Test Report of
FCC Part 22 and Part 24
for FCC Certificate

On Behalf of

Ningbo Putian Communication Technology Co., Ltd.

Product Description:	**Auto Integrated Dialing Test Terminal**
Model No.:	**DK-EM4PS**
Brand Name:	**N/A**
FCC ID:	**X7F-DK-EM4PS**
Prepared for:	**Ningbo Putian Communication Technology Co., Ltd.** Yingchun Road No. 18, Industrial Park of Wangchun, Ningbo City, Zhejiang Province, P.R.China
Prepared by:	**Bontek Compliance Testing Laboratory Ltd** 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China Tel: 86-755-86337020 Fax: 86-755-86337028
Report No.:	BCT09LP-1301E
Issue Date:	April 08, 2010
Test Date:	February 01~April 06, 2010

Test by: Kendy Wang

Reviewed By: Tony Wu

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	Ningbo Putian Communication Technology Co., Ltd.
Address of Applicant:	Yingchun Road No. 18, Industrial Park of Wangchun, Ningbo City, Zhejiang Province, P.R.China
Manufacturer:	Ningbo Putian Communication Technology Co., Ltd.
Address of Manufacturer:	Yingchun Road No. 18, Industrial Park of Wangchun, Ningbo City, Zhejiang Province, P.R.China

Equipment Under Test:	Auto Integrated Dialing Test Terminal
Test Model Name:	DK-EM4PS
Supplementary Model No.:	N/A
Brand Name:	N/A
Series Mode:	N/A
Difference description:	N/A
EUT Frequency Bands:	GSM (PCS) Module Inside
Transmit Frequency for Test:	EGSM: 824 ~ 849 MHz, PCS: 1850 ~ 1910MHz
Receive Frequency for Test:	EGSM: 869 ~ 894 MHz, PCS: 1930 ~ 1990MHz
Type of Modulation:	GMSK for GSM
Channel Control:	Auto
Antenna Type:	Dedicated Antenna
Peak Antenna Gain:	0.84dBi for E-GSM900 1.26dBi for GSM1800
Power Supply:	Input: AC 100-240V, 50~60Hz,1.5A MAX; Output: DC12V, 4 A
Adaptor Cable:	1.50m, Unshielded, With Core

*Remark: * The test data gathered are from the production sample provided by the manufacturer.*

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Part 22, Part 24 and Part 15B of the FCC 47 CFR Rules. It is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4-2009.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2009 and FCC CFR 47, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

1.4 Test Facility

All measurement required was performed at laboratory of Bontek Compliance Testing Laboratory Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China and Shenzhen Emtek Co., Ltd at Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

The test facility is recognized, certified, or accredited by the following organizations:

CNAS - Registration No.: L3923
Bontek Compliance Testing Laboratory Ltd has been accredited by China National Accreditation Service for Conformity Assessment (CNAS) for the competence in the field of EMC and Safety testing with the Registration No.: L3923 on February, 2009.

FCC – Registration No.: 338263
Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

IC Registration No.: 7631A
The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2008.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2009 and FCC CFR 47 Part 22 H and Part 24 E.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose f the measurements.

2.3 General Test Procedures

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2009.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

2.4 Description of Test Modes

The EUT had been tested under operating condition.
EUT staying in continuous transmitting mode was programmed. Channel Low, Mid and High were chosen for full testing.
After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only. The field strength of spurious emission was measured as EUT stand-up position (H mode) and lie-down position (E1, E2 mode) for both GSM and GPRS with all power adaptors. The worst emission was found in stand-up position (H mode) and the worst case was recorded.

2.5 Instrument Calibration

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.6 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Calculator date	Calibration Period
1	Peak and Avg Power Sensor	Agilent	E9327A	US40441788	07/30/2009	1 Year
2	EPM-P Series Power Meter	Agilent	E4416A	QB41292714	07/30/2009	1 Year
3	Spectrum Analyzer	Agilent	E4446A	MY44020154	08/16/2009	1 Year
4	Wireless communication test set	Agilent	8960	QB44051695	10/06/2009	1 Year
5	Spectrum Analyzer	Agilent	E4446A	MY44020154	08/16/2009	1 Year
6	EMI Test Receiver	R&S	ESPI3	101026	11/11/2009	1 Year
7	Pre-Amplfier	MINI-circuits	ZFL-1000VH2	d041703	12/13/2009	1 Year
8	Pre-Amplfier	Miteq	NSP4000-NF	870731	01/28/2009	1 Year
9	Bilog Antenna	Sunol	JB1	A110204-2	11/22/2009	1 Year
10	Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	02/01/2009	1 Year
11	PSG Analog Signal Generator	Agilent	E8257C	MY43321570	12/19/2009	1 Year
12	Wireless communication test set	Agilent	8960	QB44051695	10/06/2009	1 Year
13	Turn Table	CT	CT123	4165	N.C.R	N.C.R
14	Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
15	Controller	CT	CT1OO	95637	N.C.R	N.C.R
16	Site NSA	CCS	N/A	N/A	04/06/2009	1 Year
17	Temperature & Humidity Chamber	WUHUAN	HTP205	20021115	2009/11	1 Year
18	EMI Test Receiver	R&S	ESCI	100687	2009-4-14	2010-4-13
19	EMI Test Receiver	R&S	ESPI	100097	2009-4-14	2010-4-13
20	Amplifier	HP	8447D	1937A02492	2009-4-14	2010-4-13

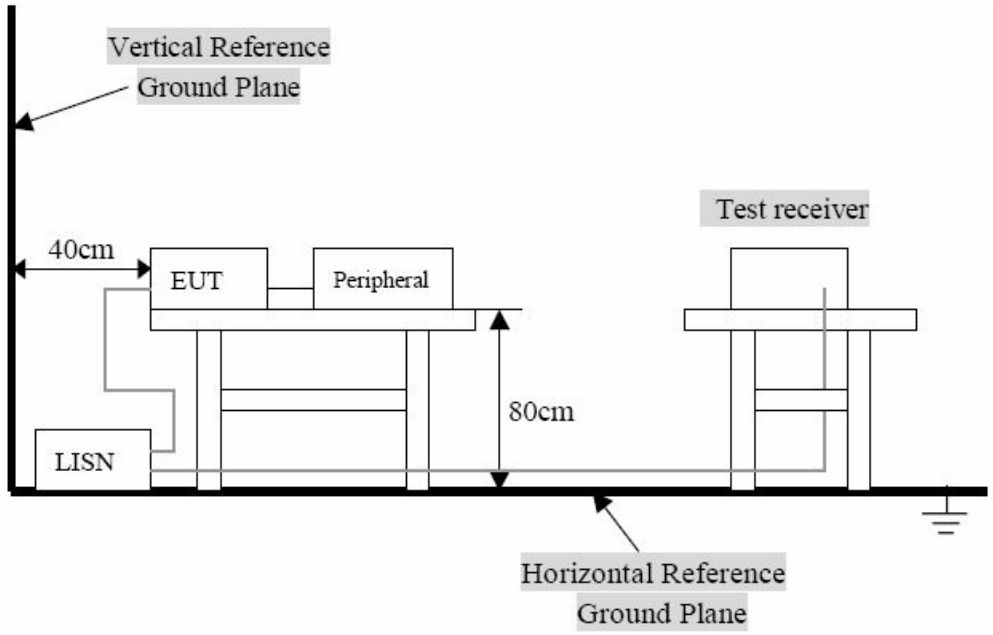
3. TEST OF CONDUCTED EMISSION

3.1 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

3.2 Test Setup Diagram



Remark: 1. The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC 15.207 limits.

2. The EUT was connected to a 120 VAC/ 60Hz power source.

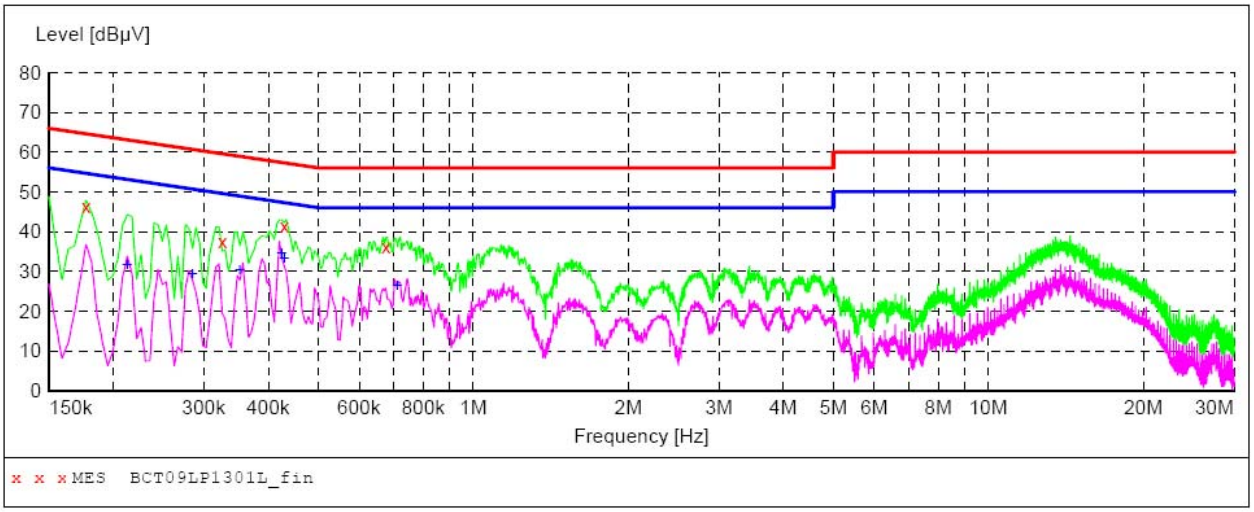
3.3 Test Result

Temperature (℃) : 23~25	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 45~58	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Charging Mode

Conducted Emission from AC/DC Adaptor:

EUT: Auto Integrated Dialing Test Terminal
Operating Condition: Charging Mode
Test Site: Shielded Room
Operator: Andy
Test Specification: DC 12V from AC/DC adapter (AC 120V/60Hz)
Comment: Live Line

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "BCT09LP1301L_fin"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	46.40	11.2	65	18.2	QP	L1	GND
0.325500	37.60	10.7	60	22.0	QP	L1	GND
0.429000	41.40	10.5	57	15.9	QP	L1	GND
0.676500	36.20	10.3	56	19.8	QP	L1	GND

MEASUREMENT RESULT: "BCT09LP1301L_fin2"

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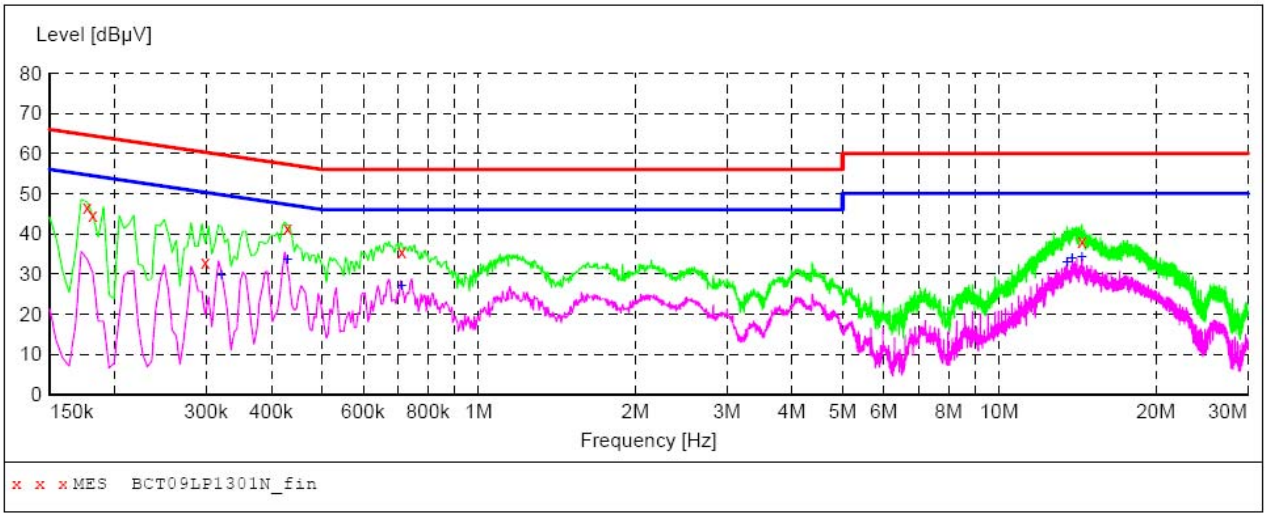
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.213000	31.60	10.9	53	21.5	AV	L1	GND
0.285000	29.40	10.7	51	21.3	AV	L1	GND
0.352500	30.50	10.6	49	18.4	AV	L1	GND
0.424500	34.60	10.5	47	12.8	AV	L1	GND
0.429000	33.40	10.5	47	13.9	AV	L1	GND
0.712500	26.40	10.3	46	19.6	AV	L1	GND

Conducted Emission from AC/DC Adaptor:

EUT: Auto Integrated Dialing Test Terminal
Operating Condition: Charging Mode
Test Site: Shielded Room
Operator: Andy
Test Specification: DC 12V from AC/DC adapter (AC 120V/60Hz)
Comment: Neutral Line

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "BCT09LP1301N_fin"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	46.50	11.2	65	18.1	QP	N	GND
0.181500	44.70	11.1	64	19.7	QP	N	GND
0.298500	33.00	10.7	60	27.3	QP	N	GND
0.429000	41.30	10.5	57	16.0	QP	N	GND
0.712500	35.50	10.3	56	20.5	QP	N	GND
14.424000	38.10	10.6	60	21.9	QP	N	GND

MEASUREMENT RESULT: "BCT09LP1301N_fin2"

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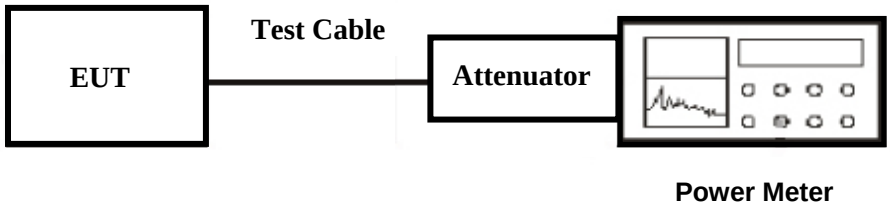
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.321000	29.80	10.7	50	19.9	AV	N	GND
0.429000	33.80	10.5	47	13.5	AV	N	GND
0.712500	26.90	10.3	46	19.1	AV	N	GND
13.501500	33.10	10.6	50	16.9	AV	N	GND
13.807500	34.00	10.6	50	16.0	AV	N	GND
14.419500	34.20	10.6	50	15.8	AV	N	GND

4. TEST OF PEAK POWER

4.1 Applicable Standard

According to FCC §2.1046.

4.2 EUT Setup



4.3 Test Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

4.4 Test Result

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Channel No.	Frequency (MHz)	Modulation	Conducted Peak Output Power Measurement (dBm)	Radiated Peak Output Power Measurement (dBm)	Limit (dBm)	Result
128	824.2	GSM	32.06	28.08	38.50	Pass
189	836.4	GSM	31.57	28.22	38.50	Pass
251	848.8	GSM	32.34	29.04	38.50	Pass

Remark: The value of factor includes both the loss of cable and external attenuator

Channel No.	Frequency (MHz)	Modulation	Conducted Peak Output Power Measurement (dBm)	Radiated Peak Output Power Measurement (dBm)	Limit (dBm)	Result
512	1850.2	GPRS	29.68	27.31	33.00	Pass
661	1880.0	GPRS	29.51	27.45	33.00	Pass
810	1909.8	GPRS	30.00	28.18	33.00	Pass

Remark: The value of factor includes both the loss of cable and external attenuator

5. ERP & EIRP MEASUREMENT

5.1 Applicable Standard

According to FCC §2.1046 and FCC 22.913(b): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts. FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

5.2 EUT Setup

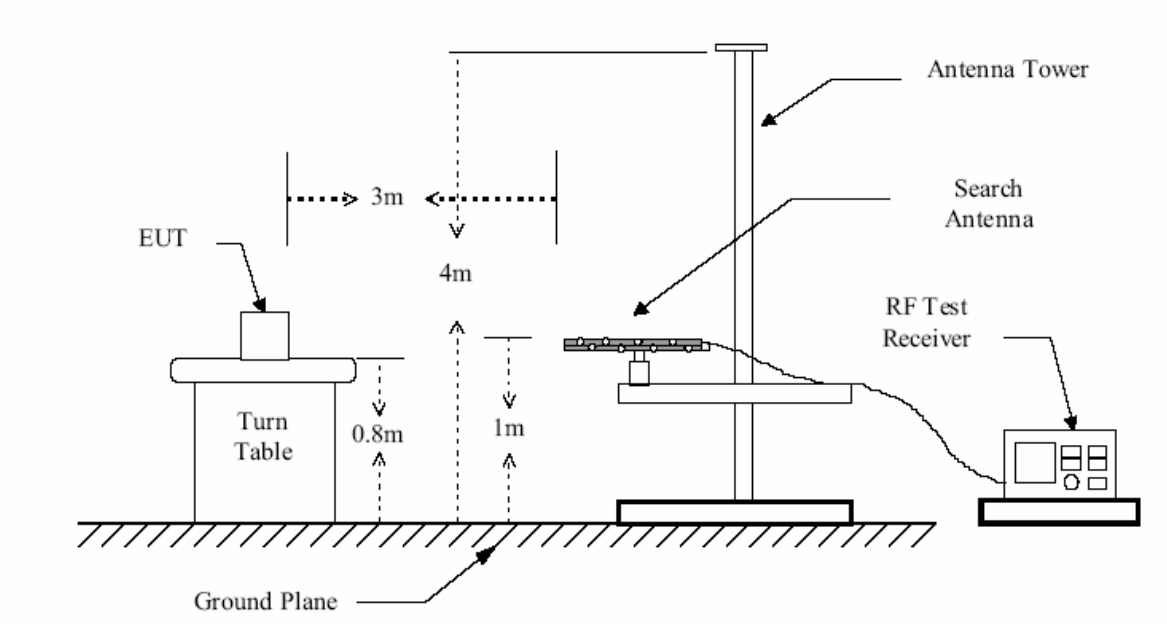


Figure 1 : Frequencies measured below 1 GHz configuration

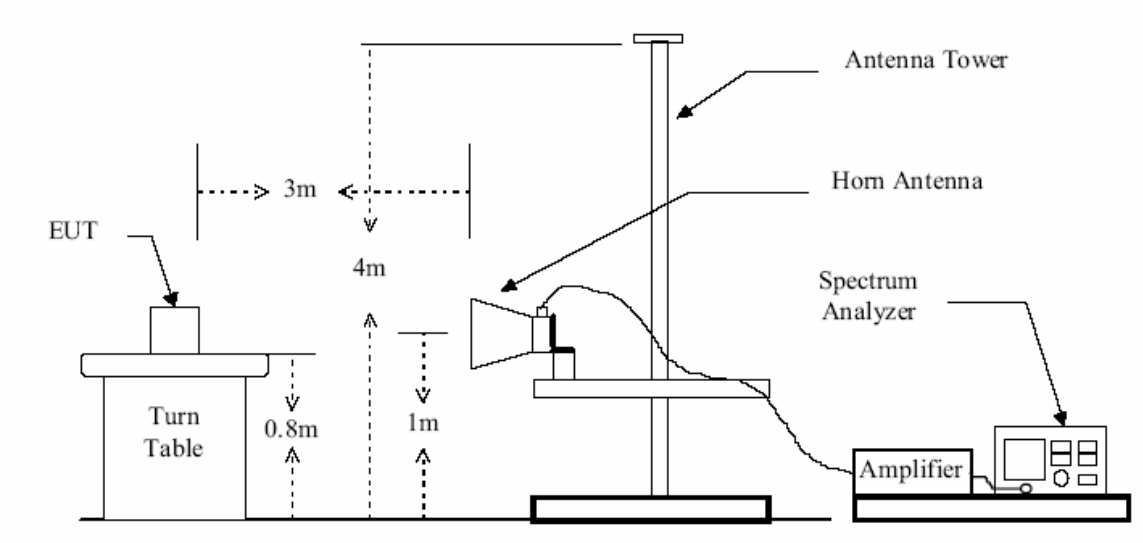


Figure 2 : Frequencies measured above 1 GHz configuration

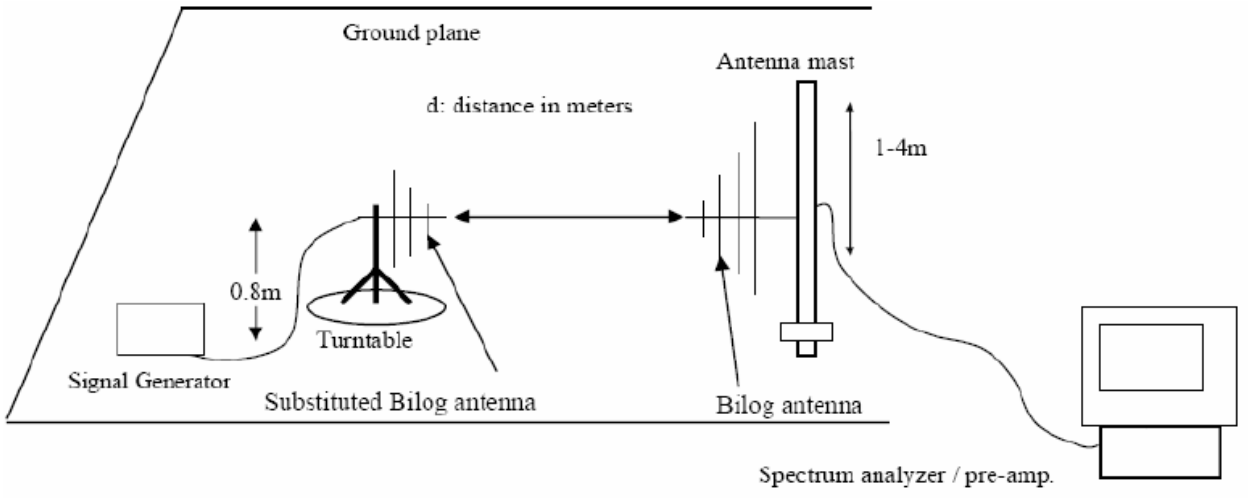


Figure 3: Substitution Method

5.3 Test Procedure

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.
ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:
ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)
EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

5.4 Test Result

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

GSM 850 Test Data:

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
824.20	-13.50	H	19.61	2.56	-0.02	17.03	38.50	-21.47
824.20	-2.40	V	30.66	2.56	-0.02	28.08	38.50	-10.42
Middle Channel 380 (836.40MHz)								
836.40	-13.12	H	19.92	2.59	0.10	17.43	38.50	-21.07
836.40	-2.24	V	30.71	2.59	0.10	28.22	38.50	-10.28
High Channel 773 (848.80MHz)								
848.80	-13.04	H	20.46	2.54	0.13	18.05	38.50	-20.45
848.80	-2.12	V	31.45	2.54	0.13	29.04	38.50	-9.46

GSM 1900 Test Data:

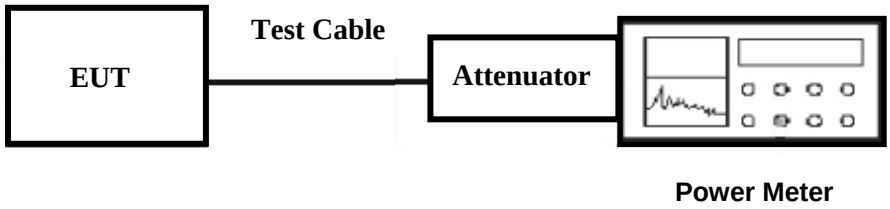
Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
1850.20	-6.06	H	19.63	3.55	10.40	26.48	33.00	-6.52
1850.20	-5.22	V	20.46	3.55	10.40	27.31	33.00	-5.69
Middle Channel 661 (1880.00MHz)								
1880.00	-5.95	H	20.12	3.53	10.43	27.02	33.00	-5.98
1880.00	-5.16	V	20.55	3.53	10.43	27.45	33.00	-5.55
High Channel 810 (1909.80MHz)								
1909.80	-5.86	H	20.47	3.56	10.44	27.35	33.00	-5.65
1909.80	-5.04	V	21.3	3.56	10.44	28.18	33.00	-4.82

6. TEST OF OCCUPIED BANDWIDTH

6.1 Applicable Standard

According to §FCC 2.1049.

6.2 EUT Setup



6.3 Test Procedure

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW is set to 3 times the RBW, -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
The spectrum analyzer is set to: RBW = 3 kHz, VBW = 10 kHz, Span = 1 MHz, Sweep = auto

6.4 Test Result

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Channel No.	Frequency (MHz)	Measurement of -26dB Bandwidth (kHz)
128	824.20	321.00
189	836.40	321.00
251	848.80	307.00

Figure Channel 128 (824.20MHz)

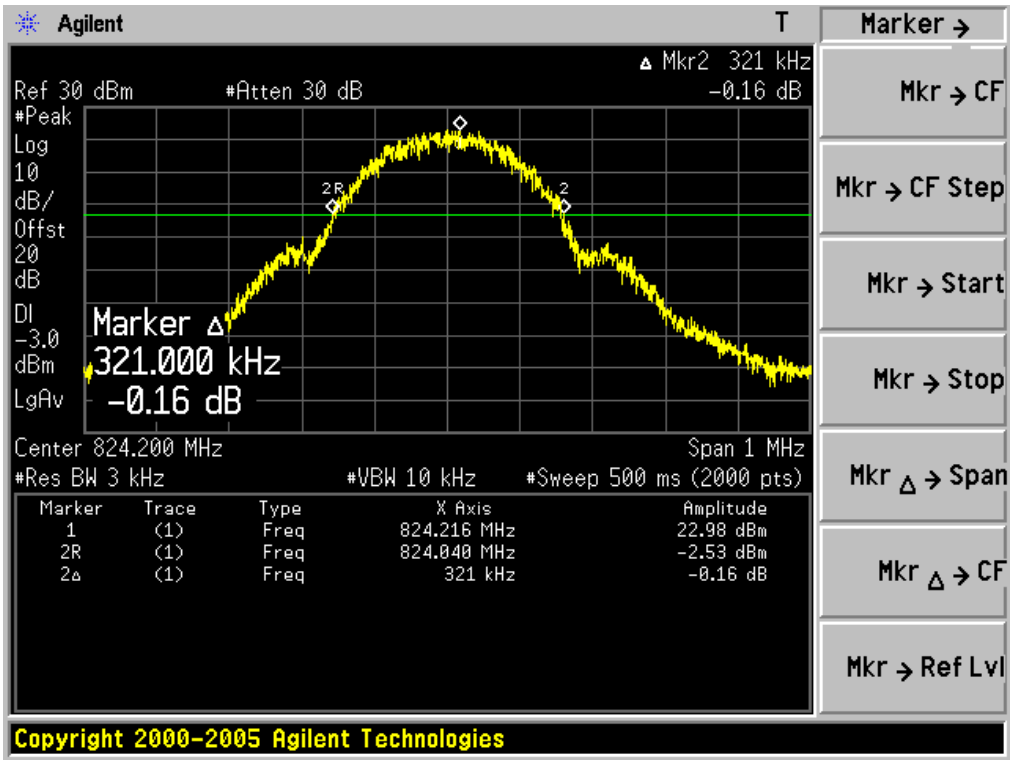


Figure Channel 189 (836.40MHz)

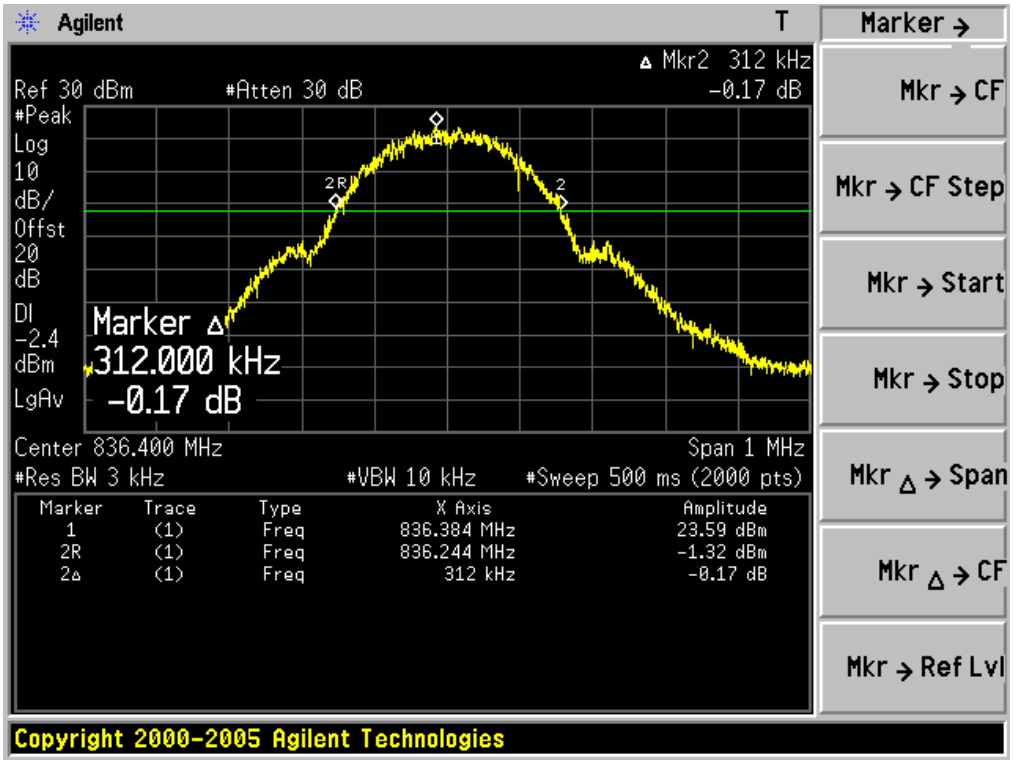
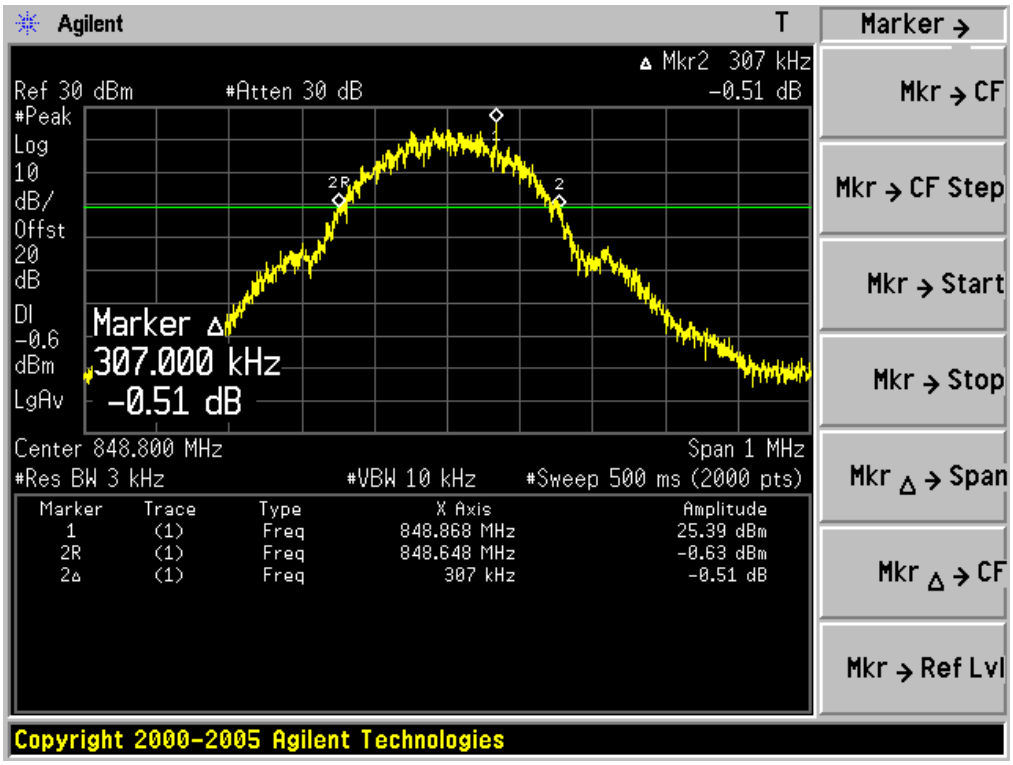


Figure Channel 251 (848.80MHz)



Channel No.	Frequency (MHz)	Measurement of -26dB Bandwidth (kHz)
512	1850.20	314.00
661	1880.00	313.00
810	1909.80	315.00

Figure Channel 512 (1850.20MHz)

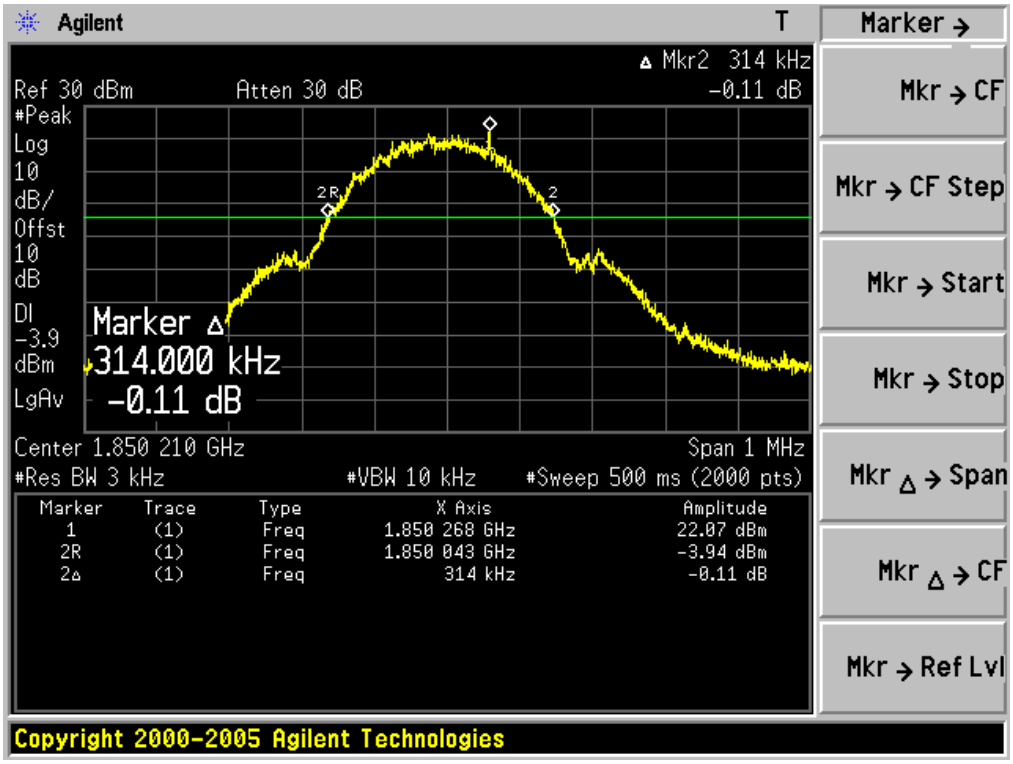


Figure Channel 661 (1880.00MHz)

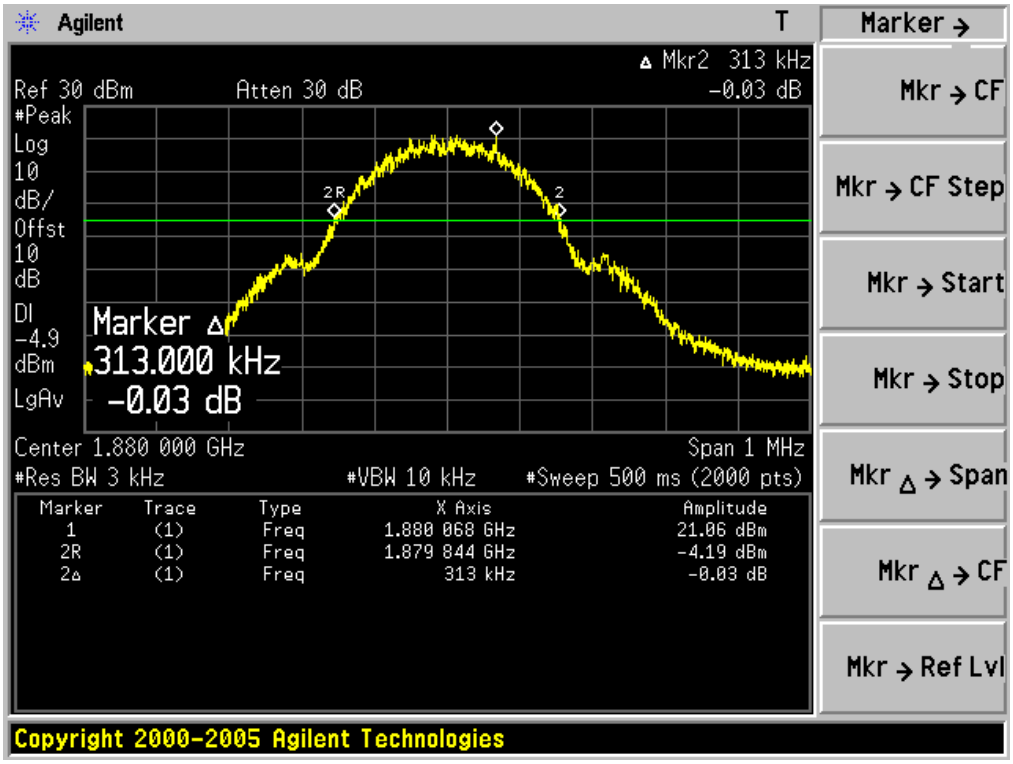
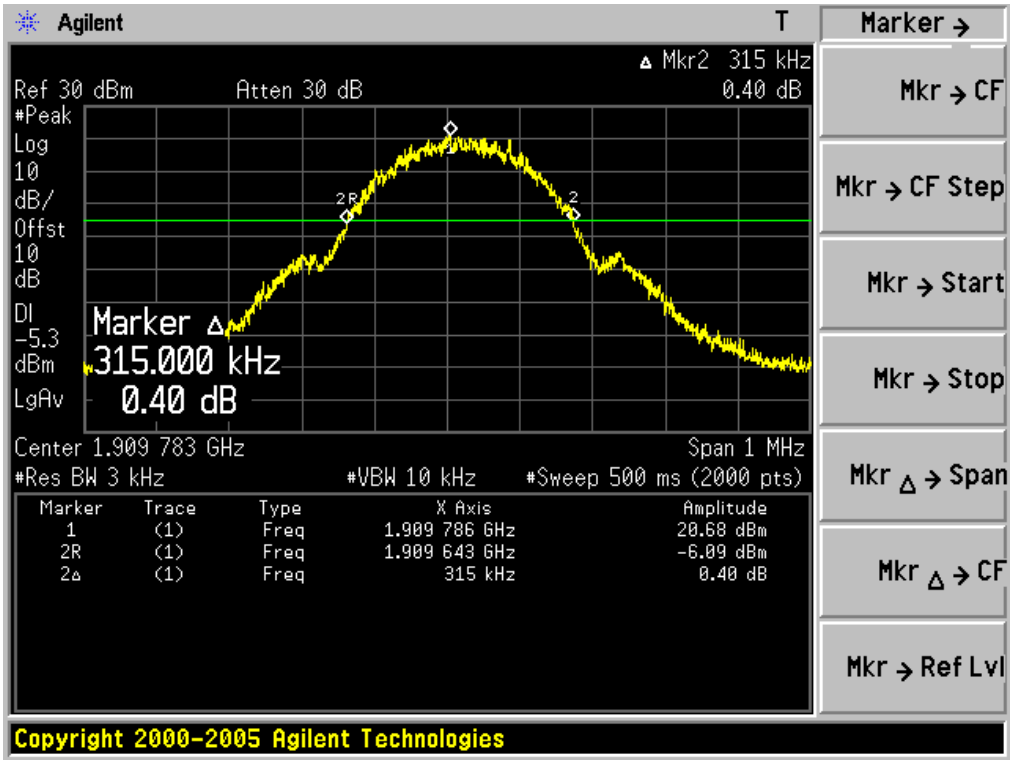


Figure Channel 810 (1909.80MHz)



7. TEST OF OUT OF BAND EMISSION AT ANTENNA TERMINALS

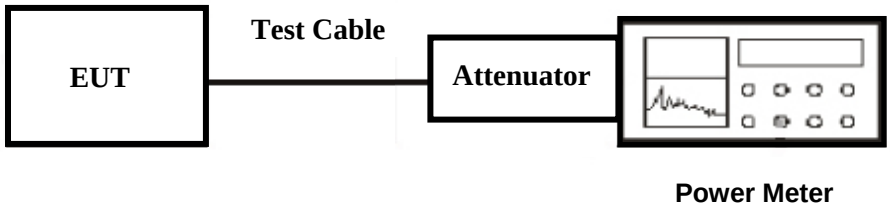
7.1 Applicable Standard

According to FCC § 2.1051, FCC § 2.2917(f), FCC § 22.917(f), FCC § 24.238(a).

Out of Band Emissions:
The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at lease 43 + 10 log P dB.

Mobile Emissions in Base Frequency Range:
The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not exceed –80 dBm at the transmit antenna connector. Band Edge Requirements: In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at lease 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the Out of band Emission

7.2 EUT Setup



7.3 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements (824 MHz and 849 MHz /1850MHz and 1910MHz): In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

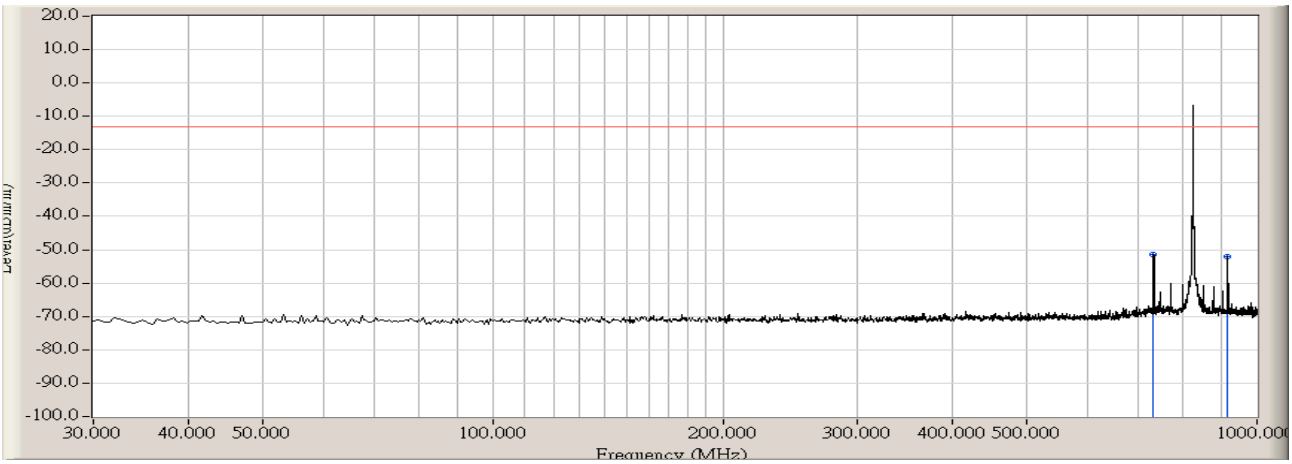
For the Band Edge: The spectrum analyzer is set to: RBW = 3 kHz, VBW = 10 kHz, Span = 1 MHz, Sweep = auto

7.4 Test Result of Out of Band emission at antenna terminals

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

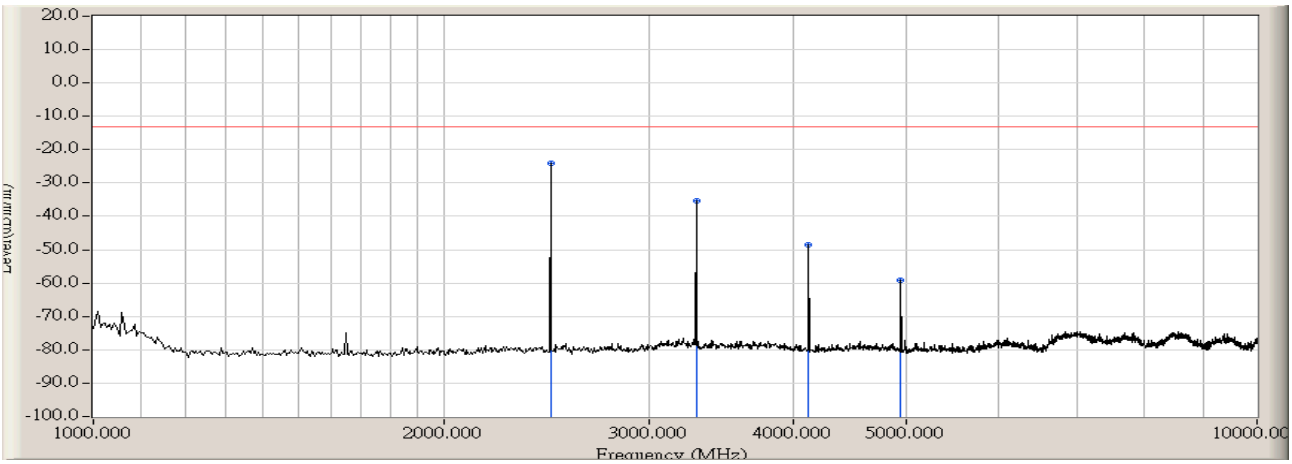
Test plots see following pages

GSM 850: Out of Band emission at antenna terminals –CH Low (30MHz~1GHz)



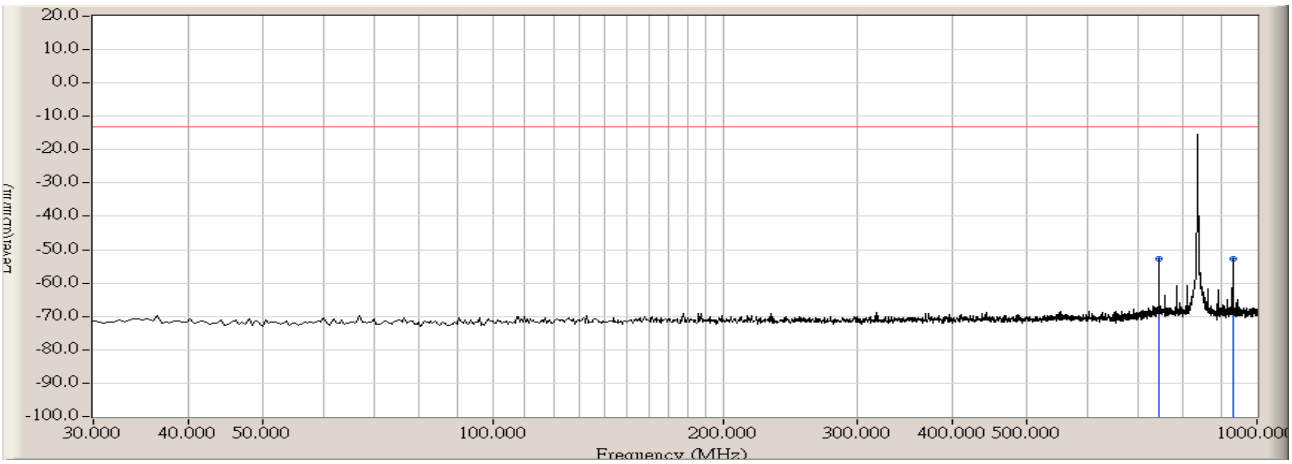
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	732.146	0.000	-51.578	-51.578	-38.578	-13.000	PEAK
2		915.568	0.000	-52.158	-52.158	-39.158	-13.000	PEAK

GSM 850: Out of Band emission at antenna terminals –CH Low (1GHz ~10GHz)



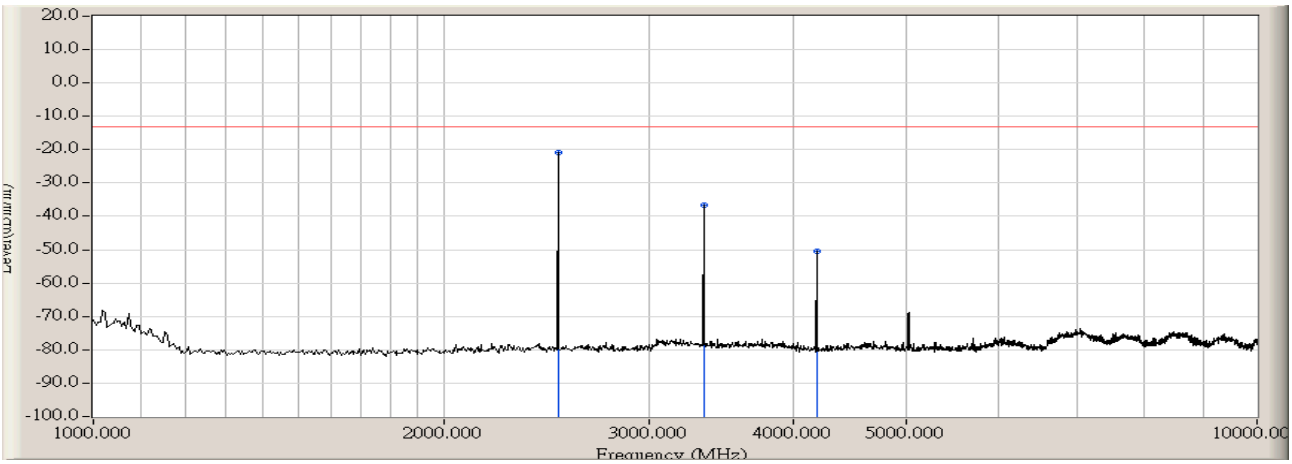
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	2472.236	0.000	-24.197	-24.197	-11.197	-13.000	PEAK
2		3296.148	0.000	-35.256	-35.256	-22.256	-13.000	PEAK
3		4120.060	0.000	-48.495	-48.495	-35.495	-13.000	PEAK
4		4943.972	0.000	-59.276	-59.276	-46.276	-13.000	PEAK

GSM 850: Out of Band emission at antenna terminals –CH Mid (30MHz~1GHz)



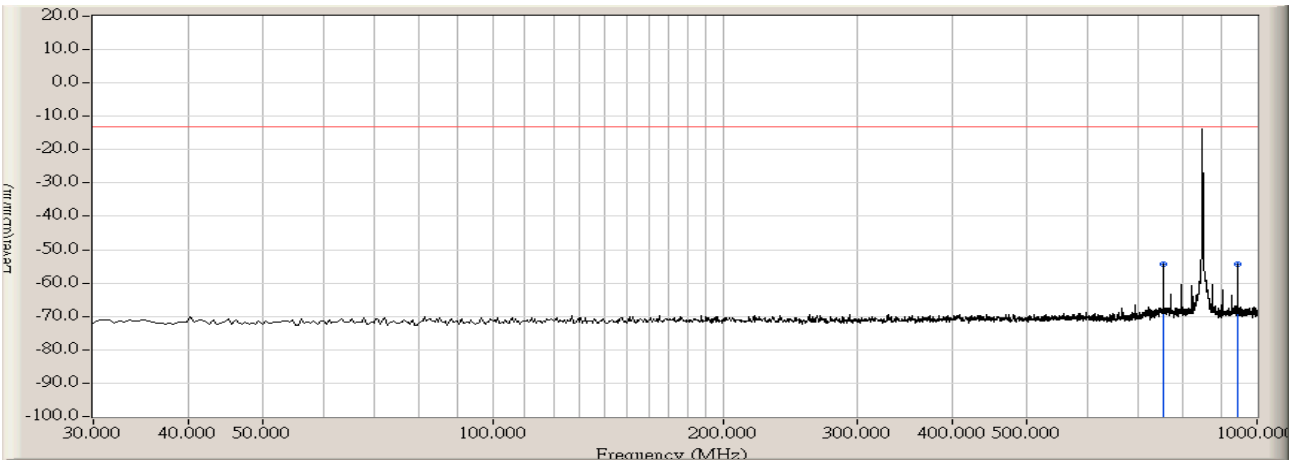
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	743.792	0.000	-52.658	-52.658	-39.658	-13.000	PEAK
2		929.640	0.000	-52.849	-52.849	-39.849	-13.000	PEAK

GSM 850: Out of Band emission at antenna terminals –CH Mid (1GHz ~10GHz)



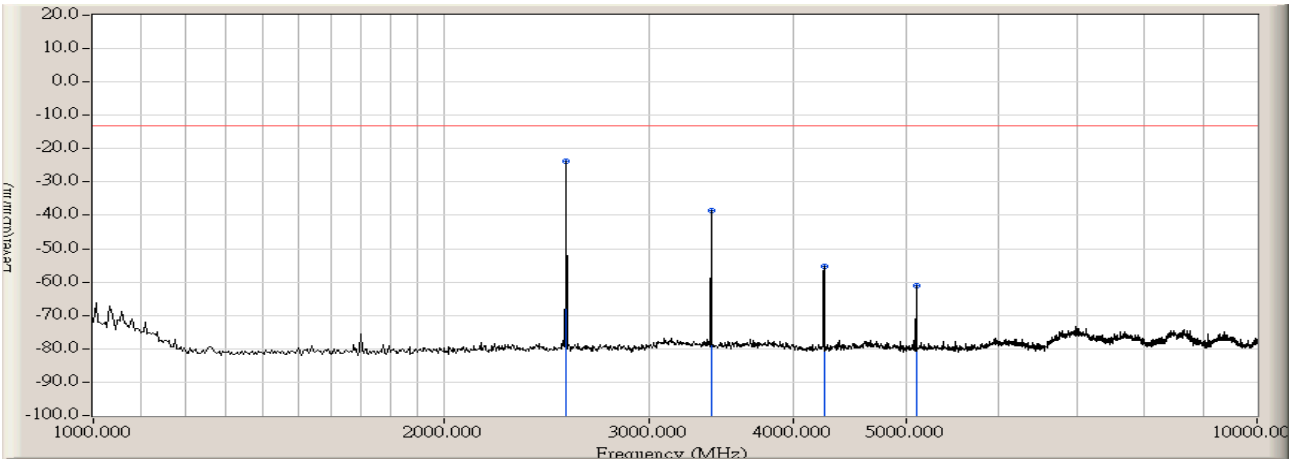
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	2508.254	0.000	-20.882	-20.882	-7.882	-13.000	PEAK
2		3345.673	0.000	-36.762	-36.762	-23.762	-13.000	PEAK
3		4183.091	0.000	-50.368	-50.368	-37.368	-13.000	PEAK

GSM 850: Out of Band emission at antenna terminals –CH High (30MHz~1GHz)



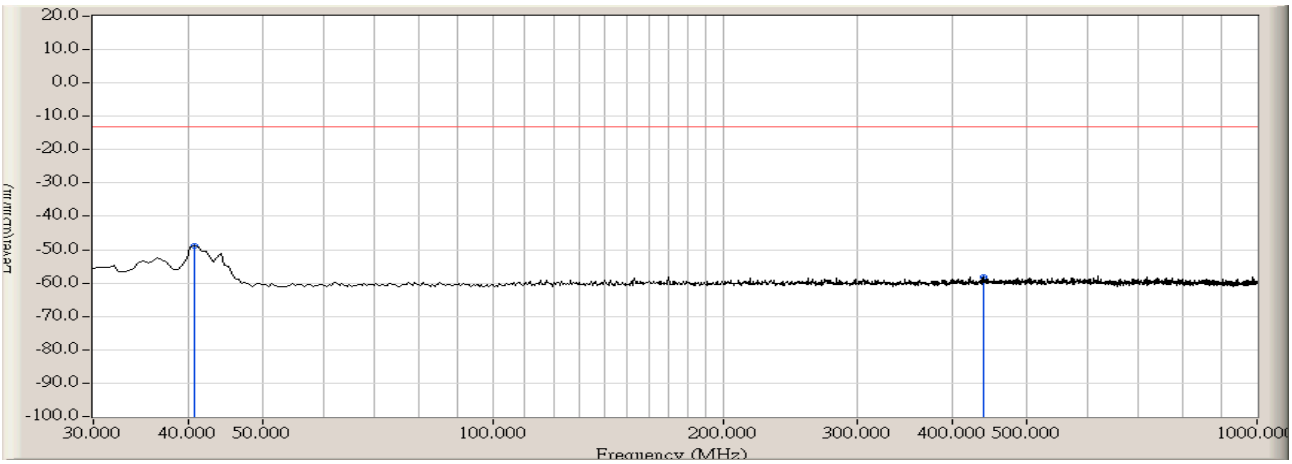
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	754.952	0.000	-54.249	-54.249	-41.249	-13.000	PEAK
2		942.741	0.000	-54.457	-54.457	-41.457	-13.000	PEAK

GSM 850: Out of Band emission at antenna terminals –CH High (1GHz ~10GHz)



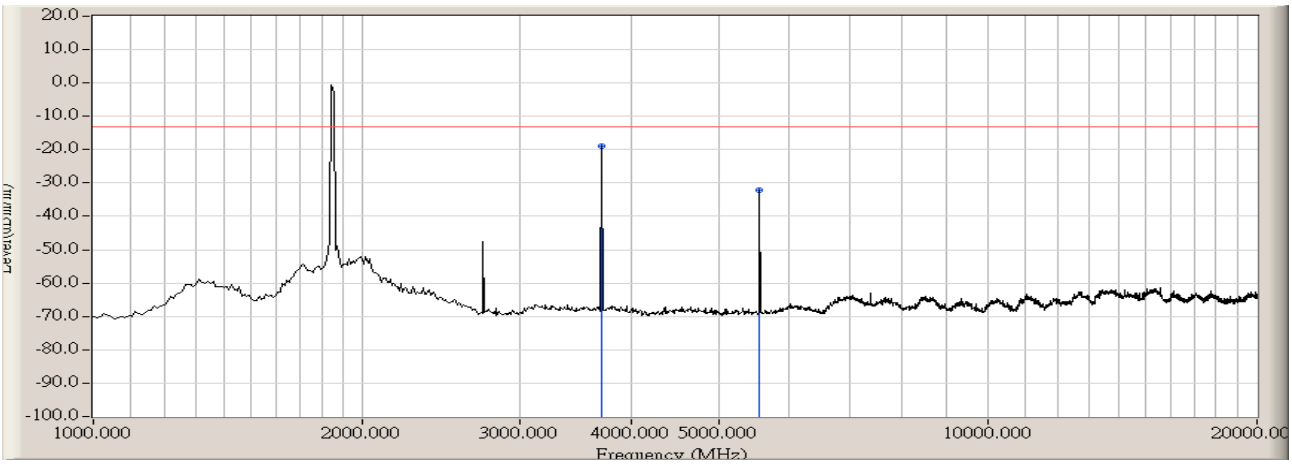
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	2548.774	0.000	-23.703	-23.703	-10.703	-13.000	PEAK
2		3395.198	0.000	-38.711	-38.711	-25.711	-13.000	PEAK
3		4246.123	0.000	-55.136	-55.136	-42.136	-13.000	PEAK
4		5092.546	0.000	-61.004	-61.004	-48.004	-13.000	PEAK

GSM 1900: Out of Band emission at antenna terminals –CH Low (30MHz~1GHz)



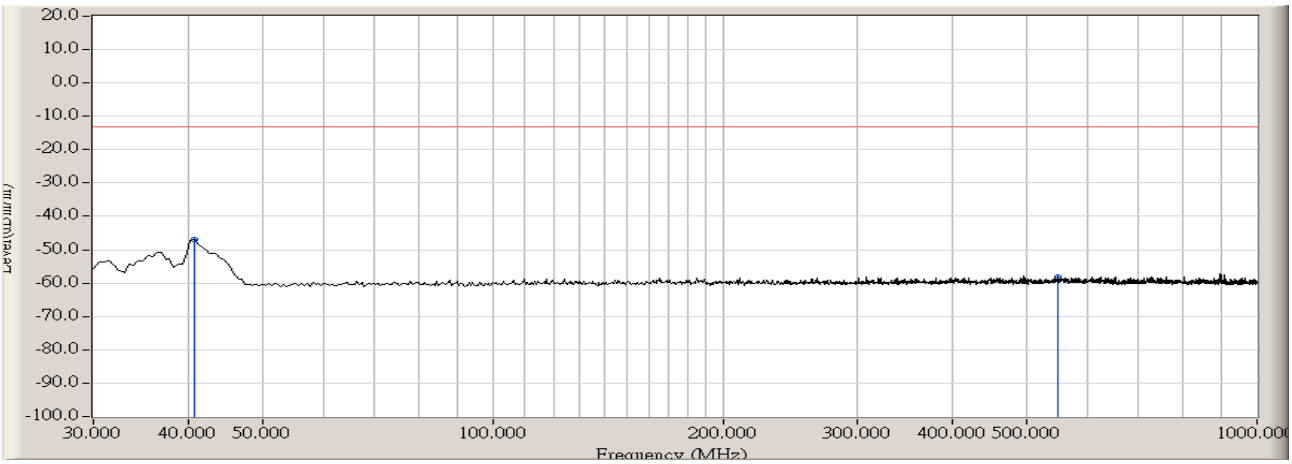
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	40.675	0.000	-48.713	-48.713	-35.713	-13.000	PEAK
2		439.060	0.000	-58.094	-58.094	-45.094	-13.000	PEAK

GSM 1900: Out of Band emission at antenna terminals –CH Low (1GHz ~20GHz)



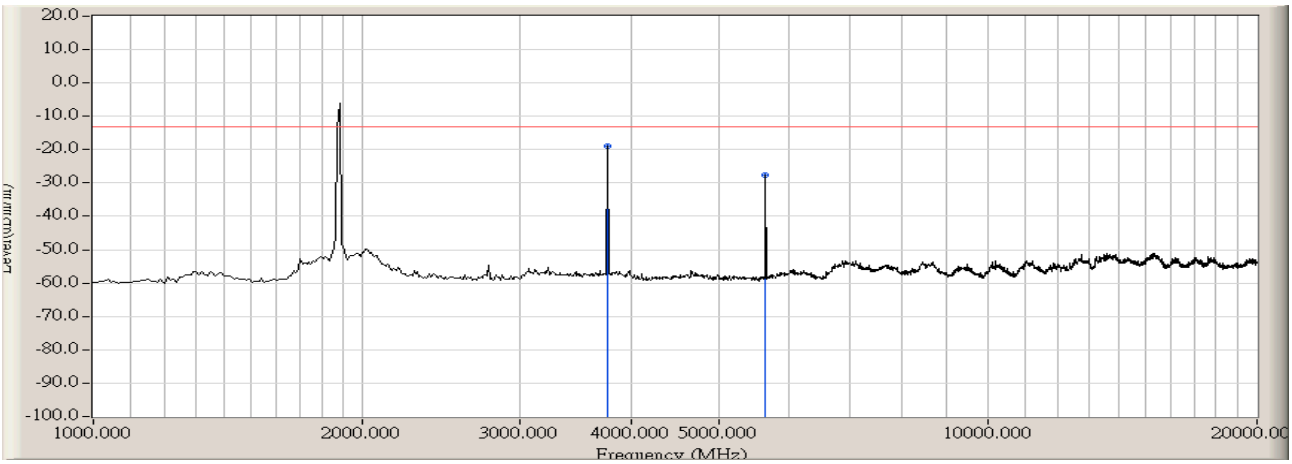
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	3699.350	0.000	-18.939	-18.939	-5.939	-13.000	PEAK
2		5552.776	0.000	-32.076	-32.076	-19.076	-13.000	PEAK

GSM 1900: Out of Band emission at antenna terminals –CH Mid (30MHz~1GHz)



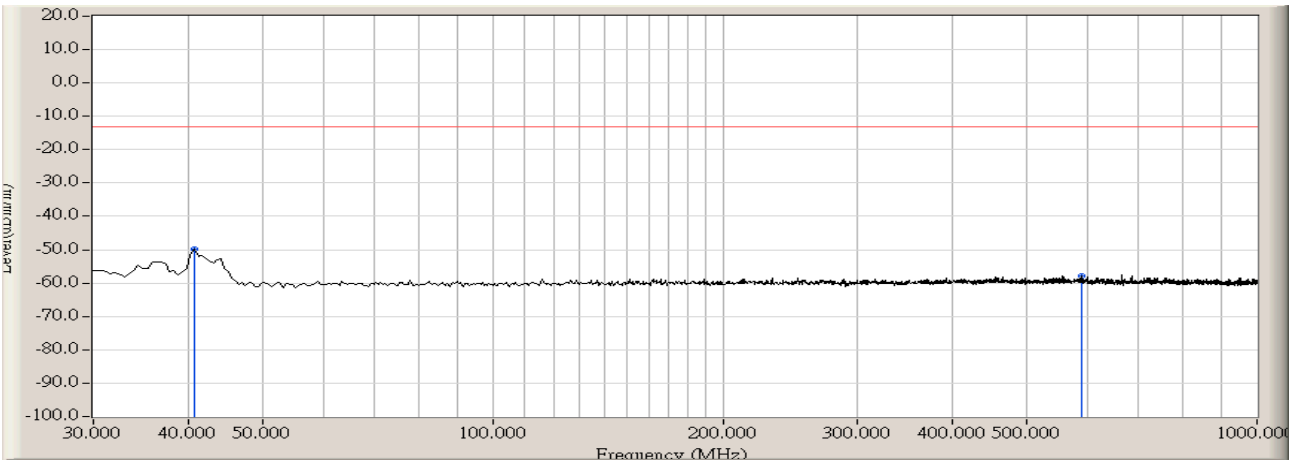
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	40.675	0.000	-46.816	-46.816	-33.816	-13.000	PEAK
2		548.724	0.000	-58.207	-58.207	-45.207	-13.000	PEAK

GSM 1900: Out of Band emission at antenna terminals –CH Mid (1GHz ~20GHz)



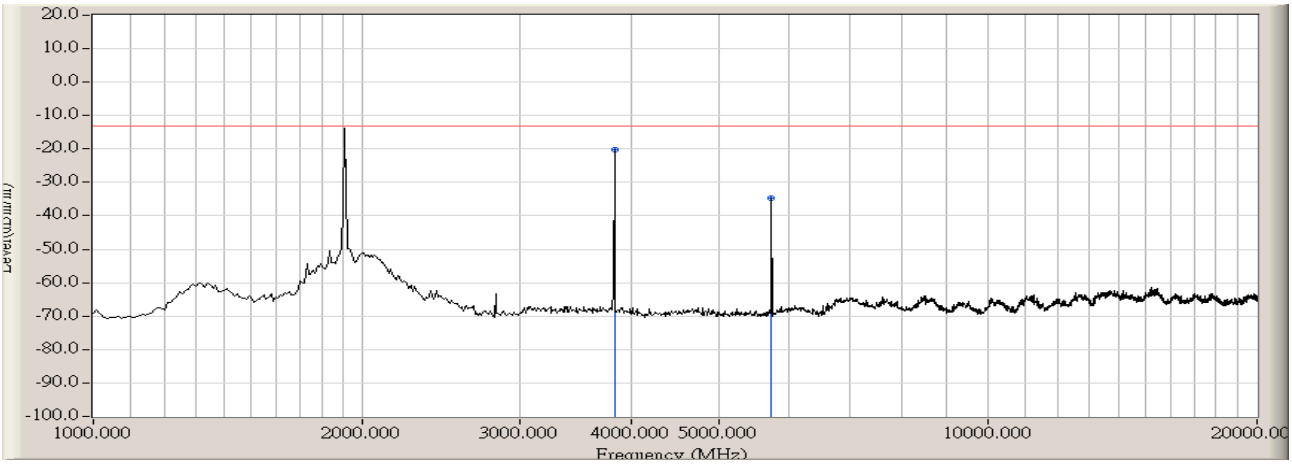
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	3756.378	0.000	-18.785	-18.785	-5.785	-13.000	PEAK
2		5638.319	0.000	-27.464	-27.464	-14.464	-13.000	PEAK

GSM 1900: Out of Band emission at antenna terminals –CH High (30MHz~1GHz)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	40.675	0.000	-49.711	-49.711	-36.711	-13.000	PEAK
2		588.514	0.000	-57.736	-57.736	-44.736	-13.000	PEAK

GSM 1900: Out of Band emission at antenna terminals –CH High (1GHz ~20GHz)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm)	Margin (dB)	Limit (dBm)	Detector Type
1	*	3822.911	0.000	-20.186	-20.186	-7.186	-13.000	PEAK
2		5733.367	0.000	-34.701	-34.701	-21.701	-13.000	PEAK

7.5 Test Result of Band Edge emissions

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Test plots see following pages

Figure Channel 128 (Mode 1: GSM850--824.20MHz)

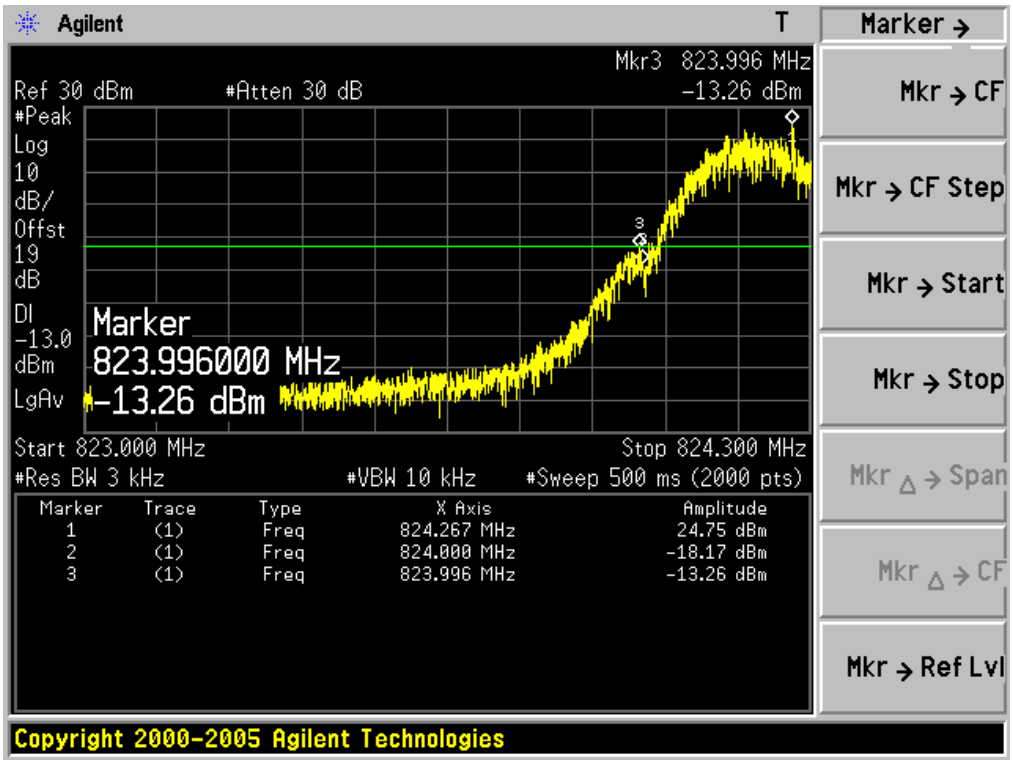


Figure Channel 251 (Mode 1: GSM850--848.80MHz)

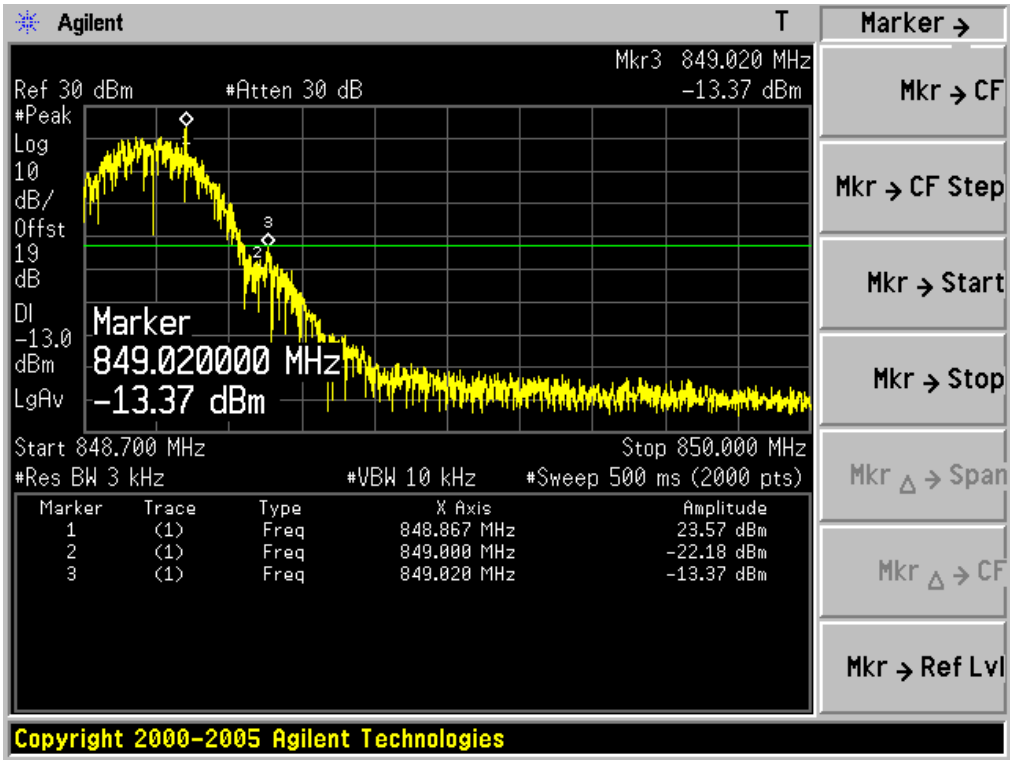


Figure Channel 512 (Mode 2: PCS1900--1850.20MHz)

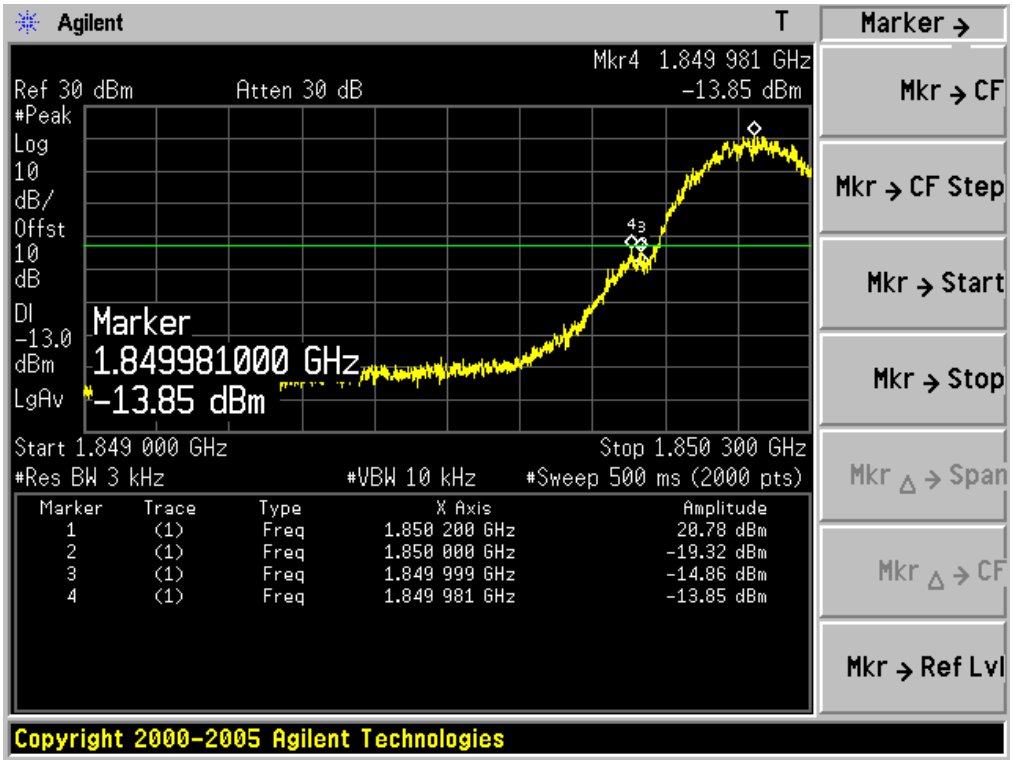
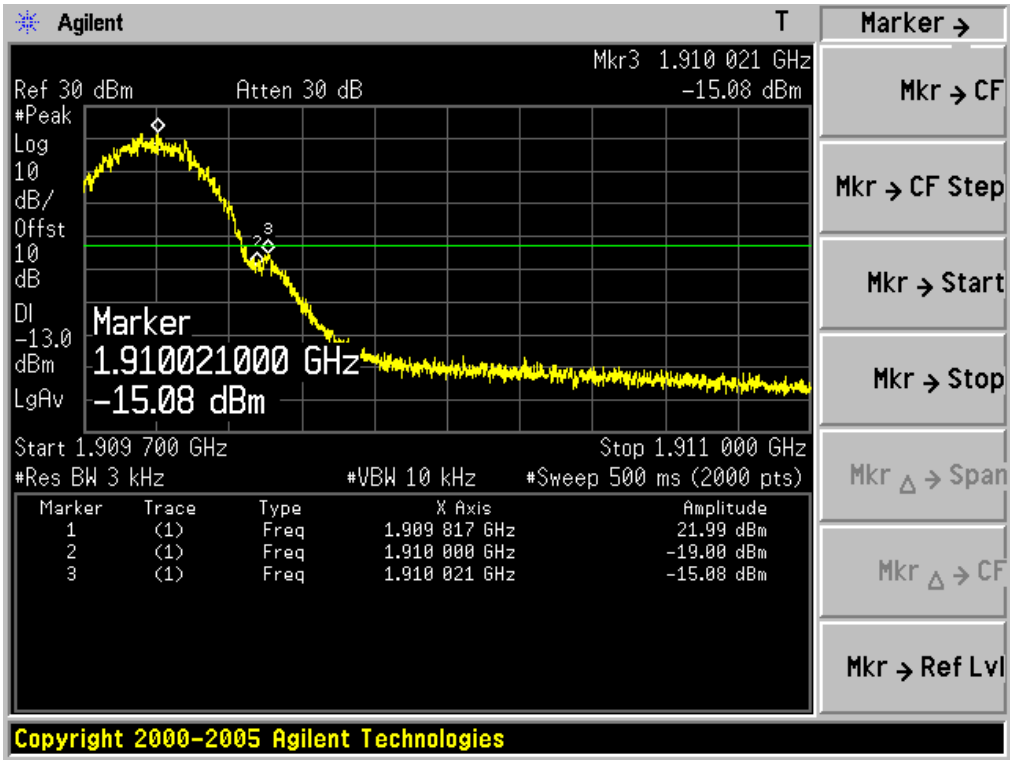


Figure Channel 810 (Mode 2: PCS1900--1909.80MHz)



8. SPURIOUS RADIATION MEASUREMENT OF GSM MODE

8.1 Applicable Standard

According to FCC §2.1053

8.2 EUT Setup

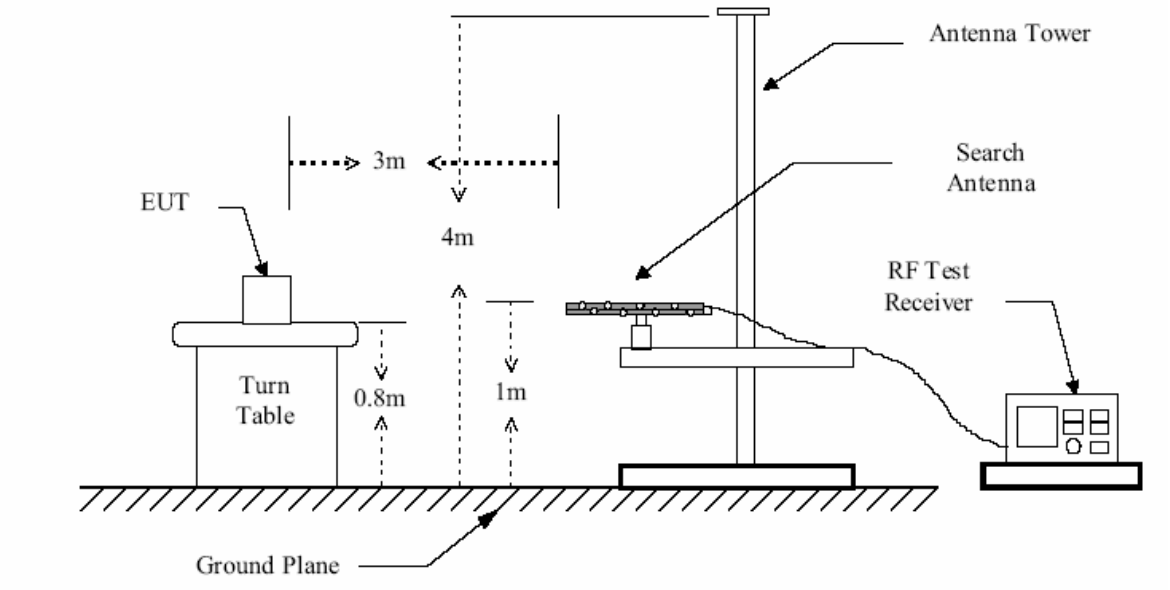


Figure 1 : Frequencies measured below 1 GHz configuration

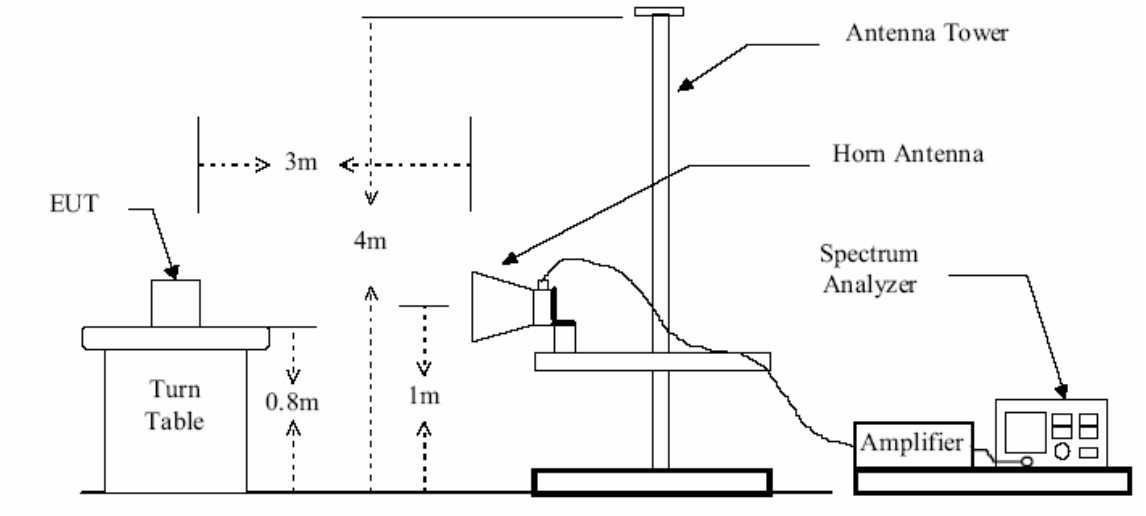


Figure 2 : Frequencies measured above 1 GHz configuration

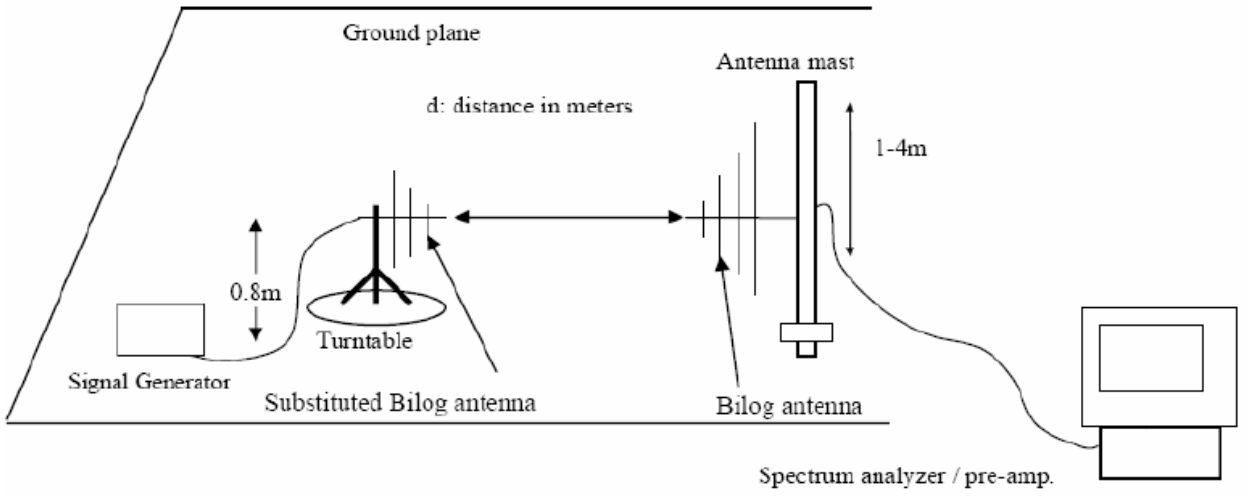


Figure 3: Substitution Method

8.3 Test Procedure

The EUT was placed on a non-conductive, the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

8.4 Test Result

GSM 850: Radiated Spurious Emission Measurement Result Below 1GHz

No emissions to be recorded. (Since no specific emission noted beyond the background noise floor)

GSM 850: Radiated Spurious Emission Measurement Result Above 1GHz

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: GSM 850 / TX / CH128

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
1645.00	-31.32	V	-40.15	3.28	9.75	-33.68	-13.00	-20.68
2470.00	-44.24	V	-56.06	4.10	10.48	-49.68	-13.00	-36.68
1645.00	-41.25	H	-36.64	3.28	9.75	-30.17	-13.00	-17.17
2470.00	-38.26	H	-53.40	4.10	10.48	-47.02	-13.00	-34.02
Middle Channel 189 (836.40MHz)								
1675.00	-32.03	V	-43.82	3.32	9.95	-37.19	-13.00	-24.19
2515.00	-48.27	V	-57.85	3.81	10.62	-51.04	-13.00	-38.04
1675.00	-40.42	H	-44.00	3.32	9.95	-37.37	-13.00	-24.37
2515.00	-49.54	H	-54.84	3.81	10.62	-48.03	-13.00	-35.03
High Channel 251 (848.80MHz)								
1690.00	-32.92	V	-43.82	3.35	10.06	-37.11	-13.00	-24.11
2545.00	-48.65	V	-58.65	4.19	10.68	-52.16	-13.00	-39.16
1705.00	-34.31	H	-42.50	3.35	10.06	-35.79	-13.00	-22.79
2545.00	-46.12	H	-55.81	4.19	10.68	-49.32	-13.00	-36.32

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above shown only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
5. Spectrum setting:
   a). Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.
   b). AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.

GSM 1900: Radiated Spurious Emission Measurement Result Below 1GHz

No emissions to be recorded. (Since no specific emission noted beyond the background noise floor)

GSM 1900: Radiated Spurious Emission Measurement Result Above 1GHz

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: GSM1900 / TX / CH512

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
3698.40	-41.87	V	-43.68	4.78	12.69	-35.77	-13.00	-22.77
5550.60	-48.16	V	-46.54	6.03	13.15	-39.42	-13.00	-26.42
3698.40	-43.28	H	-46.83	4.78	12.69	-38.92	-13.00	-25.92
5550.60	-47.22	H	-43.93	6.03	13.15	-36.81	-13.00	-23.81
Middle Channel 661 (1880.00MHz)								
3759.00	-44.86	V	-46.43	5.03	12.72	-38.74	-13.00	-25.74
5640.00	-46.53	V	-45.10	5.93	13.14	-37.89	-13.00	-24.89
3759.00	-37.76	H	-44.57	5.03	12.72	-36.88	-13.00	-23.88
5640.00	-39.14	H	-44.07	5.93	13.14	-36.86	-13.00	-23.86
High Channel 810 (1909.80MHz)								
3819.60	-43.61	V	-46.12	5.03	12.73	-38.42	-13.00	-25.42
5729.40	-49.12	V	-47.61	6.20	13.11	-40.70	-13.00	-27.70
3819.60	-42.86	H	-46.78	5.03	12.73	-39.08	-13.00	-26.08
5729.40	-47.62	H	-46.07	6.20	13.11	-39.16	-13.00	-26.16

Remark:

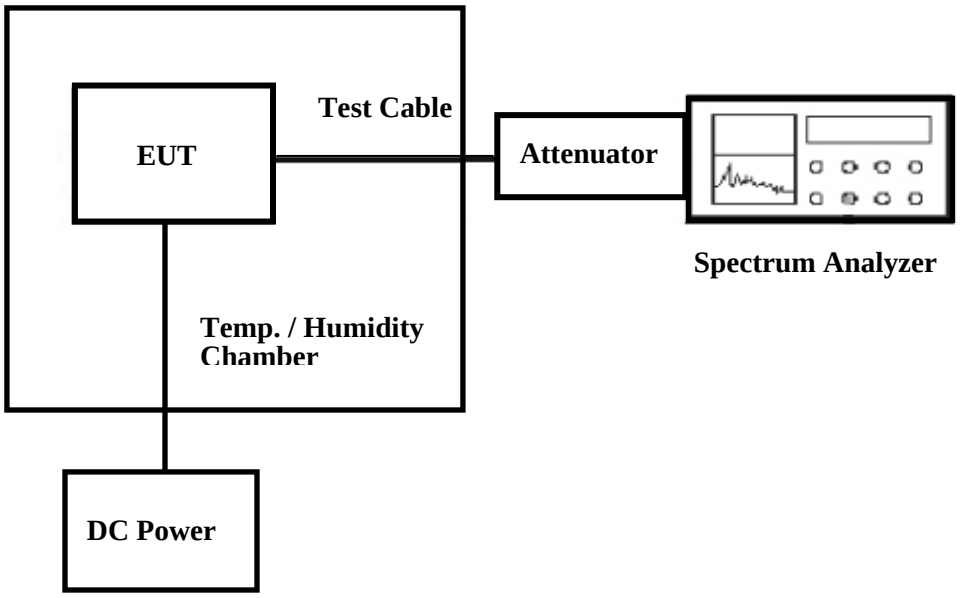
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above shown only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
5. Spectrum setting:
   a). Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 1MHz, VBW = 1MHz, Sweep time = Auto.
   b). AV Setting 1GH z to 10th harmonics of fundamental, RBW = 1MHz, VBW = 10Hz, Sweep time = Auto.

9. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

9.1 Applicable Standard

According to FCC §2.1055, FCC §24.235. Frequency Tolerance: 2.5 ppm

9.2 EUT Setup



9.3 Test Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20oC operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30oC. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10oC increased per stage until the highest temperature of +50oC reached.

9.4 Test Result

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

GSM 850MHz:

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	-62	± 2091
-20	836.40	-51	± 2091
-10	836.40	-24	± 2091
0	836.40	-16	± 2091
10	836.40	-17	± 2091
20	836.40	-17	± 2091
30	836.40	-26	± 2091
40	836.40	-39	± 2091
50	836.40	-64	± 2091

PCS 1900MHz:

Frequency Stability under Temperature

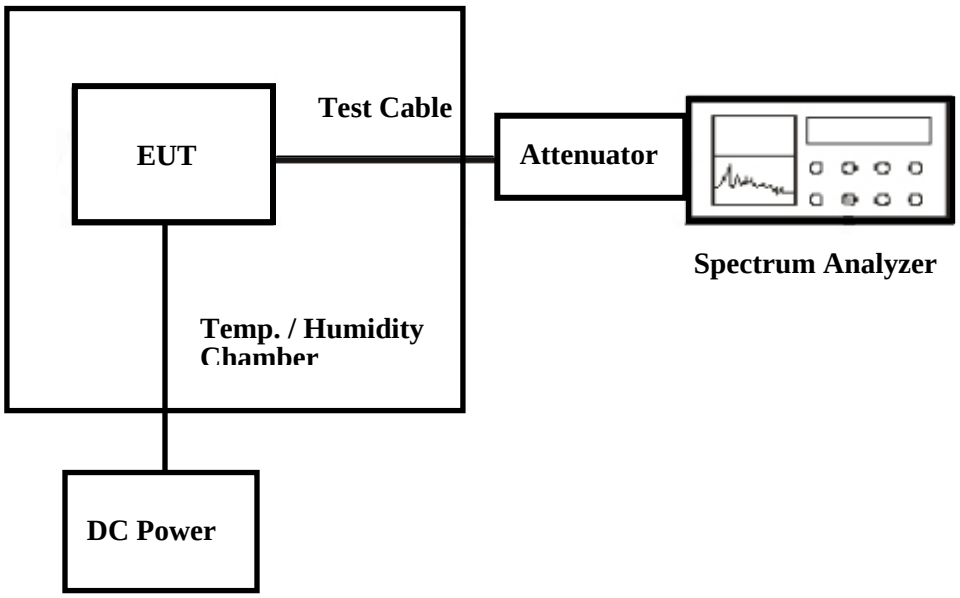
Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.0	-69	± 4700
-20	1880.0	-52	± 4700
-10	1880.0	-47	± 4700
0	1880.0	-38	± 4700
10	1880.0	-27	± 4700
20	1880.0	-22	± 4700
30	1880.0	-34	± 4700
40	1880.0	-43	± 4700
50	1880.0	-57	± 4700

10. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

10.1 Applicable Standard

According to FCC §2.1055, FCC §24.235, Frequency Tolerance: 2.5 ppm.

10.2 EUT Setup



10.3 Test Procedure

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (± 15%) and endpoint, record the maximum frequency change.

10.4 Test Result

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

GSM 850MHz:

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (KHz)
3.14	836.40	-29	± 2091
3.70	836.40	-23	± 2091
4.25	836.40	-38	± 2091

PCS 1900MHz:

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (KHz)
3.14	1880.0	-34	± 4700
3.70	1880.0	-28	± 4700
4.25	1880.0	-44	± 4700

11. SPURIOUS RADIATION MEASUREMENT OF OTHER MODE

11.1 Applicable Standard

According to FCC Section 15.209 (a), the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

11.2 EUT Setup

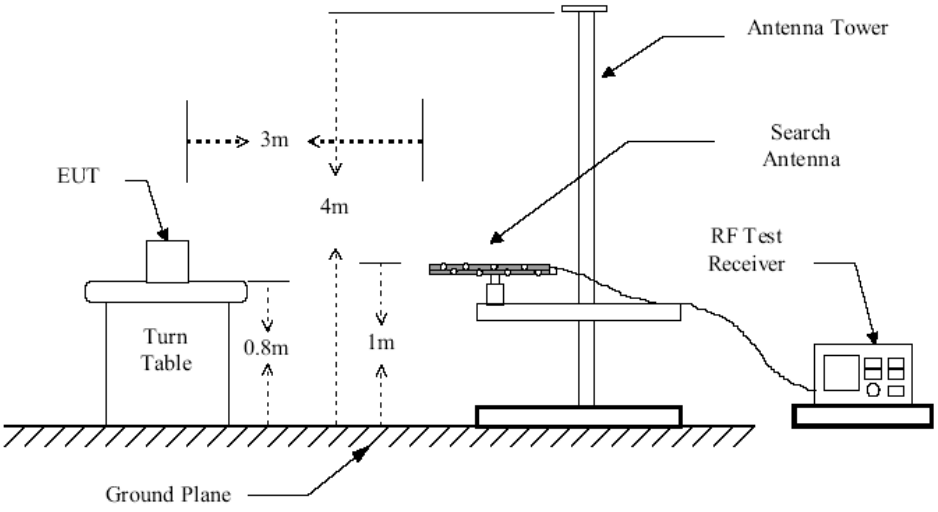


Figure 1 : Frequencies measured below 1 GHz configuration

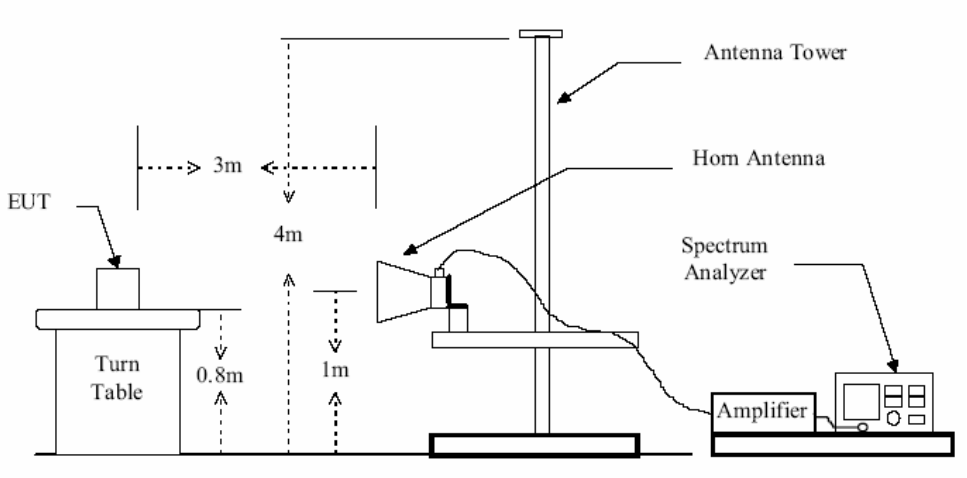


Figure 2 : Frequencies measured above 1 GHz configuration

11.3 Test Procedure

1. Configure the EUT according to ANSI C63.4-2009.

2. The EUT was placed on the top of the turntable 0.8 meter above ground.

3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

4. Power on the EUT and all the supporting units.

5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.

7. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

11.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. –Class B Limit

11.5 Test Result

Temperature (℃) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH): 50~54	M/N: DK-EM4PS
Barometric Pressure (mbar): 950~1000	Operation Condition: Charging Mode

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.

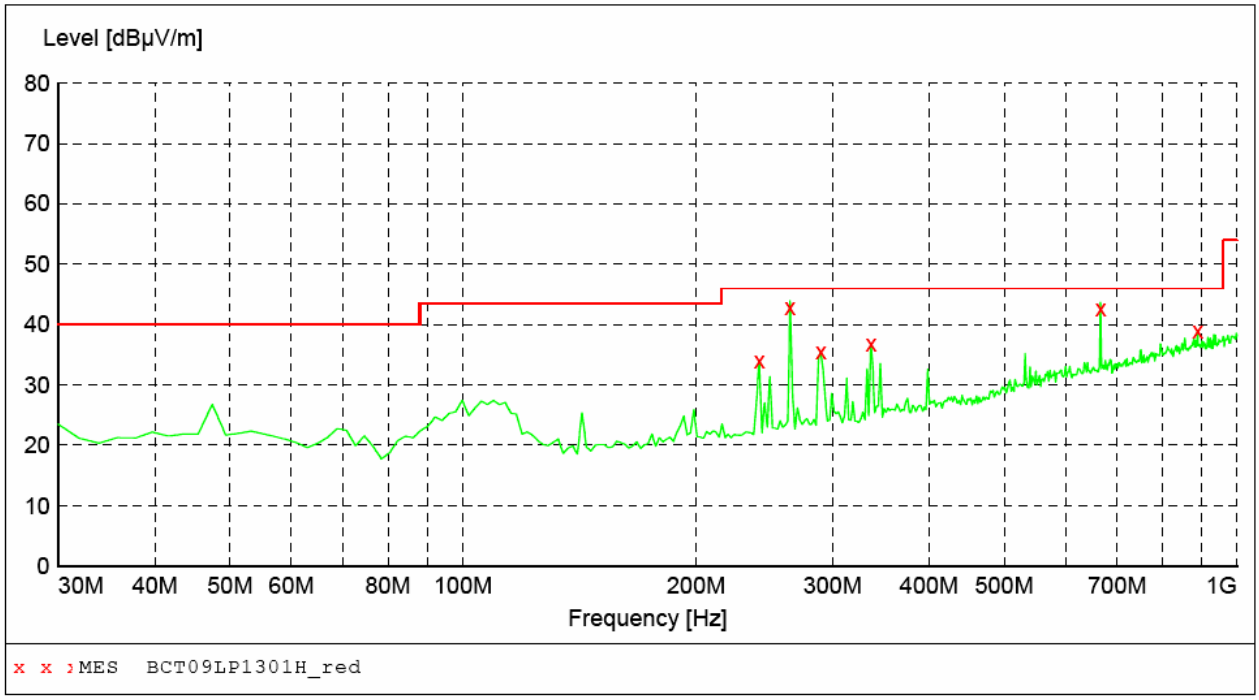
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

RADIATED EMISSION TEST DATA

EUT: Auto Integrated Dialing Test Terminal
Operating Condition: Charging mode
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: AC 120V/60Hz from AC/DC adaptor
Comment: Polarisation:H

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VULB9163 NEW



MEASUREMENT RESULT: "BCT09LP1301H_red"

2/10/2010 10:31

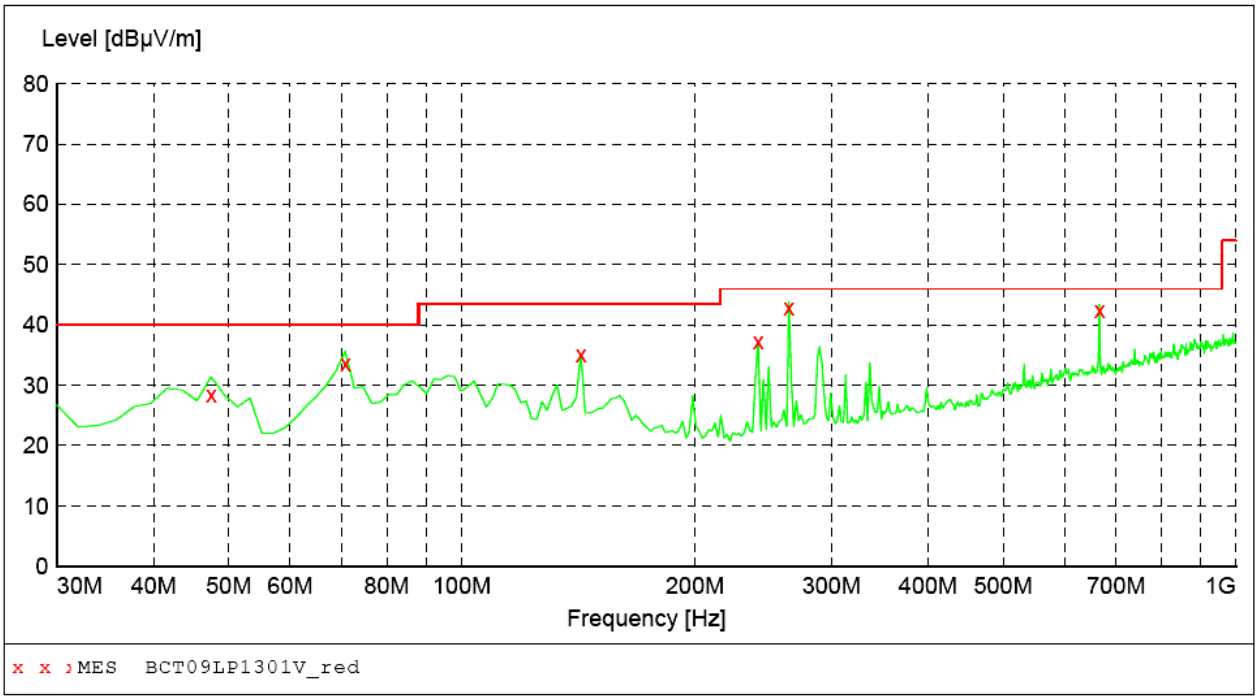
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
241.460000	34.10	17.2	46.0	11.9	QP	100.0	0.00	HORIZONTAL
264.740000	42.90	17.5	46.0	3.1	QP	100.0	0.00	HORIZONTAL
289.960000	35.50	18.4	46.0	10.5	QP	100.0	0.00	HORIZONTAL
336.520000	36.90	20.0	46.0	9.1	QP	100.0	0.00	HORIZONTAL
666.320000	42.70	27.2	46.0	3.3	QP	300.0	0.00	HORIZONTAL
889.420000	39.00	31.0	46.0	7.0	QP	300.0	0.00	HORIZONTAL

RADIATED EMISSION TEST DATA

EUT: Auto Integrated Dialing Test Terminal
Operating Condition: Charging mode
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: AC 120V/60Hz from AC/DC adaptor
Comment: Polarisation:V

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VULB9163 NEW



MEASUREMENT RESULT: "BCT09LP1301V_red"

2/10/2010 10:34

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	28.40	15.8	40.0	11.6	QP	100.0	0.00	VERTICAL
70.740000	33.60	12.4	40.0	6.4	QP	100.0	0.00	VERTICAL
142.520000	35.20	13.1	43.5	8.3	QP	100.0	0.00	VERTICAL
241.460000	37.30	17.2	46.0	8.7	QP	100.0	0.00	VERTICAL
264.740000	42.80	17.5	46.0	3.2	QP	100.0	0.00	VERTICAL
666.320000	42.40	27.2	46.0	3.6	QP	100.0	0.00	VERTICAL