5.6 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

TEST OVERVIEW

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

TEST PROCEDURE

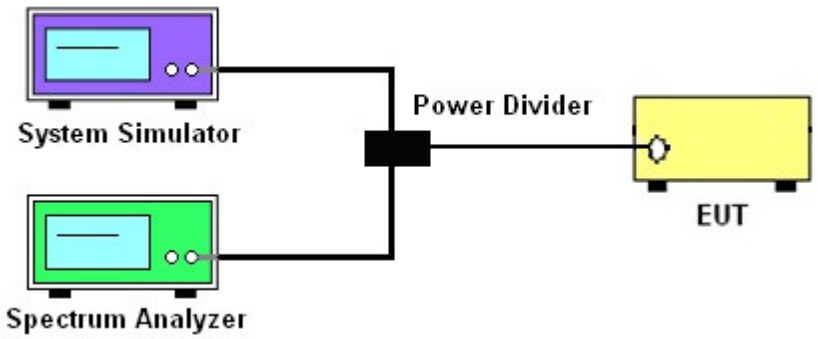
1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.5.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

= P(W) - [43 + 10log(P)] (dB)

= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 6.

5.7 BAND EDGE

TEST OVERVIEW

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

TEST PROCEDURE

1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.7.
2. Start and stop frequency were set such that the band edge would be placed in the center of the Plot.
3. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
4. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator.

The path loss was compensated to the results for each measurement.

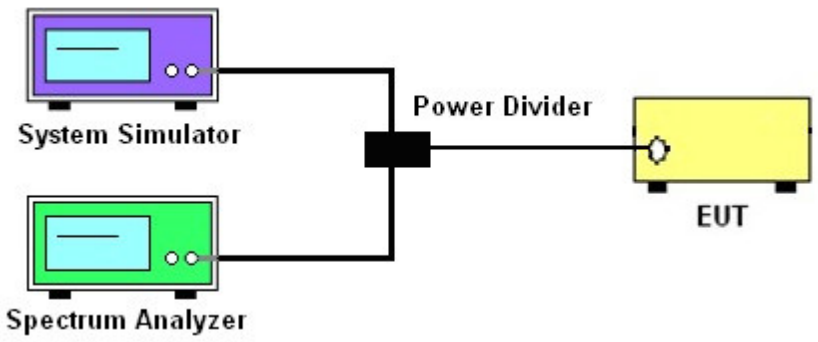
5. The band edges of low and high channels for the highest RF powers were measured.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

= P(W) - [43 + 10log(P)] (dB)

= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 7.

5.8 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

TEST OVERVIEW

Radiated spurious emissions measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signalsoperating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas.Measurements on signals operating above 1GHz are performed using vertically and horizontally polarizedhorn antennas. All measurements are performed as peak measurements while the EUT isoperating at maximum power and at the appropriate frequencies.

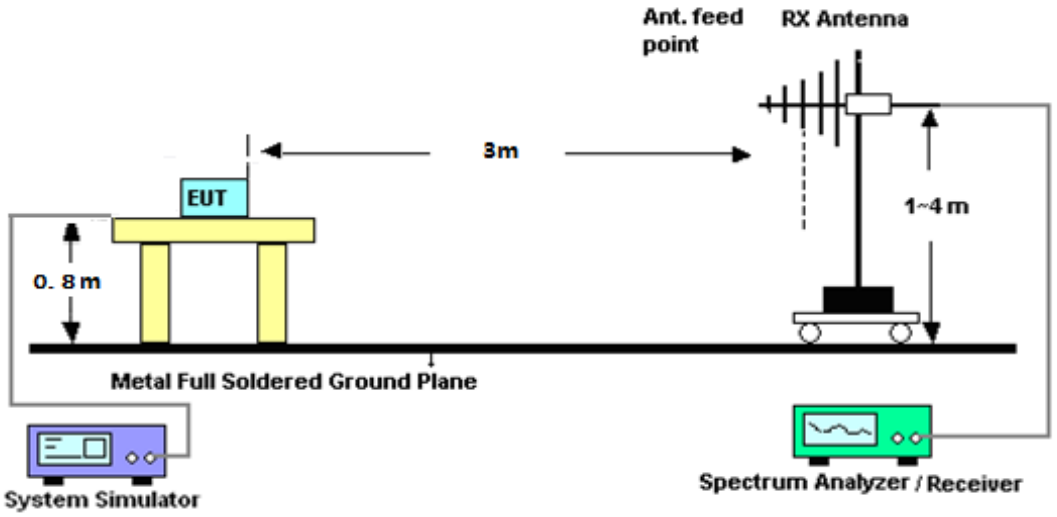
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

TEST PROCEDURE

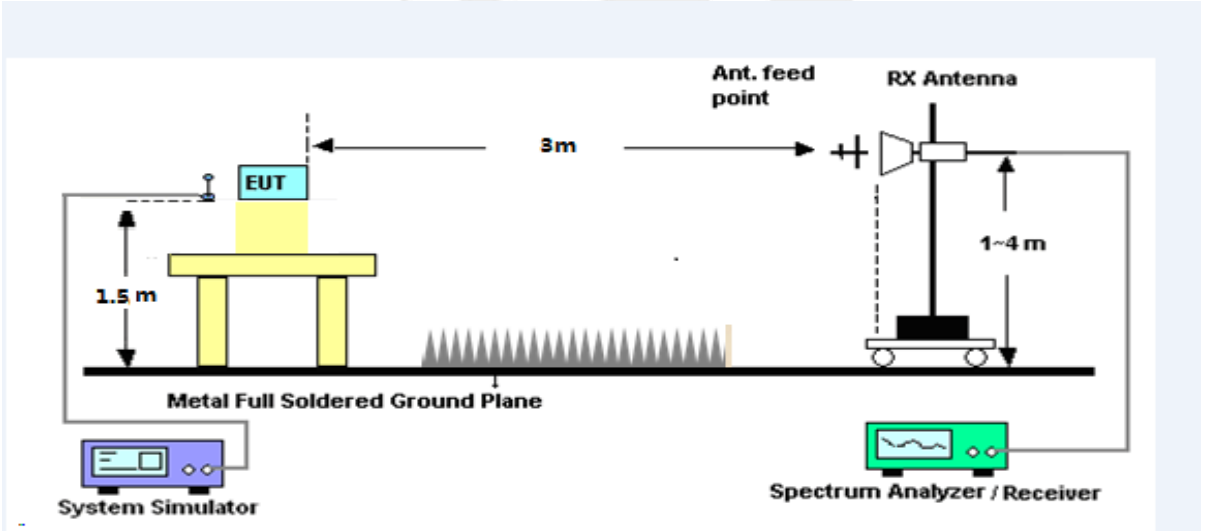
1. The testing FCC KDB 971168 D01 Section 5.8 and ANSI C63.26-2015-Section 5.5.
2. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5.No. of sweep points > 2 x span/RBW
6. Detector = Peak
7. Trace mode = max hold
8. The trace was allowed to stabilize
9. Effective Isotropic Spurious Radiation was measured by substitution method according to TIA/EIA-603-E. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.
PMea=S.G Level+ Ant-Cable loss; Margin=PMea-Limit.

TEST SETUP

For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



TEST RESULT

Note: Test data See Appendix 8.

APPENDIX A.TESTRESULT

A1. CONDUCTED OUTPUT POWER

GSM 850:

GSM 850		
Mode	Frequency (MHz)	AVG Power(dBm)
GSM (GMSK,1-Slot)	824.2	30.39
	836.6	30.64
	848.8	30.72
GPRS (GMSK,1-Slot)	824.2	30.26
	836.6	30.08
	848.8	30.33
GPRS (GMSK,2-Slot)	824.2	29.77
	836.6	29.65
	848.8	29.85
GPRS (GMSK,3-Slot)	824.2	29.33
	836.6	29.16
	848.8	29.36
GPRS (GMSK,4-Slot)	824.2	28.92
	836.6	28.72
	848.8	28.87
EGPRS (8PSK,1-Slot)	824.2	30.15
	836.6	29.94
	848.8	30.10
EGPRS (8PSK,2-Slot)	824.2	29.36
	836.6	29.19
	848.8	29.39
EGPRS (8PSK,3-Slot)	824.2	28.63
	836.6	28.40
	848.8	28.67
EGPRS (8PSK,4-Slot)	824.2	27.93
	836.6	27.68
	848.8	27.88

PCS 1900:

PCS 1900		
Mode	Frequency (MHz)	AVG Power(dBm)
GSM (GMSK,1-Slot)	1850.2	27.85
	1880.0	27.61
	1909.8	27.63
GPRS (GMSK,1-Slot)	1850.2	27.43
	1880.0	27.29
	1909.8	27.55
GPRS (GMSK,2-Slot)	1850.2	26.96
	1880.0	26.81
	1909.8	27.11
GPRS (GMSK,3-Slot)	1850.2	26.47
	1880.0	26.37
	1909.8	26.68
GPRS (GMSK,4-Slot)	1850.2	26.04
	1880.0	25.88
	1909.8	26.19
EGPRS (8PSK,1-Slot)	1850.2	27.05
	1880.0	27.22
	1909.8	27.16
EGPRS (8PSK,2-Slot)	1850.2	26.28
	1880.0	26.43
	1909.8	26.45
EGPRS (8PSK,3-Slot)	1850.2	25.55
	1880.0	25.71
	1909.8	25.67
EGPRS (8PSK,4-Slot)	1850.2	24.77
	1880.0	24.92
	1909.8	24.94

UMTS BAND V

UMTS BAND 5		
Mode	Frequency(MHz)	AVG Power
WCDMA 850 RMC	826.4	20.82
	836.6	21.14
	846.6	21.17
HSDPA Subtest 1	826.4	20.32
	836.6	20.50
	846.6	20.52
HSDPA Subtest 2	826.4	19.82
	836.6	20.10
	846.6	20.04
HSDPA Subtest 3	826.4	19.49
	836.6	19.66
	846.6	19.72
HSDPA Subtest 4	826.4	19.01
	836.6	19.25
	846.6	19.26
HSUPA Subtest 1	826.4	20.30
	836.6	20.49
	846.6	20.46
HSUPA Subtest 2	826.4	19.41
	836.6	19.53
	846.6	19.52
HSUPA Subtest 3	826.4	19.34
	836.6	19.07
	846.6	19.19
HSUPA Subtest 4	826.4	19.01
	836.6	18.75
	846.6	18.88
HSUPA Subtest 5	826.4	17.52
	836.6	17.34
	846.6	17.43

UMTS BAND II

UMTS BAND 2		
Mode	Frequency(MHz)	AVG Power
WCDMA 1900 RMC	1852.4	21.65
	1880	21.40
	1907.6	21.48
HSDPA Subtest 1	1852.4	21.06
	1880	21.25
	1907.6	21.17
HSDPA Subtest 2	1852.4	20.61
	1880	20.79
	1907.6	20.69
HSDPA Subtest 3	1852.4	20.24
	1880	20.31
	1907.6	20.23
HSDPA Subtest 4	1852.4	19.94
	1880	20.00
	1907.6	19.73
HSUPA Subtest 1	1852.4	20.95
	1880	21.03
	1907.6	20.88
HSUPA Subtest 2	1852.4	19.98
	1880	20.12
	1907.6	19.96
HSUPA Subtest 3	1852.4	19.91
	1880	19.65
	1907.6	19.54
HSUPA Subtest 4	1852.4	19.48
	1880	19.33
	1907.6	19.05
HSUPA Subtest 5	1852.4	18.03
	1880	17.88
	1907.6	17.57

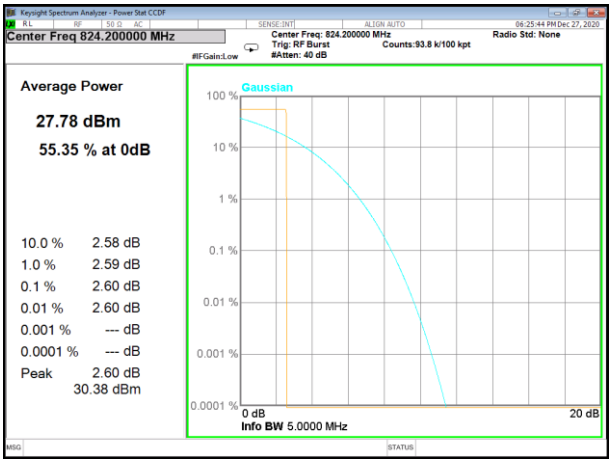
A2. PEAK-TO-AVERAGE RADIO

GSM 850		
Mode	Frequency (MHz)	PAR
GSM 850	824.2	2.60
	836.6	2.60
	848.8	2.59
GPRS 850	824.2	2.60
	836.6	2.60
	848.8	2.59
EGPRS 850	824.2	5.58
	836.6	5.63
	848.8	5.48

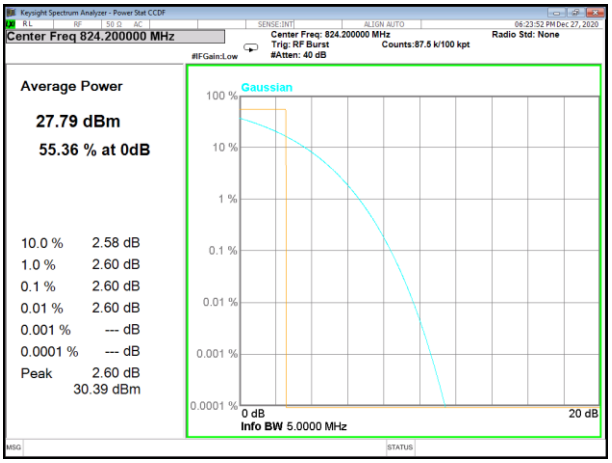
PCS 1900		
Mode	Frequency (MHz)	PAR
PCS1900	1850.2	2.61
	1880	2.62
	1909.8	2.62
GPRS1900	1850.2	2.62
	1880	2.62
	1909.8	2.63
EGPRS1900	1850.2	5.54
	1880	5.58
	1909.8	5.52

UMTS Band 2		
Mode	Frequency (MHz)	PAR
WCDMA 1900 RMC	1852.4	3.07
	1880	3.01
	1907.6	2.96
HSDPA 1900	1852.4	3.32
	1880	3.85
	1907.6	3.22
HSUPA 1900	1852.4	3.71
	1880	3.20
	1907.6	3.26

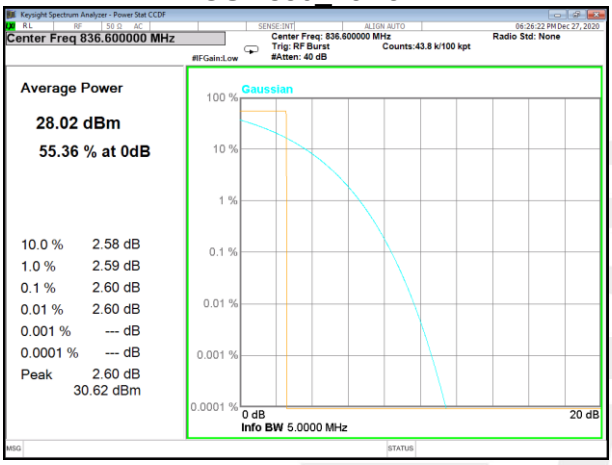
UMTS Band 5		
Mode	Frequency (MHz)	PAR
WCDMA 850 RMC	826.4	3.04
	836.6	3.11
	846.6	2.99
HSDPA 850	826.4	3.24
	836.6	3.73
	846.6	3.19
HSUPA 850	826.4	3.84
	836.6	3.08
	846.6	3.69



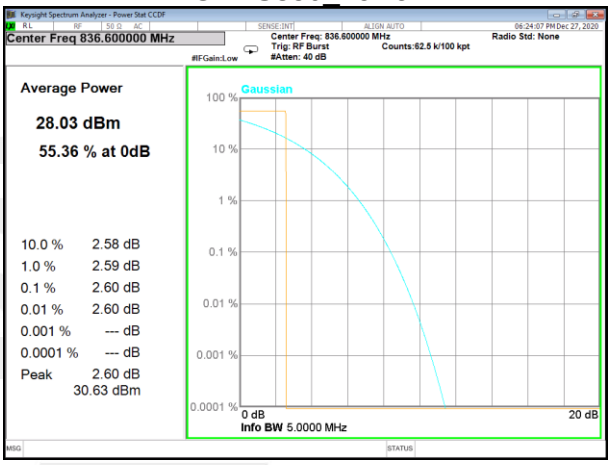
GSM850_Lower



GPRS850_Lower



GSM850_Middle



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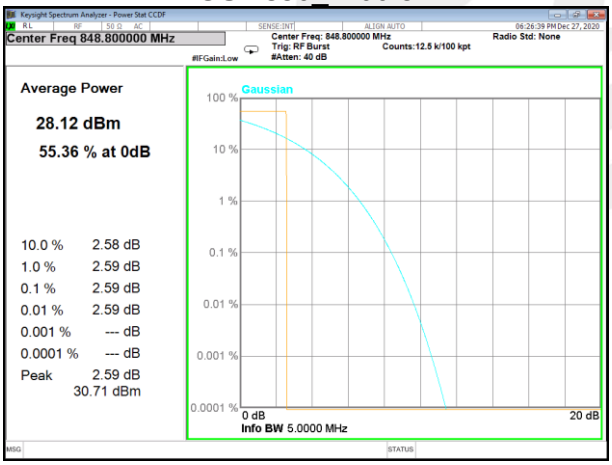
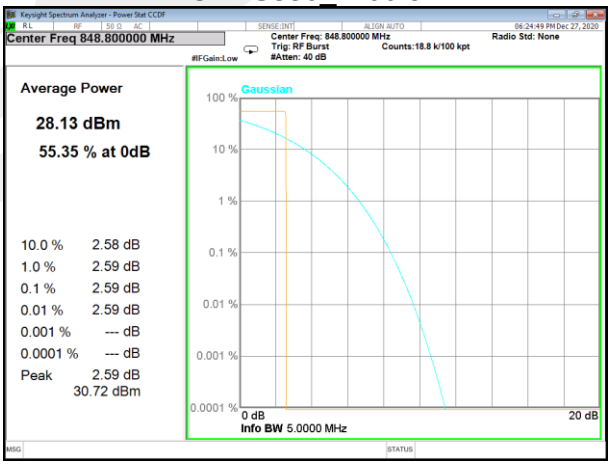


GSM850_Higher



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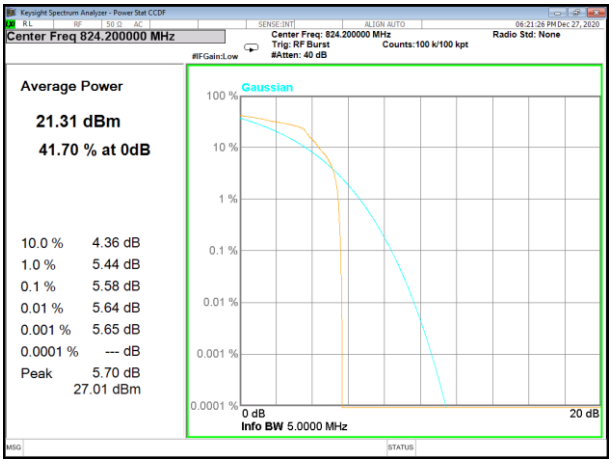
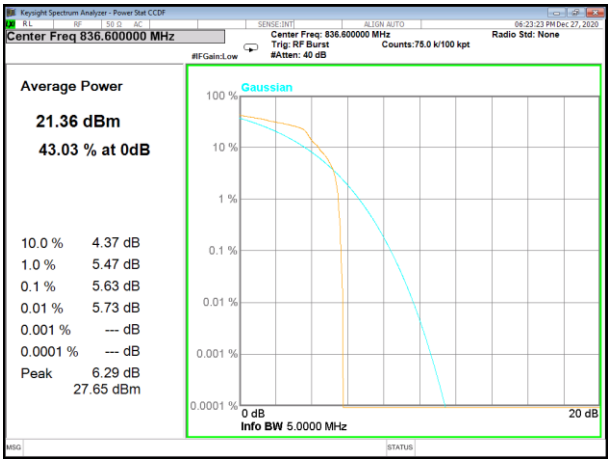


EGPRS850_Lower



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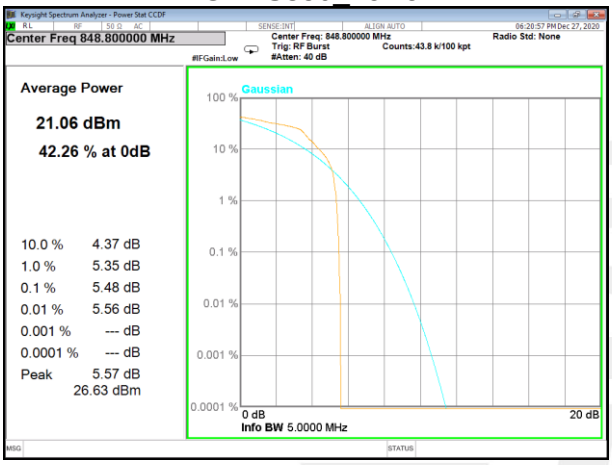
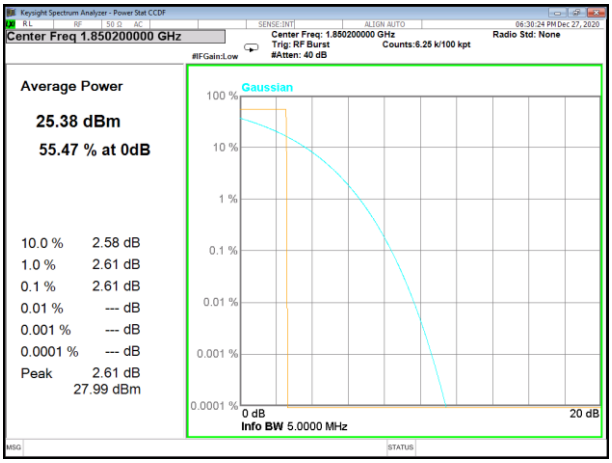
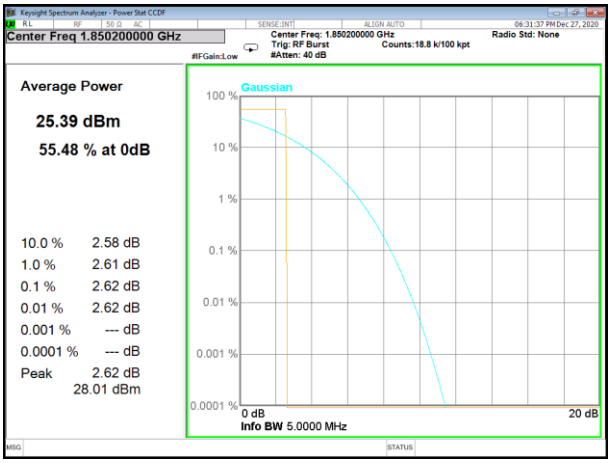


EGPRS850_Higher



GSM1900_Lower



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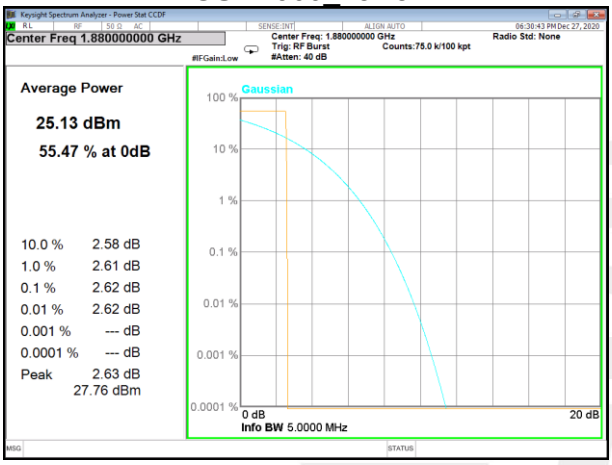

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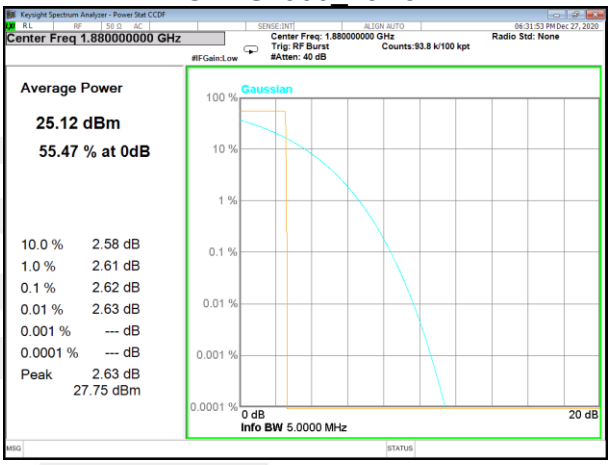

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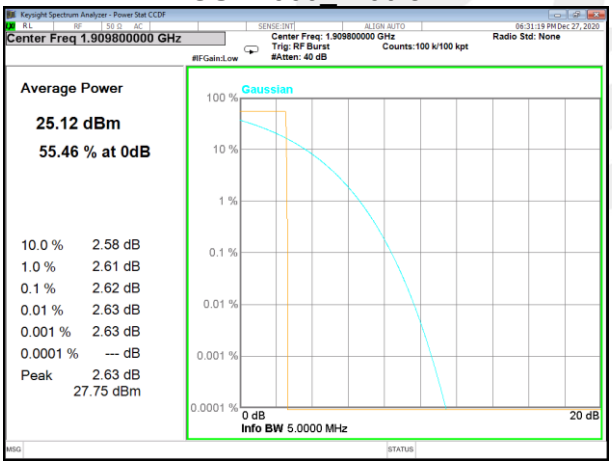

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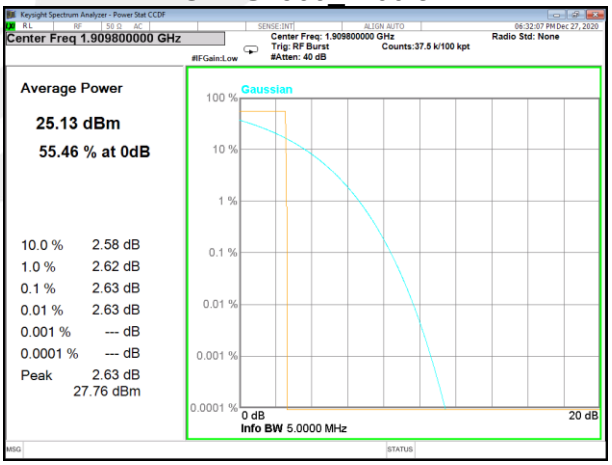

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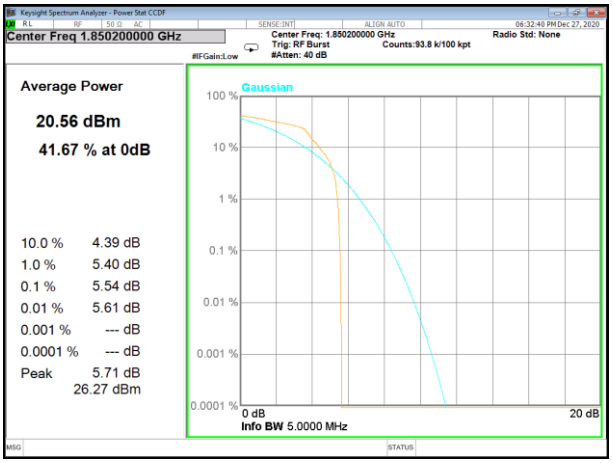

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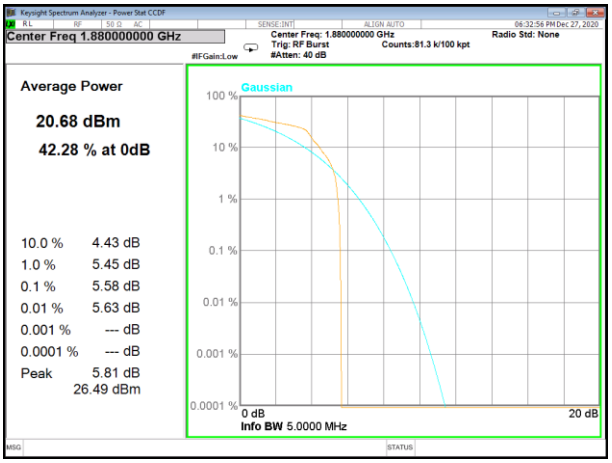
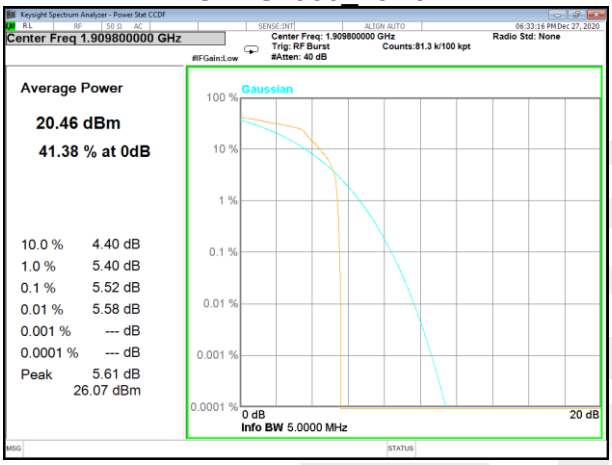


EGPRS1900_Middle



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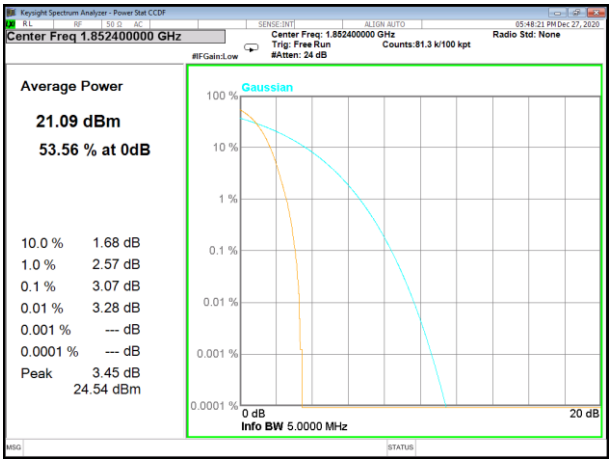
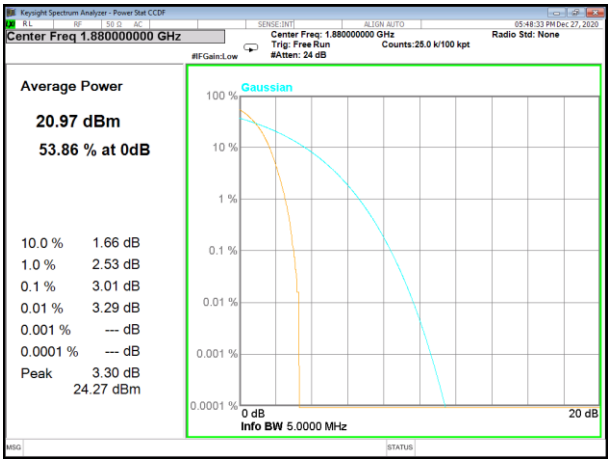
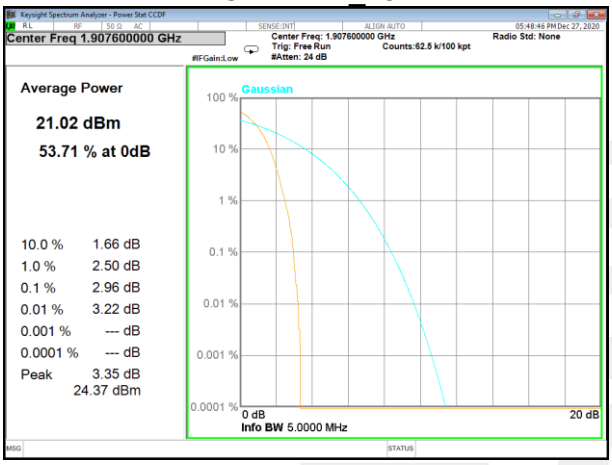


WCDMA B2_Low



WCDMA B2_Middle



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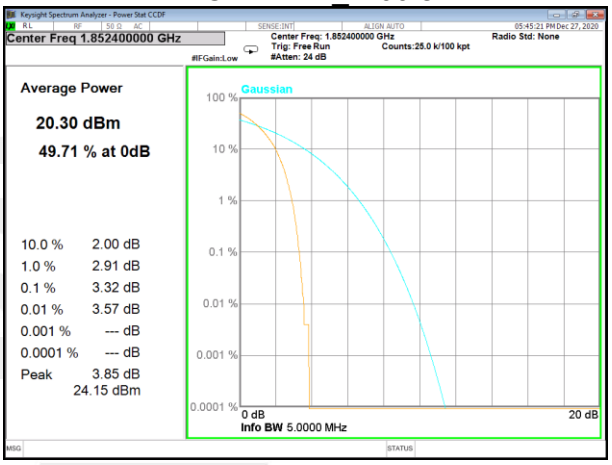
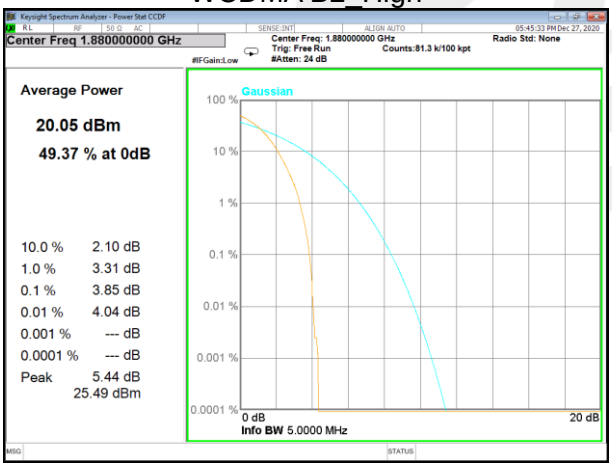
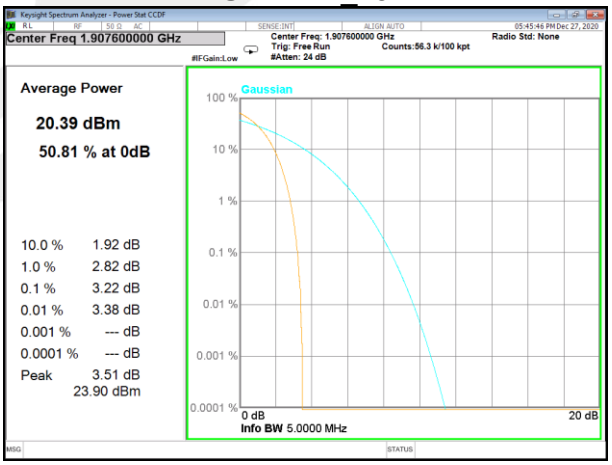


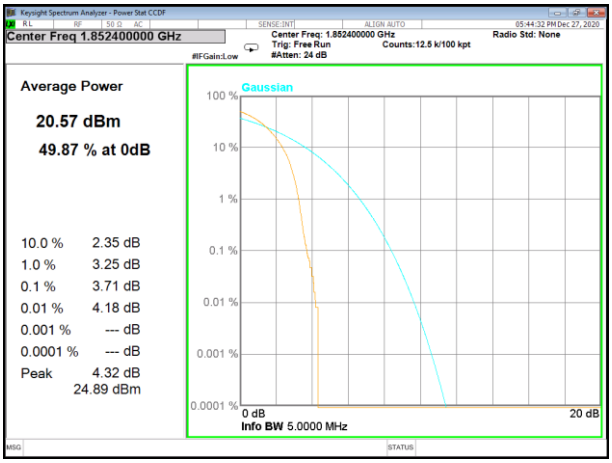
HSDPA B2_Low



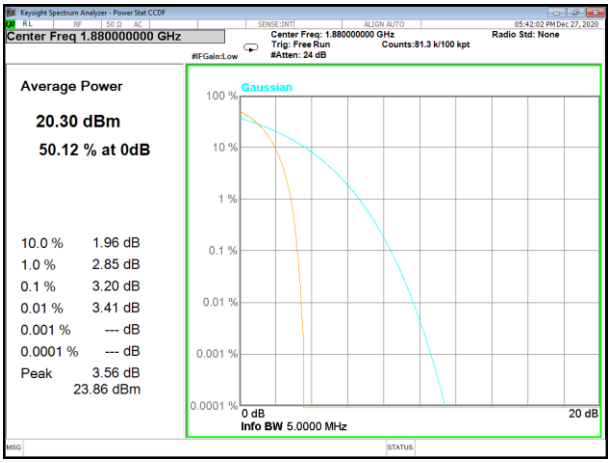
HSDPA B2_Middle



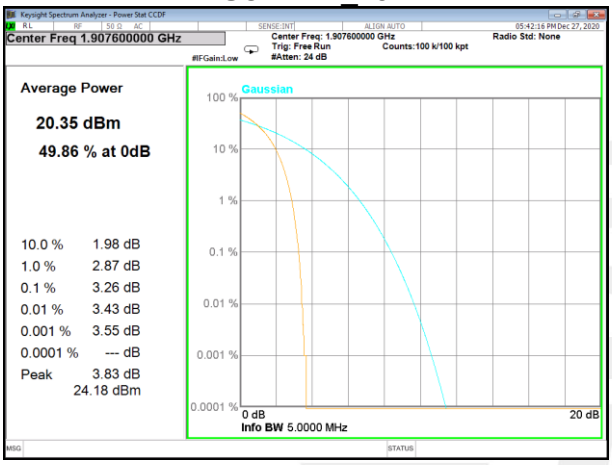
HSDPA B2_High



HSUPA B2_Low



HSUPA B2_Middle



HSUPA B2_High