3.5 Band Edge Measurement

3.5.1 Description of Band Edge Measurement

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

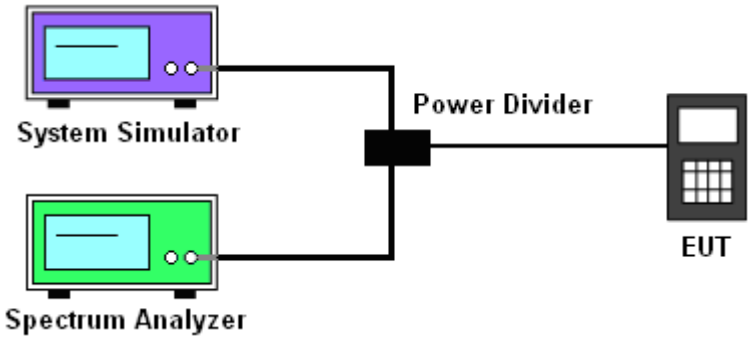
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

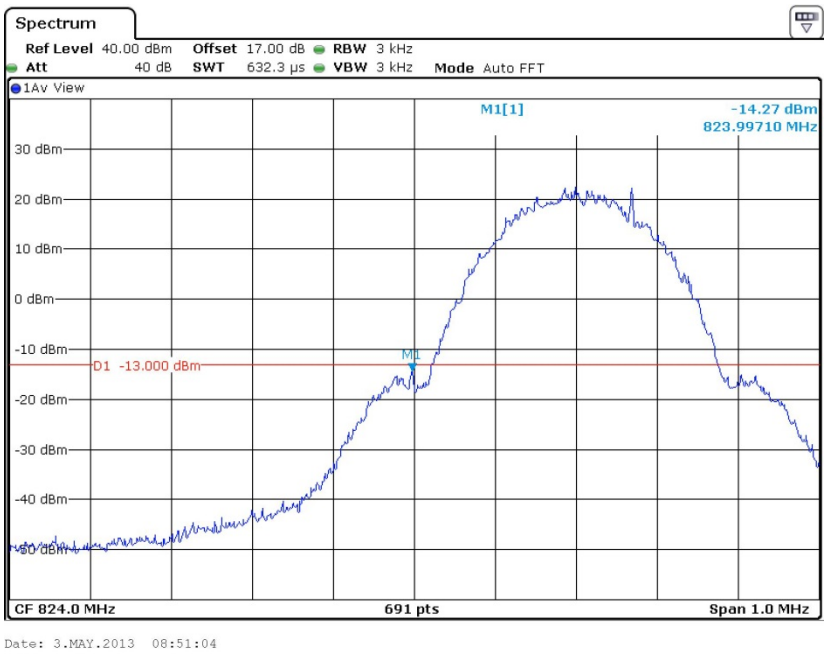
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Test Mode :	GSM Link
Correction Factor :	0.24dB	Maximum 26dB Bandwidth :	0.317MHz
Band Edge :	-14.03dBm	Measurement Value :	-14.27dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)



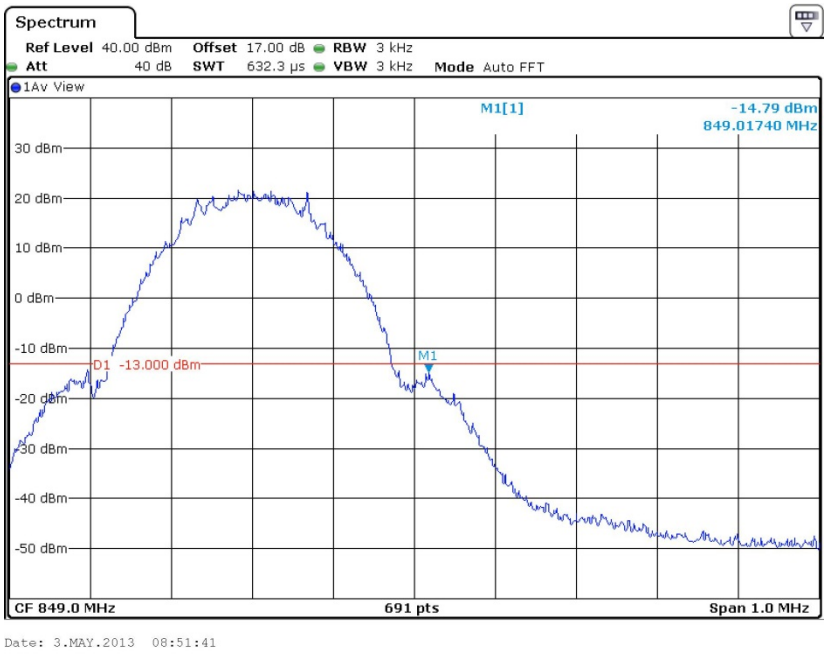
1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

For example, -14.27dBm + 0.24dB = -14.03dBm

Band :	GSM850	Test Mode :	GSM Link
Correction Factor :	0.24dB	Maximum 26dB Bandwidth :	0.317MHz
Band Edge :	-14.55dBm	Measurement Value :	-14.79dBm

Higher Band Edge Plot on Channel 251 (848.8 MHz)

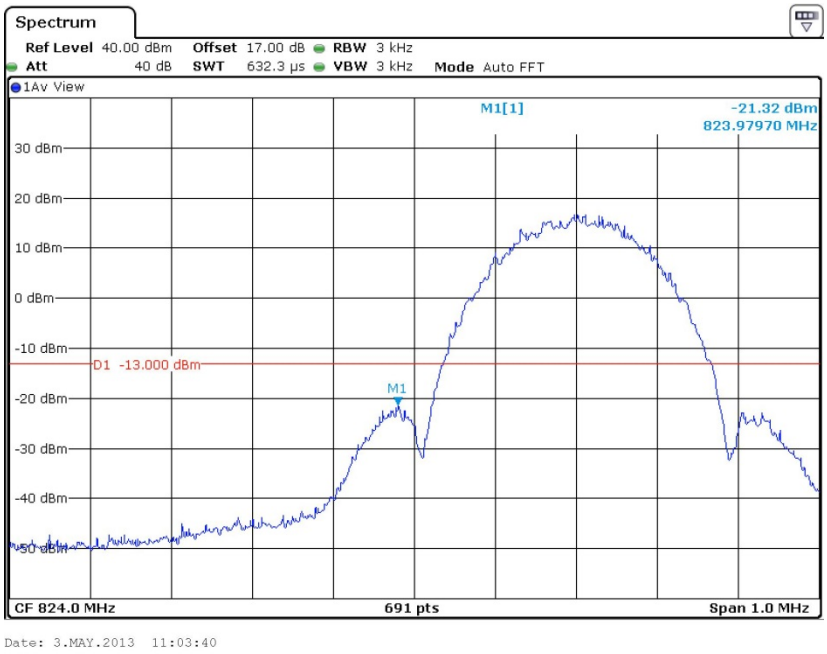


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	GSM850	Test Mode :	EDGE 8 Link
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-21.12dBm	Measurement Value :	-21.32dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)

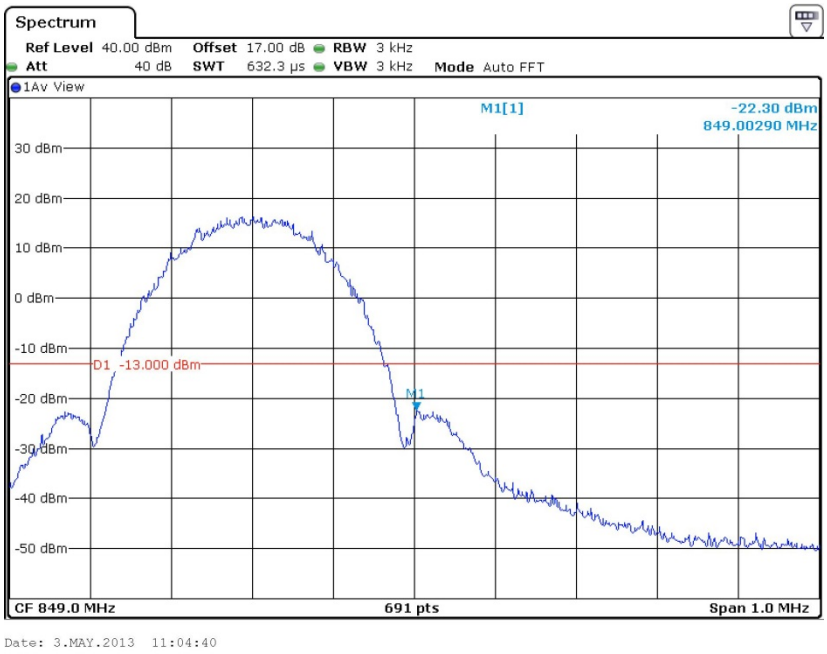


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	GSM850	Test Mode :	EDGE 8 Link
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-22.10dBm	Measurement Value :	-22.30dBm

Higher Band Edge Plot on Channel 251 (848.8 MHz)

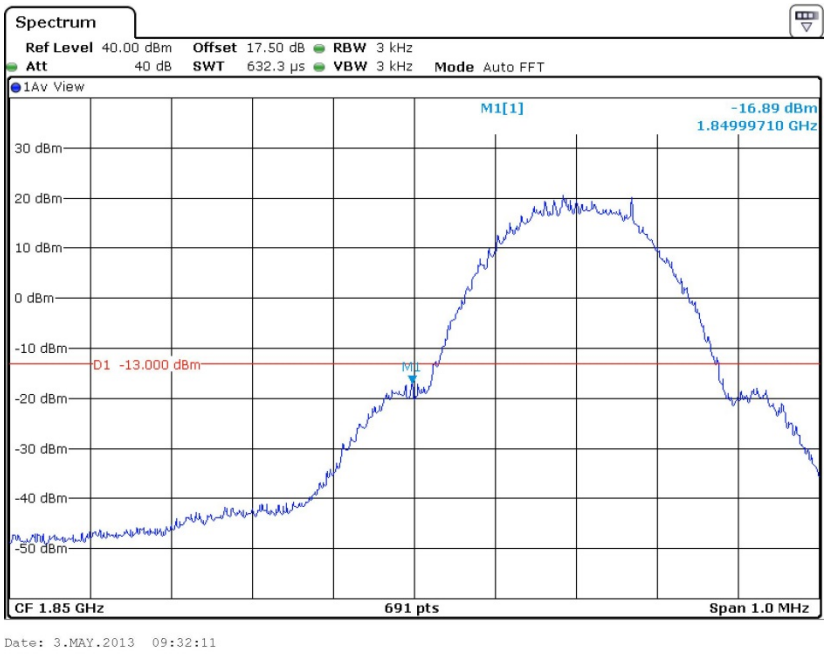


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	GSM1900	Test Mode :	GSM Link
Correction Factor :	0.24dB	Maximum 26dB Bandwidth :	0.317MHz
Band Edge :	-16.65dBm	Measurement Value :	-16.89dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)

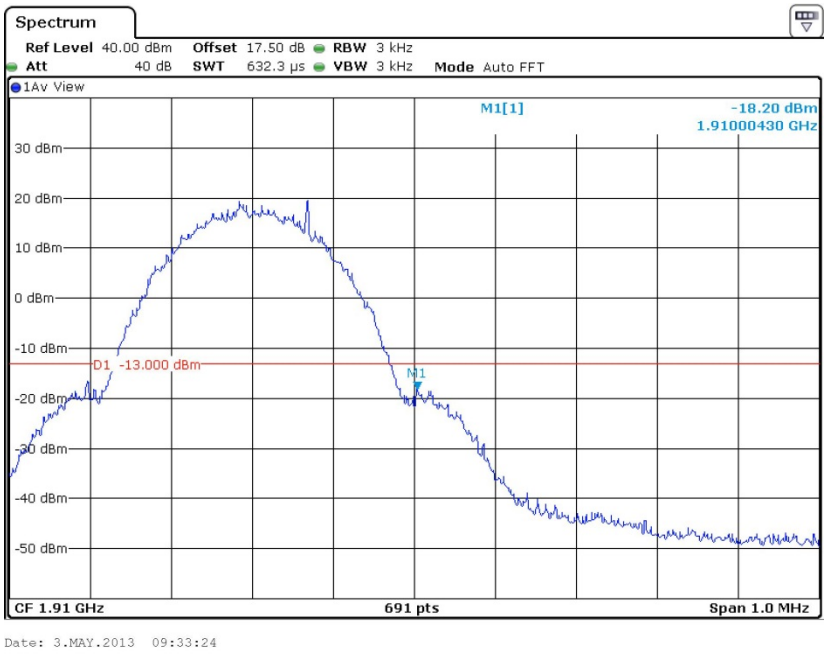


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	GSM1900	Test Mode :	GSM Link
Correction Factor :	0.24dB	Maximum 26dB Bandwidth :	0.317MHz
Band Edge :	-17.96dBm	Measurement Value :	-18.20dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)

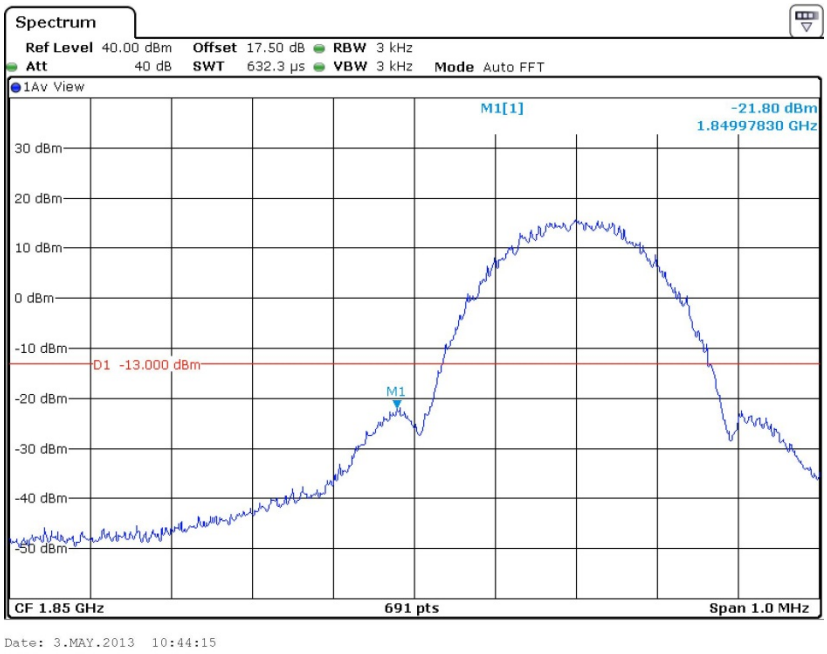


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	GSM1900	Test Mode :	EDGE 8 Link
Correction Factor :	0.28dB	Maximum 26dB Bandwidth :	0.320MHz
Band Edge :	-21.52dBm	Measurement Value :	-21.80dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)

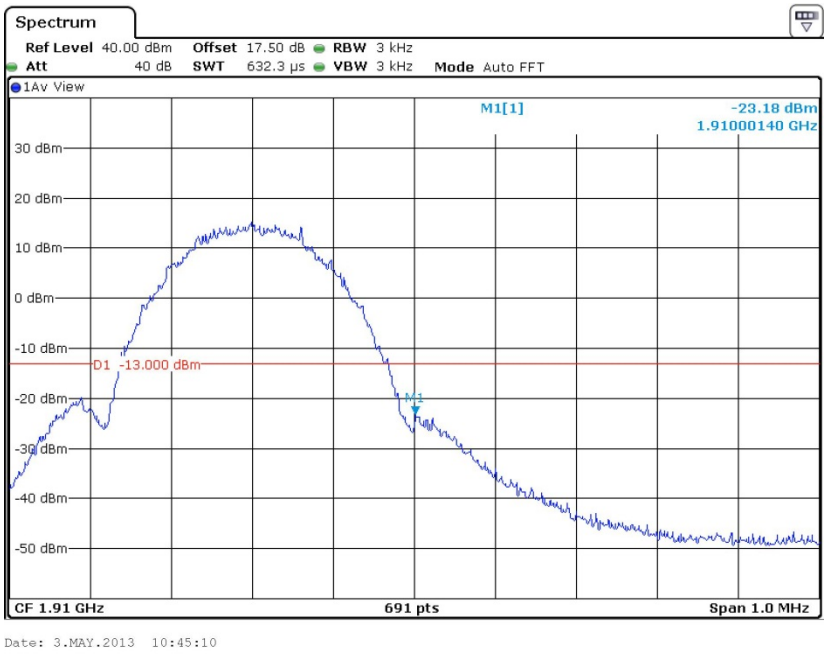


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	GSM1900	Test Mode :	EDGE 8 Link
Correction Factor :	0.28dB	Maximum 26dB Bandwidth :	0.320MHz
Band Edge :	-22.90dBm	Measurement Value :	-23.18dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)

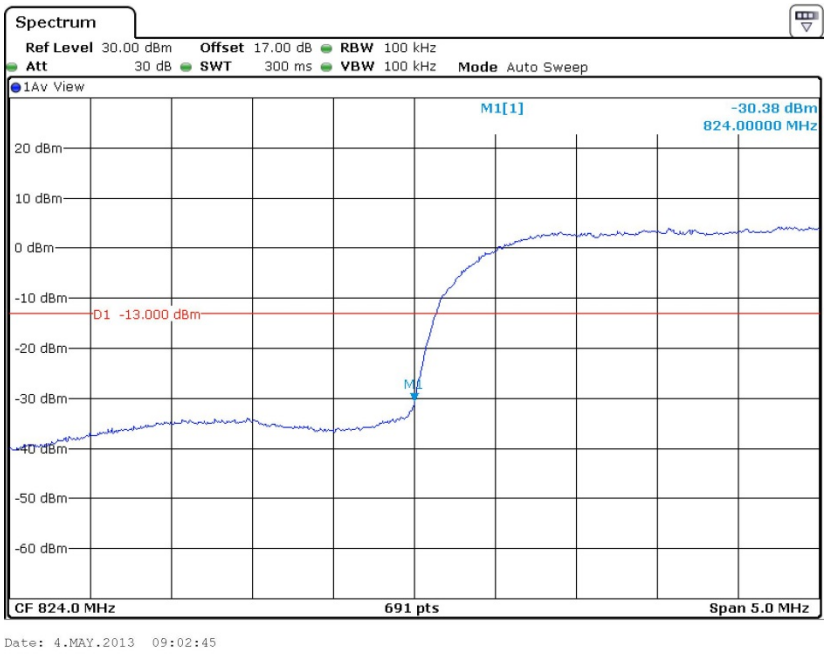


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.674MHz
Band Edge :	-33.68dBm	Measurement Value :	-30.38dBm

Lower Band Edge Plot on Channel 4132 (826.4 MHz)

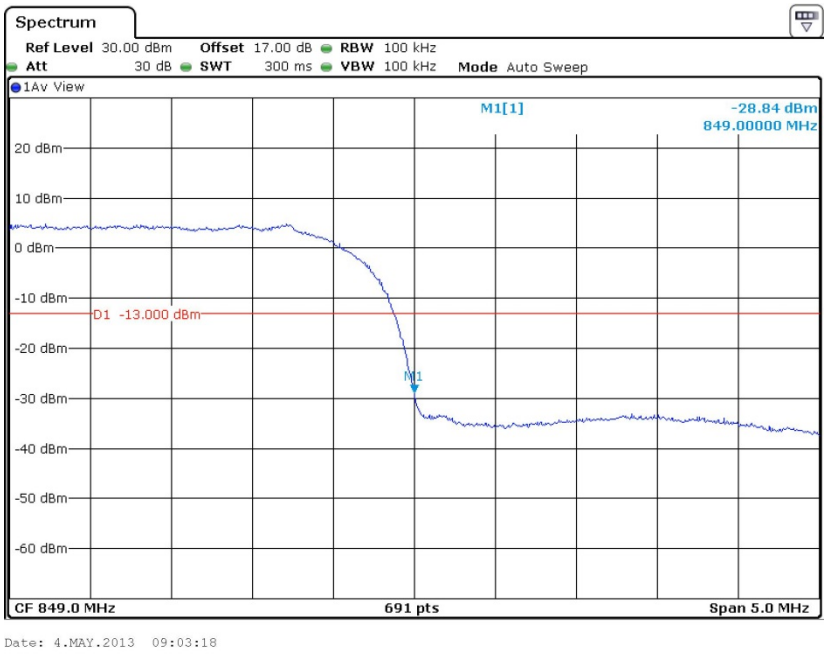


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.674MHz
Band Edge :	-32.14dBm	Measurement Value :	-28.84dBm

Higher Band Edge Plot on Channel 4233 (846.6 MHz)

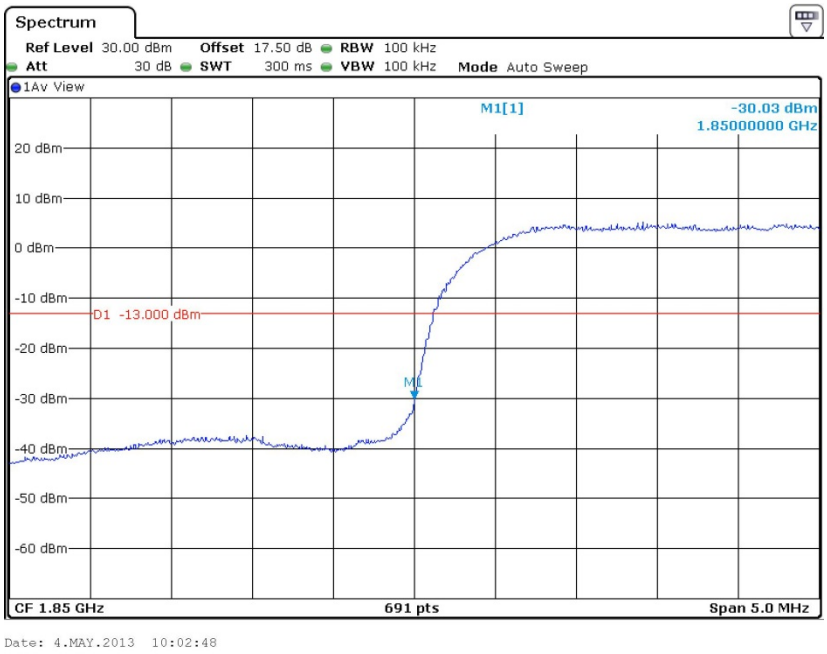


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.32dB	Maximum 26dB Bandwidth :	4.660MHz
Band Edge :	-33.35dBm	Measurement Value :	-30.03dBm

Lower Band Edge Plot on Channel 9262 (1852.4 MHz)

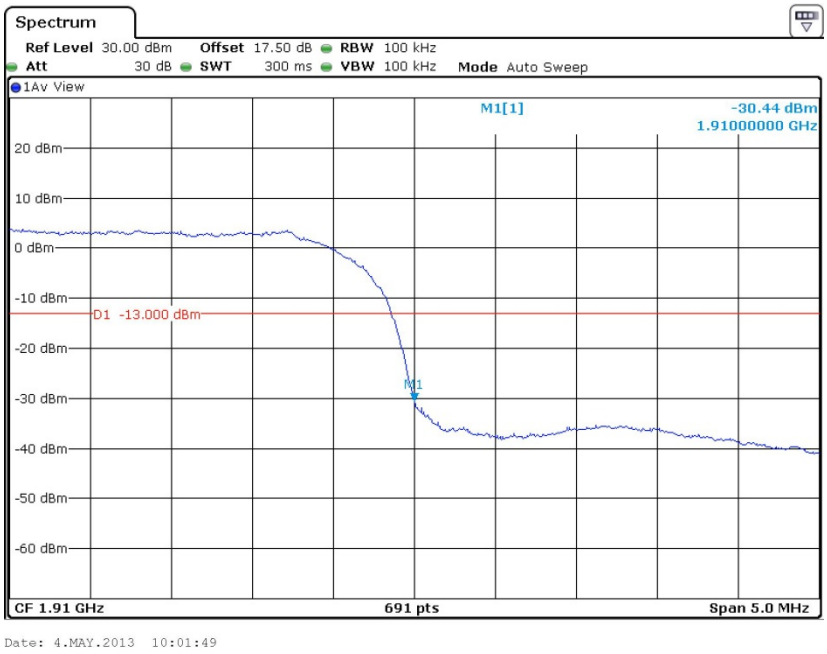


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.32dB	Maximum 26dB Bandwidth :	4.660MHz
Band Edge :	-33.76dBm	Measurement Value :	-30.44dBm

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)



1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious Emission Measurement

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

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

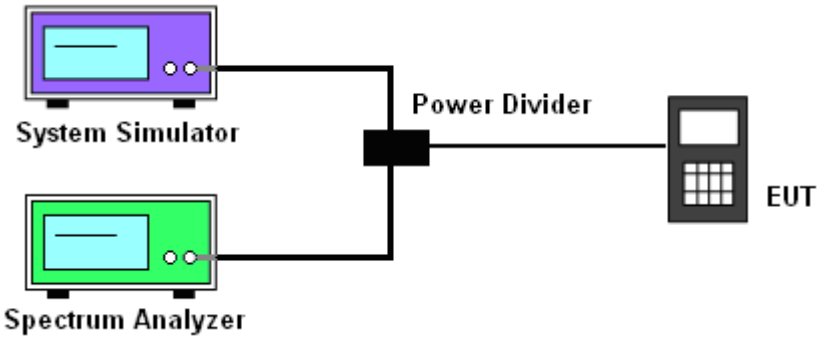
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
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 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

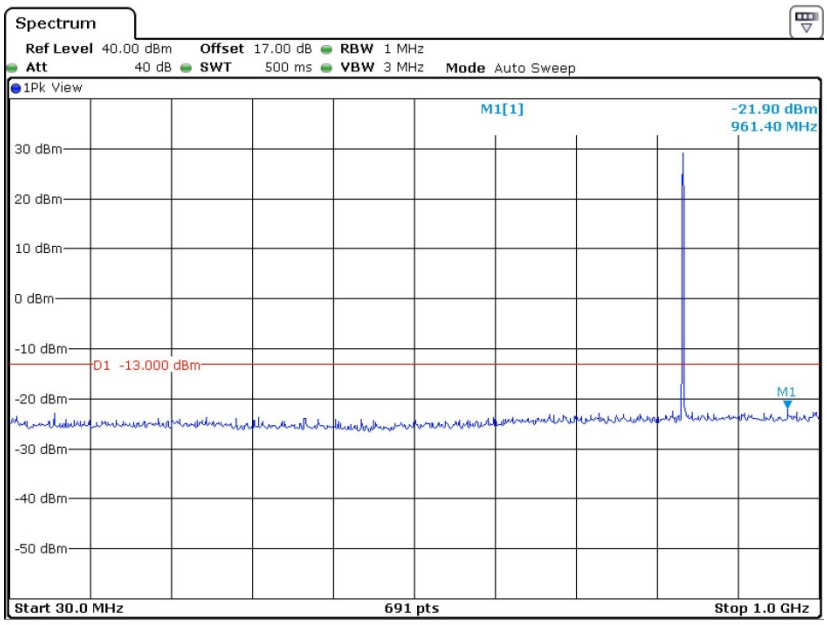
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Spurious Emission

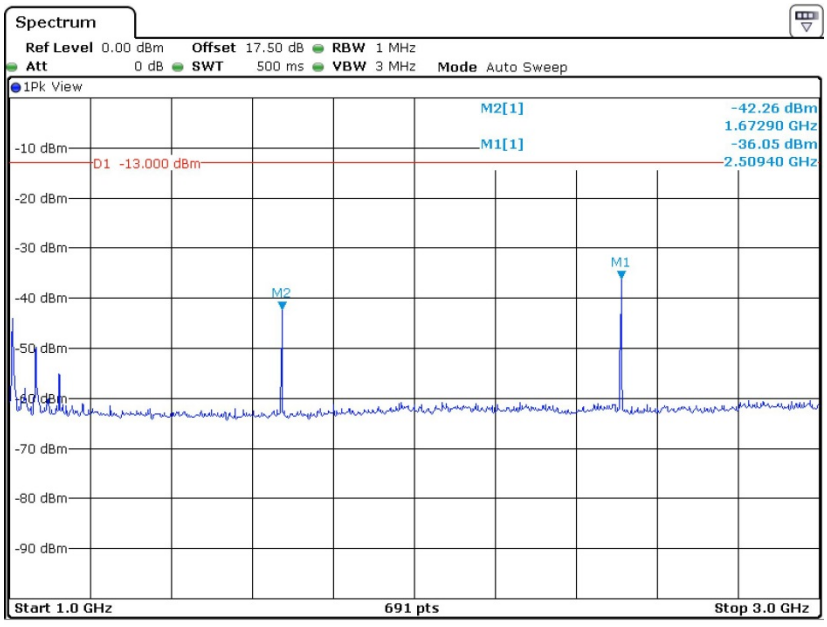
Band :	GSM850	Channel :	CH189
Test Mode :	GSM Link	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



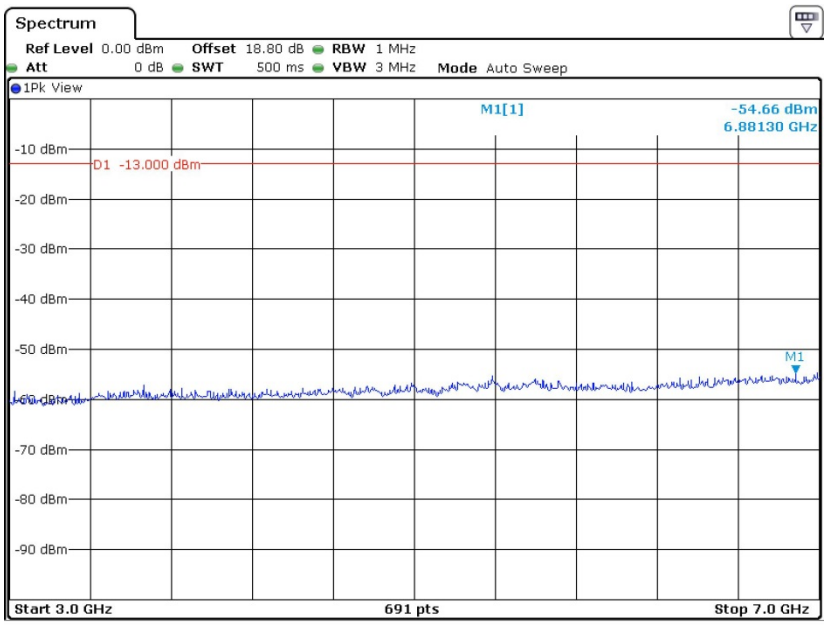
Date: 3.MAY.2013 09:02:17

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



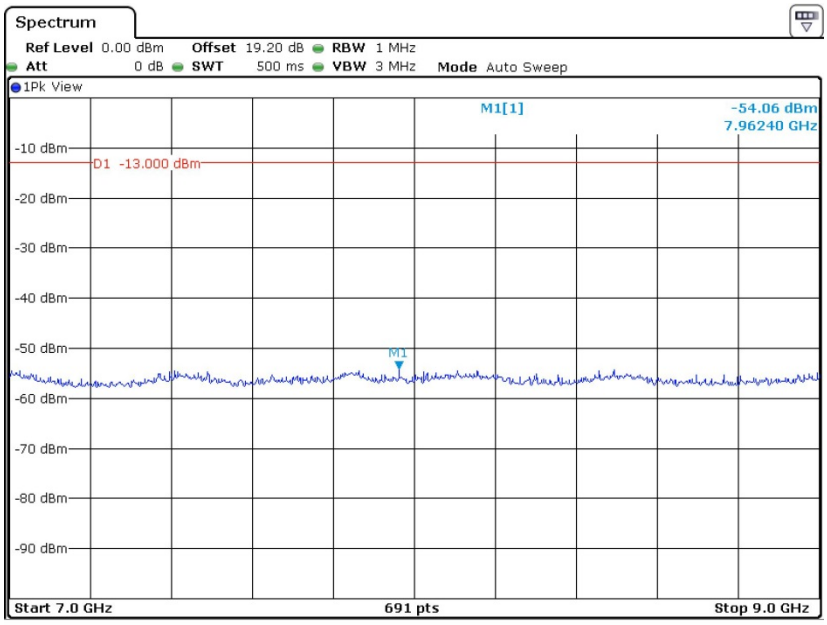
Date: 6.MAY.2013 03:46:50

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.MAY.2013 09:13:01

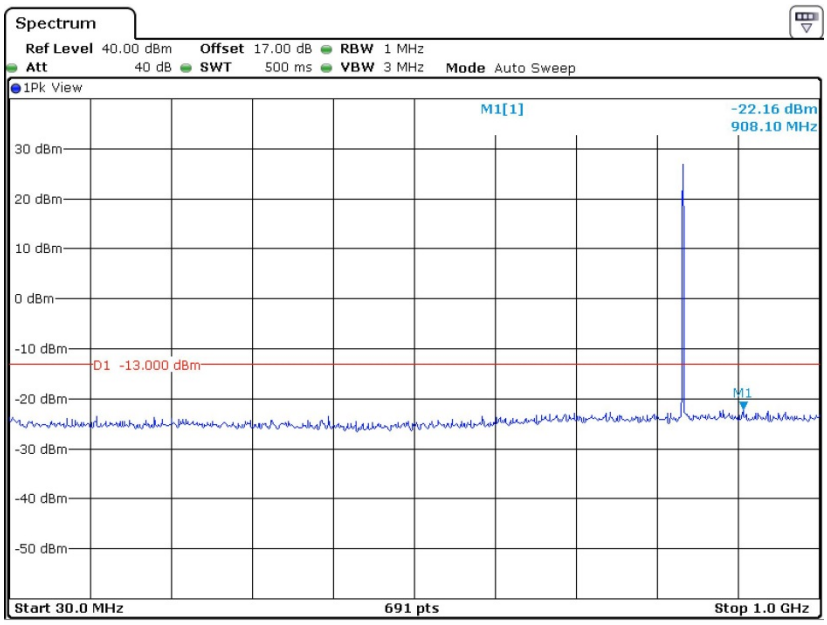
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 3.MAY.2013 09:14:27

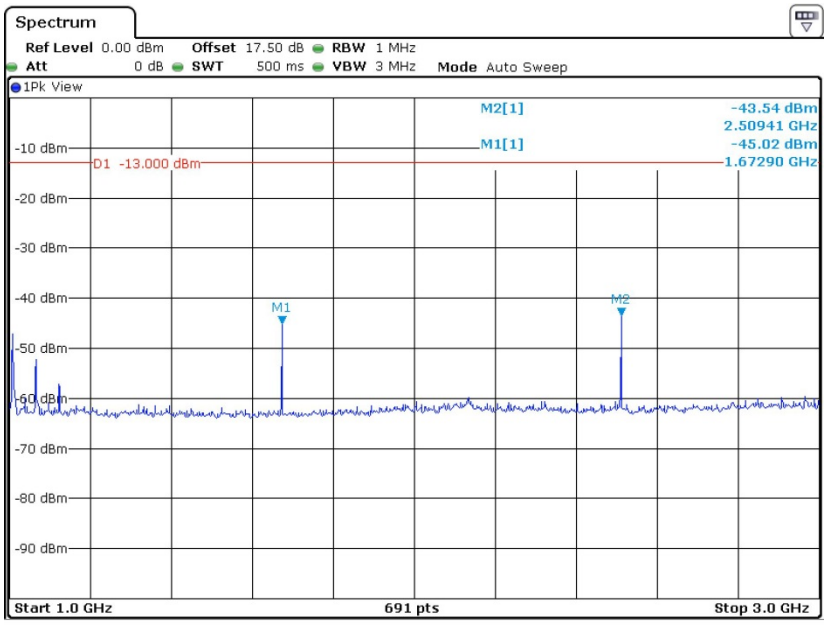
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE 8 Link	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



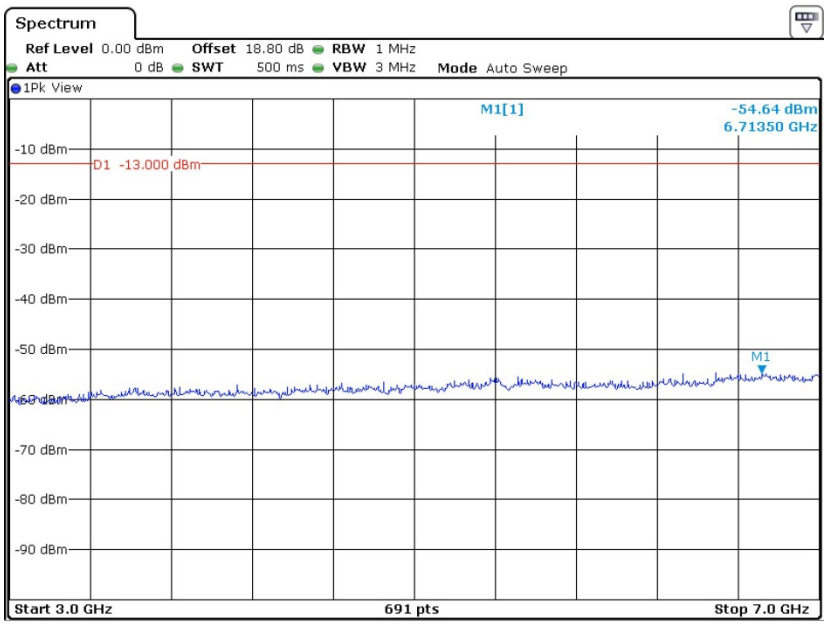
Date: 3.MAY.2013 11:02:36

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



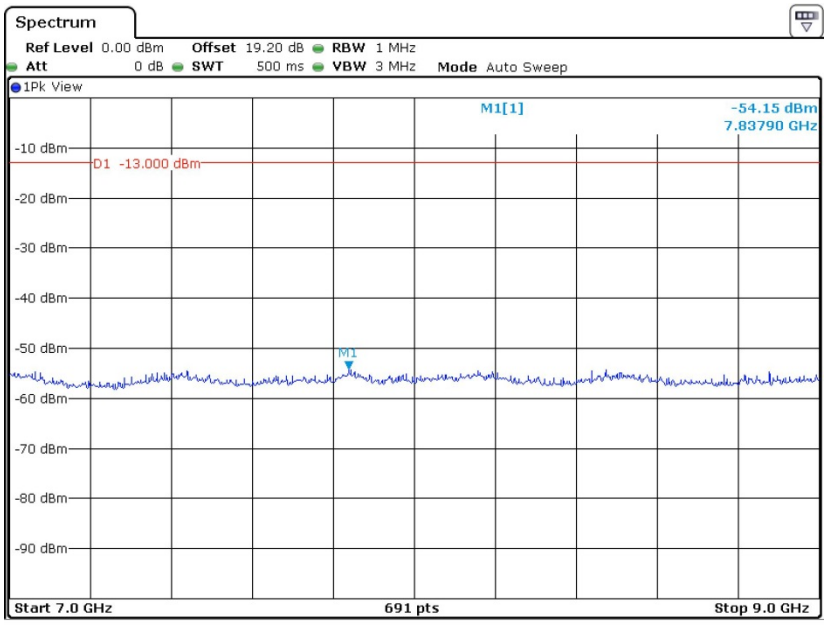
Date: 3.MAY.2013 10:58:39

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 3.MAY.2013 10:59:50

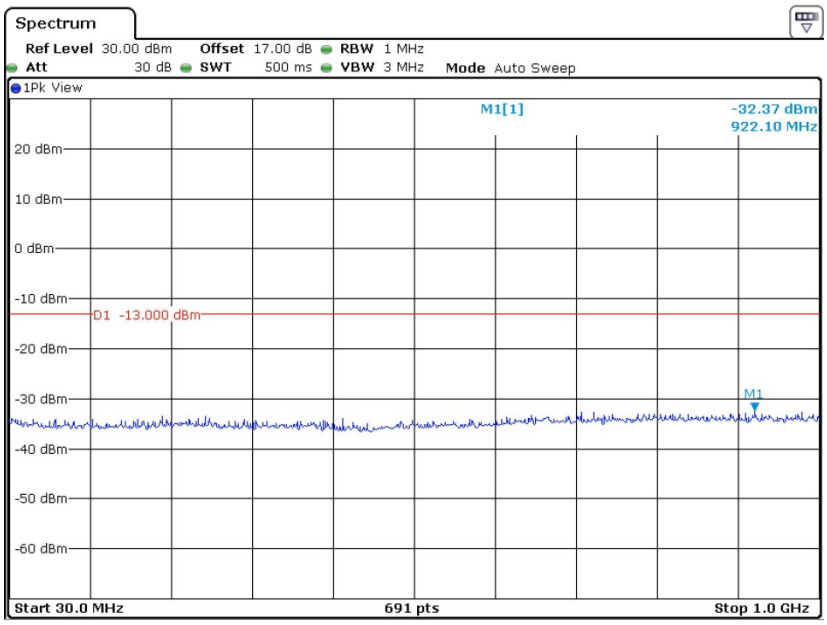
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 3.MAY.2013 11:00:45

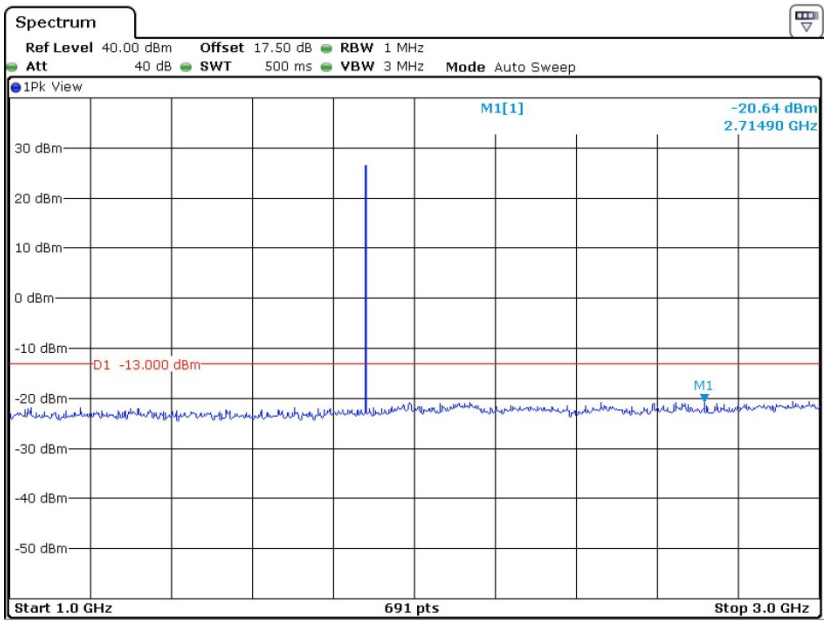
Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



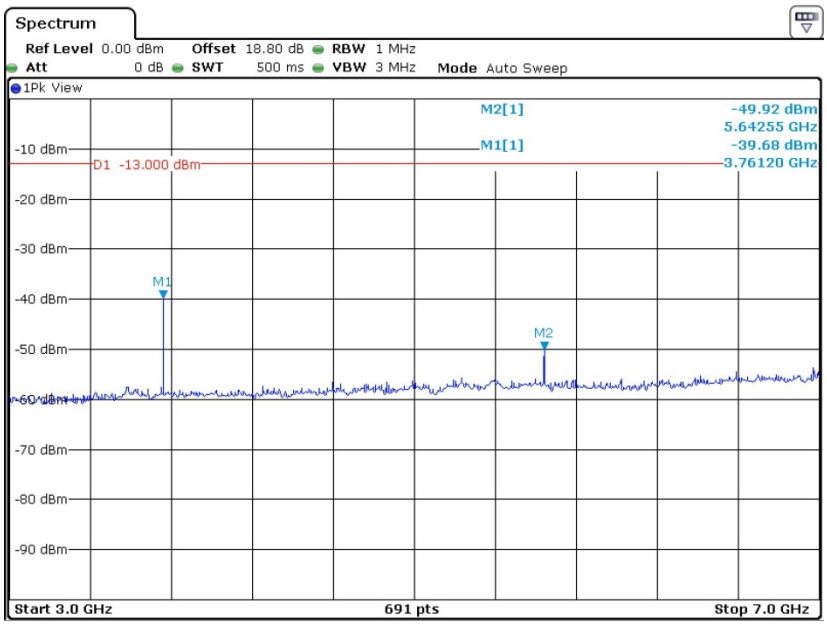
Date: 3.MAY.2013 09:29:27

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



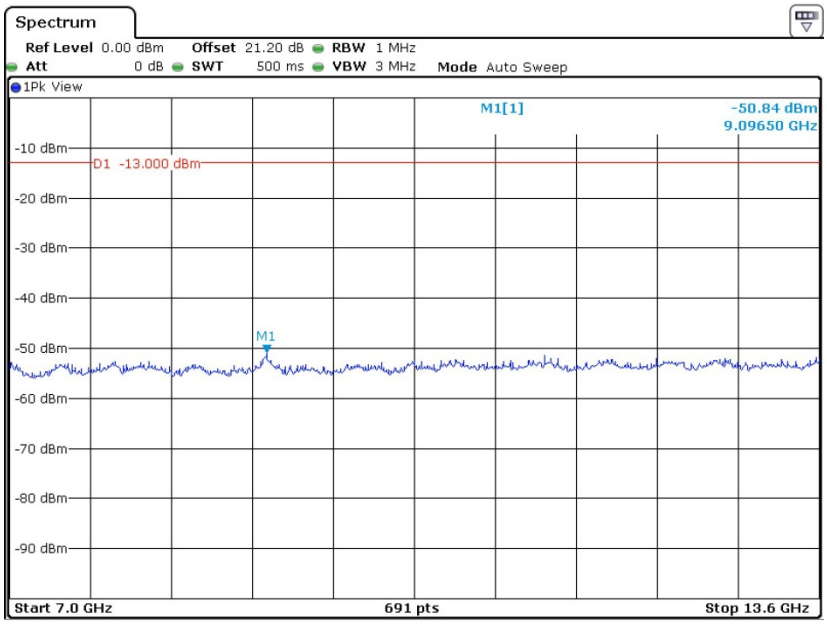
Date: 3.MAY.2013 09:30:41

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



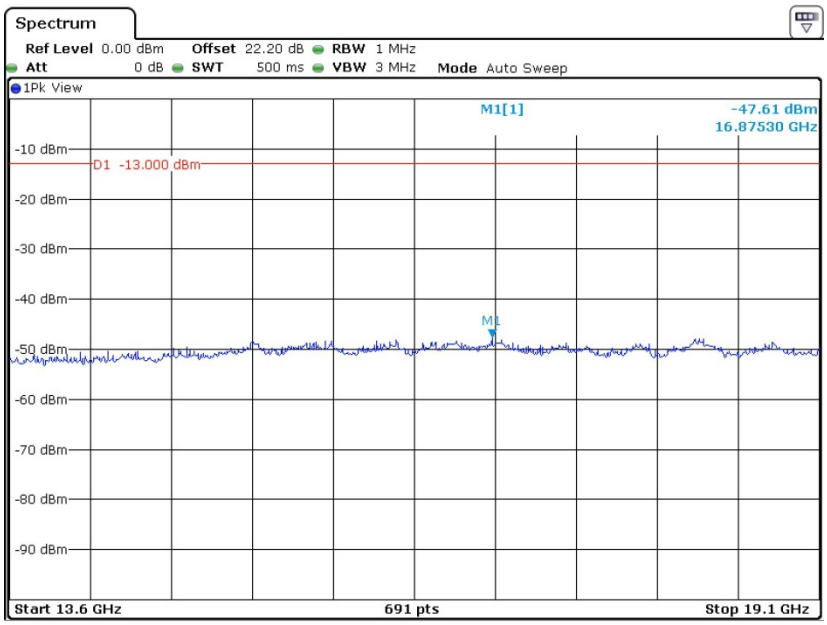
Date: 3.MAY.2013 09:18:23

Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 3.MAY.2013 09:21:49

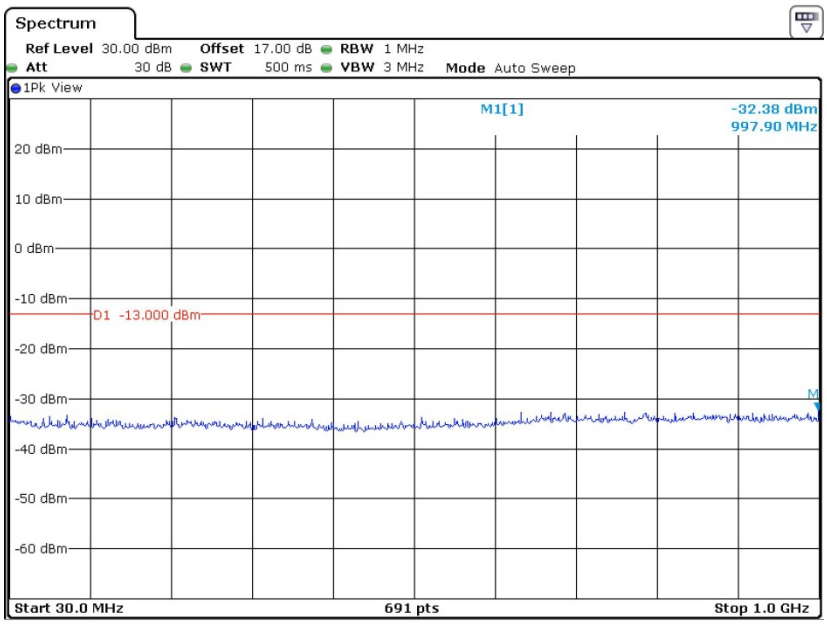
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 3.MAY.2013 09:22:45

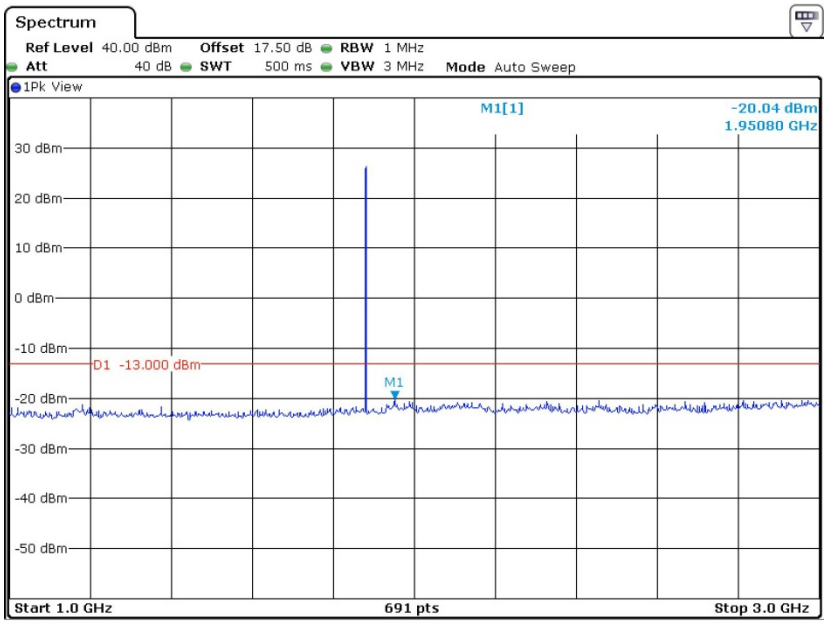
Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE 8 Link	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



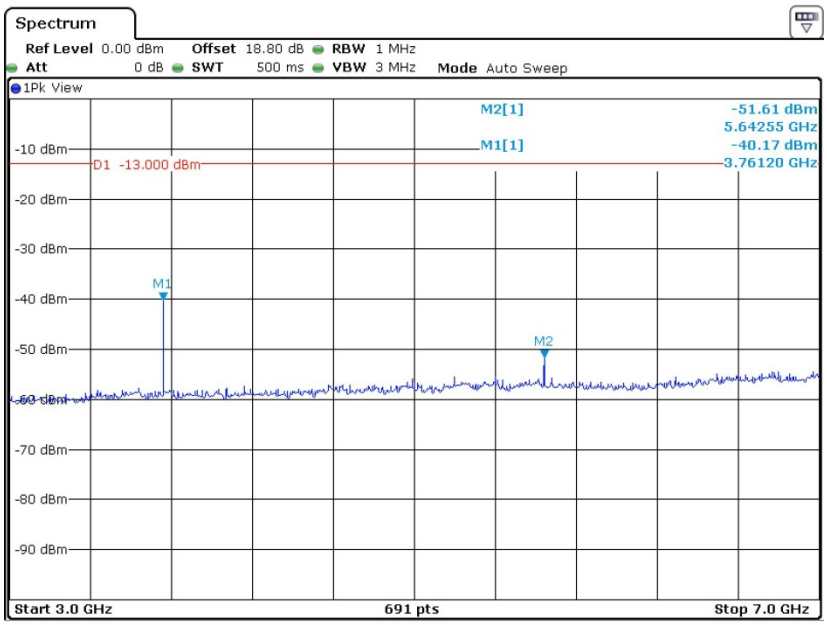
Date: 3.MAY.2013 10:49:52

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



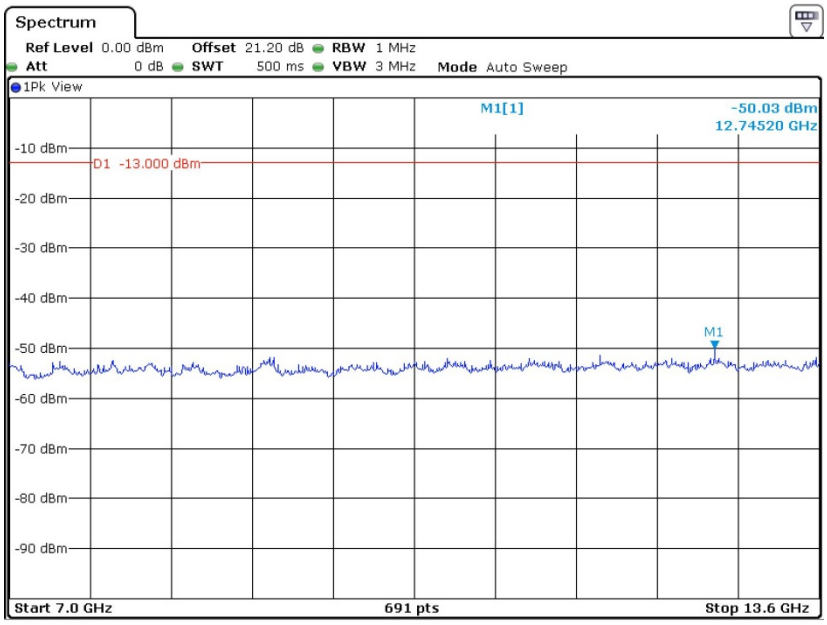
Date: 3.MAY.2013 10:51:09

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



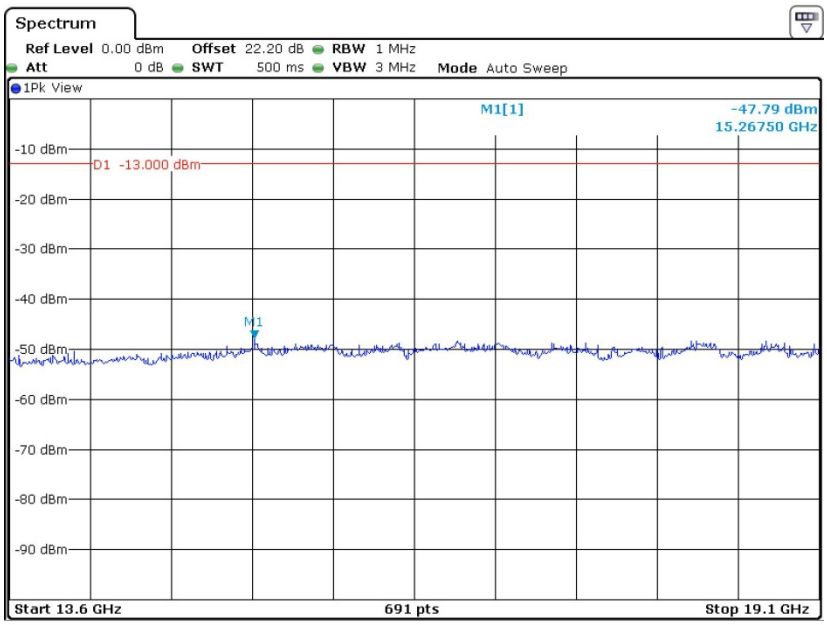
Date: 3.MAY.2013 10:53:22

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 3.MAY.2013 10:54:40

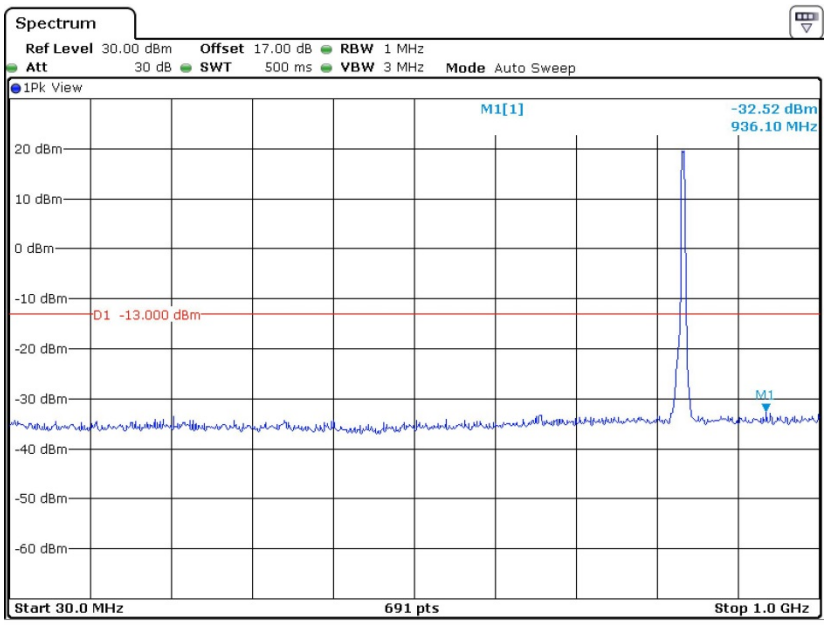
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 3.MAY.2013 10:55:26

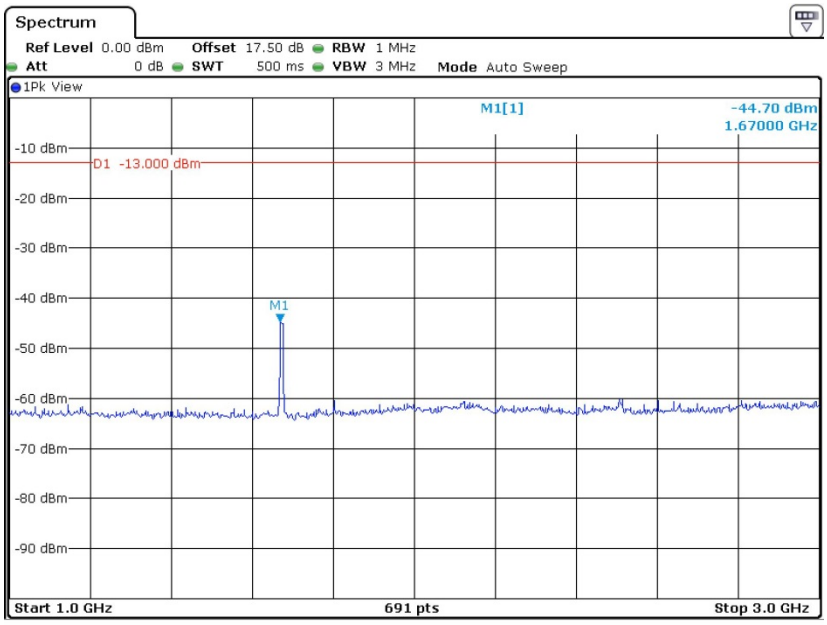
Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



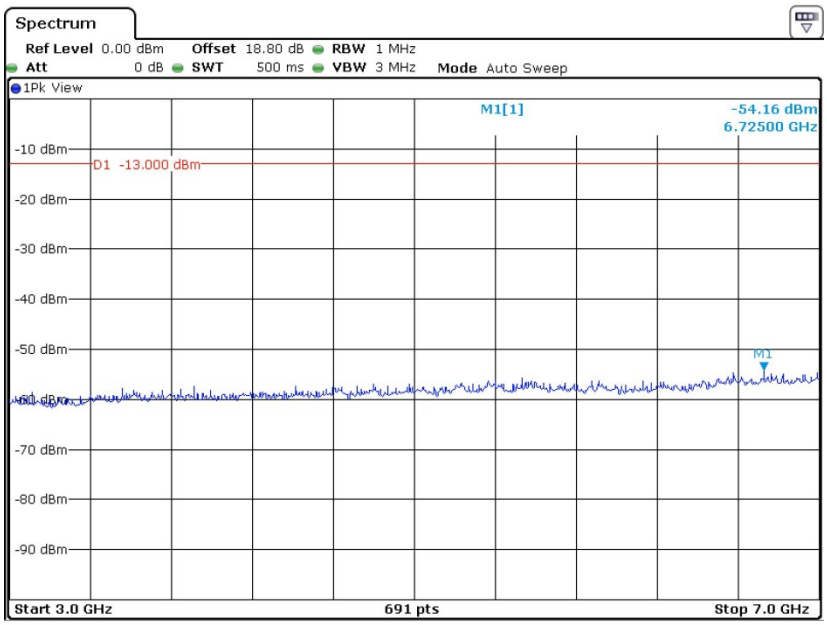
Date: 4.MAY.2013 09:21:48

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



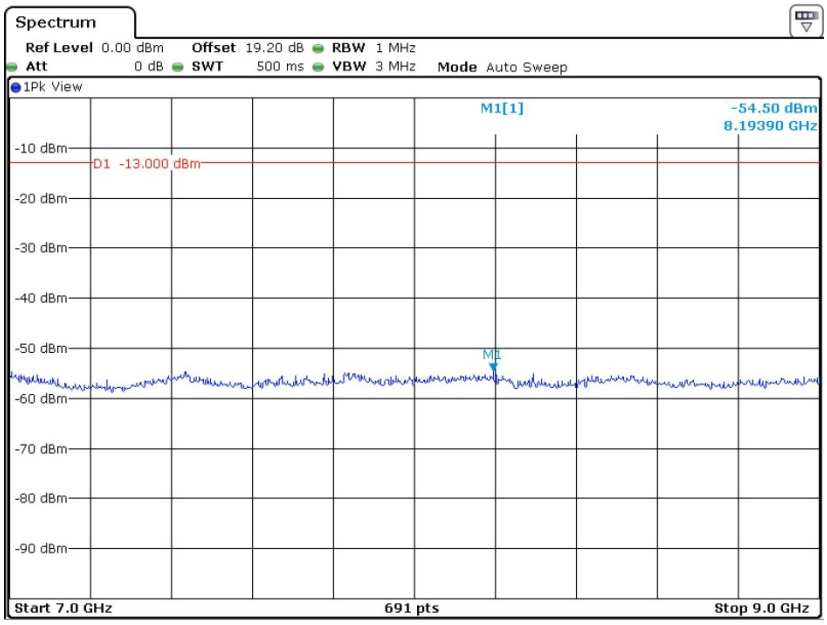
Date: 4.MAY.2013 09:16:38

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 4.MAY.2013 09:18:19

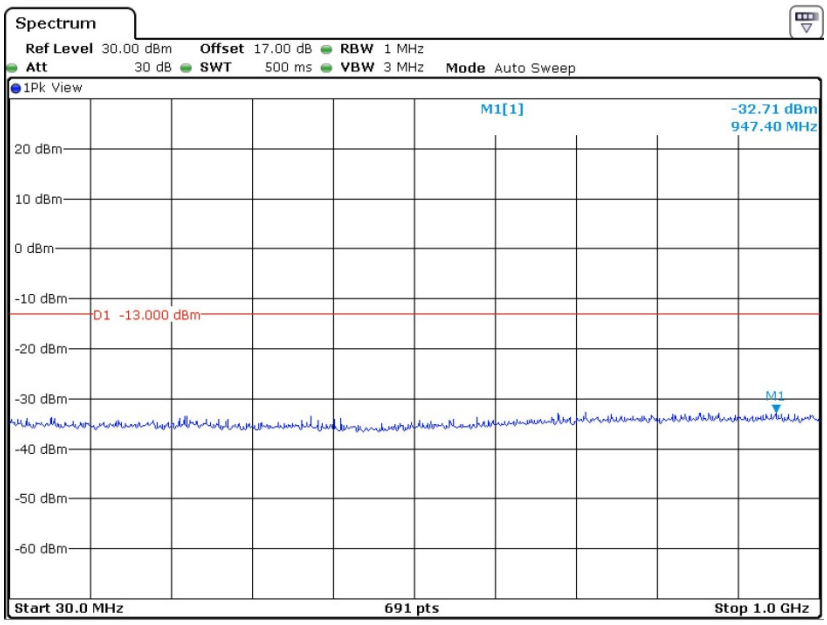
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 4.MAY.2013 09:19:13

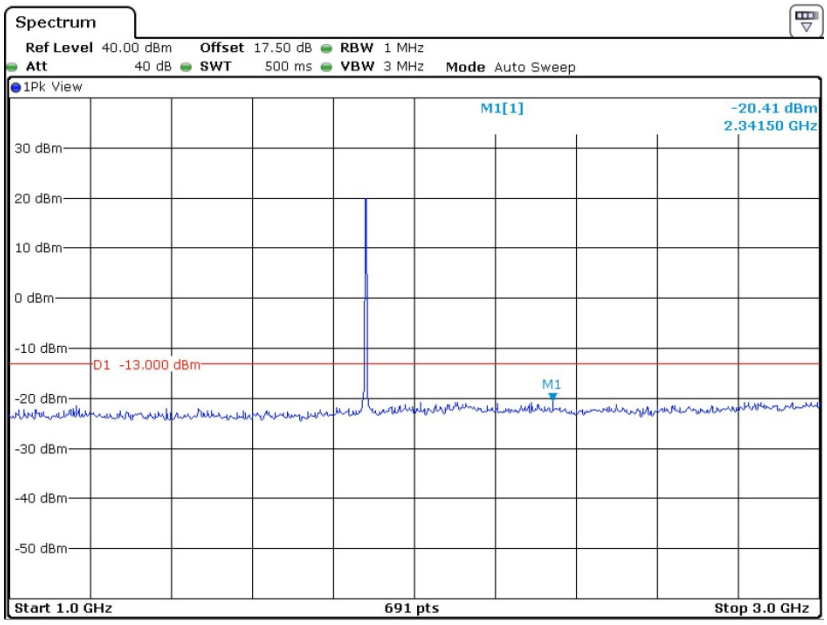
Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



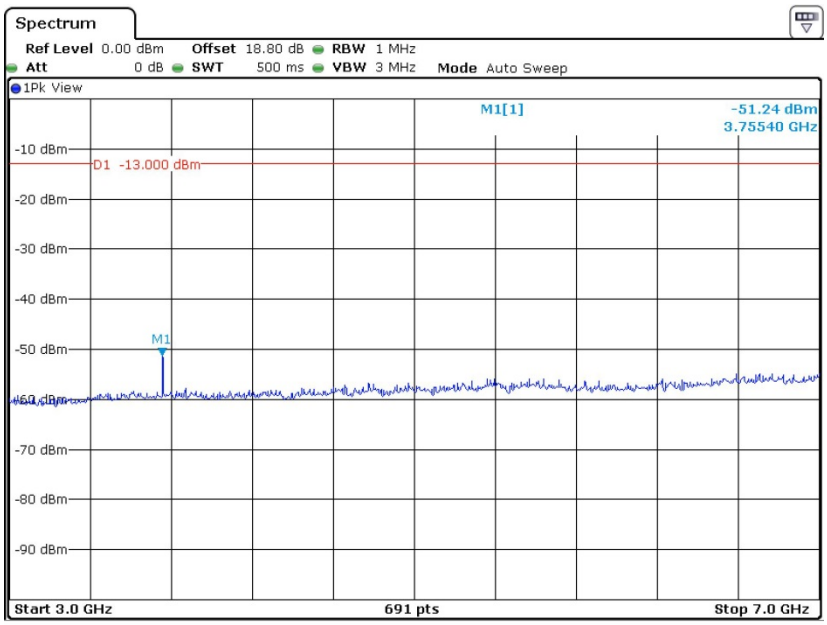
Date: 4.MAY.2013 09:22:51

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



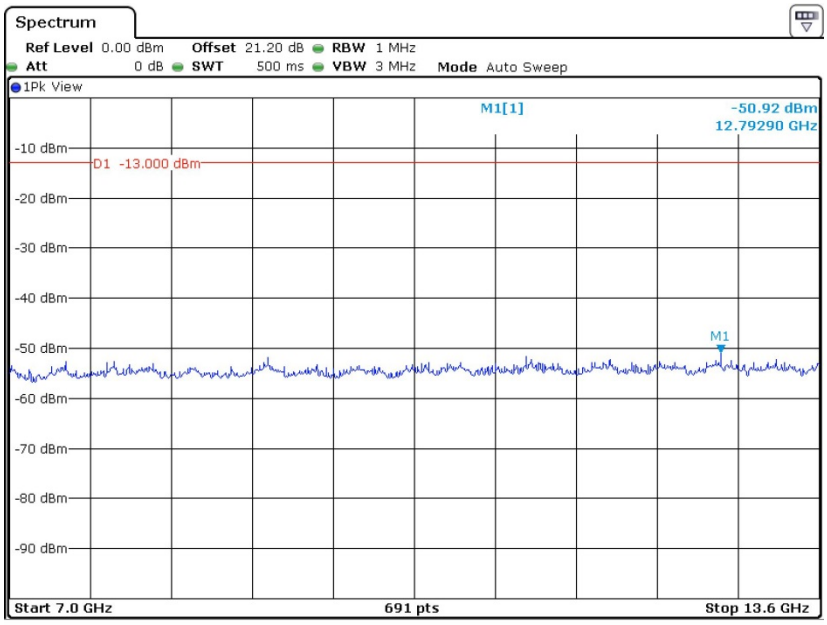
Date: 4.MAY.2013 09:23:52

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



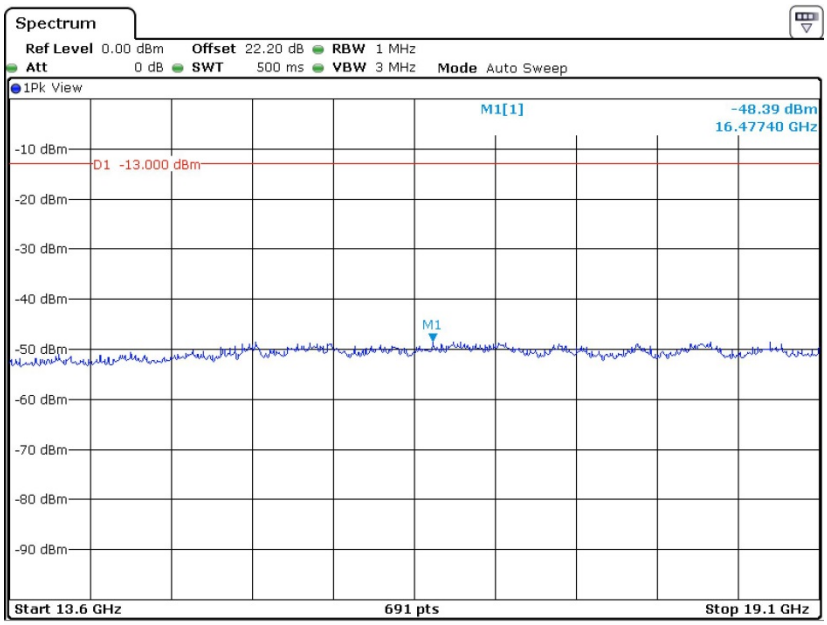
Date: 4.MAY.2013 09:26:48

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 4.MAY.2013 09:28:04

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 4.MAY.2013 09:28:59

3.7 Field Strength of Spurious Radiated Measurement

3.7.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.7.2 Measuring Instruments

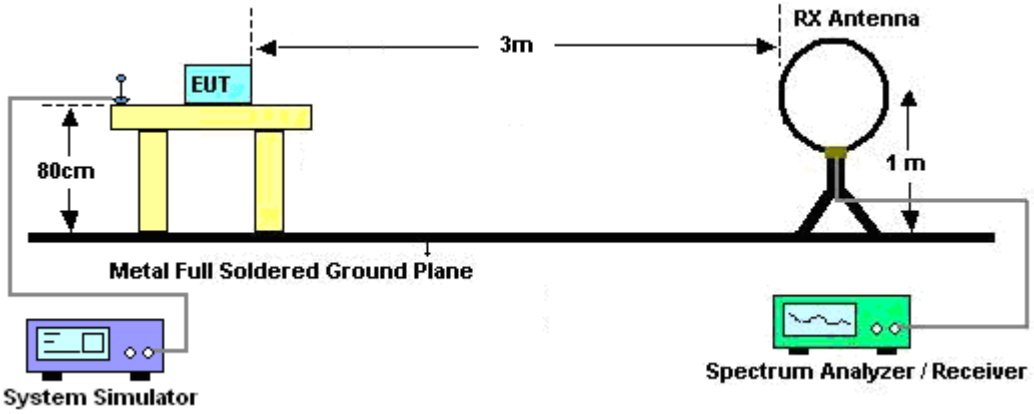
See list of measuring instruments of this test report.

3.7.3 Test Procedures

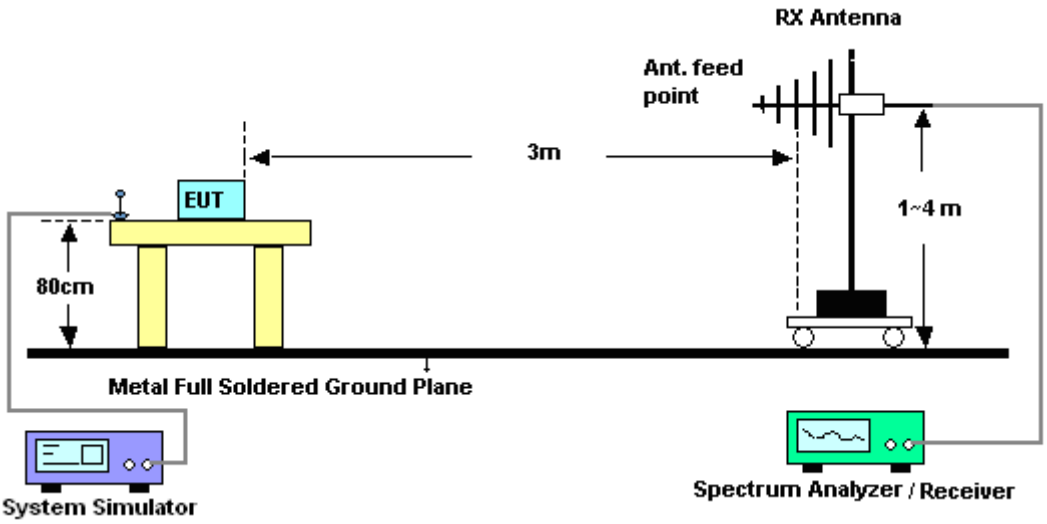
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
    = P(W) - [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
    EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
    ERP (dBm) = EIRP - 2.15

3.7.4 Test Setup

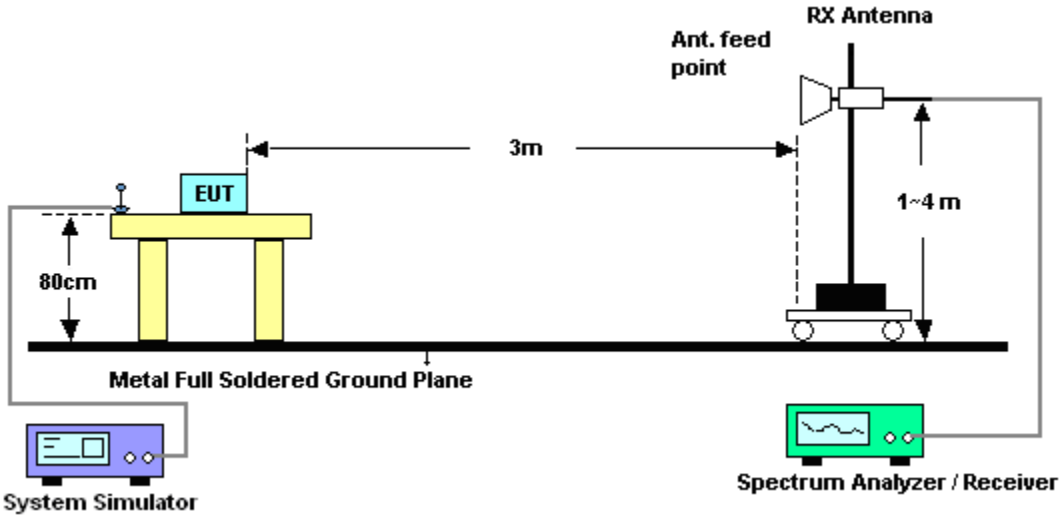
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

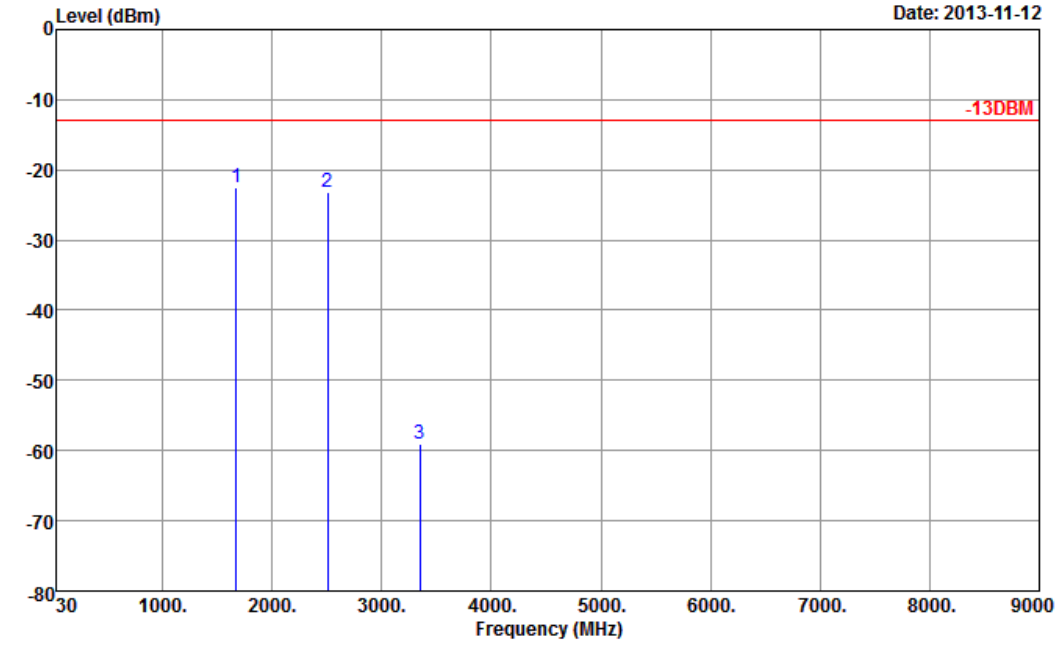


3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.7.6 Test Result of Field Strength of Spurious Radiated

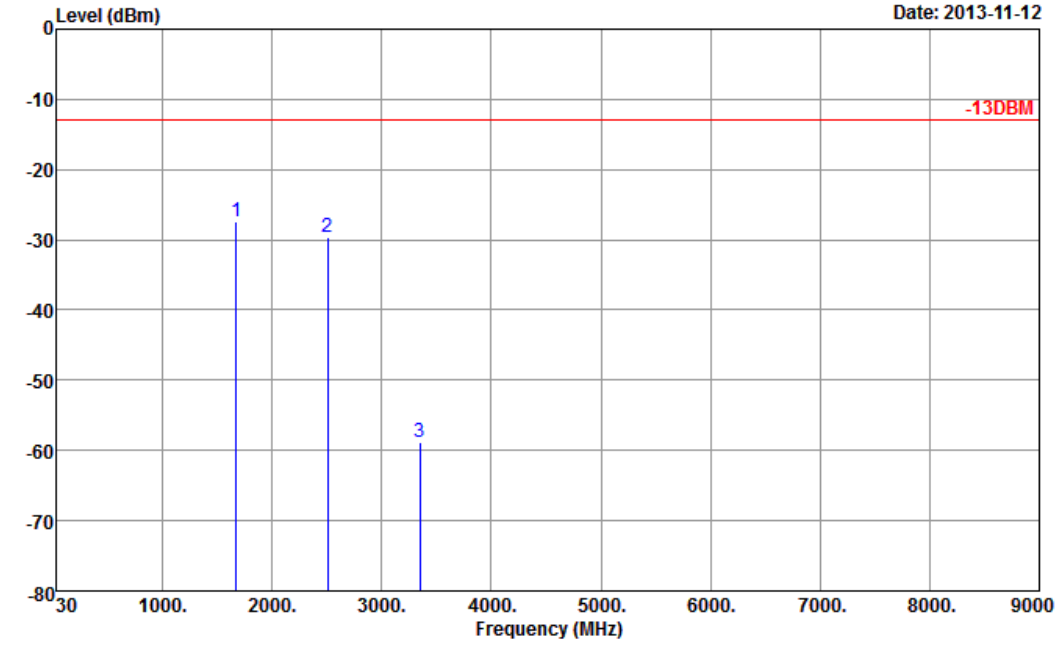
Band :	GSM850	**Temperature :**	24~25°C
Test Mode :	GSM Link	**Relative Humidity :**	50~51%
Test Engineer :	Robin Luo	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-22.42	-13	-9.42	-39.00	-25.39	0.88	6.00	H	Pass
2510	-23.16	-13	-10.16	-48.76	-25.77	1.08	5.84	H	Pass
3346	-59.12	-13	-46.12	-69.72	-63.49	1.14	7.66	H	Pass

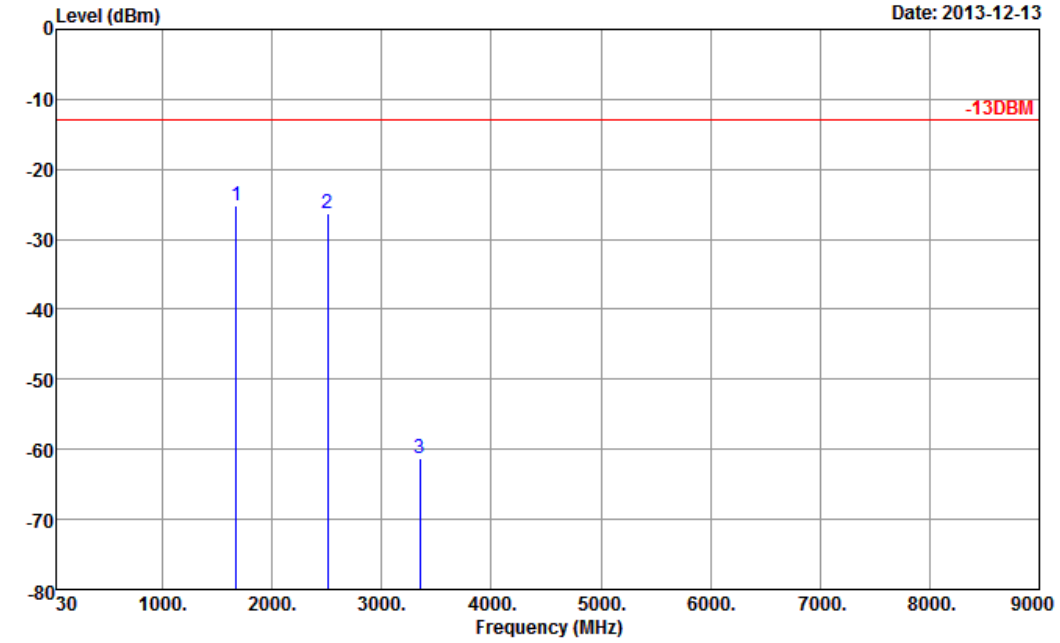
Band :	GSM850	Temperature :	24~25°C
Test Mode :	GSM Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-27.31	-13	-14.31	-41.49	-30.28	0.88	6.00	V	Pass
2510	-29.60	-13	-16.60	-52.62	-32.21	1.08	5.84	V	Pass
3346	-58.82	-13	-45.82	-70.65	-63.19	1.14	7.66	V	Pass

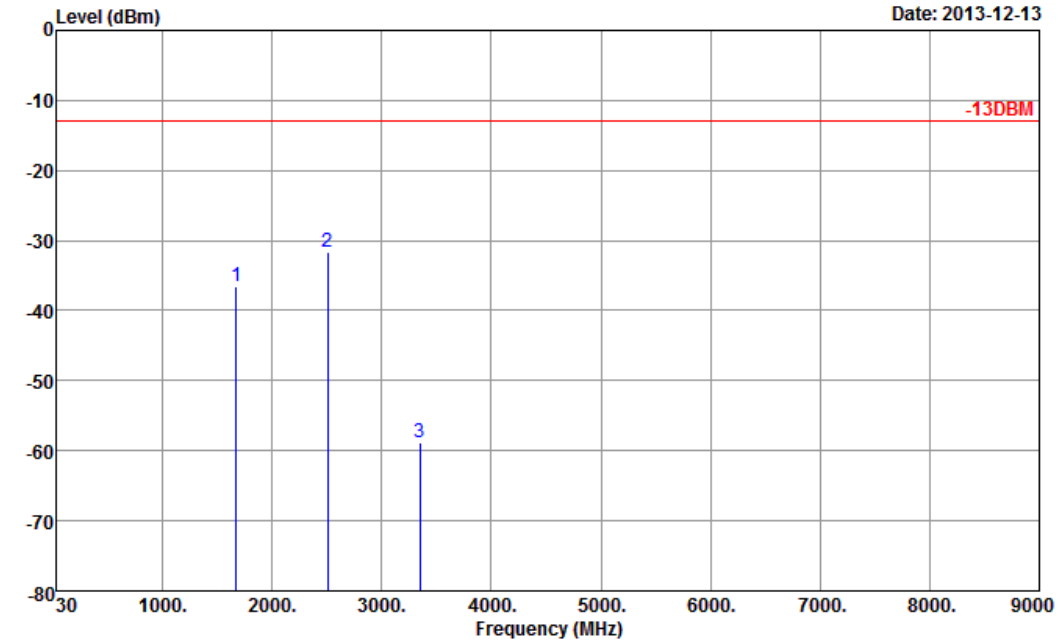
Band :	GSM850	Temperature :	24~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL
Project : (FG) 3O0802

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-25.28	-13	-12.28	-42.00	-28.25	0.88	6.00	H	Pass
2510	-26.25	-13	-13.25	-51.76	-28.86	1.08	5.84	H	Pass
3345	-61.19	-13	-48.19	-71.79	-65.56	1.14	7.66	H	Pass

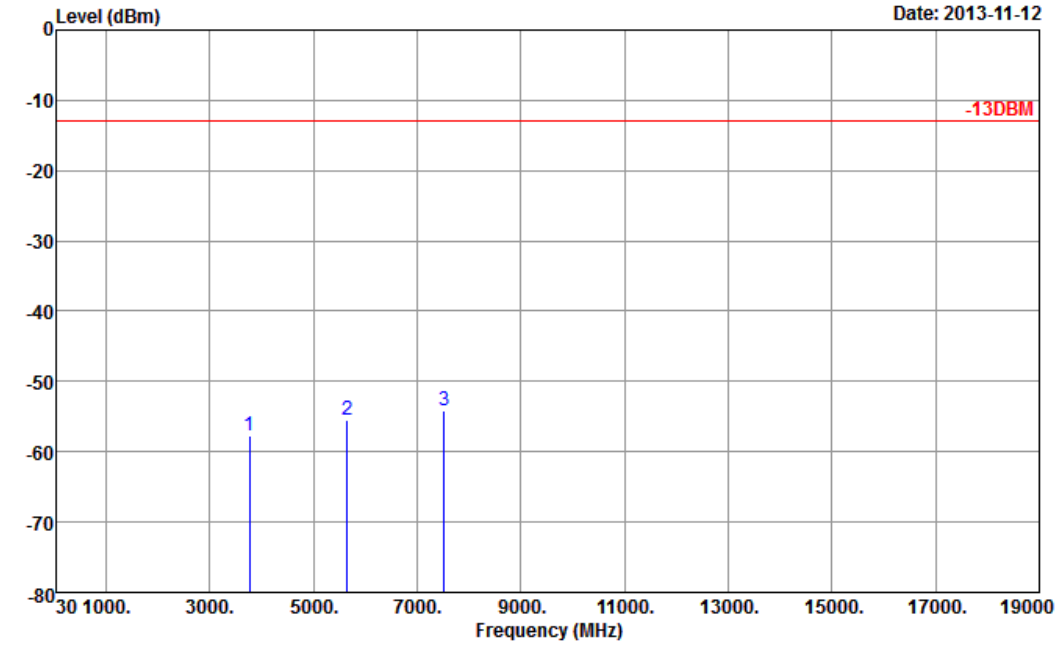
Band :	GSM850	Temperature :	24~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL
Project : (FG) 3O0802

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-36.49	-13	-23.49	-50.49	-39.46	0.88	6.00	V	Pass
2510	-31.65	-13	-18.65	-54.62	-34.26	1.08	5.84	V	Pass
3345	-58.82	-13	-45.82	-70.65	-63.19	1.14	7.66	V	Pass

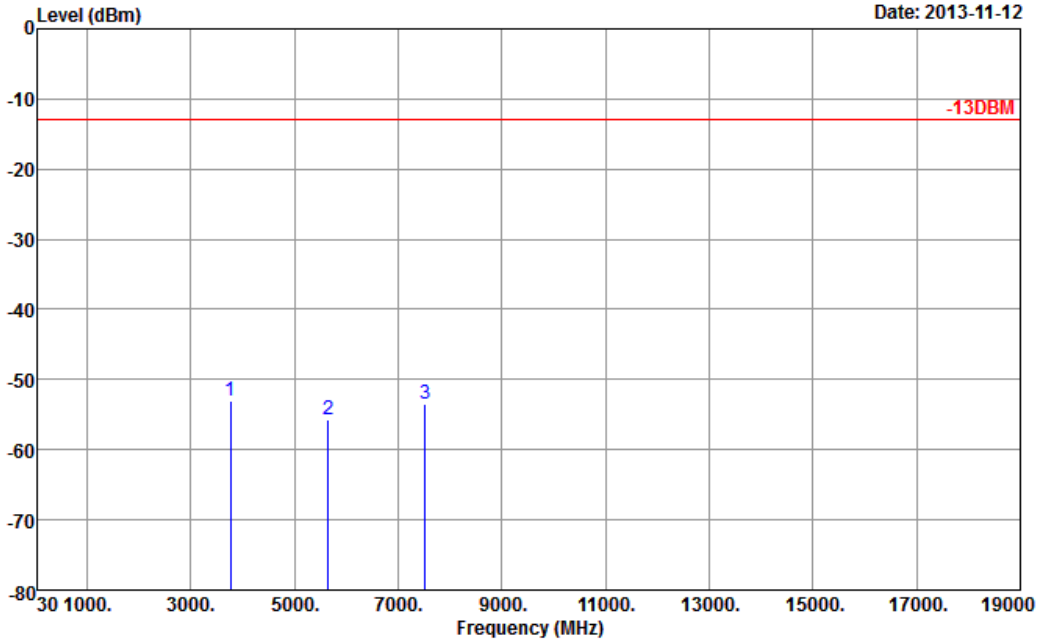
Band :	GSM1900	Temperature :	24~25°C
Test Mode :	GSM Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-57.79	-13	-44.79	-69.94	-64.53	1.28	8.02	H	Pass
5640	-55.45	-13	-42.45	-73.44	-63.87	1.58	10.00	H	Pass
7520	-54.14	-13	-41.14	-76.08	-64.46	1.78	12.10	H	Pass

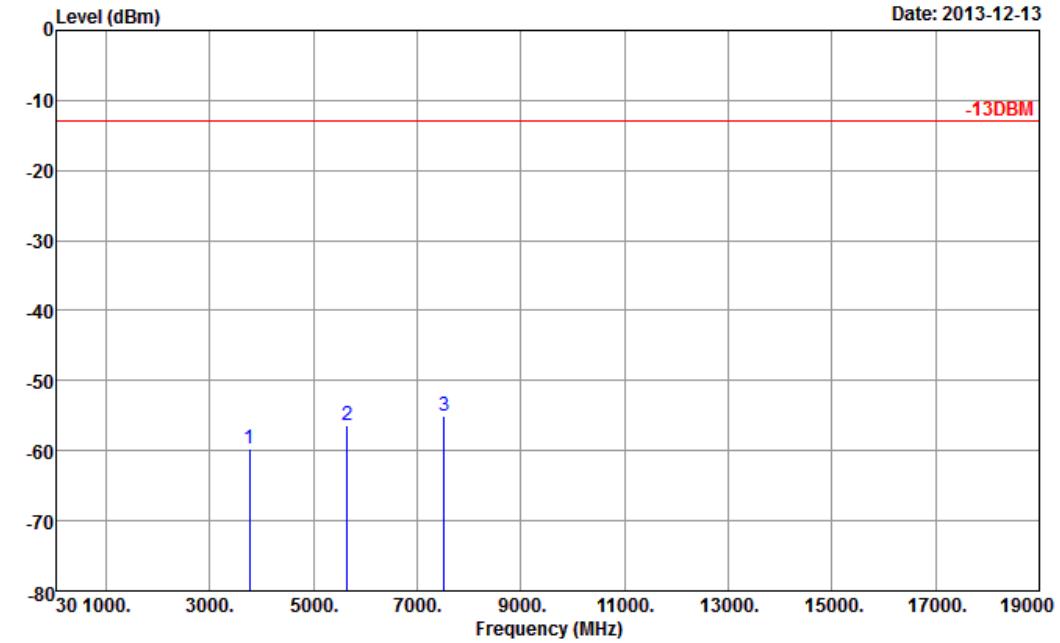
Band :	GSM1900	Temperature :	24~25°C
Test Mode :	GSM Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-52.98	-13	-39.98	-68.01	-59.72	1.28	8.02	V	Pass
5640	-55.61	-13	-42.61	-72.69	-64.03	1.58	10	V	Pass
7520	-53.51	-13	-40.51	-75.76	-63.83	1.78	12.1	V	Pass

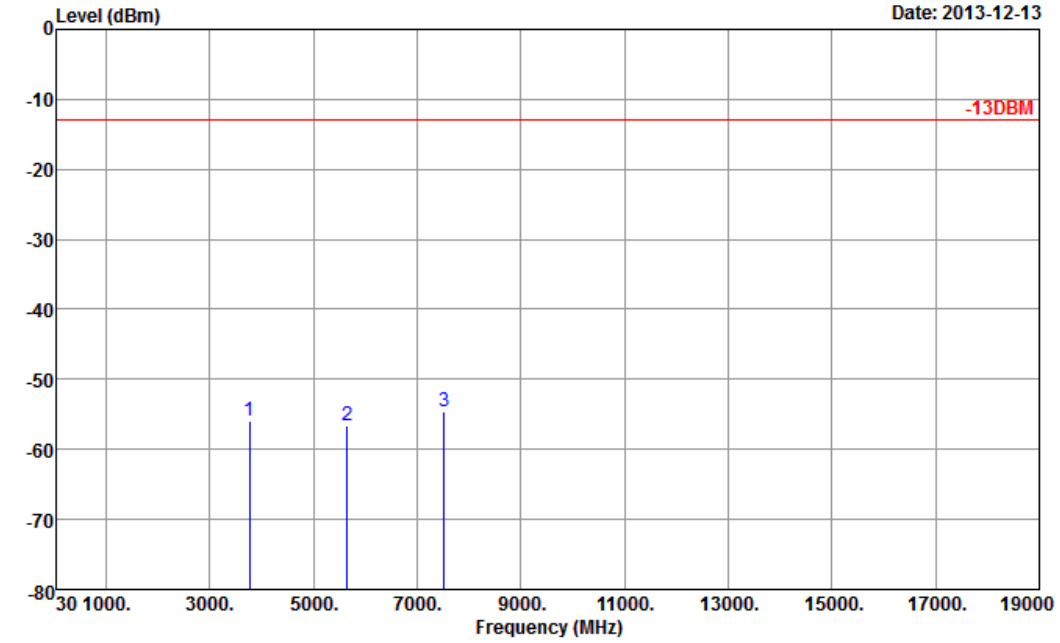
Band :	GSM1900	Temperature :	24~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_H_130101 HORIZONTAL
Project : (FG) 3O0802

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-59.79	-13	-46.79	-71.94	-66.53	1.28	8.02	H	Pass
5640	-56.45	-13	-43.45	-74.44	-64.87	1.58	10.00	H	Pass
7520	-55.14	-13	-42.14	-77.08	-65.46	1.78	12.10	H	Pass

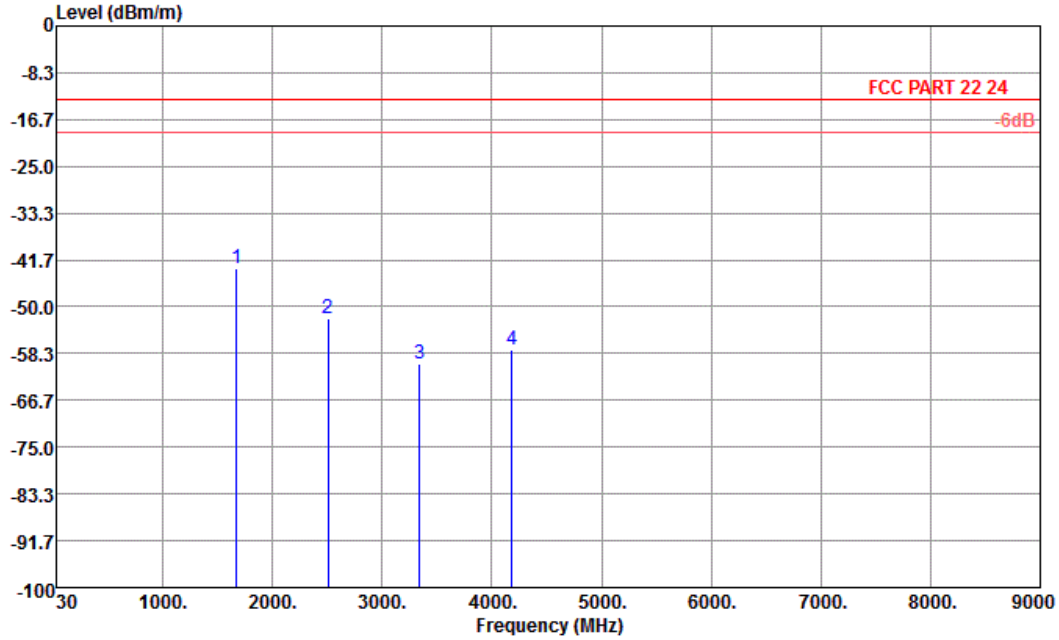
Band :	GSM1900	Temperature :	24~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	*Spurious emissions within 30-1000MHz were found more than 20dB below limit line.*		



Site : 03CH01-SZ
Condition : -13DBM HF_EIRP_V_130101 VERTICAL
Project : (FG) 3O0802

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-55.98	-13	-42.98	-71.01	-62.72	1.28	8.02	V	Pass
5640	-56.61	-13	-43.61	-73.69	-65.03	1.58	10	V	Pass
7520	-54.51	-13	-41.51	-76.76	-64.83	1.78	12.1	V	Pass

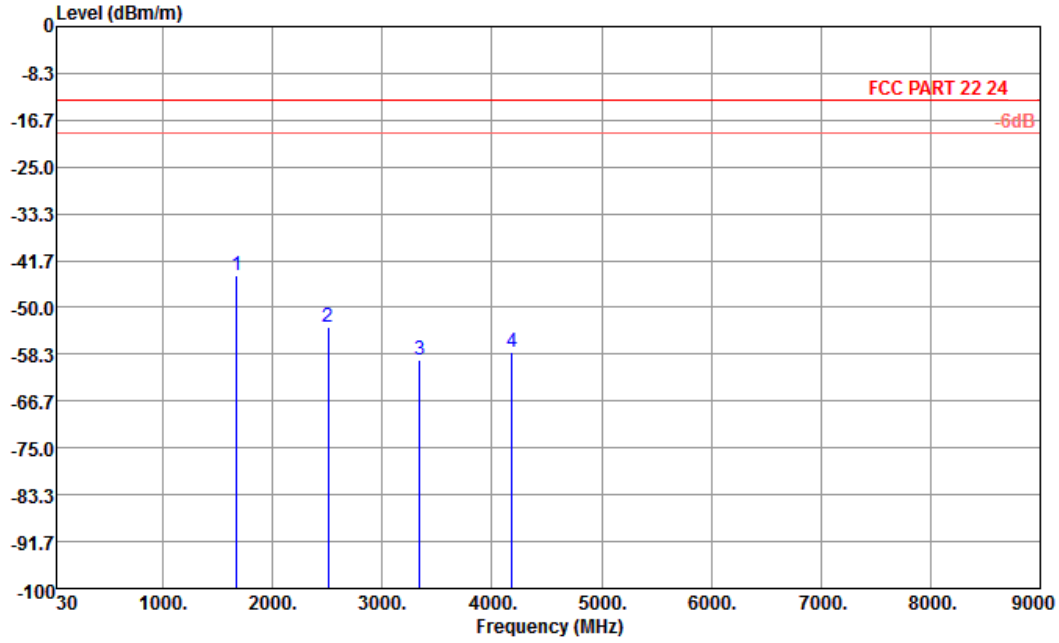
Band :	WCDMA Band V	Temperature :	24~25°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : FCC PART 22 24 3m HF EIRP H-130101 HORIZONTAL

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-43.24	-13	-30.24	-59.45	-46.21	0.88	6.00	H	Pass
2510	-50.96	-13	-37.96	-71.79	-53.57	1.08	5.84	H	Pass
3345	-60.18	-13	-47.18	-70.78	-64.55	1.14	7.66	H	Pass
4182	-57.69	-13	-44.69	-72.45	-62.96	1.37	8.79	H	Pass

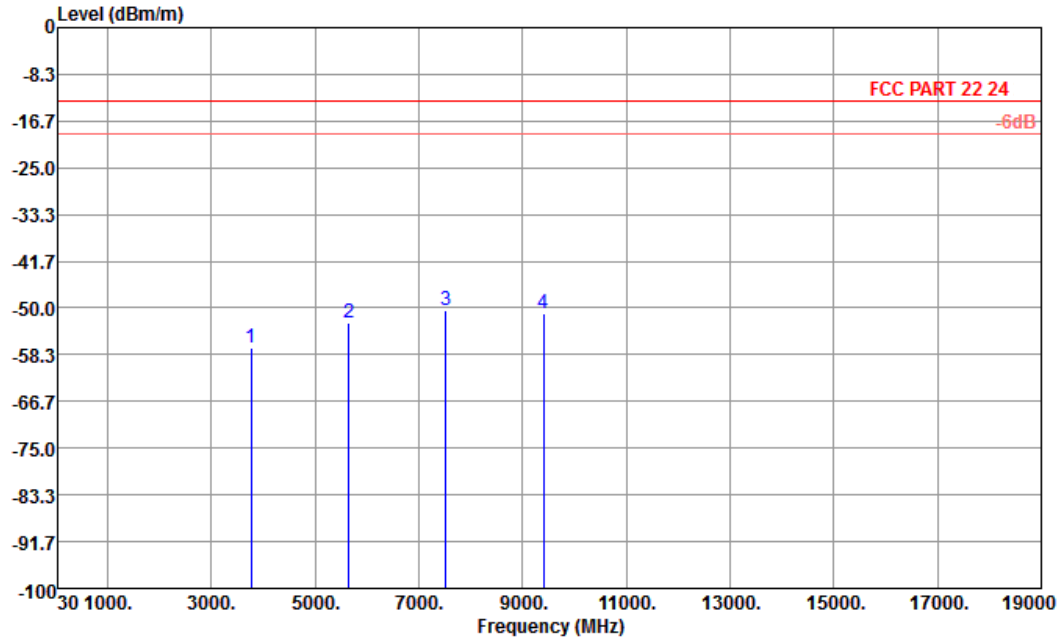
Band :	WCDMA Band V	Temperature :	24~25°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : FCC PART 22 24 3m HF EIRP V-130101 VERTICAL

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-44.30	-13	-31.30	-57.70	-47.27	0.88	6.00	V	Pass
2510	-53.48	-13	-40.48	-72.33	-56.09	1.08	5.84	V	Pass
3345	-59.26	-13	-46.26	-71.09	-63.63	1.14	7.66	V	Pass
4182	-57.80	-13	-44.80	-73.02	-63.07	1.37	8.79	V	Pass

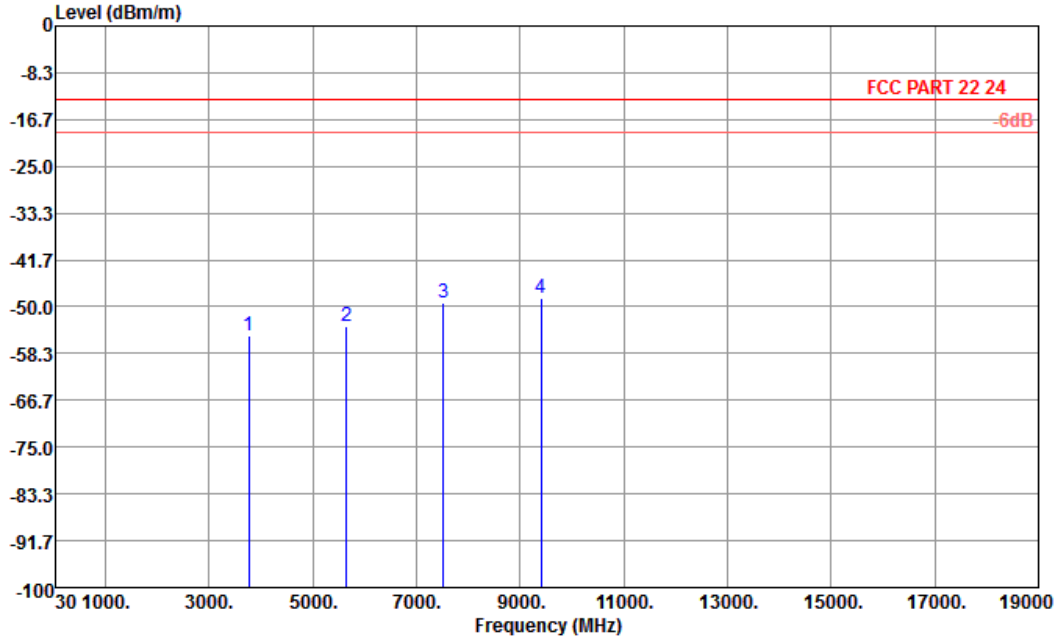
Band :	WCDMA Band II	Temperature :	24~25°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : FCC PART 22 24 3m HF EIRP H-130101 HORIZONTAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-57.05	-13	-44.05	-69.20	-63.79	1.28	8.02	H	Pass
5640	-52.70	-13	-39.70	-70.69	-61.12	1.58	10.00	H	Pass
7520	-50.34	-13	-37.34	-72.28	-60.66	1.78	12.10	H	Pass
9400	-50.97	-13	-37.97	-73.09	-61.75	2.22	13.00	H	Pass

Band :	WCDMA Band II	Temperature :	24~25°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~51%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-SZ
Condition : FCC PART 22 24 3m HF EIRP V-130101 VERTICAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-55.29	-13	-42.29	-70.32	-62.03	1.28	8.02	V	Pass
5640	-53.37	-13	-40.37	-70.45	-61.79	1.58	10	V	Pass
7520	-49.37	-13	-36.37	-71.62	-59.69	1.78	12.1	V	Pass
9400	-48.49	-13	-35.49	-72.11	-59.27	2.22	13	V	Pass

3.8 Frequency Stability for Temperature and Voltage Measurement

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

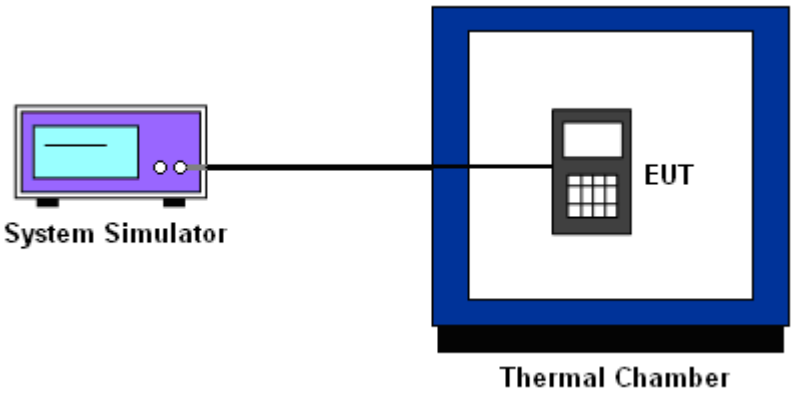
3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT cannot be turned on at -30°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	GSM 850	Channel :	189
Limit (ppm) :	2.5	Frequency :	836.4 MHz

Temperature (°C)	GSM		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	23	+0.03	-27	-0.03	PASS
-20	26	+0.03	-36	-0.04	
-10	-45	-0.05	-43	-0.05	
0	-48	-0.06	-52	-0.06	
10	-46	-0.05	-54	-0.06	
20	-54	-0.06	-57	-0.07	
30	-37	-0.04	-53	-0.06	
40	-39	-0.05	-56	-0.07	
50	-27	-0.03	-51	-0.06	

Band :	GSM 1900	Channel :	661
Limit (ppm) :	2.5	Frequency :	1880.0 MHz

Temperature (°C)	GSM		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-48	-0.03	-63	-0.03	PASS
-20	-47	-0.02	-59	-0.03	
-10	-46	-0.02	-57	-0.03	
0	-44	-0.02	-56	-0.03	
10	-45	-0.02	-48	-0.03	
20	-43	-0.02	-46	-0.02	
30	-45	-0.02	-47	-0.02	
40	-43	-0.02	-45	-0.02	
50	-46	-0.02	-47	-0.02	

Band :	WCDMA Band V	Channel :	4182
Limit (ppm) :	2.5	Frequency :	836.4 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	32	+0.04	PASS
-20	30	+0.04	
-10	-28	-0.03	
0	-29	-0.03	
10	-26	-0.03	
20	-27	-0.03	
30	-27	-0.03	
40	30	+0.04	
50	31	+0.04	

Band :	WCDMA Band II	Channel :	9400
Limit (ppm) :	2.5	Frequency :	1880.0 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-37	-0.02	PASS
-20	-34	-0.02	
-10	-35	-0.02	
0	-36	-0.02	
10	-38	-0.02	
20	-36	-0.02	
30	-40	-0.02	
40	-39	-0.02	
50	-41	-0.02	

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	9	-54	-0.06	2.5	PASS
		BEP	-52	-0.06		
		9.5	-54	-0.06		
	EDGE 8	9	-57	-0.07		
		BEP	-54	-0.06		
		9.5	-56	-0.07		
GSM 1900 CH661	GSM	9	-44	-0.02		
		BEP	-43	-0.02		
		9.5	-45	-0.02		
	EDGE 8	9	-46	-0.02		
		BEP	-46	-0.02		
		9.5	-48	-0.03		
WCDMA Band V CH4182	RMC 12.2Kbps	9	-27	-0.03		
		BEP	-27	-0.03		
		9.5	-29	-0.03		
WCDMA Band II CH9400	RMC 12.2Kbps	9	-36	-0.02		
		BEP	-35	-0.02		
		9.5	-38	-0.02		

Note:

1. Normal Voltage = 9V.
2. Battery End Point (BEP) = 8.9 V.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Jun. 01, 2012	May 03, 2013~ May 06, 2013	May 31, 2013	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV30	100845	9kHz~30GHz	Nov. 06, 2012	May 03, 2013~ May 06, 2013	Nov. 05, 2013	Conducted (TH01-SZ)
DC Power Supply	TOPWORD	3303DR	714621	N/A	Nov. 19, 2012	May 03, 2013~ May 06, 2013	Nov. 18, 2013	Conducted (TH01-SZ)
Thermal Chamber	Hongzhan	LP-150U	HD20120425	N/A	Jun. 11, 2012	May 03, 2013~ May 06, 2013	Jun. 10, 2013	Conducted (TH01-SZ)
ESCI TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Mar. 28, 2013	Dec 12, 2013~ Dec. 13, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP30	101362	9kHz~30GHz	Mar. 28, 2013	Dec 12, 2013~ Dec. 13, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 11, 2013	Dec 12, 2013~ Dec. 13, 2013	Oct. 10, 2014	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30MHz~2GHz	Nov. 02, 2013	Dec 12, 2013~ Dec. 13, 2013	Nov. 01, 2014	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz GAIN 30db	Mar. 28, 2013	Dec 12, 2013~ Dec. 13, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	Mar. 28, 2013	Dec 12, 2013~ Dec. 13, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
SHF-EHF-Horn	Schwarzbeck	BBHA9170	BBHA9170249	14GHz~40GHz	Nov. 22, 2013	Dec 12, 2013~ Dec. 13, 2013	Nov. 21, 2014	Radiation (03CH01-SZ)
Turn Table	EM Electronice	EM 1000	N/A	0 ~ 360 degree	N/A	Dec 12, 2013~ Dec. 13, 2013	N/A	Radiation (03CH01-SZ)
Antenna Mast	EM Electronice	EM 1000	N/A	1 m ~ 4 m	N/A	Dec 12, 2013~ Dec. 13, 2013	N/A	Radiation (03CH01-SZ)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**