

## Total Gain Data

| Freq(Hz)  | 24SGPol       | TotalAnt.1     | Φ(0°)Φ(7.5°)   | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°)   | Φ(90°)Φ(97.5°)   | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |                  |                  |
| Θ(0°)     | -1.46/-1.49   | -1.75/-2.02    | -2.28/-2.47    | -2.55/-2.33    | -2.16/-1.75    | -1.38/-1.09    | -0.87/-0.75    | -0.62/-0.40      | -0.02/-0.27      | 0.40/-0.41       | 0.42/-0.47       | 0.46/-0.37       | 0.09/-0.20       | -0.47/-0.78      | -1.14/-1.55      | -1.89/-2.05      | -2.12/-2.02      | -1.79/-1.51      | -1.35/-1.25      | -1.15/-1.05      | -0.90/-0.86      | -0.77/-0.82      | -1.15/-1.37      | -1.50/-1.51      |                  |                  |
| Θ(7.5°)   | -1.84/-2.26   | -2.82/-3.00    | -3.62/-3.93    | -3.98/-3.97    | -3.45/-2.86    | -2.39/-2.05    | -1.75/-1.50    | -1.38/-1.12      | -0.71/-0.33      | -0.04/-0.16      | 0.32/-0.48       | 0.55/-0.54       | 0.40/-0.08       | -0.28/-0.53      | -0.56/-0.53      | -0.47/-0.42      | -0.39/-0.38      | -0.27/-0.10      | 0.13/-0.35       | 0.53/-0.58       | 0.55/-0.44       | 0.26/-0.06       | -0.38/-0.66      | -1.00/-1.46      |                  |                  |
| Θ(15°)    | -1.50/-2.35   | -3.14/-3.53    | -3.60/-3.59    | -3.68/-3.78    | -3.73/-3.54    | -3.39/-3.16    | -2.74/-2.27    | -1.84/-1.45      | -1.03/-0.63      | -0.32/-0.00      | 0.32/-0.67       | 1.05/-1.31       | 1.43/-1.34       | 1.07/-0.80       | 0.67/-0.62       | 0.65/-0.70       | 0.67/-0.64       | 0.55/-0.55       | 0.75/-1.06       | 1.36/-1.58       | 1.70/-1.68       | 1.50/-1.13       | 0.71/-0.40       | -0.03/-0.74      |                  |                  |
| Θ(22.5°)  | -0.76/-1.48   | -2.01/-2.13    | -1.91/-1.66    | -1.65/-1.89    | -2.14/-2.35    | -2.66/-2.87    | -2.64/-2.06    | -1.41/-0.86      | -0.47/-0.30      | -0.27/-0.16      | 0.15/-0.63       | 1.11/-1.53       | 1.76/-1.76       | 1.65/-1.45       | 1.19/-0.97       | 0.86/-0.78       | 0.69/-0.63       | 0.50/-0.37       | 0.37/-0.60       | 0.97/-1.41       | 1.81/-2.00       | 1.80/-1.40       | 0.93/-0.66       | -0.41/-0.10      |                  |                  |
| Θ(30°)    | -0.44/-1.12   | -1.79/-1.95    | -1.49/-0.91    | -0.66/-0.78    | -1.07/-1.31    | -1.66/-2.08    | -2.27/-1.92    | -1.19/-0.44      | 0.04/-0.06       | -0.37/-0.86      | -0.90/-0.29      | 0.47/-1.02       | 1.17/-0.98       | 0.63/-0.18       | -0.32/-0.76      | -0.94/-0.69      | -0.68/-0.37      | -0.22/-0.31      | -0.54/-0.69      | -0.46/-0.16      | 0.86/-1.34       | 1.28/-0.80       | 0.23/-0.02       | 0.09/-0.04       |                  |                  |
| Θ(37.5°)  | -0.88/-1.89   | -2.78/-2.25    | -1.50/-0.49    | -0.05/-0.04    | -0.27/-0.52    | -0.86/-1.30    | -1.74/-1.83    | -1.32/-0.47      | 0.11/-0.00       | -0.87/-1.97      | -1.96/-0.92      | 0.05/-0.45       | 0.24/-0.50       | -1.60/-2.75      | -3.69/-4.09      | -4.08/-3.61      | -2.82/-1.83      | -0.80/-0.20      | -0.18/-0.71      | -1.20/-1.19      | 0.63/-0.18       | -0.33/-0.88      | -1.27/-0.99      | -0.38/-0.29      |                  |                  |
| Θ(45°)    | -0.61/-1.41   | -1.51/-0.86    | 0.17/-0.91     | 1.12/-0.83     | 0.25/-0.31     | -0.62/-0.74    | -0.97/-1.36    | -1.38/-0.72      | 0.04/-0.04       | -1.00/-2.65      | -3.35/-2.35      | -1.23/-0.66      | -0.62/-1.00      | -1.83/-3.16      | -4.85/-5.72      | -5.37/-4.77      | -4.33/-3.49      | -1.78/-0.21      | 0.53/-0.22       | -1.01/-2.44      | -2.79/-2.41      | -2.57/-3.00      | -2.49/-1.18      | -0.13/-0.07      |                  |                  |
| Θ(52.5°)  | 0.45/-0.36    | 0.61/-0.14     | 1.74/-2.29     | 2.22/-1.38     | 0.26/-0.70     | -1.08/-0.94    | -0.79/-1.01    | -1.11/-0.50      | 0.30/-0.44       | -0.57/-2.64      | -3.49/-2.80      | -2.25/-1.90      | -1.34/-0.84      | -0.91/-1.73      | -2.84/-3.40      | -3.05/-2.72      | -3.03/-3.07      | -1.70/-0.14      | 1.15/-1.07       | -0.29/-2.55      | -3.44/-2.96      | -3.20/-3.64      | -2.46/-0.86      | 0.19/-0.58       |                  |                  |
| Θ(60°)    | 0.95/-1.56    | 2.14/-2.35     | <b>2703.02</b> | 2.72/-1.62     | 0.41/-0.39     | -0.88/-1.07    | -1.18/-1.37    | -1.53/-1.14      | -0.37/-0.24      | -0.15/-1.43      | -2.02/-1.56      | -1.55/-1.97      | -1.62/-0.73      | -0.43/-0.88      | -1.51/-1.84      | -1.44/-0.91      | -1.08/-1.54      | -0.91/-0.47      | 1.43/-1.67       | 0.65/-1.77       | -3.23/-2.87      | -3.46/-3.66      | -2.16/-0.97      | -0.33/-0.40      |                  |                  |
| Θ(67.5°)  | 0.82/-1.65    | 2.22/-3.26     | 2.56/-2.66     | 2.08/-0.71     | -0.20/-0.19    | -0.05/-0.39    | -1.13/-1.62    | -1.58/-1.71      | -1.46/-0.90      | -1.17/-1.99      | -1.46/-0.90      | -0.98/-1.51      | -0.80/-1.04      | -0.19/-0.29      | -0.70/-0.79      | -0.38/-0.14      | 0.03/-0.68       | -0.67/-0.23      | 1.09/-1.62       | 0.77/-1.68       | -2.89/-2.33      | -2.83/-2.52      | -0.84/-0.10      | -0.32/-0.02      |                  |                  |
| Θ(75°)    | 0.27/-1.14    | 1.47/-1.31     | 1.43/-1.21     | 0.17/-1.47     | -2.16/-1.06    | -0.12/-0.11    | -0.91/-1.45    | -1.20/-1.26      | -1.76/-1.34      | -1.26/-2.54      | -2.37/-1.05      | -1.02/-1.55      | -0.82/-0.35      | 0.52/-0.19       | -0.63/-0.58      | -0.33/-0.29      | 0.38/-0.09       | -1.64/-0.56      | 0.77/-1.78       | 1.28/-1.06       | -2.35/-1.74      | -2.29/-2.39      | -1.08/-0.60      | -1.04/-0.72      |                  |                  |
| Θ(82.5°)  | -0.17/-0.97   | 1.37/-1.30     | 1.36/-0.73     | -1.14/-3.20    | -3.02/-1.07    | -0.02/-0.27    | -1.32/-2.12    | -1.89/-1.86      | -2.83/-2.22      | -1.64/-2.85      | -2.31/-1.13      | -1.46/-2.00      | -0.96/-0.16      | -0.59/-1.56      | -1.58/-1.03      | -0.47/-0.13      | -0.26/-2.33      | -2.65/-0.38      | 1.02/-1.89       | 1.20/-1.47       | -2.45/-1.68      | -2.27/-1.89      | -1.02/-1.41      | -2.60/-1.43      |                  |                  |
| Θ(90°)    | -2.05/-0.96   | -0.22/-0.03    | -0.43/-0.06    | -0.36/-5.23    | -4.94/-2.10    | -0.67/-0.87    | -1.74/-2.49    | -2.71/-2.82      | -4.90/-5.21      | -3.26/-3.63      | -3.34/-1.91      | -2.04/-2.77      | -1.89/-1.04      | -1.14/-2.42      | -2.17/-1.06      | -0.69/-0.84      | -1.79/-3.76      | -2.66/-0.56      | -0.11/-0.28      | -0.06/-2.15      | -2.51/-1.98      | -2.75/-1.61      | -0.82/-2.20      | -3.61/-2.94      |                  |                  |
| Θ(97.5°)  | -3.73/-3.08   | -1.96/-1.11    | -0.55/-1.23    | -3.76/-1.73    | -8.76/-5.10    | -3.19/-3.37    | -3.84/-3.98    | -3.49/-2.84      | -4.89/-6.40      | -4.47/-5.28      | -5.36/-3.94      | -4.34/-4.27      | -2.63/-1.50      | -2.06/-3.40      | -2.88/-1.98      | -2.54/-3.33      | -1.12/-4.84      | -1.87/-0.06      | -0.54/-0.96      | -1.24/-3.51      | -4.71/-5.05      | -5.04/-2.05      | -0.96/-2.87      | -4.96/-4.16      |                  |                  |
| Θ(105°)   | -5.82/-8.13   | -8.31/-4.79    | -7.24/-7.23    | -6.71/-6.43    | -5.71/-6.03    | -10.52/-7.72   | -5.50/-4.99    | -4.71/-5.30      | -6.78/-4.34      | -5.36/-7.04      | -4.85/-4.40      | -5.08/-4.78      | -4.62/-3.46      | -1.56/-3.02      | -0.97/-3.06      | -1.14/-4.21      | -5.00/-4.99      | -4.54/-3.97      | -1.31/-0.42      | -3.14/-4.71      | -3.33/-4.50      | -5.82/-3.25      | -2.86/-5.54      | -7.46/-5.38      |                  |                  |
| Θ(112.5°) | -6.45/-7.86   | -9.44/-8.70    | -6.60/-7.18    | -7.43/-8.06    | -7.20/-9.38    | -11.05/-10.38  | -7.36/-6.63    | -6.05/-5.44      | -5.92/-8.80      | -7.47/-6.72      | -5.04/-4.87      | -4.17/-3.20      | -1.77/-0.92      | -1.88/-4.16      | -6.29/-6.82      | -7.98/-6.56      | -4.42/-3.70      | -2.32/-2.75      | -4.93/-2.28      | -0.94/-3.62      | -7.97/-9.22      | -6.94/-4.22      | -4.46/-7.39      | -4.34/-6.71      |                  |                  |
| Θ(120°)   | -7.65/-5.80   | -4.56/-3.33    | -2.49/-2.91    | -3.79/-4.10    | -4.47/-5.61    | -7.51/-9.30    | -10.71/-15.27  | -11.06/-6.27     | -6.12/-7.75      | -7.34/-5.95      | -4.92/-4.68      | -4.62/-4.61      | -3.56/-1.83      | -1.51/-3.06      | -6.19/-8.57      | -6.85/-4.39      | -3.47/-3.62      | -3.08/-2.95      | -2.94/-1.29      | -1.43/-5.47      | -11.27/-10.37    | -8.10/-5.83      | -6.10/-7.54      | -7.80/-7.91      |                  |                  |
| Θ(127.5°) | -6.40/-6.87   | -5.88/-4.75    | -3.90/-4.18    | -4.90/-4.99    | -5.26/-6.29    | -7.04/-6.61    | -6.66/-1.01    | -14.69/-10.93    | -8.90/-8.78      | -8.26/-7.52      | -7.73/-7.02      | -4.92/-2.68      | -2.43/-3.90      | -7.87/-10.02     | -7.98/-6.41      | -6.23/-4.53      | -3.39/-2.26      | -1.82/-1.69      | -3.14/-6.02      | -5.94/-5.31      | -6.67/-7.99      | -8.15/-9.56      | -4.22/-4.70      |                  |                  |                  |
| Θ(135°)   | -6.85/-8.82   | -7.94/-7.17    | -6.19/-5.55    | -4.86/-4.08    | -3.88/-4.63    | -5.93/-6.58    | -6.78/-8.49    | -12.81/-10.71    | -7.67/-7.42      | -8.49/-10.23     | -10.80/-9.04     | -6.34/-5.21      | -4.65/-4.14      | -4.74/-6.81      | -8.07/-7.78      | -6.41/-5.69      | -5.51/-4.85      | -3.66/-2.87      | -2.72/-3.24      | -4.32/-4.32      | -2.88/-2.27      | -2.97/-3.80      | -4.12/-3.95      | -3.74/-4.76      |                  |                  |
| Θ(142.5°) | -11.72/-15.94 | -14.98/-14.13  | -11.28/-9.52   | -7.87/-6.41    | -5.74/-5.91    | -6.89/-8.04    | -9.09/-10.78   | -12.51/-10.06    | -8.81/-8.40      | -9.28/-10.60     | -10.67/-7.65     | -5.19/-4.16      | -4.22/-5.05      | -6.24/-6.58      | -5.81/-5.29      | -5.33/-5.63      | -5.86/-5.49      | -4.68/-4.11      | -4.24/-5.18      | -6.11/-4.99      | -3.37/-2.90      | -3.73/-4.86      | -5.85/-6.92      | -8.00/-9.30      |                  |                  |
| Θ(150°)   | -11.58/-11.03 | -12.03/-13.71  | -16.02/-14.95  | -16.20/-16.54  | -13.80/-12.42  | -11.49/-11.36  | -12.12/-13.08  | -15.17/-14.44    | -14.52/-11.07    | -9.94/-9.55      | -9.56/-9.14      | -8.07/-6.78      | -6.39/-6.68      | -7.02/-6.87      | -6.63/-6.87      | -7.12/-6.78      | -5.81/-4.72      | -3.97/-3.87      | -4.41/-5.26      | -5.66/-6.12      | -4.61/-5.01      | -6.66/-6.18      | -11.74/-12.68    | -12.93/-12.13    |                  |                  |
| Θ(157.5°) | -7.64/-7.53   | -7.44/-7.35    | -7.41/-8.11    | -9.64/-12.17   | -15.02/-14.87  | -14.63/-13.80  | -14.00/-14.07  | -12.88/-13.61    | -12.93/-11.03    | -6.84/-8.58      | -9.31/-10.33     | -10.61/-9.67     | -8.85/-8.10      | -7.75/-7.44      | -8.22/-8.53      | -7.65/-6.23      | -4.98/-4.25      | -1.48/-1.71      | -5.45/-5.87      | -6.00/-6.12      | -4.45/-5.72      | -9.23/-10.34     | -10.72/-9.59     | -8.13/-8.22      |                  |                  |
| Θ(165°)   | -8.03/-7.71   | -7.51/-7.14    | -6.70/-6.61    | -7.00/-7.81    | -8.54/-9.13    | -9.69/-10.11   | -10.22/-9.73   | -8.98/-8.15      | -7.32/-6.76      | -6.42/-6.47      | -6.91/-7.37      | -7.82/-8.46      | -8.13/-9.50      | -9.42/-9.16      | -8.89/-8.13      | -7.13/-6.36      | -6.01/-6.06      | -6.49/-7.09      | -7.60/-8.30      | -8.91/-9.62      | -10.54/-11.61    | -12.43/-11.71    | -10.99/-10.28    | -9.58/-8.84      |                  |                  |
| Θ(172.5°) | -12.39/-11.17 | -10.38/-9.50   | -9.32/-8.65    | -8.19/-8.66    | -7.84/-7.62    | -7.46/-7.23    | -7.20/-6.97    | -6.64/-6.22      | -5.72/-5.49      | -5.38/-5.42      | -4.84/-5.94      | -6.66/-7.34      | -7.74/-7.51      | -7.23/-7.16      | -7.23/-7.58      | -8.22/-8.80      | -9.21/-9.65      | -10.78/-11.69    | -12.98/-13.96    | -14.88/-15.55    | -14.62/-14.57    | -14.77/-15.03    | -10.77/-14.08    | -10.94/-9.99     |                  |                  |
| Θ(180°)   | -9.39/-9.13   | -9.07/-8.71    | -8.39/-8.18    | -7.16/-6.71    | -6.71/-6.49    | -6.46/-6.28    | -6.20/-6.00    | -6.13/-5.91      | -5.87/-6.11      | -6.39/-6.58      | -6.65/-6.66      | -5.85/-5.77      | -8.00/-8.46      | -8.28/-8.73      | -9.35/-9.76      | -9.89/-9.92      | -9.75/-9.50      | -10.20/-10.69    | -12.09/-12.94    | -13.87/-12.47    | -11.03/-11.05    | -10.67/-14.77    | -10.74/-9.99     |                  |                  |                  |
| Freq(Hz)  | 5.2GPol       | TotalAnt.1     | Φ(0°)Φ(7.5°)   | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°)   | Φ(90°)Φ(97.5°)   | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |                  |                  |
| Θ(0°)     | -6.07/-6.62   | -7.04/-7.61    | -7.16/-6.87    | -7.05/-7.07    | -6.59/-6.82    | -7.00/-6.85    | -6.70/-6.67    | -7.14/-7.34      | -7.69/-7.67      | -7.59/-7.62      | -7.76/-7.75      | -6.78/-7.25      | -7.27/-7.38      | -7.69/-7.61      | -7.42/-7.52      | -7.61/-7.43      | -6.44/-6.72      | -6.86/-6.49      | -6.03/-6.01      | -5.94/-6.32      | -6.61/-6.44      | -5.95/-6.51      | -6.31/-6.45      | -5.50/-5.79      |                  |                  |
| Θ(7.5°)   | -7.19/-7.36   | -7.83/-8.13    | -7.52/-7.30    | -7.03/-6.86    | -6.48/-5.92    | -5.82/-5.68    | -5.46/-5.08    | -5.47/-5.87      | -5.82/-5.97      | -5.94/-5.57      | -5.45/-5.94      | -5.92/-6.12      | -6.02/-5.81      | -6.83/-7.58      | -7.02/-7.19      | -7.42/-7.60      | -7.85/-7.84      | -8.37/-8.22      | -7.40/-6.73      | -6.22/-6.32      | -6.82/-6.99      | -6.67/-6.38      | -6.03/-5.99      | -6.58/-7.71      |                  |                  |
| Θ(15°)    | -8.78/-10.75  | -11.31/-10.94  | -12.21/-13.56  | -12.52/-12.42  | -12.07/-12.09  | -11.65/-9.26   | -6.39/-4.36    | -3.71/-4.72      | -4.94/-6.18      | -6.66/-6.00      | -5.13/-4.24      | -3.65/-4.08      | -4.78/-4.88      | -5.85/-6.63      | -5.71/-4.97      | -4.29/-4.03      | -4.23/-4.22      | -4.21/-3.08      | -2.50/-2.49      | -2.50/-2.83      | -4.00/-5.41      | -6.68/-7.17      | -7.34/-7.68      | -7.39/-8.11      |                  |                  |
| Θ(22.5°)  | -8.02/-8.95   | -10.30/-10.33  | -9.92/-11.91   | -15.64/-15.01  | -14.62/-12.70  | -11.66/-11.95  | -9.91/-6.11    | -3.73/-2.97      | -4.52/-7.64      | -7.62/-6.70      | -7.25/-7.12      | -1.63/-2.09      | -2.70/-2.93      | -3.60/-3.85      | -4.13/-2.98      | -1.99/-1.43      | -0.71/-0.11      | -0.19/-0.09      | 0.74/-1.39       | 1.13/-0.43       | -0.71/-1.86      | -2.96/-4.64      | -6.56/-7.59      | -7.50/-7.55      |                  |                  |
| Θ(30°)    | -11.91/-8.23  | -10.24/-10.70  | -7.99/-6.68    | -7.94/-8.66    | -9.83/-12.07   | -13.48/-9.70   | -7.85/-7.17    | -5.25/-3.30      | -3.70/-5.41      | -4.49/-2.57      | -1.79/-1.47      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |



# Antenna Pattern of 2.4GHz and 5GHz

# Appendix D

|           |               |                |                |                |                |                |                |                  |                  |                  |                  |                   |                  |                  |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|-------------------|------------------|------------------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Θ(22.5°)  | -10.59/-8.51  | -7.70/-7.80    | -8.17/-8.26    | -8.75/-10.08   | -11.74/-12.28  | -12.90/-12.81  | -11.42/-10.68  | -9.30/-8.47      | -6.49/-4.18      | -3.11/-3.03      | -3.91/-4.83      | -5.53/-6.88       | -6.83/-5.03      | -2.85/-1.62      | -0.31/0.13        | -1.08/-2.53      | -2.51/-2.89      | -4.54/-4.63      | -2.68/-1.75      | -2.36/-3.50      | -5.04/-7.38      | -9.78/-8.98      | -7.14/-7.76      | -10.89/-14.32    |
| Θ(30°)    | -11.56/-6.83  | -4.47/-5.09    | -6.48/-6.46    | -7.20/-8.78    | -9.80/-9.05    | -9.04/-11.35   | -9.22/-9.26    | -11.91/-11.79    | -7.35/-1.57      | -6.82/-8.38      | -4.29/-1.90      | -1.96/-2.96       | -2.58/-0.84      | 0.62/-1.35       | 2.12/2.20         | 1.81/-1.37       | 0.69/-0.34       | -1.87/-2.04      | -0.33/-0.59      | 0.41/-0.66       | -0.53/-0.70      | -1.68/-2.39      | -3.55/-5.56      | -7.98/-11.76     |
| Θ(142.5°) | -9.88/-8.79   | -5.99/-8.42    | -6.55/-2.87    | -3.13/-7.06    | -11.34/-8.35   | -4.89/-7.55    | -4.96/-6.77    | -8.91/-5.43      | -4.23/-3.45      | -4.80/-3.47      | -1.00/-0.80      | 0.38/0.16         | -0.50/-0.36      | 1.30/-1.87       | 1.80/-1.88        | 2.27/-7.3        | 2.85/-1.32       | -0.53/-0.89      | 0.30/-1.08       | 0.77/-0.54       | 0.40/0.81        | -1.81/-2.23      | -2.85/-6.40      | -5.44/-7.07      |
| Θ(45°)    | -3.77/-4.36   | -9.41/-11.33   | -9.66/-5.27    | -5.02/-10.78   | -10.88/-6.87   | -4.85/-2.71    | -1.30/-3.42    | -4.11/-2.05      | -2.28/-1.51      | -0.43/-1.07      | 1.97/-1.21       | 0.90/-1.20        | -0.22/-0.26      | 2.45/3.74        | 3.02/3.35         | 3.70/2.39        | 2.15/2.34        | 2.01/0.34        | 0.95/2.26        | 1.48/-0.16       | 0.18/0.44        | -3.87/-3.74      | -0.41/-3.21      | -5.25/-5.05      |
| Θ(52.5°)  | 0.36/-1.56    | -2.09/-4.11    | -8.68/-7.02    | -8.57/-8.70    | -5.24/-2.26    | -1.92/-8.02    | -0.30/-2.14    | -1.22/-1.30      | 1.48/-1.17       | 1.21/-1.55       | 1.68/-2.22       | 2.49/-1.09        | -0.89/-0.29      | 2.22/-4.2        | 2.96/-3.64        | 2.63/-1.40       | 1.59/-1.92       | 2.18/-1.26       | 1.67/-2.25       | 1.92/-0.29       | -0.50/-0.59      | -3.51/-0.68      | -0.09/-2.13      | -0.82/-2.13      |
| Θ(60°)    | 0.20/-1.22    | -2.14/-3.01    | -6.65/-7.46    | -10.45/-8.51   | -5.10/-4.65    | -0.48/-1.72    | -2.59/-5.43    | -4.76/-1.00      | 1.55/-1.84       | 1.49/-1.33       | 0.32/-1.05       | -2.00/-0.13       | -0.91/-1.00      | 0.95/-2.56       | <b>4.29/-4.90</b> | 2.46/-0.80       | 1.51/2.67        | 3.35/-4.25       | 3.01/0.79        | -2.80/-2.47      | -1.89/-1.95      | -3.74/-1.13      | 0.96/-0.95       |                  |
| Θ(67.5°)  | -1.48/0.23    | -1.23/-0.94    | -4.34/-6.93    | -10.69/-6.24   | -2.13/-1.06    | 0.55/-1.65     | -8.26/-7.31    | -8.10/-1.43      | -0.65/0.74       | 1.41/0.60        | -0.08/0.94       | 2.17/0.50         | 0.51/-0.21       | 1.12/2.68        | 4.56/-1.49        | 0.98/-1.98       | 1.14/2.55        | 3.77/3.31        | 3.43/3.28        | 3.04/0.75        | -2.65/-1.67      | -1.52/-4.07      | -8.58/-0.74      | -0.11/-2.55      |
| Θ(75°)    | -4.24/0.04    | -0.93/-0.32    | -2.57/-3.63    | -5.72/-3.61    | 0.55/-1.56     | -1.10/-1.83    | -9.30/-5.26    | -7.36/-1.02      | -1.65/-0.32      | 0.64/0.09        | -0.29/-0.55      | 2.40/-1.54        | 2.36/0.44        | 0.91/0.51        | 3.01/3.14         | -1.07/-2.92      | -0.50/-1.47      | 3.60/-4.54       | 3.64/-3.11       | 2.86/-0.98       | -1.18/-1.24      | -1.92/-5.68      | -5.36/-0.90      | -1.51/-2.74      |
| Θ(82.5°)  | -5.61/-0.38   | -3.04/-1.49    | -5.08/-3.60    | -3.00/-2.71    | 1.14/-1.39     | -3.02/-2.07    | -9.33/-4.40    | -6.04/-0.15      | -1.88/-1.65      | -0.24/-0.62      | -1.15/-0.17      | 1.73/-1.69        | 2.71/-0.32       | 1.24/-1.66       | 2.18/-1.14        | -5.18/-5.44      | -2.30/-1.12      | 1.13/-1.20       | 2.48/-2.51       | 1.67/-0.28       | -1.13/-1.29      | -4.71/-5.07      | -4.36/-2.69      | -3.15/-3.32      |
| Θ(90°)    | -7.05/-3.16   | -4.36/-3.46    | -11.29/-6.78   | -3.38/-3.73    | -0.11/-0.49    | -6.04/-5.32    | -7.61/-4.72    | -5.55/0.20       | -2.56/-3.10      | -2.10/-1.21      | -0.77/-1.53      | 0.95/0.28         | 2.63/-0.80       | 0.28/-1.73       | 0.73/-0.01        | -5.16/-6.03      | -7.59/-0.67      | 0.20/-1.78       | 0.66/0.30        | -0.56/-0.98      | -1.68/-1.41      | -5.97/-6.14      | -4.88/-3.41      | -8.01/-4.92      |
| Θ(97.5°)  | -8.61/-4.36   | -3.51/-4.62    | -15.15/-9.46   | -5.02/-4.22    | -1.80/-2.56    | -8.20/-8.01    | -6.41/-3.75    | -5.11/-0.97      | -3.39/-4.07      | -2.90/-2.20      | -1.36/-2.39      | -0.60/-0.59       | 1.30/-3.82       | -1.04/-3.67      | -0.44/-0.38       | -4.72/-7.64      | -8.17/-1.37      | -2.73/-1.87      | -2.80/-2.91      | -3.39/-3.13      | -6.53/-10.16     | -9.47/-6.07      | -9.20/-6.33      |                  |
| Θ(105°)   | -10.92/-7.52  | -4.45/-6.91    | -14.41/-8.51   | -14.01/-5.58   | -3.54/-4.37    | -13.40/-8.89   | -7.03/-6.60    | -5.67/-2.90      | -5.03/-5.05      | -5.41/-3.96      | -3.10/-2.60      | -2.57/-2.42       | -1.34/-5.06      | -5.01/-3.83      | -3.00/-2.09       | -3.33/-7.04      | -7.11/-2.20      | -3.56/-4.76      | -6.42/-7.56      | -3.62/-4.85      | -7.13/-3.96      | -6.73/-9.04      | -8.42/-7.86      | -10.29/-8.24     |
| Θ(112.5°) | -7.85/-5.57   | -7.87/-9.64    | -10.77/-10.29  | -8.41/-5.62    | -6.20/-9.38    | -11.88/-7.68   | -8.24/-6.29    | -6.54/-4.06      | -6.08/-6.33      | -6.75/-5.48      | -4.31/-4.11      | -4.27/-4.96       | -4.67/-12.05     | -7.06/-4.95      | -5.10/-3.86       | -4.14/-8.92      | -5.86/-6.13      | 4.43/-4.25       | -4.41/-7.86      | -3.78/-4.96      | -5.64/-6.14      | -4.75/-8.58      | -11.02/-11.32    | -9.95/-7.97      |
| Θ(120°)   | -7.21/-9.70   | -9.41/-8.44    | -11.05/-14.95  | -7.93/-4.49    | -6.34/-12.78   | -14.39/-11.95  | -9.06/-12.82   | -9.54/-8.11      | -9.64/-12.13     | -9.51/-8.32      | -6.39/-7.51      | -11.77/-6.39      | -5.65/-4.97      | -5.11/-8.81      | -9.27/-11.07      | -5.69/-5.20      | -5.08/-8.09      | -5.25/-5.94      | -7.25/-8.10      | -8.00/-9.20      | -1.74/-12.24     | -8.00/-9.20      | -11.06/-10.07    | -11.06/-10.07    |
| Θ(127.5°) | -12.67/-10.31 | -9.13/-12.01   | -12.14/-14.40  | -6.36/-4.21    | -10.59/-7.47   | -12.40/-10.69  | -10.19/-10.37  | -11.66/-10.32    | -11.62/-8.50     | -8.00/-6.56      | -6.63/-9.59      | -7.04/-9.45       | -12.06/-6.38     | -6.37/-10.73     | -3.74/-10.69      | -7.55/-10.80     | -7.04/-4.58      | -6.13/-4.21      | -7.88/-8.62      | -10.05/-6.52     | -10.80/-14.43    | -10.79/-14.82    |                  |                  |
| Θ(135°)   | -8.73/-7.96   | -9.57/-10.13   | -8.09/-8.60    | -6.21/-9.90    | -13.99/-8.94   | -13.86/-13.61  | -16.03/-11.27  | -14.88/-15.07    | -12.73/-10.27    | -8.78/-10.98     | -10.20/-5.36     | -11.50/-12.71     | -11.69/-10.95    | -13.29/-11.66    | -6.62/-2.92       | -3.00/-10.51     | -9.84/-6.37      | -7.83/-6.25      | -9.28/-14.66     | -7.65/-3.31      | -3.32/-7.64      | -15.35/-4.47     | -5.46/-10.07     | -8.40/-8.03      |
| Θ(142.5°) | -6.74/-9.00   | -11.74/-8.74   | -7.91/-13.37   | -10.18/-13.80  | -13.70/-14.70  | -11.86/-11.13  | -13.47/-9.57   | -12.83/-13.28    | -11.73/-10.28    | -8.15/-4.67      | -8.04/-10.51     | -7.86/-8.04       | -8.98/-6.42      | -9.15/-8.48      | -7.37/-3.55       | -4.88/-9.82      | -11.19/-7.75     | -5.09/-6.33      | -10.06/-12.65    | -14.44/-6.89     | -4.39/-8.99      | -7.14/-12.72     | -13.06/-10.35    | -10.99/-13.10    |
| Θ(150°)   | -15.74/-10.98 | -10.03/-9.87   | -8.50/-9.21    | -11.07/-12.96  | -13.37/-15.59  | -12.29/-12.14  | -11.02/-10.75  | -11.34/-9.41     | -8.77/-8.31      | -8.49/-10.24     | -6.28/-7.94      | -6.42/-6.65       | -7.83/-10.24     | -4.93/-4.52      | -6.54/-9.42       | -9.31/-9.32      | -5.09/-9.17      | -11.46/-9.69     | -10.08/-10.36    | -8.60/-11.38     | -15.44/-15.32    | -15.48/-10.46    | -7.35/-11.41     |                  |
| Θ(157.5°) | -12.51/-12.65 | -13.65/-14.95  | -14.49/-12.54  | -10.43/-12.62  | -15.16/-12.69  | -10.69/-11.21  | -13.35/-11.31  | -7.95/-7.20      | -8.65/-8.26      | -7.02/-7.89      | -10.05/-8.92     | -8.06/-9.42       | -10.71/-12.65    | -9.49/-9.92      | -11.22/-11.45     | -10.74/-7.60     | -7.80/-7.42      | -6.79/-8.84      | -10.96/-10.16    | -9.88/-10.24     | -8.90/-9.70      | -9.85/-9.95      | -10.92/-11.53    | -11.69/-12.18    |
| Θ(165°)   | -10.80/-11.27 | -13.56/-13.81  | -13.11/-15.43  | -13.94/-11.29  | -9.38/-8.86    | -9.07/-10.89   | -14.62/-13.60  | -10.90/-10.78    | -12.66/-12.79    | -11.20/-9.48     | -8.78/-6.82      | -10.68/-12.91     | -13.52/-13.87    | -11.58/-9.24     | -9.06/-8.90       | -8.20/-9.49      | -10.72/-7.82     | -5.56/-7.82      | -10.57/-11.94    | -13.93/-13.45    | -10.98/-11.20    | -11.33/-11.35    | -13.16/-14.61    | -14.13/-11.59    |
| Θ(172.5°) | -11.88/-11.61 | -10.33/-9.67   | -8.80/-7.92    | -7.75/-8.08    | -8.90/-9.79    | -10.13/-10.31  | -9.28/-8.51    | -8.06/-7.62      | -7.07/-7.31      | -8.30/-10.52     | -10.82/-11.28    | -11.68/-11.34     | -11.70/-11.01    | -9.87/-9.64      | -8.70/-8.42       | -7.61/-6.79      | -6.73/-7.37      | -8.09/-8.59      | -9.34/-9.57      | -10.24/-11.12    | -10.92/-10.09    | -10.23/-10.83    | -12.99/-13.54    | -13.15/-12.02    |
| Θ(180°)   | -13.81/-14.79 | -14.48/-13.94  | -15.89/-14.47  | -14.30/-13.64  | -14.10/-13.96  | -12.92/-12.57  | -12.76/-13.16  | -13.53/-13.52    | -12.88/-13.85    | -13.62/-13.90    | -13.84/-13.29    | -11.57/-10.28     | -12.94/-12.99    | -13.48/-12.82    | -11.94/-12.33     | -13.41/-13.01    | -12.86/-14.07    | -15.41/-15.03    | -15.12/-15.29    | -15.26/-15.31    | -15.32/-15.47    | -14.92/-14.82    |                  |                  |
| Freq(Hz)  | 2.45GPol      | TotalAnt.2     | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                 | -                | -                | -                 | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°)  | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°)  | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | -0.93/-1.19   | -1.61/-1.95    | -2.11/-2.03    | -1.90/-1.89    | -1.98/-2.28    | -2.54/-2.75    | -2.68/-2.12    | -1.28/-0.61      | -0.34/-0.37      | -0.50/-0.56      | -0.50/-0.50      | -0.75/-1.08       | -1.42/-1.57      | -1.65/-1.75      | -1.97/-2.30       | -2.61/-2.85      | -2.91/-2.74      | -2.28/-1.89      | -1.70/-1.63      | -1.56/-1.34      | -1.02/-0.79      | -0.73/-0.86      | -0.99/-1.08      | -1.02/-0.89      |
| Θ(7.5°)   | 0.25/0.21     | -0.09/-0.60    | -1.20/-1.63    | -1.80/-1.79    | -1.57/-1.52    | -1.67/-1.99    | -2.19/-2.02    | -1.45/-0.77      | -0.37/-0.24      | -0.23/-0.15      | 0.04/0.13        | 0.04/-0.18        | -0.43/-0.65      | -0.86/-1.08      | -1.32/-1.52       | -1.72/-1.96      | -2.09/-2.21      | -2.15/-1.86      | -1.38/-0.97      | -0.68/-0.42      | -0.09/-0.20      | 0.38/0.37        | 0.22/0.06        | -0.01/-0.11      |
| Θ(15°)    | 1.68/-1.73    | 1.56/-1.21     | 0.73/0.20      | -0.27/-0.60    | -0.59/-0.42    | -0.36/-0.40    | -0.42/-0.32    | 0.04/0.56        | 0.92/-0.14       | 1.04/-1.12       | 1.34/-1.45       | 1.46/-1.46        | 1.41/-1.33       | 1.14/0.81        | 0.36/-0.12        | -0.57/-0.88      | -1.17/-1.31      | -1.42/-1.54      | -1.30/-0.64      | 0.13/0.72        | 1.07/-1.38       | 1.64/-1.78       | 1.68/-1.51       | 1.42/-1.53       |
| Θ(22.5°)  | 1.94/-1.92    | 1.75/-1.50     | 1.27/-1.01     | 0.70/0.30      | -0.04/-0.19    | -0.23/-0.17    | 0.03/0.35      | 0.85/-1.46       | 1.95/-2.18       | 2.21/-2.22       | 2.24/-2.19       | 2.16/-2.14        | 2.12/-2.02       | 1.76/-1.29       | 0.64/-0.06        | -0.60/-1.20      | -1.48/-1.49      | -1.44/-1.52      | -1.50/-0.89      | 0.14/-1.06       | 1.56/-1.78       | 1.95/-2.04       | 2.04/-1.90       | 1.79/-1.84       |
| Θ(30°)    | 1.16/-1.09    | 0.83/0.60      | 0.58/0.77      | 0.92/0.77      | 0.32/-0.35     | -0.94/-1.05    | -0.87/-0.34    | 0.39/-1.19       | 1.98/-2.53       | 2.72/-2.63       | 2.42/-2.27       | 2.25/-2.18        | 2.03/-1.86       | 1.59/-1.10       | 0.29/-0.50        | -1.16/-1.61      | -1.81/-1.67      | -1.48/-1.43      | -1.44/-0.99      | 0.02/-1.03       | 1.49/-1.37       | 1.13/-1.08       | 1.09/-1.04       | 0.99/-1.08       |
| Θ(37.5°)  | 0.40/0.34     | -0.04/-0.41    | -0.33/0.24     | 0.82/-1.02     | 0.64/-0.34     | -1.66/-2.47    | -2.40/-1.66    | -0.73/0.26       | 1.35/-2.20       | 2.52/-2.36       | 2.13/-2.21       | 2.34/-2.12        | 1.76/-1.46       | 1.25/0.96        | 0.54/0.09         | -0.38/-0.74      | -0.96/-1.03      | -1.01/-1.04      | -1.05/-0.50      | 0.57/-1.43       | 1.49/0.69        | -0.63/-1.24      | -1.17/-0.79      | -0.32/0.16       |
| Θ(45°)    | -0.06/0.13    | 0.03/-0.27     | -0.36/-0.01    | 0.53/0.91      | 0.73/-0.24     | -2.00/-3.57    | -3.43/-2.28    | -1.52/-1.13      | -0.04/-0.19      | 1.75/-1.64       | 1.57/-1.25       | 2.58/-2.34        | 1.61/-1.00       | 0.85/-1.06       | 1.28/-1.28        | 0.30/-0.70       | 0.37/0.05        | -0.41/-0.80      | -0.80/-0.08      | 1.21/-2.13       | 2.02/0.71        | -1.68/-3.76      | -3.76/-2.56      | -1.40/-0.51      |
| Θ(52.5°)  | -0.38/-1.00   | 0.37/0.34      | 0.02/-0.34     | -0.24/0.41     | 0.83/0.51      | -0.97/-3.08    | -3.31/-1.88    | -1.19/-1.53      | -1.21/0.27       | 1.11/0.93        | 1.21/-2.34       | <b>2.91/-2.40</b> | 1.30/0.38        | 0.32/0.79        | 1.29/-1.52        | 1.64/-1.69       | 1.69/-1.34       | 0.28/-0.96       | -0.90/-0.25      | 1.62/-2.43       | 2.26/0.79        | -1.99/-4.52      | -4.33/-2.95      | -1.77/-0.95      |
| Θ(60°)    | -0.41/0.19    | 0.71/0.82      | 0.23/-0.97     | -1.70/-0.90    | 0.28/0.63      | -0.38/-2.16    | -2.80/-1.68    | -0.83/-0.95      | -1.18/-0.42      | 0.43/0.41        | 0.51/-1.73       | 2.62/-2.45        | 1.53/0.35        | -0.57/-0.47      | 0.08/0.62         | 1.41/-2.00       | 2.36/-2.40       | 1.41/-0.57       | -1.12/0.04       | 1.34/-1.95       | 1.63/0.11        | -2.75/-4.96      | -4.00/-2.61      | -1.82/-1.13      |
| Θ(67.5°)  | -0.96/-0.27   | 0.33/0.62      | 0.02/-1.41     | -2.47/-1.39    | 0.32/0.96      | 0.09/-1.79     | -2.82/-2.33    | -1.62/-1.24      | -0.97/-0.29      | 0.37/0.27        | 0.40/-0.66       | 2.51/-2.37        | 1.55/-0.11       | -1.22/-1.28      | 1.01/-0.71        | 0.56/-1.40       | 1.97/-2.36       | 1.63/-0.21       | -0.72/0.21       | 1.00/-1.29       | 1.47/-1.15       | -1.45/-6.21      | -3.98/-2.33      | -1.88/-1.70      |
| Θ(75°)    | -1.82/-0.91   | -0.10/0.31     | -0.17/-1.58    | -2.78/-2.15    | -0.31/0.63     | 0.12/-1.53     | -3.10/-3.36    | -3.00/-2.35      | -1.56/-0.83      | -0.31/-0.46      | -0.66/0.67       | 1.86/-1.93        |                  |                  |                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |

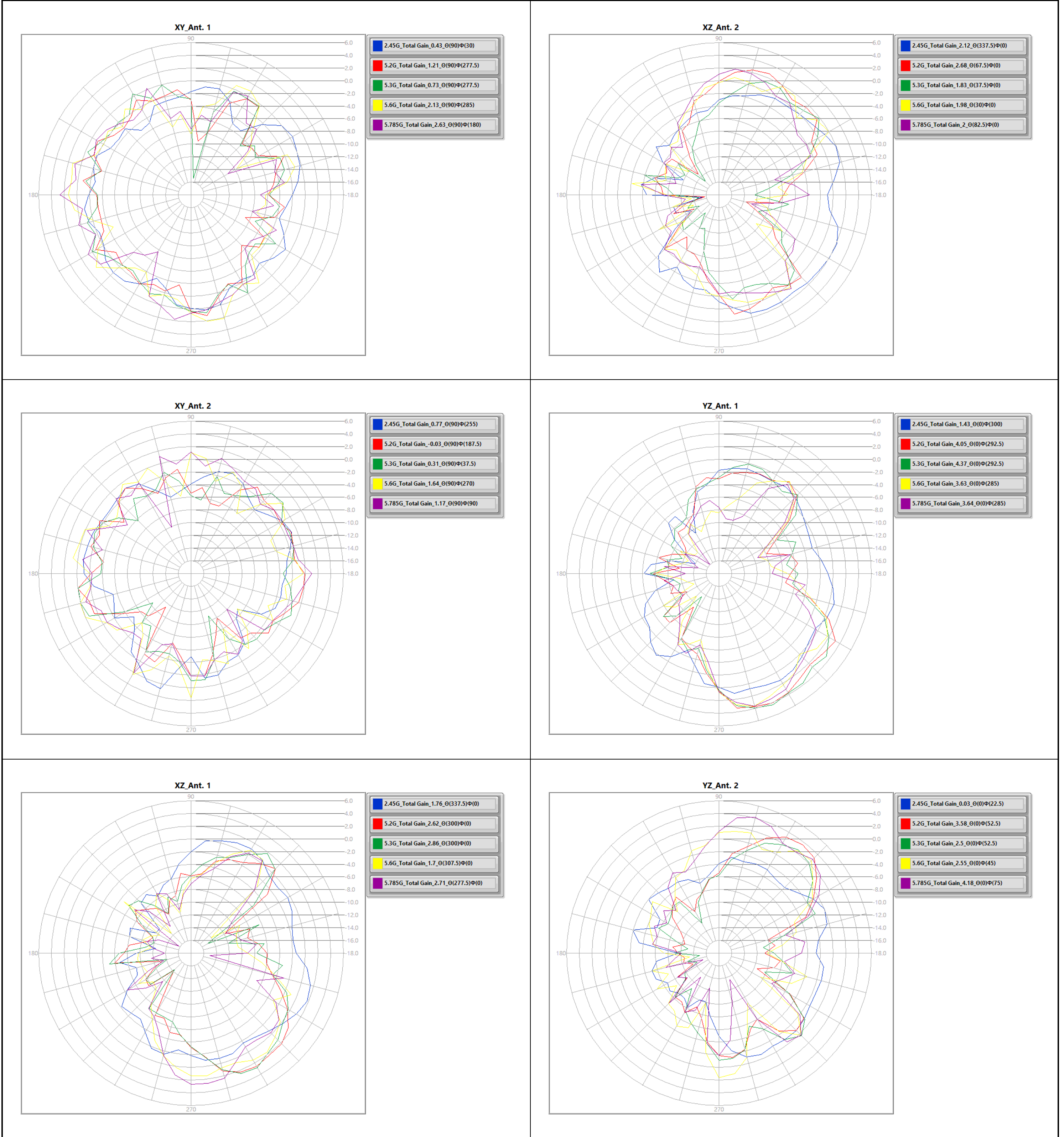


Antenna Pattern of 2.4GHz and 5GHz

Appendix D

|            |               |                |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Θ (75°)    | 0.36/0.06     | -1.60/-0.93    | 1.83/2.22      | 0.14/-0.54     | 1.47/0.99      | -0.78/2.02     | 1.65/-5.01     | 0.13/2.20        | 1.02/1.83        | 0.36/-0.08       | -2.89/-1.05      | -1.63/-1.08      | -0.48/-0.23      | 3.12/4.81        | 2.64/-3.44       | -9.86/-1.86      | 0.02/-1.96       | -9.91/-0.13      | -0.98/-5.08      | -5.60/-0.30      | -3.01/-2.24      | -4.85/-3.42      | -1.71/-1.19      | -0.88/-2.39      |
| Θ (82.5°)  | 0.69/-0.27    | -2.87/-3.72    | 0.06/0.60      | -1.31/-3.23    | -0.06/0.89     | -1.06/-1.12    | 1.30/-7.18     | -0.77/-1.49      | -0.79/1.06       | -1.00/-3.12      | -3.22/0.52       | 0.03/0.14        | -1.27/-0.18      | 1.96/3.22        | 0.91/-2.62       | -9.02/-2.02      | 1.33/-1.51       | -6.29/0.57       | 1.08/-3.91       | -3.59/-0.39      | -5.59/-3.48      | -4.23/-4.86      | -2.77/-4.06      | -1.63/-2.20      |
| Θ (90°)    | -0.31/-1.40   | -4.23/-4.41    | -0.91/0.14     | -2.57/-6.15    | -2.09/-0.71    | -2.97/0.26     | 1.02/-5.72     | -3.32/-0.08      | -1.38/-0.26      | -2.05/-3.32      | -3.06/0.07       | 0.22/0.71        | -2.01/-1.94      | 0.06/-0.02       | -2.61/-3.30      | -7.04/-5.60      | 0.38/-1.60       | -4.52/-3.28      | 1.64/-4.29       | -3.82/-2.62      | -7.96/-3.14      | -5.49/-8.83      | -3.07/-4.89      | -2.38/-3.11      |
| Θ (97.5°)  | -1.00/-3.17   | -6.44/-6.54    | -2.55/-2.01    | -3.95/-6.92    | -3.11/-2.47    | -4.97/-1.93    | -0.91/-5.48    | -5.57/-0.94      | -1.70/-1.49      | -3.80/-4.46      | -4.15/-0.55      | -1.32/-0.99      | -2.42/-1.23      | -0.57/-2.41      | -4.99/-3.69      | -5.24/-10.93     | -2.08/-3.01      | -5.71/-3.81      | -2.16/-6.04      | -4.48/-4.68      | -9.63/-4.27      | -7.12/-8.53      | -5.33/-5.06      | -3.24/-2.18      |
| Θ (105°)   | -3.19/-3.70   | -6.82/-6.33    | -3.92/-3.78    | -5.83/-9.54    | -5.36/-4.21    | -6.87/-2.80    | -1.27/-6.83    | -5.75/-2.59      | -3.96/-1.65      | -2.57/-7.20      | -6.11/-2.49      | -2.16/-1.86      | -4.81/-4.72      | -1.48/-2.35      | -7.89/-8.42      | -5.27/-7.45      | -7.11/-6.61      | -12.01/-5.51     | -9.94/-7.72      | -9.41/-9.76      | -11.10/-5.37     | -5.93/-9.42      | -4.73/-7.68      | -3.47/-2.65      |
| Θ (112.5°) | -4.05/-6.55   | -7.16/-7.07    | -6.18/-4.35    | -4.96/-8.05    | -5.24/-4.84    | -5.91/-3.09    | -3.86/-6.62    | -6.43/-3.92      | -4.92/-2.43      | -3.91/-9.91      | -7.60/-3.97      | -4.19/-3.31      | -5.54/-10.25     | -3.98/-2.90      | -6.47/-13.37     | -4.83/-6.55      | -10.25/-5.52     | -10.58/-4.76     | -5.30/-9.84      | -8.08/-14.92     | -9.13/-8.40      | -8.62/-10.14     | -7.14/-3.71      | -6.36/-3.39      |
| Θ (120°)   | -5.53/-9.31   | -9.58/-9.14    | -6.50/-4.14    | -7.23/-6.88    | -3.25/-4.21    | -6.01/-2.81    | -4.32/-7.61    | -8.49/-6.98      | -6.09/-5.15      | -3.89/-7.39      | -13.14/-7.69     | -6.36/-3.57      | -6.13/-10.10     | -8.03/-6.75      | -3.44/-9.25      | -9.82/-6.09      | -12.12/-5.57     | -12.10/-8.48     | -4.71/-9.14      | -12.54/-15.09    | -8.36/-6.60      | -10.85/-6.28     | -7.68/-4.82      | -5.73/-7.76      |
| Θ (127.5°) | -7.44/-9.79   | -8.81/-6.46    | -6.24/-7.77    | -8.26/-4.18    | -4.21/-6.98    | -6.54/-4.17    | -6.70/-8.07    | -13.68/-6.18     | -4.56/-10.94     | -5.99/-5.04      | -10.03/-13.44    | -7.68/-6.42      | -7.04/-10.24     | -13.93/-9.45     | -10.99/-12.16    | -11.11/-6.96     | -11.11/-12.33    | -9.80/-6.65      | -6.52/-11.74     | -10.48/-8.59     | -9.39/-7.79      | -5.42/-9.22      | -7.19/-7.03      | -8.95/-6.11      |
| Θ (135°)   | -6.98/-8.72   | -9.18/-8.66    | -9.48/-8.26    | -4.63/-3.64    | -6.21/-7.13    | -4.94/-5.73    | -8.72/-5.96    | -11.93/-9.02     | -6.30/-9.04      | -6.86/-7.58      | -7.24/-9.59      | -8.46/-6.11      | -5.91/-7.45      | -7.10/-6.16      | -5.98/-6.04      | -12.43/-9.62     | -10.65/-15.80    | -10.11/-8.52     | -6.76/-10.92     | -6.91/-11.69     | -7.41/-10.02     | -6.81/-7.30      | -13.20/-7.11     | -7.93/-8.84      |
| Θ (142.5°) | -12.05/-10.17 | -10.76/-8.15   | -4.62/-3.20    | -3.50/-3.92    | -4.41/-4.51    | -4.47/-5.37    | -4.75/-4.41    | -10.08/-8.22     | -7.55/-11.42     | -8.12/-8.32      | -9.12/-9.52      | -8.79/-10.24     | -11.30/-7.18     | -7.55/-9.32      | -9.04/-6.42      | -10.54/-12.56    | -11.23/-15.05    | -10.55/-10.75    | -9.57/-14.10     | -13.84/-12.21    | -10.73/-9.01     | -13.91/-10.71    | -9.07/-13.02     | -14.44/-12.85    |
| Θ (150°)   | -8.41/-8.10   | -8.21/-6.43    | -5.87/-6.57    | -6.51/-6.16    | -5.76/-5.42    | -6.23/-7.82    | -5.67/-5.18    | -10.10/-10.63    | -7.96/-11.19     | -15.55/-9.64     | -8.30/-10.65     | -9.71/-7.06      | -7.05/-9.52      | -12.35/-12.09    | -10.07/-12.95    | -14.80/-15.17    | -9.07/-8.07      | -11.30/-11.78    | -6.74/-10.62     | -11.91/-8.93     | -14.49/-12.23    | -9.69/-13.01     | -13.25/-11.69    | -10.52/-8.89     |
| Θ (157.5°) | -8.87/-7.31   | -7.23/-6.22    | -4.86/-5.29    | -6.98/-7.58    | -7.26/-6.24    | -6.30/-6.45    | -6.06/-6.39    | -10.33/-11.52    | -8.49/-8.91      | -10.19/-11.77    | -14.95/-13.49    | -13.55/-14.07    | -13.68/-14.65    | -14.57/-13.70    | -10.98/-8.50     | -7.78/-11.17     | -15.75/-14.77    | -15.23/-10.33    | -9.40/-14.57     | -14.08/-11.11    | -11.92/-11.14    | -9.17/-11.42     | -11.01/-10.73    | -9.42/-8.83      |
| Θ (165°)   | -9.37/-10.16  | -9.73/-9.21    | -8.24/-7.81    | -7.63/-7.47    | -7.43/-8.19    | -9.80/-8.93    | -7.02/-6.61    | -8.95/-14.32     | -15.70/-11.66    | -9.52/-9.48      | -11.04/-12.27    | -12.57/-11.05    | -10.41/-12.01    | -12.53/-10.69    | -9.41/-9.43      | -9.96/-9.11      | -7.33/-6.23      | -5.60/-5.74      | -7.01/-9.19      | -10.00/-10.48    | -11.60/-12.65    | -13.22/-13.92    | -9.93/-8.06      | -7.53/-7.67      |
| Θ (172.5°) | -4.20/-6.06   | -7.08/-6.87    | -5.03/-5.59    | -5.55/-5.41    | -5.37/-5.72    | -6.21/-6.73    | -7.63/-8.48    | -9.30/-10.36     | -10.75/-10.18    | -10.27/-11.37    | -13.19/-13.35    | -13.62/-14.39    | -13.65/-12.72    | -12.95/-13.96    | -14.14/-13.90    | -14.12/-15.83    | -15.58/-15.28    | -14.94/-14.58    | -13.33/-11.12    | -9.73/-9.85      | -10.01/-9.77     | -7.37/-5.48      | -4.21/-4.05      | -3.76/-3.61      |
| Θ (180°)   | -9.81/-9.60   | -9.35/-10.29   | -11.58/-11.24  | -11.73/-11.49  | -10.42/-10.30  | -9.86/-9.43    | -9.34/-9.84    | -10.89/-11.90    | -12.93/-12.77    | -12.61/-12.65    | -10.59/-8.44     | -8.00/-8.75      | -9.32/-8.39      | -7.86/-8.41      | -9.14/-9.11      | -8.88/-8.39      | -7.89/-8.44      | -8.32/-7.57      | -7.14/-6.93      | -7.34/-8.67      | -10.53/-10.74    | -9.63/-8.92      | -8.19/-8.18      | -8.17/-9.16      |
| Freq(Hz)   | 5.785GPol.    | TotalAnt 2     | -/-            | -/-            | -/-            | -/-            | -/-            | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              | -/-              |
| Gain       | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ (0°)     | -3.74/-3.82   | -4.10/-4.78    | -4.73/-4.77    | -5.13/-4.56    | -4.40/-5.37    | -6.04/-5.34    | -4.98/-4.96    | -5.48/-5.77      | -5.90/-6.09      | -5.85/-5.71      | -5.53/-5.40      | -5.39/-5.62      | -5.68/-5.73      | -6.42/-5.93      | -4.36/-4.92      | -6.14/-5.20      | -4.85/-5.75      | -5.07/-4.82      | -5.05/-4.76      | -5.10/-4.74      | -4.41/-4.46      | -4.67/-4.43      | -4.21/-4.17      | -4.10/-3.71      |
| Θ (7.5°)   | -6.08/-6.35   | -6.05/-6.73    | -5.72/-4.92    | -4.75/-4.65    | -4.90/-5.61    | -5.46/-4.84    | -4.38/-3.83    | -3.79/-4.12      | -4.76/-5.05      | -5.22/-6.04      | -6.43/-6.56      | -7.59/-8.19      | -8.04/-7.93      | -7.99/-8.23      | -7.39/-7.22      | -8.58/-9.50      | -8.02/-7.78      | -8.18/-7.30      | -7.58/-6.90      | -7.23/-6.70      | -6.57/-6.30      | -6.81/-7.07      | -6.83/-7.16      | -7.63/-7.05      |
| Θ (15°)    | -8.95/-9.62   | -10.73/-9.82   | -8.79/-8.04    | -7.18/-6.85    | -7.46/-9.36    | -9.96/-8.44    | -7.09/-5.98    | -5.72/-6.83      | -6.23/-7.59      | -10.11/-12.51    | -14.82/-15.17    | -15.63/-15.34    | -12.67/-10.30    | -9.08/-8.86      | -6.99/-5.08      | -4.70/-4.15      | -3.02/-3.34      | -4.38/-4.56      | -5.62/-4.43      | -8.92/-7.97      | -5.83/-4.64      | -4.26/-4.57      | -5.38/-5.81      | -7.14/-7.89      |
| Θ (22.5°)  | -2.28/-3.30   | -5.14/-5.68    | -5.00/-4.22    | -4.42/-5.67    | -6.85/-6.53    | -5.93/-4.20    | -2.69/-2.94    | -3.67/-4.77      | -6.20/-7.59      | -6.62/-5.27      | -4.73/-6.49      | -9.10/-9.34      | -8.75/-9.46      | -10.77/-11.12    | -11.02/-10.70    | -11.24/-12.08    | -10.58/-8.43     | -8.03/-7.22      | -7.23/-7.63      | -9.77/-8.13      | -4.84/-2.68      | -3.08/-4.12      | -4.77/-4.01      | -3.05/-1.96      |
| Θ (30°)    | -2.13/-3.98   | -5.15/-4.45    | -3.69/-3.63    | -2.48/-0.70    | -0.38/-1.77    | -2.87/-0.89    | 0.22/-0.28     | -0.55/-1.23      | -1.55/-1.67      | -2.08/-1.81      | -3.51/-9.27      | -8.44/-4.88      | -4.18/-6.20      | -9.31/-8.89      | -9.77/-9.44      | -8.27/-7.66      | -9.71/-10.27     | -8.31/-6.72      | -8.43/-10.27     | -7.35/-5.09      | -4.07/-3.08      | 4.44/-9.23       | -5.04/-2.11      | -0.63/-0.49      |
| Θ (37.5°)  | -2.48/-1.87   | -0.75/0.47     | 1.58/-1.69     | 1.18/2.16      | 3.31/2.25      | 1.00/2.44      | 2.17/1.79      | 1.62/0.60        | 0.90/-0.19       | -3.51/-0.49      | -0.82/-1.83      | -0.94/-1.34      | -3.36/-6.09      | -6.06/-3.70      | -4.54/-7.94      | -11.00/-9.39     | -6.21/-3.49      | -2.55/-1.84      | -1.88/-5.44      | -4.39/-3.87      | -5.88/-2.74      | -3.60/-4.31      | -1.20/-0.36      | -0.28/-0.82      |
| Θ (45°)    | -1.24/1.07    | 2.31/2.17      | 1.45/2.23      | 3.09/2.80      | 3.31/3.84      | 1.87/2.28      | 2.96/3.30      | 3.32/1.55        | 1.99/1.25        | -2.62/1.14       | 0.28/-2.56       | -3.05/-4.44      | -3.28/-4.64      | -7.72/-6.41      | -5.75/-6.66      | -5.79/-6.20      | -2.86/-0.48      | 1.56/0.84        | 0.27/-0.48       | -2.37/-2.22      | -5.90/-2.14      | -2.13/-1.50      | -1.80/-2.75      | -1.79/-1.91      |
| Θ (52.5°)  | 0.27/2.21     | 2.72/3.38      | 3.03/2.43      | 2.44/1.70      | 1.46/3.27      | 2.39/1.96      | 2.06/1.06      | 3.18/2.29        | 1.34/1.74        | 0.89/1.02        | -0.22/0.34       | 1.01/1.46        | 0.66/-3.31       | -8.85/-8.67      | -6.22/-3.30      | -2.01/-1.65      | -1.46/-0.91      | 1.56/0.41        | -0.37/-0.43      | -3.06/-3.04      | 4.89/-1.26       | -1.00/-2.57      | -7.47/-4.53      | -1.81/-3.43      |
| Θ (60°)    | -0.08/0.63    | 0.87/3.31      | 3.73/3.19      | 1.51/1.45      | 0.82/0.51      | 1.58/1.50      | 2.00/-1.05     | 0.86/0.40        | 0.56/2.25        | 2.48/0.54        | 0.29/1.33        | 1.92/0.70        | -0.29/-2.10      | -4.44/-7.63      | -10.05/-6.26     | -3.29/-4.87      | -4.95/-3.33      | -2.30/-3.63      | -6.04/-5.01      | -4.11/-3.70      | -3.47/-1.90      | -2.67/-5.00      | -6.22/-3.25      | -3.24/-3.94      |
| Θ (67.5°)  | 1.12/1.03     | 0.82/1.25      | 1.85/1.85      | -0.10/0.04     | 1.21/0.54      | 1.13/1.56      | 3.55/0.23      | -0.57/-1.48      | 0.49/1.30        | 2.01/0.51        | -0.44/-1.51      | -3.47/-4.52      | -1.24/-0.61      | -0.48/-1.00      | -3.90/-6.79      | -3.28/-2.37      | -7.20/-5.23      | -5.27/-7.41      | -13.46/-9.41     | -4.58/-4.51      | -2.21/-3.07      | -4.39/-5.56      | -3.89/-3.96      | -4.45/-2.08      |
| Θ (75°)    | 1.75/0.69     | 0.66/0.39      | 0.51/0.56      | -0.91/-1.42    | 0.87/1.28      | 1.65/1.27      | 4.18/1.39      | 0.53/-4.79       | 0.47/-0.34       | 1.25/-1.56       | -1.92/-3.16      | -7.23/-4.07      | -2.03/-0.35      | 1.17/1.40        | 0.82/-2.53       | -4.16/-1.43      | -2.16/-4.73      | -5.56/-4.49      | -10.05/-4.24     | -4.45/-3.69      | -1.27/-2.68      | -6.84/-4.98      | -2.42/-3.13      | -2.85/0.46       |
| Θ (82.5°)  | 2.00/0.40     | -0.57/-1.02    | -0.55/0.18     | -1.18/-1.28    | 0.21/1.46      | 1.51/0.48      | 3.53/0.54      | 0.69/-6.58       | -1.00/-0.86      | 0.09/-3.43       | -3.05/-1.50      | -5.25/-0.45      | -2.56/-0.52      | 0.22/-0.09       | -0.02/-3.75      | -4.65/-0.37      | -0.64/-5.19      | -8.70/-2.44      | -4.22/-1.10      | -4.29/-3.17      | -1.82/-3.94      | -9.37/-4.12      | -3.17/-2.44      | -1.56/0.50       |
| Θ (90°)    | 1.02/-0.98    | -1.32/-1.56    | -1.43/-1.54    | -2.51/-1.25    | -1.16/-0.33    | 0.77/-0.92     | 1.17/-0.58     | 1.10/-10.13      | -1.53/-2.52      | -1.27/-5.40      | -3.38/-0.33      | -3.52/-0.73      | -2.37/-2.11      | -0.82/-2.74      | -2.73/-3.78      | -4.90/-5.05      | 0.05/-5.88       | -6.50/-4.10      | -1.85/-1.77      | -3.83/-4.64      | -3.32/-4.67      | -10.14/-3.38     | -3.15/-2.40      | -1.27/-0.36      |
| Θ (97.5°)  | -0.34/-2.91   | -2.40/-2.64    | -2.16/-1.85    | -2.30/-2.22    | -3.36/-1.13    | -0.30/-2.36    | -1.10/-1.90    | -0.24/-8.85      | -3.45/-3.25      | -2.93/-6.14      | -4.50/-1.15      | -2.51/-1.68      | -4.81/-1.92      | -1.54/-4.14      | -7.85/-4.89      | -4.94/-7.54      | -2.13/-5.21      | -7.80/-3.17      | -3.62/-5.12      | -4.80/-6.92      | -5.63/-7.79      | -11.88/-5.27     | -2.84/-2.96      | -2.42/-1.91      |
| Θ (105°)   | -1.97/-4.58   | -4.57/-4.12    | -2.96/-3.07    | -3.81/-5.20    | -3.57/-3.07    | -3.18/-3.52    | -2.93/-3.64    | -1.12/-10.44     | -4.81/-4.14      | -3.44/-7.01      | -6.42/-2.66      | -3.60/-3.39      | -6.25/-5.10      | -1.91/-2.03      | -9.58/-6.25      | -4.81/-6.18      | -4.58/-6.93      | -8.59/-6.72      | -12.28/-7.20     | -8.75/-9.37      | -8.29/-7.57      | -10.85/-3.26     | -4.91/-3.25      | -2.68/-3.48      |
| Θ (112.5°) | -3.81/-5.78   | -5.00/-4.73    | -4.21/-3.70    | -5.03/-5.71    | -3.71/-4.24    | -4.57/-6.65    | -4.18/-5.14    | -4.99/-6.82      | -5.03/-3.83      | -3.80/-8.13      | -7.53/-4.96      | -4.15/-4.66      | -5.88/-6.16      | -3.64/-2.48      | -7.54/-9.29      | -4.22/-3.53      | -11.12/-7.91     | -11.84/-7.87     | -8.27/-9.11      | -11.76/-12.17    | -13.19/-11.22    | -11.34/-5.74     | -2.95/-6.90      | -2.95/-4.35      |
| Θ (120°)   | -4.95/-7.47   | -5.80/-6.30    | -5.43/-3.65    | -5.30/-7.11    | -7.87/-5.77    | -5.91/-7.07    | -3.45/-4.68    | -4.99/-7.80      | -5.72/-5.25      | -4.83/-6.03      | -7.74/-9.13      | -6.25/-5.16      | -5.77/-8.34      | -7.34/-6.62      | -2.97/-14.36     | -10.43/-3.48     | -8.35/-9.99      | -15.74/-9.90     | -7.30/-10.93     | -13.43/-13.60    | -12.02/-11.82    | -9.43/-5.93      | -6.18/-4.46      | -5.92/-6.86      |
| Θ (127.5°) | -8.57/-10.08  | -7.98/-6.16    | -6.11/-5.10    | -5.69/-6.35    | -6.18/-4.97    | -9.44/-6.03    | -4.87/-7.87    | -5.40/-8.02      | -6.41/-7.27      | -5.44/-6.19      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |

E1(XY plane) –  $\Theta(90)\Phi(0-360)$   
 E2(XZ plane) –  $\Theta(0-180)\Phi(0)$  and  $\Theta(0-180)\Phi(180)$   
 E3(YZ plane) –  $\Theta(0-180)\Phi(90)$  and  $\Theta(0-180)\Phi(270)$





# Antenna Pattern of 6GHz

# Appendix E

## Total Gain Data

| Freq(Hz)  | 6.175GPol.    | TotalAnt. 1    | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |                  |                  |                  |                  |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | 0.45/0.60     | 0.870/81       | 0.911/17       | 1.501/46       | 1.341/17       | 1.070/89       | 0.871/10       | 1.101/06         | 1.010/99         | 0.670/44         | 0.530/72         | 0.830/86         | 0.890/78         | 0.900/76         | 0.470/26         | 0.066/02         | -0.15/-3.6       | -0.36/-0.29      | -0.380/02        | 0.19/-41         | -0.14/-16        | 0.130/41         | 0.400/36         | 0.280/48         |
| Θ(7.5°)   | -0.39/-0.67   | -0.93/-1.33    | -1.38/-0.97    | -0.88/-0.84    | -0.77/-0.90    | -0.68/-0.44    | -0.220/17      | 0.680/97         | 1.391/65         | 1.902/04         | 2.071/91         | 1.721/62         | 1.481/59         | 1.571/53         | 1.691/83         | 1.621/56         | 1.971/95         | 1.751/58         | 1.361/21         | 1.200/85         | 0.740/55         | -0.030/17        | 0.030/06         | -0.220/-19       |
| Θ(15°)    | 0.920/38      | -0.76/-2.10    | -3.31/-3.88    | -3.89/-3.62    | -3.78/-3.94    | -4.06/-3.78    | -2.90/-1.85    | -0.930/15        | 1.331/78         | 1.922/29         | 3.133/77         | 4.144/08         | 3.612/92         | 1.931/24         | 0.750/37         | 0.130/08         | 0.300/60         | 1.161/71         | 2.032/18         | 2.202/34         | 2.332/24         | 1.892/06         | 2.282/46         | 2.091/59         |
| Θ(22.5°)  | 0.982/32      | -1.45/-2.85    | -5.31/-7.21    | -7.57/-7.46    | -7.97/-8.75    | -10.26/-10.41  | -7.92/-5.62    | -3.84/-1.48      | 0.630/20         | 2.552/81         | 3.594/69         | 5.045/02         | 4.854/07         | 2.761/64         | 1.972/37         | 2.880/55         | 4.254/62         | 4.854/85         | 4.514/19         | 3.843/81         | 3.773/27         | 2.641/58         | 1.241/96         | 2.572/06         |
| Θ(30°)    | 0.06/0.40     | -1.01/-3.61    | -8.59/-13.25   | -14.69/-9.49   | -7.00/-7.56    | -7.85/-6.11    | -6.33/-4.80    | -6.23/-1.89      | 0.280/99         | 1.382/02         | 2.614/18         | 4.554/53         | 4.233/52         | 2.972/93         | 2.572/02         | 1.431/33         | 1.973/39         | 4.915/19         | 4.342/98         | 1.921/51         | 1.620/-10        | -2.49/-3.27      | -0.970/60        | 0.670/37         |
| Θ(37.5°)  | 0.54/-0.61    | -0.62/-1.80    | -6.16/-14.08   | -10.68/-7.63   | -7.94/-7.12    | -3.76/-4.00    | -6.90/-4.84    | -1.09/-0.34      | -1.00/-0.43      | 0.511/84         | 3.084/11         | 4.433/84         | 3.632/19         | 1.22/-0.08       | 1.503/57         | 4.172/98         | 0.760/50         | 2.824/17         | 3.842/65         | 2.292/25         | 2.642/53         | 0.13/-4.69       | -5.67/-2.04      | -0.460/38        |
| Θ(45°)    | -1.78/-0.43   | -4.78/-4.12    | -6.62/-13.99   | -5.62/-4.23    | -6.19/-5.91    | -2.11/-3.38    | -11.07/-5.96   | -1.27/-0.60      | -3.56/-2.06      | 1.452/63         | 3.493/57         | 2.832/63         | 3.062/46         | 1.770/53         | 0.721/86         | 2.693/15         | 2.391/52         | 0.961/55         | 2.932/99         | 2.322/09         | 0.27/-2.65       | -3.27/-4.16      | -2.37/-1.47      |                  |
| Θ(52.5°)  | -2.91/-3.80   | -4.87/-5.52    | -8.47/-10.90   | -4.33/-2.94    | -4.67/-6.79    | -5.33/-5.48    | -14.30/-5.71   | -4.91/-7.83      | -7.53/-1.19      | 1.212/95         | 3.732/67         | 1.621/82         | 1.520/29         | 0.560/57         | -0.03/-1.41      | -4.26/-2.42      | 0.38/-0.18       | -0.79/-1.40      | -0.591/85        | 1.960/90         | -0.700/25        | -1.62/-3.88      | -4.70/-3.32      | -2.21/-2.10      |
| Θ(60°)    | -2.98/-2.75   | -2.11/-2.59    | -5.14/-5.30    | -1.57/-1.76    | -1.07/-4.38    | -8.20/-4.54    | -4.29/-3.17    | -4.44/-5.61      | -3.63/-1.96      | -1.490/35        | 3.274/22         | 3.282/51         | 1.490/60         | 0.470/59         | -0.503/35        | 1.962/01         | -1.63/-1.52      | -7.01/-7.01      | -1.91/-3.36      | -2.56/-0.89      | -1.020/39        | -0.21/-4.69      | -7.36/-1.42      | -0.72/-1.19      |
| Θ(67.5°)  | -6.08/-5.79   | -2.42/-2.62    | -5.01/-3.47    | -0.57/-1.05    | 0.92/-2.11     | -4.82/-1.54    | -1.56/-0.96    | -0.36/-2.87      | -1.88/-1.33      | -1.900/46        | 3.433/72         | 3.963/27         | 2.162/91         | 2.601/21         | 1.856/02         | 5.141/71         | 0.731/33         | -3.98/-4.08      | -2.50/-7.25      | -2.320/61        | -0.040/60        | 1.00/-1.29       | -3.41/-0.93      | 0.17/-1.62       |
| Θ(75°)    | -6.48/-6.57   | -5.24/-4.25    | -5.44/-2.52    | 0.09/-0.62     | 1.28/-0.15     | -3.270/65      | 1.150/41       | -0.49/-2.28      | -2.61/-1.16      | -1.100/78        | 2.621/95         | 1.101/24         | 1.883/51         | 4.022/58         | 1.555/45         | 5.552/12         | 0.612/46         | -0.27/-0.40      | -0.60/-6.26      | -0.910/61        | 0.960/75         | 0.05/-1.06       | -2.11/-3.03      | -1.67/-1.19      |
| Θ(82.5°)  | -6.20/-8.95   | -6.60/-7.36    | -6.39/-2.73    | -0.63/-0.60    | 1.12/-0.42     | -2.521/23      | -0.11/-1.88    | -0.11/-4.71      | -3.56/-1.24      | -0.280/60        | -0.14/-2.09      | -1.53/-0.55      | -0.61/-1.95      | 3.452/48         | 0.073/15         | 3.571/41         | 0.010/90         | 0.630/92         | -1.73/-4.20      | -0.69/-0.63      | 0.07/-0.57       | -2.00/-2.95      | -3.65/-5.56      | -4.23/-2.27      |
| Θ(90°)    | -5.91/-1.17   | -8.11/-8.22    | -7.34/-5.22    | -2.83/-2.34    | 0.06/-2.66     | -1.830/26      | -2.581/14      | -1.47/-7.86      | -3.32/-2.02      | -0.59/-1.82      | -3.74/-0.67      | -6.11/-4.92      | -4.67/-0.85      | 1.402/12         | -0.83/-1.83      | -0.54/-0.40      | -1.40/-2.40      | -1.62/-0.36      | -5.33/-3.22      | -3.41/-2.02      | -1.57/-2.41      | -3.15/-6.25      | -7.12/-8.15      | -4.81/-2.93      |
| Θ(97.5°)  | -9.00/-10.55  | -7.30/-8.51    | -7.28/-3.84    | -3.76/-2.61    | -1.18/-4.72    | -1.52/-1.75    | -4.950/10      | -4.41/-8.70      | -3.20/-2.82      | -2.42/-5.78      | -7.58/-8.28      | -8.40/-7.12      | -7.61/-3.80      | -1.960/75        | -1.41/-4.24      | -5.50/-2.85      | -5.42/-3.16      | -8.51/-3.96      | -9.84/-9.44      | -5.10/-6.31      | -8.02/-5.48      | -9.41/-9.78      | -5.13/-5.76      |                  |
| Θ(105°)   | -9.45/-8.95   | -6.49/-5.99    | -6.74/-6.60    | -5.33/-4.24    | -3.89/-4.26    | -2.35/-3.40    | -5.30/-1.45    | -7.91/-8.98      | -2.91/-3.63      | -4.55/-9.97      | -12.56/-10.20    | -9.80/-9.01      | -9.71/-7.54      | -5.95/-2.20      | -2.40/-3.11      | -10.00/-8.18     | -5.86/-7.46      | -11.68/-6.71     | -13.26/-15.34    | -10.33/-8.13     | -11.03/-12.08    | -5.19/-8.20      | -15.16/-10.36    | -5.68/-6.79      |
| Θ(112.5°) | -8.31/-7.46   | -6.89/-9.08    | -10.57/-7.37   | -5.54/-6.95    | -5.23/-4.67    | -5.02/-8.09    | -5.02/-4.31    | -10.37/-7.29     | -4.28/-5.75      | -8.45/-15.05     | -15.74/-11.46    | -8.75/-7.40      | -10.51/-11.72    | -10.26/-4.66     | -4.63/-2.86      | -8.44/-15.28     | -6.34/-6.09      | -9.92/-9.72      | -13.22/-15.04    | -13.57/-14.10    | -10.78/-4.42     | -12.81/-15.72    | -9.74/-8.57      | -9.72/-8.88      |
| Θ(120°)   | -11.32/-10.48 | -7.98/-8.09    | -9.97/-8.24    | -5.98/-6.46    | -6.27/-5.45    | -9.10/-9.94    | -5.26/-8.66    | -11.35/-7.25     | -6.07/-9.40      | -10.59/-12.56    | -11.65/-10.29    | -11.37/-8.84     | -8.84/-11.23     | -10.18/-9.16     | -8.91/-4.47      | -4.56/-11.78     | -14.70/-12.76    | -8.59/-10.65     | -14.85/-11.05    | -12.24/-6.79     | -7.98/-13.18     | -9.57/-9.04      | -14.02/-7.09     | -10.63/-11.93    |
| Θ(127.5°) | -10.25/-6.64  | -8.94/-7.67    | -8.11/-8.53    | -5.77/-6.15    | -8.22/-9.29    | -13.24/-9.35   | -7.99/-9.49    | -13.38/-9.29     | -8.29/-10.63     | -12.05/-11.43    | -11.82/-11.01    | -10.57/-10.67    | -9.71/-7.25      | -9.64/-14.03     | -8.27/-12.47     | -4.37/-6.43      | -7.47/-15.49     | -15.82/-12.86    | -15.47/-15.51    | -13.58/-15.64    | -11.63/-9.30     | -6.69/-14.02     | -12.92/-9.14     | -11.58/-11.96    |
| Θ(135°)   | -9.27/-10.99  | -12.94/-14.26  | -13.86/-9.93   | -6.13/-7.10    | -7.43/-12.67   | -12.44/-10.24  | -11.43/-15.33  | -11.86/-12.76    | -13.03/-14.28    | -14.84/-11.15    | -8.98/-12.66     | -15.01/-11.88    | -8.67/-8.40      | -7.20/-9.35      | -15.13/-16.20    | -9.71/-5.85      | -4.57/-10.48     | -15.47/-10.68    | -8.25/-15.80     | -15.11/-11.97    | -9.05/-14.05     | -11.79/-10.99    | -15.15/-14.72    | -15.37/-9.95     |
| Θ(142.5°) | -7.63/-5.95   | -7.18/-9.89    | -8.40/-5.62    | -5.47/-10.51   | -14.99/-13.86  | -9.60/-7.87    | -10.22/-15.18  | -11.13/-11.27    | -11.34/-11.24    | -13.44/-10.73    | -7.85/-8.51      | -10.73/-12.93    | -12.09/-7.64     | -7.27/-10.89     | -15.05/-15.61    | -12.34/-15.35    | -12.40/-7.56     | -3.94/-8.96      | -10.92/-12.67    | -5.94/-12.26     | -15.60/-12.72    | -12.77/-14.45    | -15.21/-9.73     | -7.40/-7.35      |
| Θ(150°)   | -10.09/-11.94 | -12.44/-11.72  | -8.31/-9.09    | -14.79/-13.11  | -10.49/-12.00  | -9.92/-14.15   | -13.73/-10.66  | -8.25/-8.90      | -14.52/-12.09    | -9.47/-10.34     | -10.57/-12.22    | -12.90/-12.42    | -9.26/-15.49     | -16.16/-15.77    | -15.74/-15.49    | -15.38/-15.78    | -14.68/-14.66    | -14.89/-11.04    | -10.73/-13.87    | -12.48/-10.63    | -14.64/-14.93    | -14.84/-11.04    | -9.64/-10.71     | -7.40/-11.58     |
| Θ(157.5°) | -10.46/-12.95 | -15.68/-13.61  | -11.20/-7.47   | -4.99/-5.56    | -9.98/-12.82   | -10.27/-13.42  | -12.99/-10.44  | -9.90/-10.85     | -11.87/-13.22    | -13.19/-12.36    | -10.81/-8.05     | -7.42/-9.52      | -11.77/-9.42     | -11.18/-11.79    | -12.38/-13.70    | -13.67/-12.98    | -12.72/-15.07    | -14.83/-12.50    | -9.73/-10.89     | -14.07/-15.84    | -14.20/-12.19    | -12.46/-14.54    | -12.34/-11.68    | -11.66/-10.95    |
| Θ(165°)   | -7.10/-6.75   | -5.52/-7.46    | -10.89/-14.36  | -15.42/-15.22  | -15.48/-14.02  | -15.31/-14.32  | -8.94/-5.45    | -4.75/-5.68      | -8.13/-12.31     | -16.10/-14.26    | -11.90/-10.65    | -10.30/-10.25    | -8.92/-9.96      | -8.90/-9.92      | -10.68/-9.29     | -8.62/-12.03     | -15.61/-13.15    | -15.40/-14.85    | -15.41/-12.61    | -15.29/-15.93    | -13.06/-13.12    | -14.35/-13.94    | -12.03/-12.10    | -11.24/-8.08     |
| Θ(172.5°) | -8.80/-8.88   | -10.13/-9.74   | -8.97/-9.24    | -8.97/-9.24    | -10.13/-9.74   | -10.13/-9.74   | -10.13/-9.74   | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     | -10.13/-9.74     |
| Θ(180°)   | -8.50/-8.37   | -8.56/-7.82    | -7.17/-7.49    | -7.58/-7.71    | -7.77/-7.37    | -7.73/-8.49    | -8.13/-7.65    | -6.99/-6.42      | -5.60/-5.19      | -5.07/-5.26      | -5.50/-6.07      | -6.52/-7.11      | -7.15/-7.07      | -7.11/-7.64      | -9.51/-10.99     | -12.42/-13.56    | -13.27/-13.04    | -14.13/-14.71    | -14.32/-12.37    | -11.11/-11.32    | -11.21/-10.78    | -9.39/-8.63      | -7.81/-7.93      | -8.50/-8.48      |
| Freq(Hz)  | 6.475GPol.    | TotalAnt. 1    | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | -0.39/-0.35   | -0.040/0.09    | 0.230/0.45     | 0.540/0.53     | 0.720/0.90     | 1.020/0.86     | 0.570/0.51     | 0.440/0.35       | 0.350/0.22       | 0.170/0.13       | 0.011/0.40       | -0.65/-0.57      | -0.49/-0.38      | -0.25/-0.39      | -0.41/-0.53      | -0.37/-0.09      | -0.07/-0.12      | 0.120/0.54       | 0.400/0.06       | -0.07/-0.13      | -0.32/-0.39      | -0.31/-0.37      | -0.31/-0.25      | -0.46/-0.49      |
| Θ(7.5°)   | -0.59/-0.97   | -1.20/-1.57    | -1.56/-1.49    | -1.25/-0.99    | -0.500/0.02    | 0.310/0.47     | 0.700/0.82     | 1.151/3.32       | 1.411/3.17       | 1.691/9.22       | 2.05/1.85        | 1.691/1.46       | 1.271/1.08       | 0.830/0.59       | 0.440/0.28       | 0.380/0.78       | 0.880/0.71       | 0.640/0.93       | 1.141/2.16       | 1.311/1.12       | 0.991/2.25       | 1.201/1.10       | 0.980/1.71       | 0.33/-0.10       |
| Θ(15°)    | 0.760/0.06    | -0.93/-2.21    | -2.78/-2.91    | -3.26/-4.14    | -4.81/-4.79    | -4.47/-3.58    | -2.61/-1.42    | 0.451/4.48       | 2.042/0.10       | 2.072/2.27       | 2.703/0.10       | 3.803/5.4        | 3.693/4.5        | 3.192/2.88       | 2.472/3.1        | 2.031/0.59       | 0.980/3.38       | 0.3301/0.4       | 1.772/3.6        | 2.272/0.4        | 2.532/3.9        | 2.321/3.96       | 1.771/1.16       |                  |
| Θ(22.5°)  | -0.46/-0.63   | -1.75/-2.93    | -3.12/-3.18    | -3.75/-4.81    | -5.70/-6.32    | -5.62/-3.73    | -2.11/-1.75    | -2.05/-1.31      | -0.171/1.18      | 2.413/3.36       | 3.894/7.3        | 5.185/0.5        | 4.423/9.1        | 2.831/6.4        | 1.001/3.2        | 2.273/4.2        | 3.943/6.3        | 2.812/3.4        | 3.114/3.6        | 4.594/0.4        | 3.292/5.9        | 1.790/7.1        | 0.210/4.0        | 0.37/-0.30       |
| Θ(30°)    | -1.31/-2.81   | -4.00/-4.74    | -5.11/-6.82    | -7.67/-7.54    | -8.07/-7.10    | -4.77/-1.79    | 0.260/0.42     | -1.04/-2.15      | -0.459/1.88      | 2.423/0.1        | 3.284/0.02       | 4.955/1.1        | 4.964/3.9        | 3.423/0.1        | 2.300/5.7        | 0.161/9.3        | 3.964/2.9        | 4.073/5.3        | 3.634/2.3        | 3.972/3.6        | 0.53/-0.78       | -0.280/3.6       | 0.521/-1.5       | 0.890/2.3        |
| Θ(37.5°)  | -0.11/-2.56   | -2.32/-2.49    | -3.65/-6.03    | -6.84/-6.74    | -4.96/-4.15    | -3.62/-1.29    | -0.701/-1.70   | -1.350/8.0       | 1.611/2.7        | 0.761/3.0        | 2.793/5.2        | 3.993/1.3        | 1.721/7.7        | 1.952/0.3        | 1.620/7.3        | 0.321/0.6        | 2.172/0.1        | 2.203/5.0        | 3.421/9.3        | 0.360/2.0        | -0.69/-2.74      | -1.52/-1.75      | 2.621/8.1        |                  |

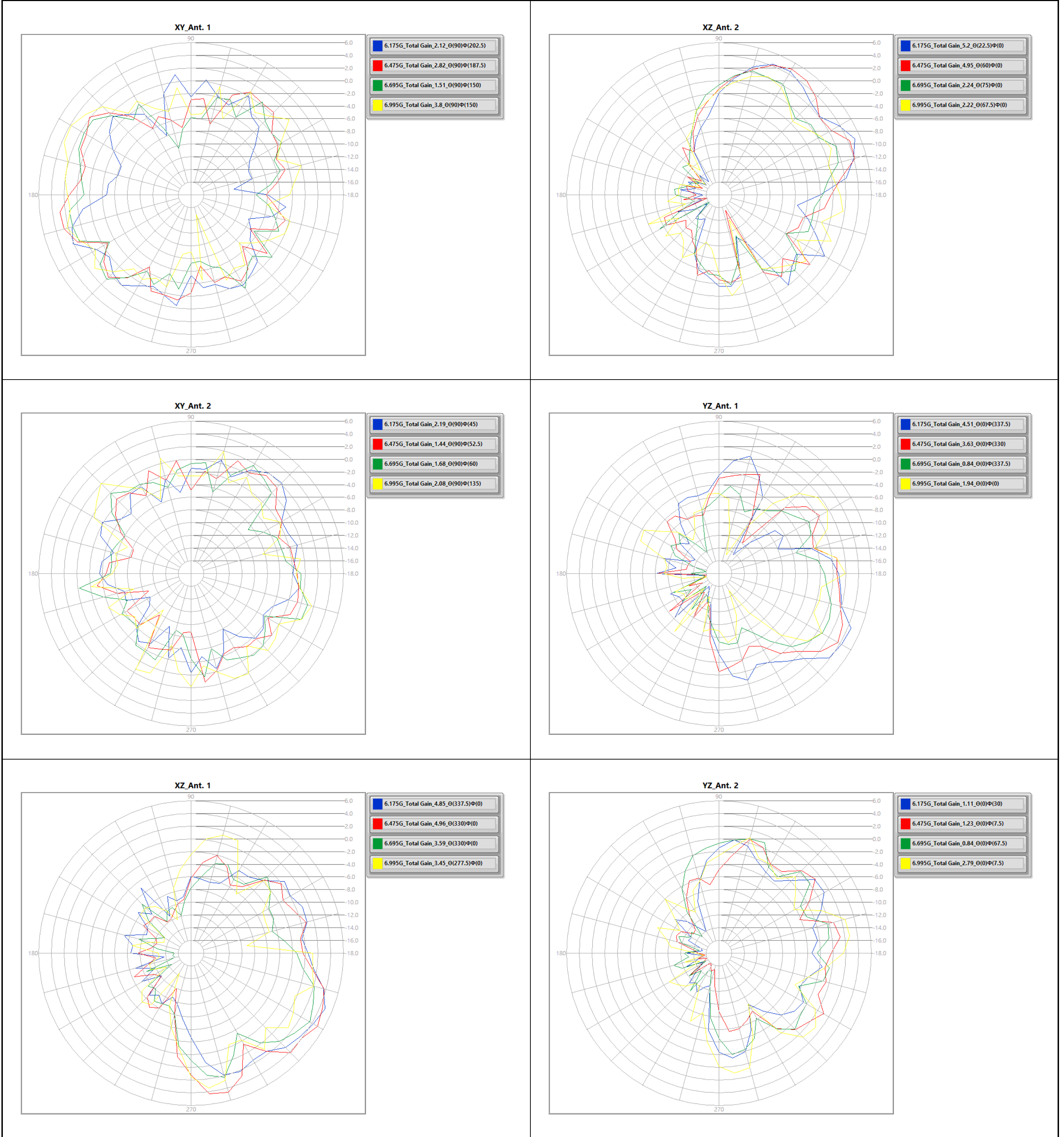


Antenna Pattern of 6GHz

Appendix E

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(22.5°)  | 5.204/85      | 4.484/17        | 4.104/26        | 4.193/52        | 2.120/44        | -1.091/-137     | -0.59/-0.08     | 0.230/11          | 0.02/-0.14        | -0.34/-0.60       | -1.22/-1.79       | -1.45/-1.18       | -1.41/-2.03       | -3.14/-3.68       | -3.60/-4.05       | -5.46/-7.10       | -8.39/-9.26       | -10.00/-7.65      | -4.25/-1.67       | 0.161/00          | 1.35/-1.55        | 2.032/71          | 3.544/32          | 4.915/19          |
| Θ(30°)    | 3.79/3.27     | 2.86/3.06       | 3.66/4.37       | 5.105/50        | 5.123/92        | 2.78/1.84       | 1.110/71        | -0.13/-1.26       | -1.74/-1.71       | -1.90/-2.89       | -2.88/-2.00       | -0.450/95         | 1.26/0.46         | -1.03/-3.26       | -4.58/-3.47       | -3.83/-5.62       | -7.74/-9.32       | -7.72/-5.18       | -2.60/-0.07       | 1.38/1.57         | 1.09/0.86         | 1.262/06          | 3.063/82          | 4.134/04          |
| Θ(37.5°)  | 2.162/01      | 1.59/1.98       | 3.013/60        | 3.734/19        | 4.334/06        | 3.692/63        | 1.000/76        | 0.42/-0.47        | -0.85/-1.38       | -2.75/-5.16       | -4.24/-4.31       | -4.29/-3.55       | -2.67/-1.75       | -1.18/-3.08       | -5.71/-4.94       | -3.66/-4.29       | -5.13/-6.24       | -6.02/-4.79       | -3.02/-1.21       | -0.73/-0.95       | -0.18/1.00        | 2.162/72          | 3.072/93          | 2.642/30          |
| Θ(45°)    | 2.462/82      | 3.052/51        | 2.672/96        | 1.94/1.34       | 1.64/1.20       | 1.190/-49       | -1.77/-1.43     | -1.37/-0.37       | -1.04/-2.56       | -4.10/-4.77       | -1.180/05         | -0.65/-1.29       | -1.77/-3.15       | -3.20/-3.49       | -5.77/-3.41       | -1.86/-2.62       | -4.32/-5.96       | -7.34/-7.63       | -4.25/-3.03       | -4.58/-3.31       | -0.58/-1.15       | 2.172/80          | 3.043/04          | 2.972/79          |
| Θ(52.5°)  | 3.58/3.38     | 4.06/3.37       | 2.58/3.52       | 3.173/02        | 3.33/1.44       | 0.51/-1.10      | -3.68/-3.42     | -4.07/-1.12       | -3.48/-6.08       | -6.45/-3.37       | -0.92/0.06        | 0.09/-0.37        | -0.09/-0.92       | -2.42/-3.71       | -7.72/-6.26       | -3.80/-4.91       | -5.89/-7.42       | -10.52/-9.98      | -6.48/-6.68       | -6.46/-3.07       | -0.57/-1.35       | 2.242/39          | 2.873/46          | 3.853/72          |
| Θ(60°)    | 4.48/3.77     | 4.07/3.85       | 3.14/4.39       | 4.884/61        | 5.133/78        | 2.87/0.46       | -3.27/-3.46     | -4.33/-1.12       | -5.61/-13.77      | -9.69/-8.19       | -4.40/-2.76       | -2.95/-5.69       | -9.36/-8.19       | -6.56/-5.44       | -6.34/-8.95       | -7.48/-9.16       | -10.53/-9.35      | -8.24/-10.97      | -8.68/-8.03       | -4.16/-2.57       | -0.29/1.33        | 2.45/1.62         | 1.992/79          | 3.754/47          |
| Θ(67.5°)  | 4.28/3.84     | 3.98/3.99       | 3.514/59        | 5.89/5.50       | 5.604/46        | 3.26/0.68       | -2.30/-2.91     | -2.42/0.06        | -4.74/-6.99       | -6.81/-5.58       | -4.76/-6.15       | -9.53/-14.00      | -10.76/-8.48      | -5.74/-5.76       | -3.38/-6.33       | -5.50/-6.87       | -7.76/-8.17       | -3.93/-7.34       | -4.81/-2.55       | -0.95/-1.14       | -0.41/0.47        | 1.20/-0.26        | 0.29/1.72         | 2.953/97          |
| Θ(75°)    | 2.89/2.69     | 2.57/2.87       | 2.65/4.15       | 5.46/4.82       | 4.773/47        | 1.69/0.81       | -0.57/-1.06     | -2.05/-0.66       | -2.59/-2.21       | -3.80/-3.54       | -2.72/-4.55       | -10.44/-6.93      | -5.05/-3.22       | -2.87/-4.77       | -4.31/-4.31       | -3.36/-4.69       | -5.41/-10.11      | -1.88/-5.26       | -1.96/-1.44       | 0.06/-0.99        | -2.41/-0.78       | 0.20/-1.78        | -0.88/-0.08       | 1.602/65          |
| Θ(82.5°)  | 0.48/0.67     | 0.97/1.36       | 1.11/2.61       | 3.91/3.78       | 3.41/1.01       | 0.81/0.21       | -0.04/-2.28     | -1.37/-3.28       | -2.37/-2.35       | -3.21/-2.11       | -1.00/-2.74       | -6.13/-3.37       | -3.45/-2.49       | -4.08/-6.30       | -6.01/-5.46       | -2.54/-3.42       | -5.27/-11.16      | -1.63/-4.64       | -1.34/-2.32       | -0.09/-2.85       | -3.62/-3.01       | -1.96/-2.53       | -3.23/-2.42       | 0.15/-1.19        |
| Θ(90°)    | -1.98/-1.53   | -0.72/-1.45     | -1.520/96       | 2.19/1.97       | 0.78/-1.52      | 0.48/-1.45      | -1.45/-5.09     | -2.51/-5.80       | -2.19/-2.25       | -4.67/-3.97       | -1.86/-2.52       | -5.36/-3.80       | -3.57/-4.76       | -7.19/-6.92       | -10.57/-9.74      | -5.79/-4.47       | -5.34/-9.02       | -4.12/-6.20       | -2.37/-4.81       | -2.44/-4.57       | -7.89/-5.46       | -3.59/-3.69       | -4.91/-4.27       | -2.07/-0.79       |
| Θ(97.5°)  | -5.38/-4.32   | -3.18/-5.04     | -4.14/-2.21     | -0.39/-0.91     | -1.00/-5.02     | -1.39/-4.09     | -3.24/-7.75     | -3.34/-7.81       | -3.36/-4.99       | -7.53/-6.62       | -3.73/-5.11       | -7.60/-5.44       | -5.07/-9.03       | -9.30/-9.70       | -12.83/-11.37     | -8.08/-6.23       | -9.09/-9.50       | -6.77/-7.71       | -5.74/-8.65       | -5.92/-7.29       | -11.43/-7.69      | -5.75/-6.35       | -5.28/-5.86       | -4.08/-3.19       |
| Θ(105°)   | -6.98/-5.95   | -6.50/-4.96     | -5.41/-4.11     | -1.83/-4.35     | -3.45/-5.40     | -2.98/-6.30     | -6.26/-9.26     | -5.55/-9.23       | -4.79/-5.43       | -8.91/-9.41       | -5.73/-5.29       | -8.25/-9.49       | -5.78/-8.12       | -10.30/-10.92     | -15.17/-14.56     | -11.52/-10.91     | -10.82/-12.88     | -10.72/-9.41      | -10.04/-10.83     | -12.65/-11.03     | -5.96/-6.30       | -7.49/-8.66       | -6.58/-4.95       |                   |
| Θ(112.5°) | -8.57/-7.48   | -7.31/-7.67     | -6.47/-6.09     | -4.83/-6.10     | -5.01/-4.93     | -6.92/-7.28     | -9.27/-8.08     | -6.80/-9.40       | -8.36/-9.89       | -14.16/-9.00      | -6.09/-6.48       | -8.74/-8.76       | -7.98/-7.91       | -11.51/-9.96      | -13.86/-13.44     | -8.13/-10.74      | -10.99/-14.83     | -9.09/-10.79      | -12.19/-11.72     | -10.80/-8.99      | -14.67/-8.52      | -7.36/-11.66      | -10.05/-8.66      | -8.02/-9.57       |
| Θ(120°)   | -10.11/-8.46  | -8.58/-7.86     | -7.67/-8.80     | -8.66/-5.80     | -7.32/-6.70     | -8.76/-8.79     | -10.02/-10.41   | -8.51/-9.82       | -8.83/-10.38      | -14.91/-10.37     | -8.92/-8.17       | -10.54/-11.71     | -13.66/-9.36      | -11.09/-10.06     | -11.41/-16.05     | -13.53/-13.21     | -13.17/-14.35     | -10.98/-10.36     | -9.29/-11.62      | -11.85/-12.55     | -10.86/-7.97      | -14.22/-13.05     | -9.65/-11.69      |                   |
| Θ(127.5°) | -15.37/-13.16 | -9.74/-9.55     | -12.75/-10.67   | -11.51/-10.46   | -7.35/-7.47     | -7.81/-9.20     | -13.16/-11.84   | -11.79/-10.96     | -9.48/-12.99      | -12.64/-11.34     | -8.93/-10.57      | -12.73/-12.77     | -13.10/-10.53     | -9.30/-10.92      | -14.15/-15.68     | -14.76/-11.64     | -15.07/-14.35     | -11.50/-13.71     | -12.10/-13.71     | -11.62/-11.29     | -15.40/-10.03     | -13.13/-15.14     | -13.60/-12.24     | -13.34/-14.02     |
| Θ(135°)   | -13.57/-11.25 | -10.46/-10.92   | -7.80/-10.22    | -14.20/-9.09    | -9.83/-9.70     | -7.41/-11.16    | -10.91/-13.69   | -13.57/-13.52     | -9.19/-10.30      | -13.79/-11.97     | -11.70/-13.65     | -13.83/-14.94     | -12.79/-11.66     | -9.87/-14.42      | -15.93/-15.22     | -15.40/-10.92     | -14.77/-14.15     | -11.22/-10.87     | -11.43/-13.00     | -11.99/-12.05     | -10.16/-14.98     | -12.97/-12.49     | -14.73/-15.34     | -14.84/-15.41     |
| Θ(142.5°) | -15.43/-12.57 | -10.16/-8.75    | -12.38/-15.88   | -9.90/-11.58    | -12.71/-10.82   | -12.71/-15.40   | -9.32/-12.07    | -15.40/-14.23     | -9.96/-10.63      | -14.76/-12.71     | -12.94/-14.27     | -15.15/-15.10     | -13.65/-11.47     | -10.06/-14.51     | -13.71/-14.33     | -15.13/-12.66     | -14.19/-13.38     | -13.98/-11.92     | -13.65/-14.50     | -12.33/-14.42     | -13.13/-14.83     | -15.18/-15.88     | -15.55/-15.45     | -15.19/-14.47     |
| Θ(150°)   | -13.91/-11.37 | -11.19/-13.08   | -12.80/-10.90   | -10.35/-8.03    | -6.33/-6.63     | -12.58/-12.26   | -13.54/-15.83   | -15.54/-12.31     | -13.54/-13.89     | -14.13/-11.01     | -11.32/-15.08     | -13.35/-9.83      | -10.62/-14.74     | -12.89/-13.71     | -15.28/-14.91     | -15.04/-14.92     | -15.44/-14.77     | -15.18/-15.58     | -15.29/-14.26     | -12.67/-13.35     | -15.12/-16.23     | -14.58/-15.10     | -14.58/-15.10     | -15.34/-14.57     |
| Θ(157.5°) | -12.77/-13.97 | -14.64/-15.19   | -15.76/-13.62   | -10.04/-9.66    | -11.28/-11.15   | -8.71/-8.88     | -12.79/-14.87   | -15.38/-15.13     | -13.95/-13.99     | -14.41/-15.22     | -15.92/-13.32     | -11.50/-10.93     | -10.99/-13.69     | -15.59/-14.71     | -15.46/-16.02     | -14.70/-13.17     | -14.71/-12.92     | -12.54/-14.69     | -14.46/-14.61     | -15.23/-15.15     | -15.54/-15.06     | -13.54/-15.36     | -15.34/-13.74     |                   |
| Θ(165°)   | -14.20/-14.47 | -14.41/-14.29   | -14.31/-14.94   | -15.62/-14.41   | -11.87/-11.04   | -11.58/-13.96   | -15.04/-15.54   | -13.40/-13.63     | -15.00/-15.70     | -14.84/-15.68     | -15.13/-15.18     | -15.36/-15.15     | -15.21/-14.93     | -14.12/-11.42     | -9.95/-12.12      | -15.20/-15.12     | -12.74/-11.48     | -12.91/-15.43     | -14.87/-15.42     | -14.40/-15.15     | -15.43/-15.19     | -13.68/-12.65     | -13.53/-14.25     | -15.79/-15.05     |
| Θ(172.5°) | -11.87/-11.64 | -12.59/-14.57   | -15.56/-15.23   | -13.09/-13.62   | -13.89/-13.20   | -13.14/-14.32   | -15.37/-14.90   | -14.63/-14.71     | -13.59/-14.70     | -15.43/-14.69     | -15.44/-14.67     | -13.70/-12.99     | -14.06/-14.93     | -14.71/-15.29     | -16.12/-15.65     | -15.42/-14.86     | -14.10/-13.78     | -13.92/-13.69     | -13.47/-13.06     | -13.09/-12.41     | -12.18/-11.98     |                   |                   |                   |
| Θ(180°)   | -15.55/-14.78 | -15.30/-14.85   | -13.93/-13.78   | -14.52/-14.47   | -14.73/-14.50   | -14.36/-13.71   | -12.70/-12.00   | -11.43/-11.26     | -11.17/-11.24     | -11.31/-11.81     | -12.10/-12.86     | -13.98/-14.47     | -13.97/-13.95     | -13.79/-13.38     | -14.32/-15.21     | -14.91/-14.91     | -14.90/-15.00     | -15.56/-15.36     | -15.42/-14.65     | -14.09/-15.13     | -14.94/-14.84     | -15.64/-15.51     | -14.69/-15.06     |                   |
| Freq(Hz)  | 6.4750Pol.    | TotalAnt.2      | +               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | -0.29/-0.62   | -0.76/-0.60     | -0.53/-0.81     | -0.68/-0.71     | -0.56/-0.33     | -0.36/-0.39     | -0.35/-0.37     | -0.40/-0.41       | -0.52/-0.72       | -1.10/-1.31       | -1.38/-1.18       | -1.19/-1.18       | -1.37/-1.65       | -1.56/-1.28       | -0.96/-0.60       | -0.41/-0.16       | 0.00/0.23         | 0.44/0.53         | 0.68/0.74         | 0.86/1.03         | 0.94/0.80         | 0.71/0.58         | 0.30/0.22         | 0.40/-0.20        |
| Θ(7.5°)   | 1.35/1.42     | 1.702/1.20      | 2.352/1.71      | 3.043/2.36      | 3.192/88        | 2.39/1.91       | 1.230/67        | 0.04/0.49         | -0.87/-1.34       | -1.82/-2.04       | -1.84/-1.62       | -1.64/-1.47       | -1.29/-1.35       | -1.48/-1.35       | -1.14/-0.60       | -0.48/-0.76       | -1.31/-1.44       | -1.38/-1.25       | -1.17/-0.90       | -0.53/-0.07       | 0.00/0.38         | 0.550/0.75        | 0.89/1.12         | 1.21/-1.25        |
| Θ(15°)    | 4.17/1.41     | 4.124/3.1       | 4.484/4.9       | 4.344/4.42      | 4.384/1.6       | 3.49/2.16       | -2.91/-3.39     | -2.58/-1.99       | -1.76/-2.05       | -2.68/-3.13       | -3.29/-3.72       | -4.26/-5.16       | -6.14/-5.96       | -1.40/-3.10       | -1.92/-1.39       | -1.30/-1.29       | -1.53/-1.39       | -0.51/0.73        | 1.752/3.2         | 2.362/3.8         | 2.282/2.0         | 2.683/2.9         | 3.844/1.8         |                   |
| Θ(22.5°)  | 4.304/1.0     | 3.903/8.9       | 4.013/9.1       | 3.703/7.1       | 3.723/10        | 1.42/-1.24      | -4.25/-5.02     | -3.49/-2.23       | -1.79/-1.76       | -2.30/-3.18       | -4.49/-5.42       | -5.63/-5.11       | -4.49/-3.59       | -2.96/-2.14       | -2.14/-2.98       | -4.00/-4.16       | -4.06/-4.21       | -4.39/-2.98       | -1.100/3.4        | 1.17/1.57         | 2.102/65          | 2.913/0.8         | 3.413/6.9         | 4.064/2.8         |
| Θ(30°)    | 2.392/4.2     | 2.09/1.81       | 1.872/7.2       | 3.814/55        | 4.804/3.1       | 2.87/0.61       | -1.52/-1.14     | -0.25/-0.65       | -1.94/-2.69       | -3.29/-4.14       | -4.63/-4.24       | -3.03/-2.73       | -5.77/-12.44      | -9.47/-5.33       | -3.87/-4.00       | -4.17/-5.14       | -7.38/-8.51       | -5.60/-1.17       | 1.06/1.68         | 1.87/1.94         | 2.603/3.1         | 4.124/4.0         | 4.143/5.8         | 3.062/3.3         |
| Θ(37.5°)  | 1.99/1.40     | 1.19/1.50       | 1.883/0.9       | 4.194/45        | 4.755/1.1       | 4.262/8.9       | 1.150/26        | 0.50/-0.95        | -2.09/-1.76       | -1.73/-3.54       | -4.91/-3.13       | -0.250/7.9        | 0.12/-2.61        | -5.37/-6.64       | -6.58/-6.52       | -3.90/-5.37       | -10.13/-10.62     | -4.09/-0.93       | -0.21/-0.23       | 0.52/1.15         | 1.32/1.96         | 2.993/6.4         | 3.353/0.8         | 3.212/7.7         |
| Θ(45°)    | 3.65/2.30     | 1.17/1.58       | 1.09/1.53       | 2.79/2.02       | 0.87/1.18       | 0.30/0.27       | 0.40/-1.34      | -0.72/-1.07       | 0.39/1.23         | 0.40/-2.04        | -5.27/-3.71       | -3.32/-4.43       | -3.84/-1.52       | -0.32/-1.71       | -5.68/-11.05      | -5.68/-4.83       | -9.09/-10.51      | -6.00/-1.54       | -0.99/-0.64       | -0.39/-1.62       | -2.69/-0.55       | 1.592/87          | 3.343/6.8         | 4.064/2.7         |
| Θ(52.5°)  | 4.66/4.29     | 2.782/6.3       | 2.120/67        | 1.660/68        | -0.34/-0.24     | -3.18/-2.05     | -1.78/-2.37     | -0.71/-0.92       | 0.45/0.63         | 0.440/33          | 0.91/1.40         | -0.07/-0.86       | -1.76/-0.97       | 0.08/-1.16        | -5.48/-12.20      | -11.97/-10.99     | -9.56/-8.72       | -8.10/-4.19       | -3.06/-2.74       | -1.82/-1.79       | -1.64/0.85        | 2.082/35          | 2.443/0.0         | 3.534/3.2         |
| Θ(60°)    | 4.95/5.28     | 3.922/62        | 2.93/1.69       | 3.293/40        | 2.142/8.9       | 0.25/-0.29      | -1.77/-1.44     | 0.64/0.23         | -2.53/-4.35       | -3.40/-2.42       | -2.31/-1.25       | -3.10/-4.01       | -3.88/-4.10       | -3.10/-4.33       | -5.72/-14.88      | -12.24/-10.35     | -6.20/-9.68       | -10.12/-9.25      | -7.42/-3.62       | -1.97/-0.08       | -0.18/1.07        | 2.00/1.60         | 1.08/1.29         | 2.863/9.9         |
| Θ(67.5°)  | 4.14/4.56     | 3.662/0.2       | 2.942/7.1       | 4.74/9.38       | 3.503/7.0       | 1.882/3.9       | -0.02/-0.05     | 0.74/-0.27        | -3.24/-7.97       | -4.79/-4.85       | -4.03/-2.35       | -4.66/-13.59      | -15.31/-13.19     | -9.39/-6.14       | -5.52/-8.04       | -5.72/-4.10       | -11.20/-9.65      | -6.48/-0.77       | 0.23/-0.10        | 1.08/1.34         | 1.540/96          | -1.02/5.3         | 3.263/0.6         |                   |
| Θ(75°)    | 2.432/76      | 2.210/48        | 1.672/20        | 4.454/63        | 3.373/22        | 2.943/58        | 0.530/69        | 0.64/0.0          |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |

E1(XY plane) –  $\Theta(90)\Phi(0-360)$   
E2(XZ plane) –  $\Theta(0-180)\Phi(0)$  and  $\Theta(0-180)\Phi(180)$   
E3(YZ plane) –  $\Theta(0-180)\Phi(90)$  and  $\Theta(0-180)\Phi(270)$





# Antenna Pattern of Scan Radio and BLE

# Appendix F

## Total Gain Data

| Freq(Hz)  | 2.45G/Pol.    | TotalAnt. 1    | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                 |                  |                  |                  |                  |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|------------------|------------------|------------------|------------------|
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°)  | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | -2.06/-1.86   | -1.95/-2.26    | -2.21/-2.38    | -2.58/-2.76    | -2.95/-3.08    | -3.08/-3.08    | -2.53/-2.87    | -4.59/-3.08      | -1.63/-1.30      | -1.17/-1.13      | -1.24/-1.50      | -1.33/-1.33      | -1.19/-1.16      | -1.84/-2.02      | -1.67/-1.70      | -1.68/-1.70      | -1.84/-2.02      | -2.15/-1.80      | -1.37/-1.20      | -1.44/-2.14       | -2.95/-3.31      | -3.14/-2.47      |                  |                  |
| Θ(7.5°)   | -1.25/-0.98   | -0.95/-1.20    | -1.72/-2.32    | -2.90/-3.43    | -3.81/-4.04    | -4.11/-3.96    | -3.74/-3.66    | -3.43/-3.18      | -2.76/-2.27      | -1.80/-1.45      | -1.33/-1.51      | -1.80/-1.98      | -1.89/-1.64      | -1.44/-1.41      | -1.48/-1.58      | -1.61/-1.58      | -1.47/-1.41      | -1.45/-1.53      | -1.59/-1.57      | -1.39/-1.03       | -0.83/-0.29      | -0.18/-0.35      | -0.77/-1.18      | -1.51/-1.51      |
| Θ(15°)    | -0.06/-0.06   | 0.09/-0.12     | -0.66/-1.36    | -2.05/-2.63    | -3.02/-3.16    | -2.98/-2.73    | -2.63/-2.69    | -2.70/-2.55      | -2.21/-1.72      | -1.18/-0.64      | -0.36/-0.43      | -0.67/-0.89      | -0.95/-0.79      | -0.64/-0.60      | -0.67/-0.80      | -0.94/-1.04      | -1.15/-1.38      | -1.77/-2.20      | -2.50/-2.60      | -2.47/-2.16       | -1.70/-1.18      | -0.56/-0.05      | 0.30/-0.41       | 0.27/-0.01       |
| Θ(22.5°)  | 0.36/-0.27    | 0.26/-0.15     | -0.13/-0.46    | -0.67/-0.80    | -0.89/-0.83    | -0.61/-0.47    | -0.50/-0.58    | -0.57/-0.51      | -0.36/-0.22      | 0.05/-0.43       | 0.66/-0.59       | 0.40/-0.10       | -0.18/-0.29      | -0.30/-0.41      | -0.52/-0.55      | -0.52/-0.61      | -0.83/-1.19      | -1.69/-2.11      | -2.29/-2.37      | -2.39/-2.28       | -1.00/-0.31      | 0.29/-0.69       | 0.82/-0.62       |                  |
| Θ(30°)    | 0.18/-0.08    | -0.30/-0.32    | -0.22/-0.02    | 0.35/-0.63     | 0.74/-0.78     | 0.82/-0.80     | 0.74/-0.76     | 0.82/-0.93       | 0.93/-0.81       | 0.67/-0.59       | 0.60/-0.65       | 0.87/-1.01       | 0.78/-0.33       | -0.20/-0.69      | -1.03/-0.88      | -0.47/-0.17      | -0.10/-0.28      | -0.51/-0.50      | -0.18/-0.15      | 0.35/-0.32        | 0.14/-0.06       | -0.13/-0.06      | 0.12/-0.25       | 0.41/-0.40       |
| Θ(37.5°)  | -0.12/-0.06   | -0.28/-0.53    | -0.43/-0.04    | 0.61/-0.95     | 0.95/-0.84     | 0.62/-0.41     | 0.29/-0.34     | 0.49/-0.72       | 0.85/-0.87       | 0.74/-0.41       | 0.02/-0.04       | 0.53/-1.13       | 1.18/-0.65       | -0.09/-0.77      | -1.26/-1.00      | -0.26/-0.50      | 1.00/-0.97       | 0.78/-0.88       | 1.30/-1.74       | 1.93/-1.81        | 1.48/-1.10       | 0.76/-0.39       | 0.03/-0.33       | -0.48/-0.38      |
| Θ(45°)    | 0.14/-0.61    | 0.58/-0.00     | -0.42/-0.18    | 0.21/-0.24     | -0.11/-0.35    | -0.60/-0.87    | -1.18/-1.34    | -1.15/-0.69      | -0.26/-1.10      | 0.30/-0.24       | -0.14/-0.56      | -0.41/-0.19      | 0.61/-0.54       | 0.16/-0.39       | -1.00/-1.13      | -0.28/-1.09      | 1.96/-1.97       | 1.62/-1.51       | 1.95/-2.47       | 2.69/-2.51        | 2.06/-1.62       | 1.32/-1.06       | 0.77/-0.45       | 0.07/-0.17       |
| Θ(52.5°)  | 0.93/-1.19    | 1.36/-0.70     | -0.23/-0.45    | -0.41/-0.85    | -1.36/-1.50    | -1.44/-1.78    | -2.34/-2.48    | -1.95/-1.28      | -0.83/-0.48      | -0.05/-0.26      | 0.18/-0.38       | -0.94/-0.89      | -0.51/-0.33      | -0.33/-0.48      | -0.83/-1.18      | -0.06/-1.67      | 2.52/-2.49       | 2.14/-2.04       | 2.51/-3.14       | 3.46/-3.21        | 2.47/-1.65       | 1.24/-1.27       | 1.49/-1.75       | 1.71/-1.19       |
| Θ(60°)    | 1.30/-1.36    | 1.60/-0.97     | -0.33/-1.20    | -1.48/-1.80    | -1.60/-1.05    | -1.14/-1.84    | -2.58/-2.47    | -1.56/-0.78      | -0.51/-0.54      | -0.42/-0.05      | 0.13/-0.30       | -1.20/-1.66      | -1.57/-1.52      | -1.42/-1.03      | -0.85/-1.35      | -0.50/-1.23      | 2.24/-2.45       | 2.27/-2.20       | 2.57/-3.23       | <b>3.67/-3.35</b> | 2.24/-0.82       | -0.06/-0.08      | 0.84/-1.66       | 2.12/-1.73       |
| Θ(67.5°)  | 0.81/-0.94    | 1.23/-0.73     | -0.52/-1.87    | -3.01/-3.12    | -1.38/-0.62    | -1.24/-2.34    | -2.82/-2.34    | -1.26/-0.36      | -0.11/-0.48      | -0.86/-0.62      | -0.28/-0.41      | -1.01/-1.51      | -2.21/-3.04      | -2.76/-1.66      | -1.39/-1.82      | -0.99/-0.62      | 1.68/-1.93       | 1.87/-1.84       | 2.14/-2.84       | 3.43/-3.07        | 1.70/-0.14       | -1.70/-1.78      | -0.42/-0.87      | 1.57/-1.29       |
| Θ(75°)    | 0.07/-0.13    | 0.35/-0.19     | -1.10/-2.23    | -3.88/-4.04    | -1.67/-1.10    | -2.29/-3.30    | -3.36/-3.10    | -2.10/-0.81      | -0.24/-0.59      | -1.32/-1.40      | -0.78/-0.43      | -1.01/-2.01      | -3.49/-5.13      | -4.72/-2.98      | -2.35/-2.62      | -1.96/-0.62      | 0.38/-0.60       | 0.91/-1.26       | 1.46/-2.30       | 3.19/-2.90        | 1.40/-0.65       | -2.69/-3.22      | -1.44/-0.21      | 0.88/-0.58       |
| Θ(82.5°)  | -1.14/-0.91   | -0.53/-1.13    | -2.13/-3.18    | -4.71/-4.17    | -1.88/-2.11    | -4.03/-4.08    | -3.42/-3.30    | -2.41/-1.15      | -0.53/-1.07      | -2.11/-2.52      | -1.89/-1.83      | -2.60/-3.67      | -4.96/-6.04      | -5.17/-3.53      | -2.72/-2.46      | -2.25/-1.82      | -1.35/-1.10      | 0.11/-0.69       | 0.57/-1.42       | 2.38/-1.82        | -0.15/-2.79      | -5.44/-5.57      | -2.98/-0.90      | -0.22/-0.59      |
| Θ(90°)    | -3.03/-2.73   | -1.95/-2.02    | -2.85/-4.12    | -5.83/-4.41    | -1.95/-2.58    | -6.01/-5.62    | -3.65/-3.24    | -2.61/-1.47      | -0.84/-1.30      | -2.66/-3.83      | -3.53/-2.78      | -2.82/-3.62      | -5.41/-7.12      | -7.73/-4.92      | -2.96/-2.63      | -3.14/-3.58      | -3.92/-3.43      | -1.11/-0.34      | -0.96/-0.05      | 1.18/-0.65        | -1.46/-4.40      | -9.47/-9.61      | -5.26/-2.88      | -1.94/-2.20      |
| Θ(97.5°)  | -5.37/-5.36   | -4.19/-3.65    | -3.72/-5.11    | -7.47/-4.81    | -1.89/-2.36    | -6.17/-7.07    | -5.19/-4.68    | -3.78/-2.63      | -2.10/-2.47      | -4.05/-4.90      | -3.76/-2.73      | -3.42/-5.75      | -7.67/-8.96      | -6.72/-3.73      | -3.04/-3.90      | -4.87/-5.78      | -6.26/-4.18      | -1.57/-1.20      | -2.18/-1.06      | 0.16/-0.69        | -2.94/-5.87      | -12.36/-13.66    | -7.35/-4.85      | -3.71/-4.03      |
| Θ(105°)   | -6.13/-7.55   | -7.44/-7.17    | -5.62/-5.69    | -8.38/-6.21    | -2.77/-2.50    | -5.27/-7.75    | -6.87/-5.85    | -4.79/-3.83      | -3.41/-3.44      | -4.08/-4.48      | -4.04/-3.81      | -5.23/-6.13      | -8.31/-7.48      | -5.99/-4.27      | -4.44/-5.68      | -6.15/-6.97      | -7.23/-5.40      | -3.00/-3.94      | -5.10/-3.94      | -2.06/-2.72       | -4.31/-5.77      | -9.08/-12.74     | -11.49/-8.10     | -5.37/-6.47      |
| Θ(112.5°) | -5.52/-6.01   | -1.85/-2.02    | -8.99/-7.24    | -8.32/-6.31    | -2.76/-2.18    | -4.28/-6.38    | -5.97/-4.94    | -3.98/-3.23      | -3.13/-3.48      | -5.65/-5.62      | -5.94/-6.11      | -7.25/-7.61      | -6.33/-5.41      | -4.82/-5.34      | -7.78/-9.44      | -10.19/-10.33    | -7.68/-6.93      | -4.80/-6.09      | -10.05/-6.36     | -4.00/-4.37       | -4.50/-4.48      | -5.89/-8.12      | -10.65/-10.52    | -7.59/-6.53      |
| Θ(120°)   | -8.09/-6.23   | -4.96/-6.13    | -8.22/-8.71    | -10.45/-7.84   | -3.06/-1.45    | -2.54/-4.69    | -5.52/-4.52    | -3.33/-2.74      | -3.00/-3.93      | -5.29/-6.20      | -6.31/-6.07      | -6.90/-7.66      | -6.56/-5.81      | -6.34/-8.52      | -9.49/-7.41      | -6.40/-6.29      | -7.88/-7.23      | -5.88/-7.22      | -8.04/-5.00      | -4.08/-5.64       | -6.39/-5.90      | -6.50/-7.96      | -8.95/-7.80      | -7.22/-7.95      |
| Θ(127.5°) | -11.84/-9.80  | -6.62/-6.38    | -6.82/-7.13    | -9.22/-10.50   | -5.32/-2.61    | -2.66/-4.54    | -5.59/-4.79    | -3.64/-3.33      | -3.86/-4.71      | -5.31/-5.54      | -5.77/-6.87      | -8.97/-8.83      | -7.26/-6.71      | -8.05/-9.15      | -8.67/-8.95      | -9.56/-11.46     | -11.80/-8.12     | -6.35/-7.05      | -6.81/-9.44      | -4.60/-6.00       | -6.85/-6.81      | -7.66/-9.06      | -8.84/-8.63      | -5.59/-5.75      |
| Θ(135°)   | -9.47/-11.20  | -11.02/-10.01  | -8.27/-7.14    | -7.79/-9.14    | -7.79/-9.14    | -3.83/-4.61    | -6.07/-6.20    | -5.20/-4.62      | -4.72/-5.02      | -5.18/-5.52      | -6.61/-6.89      | -9.57/-7.86      | -6.24/-6.41      | -8.29/-10.44     | -12.09/-14.35    | -15.02/-11.93    | -9.06/-9.63      | -6.38/-7.26      | -7.55/-6.43      | -5.97/-6.38       | -6.62/-6.93      | -8.33/-10.02     | -10.24/-7.39     | -5.96/-7.02      |
| Θ(142.5°) | -9.74/-10.17  | -10.18/-8.64   | -6.47/-5.51    | -6.41/-8.62    | -8.71/-6.99    | -5.82/-5.49    | -6.04/-5.56    | -6.47/-6.16      | -6.07/-5.92      | -5.99/-6.66      | -8.09/-8.61      | -6.44/-8.71      | -11.88/-11.80    | -9.89/-9.87      | -8.56/-9.38      | -9.56/-9.07      | -9.21/-8.90      | -8.44/-8.22      | -8.70/-9.47      | -9.52/-10.08      | -12.92/-15.33    | -12.82/-9.75     | -10.66/-8.86     |                  |
| Θ(150°)   | -11.92/-11.73 | -9.82/-6.99    | -4.52/-4.30    | -3.82/-5.76    | -9.05/-11.82   | -10.75/-9.17   | -7.90/-7.11    | -6.64/-6.38      | -6.27/-6.12      | -5.88/-6.01      | -6.45/-6.73      | -6.98/-7.70      | -9.26/-11.08     | -10.86/-9.20     | -7.87/-7.42      | -7.68/-8.52      | -9.67/-10.83     | -12.00/-12.80    | -13.03/-15.19    | -14.51/-12.12     | -10.12/-6.67     | -8.44/-8.93      | -8.10/-8.87      | -9.09/-10.29     |
| Θ(157.5°) | -9.54/-9.38   | -8.09/-6.20    | -4.41/-3.28    | -3.09/-3.91    | -5.56/-7.85    | -9.83/-10.64   | -10.57/-10.25  | -9.42/-8.53      | -7.57/-6.86      | -6.52/-6.73      | -7.40/-6.39      | -9.81/-10.91     | -10.77/-9.84     | -9.11/-8.65      | -8.23/-7.70      | -7.17/-6.80      | -6.97/-7.66      | -8.97/-11.48     | -14.38/-15.06    | -13.37/-9.80      | -7.61/-6.33      | -5.74/-5.87      | -6.61/-7.48      | -7.98/-8.39      |
| Θ(165°)   | -10.89/-9.36  | -8.09/-7.08    | -6.12/-5.27    | -4.83/-4.88    | -5.47/-6.33    | -7.18/-7.84    | -8.48/-9.00    | -8.89/-8.09      | -7.16/-6.80      | -7.10/-8.02      | -8.72/-8.98      | -9.38/-9.30      | -9.52/-10.34     | -11.69/-12.24    | -10.90/-9.03     | -7.59/-6.84      | -6.58/-6.74      | -7.41/-8.61      | -10.32/-11.56    | -11.38/-10.98     | -10.13/-9.68     | -9.66/-10.23     | -11.40/-12.57    | -13.06/-12.29    |
| Θ(172.5°) | -10.56/-9.18  | -8.34/-7.89    | -7.65/-7.32    | -7.20/-7.20    | -7.58/-8.03    | -8.33/-8.32    | -8.23/-8.02    | -7.66/-7.40      | -7.45/-7.79      | -8.27/-8.22      | -8.20/-7.99      | -8.10/-8.81      | -9.86/-10.29     | -10.82/-9.91     | -8.79/-9.98      | -7.59/-7.48      | -7.54/-7.77      | -8.25/-9.00      | -9.96/-11.01     | -11.71/-12.11     | -12.57/-13.14    | -13.81/-14.44    | -14.84/-14.67    | -13.96/-11.97    |
| Θ(180°)   | -7.68/-7.24   | -7.22/-7.37    | -7.40/-7.24    | -7.23/-7.29    | -7.71/-8.27    | -8.87/-8.95    | -8.44/-7.99    | -7.60/-7.44      | -7.56/-7.92      | -8.41/-8.72      | -8.85/-8.97      | -9.18/-9.48      | -9.74/-9.75      | -9.06/-8.51      | -8.34/-8.69      | -9.29/-9.68      | -9.67/-9.69      | -9.97/-10.36     | -10.81/-11.02    | -11.10/-10.92     | -10.43/-9.75     | -9.00/-8.32      | -7.91/-8.09      | -8.19/-7.98      |
| Freq(Hz)  | 5.2G/Pol.     | TotalAnt. 1    | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                 | -                | -                | -                | -                |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°)  | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| Θ(0°)     | 0.09/-0.02    | 0.06/-0.12     | 0.32/-0.37     | 0.51/-0.76     | 1.08/-0.96     | 0.91/-1.02     | 0.81/-0.98     | 1.21/-1.18       | 0.98/-1.06       | 1.05/-0.91       | 0.76/-0.37       | 0.27/-0.44       | 0.20/-0.15       | 0.47/-0.52       | 0.73/-0.90       | 0.98/-0.95       | 0.94/-0.96       | 0.92/-0.96       | 1.23/-1.34       | 1.23/-1.29        | 1.09/-1.04       | 0.87/-0.67       | 0.56/-0.57       | 0.50/-0.60       |
| Θ(7.5°)   | 2.07/-1.63    | 0.77/-0.28     | 0.27/-0.32     | -0.05/-0.14    | -0.11/-0.58    | -0.66/-0.58    | -0.81/-0.41    | 0.23/-0.61       | 1.02/-1.06       | 1.31/-1.52       | 1.80/-1.79       | 1.32/-1.15       | 1.07/-0.98       | 0.66/-0.33       | 0.26/-0.06       | -0.68/-1.04      | -1.40/-1.57      | -1.40/-0.83      | -0.16/-0.14      | 0.14/-0.74        | 1.21/-1.29       | 1.34/-1.84       | 1.98/-1.78       | 1.87/-2.30       |
| Θ(15°)    | 2.41/-2.46    | 1.55/-0.02     | -1.20/-1.01    | -0.84/-0.09    | 0.29/-0.12     | -0.50/-1.16    | -1.18/-0.20    | 0.48/-0.10       | 1.58/-1.61       | 2.09/-2.21       | 1.93/-1.70       | 1.43/-0.69       | -0.29/-1.09      | -1.73/-2.26      | -2.59/-2.76      | -2.64/-2.30      | -1.60/-1.08      | -0.74/-0.55      | -0.40/-0.27      | 0.93/-0.75        | 0.59/-1.17       | 1.21/-1.65       |                  |                  |
| Θ(22.5°)  | 3.06/-2.35    | 2.77/-1.51     | 0.31/-0.11     | -1.02/-0.39    | -0.12/-0.03    | -0.21/-0.63    | 0.54/-1.77     | 2.67/-2.91       | 2.61/-2.01       | 0.98/-0.88       | 1.87/-2.35       | 2.38/-2.71       | 2.52/-1.16       | -0.91/-2.53      | -3.90/-5.67      | -4.88/-2.76      | -1.76/-1.39      | -0.98/-0.39      | 0.38/-0.37       | -0.03/-0.42       | -0.77/-0.40      | 0.82/-1.60       | 1.81/-1.81       | 1.86/-2.13       |
| Θ(30°)    | 0.95/-2.42    | 2.16/-0.48     | -0.02/-0.51    | -0.06/-0.48    | 0.04/-0.32     | -0.43/-0.15    | 0.91/-1.63     | 1.78/-1.29       | 0.03/-1.57       | -2.81/-3.44      | -2.29/-1.12      | -0.10/-0.92      | 0.30/-1.85       | -2.69/-2.22      | -3.14/-6.13      | -5.28/-2.13      | -1.14/-0.88      | -0.69/-0.85      | -0.15/-0.33      | 1.04/-2.11        | 2.88/-3.10       | 2.72/-2.05       | 2.29/-2.64       | 2.03/-0.59       |
| Θ(37.5°)  | -0.57/-0.92   | 1.65/-0.44     | -1.04/-2.36    | -1.19/-1.81    | 1.17/-0.81     | -0.97/-1.23    | 1.92/-0.96     | -0.76/-2.65      | -1.73/-1.14      | -4.77/-6.51      | -7.53/-3.38      | -0.18/-0.22      | -2.79/-8.33      | -6.15/-3.29      | -5.70/-10.13     | -6.01/-3.03      | -2.26/-2.29      | -1.09/-1.40      | -0.26/-2.49      | 1.94/-2.63        | 1.63/-1.70       | 1.30/-1.89       | 2.44/-0.89       | 2.40/-0.91       |
| Θ(45°)    | -0.11/-1.30   | 0.33/-0.42     | -1.22/-3.53    | 1.29/-2.46     | 1.             |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                  |                  |                  |                  |



# Antenna Pattern of Scan Radio and BLE

# Appendix F

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(22.5°)  | -0.32/-2.32   | -3.23/-2.38     | -1.61/-0.12     | 0.91/1.19       | 1.40/2.01       | 2.41/3.03       | 3.09/2.81       | 2.10/1.13         | 0.35/-0.35        | -0.74/-0.71       | -0.95/-0.73       | 0.65/1.77         | 2.49/3.22         | 3.27/2.44         | 0.95/-1.61        | -4.30/-4.12       | -2.50/-2.48       | -2.70/-2.15       | -0.85/0.48        | 1.11/0.45         | 0.20/0.94         | 0.99/0.62         | 1.01/0.66         | 0.44/-1.16        |
| Θ(30°)    | 0.95/-0.52    | -3.44/-5.92     | -3.98/0.04      | 1.43/1.28       | 0.43/1.83       | 3.70/3.97       | 2.74/1.69       | 0.50/-0.69        | -0.99/-1.01       | -1.35/-1.40       | -1.75/-2.70       | -2.44/-1.35       | -2.29/-2.39       | -2.45/-1.94       | -0.94/-2.38       | -6.03/-4.32       | -0.97/-0.12       | 0.06/-0.13        | 0.19/0.97         | 0.99/0.53         | 1.15/1.87         | 2.21/2.83         | 2.98/2.19         | 1.80/1.33         |
| Θ(37.5°)  | 2.52/2.66     | -1.12/-4.29     | -3.32/-0.71     | 0.25/0.64       | 0.03/0.18       | 2.25/2.27       | 0.36/-0.70      | -1.43/-0.59       | 0.71/0.25         | -1.06/-0.29       | -0.05/-1.42       | -3.05/-3.93       | -7.03/-5.33       | -1.01/-1.99       | -4.00/-4.49       | -7.43/-2.60       | 1.16/-1.12        | 0.10/-0.16        | -0.82/-0.17       | 0.80/1.80         | 2.90/2.80         | 1.02/-0.35        | 0.28/-1.42        | 1.81/0.21         |
| Θ(45°)    | 1.98/0.40     | 1.40/-2.32      | -1.47/0.47      | -0.72/-0.72     | -1.01/0.15      | 1.53/1.00       | -1.46/-1.93     | -1.29/-0.62       | -0.48/-2.34       | -2.19/0.50        | 1.06/-0.69        | -3.12/-5.36       | -4.93/-4.99       | -13.82/-15.48     | -8.60/-4.64       | -9.64/-5.43       | -0.33/-0.48       | -1.75/-0.08       | 0.66/1.81         | 1.67/2.46         | 3.18/1.93         | 2.08/0.31         | 2.57/2.09         | 1.87/1.80         |
| Θ(52.5°)  | -1.15/-0.10   | 0.83/-1.02      | -1.15/0.39      | -1.03/-2.89     | -0.56/-1.72     | 1.98/-0.26      | -1.65/-0.46     | -0.92/-0.63       | -1.01/-2.24       | -1.24/-0.81       | -1.13/-1.77       | -3.10/-2.00       | -2.85/-4.85       | -13.01/-10.89     | -7.28/-4.66       | -10.02/-4.30      | -2.58/-4.98       | -0.03/-0.49       | 0.96/2.12         | 1.80/3.16         | 4.09/4.68         | <b>5.08/3.71</b>  | 1.33/0.03         | 0.46/0.84         |
| Θ(60°)    | 1.13/-1.79    | -2.09/-1.52     | -1.58/-1.32     | -1.94/-1.68     | 0.54/0.48       | 1.87/0.40       | 0.61/0.81       | 0.09/1.06         | 0.16/-0.07        | -0.96/-4.72       | -4.78/-4.41       | -5.04/-2.77       | -1.18/-2.73       | -4.67/-6.56       | -7.35/-2.26       | -3.23/-1.79       | -1.18/-2.74       | -2.82/0.71        | 0.59/0.67         | 1.21/1.73         | 0.81/2.78         | 4.06/1.73         | -2.52/-1.29       | 0.96/1.13         |
| Θ(67.5°)  | 1.67/0.83     | -3.99/-1.48     | -2.32/-3.38     | -1.98/0.07      | -0.06/-2.20     | 1.90/1.21       | 1.41/0.64       | 1.15/1.66         | 0.18/1.25         | -0.25/-3.81       | -6.32/-6.93       | -6.49/-3.47       | -3.10/-5.20       | -2.64/-5.36       | -3.74/-1.46       | -1.47/0.26        | 0.37/-0.83        | -0.01/0.03        | 1.48/1.27         | 1.88/2.62         | 1.45/3.34         | 3.26/-0.04        | -2.01/-1.49       | 0.77/1.26         |
| Θ(75°)    | 1.76/1.50     | -3.30/-1.02     | -3.75/-4.25     | -2.52/-0.20     | -1.58/-4.82     | 1.37/1.09       | 0.16/-1.32      | 0.52/0.73         | -0.02/-1.65       | 0.88/-0.80        | -5.43/-6.70       | -5.85/-4.30       | -3.98/-6.80       | -3.08/-3.75       | -2.57/-1.04       | -0.68/0.65        | 0.35/-0.49        | 1.87/4.47         | 2.89/1.81         | 1.96/4.46         | 4.04/3.55         | 2.19/-0.77        | -1.86/-2.65       | -0.88/0.36        |
| Θ(82.5°)  | 0.93/0.59     | -2.85/-1.29     | -5.51/-5.35     | -3.22/-2.05     | -4.93/-5.30     | 0.17/-0.31      | -2.06/-2.21     | -0.41/-0.62       | -0.19/1.03        | -0.06/0.85        | -6.03/-6.84       | -4.75/-5.38       | -4.42/-7.60       | -3.22/-4.43       | -2.24/-1.05       | -0.33/-0.37       | -1.03/-0.59       | 1.48/4.29         | 3.04/2.29         | 0.84/4.86         | 4.94/2.96         | 1.37/-1.67        | -4.63/-5.27       | -2.24/-0.28       |
| Θ(90°)    | -0.42/-1.05   | -4.51/-3.22     | -8.37/-8.38     | -4.23/-3.55     | -8.38/-5.33     | -1.29/-1.92     | -4.62/-3.96     | -2.26/-2.28       | -1.16/0.12        | -1.70/-1.84       | -4.86/-6.08       | -4.89/-5.52       | -2.80/-7.74       | -4.07/-3.78       | -3.15/-1.76       | -0.45/-1.55       | -2.31/-2.17       | -0.13/-1.49       | 2.14/1.17         | -2.79/2.93        | 4.52/1.58         | -1.71/-4.34       | -7.94/-4.85       | -3.51/-0.84       |
| Θ(97.5°)  | -3.87/-5.01   | -6.69/-5.67     | -9.41/-8.68     | -5.40/-5.04     | -10.32/-5.63    | -2.02/-2.96     | -6.22/-4.96     | -3.67/-3.57       | -2.39/-1.09       | -3.02/-3.36       | -5.01/-5.34       | -6.15/-4.23       | -2.92/-8.05       | -4.99/-4.85       | -3.65/-2.44       | -1.48/-3.41       | -3.86/-3.49       | -2.69/-2.98       | -1.18/-1.81       | -6.12/-0.93       | 1.37/-0.49        | -6.49/-7.13       | -8.78/-9.33       | -1.45/-0.98       |
| Θ(105°)   | -8.78/-7.84   | -5.63/-7.54     | -7.84/-8.96     | -6.57/-5.70     | -12.11/-7.51    | -4.51/-1.11     | -8.86/-8.57     | -5.86/-6.31       | -4.66/-4.11       | -3.07/-4.88       | -5.25/-4.34       | -6.15/-5.81       | -3.25/-6.99       | -5.16/-4.11       | -5.74/-6.56       | -2.16/-4.88       | -3.50/-7.96       | -3.31/-6.47       | -10.07/-7.79      | -6.31/-3.00       | -6.29/-10.36      | -8.21/-4.96       | -6.10/-6.29       |                   |
| Θ(112.5°) | -6.77/-6.36   | -6.73/-6.70     | -10.29/-7.28    | -6.05/-9.33     | -10.11/-9.49    | -6.39/-5.34     | -9.40/-8.50     | -5.56/-6.09       | -5.93/-5.62       | -4.00/-5.29       | -6.60/-6.79       | -9.69/-2.75       | -5.02/-7.58       | -5.08/-7.63       | -5.71/-5.02       | -6.35/-6.43       | -3.34/-1.98       | -6.11/-3.85       | -4.90/-5.04       | -8.27/-6.12       | -6.92/-5.21       | -6.08/-12.27      | -7.99/-8.64       | -11.06/-12.00     |
| Θ(120°)   | -7.41/-8.07   | -10.77/-11.25   | -10.78/-9.05    | -7.86/-12.50    | -9.32/-9.94     | -8.64/-5.39     | -9.80/-6.62     | -6.63/-5.32       | -6.85/-8.31       | -4.68/-5.23       | -4.64/-8.60       | -9.78/-4.69       | -4.86/-7.30       | -7.75/-6.49       | -8.62/-7.16       | -10.09/-7.25      | -7.46/-5.67       | -13.47/-5.54      | -6.49/-7.10       | -7.19/-6.25       | -3.47/-3.62       | -6.46/-10.91      | -8.78/-9.33       | -1.45/-0.98       |
| Θ(127.5°) | -13.86/-10.11 | -11.05/-12.06   | -8.89/-15.01    | -7.26/-11.06    | -10.56/-10.50   | -9.17/-6.96     | -13.26/-8.00    | -5.58/-5.74       | -7.80/-4.27       | -5.82/-7.00       | -6.77/-5.40       | -7.12/-6.40       | -6.38/-11.50      | -10.09/-9.61      | -8.72/-13.04      | -6.36/-12.57      | -15.46/-8.28      | -10.47/-4.81      | -7.04/-7.14       | -9.93/-8.60       | -15.77/-8.74      | -7.83/-9.42       | -12.80/-9.42      |                   |
| Θ(135°)   | -11.01/-10.95 | -13.53/-15.17   | -10.15/-8.83    | -8.38/-13.15    | -13.57/-8.82    | -10.03/-6.40    | -12.55/-8.37    | -8.26/-7.28       | -4.94/-7.16       | -5.18/-7.97       | -8.56/-11.11      | -8.03/-7.26       | -4.68/-10.40      | -8.99/-10.86      | -9.74/-10.81      | -7.68/-13.36      | -15.27/-13.07     | -15.15/-13.63     | -14.15/-9.91      | -6.73/-7.53       | -13.83/-11.87     | -11.94/-6.32      | -8.71/-12.47      | -12.33/-9.30      |
| Θ(142.5°) | -11.13/-10.88 | -10.63/-11.97   | -8.47/-9.79     | -15.68/-8.49    | -7.86/-12.52    | -8.58/-7.81     | -9.29/-7.38     | -4.37/-5.58       | -4.67/-6.10       | -8.58/-8.53       | -12.82/-11.33     | -8.65/-4.77       | -10.09/-9.41      | -8.62/-12.77      | -15.23/-12.29     | -11.55/-13.03     | -10.45/-9.72      | -11.37/-9.70      | -11.32/-8.78      | -9.61/-12.42      | -14.20/-11.38     | -9.28/-12.16      | -13.55/-8.99      |                   |
| Θ(150°)   | -12.82/-11.60 | -11.74/-15.36   | -10.93/-9.74    | -8.09/-8.58     | -10.85/-10.51   | -8.49/-7.62     | -7.56/-9.45     | -8.44/-10.11      | -14.44/-11.34     | -4.82/-8.36       | -8.11/-10.92      | -11.18/-9.20      | -10.61/-10.50     | -10.06/-11.61     | -10.48/-10.85     | -14.41/-12.31     | -15.41/-15.34     | -14.92/-14.59     | -16.10/-15.70     | -12.60/-15.18     | -12.86/-15.04     | -15.26/-15.15     | -15.21/-12.16     | -10.13/-12.44     |
| Θ(157.5°) | -10.77/-12.63 | -11.99/-11.76   | -13.23/-14.27   | -13.99/-12.43   | -9.71/-9.13     | -10.00/-9.36    | -9.43/-10.70    | -11.21/-8.84      | -8.22/-9.57       | -11.11/-12.32     | -11.93/-9.14      | -7.77/-9.57       | -12.76/-13.57     | -13.74/-12.51     | -11.91/-12.70     | -12.86/-11.83     | -14.40/-14.60     | -14.39/-15.28     | -15.62/-14.87     | -12.50/-13.80     | -15.70/-16.07     | -13.51/-13.70     | -14.64/-15.38     | -13.48/-10.87     |
| Θ(165°)   | -14.39/-14.49 | -11.57/-11.24   | -10.59/-10.26   | -10.99/-11.13   | -11.14/-12.97   | -11.92/-9.70    | -8.82/-10.49    | -13.73/-15.84     | -15.13/-15.24     | -13.75/-12.74     | -11.80/-10.94     | -11.52/-14.85     | -15.40/-15.08     | -11.23/-10.01     | -11.30/-14.95     | -15.95/-15.80     | -15.28/-15.30     | -11.57/-15.10     | -13.44/-14.57     | -15.79/-15.51     | -15.66/-15.33     | -15.16/-11.67     | -11.20/-12.06     | -12.23/-15.67     |
| Θ(172.5°) | -13.97/-13.51 | -11.98/-12.25   | -12.25/-12.96   | -13.83/-15.30   | -12.18/-10.70   | -8.90/-8.40     | -8.67/-9.38     | -11.28/-12.93     | -12.99/-14.31     | -13.86/-13.41     | -12.50/-13.00     | -13.88/-11.26     | -11.40/-13.67     | -13.50/-11.70     | -11.75/-11.67     | -11.14/-10.03     | -9.42/-9.54       | -9.88/-9.93       | -11.06/-12.34     | -12.77/-12.97     | -12.86/-13.52     | -12.41/-11.92     | -12.29/-13.84     | -10.63/-15.06     |
| Θ(180°)   | -10.16/-10.14 | -9.38/-9.04     | -10.14/-11.30   | -11.37/-11.07   | -11.30/-12.44   | -13.65/-12.40   | -11.32/-11.61   | -13.10/-14.03     | -13.65/-12.78     | -12.41/-12.64     | -12.51/-12.48     | -11.79/-13.06     | -12.63/-11.02     | -10.92/-12.03     | -11.21/-12.45     | -14.08/-14.67     | -14.08/-12.36     | -11.60/-11.33     | -10.90/-10.52     | -10.51/-9.99      | -9.69/-10.30      | -11.45/-10.99     | -10.75/-11.36     |                   |
| Freq(Hz)  | 6.175GPol.    | TotalAnt. 1     | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | 2.29/2.14     | 2.50/2.81       | 2.76/2.43       | 2.49/2.41       | 2.39/2.30       | 2.31/2.53       | 2.22/1.87       | 2.14/2.36         | 2.12/2.05         | 2.18/2.20         | 2.31/2.48         | 2.35/2.28         | 2.25/2.12         | 2.13/2.03         | 1.94/1.94         | 1.97/1.97         | 2.03/1.95         | 1.71/0.86         | 2.30/2.51         | 2.05/2.18         | 2.47/2.16         | 2.26/2.64         | 2.27/2.28         | 2.53/2.36         |
| Θ(7.5°)   | 0.20/0.02     | 0.49/0.80       | 0.90/0.91       | 1.65/2.24       | 2.78/3.18       | 3.44/3.59       | 3.60/3.13       | 2.95/3.06         | 2.95/2.62         | 2.44/2.42         | 2.34/2.43         | 2.22/2.05         | 2.09/2.01         | 2.14/2.20         | 2.20/2.29         | 2.34/2.45         | 2.58/2.77         | 2.91/3.05         | 3.25/3.32         | 2.91/2.10         | 2.02/1.89         | 1.18/0.84         | 0.65/0.29         | 0.76/0.46         |
| Θ(15°)    | 1.17/0.88     | 0.76/0.77       | 0.50/-0.12      | 0.56/1.49       | 2.33/3.21       | 4.01/3.32       | 4.42/3.95       | 3.21/2.77         | 2.05/-1.42        | 1.14/0.98         | 1.38/1.97         | 2.46/3.01         | 4.00/4.69         | 5.23/5.37         | 4.51/2.98         | 0.79/-1.05        | 1.06/0.19         | 0.82/0.62         | -0.07/-0.54       | -1.23/-1.97       | -1.90/-0.70       | 0.41/0.89         | 1.41/1.69         | 1.03/1.05         |
| Θ(22.5°)  | -1.16/-0.86   | -0.78/-0.74     | 0.59/1.19       | 1.40/1.45       | 1.59/1.94       | 2.53/3.01       | 2.69/1.32       | -0.66/-1.40       | -0.91/-0.81       | -1.34/-1.61       | -2.14/-2.90       | -2.46/-2.46       | -0.76/-1.41       | 2.43/3.48         | 3.96/3.28         | 1.48/-0.89        | -1.34/-0.42       | 0.17/0.14         | -0.18/0.07        | 0.96/1.85         | 2.15/1.10         | -0.11/-0.84       | -1.34/-0.65       | 0.84/0.30         |
| Θ(30°)    | 0.08/-3.00    | -1.21/-0.54     | 1.57/1.43       | -0.26/-0.58     | 0.84/-1.52      | 0.86/0.12       | -0.86/-2.08     | -1.35/0.59        | 1.61/1.38         | 1.35/1.80         | 2.31/1.92         | 1.17/0.92         | -1.05/-1.92       | -1.64/-3.34       | -1.45/-0.67       | -1.20/-3.31       | -2.96/-0.57       | 0.59/0.88         | 1.19/1.69         | 1.78/1.42         | 0.75/0.39         | 1.79/3.54         | 3.84/-1.72        | 0.64/2.36         |
| Θ(37.5°)  | -0.82/-4.57   | -4.62/-0.92     | 2.15/1.03       | -1.32/-2.29     | -1.30/0.38      | 0.61/-1.35      | -2.45/-1.47     | -0.72/0.26        | 0.42/0.47         | 1.23/1.63         | 1.59/1.67         | 0.67/0.17         | 0.18/-2.67        | -4.57/-5.70       | -3.27/4.90        | -3.22/-4.53       | -0.78/1.18        | 1.09/0.61         | 0.96/0.68         | 1.53/2.58         | 2.70/2.41         | 2.05/2.50         | 3.15/2.44         | 1.72/1.27         |
| Θ(45°)    | 1.57/-0.61    | -4.79/-2.22     | 1.42/-0.62      | -2.42/-1.48     | -0.48/-0.20     | -0.84/-1.37     | -0.12/0.26      | -0.97/-0.60       | -0.38/-0.43       | -0.43/-0.52       | -0.22/0.54        | -0.16/-1.30       | -1.57/-1.16       | -0.06/-4.45       | -4.26/-4.94       | -2.43/-5.38       | -1.61/1.70        | 0.36/0.75         | 1.98/1.47         | 2.21/2.62         | 3.23/2.80         | -0.11/-0.73       | 1.28/1.14         | 2.57/3.42         |
| Θ(52.5°)  | 0.50/-0.20    | -0.31/-2.46     | -0.26/-1.17     | -1.12/0.41      | 0.63/0.11       | -0.18/0.88      | 1.95/1.69       | 0.44/0.97         | 0.17/-0.94        | -4.13/-5.80       | -3.49/-2.92       | -2.91/-2.89       | -3.17/-5.04       | -2.31/-0.78       | -3.19/-3.36       | -2.25/-6.30       | -2.02/0.40        | -0.31/0.73        | 3.08/3.42         | 2.49/2.37         | 4.83/4.08         | 2.22/1.60         | 2.59/1.83         | 0.60/1.83         |
| Θ(60°)    | 0.17/1.08     | 0.34/-0.82      | -2.77/-1.86     | -0.47/1.89      | -0.95/1.23      | 0.67/1.38       | 0.92/1.58       | 0.59/1.34         | 1.11/-0.30        | -2.54/-5.06       | -6.38/-1.06       | -5.76/-2.35       | -1.59/-4.11       | -0.32/0.36        | -4.16/-4.85       | -3.88/-3.13       | -1.32/1.19        | -1.10/0.38        | 0.98/1.80         | 1.63/0.07         | 2.23/1.64         | 2.20/1.36         | -0.92/-3.20       | -2.36/0.40        |
| Θ(67.5°)  | 3.29/0.05     | -0.19/0.47      | -3.12/-2.27     | 0.20/1.63       | -1.84/1.77      | 0.32/-0.32      | 0.07/0.28       | 0.09/0.98         | 1.59/-0.06        | -1.95/-5.44       | -7.99/-6.70       | -5.42/-2.34       | -2.08/-4.60       | -1.52/-1.01       | -1.59/-2.37       | -1.09/0.05        | 0.12/2.51         | 1.50/2.14         | 1.21/2.43         | 3.54/3.23         | 1.50/0.74         | 1.88/0.33         | -4.65/-6.50       | -0.22/0.32        |
| Θ(75°)    | 3.51/1.51     | 0.14/0.84       | -2.67/-2.74     | -0.59/-0.87     | -0.63/0.08      | 0.86/-2.66      | -2.23/-1.97     | -0.38/-0.48       | 0.79/-0.16        |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |



# Antenna Pattern of Scan Radio and BLE

# Appendix F

|           |               |                |                |                |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
|-----------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| θ(75°)    | 0.11/1.52     | 0.81/4.99      | -2.43/-0.93    | -5.42/-0.94    | 0.15/0.70      | -0.14/-0.08    | 0.82/4.05      | -3.80/-1.62      | 0.56/1.22        | 0.88/0.35        | -5.20/0.66       | -2.50/-2.20      | -4.60/-3.74      | -2.93/-3.54      | -5.38/-5.86      | -2.29/-1.20      | -1.50/-0.03      | 2.97/2.57        | 1.73/3.58        | 4.74/1.98        | 0.31/1.60        | 1.18/2.31        | -0.01/-1.67      | 0.31/1.41        |
| θ(82.5°)  | -1.02/0.57    | -1.00/-4.30    | -3.33/-1.58    | -7.19/-2.79    | -3.40/0.82     | -1.18/0.79     | 0.43/-3.42     | -2.70/-2.82      | 0.54/0.69        | 0.20/-0.91       | -5.77/-1.76      | -5.01/-1.78      | -5.97/-5.38      | -3.86/-4.89      | -6.69/-5.09      | -2.82/1.62       | -2.23/-1.70      | 3.73/2.99        | 1.78/4.34        | <b>4.75/4.37</b> | 2.59/2.62        | 1.70/1.19        | -0.38/-5.41      | 0.50/0.90        |
| θ(90°)    | -2.70/-1.23   | -4.83/-5.04    | -3.87/-2.74    | -9.63/-4.12    | -0.93/-3.28    | -0.49/-0.79    | -1.68/-6.45    | -2.40/-1.79      | -0.91/-0.72      | -2.30/-2.03      | -6.51/-3.44      | -6.41/-4.43      | -7.31/-5.61      | -1.25/-5.98      | -5.76/0.73       | -1.60/-7.33      | 1.92/2.00        | 1.05/2.89        | 3.31/4.14        | 1.85/0.35        | 0.25/-1.67       | -0.96/-7.28      | -0.64/-1.91      |                  |
| θ(97.5°)  | -4.44/-1.45   | -7.94/-6.38    | -5.71/-3.49    | -7.58/-5.22    | -2.78/-7.72    | -1.21/-3.02    | -3.89/-8.08    | -4.63/-2.76      | -2.47/-2.62      | -4.75/-4.03      | -4.20/-6.09      | -8.59/-4.86      | -6.37/-5.89      | -9.51/-7.56      | -7.34/-7.31      | -5.75/-2.86      | -3.56/-9.99      | -1.36/-2.11      | -2.44/-1.04      | 0.56/1.23        | -0.43/-4.56      | -3.18/-2.70      | -3.01/-6.99      | -3.51/-3.35      |
| θ(102.5°) | -5.00/-5.02   | -7.66/-11.95   | -6.81/-7.11    | -9.62/-6.01    | -5.43/-5.15    | -4.96/-5.01    | -4.33/-9.93    | -5.10/-5.28      | -3.72/-0.57      | -7.59/-1.77      | -6.40/-6.17      | -9.04/-6.68      | -10.35/-8.16     | -12.56/-7.19     | -9.64/-12.40     | -9.47/-6.72      | -6.19/-8.25      | -5.56/-6.43      | -6.60/-5.47      | -4.49/-4.77      | -4.87/-8.42      | -7.21/-2.35      | -6.30/-5.23      | -0.69/-5.53      |
| θ(115°)   | -5.59/-5.04   | -7.73/-9.06    | -9.51/-8.65    | -11.13/-7.31   | -6.77/-7.38    | -5.03/-8.21    | -8.63/-12.52   | -10.91/-4.55     | -3.22/-8.33      | -6.86/-7.07      | -7.01/-8.25      | -10.24/-6.70     | -10.67/-7.07     | -7.82/-9.38      | -13.48/-14.02    | -12.33/-9.73     | -8.61/-6.74      | -4.58/-8.39      | -4.90/-5.75      | -3.35/-3.54      | -6.73/-9.93      | -5.22/-4.79      | -6.45/-7.57      | -9.67/-10.72     |
| θ(120°)   | -5.08/-5.90   | -10.49/-12.15  | -12.85/-7.96   | -9.75/-7.40    | -6.30/-10.80   | -6.80/-7.78    | -7.59/-10.25   | -6.43/-3.85      | -8.19/-7.63      | -9.89/-9.46      | -15.19/-11.81    | -9.81/-8.66      | -11.43/-6.11     | -8.13/-13.39     | -14.45/-15.68    | -12.27/-12.54    | -8.53/-8.40      | -9.60/-11.02     | -8.30/-6.14      | -6.57/-7.25      | -4.81/-9.38      | -5.10/-6.48      | -8.12/-12.23     | -12.61/-7.18     |
| θ(127.5°) | -6.79/-7.31   | -11.58/-8.82   | -11.84/-9.28   | -9.08/-8.29    | -9.79/-6.64    | -7.93/-10.65   | -8.64/-8.91    | -10.76/-7.06     | -7.83/-7.16      | -9.83/-13.98     | -12.78/-10.43    | -12.06/-9.42     | -10.96/-8.53     | -11.55/-11.79    | -13.63/-13.14    | -14.03/-8.25     | -14.93/-14.20    | -9.35/-15.17     | -13.03/-10.99    | -5.01/-6.90      | -7.77/-6.84      | -9.15/-10.68     | -9.10/-12.49     | -14.53/-7.47     |
| θ(135°)   | -8.59/-9.43   | -12.75/-8.51   | -13.84/-8.76   | -12.01/-10.28  | -10.28/-7.37   | -8.03/-9.25    | -7.45/-13.10   | -7.79/-7.45      | -4.81/-8.98      | -14.93/-15.41    | -12.07/-10.36    | -13.76/-11.82    | -8.96/-8.68      | -9.03/-15.97     | -15.10/-10.21    | -13.26/-6.35     | -6.51/-14.21     | -8.53/-9.62      | -7.30/-8.36      | -3.50/-4.34      | -9.87/-8.39      | -3.62/-9.01      | -14.45/-10.57    | -9.15/-7.41      |
| θ(142.5°) | -9.43/-9.59   | -8.99/-9.17    | -11.87/-8.42   | -14.92/-9.18   | -8.95/-8.86    | -10.72/-10.25  | -8.16/-11.11   | -10.14/-9.34     | -11.63/-10.90    | -9.86/-12.17     | -15.51/-11.85    | -11.83/-15.93    | -9.58/-8.59      | -12.35/-13.04    | -15.27/-10.97    | -13.67/-10.25    | -14.20/-11.59    | -10.40/-10.73    | -10.57/-16.10    | -9.28/-5.38      | -10.33/-14.18    | -14.21/-10.41    | -13.76/-10.90    | -13.46/-13.61    |
| θ(150°)   | -4.75/-12.58  | -14.59/-10.70  | -14.66/-10.80  | -13.17/-9.17   | -11.01/-13.06  | -8.77/-9.33    | -9.95/-10.12   | -13.69/-9.37     | -8.12/-9.39      | -12.82/-14.08    | -11.50/-10.06    | -15.67/-15.53    | -15.10/-10.82    | -11.16/-12.12    | -14.72/-11.63    | -15.14/-15.49    | -15.84/-15.12    | -15.44/-14.68    | -9.19/-8.86      | -10.21/-9.25     | -11.65/-15.42    | -15.90/-14.11    | -8.08/-8.59      | -10.88/-7.85     |
| θ(157.5°) | -13.93/-12.32 | -9.77/-12.26   | -13.76/-11.32  | -10.35/-8.10   | -9.73/-13.26   | -11.77/-11.13  | -14.29/-13.76  | -12.51/-11.24    | -12.28/-11.65    | -12.11/-12.93    | -13.58/-14.11    | -11.39/-8.40     | -11.44/-14.78    | -9.39/-10.94     | -15.17/-15.22    | -15.84/-15.80    | -14.67/-11.94    | -14.27/-15.83    | -15.28/-15.04    | -12.66/-14.77    | -14.77/-10.49    | -12.10/-11.98    | -13.14/-11.93    |                  |
| θ(165°)   | -8.28/-10.25  | -12.31/-16.23  | -14.61/-11.12  | -9.52/-10.38   | -14.42/-13.22  | -11.35/-9.93   | -9.92/-10.98   | -12.93/-15.80    | -15.43/-13.68    | -12.92/-11.96    | -11.23/-13.34    | -15.28/-15.48    | -16.15/-13.56    | -12.06/-11.67    | -12.38/-15.68    | -13.74/-13.10    | -15.50/-16.02    | -15.12/-15.65    | -15.31/-15.33    | -15.93/-14.30    | -15.56/-11.91    | -7.15/-6.77      | -11.44/-16.10    | -9.88/-8.59      |
| θ(172.5°) | -16.20/-12.39 | -10.70/-11.48  | -11.62/-13.13  | -13.39/-13.16  | -10.80/-10.41  | -9.85/-9.85    | -9.89/-10.65   | -12.82/-14.87    | -16.45/-15.21    | -15.55/-15.06    | -15.75/-15.76    | -14.93/-14.35    | -14.25/-13.81    | -14.22/-14.85    | -15.73/-15.19    | -15.09/-10.99    | -14.50/-14.03    | -15.53/-15.67    | -15.44/-14.26    | -15.21/-14.27    | -13.33/-12.66    | -11.81/-11.18    | -11.84/-12.61    | -12.71/-14.27    |
| θ(180°)   | -12.95/-13.53 | -11.93/-12.27  | -14.33/-13.83  | -13.84/-14.71  | -15.58/-15.33  | -15.01/-15.01  | -15.82/-14.18  | -12.79/-13.37    | -13.37/-13.82    | -14.91/-14.02    | -14.33/-13.41    | -11.87/-11.66    | -12.48/-13.79    | -13.14/-15.15    | -15.46/-15.76    | -15.87/-14.89    | -15.32/-14.85    | -12.88/-13.14    | -12.76/-11.81    | -12.17/-12.50    | -12.42/-13.42    | -13.92/-13.70    | -13.34/-14.14    | -14.77/-14.28    |
| Freq(Hz)  | 2.45GPol.     | Total/Ant. 2   | -              | -              | -              | -              | -              | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                | -                |
| Gain      | Φ(0°)Φ(7.5°)  | Φ(15°)Φ(22.5°) | Φ(30°)Φ(37.5°) | Φ(45°)Φ(52.5°) | Φ(60°)Φ(67.5°) | Φ(75°)Φ(82.5°) | Φ(90°)Φ(97.5°) | Φ(105°)Φ(112.5°) | Φ(120°)Φ(127.5°) | Φ(135°)Φ(142.5°) | Φ(150°)Φ(157.5°) | Φ(165°)Φ(172.5°) | Φ(180°)Φ(187.5°) | Φ(195°)Φ(202.5°) | Φ(210°)Φ(217.5°) | Φ(225°)Φ(232.5°) | Φ(240°)Φ(247.5°) | Φ(255°)Φ(262.5°) | Φ(270°)Φ(277.5°) | Φ(285°)Φ(292.5°) | Φ(300°)Φ(307.5°) | Φ(315°)Φ(322.5°) | Φ(330°)Φ(337.5°) | Φ(345°)Φ(352.5°) |
| θ(0°)     | 2.70/2.70     | 2.68/2.64      | 2.51/2.32      | 2.13/1.97      | 1.87/1.73      | 1.51/1.33      | 1.17/1.02      | 0.86/0.91        | 1.14/1.32        | 1.36/1.23        | 1.02/0.86        | 0.94/1.22        | 1.50/1.73        | 1.89/1.98        | 1.89/1.68        | 1.47/1.39        | 1.31/1.16        | 0.99/0.91        | 0.85/0.85        | 0.93/1.03        | 1.14/1.24        | 1.42/1.78        | 2.11/2.33        | 2.46/2.56        |
| θ(7.5°)   | 2.352/4.7     | 2.472/3.29     | 2.201/1.96     | 1.79/1.73      | 1.78/1.80      | 1.82/1.79      | 1.77/1.68      | 1.56/1.59        | 1.73/1.91        | 1.99/1.97        | 1.80/1.62        | 1.58/1.73        | 1.97/2.20        | 2.37/2.41        | 2.31/2.08        | 1.89/1.78        | 1.57/1.33        | 1.10/1.02        | 0.96/0.87        | 0.82/0.82        | 0.87/0.91        | 1.01/1.18        | 1.39/1.62        | 1.86/2.12        |
| θ(15°)    | 2.782/5.6     | 2.157/1.72     | 1.270/0.98     | 0.98/1.18      | 1.46/1.70      | 1.82/1.84      | 1.80/1.70      | 1.63/1.66        | 1.80/1.90        | 1.95/1.94        | 1.99/1.90        | 1.77/1.66        | 1.70/1.93        | 2.20/2.47        | 2.60/2.60        | 2.52/2.35        | 2.07/1.80        | 1.61/1.59        | 1.73/1.93        | 2.19/2.43        | 2.68/2.85        | 2.92/2.91        | 2.84/2.78        | 2.77/2.83        |
| θ(22.5°)  | 3.012/4.29    | 1.81/1.08      | 0.35/-0.11     | 0.00/0.48      | 0.98/1.30      | 1.39/1.21      | 0.91/0.59      | 0.35/0.34        | 0.50/0.67        | 0.76/0.87        | 1.07/1.20        | 1.06/0.71        | 0.47/0.50        | 0.92/1.49        | 1.99/2.33        | 2.45/2.37        | 2.10/1.87        | 1.79/1.99        | 2.37/2.79        | 3.18/3.51        | 3.73/3.83        | <b>3.84/3.78</b> | 3.69/3.59        | 3.47/3.33        |
| θ(30°)    | 2.381/6.9     | 1.070/5.5      | -0.04/-0.54    | -0.51/-0.00    | 0.60/1.00      | 1.04/0.67      | 0.10/-0.59     | -1.18/-1.46      | -1.32/-0.99      | -0.75/-0.57      | -0.35/-0.12      | -0.02/-0.09      | -0.30/-0.50      | -0.45/-0.09      | 0.59/1.27        | 1.79/1.97        | 1.84/1.60        | 1.57/1.95        | 2.52/2.99        | 3.26/3.32        | 3.22/3.04        | 2.90/2.94        | 3.09/3.25        | 3.26/2.97        |
| θ(37.5°)  | 1.700/8.7     | 0.400/2.4      | 0.05/-0.25     | -0.37/-0.06    | 0.53/1.05      | 1.20/0.91      | 0.37/-0.34     | -0.95/-1.16      | -1.11/-1.08      | -1.15/-1.36      | -1.77/-2.23      | -2.32/-1.94      | -1.30/-0.82      | -0.75/-0.88      | -0.70/-0.05      | 0.78/1.18        | 1.17/0.85        | 0.78/1.35        | 2.07/2.39        | 2.21/1.67        | 1.17/0.86        | 0.92/1.33        | 1.90/2.51        | 2.78/2.47        |
| θ(45°)    | 1.10/0.23     | -0.16/0.01     | 0.35/0.45      | 0.34/0.37      | 0.77/1.31      | 1.50/1.27      | 0.76/0.10      | -0.36/-0.37      | -0.26/-0.43      | -0.84/-1.36      | -2.27/-3.74      | -5.15/-5.07      | -3.43/-2.03      | -1.55/-1.96      | -2.66/-2.73      | -1.88/-1.01      | -0.63/-0.77      | -0.59/0.60       | 1.72/1.90        | 1.04/0.36        | -1.24/-1.03      | -0.24/0.63       | 1.37/1.99        | 2.27/1.94        |
| θ(52.5°)  | 0.93/0.05     | -0.40/0.06     | 0.89/1.26      | 1.13/0.84      | 0.97/1.41      | 1.54/1.18      | 0.55/-0.09     | -0.37/-0.18      | -0.03/-0.29      | -0.69/-0.98      | -1.79/-3.05      | -3.92/-3.84      | -2.89/-1.86      | -1.45/-1.84      | -2.87/-3.91      | -3.86/-2.83      | -1.92/-1.71      | -1.01/0.74       | 2.02/2.07        | 0.92/-0.76       | -1.47/-0.70      | 0.32/0.99        | 1.43/1.75        | 1.90/1.64        |
| θ(60°)    | 0.62/-0.36    | -0.63/0.07     | 0.91/1.11      | 0.87/0.53      | 0.51/0.88      | 1.16/1.03      | 0.58/0.24      | 0.10/0.17        | -0.01/-0.61      | -0.08/-0.93      | -1.28/-2.36      | -2.93/-2.78      | -2.41/-1.75      | -1.31/-1.65      | -2.62/-3.93      | -4.17/-2.52      | -0.92/-0.55      | -0.40/0.85       | 2.04/2.16        | 1.36/0.51        | 0.48/1.06        | 1.52/1.66        | 1.68/1.72        | 1.73/1.43        |
| θ(67.5°)  | -0.35/-1.29   | -1.22/-0.57    | 0.10/0.42      | 0.43/0.39      | 0.48/0.87      | 1.40/1.39      | 0.97/0.75      | 0.82/0.73        | 0.02/-1.33       | -2.03/-1.73      | -2.32/-3.29      | -2.94/-2.25      | -1.71/-1.16      | -0.96/-1.24      | -2.07/-3.52      | -4.46/-3.01      | -1.20/-0.56      | -0.28/0.96       | 2.06/1.96        | 1.18/0.75        | 1.05/1.56        | 1.82/1.71        | 1.35/1.09        | 0.98/0.54        |
| θ(75°)    | -1.02/-1.75   | -1.72/-0.91    | 0.11/0.49      | 0.19/-0.08     | -0.09/0.13     | 0.80/1.12      | 0.57/0.22      | 0.42/0.41        | -0.58/-2.73      | -4.26/-3.40      | -3.65/-4.40      | -3.63/-2.49      | -1.69/-0.74      | -0.16/-0.14      | -0.62/-1.68      | -3.05/-3.32      | -2.05/-1.14      | -0.92/0.34       | 1.74/1.97        | 1.39/0.87        | 0.89/1.14        | 1.25/0.74        | -0.33/-0.97      | -0.67/-0.46      |
| θ(82.5°)  | -0.86/-1.85   | -1.83/-0.87    | -0.40/-0.80    | -1.59/-1.32    | -0.88/-0.55    | 0.61/1.28      | 0.77/0.35      | 0.41/0.10        | -1.60/-5.10      | -6.20/-4.29      | -4.30/-5.09      | -3.78/-2.63      | -2.17/-1.19      | -0.72/-0.98      | -1.18/-1.58      | -2.11/-2.00      | -1.08/-0.64      | -0.89/-0.06      | 1.10/1.49        | 1.29/0.74        | 0.40/0.26        | 1.02/-0.63       | -1.91/-2.41      | -0.29/-0.46      |
| θ(90°)    | -0.97/-2.30   | -2.66/-1.97    | -1.57/-1.71    | -2.04/-1.57    | -1.39/-1.45    | 0.24/1.19      | 0.42/-0.26     | -0.16/-0.44      | -2.38/-6.61      | -8.35/-4.75      | -3.53/-4.04      | -2.96/-2.27      | -2.69/-2.52      | -2.14/-2.20      | -1.45/-0.94      | -1.16/-1.25      | -0.78/-0.64      | -0.85/-0.01      | 0.86/0.97        | 0.68/0.03        | -0.72/-1.22      | -1.29/-1.42      | -1.97/-2.42      | -1.57/-0.51      |
| θ(97.5°)  | -0.82/-2.23   | -3.56/-3.43    | -2.39/-2.23    | -3.01/-2.73    | -2.65/-2.57    | 0.02/0.93      | -0.36/-1.72    | -1.01/-1.69      | -4.55/-9.73      | -11.63/-5.96     | -4.51/-5.04      | -4.10/-4.32      | -5.33/-4.51      | -3.92/-3.94      | -2.50/-1.45      | -1.41/-0.91      | 0.11/0.26        | -0.23/0.29       | 0.77/0.71        | 0.39/-0.62       | -1.86/-2.54      | -2.82/-2.65      | -2.38/-2.31      | -1.69/-0.64      |
| θ(105°)   | -1.26/-2.15   | -3.42/-3.23    | -2.58/-2.96    | -3.82/-3.03    | -2.88/-4.02    | -2.22/-1.50    | -3.29/-3.73    | -2.46/-3.32      | -7.60/-13.25     | -15.78/-8.45     | -5.88/-6.03      | -5.18/-5.35      | -6.54/-5.50      | -4.64/-5.70      | -4.37/-3.10      | -3.68/-3.20      | -1.16/-0.28      | -0.83/-0.81      | -0.22/0.30       | 0.65/-0.17       | -1.84/-2.82      | -3.24/-3.47      | -2.82/-2.02      | -1.79/-1.37      |
| θ(112.5°) | -1.99/-2.24   | -2.50/-2.34    | -2.76/-4.04    | -5.62/-5.80    | -6.46/-8.25    | -4.54/-3.21    | -4.47/-3.74    | -2.63/-4.23      | -9.42/-12.54     | -11.17/-7.09     | -6.95/-9.39      | -10.20/-11.60    | -8.29/-5.09      | -6.04/-9.71      | -7.48/-7.52      | -5.64/-4.31      | -1.84/-0.91      | -1.35/-1.87      | -2.70/-2.98      | -1.61/-1.22      | -2.38/-3.53      | -4.10/-4.56      | -3.91/-2.57      | -2.15/-2.18      |
| θ(120°)   | -3.29/-3.43   | -3.73/-3.72    | -4.12/-5.21    | -6.38/-7.49    | -9.64/-11.37   | -7.53/-6.34    | -9.76/-9.86    | -7.43/-9.57      | -14.66/-11.35    | -10.08/-10.57    | -15.08/-12.03    | -10.90/-11.44    | -10.65/-7.72     | -8.70/-14.10     | -12.38/-13.32    | -13.52/-8.32     | -3.88/-2.50      | -2.07/-1.01      | -0.99/-2.73      | -3.73/-2.99      | -3.11/-4.00      | -4.61/-5.41      | -5.68/-4.11      | -3.00/-2.95      |
| θ(127.5°) | -3.31/-4.16   | -5.54/-6.00    | -5.68/-5.92    | -6.73/-8.22</  |                |                |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |



# Antenna Pattern of Scan Radio and BLE

# Appendix F

|            |               |                 |                  |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|------------|---------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ (112.5°) | -6.48/-3.79   | -2.73/-6.63     | -8.90/-7.62      | -5.58/-8.56     | -11.78/-9.94    | -8.27/-4.24     | -6.82/-6.41     | -13.33/-10.79     | -7.80/-5.03       | -3.62/-5.35       | -6.87/-9.08       | -12.07/-9.51      | -10.86/-7.87      | -10.58/-10.09     | -14.96/-5.70      | -8.65/-11.84      | -7.99/-5.40       | -5.48/-6.75       | -4.30/-4.46       | -3.51/-4.16       | -5.29/-8.30       | -3.64/-0.27       | -0.94/-2.45       | -2.95/-5.45       |
| Θ (120°)   | -8.18/-4.73   | -3.88/-7.63     | -9.22/-8.95      | -6.24/-8.55     | -10.02/-12.64   | -9.95/-5.92     | -5.90/-4.55     | -8.93/-11.98      | -7.26/-5.18       | -4.48/-6.28       | -9.77/-9.65       | -13.16/-12.84     | -8.05/-8.85       | -9.04/-11.44      | -12.75/-7.80      | -12.75/-10.78     | -9.26/-7.14       | -8.27/-7.70       | -5.63/-3.57       | -3.81/-5.19       | -5.07/-5.76       | -4.05/-1.93       | -3.31/-2.90       | -0.38/-3.35       |
| Θ (127.5°) | -5.47/-5.74   | -4.45/-10.86    | -7.64/-8.27      | -10.46/-9.33    | -7.19/-7.68     | -11.36/-12.79   | -9.31/-8.80     | -8.01/-9.50       | -6.58/-6.69       | -6.41/-6.88       | -5.27/-9.45       | -12.07/-7.83      | -9.01/-10.50      | -13.71/-13.16     | -7.78/-4.61       | -13.62/-14.24     | -5.79/-11.35      | -11.81/-6.18      | -5.50/-4.12       | -6.79/-7.62       | -6.51/-3.69       | -0.03/-2.31       | -8.01/-4.03       | -5.96/-8.81       |
| Θ (135°)   | -7.05/-4.69   | -6.09/-6.27     | -13.75/-10.88    | -9.72/-11.29    | -13.36/-10.89   | -9.92/-12.23    | -11.21/-9.73    | -12.72/-15.37     | -14.36/-7.97      | -6.93/-5.22       | -1.88/-5.47       | -9.17/-8.31       | -12.33/-10.76     | -14.10/-11.71     | -4.66/-4.90       | -7.03/-8.05       | -7.98/-7.07       | -9.59/-5.64       | -4.35/-2.70       | -4.10/-5.06       | -6.75/-3.12       | -0.41/-1.81       | -8.70/-5.16       | -7.82/-11.85      |
| Θ (142.5°) | -5.68/-3.71   | -5.03/-8.03     | -7.70/-10.93     | -13.61/-11.08   | -11.05/-10.06   | -6.86/-8.63     | -9.74/-9.91     | -13.31/-13.76     | -15.68/-12.23     | -10.01/-12.77     | -6.60/-8.65       | -10.83/-9.31      | -8.51/-8.14       | -12.04/-11.91     | -10.46/-8.93      | -6.51/-5.78       | -7.40/-6.10       | -7.85/-5.14       | -3.78/-2.15       | -2.10/-5.33       | -6.90/-5.45       | -3.55/-5.95       | -8.07/-6.57       | -2.76/-3.61       |
| Θ (150°)   | -7.54/-5.90   | -4.35/-5.54     | -7.75/-9.71      | -12.04/-13.42   | -12.65/-11.85   | -10.65/-9.44    | -8.70/-7.02     | -8.41/-12.10      | -10.27/-10.06     | -12.05/-14.15     | -15.40/-12.15     | -10.56/-11.82     | -8.03/-11.06      | -8.16/-13.04      | -14.95/-10.61     | -11.01/-10.79     | -8.06/-7.07       | -7.47/-4.55       | -4.24/-4.88       | -4.21/-5.68       | -6.50/-6.11       | -7.84/-12.92      | -10.50/-9.21      | -9.23/-7.58       |
| Θ (157.5°) | -8.16/-6.65   | -4.92/-4.11     | -4.80/-5.41      | -5.80/-7.18     | -10.22/-10.97   | -10.10/-10.77   | -8.07/-6.99     | -8.49/-11.84      | -12.49/-12.59     | -13.48/-13.03     | -13.62/-11.41     | -10.00/-10.44     | -13.20/-14.26     | -14.76/-12.77     | -11.43/-10.22     | -9.99/-8.60       | -6.79/-6.55       | -7.09/-7.24       | -6.98/-5.19       | -4.30/-5.52       | -7.79/-10.41      | -11.64/-9.49      | -8.80/-9.98       | -11.79/-10.60     |
| Θ (165°)   | -9.52/-8.10   | -7.60/-6.83     | -5.01/-4.59      | -5.75/-7.77     | -10.20/-10.04   | -9.73/-10.83    | -11.37/-11.83   | -13.34/-14.54     | -14.01/-13.55     | -14.14/-12.61     | -10.92/-11.42     | -15.09/-15.33     | -15.17/-15.29     | -13.29/-11.98     | -11.18/-11.17     | -10.51/-11.75     | -14.09/-14.87     | -14.63/-13.61     | -11.60/-12.33     | -10.60/-8.71      | -8.96/-9.95       | -8.19/-8.49       | -9.49/-8.61       |                   |
| Θ (172.5°) | -5.57/-8.35   | -9.95/-9.02     | -9.95/-10.29     | -8.29/-7.17     | -6.11/-5.86     | -5.76/-6.34     | -8.00/-9.35     | -10.80/-11.30     | -10.82/-10.97     | -12.12/-12.77     | -12.39/-13.09     | -12.48/-11.04     | -10.25/-8.92      | -9.76/-10.25      | -9.36/-9.72       | -9.85/-9.62       | -9.42/-8.92       | -8.93/-9.08       | -10.21/-9.90      | -9.17/-8.05       | -6.69/-6.12       | -5.65/-5.10       | -5.16/-5.02       | -4.36/-4.02       |
| Θ (180°)   | -8.97/-10.37  | -10.23/-9.77    | -9.50/-9.86      | -10.22/-10.21   | -10.36/-10.43   | -10.68/-11.54   | -12.19/-11.35   | -10.29/-9.90      | -10.32/-10.95     | -11.47/-10.82     | -10.18/-9.51      | -8.88/-8.84       | -8.55/-8.62       | -9.07/-9.20       | -8.99/-8.79       | -8.38/-8.32       | -7.87/-7.33       | -7.18/-7.18       | -7.16/-7.43       | -7.37/-6.93       | -6.95/-7.01       | -6.96/-7.02       | -6.61/-6.26       | -6.81/-7.58       |
| Freq(Hz)   | 5.785GPol.    | TotalAnt. 2     | -                | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain       | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°)  | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ (0°)     | 2.15/2.21     | 2.51/2.58       | 2.15/1.96        | 1.93/1.89       | 1.83/1.71       | 1.65/1.50       | 1.72/1.93       | 2.13/2.23         | 2.51/2.59         | 2.55/2.74         | 2.96/2.89         | 2.65/2.71         | 3.06/3.22         | 3.03/2.72         | 2.79/3.02         | 3.12/3.09         | 3.07/3.03         | 2.99/2.94         | 2.97/2.93         | 3.02/3.02         | 3.00/2.94         | 2.86/2.82         | 2.81/2.80         | 2.53/2.23         |
| Θ (7.5°)   | 2.32/2.40     | 2.48/2.88       | 2.97/3.16        | 3.55/3.76       | 3.76/3.72       | 3.66/3.39       | 3.13/3.01       | 2.68/2.23         | 1.97/1.73         | 1.23/0.71         | 0.46/0.31         | -0.22/-0.56       | -0.29/0.11        | 0.60/0.80         | 0.72/1.55         | 2.15/2.56         | 2.93/3.74         | 3.87/3.79         | 3.73/3.64         | 3.45/3.34         | 3.06/2.75         | 2.73/2.45         | 2.15/2.30         |                   |
| Θ (15°)    | 3.52/3.97     | 4.17/3.90       | 3.50/3.12        | 3.19/3.16       | 3.28/3.68       | 4.09/4.33       | 4.28/4.00       | 3.36/2.85         | 2.69/2.68         | 2.47/2.26         | 2.03/1.64         | 0.85/-0.31        | -0.59/-0.20       | 0.40/0.29         | -0.10/0.66        | 1.18/1.62         | 2.05/2.68         | 3.35/4.13         | 4.50/4.61         | 4.51/4.27         | 3.77/3.62         | 3.42/3.28         | 3.33/3.36         |                   |
| Θ (22.5°)  | 2.90/3.32     | 4.12/4.67       | <b>4.68/4.53</b> | 3.94/2.59       | 1.69/1.77       | 2.17/2.42       | 2.41/2.27       | 1.84/1.46         | 1.80/2.34         | 2.82/2.89         | 2.73/2.61         | 1.99/1.00         | 0.29/-0.21        | 0.07/0.19         | -0.44/-0.18       | 0.09/0.62         | 0.85/0.97         | 1.56/2.52         | 3.05/3.03         | 2.46/1.89         | 1.74/1.98         | 2.45/2.60         | 2.54/2.47         | 2.39/2.62         |
| Θ (30°)    | 2.02/3.18     | 3.37/2.51       | 1.55/1.53        | 1.34/0.10       | -0.98/-0.41     | 0.54/0.93       | 1.61/2.48       | 2.45/1.88         | 1.57/1.28         | 1.22/1.71         | 2.55/2.97         | 2.80/2.09         | 1.05/0.16         | -0.51/-1.20       | -1.04/-1.03       | -1.03/0.20        | 1.53/1.63         | 1.25/0.95         | 0.85/0.93         | 0.70/-0.01        | -1.04/-1.36       | -0.84/-0.01       | 0.54/0.10         | 0.03/0.00         |
| Θ (37.5°)  | -0.64/-1.15   | 2.16/2.07       | 0.21/-1.49       | -1.01/-0.83     | -1.46/-1.27     | 0.28/0.95       | 1.77/2.73       | 2.61/1.44         | 1.08/1.37         | 1.87/2.56         | 2.67/2.35         | 2.31/2.24         | 0.65/-2.58        | -3.37/-1.47       | -1.21/-1.58       | -2.05/-0.65       | 1.09/2.18         | 2.62/1.77         | 1.04/1.58         | 1.98/0.98         | -1.43/-3.49       | -3.13/-0.98       | 0.67/0.46         | -1.35/-2.22       |
| Θ (45°)    | -0.40/-1.53   | -1.11/-1.37     | 1.51/-0.41       | -0.56/-0.55     | -2.67/-2.78     | -1.09/0.14      | 1.35/1.72       | 1.88/1.77         | 2.64/2.58         | 1.56/1.87         | 3.08/3.03         | 2.50/3.42         | 2.96/-0.41        | -3.27/-0.52       | 0.36/-0.42        | -1.01/-1.14       | 0.25/0.77         | 0.86/0.20         | -0.88/0.43        | 1.86/2.20         | 0.17/-1.34        | -3.86/-1.95       | -0.67/-0.12       | -0.65/-0.80       |
| Θ (52.5°)  | -1.64/-0.73   | -1.60/0.42      | 1.21/1.03        | -0.10/-1.40     | -3.68/-2.64     | -1.49/0.10      | 0.21/0.57       | 0.44/0.43         | 2.24/-1.92        | 0.28/0.86         | 2.76/2.78         | 2.28/2.83         | 2.07/-0.90        | -1.59/0.93        | 0.90/-2.55        | -2.34/-2.69       | -1.44/0.65        | 0.78/0.60         | -0.92/-0.15       | 1.72/2.46         | 1.16/-0.92        | -1.93/-1.81       | -0.02/-0.21       | -1.52/-2.76       |
| Θ (60°)    | -1.50/-0.92   | -0.32/0.65      | -0.72/-0.18      | -1.44/-3.41     | -4.00/-2.85     | -3.08/-0.52     | -0.40/-2.22     | -0.47/0.29        | 1.38/0.75         | -0.98/-2.58       | -2.47/-0.88       | -0.36/-3.46       | -3.71/-1.56       | -0.63/-3.46       | -3.74/-1.78       | -1.84/-0.81       | 0.28/1.07         | 0.45/0.64         | 1.70/2.48         | 2.30/1.54         | 0.92/-0.25        | 0.91/0.51         | 0.08/-1.31        | 0.08/-1.31        |
| Θ (67.5°)  | -0.69/-0.32   | -0.09/0.16      | -2.40/-1.46      | -3.78/-5.77     | -4.87/-1.59     | -1.49/-0.47     | -0.33/0.76      | 0.87/1.63         | 2.17/0.22         | -2.70/-4.04       | -4.16/-1.49       | -0.66/-1.58       | 1.63/-0.45        | -2.14/-3.36       | -3.54/-3.74       | -2.42/0.09        | -1.11/-0.90       | 0.51/1.45         | 1.29/1.33         | 2.30/2.36         | 1.90/1.69         | 1.72/1.04         | 1.66/0.89         | -0.69/-0.20       |
| Θ (75°)    | -0.33/-0.30   | -0.38/-1.52     | -4.05/-3.20      | -6.10/-6.56     | -3.23/-0.04     | 0.02/-1.18      | -0.33/-1.34     | 2.51/2.96         | 3.61/1.40         | -1.05/-0.93       | -0.98/0.30        | 0.93/1.03         | 1.20/-1.46        | -0.97/-3.73       | -5.40/-4.76       | -3.82/-0.71       | 0.23/-2.25        | -0.96/0.03        | 1.21/1.81         | 3.05/1.71         | 0.69/1.59         | 2.23/1.91         | 1.85/0.10         | -1.09/0.32        |
| Θ (82.5°)  | -0.05/-0.98   | -2.76/-3.21     | -3.50/-3.39      | -4.69/-4.48     | -3.09/0.93      | -0.22/-1.91     | -0.85/-0.08     | 2.15/2.61         | 3.65/0.79         | -1.10/-0.96       | -1.31/0.41        | -0.01/-1.66       | -0.87/-3.03       | -1.60/-5.36       | -7.75/-4.74       | -1.17/0.80        | -1.10/-3.24       | -2.93/-2.17       | 0.94/1.62         | 3.06/0.94         | -1.15/0.49        | 1.91/1.24         | 1.13/-1.53        | -1.81/-0.21       |
| Θ (90°)    | -0.78/-3.02   | -3.13/-4.15     | -4.51/-3.29      | -3.00/-4.12     | -3.34/-1.46     | -1.00/-3.15     | -1.99/-2.11     | 0.26/0.58         | 2.46/0.05         | -1.96/-2.78       | -1.39/-2.47       | -1.71/-3.38       | -3.44/-5.25       | -4.80/-5.11       | -9.38/-9.25       | -4.99/-2.23       | -4.83/-5.39       | -5.84/-4.12       | -0.52/0.36        | 1.65/-0.41        | -3.52/-1.54       | 0.49/0.41         | 0.56/-2.91        | -1.70/-0.82       |
| Θ (97.5°)  | -1.81/-4.39   | -4.06/-5.27     | -4.50/-3.37      | -3.65/-6.75     | -4.73/-2.23     | -1.83/-4.71     | -3.84/-4.91     | -2.12/-1.43       | 0.36/-1.54        | -3.82/-4.54       | -5.08/-7.65       | -5.39/-6.21       | -4.79/-7.87       | -6.25/-7.90       | -10.30/-12.19     | -6.37/-5.52       | -10.76/-8.21      | -9.79/-6.88       | -2.89/-1.86       | -1.24/-2.49       | -5.78/-3.35       | -1.03/-0.75       | -0.56/-3.43       | -2.23/-1.91       |
| Θ (105°)   | -3.40/-4.87   | -5.10/-6.71     | -4.88/-3.73      | -5.24/-7.43     | -8.27/-4.97     | -3.34/-6.18     | -5.49/-6.93     | -5.54/-5.31       | -2.85/-2.73       | -6.33/-4.80       | -6.03/-9.38       | -7.84/-5.49       | -7.07/-8.70       | -11.23/-11.16     | -14.81/-11.53     | -8.06/-11.73      | -14.44/-9.25      | -12.24/-11.18     | -6.00/-4.84       | -4.07/-4.48       | -7.03/-4.57       | -3.70/-2.35       | -1.15/-0.47       | -3.84/-2.95       |
| Θ (112.5°) | -6.27/-5.06   | -6.42/-7.38     | -5.68/-5.25      | -7.08/-9.24     | -11.44/-10.94   | -7.12/-10.22    | -7.09/-6.07     | -4.86/-8.00       | -5.76/-4.89       | -5.92/-9.24       | -9.37/-10.55      | -12.78/-6.27      | -9.77/-9.88       | -13.23/-12.50     | -12.66/-8.19      | -8.66/-12.77      | -14.42/-6.60      | -9.31/-10.20      | -5.65/-4.80       | -3.91/-4.61       | -8.65/-8.13       | -3.63/-1.76       | -2.07/-4.59       | -5.22/-4.96       |
| Θ (120°)   | -8.32/-4.73   | -5.51/-5.37     | -7.01/-6.32      | -6.48/-11.94    | -11.36/-13.14   | -9.76/-9.69     | -5.97/-5.10     | -8.67/-9.25       | -7.49/-4.65       | -5.29/-4.79       | -15.16/-12.67     | -11.31/-11.99     | -9.68/-8.81       | -13.21/-12.97     | -13.61/-8.53      | -12.74/-13.23     | -13.11/-9.54      | -10.05/-4.92      | -7.68/-5.19       | -4.00/-5.86       | -8.95/-11.58      | -5.55/-3.14       | -3.84/-4.51       | -4.27/-4.40       |
| Θ (127.5°) | -7.24/-7.35   | -4.95/-9.20     | -6.03/-10.13     | -7.51/-10.29    | -10.46/-10.09   | -12.45/-10.60   | -9.92/-8.27     | -8.78/-8.62       | -7.85/-5.27       | -5.21/-7.58       | -8.93/-11.70      | -11.41/-8.58      | -9.85/-10.99      | -12.51/-13.57     | -11.93/-5.50      | -11.61/-14.01     | -8.99/-11.70      | -11.34/-6.42      | -8.92/-5.32       | -6.28/-7.03       | -10.43/-8.35      | -2.13/-2.80       | -8.83/-6.24       | -7.61/-6.06       |
| Θ (135°)   | -6.76/-7.43   | -6.38/-6.54     | -14.25/-8.95     | -8.68/-10.80    | -9.48/-14.01    | -15.45/-12.42   | -12.44/-8.84    | -11.59/-14.09     | -12.53/-8.92      | -5.61/-6.70       | -3.95/-7.66       | -9.53/-10.66      | -12.28/-11.76     | -10.10/-10.72     | -7.67/-5.68       | -7.66/-8.58       | -10.33/-7.57      | -10.22/-7.54      | -8.98/-6.15       | -7.03/-7.63       | -7.35/-5.54       | -1.72/-3.16       | -8.15/-5.10       | -6.36/-9.26       |
| Θ (142.5°) | -6.98/-9.47   | -7.24/-6.72     | -9.67/-13.97     | -13.90/-10.36   | -9.64/-9.59     | -10.60/-8.02    | -7.47/-8.37     | -10.12/-13.16     | -14.22/-13.60     | -10.14/-10.19     | -9.39/-6.16       | -11.71/-13.05     | -8.38/-8.17       | -12.66/-10.51     | -10.12/-8.79      | -9.88/-8.51       | -9.84/-8.54       | -10.47/-8.09      | -5.80/-4.49       | -4.85/-7.18       | -8.78/-6.74       | -4.33/-7.08       | -8.51/-5.91       | -7.71/-9.10       |
| Θ (150°)   | -11.28/-7.68  | -5.44/-6.39     | -6.84/-9.77      | -12.26/-11.56   | -11.98/-13.32   | -12.43/-12.30   | -12.07/-10.29   | -8.32/-8.92       | -9.13/-8.76       | -8.66/-11.19      | -16.00/-12.73     | -9.20/-14.76      | -10.21/-10.10     | -13.25/-14.01     | -14.11/-13.28     | -9.97/-11.01      | -7.84/-6.98       | -7.51/-6.54       | -6.05/-7.08       | -6.58/-7.37       | -9.73/-11.09      | -10.26/-11.95     | -15.95/-13.55     |                   |
| Θ (157.5°) | -10.24/-7.48  | -6.27/-5.60     | -5.96/-7.33      | -8.79/-10.73    | -11.67/-12.42   | -13.58/-10.53   | -7.73/-6.90     | -7.75/-10.75      | -13.04/-12.29     | -11.47/-10.51     | -10.88/-14.05     | -10.26/-8.61      | -13.68/-13.37     | -12.11/-13.32     | -11.75/-11.03     | -11.13/-11.59     | -6.40/-7.19       | -6.63/-4.45       | -4.53/-6.48       | -8.36/-9.49       | -9.97/-8.99       | -8.22/-9.28       | -13.19/-13.89     |                   |
| Θ (165°)   | -10.82/-9.43  | -8.30/-7.33     | -6.17/-5.62      | -5.54/-6.13     | -7.47/-8.85     | -9.47/-9.36     | -10.58/-12.50   | -15.32/-15.40     | -15.39/-12.89     |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |



Antenna Pattern of Scan Radio and BLE

Appendix F

|           |               |                 |                 |                 |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
|-----------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Θ(165°)   | -12.34/-10.96 | -8.88/-8.93     | -10.48/-11.22   | -9.82/-9.64     | -8.76/-8.80     | -7.83/-8.07     | -8.68/-10.41    | -14.58/-15.01     | -14.84/-14.83     | -14.76/-14.32     | -14.57/-13.72     | -15.95/-14.84     | -14.75/-12.44     | -8.38/-6.38       | -5.89/-7.21       | -8.71/-10.23      | -12.39/-12.41     | -11.27/-9.11      | -8.44/-9.82       | -12.87/-15.07     | -15.11/-15.66     | -15.50/-11.07     | -9.69/-10.32      | -11.64/-11.40     |
| Θ(172.5°) | -13.31/-11.93 | -10.99/-10.84   | -10.12/-9.83    | -9.56/-9.82     | -9.84/-9.15     | -8.47/-7.96     | -7.89/-8.89     | -10.03/-11.14     | -12.57/-13.68     | -14.59/-14.41     | -14.16/-11.80     | -9.71/-9.43       | -11.39/-13.72     | -13.18/-15.07     | -15.51/-14.71     | -15.03/-14.75     | -14.68/-15.65     | -15.70/-14.08     | -15.48/-15.35     | -15.47/-15.14     | -15.14/-13.47     | -12.84/-11.87     | -12.74/-14.38     | -14.42/-14.13     |
| Θ(180°)   | -9.58/-10.30  | -11.96/-13.46   | -12.23/-10.21   | -9.47/-10.46    | -10.57/-9.92    | -11.52/-11.45   | -12.23/-11.93   | -11.81/-11.66     | -13.13/-13.37     | -12.15/-12.09     | -12.09/-13.37     | -12.60/-11.85     | -12.03/-12.75     | -12.17/-11.23     | -10.58/-12.11     | -12.53/-13.24     | -12.28/-11.95     | -11.78/-11.64     | -11.19/-10.42     | -9.97/-10.27      | -10.09/-9.19      | -8.52/-8.87       | -9.56/-10.39      | -9.84/-10.05      |
| Freq(Hz)  | 6.995GPol.    | TotalAnt. 2     | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | 2.28/2.22     | 2.42/2.46       | 2.16/1.57       | 1.44/1.81       | 2.00/2.07       | 2.03/2.23       | 2.23/2.16       | 2.29/2.39         | 2.51/2.02         | 2.97/2.93         | 2.49/2.41         | 2.68/2.63         | 2.42/2.39         | 2.24/2.12         | 1.87/2.05         | 2.36/2.47         | 2.42/2.21         | 2.24/2.38         | 2.44/2.53         | 2.24/2.38         | 2.50/2.61         | 2.68/2.64         | 2.50/2.38         | 2.30/2.44         |
| Θ(7.5°)   | 1.70/1.11     | 1.26/1.46       | 1.31/1.19       | 1.36/1.37       | 1.64/1.71       | 1.75/1.72       | 1.68/1.67       | 1.84/1.84         | 2.11/2.52         | 2.69/2.61         | 2.38/2.43         | 2.68/2.63         | 2.42/2.31         | 2.10/1.82         | 1.89/2.11         | 2.21/2.42         | 2.25/2.19         | 2.32/2.42         | 2.64/2.81         | 3.02/3.25         | 3.47/3.53         | 3.62/3.36         | 2.72/2.62         | 2.47/2.24         |
| Θ(15°)    | 1.78/1.12     | 0.97/1.02       | 0.61/0.20       | 0.32/0.78       | 0.88/0.48       | -0.26/-0.70     | -0.65/-0.78     | -0.92/-0.79       | -0.15/0.84        | 1.48/1.87         | 2.03/2.46         | 3.07/3.56         | 3.21/2.62         | 1.94/1.26         | 0.96/1.15         | 1.30/1.61         | 1.65/1.49         | 1.55/1.80         | 2.13/2.35         | 2.41/2.27         | 2.19/2.16         | 1.88/1.87         | 1.43/1.32         | 2.00/2.05         |
| Θ(22.5°)  | 1.50/0.81     | 1.07/1.30       | 1.26/0.76       | 0.35/0.84       | 1.39/1.34       | 0.61/-0.26      | -0.75/-0.85     | -0.68/-0.58       | -0.52/-0.67       | -0.83/-0.96       | -1.92/-1.90       | -0.20/1.46        | 1.57/1.41         | 1.46/1.26         | 0.98/1.08         | 1.19/1.05         | 1.31/1.59         | 1.61/1.67         | 1.51/1.09         | 0.59/0.02         | -0.85/-1.77       | -1.90/-1.53       | -0.22/1.06        | 1.95/2.09         |
| Θ(30°)    | 1.83/1.39     | 1.29/1.53       | 1.94/2.27       | 2.39/1.50       | -0.12/-1.18     | -1.75/-2.16     | -0.87/0.33      | 0.28/-0.35        | -0.14/0.18        | 0.72/1.42         | 0.15/-1.89        | -2.17/-0.16       | 0.22/-0.53        | 0.63/2.37         | 2.65/1.30         | -0.41/-1.78       | -1.20/-0.51       | -0.48/-0.17       | -1.03/-3.25       | -2.58/-2.40       | -2.62/-0.35       | 1.12/0.79         | 0.01/0.35         | 1.53/2.19         |
| Θ(37.5°)  | 1.56/1.34     | 1.33/1.03       | 0.64/1.18       | 1.86/1.41       | -1.31/-3.68     | -2.47/0.34      | 1.62/2.47       | 2.97/2.53         | 2.16/1.58         | 0.84/0.41         | 0.50/0.80         | -0.17/-2.00       | -1.60/-0.50       | -1.73/0.63        | 1.81/-0.52        | -1.53/-0.96       | 0.47/1.18         | 1.14/1.08         | -0.96/-2.96       | -4.58/-7.08       | -4.00/-0.88       | 0.45/0.58         | 0.23/0.19         | 1.05/1.99         |
| Θ(45°)    | 0.03/0.19     | 1.94/1.21       | -0.54/0.19      | 0.55/0.22       | -1.44/-3.15     | -4.52/0.64      | 1.56/2.71       | 2.63/1.01         | 0.57/0.96         | 2.29/1.89         | 1.67/1.30         | -0.06/-2.12       | -1.51/-1.26       | -2.09/-3.73       | 0.80/-1.46        | 0.24/0.99         | 0.72/0.77         | 1.71/3.63         | 3.28/2.67         | -1.42/-1.28       | -1.86/0.41        | -1.91/-3.13       | -0.43/-0.14       | -1.06/-1.44       |
| Θ(52.5°)  | -0.35/-0.23   | 1.71/0.26       | -1.92/-0.56     | -0.06/-1.18     | -1.74/-1.51     | -4.83/0.72      | 2.62/2.97       | 1.47/0.04         | -0.69/-1.00       | 0.86/0.54         | 1.10/2.28         | 0.49/-3.93        | -2.40/-3.56       | -1.89/-1.51       | 1.45/-1.73        | 0.78/0.09         | -0.91/-0.12       | 1.94/-0.19        | -3.22/-5.58       | -4.48/-0.94       | -2.75/-2.65       | -3.87/-3.09       | -2.98/-5.46       | -3.87/-1.73       |
| Θ(60°)    | -0.49/0.81    | 1.53/-0.75      | -0.37/-1.41     | -1.08/-1.33     | -3.34/-3.67     | -4.31/0.08      | 3.50/3.16       | 1.68/0.24         | 1.21/1.27         | 1.62/3.10         | 2.54/1.51         | 1.52/-2.68        | -3.66/-2.86       | -1.43/-1.08       | -0.06/-0.58       | -0.69/-0.99       | -1.80/1.30        | 2.56/1.55         | -3.26/-4.10       | -2.40/-0.04       | -3.82/-3.07       | -3.31/-2.86       | -2.68/-3.81       | -5.25/-2.14       |
| Θ(67.5°)  | -0.18/1.00    | 1.48/-0.35      | -0.29/-2.93     | -2.02/-2.48     | -5.32/-4.78     | -2.76/-0.72     | 0.50/-0.80      | -0.66/0.08        | -3.27/-0.90       | -2.53/1.15        | 0.07/-3.00        | -3.68/-5.15       | -3.69/-5.07       | -3.21/-3.83       | -1.77/-0.49       | 0.19/0.97         | 1.71/3.63         | 3.28/2.67         | -1.42/-1.28       | -1.86/0.41        | -1.91/-3.13       | -0.43/-0.14       | -1.06/-1.44       | -4.47/-2.39       |
| Θ(75°)    | 0.15/0.40     | 1.91/0.05       | -2.00/-3.00     | -2.21/-3.79     | -5.39/-7.00     | -4.41/-2.50     | -1.50/-1.47     | -1.61/0.92        | -6.91/-4.60       | -11.21/-7.06      | -3.00/-5.85       | -5.12/-3.91       | -2.06/-5.06       | -7.88/-8.61       | -6.25/-0.91       | -0.04/0.52        | 3.02/4.86         | 4.26/2.22         | -0.65/-0.28       | -1.46/0.62        | -1.58/-1.30       | 0.67/1.01         | -0.48/-2.18       | -4.00/-1.98       |
| Θ(82.5°)  | -0.14/0.83    | 0.83/-0.26      | -3.16/-5.05     | -2.64/-4.01     | -7.35/-9.85     | -4.13/-1.34     | -1.45/-0.02     | -2.63/0.57        | -1.76/-3.30       | -4.06/-2.93       | -2.02/-5.68       | -1.47/-2.84       | -2.36/-3.31       | -7.77/-14.75      | -9.16/-1.14       | -0.16/0.52        | <b>3.52/4.88</b>  | 3.05/0.38         | -1.27/-0.31       | -1.08/0.17        | -1.36/-0.77       | 0.61/1.06         | -0.32/-2.95       | -5.49/-2.03       |
| Θ(90°)    | -2.12/0.03    | -0.86/-1.56     | -6.20/-5.03     | -3.11/-5.06     | -8.76/-12.09    | -4.73/-1.84     | -1.72/-0.14     | -2.18/-3.42       | 1.47/-4.41        | -3.57/-1.42       | -2.01/-5.26       | -4.03/-1.50       | -5.21/-2.62       | -5.55/-13.91      | -10.27/-3.15      | -2.85/-1.43       | 1.12/2.70         | 1.20/-3.91        | -3.82/-2.77       | -2.49/-1.41       | -2.55/-1.20       | -1.04/-0.13       | -1.94/-4.20       | -6.84/-2.66       |
| Θ(97.5°)  | -3.15/-1.79   | -3.02/-2.34     | -8.32/-5.64     | -4.25/-5.91     | -7.77/-14.12    | -8.39/-4.02     | -3.06/-3.44     | -3.24/-5.51       | 0.76/-7.58        | -4.60/-2.36       | -4.47/-5.86       | -4.97/-3.26       | -7.61/-4.84       | -8.02/-15.46      | -8.58/-8.05       | -7.46/-4.79       | -2.97/-1.52       | -3.09/-7.61       | -9.10/-5.33       | -4.51/-4.49       | -2.77/-1.77       | -2.63/-2.57       | -4.04/-6.48       | -7.78/-2.56       |
| Θ(105°)   | -5.21/-3.12   | -3.76/-4.51     | -6.14/-8.53     | -6.60/-8.12     | -10.55/-12.22   | -11.27/-5.63    | -4.98/-4.68     | -5.32/-6.31       | -1.94/-7.63       | -7.94/-3.59       | -5.11/-8.34       | -4.04/-6.69       | -7.41/-11.67      | -5.87/-16.15      | -8.33/-9.82       | -8.75/-6.88       | -6.65/-4.34       | -3.06/-8.94       | -9.04/-5.86       | -6.54/-8.32       | -3.02/-3.32       | -4.10/-5.16       | -6.09/-6.54       | -7.87/-5.42       |
| Θ(112.5°) | -5.53/-5.71   | -4.18/-5.53     | -7.22/-10.60    | -9.97/-8.10     | -10.97/-10.54   | -8.84/-8.81     | -6.53/-6.15     | -4.67/-10.33      | -4.23/-9.88       | -4.99/-4.84       | -8.50/-11.10      | -5.65/-7.33       | -12.72/-9.23      | -9.08/-12.91      | -11.02/-6.69      | -6.62/-5.66       | -5.49/-2.35       | -3.77/-9.58       | -6.30/-4.56       | -6.91/-9.54       | -5.73/-3.92       | -5.65/-7.87       | -7.35/-10.36      | -5.71/-6.73       |
| Θ(120°)   | -4.79/-7.93   | -4.68/-4.99     | -7.41/-11.02    | -12.12/-9.05    | -12.57/-15.18   | -12.41/-8.37    | -8.17/-11.02    | -9.18/-10.53      | -4.55/-12.16      | -9.10/-7.33       | -9.17/-10.47      | -11.53/-10.19     | -11.56/-7.07      | -9.64/-15.00      | -12.84/-9.82      | -10.13/-6.06      | -7.08/-7.00       | -6.59/-11.87      | -6.46/-7.60       | -7.01/-10.44      | -6.20/-4.94       | -8.54/-10.56      | -7.90/-13.69      | -5.29/-7.78       |
| Θ(127.5°) | -6.43/-7.07   | -5.12/-5.81     | -8.18/-13.78    | -12.22/-15.13   | -11.34/-13.07   | -15.16/-12.13   | -9.23/-9.06     | -8.67/-9.77       | -11.10/-8.29      | -11.67/-9.79      | -14.49/-14.32     | -7.42/-9.16       | -5.93/-14.50      | -12.30/-8.49      | -11.51/-10.54     | -5.32/-4.28       | -6.54/-4.58       | -7.69/-10.06      | -4.47/-5.94       | -7.37/-8.68       | -7.38/-7.37       | -13.68/-12.43     | -7.92/-10.99      | -10.00/-9.02      |
| Θ(135°)   | -8.07/-6.11   | -10.27/-6.96    | -10.92/-11.47   | -10.79/-13.37   | -14.85/-11.77   | -15.45/-10.88   | -10.89/-9.63    | -10.19/-12.06     | -11.44/-11.18     | -11.13/-8.72      | -10.62/-13.13     | -12.76/-13.58     | -10.37/-13.13     | -10.51/-13.34     | -12.61/-11.03     | -4.38/-8.39       | -8.90/-3.75       | -7.28/-9.88       | -6.59/-7.33       | -6.68/-15.83      | -13.34/-7.60      | -8.20/-8.22       | -6.43/-10.61      | -9.44/-9.17       |
| Θ(142.5°) | -12.08/-8.97  | -8.56/-9.14     | -7.00/-10.08    | -15.61/-11.26   | -13.76/-12.09   | -14.62/-12.01   | -8.85/-7.62     | -9.63/-9.99       | -11.09/-14.87     | -12.04/-15.87     | -14.34/-9.07      | -9.07/-9.05       | -10.83/-15.12     | -10.87/-11.65     | -11.82/-12.02     | -10.74/-11.20     | -10.06/-7.10      | -14.95/-14.30     | -13.52/-13.99     | -13.87/-15.91     | -14.50/-11.43     | -8.66/-9.78       | -7.19/-8.30       | -10.19/-8.92      |
| Θ(150°)   | -9.18/-9.44   | -8.46/-7.50     | -8.60/-9.12     | -8.13/-12.46    | -10.96/-8.76    | -11.83/-12.42   | -13.87/-12.53   | -12.81/-10.84     | -9.10/-9.44       | -8.37/-13.89      | -12.94/-14.88     | -11.88/-9.16      | -10.70/-6.89      | -6.44/-14.74      | -11.01/-11.06     | -13.15/-12.93     | -10.70/-8.16      | -10.75/-10.71     | -10.59/-8.45      | -10.02/-12.16     | -12.27/-12.91     | -11.97/-10.85     | -12.67/-11.39     | -9.42/-9.71       |
| Θ(157.5°) | -14.34/-15.23 | -12.23/-11.15   | -9.59/-11.26    | -12.54/-11.05   | -14.34/-15.86   | -10.90/-10.60   | -13.76/-13.07   | -10.59/-12.99     | -14.97/-15.30     | -15.75/-14.20     | -12.84/-11.04     | -10.21/-9.06      | -10.04/-13.59     | -15.06/-13.00     | -13.00/-10.94     | -12.76/-14.76     | -14.77/-13.08     | -14.92/-12.00     | -10.48/-8.83      | -8.46/-12.34      | -14.81/-14.12     | -13.05/-13.38     | -13.28/-13.21     |                   |
| Θ(165°)   | -11.39/-11.87 | -12.89/-11.63   | -11.90/-10.68   | -9.21/-8.39     | -9.09/-9.13     | -9.35/-10.20    | -11.93/-12.47   | -15.06/-14.34     | -13.07/-14.92     | -15.80/-14.63     | -12.62/-9.68      | -9.04/-11.46      | -12.48/-10.84     | -10.41/-11.25     | -11.61/-9.81      | -10.10/-12.79     | -15.46/-15.44     | -15.03/-14.58     | -14.94/-15.09     | -15.38/-15.36     | -15.12/-14.94     | -11.19/-10.36     | -9.08/-9.58       | -11.84/-11.64     |
| Θ(172.5°) | -11.02/-11.03 | -10.74/-11.31   | -13.11/-15.11   | -13.89/-11.82   | -11.31/-11.36   | -11.58/-13.07   | -13.43/-12.98   | -13.17/-12.85     | -12.44/-11.76     | -11.91/-11.08     | -10.07/-9.51      | -10.72/-10.92     | -11.51/-13.37     | -15.46/-15.69     | -14.38/-12.38     | -12.12/-11.36     | -11.53/-11.75     | -12.30/-12.29     | -11.52/-10.59     | -9.84/-9.01       | -9.00/-9.10       | -10.28/-10.30     | -10.10/-12.48     | -12.58/-11.38     |
| Θ(180°)   | -10.65/-10.56 | -11.01/-10.22   | -9.88/-9.65     | -9.95/-10.83    | -11.04/-11.63   | -12.53/-13.76   | -13.27/-13.06   | -12.14/-11.16     | -10.51/-10.05     | -9.52/-9.43       | -9.81/-10.46      | -10.21/-10.34     | -11.84/-11.34     | -11.80/-11.63     | -11.68/-12.54     | -14.86/-15.89     | -14.94/-14.74     | -13.27/-13.08     | -11.78/-10.78     | -11.84/-11.81     | -12.59/-13.05     | -11.50/-11.67     | -11.28/-11.38     | -10.34/-10.25     |
| Freq(Hz)  | 2.45GPol.     | TotalAnt. 3     | -               | -               | -               | -               | -               | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 | -                 |
| Gain      | Φ(0°)/Φ(7.5°) | Φ(15°)/Φ(22.5°) | Φ(30°)/Φ(37.5°) | Φ(45°)/Φ(52.5°) | Φ(60°)/Φ(67.5°) | Φ(75°)/Φ(82.5°) | Φ(90°)/Φ(97.5°) | Φ(105°)/Φ(112.5°) | Φ(120°)/Φ(127.5°) | Φ(135°)/Φ(142.5°) | Φ(150°)/Φ(157.5°) | Φ(165°)/Φ(172.5°) | Φ(180°)/Φ(187.5°) | Φ(195°)/Φ(202.5°) | Φ(210°)/Φ(217.5°) | Φ(225°)/Φ(232.5°) | Φ(240°)/Φ(247.5°) | Φ(255°)/Φ(262.5°) | Φ(270°)/Φ(277.5°) | Φ(285°)/Φ(292.5°) | Φ(300°)/Φ(307.5°) | Φ(315°)/Φ(322.5°) | Φ(330°)/Φ(337.5°) | Φ(345°)/Φ(352.5°) |
| Θ(0°)     | 4.94/4.93     | 4.96/5.02       | 5.12/5.29       | 5.48/5.68       | 5.87/6.02       | 6.14/6.24       | 6.31/6.36       | 6.39/6.34         | 6.26/6.13         | 5.96/5.77         | 5.59/5.41         | 5.23/5.08         | 5.00/4.98         | 5.03/5.13         | 5.27/5.45         | 5.65/5.84         | 6.02/6.16         | 6.29/6.38         | 6.45/6.39         | 6.37/6.38         | 6.25/6.08         | 5.88/5.65         | 5.44/5.25         | 5.10/5.01         |
| Θ(7.5°)   | 4.95/4.84     | 4.78/4.79       | 4.84/4.95       | 5.12/5.31       | 5.50/5.68       | 5.81/5.91       | 5.99/6.05       | 6.05/6.01         | 5.92/5.76         | 5.57/5.40         | 5.26/5.17         | 5.10/5.07         | 5.08/5.18         | 5.34/5.53         | 5.17/5.88         | 6.05/6.21         | 6.35/6.46         | 6.55/6.63         | 6.61/6.46         | 6.45/6.38         | 6.47/6.42         | 6.23/6.00         | 5.77/5.54         | 5.31/5.11         |
| Θ(15°)    | 5.11/4.85     | 4.65/4.54       | 4.49/4.54       | 4.63/4.75       |                 |                 |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |

E1(XY plane) –  $\Theta(90)\Phi(0-360)$   
 E2(XZ plane) –  $\Theta(0-180)\Phi(0)$  and  $\Theta(0-180)\Phi(180)$   
 E3(YZ plane) –  $\Theta(0-180)\Phi(90)$  and  $\Theta(0-180)\Phi(270)$

