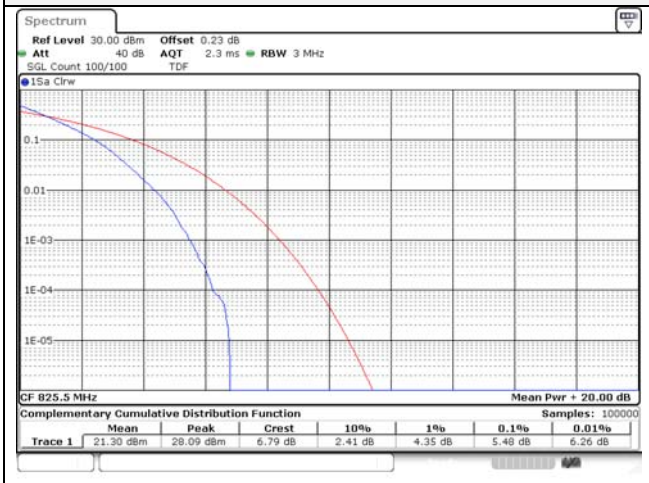
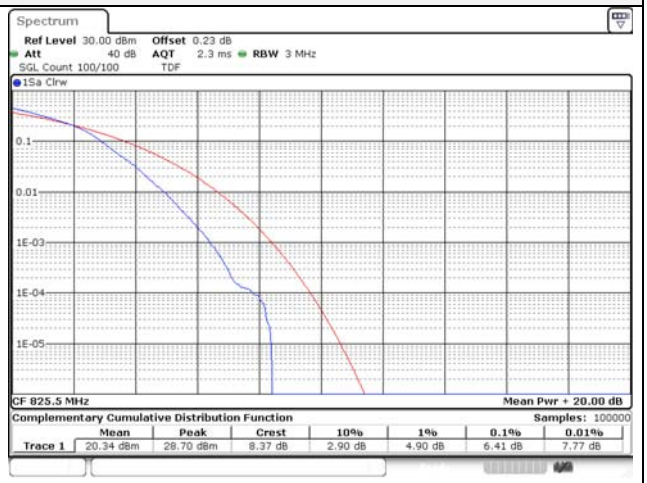
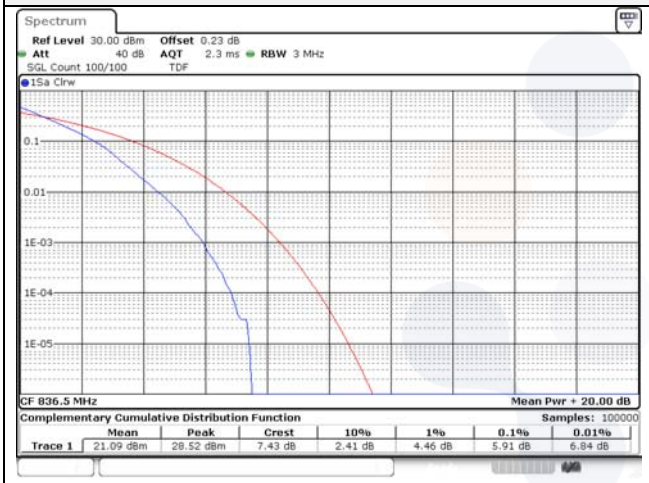
3M BW QPSK Low ch.



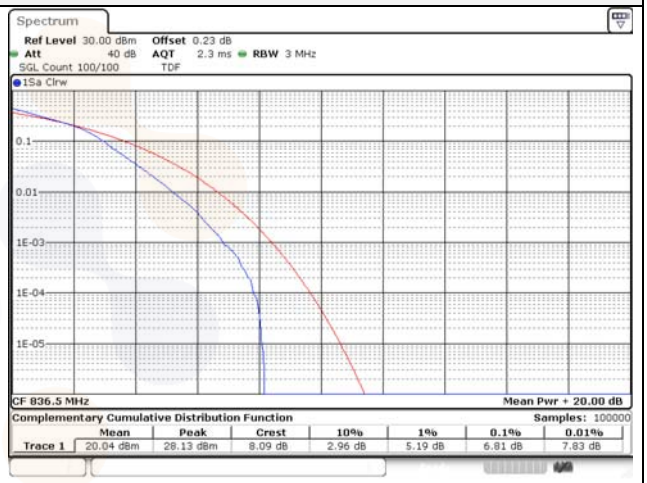
3M BW 16QAM Low ch.



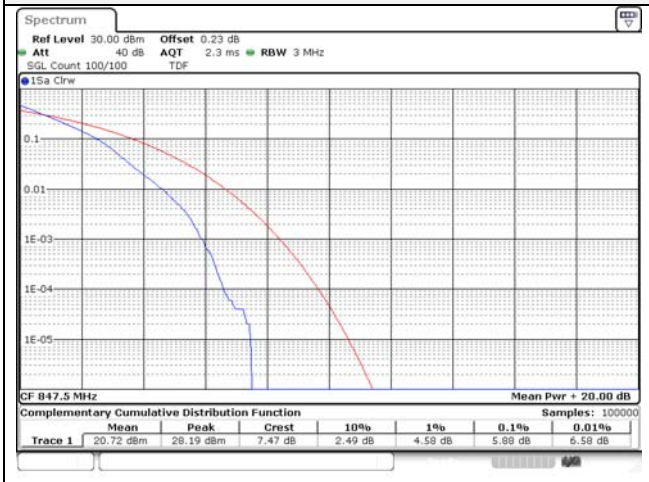
3M BW QPSK Mid ch.



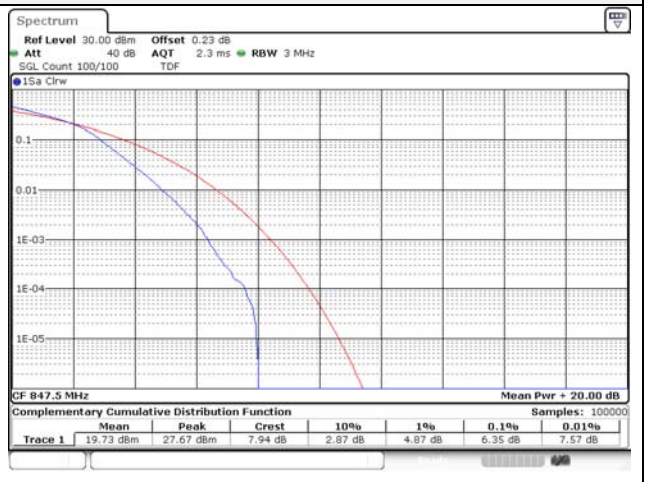
3M BW 16QAM Mid ch.



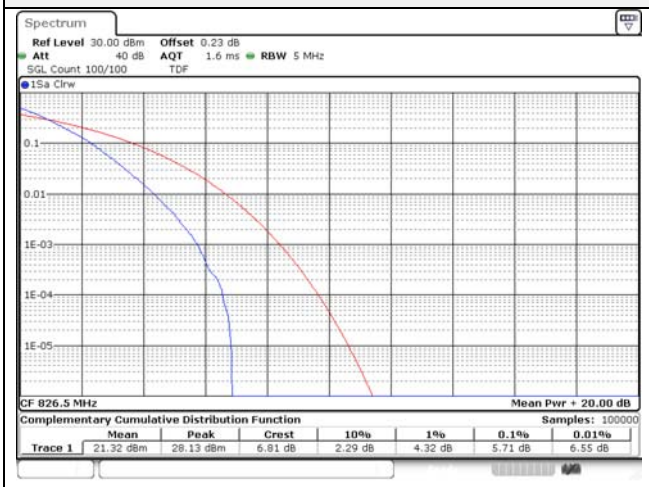
3M BW QPSK High ch.



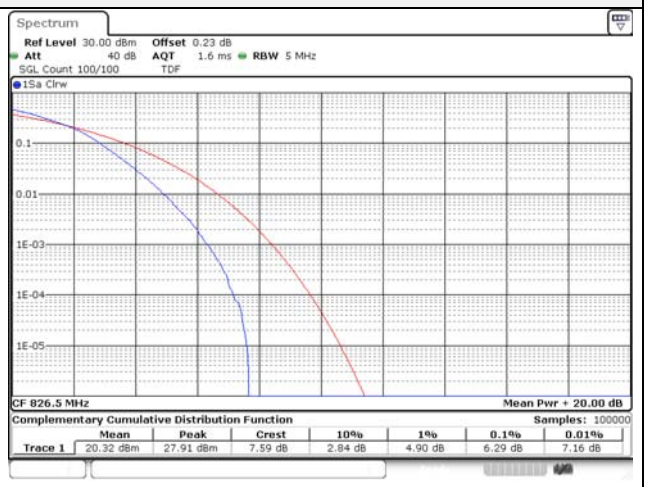
3M BW 16QAM High ch.



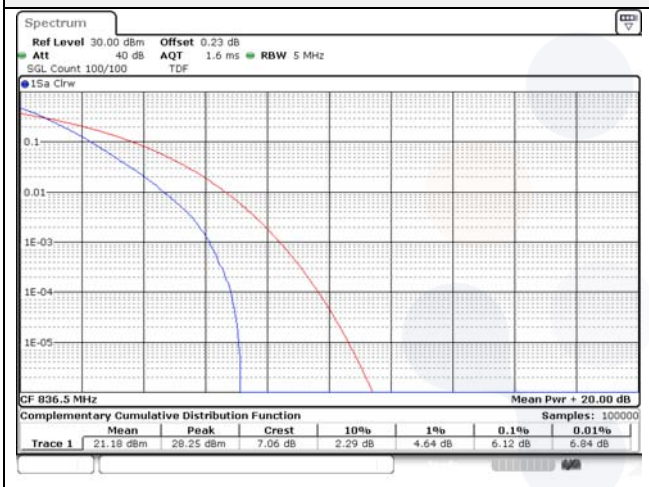
5M BW QPSK Low ch.



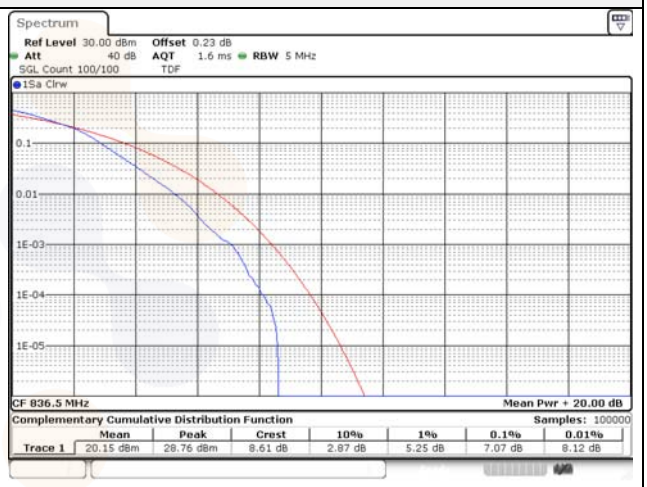
5M BW 16QAM Low ch.



5M BW QPSK Mid ch.



5M BW 16QAM Mid ch.



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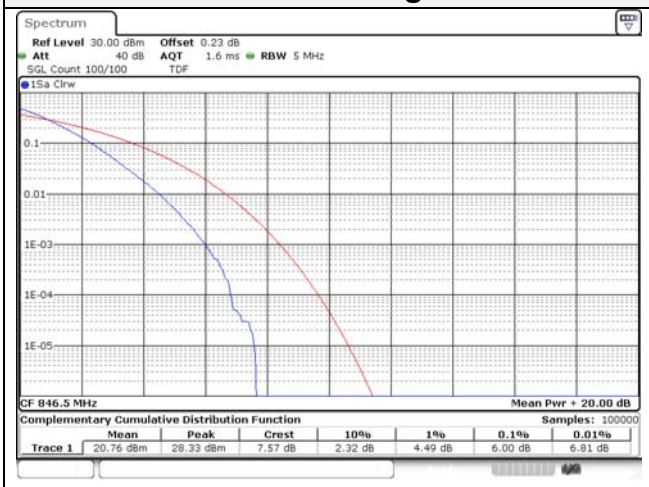
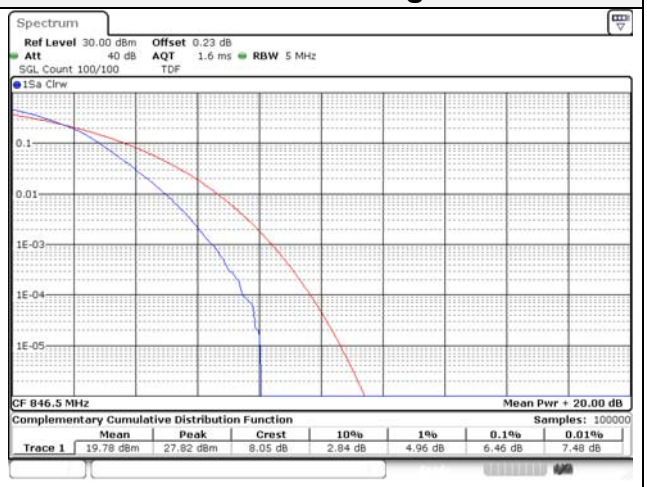
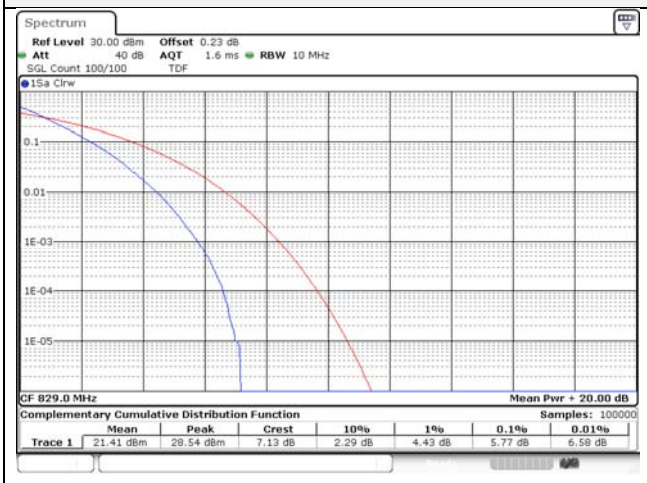


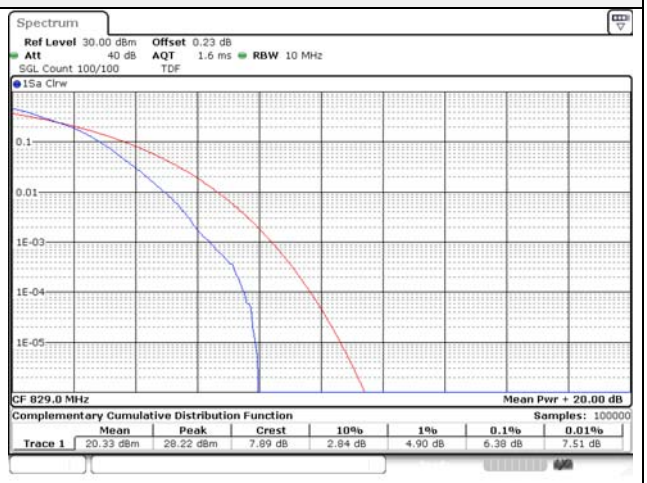
5M BW 16QAM High ch.



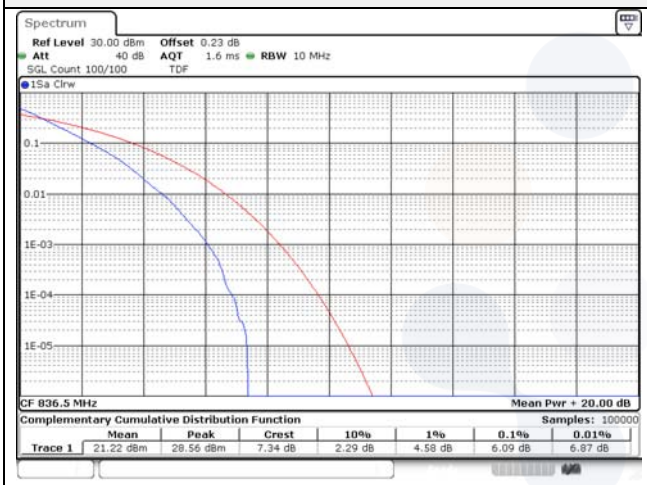
10M BW QPSK Low ch.



10M BW 16QAM Low ch.



10M BW QPSK Mid ch.



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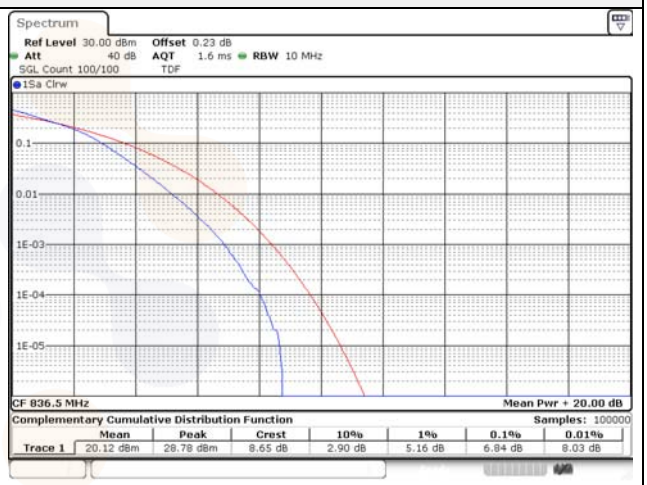
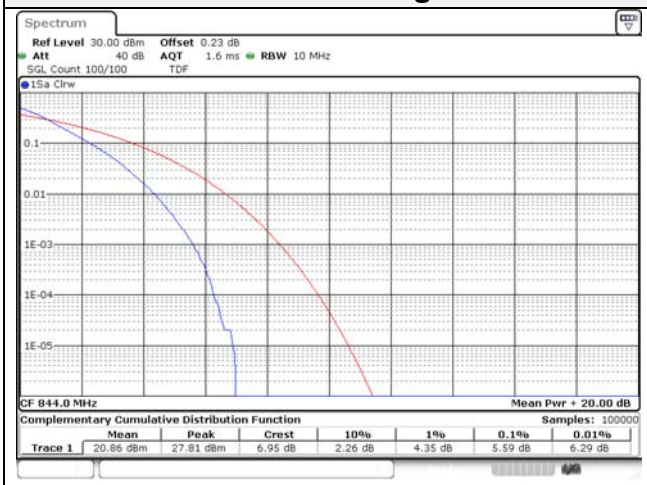
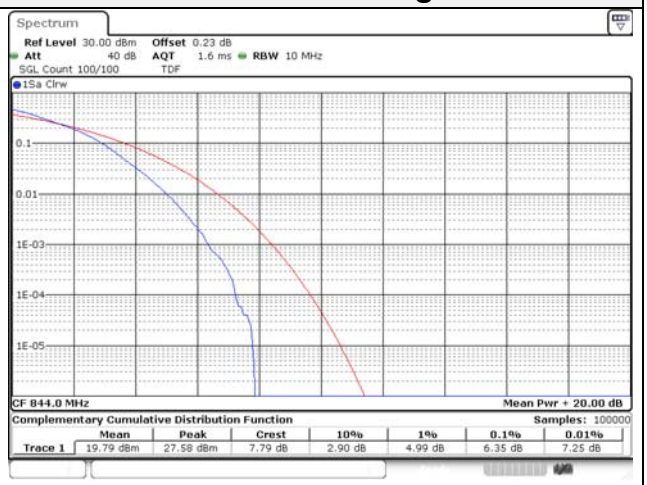


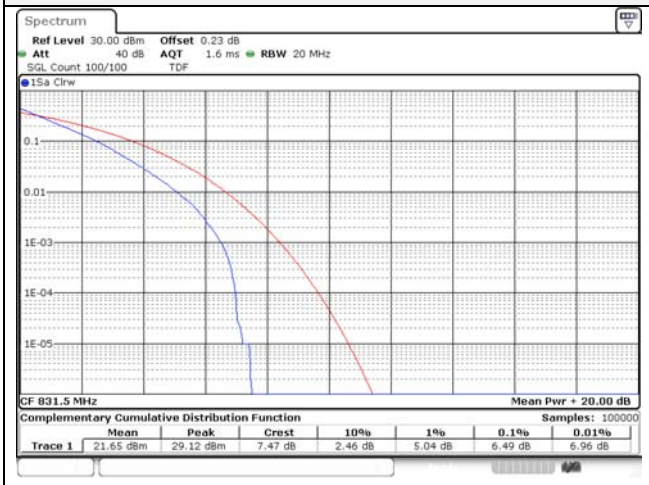
10M BW QPSK High ch.



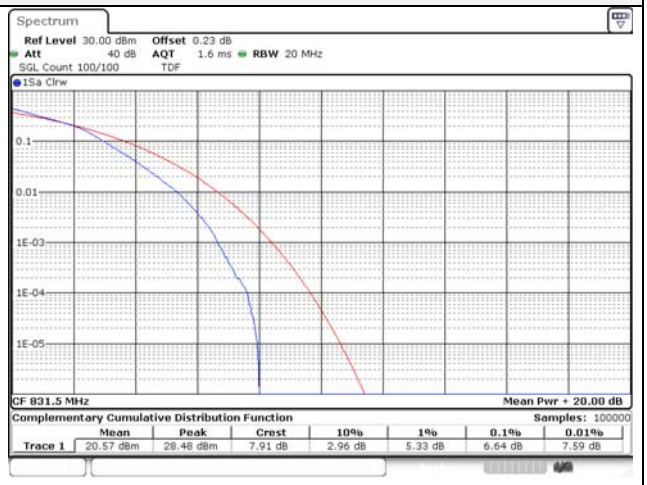
10M BW 16QAM High ch.



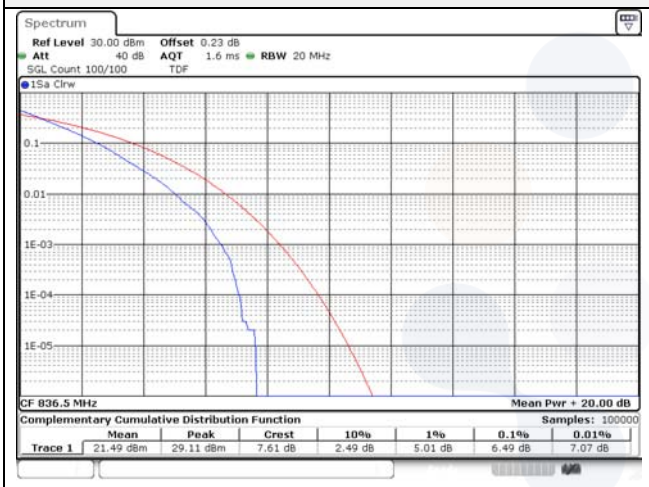
15M BW QPSK Low ch.



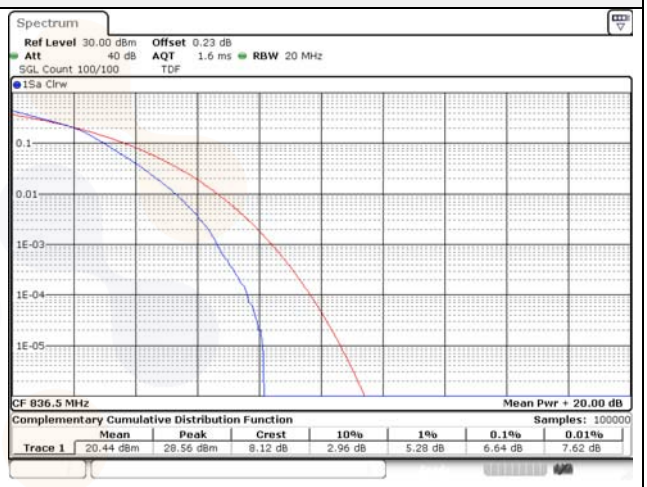
15M BW 16QAM Low ch.



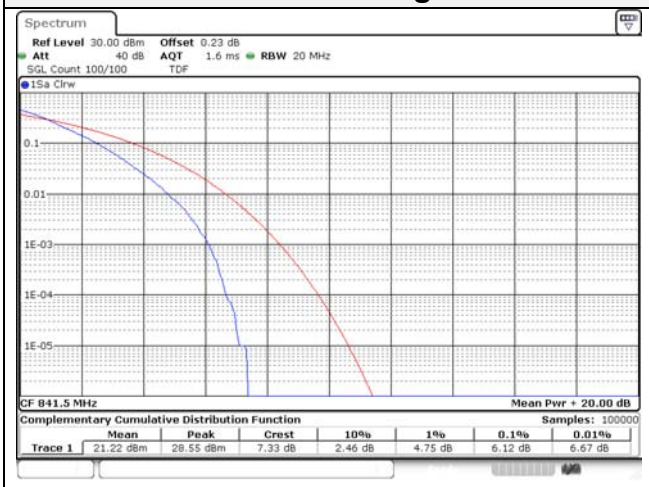
15M BW QPSK Mid ch.



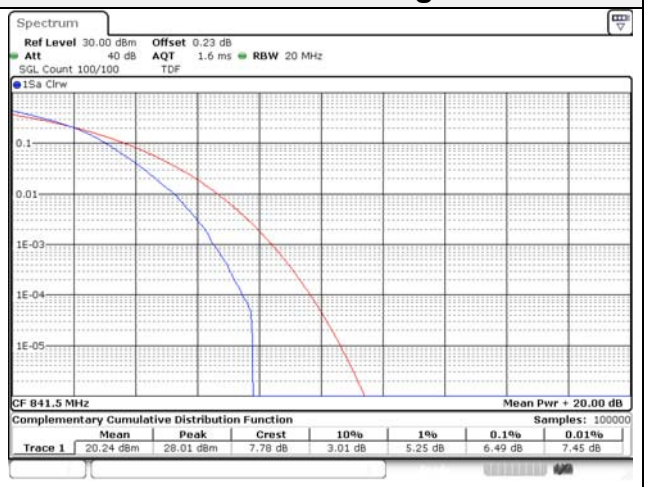
15M BW 16QAM Mid ch.



15M BW QPSK High ch.

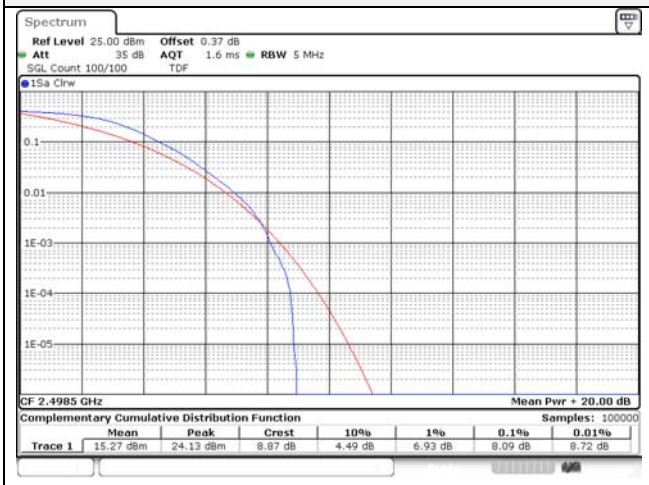


15M BW 16QAM High ch.

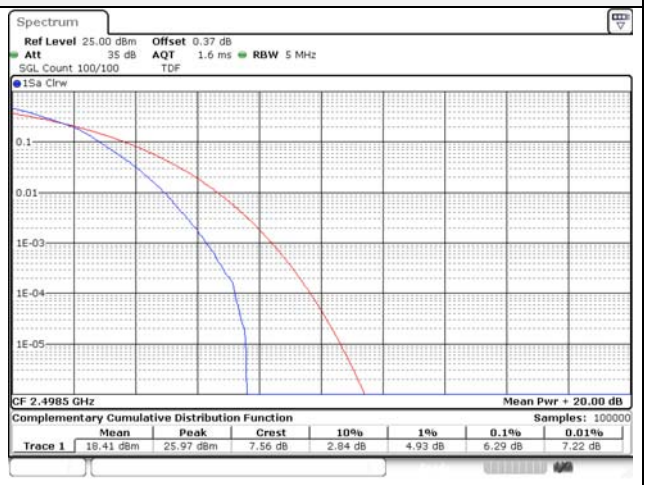


Test mode: LTE Band 41

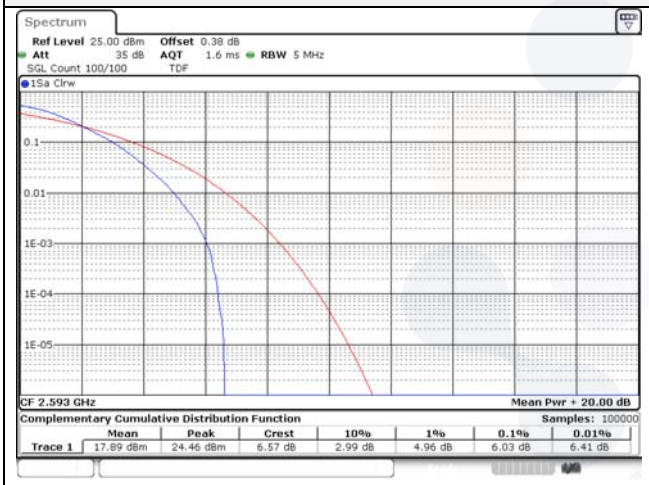
5M BW QPSK Low ch.



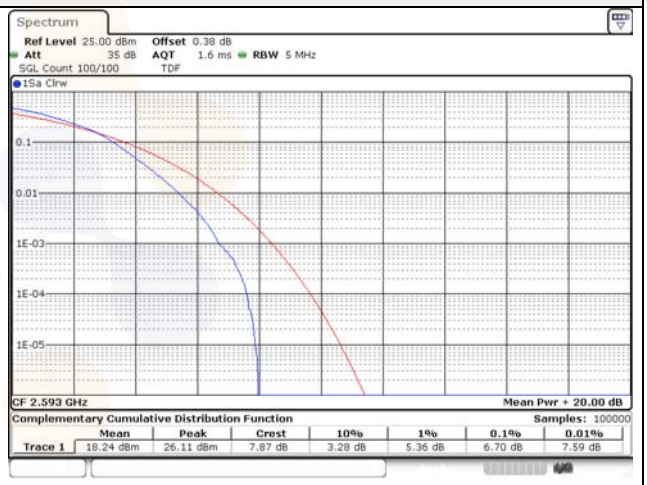
5M BW 16QAM Low ch.



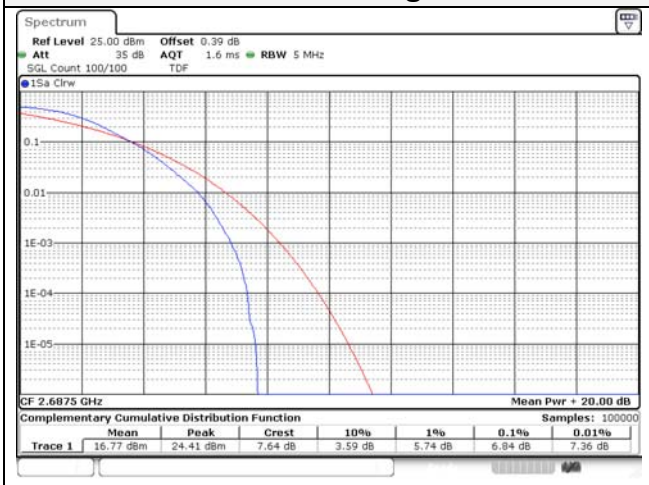
5M BW QPSK Mid ch.



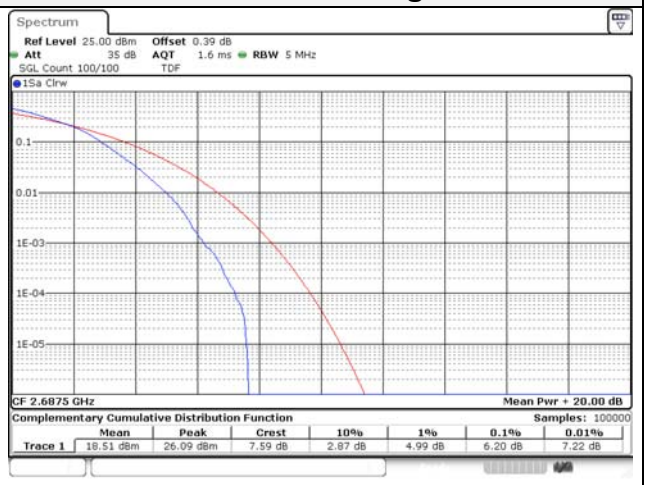
5M BW 16QAM Mid ch.



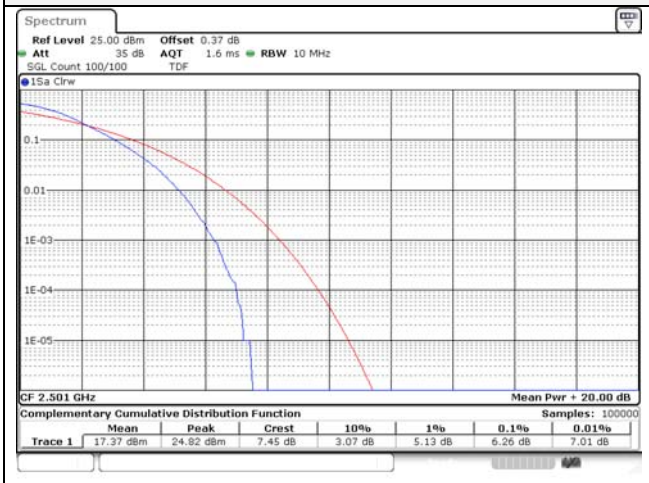
5M BW QPSK High ch.



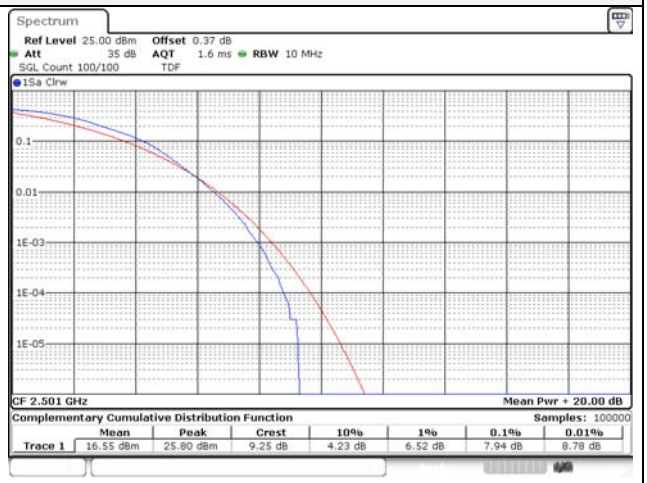
5M BW 16QAM High ch.



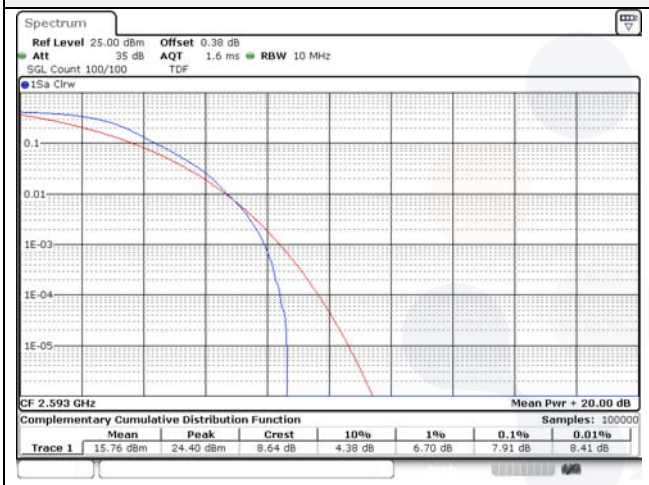
10M BW QPSK Low ch.



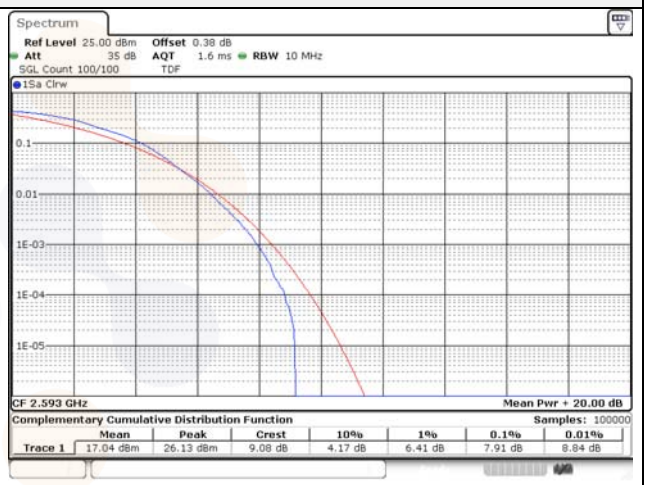
10M BW 16QAM Low ch.



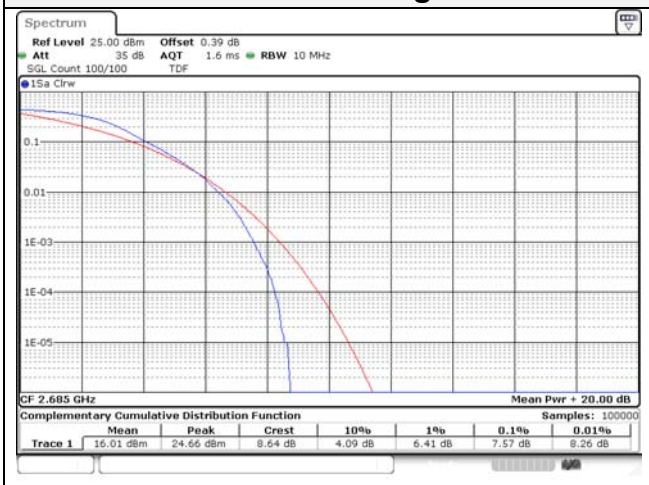
10M BW QPSK Mid ch.



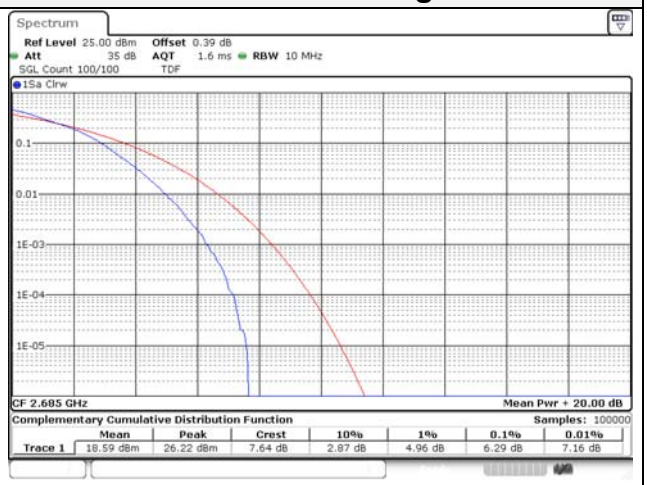
10M BW 16QAM Mid ch.



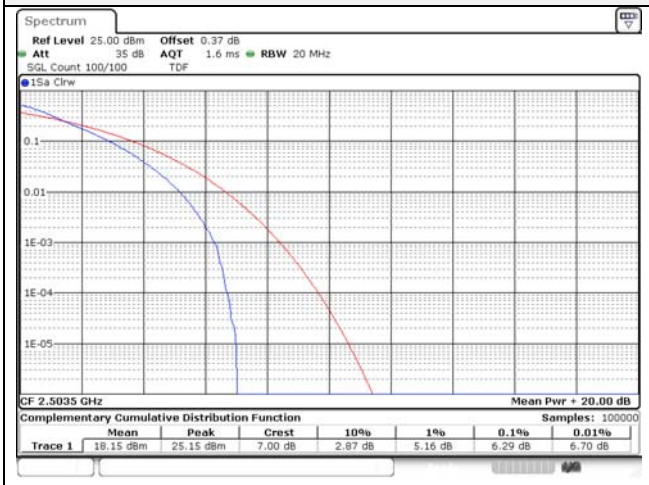
10M BW QPSK High ch.



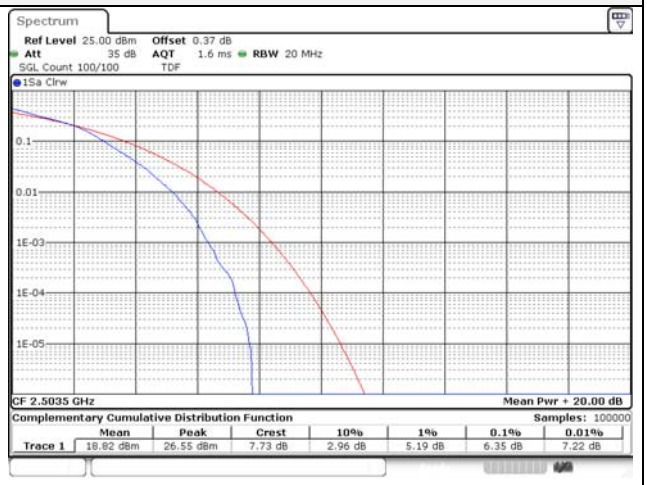
10M BW 16QAM High ch.



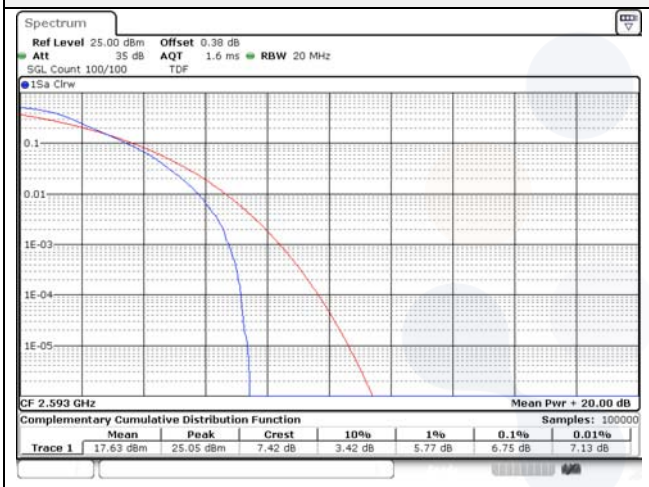
15M BW QPSK Low ch.



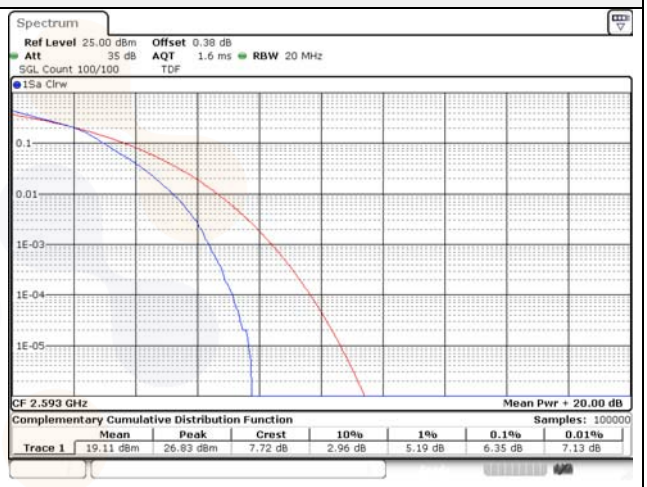
15M BW 16QAM Low ch.



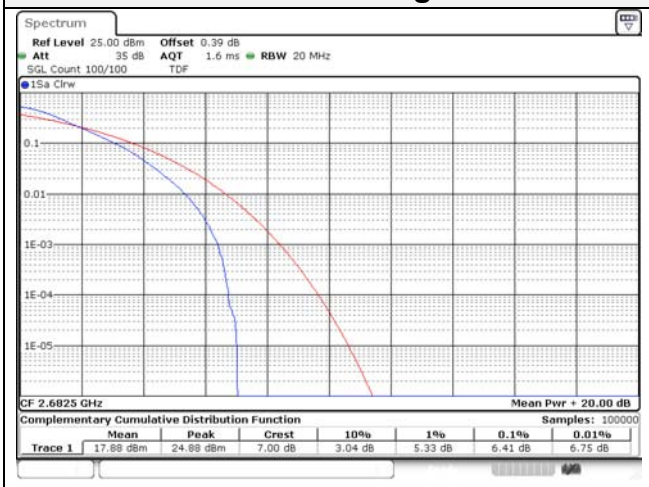
15M BW QPSK Mid ch.



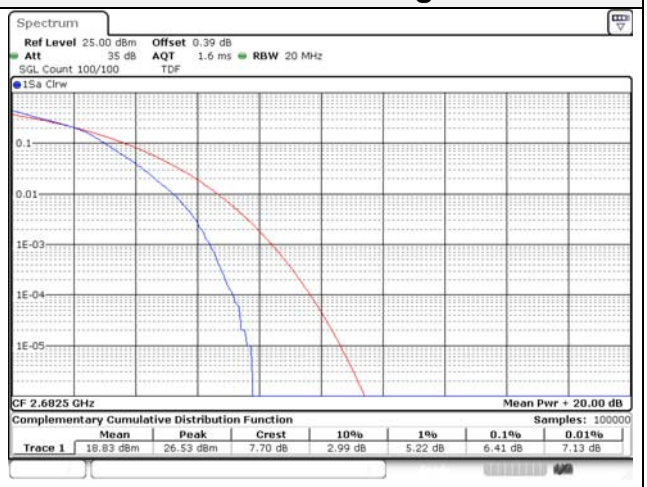
15M BW 16QAM Mid ch.



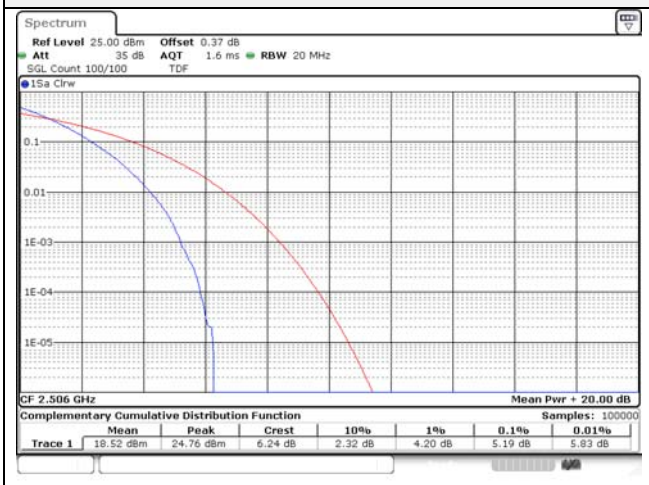
15M BW QPSK High ch.



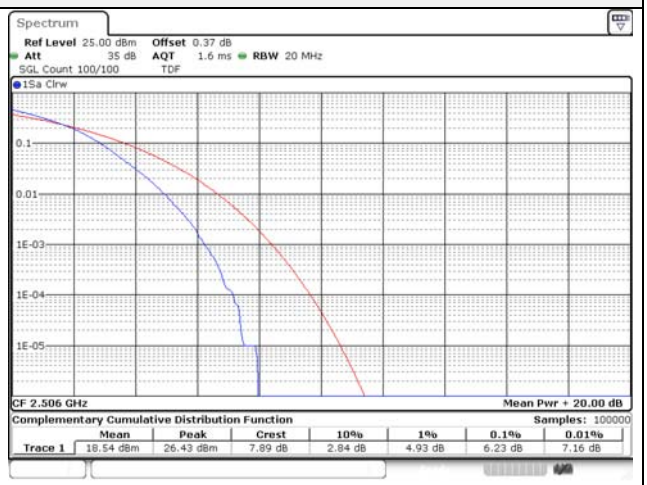
15M BW 16QAM High ch.



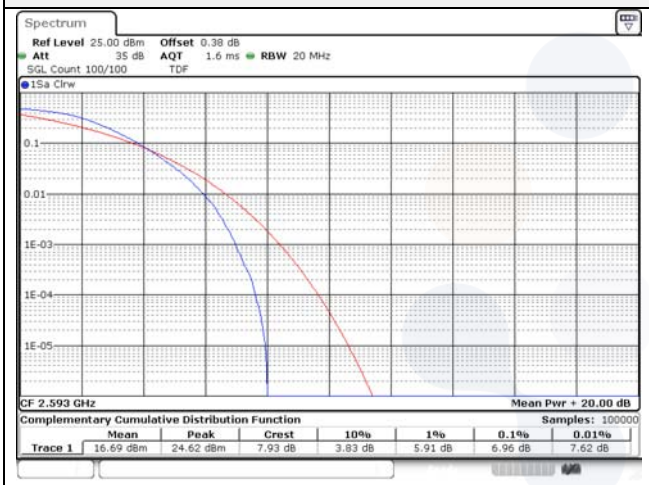
20M BW QPSK Low ch.



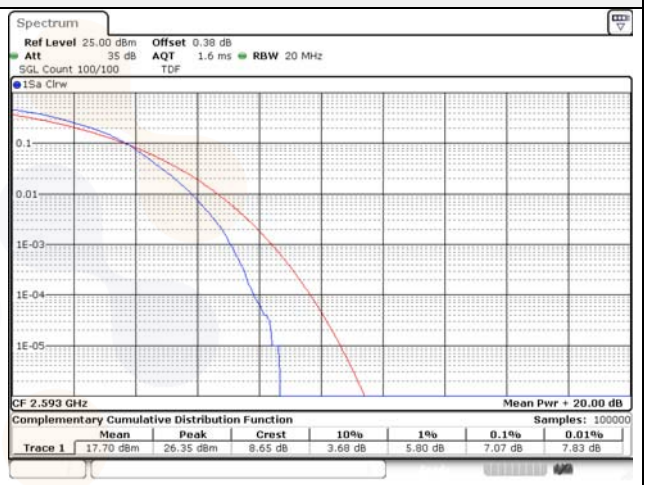
20M BW 16QAM Low ch.



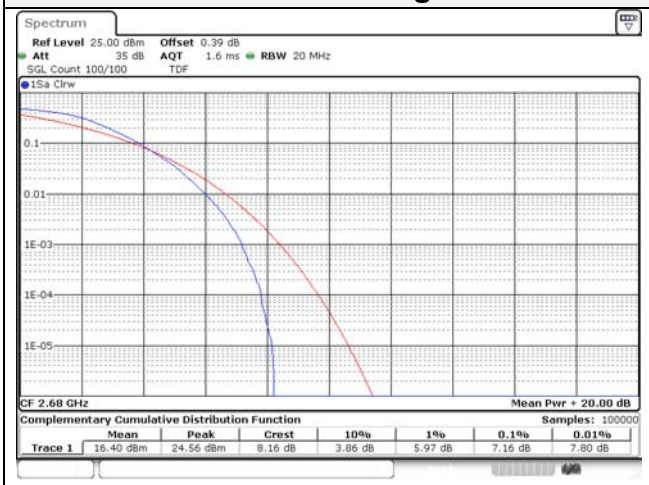
20M BW QPSK Mid ch.



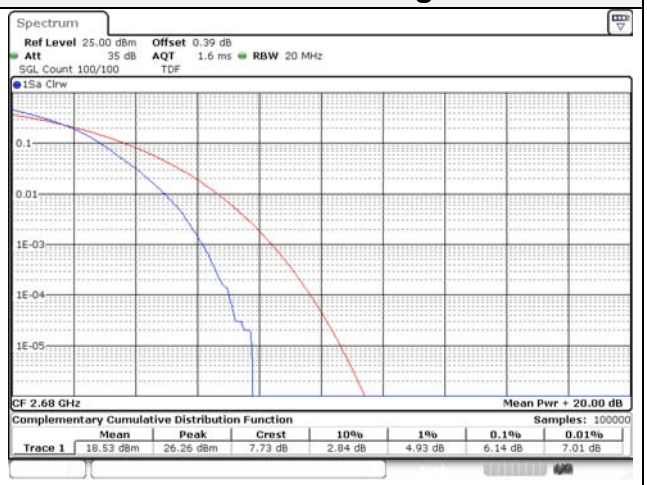
20M BW 16QAM Mid ch.



20M BW QPSK High ch.

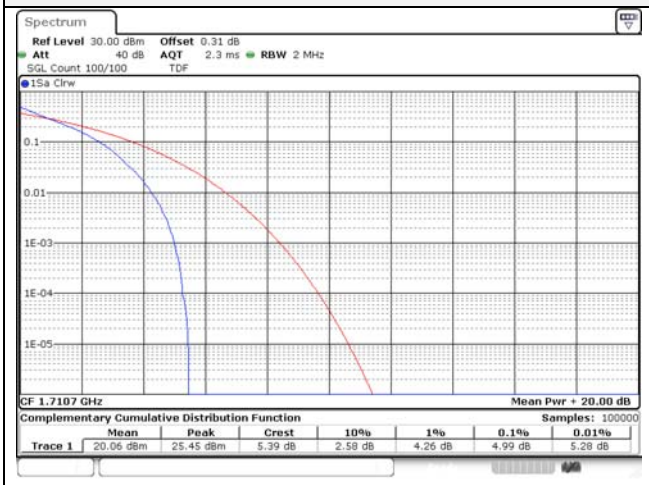


20M BW 16QAM High ch.

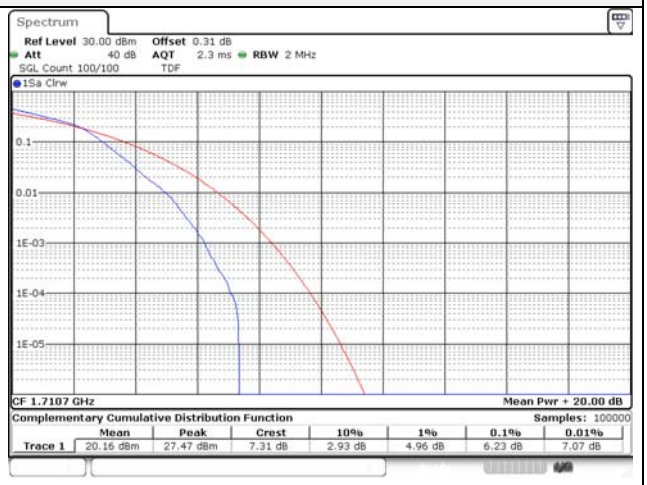


Test mode: LTE Band 66

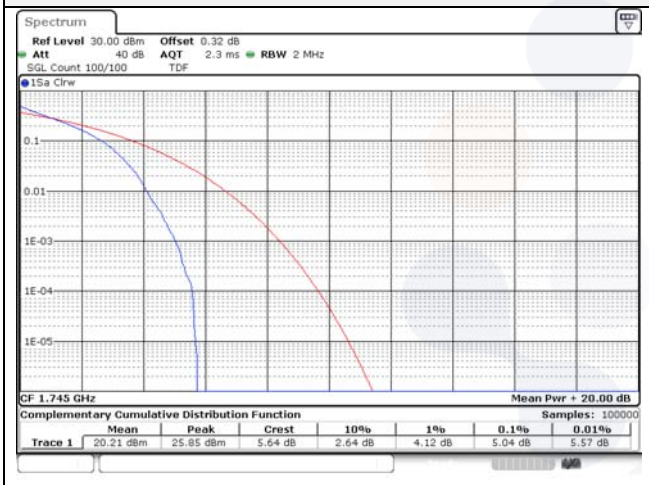
1.4M BW QPSK Low ch.



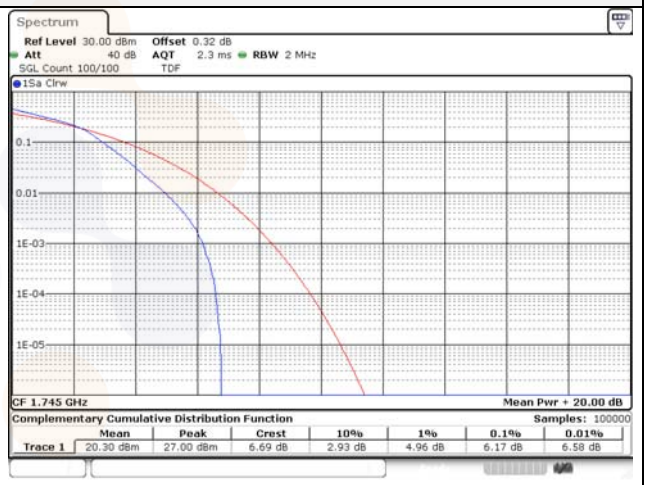
1.4M BW 16QAM Low ch.



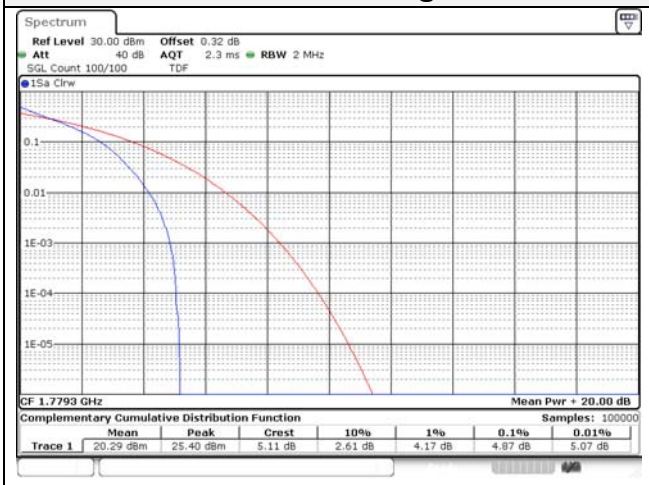
1.4M BW QPSK Mid ch.



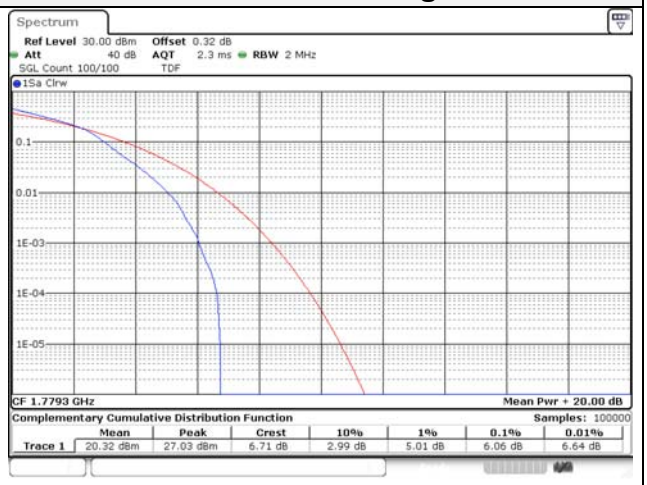
1.4M BW 16QAM Mid ch.



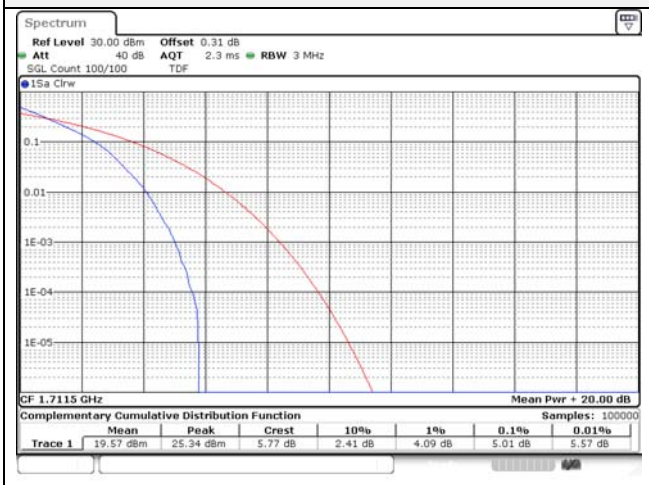
1.4M BW QPSK High ch.



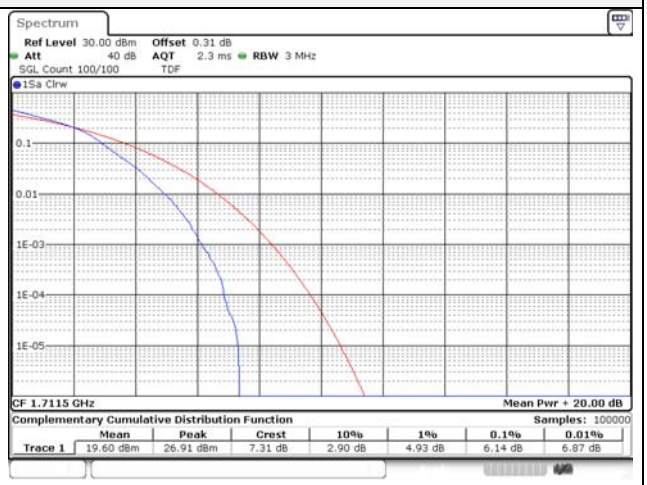
1.4M BW 16QAM High ch.



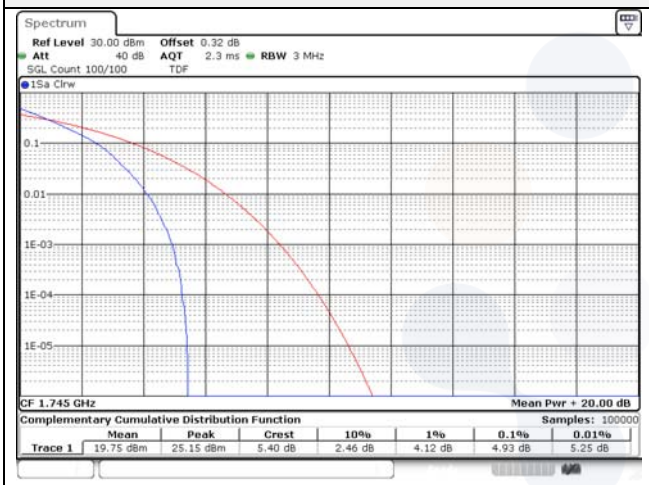
3M BW QPSK Low ch.



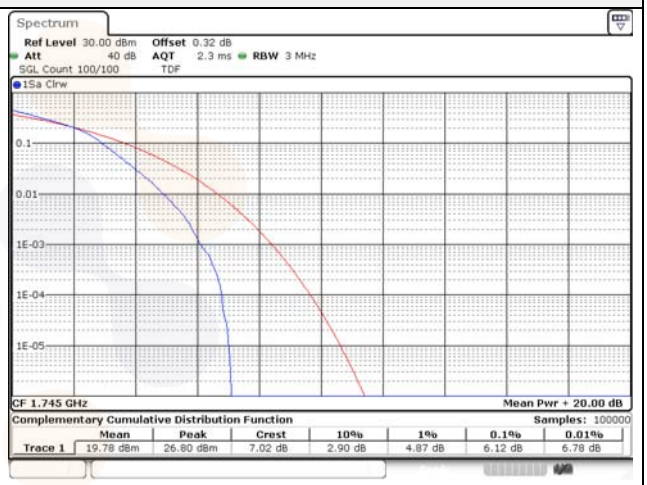
3M BW 16QAM Low ch.



3M BW QPSK Mid ch.



3M BW 16QAM Mid ch.



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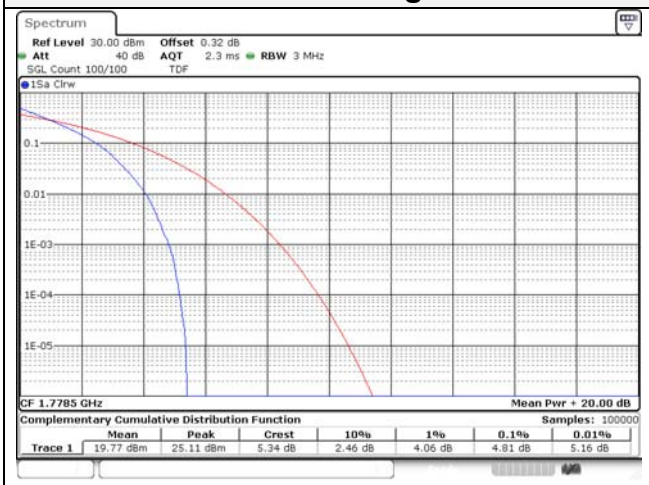

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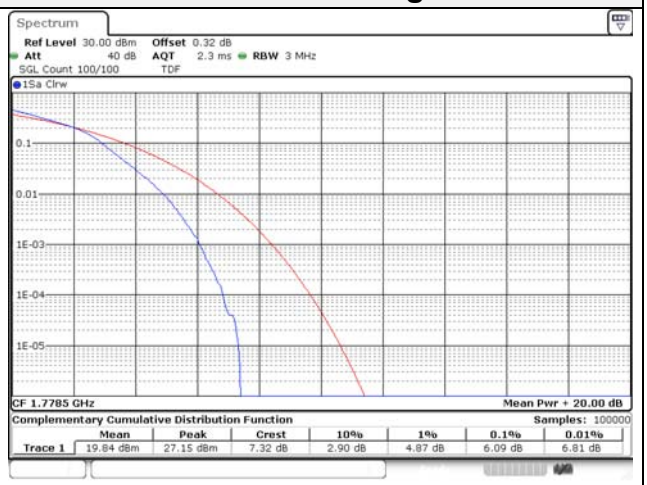

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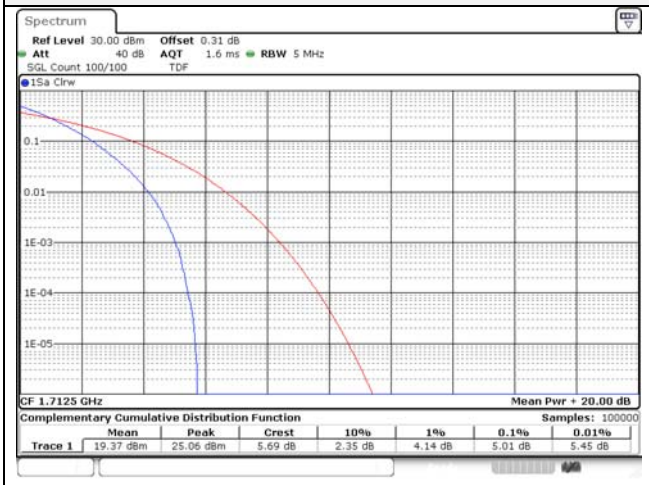

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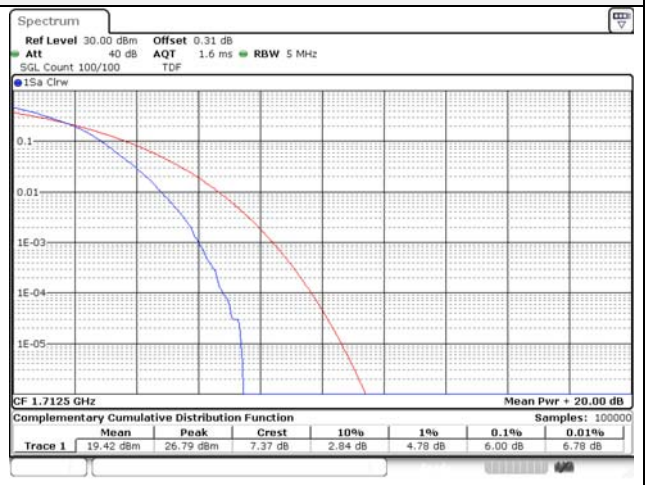

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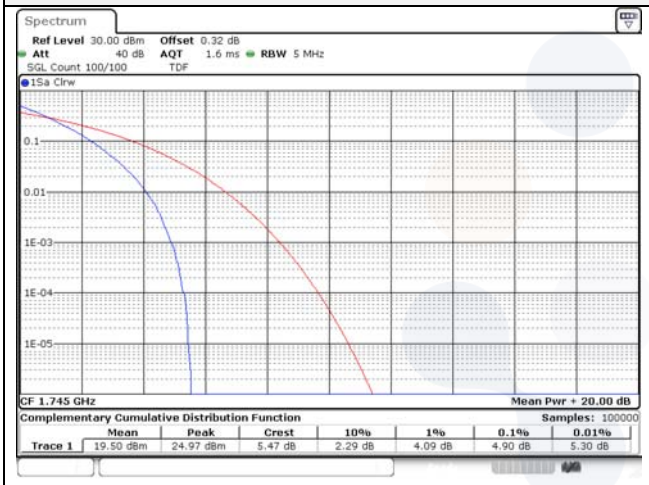

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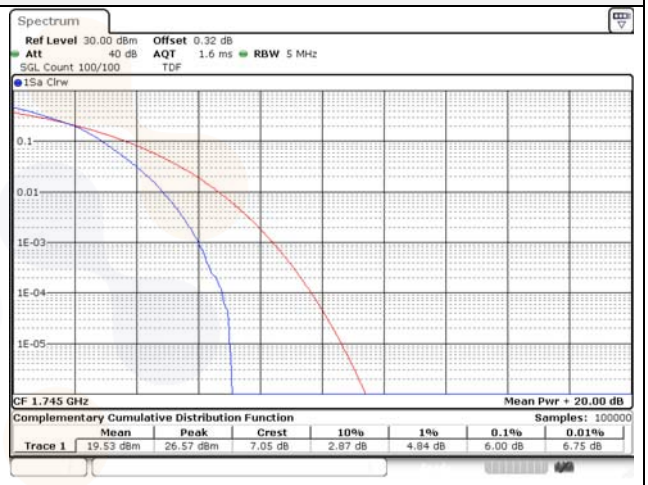

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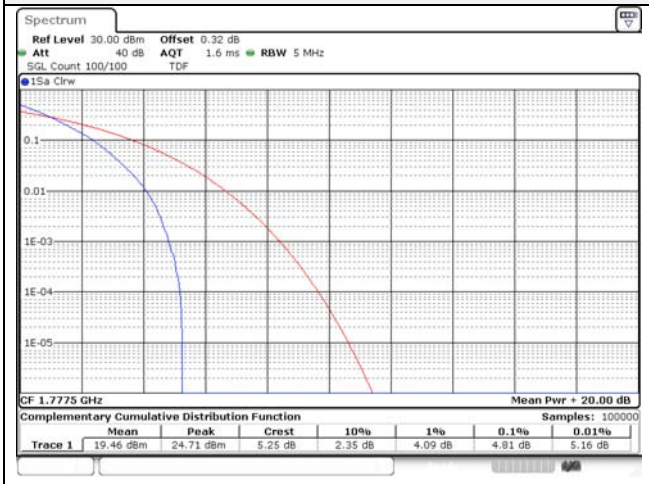

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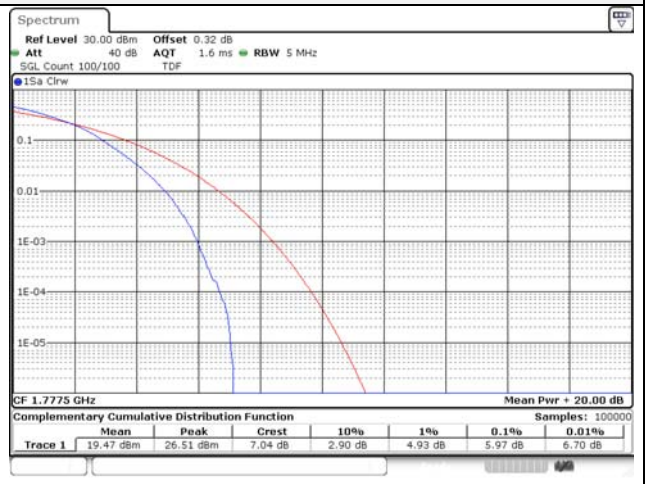

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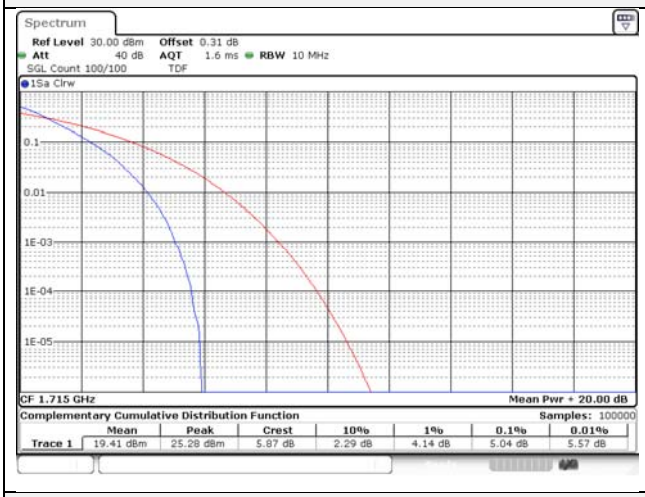

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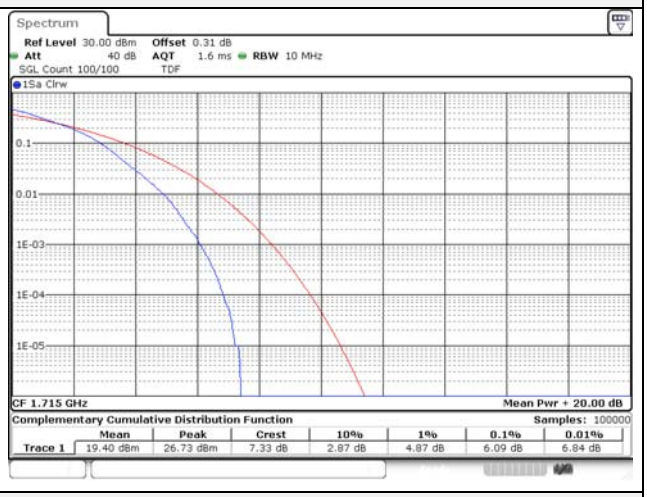

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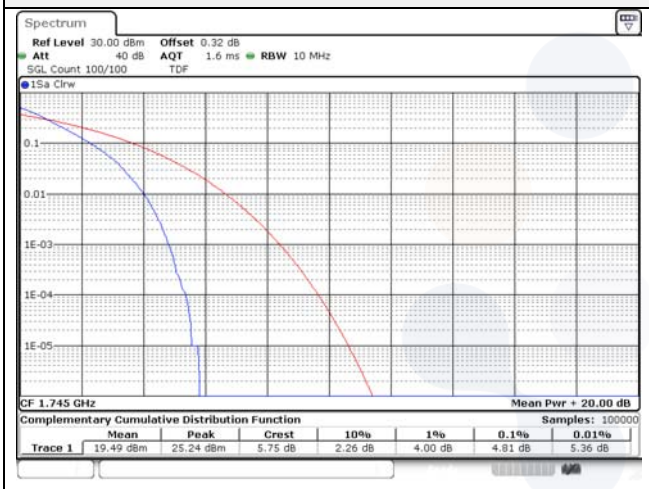

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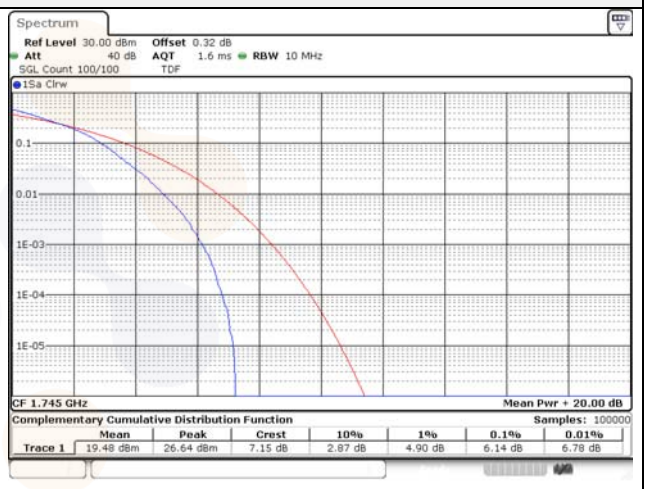
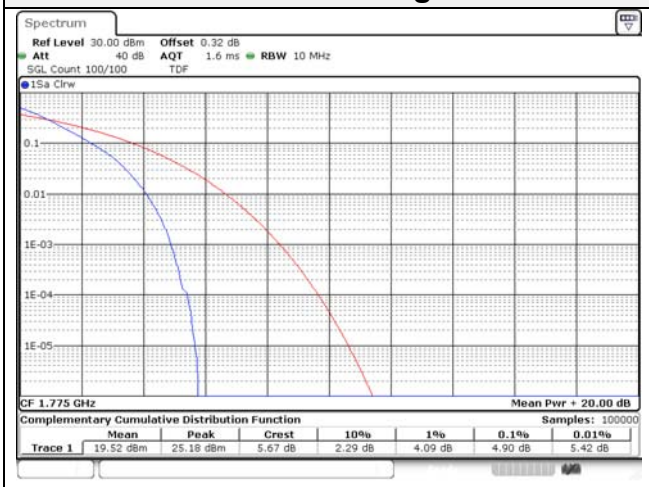
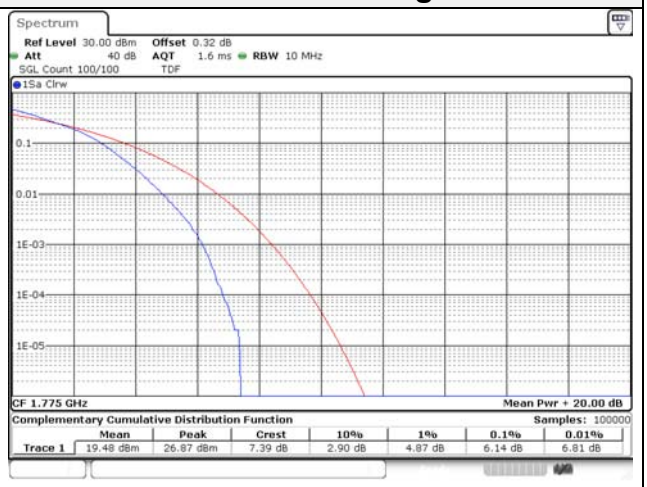


10M BW QPSK High ch.



10M BW 16QAM High ch.



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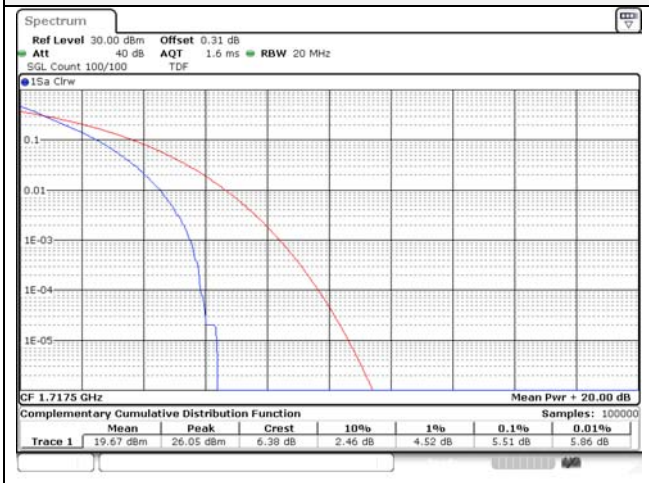

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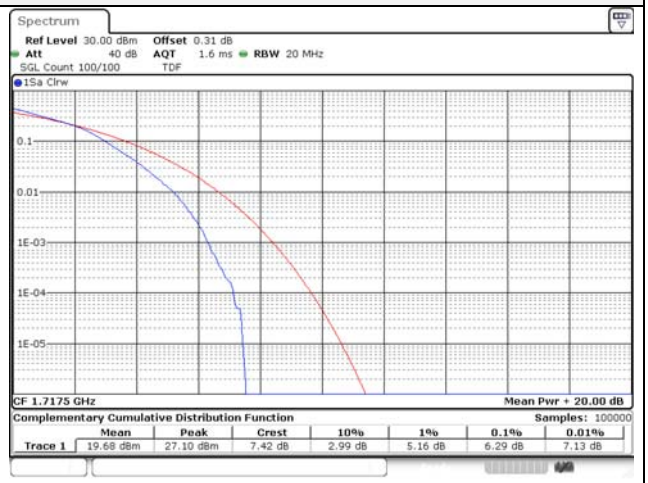

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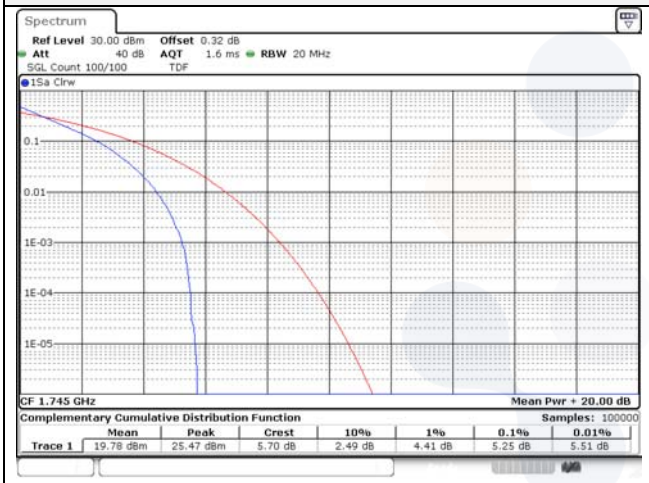

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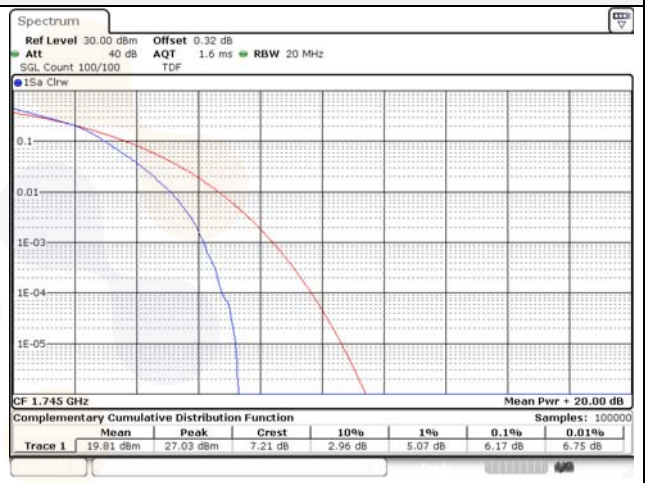

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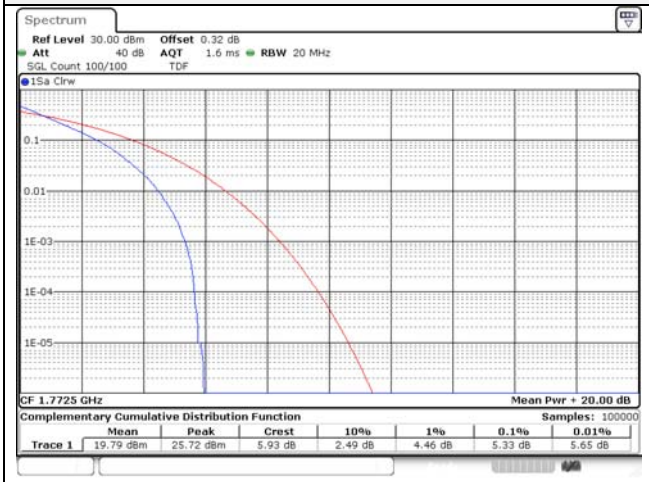

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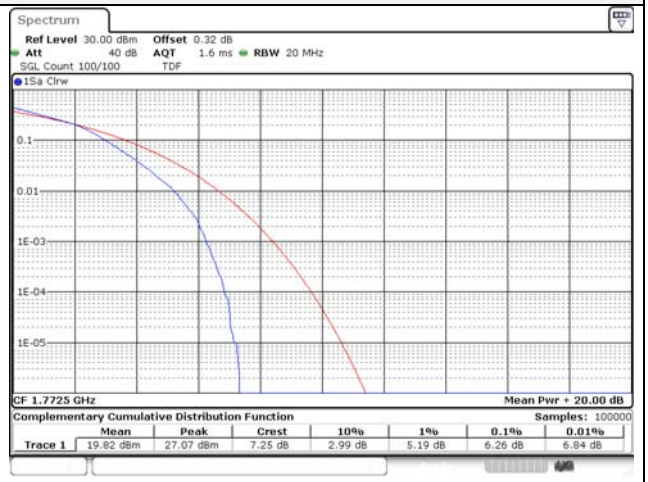

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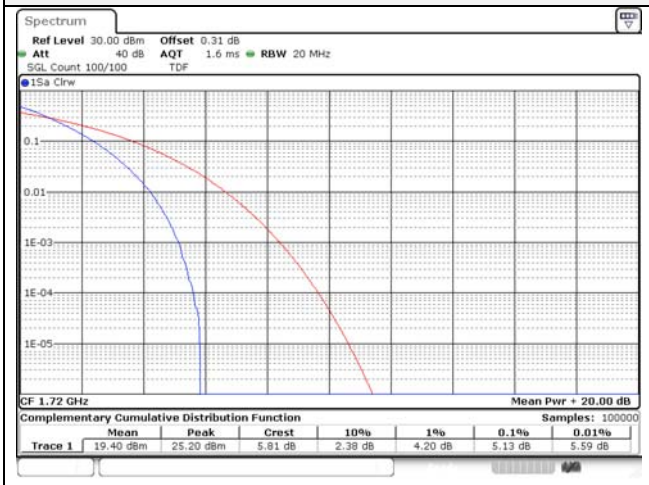

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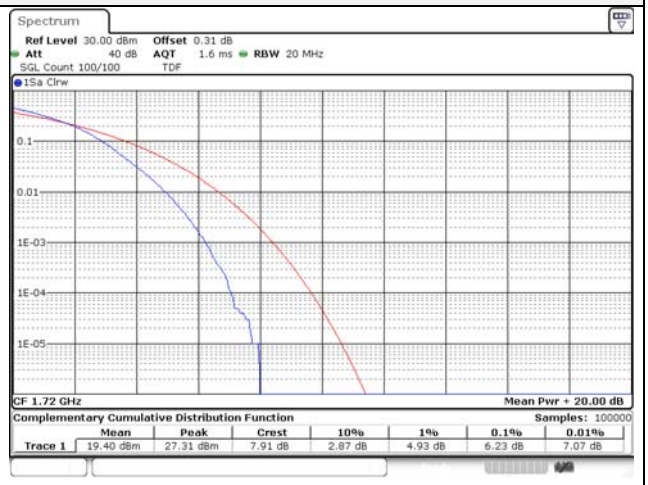

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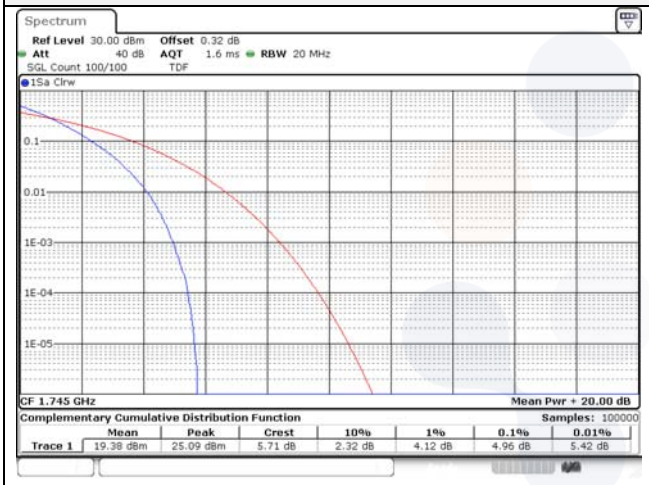

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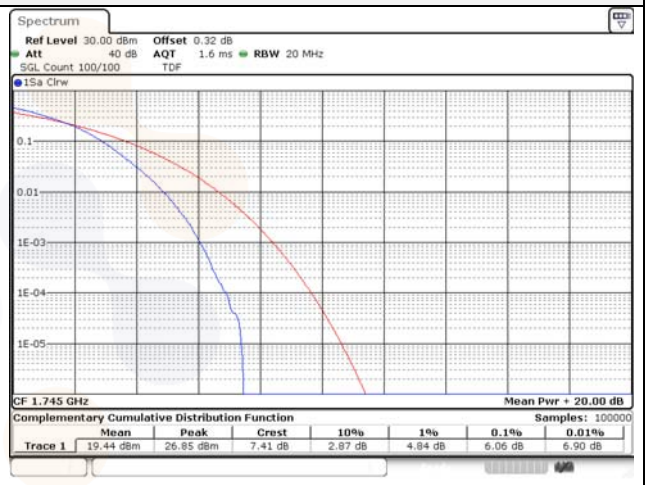

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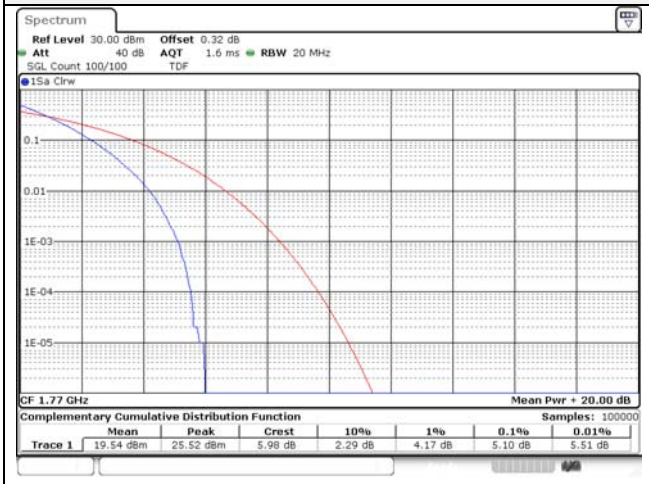

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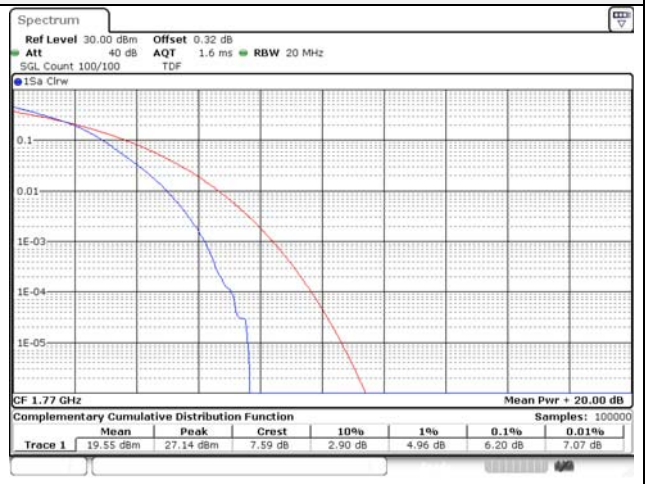
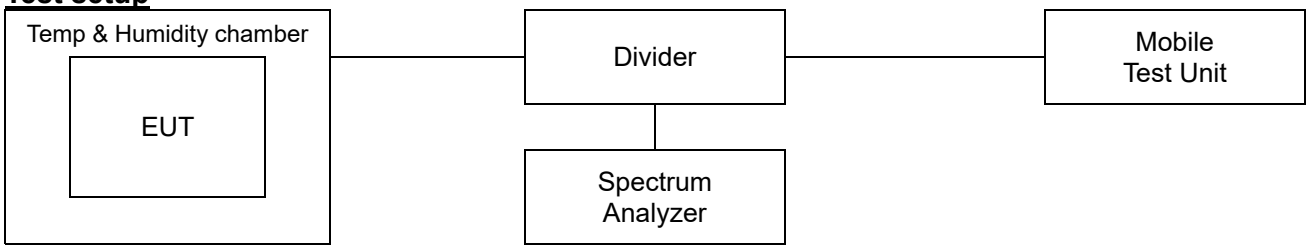


7.6. Frequency stability

Test setup



Limit

According to §2.1055(a),

The frequency stability shall be measured with variation of ambient temperature as follows:

1) From -30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
2) From -20° to + 50° centigrade for equipment to be licensed for use in the maritime services under part 80 of this chapter, except for class A, B, and S emergency position indicating radiobeacons (EPIRBS), and equipment to be licensed for use above 952 ㎒ at operational fixed stations in all services, stations in the local television transmission service and point-to-point microwave radio service under part 21 of this chapter, equipment licensed for use aboard aircraft in the aviation services under part 87 of this chapter, and equipment authorized for use in the family radio service under part 95 of this chapter.
3) From 0° to + 50° centigrade for equipment to be licensed for use in the radio broadcast Services under part 73 of this chapter.

According to §2.1055(d),

The frequency stability shall be measured with variation of primary supply Voltage as follows:

1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacturer.
3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

According to §22.355,

The carrier frequency of each transmitter in the public mobile services must be maintained within the tolerances given in Table of this section.

For mobile devices operating in the 824 to 849 ㎒ band at a power level than or equal to 3 Watts, the limit specified in Table C-1 is ±2.5 ppm.

According to §24.235,
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±1.0 ppm for base stations.

According to §27.54,
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

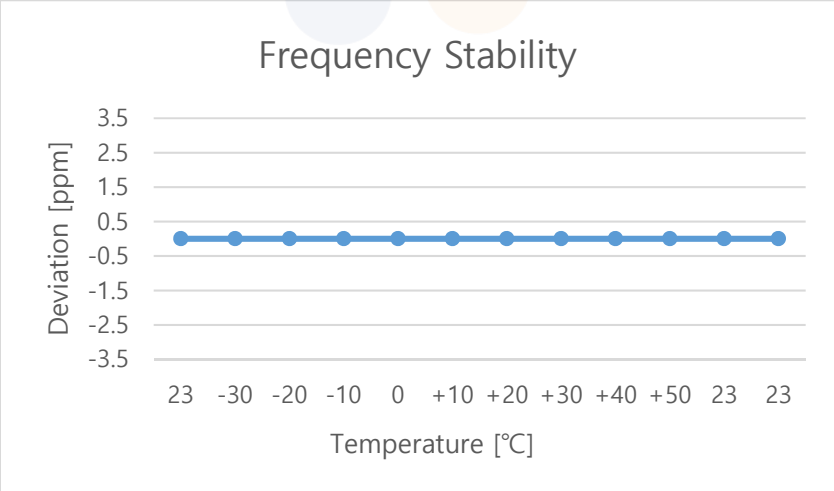
Test procedure
ANSI 63.26-2015 – Section 5.6

Test settings
1) The carrier frequency of the transmitter is measured at room temperature. (20°C to provide a reference)
2) The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3) Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each Temperature level.

Test results

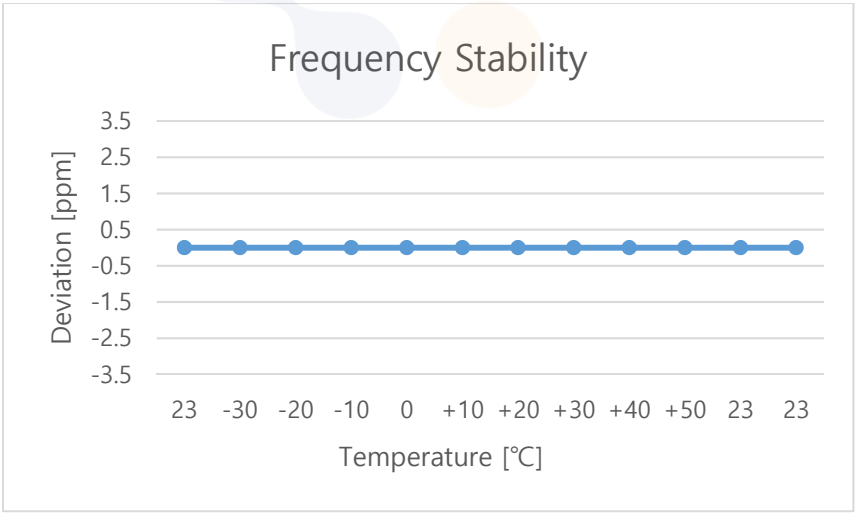
Test mode : LTE Band 2
Frequency (㎐) : 1 880 000 000
Channel : 18900
Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	1,879,999,994	5.76	0.0	0.000000
		-30	1,879,999,991	8.61	0.0	0.000000
		-20	1,879,999,992	7.81	0.0	0.000000
		-10	1,879,999,993	6.82	0.0	0.000000
		0	1,879,999,998	1.92	0.0	0.000000
		+10	1,879,999,997	3.16	0.0	0.000000
		+20	1,879,999,994	5.58	0.0	0.000000
		+30	1,879,999,997	3.10	0.0	0.000000
		+40	1,879,999,994	6.21	0.0	0.000000
		+50	1,879,999,993	7.41	0.0	0.000000
115%	4.46	+23(Ref)	1,879,999,995	5.18	0.0	0.000000
End point	3.40	+23(Ref)	1,879,999,995	4.78	0.0	0.000000



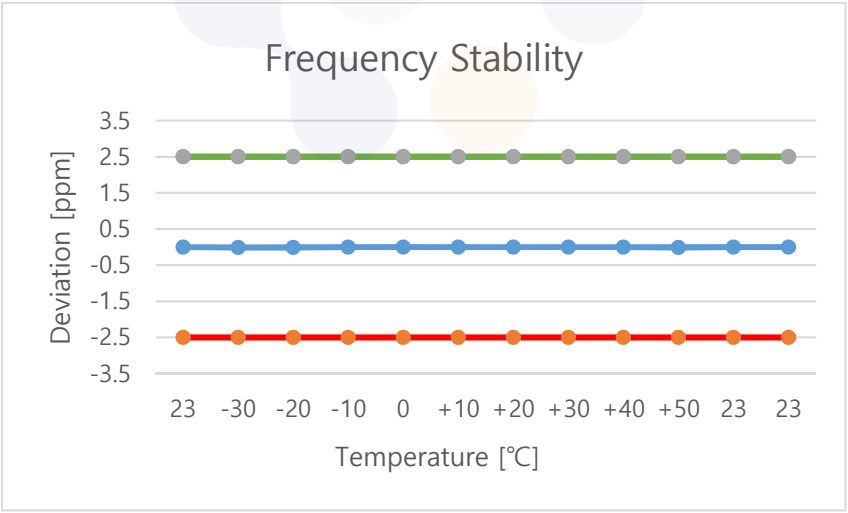
Test mode : LTE Band 4
Frequency (㎐) : 1 732 500 000
Channel : 20175
Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized bands of operation.

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	1,732,500,004	-3.89	0.0	0.000000
		-30	1,732,499,993	6.94	0.0	0.000000
		-20	1,732,499,994	5.88	0.0	0.000000
		-10	1,732,499,995	4.95	0.0	0.000000
		0	1,732,500,000	0.43	0.0	0.000000
		+10	1,732,500,001	-0.92	0.0	0.000000
		+20	1,732,500,002	-1.99	0.0	0.000000
		+30	1,732,500,002	-2.27	0.0	0.000000
		+40	1,732,500,003	-3.40	0.0	0.000000
		+50	1,732,500,006	-6.32	0.0	0.000000
115%	4.46	+23(Ref)	1,732,500,003	-3.45	0.0	0.000000
End point	3.40	+23(Ref)	1,732,500,004	-3.56	0.0	0.000000



Test mode : LTE Band 5
Frequency (㎐) : 836 500 000
Channel : 20525
Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	836,499,998	1.65	0.0	0.000000
		-30	836,499,994	6.22	0.0	-0.000001
		-20	836,499,995	4.72	0.0	-0.000001
		-10	836,499,998	2.30	0.0	0.000000
		0	836,499,996	3.86	0.0	0.000000
		+10	836,499,998	2.10	0.0	0.000000
		+20	836,499,999	0.70	0.0	0.000000
		+30	836,499,998	2.12	0.0	0.000000
		+40	836,499,997	3.28	0.0	0.000000
		+50	836,499,994	6.04	0.0	-0.000001
115%	4.46	+23(Ref)	836,499,997	2.65	0.0	0.000000
End point	3.40	+23(Ref)	836,499,997	3.23	0.0	0.000000



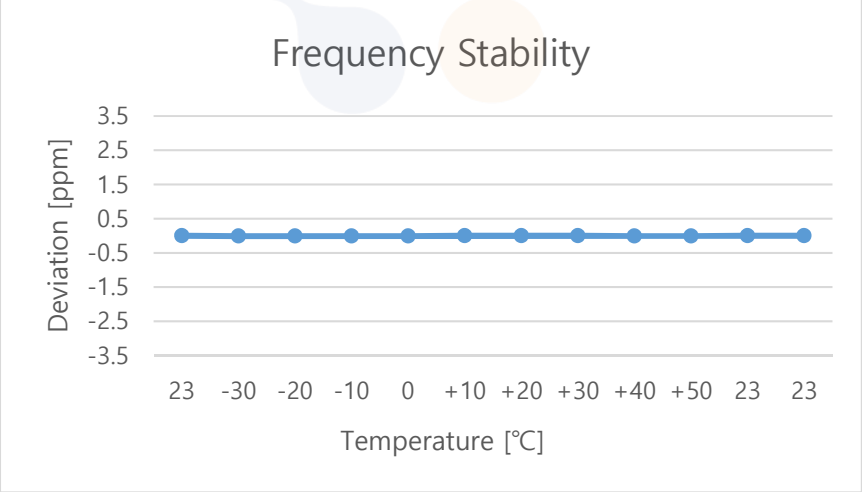
Test mode : LTE Band 12/17

Frequency (㎐) : 707 500 000

Channel : 23095

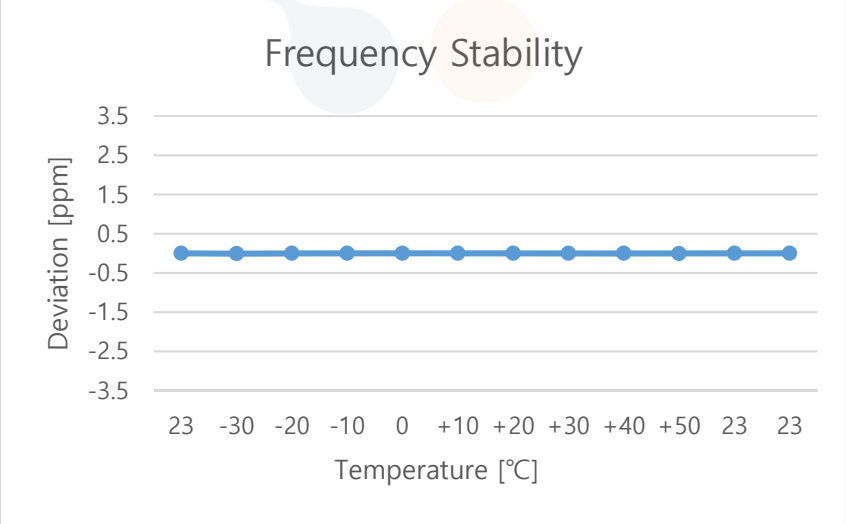
Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized bands of operation

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	707,499,997	2.70	0.0	0.000000
		-30	707,499,993	6.87	0.0	-0.000001
		-20	707,499,995	5.36	0.0	-0.000001
		-10	707,499,996	4.39	0.0	-0.000001
		0	707,499,996	3.92	0.0	-0.000001
		+10	707,499,997	3.25	0.0	0.000000
		+20	707,499,998	2.36	0.0	0.000000
		+30	707,499,997	3.30	0.0	0.000000
		+40	707,499,994	6.18	0.0	-0.000001
		+50	707,499,992	7.84	0.0	-0.000001
115%	4.46	+23(Ref)	707,499,998	2.50	0.0	0.000000
End point	3.40	+23(Ref)	707,499,998	2.20	0.0	0.000000



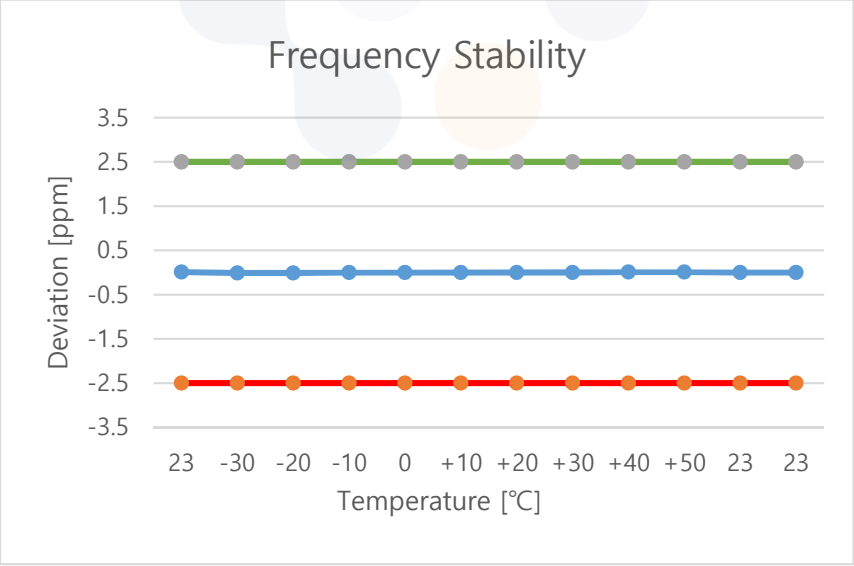
Test mode : LTE Band 13
Frequency (㎐) : 782 000 000
Channel : 23230
Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized bands of operation

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	782,000,002	-2.32	0.0	0.000000
		-30	781,999,995	4.51	0.0	-0.000001
		-20	781,999,996	3.69	0.0	0.000000
		-10	781,999,997	3.32	0.0	0.000000
		0	781,999,998	2.19	0.0	0.000000
		+10	781,999,998	1.87	0.0	0.000000
		+20	782,000,001	-1.34	0.0	0.000000
		+30	781,999,999	1.36	0.0	0.000000
		+40	781,999,998	2.46	0.0	0.000000
		+50	781,999,996	4.32	0.0	-0.000001
115%	4.46	+23(Ref)	782,000,002	-2.37	0.0	0.000000
End point	3.40	+23(Ref)	782,000,003	-2.86	0.0	0.000000



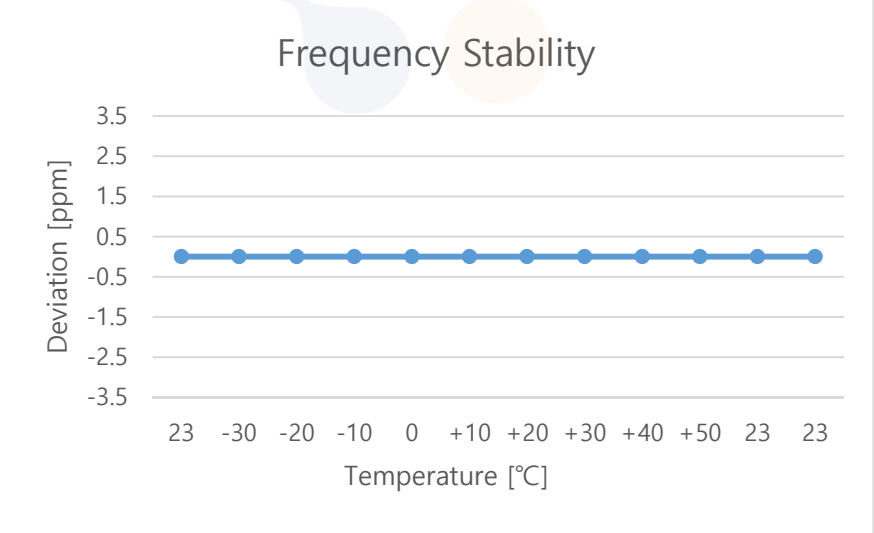
Test mode : LTE Band 26
Frequency (㎐) : 836 500 000
Channel : 26915
Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	836,500,004	-4.19	0.0	0.000001
		-30	836,499,992	7.65	0.0	-0.000001
		-20	836,499,993	6.77	0.0	-0.000001
		-10	836,499,997	3.32	0.0	0.000000
		0	836,499,997	2.81	0.0	0.000000
		+10	836,500,002	-1.67	0.0	0.000000
		+20	836,500,003	-3.13	0.0	0.000000
		+30	836,500,004	-3.73	0.0	0.000000
		+40	836,500,004	-4.26	0.0	0.000001
		+50	836,500,006	-5.54	0.0	0.000001
115%	4.46	+23(Ref)	836,500,003	-2.96	0.0	0.000000
End point	3.40	+23(Ref)	836,500,003	-3.08	0.0	0.000000



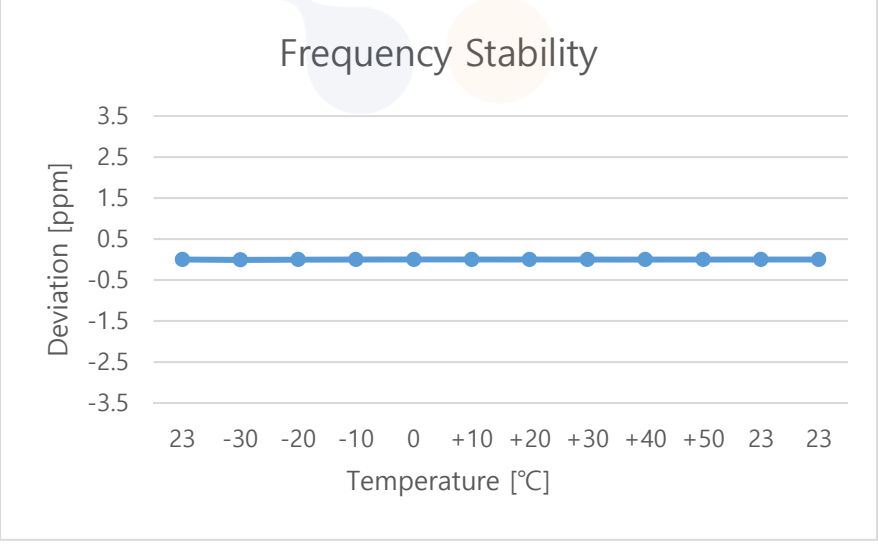
Test mode : LTE Band 41
Frequency (㎐) : 2 593 000 000
Channel : 40620
Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized bands of operation.

Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	2,592,999,999	0.51	0.0	0.000000
		-30	2,592,999,990	9.77	0.0	0.000000
		-20	2,592,999,995	4.88	0.0	0.000000
		-10	2,592,999,997	3.49	0.0	0.000000
		0	2,592,999,997	2.95	0.0	0.000000
		+10	2,592,999,998	1.51	0.0	0.000000
		+20	2,592,999,999	1.24	0.0	0.000000
		+30	2,592,999,996	4.35	0.0	0.000000
		+40	2,592,999,994	5.78	0.0	0.000000
		+50	2,592,999,991	8.78	0.0	0.000000
115%	4.46	+23(Ref)	2,593,000,001	-1.07	0.0	0.000000
End point	3.40	+23(Ref)	2,593,000,001	-0.62	0.0	0.000000



Test mode : LTE Band 66
Frequency (㎐) : 1 745 000 000
Channel : 132322
Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized bands of operation.

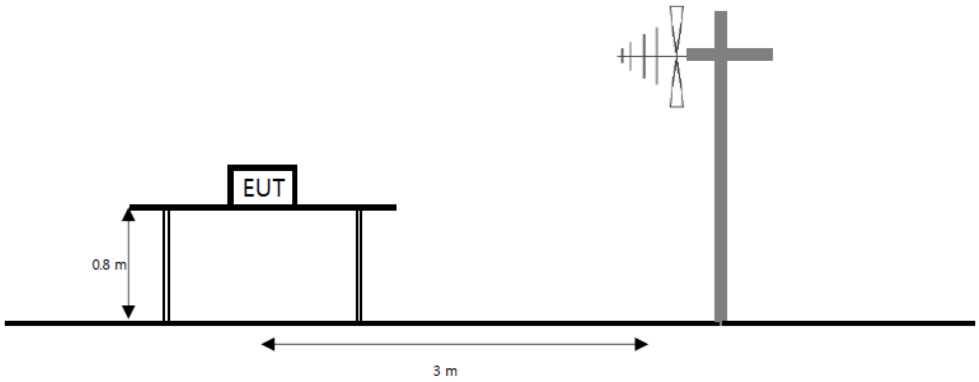
Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100%	3.88	+23(Ref)	1,745,000,001	-1.23	0.0	0.000000
		-30	1,744,999,990	10.29	0.0	-0.000001
		-20	1,744,999,995	5.01	0.0	0.000000
		-10	1,744,999,995	4.58	0.0	0.000000
		0	1,744,999,996	3.65	0.0	0.000000
		+10	1,744,999,999	1.09	0.0	0.000000
		+20	1,745,000,000	0.07	0.0	0.000000
		+30	1,744,999,998	1.65	0.0	0.000000
		+40	1,744,999,996	3.78	0.0	0.000000
		+50	1,744,999,992	7.97	0.0	0.000000
115%	4.46	+23(Ref)	1,745,000,002	-1.83	0.0	0.000000
End point	3.40	+23(Ref)	1,745,000,003	-2.79	0.0	0.000000



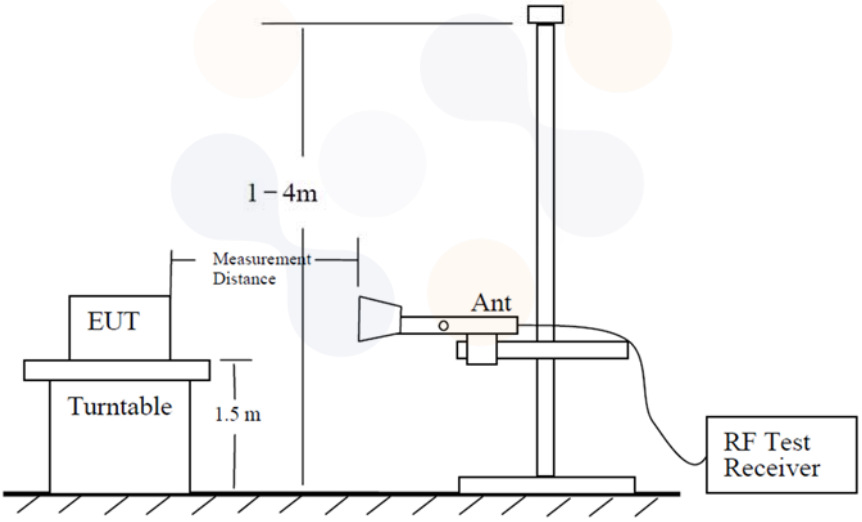
7.7. Radiated Power (ERP/EIRP)

Test setup

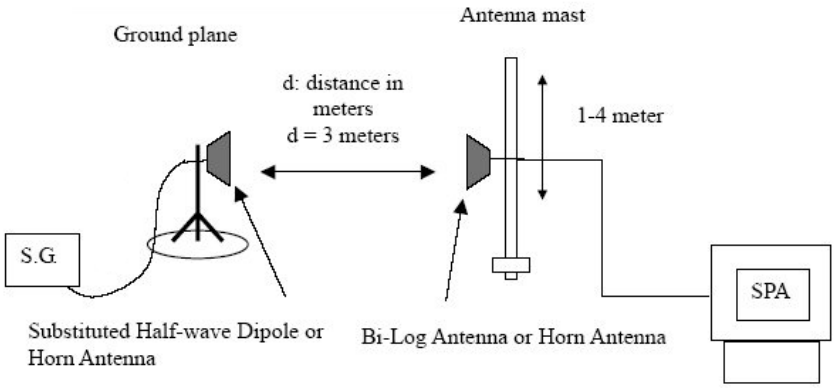
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



The diagram below shows the test setup for substituted method.



Limit

According to §22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to §24.232(c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(b)(10), Portable stations (hand-held devices) transmitting in the 746-757 ㎒, 776-788 ㎒, and 805-806 ㎒ bands are limited to 3 watts ERP.

According to §27.50(c)(10), Portable stations (hand-held devices) in the 600 ㎒ uplink band and the 698-746 ㎒ band, and fixed and mobile stations in the 600 ㎒ uplink band are limited to 3 watts ERP.

According to §27.50(d)(4), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 ㎒ band and mobile and portable stations operating in the 1695-1710 ㎒ and 1755-1780 ㎒ bands are limited to 1 watt EIRP.

According to §27.50(h)(2), Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test procedure

971168 D01 v03r01 - Section 5.2 and 5.8, 412172 D01 v01r01
ANSI 63.26-2015 – Section 5.2
ANSI/TIA-603-E-2016 - Section 2.2.17

Test settings

1) RBW = 1 % to 5 % of the OBW.
2) VBW ≥ 3 × RBW.
3) SPAN = 2 × to 3 × the OBW.
4) Number of measurement points in sweep ≥ 2 × span / RBW.
5) Sweep time :
   1) Auto couple, or
   2) ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6) Detector = RMS
7) If the EUT can be configured to transmit continuously, then set the trigger to free run.
8) If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full -power transmissions).
9) Trace mode = trace averaging (RMS) over 100 sweeps.
10) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the

RBW extending across the entire OBW of the spectrum.

11) Allow trace to fully stabilize.

Notes:

1. On a test site, the EUT shall be placed at 80 cm or 1.5 m height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to Correspond to the fundamental frequency of the transmitter.
3. The turntable is rotated through 360°, and the receiving antenna scans in order to determine the Level of the maximized emission.
4. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
5. The maximum signal level detected by the measuring receiver shall be noted.
6. The EUT was replaced by half-wave dipole (1 ㎓ below) or horn antenna (1 ㎓ above) connected to a signal generator.
   The power is calculated by the following formula;
   Pd(㏈m) = Pg(㏈m) – Cable loss (㏈) + Antenna gain (㏈)
   Note. Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.
7. The test antenna shall be raised and lowered through the specified range of height to ensure that The maximum signal is received.
8. The input signal to the substitution antenna shall be adjusted to the level that produces a level Detected by the measuring corrected for the change of input attenuator setting of the measuring Receiver.
9. The input level to the substitution antenna shall be recorded as power level in ㏈m, corrected for Any change of input attenuator setting of the measuring receiver.
10. The measurement shall be repeated with the test antenna and the substitution antenna Orientated for horizontal polarization.

Test results

Main Antenna
Test mode: LTE Band 2

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1 850.70	H	5.02	7.14	22.83	20.71	0.118
		1 880.00	H	4.94	7.21	24.17	21.90	0.155
		1 909.30	H	4.85	7.31	23.34	20.88	0.122
	16QAM	1 850.70	H	5.02	7.14	21.81	19.69	0.093
		1 880.00	H	4.94	7.21	23.01	20.74	0.119
		1 909.30	H	4.85	7.31	22.49	20.03	0.101
3 M	QPSK	1 851.50	H	5.02	7.14	22.88	20.76	0.119
		1 880.00	H	4.94	7.21	24.13	21.86	0.153
		1 908.50	H	4.86	7.31	24.25	21.80	0.151
	16QAM	1 851.50	H	5.02	7.14	22.05	19.93	0.098
		1 880.00	H	4.94	7.21	23.28	21.01	0.126
		1 908.50	H	4.86	7.31	23.15	20.70	0.117
5 M	QPSK	1 852.50	H	5.01	7.14	22.97	20.84	0.121
		1 880.00	H	4.94	7.21	24.28	22.01	0.159
		1907.50	H	4.86	7.31	23.65	21.20	0.132
	16QAM	1 852.50	H	5.01	7.14	21.99	19.86	0.097
		1 880.00	H	4.94	7.21	23.34	21.07	0.128
		1 907.50	H	4.86	7.31	22.66	20.21	0.105
10 M	QPSK	1 855.00	H	5.01	7.15	23.72	21.58	0.144
		1 880.00	H	4.94	7.21	24.15	21.88	0.154
		1 905.00	H	4.87	7.32	23.88	21.43	0.139
	16QAM	1 855.00	H	5.01	7.15	22.78	20.64	0.116
		1 880.00	H	4.94	7.21	23.31	21.04	0.127
		1 905.00	H	4.87	7.32	22.78	20.33	0.108
15 M	QPSK	1 857.50	H	5.00	7.17	24.08	21.91	0.155
		1 880.00	H	4.94	7.21	24.28	22.01	0.159
		1 902.50	H	4.87	7.31	24.38	21.94	0.156
	16QAM	1 857.50	H	5.00	7.17	23.14	20.97	0.125
		1 880.00	H	4.94	7.21	23.28	21.01	0.126
		1 902.50	H	4.87	7.31	23.38	20.94	0.124
20 M	QPSK	1 860.00	H	4.99	7.19	24.35	22.15	0.164
		1 880.00	H	4.94	7.21	24.06	21.79	0.151
		1 900.00	H	4.88	7.32	24.36	21.92	0.156
	16QAM	1 860.00	H	4.99	7.19	23.37	21.17	0.131
		1 880.00	H	4.94	7.21	23.31	21.04	0.127
		1 900.00	H	4.88	7.32	23.64	21.20	0.132

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode: LTE Band 4

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1 710.70	H	5.41	6.88	21.46	19.99	0.100
		1 732.50	H	5.35	6.90	19.53	17.98	0.063
		1 754.30	H	5.29	6.94	20.89	19.24	0.084
	16QAM	1 710.70	H	5.41	6.88	20.46	18.99	0.079
		1 732.50	H	5.35	6.90	18.60	17.05	0.051
		1 754.30	H	5.29	6.94	19.78	18.13	0.065
3 M	QPSK	1 711.50	H	5.41	6.88	21.31	19.84	0.096
		1 732.50	H	5.35	6.90	19.43	17.88	0.061
		1 753.50	H	5.29	6.94	20.57	18.92	0.078
	16QAM	1 711.50	H	5.41	6.88	20.29	18.82	0.076
		1 732.50	H	5.35	6.90	18.52	16.97	0.050
		1 753.50	H	5.29	6.94	19.55	17.90	0.062
5 M	QPSK	1 712.50	H	5.41	6.88	20.88	19.40	0.087
		1 732.50	H	5.35	6.90	19.64	18.09	0.064
		1 752.50	H	5.29	6.95	20.62	18.96	0.079
	16QAM	1 712.50	H	5.41	6.88	19.96	18.48	0.070
		1 732.50	H	5.35	6.90	18.64	17.09	0.051
		1 752.50	H	5.29	6.95	19.58	17.92	0.062
10 M	QPSK	1 715.00	H	5.40	6.87	21.09	19.62	0.092
		1 732.50	H	5.35	6.90	19.33	17.78	0.060
		1 750.00	H	5.30	6.94	18.83	17.19	0.052
	16QAM	1 715.00	H	5.40	6.87	20.30	18.83	0.076
		1 732.50	H	5.35	6.90	18.66	17.11	0.051
		1 750.00	H	5.30	6.94	17.94	16.30	0.043
15 M	QPSK	1 717.50	H	5.39	6.89	21.31	19.81	0.096
		1 732.50	H	5.35	6.90	19.22	17.67	0.058
		1 747.50	H	5.31	6.93	18.44	16.82	0.048
	16QAM	1 717.50	H	5.39	6.89	20.47	18.97	0.079
		1 732.50	H	5.35	6.90	18.71	17.16	0.052
		1 747.50	H	5.31	6.93	17.50	15.88	0.039
20 M	QPSK	1 720.00	H	5.38	6.89	20.90	19.39	0.087
		1 732.50	H	5.35	6.90	19.46	17.91	0.062
		1 745.00	H	5.31	6.93	18.43	16.81	0.048
	16QAM	1 720.00	H	5.38	6.89	19.95	18.44	0.070
		1 732.50	H	5.35	6.90	18.83	17.28	0.053
		1 745.00	H	5.31	6.93	17.44	15.82	0.038

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode: LTE Band 5

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[㎒]	[V/H]	[dBd]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	824.70	H	0.09	4.88	25.79	21.00	0.126
		836.50	H	-0.32	4.97	26.07	20.78	0.120
		848.30	H	-0.77	5.03	25.88	20.08	0.102
	16QAM	824.70	H	0.09	4.88	24.75	19.96	0.099
		836.50	H	-0.32	4.97	24.96	19.67	0.093
		848.30	H	-0.77	5.03	24.89	19.09	0.081
3 M	QPSK	825.50	H	0.11	4.88	25.64	20.87	0.122
		836.50	H	-0.32	4.97	25.97	20.68	0.117
		847.50	H	-0.75	5.03	25.75	19.97	0.099
	16QAM	825.50	H	0.11	4.88	24.83	20.06	0.101
		836.50	H	-0.32	4.97	25.12	19.83	0.096
		847.50	H	-0.75	5.03	24.78	19.00	0.079
5 M	QPSK	826.50	H	0.13	4.89	25.56	20.80	0.120
		836.50	H	-0.32	4.97	26.24	20.95	0.124
		846.50	H	-0.73	5.03	25.84	20.08	0.102
	16QAM	826.50	H	0.13	4.89	24.85	20.09	0.102
		836.50	H	-0.32	4.97	25.20	19.91	0.098
		846.50	H	-0.73	5.03	24.94	19.18	0.083
10 M	QPSK	829.00	H	0.18	4.91	25.65	20.92	0.124
		836.50	H	-0.32	4.97	26.08	20.79	0.120
		844.00	H	-0.68	5.03	25.40	19.69	0.093
	16QAM	829.00	H	0.18	4.91	24.78	20.05	0.101
		836.50	H	0.09	4.97	24.73	19.85	0.097
		844.00	H	-0.32	5.03	24.07	18.72	0.074

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Test mode: LTE Band 12/17

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[㎒]	[V/H]	[dBd]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	699.70	H	-0.50	4.43	22.89	17.95	0.062
		707.50	H	-0.35	4.48	22.67	17.84	0.061
		715.30	H	-0.56	4.51	22.99	17.91	0.062
	16QAM	699.70	H	-0.50	4.43	21.91	16.97	0.050
		707.50	H	-0.35	4.48	21.88	17.05	0.051
		715.30	H	-0.56	4.51	21.95	16.87	0.049
3 M	QPSK	700.50	H	-0.49	4.44	22.76	17.83	0.061
		707.50	H	-0.35	4.48	22.95	18.12	0.065
		714.50	H	-0.53	4.51	23.25	18.21	0.066
	16QAM	700.50	H	-0.49	4.44	21.93	17.00	0.050
		707.50	H	-0.35	4.48	22.03	17.20	0.052
		714.50	H	-0.53	4.51	22.32	17.28	0.053
5 M	QPSK	701.50	H	-0.47	4.44	23.05	18.14	0.065
		707.50	H	-0.35	4.48	22.91	18.08	0.064
		713.50	H	-0.48	4.50	23.53	18.55	0.072
	16QAM	701.50	H	-0.47	4.44	22.07	17.16	0.052
		707.50	H	-0.35	4.48	21.98	17.15	0.052
		713.50	H	-0.48	4.50	22.51	17.53	0.057
10 M	QPSK	704.00	H	-0.42	4.46	22.98	18.10	0.065
		707.50	H	-0.35	4.48	22.96	18.13	0.065
		711.00	H	-0.35	4.49	23.18	18.34	0.068
	16QAM	704.00	H	-0.42	4.46	21.91	17.03	0.050
		707.50	H	-0.50	4.48	22.07	17.09	0.051
		711.00	H	-0.35	4.49	22.42	17.58	0.057

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

Test mode: LTE Band 13

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[㎒]	[V/H]	[dBd]	[dB]	[dBm]	[dBm]	[W]
5 M	QPSK	779.50	H	0.60	4.68	24.13	20.05	0.101
		782.00	H	0.56	4.70	24.22	20.08	0.102
		784.50	H	0.51	4.71	24.31	20.11	0.103
	16QAM	779.50	H	0.60	4.68	23.46	19.38	0.087
		782.00	H	0.56	4.70	23.30	19.16	0.082
		784.50	H	0.51	4.71	23.30	19.10	0.081
10 M	QPSK	782.00	H	0.56	4.70	24.36	20.22	0.105
	16QAM	782.00	H	0.56	4.70	23.58	19.44	0.088

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

Test mode: LTE Band 26

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[㎒]	[V/H]	[dBd]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	824.70	H	0.09	4.87	25.85	21.07	0.128
		836.50	H	-0.32	4.97	25.92	20.63	0.116
		848.30	H	-0.77	5.03	25.76	19.96	0.099
	16QAM	824.70	H	0.09	4.87	24.87	20.09	0.102
		836.50	H	-0.32	4.97	25.02	19.73	0.094
		848.30	H	-0.77	5.03	24.47	18.67	0.074
3 M	QPSK	825.50	H	0.11	4.88	25.80	21.03	0.127
		836.50	H	-0.32	4.97	26.01	20.72	0.118
		847.50	H	-0.75	5.03	25.69	19.91	0.098
	16QAM	825.50	H	0.11	4.88	24.86	20.09	0.102
		836.50	H	-0.32	4.97	25.29	20.00	0.100
		847.50	H	-0.75	5.03	24.63	18.85	0.077
5 M	QPSK	826.50	H	0.13	4.89	25.78	21.02	0.126
		836.50	H	-0.32	4.97	26.08	20.79	0.120
		846.50	H	-0.73	5.03	25.67	19.91	0.098
	16QAM	826.50	H	0.13	4.89	24.67	19.91	0.098
		836.50	H	-0.32	4.97	24.82	19.53	0.090
		846.50	H	-0.73	5.03	24.95	19.19	0.083
10 M	QPSK	829.00	H	0.18	4.91	25.91	21.18	0.131
		836.50	H	-0.32	4.97	26.21	20.92	0.124
		844.00	H	-0.68	5.03	25.50	19.79	0.095
	16QAM	829.00	H	0.18	4.91	25.25	20.52	0.113
		836.50	H	-0.32	4.97	25.15	19.86	0.097
		844.00	H	-0.68	5.03	24.55	18.84	0.077
15 M	QPSK	831.50	H	0.08	4.92	26.26	21.42	0.139
		836.50	H	-0.32	4.97	26.13	20.84	0.121
		841.50	H	-0.63	5.02	25.84	20.19	0.104
	16QAM	831.50	H	0.08	4.92	25.14	20.30	0.107
		836.50	H	-0.32	4.97	25.17	19.88	0.097
		841.50	H	-0.63	5.02	24.98	19.33	0.086

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Test mode: LTE Band 41

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
5 M	QPSK	2 498.50	H	6.10	8.36	20.27	18.01	0.063
		2 593.00	H	6.29	8.51	19.36	17.14	0.052
		2 687.50	H	6.48	8.76	19.08	16.79	0.048
	16QAM	2 498.50	H	6.10	8.36	19.00	16.74	0.047
		2 593.00	H	6.29	8.51	18.02	15.80	0.038
		2 687.50	H	6.48	8.76	17.89	15.60	0.036
10 M	QPSK	2 501.00	H	6.10	8.35	19.92	17.67	0.058
		2 593.00	H	6.29	8.51	19.47	17.25	0.053
		2 685.00	H	6.47	8.74	19.95	17.68	0.059
	16QAM	2 501.00	H	6.10	8.35	18.42	16.17	0.041
		2 593.00	H	6.29	8.51	18.23	16.01	0.040
		2 685.00	H	6.47	8.74	19.38	17.11	0.051
15 M	QPSK	2 503.50	H	6.11	8.35	19.55	17.31	0.054
		2 593.00	H	6.29	8.51	18.98	16.76	0.047
		2 682.50	H	6.47	8.74	20.31	18.03	0.064
	16QAM	2 503.50	H	6.11	8.35	18.57	16.33	0.043
		2 593.00	H	6.29	8.51	17.81	15.59	0.036
		2 682.50	H	6.47	8.74	19.78	17.50	0.056
20 M	QPSK	2 506.00	H	6.11	8.36	20.05	17.80	0.060
		2 593.00	H	6.29	8.51	19.21	16.99	0.050
		2 680.00	H	6.46	8.75	20.13	17.84	0.061
	16QAM	2 506.00	H	6.11	8.36	18.71	16.46	0.044
		2 593.00	H	6.29	8.51	18.18	15.96	0.039
		2 680.00	H	6.46	8.75	18.98	16.69	0.047

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode: LTE Band 66

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1 710.70	H	5.41	6.88	21.46	19.99	0.100
		1 745.00	H	5.31	6.93	18.10	16.48	0.044
		1 779.30	H	5.22	7.02	20.89	19.09	0.081
	16QAM	1 710.70	H	5.41	6.88	20.69	19.22	0.084
		1 745.00	H	5.31	6.93	17.06	15.44	0.035
		1 779.30	H	5.22	7.02	19.95	18.15	0.065
3 M	QPSK	1 711.50	H	5.41	6.88	21.30	19.83	0.096
		1 745.00	H	5.31	6.93	18.47	16.85	0.048
		1 778.50	H	5.22	7.02	20.67	18.87	0.077
	16QAM	1 711.50	H	5.41	6.88	20.29	18.82	0.076
		1 745.00	H	5.31	6.93	17.57	15.95	0.039
		1 778.50	H	5.22	7.02	19.72	17.92	0.062
5 M	QPSK	1 712.50	H	5.41	6.88	21.15	19.67	0.093
		1 745.00	H	5.31	6.93	18.57	16.95	0.050
		1 777.50	H	5.22	7.02	21.05	19.25	0.084
	16QAM	1 712.50	H	5.41	6.88	20.20	18.72	0.074
		1 745.00	H	5.31	6.93	17.67	16.05	0.040
		1 777.50	H	5.22	7.02	20.07	18.27	0.067
10 M	QPSK	1 715.00	H	5.40	6.87	21.26	19.79	0.095
		1 745.00	H	5.31	6.93	18.48	16.86	0.049
		1 775.00	H	5.23	7.00	21.16	19.39	0.087
	16QAM	1 715.00	H	5.40	6.87	20.40	18.93	0.078
		1 745.00	H	5.31	6.93	17.60	15.98	0.040
		1 775.00	H	5.23	7.00	20.15	18.38	0.069
15 M	QPSK	1 717.50	H	5.39	6.89	21.39	19.89	0.097
		1 745.00	H	5.31	6.93	18.50	16.88	0.049
		1 772.50	H	5.24	7.00	20.57	18.81	0.076
	16QAM	1 717.50	H	5.39	6.89	20.18	18.68	0.074
		1 745.00	H	5.31	6.93	17.58	15.96	0.039
		1 772.50	H	5.24	7.00	19.71	17.95	0.062
20 M	QPSK	1 720.00	H	5.38	6.89	20.90	19.39	0.087
		1 745.00	H	5.31	6.93	18.37	16.75	0.047
		1 770.00	H	5.24	7.00	20.74	18.98	0.079
	16QAM	1 720.00	H	5.38	6.89	19.84	18.33	0.068
		1 745.00	H	5.31	6.93	17.29	15.67	0.037
		1 770.00	H	5.24	7.00	19.90	18.14	0.065

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Sub Antenna
Test mode: LTE Band 2

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1 850.70	V	5.02	7.14	19.14	17.02	0.050
		1 880.00	V	4.94	7.21	18.89	16.62	0.046
		1 909.30	V	4.85	7.31	18.04	15.58	0.036
	16QAM	1 850.70	V	5.02	7.14	18.34	16.22	0.042
		1 880.00	V	4.94	7.21	17.97	15.70	0.037
		1 909.30	V	4.85	7.31	17.07	14.61	0.029
3 M	QPSK	1 851.50	V	5.02	7.14	19.20	17.08	0.051
		1 880.00	V	4.94	7.21	18.92	16.65	0.046
		1 908.50	V	4.86	7.31	17.76	15.31	0.034
	16QAM	1 851.50	V	5.02	7.14	18.02	15.90	0.039
		1 880.00	V	4.94	7.21	17.88	15.61	0.036
		1 908.50	V	4.86	7.31	17.01	14.56	0.029
5 M	QPSK	1 852.50	V	5.01	7.14	18.94	16.81	0.048
		1 880.00	V	4.94	7.21	19.04	16.77	0.048
		1 907.50	V	4.86	7.31	18.22	15.77	0.038
	16QAM	1 852.50	V	5.01	7.14	18.32	16.19	0.042
		1 880.00	V	4.94	7.21	17.98	15.71	0.037
		1 907.50	V	4.86	7.31	17.07	14.62	0.029
10 M	QPSK	1 855.00	V	5.01	7.15	19.11	16.97	0.050
		1 880.00	V	4.94	7.21	18.75	16.48	0.044
		1 905.00	V	4.87	7.32	18.36	15.91	0.039
	16QAM	1 855.00	V	5.01	7.15	18.00	15.86	0.039
		1 880.00	V	4.94	7.21	18.04	15.77	0.038
		1 905.00	V	4.87	7.32	17.56	15.11	0.032
15 M	QPSK	1 857.50	V	5.00	7.17	18.74	16.57	0.045
		1 880.00	V	4.94	7.21	18.93	16.66	0.046
		1 902.50	V	4.87	7.31	19.13	16.69	0.047
	16QAM	1 857.50	V	5.00	7.17	17.63	15.46	0.035
		1 880.00	V	4.94	7.21	18.10	15.83	0.038
		1 902.50	V	4.87	7.31	18.71	16.27	0.042
20 M	QPSK	1 860.00	V	4.99	7.19	19.00	16.80	0.048
		1 880.00	V	4.94	7.21	18.76	16.49	0.045
		1 900.00	V	4.88	7.32	19.66	17.22	0.053
	16QAM	1 860.00	V	4.99	7.19	18.25	16.05	0.040
		1 880.00	V	4.94	7.21	17.89	15.62	0.036
		1 900.00	V	4.88	7.32	18.95	16.51	0.045

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode: LTE Band 4

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1710.70	H	5.41	6.88	19.70	18.23	0.067
		1732.50	H	5.35	6.90	18.65	17.10	0.051
		1754.30	H	5.29	6.94	17.88	16.23	0.042
	16QAM	1710.70	H	5.41	6.88	18.40	16.93	0.049
		1732.50	H	5.35	6.90	17.52	15.97	0.040
		1754.30	H	5.29	6.94	16.67	15.02	0.032
3 M	QPSK	1711.50	H	5.41	6.88	19.64	18.17	0.066
		1732.50	H	5.35	6.90	18.79	17.24	0.053
		1753.50	H	5.29	6.94	17.69	16.04	0.040
	16QAM	1711.50	H	5.41	6.88	18.32	16.85	0.048
		1732.50	H	5.35	6.90	17.57	16.02	0.040
		1753.50	H	5.29	6.94	16.92	15.27	0.034
5 M	QPSK	1712.50	H	5.41	6.88	19.34	17.86	0.061
		1732.50	H	5.35	6.90	18.88	17.33	0.054
		1752.50	H	5.29	6.95	17.64	15.98	0.040
	16QAM	1712.50	H	5.41	6.88	18.30	16.82	0.048
		1732.50	H	5.35	6.90	17.60	16.05	0.040
		1752.50	H	5.29	6.95	16.55	14.89	0.031
10 M	QPSK	1715.00	H	5.40	6.87	19.38	17.91	0.062
		1732.50	H	5.35	6.90	18.93	17.38	0.055
		1750.00	H	5.30	6.94	16.19	14.55	0.029
	16QAM	1715.00	H	5.40	6.87	18.30	16.83	0.048
		1732.50	H	5.35	6.90	17.86	16.31	0.043
		1750.00	H	5.30	6.94	15.25	13.61	0.023
15 M	QPSK	1717.50	H	5.39	6.89	19.40	17.90	0.062
		1732.50	H	5.35	6.90	18.73	17.18	0.052
		1747.50	H	5.31	6.93	16.41	14.79	0.030
	16QAM	1717.50	H	5.39	6.89	18.53	17.03	0.050
		1732.50	H	5.35	6.90	17.89	16.34	0.043
		1747.50	H	5.31	6.93	15.42	13.80	0.024
20 M	QPSK	1720.00	H	5.38	6.89	19.09	17.58	0.057
		1732.50	H	5.35	6.90	18.69	17.14	0.052
		1745.00	H	5.31	6.93	16.62	15.00	0.032
	16QAM	1720.00	H	5.38	6.89	17.80	16.29	0.043
		1732.50	H	5.35	6.90	17.35	15.80	0.038
		1745.00	H	5.31	6.93	15.55	13.93	0.025

Note.
1. E.R.P & E.I.R.P(㏈ m) = Substitute Level(㏈) + Antenna gain(㏈ d&㏈ i) - C.L(Cable loss) (㏈)

Test mode: LTE Band 66

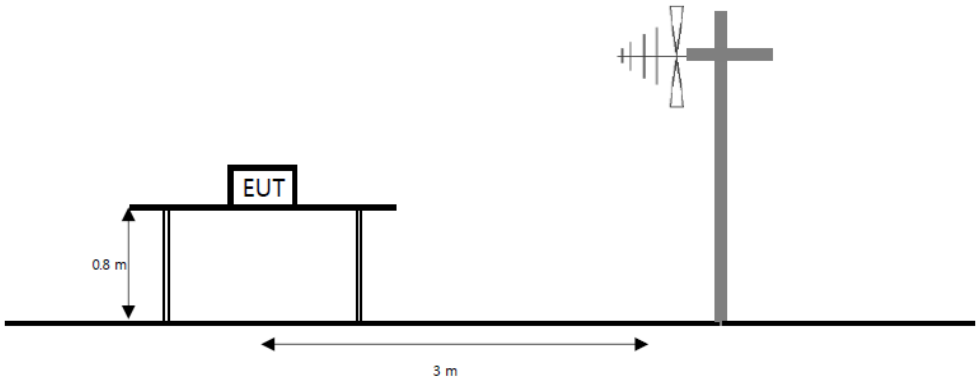
Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1 710.70	V	5.41	6.88	19.54	18.07	0.064
		1 745.00	V	5.31	6.93	16.78	15.16	0.033
		1 779.30	V	5.22	7.02	18.61	16.81	0.048
	16QAM	1 710.70	V	5.41	6.88	18.72	17.25	0.053
		1 745.00	V	5.31	6.93	16.08	14.46	0.028
		1 779.30	V	5.22	7.02	17.72	15.92	0.039
3 M	QPSK	1 711.50	V	5.41	6.88	19.62	18.15	0.065
		1 745.00	V	5.31	6.93	16.98	15.36	0.034
		1 778.50	V	5.22	7.02	19.13	17.33	0.054
	16QAM	1 711.50	V	5.41	6.88	19.07	17.60	0.058
		1 745.00	V	5.31	6.93	15.96	14.34	0.027
		1 778.50	V	5.22	7.02	17.98	16.18	0.041
5 M	QPSK	1 712.50	V	5.41	6.88	19.88	18.40	0.069
		1 745.00	V	5.31	6.93	17.04	15.42	0.035
		1 777.50	V	5.22	7.02	18.90	17.10	0.051
	16QAM	1 712.50	V	5.41	6.88	18.77	17.29	0.054
		1 745.00	V	5.31	6.93	16.21	14.59	0.029
		1 777.50	V	5.22	7.02	18.11	16.31	0.043
10 M	QPSK	1 715.00	V	5.40	6.87	19.95	18.48	0.070
		1 745.00	V	5.31	6.93	17.12	15.50	0.035
		1 775.00	V	5.23	7.00	19.10	17.33	0.054
	16QAM	1 715.00	V	5.40	6.87	18.86	17.39	0.055
		1 745.00	V	5.31	6.93	16.38	14.76	0.030
		1 775.00	V	5.23	7.00	18.25	16.48	0.044
15 M	QPSK	1 717.50	V	5.39	6.89	19.59	18.09	0.064
		1 745.00	V	5.31	6.93	17.09	15.47	0.035
		1 772.50	V	5.24	7.00	19.19	17.43	0.055
	16QAM	1 717.50	V	5.39	6.89	18.81	17.31	0.054
		1 745.00	V	5.31	6.93	16.42	14.80	0.030
		1 772.50	V	5.24	7.00	18.38	16.62	0.046
20 M	QPSK	1 720.00	V	5.38	6.89	19.97	18.46	0.070
		1 745.00	V	5.31	6.93	17.18	15.56	0.036
		1 770.00	V	5.24	7.00	19.23	17.47	0.056
	16QAM	1 720.00	V	5.38	6.89	19.35	17.84	0.061
		1 745.00	V	5.31	6.93	16.23	14.61	0.029
		1 770.00	V	5.24	7.00	18.38	16.62	0.046

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

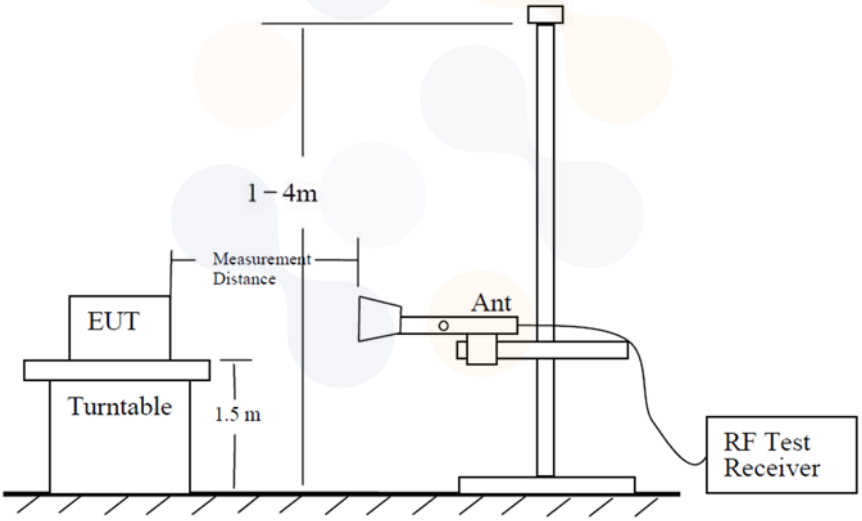
7.8. Radiated Spurious Emissions

Test setup

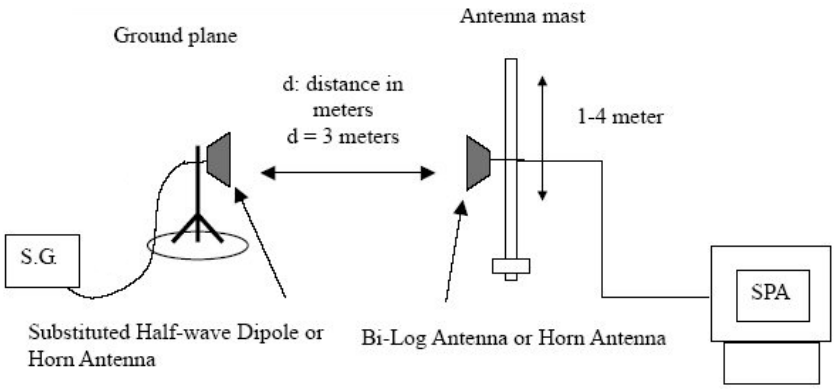
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



The diagram below shows the test setup for substituted method.



Limit

According to §22.917(a), §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(c)(2), on any frequency outside the 776-788 ㎒ band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log ($P_{[Watts]}$) ㏈.

According to §27.53(f), for operations in the 746-758 ㎒, 775-788 , and 805-806 bands, emissions in the band 1559-1610 shall be limited to −70 ㏈W/㎒ equivalent isotropically radiated power (EIRP) for wideband signals, and −80 ㏈W EIRP for discrete emissions of less than 700 ㎐ 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.

According to §27.53(g), for operations in the 600 ㎒ band and the 698-746 ㎒ band, the power of any emission outside a 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, by at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(m)(4), the minimum permissible attenuation level of any spurious emission is 53 + 10log($P_{[Watts]}$) ㏈.

Test procedure

971168 D01 v03r01 - Section 6.2
ANSI 63.26-2015 – Section 5.5
ANSI/TIA-603-E-2016 - Section 2.2.12

Test settings

1) RBW = 100 ㎑ for below 1 ㎓ and 1 ㎒ for above 1 ㎓.
2) VBW ≥ 3 × RBW.
3) Detector = RMS
4) Trace mode = Max hold
5) Sweep time = Auto couple
6) Number of sweep points ≥ 2 × span / RBW
7) Allow trace to fully stabilize.

Notes:

1. On a test site, the EUT shall be placed at 80 cm or 1.5 m height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The turntable is rotated through 360°, and the receiving antenna scans in order to determine the level of the maximized emission.
4. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
5. The maximum signal level detected by the measuring receiver shall be noted.
6. The EUT was replaced by half-wave dipole (1 ㎓ below) or horn antenna (1 ㎓ above) connected to a signal generator.
7. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
8. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring corrected for the change of input attenuator setting of the measuring receiver.
9. The input level to the substitution antenna shall be recorded as power level in ㏈m, corrected for any change of input attenuator setting of the measuring receiver.
10. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

Test results (Above 1 000 ㎒)

Main Antenna

Test mode : LTE Band 2
Frequency(㎒) : 1 860.0
Channel : 18700
Bandwidth(㎒) : 20

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 737.25	H	8.48	11.05	-50.83	-53.40	-13.00	40.40
	5 612.25	H	10.34	13.49	-54.65	-57.80	-13.00	44.80
	7 479.75	V	11.70	15.83	-52.07	-56.20	-13.00	43.20
	9 348.00	V	12.97	17.77	-48.80	-53.60	-13.00	40.60

Test mode : LTE Band 2
Frequency(㎒) : 1 880.0
Channel : 18900
Bandwidth(㎒) : 20

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 759.75	H	8.52	10.85	-52.87	-55.20	-13.00	42.20
	5 642.25	H	10.36	13.53	-53.93	-57.10	-13.00	44.10
	7 520.25	H	11.73	15.83	-50.70	-54.80	-13.00	41.80
	9 400.50	V	12.98	17.59	-45.89	-50.50	-13.00	37.50

Test mode : LTE Band 2
Frequency(㎒) : 1 900
Channel : 19100
Bandwidth(㎒) : 20

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 781.50	H	8.55	10.88	-47.07	-49.40	-13.00	36.40
	5 672.25	H	10.37	13.58	-55.29	-58.50	-13.00	45.50
	7 563.75	V	11.80	15.88	-48.22	-52.30	-13.00	39.30
	9 454.50	V	12.99	17.64	-46.25	-50.90	-13.00	37.90

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Test mode : LTE Band 4
Frequency(㎒) : 1 710.7
Channel : 19957
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 421.50	H	7.94	10.39	-54.75	-57.20	-13.00	44.20
	5 133.00	H	9.93	13.10	-55.53	-58.70	-13.00	45.70
	6 842.25	H	11.44	15.26	-51.68	-55.50	-13.00	42.50
	8 553.75	V	12.90	16.90	-44.50	-48.50	-13.00	35.50
	11 975.25	V	13.00	20.13	-35.97	-43.10	-13.00	30.10

Test mode : LTE Band 4
Frequency(㎒) : 1 732.5
Channel : 20175
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 463.50	H	8.03	10.48	-53.45	-55.90	-13.00	42.90
	5 196.75	V	10.00	13.17	-54.43	-57.60	-13.00	44.60
	6 927.75	H	11.53	15.28	-51.35	-55.10	-13.00	42.10
	8 659.50	V	12.90	16.88	-41.72	-45.70	-13.00	32.70
	12 123.75	V	13.02	20.08	-36.34	-43.40	-13.00	30.40

Test mode : LTE Band 4
Frequency(㎒) : 1 754.3
Channel : 20393
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 508.50	H	8.11	10.58	-53.63	-56.10	-13.00	43.10
	5 262.75	H	10.06	13.09	-55.37	-58.40	-13.00	45.40
	7 017.00	V	11.60	15.45	-51.95	-55.80	-13.00	42.80
	8 771.25	V	12.90	17.34	-40.96	-45.40	-13.00	32.40
	12 280.50	V	13.06	20.49	-36.77	-44.20	-13.00	31.20

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Test mode : LTE Band 5
Frequency(㎒) : 824.7
Channel : 20407
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 648.65	H	5.58	6.76	-59.62	-60.80	-13.00	47.80
	2 472.90	H	6.02	8.33	-47.09	-49.40	-13.00	36.40
	3 296.73	H	7.69	10.11	-52.88	-55.30	-13.00	42.30
	4 120.57	V	8.97	11.60	-55.77	-58.40	-13.00	45.40

Test mode : LTE Band 5
Frequency(㎒) : 836.5
Channel : 20525
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 673.27	H	5.51	6.73	-58.78	-60.00	-13.00	47.00
	2 509.82	H	6.12	8.37	-48.55	-50.80	-13.00	37.80
	3 346.38	H	7.79	10.22	-53.17	-55.60	-13.00	42.60
	4 183.34	V	9.01	11.43	-54.28	-56.70	-13.00	43.70

Test mode : LTE Band 5
Frequency(㎒) : 848.3
Channel : 20643
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 697.06	H	5.45	6.80	-56.65	-58.00	-13.00	45.00
	2 545.11	H	6.19	8.47	-48.82	-51.10	-13.00	38.10
	3 391.10	H	7.88	10.32	-56.16	-58.60	-13.00	45.60
	4 239.55	V	9.04	11.62	-54.52	-57.10	-13.00	44.10

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Test mode : LTE Band 12/17
Frequency(㎒) : 701.5
Channel : 23035
Bandwidth(㎒) : 5

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 404.53	V	5.39	6.18	-62.31	-63.10	-13.00	50.10
	2 105.29	H	4.92	7.66	-50.76	-53.50	-13.00	40.50
	2 806.45	H	6.71	9.02	-55.69	-58.00	-13.00	45.00
	3 510.90	H	8.12	10.59	-55.83	-58.30	-13.00	45.30

Test mode : LTE Band 12/17
Frequency(㎒) : 707.5
Channel : 23095
Bandwidth(㎒) : 5

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 416.02	V	5.46	6.21	-63.95	-64.70	-13.00	51.70
	2 122.93	H	4.97	7.69	-50.98	-53.70	-13.00	40.70
	2 831.89	V	6.76	9.08	-55.98	-58.30	-13.00	45.30
	3 537.16	V	8.16	10.65	-56.81	-59.30	-13.00	46.30

Test mode : LTE Band 12/17
Frequency(㎒) : 713.5
Channel : 23155
Bandwidth(㎒) : 5

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 425.87	V	5.53	6.23	-63.60	-64.30	-13.00	51.30
	2 140.98	V	5.02	7.72	-53.10	-55.80	-13.00	42.80
	2 854.04	V	6.81	9.13	-56.48	-58.80	-13.00	45.80
	3 567.52	H	8.21	10.16	-55.85	-57.80	-13.00	44.80

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode : LTE Band 13
Frequency(㎒) : 782.0
Channel : 23230
Bandwidth(㎒) : 10

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 553.46	V	5.85	6.46	-62.29	-62.90	-13.00	49.90
	2 332.58	H	5.60	8.03	-50.27	-52.70	-13.00	39.70
	3 108.42	V	7.32	9.70	-56.12	-58.50	-13.00	45.50
	3 883.84	H	8.71	11.09	-56.32	-58.70	-13.00	45.70

Test mode : LTE Band 13
Frequency(㎒) : 782.0 (1 559 – 1 610 ㎒)
Channel : 23230
Bandwidth(㎒) : 10

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 562.87	V	5.82	6.48	-58.14	-58.80	-40.00	18.80

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
   Limit Calculation of wide-band (dBm/㎒) = -70dBW/㎒ (-40 dBm/㎒)
   Limit Calculation of narrow-band (dBm) = -80dBW (-50dBm)
2. E.R.P & E.I.R.P(dB m) = Substitute Level(dB) + Antenna gain(dB i&dB d) - C.L(Cable loss) (dB)

Test mode : LTE Band 26
Frequency(㎒) : 831.5
Channel : 26865
Bandwidth(㎒) : 15

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 678.19	V	5.50	6.74	-61.26	-62.50	-13.00	49.50
	2 514.33	H	6.13	8.39	-52.94	-55.20	-13.00	42.20
	3 354.99	V	7.81	10.24	-56.57	-59.00	-13.00	46.00
	4 194.01	V	9.02	11.45	-56.17	-58.60	-13.00	45.60

Test mode : LTE Band 26
Frequency(㎒) : 836.5
Channel : 26915
Bandwidth(㎒) : 15

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 673.27	H	5.51	6.73	-57.98	-59.20	-13.00	46.20
	2 509.41	H	6.12	8.37	-52.55	-54.80	-13.00	41.80
	3 346.38	H	7.79	10.22	-53.67	-56.10	-13.00	43.10
	4 181.29	V	9.01	11.43	-53.58	-56.00	-13.00	43.00

Test mode : LTE Band 26
Frequency(㎒) : 841.5
Channel : 26965
Bandwidth(㎒) : 15

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 683.52	V	5.49	6.76	-59.63	-60.90	-13.00	47.90
	2 525.00	H	6.15	8.41	-52.74	-55.00	-13.00	42.00
	3 365.25	V	7.83	10.27	-56.26	-58.70	-13.00	45.70
	4 208.37	V	9.03	11.57	-55.86	-58.40	-13.00	45.40

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode : LTE Band 41
Frequency(㎒) : 2 503.5
Channel : 39725
Bandwidth(㎒) : 15

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	5 007.75	V	9.81	12.82	-55.29	-58.30	-25.00	33.30
	7 510.50	H	11.72	15.82	-47.50	-51.60	-25.00	26.60
	10 014.00	V	12.90	18.14	-47.86	-53.10	-25.00	28.10
	12 518.25	V	13.10	20.66	-38.74	-46.30	-25.00	21.30

Test mode : LTE Band 41
Frequency(㎒) : 2 593.0
Channel : 40620
Bandwidth(㎒) : 15

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	5 169.00	V	9.97	13.14	-53.13	-56.30	-25.00	31.30
	7 758.75	H	12.11	16.12	-45.29	-49.30	-25.00	24.30
	10 344.00	H	12.90	18.63	-47.97	-53.70	-25.00	28.70
	12 929.25	H	13.10	20.95	-43.05	-50.90	-25.00	25.90

Test mode : LTE Band 41
Frequency(㎒) : 2 682.5
Channel : 41515
Bandwidth(㎒) : 15

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	5 350.50	H	10.15	13.28	-54.67	-57.80	-25.00	32.80
	8 027.25	V	12.52	16.48	-46.24	-50.20	-25.00	25.20
	10 703.25	V	12.94	18.91	-42.73	-48.70	-25.00	23.70
	13 373.25	H	13.47	21.05	-43.02	-50.60	-25.00	25.60

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode : LTE Band 66
Frequency(㎒) : 1 710.7
Channel : 131979
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 420.00	V	7.94	10.39	-51.85	-54.30	-13.00	41.30
	5 129.25	H	9.93	13.09	-56.14	-59.30	-13.00	46.30
	6 841.50	V	11.44	15.26	-51.58	-55.40	-13.00	42.40
	8 550.75	V	12.90	16.90	-43.60	-47.60	-13.00	34.60
	11 971.50	V	13.01	20.13	-34.28	-41.40	-13.00	28.40

Test mode : LTE Band 66
Frequency(㎒) : 1 745.0
Channel : 132322
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 490.50	V	8.08	10.54	-57.04	-59.50	-13.00	46.50
	5 239.50	V	10.04	13.06	-54.28	-57.30	-13.00	44.30
	6 983.25	V	11.58	15.35	-52.03	-55.80	-13.00	42.80
	8 727.00	V	12.90	17.31	-44.89	-49.30	-13.00	36.30
	12 217.50	V	13.04	20.43	-37.11	-44.50	-13.00	31.50

Test mode : LTE Band 66
Frequency(㎒) : 1 779.3
Channel : 132665
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 558.00	V	8.19	10.12	-57.37	-59.30	-13.00	46.30
	5 338.50	H	10.14	13.26	-54.48	-57.60	-13.00	44.60
	7 119.00	V	11.62	15.34	-53.08	-56.80	-13.00	43.80
	8 898.00	V	12.90	17.05	-43.05	-47.20	-13.00	34.20
	12 458.25	V	13.09	20.52	-37.97	-45.40	-13.00	32.40

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Sub Antenna

Test mode : LTE Band 2
Frequency(㎒) : 1 860.0
Channel : 18700
Bandwidth(㎒) : 20

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 723.00	V	8.46	11.03	-57.83	-60.40	-13.00	47.40
	5 579.25	V	10.33	13.56	-54.47	-57.70	-13.00	44.70
	7 440.00	V	11.69	15.79	-53.10	-57.20	-13.00	44.20
	9 300.75	V	12.96	17.73	-50.43	-55.20	-13.00	42.20

Test mode : LTE Band 2
Frequency(㎒) : 1 880.0
Channel : 18900
Bandwidth(㎒) : 20

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 760.50	V	8.52	10.85	-56.97	-59.30	-13.00	46.30
	5 640.00	H	10.36	13.53	-55.33	-58.50	-13.00	45.50
	7 521.00	V	11.73	15.83	-50.10	-54.20	-13.00	41.20
	9 399.75	V	12.98	17.82	-49.16	-54.00	-13.00	41.00

Test mode : LTE Band 2
Frequency(㎒) : 1 900.0
Channel : 19100
Bandwidth(㎒) : 20

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 777.00	V	8.54	10.88	-57.36	-59.70	-13.00	46.70
	5 670.00	H	10.37	13.57	-53.80	-57.00	-13.00	44.00
	7 560.75	H	11.80	15.87	-51.63	-55.70	-13.00	42.70
	9 451.50	H	12.99	17.64	-49.45	-54.10	-13.00	41.10

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

Test mode : LTE Band 4
Frequency(㎒) : 1 710.7
Channel : 19957
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 421.50	V	7.94	10.39	-56.35	-58.80	-13.00	45.80
	5 133.00	V	9.93	13.10	-54.13	-57.30	-13.00	44.30
	6 845.25	V	11.45	15.27	-52.68	-56.50	-13.00	43.50
	8 559.00	H	12.90	16.91	-49.29	-53.30	-13.00	40.30

Test mode : LTE Band 4
Frequency(㎒) : 1 732.5
Channel : 20175
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 465.00	H	8.03	10.49	-56.04	-58.50	-13.00	45.50
	5 195.25	V	10.00	13.17	-53.23	-56.40	-13.00	43.40
	6 931.50	V	11.53	15.28	-51.85	-55.60	-13.00	42.60
	8 664.00	V	12.90	16.88	-51.32	-55.30	-13.00	42.30

Test mode : LTE Band 4
Frequency(㎒) : 1 754.3
Channel : 20393
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 507.00	V	8.11	10.58	-56.23	-58.70	-13.00	45.70
	5 263.50	H	10.06	13.09	-54.17	-57.20	-13.00	44.20
	7 013.25	V	11.60	15.44	-53.16	-57.00	-13.00	44.00
	8 772.75	V	12.90	17.34	-50.36	-54.80	-13.00	41.80

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

Test mode : LTE Band 66
Frequency(㎒) : 1 715.0
Channel : 132022
Bandwidth(㎒) : 10

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 398.25	V	7.90	10.34	-56.66	-59.10	-13.00	46.10
	5 130.00	H	9.93	13.09	-55.74	-58.90	-13.00	45.90
	6 840.00	V	11.44	15.26	-52.48	-56.30	-13.00	43.30
	8 552.25	V	12.90	16.90	-49.50	-53.50	-13.00	40.50

Test mode : LTE Band 66
Frequency(㎒) : 1 745.0
Channel : 132322
Bandwidth(㎒) : 10

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 479.25	V	8.06	10.52	-56.14	-58.60	-13.00	45.60
	5 221.50	H	10.02	13.03	-55.39	-58.40	-13.00	45.40
	6 958.50	H	11.56	15.31	-52.75	-56.50	-13.00	43.50
	8 697.75	V	12.90	16.92	-51.38	-55.40	-13.00	42.40

Test mode : LTE Band 66
Frequency(㎒) : 1 775.0
Channel : 132622
Bandwidth(㎒) : 10

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 537.00	V	8.16	10.65	-57.11	-59.60	-13.00	46.60
	5 310.75	V	10.11	13.23	-54.98	-58.10	-13.00	45.10
	7 080.75	V	11.62	15.51	-52.61	-56.50	-13.00	43.50
	8 852.25	H	12.90	17.01	-50.29	-54.40	-13.00	41.40

Note.
1. E.R.P & E.I.R.P(㏈m) = Substitute Level(㏈) + Antenna gain(㏈d&㏈i) - C.L(Cable loss) (㏈)

ULCA Mode

Test mode : 2A-4A
Frequency(㎒) : 1 860.0 (B2) / 1 710.7 (B4)
Channel : 18700 (B2) / 19957 (B4)
Bandwidth(㎒) : 20 (B2), 1.4 (B4)

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 423.00	V	7.95	10.39	-57.16	-59.60	-13.00	46.60
	5 134.50	H	9.93	13.10	-56.23	-59.40	-13.00	46.40
	6 848.25	V	11.45	15.27	-52.58	-56.40	-13.00	43.40
	8 554.50	H	12.90	16.90	-50.80	-54.80	-13.00	41.80

Note.
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd&dBi) - C.L(Cable loss) (dB)

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV30	100810	23.07.12
DC Power Supply	AGILENT	E3632A	KR73001026	23.03.28
Divider	Marki Microwave, Inc.	PD-0040	D0002	23.08.10
Wide band Radio Communication Tester	R&S	CMW500	141780	23.03.28
Temp & Humid Chamber	Daejin Engineering	DJ-THR11000	10041	23.01.19
Vector Signal Generator	R&S	SMBV100A	257566	23.07.04
Signal Generator	R&S	SMB100A	176206	23.01.19
Bilog Antenna	Teseq GmbH	CBL 6143A	35039	23.05.12
Bilog Antenna	ETS.LINDGREN	3143B	00228420	23.09.28
Horn Antenna	ETS.LINDGREN	3117	161225	23.05.04
Horn Antenna	ETS.LINDGREN	3117	00227509	23.09.20
Horn Antenna	ETS.lindgren	3116	00086632	23.01.25
Horn Antenna	Steatite Antennas	QMS-00225	17790	23.07.14
Horn Antenna	Steatite Antennas	QMS-00238	17791	23.07.14
Band Reject Filter	Wainwright Instruments GmbH	WRCGV1805/1880-1785/1900-50/10SS	2	23.01.19
Band Reject Filter	Wainwright Instruments GmbH	WRCG 824/849-814/859-60/10SS	32	23.07.11
Band Reject Filter	Wainwright Instruments GmbH	WRCG 1710/1785-1690/1805-60/12SS	43	23.01.19
High Pass Filter	Wainwright Instruments GmbH	WHKX10-900-1000-15000-40SS	11	23.08.10
High Pass Filter	Wainwright Instruments GmbH	WHKX12-2805-3000-18000-40SS	32	23.08.10
Broadband Amplifier	SONOMA INSTRUMENT	315	300314	23.01.19
Low Noise Amplifier	TESTEK	TK-PA18H	220123-L	23.12.02*
Amplifier	L-3 Narda-MITEQ	JS44-18004000-33-8P	2000996	23.01.21
Antenna Stand	innco systems GmbH	AS1500-EP-10kg	-	-
Antenna Stand	innco systems GmbH	AS1500-EP-10kg	-	-
Compact Table	innco systems GmbH	CT1000	-	-

* Tests related to this equipment were progressed after the calibration was completed

End of test report