Lab Code: 200707-0

FCC PART 22H, PART 24E

TEST REPORT

For

VeryKool USA INC.

3636 Nobel Drive, Suite 325, San Diego, California, United States, 92122

FCC ID: WA6RS90

Report Type:	**Product Type:**
Original Report	Mobile phone

Test Engineer: Henry Ding

Report Number: RSZ120929001-00C

Report Date: 2013-01-07

Reviewed By: Alvin Huang
RF Leader

Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen)
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TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *VeryKool USA INC.*'s product, model number: *RS90 (FCC ID: WA6RS90)* or the "EUT" in this report was a *Mobile phone,* which was measured approximately: 14.0 cm (L) x 7.5 cm (W) x 1.0 cm (H), rated input voltage: DC 3.7 V Li-ion battery.

** All measurement and test data in this report was gathered from production sample serial number: 1209140 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2012-09-29.*

Objective

This test report is prepared on behalf of *VeryKool USA INC.* 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 the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 15.247 DTS and Part 15B JBP submissions with FCC ID: WA6RS90.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart 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-D, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) 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 December 06, 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.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The final qualification test was performed with the EUT operating at normal mode.

GSM:
The following tests were conducted according to the test requirements outlines in section 13.3 of the 3GPP TS 51.010-1 specification. The EUT has a nominal maximum output power of 33dBm (+3/-3) for GSM 850, 30dBm (+3/-3) for PCS 1900.

GPRS:
The following tests were conducted according to the test requirements outlines in section 13.16 of the 3GPP TS 51.010-1 specification. The EUT has a nominal maximum output power of 33dBm (+3/-3) for GSM 850, 30dBm (+3/-3) for PCS 1900.

EDGE:
The following tests were conducted according to the test requirements outlines in section 13.17 of the 3GPP TS 51.010-1 specification. The EUT has a nominal maximum output power of 27dBm (+3/-3) for GSM 850, 26dBm (+3/-3) for PCS 1900.

WCDMA-Release 99:

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

WCDMA General Settings	**Loopback Mode**	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc /βd	8/15

WCDMA HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	D_{CQI}	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs= βhs/βc	30/15			

WCDMA HSUPA

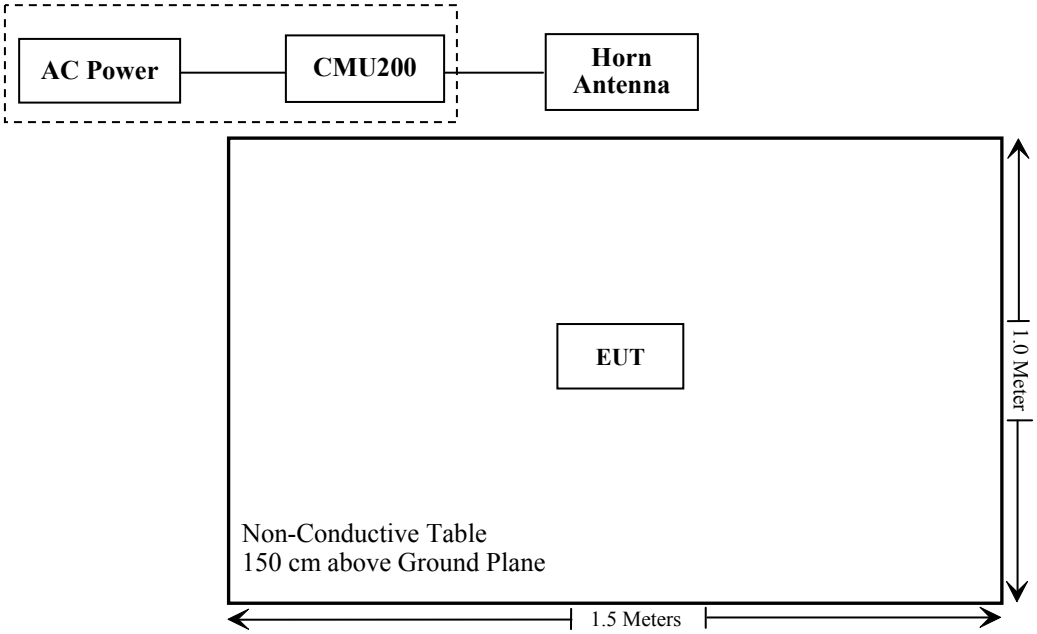
The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subset	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	CM(dB)	1.0	3.0	2.0	3.0	1.0
	MPR(dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	Ahs=βhs/βc	30/15				
HSUPA Specific Settings	DE-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCIs	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27	

Equipment Modifications

No modification was made to the EUT.

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	Not Applicable
§ 2.1049; § 22.905 § 22.917; § 24.238	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 BACL, report number: RSZ120929001-20

FCC §1.1307 & §2.1093 - RF EXPOSURE

Applicable Standard

FCC§1.1307 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ120929001-20.

FCC §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.

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

Applicable Standard

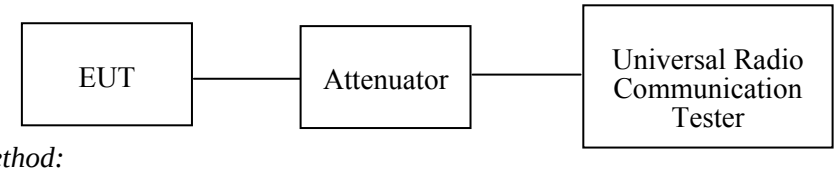
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

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-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2013-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
HP	Synthesized Sweeper	8341B	2624A00116	2012-05-17	2013-05-16
COM POWER	Dipole Antenna	AD-100	041000	2012-06-06	2013-06-05
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2012-04-11	2013-04-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Henry Ding on 2012-11-14.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.98	38.45
	190	836.6	31.86	38.45
	251	848.8	31.41	38.45

Mode	Frequency (MHz)	Peak Output Power (dBm)				Limit (dBm)
		Slot 1	Slot 2	Slot 3	Slot 4	
GPRS	824.2	31.95	30.12	28.55	27.06	38.45
	836.6	31.85	30.13	28.50	26.77	38.45
	848.8	31.66	30.04	28.37	26.67	38.45

Mode	Frequency (MHz)	Peak Output Power (dBm)				Limit (dBm)
		Slot 1	Slot 2	Slot 3	Slot 4	
EGPRS (EDGE)	824.2	26.99	24.79	23.27	21.72	38.45
	836.6	26.94	24.75	23.22	21.70	38.45
	848.8	26.84	24.59	23.09	21.54	38.45

Mode	Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
WCDMA850 (RMC 12.2kbps)	4132	826.4	22.27	38.45
	4183	836.6	22.39	38.45
	4233	846.6	22.23	38.45

Mode	Frequency (MHz)	Channel No.	Conducted Output Power			
			Subset 1	Subset 2	Subset 3	Subset 4
HSDPA	826.4	4132	22.20	21.94	22.04	21.57
	836.6	4183	22.17	22.05	21.96	21.61
	846.6	4233	21.78	21.63	21.74	21.89

Mode	Frequency (MHz)	Channel NO.	Conducted Output Power				
			Subset 1	Subset 2	Subset 3	Subset 4	Subset 5
HSUPA	826.4	4132	22.20	22.09	21.92	22.02	21.55
	836.6	4 183	22.33	22.06	22.03	21.94	21.59
	846.6	4 233	22.21	21.67	21.61	21.72	21.87

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.14	33
	661	1880.0	29.20	33
	810	1909.8	29.06	33

Mode	Frequency (MHz)	Peak Output Power (dBm)				Limit (dBm)
		Slot 1	Slot 2	Slot 3	Slot 4	
GPRS	1850.2	29.13	27.50	25.87	24.27	33
	1880.0	29.46	27.88	26.16	24.66	33
	1909.8	29.28	27.78	26.05	24.56	33

Mode	Frequency (MHz)	Peak Output Power (dBm)				Limit (dBm)
		Slot 1	Slot 2	Slot 3	Slot 4	
EGPRS (EDGE)	1850.2	25.93	25.31	25.29	24.72	33
	1880.0	26.25	25.58	25.52	24.96	33
	1909.8	26.29	25.61	25.54	25.00	33

Mode	Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
WCDMA1900 (RMC 12.2kbps)	9262	1852.4	22.44	33
	9400	1880.0	22.18	33
	9538	1907.6	22.96	33

Mode	Frequency (MHz)	Channel No.	Conducted Output Power			
			Subset 1	Subset 2	Subset 3	Subset 4
HSDPA	1852.4	9262	22.38	22.25	21.99	22.04
	1880.0	9400	21.83	22.13	22.45	22.32
	1907.6	9538	22.54	22.68	22.27	22.39

Mode	Frequency (MHz)	Channel No.	Conducted Output Power				
			Subset 1	Subset 2	Subset 3	Subset 4	Subset 5
HSUPA	1852.4	9 262	22.42	22.27	22.23	21.97	22.02
	1880.0	9 400	22.08	21.72	22.11	22.43	22.30
	1907.6	9 538	22.81	22.43	22.66	22.25	22.37

Radiated Power

ERP & EIRP

GSM Mode:

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H
		Angle Degree	Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
836.6	93.79	16	1.5	H	26.0	0.69	0.0	25.31	38.45
836.6	99.62	46	1.6	V	32.3	0.69	0.0	31.61	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1880.0	88.89	45	1.6	H	15.3	1.03	9.4	23.67	33
1880.0	86.74	44	1.6	V	18.3	1.03	9.4	26.67	33

EGPRS (EDGE) Mode:

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H
		Angle Degree	Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
836.6	89.56	23	1.6	H	21.7	0.69	0	21.01	38.45
836.6	94.13	51	1.6	V	26.8	0.69	0	26.11	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1880	84.78	48	1.6	H	11.1	1.03	9.4	19.47	33
1880	84.93	50	1.5	V	16.4	1.03	9.4	24.77	33

WCDMA Mode:

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBµV)	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H
		Angle Degree	Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
836.6	78.55	29	1.7	H	10.7	0.69	0.0	10.01	38.45
836.6	90.46	235	1.6	V	23.2	0.69	0.0	22.51	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1880.0	80.63	69	1.6	H	6.6	1.03	9.4	14.97	33
1880.0	78.39	255	1.8	V	9.5	1.03	9.4	17.87	33

FCC §2.1049, §22.917, §22.905 & §24.238 - BANDWIDTH

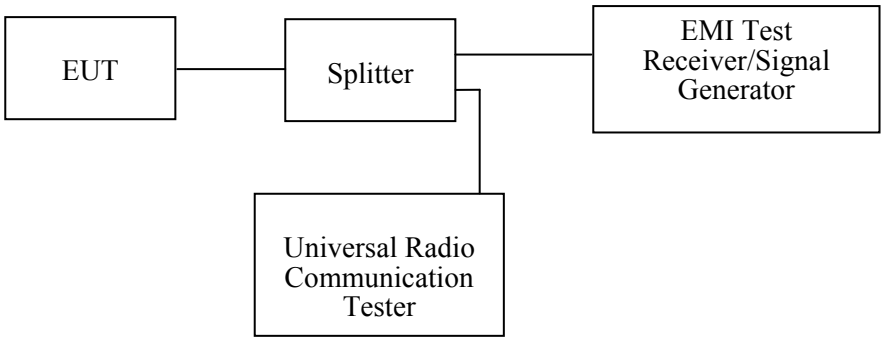
Applicable Standard

FCC §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 3 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	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2013-11-23
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2012-04-11	2013-04-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-15 and 2013-01-18.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
GSM	190	836.6	244.5	316.0

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
EGPRS (EDGE)	190	836.6	248.5	314.6

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA(QPSK)	190	836.6	4.17	4.65

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
HSDPA (16 QMA)	190	836.6	4.17	4.65

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
GSM	661	1880.0	244.5	316.0

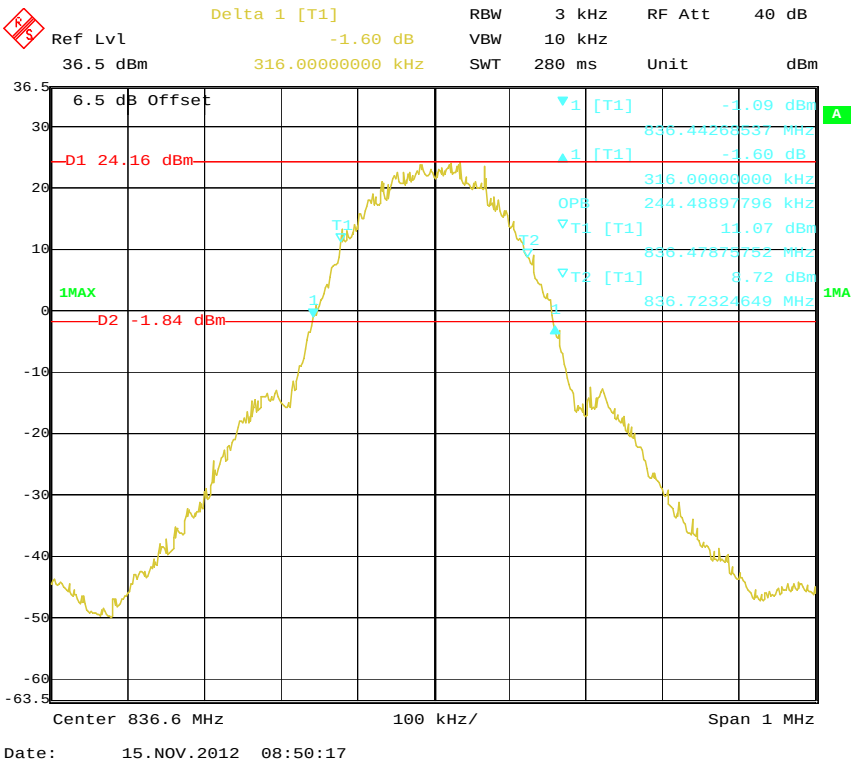
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
EGPRS (EDGE)	661	1880.0	248.5	314.6

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA(QPSK)	661	1880.0	4.19	4.67

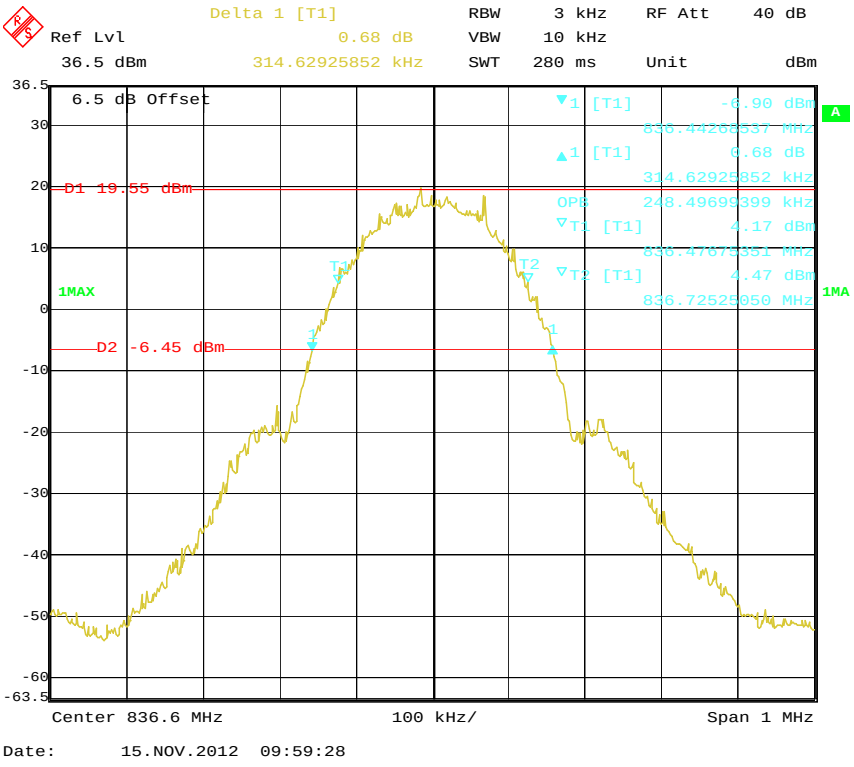
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
HSDPA (16 QMA)	661	1880.0	4.17	4.65

Cellular Band (Part 22H)

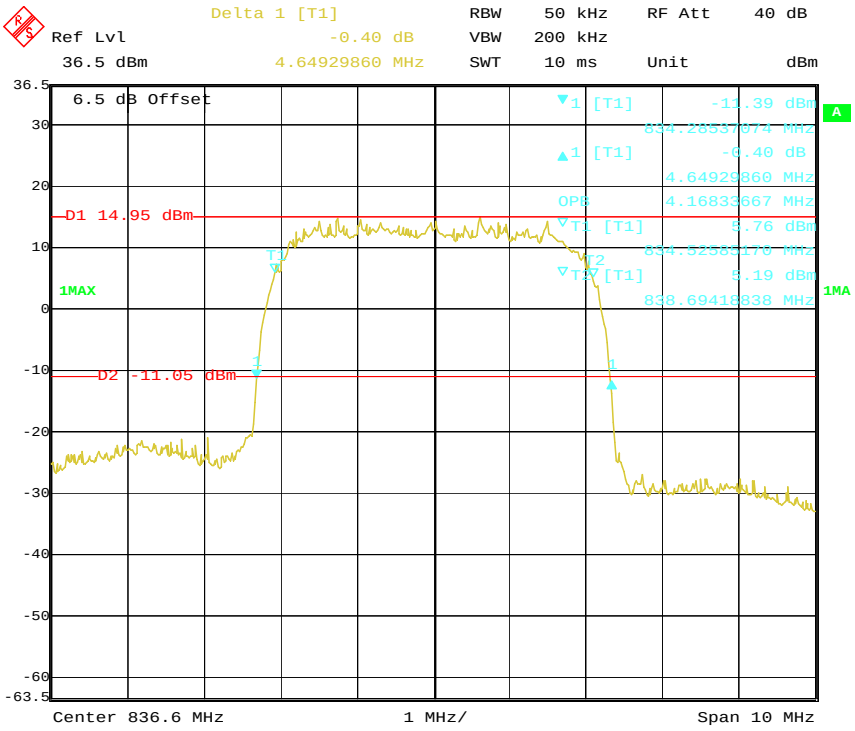
Bandwidth for GSM Mode



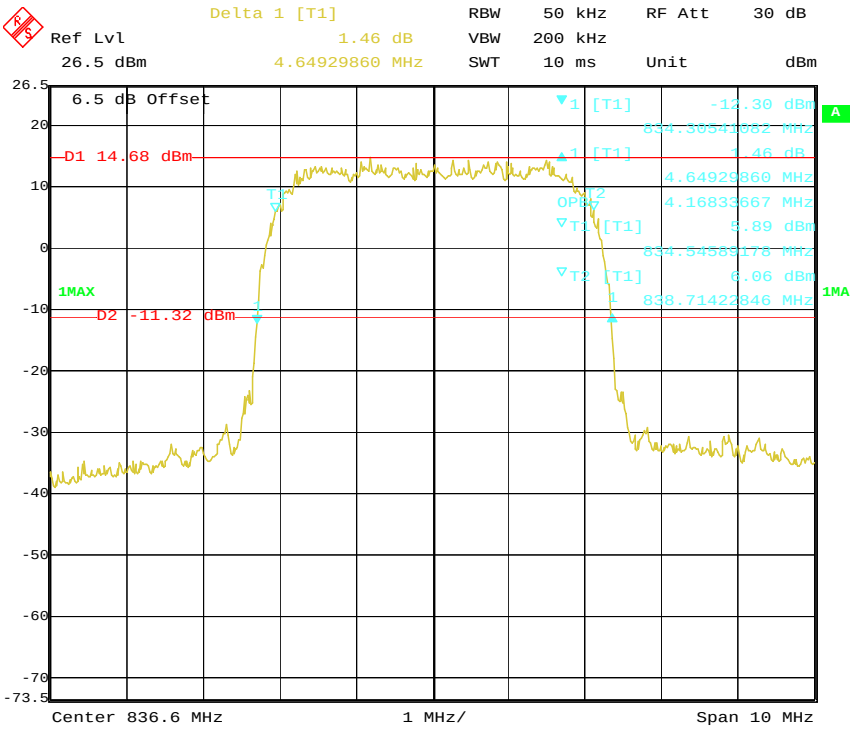
Bandwidth for EGPRS (EDGE) Mode



Bandwidth for WCDMA (QPSK) Mode

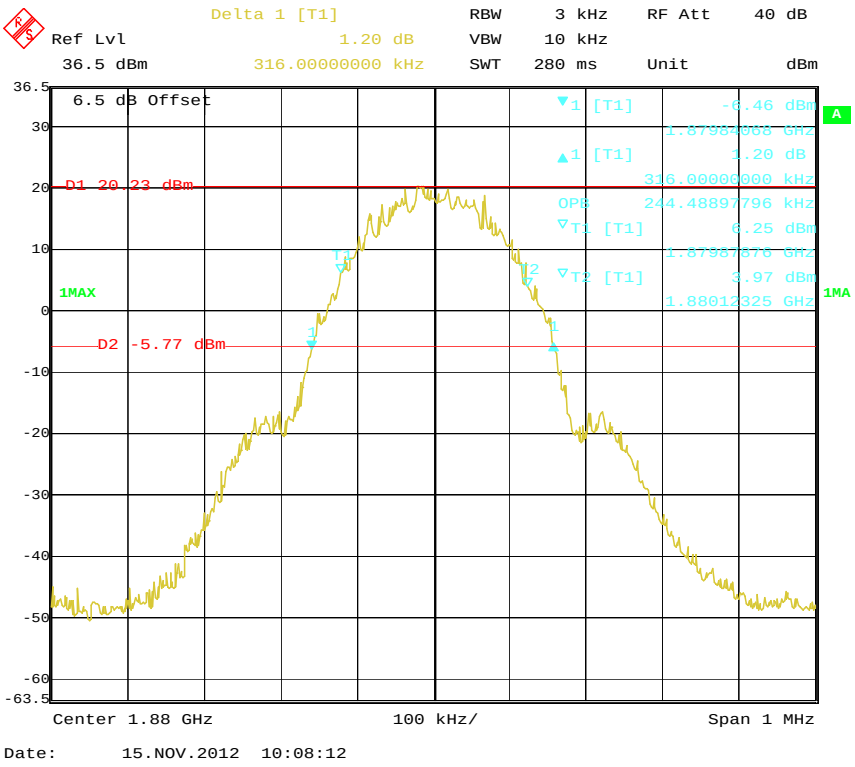


Bandwidth for HSDPA (16 QAM) Mode

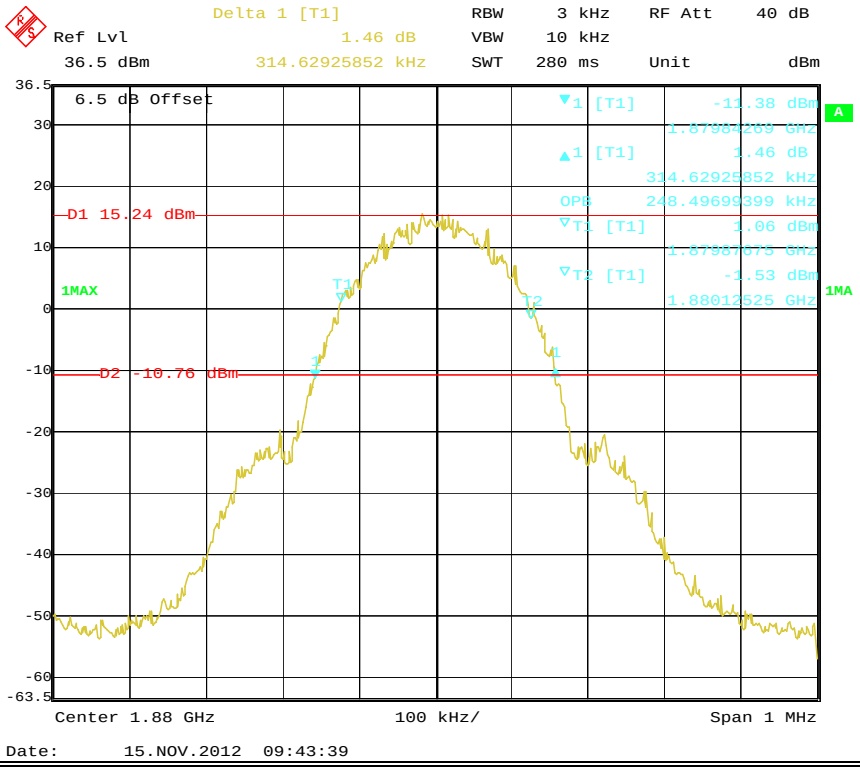


PCS Band (Part 24E)

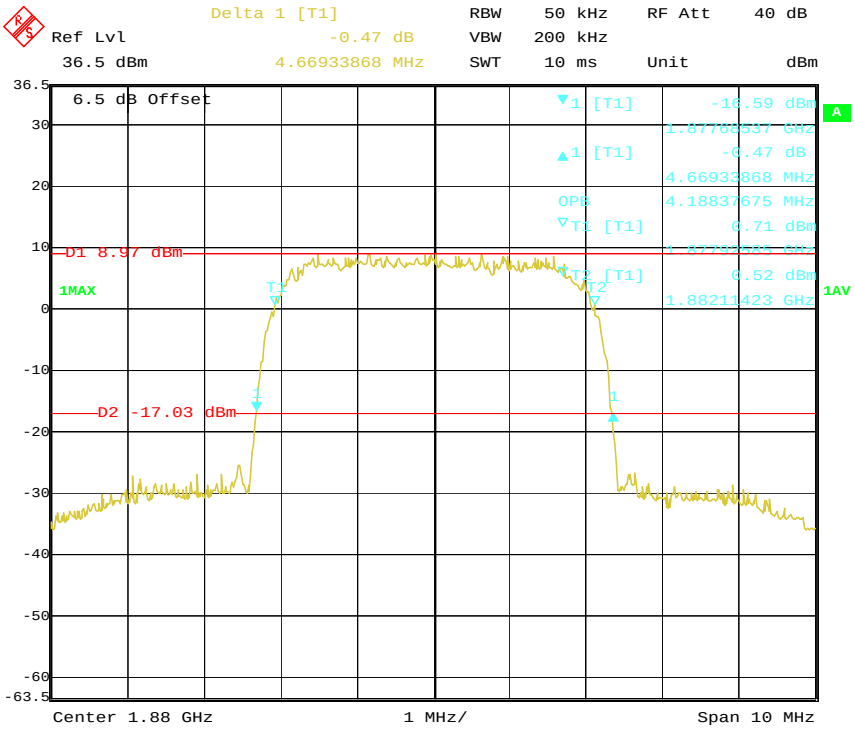
Bandwidth for GSM Mode



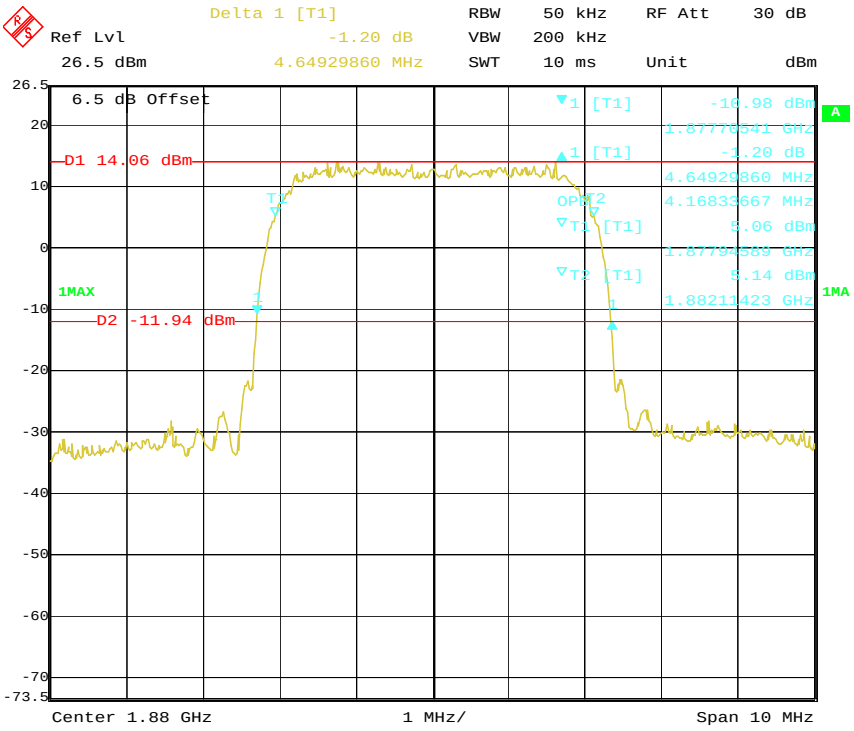
Bandwidth for EGPRS (EDGE) Mode



Bandwidth for WCDMA (QPSK) Mode



Bandwidth for HSDPA (16 QAM) Mode



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

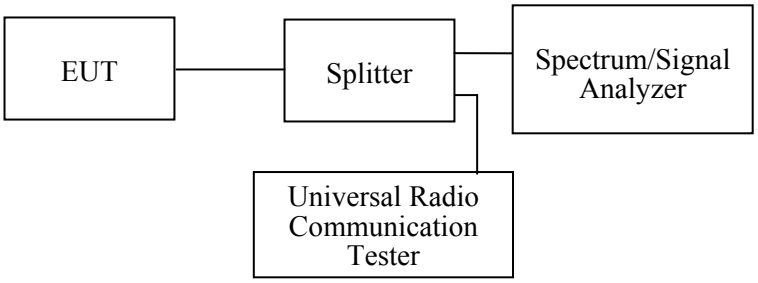
Applicable Standard

FCC §2.1051, §22.917(a) and §24.238(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 1MHz. 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	Universal Radio Communication Tester	CMU200	109038	2012-04-11	2013-04-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2013-11-23
Weinschel Engineering Gaithersburg.	DC-20GHz 10 dB Coaxial attenuator	50-10	H2174	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

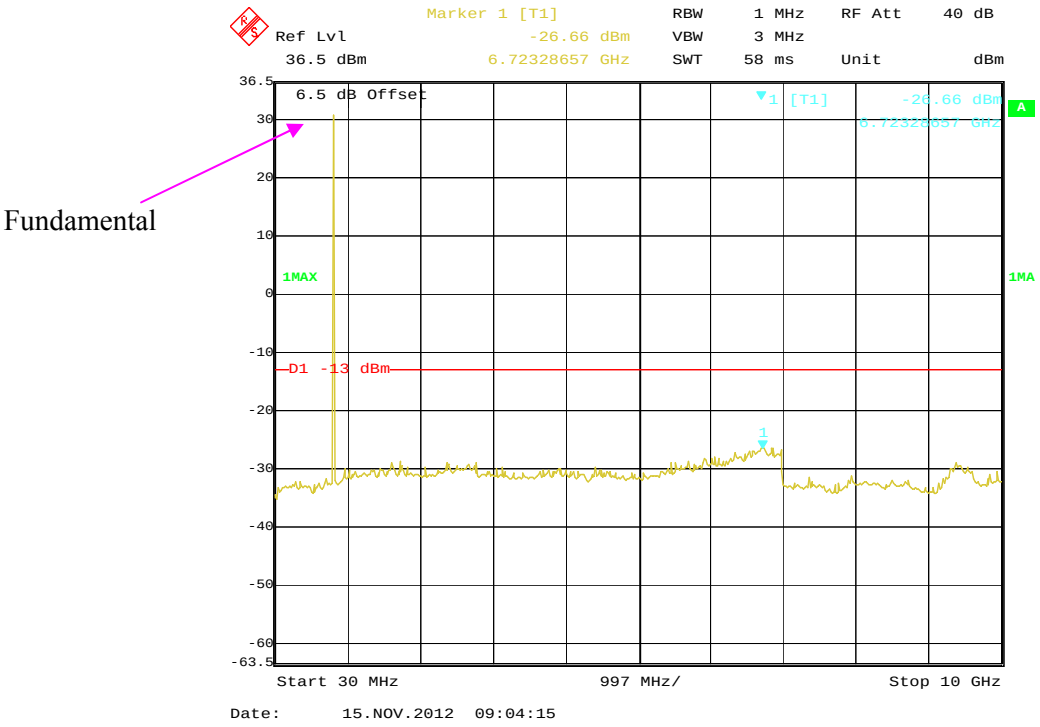
The testing was performed by Henry Ding on 2012-11-15 and 2013-01-21.

Test result: Compliance, please refer to the following plots.

GSM mode

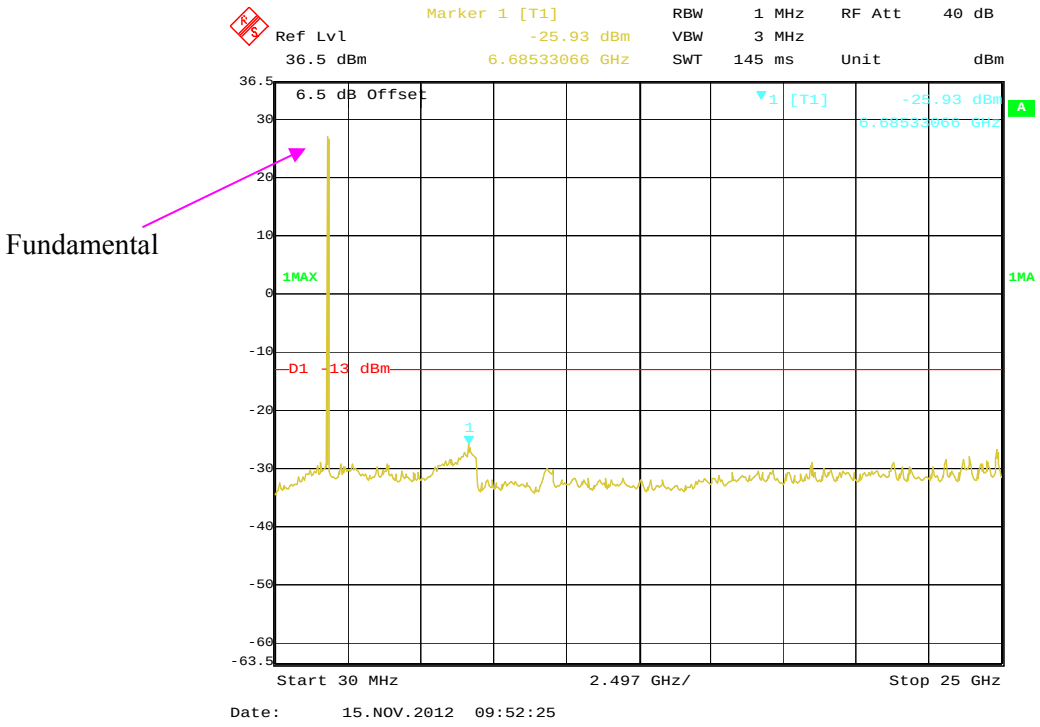
Cellular Band (Part 22H)

30 MHz – 10 GHz - Middle Channel



PCS Band (Part 24E)

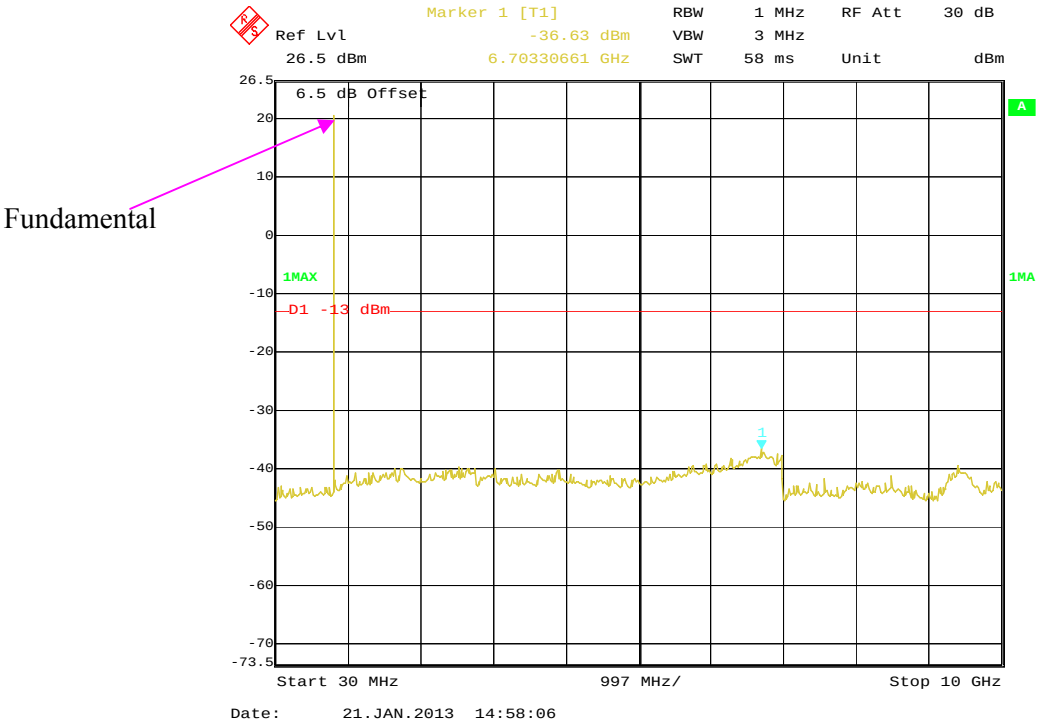
30 MHz – 25 GHz - Middle Channel



WCDMA mode

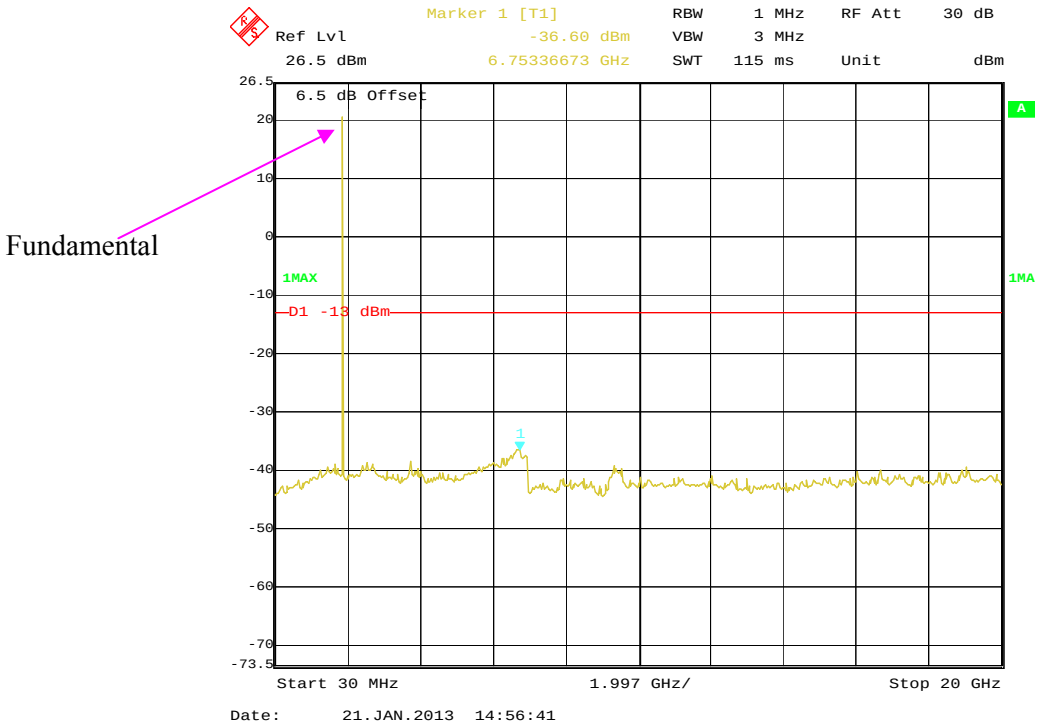
Cellular Band (Part 22H)

30 MHz – 10 GHz - Middle Channel



PCS Band (Part 24E)

30 MHz – 20 GHz - Middle Channel



FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 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 receiving 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 (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2013-11-23
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
HP	Amplifier	HP8447D	2944A09795	2011-11-24	2012-11-23
HP	Synthesized Sweeper	8341B	2624A00116	2012-05-17	2013-05-16
COM POWER	Dipole Antenna	AD-100	041000	2012-06-06	2013-06-05
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
Electro-Mechanics	Horn Antenna	3116	9510-2270	2010-10-14	2013-10-13
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2012-04-11	2013-04-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-15.

EUT operation mode: Transmitting (worst case)

30 MHz ~ 10 GHz:

Cellular Band (Part 22H) for GSM Mode

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Middle Channel (836.6 MHz)										
2509.8	59.14	6	1.8	H	-41.6	1.46	10.7	-32.36	-13	19.36
1673.2	58.96	351	1.6	V	-41.5	0.97	9.4	-33.07	-13	20.07
2509.8	53.22	85	1.5	V	-43.1	1.46	10.7	-33.86	-13	20.86
3346.4	47.15	45	1.6	H	-47.3	2.08	10.8	-38.58	-13	25.58
1673.2	54.62	226	1.5	H	-48.4	0.97	9.4	-39.97	-13	26.97
3346.4	41.22	158	1.9	V	-52.3	2.08	10.8	-43.58	-13	30.58
129.3	39.65	25	1.8	H	-57.6	0.26	0.0	-57.86	-13	44.86
516.1	39.68	85	1.6	V	-57.6	0.49	0.0	-58.09	-13	45.09
322.6	35.26	16	1.5	V	-62.0	0.42	0.0	-62.42	-13	49.42

Cellular Band (Part 22H) for WCDMA Mode

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Middle Channel (836.6 MHz)										
1673.2	57.89	2	1.7	V	-42.6	0.97	9.4	-34.17	-13	21.17
1673.2	54.59	39	1.6	H	-48.4	0.97	9.4	-39.97	-13	26.97
2509.8	42.33	65	1.6	V	-54.0	1.46	10.7	-44.76	-13	31.76
3346.4	35.29	166	1.6	V	-58.3	2.08	10.8	-49.58	-13	36.58
3346.4	35.27	88	1.5	H	-59.2	2.08	10.8	-50.48	-13	37.48
2509.8	40.16	65	1.6	H	-60.6	1.46	10.7	-51.36	-13	38.36
329.8	38.55	8	1.6	V	-58.7	0.42	0.0	-59.12	-13	46.12
116.9	38.26	52	1.5	H	-59.0	0.26	0.0	-59.26	-13	46.26
528.3	37.49	4	1.8	V	-59.8	0.49	0.0	-60.29	-13	47.29

30 MHz ~ 20 GHz:

PCS Band (Part 24E) for GSM Mode

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Middle Channel (1880.0 MHz)										
5640.0	51.62	50	1.6	V	-38.4	3.94	11.7	-30.64	-13	17.64
3760.0	52.96	45	1.6	V	-41.7	2.96	10.4	-34.26	-13	21.26
5640.0	49.8	252	1.6	H	-42.9	3.94	11.7	-35.14	-13	22.14
3760.0	52.94	15	1.5	H	-43.2	2.96	10.4	-35.76	-13	22.76
7520.0	44.36	315	1.4	V	-45.1	3.07	12.0	-36.17	-13	23.17
7520.0	40.16	332	1.5	H	-48.1	3.07	12.0	-39.17	-13	26.17
129.3	40.12	85	1.6	H	-57.1	0.26	0.0	-57.36	-13	44.36
322.6	40.22	10	1.5	V	-57.0	0.42	0.0	-57.42	-13	44.42
516.1	39.63	23	1.8	V	-57.6	0.49	0.0	-58.09	-13	45.09

PCS Band (Part 24E) for WCDMA Mode

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
Middle Channel (1880.0 MHz)										
7520.0	40.13	66	1.5	H	-48.1	3.07	12.0	-39.17	-13	26.17
7520.0	40.22	116	1.6	V	-49.2	3.07	12.0	-40.27	-13	27.27
3760.0	46.93	5	1.4	V	-47.8	2.96	10.4	-40.36	-13	27.36
3760.0	47.77	2	1.5	H	-48.3	2.96	10.4	-40.86	-13	27.86
5640.0	40.69	2	1.5	V	-49.4	3.94	11.7	-41.64	-13	28.64
5640.0	40.25	26	1.6	H	-52.4	3.94	11.7	-44.64	-13	31.64
116.9	38.25	5	1.6	H	-59.0	0.26	0.0	-59.26	-13	46.26
329.8	37.46	61	1.5	V	-59.8	0.42	0.0	-60.22	-13	47.22
528.3	36.98	64	1.9	V	-60.3	0.49	0.0	-60.79	-13	47.79

Note:

Absolute Level = SG Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FCC §22.917(a) & §24.238(a) - BAND EDGES

Applicable Standard

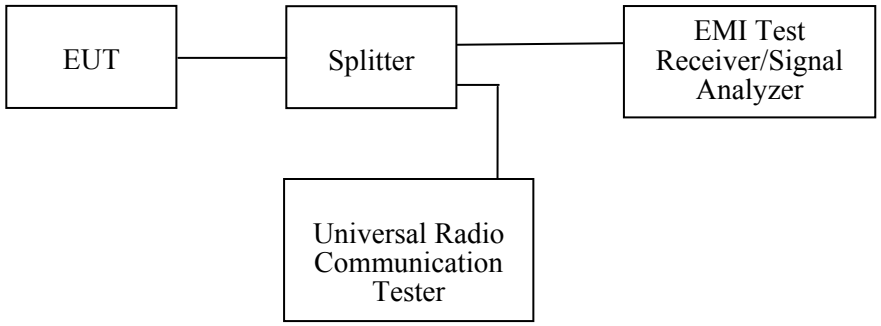
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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 5 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2013-11-23
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2012-04-11	2013-04-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-15.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

Cellular Band (Part 22H)

Mode	Frequency (MHz)	Emission (dBm)	Limit (dBm)
GSM	823.978	-25.64	⩽-13
	849.015	-28.01	⩽-13

Mode	Frequency (MHz)	Emission (dBm)	Limit (dBm)
EGPRS (EDGE)	823.985	-36.72	⩽-13
	849.009	-39.70	⩽-13

Mode	Frequency (MHz)	Emission (dBm)	Limit (dBm)
WCDMA	823.978	-28.18	⩽-13
	849.000	-30.77	⩽-13

PCS Band (Part 24E)

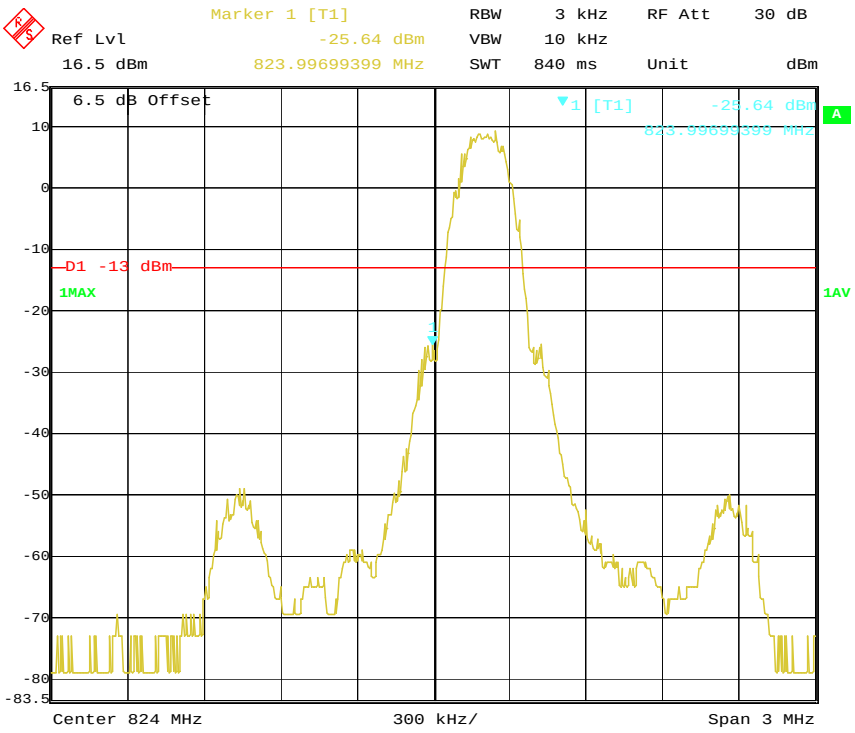
Mode	Frequency (MHz)	Emission (dBm)	Limit (dBm)
GSM	1849.985	-32.34	⩽-13
	1910.015	-31.72	⩽-13

Mode	Frequency (MHz)	Emission (dBm)	Limit (dBm)
EGPRS (EDGE)	1849.997	-44.06	≤-13
	1910.027	-45.72	≤-13

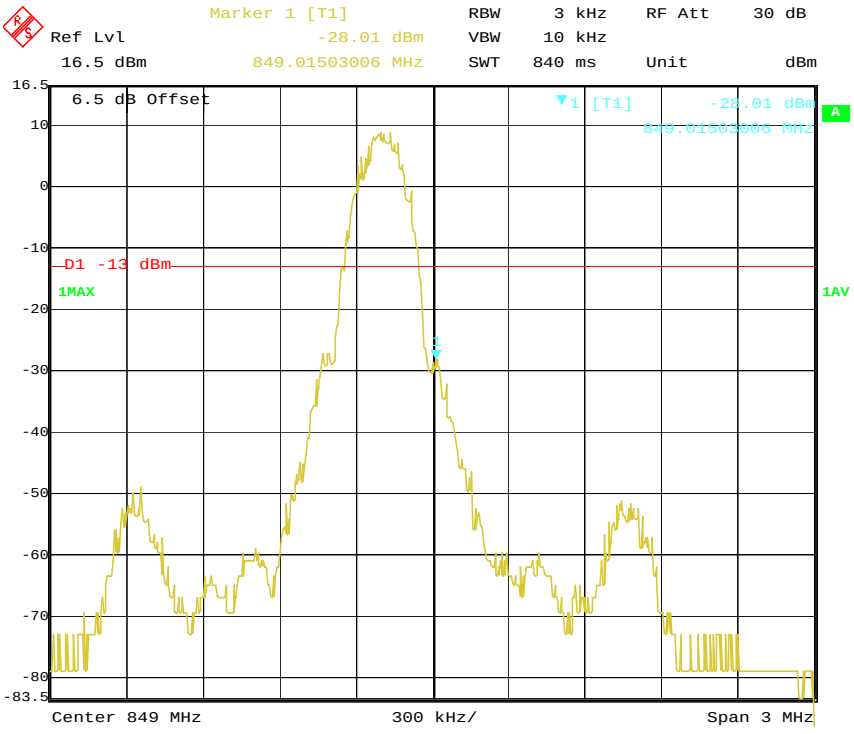
Mode	Frequency (MHz)	Emission (dBm)	Limit (dBm)
WCDMA	1849.880	-24.58	≤-13
	1910.200	-33.49	≤-13

GSM Mode

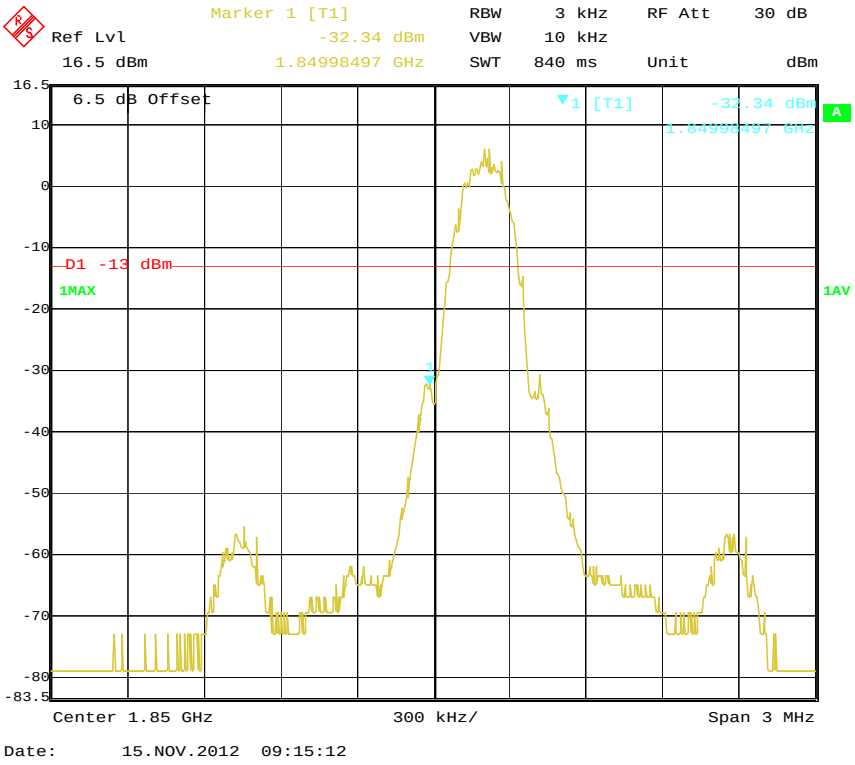
Cellular Band, Left Band Edge



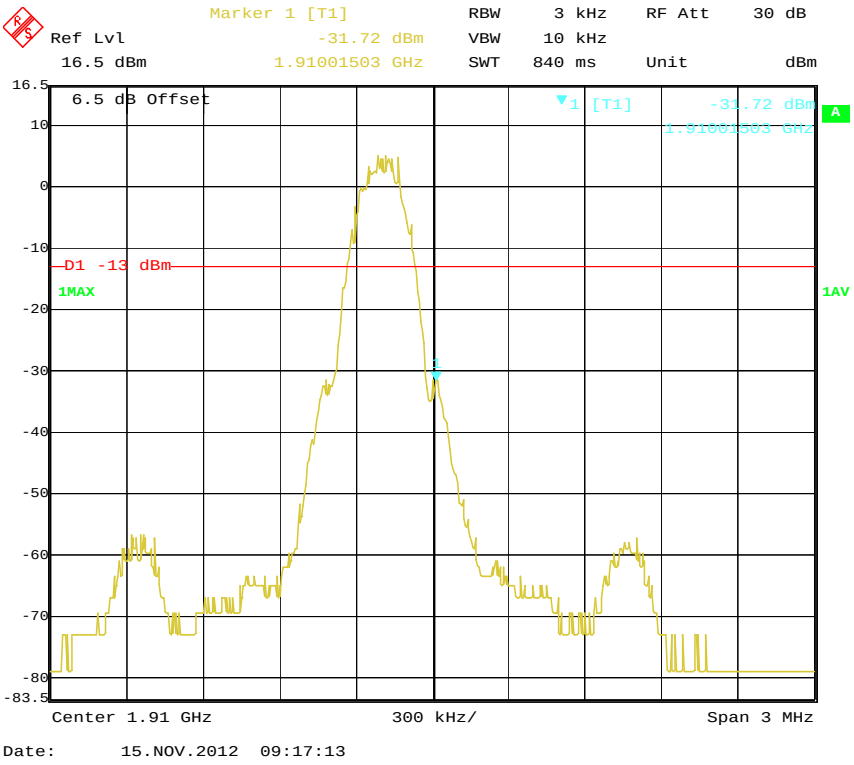
Cellular Band, Right Band Edge



PCS Band, Left Band Edge

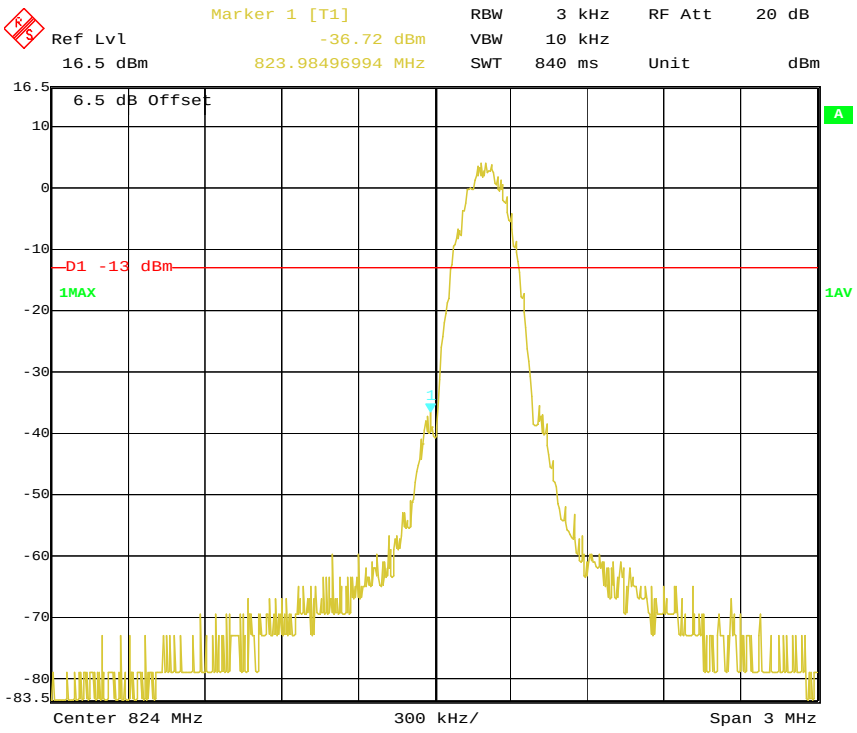


PCS Band, Right Band Edge

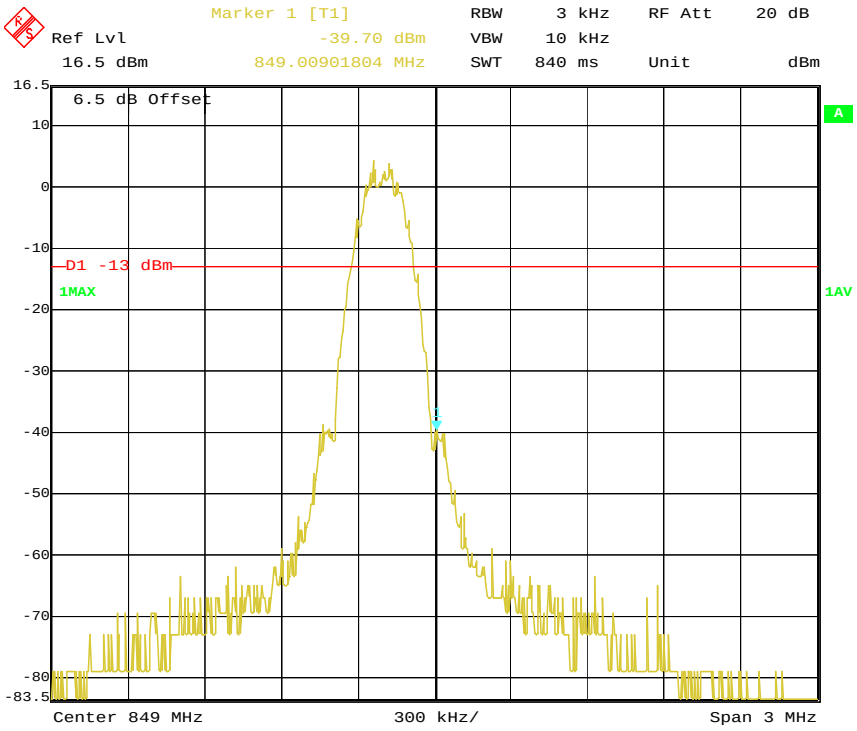


EGPRS (EDGE) Mode

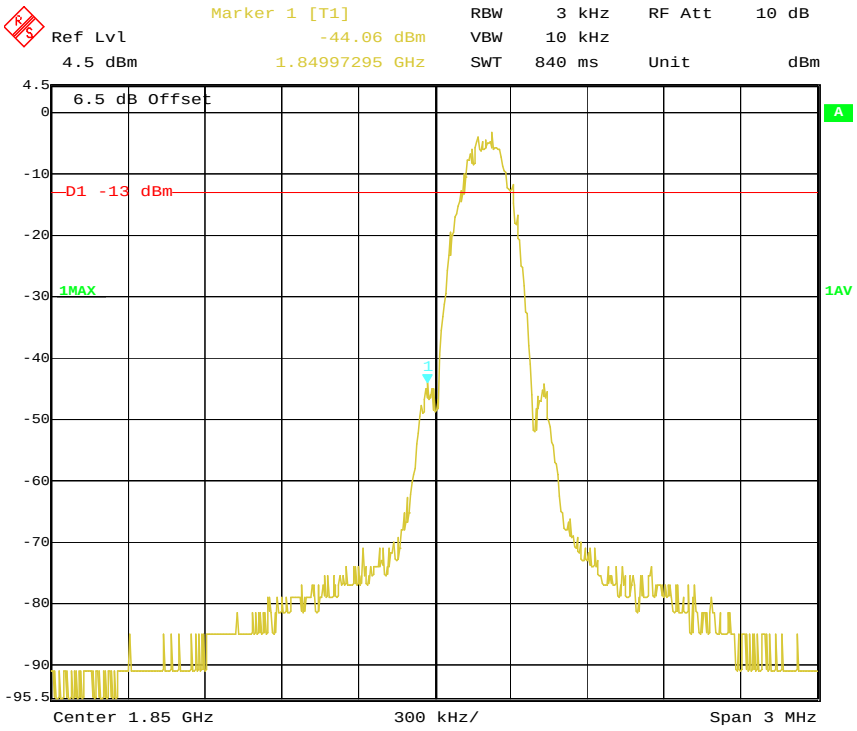
Cellular Band, Left Band Edge



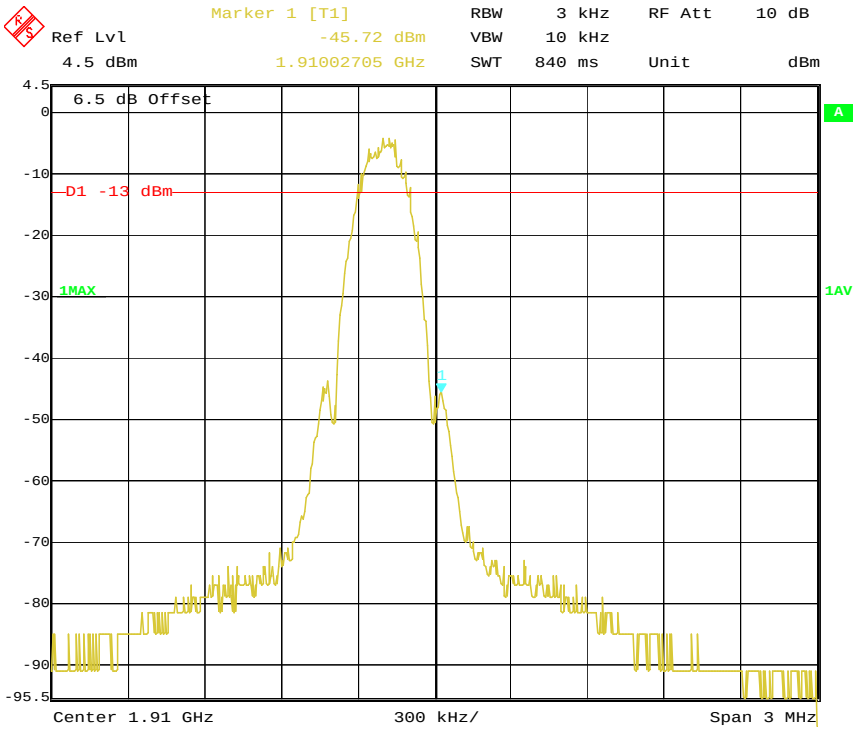
Cellular Band, Right Band Edge



PCS Band, Left Band Edge

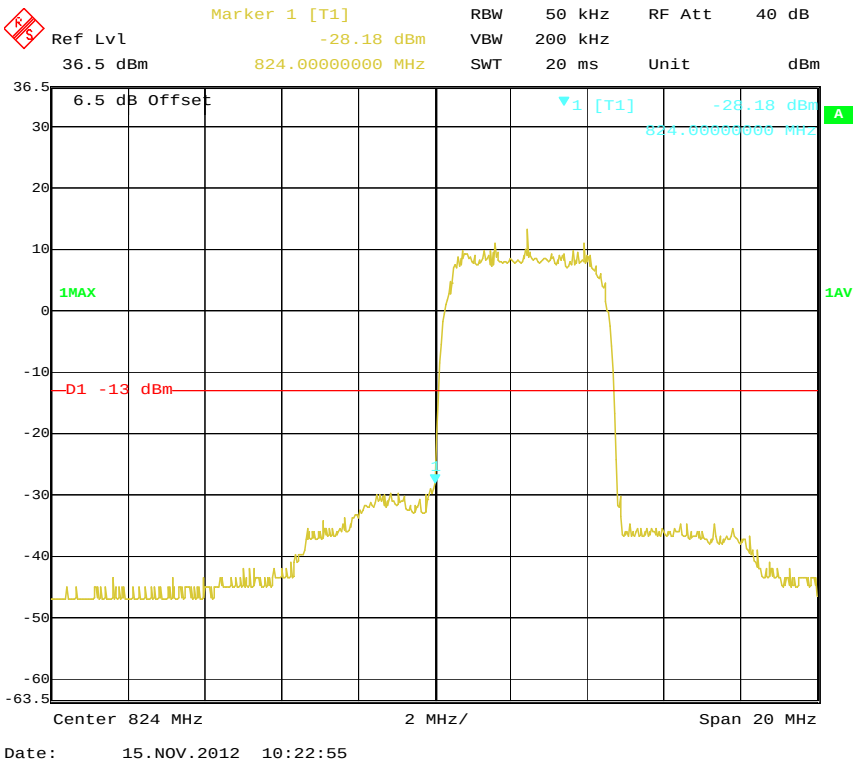


PCS Band, Right Band Edge

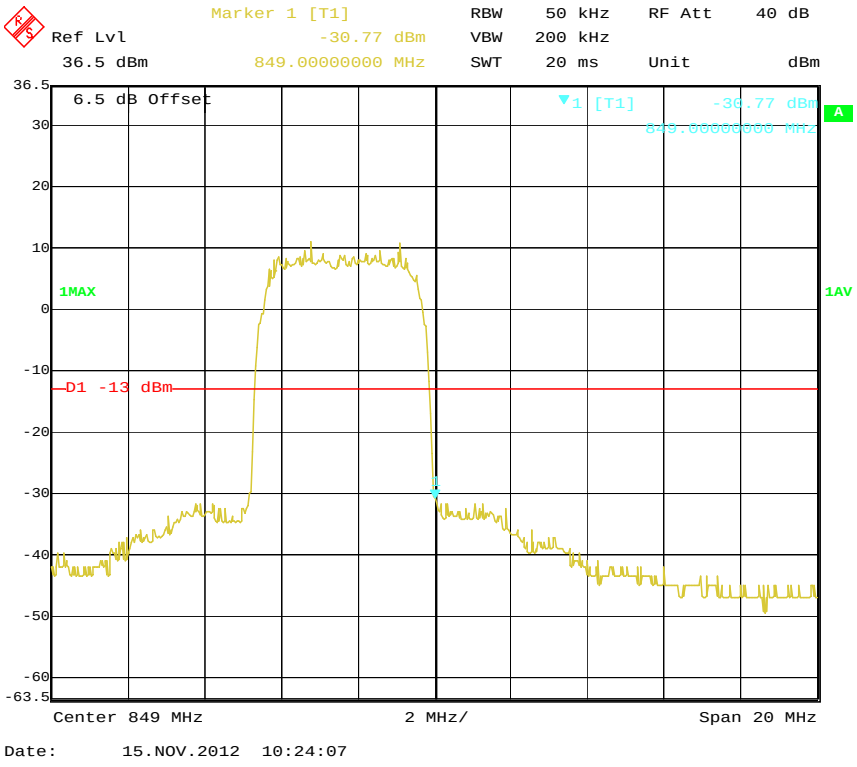


WCDMA Mode

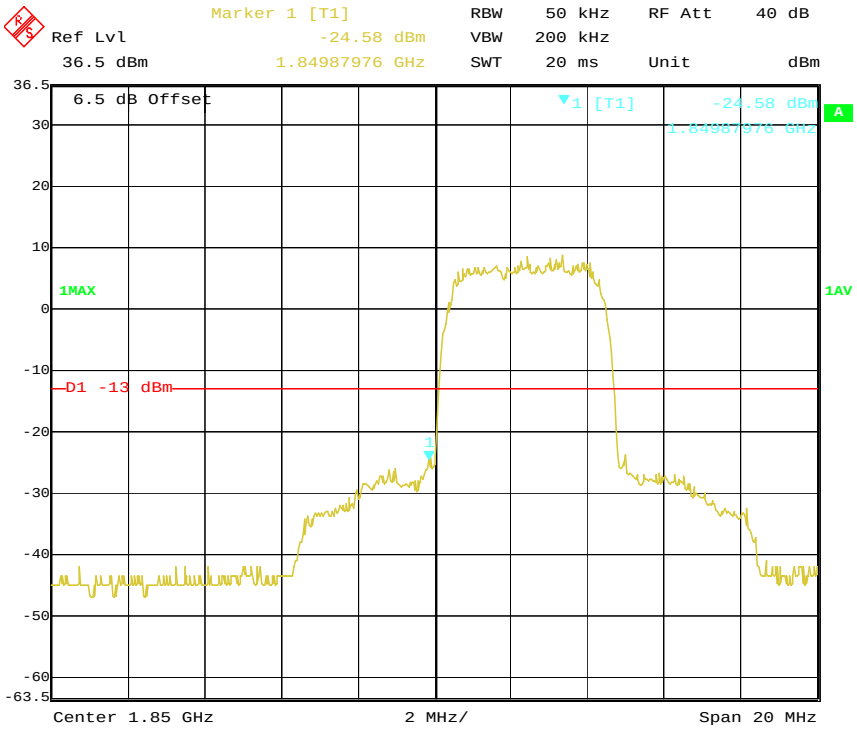
Cellular Band, Left Band Edge



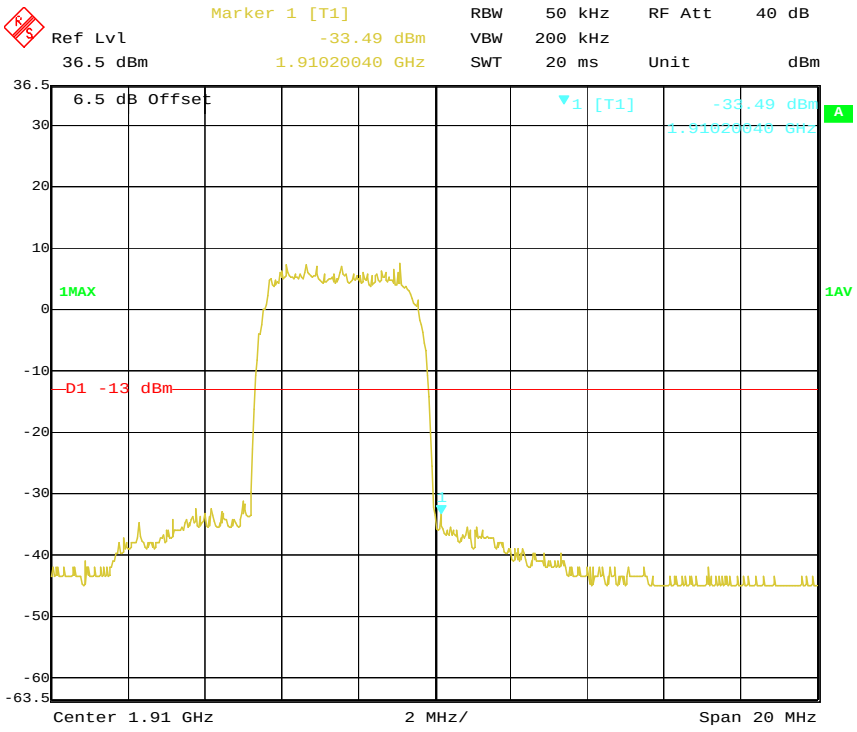
Cellular Band, Right Band Edge



PCS Band, Left Band Edge



PCS Band, Right Band Edge



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

Applicable Standard

FCC § 2.1055, §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

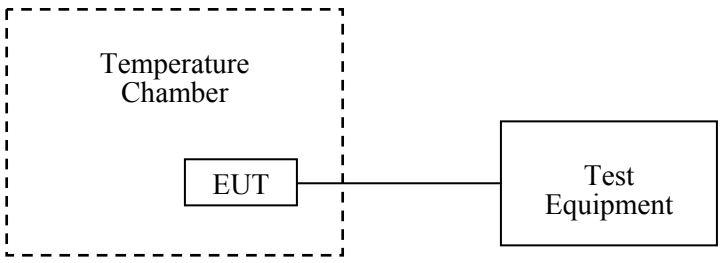
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2011-11-02	2012-11-01
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2012-04-11	2013-04-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-15.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

GSM mode

Cellular Band (Part 22H)

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-4	-0.004781	2.5
-20		-2	-0.002391	2.5
-10		-1	-0.001195	2.5
0		1	0.001195	2.5
10		2	0.002391	2.5
20		-1	-0.001195	2.5
30		-3	-0.003586	2.5
40		-5	-0.005977	2.5
50		-4	-0.004781	2.5
25	$V_{min.}$= 3.5	-2	-0.002391	2.5
25	$V_{max.}$=4.2	-3	-0.003586	2.5

PCS Band (Part 24E)

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-12	-0.006383	Pass
-20		-9	-0.004787	Pass
-10		-7	-0.003723	Pass
0		-8	-0.004255	Pass
10		-5	-0.002660	Pass
20		-3	-0.001596	Pass
30		-6	-0.003191	Pass
40		-5	-0.002660	Pass
50		-4	-0.002128	Pass
25	$V_{min.}$= 3.5	-6	-0.003191	Pass
25	$V_{max.}$=4.2	-4	-0.002128	Pass

EGPRS (EDGE) mode

Cellular Band (Part 22H)

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-6	-0.007172	2.5
-20		-5	-0.005977	2.5
-10		-3	-0.003586	2.5
0		-1	-0.001195	2.5
10		1	0.001195	2.5
20		-2	-0.002391	2.5
30		4	0.004781	2.5
40		-6	-0.007172	2.5
50		-8	-0.009563	2.5
25	$V_{min.}$= 3.5	-3	-0.003586	2.5
25	$V_{max.}$=4.2	-5	-0.005977	2.5

PCS Band (Part 24E)

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-7	-0.003723	Pass
-20		-4	-0.002128	Pass
-10		-5	-0.002660	Pass
0		-3	-0.001596	Pass
10		2	0.001064	Pass
20		-1	-0.000532	Pass
30		-3	-0.001596	Pass
40		-5	-0.002660	Pass
50		-7	-0.003723	Pass
25	$V_{min.}$= 3.5	-4	-0.002128	Pass
25	$V_{max.}$=4.2	-6	-0.003191	Pass

WCDMA mode

Cellular Band (Part 22H)

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-6	-0.007172	2.5
-20		-4	-0.004781	2.5
-10		-3	-0.003586	2.5
0		-2	-0.002391	2.5
10		2	0.002391	2.5
20		-1	-0.001195	2.5
30		-3	-0.003586	2.5
40		-5	-0.005977	2.5
50		-6	-0.007172	2.5
25	$V_{min.}$= 3.5	-8	-0.009563	2.5
25	$V_{max.}$=4.2	-7	-0.008367	2.5

PCS Band (Part 24E)

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-9	-0.004787	Pass
-20		-7	-0.003723	Pass
-10		-5	-0.002660	Pass
0		-3	-0.001596	Pass
10		-1	-0.000532	Pass
20		1	0.000532	Pass
30		-3	-0.001596	Pass
40		-4	-0.002128	Pass
50		-3	-0.001596	Pass
25	$V_{min.}$= 3.5	-7	-0.003723	Pass
25	$V_{max.}$=4.2	-5	-0.002660	Pass

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