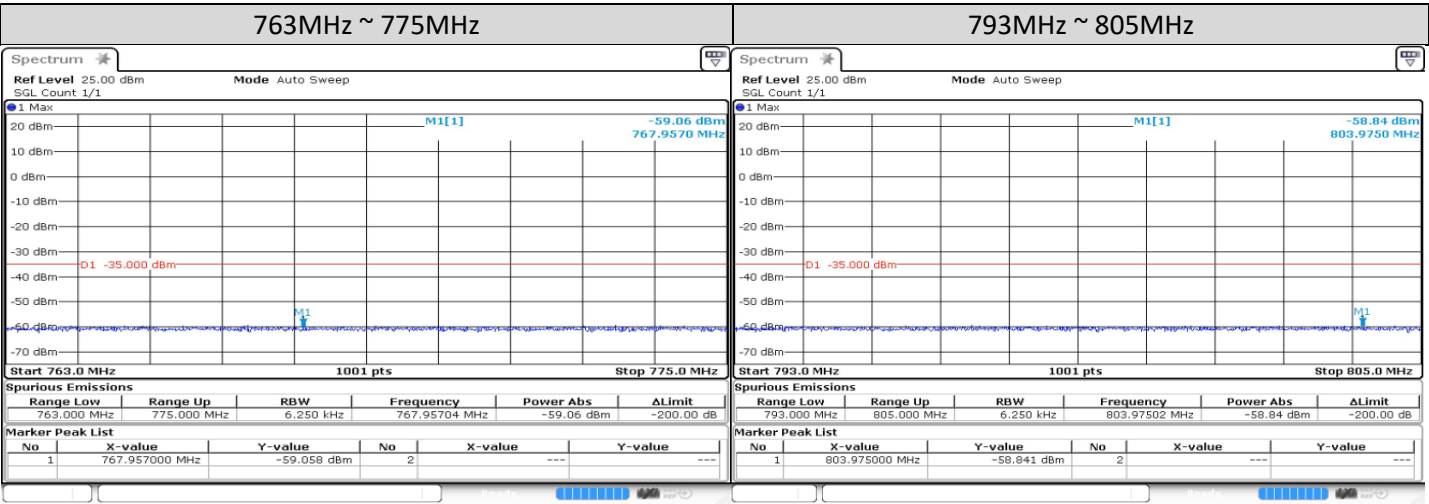
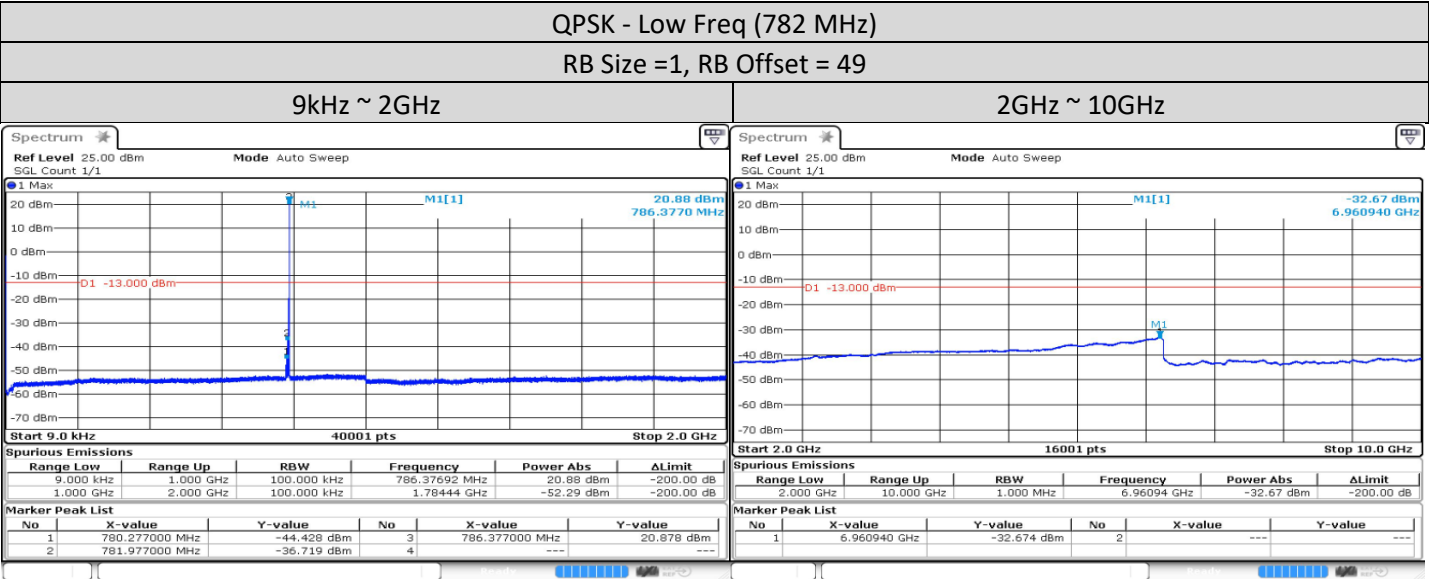
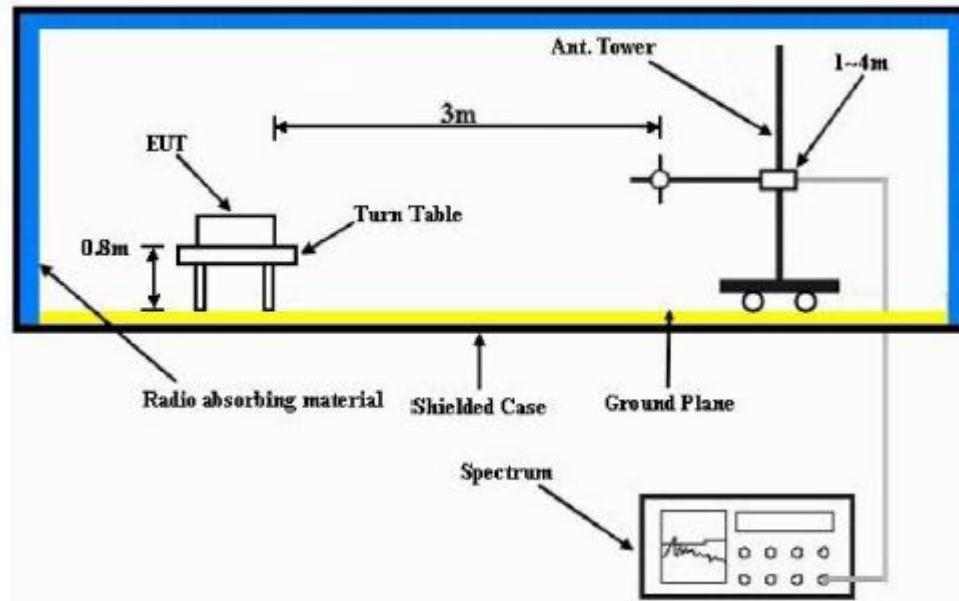


10MHz



1.12. Radiated Spurious Emission

1.12.1. Test Setup



- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is positive peak.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the Turn Table at 0.8m height for below 1Ghz measurement and at 1.5m height for above 1GHz measurement, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Final Radiated Spurious Emission = “Read Value” + Measured substitution value.

1.12.2. Test Limit

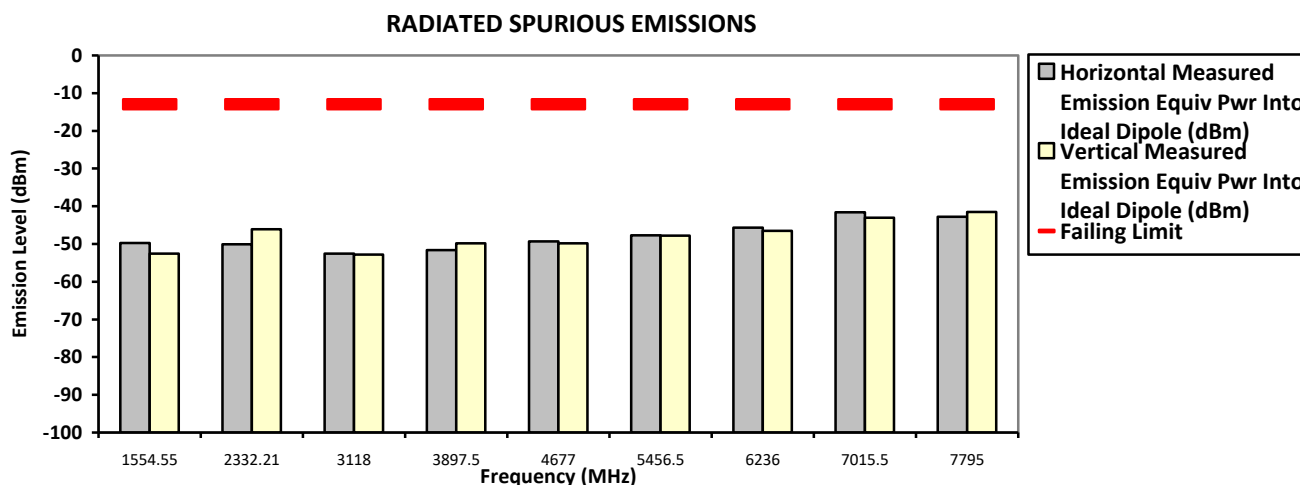
For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (1) and (2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

1.12.3. Radiated Spurious Emission – LTE Band 13 (777-787MHz)

SAC Transmitter Radiated Emission:
Model Number: AAH90ZDU9RH1AN **S/N:** 734TWP0308 **SR:**18058-EMC-00053
Battery Part No: PMNN4804A **Accy Part No:** AN000348A01
Test Mode: TX LTE (Band 13) X-Plane **Bandwidth** 5MHz **0.252 Watt(s) /Max Power**
779.500000 MHz (Low)

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1554.5500	-13.0000	-49.7400 *	-52.5400 *
2332.2100	-13.0000	-50.1100 *	-46.1300 *
3118.0000	-13.0000	-52.5411 **	-52.8136 **
3897.5000	-13.0000	-51.6474 **	-49.8349 **
4677.0000	-13.0000	-49.3457 **	-49.8598 **
5456.5000	-13.0000	-47.7478 **	-47.7812 **
6236.0000	-13.0000	-45.6881 **	-46.4952 **
7015.5000	-13.0000	-41.6040 **	-43.0369 **
7795.0000	-13.0000	-42.7941 **	-41.5394 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sat, Aug 29, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
 *Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

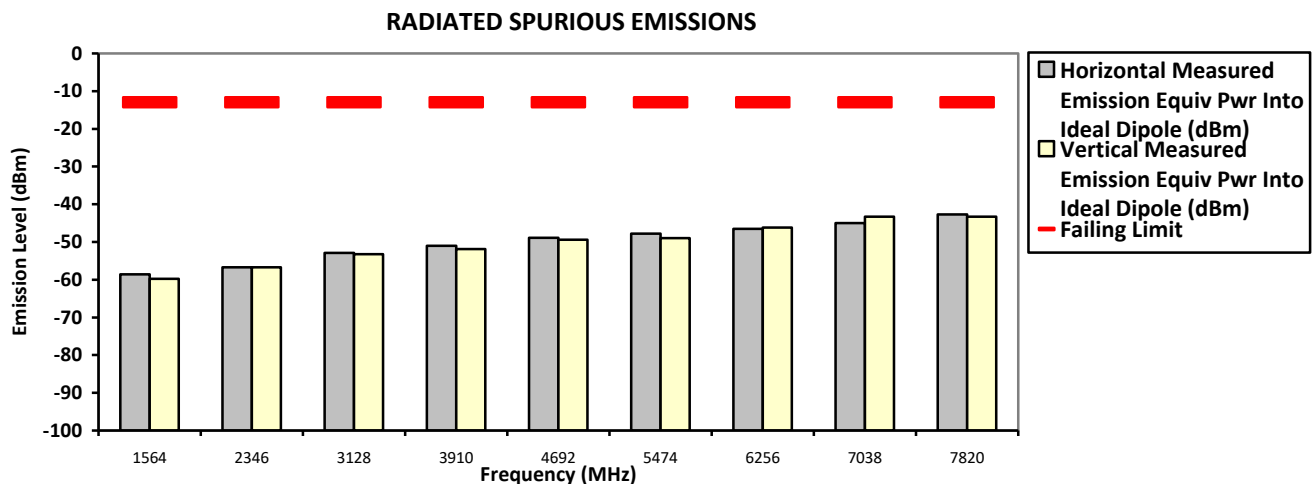
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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SAC Transmitter Radiated Emission:
Model Number: AAH90ZDU9RH1AN **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) X-Plane
782.000000 MHz (Mid) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1564.0000	-13.0000	-58.5333 **	-59.7620 **
2346.0000	-13.0000	-56.7473 **	-56.7279 **
3128.0000	-13.0000	-52.9042 **	-53.2488 **
3910.0000	-13.0000	-51.0364 **	-51.8447 **
4692.0000	-13.0000	-48.9201 **	-49.4428 **
5474.0000	-13.0000	-47.7584 **	-48.9465 **
6256.0000	-13.0000	-46.4812 **	-46.2194 **
7038.0000	-13.0000	-45.0006 **	-43.2672 **
7820.0000	-13.0000	-42.7041 **	-43.2936 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sat, Aug 29, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

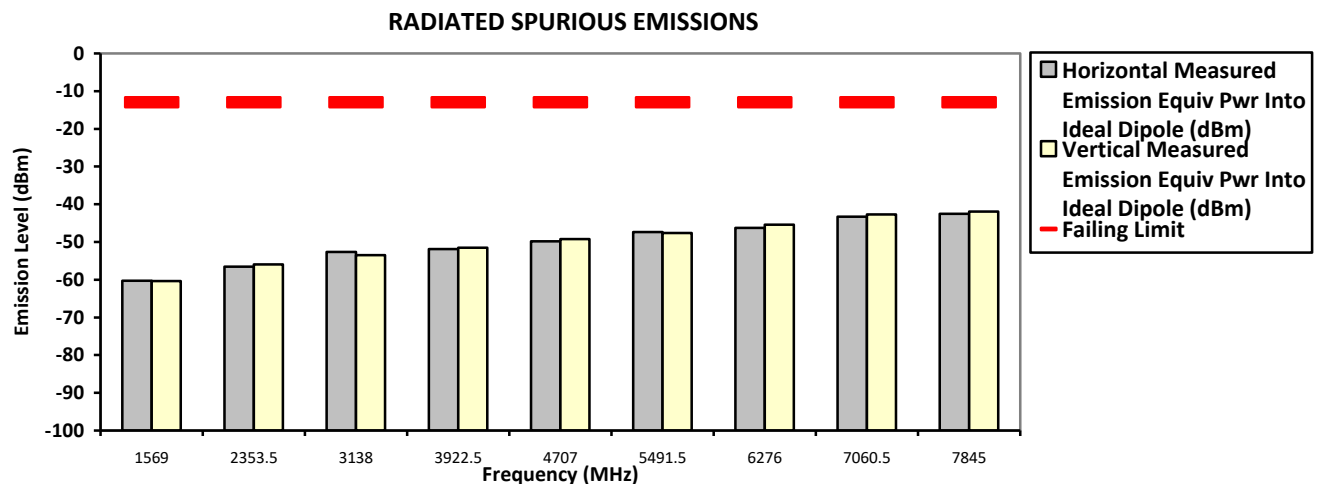
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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SAC Transmitter Radiated Emission:
Model Number: AAH90ZDU9RH1AN **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) X-Plane
784.500000 MHz (High) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1569.0000	-13.0000	-60.2694 **	-60.3609 **
2353.5000	-13.0000	-56.5125 **	-55.9776 **
3138.0000	-13.0000	-52.6463 **	-53.4745 **
3922.5000	-13.0000	-51.8747 **	-51.5530 **
4707.0000	-13.0000	-49.8025 **	-49.2765 **
5491.5000	-13.0000	-47.3274 **	-47.6078 **
6276.0000	-13.0000	-46.2454 **	-45.3907 **
7060.5000	-13.0000	-43.3270 **	-42.7158 **
7845.0000	-13.0000	-42.5500 **	-41.9148 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sat, Aug 29, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

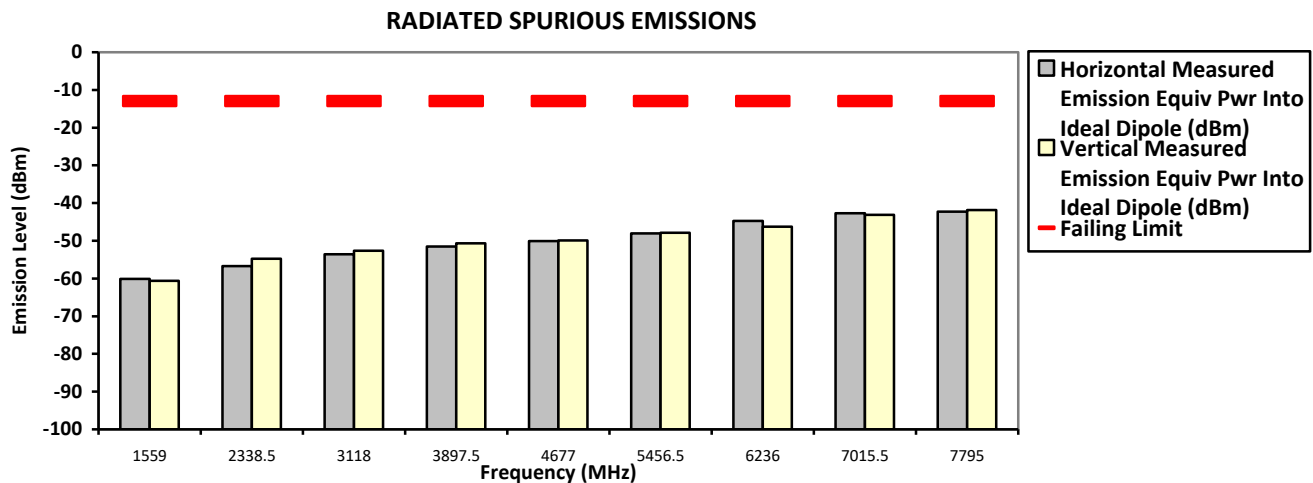
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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Model Number: AAH90ZDU9RH1AN **SAC Transmitter Radiated Emission:** **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) Y-Plane
779.500000 MHz (Low) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1559.0000	-13.0000	-60.0782 **	-60.6167 **
2338.5000	-13.0000	-56.6862 **	-54.7461 **
3118.0000	-13.0000	-53.5911 **	-52.5904 **
3897.5000	-13.0000	-51.5102 **	-50.7049 **
4677.0000	-13.0000	-50.0448 **	-49.9346 **
5456.5000	-13.0000	-48.0069 **	-47.8602 **
6236.0000	-13.0000	-44.6958 **	-46.2977 **
7015.5000	-13.0000	-42.6963 **	-43.1389 **
7795.0000	-13.0000	-42.3076 **	-41.8272 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sun, Aug 30, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

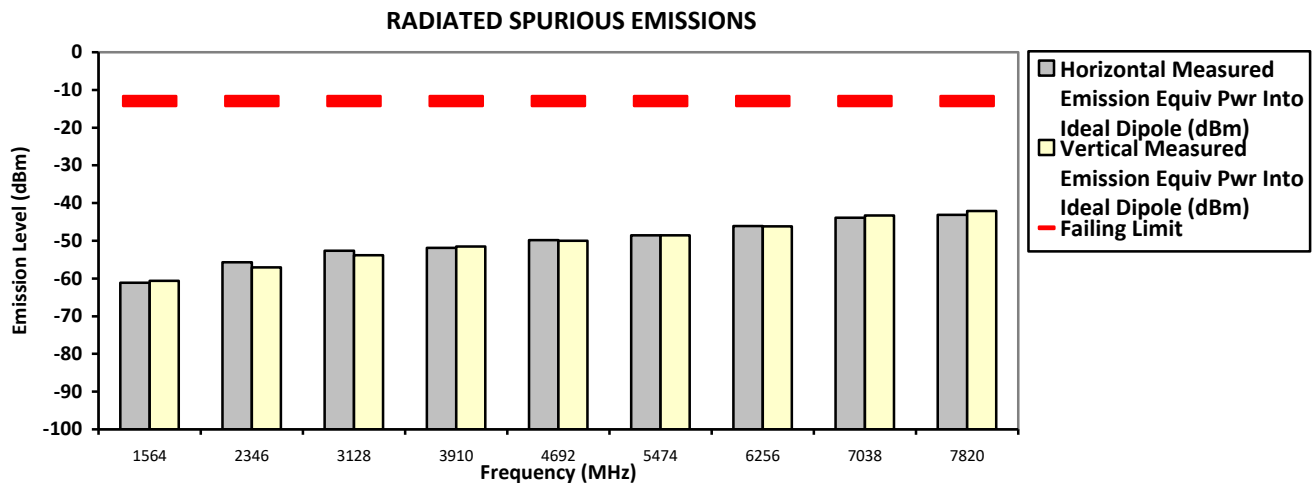
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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Model Number: AAH90ZDU9RH1AN **SAC Transmitter Radiated Emission:** **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) Y-Plane
782.000000 MHz (Mid) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1564.0000	-13.0000	-61.1115 **	-60.5773 **
2346.0000	-13.0000	-55.6529 **	-57.0100 **
3128.0000	-13.0000	-52.6008 **	-53.8060 **
3910.0000	-13.0000	-51.8286 **	-51.5656 **
4692.0000	-13.0000	-49.8516 **	-50.0216 **
5474.0000	-13.0000	-48.5977 **	-48.5884 **
6256.0000	-13.0000	-46.0547 **	-46.1472 **
7038.0000	-13.0000	-43.9299 **	-43.3141 **
7820.0000	-13.0000	-43.1348 **	-42.1227 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sun, Aug 30, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
Temp(Deg): 23.8 Hum(%RH): 69.8

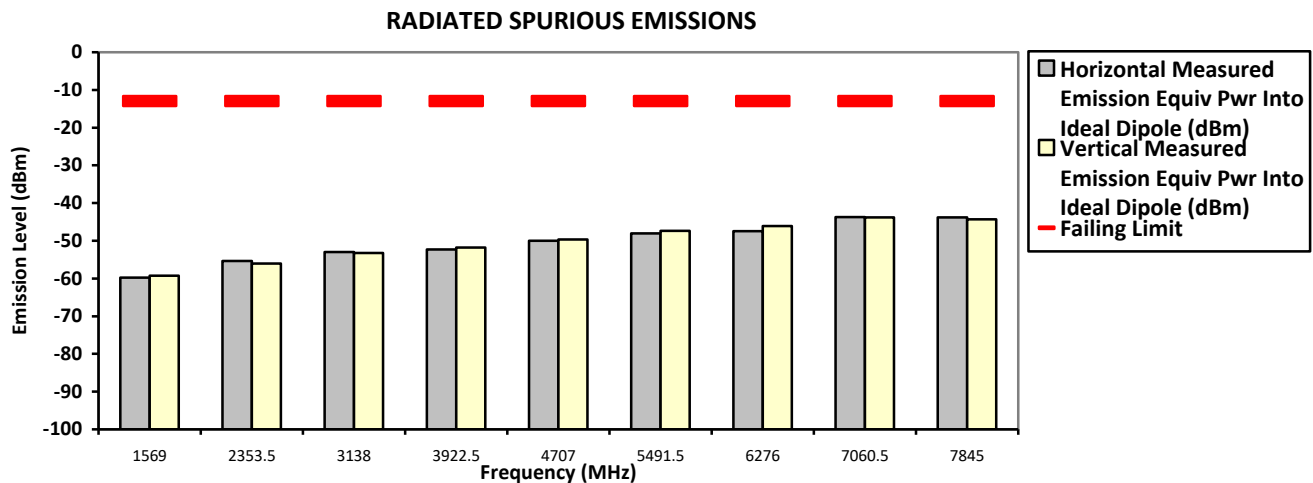
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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Model Number: AAH90ZDU9RH1AN **SAC Transmitter Radiated Emission:** **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) Y-Plane
784.500000 MHz (High) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1569.0000	-13.0000	-59.7518 **	-59.2666 **
2353.5000	-13.0000	-55.3219 **	-56.0342 **
3138.0000	-13.0000	-52.9830 **	-53.2545 **
3922.5000	-13.0000	-52.3023 **	-51.7445 **
4707.0000	-13.0000	-50.0236 **	-49.6955 **
5491.5000	-13.0000	-48.0359 **	-47.3869 **
6276.0000	-13.0000	-47.4670 **	-46.1022 **
7060.5000	-13.0000	-43.7214 **	-43.7872 **
7845.0000	-13.0000	-43.8335 **	-44.2715 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sun, Aug 30, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

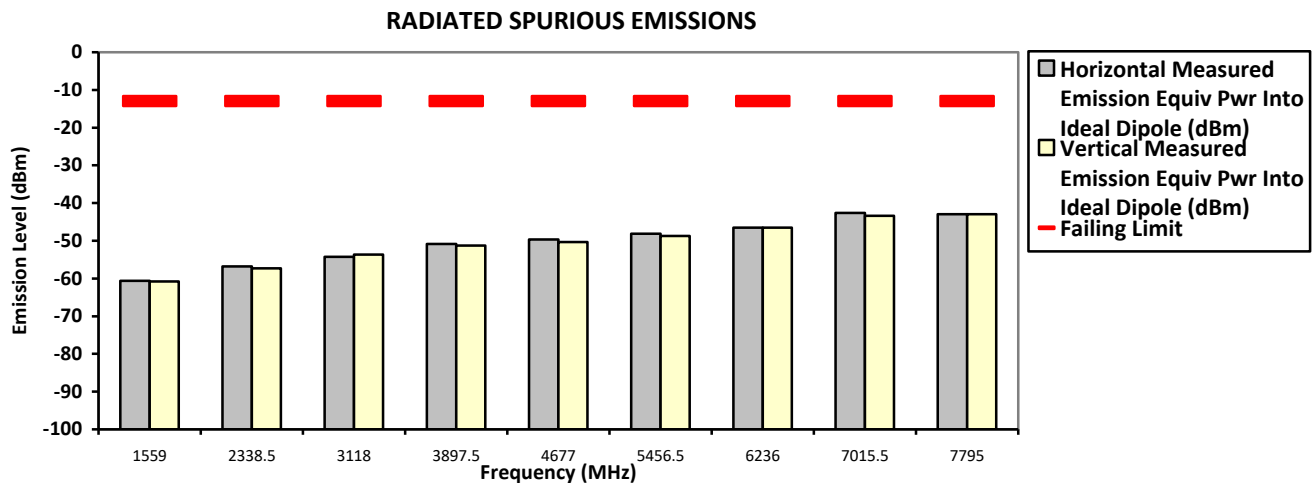
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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Model Number: AAH90ZDU9RH1AN **SAC Transmitter Radiated Emission:** **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) Z-Plane
779.500000 MHz (Low) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1559.0000	-13.0000	-60.6347 **	-60.8036 **
2338.5000	-13.0000	-56.7971 **	-57.3121 **
3118.0000	-13.0000	-54.2055 **	-53.6405 **
3897.5000	-13.0000	-50.8247 **	-51.2344 **
4677.0000	-13.0000	-49.6623 **	-50.2987 **
5456.5000	-13.0000	-48.1619 **	-48.7211 **
6236.0000	-13.0000	-46.5082 **	-46.4946 **
7015.5000	-13.0000	-42.5787 **	-43.3535 **
7795.0000	-13.0000	-42.9508 **	-42.9865 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sun, Aug 30, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

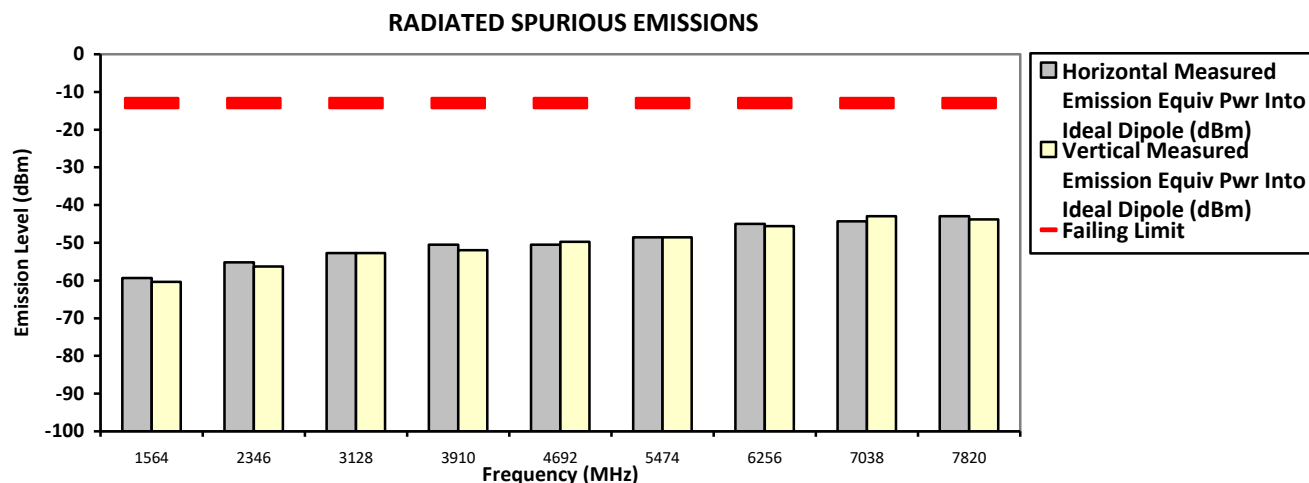
*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

System MU: 4.03 dB

Remarks: Passed Results Marginal Results Failed Results

Model Number: AAH90ZDU9RH1AN **SAC Transmitter Radiated Emission:** **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) Z-Plane
782.000000 MHz (Mid) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1564.0000	-13.0000	-59.3140 **	-60.3272 **
2346.0000	-13.0000	-55.1778 **	-56.3060 **
3128.0000	-13.0000	-52.6871 **	-52.6977 **
3910.0000	-13.0000	-50.5407 **	-51.9191 **
4692.0000	-13.0000	-50.4818 **	-49.7082 **
5474.0000	-13.0000	-48.5164 **	-48.5216 **
6256.0000	-13.0000	-45.0103 **	-45.6143 **
7038.0000	-13.0000	-44.3279 **	-42.9787 **
7820.0000	-13.0000	-42.9953 **	-43.7644 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sun, Aug 30, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
Temp(Deg): 23.8 Hum(%RH): 69.8

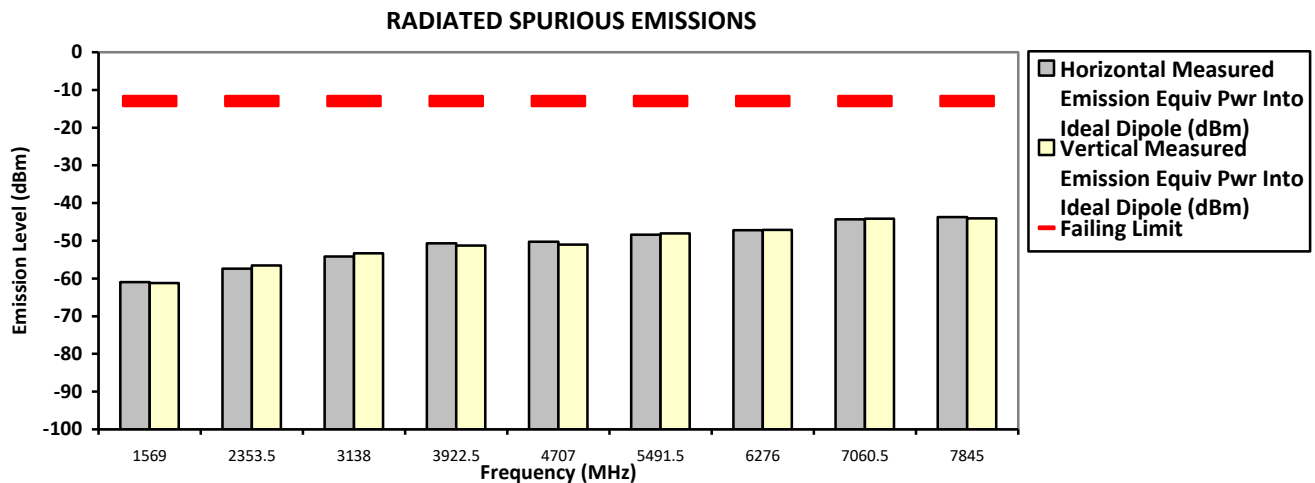
System MU: 4.03 dB

Remarks:

Passed Results	Marginal Results	Failed Results
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SAC Transmitter Radiated Emission:
Model Number: AAH90ZDU9RH1AN **S/N: 734TWP0308** **SR:18058-EMC-00053**
Battery Part No: PMNN4804A **Accy Part No: AN000348A01**
Test Mode: TX LTE (Band 13) Z-Plane
784.500000 MHz (High) **Bandwidth 5MHz** **0.252 Watt(s) /Max Power**

Frequency (MHz)	Limit	Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm)
1569.0000	-13.0000	-60.9150 **	-61.1815 **
2353.5000	-13.0000	-57.3850 **	-56.5503 **
3138.0000	-13.0000	-54.1226 **	-53.2885 **
3922.5000	-13.0000	-50.6893 **	-51.3066 **
4707.0000	-13.0000	-50.2944 **	-51.0078 **
5491.5000	-13.0000	-48.3631 **	-48.0704 **
6276.0000	-13.0000	-47.1973 **	-47.1269 **
7060.5000	-13.0000	-44.3281 **	-44.1146 **
7845.0000	-13.0000	-43.7518 **	-44.0495 **



The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.
 Motorola Penang EMC Lab - Test Performed by: Qawiman&Fendi Sun, Aug 30, 2020

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.

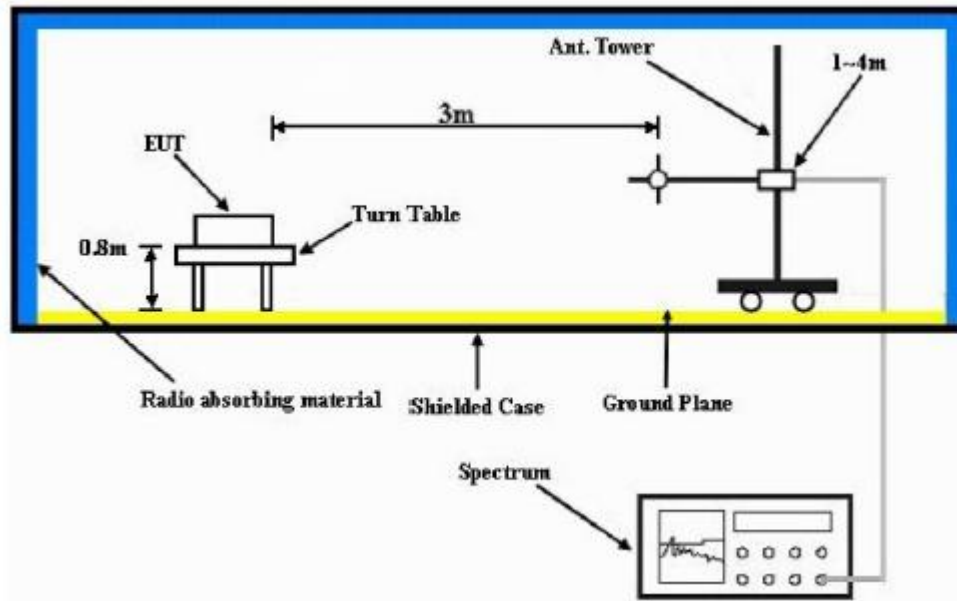
*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported
 Temp(Deg): 23.8 Hum(%RH): 69.8

System MU: 4.03 dB

Remarks: Passed Results Marginal Results Failed Results

1.13. Effective Radiated Power (ERP)

1.13.1. Test Setup



- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is RMS.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the Turn Table at 0.8m height for below 1GHz measurement and at 1.5m height for above 1GHz measurement, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) $EIRP = \text{“Read Value”} + \text{Measured substitution value.}$

1.13.2. Test Limit

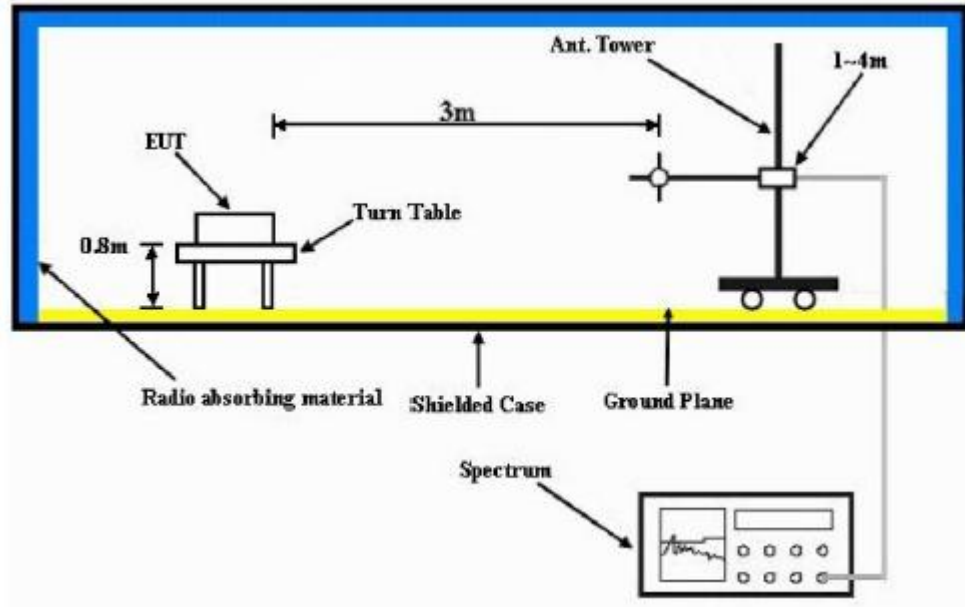
FCC: Portable stations (hand-held devices) transmitting in the 776-788 MHz band is limited to 3 watts ERP.
ISED: The e.i.r.p. shall not exceed 50 watts for mobile equipment or for outdoor fixed subscriber equipment, nor shall it exceed 5 watts for portable equipment or for indoor fixed subscriber equipment.

1.13.3. Effective Radiated Power (ERP) - LTE Band 13 (777-787MHz)

Not Performed.

1.14. GNSS (EIRP for 1559 - 1610MHz)

1.14.1. Test Setup



- 1) The Resolution Bandwidth for Equivalent Isotropically Radiated Power (EIRP) below 1 GHz is 100 kHz with Video Bandwidth = 300 kHz and Resolution Bandwidth for EIRP above 1 GHz is 1 MHz with Video Bandwidth = 3 MHz. Detector Mode is RMS.
- 2) In the semi-anechoic chamber, setup as illustrated above the DUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The “Read Value” is the spectrum reading of maximum power value.
- 3) The substitution antenna is substituted for DUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) $EIRP = \text{“Read Value”} + \text{Measured substitution value} + 2.15.$

1.14.2. Test Limit

FCC: For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

ISED: The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

1.14.3. GNSS (EIRP for 1599 – 1610MHz) - LTE Band 13 (777-787MHz)

EIRP in RNSS band (1.559GHz to 1.610GHz)

S/N: 734TWP0308

Channel Bandwidth: 5 MHz

Accessory: AN000348A01

Tx Power: 0.252 Watts

Modulation: QPSK

Battery: PMNN4804A

Frequency Channel: 779.5000 MHz (X-Plane)

Antenna Polarization	2Fc (MHz)	EIRP (dBm)	Limit (dBm)
Horizontal	1559.0000	-65.23	-40
Vertical	1559.0000	-65.91	-40

EIRP in RNSS band (1.559GHz to 1.610GHz)

S/N: 734TWP0308

Channel Bandwidth: 5 MHz

Accessory: AN000348A01

Tx Power: 0.252 Watts

Modulation: QPSK

Battery: PMNN4804A

Frequency Channel: 782.0000 MHz (X-Plane)

Antenna Polarization	2Fc (MHz)	EIRP (dBm)	Limit (dBm)
Horizontal	1564.0000	-61.22	-40
Vertical	1564.0000	-65.66	-40

EIRP in RNSS band (1.559GHz to 1.610GHz)

S/N: 734TWP0308
Channel Bandwidth: 5 MHz
Accessory: AN000348A01

Tx Power: 0.252 Watts
Modulation: QPSK
Battery: PMNN4804A

Frequency Channel: 784.5000 MHz (X-Plane)

Antenna Polarization	2Fc (MHz)	EIRP (dBm)	Limit (dBm)
Horizontal	1569.0000	-59.93	-40
Vertical	1569.0000	-63.09	-40

--End of Test Report--