



FCC PART 22 H/24 E

MEASUREMENT AND TEST REPORT

For

EYO ASIA ELECTRONIC CO.,LTD

Room 2128,Block A,QunXing Plaza, HuaQiangNorth Road,
Futian District,Shenzhen

Report Type: Original Report	Product Type: GSM Mobile Phone
Test Engineer:	Simon Mo <i>simon mo</i>
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Reviewed By:	Mike Yong <i>Mike Yong</i>
Prepared By:	EMC Engineer SHENZHEN BATT TESTING TECHNOLOGY CO.,LTD. 11F,Bldg.B,Xinbaoyuan,XinanhuCommercialcity,Bao'an District,Shenzhen,Guangdong,China Tel.:86-755-27754004(100 lines) Fax.:86-755-27754182

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *EYO ASIA ELECTRONIC CO.,LTD*'s product, model number: *A060* or the "EUT" as referred to in this report is a *GSM Mobile Phone*, which measures approximately:
111.0 mm (L) x 61.0 mm (W) x 15.0 mm (H), rated input voltage: DC 3.7V Rechargeable Li-ion battery or DC 5.0 V adapter for charging.

Frequency Range:

Cellular Band: 824-849 MHz (TX), 869-894 MHz (RX)
PCS Band: 1850-1910 MHz (TX), 1930-1990 MHz (RX)
Bluetooth: 2402-2480MHz (TX/ RX)
WI-FI IEEE 802.11b/g: 2412-2462MHz (TX/RX)

Modulation Mode: GSM/PCS: GMSK; Bluetooth: GFSK; WI-FI: DSSS/OFDM

Transmitter Output Power:

Cellular Band: 32±2dBm
PCS Band: 30±2dBm
Bluetooth: -6~4dBm
WI-FI IEEE 802.11b: 16±2dBm; IEEE 802.11g: 13±2dBm

Adapter information:

Input: 100-240VAC 50/60Hz 150mA;
Output: 5.0V 600mA

Objective

This type approval report is prepared on behalf of *EYO ASIA ELECTRONIC CO.,LTD* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at ShenZhen Emtex Co.,Ltd . The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by ShenZhen Emtex Co.,Ltd to collect test data is located in Bldg. 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China.

Test site at ShenZhen Emtex Co.,Ltd has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on March 18, 2008 and October 28, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 709623 and 406365. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA/EIA-603-C.

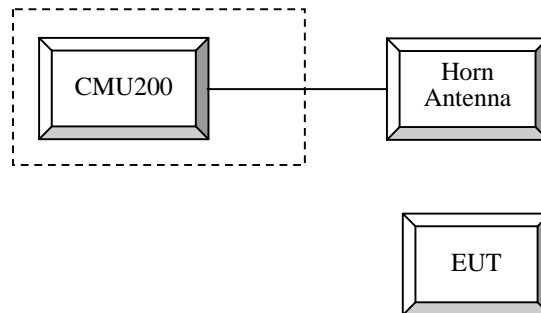
The GSM/PCS item test was performed with the EUT operating at normal mode.

The GPRS item test was performed with the EUT operating at engineering mode.

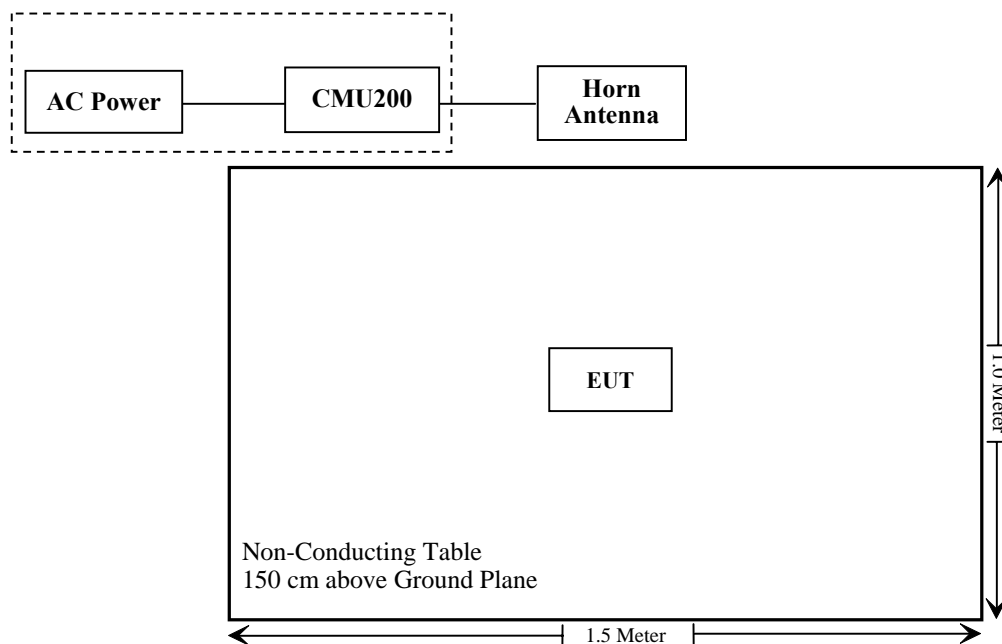
Equipment Modifications

No modifications were made to the EUT.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307, §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; § 22.905 § 22.917; § 24.238	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051, § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053 § 22.917 (a); § 24.238 (a)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a)	Out of band emission, Band Edge	Compliance
§ 2.1055 § 22.355; § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: * Please refer to SAR report released by *Compliance Certification Service Inc.*, Report No: KS110623B03.

§1.1037, §2.1093 - RF EXPOSURE

Applicable Standard

§1.1307 and §2.1093.

Test Result

Compliance

The EUT is a portable device and thus requires SAR evaluation; please refer to *Compliance Certification Service Inc.* SAR report: KS110623B03.

§2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

§ 2.1046, § 22.913 (a), & § 24.232 (c) - RF OUTPUT POWER

Applicable Standard

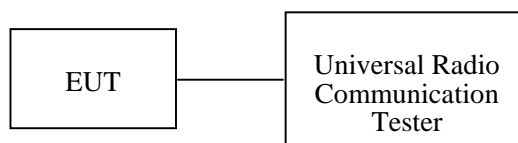
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications..

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

TIA 603-C section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP30	839511/010	2010-09-26	2011-09-25
Rohde & Schwarz	EMI Test Receiver	ESCI	100005	2011-03-08	2012-03-07
HP	Amplifier	8447D	2944A07999	2010-10-02	2011-10-02
HP	Amplifier	8449B	2624A00116	2011-03-03	2012-03-02
Hewlett-Packard	Signal Generator	8657A	3217A04699	2010-11-03	2011-11-02
Electro-Metrics	Horn Antenna	EM6961	103314	2011-04-17	2012-04-16
Schwarzbeck	Horn Antenna	BBHA 9120	D143	2010-09-04	2011-09-03
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	102910	2010-09-26	2011-09-25
COM POWER	Dipole Antenna	AD-100	041001	2010-09-25	2011-09-24
Schwarzbeck	Bilog Antenna	VULB9163	142	2011-04-12	2012-04-11
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-03-11	2012-03-10

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	100.0kPa

The testing was performed by Simon Mo on 2011-06-18.

Test mode: Transmitting

Please refer to the following tables

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.23	38.45
	190	836.6	31.92	38.45
	251	848.8	31.62	38.45

Mode	Channel	Frequency (MHz)	Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GPRS	128	824.2	32.16	31.41	Not Supported	
	190	836.6	31.74	30.55		
	251	848.8	31.58	30.34		

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
PCS	512	1850.2	30.17	33
	661	1880.0	29.83	33
	810	1909.8	29.59	33

Mode	Channel	Frequency (MHz)	Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
GPRS	512	1850.2	30.09	28.68	Not Supported	
	661	1880.0	29.77	28.47		
	810	1909.8	29.49	28.24		

ERP & EIRP**ERP for Cellular Band (Part 22H)**

GSM 850:

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBd)	Cable Loss (dB)	Absolute Level (dBm)	Part 22H
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Polar (H/V)				Limit (dBm)
Low Channel											
824.2	100.32	220	2.0	V	824.2	31.5	V	0	0.9	30.6	38.45
824.2	86.15	245	2.0	H	824.2	22.6	H	0	0.9	21.7	38.45

EIRP for PCS Band (Part 24E)

PCS 1900:

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Part 24E
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Polar (H/V)				Limit (dBm)
Low Channel											
1850.2	95.19	82	1.1	V	1850.2	23.4	V	6.2	1.1	28.5	33
1850.2	89.25	320	1.9	H	1850.2	20.3	H	6.2	1.1	25.4	33

Note: all above data were tested with no amplifier.

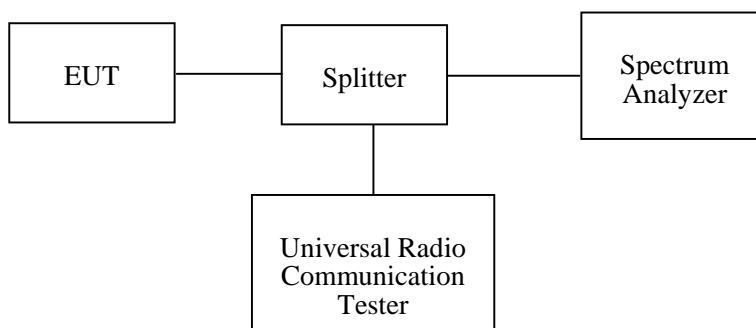
§2.1049, §22.917, §22.905, & §24.238 - OCCUPIED BANDWIDTH**Applicable Standards**

CFR 47 §2.1049, §22.917, §22.905 and §24.238.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 kHz (Cellular /PCS) and the 26 dB & 99% bandwidth was recorded.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100005	2011-03-08	2012-03-07
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	102910	2010-09-26	2011-09-25

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	100.0kPa

The testing was performed by Simon Mo on 2011-06-18.

Test mode: Transmitting

Please refer to the following tables and plots

GMSK:

Cellular Band (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
190	836.6	250.00	336.00

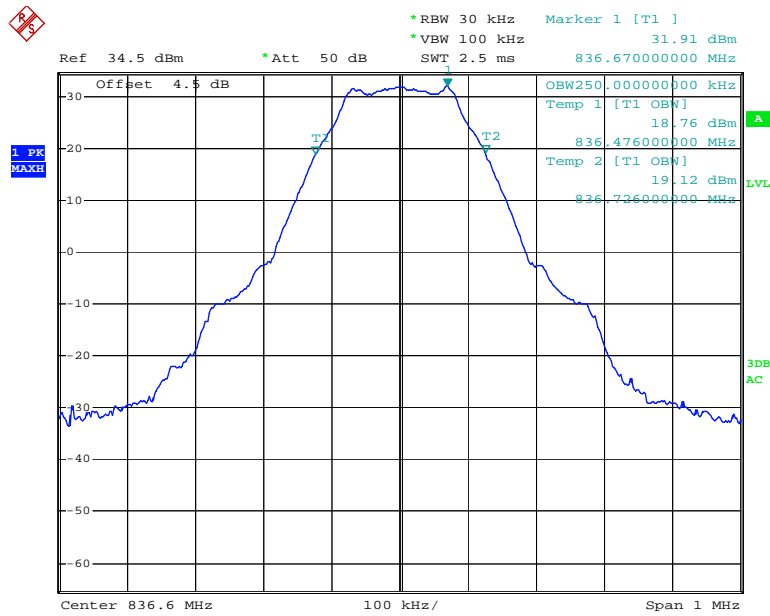
PCS Band (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
661	1880.0	250.00	334.00

Please refer to the following plots.

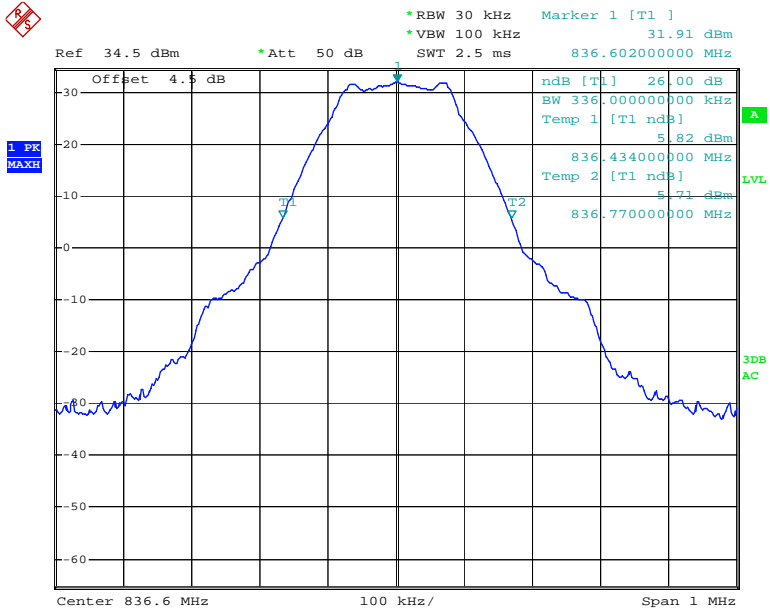
Cellular Band (Part 22H)

99% Band width



File: 14-EMW-2011-03-23-01

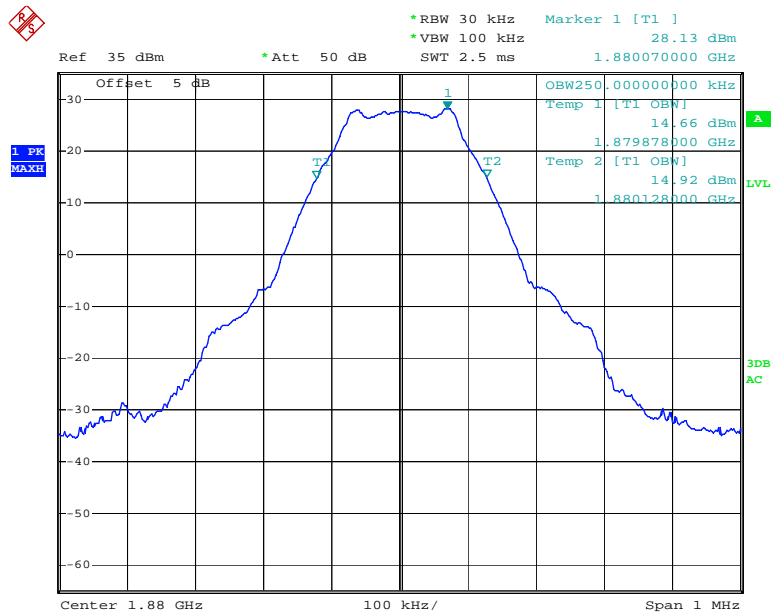
26 dB Bandwidth



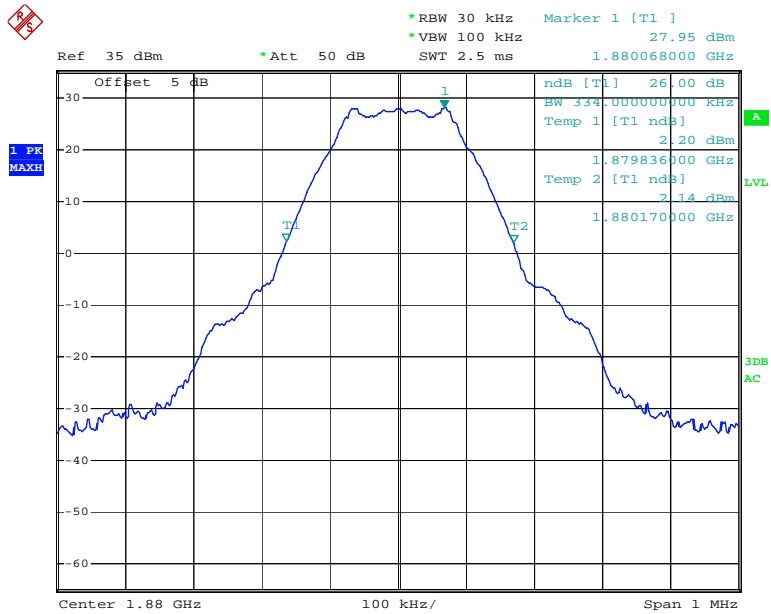
File: 14-EMW-2011-03-23-01

PCS Band (Part 24E)

99% Band width



26 dB Bandwidth



§2.1051, §22.917(a), & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

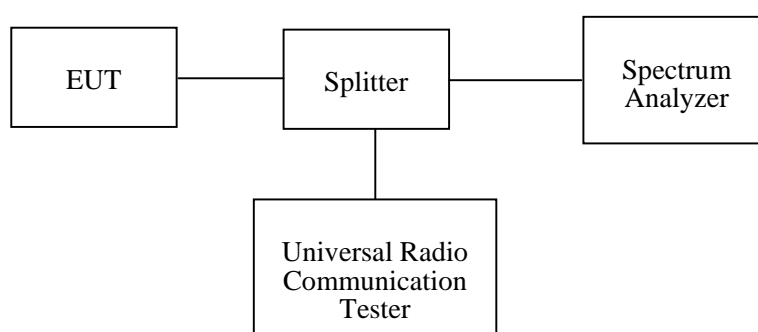
Applicable Standards

CFR 47 §2.1051, §22.917(a) and §4.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP30	839511/010	2010-09-26	2011-09-25
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	102910	2010-09-26	2011-09-25

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	100.0kPa

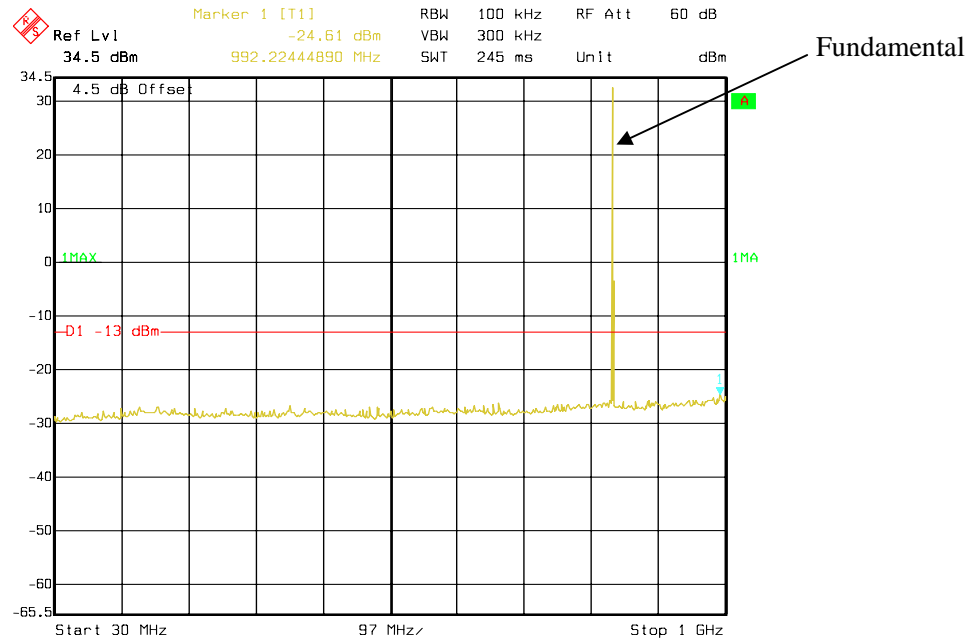
The testing was performed by Simon Mo on 2011-06-18.

Test mode: Transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

30 – 1000 MHz – Low Channel

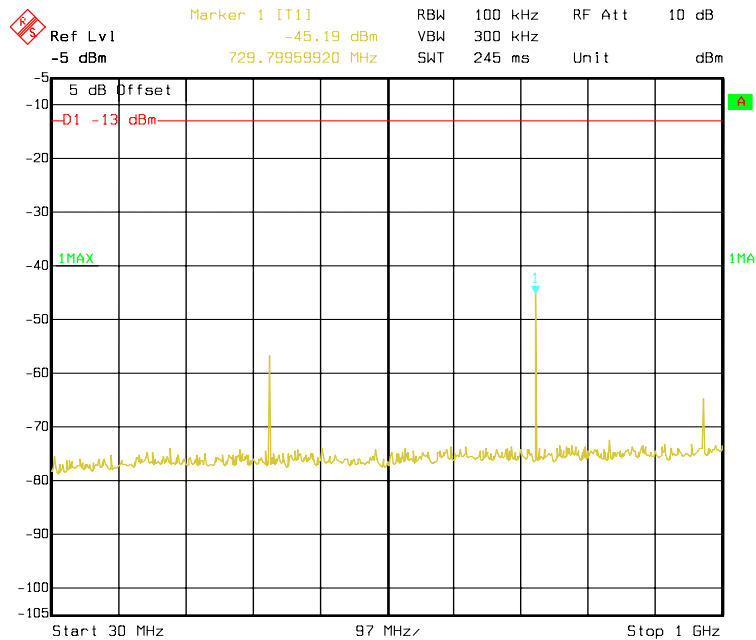


1 – 10 GHz - Low Channel

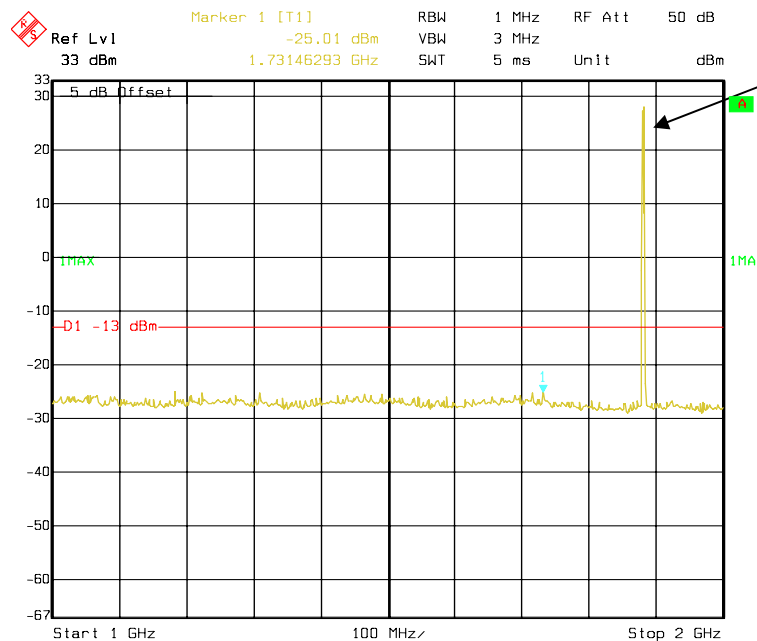


PCS Band (Part24E)

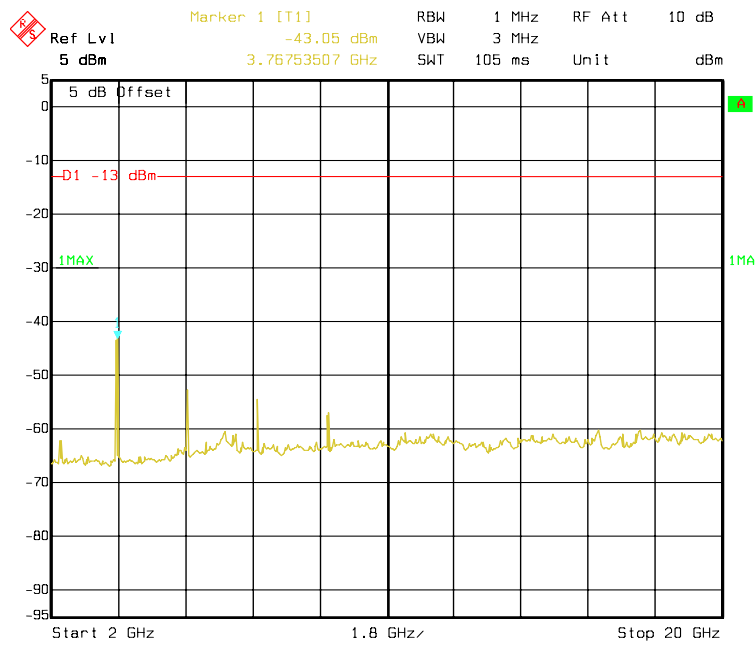
30 – 1000 MHz - Low Channel



1 – 2 GHz - Low Channel



2 – 20 GHz - Low Channel



§2.1053, §22.917, §24.238 - SPURIOUS RADIATED EMISSIONS**Applicable Standards**

CFR 47 § 2.1053, §22.917 and § 24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSP30	839511/010	2010-09-26	2011-09-25
Rohde & Schwarz	EMI Test Receiver	ESCI	100005	2011-03-08	2012-03-07
HP	Amplifier	8447D	2944A07999	2010-10-02	2011-10-02
HP	Amplifier	8449B	2624A00116	2011-03-03	2012-03-02
Hewlett-Packard	Signal Generator	8657A	3217A04699	2010-11-03	2011-11-02
Electro-Metrics	Horn Antenna	EM6961	103314	2011-04-17	2012-04-16
Schwarzbeck	Horn Antenna	BBHA 9120	D143	2010-09-04	2011-09-03
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	102910	2010-09-26	2011-09-25
COM POWER	Dipole Antenna	AD-100	041001	2010-09-25	2011-09-24
Schwarzbeck	Bilog Antenna	VULB9163	142	2011-04-12	2012-04-11
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-03-11	2012-03-10

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	100.0kPa

The testing was performed by Simon Mo on 2011-06-20.

Test mode: Transmitting

Cellular Band (Part 22H)

Below 1 GHz

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBd)	Cable Loss (dB)			
Low Channel											
252.35	40.23	171	1.3	H	252.35	-60.4	0	0.55	-60.95	-13	47.95
252.35	42.46	152	1.5	V	252.35	-56.7	0	0.55	-57.25	-13	44.25
467.46	41.16	249	1.2	H	467.46	-58.3	0	0.65	-58.95	-13	45.95
467.46	43.67	213	1.6	V	467.46	-54.7	0	0.65	-55.35	-13	42.35

Above 1 GHz

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Low Channel											
1648.8	46.54	352	1.8	H	1648.8	-53.9	6.2	2.40	-50.1	-13	37.10
1648.8	51.77	187	1.4	V	1648.8	-48.7	6.2	2.40	-44.9	-13	31.9
2472.6	42.67	294	1.8	H	2472.6	-55.8	7.3	3.21	-51.71	-13	38.71
2472.6	43.56	188	1.5	V	2472.6	-52.9	7.3	3.21	-48.81	-13	35.81

PCS Band (Part 24E)

Below 1 GHz

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBd)	Cable Loss (dB)			
Low Channel											
201.32	42.23	187	1.4	H	201.32	-58.0	0	0.50	-58.5	-13	45.50
201.32	44.75	122	1.5	V	201.32	-53.6	0	0.50	-54.1	-13	41.10
410.28	41.61	72	1.5	H	410.28	-57.5	0	0.63	-58.13	-13	45.13
410.28	43.33	243	1.2	V	410.28	-55.2	0	0.63	-55.83	-13	42.83

Above 1 GHz

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Low Channel											
3700.4	44.47	246	1.6	H	3700.4	-50.1	6.9	3.75	-46.95	-13	33.95
3700.4	46.41	193	1.5	V	3700.4	-48.1	6.9	3.75	-44.95	-13	31.95
5550.6	49.58	174	1.6	H	5550.6	-40.9	8.3	4.66	-37.26	-13	24.26
5550.6	45.94	83	1.2	V	5550.6	-44.6	8.3	4.66	-40.96	-13	27.96

§22.917(a) & §24.238(a) - BAND EDGES

Applicable Standards

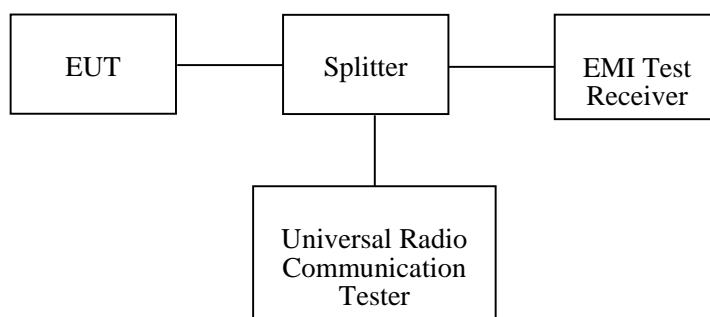
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100005	2011-03-08	2012-03-07
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	102910	2010-09-26	2011-09-25

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI)

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	100.0kPa

The testing was performed by Simon Mo on 2011-06-18.

Test mode: Transmitting

Please refer to the following tables and plots.

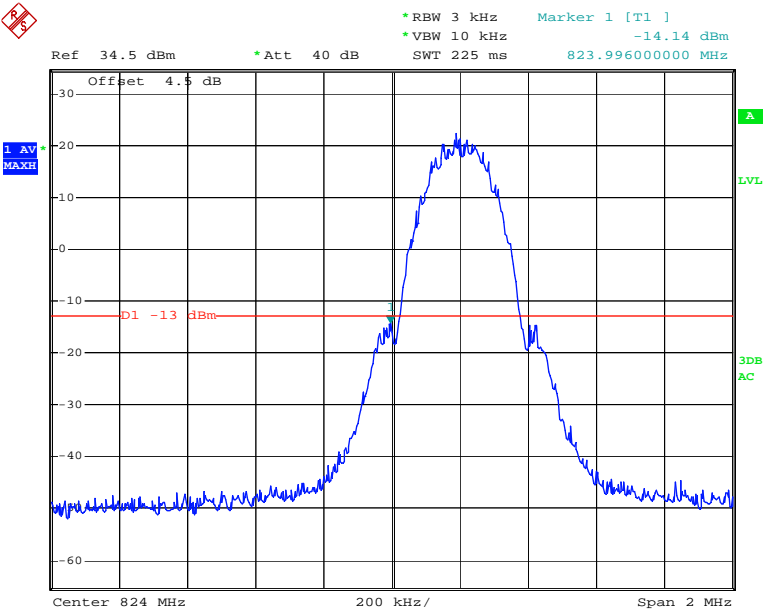
Cellular Band (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.996	-14.14	-13
849.024	-13.87	-13

PCS Band (Part 24E)

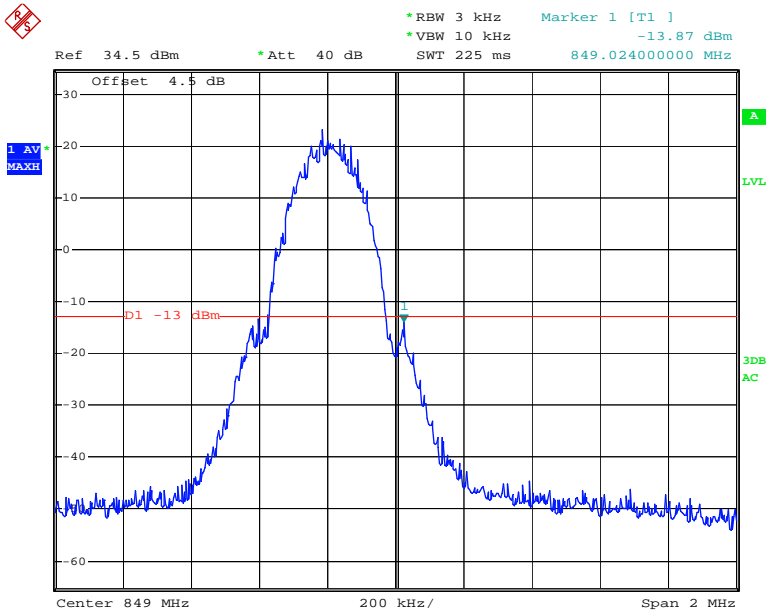
Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.996	-20.29	-13
1910.020	-18.94	-13

Cellular Band, Left Band Edge



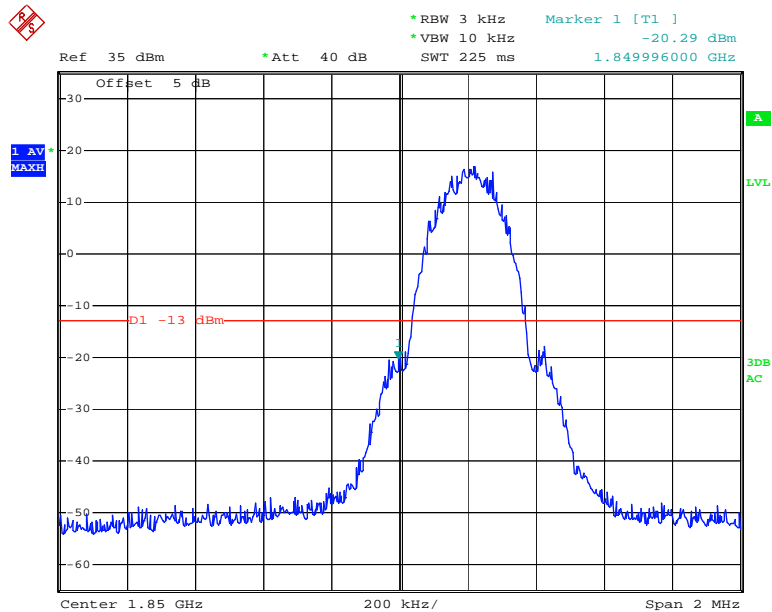
15 JUN 2013 10:22:22

Cellular Band, Right Band Edge



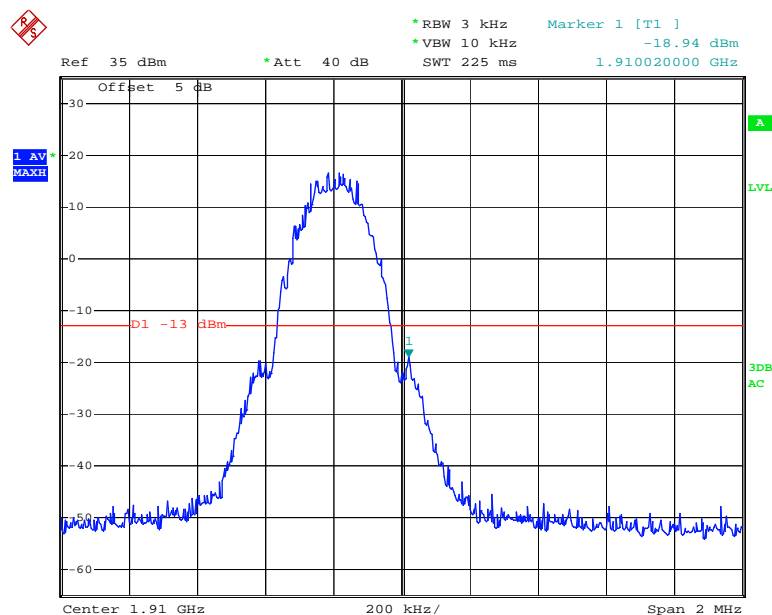
15 JUN 2013 10:24:52

PCS Band, Left Band Edge



15 JUN 2011 10:15:00

PCS Band, Right Band Edge



15 JUN 2011 10:10:00

§2.1055, §22.355, & §24.235 - FREQUENCY STABILITY

Applicable Standard

CFR47 § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

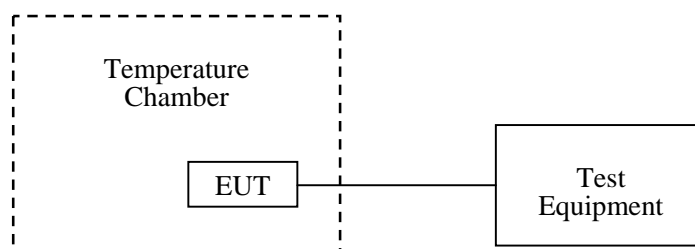
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
WUHUAN	Temperature & Humidity Chamber	HTP205	20021117	2010-10-28	2011-10-27
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	102910	2010-09-26	2011-09-25

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	100.0kPa

The testing was performed by Simon Mo on 2011-06-20.

Test mode: Transmitting

Cellular Band (Part 22H)

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-20	3.7	-16	-0.01913	2.5
-10		-16	-0.01913	2.5
0		-17	-0.02032	2.5
10		-15	-0.01793	2.5
20		-16	-0.01913	2.5
30		-14	-0.01673	2.5
40		-15	-0.01793	2.5
50		-18	-0.02152	2.5
55		-14	-0.01673	2.5
25	V max.= 4.2	-15	-0.01793	2.5
	V min.= 3.5	-16	-0.01913	2.5

PCS Band (Part 24E)

Middle Channel, $f_o = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	3.7	-16	-0.00851	Compliance
-10		-19	-0.01011	Compliance
0		-15	-0.00798	Compliance
10		-23	-0.01223	Compliance
20		-18	-0.00957	Compliance
30		-14	-0.00745	Compliance
40		-17	-0.00904	Compliance
50		-24	-0.01277	Compliance
55		-18	-0.00957	Compliance
25	V max.= 4.2	-15	-0.00798	Compliance
	V min.= 3.5	-16	-0.00851	Compliance

******* END OF REPORT *******