

Variant FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : Smart Tab 7
BRAND NAME : ZTE
MODEL NAME : Smart Tab 7
FCC ID : Q78-V71A
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
Tx/Rx FREQUENCY RANGE : GSM850 : 824.2 ~ 848.8 MHz /
869.2 ~ 893.8 MHz
GSM1900 : 1850.2 ~ 1909.8 MHz /
1930.2 ~ 1989.8 MHz
MAX. ERP/EIRP POWER : GSM850 (GPRS 8) : 0.61 W
GSM850 (EDGE 8) : 0.20 W
GSM1900 (GPRS 8) : 0.72 W
GSM1900 (EDGE 8) : 0.30 W
EMISSION DESIGNATOR : GMSK : 242KGXW
8PSK : 250KG7W

The product was received on Nov. 03, 2011 and completely tested on Nov. 04, 2011. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORT ON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.1	Effective Radiated Power	< 7 Watts	PASS	-	-
3.1	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-	-
3.1	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-	-
3.2	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 35.60 dB at 2510 MHz

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nan shan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nan shan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smart Tab 7
Brand Name	ZTE
Model Name	Smart Tab 7
FCC ID	Q78-V71A
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 32.89 dBm GSM1900 : 28.65 dBm
Maximum ERP/EIRP	GSM850 (GPRS 8) : 0.61 W (27.85 dBm) GSM850 (EDGE 8) : 0.20 W (22.93 dBm) GSM1900 (GPRS 8) : 0.72 W (28.59 dBm) GSM1900 (EDGE 8) : 0.30 W (24.80 dBm)
Antenna Type	Fixed Internal Antenna
HW Version	110602
SW Version	SmartTab7-MSM8260-V02d-Nov012011-Vodafone-DE
Type of Modulation	GSM / GPRS : GMSK EDGE : 8PSK
Type of Emission	GMSK : 242KGXW 8PSK : 250KG7W
EUT Stage	Identical Prototype

Remark:

1. For other wireless features of this EUT, the test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter (PCB).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC Registration No.
	TH01-KS	03CH01-KS	149928

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (Certification), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Base Station	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GPRS850.
2. 30 MHz to 19000 MHz for GPRS1900.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GPRS 8 Link	■ GPRS Link ■ EDGE 8 Link
GSM 1900	■ GPRS 8 Link	■ GPRS Link ■ EDGE 8 Link

Note:

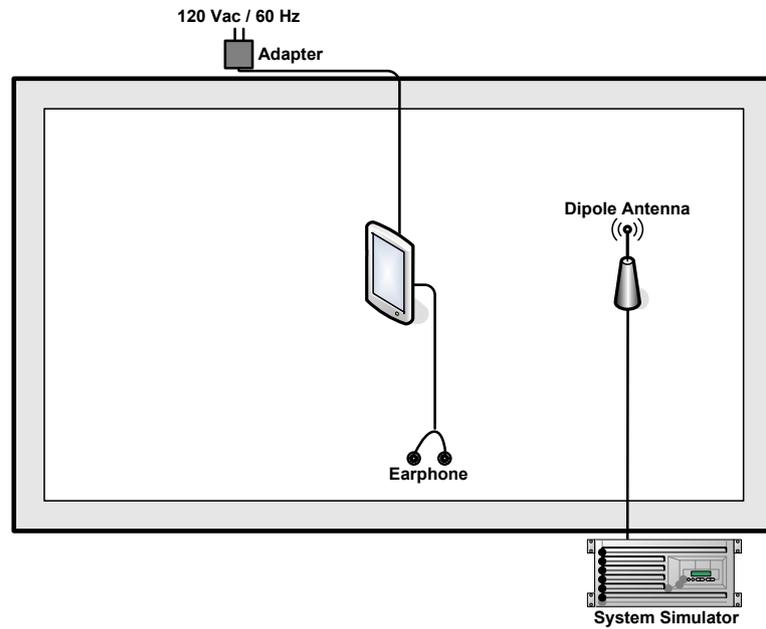
The maximum power levels are GP RS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, only these modes were used for all tests.



The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GPRS 8 (1 Uplink) – CS1	32.65	32.86	32.89	28.55	28.65	28.46
GPRS 10 (2 Uplink) – CS1	29.64	29.83	29.67	25.12	25.22	25.05
GPRS 11 (3 Uplink) – CS1	28.00	28.08	28.05	24.46	24.66	24.22
GPRS 12 (4 Uplink) – CS1	26.38	26.25	26.34	22.50	22.79	22.73
EDGE 8 (8PSK, 1 Uplink) – MCS9	26.21	26.21	26.28	24.42	24.47	24.40
EDGE 10 (8PSK, 2 Uplink) – MCS9	24.13	24.11	24.18	23.26	23.31	23.28
EDGE 11 (8PSK, 3 Uplink) – MCS9	22.00	21.99	22.03	21.15	21.24	21.17
EDGE 12 (8PSK, 4 Uplink) – MCS9	21.21	21.20	21.25	20.59	20.59	20.42

2.2 Connection Diagram of Test System



3 Test Result

3.1 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.1.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts for 824 MHz ~ 849 MHz. The EIRP of mobile transmitters are limited to 2 Watts for 1850~1910 MHz.

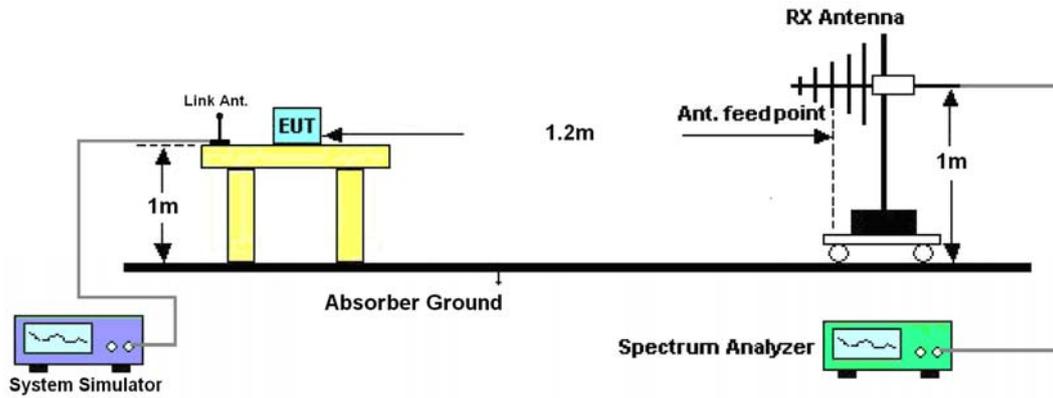
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 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 radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$
Ps (dBm) : Input power to substitution antenna.
Gs (dBi or dBd) : Substitution antenna Gain.
Et = Rt + AF
Es = Rs + AF
AF (dB/m) : Receive antenna factor
Rt : The highest received signal in spectrum analyzer for EUT.
Rs : The highest received signal in spectrum analyzer for substitution antenna.

3.1.4 Test Setup





3.1.5 Test Result of ERP

GSM850 (GPRS 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-19.19	-48.12	0.00	-1.08	27.85	0.61
836.40	-19.53	-48.28	0.00	-0.93	27.82	0.60
848.80	-20.20	-48.35	0.00	-0.76	27.39	0.55
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-24.76	-47.97	0.00	-1.08	22.13	0.16
836.40	-24.81	-48.01	0.00	-0.93	22.27	0.17
848.80	-25.15	-48.05	0.00	-0.76	22.14	0.16

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-24.43	-48.12	0.00	-1.08	22.61	0.18
836.40	-24.42	-48.28	0.00	-0.93	22.93	0.20
848.80	-25.08	-48.35	0.00	-0.76	22.51	0.18
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-29.98	-47.97	0.00	-1.08	16.91	0.05
836.40	-30.18	-48.01	0.00	-0.93	16.90	0.05
848.80	-29.98	-48.05	0.00	-0.76	17.31	0.05

3.1.6 Test Result of EIRP

GSM1900 (GPRS 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.25	-51.88	0.00	1.96	28.59	0.72
1880.00	-26.47	-52.99	0.00	2.00	28.52	0.71
1909.80	-27.86	-54.28	0.00	1.98	28.40	0.69
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.84	-52.13	0.00	1.96	28.26	0.67
1880.00	-27.00	-53.17	0.00	2.00	28.17	0.66
1909.80	-27.74	-54.13	0.00	1.98	28.37	0.69

GSM1900 (EDGE 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-29.04	-51.88	0.00	1.96	24.80	0.30
1880.00	-30.25	-52.99	0.00	2.00	24.74	0.30
1909.80	-31.66	-54.28	0.00	1.98	24.60	0.29
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-30.51	-52.13	0.00	1.96	23.59	0.23
1880.00	-30.56	-53.17	0.00	2.00	24.61	0.29
1909.80	-31.50	-54.13	0.00	1.98	24.61	0.29

3.2 Field Strength of Spurious Radiation Measurement

3.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. 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.

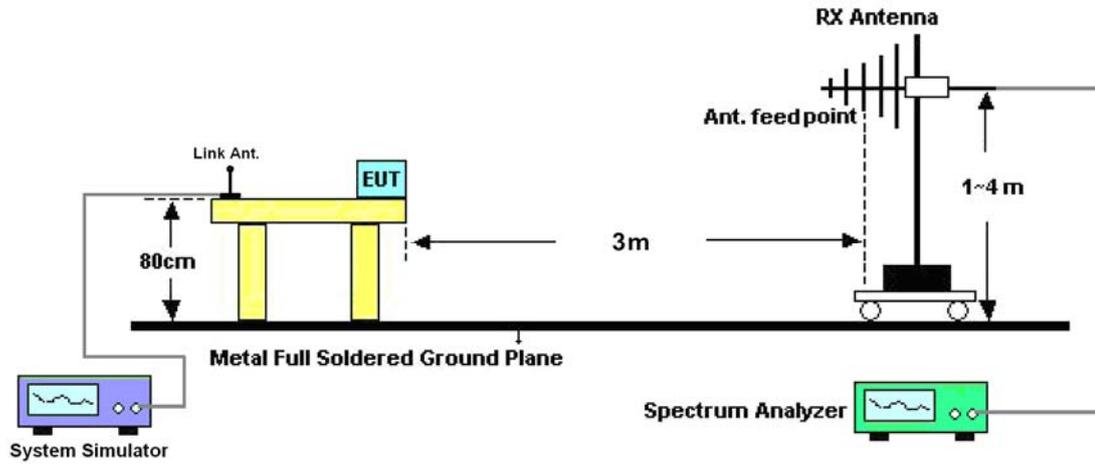
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter about 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. 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. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$

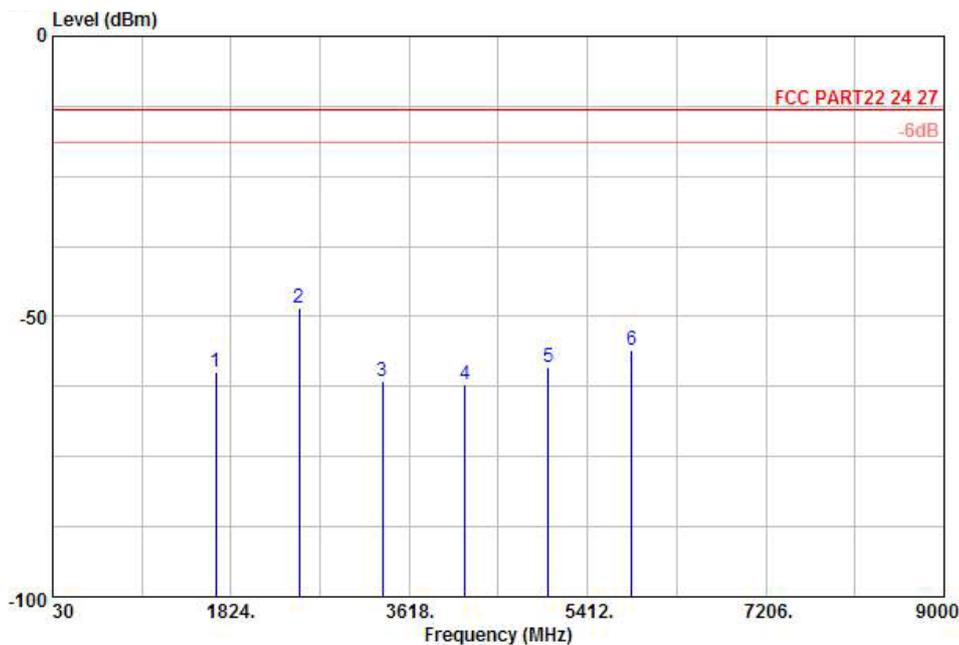
3.2.4 Test Setup





3.2.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	21~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

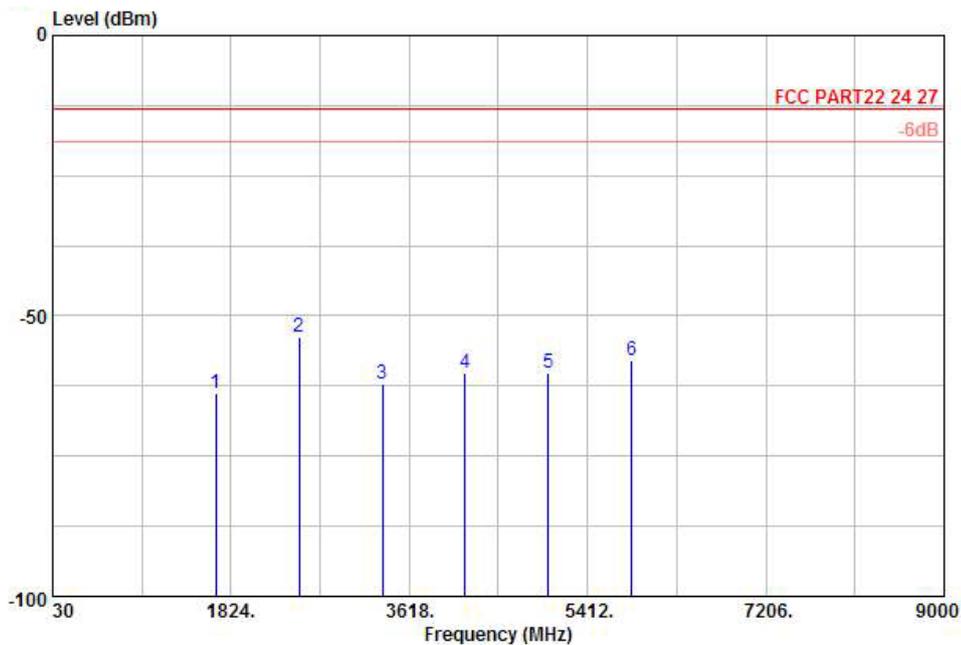


Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
 EUT : (FG) 181807-02

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	-60.00	-13	-47.00	-55.78	-60.65	0.57	3.37	H	Pass
2510	-48.60	-13	-35.60	-50.87	-50.83	0.78	5.16	H	Pass
3345	-61.69	-13	-48.69	-63.63	-65.33	0.87	6.66	H	Pass
4182	-62.21	-13	-49.21	-64.95	-66.80	0.97	7.71	H	Pass
5018	-59.10	-13	-46.10	-65.30	-64.77	1.09	8.91	H	Pass
5854	-55.97	-13	-42.97	-64.68	-62.41	1.22	9.81	H	Pass



Band :	GSM850	Temperature :	21~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

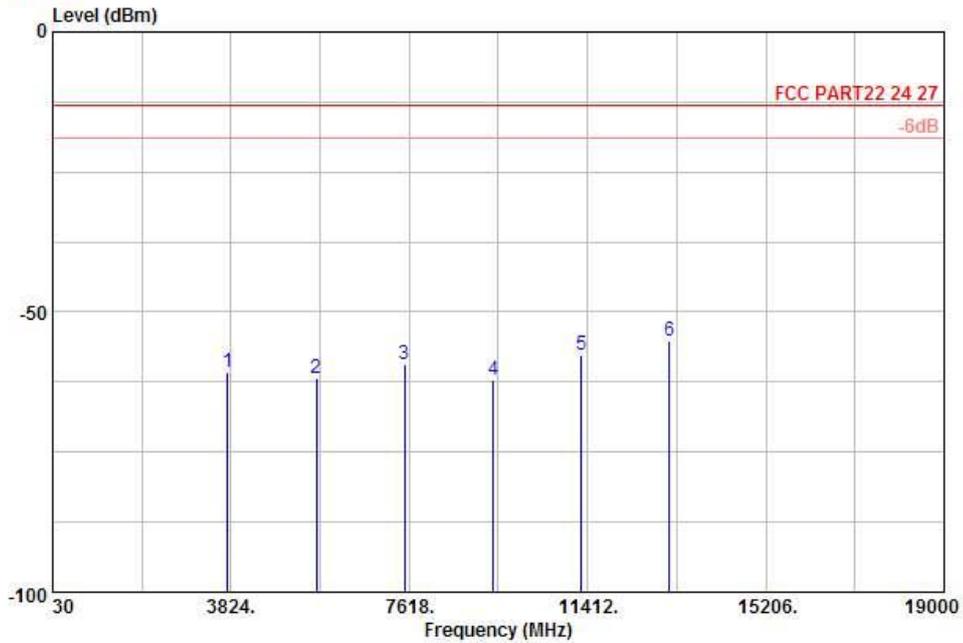


Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
 EUI : (FG) 181807-02

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	-63.70	-13	-50.70	-59.35	-64.35	0.57	3.37	V	Pass
2510	-53.82	-13	-40.82	-56.93	-56.05	0.78	5.16	V	Pass
3345	-61.98	-13	-48.98	-63.96	-65.62	0.87	6.66	V	Pass
4182	-60.09	-13	-47.09	-63.93	-64.68	0.97	7.71	V	Pass
5018	-60.04	-13	-47.04	-64.98	-65.71	1.09	8.91	V	Pass
5854	-57.80	-13	-44.80	-65.79	-64.24	1.22	9.81	V	Pass



Band :	GSM1900	Temperature :	21~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

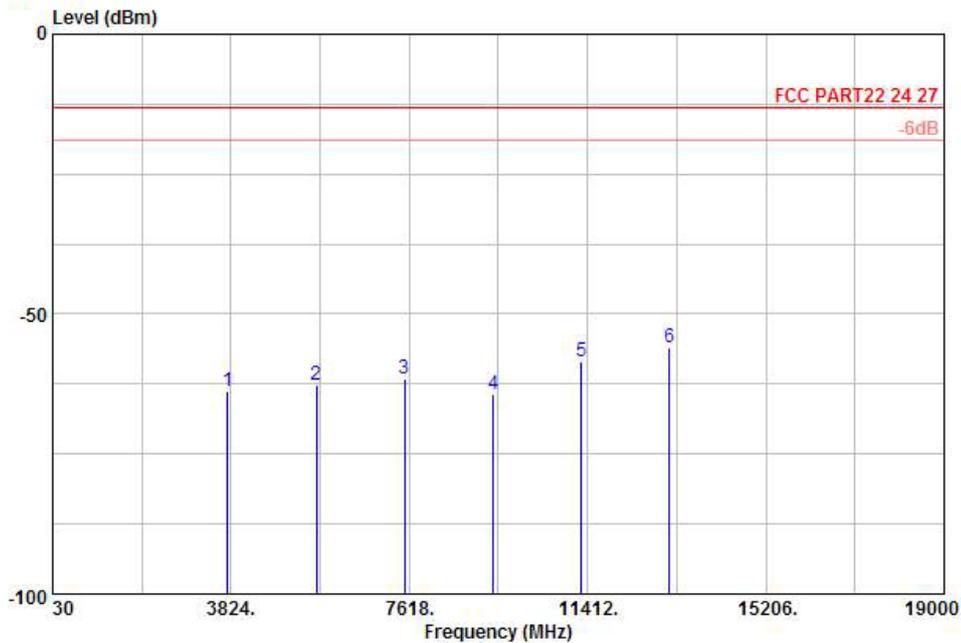


Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
 EUI : (FG) 181807-02

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	-60.73	-13	-47.73	-61.70	-67.11	0.78	7.16	H	Pass
5640	-61.92	-13	-48.92	-66.10	-70.46	1.04	9.58	H	Pass
7520	-59.40	-13	-46.40	-64.53	-69.51	1.35	11.46	H	Pass
9400	-62.03	-13	-49.03	-65.29	-73.09	1.75	12.81	H	Pass
11280	-57.69	-13	-44.69	-69.18	-68.78	2	13.09	H	Pass
13160	-55.04	-13	-42.04	-66.34	-66.75	2.04	13.75	H	Pass



Band :	GSM1900	Temperature :	21~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
 EUI : (FG) 181807-02

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	-63.89	-13	-50.89	-65.26	-70.27	0.78	7.16	V	Pass
5640	-62.57	-13	-49.57	-65.79	-71.11	1.04	9.58	V	Pass
7520	-61.55	-13	-48.55	-66.04	-71.66	1.35	11.46	V	Pass
9400	-64.29	-13	-51.29	-65.51	-75.35	1.75	12.81	V	Pass
11280	-58.37	-13	-45.37	-69.61	-69.46	2	13.09	V	Pass
13160	-55.86	-13	-42.86	-67.05	-67.57	2.04	13.75	V	Pass

3 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 07, 2011	Jan. 06, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 16, 2010	Nov. 15, 2011	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2010	Dec. 06, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 09, 2010	Dec. 08, 2011	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz-18GHz	Nov. 09, 2010	Nov. 08, 2011	Radiation (03CH01-KS)
SHE-EHF Horn	Schwarzbeck	BBHA9170	BBHA170249	15GHz-40GHz	Oct. 11, 2011	Oct. 10, 2012	Radiation (03CH01-KS)
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)

4 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP181807-02 as below.