

## 5 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### Applicable Standard

FCC §2.1051, §22.861, §74.462, §80.211, and §90.210

### Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.

### Test Data

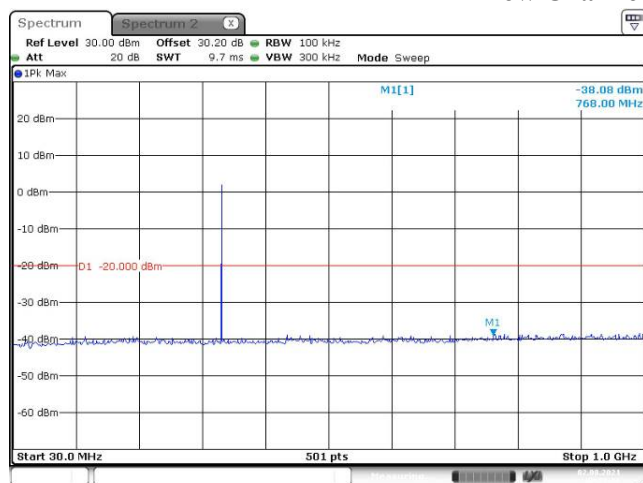
Test Mode: Transmitting

**Test Result: Compliance.** Please refer to following plots.

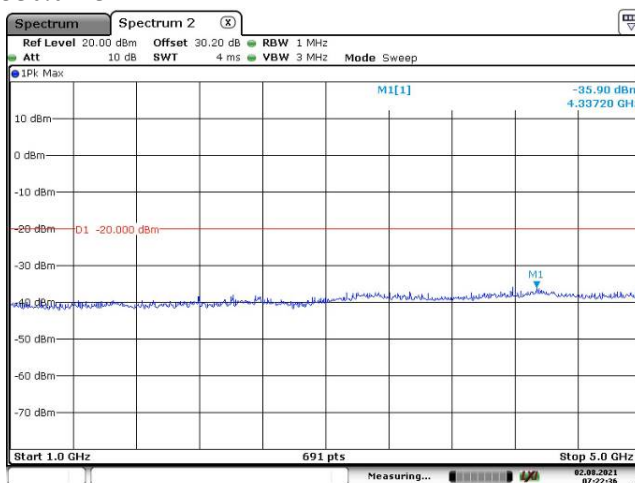
Test performed at high power level with Band Rejector Filter, please refer to the following table.

FM, 12.5kHz:

#### Low Channel, 350.0125 MHz

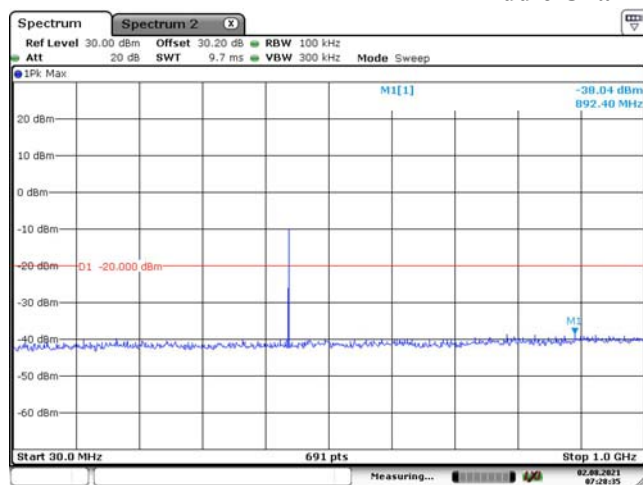


Date: 2.AUG.2021 07:21:20

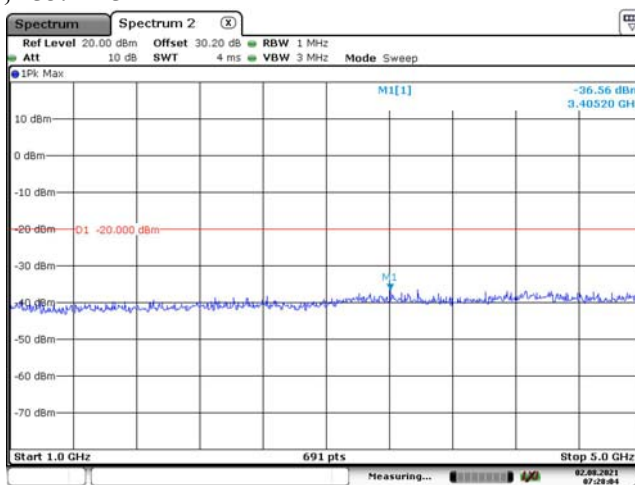


Date: 2.AUG.2021 07:22:36

#### Middle Channel, 453.2125 MHz

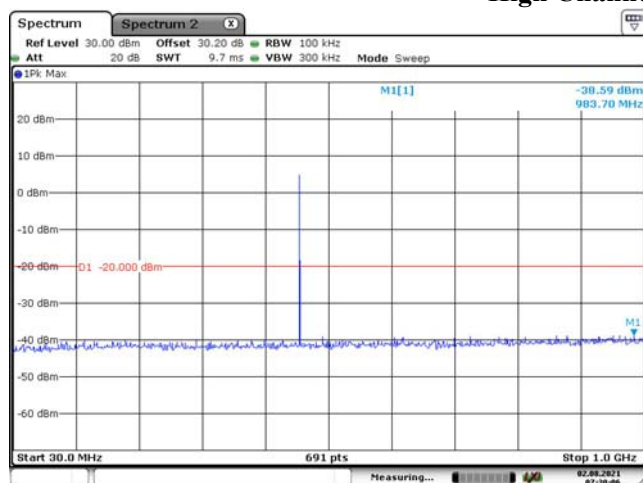


Date: 2.AUG.2021 07:28:35

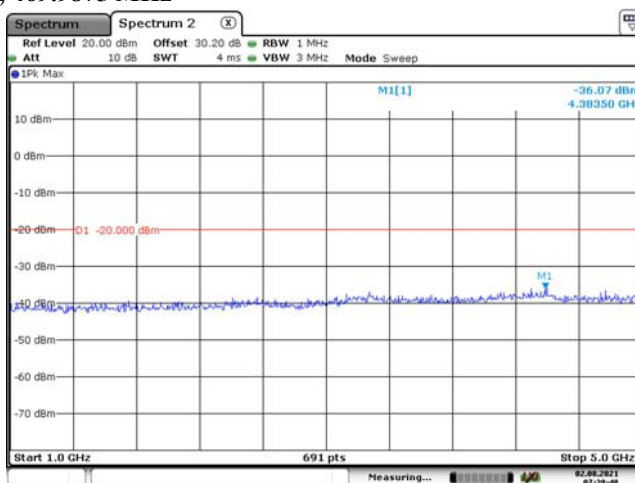


Date: 2.AUG.2021 07:28:04

## High Channel, 469.9875 MHz



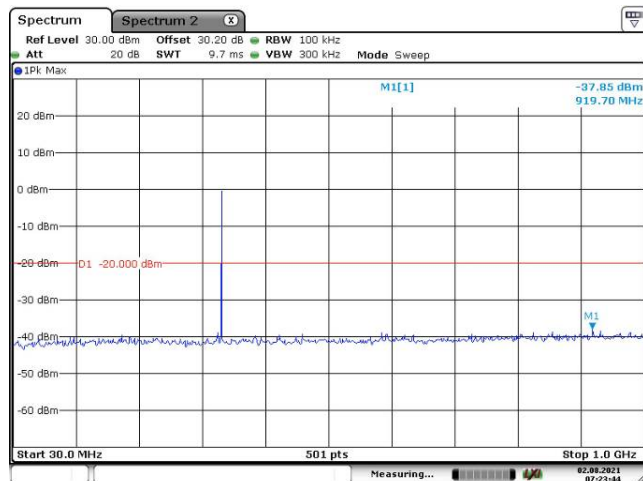
Date: 2.AUG.2021 07:30:06



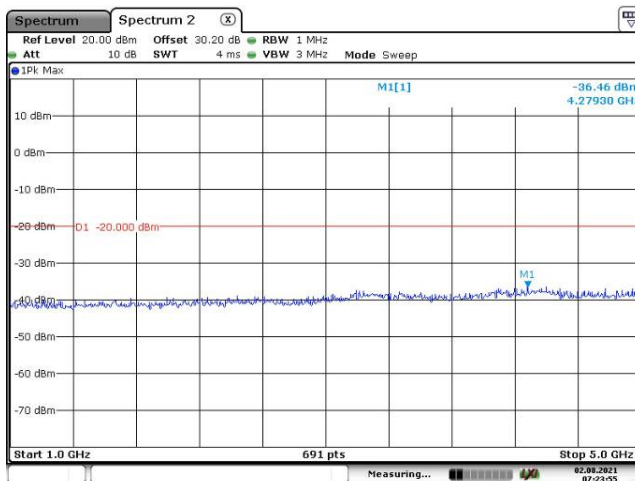
Date: 2.AUG.2021 07:29:48

## 4FSK, 12.5kHz:

## Low Channel, 350.0125 MHz

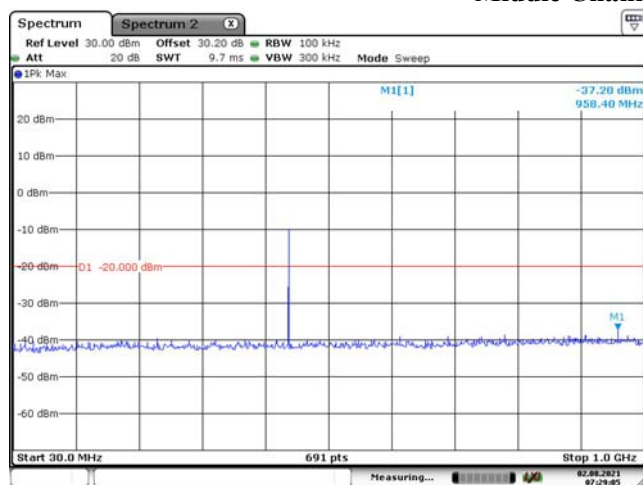


Date: 2.AUG.2021 07:23:44

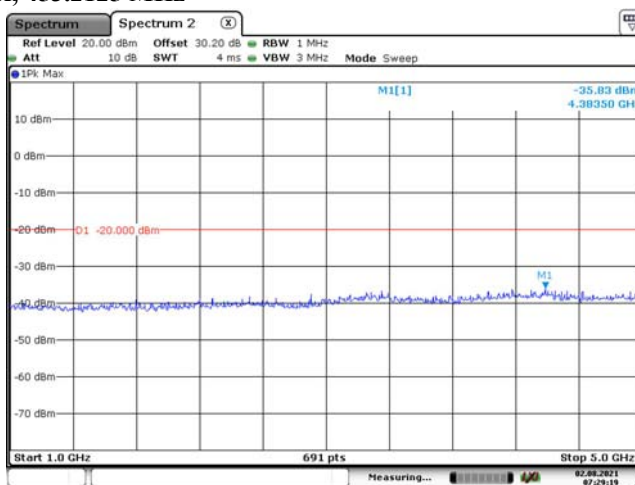


Date: 2.AUG.2021 07:23:56

## Middle Channel, 453.2125 MHz

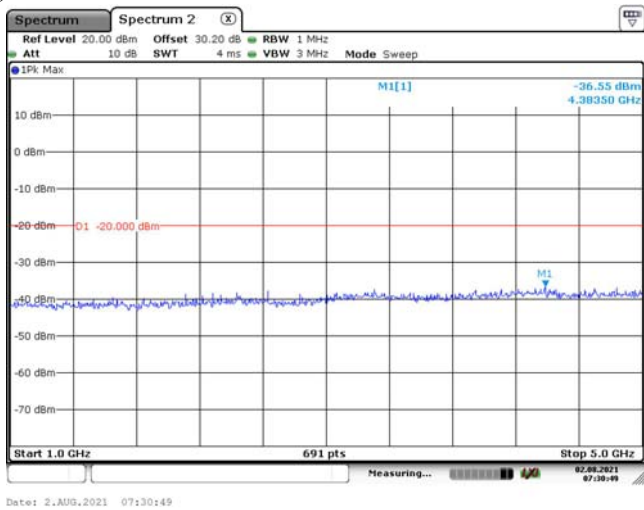
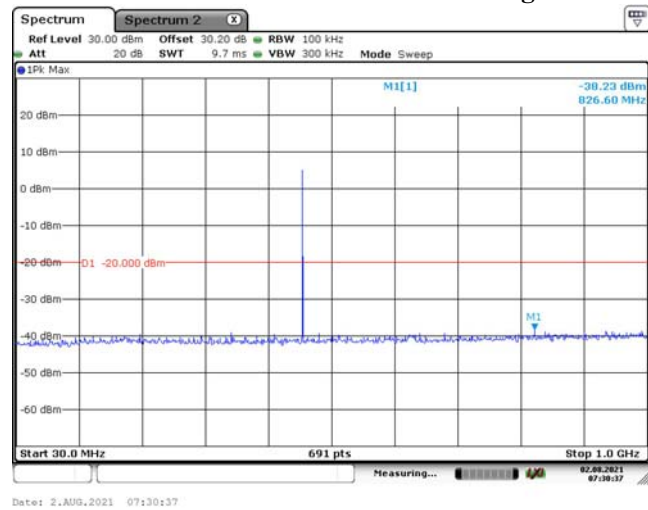


Date: 2.AUG.2021 07:29:05



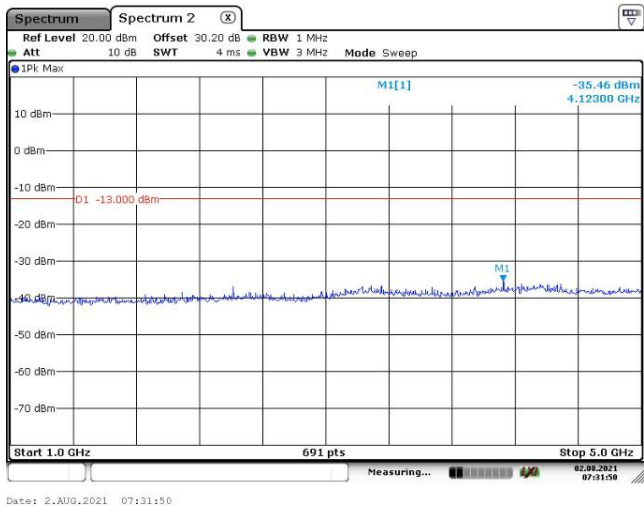
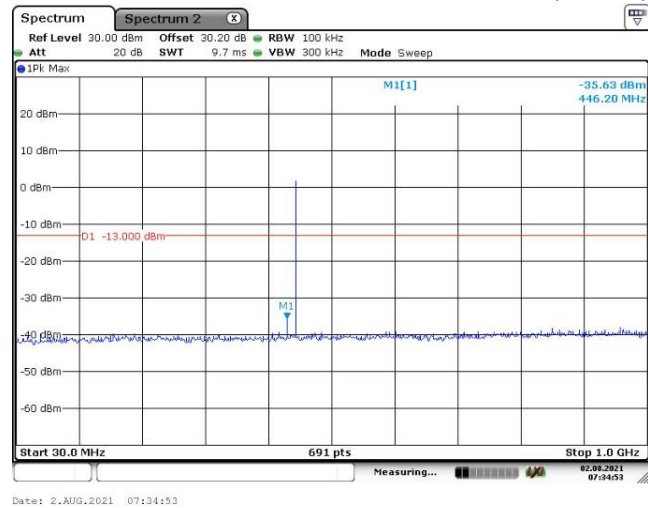
Date: 2.AUG.2021 07:29:19

High Channel, 469.9875 MHz



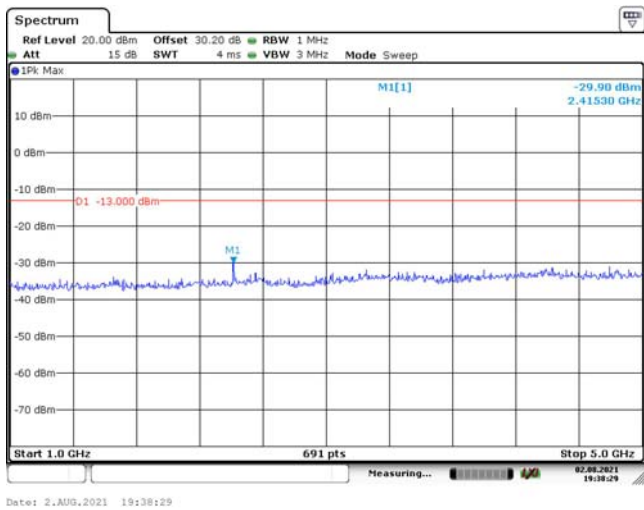
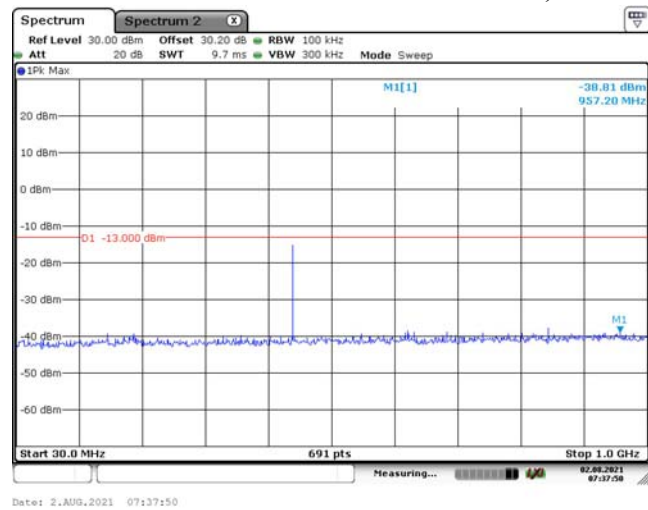
Part 80:

FM,25kHz, 459.8875 MHz

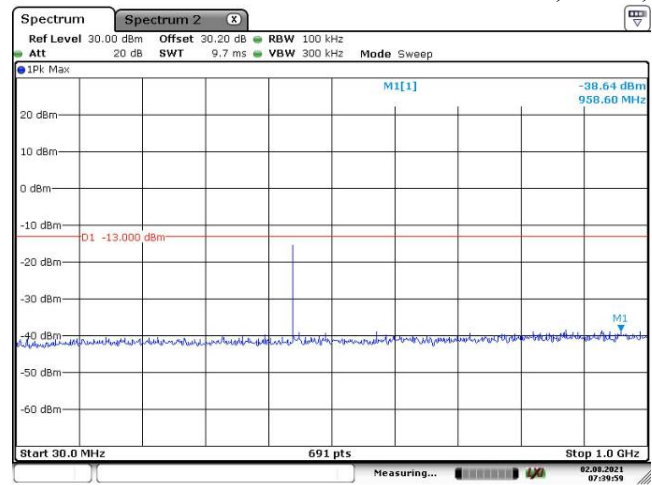


Part 74:

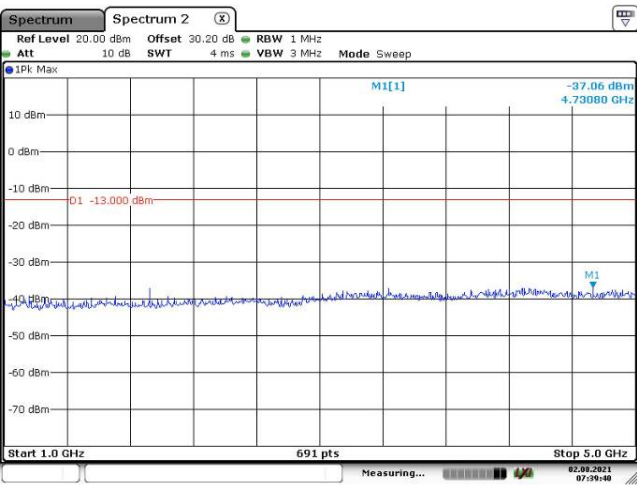
FM,12.5kHz, 455.0125 MHz



FM,25kHz, 455.0125 MHz

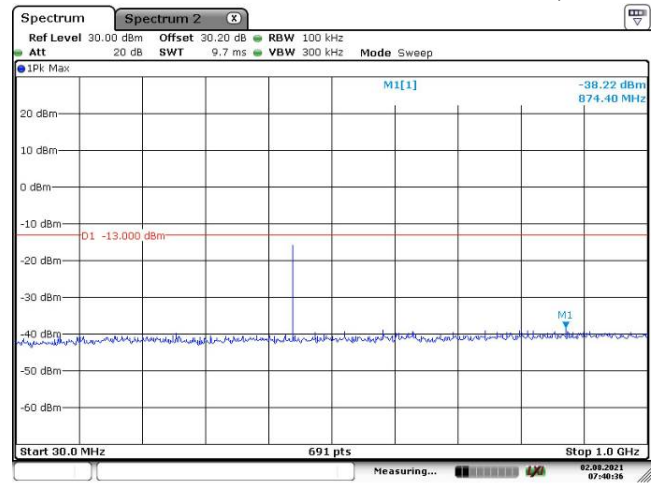


Date: 2.AUG.2021 07:39:59

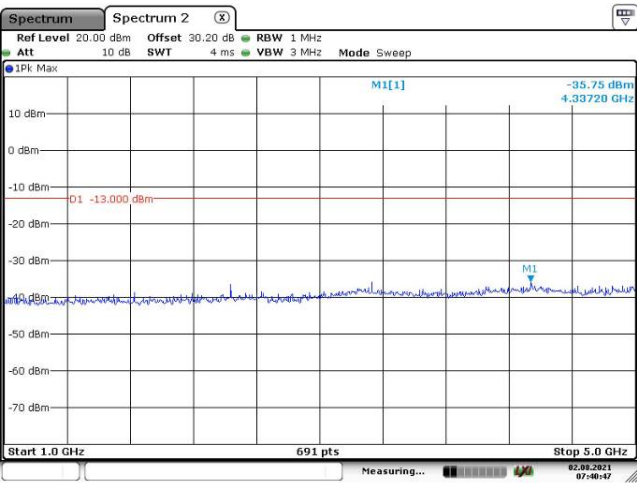


Date: 2.AUG.2021 07:39:40

4FSK,12.5kHz, 455.0125 MHz



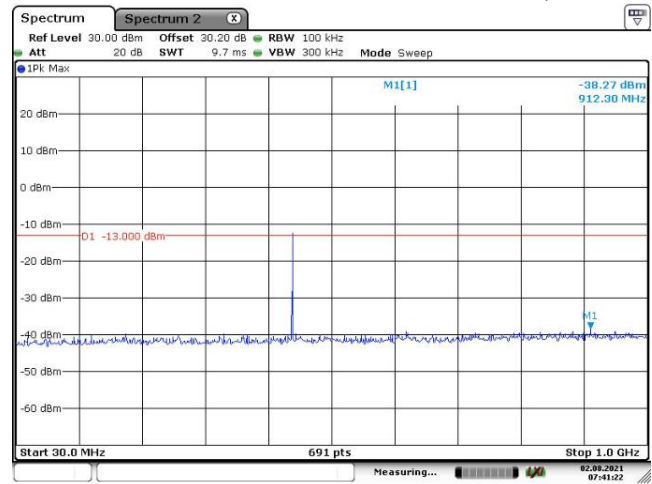
Date: 2.AUG.2021 07:40:37



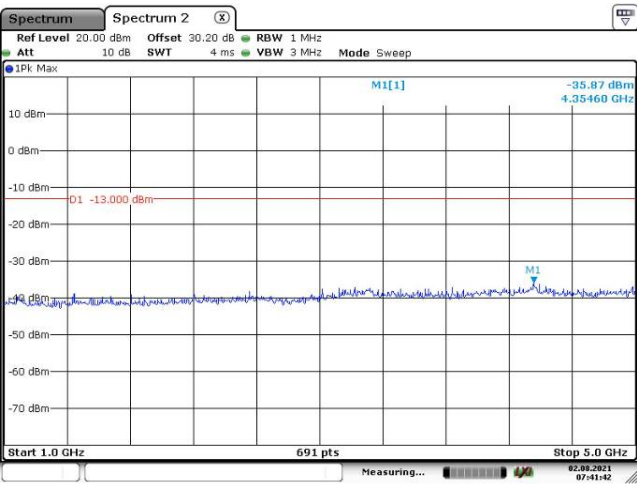
Date: 2.AUG.2021 07:40:48

Part 22:

FM,12.5kHz, 454.0125 MHz

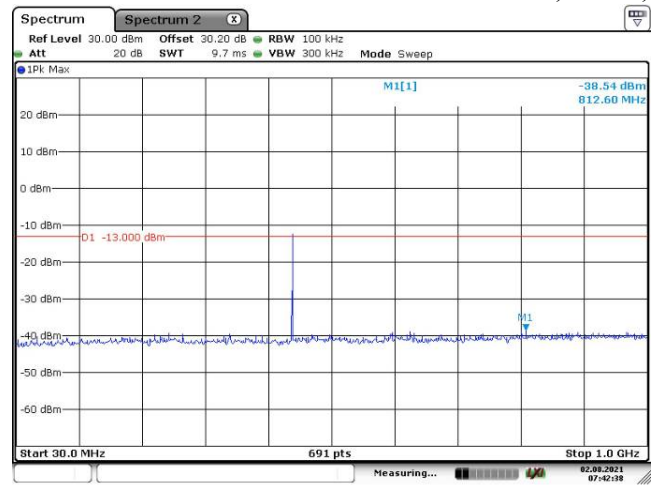


Date: 2.AUG.2021 07:41:22

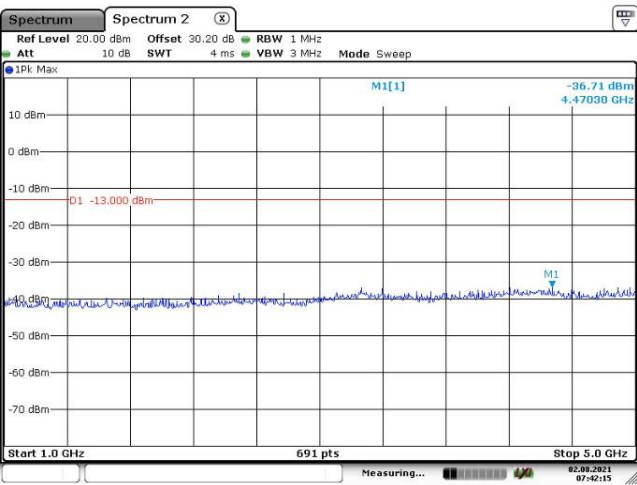


Date: 2.AUG.2021 07:41:42

FM,25kHz, 454.0125 MHz

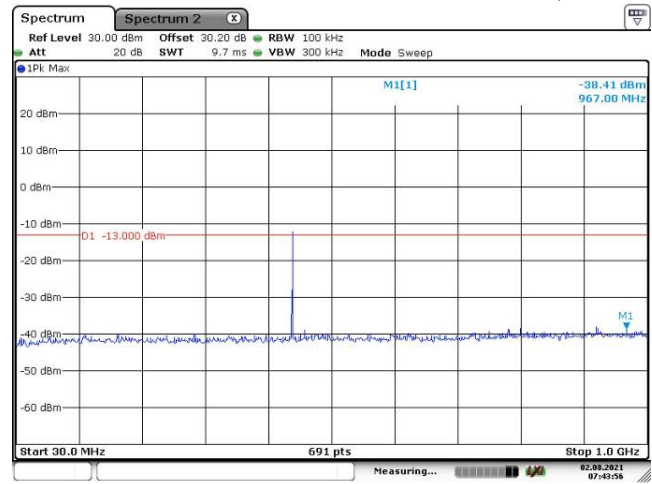


Date: 2.AUG.2021 07:42:39

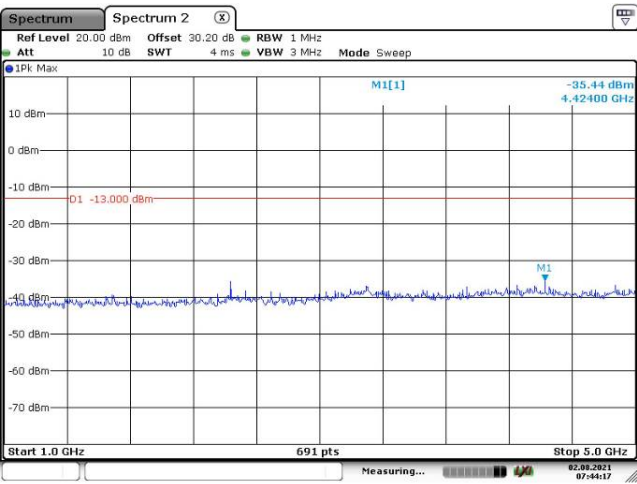


Date: 2.AUG.2021 07:42:15

4FSK,12.5kHz, 454.0125 MHz



Date: 2.AUG.2021 07:43:56



Date: 2.AUG.2021 07:44:17

## 6 - RADIATED SPURIOUS EMISSIONS

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### Applicable Standard

FCC §2.1053, §22.861, §74.462, §80.211 and §90.210

### Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001)-the absolute level

### Test Data

Test Mode: Transmitting

### Test Result: Compliance.

Note: Pre-scan the model HP782 Uv and HP702 Uv, the worst case is model HP782 Uv.

Test performed at high power level with Band Rejector Filter, *please refer to the following table.*

**30MHz - 5GHz:**

| Frequency<br>(MHz)                   | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                      |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| FM,Frequency: 350.0125MHz-12.5 kHz   |                |                               |                               |                              |                       |                            |                |                |
| 700.03                               | H              | 38.07                         | -63.36                        | 0.00                         | 0.94                  | -64.30                     | -20.00         | 44.30          |
| 700.03                               | V              | 66.50                         | -37.40                        | 0.00                         | 0.94                  | -38.34                     | -20.00         | 18.34          |
| 1050.04                              | H              | 38.15                         | -65.68                        | 7.65                         | 0.88                  | -58.91                     | -20.00         | 38.91          |
| 1050.04                              | V              | 38.26                         | -66.07                        | 7.65                         | 0.88                  | -59.30                     | -20.00         | 39.30          |
| 1400.05                              | H              | 37.26                         | -66.13                        | 9.00                         | 1.20                  | -58.33                     | -20.00         | 38.33          |
| 1400.05                              | V              | 37.52                         | -66.47                        | 9.00                         | 1.20                  | -58.67                     | -20.00         | 38.67          |
| 1750.06                              | H              | 37.62                         | -66.37                        | 10.95                        | 0.71                  | -56.13                     | -20.00         | 36.13          |
| 1750.06                              | V              | 37.18                         | -67.41                        | 10.95                        | 0.71                  | -57.17                     | -20.00         | 37.17          |
| 2100.08                              | H              | 36.59                         | -65.47                        | 11.40                        | 1.10                  | -55.17                     | -20.00         | 35.17          |
| 2100.08                              | V              | 36.24                         | -65.82                        | 11.40                        | 1.10                  | -55.52                     | -20.00         | 35.52          |
| 2450.09                              | H              | 36.75                         | -65.93                        | 12.70                        | 1.26                  | -54.49                     | -20.00         | 34.49          |
| 2450.09                              | V              | 36.58                         | -66.20                        | 12.70                        | 1.26                  | -54.76                     | -20.00         | 34.76          |
| 2800.10                              | H              | 36.75                         | -64.97                        | 13.10                        | 1.36                  | -53.23                     | -20.00         | 33.23          |
| 2800.10                              | V              | 36.18                         | -65.74                        | 13.10                        | 1.36                  | -54.00                     | -20.00         | 34.00          |
| 3150.11                              | H              | 36.84                         | -62.46                        | 13.40                        | 1.70                  | -50.76                     | -20.00         | 30.76          |
| 3150.11                              | V              | 36.28                         | -63.05                        | 13.40                        | 1.70                  | -51.35                     | -20.00         | 31.35          |
| 3500.13                              | H              | 35.49                         | -63.52                        | 13.80                        | 1.61                  | -51.33                     | -20.00         | 31.33          |
| 3500.13                              | V              | 35.13                         | -63.88                        | 13.80                        | 1.61                  | -51.69                     | -20.00         | 31.69          |
| 4FSK,Frequency: 350.0125MHz-12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 700.03                               | H              | 37.31                         | -64.12                        | 0.00                         | 0.94                  | -65.06                     | -20.00         | 45.06          |
| 700.03                               | V              | 66.75                         | -37.15                        | 0.00                         | 0.94                  | -38.09                     | -20.00         | 18.09          |
| 1050.04                              | H              | 38.29                         | -65.54                        | 7.65                         | 0.88                  | -58.77                     | -20.00         | 38.77          |
| 1050.04                              | V              | 38.40                         | -65.93                        | 7.65                         | 0.88                  | -59.16                     | -20.00         | 39.16          |
| 1400.05                              | H              | 37.40                         | -65.99                        | 9.00                         | 1.20                  | -58.19                     | -20.00         | 38.19          |
| 1400.05                              | V              | 37.66                         | -66.33                        | 9.00                         | 1.20                  | -58.53                     | -20.00         | 38.53          |
| 1750.06                              | H              | 37.76                         | -66.23                        | 10.95                        | 0.71                  | -55.99                     | -20.00         | 35.99          |
| 1750.06                              | V              | 37.32                         | -67.27                        | 10.95                        | 0.71                  | -57.03                     | -20.00         | 37.03          |
| 2100.08                              | H              | 36.73                         | -65.33                        | 11.40                        | 1.10                  | -55.03                     | -20.00         | 35.03          |
| 2100.08                              | V              | 36.38                         | -65.68                        | 11.40                        | 1.10                  | -55.38                     | -20.00         | 35.38          |
| 2450.09                              | H              | 36.89                         | -65.79                        | 12.70                        | 1.26                  | -54.35                     | -20.00         | 34.35          |
| 2450.09                              | V              | 36.72                         | -66.06                        | 12.70                        | 1.26                  | -54.62                     | -20.00         | 34.62          |
| 2800.10                              | H              | 36.89                         | -64.83                        | 13.10                        | 1.36                  | -53.09                     | -20.00         | 33.09          |
| 2800.10                              | V              | 36.32                         | -65.60                        | 13.10                        | 1.36                  | -53.86                     | -20.00         | 33.86          |
| 3150.11                              | H              | 36.98                         | -62.32                        | 13.40                        | 1.70                  | -50.62                     | -20.00         | 30.62          |
| 3150.11                              | V              | 36.42                         | -62.91                        | 13.40                        | 1.70                  | -51.21                     | -20.00         | 31.21          |
| 3500.13                              | H              | 35.63                         | -63.38                        | 13.80                        | 1.61                  | -51.19                     | -20.00         | 31.19          |
| 3500.13                              | V              | 35.27                         | -63.74                        | 13.80                        | 1.61                  | -51.55                     | -20.00         | 31.55          |

| Frequency<br>(MHz)                    | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|---------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                       |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| FM,Frequency: 453.2125MHz-12.5 kHz    |                |                               |                               |                              |                       |                            |                |                |
| 906.43                                | H              | 32.90                         | -63.97                        | 0.00                         | 1.03                  | -65.00                     | -20.00         | 45.00          |
| 906.43                                | V              | 59.30                         | -39.54                        | 0.00                         | 1.03                  | -40.57                     | -20.00         | 20.57          |
| 1359.64                               | H              | 38.42                         | -65.14                        | 8.72                         | 1.20                  | -57.62                     | -20.00         | 37.62          |
| 1359.64                               | V              | 38.53                         | -65.75                        | 8.72                         | 1.20                  | -58.23                     | -20.00         | 38.23          |
| 1812.85                               | H              | 37.53                         | -66.57                        | 11.19                        | 0.72                  | -56.10                     | -20.00         | 36.10          |
| 1812.85                               | V              | 37.79                         | -66.87                        | 11.19                        | 0.72                  | -56.40                     | -20.00         | 36.40          |
| 2266.06                               | H              | 37.89                         | -64.16                        | 11.06                        | 1.20                  | -54.30                     | -20.00         | 34.30          |
| 2266.06                               | V              | 37.45                         | -64.50                        | 11.06                        | 1.20                  | -54.64                     | -20.00         | 34.64          |
| 2719.28                               | H              | 36.86                         | -65.05                        | 13.10                        | 1.27                  | -53.22                     | -20.00         | 33.22          |
| 2719.28                               | V              | 36.51                         | -65.51                        | 13.10                        | 1.27                  | -53.68                     | -20.00         | 33.68          |
| 3172.49                               | H              | 37.02                         | -62.00                        | 13.49                        | 1.64                  | -50.15                     | -20.00         | 30.15          |
| 3172.49                               | V              | 36.85                         | -62.21                        | 13.49                        | 1.64                  | -50.36                     | -20.00         | 30.36          |
| 3625.70                               | H              | 37.02                         | -61.74                        | 14.07                        | 1.58                  | -49.25                     | -20.00         | 29.25          |
| 3625.70                               | V              | 36.45                         | -62.31                        | 14.07                        | 1.58                  | -49.82                     | -20.00         | 29.82          |
| 4078.91                               | H              | 37.11                         | -60.88                        | 13.76                        | 1.36                  | -48.48                     | -20.00         | 28.48          |
| 4078.91                               | V              | 36.55                         | -61.56                        | 13.76                        | 1.36                  | -49.16                     | -20.00         | 29.16          |
| 4532.13                               | H              | 35.76                         | -61.49                        | 14.13                        | 1.64                  | -49.00                     | -20.00         | 29.00          |
| 4532.13                               | V              | 35.40                         | -61.78                        | 14.13                        | 1.64                  | -49.29                     | -20.00         | 29.29          |
| 4FSK,Frequency: 453.2125MHz -12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 906.43                                | H              | 30.91                         | -65.96                        | 0.00                         | 1.03                  | -66.99                     | -20.00         | 46.99          |
| 906.43                                | V              | 67.64                         | -31.20                        | 0.00                         | 1.03                  | -32.23                     | -20.00         | 12.23          |
| 1359.64                               | H              | 38.57                         | -64.99                        | 8.72                         | 1.20                  | -57.47                     | -20.00         | 37.47          |
| 1359.64                               | V              | 38.68                         | -65.60                        | 8.72                         | 1.20                  | -58.08                     | -20.00         | 38.08          |
| 1812.85                               | H              | 37.68                         | -66.42                        | 11.19                        | 0.72                  | -55.95                     | -20.00         | 35.95          |
| 1812.85                               | V              | 37.94                         | -66.72                        | 11.19                        | 0.72                  | -56.25                     | -20.00         | 36.25          |
| 2266.06                               | H              | 38.04                         | -64.01                        | 11.06                        | 1.20                  | -54.15                     | -20.00         | 34.15          |
| 2266.06                               | V              | 37.60                         | -64.35                        | 11.06                        | 1.20                  | -54.49                     | -20.00         | 34.49          |
| 2719.28                               | H              | 37.01                         | -64.90                        | 13.10                        | 1.27                  | -53.07                     | -20.00         | 33.07          |
| 2719.28                               | V              | 36.66                         | -65.36                        | 13.10                        | 1.27                  | -53.53                     | -20.00         | 33.53          |
| 3172.49                               | H              | 37.17                         | -61.85                        | 13.49                        | 1.64                  | -50.00                     | -20.00         | 30.00          |
| 3172.49                               | V              | 37.00                         | -62.06                        | 13.49                        | 1.64                  | -50.21                     | -20.00         | 30.21          |
| 3625.70                               | H              | 37.17                         | -61.59                        | 14.07                        | 1.58                  | -49.10                     | -20.00         | 29.10          |
| 3625.70                               | V              | 36.60                         | -62.16                        | 14.07                        | 1.58                  | -49.67                     | -20.00         | 29.67          |
| 4078.91                               | H              | 37.26                         | -60.73                        | 13.76                        | 1.36                  | -48.33                     | -20.00         | 28.33          |
| 4078.91                               | V              | 36.70                         | -61.41                        | 13.76                        | 1.36                  | -49.01                     | -20.00         | 29.01          |
| 4532.13                               | H              | 35.91                         | -61.34                        | 14.13                        | 1.64                  | -48.85                     | -20.00         | 28.85          |
| 4532.13                               | V              | 35.55                         | -61.63                        | 14.13                        | 1.64                  | -49.14                     | -20.00         | 29.14          |

| Frequency<br>(MHz)                    | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|---------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                       |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| FM,Frequency: 469.9875MHz-12.5 kHz    |                |                               |                               |                              |                       |                            |                |                |
| 939.98                                | H              | 35.05                         | -60.43                        | 0.00                         | 0.93                  | -61.36                     | -20.00         | 41.36          |
| 939.98                                | V              | 65.12                         | -32.08                        | 0.00                         | 0.93                  | -33.01                     | -20.00         | 13.01          |
| 1409.96                               | H              | 38.38                         | -65.16                        | 9.05                         | 1.21                  | -57.32                     | -20.00         | 37.32          |
| 1409.96                               | V              | 38.49                         | -65.60                        | 9.05                         | 1.21                  | -57.76                     | -20.00         | 37.76          |
| 1879.95                               | H              | 37.49                         | -65.62                        | 11.66                        | 0.95                  | -54.91                     | -20.00         | 34.91          |
| 1879.95                               | V              | 37.75                         | -65.72                        | 11.66                        | 0.95                  | -55.01                     | -20.00         | 35.01          |
| 2349.94                               | H              | 37.85                         | -64.45                        | 11.75                        | 1.26                  | -53.96                     | -20.00         | 33.96          |
| 2349.94                               | V              | 37.41                         | -64.94                        | 11.75                        | 1.26                  | -54.45                     | -20.00         | 34.45          |
| 2819.93                               | H              | 36.82                         | -64.70                        | 13.26                        | 1.36                  | -52.80                     | -20.00         | 32.80          |
| 2819.93                               | V              | 36.47                         | -65.27                        | 13.26                        | 1.36                  | -53.37                     | -20.00         | 33.37          |
| 3289.91                               | H              | 36.98                         | -62.72                        | 13.60                        | 1.59                  | -50.71                     | -20.00         | 30.71          |
| 3289.91                               | V              | 36.81                         | -62.90                        | 13.60                        | 1.59                  | -50.89                     | -20.00         | 30.89          |
| 3759.90                               | H              | 36.98                         | -60.66                        | 13.76                        | 1.63                  | -48.53                     | -20.00         | 28.53          |
| 3759.90                               | V              | 36.41                         | -61.09                        | 13.76                        | 1.63                  | -48.96                     | -20.00         | 28.96          |
| 4229.89                               | H              | 37.07                         | -60.60                        | 13.97                        | 1.35                  | -47.98                     | -20.00         | 27.98          |
| 4229.89                               | V              | 36.51                         | -61.15                        | 13.97                        | 1.35                  | -48.53                     | -20.00         | 28.53          |
| 4699.88                               | H              | 35.72                         | -61.51                        | 14.40                        | 1.67                  | -48.78                     | -20.00         | 28.78          |
| 4699.88                               | V              | 35.41                         | -61.91                        | 14.40                        | 1.67                  | -49.18                     | -20.00         | 29.18          |
| 4FSK,Frequency: 469.9875MHz -12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 939.98                                | H              | 35.17                         | -60.31                        | 0.00                         | 0.93                  | -61.24                     | -20.00         | 41.24          |
| 939.98                                | V              | 63.41                         | -33.79                        | 0.00                         | 0.93                  | -34.72                     | -20.00         | 14.72          |
| 1409.96                               | H              | 38.63                         | -64.91                        | 9.05                         | 1.21                  | -57.07                     | -20.00         | 37.07          |
| 1409.96                               | V              | 38.74                         | -65.35                        | 9.05                         | 1.21                  | -57.51                     | -20.00         | 37.51          |
| 1879.95                               | H              | 37.74                         | -65.37                        | 11.66                        | 0.95                  | -54.66                     | -20.00         | 34.66          |
| 1879.95                               | V              | 38.00                         | -65.47                        | 11.66                        | 0.95                  | -54.76                     | -20.00         | 34.76          |
| 2349.94                               | H              | 38.10                         | -64.20                        | 11.75                        | 1.26                  | -53.71                     | -20.00         | 33.71          |
| 2349.94                               | V              | 37.66                         | -64.69                        | 11.75                        | 1.26                  | -54.20                     | -20.00         | 34.20          |
| 2819.93                               | H              | 37.07                         | -64.45                        | 13.26                        | 1.36                  | -52.55                     | -20.00         | 32.55          |
| 2819.93                               | V              | 36.72                         | -65.02                        | 13.26                        | 1.36                  | -53.12                     | -20.00         | 33.12          |
| 3289.91                               | H              | 37.23                         | -62.47                        | 13.60                        | 1.59                  | -50.46                     | -20.00         | 30.46          |
| 3289.91                               | V              | 37.06                         | -62.65                        | 13.60                        | 1.59                  | -50.64                     | -20.00         | 30.64          |
| 3759.90                               | H              | 37.23                         | -60.41                        | 13.76                        | 1.63                  | -48.28                     | -20.00         | 28.28          |
| 3759.90                               | V              | 36.66                         | -60.84                        | 13.76                        | 1.63                  | -48.71                     | -20.00         | 28.71          |
| 4229.89                               | H              | 37.32                         | -60.35                        | 13.97                        | 1.35                  | -47.73                     | -20.00         | 27.73          |
| 4229.89                               | V              | 36.76                         | -60.90                        | 13.97                        | 1.35                  | -48.28                     | -20.00         | 28.28          |
| 4699.88                               | H              | 35.97                         | -61.26                        | 14.40                        | 1.67                  | -48.53                     | -20.00         | 28.53          |
| 4699.88                               | V              | 35.66                         | -61.66                        | 14.40                        | 1.67                  | -48.93                     | -20.00         | 28.93          |

**Part 80**

| Frequency<br>(MHz)                | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-----------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                   |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| FM, Frequency: 459.9875MHz-25 kHz |                |                               |                               |                              |                       |                            |                |                |
| 919.98                            | H              | 30.34                         | -65.97                        | 0.00                         | 0.99                  | -66.96                     | -13.00         | 53.96          |
| 919.98                            | V              | 71.45                         | -26.73                        | 0.00                         | 0.99                  | -27.72                     | -13.00         | 14.72          |
| 1379.96                           | H              | 38.48                         | -64.99                        | 8.86                         | 1.20                  | -57.33                     | -13.00         | 44.33          |
| 1379.96                           | V              | 38.59                         | -65.54                        | 8.86                         | 1.20                  | -57.88                     | -13.00         | 44.88          |
| 1839.95                           | H              | 37.59                         | -66.11                        | 11.38                        | 0.82                  | -55.55                     | -13.00         | 42.55          |
| 1839.95                           | V              | 37.85                         | -66.33                        | 11.38                        | 0.82                  | -55.77                     | -13.00         | 42.77          |
| 2299.94                           | H              | 37.95                         | -64.20                        | 11.20                        | 1.23                  | -54.23                     | -13.00         | 41.23          |
| 2299.94                           | V              | 37.51                         | -64.54                        | 11.20                        | 1.23                  | -54.57                     | -13.00         | 41.57          |
| 2759.93                           | H              | 36.92                         | -64.89                        | 13.10                        | 1.32                  | -53.11                     | -13.00         | 40.11          |
| 2759.93                           | V              | 36.57                         | -65.40                        | 13.10                        | 1.32                  | -53.62                     | -13.00         | 40.62          |
| 3219.91                           | H              | 37.08                         | -61.82                        | 13.60                        | 1.57                  | -49.79                     | -13.00         | 36.79          |
| 3219.91                           | V              | 36.91                         | -62.04                        | 13.60                        | 1.57                  | -50.01                     | -13.00         | 37.01          |
| 3679.90                           | H              | 37.08                         | -61.12                        | 14.02                        | 1.76                  | -48.86                     | -13.00         | 35.86          |
| 3679.90                           | V              | 36.51                         | -61.67                        | 14.02                        | 1.76                  | -49.41                     | -13.00         | 36.41          |
| 4139.89                           | H              | 37.17                         | -60.77                        | 13.82                        | 1.45                  | -48.40                     | -13.00         | 35.40          |
| 4139.89                           | V              | 36.61                         | -61.40                        | 13.82                        | 1.45                  | -49.03                     | -13.00         | 36.03          |
| 4599.88                           | H              | 35.82                         | -61.25                        | 14.20                        | 1.85                  | -48.90                     | -13.00         | 35.90          |
| 4599.88                           | V              | 35.51                         | -61.66                        | 14.20                        | 1.85                  | -49.31                     | -13.00         | 36.31          |

## Part 74

| Frequency<br>(MHz)                  | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                     |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| FM, Frequency: 455.0125MHz-12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 910.03                              | H              | 31.79                         | -64.93                        | 0.00                         | 1.02                  | -65.95                     | -20.00         | 45.95          |
| 910.03                              | V              | 65.07                         | -33.59                        | 0.00                         | 1.02                  | -34.61                     | -20.00         | 14.61          |
| 1365.04                             | H              | 38.73                         | -64.80                        | 8.76                         | 1.20                  | -57.24                     | -20.00         | 37.24          |
| 1365.04                             | V              | 38.84                         | -65.40                        | 8.76                         | 1.20                  | -57.84                     | -20.00         | 37.84          |
| 1820.05                             | H              | 37.84                         | -66.16                        | 11.24                        | 0.75                  | -55.67                     | -20.00         | 35.67          |
| 1820.05                             | V              | 38.10                         | -66.44                        | 11.24                        | 0.75                  | -55.95                     | -20.00         | 35.95          |
| 2275.06                             | H              | 38.20                         | -63.88                        | 11.10                        | 1.21                  | -53.99                     | -20.00         | 33.99          |
| 2275.06                             | V              | 37.76                         | -64.22                        | 11.10                        | 1.21                  | -54.33                     | -20.00         | 34.33          |
| 2730.08                             | H              | 37.17                         | -64.71                        | 13.10                        | 1.28                  | -52.89                     | -20.00         | 32.89          |
| 2730.08                             | V              | 36.82                         | -65.19                        | 13.10                        | 1.28                  | -53.37                     | -20.00         | 33.37          |
| 3185.09                             | H              | 37.33                         | -61.53                        | 13.54                        | 1.61                  | -49.60                     | -20.00         | 29.60          |
| 3185.09                             | V              | 37.16                         | -61.75                        | 13.54                        | 1.61                  | -49.82                     | -20.00         | 29.82          |
| 3640.10                             | H              | 37.33                         | -61.28                        | 14.06                        | 1.63                  | -48.85                     | -20.00         | 28.85          |
| 3640.10                             | V              | 36.76                         | -61.84                        | 14.06                        | 1.63                  | -49.41                     | -20.00         | 29.41          |
| 4095.11                             | H              | 37.42                         | -60.68                        | 13.71                        | 1.35                  | -48.32                     | -20.00         | 28.32          |
| 4095.11                             | V              | 36.86                         | -61.37                        | 13.71                        | 1.35                  | -49.01                     | -20.00         | 29.01          |
| 4550.13                             | H              | 36.07                         | -61.13                        | 14.15                        | 1.70                  | -48.68                     | -20.00         | 28.68          |
| 4550.13                             | V              | 35.76                         | -61.41                        | 14.15                        | 1.70                  | -48.96                     | -20.00         | 28.96          |
| FM, Frequency: 455.0125MHz-25 kHz   |                |                               |                               |                              |                       |                            |                |                |
| 910.03                              | H              | 31.99                         | -64.73                        | 0.00                         | 1.02                  | -65.75                     | -13.00         | 52.75          |
| 910.03                              | V              | 62.76                         | -35.90                        | 0.00                         | 1.02                  | -36.92                     | -13.00         | 23.92          |
| 1365.04                             | H              | 38.84                         | -64.69                        | 8.76                         | 1.20                  | -57.13                     | -13.00         | 44.13          |
| 1365.04                             | V              | 38.95                         | -65.29                        | 8.76                         | 1.20                  | -57.73                     | -13.00         | 44.73          |
| 1820.05                             | H              | 37.95                         | -66.05                        | 11.24                        | 0.75                  | -55.56                     | -13.00         | 42.56          |
| 1820.05                             | V              | 38.21                         | -66.33                        | 11.24                        | 0.75                  | -55.84                     | -13.00         | 42.84          |
| 2275.06                             | H              | 38.31                         | -63.77                        | 11.10                        | 1.21                  | -53.88                     | -13.00         | 40.88          |
| 2275.06                             | V              | 37.87                         | -64.11                        | 11.10                        | 1.21                  | -54.22                     | -13.00         | 41.22          |
| 2730.08                             | H              | 37.28                         | -64.60                        | 13.10                        | 1.28                  | -52.78                     | -13.00         | 39.78          |
| 2730.08                             | V              | 36.93                         | -65.08                        | 13.10                        | 1.28                  | -53.26                     | -13.00         | 40.26          |
| 3185.09                             | H              | 37.44                         | -61.42                        | 13.54                        | 1.61                  | -49.49                     | -13.00         | 36.49          |
| 3185.09                             | V              | 37.27                         | -61.64                        | 13.54                        | 1.61                  | -49.71                     | -13.00         | 36.71          |
| 3640.10                             | H              | 37.44                         | -61.17                        | 14.06                        | 1.63                  | -48.74                     | -13.00         | 35.74          |
| 3640.10                             | V              | 36.87                         | -61.73                        | 14.06                        | 1.63                  | -49.30                     | -13.00         | 36.30          |
| 4095.11                             | H              | 37.53                         | -60.57                        | 13.71                        | 1.35                  | -48.21                     | -13.00         | 35.21          |
| 4095.11                             | V              | 36.97                         | -61.26                        | 13.71                        | 1.35                  | -48.90                     | -13.00         | 35.90          |
| 4550.13                             | H              | 36.18                         | -61.02                        | 14.15                        | 1.70                  | -48.57                     | -13.00         | 35.57          |
| 4550.13                             | V              | 35.87                         | -61.30                        | 14.15                        | 1.70                  | -48.85                     | -13.00         | 35.85          |

| Frequency<br>(MHz)                    | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|---------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                       |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 4FSK, Frequency: 455.0125MHz-12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 910.03                                | H              | 31.21                         | -65.51                        | 0.00                         | 1.02                  | -66.53                     | -20.00         | 46.53          |
| 910.03                                | V              | 70.67                         | -27.99                        | 0.00                         | 1.02                  | -29.01                     | -20.00         | 9.01           |
| 1365.04                               | H              | 38.63                         | -64.91                        | 8.76                         | 1.20                  | -57.35                     | -20.00         | 37.35          |
| 1365.04                               | V              | 38.74                         | -65.50                        | 8.76                         | 1.20                  | -57.94                     | -20.00         | 37.94          |
| 1820.05                               | H              | 37.74                         | -66.26                        | 11.24                        | 0.75                  | -55.77                     | -20.00         | 35.77          |
| 1820.05                               | V              | 38.00                         | -66.54                        | 11.24                        | 0.75                  | -56.05                     | -20.00         | 36.05          |
| 2275.06                               | H              | 38.10                         | -63.98                        | 11.10                        | 1.21                  | -54.09                     | -20.00         | 34.09          |
| 2275.06                               | V              | 37.66                         | -64.32                        | 11.10                        | 1.21                  | -54.43                     | -20.00         | 34.43          |
| 2730.08                               | H              | 37.07                         | -64.81                        | 13.10                        | 1.28                  | -52.99                     | -20.00         | 32.99          |
| 2730.08                               | V              | 36.72                         | -65.29                        | 13.10                        | 1.28                  | -53.47                     | -20.00         | 33.47          |
| 3185.09                               | H              | 37.23                         | -61.63                        | 13.54                        | 1.61                  | -49.70                     | -20.00         | 29.70          |
| 3185.09                               | V              | 37.06                         | -61.85                        | 13.54                        | 1.61                  | -49.92                     | -20.00         | 29.92          |
| 3640.10                               | H              | 37.23                         | -61.39                        | 14.06                        | 1.63                  | -48.96                     | -20.00         | 28.96          |
| 3640.10                               | V              | 36.66                         | -61.95                        | 14.06                        | 1.63                  | -49.52                     | -20.00         | 29.52          |
| 4095.11                               | H              | 37.32                         | -60.78                        | 13.71                        | 1.35                  | -48.42                     | -20.00         | 28.42          |
| 4095.11                               | V              | 36.76                         | -61.48                        | 13.71                        | 1.35                  | -49.12                     | -20.00         | 29.12          |
| 4550.13                               | H              | 35.97                         | -61.23                        | 14.15                        | 1.70                  | -48.78                     | -20.00         | 28.78          |
| 4550.13                               | V              | 35.66                         | -61.52                        | 14.15                        | 1.70                  | -49.07                     | -20.00         | 29.07          |

**Part 22**

| Frequency<br>(MHz)                 | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                    |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| FM,Frequency: 454.0125MHz-12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 908.03                             | H              | 30.05                         | -66.76                        | 0.00                         | 1.03                  | -67.79                     | -13.00         | 54.79          |
| 908.03                             | V              | 65.81                         | -32.95                        | 0.00                         | 1.03                  | -33.98                     | -13.00         | 20.98          |
| 1362.04                            | H              | 38.84                         | -64.70                        | 8.73                         | 1.20                  | -57.17                     | -13.00         | 44.17          |
| 1362.04                            | V              | 38.95                         | -65.31                        | 8.73                         | 1.20                  | -57.78                     | -13.00         | 44.78          |
| 1816.05                            | H              | 37.95                         | -66.10                        | 11.21                        | 0.73                  | -55.62                     | -13.00         | 42.62          |
| 1816.05                            | V              | 38.21                         | -66.39                        | 11.21                        | 0.73                  | -55.91                     | -13.00         | 42.91          |
| 2270.06                            | H              | 38.31                         | -63.75                        | 11.08                        | 1.20                  | -53.87                     | -13.00         | 40.87          |
| 2270.06                            | V              | 37.87                         | -64.09                        | 11.08                        | 1.20                  | -54.21                     | -13.00         | 41.21          |
| 2724.08                            | H              | 37.28                         | -64.61                        | 13.10                        | 1.28                  | -52.79                     | -13.00         | 39.79          |
| 2724.08                            | V              | 36.93                         | -65.09                        | 13.10                        | 1.28                  | -53.27                     | -13.00         | 40.27          |
| 3178.09                            | H              | 37.44                         | -61.50                        | 13.51                        | 1.63                  | -49.62                     | -13.00         | 36.62          |
| 3178.09                            | V              | 37.27                         | -61.72                        | 13.51                        | 1.63                  | -49.84                     | -13.00         | 36.84          |
| 3632.10                            | H              | 37.44                         | -61.25                        | 14.07                        | 1.61                  | -48.79                     | -13.00         | 35.79          |
| 3632.10                            | V              | 36.87                         | -61.82                        | 14.07                        | 1.61                  | -49.36                     | -13.00         | 36.36          |
| 4086.11                            | H              | 37.53                         | -60.51                        | 13.74                        | 1.36                  | -48.13                     | -13.00         | 35.13          |
| 4086.11                            | V              | 36.97                         | -61.19                        | 13.74                        | 1.36                  | -48.81                     | -13.00         | 35.81          |
| 4540.13                            | H              | 36.18                         | -61.04                        | 14.14                        | 1.66                  | -48.56                     | -13.00         | 35.56          |
| 4540.13                            | V              | 35.87                         | -61.30                        | 14.14                        | 1.66                  | -48.82                     | -13.00         | 35.82          |
| FM, Frequency: 454.0125MHz-25 kHz  |                |                               |                               |                              |                       |                            |                |                |
| 908.03                             | H              | 31.22                         | -65.59                        | 0.00                         | 1.03                  | -66.62                     | -13.00         | 53.62          |
| 908.03                             | V              | 71.75                         | -27.01                        | 0.00                         | 1.03                  | -28.04                     | -13.00         | 15.04          |
| 1362.04                            | H              | 38.61                         | -64.93                        | 8.73                         | 1.20                  | -57.40                     | -13.00         | 44.40          |
| 1362.04                            | V              | 38.72                         | -65.54                        | 8.73                         | 1.20                  | -58.01                     | -13.00         | 45.01          |
| 1816.05                            | H              | 37.72                         | -66.33                        | 11.21                        | 0.73                  | -55.85                     | -13.00         | 42.85          |
| 1816.05                            | V              | 37.98                         | -66.62                        | 11.21                        | 0.73                  | -56.14                     | -13.00         | 43.14          |
| 2270.06                            | H              | 38.08                         | -63.98                        | 11.08                        | 1.20                  | -54.10                     | -13.00         | 41.10          |
| 2270.06                            | V              | 37.64                         | -64.32                        | 11.08                        | 1.20                  | -54.44                     | -13.00         | 41.44          |
| 2724.08                            | H              | 37.05                         | -64.84                        | 13.10                        | 1.28                  | -53.02                     | -13.00         | 40.02          |
| 2724.08                            | V              | 36.70                         | -65.32                        | 13.10                        | 1.28                  | -53.50                     | -13.00         | 40.50          |
| 3178.09                            | H              | 37.21                         | -61.73                        | 13.51                        | 1.63                  | -49.85                     | -13.00         | 36.85          |
| 3178.09                            | V              | 37.04                         | -61.95                        | 13.51                        | 1.63                  | -50.07                     | -13.00         | 37.07          |
| 3632.10                            | H              | 37.21                         | -61.48                        | 14.07                        | 1.61                  | -49.02                     | -13.00         | 36.02          |
| 3632.10                            | V              | 36.64                         | -62.05                        | 14.07                        | 1.61                  | -49.59                     | -13.00         | 36.59          |
| 4086.11                            | H              | 37.30                         | -60.74                        | 13.74                        | 1.36                  | -48.36                     | -13.00         | 35.36          |
| 4086.11                            | V              | 36.74                         | -61.42                        | 13.74                        | 1.36                  | -49.04                     | -13.00         | 36.04          |
| 4540.13                            | H              | 35.95                         | -61.27                        | 14.14                        | 1.66                  | -48.79                     | -13.00         | 35.79          |
| 4540.13                            | V              | 35.64                         | -61.53                        | 14.14                        | 1.66                  | -49.05                     | -13.00         | 36.05          |

| Frequency<br>(MHz)                   | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                                      |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 4FSK,Frequency: 454.0125MHz-12.5 kHz |                |                               |                               |                              |                       |                            |                |                |
| 908.03                               | H              | 32.35                         | -64.46                        | 0.00                         | 1.03                  | -65.49                     | -13.00         | 52.49          |
| 908.03                               | V              | 60.48                         | -38.28                        | 0.00                         | 1.03                  | -39.31                     | -13.00         | 26.31          |
| 1362.04                              | H              | 38.75                         | -64.79                        | 8.73                         | 1.20                  | -57.26                     | -13.00         | 44.26          |
| 1362.04                              | V              | 38.86                         | -65.40                        | 8.73                         | 1.20                  | -57.87                     | -13.00         | 44.87          |
| 1816.05                              | H              | 37.86                         | -66.19                        | 11.21                        | 0.73                  | -55.71                     | -13.00         | 42.71          |
| 1816.05                              | V              | 38.12                         | -66.48                        | 11.21                        | 0.73                  | -56.00                     | -13.00         | 43.00          |
| 2270.06                              | H              | 38.22                         | -63.84                        | 11.08                        | 1.20                  | -53.96                     | -13.00         | 40.96          |
| 2270.06                              | V              | 37.78                         | -64.18                        | 11.08                        | 1.20                  | -54.30                     | -13.00         | 41.30          |
| 2724.08                              | H              | 37.19                         | -64.70                        | 13.10                        | 1.28                  | -52.88                     | -13.00         | 39.88          |
| 2724.08                              | V              | 36.84                         | -65.18                        | 13.10                        | 1.28                  | -53.36                     | -13.00         | 40.36          |
| 3178.09                              | H              | 37.35                         | -61.59                        | 13.51                        | 1.63                  | -49.71                     | -13.00         | 36.71          |
| 3178.09                              | V              | 37.18                         | -61.81                        | 13.51                        | 1.63                  | -49.93                     | -13.00         | 36.93          |
| 3632.10                              | H              | 37.35                         | -61.34                        | 14.07                        | 1.61                  | -48.88                     | -13.00         | 35.88          |
| 3632.10                              | V              | 36.78                         | -61.91                        | 14.07                        | 1.61                  | -49.45                     | -13.00         | 36.45          |
| 4086.11                              | H              | 37.44                         | -60.60                        | 13.74                        | 1.36                  | -48.22                     | -13.00         | 35.22          |
| 4086.11                              | V              | 36.88                         | -61.28                        | 13.74                        | 1.36                  | -48.90                     | -13.00         | 35.90          |
| 4540.13                              | H              | 36.09                         | -61.13                        | 14.14                        | 1.66                  | -48.65                     | -13.00         | 35.65          |
| 4540.13                              | V              | 35.78                         | -61.39                        | 14.14                        | 1.66                  | -48.91                     | -13.00         | 35.91          |

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

## 7 - FREQUENCY STABILITY

### Applicable Standard

FCC §2.1055, § 22.355, §74.464, §80.209 and §90.213

### Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

### Test Data

Test Mode: Transmitting

**Test Result: Compliance.** Please refer to following tables.

FCC Part 90:

| FM,12.5kHz, Reference Frequency: 453.2125 MHz, Limit: ±2.5 ppm |                                     |                          |                       |
|----------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                               | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                            | 7.7                                 | 453.2127428              | 0.54                  |
| -20                                                            |                                     | 453.2127399              | 0.53                  |
| -10                                                            |                                     | 453.2125751              | 0.17                  |
| 0                                                              |                                     | 453.2125833              | 0.18                  |
| 10                                                             |                                     | 453.2126462              | 0.32                  |
| 20                                                             |                                     | 453.2125800              | 0.18                  |
| 30                                                             |                                     | 453.2125046              | 0.01                  |
| 40                                                             |                                     | 453.2126696              | 0.37                  |
| 50                                                             |                                     | 453.2127952              | 0.65                  |
| 20                                                             | 6.0                                 | 453.2127215              | 0.49                  |
| 20                                                             | 8.8                                 | 453.2126587              | 0.35                  |

| 4FSK, 12.5kHz, Reference Frequency: 453.2125MHz, Limit: ±2.5 ppm |                                     |                          |                       |
|------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                 | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                              | 7.7                                 | 453.2127257              | 0.50                  |
| -20                                                              |                                     | 453.2125764              | 0.17                  |
| -10                                                              |                                     | 453.2125865              | 0.19                  |
| 0                                                                |                                     | 453.2127626              | 0.58                  |
| 10                                                               |                                     | 453.2126219              | 0.27                  |
| 20                                                               |                                     | 453.2125500              | 0.11                  |
| 30                                                               |                                     | 453.2126543              | 0.34                  |
| 40                                                               |                                     | 453.2125786              | 0.17                  |
| 50                                                               |                                     | 453.2126089              | 0.24                  |
| 20                                                               | 6.0                                 | 453.2126734              | 0.38                  |
| 20                                                               | 8.8                                 | 453.2126395              | 0.31                  |

## FCC Part 80:

| FM, 25kHz, Reference Frequency: 459.9875MHz, Limit: $\pm 5.0$ ppm |                                     |                          |                       |
|-------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                  | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                               | 7.7                                 | 459.987544               | 0.10                  |
| -20                                                               |                                     | 459.987487               | -0.03                 |
| -10                                                               |                                     | 459.987689               | 0.41                  |
| 0                                                                 |                                     | 459.987633               | 0.29                  |
| 10                                                                |                                     | 459.987575               | 0.16                  |
| 20                                                                |                                     | 459.987540               | 0.09                  |
| 30                                                                |                                     | 459.987501               | 0.00                  |
| 40                                                                |                                     | 459.987486               | -0.03                 |
| 50                                                                |                                     | 459.987573               | 0.16                  |
| 20                                                                | 6.0                                 | 459.987576               | 0.17                  |
| 20                                                                | 8.8                                 | 459.987698               | 0.43                  |

## FCC Part 74:

| FM, 12.5kHz, Reference Frequency: 455.0125 MHz, Limit: $\pm 2.5$ ppm |                                     |                          |                       |
|----------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                     | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                                  | 7.7                                 | 455.0124639              | -0.08                 |
| -20                                                                  |                                     | 455.0125686              | 0.15                  |
| -10                                                                  |                                     | 455.0127044              | 0.45                  |
| 0                                                                    |                                     | 455.0126991              | 0.44                  |
| 10                                                                   |                                     | 455.0126999              | 0.44                  |
| 20                                                                   |                                     | 455.0125400              | 0.09                  |
| 30                                                                   |                                     | 455.0125219              | 0.05                  |
| 40                                                                   |                                     | 455.0127073              | 0.46                  |
| 50                                                                   |                                     | 455.0125624              | 0.14                  |
| 20                                                                   | 6.0                                 | 455.0127006              | 0.44                  |
| 20                                                                   | 8.8                                 | 455.0127103              | 0.46                  |

| 4FSK, 12.5kHz, Reference Frequency: 455.0125 MHz, Limit: $\pm 2.5$ ppm |                                     |                          |                       |
|------------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                       | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                                    | 7.7                                 | 455.0126441              | 0.32                  |
| -20                                                                    |                                     | 455.0127169              | 0.48                  |
| -10                                                                    |                                     | 455.0126029              | 0.23                  |
| 0                                                                      |                                     | 455.0127140              | 0.47                  |
| 10                                                                     |                                     | 455.0124993              | 0.00                  |
| 20                                                                     |                                     | 455.0125000              | 0.00                  |
| 30                                                                     |                                     | 455.0125743              | 0.16                  |
| 40                                                                     |                                     | 455.0124703              | -0.07                 |
| 50                                                                     |                                     | 455.0126811              | 0.40                  |
| 20                                                                     | 6.0                                 | 455.0126904              | 0.42                  |
| 20                                                                     | 8.8                                 | 455.0127164              | 0.48                  |

| FM, 25kHz, Reference Frequency: 455.0125 MHz, Limit: $\pm 2.5$ ppm |                                     |                          |                       |
|--------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                   | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                                | 7.7                                 | 455.0127412              | 0.53                  |
| -20                                                                |                                     | 455.0126584              | 0.35                  |
| -10                                                                |                                     | 455.0125379              | 0.08                  |
| 0                                                                  |                                     | 455.0125451              | 0.10                  |
| 10                                                                 |                                     | 455.0127427              | 0.53                  |
| 20                                                                 |                                     | 455.0125400              | 0.09                  |
| 30                                                                 |                                     | 455.0124718              | -0.06                 |
| 40                                                                 |                                     | 455.0125171              | 0.04                  |
| 50                                                                 |                                     | 455.0126921              | 0.42                  |
| 20                                                                 | 6.0                                 | 455.0124894              | -0.02                 |
| 20                                                                 | 8.8                                 | 455.0126935              | 0.43                  |

FCC Part 22:

| FM, 12.5kHz, Reference Frequency: 454.0125MHz, Limit: $\pm 5.0$ ppm |                                     |                          |                       |
|---------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                    | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                                 | 7.7                                 | 454.0126294              | 0.29                  |
| -20                                                                 |                                     | 454.0126623              | 0.36                  |
| -10                                                                 |                                     | 454.0125522              | 0.11                  |
| 0                                                                   |                                     | 454.0126014              | 0.22                  |
| 10                                                                  |                                     | 454.0125877              | 0.19                  |
| 20                                                                  |                                     | 454.0125400              | 0.09                  |
| 30                                                                  |                                     | 454.0125021              | 0.00                  |
| 40                                                                  |                                     | 454.0126330              | 0.29                  |
| 50                                                                  |                                     | 454.0126850              | 0.41                  |
| 20                                                                  | 6.0                                 | 454.0124971              | -0.01                 |
| 20                                                                  | 8.8                                 | 454.0125377              | 0.08                  |

| 4FSK,12.5kHz, Reference Frequency: 454.0125MHz, Limit: $\pm 5.0$ ppm |                                     |                          |                       |
|----------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                     | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                                  | 7.7                                 | 454.0126676              | 0.37                  |
| -20                                                                  |                                     | 454.0127111              | 0.46                  |
| -10                                                                  |                                     | 454.0126016              | 0.22                  |
| 0                                                                    |                                     | 454.0125128              | 0.03                  |
| 10                                                                   |                                     | 454.0126747              | 0.38                  |
| 20                                                                   |                                     | 454.0125500              | 0.11                  |
| 30                                                                   |                                     | 454.0125352              | 0.08                  |
| 40                                                                   |                                     | 454.0126735              | 0.38                  |
| 50                                                                   |                                     | 454.0126369              | 0.30                  |
| 20                                                                   | 6.0                                 | 454.0125512              | 0.11                  |
| 20                                                                   | 8.8                                 | 454.0125924              | 0.20                  |

| FM, 25kHz, Reference Frequency: 454.0125MHz, Limit: $\pm 5.0$ ppm |                                     |                          |                       |
|-------------------------------------------------------------------|-------------------------------------|--------------------------|-----------------------|
| Temperature (°C)                                                  | Voltage Supplied (V <sub>DC</sub> ) | Measured Frequency (MHz) | Frequency Error (ppm) |
| -30                                                               | 7.7                                 | 454.0127056              | 0.45                  |
| -20                                                               |                                     | 454.0126637              | 0.36                  |
| -10                                                               |                                     | 454.0125852              | 0.19                  |
| 0                                                                 |                                     | 454.0125721              | 0.16                  |
| 10                                                                |                                     | 454.0124812              | -0.04                 |
| 20                                                                |                                     | 454.0125400              | 0.09                  |
| 30                                                                |                                     | 454.0127490              | 0.55                  |
| 40                                                                |                                     | 454.0126558              | 0.34                  |
| 50                                                                |                                     | 454.0126948              | 0.43                  |
| 20                                                                | 6.0                                 | 454.0125544              | 0.12                  |
| 20                                                                | 8.8                                 | 454.0126967              | 0.43                  |

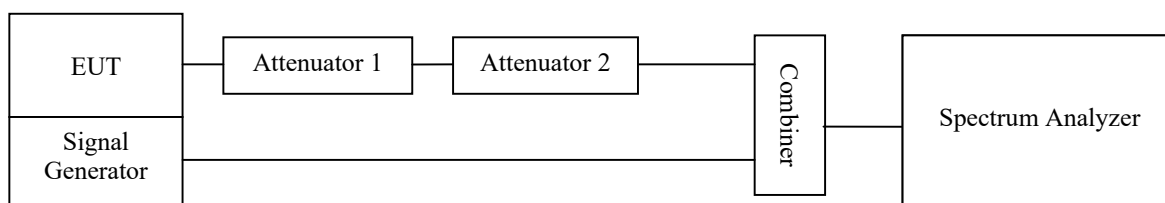
## 8 - TRANSIENT FREQUENCY BEHAVIOR

### Applicable Standard

Regulations: FCC §90.214

### Test Procedure

- a) Connect the EUT and test equipment as shown on the following block diagram.
- b) Set the Spectrum Analyzer to measure FM deviation, and tune the RF frequency to the transmitter assigned frequency.
- c) Set the signal generator to the assigned transmitter frequency and modulate it with a 1 kHz tone at  $\pm 12.5$  kHz deviation and set its output level to -100dBm.
- d) Turn on the transmitter.
- e) Supply sufficient attenuation via the RF attenuator to provide an input level to the Spectrum Analyzer that is 40 dB below the maximum allowed input power when the transmitter is operating at its rated power level. Note this power level on the Spectrum Analyzer as  $P_0$ .
- f) Turn off the transmitter.
- g) Adjust the RF level of the signal generator to provide RF power equal to  $P_0$ . This signal generator RF level shall be maintained throughout the rest of the measurement.
- h) Remove the attenuation 1, so the input power to the Spectrum Analyzer is increased by 30 dB when the transmitter is turned on.
- i) Adjust the vertical amplitude control of the spectrum analyzer to display the 1000 Hz at  $\pm 4$  divisions vertically centered on the display. Set trigger mode of the Spectrum Analyzer to "Video", and tune the "trigger level" on suitable level. Then set the "trigger offset" to -10ms for turn on and -15ms for turn off.
- j) Turn on the transmitter and the transient wave will be captured on the screen of Spectrum Analyzer. Observe the stored display. The instant when the 1 kHz test signal is completely suppressed is considered to be  $t_{on}$ . The trace should be maintained within the allowed divisions during the period  $t_1$  and  $t_2$ .
- k) Then turn off the transmitter, and another transient wave will be captured on the screen of Spectrum Analyzer. The trace should be maintained within the allowed divisions during the period  $t_3$ .

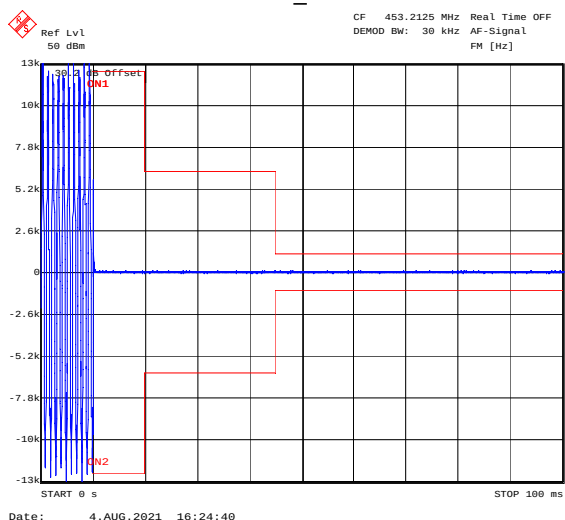
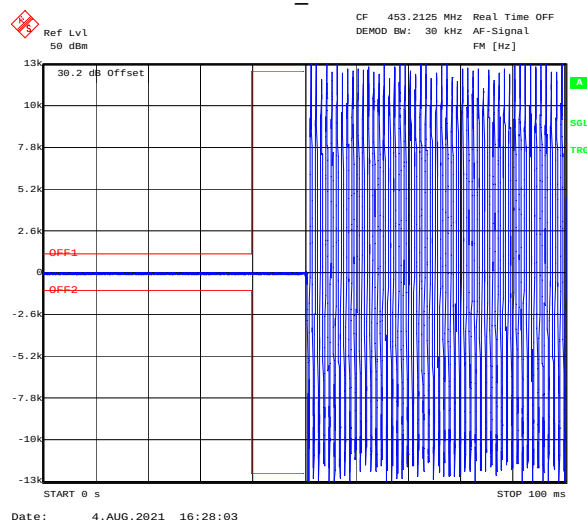


**Test Data**

Test Mode: Transmitting

**Test Result: Compliance.** Please refer to the following table and plots.

| Channel Spacing (kHz) | Transient Period (ms) | Transient Frequency | Result |
|-----------------------|-----------------------|---------------------|--------|
| 12.5                  | 10( $t_1$ )           | $\pm 12.5$ kHz      | Pass   |
|                       | 25( $t_2$ )           | $\pm 6.25$ kHz      |        |
|                       | 10( $t_3$ )           | $\pm 12.5$ kHz      |        |

**453.2125\_Turn On****453.2125\_Turn Off****\*\*\*\*\* END OF REPORT \*\*\*\*\***