

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E

OF

Product Name:	Smartphone
Brand Name:	HTC
Model Name:	PB99200
Model Difference:	N/A
FCC ID:	NM8PB99200
Report No.:	EH/2010/30024
Issue Date:	Mar. 15, 2010
FCC Rule Part:	2,22H,24E
Prepared for:	HTC Corporation
	No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.
Prepared by:	SGS Taiwan Ltd.
	Electronics & Communication Laboratory
	No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.



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FCC ID: NM8PB99200

Report No.: EH/2010/30024 Issue Date: Mar. 15, 2010 Page: 2 of 62

VERIFICATION OF COMPLIANCE

Applicant:	HTC Corporation		
	No. 23 Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.		
Product Name:	Smartphone		
FCC ID:	NM8PB99200		
Brand Name:	HTC		
Model No.:	PB99200		
Model Difference:	N/A		
File Number:	EH/2010/30024		
Date of test:	Mar. 04, 2010 ~ Mar. 12, 2010		
Date of EUT Received:	Mar. 04, 2010		

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule PART 22 subpart H, PART 24 subpart E.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Sky Wang	Date:	Mar. 15, 2010
	Sky Wang / Asst. Supervisor		
Prepared By:	Gigi yeh	Date:	Mar. 15, 2010
_	Gigi Yeh / Clerk		
Approved By:	Timent du	Date:	Mar. 15, 2010
_	Vincent Su / Manager		

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Version

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GENERAL INFORMATION 1

General:				
Product Name	Smartphone			
Brand Name	HTC			
Model Name	PB99200			
Model Difference	N/A			
Data Cable (USB)	 Model No.: DC M410, Brand Name: MEC Model No.: DC M410, Brand Name: Foxlink 			
Simple Hands-free (SHF)	 Model No.: RC E160, Brand Name: Cotron Model No.: RC E160, Brand Name: Merry 			
LCD Panel:	Model No.: AMS369FG03-0, Brand Name: SMD			
Camera	 Model No.: 08PM15A, Brand Name: LITEON Model No.: CHT5A-007A, Brand Name: FOXCONN 			
	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter			
	Battery:1.Model No.: BB99100, Brand Name: Formosa2.Model No.: BB99100, Brand Name: HT-Energy			
Power Supply	Adapter:1. Model: TC X250 (X=C, U, E), Brand Name: Delta2. Model: TC X250 (X=B, U, E), Brand Name: Emerson3. Model: TC P300, Brand Name: Delta4. Model: TC P300, Brand Name: Foxlink			

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GSM and WCDMA:

	Operating Frequency				
	GSM/GPRS 850, Class 12 824.2 MHz– 848.8 MHz		33 dBm		
	GSM/GPRS 900, Class 12	880.2MHz – 914.8MHz	33 dBm		
	GSM/GPRS 1800, Class 12	1710.2MHz – 1784.8MHz	30 dBm		
Cellular Phone Standards	GSM/GPRS 1900, Class 12 1850.2MHz – 1909.		30 dBm		
Frequency Range and	EDGE 850, Class 12	824.2 MHz- 848.8 MHz	27 dBm		
i ower.	EDGE 900, Class 12	880.2MHz - 914.8MHz	27 dBm		
	EDGE 1800, Class 12	1710.2MHz – 1784.8MHz	26 dBm		
	EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	26 dBm		
	WCDMA/HSUPA/HSDPA Band I	1922.4MHz –1977.6MHz	24 dBm		
	WCDMA/HSUPA/HSDPA Band VIII 882.4MHz –912.6MHz		24 dBm		
Hardware Version:	N/A				
Software Version:	N/A				
	22H(GMSK): 824.2 - 848.8 MHz: 247KGXW				
Type of Emission	24E(GMSK): 1850.2 – 1909.8 MHz: 248KGXW				
-) -) -) -) -) -) -) -) -) -)	22H(8PSK): 824.2 - 848.8 MHz: 249KG7W				
	24E(8PSK): 1850.2 – 1909.8 MHz: 245KG7W				
IMEI:	357841030038364				

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WLAN: 802.11 b/g:

Frequency Range:	802.11 b/g: 2412 – 2462 MHz
Channel number:	11 channels
Output Power:	802.11 b: 17.41dBm 802.11 g: 13.54dBm
Modulation Technology:	DSSS, OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	PIFA Antenna, 1.1dBi.

Bluetooth:

Bluetooth Version:	V2.1 + EDR (GFSK + $\pi/4$ DQPSK + 8DPSK)
Channel number:	79 channels
Modulation type:	Frequency Hopping Spread Spectrum
Rated Power:	1.85 dBm
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Operating Mode:	Point-to-Point
Antenna Designation:	PIFA Antenna, 1.1dBi.

GPS:

Receiver Frequency	L1 Band, 1575.42MHz
Frequency Conversion os- cillator	19.2MHz
Antenna Designation	PIFA Antenna

The EUT is compliance with Bluetooth 2.1 + EDR Standard.

This test report applies for GSM/GPRS/EDGE 850/1900 MHz.

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1.1 **Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: NM8PB99200 filing to comply with Section Part 22 subpart H, Part 24 subpart E.

1.2 **Test Methodology**

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603C and FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

1.3 **Test Facility**

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.4 **Special Accessories**

Not available for this EUT intended for grant.

1.5 **Equipment Modifications**

Not available for this EUT intended for grant.

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SYSTEM TEST CONFIGURATION 2

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 which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C and TIA/EIA IS-98 for Mobile stations. The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table 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 max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements.

A standard antenna was used to replace the EUT and connect to the SG. Adjust the SG output level to reach the max emission level which were measured above.

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2.4. Measurement Equipment Used:

Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010	
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2010	01/22/2012	
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/13/2010	
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/04/2009	01/03/2011	
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/04/2009	01/03/2011	
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010	
Temperature Chamber	GIANT FORCE	GTH-150-40- CP-AR	MAA0512-018	02/05/2010	02/04/2012	
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010	
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010	
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010	
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010	
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010	
DC Power Supply	HP	6038A	2929A-07548	06/27/2009	06/26/2011	
DC Power Supply	Topward	3303D	981327	10/26/2008	10/25/2010	

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber											
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.						
ТҮРЕ		NUMBER	NUMBER	CAL.							
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011						
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/19/2009	11/18/2010						
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2008	07/09/2010						
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2008	07/09/2010						
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	05/09/2008	05/10/2010						
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010						
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012						
Signal Generator	Agilent	E4438C	MY45093613	05/22/2009	05/21/2010						
Pre-Amplifier	Agilent	8447D	3447D 1937A02834		11/27/2010						
Pre-Amplifier	Agilent	8449B	3008A01973	01/04/2010	01/03/2011						
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010						
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010						
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010						
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/13/2010						
Turn Table	HD	DT420	N/A	N.C.R	N.C.R						
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R						
Controller	HD	HD100	N/A	N.C.R	N.C.R						
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	SUCOFLEX 104PEA-10M 10m		01/03/2011						
Low Loss Cable	w Loss Cable HUBER+SUHNER		SUCOFLEX 104PEA-3M 3m		01/03/2011						
3m Site	SGS	966 chamber	N/A	11/08/2009	11/07/2010						

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2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel)



Fig. 2-2 Configuration of Tested System (Remote Side)



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
1.	Radio Communica- tion Analyzer	R&S	CMU200	N/A	102189

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)		
§22.913(a)(2)	RF Conducted Power Output	Compliant
§24.232(c)		
§2.1046(a)		
§22.913(a)(2)	ERP/EIRP measurement	Compliant
§24.232(c)		
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051		
§22.917(a)	Out of Band Emissions at Antenna Ter-	Compliant
§24.238(a)	ininais	
§2.1053		
§22.917(a)	Field Strength of Spurious Radiation	Compliant
§24.238(a)	(1A)	
§2.1055(a)(1)		
§22.355	Frequency Stability vs. Temperature	Compliant
§24.235		
§2.1055(d)(2)		
§22.355	Frequency Stability vs. Voltage	Compliant
§24.235-		

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DESCRIPTION OF TEST MODES 4

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for GSM/GPRS/EDGE with power adaptors. The worst-case of E2 position for GSM 850 band, H position for GSM 1900 were reported.

> W dBm dB GSM 850 Band 29.09 ERP 0.811 GSM 1900 Band 27.62 EIRP 0.578 EDGE 850 Band 25.21 ERP 0.332 EDGE 1900 Band EIRP 0.256 24.08

Max ERP/EIRP measurement result:

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SGS Taiwan Ltd.



RF POWER OUTPUT MEASUREMENT 5

5.1 **Standard Applicable**

According to FCC §2.1046.

FCC 22.913(a) Mobile station are limited to 7W.

FCC 24.232(c) Peak Power Measurement.

5.2 **Test Set-up:**



Note: Measurement setup for testing on Antenna connector

5.3 **Measurement 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.

5.4 **Measurement Equipment Used:**

Refer to section 2.4 in this report

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5.5 **Measurement Result:**

5.5.1 **RF Conducted Output Power** 5.5.1.1.: GSM/EDGE (GMSK; 8-PSK)

Result:

EUT Mode	Frequency	СН	Path Loss (dB)	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	Peak Power (1DN 2UP)	Avg. Power (1DN 2UP)	Peak Power (1DN 3UP)	Avg. Power (1DN 3UP)	Peak Power (1DN 4UP)	Peak Power (1DN 4UP)
	(MHz)			(dBm)							
GPRS 850 (Class 12)	824.2	128	0.5	33.10	32.90	33.00	32.90	33.00	32.90	33.00	32.90
	836.6	190	0.5	33.20	33.00	33.10	33.00	33.10	33.00	33.10	33.00
	848.8	251	0.5	33.10	33.00	33.10	33.00	33.10	33.00	33.10	33.00

EUT Mode	Frequency	СН	Path Loss (dB)	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	Peak Power (1DN 2UP)	Avg. Power (1DN 2UP)	Peak Power (1DN 3UP)	Avg. Power (1DN 3UP)	Peak Power (1DN 4UP)	Peak Power (1DN 4UP)
	(MHz)			(dBm)							
CDD C 1000	1850.2	512	0.5	29.60	29.40	29.00	28.90	29.00	28.90	27.80	27.60
GPRS 1900 (Class 12)	1880.0	661	0.5	29.60	29.50	29.00	28.90	29.00	28.90	27.90	27.70
(0100012)	1909.8	810	0.5	29.30	29.20	28.70	28.60	28.70	28.60	27.50	27.30

EUT Mode	Frequency	СН	Path Loss (dB)	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	Peak Power (1DN 2UP)	Avg. Power (1DN 2UP)	Peak Power (1DN 3UP)	Avg. Power (1DN 3UP)	Peak Power (1DN 4UP)	Peak Power (1DN 4UP)
	(MHz)			(dBm)							
EDGE 850 (Class 12)	824.2	128	0.5	30.20	27.00	29.20	26.00	29.10	25.90	29.10	25.90
	836.6	190	0.5	30.30	27.10	29.20	26.00	29.20	26.00	29.20	26.00
	848.8	251	0.5	30.30	27.10	29.20	26.00	29.20	26.00	29.20	26.00

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EUT Mode	Frequency	СН	Path Loss (dB)	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	Peak Power (1DN 2UP)	Avg. Power (1DN 2UP)	Peak Power (1DN 3UP)	Avg. Power (1DN 3UP)	Peak Power (1DN 4UP)	Peak Power (1DN 4UP)
	(MHz)			(dBm)							
EDGE1900 (Class 12)	1850.2	512	0.5	28.60	25.40	27.60	24.40	27.40	24.30	27.50	24.40
	1880.0	661	0.5	28.70	25.50	27.60	24.50	27.60	24.40	27.60	24.40
	1909.8	810	0.5	28.70	25.40	27.60	24.40	27.60	24.40	27.50	24.30

EUT Mode	Frequency (MHz)	СН	Path Loss (dB)	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)
	824.2	128	0.5	33.10	32.90
GSM 850	836.6	190	0.5	33.20	33.00
	848.8	251	0.5	33.10	33.00

EUT Mode	Frequency (MHz)	СН	Path Loss (dB)	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)
DCC1000	1850.2	512	0.5	29.60	29.50
PCS1900	1880.0	661	0.5	29.60	29.50
	1909.8	810	0.5	29.40	29.20

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PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.5	27.2	25.2	23.3	21.3	19.3	17.3	15.3	13.3
PCL	9	10	11	12	13	14	15	16	17
Output power	11.0	0.2	7.2	5.2	2.4	1.2	0.6		

Maximum Power Reduction: PCS1900 band

Maximum Power Reduction: EDGE 1900 band

PCL	0	1	2	3	4	5	6	7	8	
Output power (dBm)	25.5	25.5	25.5	25.5	25.5	25.5	24.5	22.4	20.5	
PCL	9	10	11	12	13	14	15	16	17	18
Output power (dBm)	18.5	16.4	14.5	12.4	10.4	8.4	6.4	4.4	2.4	0.3

Note: The EUT output power was controlled by simulator. Set Communication Tester CMU200 PCL as above, and get the mobile phone output power reading.

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ERP, EIRP MEASUREMENT 6

6.1 **Standard Applicable**

According to FCC §2.1046

FCC 22.913(a) Mobile station are limited to 7W ERP.

FCC 24.232(c) Mobile station are limited to 2W EIRP.

6.2 **Test SET-UP (Block Diagram of Configuration)**

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz

Substituted Method Test Set-UP (C)



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6.3 **Measurement Procedure**

The EUT was placed on a 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, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-850 MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1710-1755MHz and 1850 –1910MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

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

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

6.4 **Measurement Equipment Used:**

Refer to section 2.4 in this report

ss otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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6.5 **Measurement Result**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
			п	V	117.40	31.01	-7.87	3.62	19.51	38.45
			п	Н	124.62	38.35	-7.87	3.62	26.85	38.45
	824 20	128	E1	V	118.51	32.12	-7.87	3.62	20.62	38.45
	021.20	120		Н	124.33	38.06	-7.87	3.62	26.56	38.45
			E2	V	125.99	39.60	-7.87	3.62	28.10	38.45
				Н	122.57	36.30	-7.87	3.62	24.80	38.45
	836.60	190	ц	V	118.96	32.71	-7.88	3.65	21.18	38.45
			п	Н	126.60	40.37	-7.88	3.65	28.84	38.45
CSM 850			E1	V	120.18	33.93	-7.88	3.65	22.40	38.45
05111 050				Н	125.64	39.41	-7.88	3.65	27.88	38.45
			. Г.Э	V	126.87	40.62	-7.88	3.65	29.09	38.45
			Ľ2	Н	124.18	37.95	-7.88	3.65	26.42	38.45
			ц	V	119.10	32.98	-7.88	3.68	21.42	38.45
			11	Н	125.54	39.35	-7.88	3.68	27.79	38.45
8	848 80	251	E1	V	120.42	34.30	-7.88	3.68	22.74	38.45
	040.00	231		Н	125.78	39.59	-7.88	3.68	28.03	38.45
		-	E2	V	126.32	40.20	-7.88	3.68	28.64	38.45
				Н	123.73	37.54	-7.88	3.68	25.98	38.45

Remark :

(1) The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

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EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
			н	V	118.56	14.17	9.90	5.56	18.51	33.00
			11	Н	127.46	23.28	9.90	5.56	27.62	33.00
	1850.20	512	F1	V	127.33	22.94	9.90	5.56	27.28	33.00
	1050.20	512	LI	Н	123.76	19.58	9.90	5.56	23.92	33.00
			E2	V	122.27	17.88	9.90	5.56	22.22	33.00
			1.2	Н	123.52	19.34	9.90	5.84	23.40	33.00
		661	Н	V	118.13	13.77	9.99	5.61	18.15	33.00
				Н	127.05	22.91	9.99	5.61	27.28	33.00
PCS 1000	1880.00		E1	V	126.57	22.21	9.99	5.61	26.59	33.00
105 1900				Н	123.28	19.14	9.99	5.61	23.51	33.00
			E2	V	123.35	18.99	9.99	5.61	23.37	33.00
				Н	123.58	19.44	9.99	5.61	23.81	33.00
			ч	V	117.01	12.68	10.08	5.66	17.10	33.00
			11	Н	126.51	22.40	10.08	5.66	26.82	33.00
	1000 80	Q10	F 1	V	125.55	21.22	10.08	5.66	25.64	33.00
	1707.00	010		Н	122.17	18.06	10.08	5.66	22.48	33.00
			БЭ	V	122.46	18.13	10.08	5.66	22.55	33.00
			ĽŹ	Н	121.15	17.04	10.08	5.66	21.46	33.00

Remark :

The RBW, VBW of SPA for frequency (1)

RBW=300 KHz, VBW=1MHz,

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Measurement Result:

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
			ц	V	118.49	32.10	-7.87	3.62	20.60	38.45
			11	Н	122.98	36.71	-7.87	3.62	25.21	38.45
	824 20	128	F1	V	120.67	34.28	-7.87	3.62	22.78	38.45
	824.20	120	LI	Н	119.70	33.43	-7.87	3.62	21.93	38.45
			F2	V	114.38	27.99	-7.87	3.62	16.49	38.45
			E2	Н	120.81	34.54	-7.87	3.62	23.04	38.45
	836.60	190	Н	V	118.66	32.41	-7.88	3.65	20.88	38.45
				Н	122.14	35.91	-7.88	3.65	24.38	38.45
			E1	V	120.54	34.29	-7.88	3.65	22.76	38.45
EDGE 850				Н	119.09	32.86	-7.88	3.65	21.33	38.45
			E2	V	114.84	28.59	-7.88	3.65	17.06	38.45
				Н	117.90	31.67	-7.88	3.65	20.14	38.45
			ц	V	120.13	34.01	-7.88	3.68	22.45	38.45
			11	Н	122.45	36.26	-7.88	3.68	24.70	38.45
	848 80	251	E1	V	120.93	34.81	-7.88	3.68	23.25	38.45
	040.00	231	EI	Н	119.39	33.20	-7.88	3.68	21.64	38.45
			Е2	V	116.59	30.47	-7.88	3.68	18.91	38.45
			E2	Н	119.67	33.48	-7.88	3.68	21.92	38.45

Remark :

(1) The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

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EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
			ц	V	124.13	19.74	9.90	5.56	24.08	33.00
			11	Н	119.36	15.18	9.90	5.56	19.52	33.00
	1850 20	512	F1	V	111.60	7.21	9.90	5.56	11.55	33.00
	1050.20	512		Н	123.82	19.64	9.90	5.56	23.98	33.00
			F2	V	120.29	15.90	9.90	5.56	20.24	33.00
			L2	Н	121.78	17.60	9.90	5.84	21.66	33.00
	1880.00	661	Н	V	120.85	16.49	9.99	5.61	20.87	33.00
				Н	117.31	13.17	9.99	5.61	17.54	33.00
EDGE 1900			E1	V	111.64	7.28	9.99	5.61	11.66	33.00
				Н	122.72	18.58	9.99	5.61	22.95	33.00
			E2	V	119.43	15.07	9.99	5.61	19.45	33.00
				Н	121.06	16.92	9.99	5.61	21.29	33.00
			ц	V	120.15	15.82	10.08	5.66	20.24	33.00
			11	Н	117.34	13.23	10.08	5.66	17.65	33.00
	1000.80	8 10	E1	V	110.44	6.11	10.08	5.66	10.53	33.00
	1707.00	010		Н	121.20	17.09	10.08	5.66	21.51	33.00
			E2	V	117.65	13.32	10.08	5.66	17.74	33.00
			ĽZ	Н	120.30	16.19	10.08	5.66	20.61	33.00

Remark :

(1) The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

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7 **99% OCCUPIED BANDWIDTH MEASUREMENT**

7.1 **Standard Applicable**

According to FCC§2.1049(h).

7.2 **Test Set-up:**



Note: Measurement setup for testing on Antenna connector

7.3 **Measurement Procedure**

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30KHz) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -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.

7.4 Measurement Equipment Used:

Refer to section 2.4 in this report

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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7.5 **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	824.20	128	0.2459
GSM 850	836.60	190	0.2467
	848.80	251	0.2437

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
EDGE 850	824.20	128	0.2487
	836.60	190	0.2448
	848.80	251	0.2441

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
PCS 1900	1850.20	512	0.2479
	1880.00	661	0.2465
	1909.80	810	0.2451

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	1850.20	512	0.2442
EDGE 1900	1880.00	661	0.2447
	1909.80	810	0.2451

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Figure 7-1: GSM Channel Low



Figure 7-2 GSM Channel Mid



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Figure 7-3: GSM Channel High



Figure 7-4: PCS Channel Low



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Figure 7-5 PCS Channel Mid



Figure 7-6: PCS Channel High



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Figure 7-7: EDGE 850 Channel Low



Figure 7-8 EDGE 850 Channel Mid



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Figure 7-9 EDGE 850 Channel High



Figure 7-10 EDGE 1900 Channel Low



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Figure 7-11 EDGE 1900 Channel Mid



Figure 7-12 EDGE 1900 Channel High



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8 **OUT OF BAND EMISSION AT ANTENNA TERMINALS**

Standard Applicable 8.1

According to FCC §2.1051.

FCC §22.917(a), §24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than $43 + 10 \log$ (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

Test SET-UP 8.2

Refer to section 7.2 in this report

8.3 **Measurement 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: 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.

8.4 **Measurement Equipment Used:**

Refer to section 2.4 in this report

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

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8.5 Measurement Result



Start 30 MHz Stop 2.500 GHz Span Pair #Res BW 1 MHz #VBW 1 MHz Sweep 4.12 ms (601 pts) Span Center Marker Amplitude Trace Type X Axis 825 MHz 1.648 GHz (1)Freq 33.03 dBm -34.06 dBm (1)Freq 23 Off (1)Freq 2.471 GHz -31.64 dBm More 1 of 2

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Figure 8-2: Out of Band emission at antenna terminals -GSM 850 Channel Mid



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Figure 8-3: Out of Band emission at antenna terminals-GSM 850 Channel Highest



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Figure 8-4: Band edge emission at antenna terminals - GSM 850 Channel Lowest





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🔆 Agilent			L	Freq/Channel
Ref 35 dBm #Peak	Atten 30 dB	Mk	r1 1.850 GHz 29.25 dBm	Center Freq 1.26500000 GHz
Log 10 dB/ Offst				Start Freq 30.0000000 MHz
16 dB DI 12.0				Stop Freq 2.50000000 GHz
dBm				CF Step 247.000000 MHz <u>Auto</u> Man
Start 30 MHz #Res BW 1 MHz Marker Trace	#VBW 1 Type	St MHz Sweep 4.12 X Axis	top 2.500 GHz ms (601 pts) Amplitude	FreqOffset 0.00000000 Hz
1 (1)	Freq 1	.850 GHz	29.25 dBm	Signal Track ^{On <u>Off</u>}
Conuright 2000-1	2005 Agilant Tashna			





Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Mkr1 1.878 GHz Select Mari #Peak 29.52 dBm 1 2 3 Log 1 1 2 3 1 2 3	
	Select Marker <u>1</u> 234
dB/ Offst	Normal
16 dB DI 12 0	Delta
dBm LgAv	Delta Pair (Tracking Ref) Ref ▲
Start 30 MHz Stop 2.500 GHz #Res BW 1 MHz #VBW 1 MHz Sweep 4.12 ms (601 pts) Marker Trace Type X Axis	(z span Pair Span <u>Center</u>
1 (1) Freq 1.878 GHz 29.52 dBm	Off
	More 1 of 2

Figure 8-7: Out of Band emission at antenna terminals –PCS 1900 Channel Mid



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Figure 8-8: Out of Band emission at antenna terminals-PCS 1900 Channel Highest



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Figure 8-9: Bad edge emission at antenna terminals – PCS 1900 Channel Lowest

Figure 8-10: Band edge emission at antenna terminals – PCS 1900 Channel Highest



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9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

9.1 **Standard Applicable**

According to FCC §2.1053,

FCC §22.917(a),§24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than $43 + 10 \log$ (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

9.2 **EUT Setup (Block Diagram of Configuration)**

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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(C) Substituted Method Test Set-UP



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9.3 **Measurement 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.

ERP in frequency band 824 –850 MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

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

9.4 **Measurement Equipment Used:**

Refer to section 2.4 in this report

9.5 Measurement Result

Refer to attach tabular data sheets.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Low Mode	Test Date:	Jan. 09, 2010
Fundamental Frequency	: 824.20 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
33.88	45.68	V	-57.89	-5.52	0.93	-64.34	-13.00	-51.34
48.43	40.34	V	-65.84	-0.92	1.09	-67.86	-13.00	-54.86
133.79	39.45	V	-59.34	-7.79	1.52	-68.64	-13.00	-55.64
158.04	45.37	V	-52.64	-7.81	1.61	-62.06	-13.00	-49.06
240.49	43.37	V	-56.88	-7.88	1.94	-66.70	-13.00	-53.70
288.99	40.05	V	-58.56	-7.91	2.13	-68.60	-13.00	-55.60
824.00	81.17	V	-5.22	-7.87	3.62	-16.72	-13.00	-3.72
1643.50	51.36	V	-53.23	9.27	5.22	-49.17	-13.00	-36.17
2472.60	52.74	V	-48.27	10.08	6.53	-44.72	-13.00	-31.72
3296.80		V		12.17	7.71		-13.00	
4121.00		V		12.61	8.86		-13.00	
4945.20		V		12.65	9.74		-13.00	
5769.40		V		13.55	10.54		-13.00	
6593.60		V		12.05	11.30		-13.00	
7417.80		V		11.49	12.10		-13.00	
8242.00		V		11.48	12.71		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB				
	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Low Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 824.20 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	43.28	Н	-60.52	-4.16	0.91	-65.58	-13.00	-52.58
119.24	45.65	Н	-55.34	-7.78	1.45	-64.56	-13.00	-51.56
135.73	44.04	Н	-55.22	-7.79	1.52	-64.54	-13.00	-51.54
155.13	42.45	Н	-55.72	-7.80	1.60	-65.12	-13.00	-52.12
247.28	43.52	Н	-55.83	-7.89	1.97	-65.69	-13.00	-52.69
363.68	37.38	Н	-59.61	-7.65	2.40	-69.66	-13.00	-56.66
824.00	79.04	Н	-7.23	-7.87	3.62	-18.73	-13.00	-5.73
1648.40	49.26	Н	-55.14	9.29	5.23	-51.08	-13.00	-38.08
2472.60	51.03	Н	-49.88	10.08	6.53	-46.33	-13.00	-33.33
3296.80		Н		12.17	7.71		-13.00	
4121.00		Н		12.61	8.86		-13.00	
4945.20		Н		12.65	9.74		-13.00	
5769.40		Н		13.55	10.54		-13.00	
6593.60		Н		12.05	11.30		-13.00	
7417.80		Н		11.49	12.10		-13.00	
8242.00		Н		11.48	12.71		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 836.60 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	41.70	V	-61.03	-4.16	0.91	-66.10	-13.00	-53.10
48.43	41.20	V	-64.98	-0.92	1.09	-67.00	-13.00	-54.00
101.78	42.13	V	-59.63	-7.76	1.37	-68.75	-13.00	-55.75
155.13	44.56	V	-53.19	-7.80	1.60	-62.60	-13.00	-49.60
240.49	43.50	V	-56.75	-7.88	1.94	-66.57	-13.00	-53.57
295.78	40.26	V	-58.13	-7.92	2.15	-68.20	-13.00	-55.20
1673.20	51.65	V	-52.91	9.36	5.27	-48.81	-13.00	-35.81
2509.80	50.80	V	-49.98	10.09	6.58	-46.48	-13.00	-33.48
3346.40		V		12.28	7.79		-13.00	
4183.00		V		12.62	8.93		-13.00	
5019.60		V		12.67	9.81		-13.00	
5856.20		V		13.68	10.62		-13.00	
6692.80		V		11.95	11.39		-13.00	
7529.40		V		11.45	12.20		-13.00	
8366.00		V		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belongs to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 836.60 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	43.19	Н	-60.61	-4.16	0.91	-65.67	-13.00	-52.67
119.24	47.55	Н	-53.44	-7.78	1.45	-62.66	-13.00	-49.66
155.13	41.97	Н	-56.20	-7.80	1.60	-65.60	-13.00	-52.60
242.43	44.00	Н	-55.59	-7.88	1.95	-65.42	-13.00	-52.42
256.98	43.89	Н	-55.11	-7.89	2.02	-65.02	-13.00	-52.02
332.64	36.17	Н	-61.19	-7.74	2.29	-71.22	-13.00	-58.22
1673.20	47.40	Н	-56.98	9.36	5.27	-52.88	-13.00	-39.88
2509.80	49.52	Н	-51.18	10.09	6.58	-47.68	-13.00	-34.68
3346.40		Н		12.28	7.79		-13.00	
4183.00		Н		12.62	8.93		-13.00	
5019.60		Н		12.67	9.81		-13.00	
5856.20		Н		13.68	10.62		-13.00	
6692.80		Н		11.95	11.39		-13.00	
7529.40		Н		11.45	12.20		-13.00	
8366.00		Н		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH High Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 848.80 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
31.94	50.28	V	-53.86	-6.43	0.94	-61.23	-13.00	-48.23
90.14	43.66	V	-59.52	-7.75	1.27	-68.54	-13.00	-55.54
119.24	40.69	V	-59.45	-7.78	1.45	-68.67	-13.00	-55.67
158.04	44.52	V	-53.49	-7.81	1.61	-62.91	-13.00	-49.91
242.43	43.66	V	-56.52	-7.88	1.95	-66.35	-13.00	-53.35
298.69	39.39	V	-58.90	-7.92	2.17	-68.99	-13.00	-55.99
850.00	81.27	V	-4.84	-7.88	3.68	-16.40	-13.00	-3.40
1697.60	50.39	V	-54.15	9.44	5.31	-50.02	-13.00	-37.02
2546.40	51.88	V	-48.76	10.20	6.63	-45.20	-13.00	-32.20
3395.20		V		12.38	7.87		-13.00	
4244.00		V		12.63	9.00		-13.00	
5092.80		V		12.74	9.88		-13.00	
5941.60		V		13.81	10.70		-13.00	
6790.40		V		11.86	11.48		-13.00	
7639.20		V		11.40	12.27		-13.00	
8488.00		V		11.70	12.91		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Radiated Spurious Emission Measurement Result: GSM 850 Mode

Operation Mode	: TX CH High Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 848.80 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	43.40	Н	-60.40	-4.16	0.91	-65.46	-13.00	-52.46
121.18	47.01	Н	-53.77	-7.78	1.46	-63.01	-13.00	-50.01
133.79	44.69	Н	-54.78	-7.79	1.52	-64.08	-13.00	-51.08
153.19	41.41	Н	-56.61	-7.80	1.60	-66.01	-13.00	-53.01
255.04	44.35	Н	-54.71	-7.89	2.01	-64.61	-13.00	-51.61
349.13	36.21	Н	-61.00	-7.64	2.36	-71.00	-13.00	-58.00
850.00	80.97	Н	-5.22	-7.88	3.68	-16.78	-13.00	-3.78
1697.60	48.21	Н	-56.14	9.44	5.31	-52.01	-13.00	-39.01
2546.40	50.27	Н	-50.33	10.20	6.63	-46.77	-13.00	-33.77
3395.20		Н		12.38	7.87		-13.00	
4244.00		Н		12.63	9.00		-13.00	
5092.80		Н		12.74	9.88		-13.00	
5941.60		Н		13.81	10.70		-13.00	
6790.40		Н		11.86	11.48		-13.00	
7639.20		Н		11.40	12.27		-13.00	
8488.00		Н		11.70	12.91		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Low Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 1850.20MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	46.07	V	-56.66	-4.16	0.91	-61.73	-13.00	-48.73
90.14	44.64	V	-58.54	-7.75	1.27	-67.56	-13.00	-54.56
104.69	42.57	V	-58.92	-7.76	1.38	-68.06	-13.00	-55.06
153.19	45.24	V	-52.34	-7.80	1.60	-61.74	-13.00	-48.74
250.19	41.05	V	-58.83	-7.89	1.99	-68.71	-13.00	-55.71
288.99	43.28	V	-55.33	-7.91	2.13	-65.37	-13.00	-52.37
1850.00		V		9.90	5.56		-13.00	
3700.40	43.11	V	-54.82	12.61	8.31	-50.52	-13.00	-37.52
5550.60		V		13.23	10.33		-13.00	
7400.80		V		11.50	12.08		-13.00	
9251.00		V		11.92	13.50		-13.00	
11101.20		V		11.66	15.11		-13.00	
12951.40		V		13.63	16.60		-13.00	
14801.60		V		12.76	17.95		-13.00	
16651.80		V		15.92	19.14		-13.00	
18502.00		V		18.75	10.40		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



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Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Low Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 1850.20MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
40.67	42.73	Н	-60.36	-2.51	0.91	-63.78	-13.00	-50.78
90.14	45.23	Н	-58.50	-7.75	1.27	-67.52	-13.00	-54.52
133.79	45.83	Н	-53.64	-7.79	1.52	-62.94	-13.00	-49.94
153.19	44.89	Н	-53.13	-7.80	1.60	-62.53	-13.00	-49.53
245.34	43.77	Н	-55.68	-7.89	1.96	-65.53	-13.00	-52.53
295.78	40.68	Н	-57.11	-7.92	2.15	-67.18	-13.00	-54.18
1850.00		Н		9.90	5.56		-13.00	
3700.40	43.09	Н	-54.95	12.61	8.31	-50.65	-13.00	-37.65
5550.60		Н		13.23	10.33		-13.00	
7400.80		Н		11.50	12.08		-13.00	
9251.00		Н		11.92	13.50		-13.00	
11101.20		Н		11.66	15.11		-13.00	
12951.40		Н		13.63	16.60		-13.00	
14801.60		Н		12.76	17.95		-13.00	
16651.80		Н		15.92	19.14		-13.00	
18502.00		Н		18.75	10.40		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)



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Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 1880MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	51.58	V	-51.15	-4.16	0.91	-56.22	-13.00	-43.22
62.98	50.69	V	-60.76	-0.64	1.10	-62.50	-13.00	-49.50
90.14	44.87	V	-58.31	-7.75	1.27	-67.33	-13.00	-54.33
153.19	46.09	V	-51.49	-7.80	1.60	-60.89	-13.00	-47.89
250.19	41.03	V	-58.85	-7.89	1.99	-68.73	-13.00	-55.73
293.84	42.87	V	-55.58	-7.92	2.15	-65.65	-13.00	-52.65
3760.00	42.51	V	-55.15	12.60	8.39	-50.93	-13.00	-37.93
5640.00		V		13.36	10.41		-13.00	
7520.00		V		11.45	12.19		-13.00	
9400.00		V		11.93	13.61		-13.00	
11280.00		V		11.92	15.27		-13.00	
13160.00		V		13.33	16.71		-13.00	
15040.00		V		13.76	18.15		-13.00	
16920.00		V		15.27	19.32		-13.00	
18800.00		V		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH Mid Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 1880MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
40.67	42.55	Н	-60.54	-2.51	0.91	-63.96	-13.00	-50.96
90.14	44.68	Н	-59.05	-7.75	1.27	-68.07	-13.00	-55.07
133.79	44.66	Н	-54.81	-7.79	1.52	-64.11	-13.00	-51.11
153.19	44.60	Н	-53.42	-7.80	1.60	-62.82	-13.00	-49.82
240.49	43.96	Н	-55.72	-7.88	1.94	-65.54	-13.00	-52.54
286.08	40.00	Н	-58.09	-7.91	2.12	-68.13	-13.00	-55.13
3760.00	45.82	Н	-51.95	12.60	8.39	-47.74	-13.00	-34.74
5640.00		Н		13.36	10.41		-13.00	
7520.00		Н		11.45	12.19		-13.00	
9400.00		Н		11.93	13.61		-13.00	
11280.00		Н		11.92	15.27		-13.00	
13160.00		Н		13.33	16.71		-13.00	
15040.00		Н		13.76	18.15		-13.00	
16920.00		Н		15.27	19.32		-13.00	
18800.00		Н		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

biness other west stated the results simple (s) lest report results an piece) test report results an piece) and set report sample (s) lest report results an piece) and set report results an piece) and set report results and piece) results and results and results and piece) resu cation of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
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Report No.: EH/2010/30024 Issue Date: Mar. 15, 2010 Page: 57 of 62

Radiated Spurious Emission Measurement Result: PCS 1900 Mode

Operation Mode	: TX CH High Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 1909.8 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	45.57	V	-57.16	-4.16	0.91	-62.23	-13.00	-49.23
90.14	45.64	V	-57.54	-7.75	1.27	-66.56	-13.00	-53.56
104.69	41.80	V	-59.69	-7.76	1.38	-68.83	-13.00	-55.83
153.19	44.48	V	-53.10	-7.80	1.60	-62.50	-13.00	-49.50
164.83	43.84	V	-54.78	-7.81	1.63	-64.22	-13.00	-51.22
286.08	42.83	V	-55.88	-7.91	2.12	-65.91	-13.00	-52.91
1910.00	80.86	V	-23.47	10.08	5.66	-19.05	-13.00	-6.05
3819.60	42.34	V	-55.05	12.60	8.47	-50.92	-13.00	-37.92
5729.40		V		13.49	10.50		-13.00	
7639.20		V		11.40	12.27		-13.00	
9549.00		V		11.95	13.74		-13.00	
11458.80		V		12.17	15.43		-13.00	
13368.60		V		12.97	16.82		-13.00	
15278.40		V		15.00	18.29		-13.00	
17188.20		V		14.47	19.52		-13.00	
19098.00		V		18.66	20.78		-13.00	

	30MHz - 80MHz: 5.04dB		
Measurement uncertainty	80MHz -1000MHz: 3.76dB		
	1GHz - 13GHz: 4.45dB		

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"----" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)



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Radiated Spurious Emission Measurement Result: PCS 1900 Mode

-			
Operation Mode	: TX CH High Mode	Test Date:	Mar. 09, 2010
Fundamental Frequency	: 1909.8 MHz	Test By:	Jazz
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
40.67	42.32	Н	-60.77	-2.51	0.91	-64.19	-13.00	-51.19
90.10	45.48	Н	-58.25	-7.75	1.27	-67.27	-13.00	-54.27
133.79	44.91	Н	-54.56	-7.79	1.52	-63.86	-13.00	-50.86
150.28	44.98	Н	-52.81	-7.80	1.59	-62.20	-13.00	-49.20
252.13	43.63	Н	-55.52	-7.89	2.00	-65.41	-13.00	-52.41
288.99	40.93	Н	-57.07	-7.91	2.13	-67.12	-13.00	-54.12
1910.00	68.16	Н	-35.95	10.08	5.66	-31.53	-13.00	-18.53
3819.60	43.54	Н	-53.97	12.60	8.47	-49.83	-13.00	-36.83
5729.40		Н		13.49	10.50		-13.00	
7639.20		Н		11.40	12.27		-13.00	
9549.00		Н		11.95	13.74		-13.00	
11458.80		Н		12.17	15.43		-13.00	
13368.60		Н		12.97	16.82		-13.00	
15278.40		Н		15.00	18.29		-13.00	
17188.20		Н		14.47	19.52		-13.00	
19098.00		Н		18.66	20.78		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB		
	80MHz -1000MHz: 3.76dB		
	1GHz - 13GHz: 4.45dB		

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"----" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)



FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT 10

10.1 **Standard Applicable** According to FCC §2.1055(a)(1)

Frequency Tolerance: +/- 2.5 ppm

10.2 **Test Set-up:**



Variable DC Power Supply

Note : Measurement setup for testing on Antenna connector

10.3 **Measurement 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 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30° C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10° C increased per stage until the highest temperature of $+50^{\circ}$ C reached.

10.4 **Measurement Equipment Used:**

Refer to section 2.4 in this report

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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10.5 **Measurement Result**

Reference Frequency: GSM Mid Channel 836.6 MHz°C						
	Limit	: +/- 2.5 ppm = 20	91 Hz			
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Hz)		
Vdc	Temperature (℃)	(MHz)	Della (HZ)	Linint (HZ)		
3.7	-30	836.599998	-15.00	2091		
3.7	-20	836.599993	-10.00	2091		
3.7	-10	836.59999	-7.00	2091		
3.7	0	836.599974	9.00	2091		
3.7	10	836.599978	5.00	2091		
3.7	20	836.599983	0.00	2091		
3.7	30	836.599988	-5.00	2091		
3.7	40	836.599979	4.00	2091		
3.7	50	836.59999	-7.00	2091		

Reference Frequency: PCS Mid Channel 1880 MHz								
	Limit: +/- 2.5 ppm = 4700 Hz							
Power Supply	Environment	Frequency	Dolta (Uz)	Limit (Uz)				
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Linint (HZ)				
3.7	-30	1879.999911	57.00	4700				
3.7	-20	1879.999992	-24.00	4700				
3.7	-10	1879.999964	4.00	4700				
3.7	0	1879.999958	10.00	4700				
3.7	10	1879.999975	-7.00	4700				
3.7	20	1879.999968	0.00	4700				
3.7	30	1879.999980	-12.00	4700				
3.7	40	1879.999952	16.00	4700				
3.7	50	1879.999965	3.00	4700				

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

11.1 **Standard Applicable**

According to FCC §2.1055(d)(2) Frequency Tolerance: +/- 2.5 ppm

11.2 **Test Set-up:** Refer to section 10.2 in this report

11.3 **Measurement Procedure**

Set chamber temperature to 25°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 specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

11.4 **Measurement Equipment Used:**

Refer to section 2.4 in this report

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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11.5 **Measurement Result**

Reference Frequency: GSM Mid Channel 836.6 MHz								
	Limit: +/- 2.5 ppm = 2091 Hz							
Power Supply	Environment	Frequency						
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Linint (HZ)				
4.25	25.00	836.599980	3.00	2091.00				
3.7	25.00	836.599983	0.00	2091.00				
3.3	25.00	836.599971	12.00	2091.00				
3.3	25.00	026 500071	12.00	2001.00				
(Endpoint)	25.00	836.399971	12.00	2091.00				

Reference Frequency: PCS Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.25	25	1879.999963	5.00	4700
3.7	25	1879.999968	0.00	4700
3.3	25	1879.999953	15.00	4700
3.3	25	1070 000052	15.00	1700
(Endpoint)	25	18/9.999953	15.00	4700

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