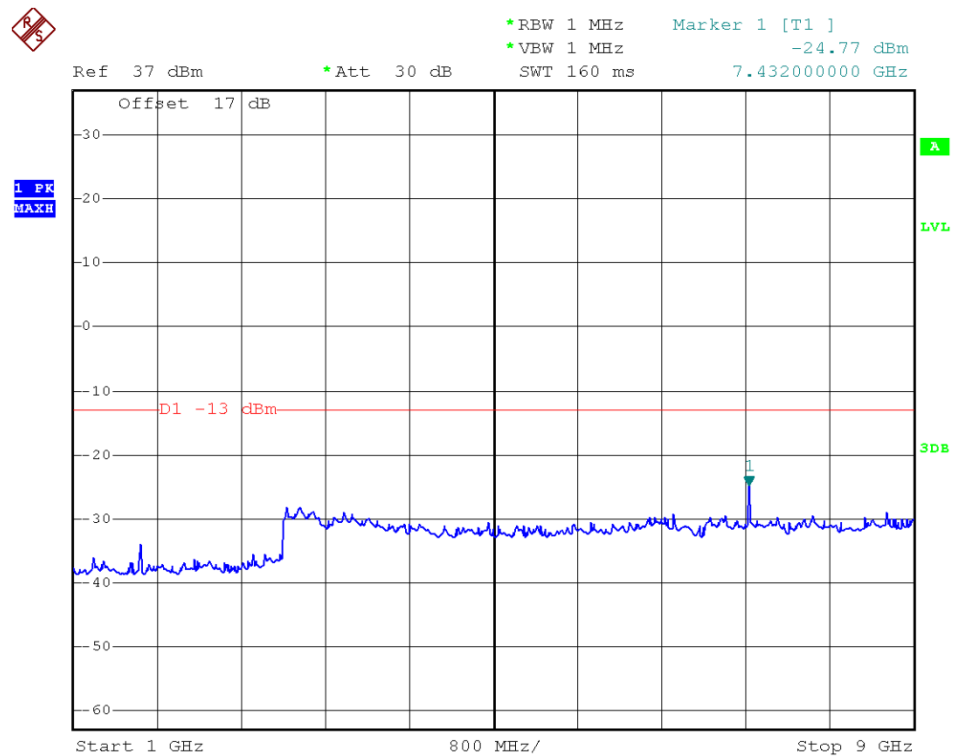
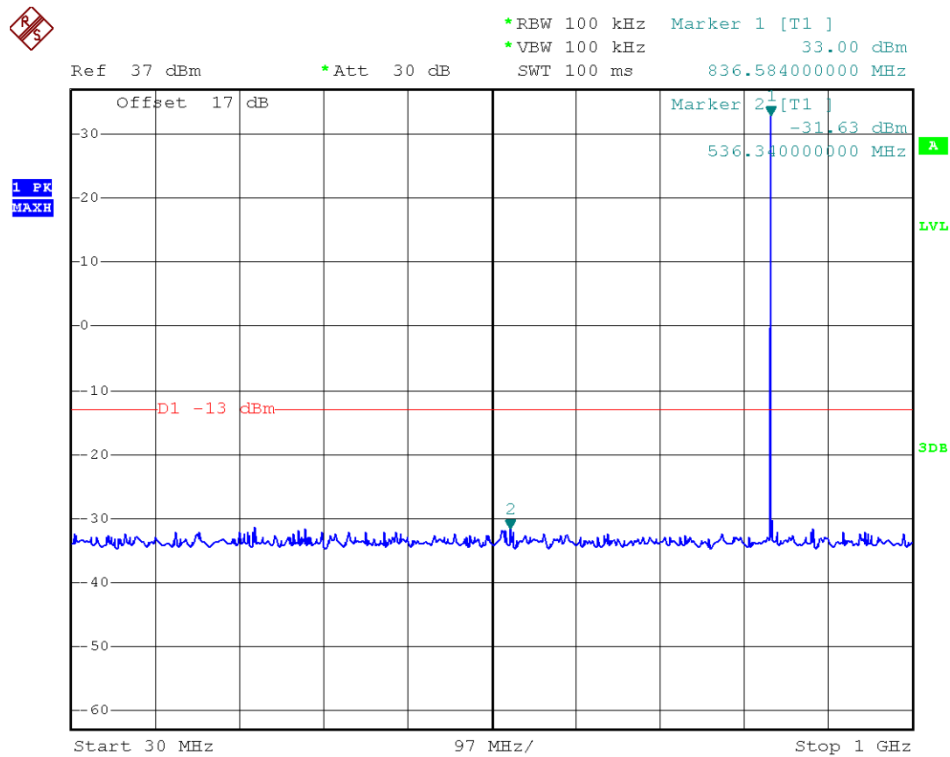


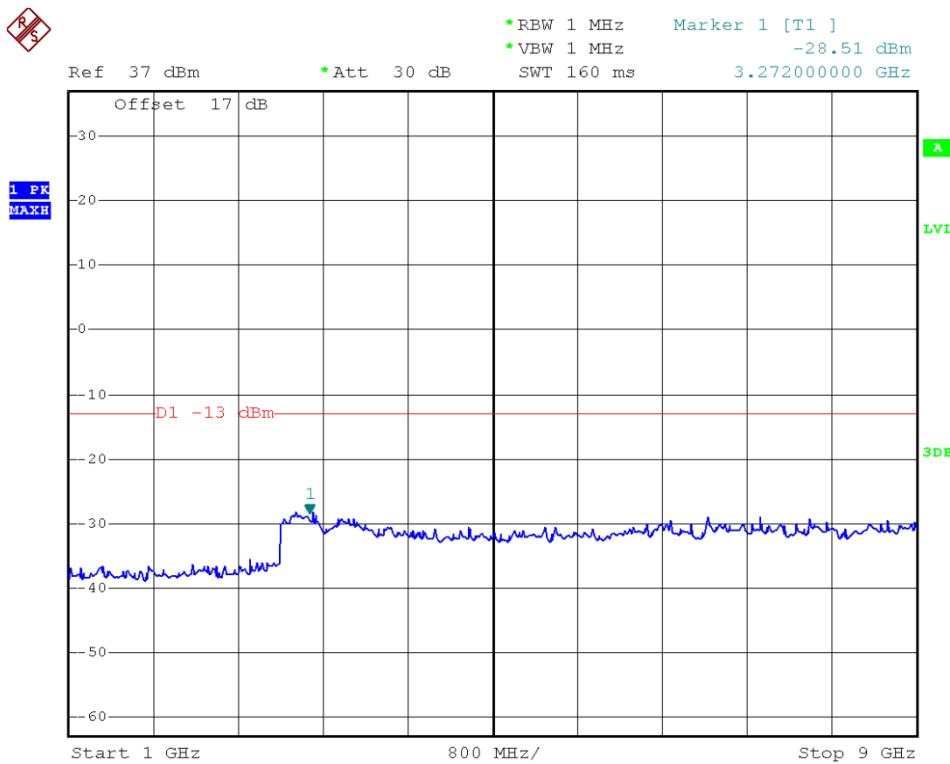
EDGE 850MHz Channel = 128, 30MHz to 1GHz



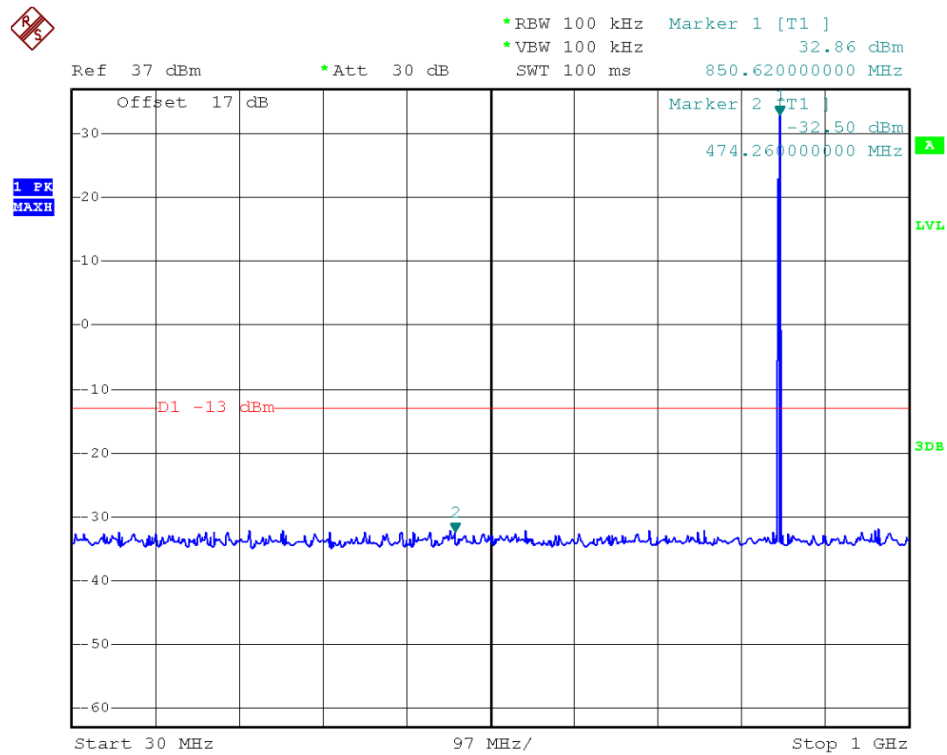
EDGE 850MHz Channel = 128, 1GHz to 9GHz



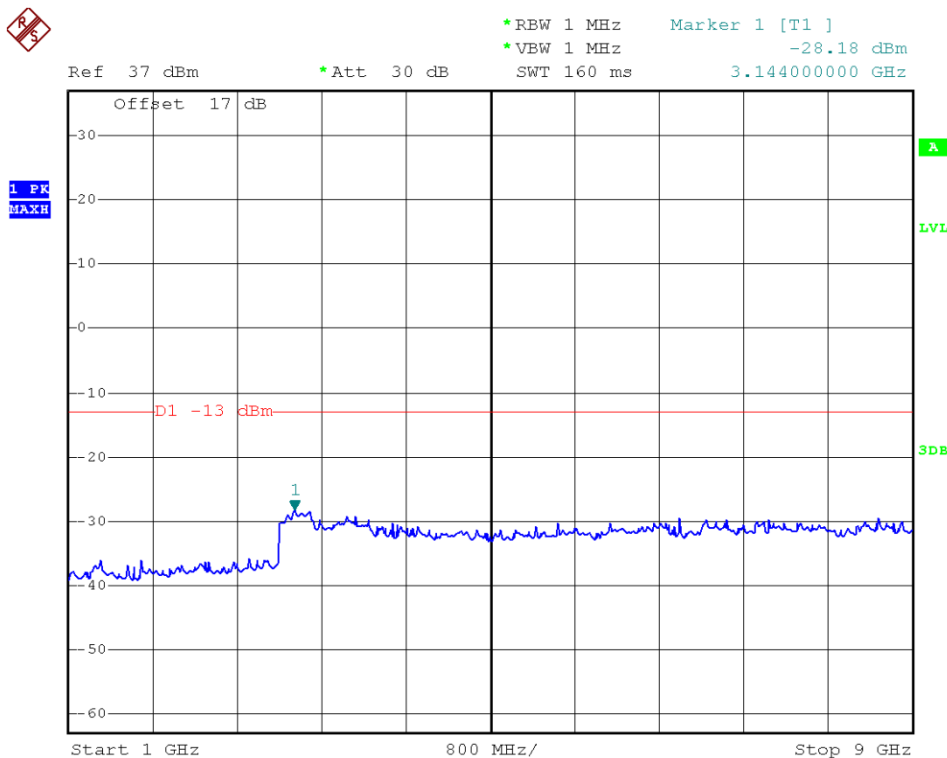
EDGE 850MHz Channel = 190, 30MHz to 1GHz



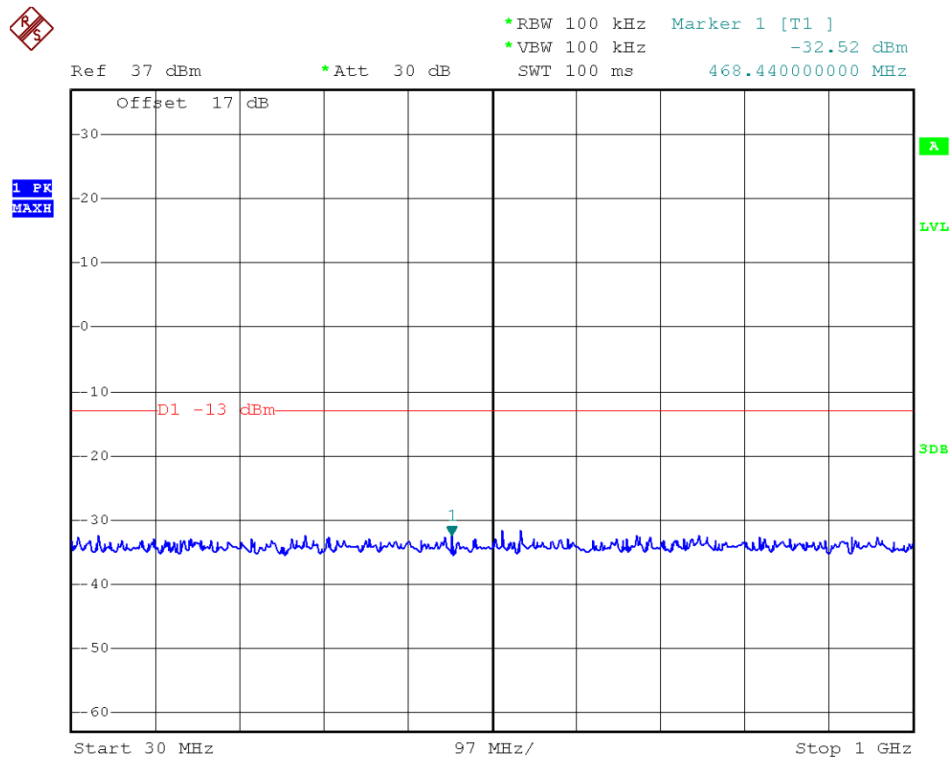
EDGE 850MHz Channel = 190, 1GHz to 9GHz



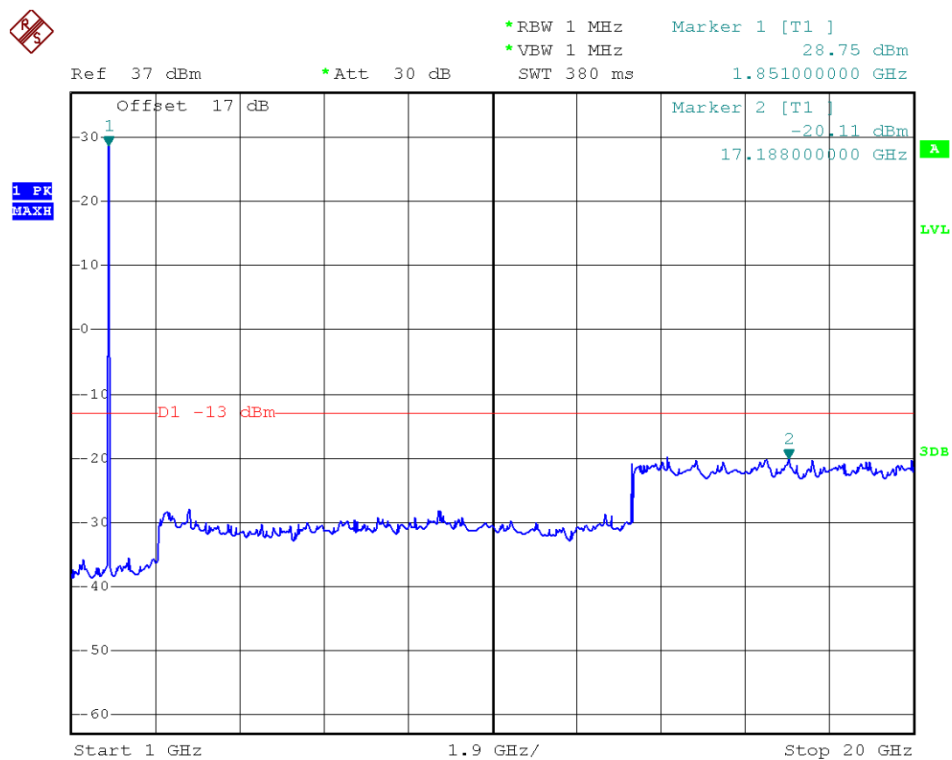
EDGE 850MHz Channel = 251, 30MHz to 1GHz



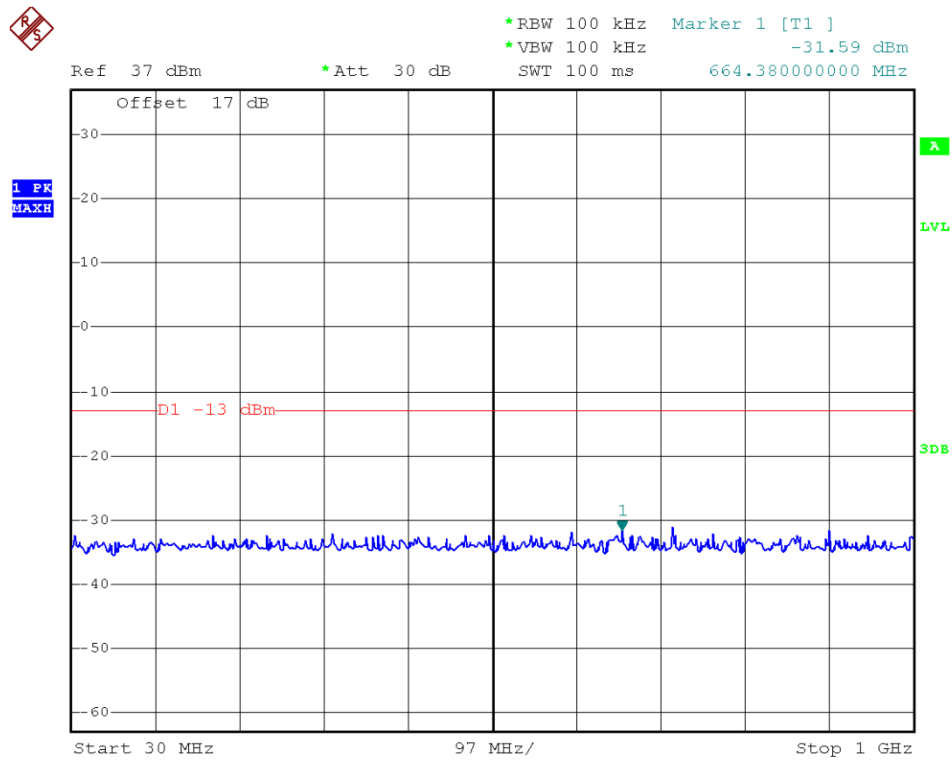
EDGE 850MHz Channel = 251, 1GHz to 9GHz



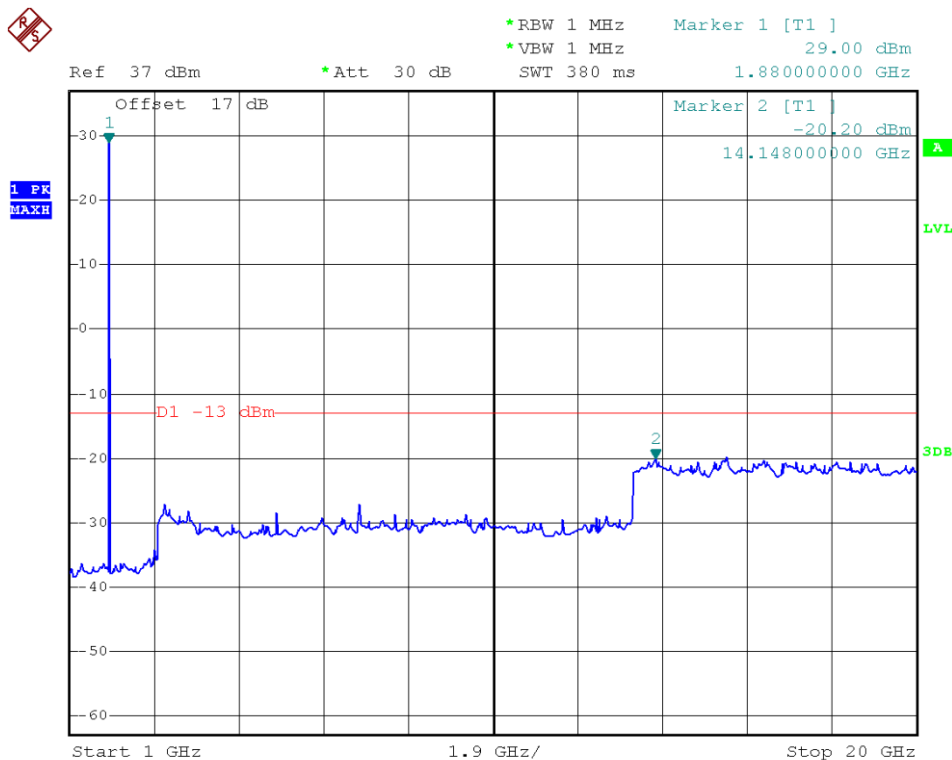
EDGE 1900MHz Channel = 512, 30MHz to 1GHz



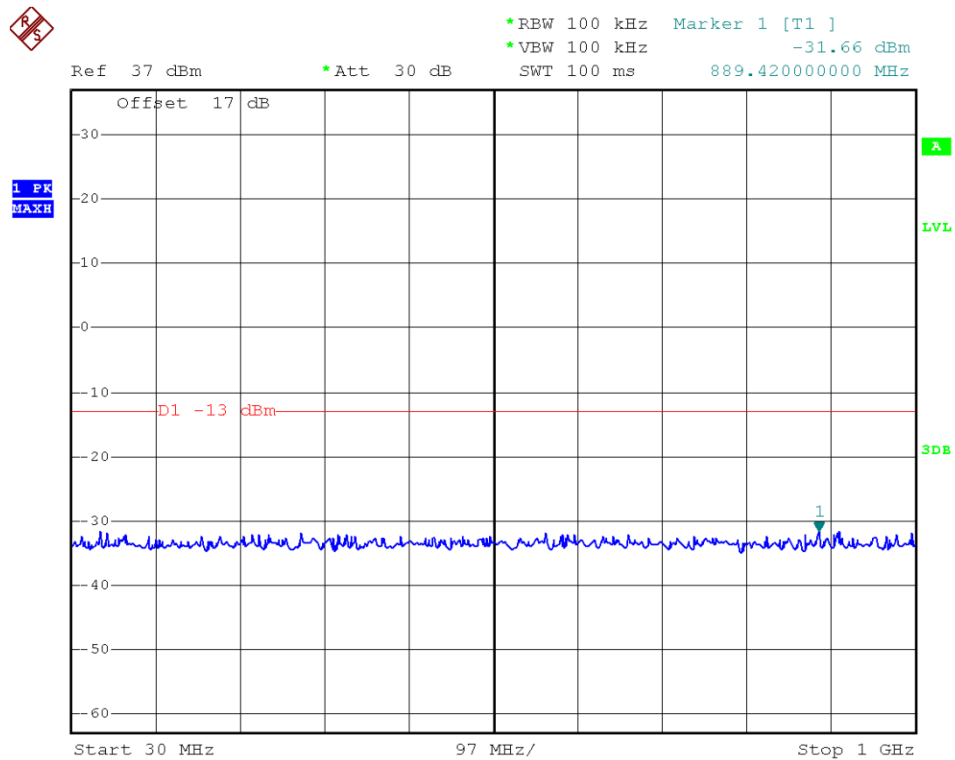
EDGE 1900MHz Channel = 512, 1GHz to 20GHz



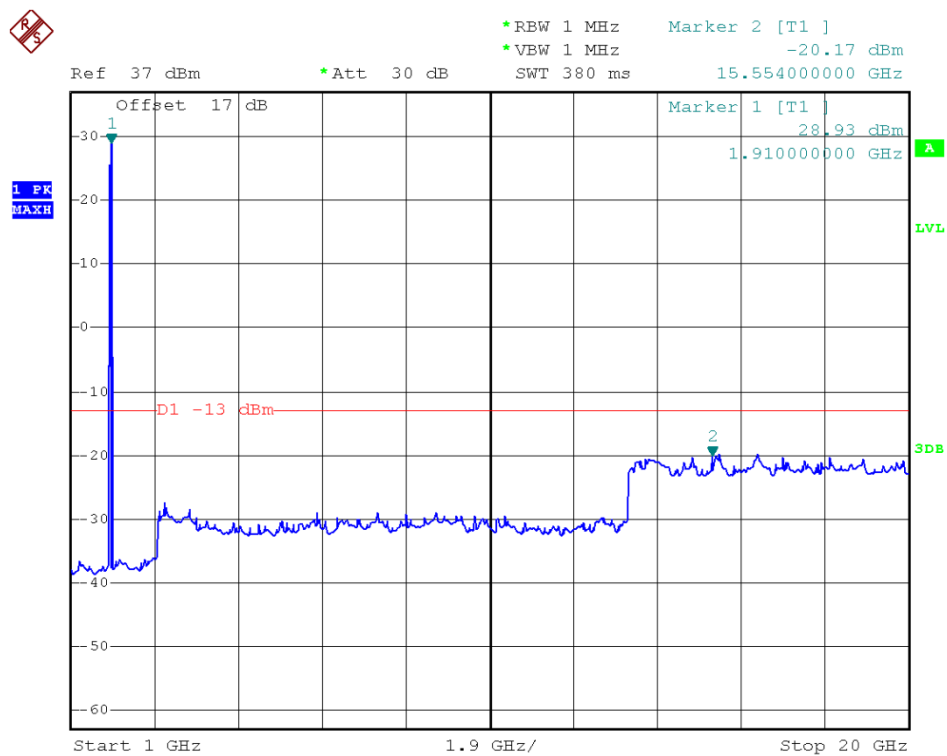
EDGE 1900MHz Channel = 661, 30MHz to 1GHz



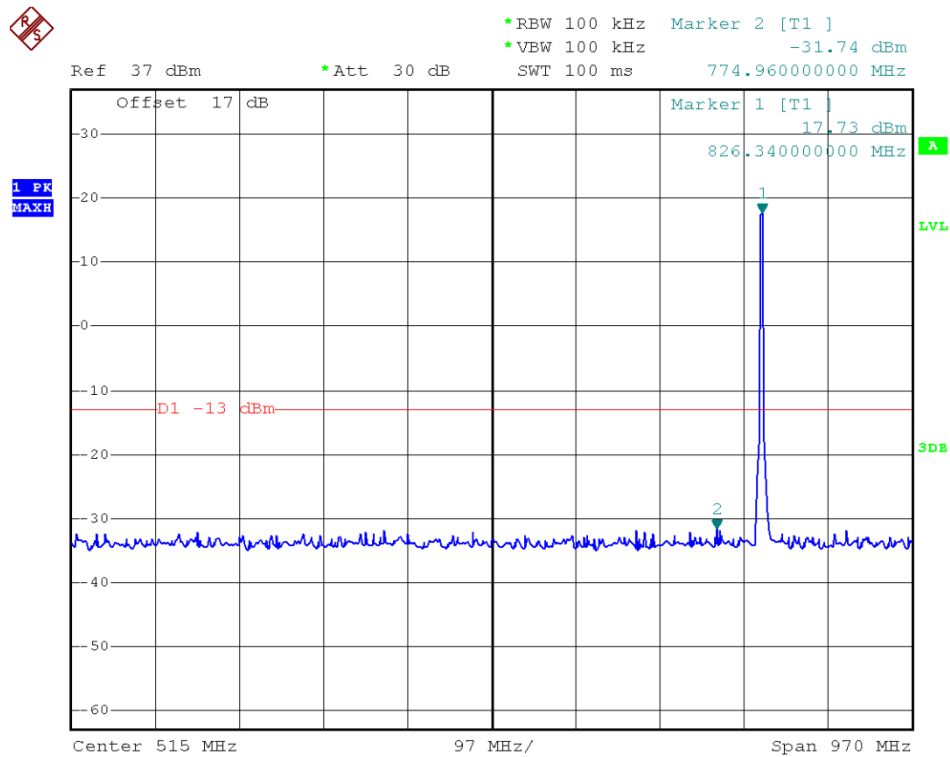
EDGE 1900MHz Channel = 661, 1GHz to 20GHz



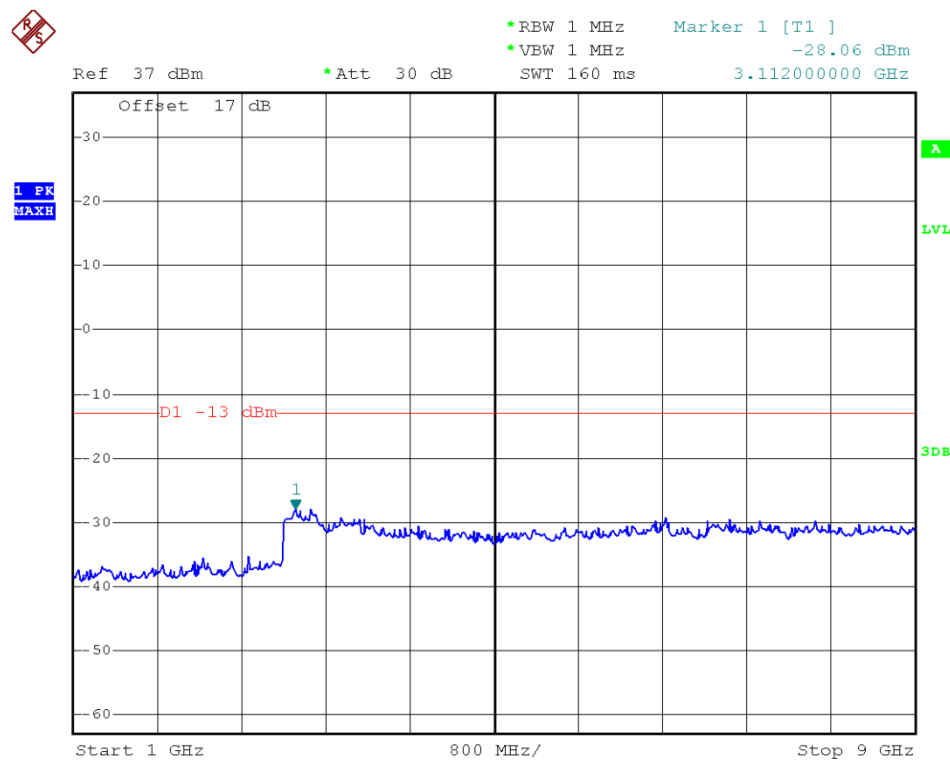
EDGE 1900MHz Channel = 810, 30MHz to 1GHz



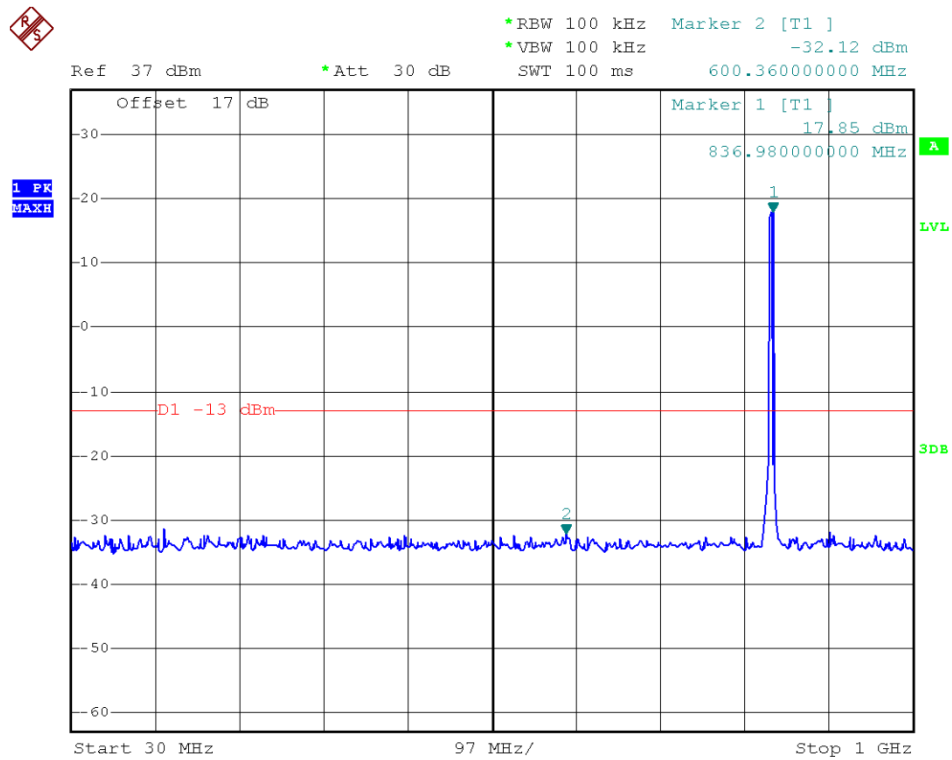
EDGE 1900MHz Channel = 810, 1GHz to 20GHz



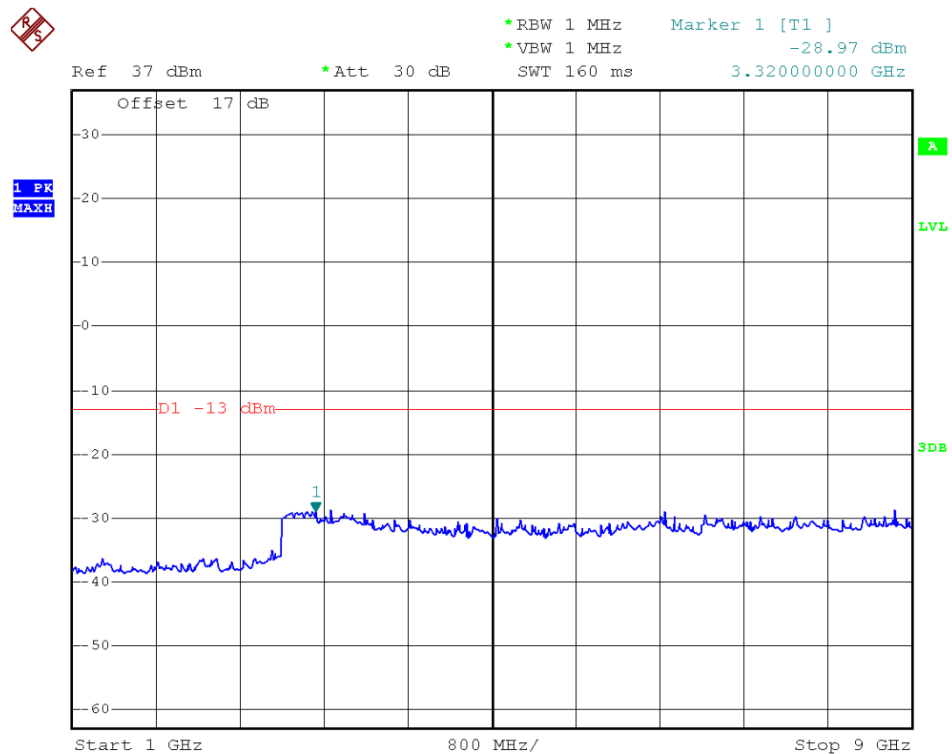
WCDMA850MHz Channel = 4132, 30MHz to 1GHz



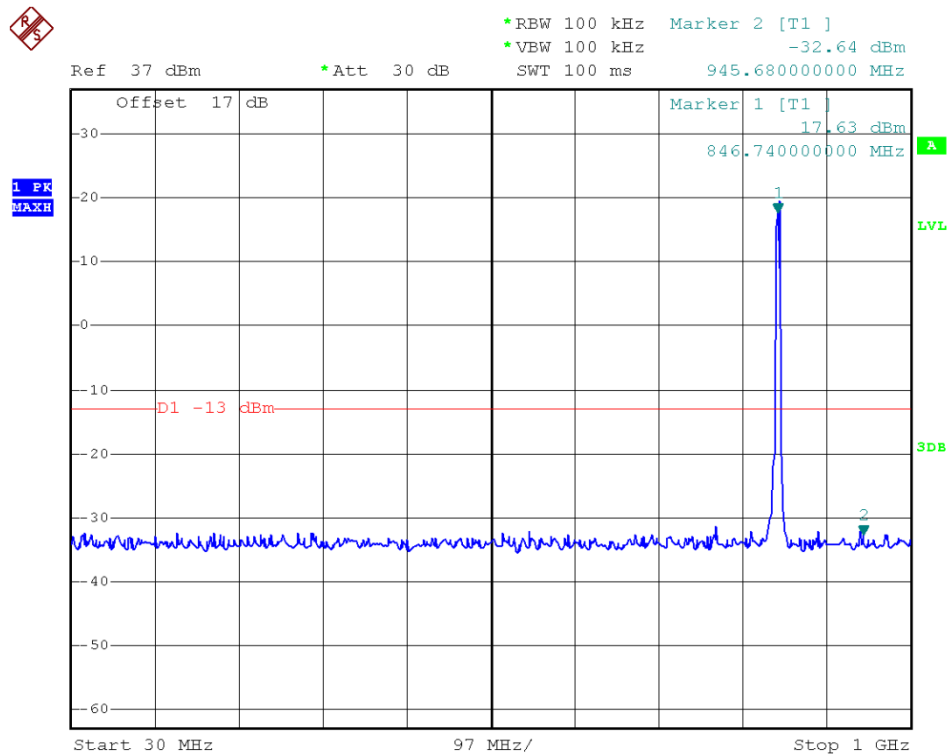
WCDMA850MHz Channel = 4132, 1GHz to 9GHz



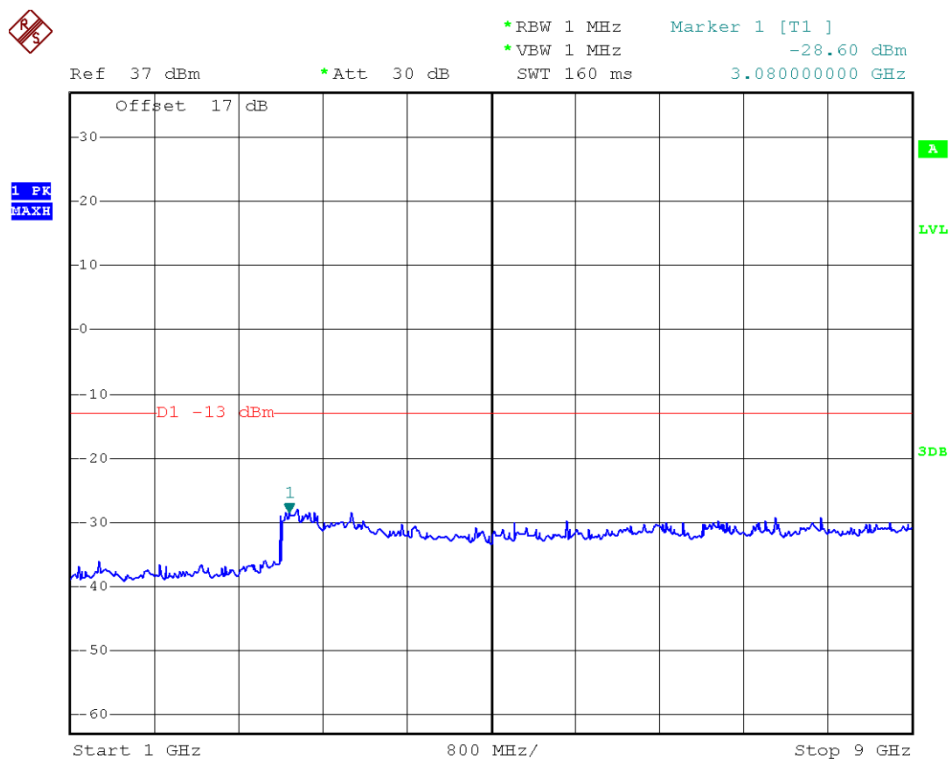
WCDMA850MHz Channel = 4183, 30MHz to 1GHz



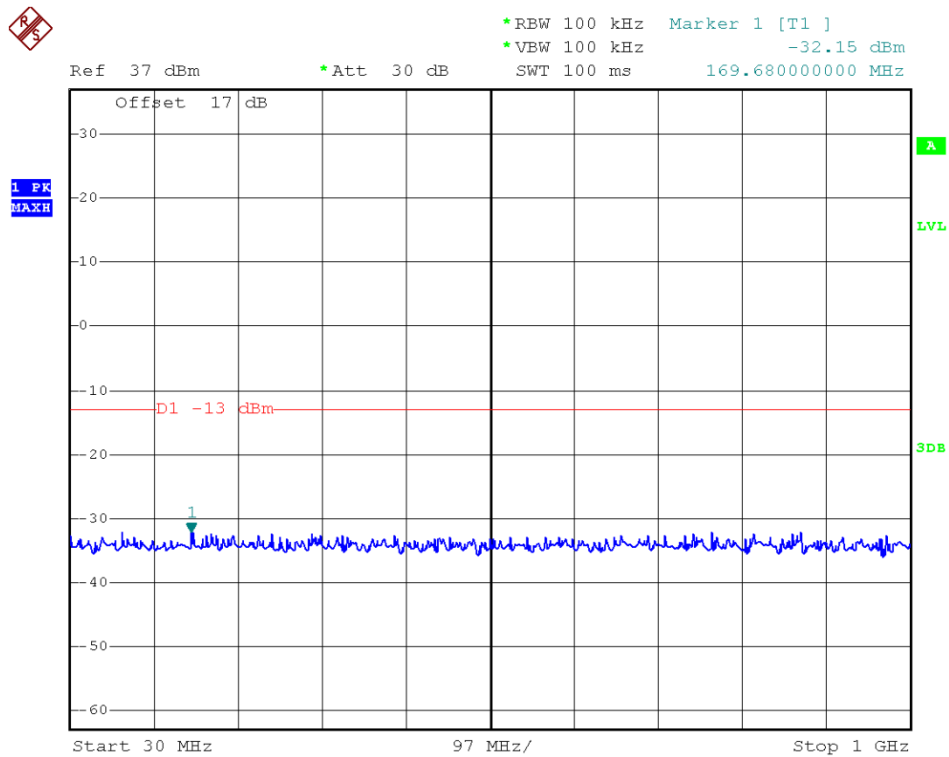
WCDMA850MHz Channel = 4183, 1GHz to 9GHz



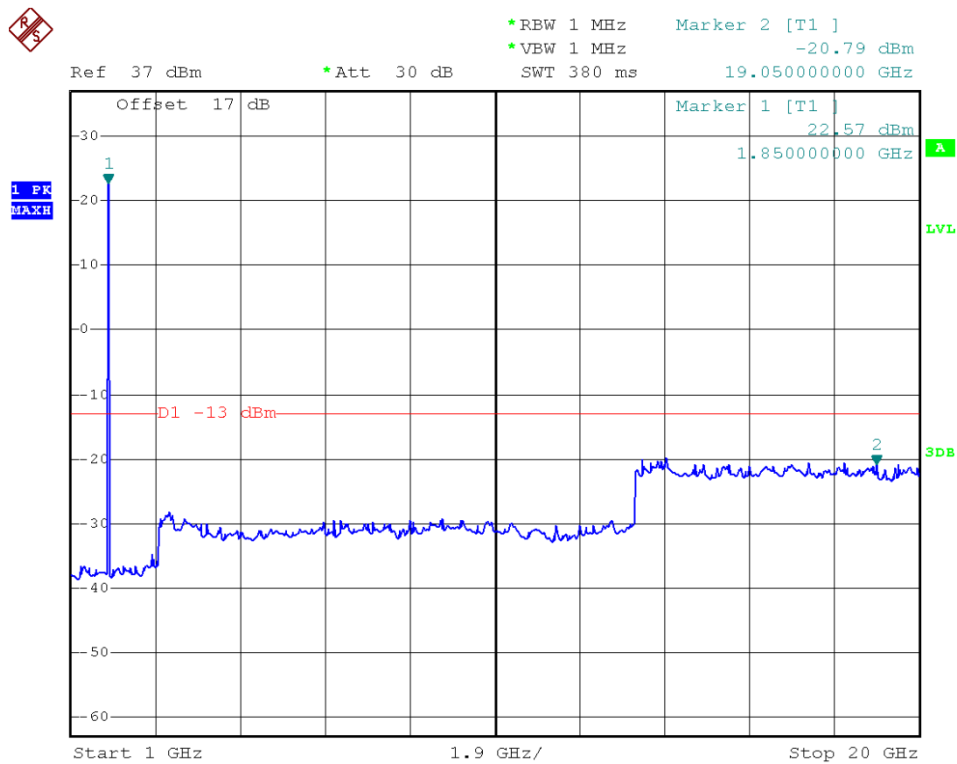
WCDMA850MHz Channel = 4233, 30MHz to 1GHz



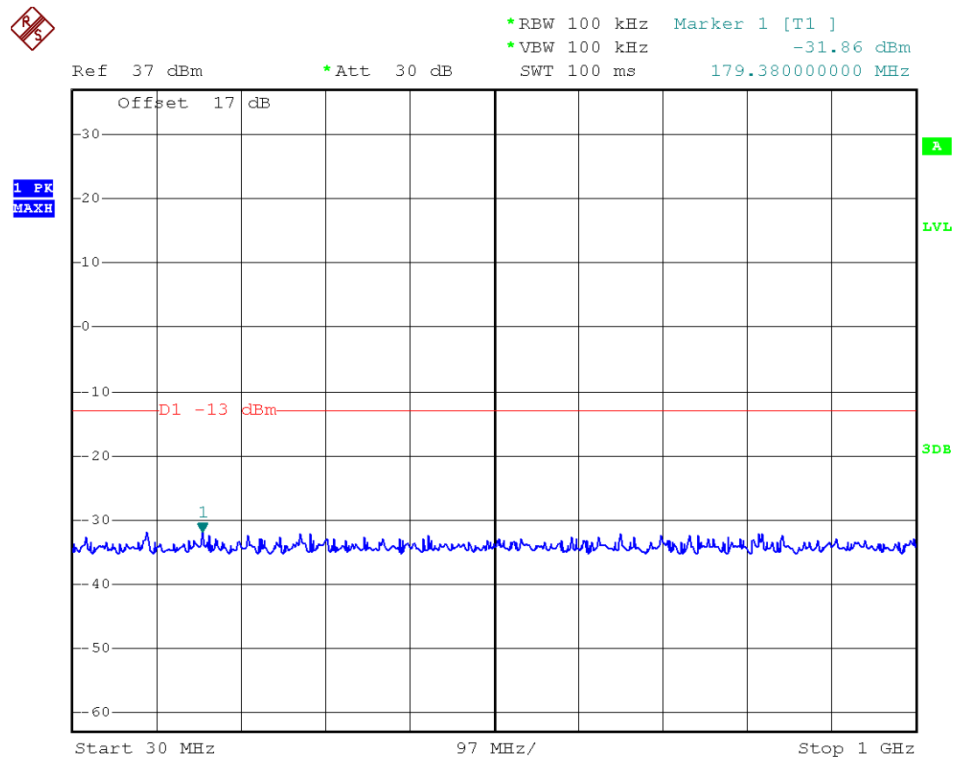
WCDMA850MHz Channel = 4233, 1GHz to 9GHz



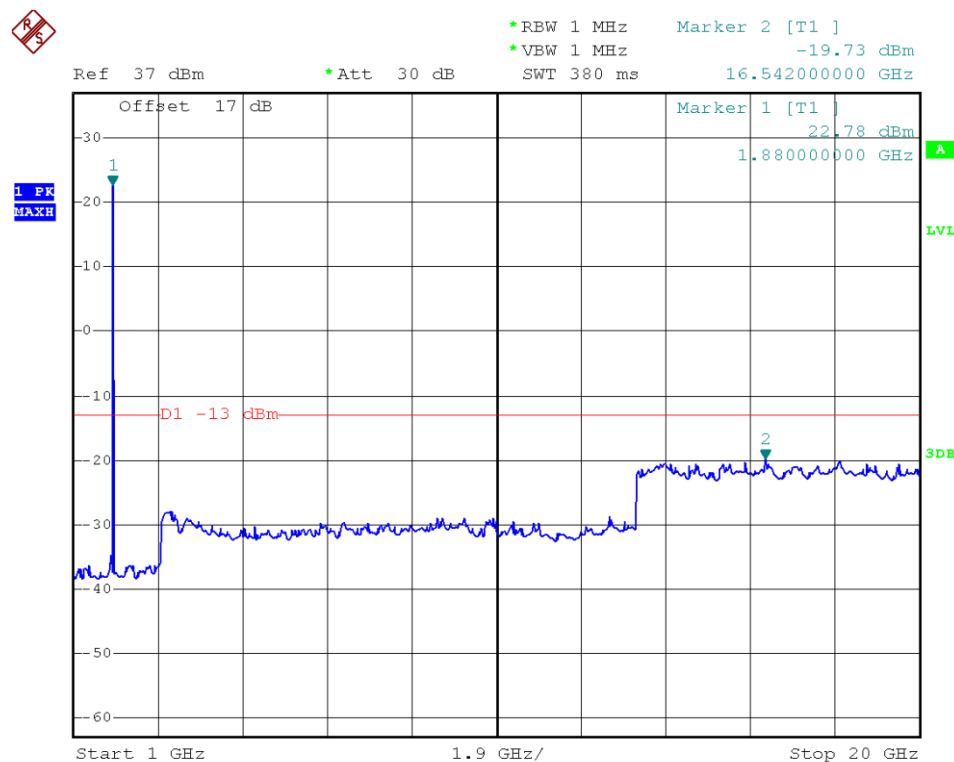
WCDMA1900MHz Channel = 9262, 30MHz to 1GHz



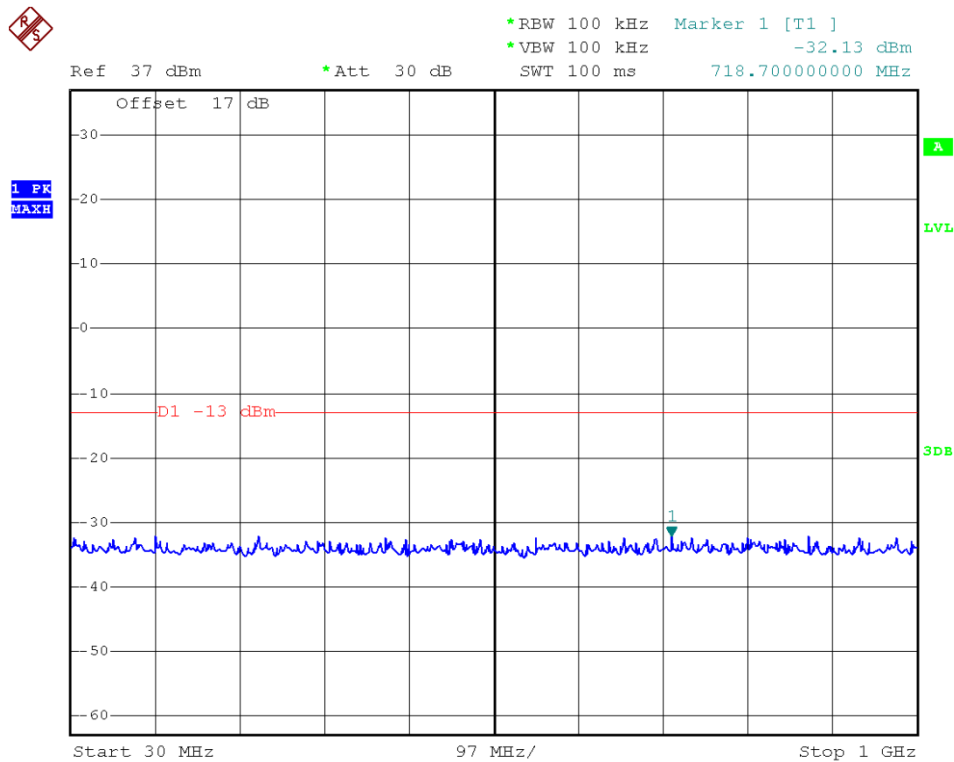
WCDMA1900MHz Channel = 9262, 1GHz to 20GHz



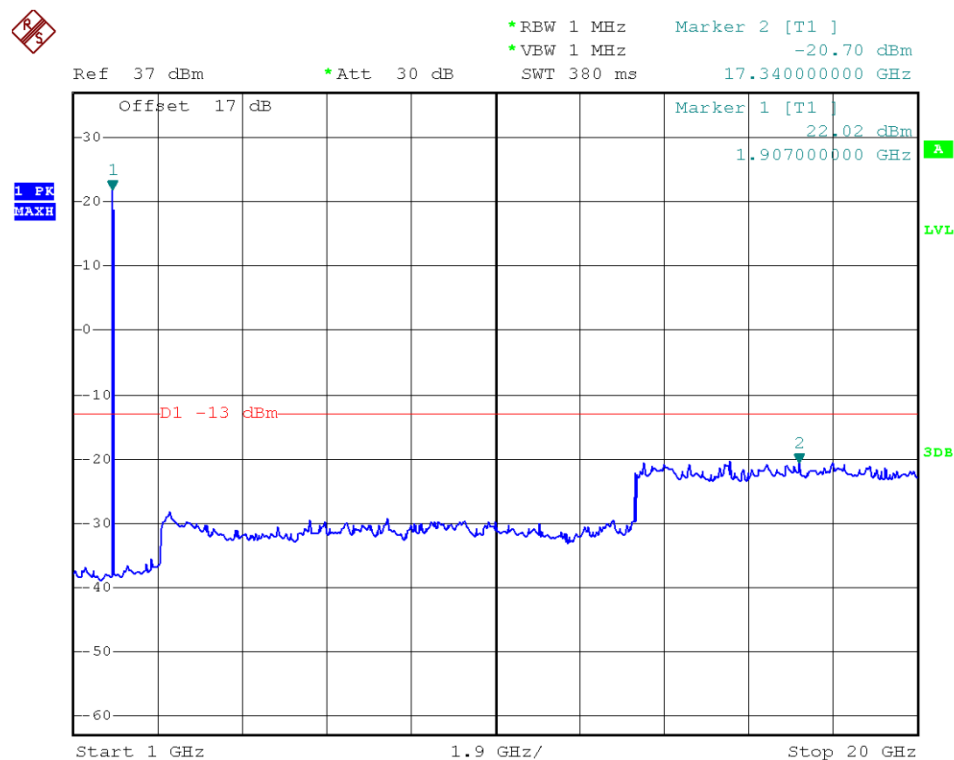
WCDMA1900MHz Channel = 9400, 30MHz to 1GHz



WCDMA1900MHz Channel = 9400, 1GHz to 20GHz



WCDMA1900MHz Channel = 9538, 30MHz to 1GHz



WCDMA1900MHz Channel = 9538 1GHz to 20GHz

2.6 Band Edge

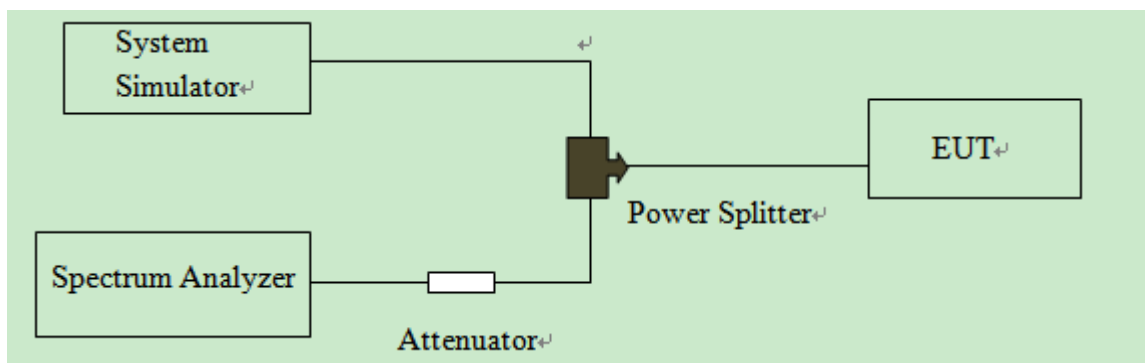
2.6.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

2.6.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3 Test Setup



2.6.4 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator
The path loss was compensated to the results for each measurement.
4. The band edges of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

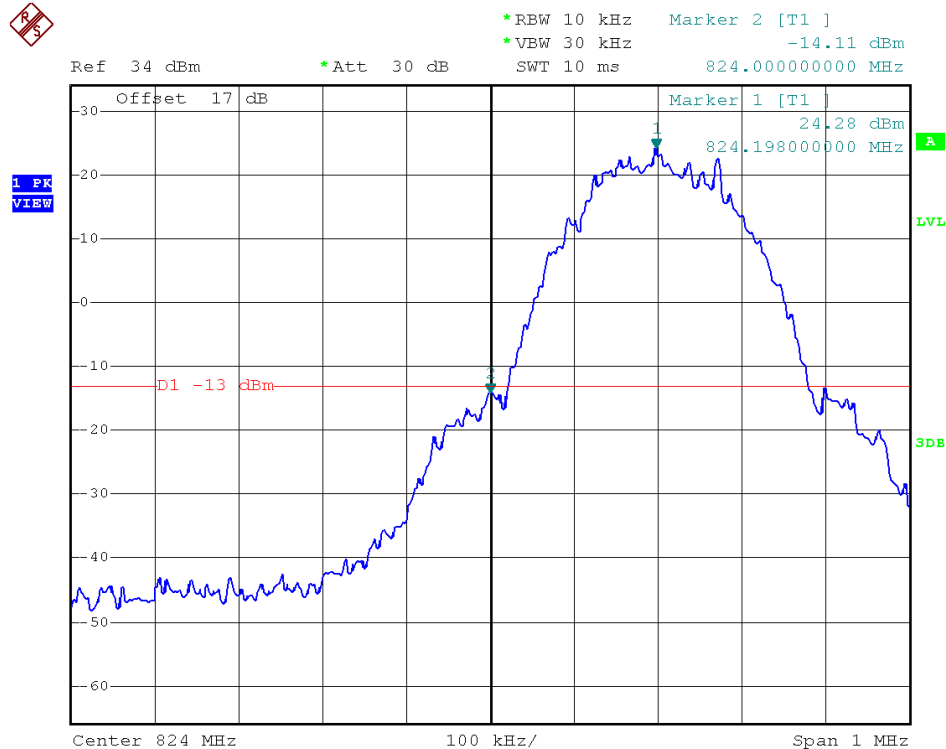
$$= -13\text{dBm}.$$

2.6.5 Test Result

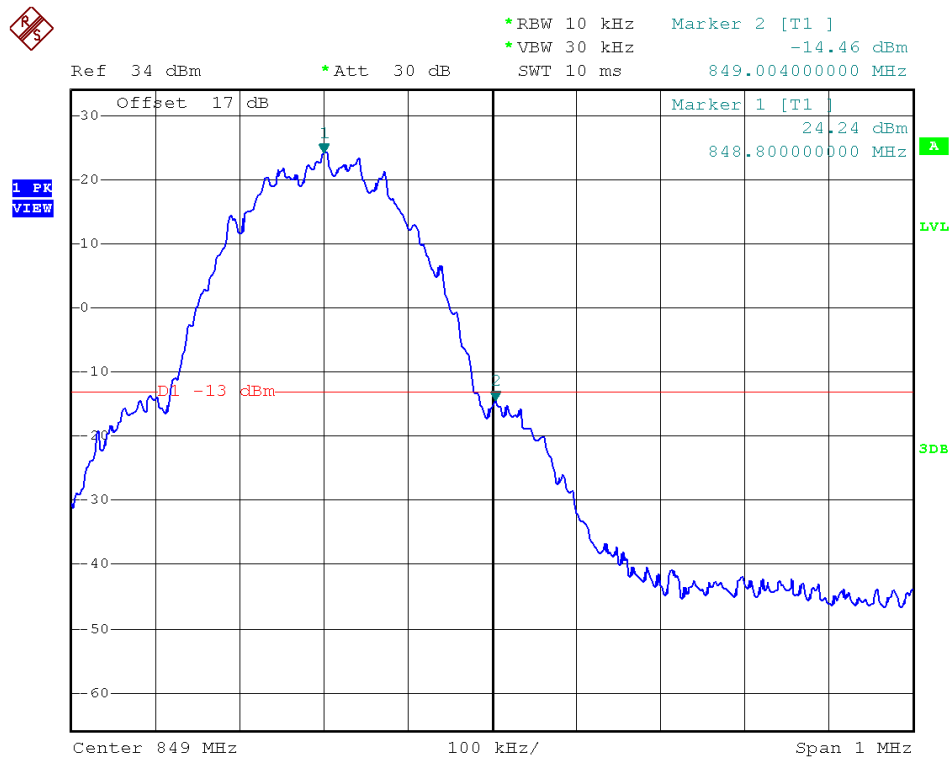
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-14.11	Plat A	-13	PASS
	251	848.8	-14.46	Plot B		PASS
GSM 1900MHz	512	1850.2	-13.83	Plat C	-13	PASS
	810	1909.8	-15.15	Plot D		PASS
EDGE 850MHz	128	824.2	-14.46	Plat E	-13	PASS
	251	848.8	-14.99	Plot F		PASS
EDGE 1900MHz	512	1850.2	-14.22	Plat G	-13	PASS
	810	1909.8	-14.10	Plot H		PASS
WCDMA 850MHz	4132	826.4	-16.54	Plat I	-13	PASS
	4233	846.6	-14.75	Plot J		PASS
WCDMA 1900MHz	9262	1852.4	-16.99	Plat K	-13	PASS
	9538	1907.6	-15.69	Plot L		PASS

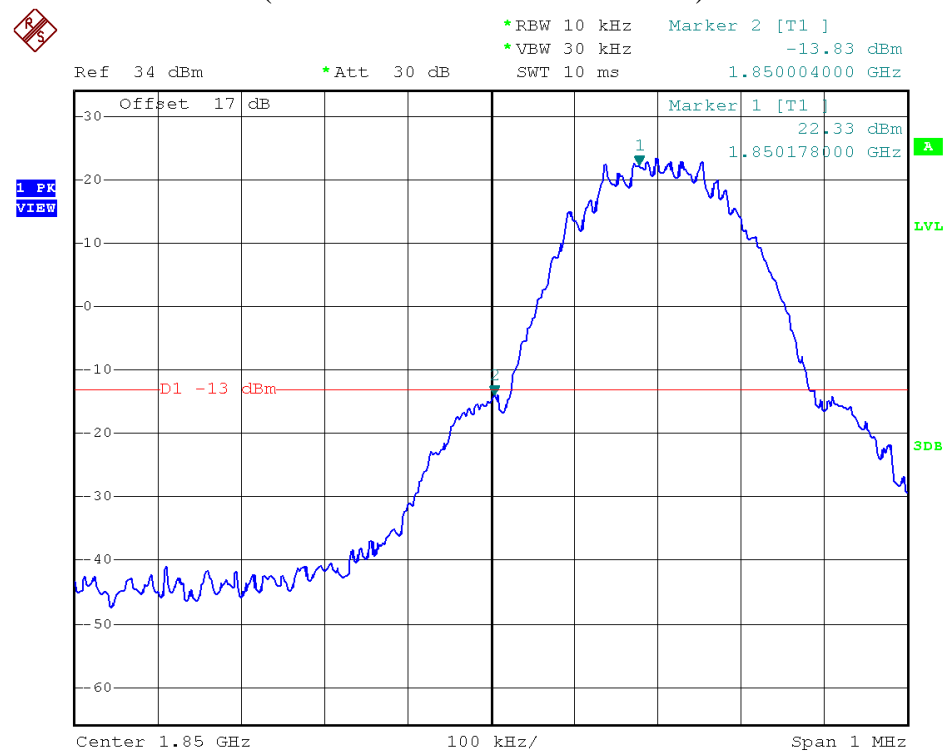
2. Test Plots:



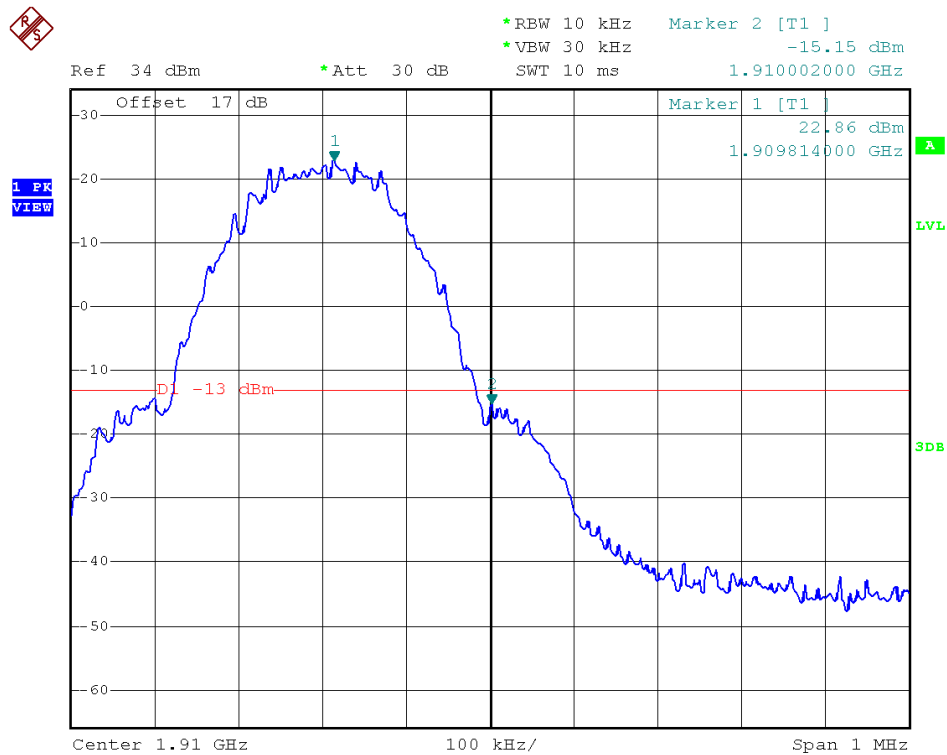
(Plot A: GSM 850 Channel = 128)



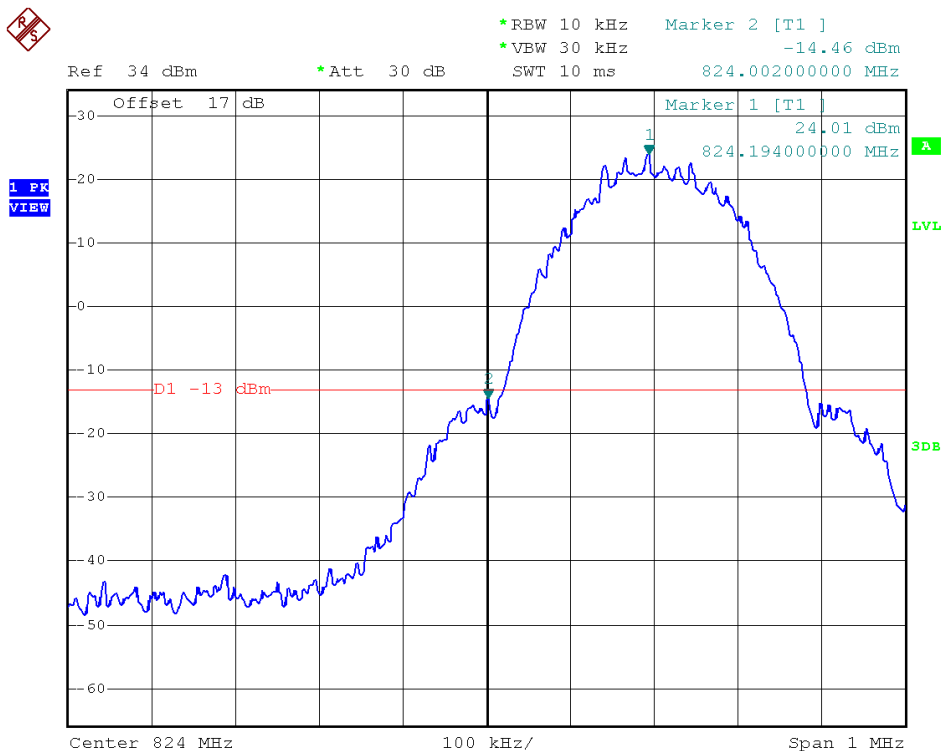
(Plot B: GSM 850 Channel = 251)



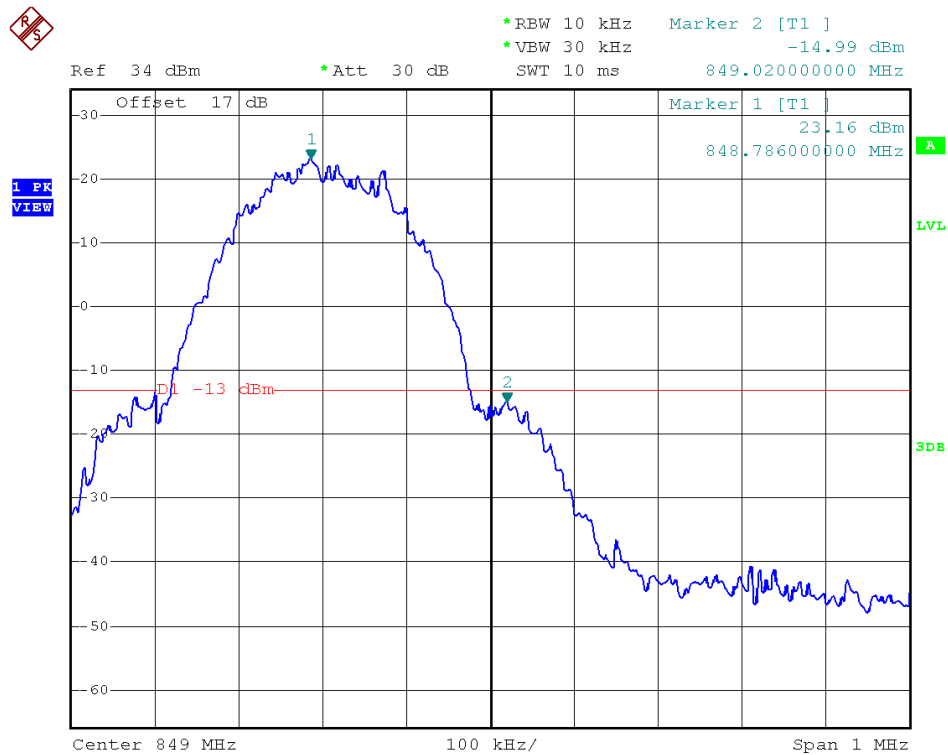
(Plot C: GSM 1900 Channel = 512)



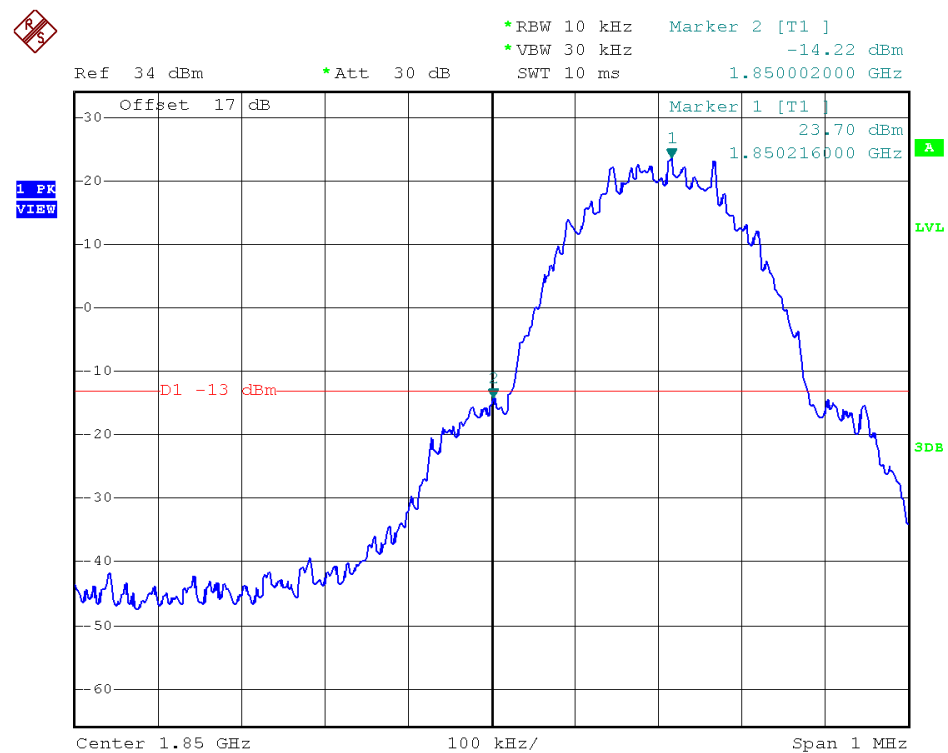
(Plot D: GSM 1900 Channel = 810)



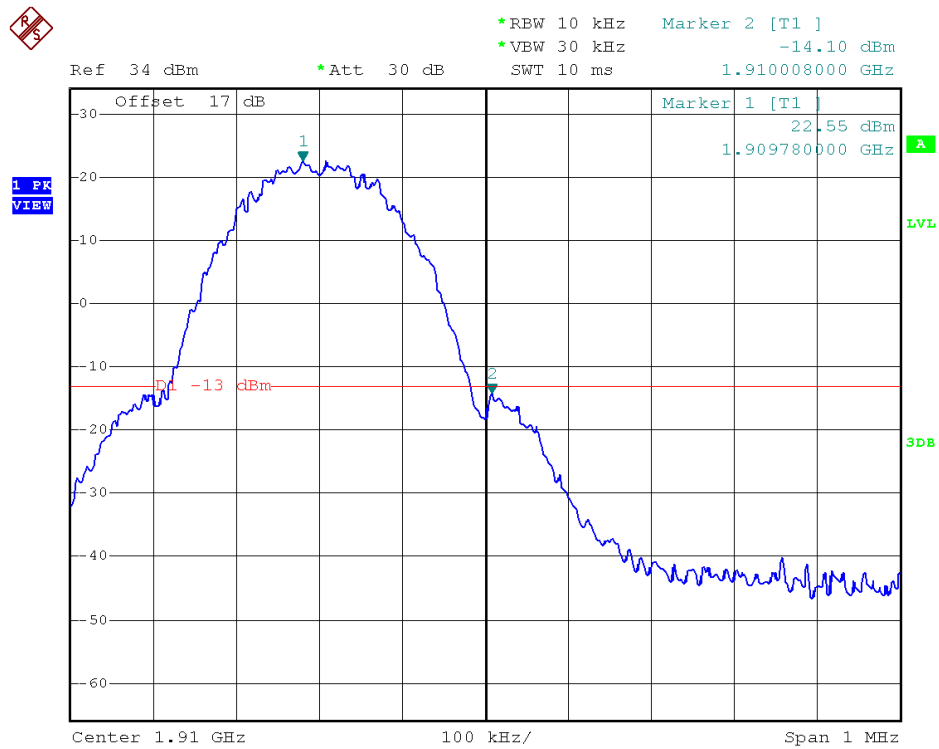
(Plot E: EDGE 850 Channel = 128)



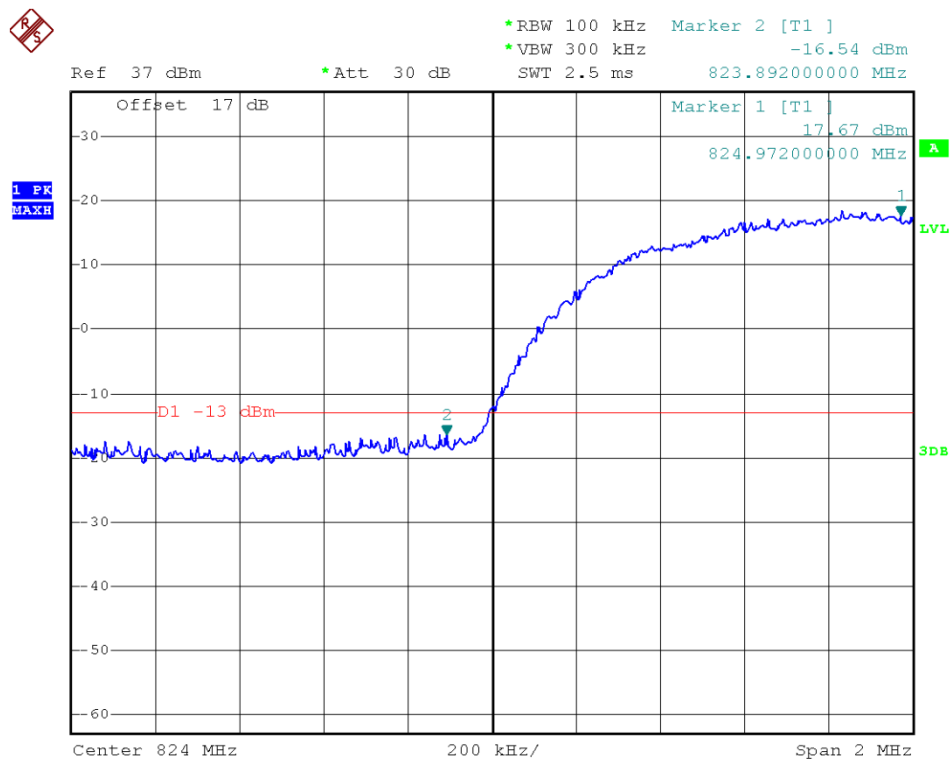
(Plot F: EDGE 850 Channel = 251)



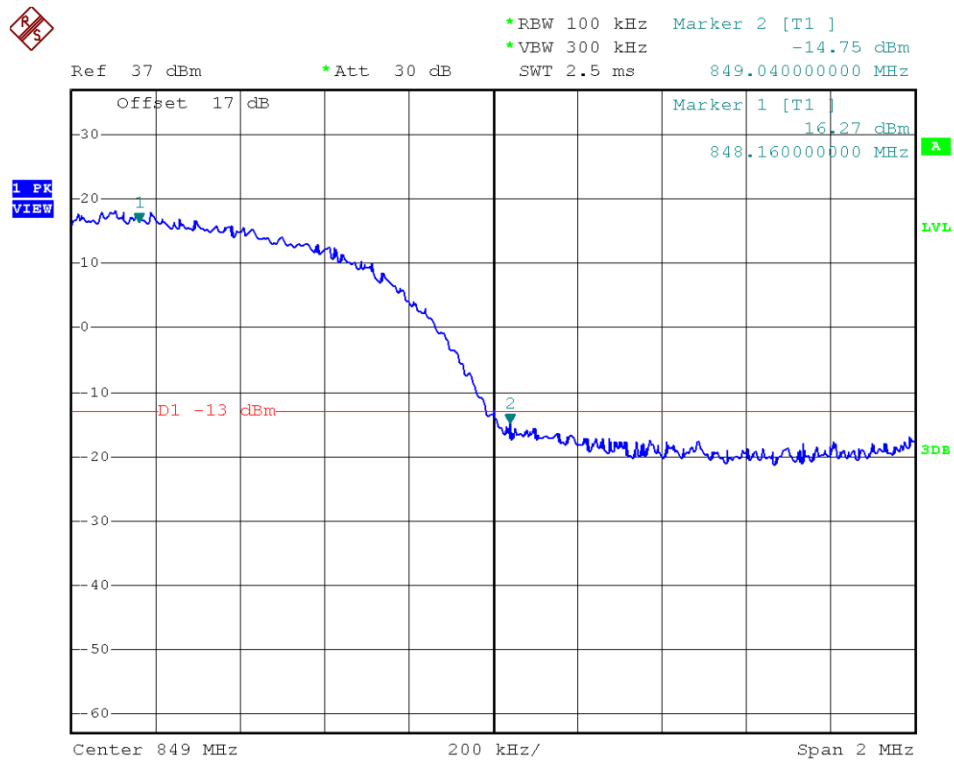
(Plot G: EDGE 1900 Channel = 512)



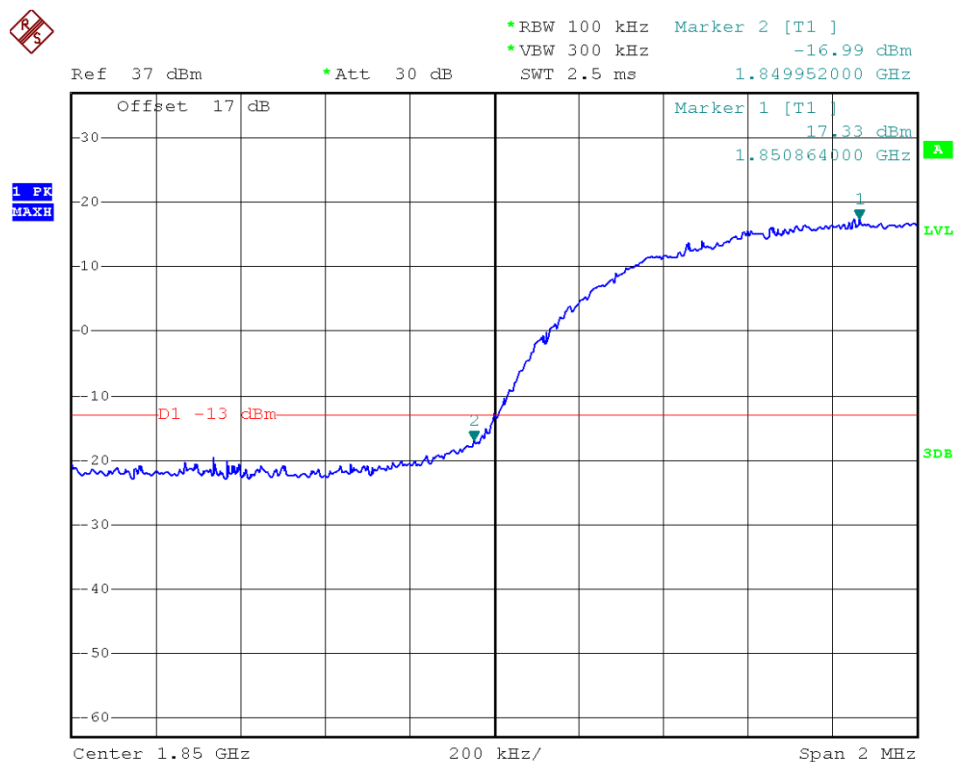
(Plot H: EDGE 1900 Channel = 810)



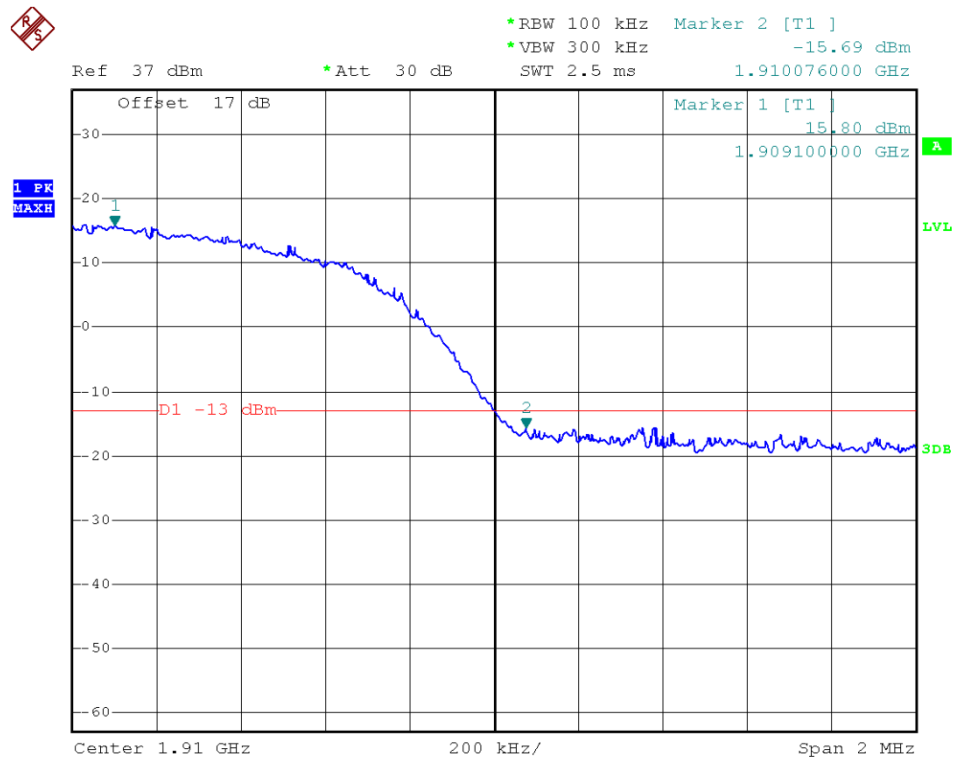
(Plot I: WCDMA 850 Channel = 4132)



(Plot J: WCDMA 850 Channel = 4233)



(Plot K: WCDMA 1900 Channel = 9262)



(Plot L: WCDMA 1900 Channel = 9538)

2.7 Transmitter Radiated Power (EIRP/ERP)

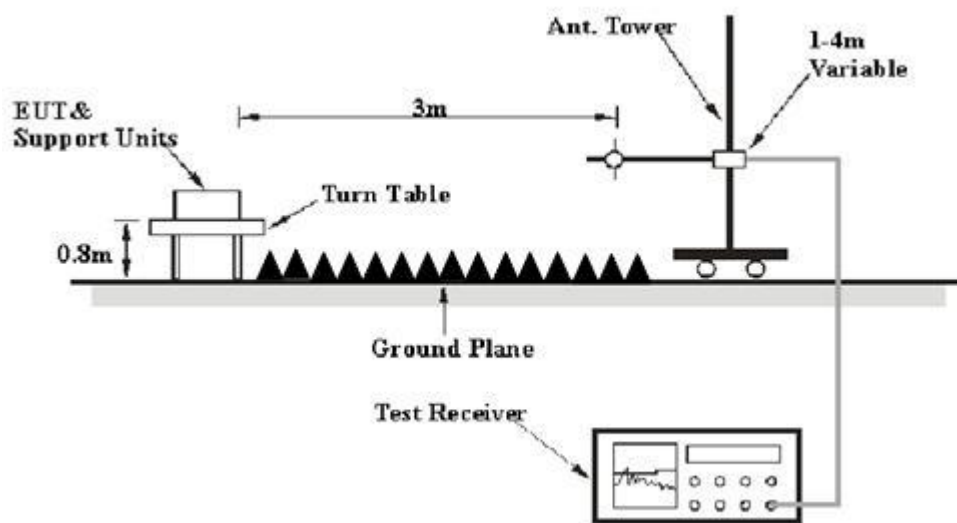
2.7.1 Requirement

The substitution method, in ANSI / TIA / EIA-603-D-2010, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

2.7.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3 Test Setup



2.7.4 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.2.1. (for CDMA/WCDMA), Section 5.2.2.2 (for GSM/GPRS/EDGE) and ANSI / TIA-603-D-2010 Section 2.2.17.
2. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
3. The EUT was placed 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;

UMTS operating modes: Set RBW= 100 kHz, VBW= 300 kHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per KDB 971168 D01.

5. The table was rotated 360 degrees to determine the position of the highest radiated power.
6. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
7. Taking the record of maximum ERP/EIRP.
8. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
9. The conducted power at the terminal of the dipole antenna is measured.
10. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
11. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm): Input power to substitution antenna.

G_s (dBi or dBd): Substitution antenna Gain.

$E_t = R_t + AF$ $E_s = R_s + AF$

AF (dB/m): Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

2.7.5 Test Result

Test Notes:

1. This device employs GMSK technology with GSM and GPRS capabilities. All configurations were investigated and the worst case emissions were found in GSM mode.
2. This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA and HSUPA capabilities. All configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2Kbps.
3. This unit was tested with its standard battery.
4. The worst case test configuration was found in the vertical positioning where the EUT is laying on its side. The data reported in the tables below were measured in this test setup.

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured ERP dBm	Limit dBm	Verdict
GSM 850MHz	128	824.20	V	5	33.12	38.5	PASS
	190	836.60	V	5	33.26		PASS
	251	848.80	V	5	33.15		PASS



Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured ERP dBm	Limit dBm	Verdict
GSM 850MHz	128	824.20	H	5	33.04	38.5	PASS
	190	836.60	H	5	33.14		PASS
	251	848.80	H	5	33.07		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured EIRP dBm	Limit dBm	Verdict
GSM 1900MHz	512	1850.2	V	0	30.12	33	PASS
	661	1880.0	V	0	30.35		PASS
	810	1909.8	V	0	30.13		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured EIRP dBm	Limit dBm	Verdict
GSM 1900MHz	512	1850.2	H	0	30.07	33	PASS
	661	1880.0	H	0	30.19		PASS
	810	1909.8	H	0	30.06		PASS
Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured ERP dBm	Limit dBm	Verdict
EDGE 850MHz	128	824.20	V	5	33.05	38.5	PASS
	190	836.60	V	5	33.19		PASS
	251	848.80	V	5	33.11		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured ERP dBm	Limit dBm	Verdict
EDGE 850MHz	128	824.20	H	5	33.00	38.5	PASS
	190	836.60	H	5	33.09		PASS
	251	848.80	H	5	33.09		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured EIRP dBm	Limit dBm	Verdict
EDGE 1900MHz	512	1850.2	V	0	29.72	33	PASS
	661	1880.0	V	0	29.95		PASS
	810	1909.8	V	0	29.83		PASS



Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	PCL	Measured EIRP dBm	Limit dBm	Verdict
EDGE 1900MHz	512	1850.2	H	0	29.62	33	PASS
	661	1880.0	H	0	29.87		PASS
	810	1909.8	H	0	29.72		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	Measured ERP dBm	Limit dBm	Verdict
WCDMA 850MHz	4132	826.4	V	25.42	38.5	PASS
	4175	835	V	25.68		PASS
	4233	846.6	V	25.79		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	Measured ERP dBm	Limit dBm	Verdict
WCDMA 850MHz	4132	826.4	H	25.33	38.5	PASS
	4175	835	H	25.51		PASS
	4233	846.6	H	25.67		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	Measured EIRP dBm	Limit dBm	Verdict
WCDMA 1900MHz	9262	1852.4	V	25.51	33	PASS
	9400	1880	V	25.64		PASS
	9538	1907.6	V	25.38		PASS

Band	Channel	Frequency (MHz)	Antenna Pol (H/V)	Measured EIRP dBm	Limit dBm	Verdict
WCDMA 1900MHz	9262	1852.4	H	25.40	33	PASS
	9400	1880	H	25.63		PASS
	9538	1907.6	H	25.24		PASS

2.8 Radiated Spurious Emissions

2.8.1 Requirement

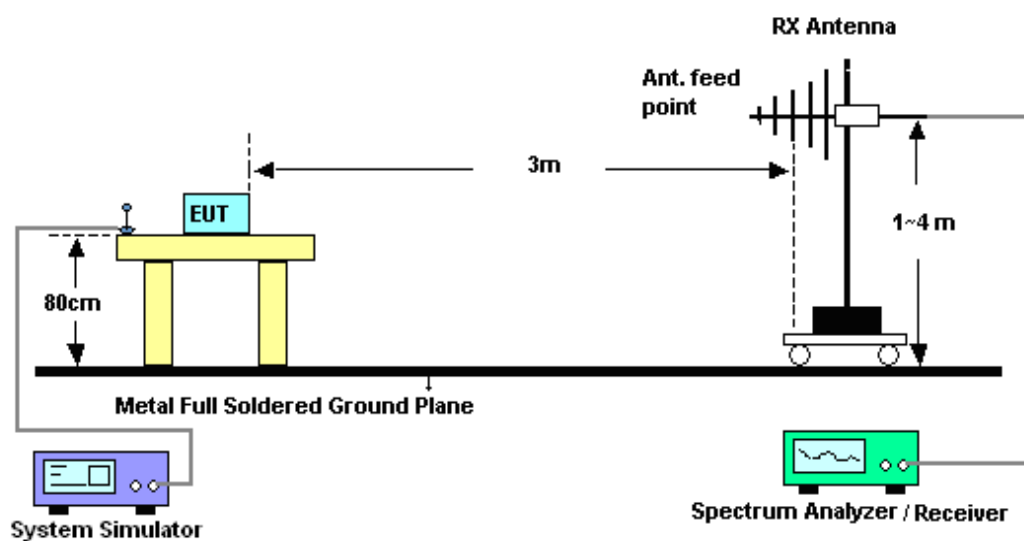
According to FCC section 22.917(a) and section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10*\log(P)$ dB. This calculated to be -13dBm.

2.8.2 Measuring Instruments

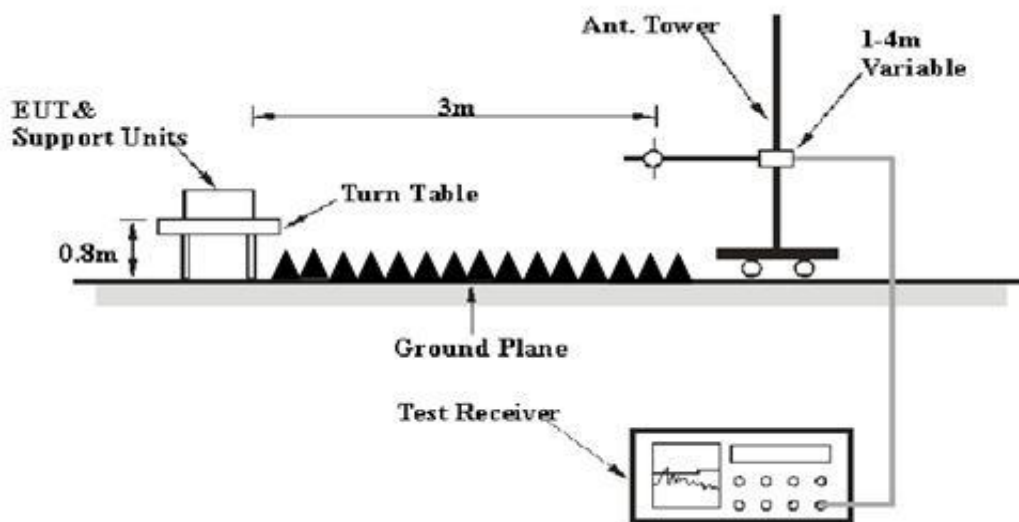
The measuring equipment is listed in the section 3 of this test report.

2.8.3 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.8.4 Test Procedures

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty

All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 1GHz – 40GHz is $\pm 6.0\text{dB}$ (for EUTs $< 0.5\text{m} \times 0.5\text{m} \times 0.5\text{m}$).

4. Environmental Conditions

Temperature	23°C
Relative Humidity	49%
Atmospheric Pressure	1010mbar
5. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.
6. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
7. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions

were measured by the substitution.

8. Sample Calculation:

EUT Field Strength (dBm) = Reading (Signal generator) + Antenna Gain (substitution antenna) - Cable loss (From Signal Generator to substitution antenna)

9. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm.}$$

2.8.5 Test Result of Radiated Spurious Emissions

GSM 850 (Low Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
1648.4	-39.14	H	5.51	1.12	-34.75	-13	Pass
1648.4	-40.38	V	5.51	1.12	-35.99	-13	Pass
317.2	-55.15	H	3.13	0.52	-52.54	-13	Pass
542.6	-54.25	V	3.51	0.62	-51.36	-13	Pass

GSM 850 (Middle Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
1673.2	-39.28	H	5.51	1.12	-34.89	-13	Pass
1673.2	-40.42	V	5.51	1.12	-36.03	-13	Pass
316.8	-53.37	H	3.13	0.52	-50.76	-13	Pass
541.5	-53.51	V	3.51	0.62	-50.62	-13	Pass

GSM 850 (High Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
1697.6	-38.79	H	5.51	1.12	-34.40	-13	Pass
1697.6	-39.27	V	5.51	1.12	-34.88	-13	Pass
317.0	-54.17	H	3.13	0.52	-51.56	-13	Pass
540.7	-53.40	V	3.51	0.62	-50.51	-13	Pass



GSM 1900 (Low Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
3700.4	-39.47	H	8.65	2.45	-33.27	-13	Pass
3700.4	-38.11	V	8.65	2.45	-31.91	-13	Pass
318.4	-52.77	H	3.13	0.52	-50.16	-13	Pass
540.5	-54.16	V	3.51	0.62	-51.27	-13	Pass

GSM 1900 (Middle Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
3760	-38.81	H	8.65	2.45	-32.61	-13	Pass
3760	-38.92	V	8.65	2.45	-32.72	-13	Pass
317.6	-53.55	H	3.13	0.52	-50.94	-13	Pass
539.4	-54.08	V	3.51	0.62	-51.19	-13	Pass

GSM 1900 (High Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
3819.6	-37.89	H	8.65	2.45	-31.69	-13	Pass
3819.6	-38.60	V	8.65	2.45	-32.40	-13	Pass
316.6	-54.47	H	3.13	0.52	-51.86	-13	Pass
538.4	-54.22	V	3.51	0.62	-51.33	-13	Pass



WCDMA Band V (Low Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
1652.8	-41.15	H	5.51	1.12	-36.76	-13	Pass
1652.8	-40.65	V	5.51	1.12	-36.26	-13	Pass
317.6	-56.35	H	3.13	0.52	-53.74	-13	Pass
539.2	-56.64	V	3.51	0.62	-53.75	-13	Pass

WCDMA Band V (Middle Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
1670	-42.37	H	5.51	1.12	-37.98	-13	Pass
1670	-41.24	V	5.51	1.12	-36.85	-13	Pass
317.1	-57.58	H	3.13	0.52	-54.97	-13	Pass
537.5	-56.61	V	3.51	0.62	-53.72	-13	Pass

WCDMA Band V (High Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
1693.2	-42.81	H	5.51	1.12	-38.42	-13	Pass
1693.2	-42.59	V	5.51	1.12	-38.20	-13	Pass
316.9	-56.84	H	3.13	0.52	-54.23	-13	Pass
539.7	-57.73	V	3.51	0.62	-54.84	-13	Pass



WCDMA Band II (Low Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
3704.8	-43.71	H	8.65	2.45	-37.51	-13	Pass
3704.8	-42.94	V	8.65	2.45	-36.74	-13	Pass
317.8	-56.59	H	3.13	0.52	-53.98	-13	Pass
537.6	-57.44	V	3.51	0.62	-54.55	-13	Pass

WCDMA Band II (Middle Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
3760	-42.84	H	8.65	2.45	-36.64	-13	Pass
3760	-43.02	V	8.65	2.45	-36.82	-13	Pass
317.9	-57.37	H	3.13	0.52	-54.76	-13	Pass
541.6	-57.35	V	3.51	0.62	-54.46	-13	Pass

WCDMA Band II (High Channel)							
Frequency (MHz)	Substituted level(dBm)	Polarity (H/V)	Antenna Gain(dBi)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Result
3815.2	-44.84	H	8.65	2.45	-38.64	-13	Pass
3815.2	-44.75	V	8.65	2.45	-38.55	-13	Pass
315.6	-56.38	H	3.13	0.52	-53.77	-13	Pass
538.3	-57.41	V	3.51	0.62	-54.52	-13	Pass



3. LIST OF MEASURING EQUIPMENT

Description	Manufacturer	Model	Serial No.	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESIB26	A0304218	2015.06.02	2016.06.02	Radiation
Full-Anechoic Chamber	Albatross	12.8m*6.8m*6.4m	A0412372	2015.01.05	2016.01.04	Radiation
Loop Antenna	Schwarz beck	HFH2-Z2	100047	2015.06.02	2016.06.02	Radiation
Bilog Antenna	Schwarzbeck	VULB 9163	9163-274	2015.06.02	2016.06.02	Radiation
Double ridge horn antenna	R&S	HF960	100150	2015.06.02	2016.06.02	Radiation
Ultra-wideband antenna	R&S	HL562	100089	2015.06.02	2016.06.02	Radiation
Test Antenna – Horn (18-25GHz)	ETS	UG-596A/U	A0902607	2015.06.02	2016.06.02	Radiation
Amplifier 20M~3GHz	R&S	PAP-0203H	22018	2015.06.02	2016.06.02	Radiation
Amplifier 1G~18GHz	R&S	MITEQ AFS42-00101800	25-S-42	2015.06.02	2016.06.02	Radiation
Amplifier 18G~40GHz	R&S	JS42-18002600-28-5A	12111.0980.00	2015.06.02	2016.06.02	Radiation
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2015.07.07	2016.07.07	Conducted
Power Meter	R&S	NRVS	1020.1809.02	2015.06.02	2016.06.02	Conducted
Power Sensor	R&S	NRV-Z4	823.3618.03	2015.06.02	2016.06.02	Conducted
LISN	ROHDE&SCHWARZ	ESH2-Z5	A0304221	2015.06.02	2016.06.02	Conducted
Test Receiver	R&S	ESCS30	A0304260	2015.06.02	2016.06.02	Conducted
Cable	SUNHNER	SUCOFLEX 100	/	2015.06.02	2016.06.02	Radiation
Cable	SUNHNER	SUCOFLEX 104	/	2015.06.02	2016.06.02	Radiation

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