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Report No.:  
KR19-SRF0017

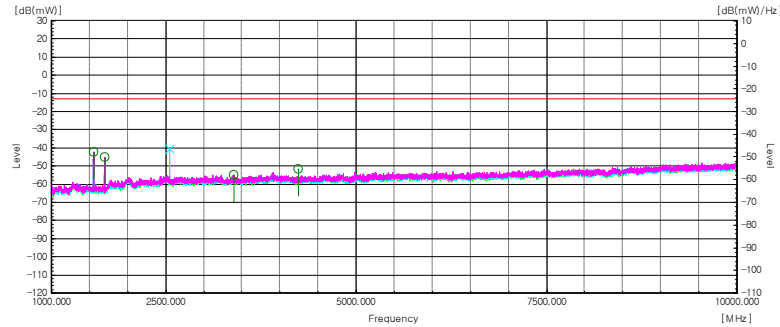
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Test mode : GPRS850

Frequency(MHz) : 848.8

Channel : 251

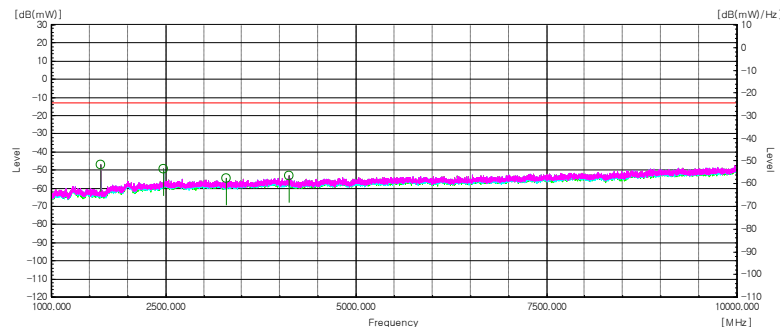


| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| GMSK | 1 553.06  | H     | 8.0          | 5.17       | -45.23           | -42.40 | -13.00 | 29.40  |
|      | 1 697.08  | H     | 8.6          | 5.51       | -48.39           | -45.30 | -13.00 | 32.30  |
|      | 2 546.17  | V     | 9.7          | 6.74       | -43.66           | -40.70 | -13.00 | 27.70  |
|      | 3 395.27  | H     | 9.2          | 7.78       | -56.32           | -54.90 | -13.00 | 41.90  |
|      | 4 243.36  | H     | 10.3         | 9.61       | -52.29           | -51.60 | -13.00 | 38.60  |

Test mode : EDGE850

Frequency(MHz) : 824.2

Channel : 128



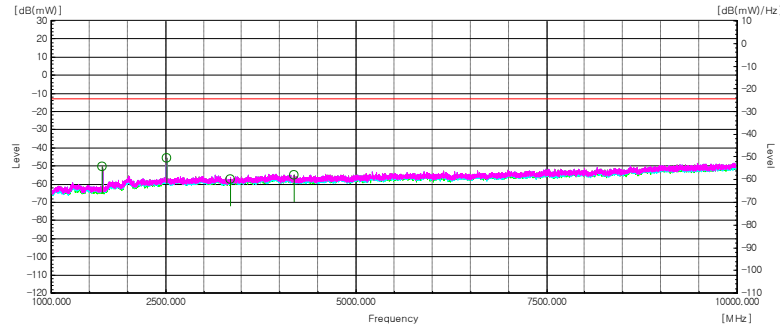
| Mode  | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|-------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|       | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| 8-PSK | 1 553.06  | H     | 8.0          | 5.17       | -45.23           | -42.40 | -13.00 | 29.40  |
|       | 1 697.08  | H     | 8.6          | 5.51       | -48.39           | -45.30 | -13.00 | 32.30  |
|       | 2 546.17  | V     | 9.7          | 6.74       | -43.66           | -40.70 | -13.00 | 27.70  |
|       | 3 395.27  | H     | 9.2          | 7.78       | -56.32           | -54.90 | -13.00 | 41.90  |
|       | 4 243.36  | H     | 10.3         | 9.61       | -52.29           | -51.60 | -13.00 | 38.60  |

Note.

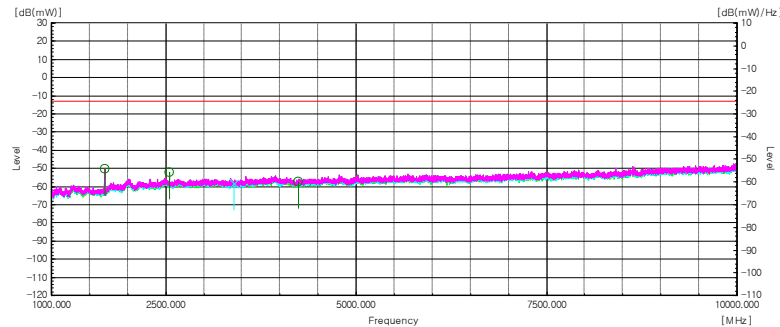
1. Limit Calculation(dBm)= 43 + 10log(P<sub>Watts</sub>) [dBc]

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KCTL-TIR001-003/2

Test mode : EDGE850Frequency(MHz) : 836.6Channel : 190

| Mode  | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|-------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|       | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| 8-PSK | 1 673.08  | H     | 8.5          | 5.45       | -53.25           | -50.20 | -13.00 | 37.20  |
|       | 2 510.17  | H     | 9.8          | 6.74       | -48.66           | -45.60 | -13.00 | 32.60  |
|       | 3 346.26  | H     | 9.3          | 7.78       | -58.82           | -57.30 | -13.00 | 44.30  |
|       | 4 182.35  | H     | 10.1         | 9.35       | -55.65           | -54.90 | -13.00 | 41.90  |

Test mode : EDGE850Frequency(MHz) : 848.8Channel : 251

| Mode  | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|-------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|       | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| 8-PSK | 1 697.08  | H     | 8.6          | 5.51       | -53.29           | -50.20 | -13.00 | 37.20  |
|       | 2 546.17  | H     | 9.7          | 6.74       | -55.16           | -52.20 | -13.00 | 39.20  |
|       | 3 395.27  | V     | 9.2          | 7.78       | -59.72           | -58.30 | -13.00 | 45.30  |
|       | 4 243.36  | H     | 10.3         | 9.61       | -58.09           | -57.40 | -13.00 | 44.40  |

Note.

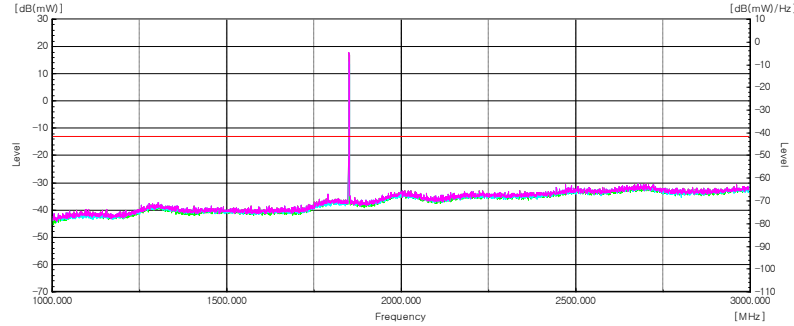
1. Limit Calculation(dBm)= 43 + 10log(P<sub>[Watts]</sub>) [dBc]

Test mode : GPRS1900

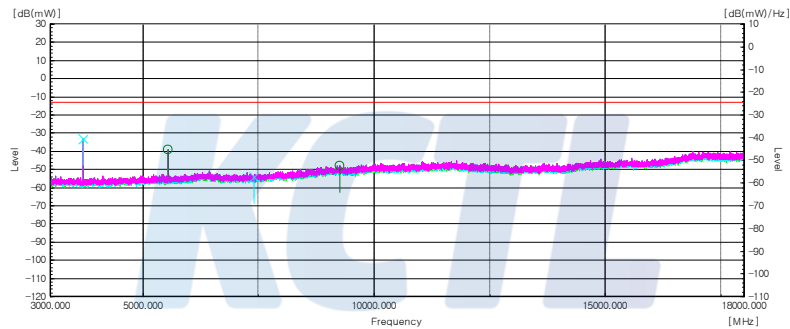
Frequency(MHz) : 1 850.2

Channel : 512

1 000 MHz to 3 000 MHz



Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| GMSK | 3 700.05  | V     | 9.6          | 8.92       | -33.98           | -33.30 | -13.00 | 20.30  |
|      | 5 550.17  | H     | 10.8         | 11.20      | -38.70           | -39.10 | -13.00 | 26.10  |
|      | 7 400.29  | V     | 10.8         | 13.24      | -51.46           | -53.90 | -13.00 | 40.90  |
|      | 9 250.42  | H     | 11.9         | 14.41      | -45.79           | -48.30 | -13.00 | 35.30  |

Note.

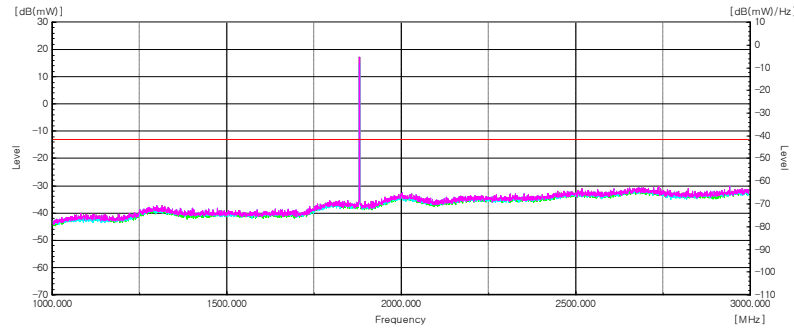
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : GPRS1900

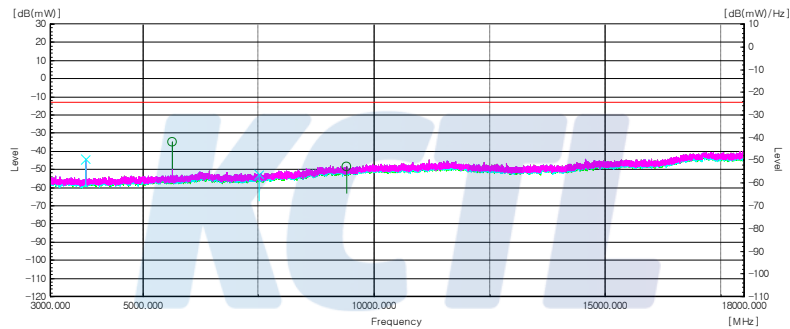
Frequency(MHz) : 1 880.0

Channel : 661

1 000 MHz to 3 000 MHz



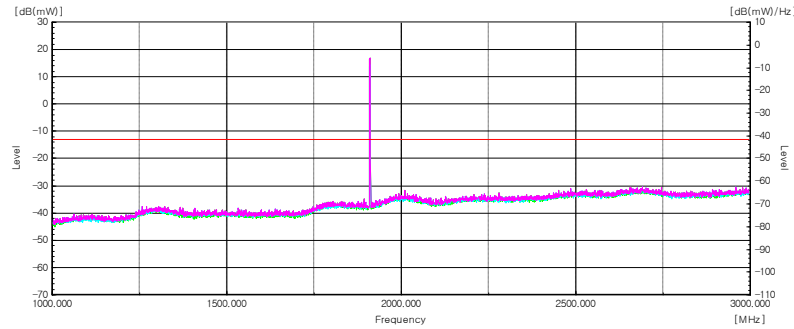
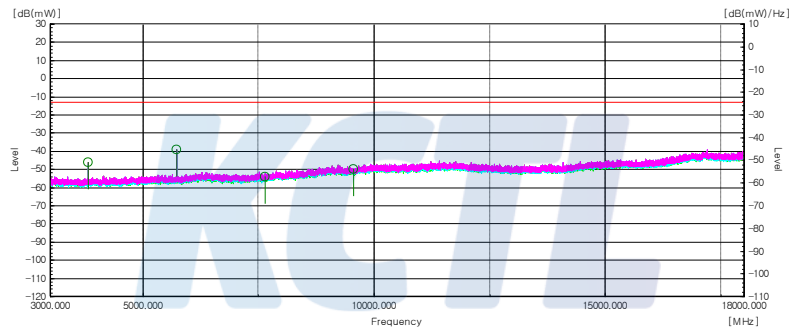
Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| GMSK | 3 760.05  | V     | 9.3          | 8.92       | -44.68           | -44.30 | -13.00 | 31.30  |
|      | 5 640.18  | H     | 10.9         | 11.27      | -34.53           | -34.90 | -13.00 | 21.90  |
|      | 7 520.30  | V     | 11.0         | 13.24      | -50.36           | -52.60 | -13.00 | 39.60  |
|      | 9 399.43  | H     | 12.0         | 14.50      | -45.90           | -48.40 | -13.00 | 35.40  |

Note.

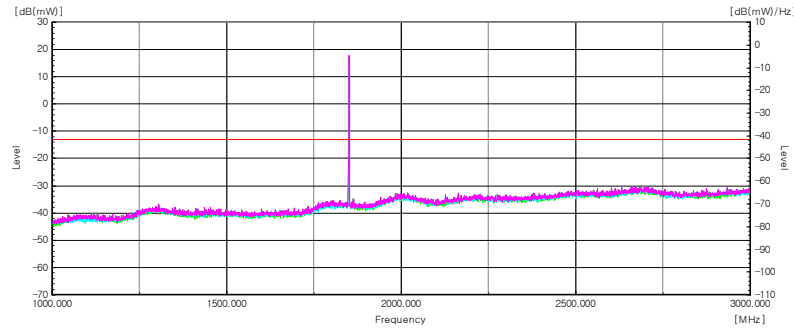
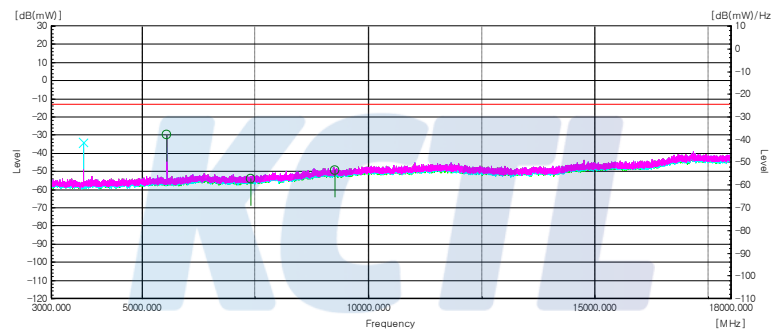
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : GPRS1900Frequency(MHz) : 1 909.8Channel : 8101 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|-------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm] | [dB]   |
| GMSK | 3 820.06  | H     | 9.1          | 9.04       | -46.10           | -13.00 | 33.10 | 30.30  |
|      | 5 729.18  | H     | 10.9         | 11.16      | -39.00           | -13.00 | 26.00 | 30.00  |
|      | 7 639.31  | H     | 11.3         | 13.25      | -54.00           | -13.00 | 41.00 | 40.60  |
|      | 9 549.44  | H     | 12.0         | 14.65      | -49.90           | -13.00 | 36.90 | 34.00  |

Note.

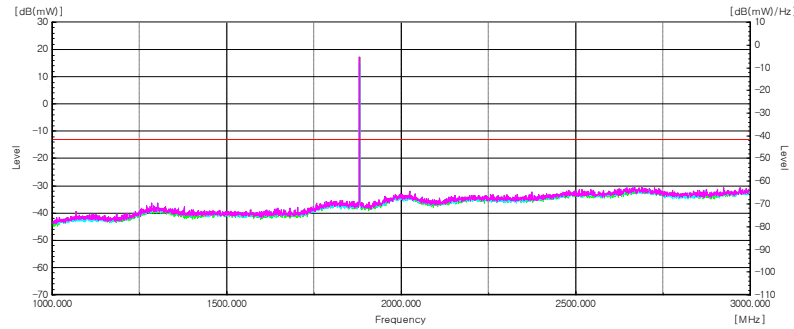
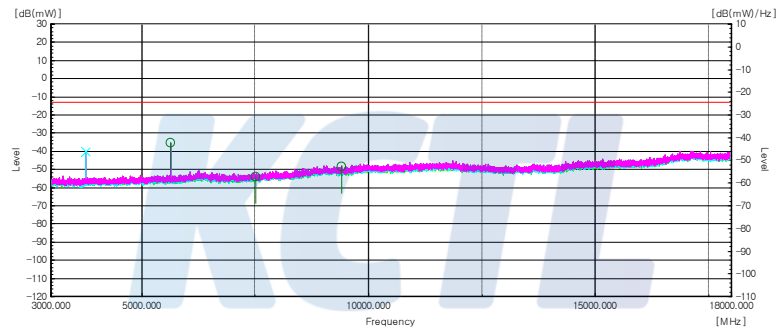
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : EDGE1900Frequency(MHz) : 1 850.2Channel : 5121 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode  | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|-------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|       | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| 8-PSK | 3 700.05  | V     | 9.6          | 8.92       | -34.48           | -33.80 | -13.00 | 20.80  |
|       | 5 550.17  | H     | 10.8         | 11.20      | -29.40           | -29.80 | -13.00 | 16.80  |
|       | 7 400.29  | H     | 10.8         | 13.24      | -51.46           | -53.90 | -13.00 | 40.90  |
|       | 9 251.42  | H     | 11.9         | 14.41      | -46.89           | -49.40 | -13.00 | 36.40  |

Note.

1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : EDGE1900Frequency(MHz) : 1 880.0Channel : 6611 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode  | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|-------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|       | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| 8-PSK | 3 760.05  | V     | 9.3          | 8.92       | -40.28           | -39.90 | -13.00 | 26.90  |
|       | 5 640.18  | H     | 10.9         | 11.27      | -35.23           | -35.60 | -13.00 | 22.60  |
|       | 7 520.30  | H     | 11.0         | 13.24      | -52.06           | -54.30 | -13.00 | 41.30  |
|       | 9 400.43  | H     | 12.0         | 14.50      | -46.10           | -48.60 | -13.00 | 35.60  |

Note.

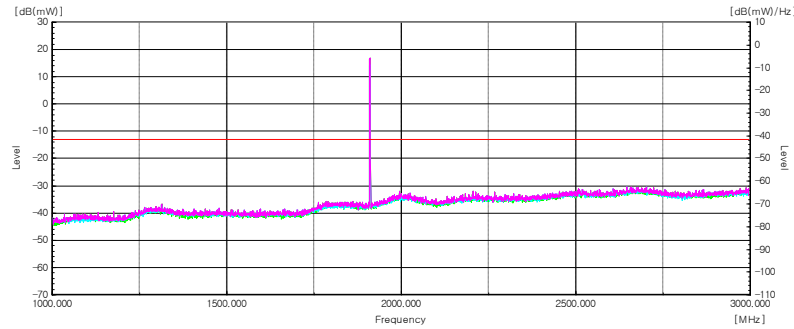
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : EDGE1900

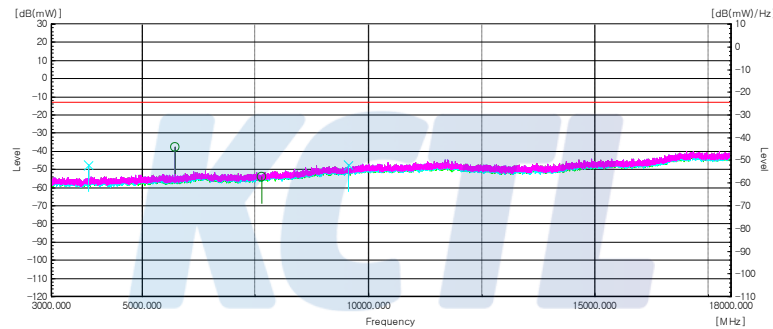
Frequency(MHz) : 1 909.8

Channel : 810

### 1 000 MHz to 3 000 MHz



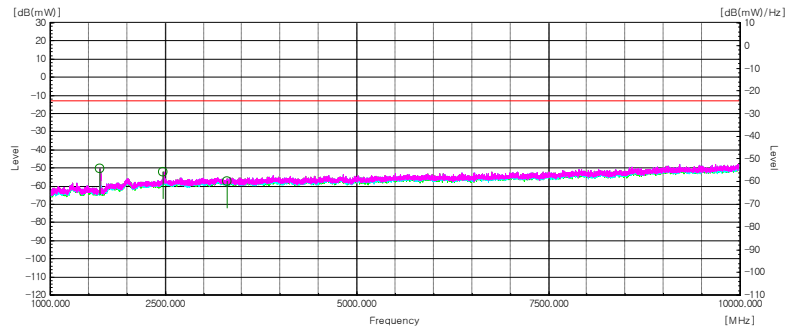
### Above 3 000 MHz



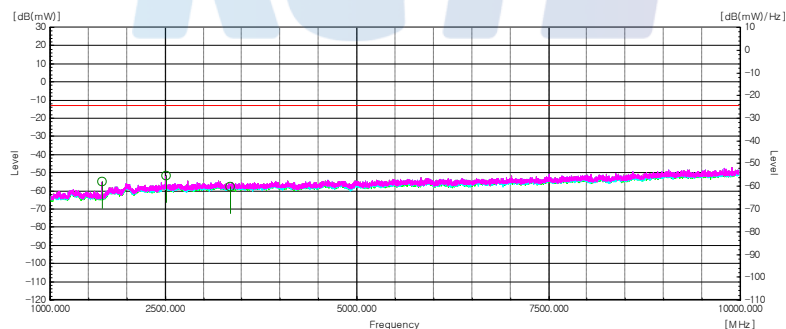
| Mode  | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|-------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|       | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| 8-PSK | 3 820.06  | V     | 9.1          | 9.04       | -47.56           | -47.50 | -13.00 | 34.50  |
|       | 5 729.18  | H     | 10.9         | 11.16      | -37.34           | -37.60 | -13.00 | 24.60  |
|       | 7 639.31  | H     | 11.3         | 13.25      | -52.15           | -54.10 | -13.00 | 41.10  |
|       | 9 548.44  | V     | 12.0         | 14.65      | -44.85           | -47.50 | -13.00 | 34.50  |

Note.

1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC850Frequency(MHz) : 826.4Channel : 4132

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 650.07  | H     | 8.4          | 5.38       | -53.32           | -50.30 | -13.00 | 37.30  |
|      | 2 475.16  | H     | 9.8          | 6.74       | -55.46           | -52.40 | -13.00 | 39.40  |
|      | 3 305.26  | H     | 9.3          | 7.78       | -58.82           | -57.30 | -13.00 | 44.30  |

Test mode : RMC850Frequency(MHz) : 836.4Channel : 4182

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 674.08  | H     | 8.5          | 5.51       | -57.99           | -55.00 | -13.00 | 42.00  |
|      | 2 511.17  | H     | 9.8          | 6.70       | -55.10           | -52.00 | -13.00 | 39.00  |
|      | 3 345.26  | H     | 9.2          | 7.78       | -59.32           | -57.90 | -13.00 | 44.90  |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P<sub>[watts]</sub>) [dBc]

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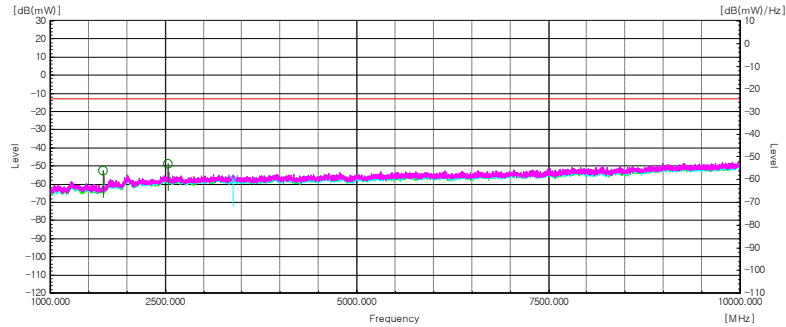
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Test mode : RMC850

Frequency(MHz) : 846.6

Channel : 4233

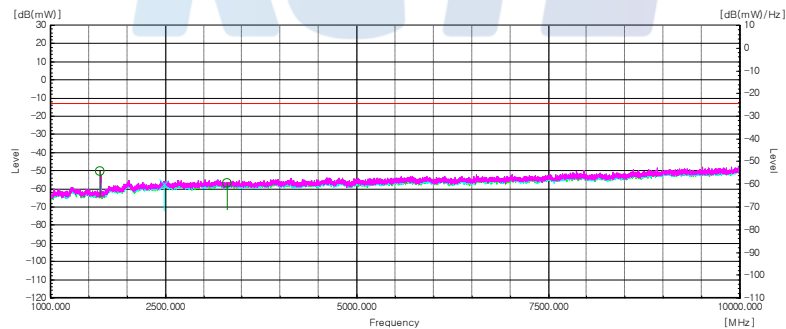


| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 695.08  | H     | 8.6          | 5.51       | -55.99           | -52.90 | -13.00 | 39.90  |
|      | 2 536.17  | H     | 9.7          | 6.74       | -52.16           | -49.20 | -13.00 | 36.20  |
|      | 3 386.27  | V     | 9.4          | 7.93       | -58.67           | -57.20 | -13.00 | 44.20  |

Test mode : HSDPA850

Frequency(MHz) : 826.4

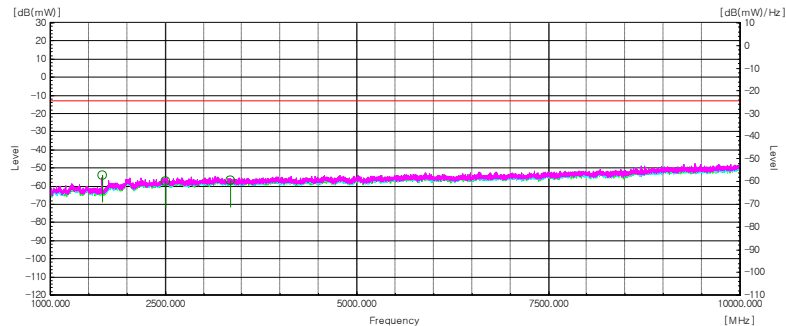
Channel : 4132



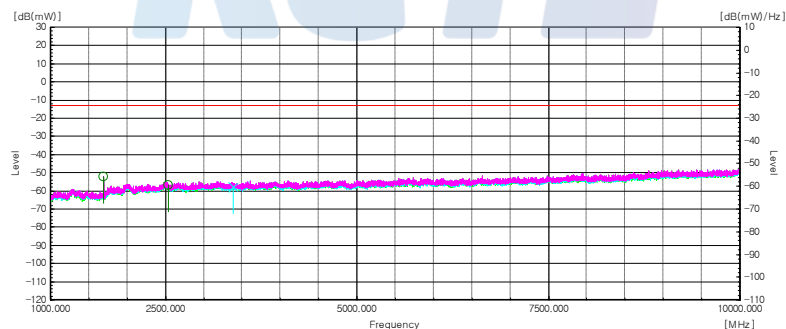
| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 651.07  | H     | 8.4          | 5.38       | -53.32           | -50.30 | -13.00 | 37.30  |
|      | 2 479.17  | V     | 9.8          | 6.74       | -60.66           | -57.60 | -13.00 | 44.60  |
|      | 3 305.26  | H     | 9.3          | 7.78       | -58.22           | -56.70 | -13.00 | 43.70  |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P<sub>[watts]</sub>) [dBc]

Test mode : HSDPA850Frequency(MHz) : 836.4Channel : 4182

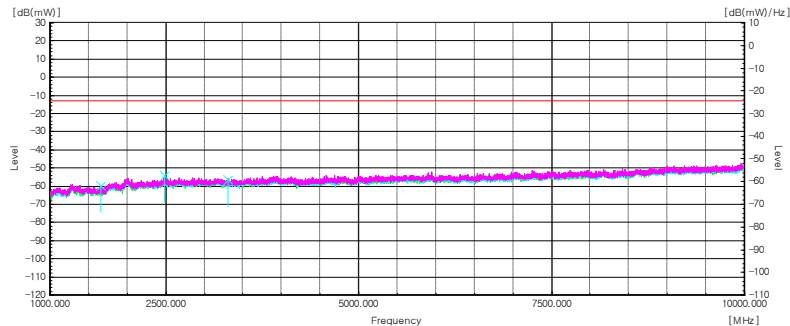
| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 675.08  | H     | 8.5          | 5.51       | -57.19           | -54.20 | -13.00 | 41.20  |
|      | 2 509.17  | H     | 9.8          | 6.70       | -60.50           | -57.40 | -13.00 | 44.40  |
|      | 3 345.26  | H     | 9.2          | 7.78       | -58.42           | -57.00 | -13.00 | 44.00  |

Test mode : HSDPA850Frequency(MHz) : 846.6Channel : 4233

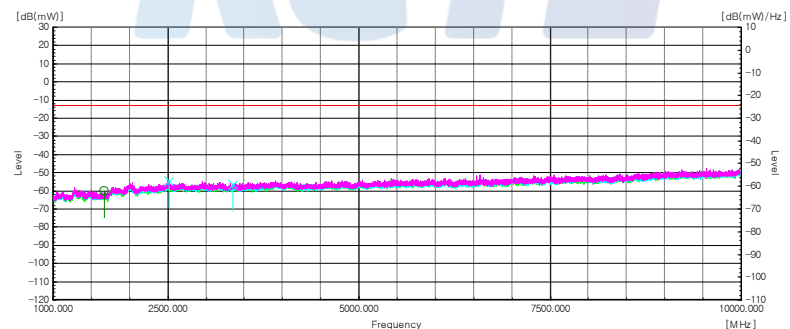
| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 691.08  | H     | 8.6          | 5.51       | -55.39           | -52.30 | -13.00 | 39.30  |
|      | 2 539.17  | H     | 9.7          | 6.74       | -59.66           | -56.70 | -13.00 | 43.70  |
|      | 3 386.27  | V     | 9.4          | 7.93       | -59.17           | -57.70 | -13.00 | 44.70  |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P<sub>[watts]</sub>) [dBc]

Test mode : HSUPA850Frequency(MHz) : 826.4Channel : 4132

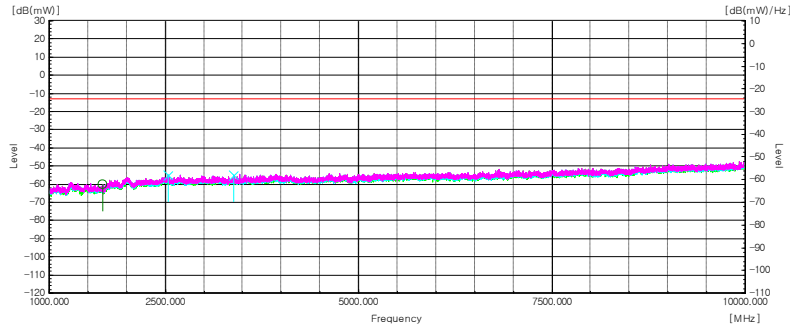
| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 654.07  | V     | 8.4          | 5.38       | -62.92           | -59.90 | -13.00 | 46.90  |
|      | 2 482.17  | V     | 9.8          | 6.74       | -56.96           | -53.90 | -13.00 | 40.90  |
|      | 3 302.26  | V     | 9.3          | 7.78       | -57.82           | -56.30 | -13.00 | 43.30  |

Test mode : HSUPA850Frequency(MHz) : 836.4Channel : 4182

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 671.08  | H     | 8.5          | 5.51       | -63.29           | -60.30 | -13.00 | 47.30  |
|      | 2 512.17  | V     | 9.8          | 6.70       | -57.80           | -54.70 | -13.00 | 41.70  |
|      | 3 346.26  | V     | 9.2          | 7.78       | -57.82           | -56.40 | -13.00 | 43.40  |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P<sub>[watts]</sub>) [dBc]

Test mode : HSUPA850Frequency(MHz) : 846.6Channel : 4233

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 1 695.08  | H     | 8.6          | 5.51       | -63.29           | -60.20 | -13.00 | 47.20  |
|      | 2 540.17  | V     | 9.7          | 6.74       | -58.06           | -55.10 | -13.00 | 42.10  |
|      | 3 388.27  | V     | 9.4          | 7.93       | -56.77           | -55.30 | -13.00 | 42.30  |

Note.

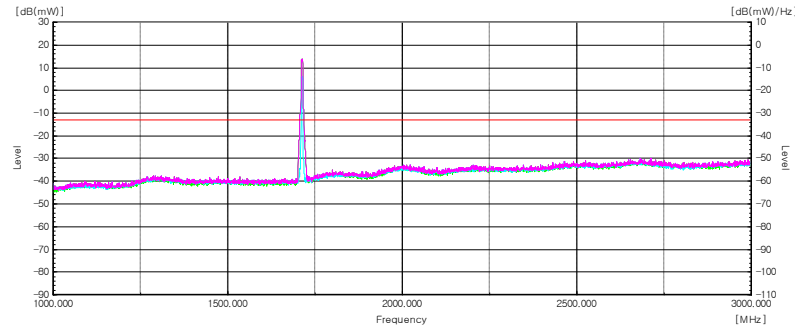
1. Limit Calculation(dBm)= 43 + 10log(P<sub>[Watts]</sub>) [dBc]**KCTL**

Test mode : RMC1700

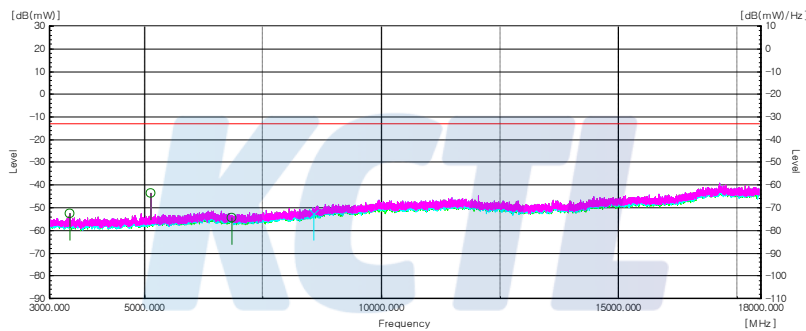
Frequency(MHz) : 1 712.4

Channel : 1312

### 1 000 MHz to 3 000 MHz



### Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 423.03  | H     | 9.4          | 7.93       | -53.97           | -52.50 | -13.00 | 39.50  |
|      | 5 134.14  | H     | 10.8         | 10.63      | -43.97           | -43.80 | -13.00 | 30.80  |
|      | 6 849.26  | H     | 11.1         | 12.42      | -53.08           | -54.40 | -13.00 | 41.40  |
|      | 8 562.37  | V     | 11.4         | 13.84      | -50.36           | -52.80 | -13.00 | 39.80  |

Note.

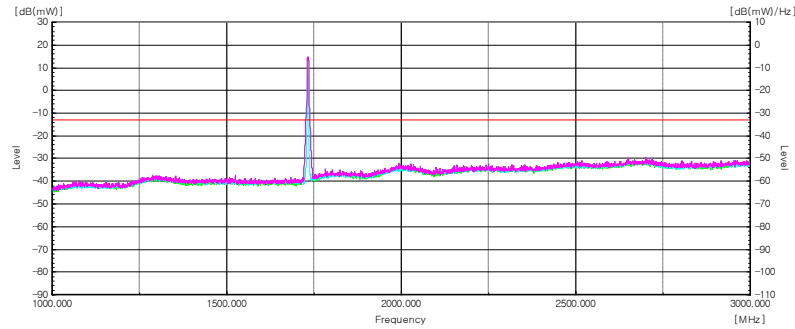
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC1700

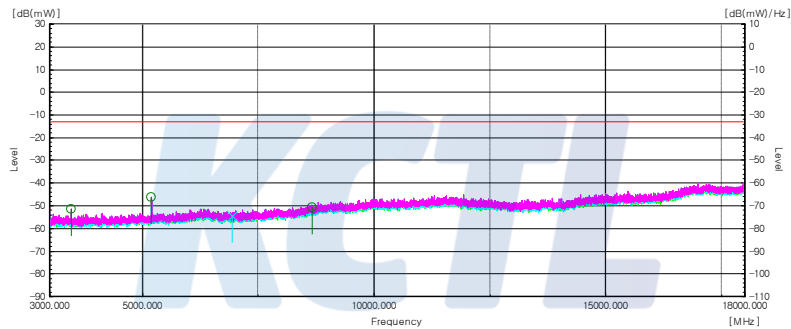
Frequency(MHz) : 1 732.4

Channel : 1412

1 000 MHz to 3 000 MHz



Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 463.03  | H     | 9.4          | 7.93       | -53.07           | -51.60 | -13.00 | 38.60  |
|      | 5 194.15  | H     | 10.9         | 10.63      | -46.67           | -46.40 | -13.00 | 33.40  |
|      | 6 929.26  | V     | 11.2         | 12.66      | -53.14           | -54.60 | -13.00 | 41.60  |
|      | 8 662.38  | H     | 11.4         | 13.96      | -48.34           | -50.90 | -13.00 | 37.90  |

Note.

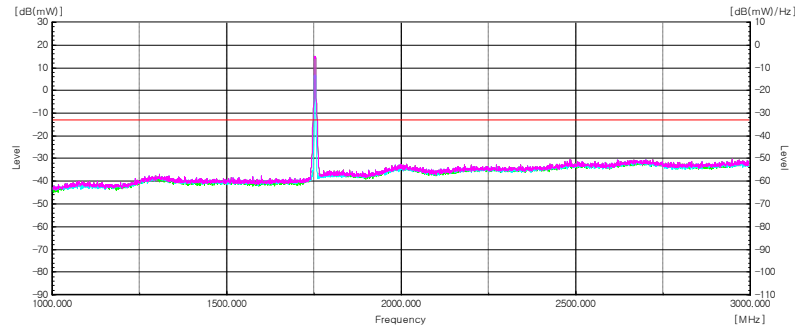
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC1700

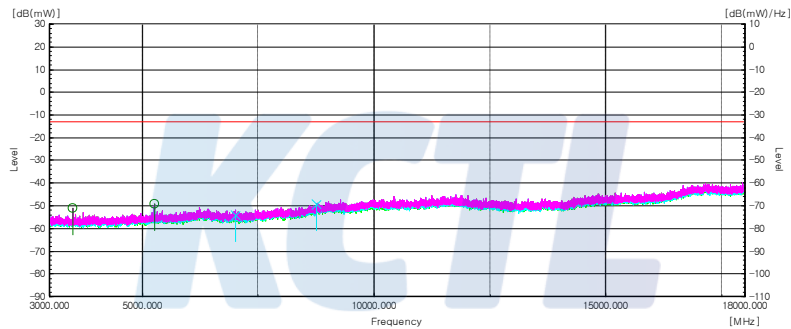
Frequency(MHz) : 1 752.6

Channel : 1513

1 000 MHz to 3 000 MHz



Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 507.03  | H     | 9.6          | 8.05       | -52.55           | -51.00 | -13.00 | 38.00  |
|      | 5 260.15  | H     | 11.3         | 10.73      | -49.97           | -49.40 | -13.00 | 36.40  |
|      | 7 010.27  | V     | 11.4         | 12.77      | -52.93           | -54.30 | -13.00 | 41.30  |
|      | 8 761.38  | V     | 11.3         | 14.12      | -46.28           | -49.10 | -13.00 | 36.10  |

Note.

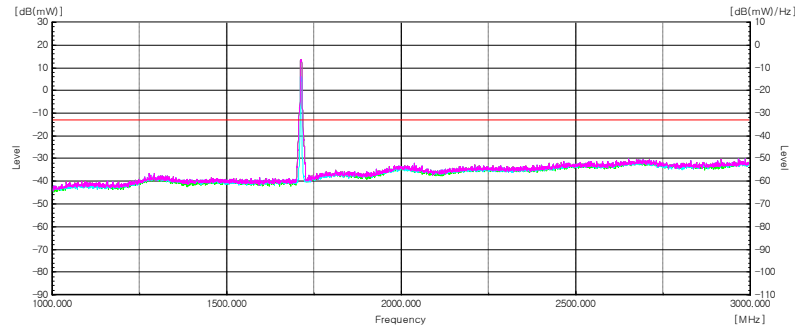
- Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
- No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSDPA1700

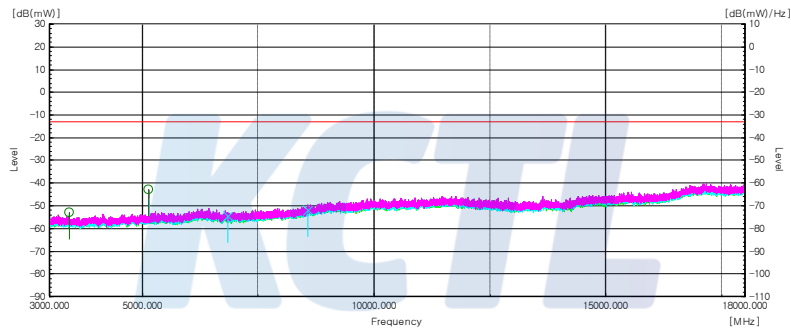
Frequency(MHz) : 1 712.4

Channel : 1312

1 000 MHz to 3 000 MHz



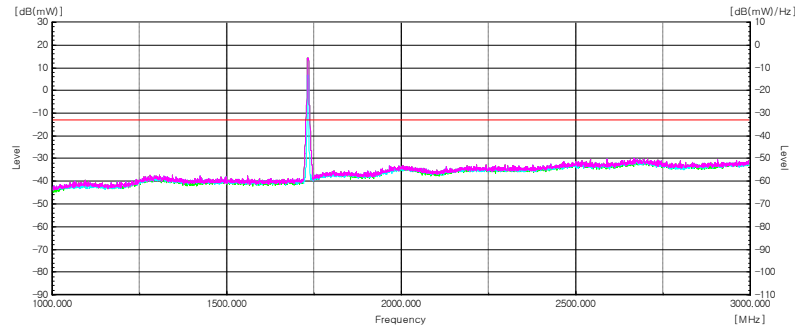
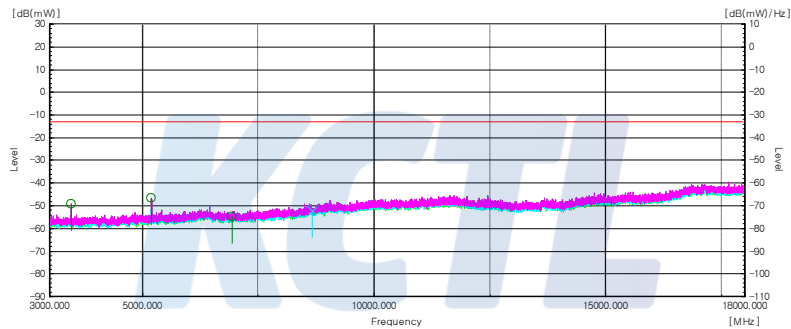
Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 424.03  | H     | 9.4          | 7.93       | -54.47           | -53.00 | -13.00 | 40.00  |
|      | 5 134.14  | H     | 10.8         | 10.63      | -43.17           | -43.00 | -13.00 | 30.00  |
|      | 6 849.26  | V     | 11.1         | 12.42      | -53.18           | -54.50 | -13.00 | 41.50  |
|      | 8 562.37  | V     | 11.4         | 13.84      | -49.26           | -51.70 | -13.00 | 38.70  |

Note.

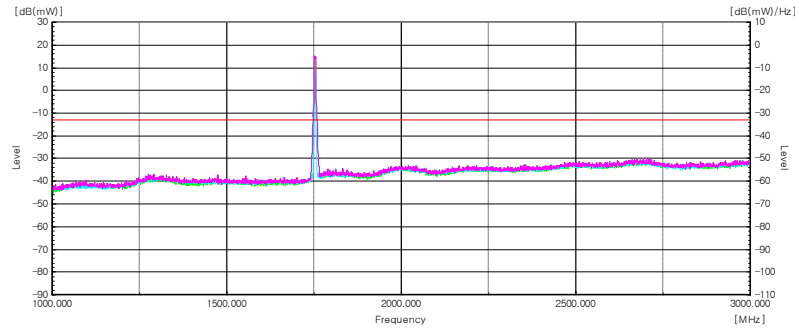
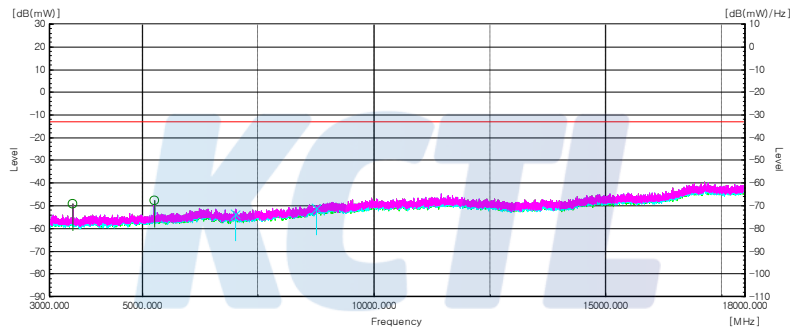
1. Limit Calculation(dBm)= 43 + 10log(P<sub>[Watts]</sub>) [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSDPA1700Frequency(MHz) : 1 732.4Channel : 14121 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 466.03  | H     | 9.4          | 7.93       | -50.87           | -49.40 | -13.00 | 36.40  |
|      | 5 199.15  | H     | 10.9         | 10.63      | -46.87           | -46.60 | -13.00 | 33.60  |
|      | 6 928.26  | H     | 11.2         | 12.66      | -53.34           | -54.80 | -13.00 | 41.80  |
|      | 8 662.38  | V     | 11.4         | 13.96      | -49.54           | -52.10 | -13.00 | 39.10  |

Note.

1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSDPA1700Frequency(MHz) : 1 752.6Channel : 15131 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 507.03  | H     | 9.6          | 8.05       | -50.65           | -49.10 | -13.00 | 36.10  |
|      | 5 261.15  | H     | 11.3         | 10.73      | -48.47           | -47.90 | -13.00 | 34.90  |
|      | 7 010.27  | V     | 11.4         | 12.77      | -52.53           | -53.90 | -13.00 | 40.90  |
|      | 8 763.38  | V     | 11.3         | 14.12      | -48.08           | -50.90 | -13.00 | 37.90  |

Note.

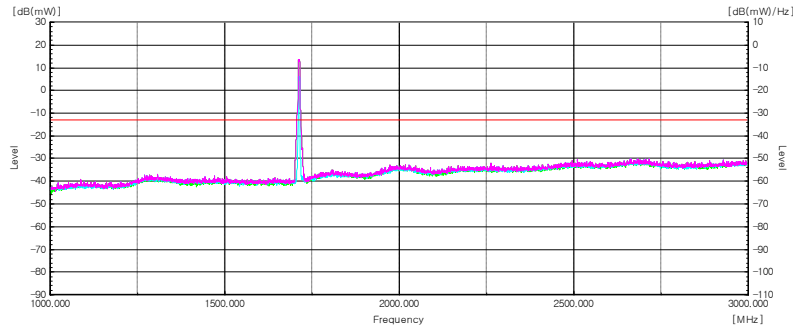
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSUPA1700

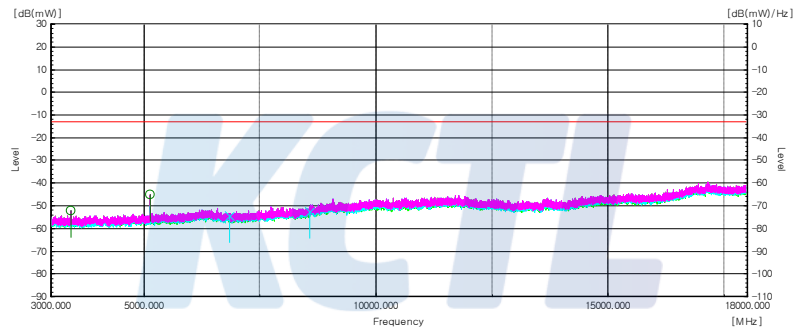
Frequency(MHz) : 1 712.4

Channel : 1312

1 000 MHz to 3 000 MHz



Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 427.03  | H     | 9.4          | 7.93       | -53.77           | -52.30 | -13.00 | 39.30  |
|      | 5 139.14  | H     | 10.8         | 10.63      | -45.47           | -45.30 | -13.00 | 32.30  |
|      | 6 849.26  | V     | 11.1         | 12.42      | -53.18           | -54.50 | -13.00 | 41.50  |
|      | 8 562.37  | V     | 11.4         | 13.84      | -50.36           | -52.80 | -13.00 | 39.80  |

Note.

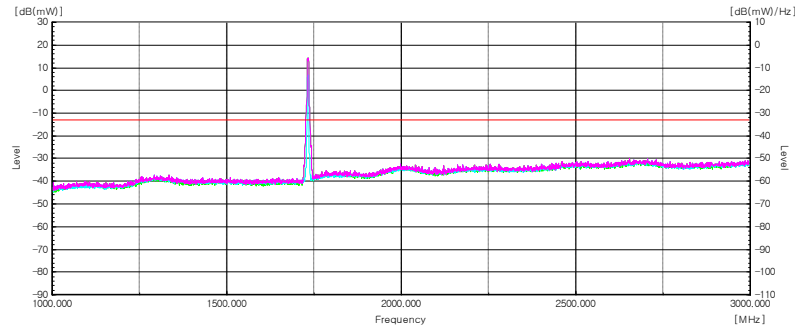
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSUPA1700

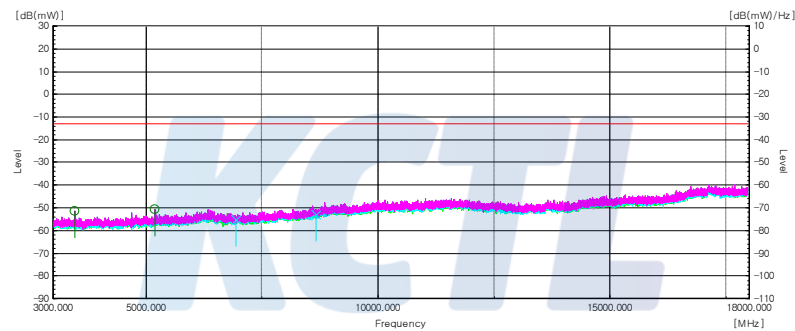
Frequency(MHz) : 1 732.4

Channel : 1412

1 000 MHz to 3 000 MHz



Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 463.03  | H     | 9.4          | 7.93       | -53.17           | -51.70 | -13.00 | 38.70  |
|      | 5 194.15  | H     | 10.9         | 10.63      | -51.07           | -50.80 | -13.00 | 37.80  |
|      | 6 929.26  | V     | 11.2         | 12.66      | -53.94           | -55.40 | -13.00 | 42.40  |
|      | 8 662.38  | V     | 11.4         | 13.96      | -50.34           | -52.90 | -13.00 | 39.90  |

Note.

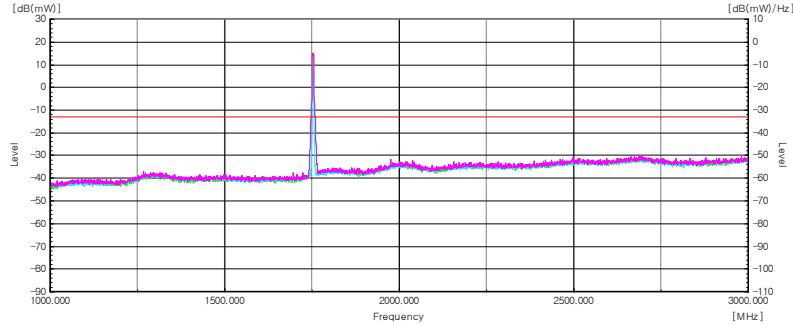
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSUPA1700

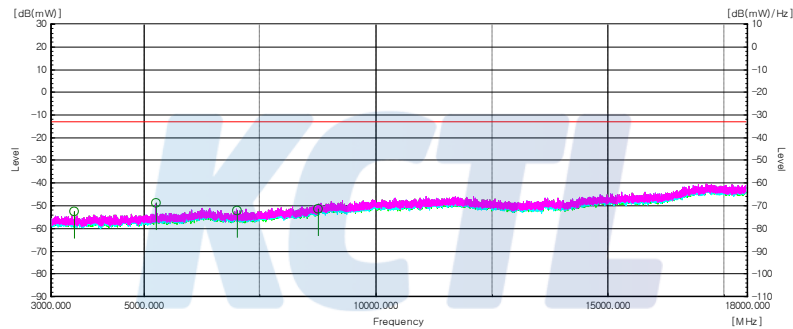
Frequency(MHz) : 1 752.6

Channel : 1513

1 000 MHz to 3 000 MHz



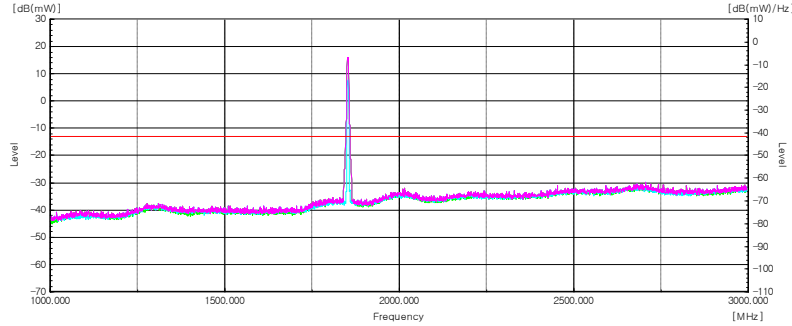
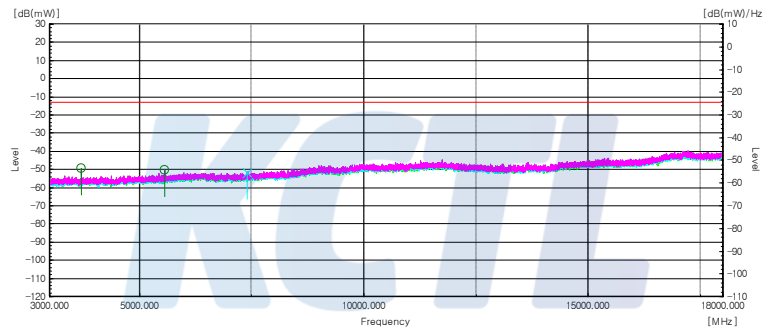
Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 507.03  | H     | 9.6          | 8.05       | -54.25           | -52.70 | -13.00 | 39.70  |
|      | 5 260.15  | H     | 11.3         | 10.73      | -49.67           | -49.10 | -13.00 | 36.10  |
|      | 7 010.27  | H     | 11.4         | 12.77      | -50.73           | -52.10 | -13.00 | 39.10  |
|      | 8 763.38  | H     | 11.3         | 14.12      | -48.68           | -51.50 | -13.00 | 38.50  |

Note.

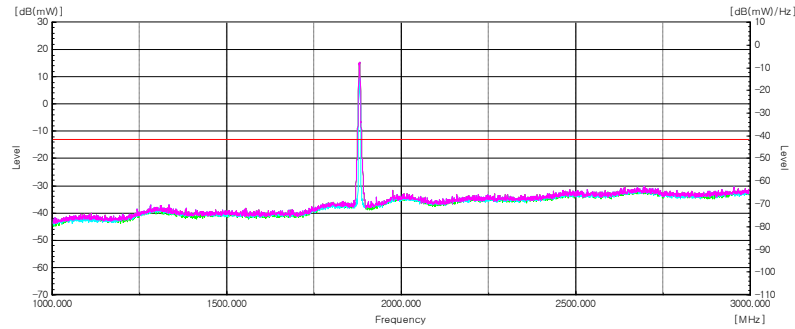
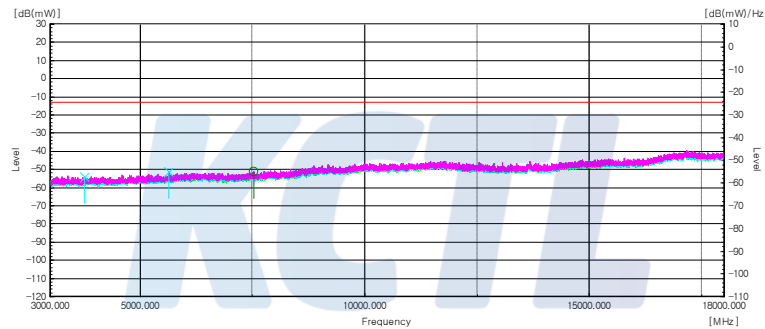
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC1900Frequency(MHz) : 1 852.4Channel : 92621 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 702.05  | H     | 9.6          | 8.92       | -49.88           | -49.20 | -13.00 | 36.20  |
|      | 5 559.17  | H     | 10.8         | 11.20      | -50.00           | -50.40 | -13.00 | 37.40  |
|      | 7 407.29  | V     | 10.8         | 13.24      | -49.56           | -52.00 | -13.00 | 39.00  |

Note.

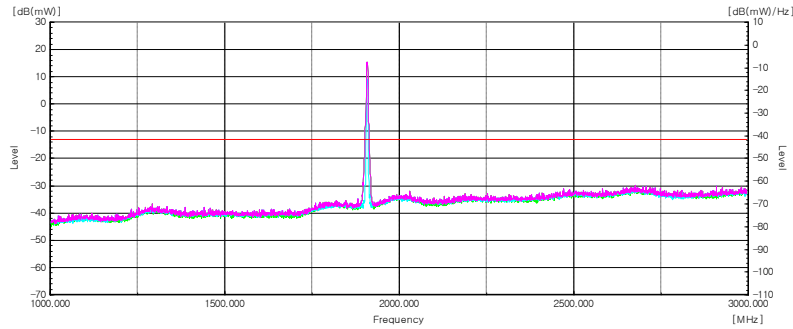
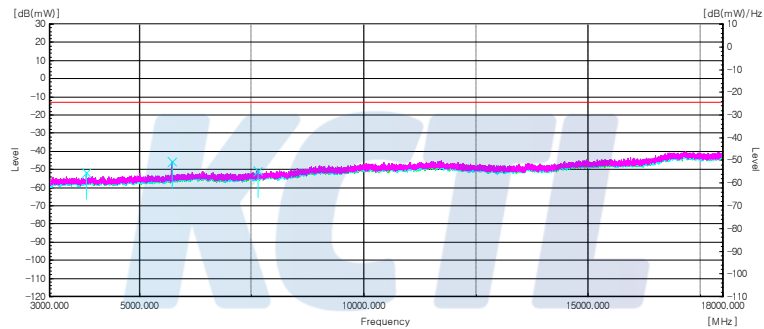
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC1900Frequency(MHz) : 1 880.0Channel : 94001 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 758.05  | V     | 9.3          | 8.92       | -54.58           | -54.20 | -13.00 | 41.20  |
|      | 5 636.17  | V     | 10.8         | 11.27      | -50.83           | -51.30 | -13.00 | 38.30  |
|      | 7 522.30  | H     | 11.0         | 13.24      | -48.86           | -51.10 | -13.00 | 38.10  |

Note.

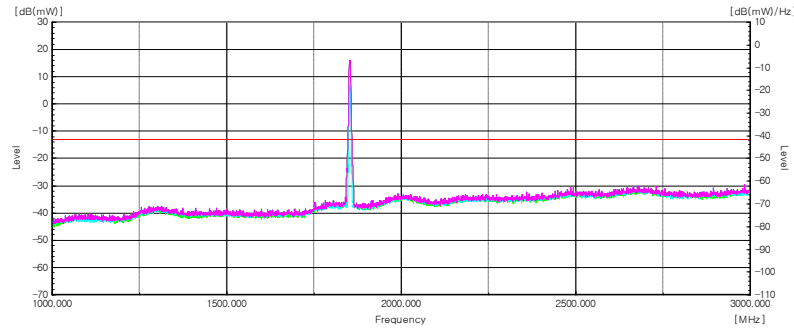
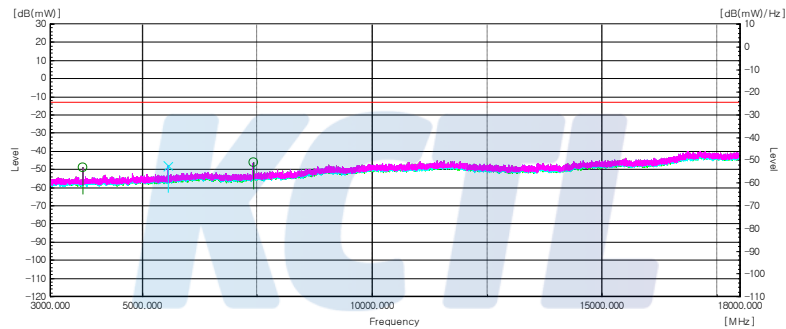
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC1900Frequency(MHz) : 1 907.6Channel : 95381 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 818.06  | V     | 9.1          | 9.04       | -51.86           | -51.80 | -13.00 | 38.80  |
|      | 5 726.18  | V     | 11.5         | 11.16      | -46.14           | -45.80 | -13.00 | 32.80  |
|      | 7 632.31  | V     | 11.3         | 13.25      | -48.75           | -50.70 | -13.00 | 37.70  |

Note.

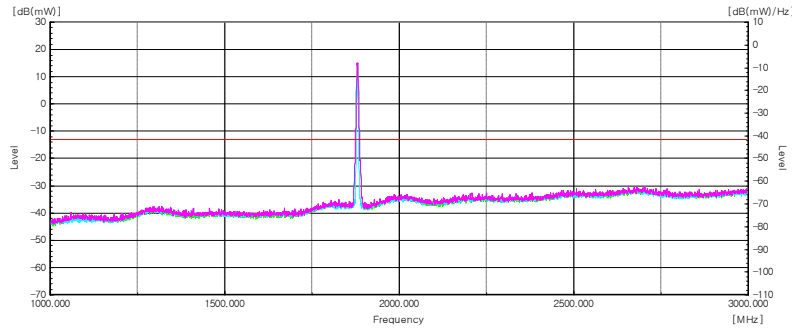
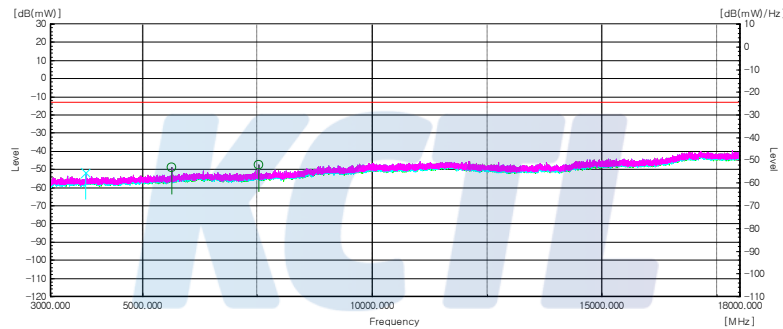
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : RMC1900Frequency(MHz) : 1 852.4Channel : 92621 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 702.05  | H     | 9.6          | 8.92       | -49.58           | -48.90 | -13.00 | 35.90  |
|      | 5 554.17  | V     | 10.8         | 11.20      | -47.50           | -47.90 | -13.00 | 34.90  |
|      | 7 413.29  | H     | 10.8         | 13.24      | -43.86           | -46.30 | -13.00 | 33.30  |

Note.

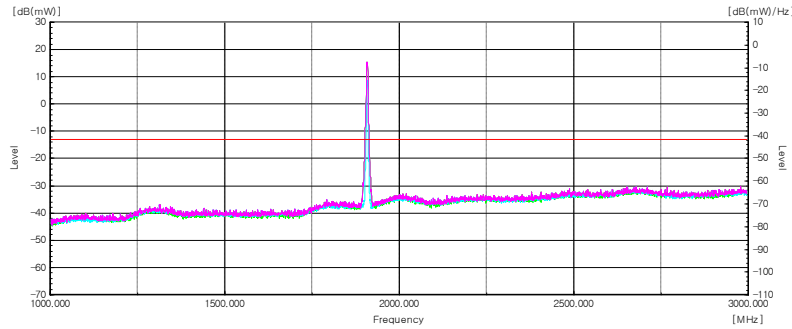
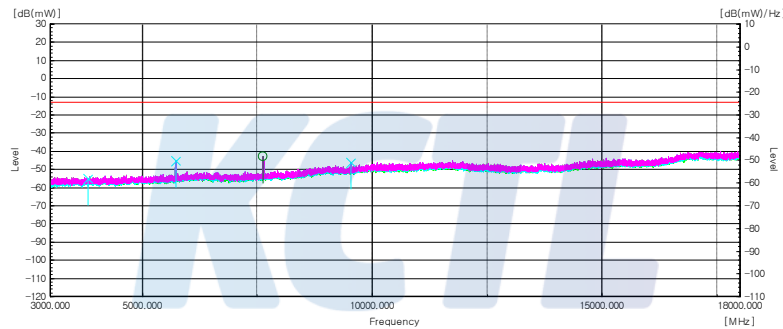
1. Limit Calculation(dBm)= 43 + 10log(P<sub>Watts</sub>) [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSDPA1900Frequency(MHz) : 1 880.0Channel : 94001 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 762.05  | V     | 9.3          | 8.92       | -51.98           | -51.60 | -13.00 | 38.60  |
|      | 5 643.17  | H     | 10.8         | 11.27      | -48.53           | -49.00 | -13.00 | 36.00  |
|      | 7 523.30  | H     | 11.0         | 13.24      | -45.36           | -47.60 | -13.00 | 34.60  |

Note.

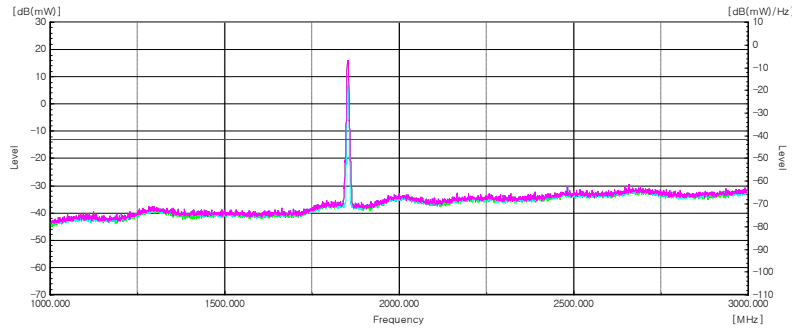
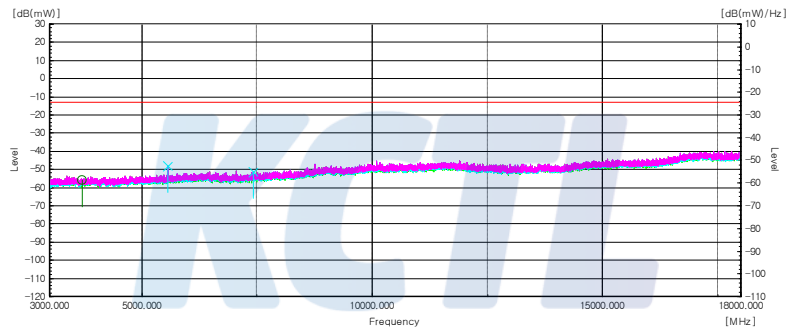
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSDPA1900Frequency(MHz) : 1 907.6Channel : 95381 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 814.05  | V     | 9.1          | 9.04       | -54.96           | -54.90 | -13.00 | 41.90  |
|      | 5 725.18  | V     | 11.5         | 11.16      | -45.64           | -45.30 | -13.00 | 32.30  |
|      | 7 626.31  | H     | 11.3         | 13.25      | -40.95           | -42.90 | -13.00 | 29.90  |
|      | 9 533.5   | V     | 12.0         | 14.65      | -43.45           | -46.10 | -13.00 | 33.10  |

Note.

1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

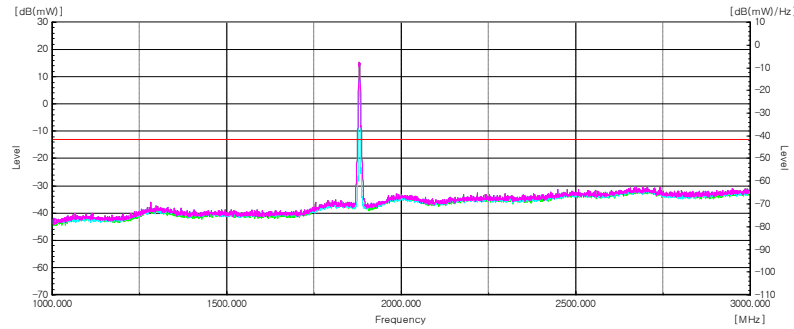
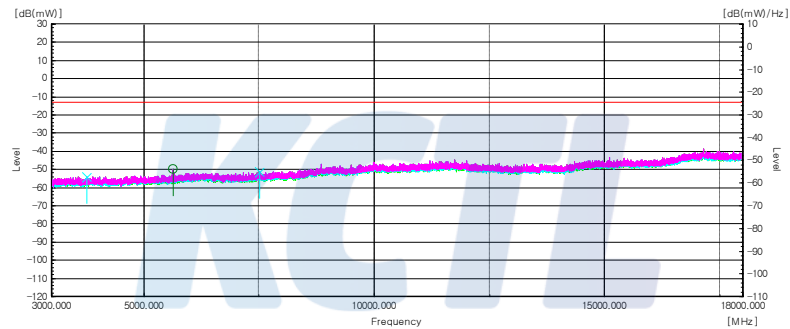
Test mode : HSUPA1900Frequency(MHz) : 1 852.4Channel : 92621 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 704.05  | H     | 9.6          | 8.92       | -56.78           | -56.10 | -13.00 | 43.10  |
|      | 5 560.17  | V     | 10.8         | 11.20      | -47.60           | -48.00 | -13.00 | 35.00  |
|      | 7 409.29  | V     | 10.8         | 13.24      | -48.86           | -51.30 | -13.00 | 38.30  |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P<sub>Watts</sub>) [dBc]

2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSUPA1900Frequency(MHz) : 1 880.0Channel : 94001 000 MHz to 3 000 MHzAbove 3 000 MHz

| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 5 637.18  | H     | 9.3          | 8.92       | -50.08           | -49.70 | -13.00 | 36.70  |
|      | 3 761.05  | V     | 10.8         | 11.27      | -53.83           | -54.30 | -13.00 | 41.30  |
|      | 7 519.30  | V     | 11.0         | 13.24      | -49.06           | -51.30 | -13.00 | 38.30  |

Note.

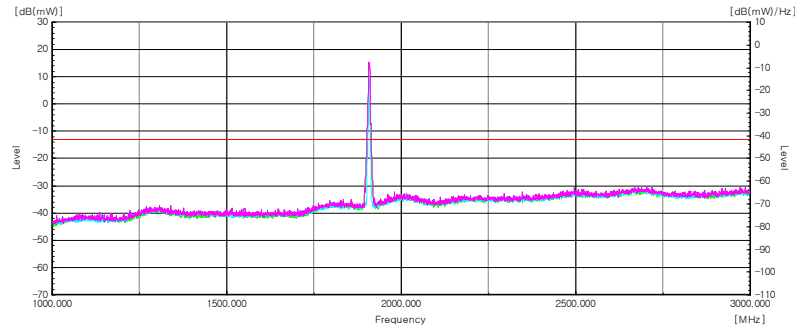
1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

Test mode : HSUPA1900

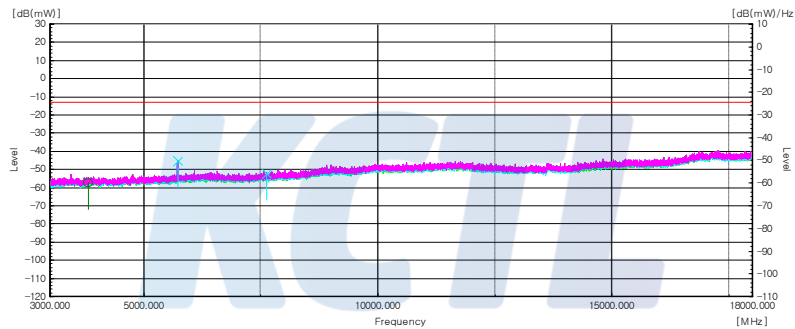
Frequency(MHz) : 1 907.6

Channel : 9538

### 1 000 MHz to 3 000 MHz



### Above 3 000 MHz



| Mode | Frequency | Pol.  | Antenna Gain | Cable loss | Substitute Level | Level  | Limit  | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
|      | [MHz]     | [V/H] | [dBi]        | [dB]       | [dBm]            | [dBm]  | [dBm]  | [dB]   |
| QPSK | 3 815.05  | H     | 9.1          | 9.04       | -57.56           | -57.50 | -13.00 | 44.50  |
|      | 5 725.18  | V     | 11.5         | 11.16      | -45.44           | -45.10 | -13.00 | 32.10  |
|      | 7 627.31  | V     | 11.3         | 13.25      | -50.45           | -52.40 | -13.00 | 39.40  |

Note.

1. Limit Calculation(dBm)=  $43 + 10\log(P_{\text{Watts}})$  [dBc]
2. No spurious emission were detected 1 000 MHz to 3 000 MHz.

# KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Korea  
TEL: 82-31-285-0894 FAX: 82-505-299-8311  
[www.kctl.co.kr](http://www.kctl.co.kr)

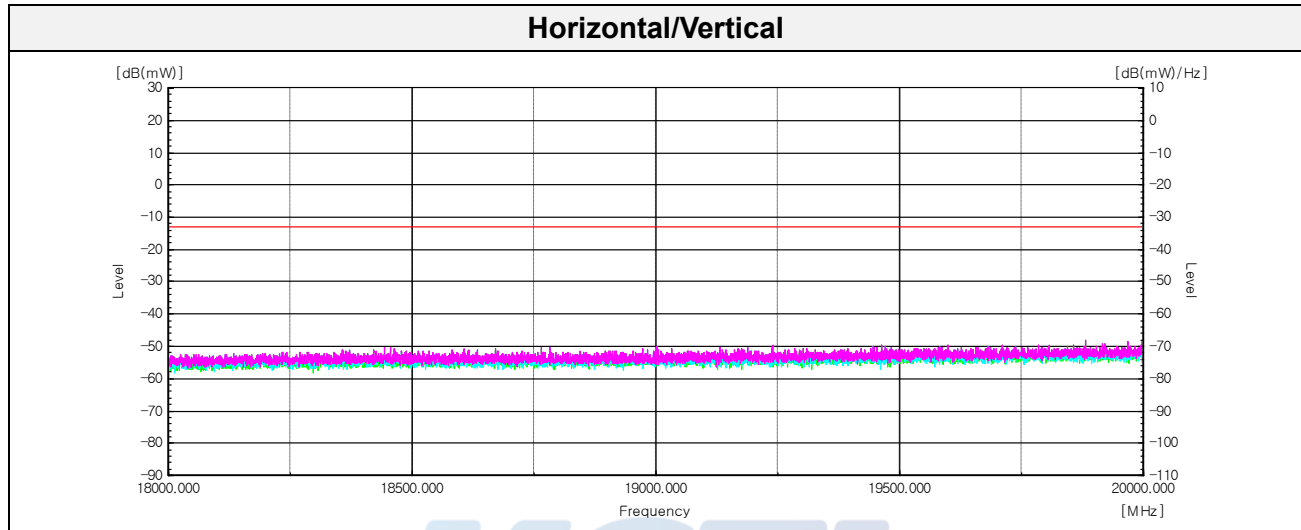
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KR19-SRF0017

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# KCTL

## Test results (Above 18 GHz to 20 GHz) – Worst case

Test mode : GSM1900  
Frequency (MHz) : 1 850.2  
Channel : 512



Note.

1. No spurious emissions were detected above 18GHz.

## 7. Measurement equipment

| Equipment Name                         | Manufacturer                   | Model No.                | Serial No.  | Next Cal. Date |
|----------------------------------------|--------------------------------|--------------------------|-------------|----------------|
| Spectrum Analyzer                      | R & S                          | FSW50                    | 101013      | 19.05.14       |
| Spectrum Analyzer                      | AGILENT                        | N9040B                   | MY57010132  | 19.10.12       |
| Power Divider                          | Aeroflex/<br>Weinschel, Inc.   | 1580-1                   | NX380       | 19.08.02       |
| Wideband Radio<br>Communication Tester | R & S                          | CMW500                   | 102159      | 19.08.08       |
| Wideband Radio<br>Communication Tester | R & S                          | CMW500                   | 106840      | 20.01.25       |
| Radio Communication<br>Analyzer        | Anritsu                        | MT8820C                  | 6201010005  | 19.08.02       |
| High pass Filter                       | Wainwright<br>Instruments GmbH | WHKX3.0/18G-12SS         | 44          | 20.01.25       |
| High pass Filter                       | Wainwright<br>Instruments GmbH | WHKX1.0/1.5S-10SS        | 14          | 20.01.25       |
| Attenuator                             | Weinschel<br>ENGINEERING       | 10                       | AJ1239      | 19.05.14       |
| ATTENUATOR                             | API Inmet                      | 40AH2W-10                | 15          | 19.05.17       |
| Biconical VHF-UHF<br>Broadband Antenna | SCHWARZBECK                    | VUBA9117                 | 275         | 20.04.13       |
| Horn Antenna                           | ETS.lindgren                   | 3115                     | 62589       | 19.08.24       |
| Bilog Antenna                          | Teseq GmbH                     | CBL 6143A                | 35039       | 19.05.19       |
| Horn Antenna                           | ETS.lindgren                   | 3117                     | 161225      | 19.05.18       |
| Amplifier                              | SONOMA<br>INSTRUMENT           | 317                      | 321041      | 20.01.04       |
| Amplifier                              | L-3 Narda-MITEQ                | AFS5-00101800<br>-25-S-5 | 2054570     | 19.10.18       |
| RF Selector                            | TOYO Corporation               | NS5800                   | 1003-010    | N/A            |
| Band Selector                          | TOYO Corporation               | NS5800                   | 1003-135    | N/A            |
| Band Selector                          | TOYO Corporation               | NS5800                   | 1003-320    | N/A            |
| Antenna Mast                           | MATURO                         | EAS 1.5                  | 042/8941211 | N/A            |
| Antenna Mast                           | MATURO                         | EAS 1.5                  | 043/8941211 | N/A            |
| Turn Table                             | MATURO                         | TT 0.8 PF                | 041/8941211 | N/A            |
| Cable Assembly                         | Radiall                        | R286303620               | 1649.241    | N/A            |
| Cable Assembly                         | Radiall                        | TESTPRO 3                | -           | N/A            |

**End of test report**