

KCTL Inc.

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TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

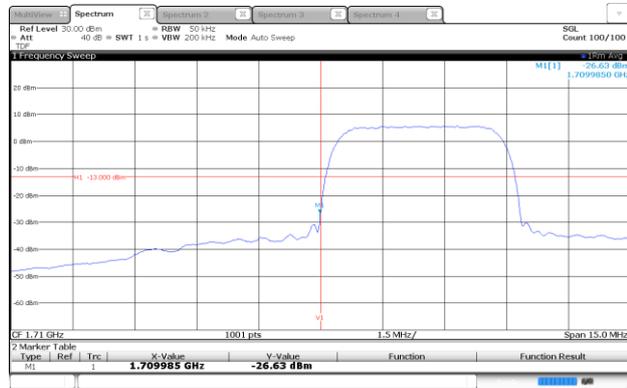
Report No.:
KR19-SRF0017

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Test mode: WCDMA1700

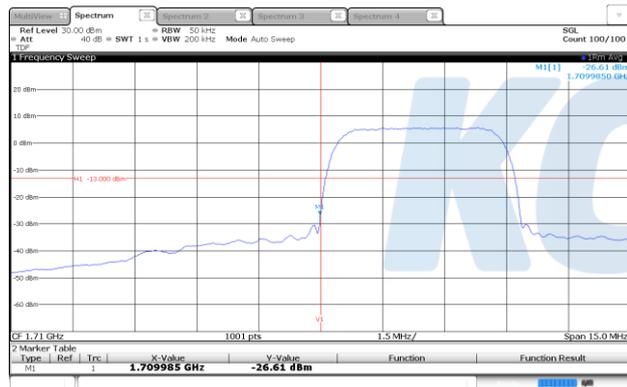
RMC / Low ch.



RMC / High ch.



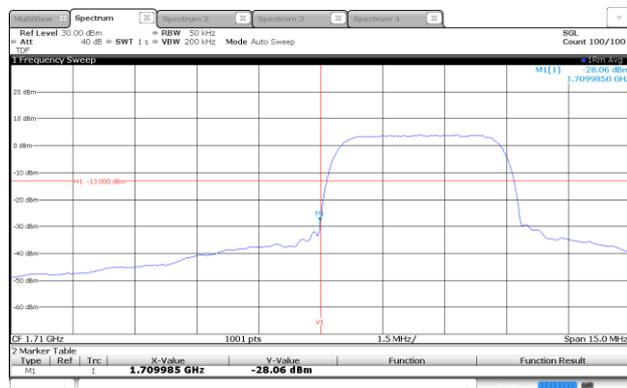
HSDPA / Low ch.



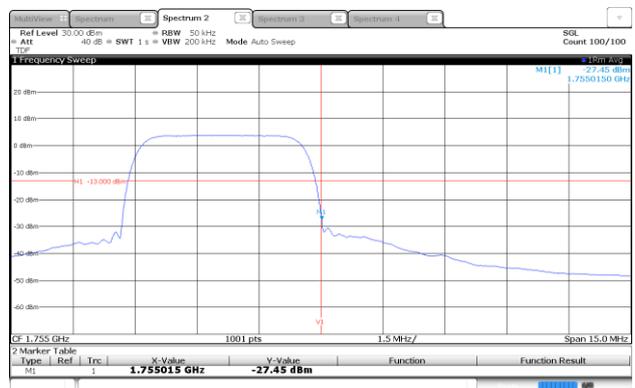
HSDPA / High ch.



HSUPA / Low ch.



HSUPA / High ch.



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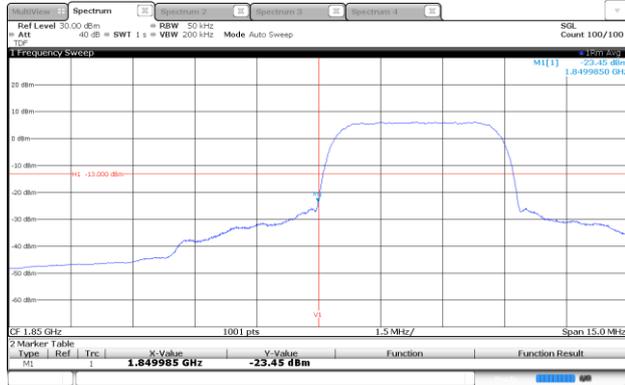
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Test mode: WCDMA1900

RMC / Low ch.



RMC / High ch.



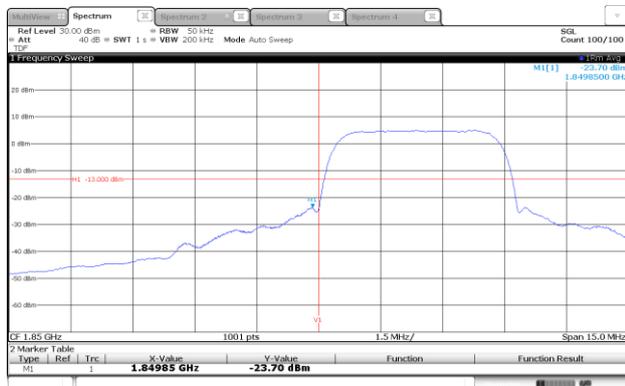
HSDPA / Low ch.



HSDPA / High ch.



HSUPA / Low ch.

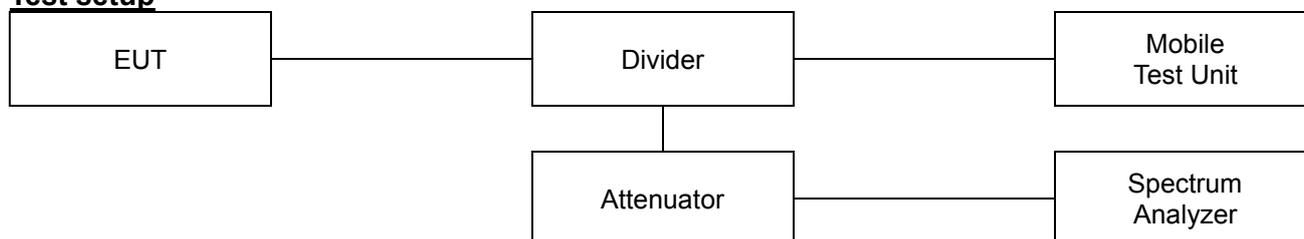


HSUPA / High ch.



7.4. Peak to Average Power Ratio (PAPR)

Test setup



Limit

According to §22.913(d), §24.232(d), the peak-to-average ratio(PAR) of the transmission must not exceed 13 dB.

According to §27.50(d)(5), the peak-to-average ratio(PAR) of the transmission may not exceed 13 dB.

Test procedure

971168 D01 v03r01 - Section 5.7.2

ANSI 63.26-2015 – Section 5.2.3.4

Test settings

5.2.3.4 Measurement of peak power in a broadband noise-like signal using CCDF

- 1) Set resolution/measurement bandwidth \geq OBW or specified reference bandwidth
- 2) Set the number of counts to a value that stabilizes the measured CCDF curve.
- 3) Set the measurement interval as follows:
 - a) For continuous transmissions, set to the greater of $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ or 1 ms .
 - b) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
 - c) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
- 4) Record the maximum PAPR level associated with a probability of 0.1%

5.2.6 Peak-to-average power ratio

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{PK} .

Use one of the applicable procedure presented 5.2(ANSI C63.26-2015) to measure the total average power and record as P_{AG} . Determine the P.A.P.R from:

$$PAPR(\text{dB}) = P_{PK}(\text{dBm or dBW}) - P_{AG}(\text{dBm or dBW})$$

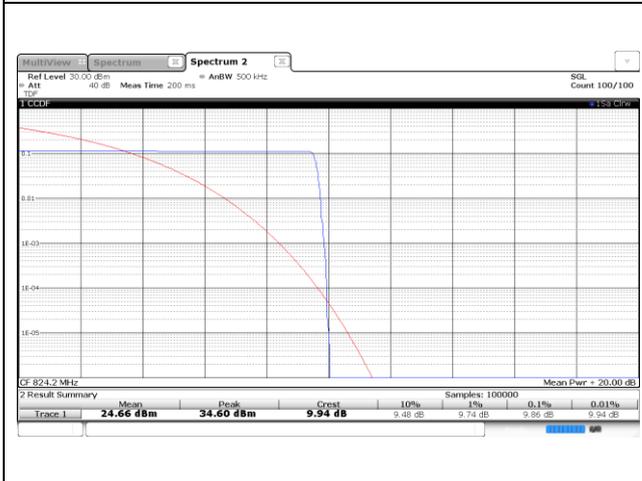
Notes:

1. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function. Please refer to the page 10.

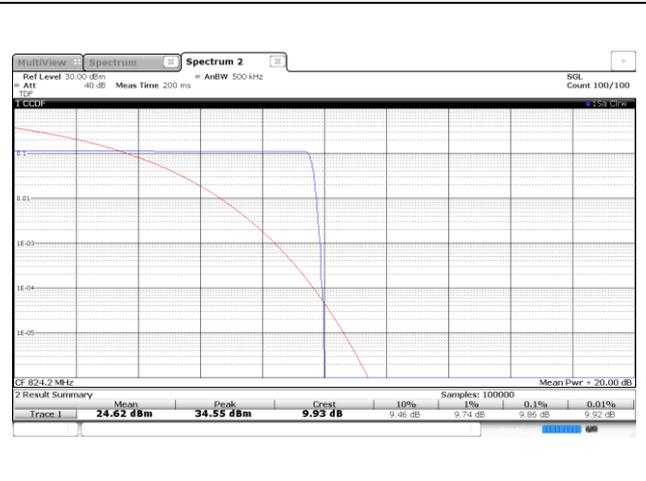
Test results

Test mode: GSM850

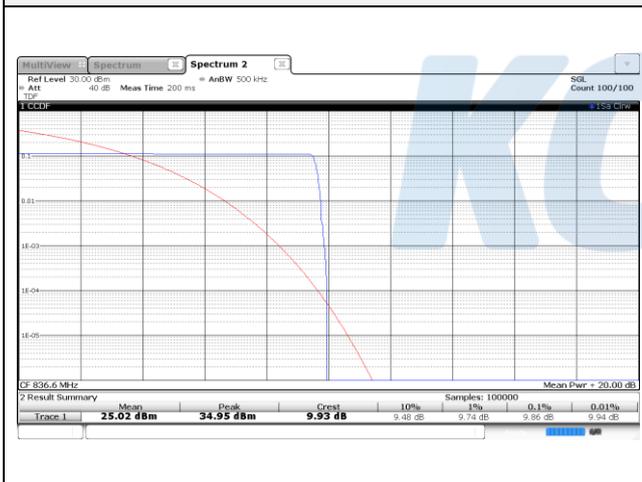
GPRS / Low ch.



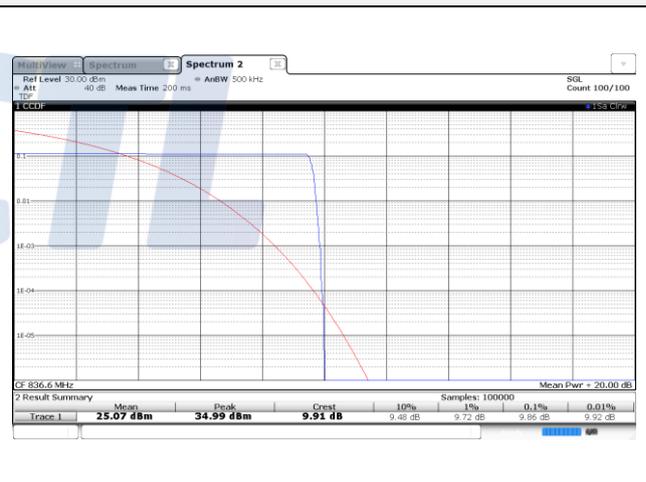
EDGE / Low ch.



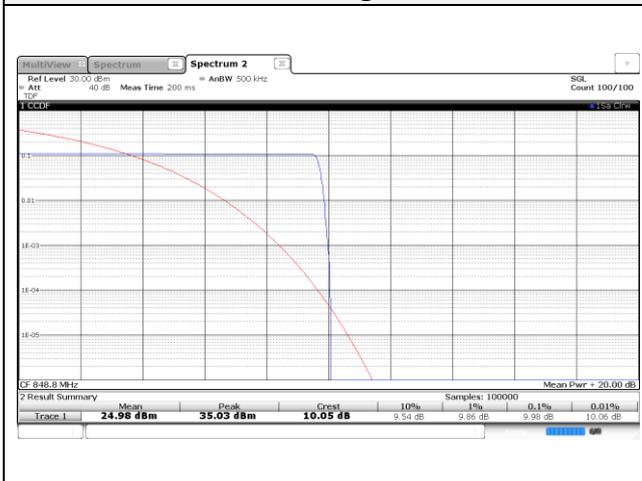
GPRS / Mid ch.



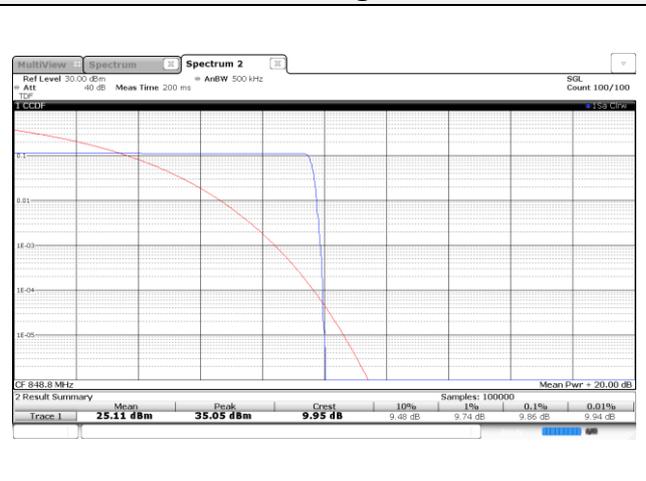
EDGE / Mid ch.



GPRS / High ch.

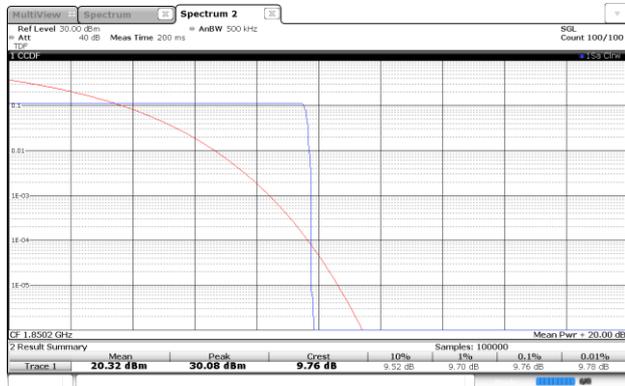


EDGE / High ch.

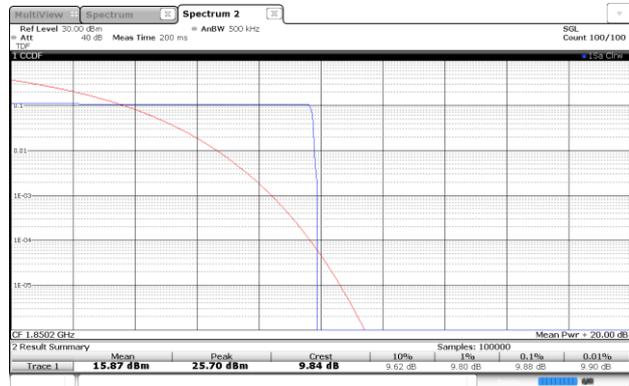


Test mode: GSM1900

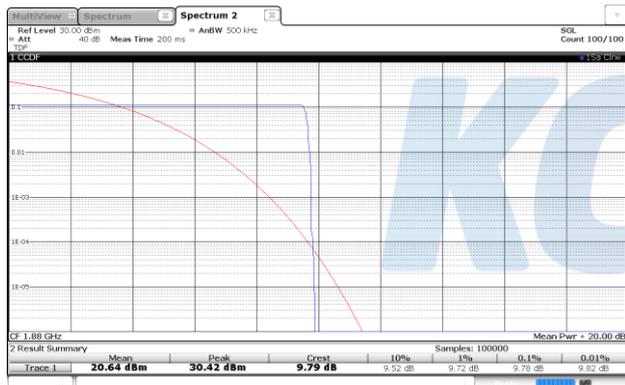
GPRS / Low ch.



EDGE / Low ch.



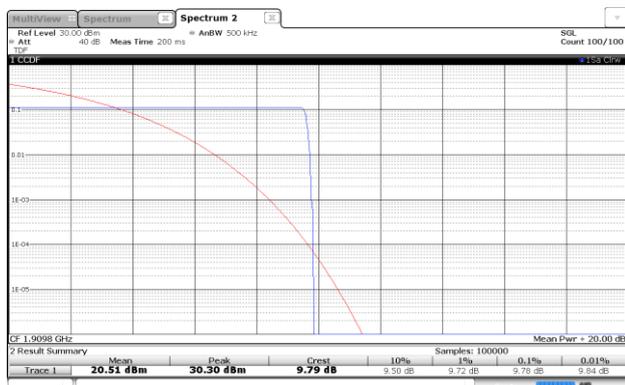
GPRS / Mid ch.



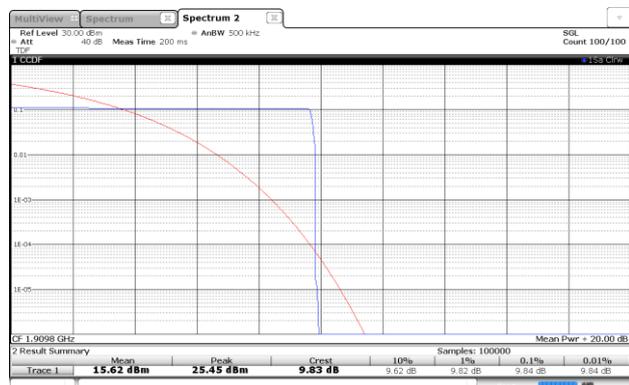
EDGE / Mid ch.



GPRS / High ch.



EDGE / High ch.

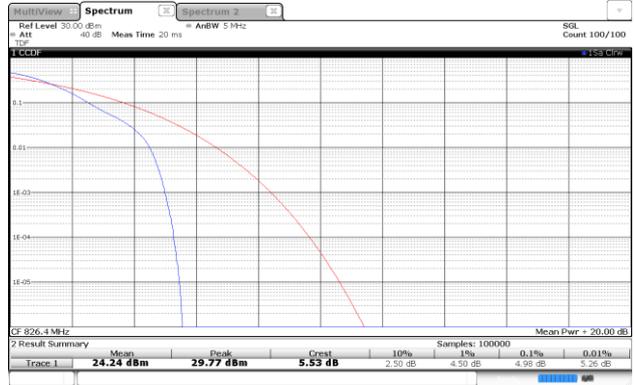


Test mode: WCDMA850

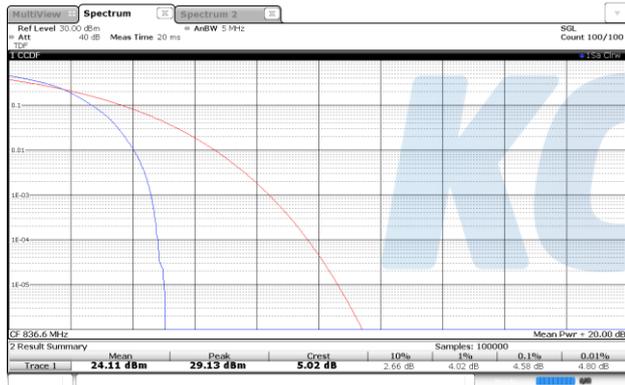
RMC / Low ch.



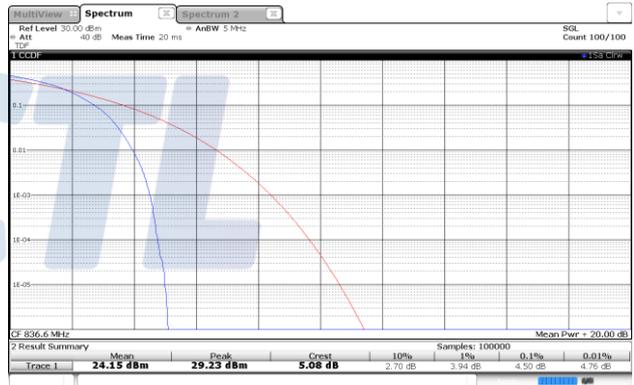
HSDPA / Low ch.



RMC / Mid ch.



HSDPA / Mid ch.



RMC / High ch.



HSDPA / High ch.



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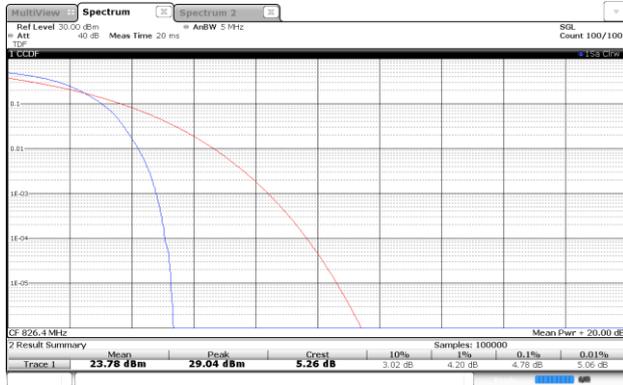
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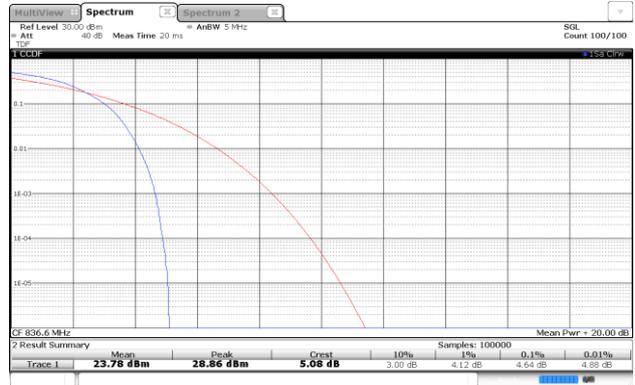
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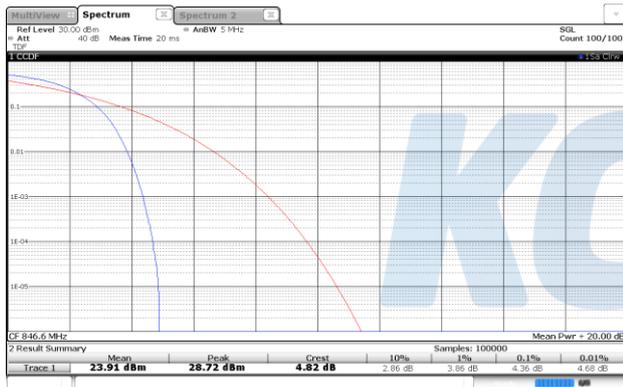
HSUPA / Low ch.



HSUPA / Mid ch.



HSUPA / High ch.



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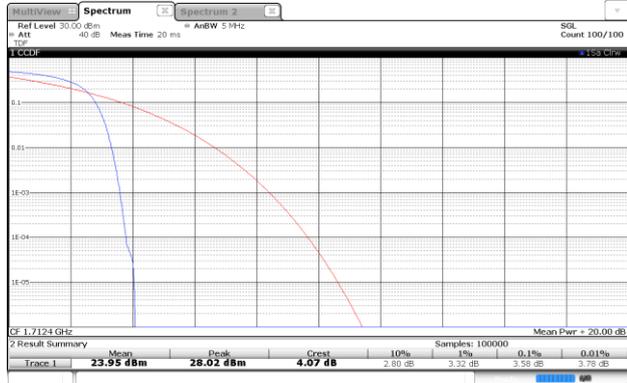
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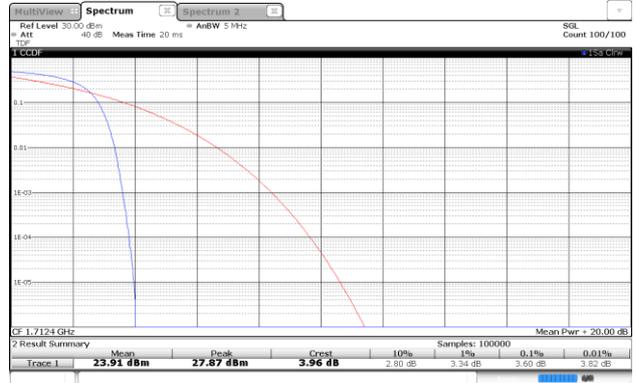


Test mode: WCDMA1700

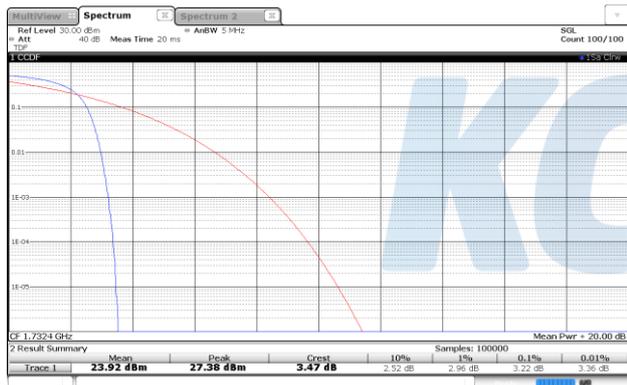
RMC / Low ch.



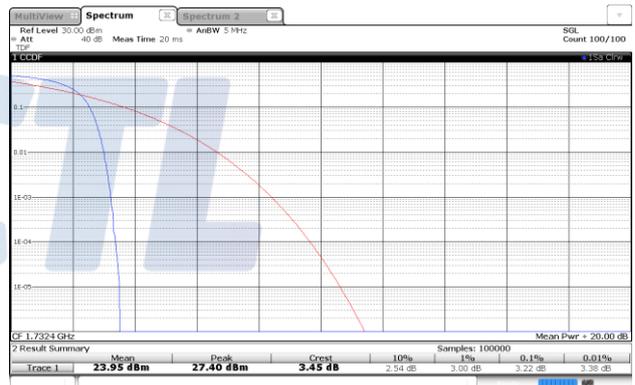
HSDPA / Low ch.



RMC / Mid ch.



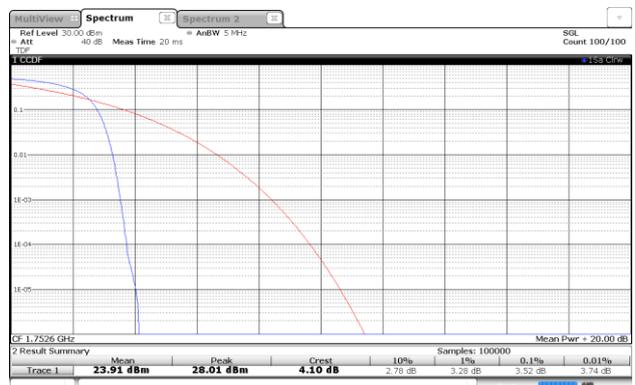
HSDPA / Mid ch.



RMC / High ch.



HSDPA / High ch.



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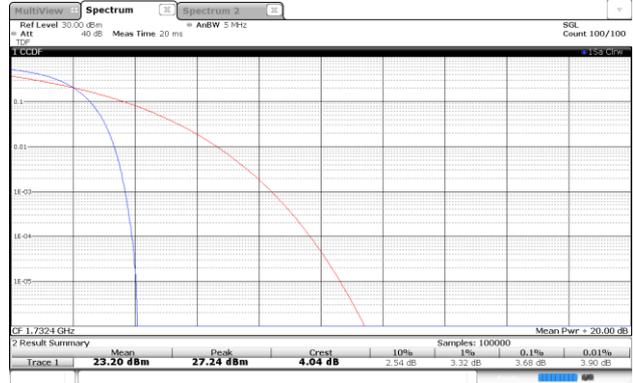
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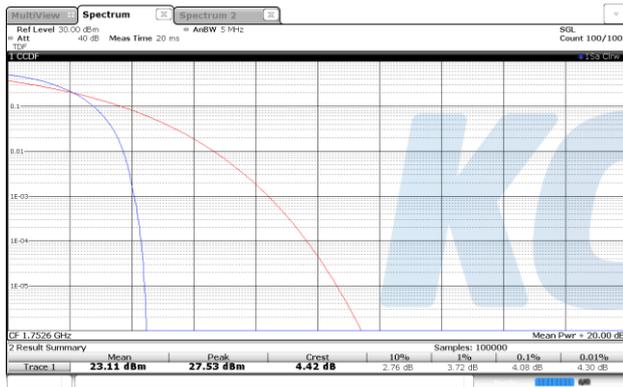
HSUPA / Low ch.



HSUPA / Mid ch.



HSUPA / High ch.



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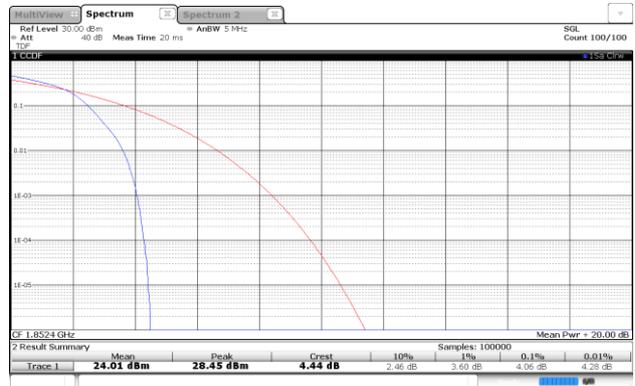


Test mode: WCDMA1900

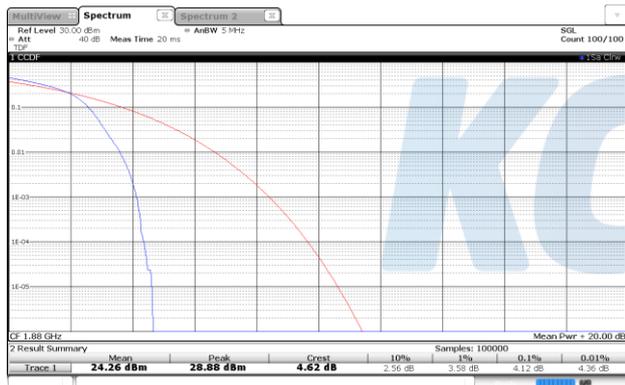
RMC / Low ch.



HSDPA / Low ch.



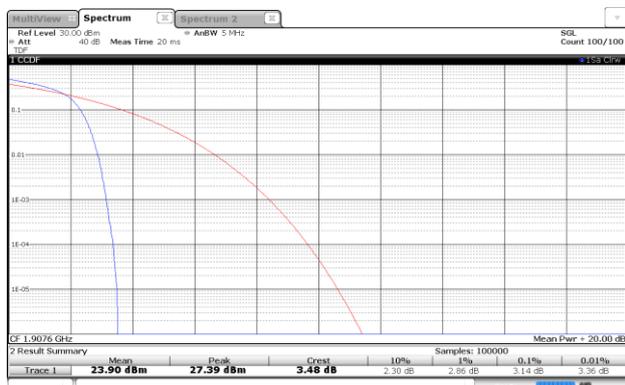
RMC / Mid ch.



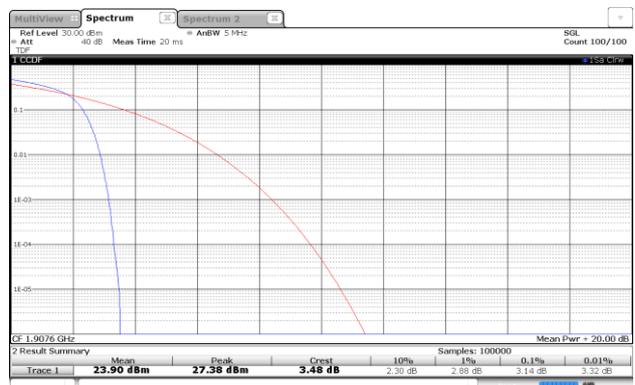
HSDPA / Mid ch.



RMC / High ch.



HSDPA / High ch.



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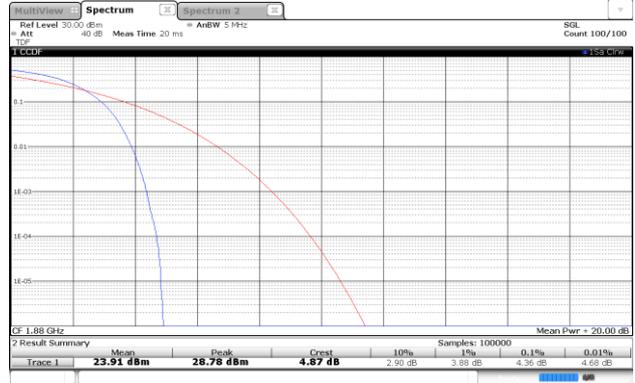
Page (71) of (123)



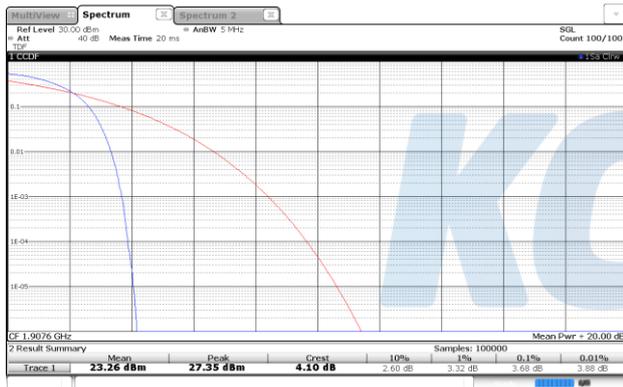
HSUPA / Low ch.



HSUPA / Mid ch.



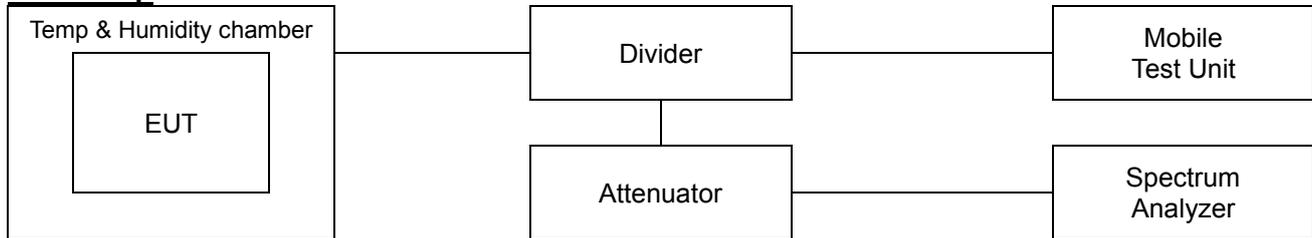
HSUPA / High ch.



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7.5. 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 $+50^{\circ}$ centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
- 2) From -20° to $+50^{\circ}$ 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 MHz 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 $+50^{\circ}$ 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 MHz 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.

According to §27.54,

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the Authorized bands of operation.

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KCTL**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.

Notes:

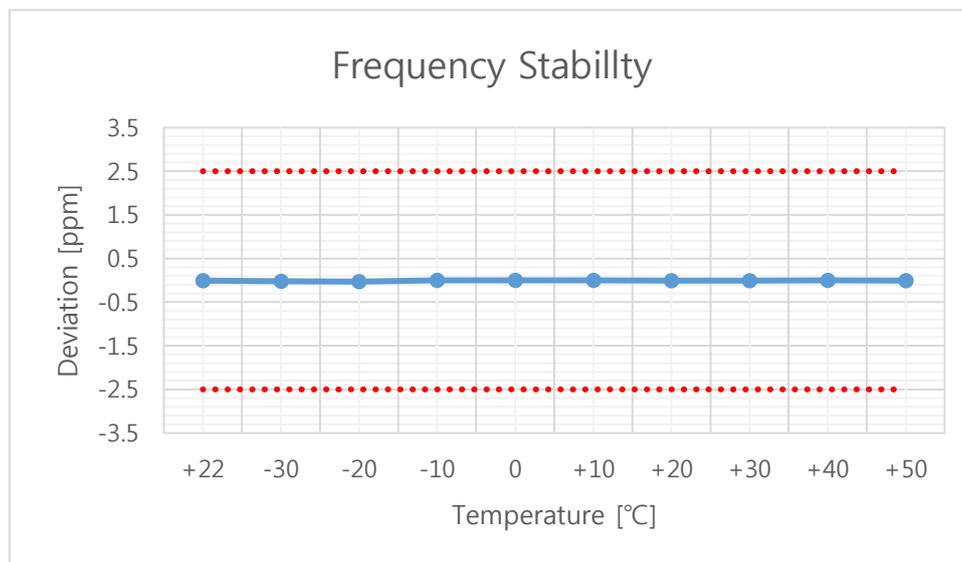
1. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function. Please refer to the page 10.

KCTL

Test results

Test mode : GSM850
 Frequency (Hz) : 836 600 000
 Channel : 190
 Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+22(Ref)	836 599 992	-8	-0.01	-0.000 001
		-30	836 599 987	-13	-0.02	-0.000 002
		-20	836 599 974	-26	-0.03	-0.000 003
		-10	836 600 003	3	0.00	0.000 000
		0	836 600 003	3	0.00	0.000 000
		+10	836 599 996	-4	0.00	0.000 000
		+20	836 599 991	-9	-0.01	-0.000 001
		+30	836 599 988	-12	-0.01	-0.000 001
		+40	836 599 999	-1	0.00	0.000 000
		+50	836 599 991	-9	-0.01	-0.000 001
115%	4.43	+22(Ref)	836 599 981	-19	-0.02	-0.000 002
End point	3.55	+22(Ref)	836 599 991	-9	-0.01	-0.000 001



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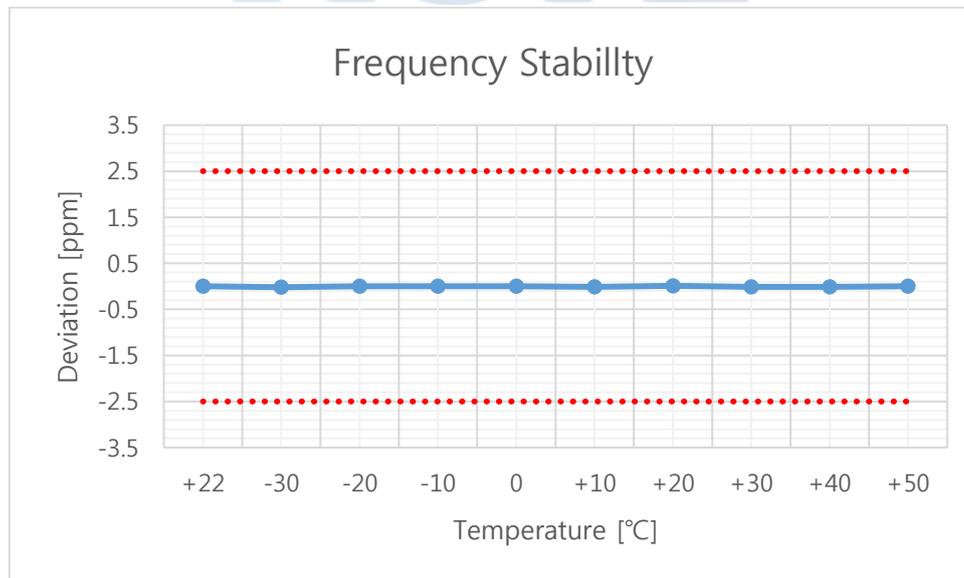
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Test mode : GSM1900
Frequency (Hz) : 1 880 000 000
Channel : 661
Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+22(Ref)	1 879 999 995	-5	0.00	0.000 000
		-30	1 879 999 969	-31	-0.02	-0.000 002
		-20	1 880 000 007	7	0.00	0.000 000
		-10	1 879 999 998	-2	0.00	0.000 000
		0	1 879 999 996	-4	0.00	0.000 000
		+10	1 879 999 989	-11	-0.01	-0.000 001
		+20	1 880 000 016	16	0.01	0.000 001
		+30	1 879 999 983	-17	-0.01	-0.000 001
		+40	1 879 999 984	-16	-0.01	-0.000 001
		+50	1 880 000 005	5	0.00	0.000 000
115%	4.43	+22(Ref)	1 879 999 996	-4	0.00	0.000 000
End point	3.55	+22(Ref)	1 879 999 996	-4	0.00	0.000 000



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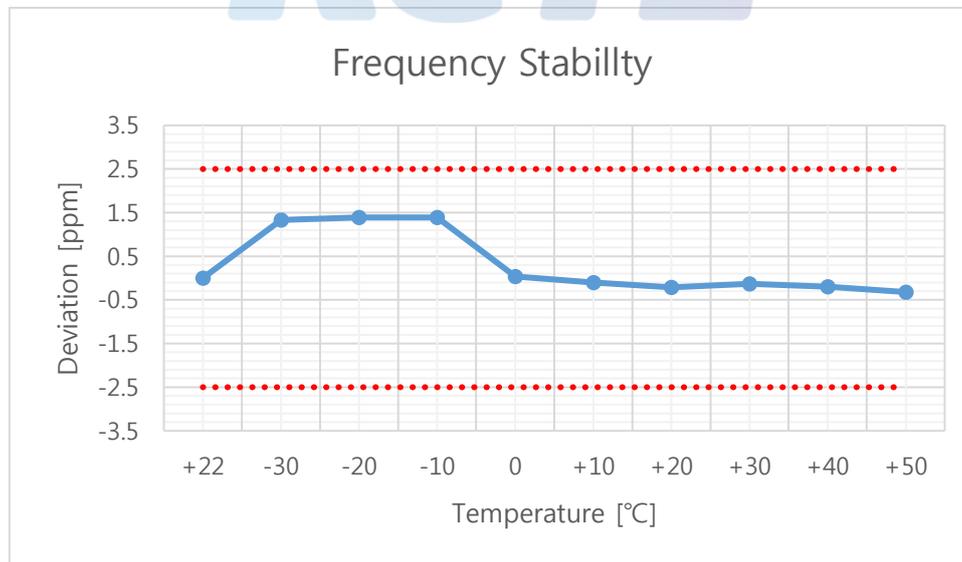
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Test mode : WCDMA850
Frequency (Hz) : 836 600 000
Channel : 4183
Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+22(Ref)	836 599 997	-3	0.00	0.000 000
		-30	836 601 115	1 115	1.33	0.000 133
		-20	836 601 165	1 165	1.39	0.000 139
		-10	836 601 164	1 164	1.39	0.000 139
		0	836 600 037	37	0.04	0.000 004
		+10	836 599 918	-82	-0.01	-0.000 010
		+20	836 599 827	-173	-0.21	-0.000 021
		+30	836 599 891	-109	-0.13	-0.000 013
		+40	836 599 830	-170	-0.20	-0.000 020
		+50	836 599 734	-266	-0.32	-0.000 032
115%	4.43	+22(Ref)	836 599 980	-20	-0.02	-0.000 002
End point	3.55	+22(Ref)	836 599 902	-98	-0.12	-0.000 012



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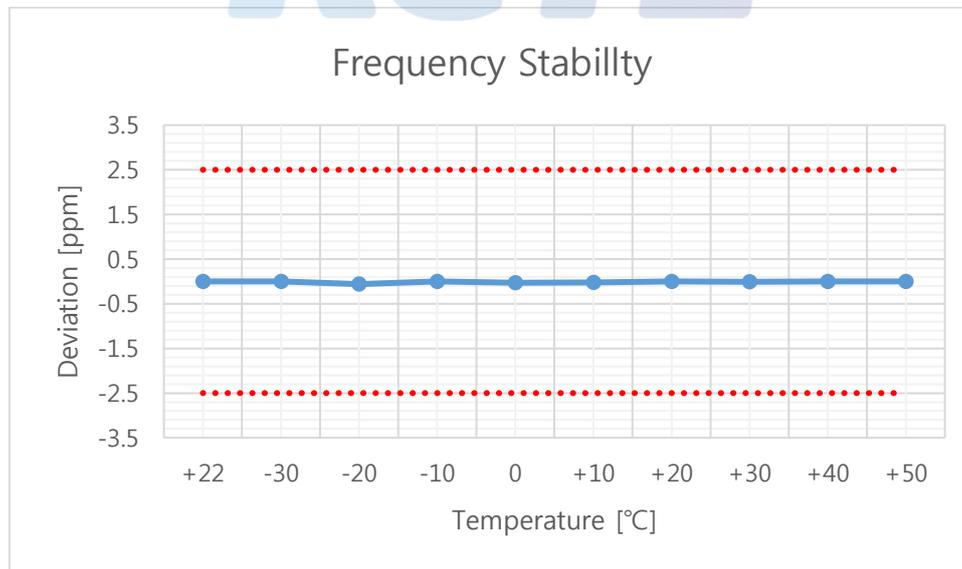
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Test mode : WCDMA1700
Frequency (Hz) : 1 732 400 000
Channel : 1412
Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+22(Ref)	1 732 399 998	-2	0.00	0.000 000
		-30	1 732 400 000	0	0.00	0.000 000
		-20	1 732 399 898	-102	-0.06	-0.000 006
		-10	1 732 399 995	-5	0.00	0.000 000
		0	1 732 399 945	-55	-0.03	-0.000 003
		+10	1 732 399 973	-27	-0.02	-0.000 002
		+20	1 732 399 996	-4	0.00	0.000 000
		+30	1 732 399 984	-16	-0.01	-0.000 001
		+40	1 732 399 999	-1	0.00	0.000 000
		+50	1 732 400 001	1	0.00	0.000 000
115%	4.43	+22(Ref)	1 732 399 997	-3	0.00	0.000 000
End point	3.55	+22(Ref)	1 732 399 996	-4	0.00	0.000 000



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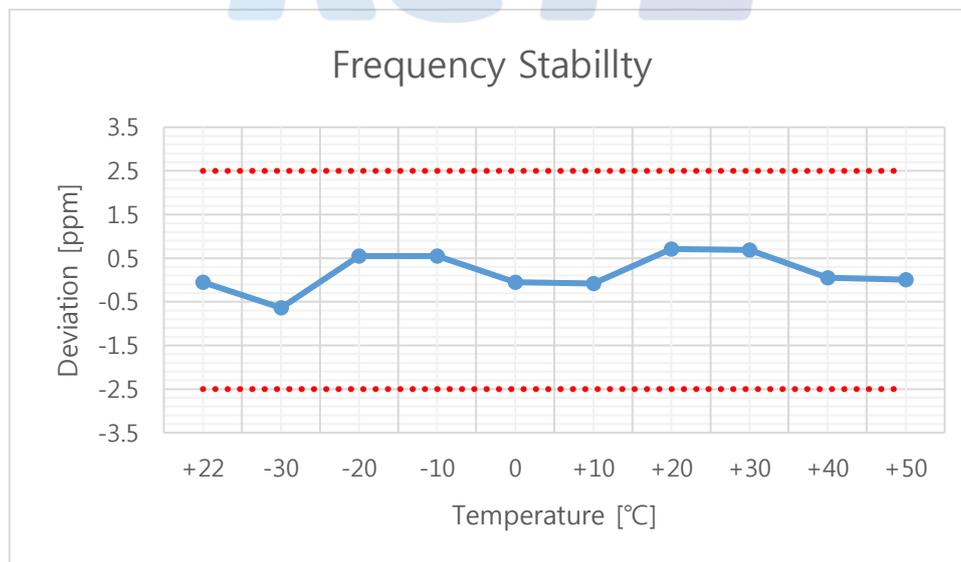
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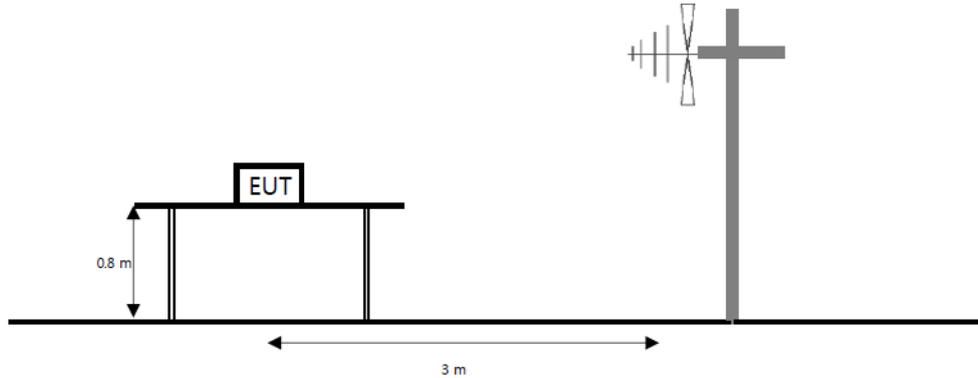
Test mode : WCDMA1900
Frequency (Hz) : 1 880 000 000
Channel : 9400
Deviation limit : ±0.00025% or 2.5ppm

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+22(Ref)	1 879 999 901	-99	-0.05	-0.000 005
		-30	1 879 998 791	-1 209	-0.64	-0.000 064
		-20	1 880 001 026	1 026	0.55	0.000 055
		-10	1 880 001 039	-96	0.55	0.000 055
		0	1 879 999 904	-154	-0.05	-0.000 005
		+10	1 879 999 846	1 333	-0.08	-0.000 008
		+20	1 880 001 333	1 288	0.71	0.000 071
		+30	1 880 001 288	100	0.69	0.000 069
		+40	1 880 000 100	23	0.05	0.000 005
		+50	1 880 000 023	-1	0.01	0.000 001
115%	4.43	+22(Ref)	1 879 999 999	16	0.00	0.000 000
End point	3.55	+22(Ref)	1 880 000 016	-99	0.01	0.000 001

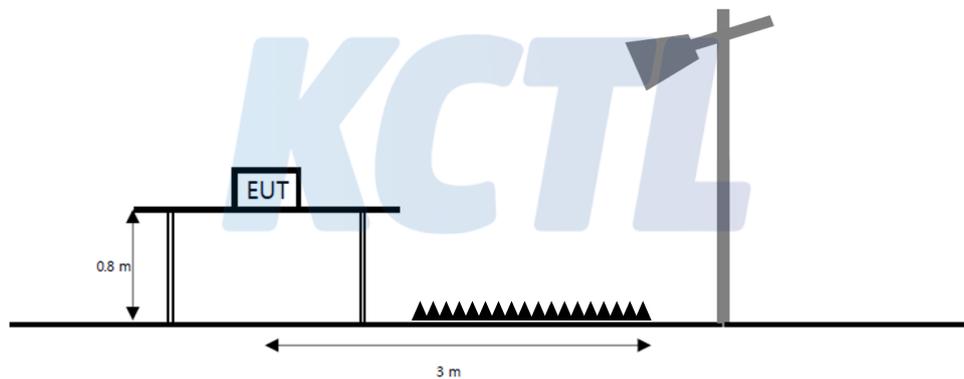


7.6. Radiated Power (ERP/EIRP)**Test setup**

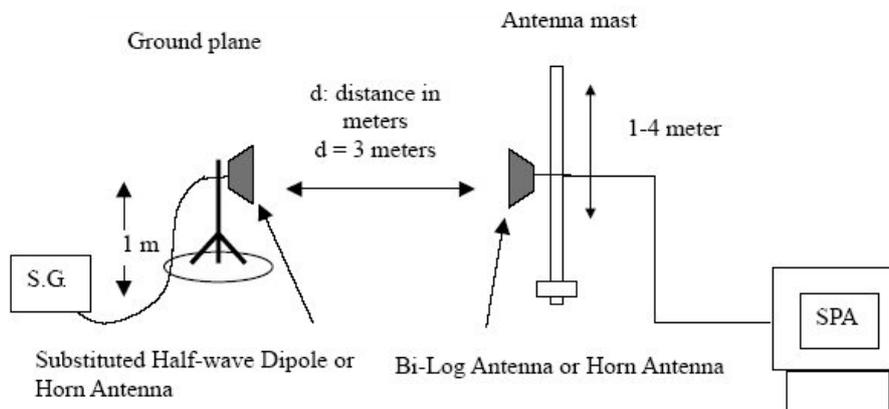
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



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



The diagram below shows the test setup for substituted method.



Limit

According to §22.913(a)(5), the ERP of transmitters in the cellular radiotelephone service must not exceed the limits in this section. 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(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1710~1755 MHz band and mobile and portable stations operating in the 1695~1710 MHz and 1755~1780 MHz bands are 1 watt EIRP.

Test procedure

971168 D01 v03r01 - Section 5.2.2

ANSI 63.26-2015 – Section 5.2.4.4.1

ANSI/TIA-603-E-2016 - Section 2.2.17

Test settings

- 1) RBW = 1 % to 5 % of the OBW.
- 2) VBW $\geq 3 \times$ RBW.
- 3) SPAN = 2 \times to 3 \times the OBW.
- 4) Number of measurement points in sweep $\geq 2 \times$ span / RBW.
- 5) Sweep time :
 - 1) Auto couple, or
 - 2) $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$ 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 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 GHz below) or horn antenna (1 GHz above) connected to a signal generator.
The power is calculated by the following formula;
$$Pd(\text{dBm}) = Pg(\text{dBm}) - \text{Cable loss (dB)} + \text{Antenna gain (dB)}$$

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 dBm, 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.

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**Test results****Test mode: GSM850**

Mode	Channel	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[MHz]	[V/H]	[dBi]	[dB]	[dB m]	[dB m]	[W]
GPRS	128	824.20	H	-0.50	3.80	30.00	25.70	0.372
	190	836.60	H	-0.50	3.84	31.57	27.23	0.528
	251	848.80	H	-0.50	3.87	32.39	28.02	0.634
EDGE	128	824.20	V	-0.50	3.80	24.93	20.63	0.116
	190	836.60	V	-0.50	3.84	25.63	21.29	0.135
	251	848.80	V	-0.50	3.87	24.77	20.40	0.110

Test mode: GSM1900

Mode	Channel	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[MHz]	[V/H]	[dBi]	[dB]	[dB m]	[dB m]	[W]
GPRS	512	1 850.20	H	8.70	5.72	23.22	26.20	0.417
	661	1 880.00	H	8.70	5.80	23.22	26.12	0.409
	810	1 909.80	H	8.70	5.88	22.90	25.72	0.373
EDGE	512	1 850.20	H	8.70	5.72	20.87	23.85	0.243
	661	1 880.00	H	8.70	5.80	20.90	23.80	0.240
	810	1 909.80	H	8.70	5.88	20.44	23.26	0.212

Note.

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

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**Test mode: WCDMA850**

Mode	Channel	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[MHz]	[V/H]	[dBi]	[dB]	[dB m]	[dB m]	[W]
RMC	4132	826.40	H	-0.50	3.80	22.37	18.07	0.064
	4182	836.40	H	-0.50	3.84	23.17	18.83	0.076
	4233	846.60	H	-0.50	3.87	23.50	19.13	0.082
HSDPA	4132	826.40	H	-0.50	3.80	22.06	17.76	0.060
	4182	836.40	H	-0.50	3.84	22.79	18.45	0.070
	4233	846.60	H	-0.50	3.87	23.04	18.67	0.074
HSUPA	4132	826.40	H	-0.50	3.80	24.93	20.63	0.116
	4182	836.40	H	-0.50	3.84	25.89	21.55	0.143
	4233	846.60	H	-0.50	3.87	25.59	21.22	0.132

Test mode: WCDMA1700

Mode	Channel	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[MHz]	[V/H]	[dBi]	[dB]	[dB m]	[dB m]	[W]
RMC	1312	1 712.4	H	8.50	5.51	19.84	22.83	0.192
	1412	1 732.4	H	8.40	5.51	19.42	22.31	0.170
	1513	1 752.6	H	8.30	5.51	20.11	22.90	0.195
HSDPA	1312	1 712.4	H	8.50	5.51	19.80	22.79	0.190
	1412	1 732.4	H	8.40	5.51	19.31	22.20	0.166
	1513	1 752.6	H	8.30	5.51	19.75	22.54	0.179
HSUPA	1312	1 712.4	H	8.50	5.51	18.09	21.08	0.128
	1412	1 732.4	H	8.40	5.51	17.16	20.05	0.101
	1513	1 752.6	H	8.30	5.51	19.03	21.82	0.152

Note.

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

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KCTL**Test mode: WCDMA1900**

Mode	Channel	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[MHz]	[V/H]	[dBi]	[dB]	[dB m]	[dB m]	[W]
RMC	9262	1 852.40	V	8.70	5.72	18.84	21.82	0.152
	9400	1 880.00	V	8.70	5.80	18.49	21.39	0.138
	9538	1 907.60	V	8.70	5.88	18.78	21.60	0.145
HSDPA	9262	1 852.40	V	8.70	5.72	16.49	19.47	0.089
	9400	1 880.00	V	8.70	5.80	16.40	19.30	0.085
	9538	1 907.60	V	8.70	5.88	16.83	19.65	0.092
HSUPA	9262	1 852.40	V	8.70	5.72	17.60	20.58	0.114
	9400	1 880.00	V	8.70	5.80	17.68	20.58	0.114
	9538	1 907.60	V	8.70	5.88	17.82	20.64	0.116

Note.

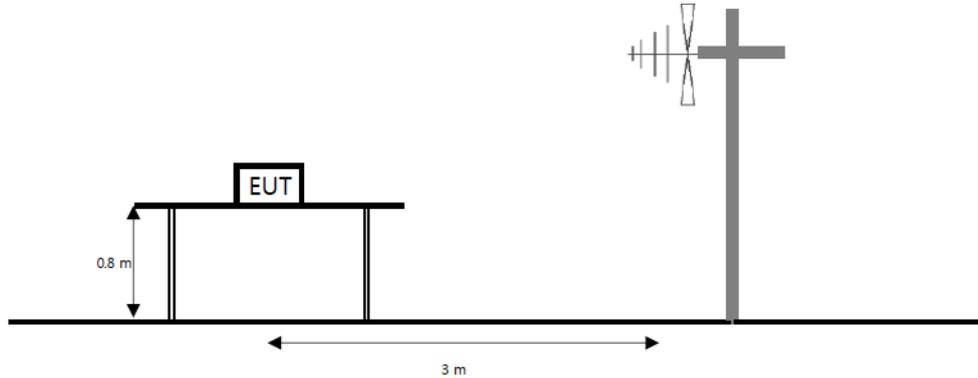
1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBd) - C.L(Cable loss) (dB)

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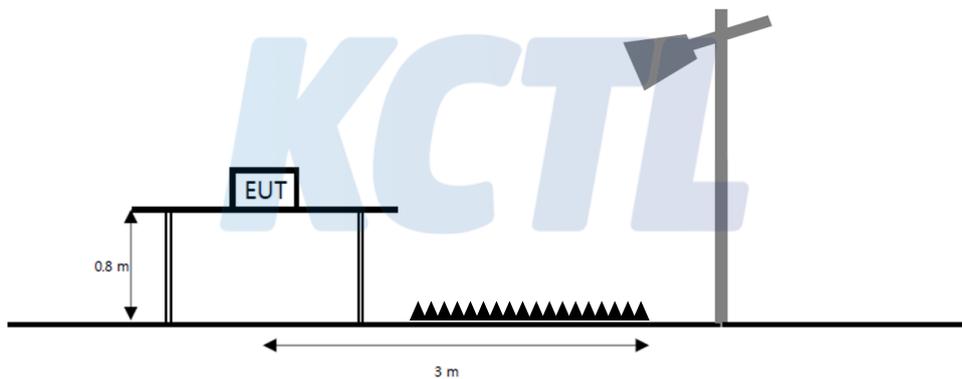
7.7. Radiated Spurious Emissions

Test setup

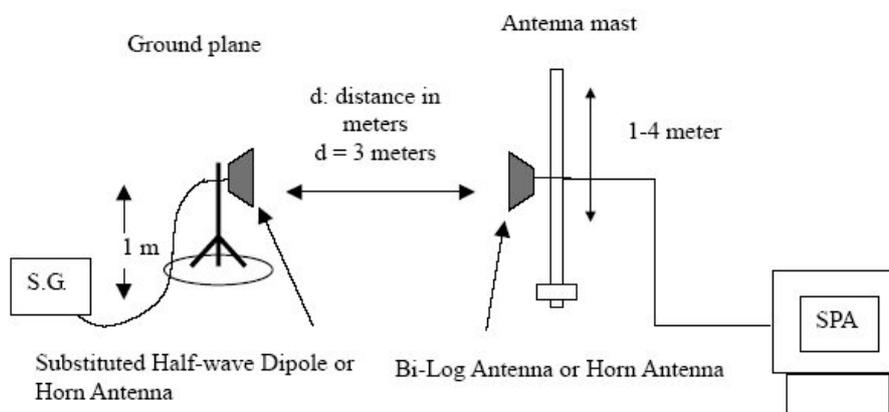
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz 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 $43 + 10\log(P)$ dB.

According to §27.53(h), except as otherwise specified below, for operations in the 1695~1710 MHz, 1710 ~ 1755 MHz, 1755 ~ 1780 MHz, 1915~1920 MHz, 1995~2000 MHz, 2000~2020 MHz, 2110~2155 MHz, 2155~2180 MHz, and 2180~2200 bands, the power of an emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log(P_{\text{[Watts]}})$ dB.

Test procedure

971168 D01 v03r01 - Section 5.8

ANSI 63.26-2015 – Section 5.5

ANSI/TIA-603-E-2016 - Section 2.2.12

Test settings

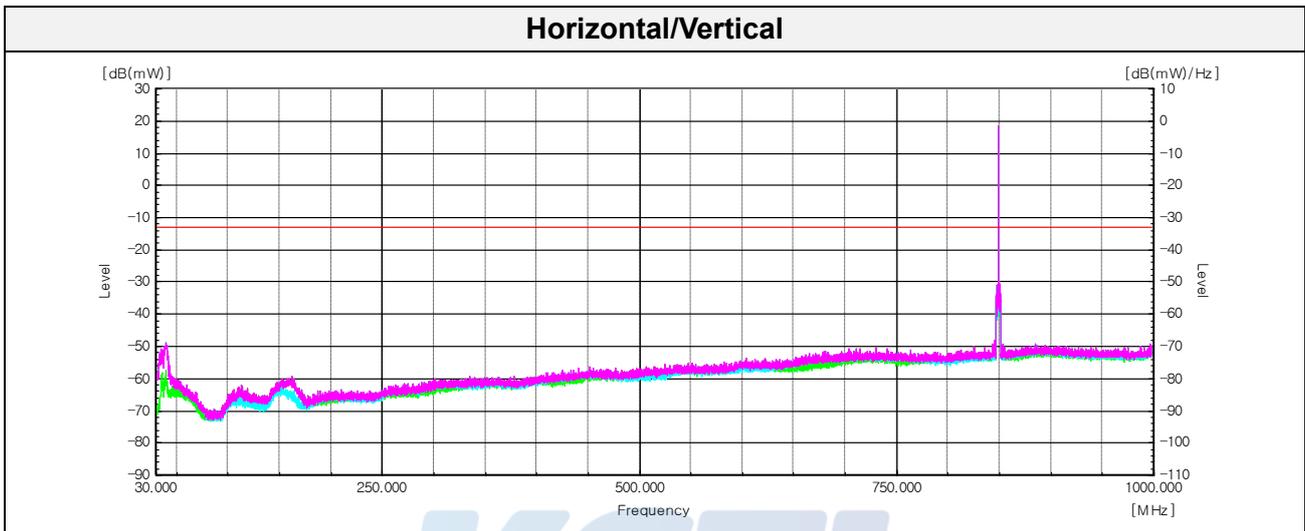
- 1) RBW = 1 kHz for below 1 GHz and 1 MHz for above 1 GHz.
- 2) VBW $\geq 3 \times$ RBW.
- 3) Detector = RMS
- 4) Trace mode = Max hold
- 5) Sweep time = Auto couple
- 6) Number of sweep points $\geq 2 \times$ span / RBW
- 7) Allow trace to fully stabilize.

Notes:

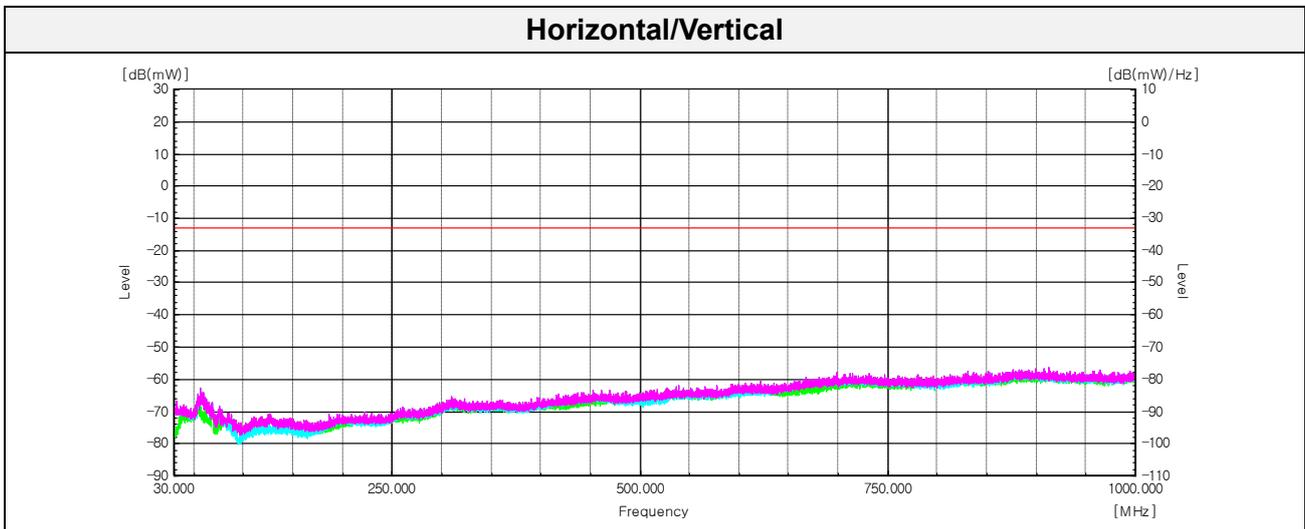
1. On a test site, the EUT shall be placed at 80 cm height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
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 GHz below) or horn antenna (1 GHz 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 dBm, 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 oriented for horizontal polarization.

Test results (Below 1 000 MHz) – Worst case

Test mode : GSM850
Frequency (MHz) : 848.8
Channel : 251

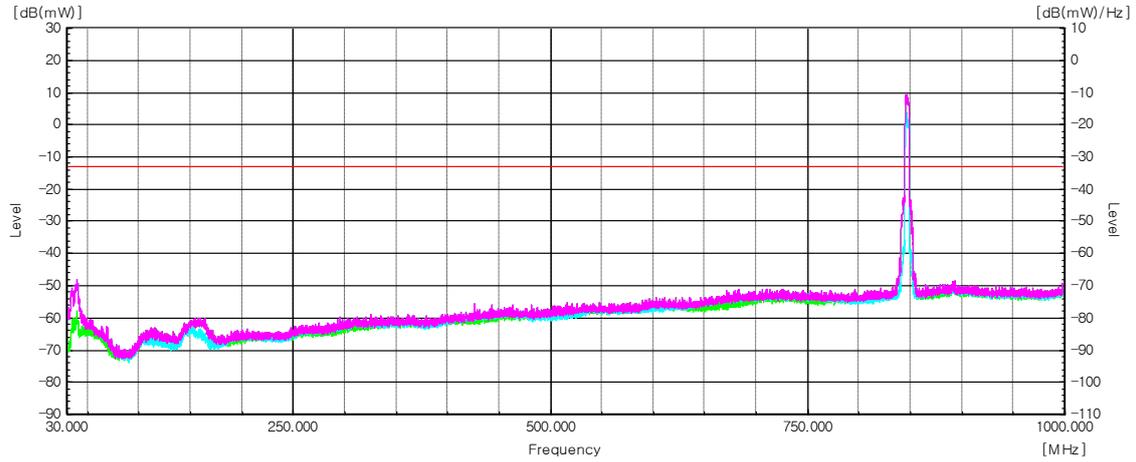


Test mode : GSM1900
Frequency (MHz) : 1 850.2
Channel : 512

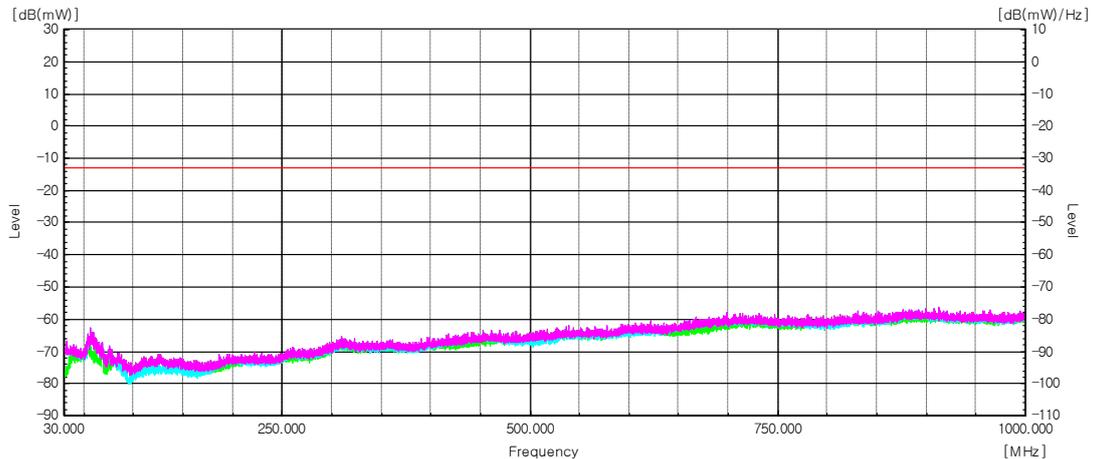
**Note.**

1. No spurious emission were detected below 1 000 MHz.

Test mode : WCDMA850
Frequency (MHz) : 846.6
Channel : 4233

Horizontal/Vertical

Test mode : WCDMA1700
Frequency (MHz) : 1 752.6
Channel : 1513

Horizontal/Vertical**Note.**

1. No spurious emission were detected below 1 000 MHz.

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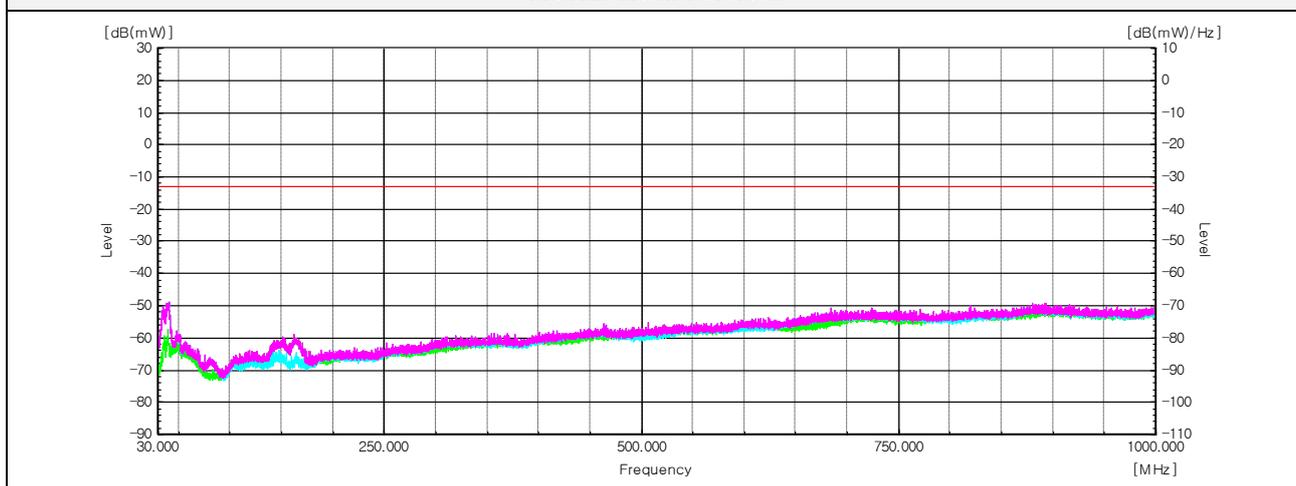
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Test mode : WCDMA 1900
Frequency (MHz) : 1 852.4
Channel : 9262

Horizontal/Vertical



Note.

1. No spurious emission were detected below 1 000 MHz.

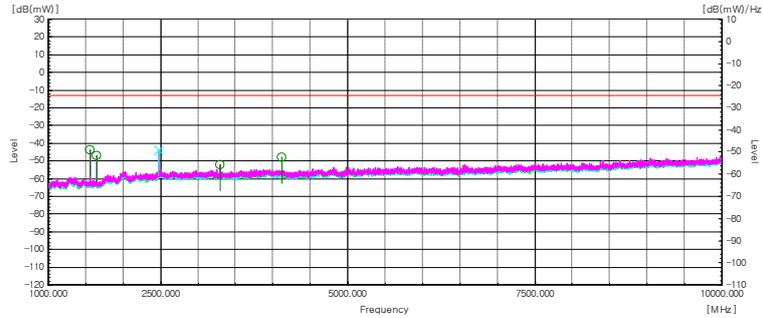
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Test results (Above 1 000 MHz)

Test mode : GPRS850

Frequency(MHz) : 824.2

Channel : 128

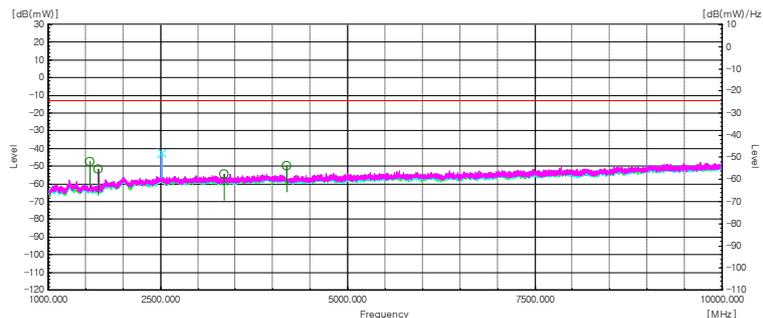


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[MHz]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
GMSK	1 557.06	H	8.0	5.17	-46.83	-44.00	-13.00	31.00
	1 648.07	H	8.4	5.38	-49.92	-46.90	-13.00	33.90
	2 472.16	V	9.8	6.62	-46.98	-43.80	-13.00	30.80
	3 297.26	H	9.3	7.65	-54.15	-52.50	-13.00	39.50
	4 120.35	H	9.9	9.35	-48.65	-48.10	-13.00	35.10

Test mode : GPRS850

Frequency(MHz) : 836.6

Channel : 190



Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[MHz]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
GMSK	1 555.06	H	8.0	5.17	-50.63	-47.80	-13.00	34.80
	1 673.08	H	8.5	5.45	-54.65	-51.60	-13.00	38.60
	2 510.17	V	9.8	6.74	-45.46	-42.40	-13.00	29.40
	3 346.26	H	9.3	7.78	-56.12	-54.60	-13.00	41.60
	4 182.35	H	10.1	9.35	-50.55	-49.80	-13.00	36.80

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_{Watts}) [dBc]

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