FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

K2KONNECT LLC

2323 NW 82ND AVE, DORAL, FL 33122, United States

FCC ID: 2AMVG4E5

Report Type:	Product Type:
Original Report	3G Mobile phone

Report Number:	RSZ170713002-00D
Report Date:	2017-08-22
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *K2KONNECT LLC's* product, model number: *4E (FCC ID: 2AMVG4E5)* or the "EUT" in this report was a *3G Mobile phone*, which was measured approximately: 12.2 cm (L) × 6.5 cm (W) × 1.2 cm (H), rated with input voltage: DC 3.8 V battery or DC 5V from adapter.

Adapter Information:
Model: C4E5
Input: AC 100-240V, 50/60Hz, 0.2A
Output: DC 5.0V, 0.5A

Notes: This series products model: AM4E5I056, AM4E5I043 and 4E are identical; they have the identical schematics, only named differently. Model 4E was selected for fully testing, the detailed information can be referred to the declaration which was stated and guaranteed by the applicant.

**All measurement and test data in this report was gathered from production sample serial number: 1701661 (Assigned by applicant).The EUT supplied by the applicant was received on 2017-07-13.*

Objective

This type approval report is prepared on behalf of *K2KONNECT LLC* in accordance with Part 2, Part 22-Subpart H, Part 24-Subpart E of the Federal Communication Commission's rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP, Part 15.247 DTS&DSS submissions with FCC ID: 2AMVG4E5.

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-D.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	Flab	Maximum allow uncertainty
Occupied Channel Bandwidth	±5%	±5%
RF output power, conducted	±1.5dB	±1.5dB
Unwanted Emission, conducted	±1.5dB	±3dB
All emissions, radiated	±4.88dB	±6dB
Temperature	±1℃	±3℃
Supply voltages	±0.4%	±3%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

Bay Area Compliance Laboratories Corp. (Shenzhen) has been accredited to ISO/IEC 17025 by CNAS(Lab code: L2408). And accredited to ISO/IEC 17025 by NVLAP(Lab code: 200707-0), the FCC Designation No. CN5001 under the KDB 974614 D01.

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.

Bay Area Compliance Laboratories Corp. (Shenzhen) was registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Justification

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.

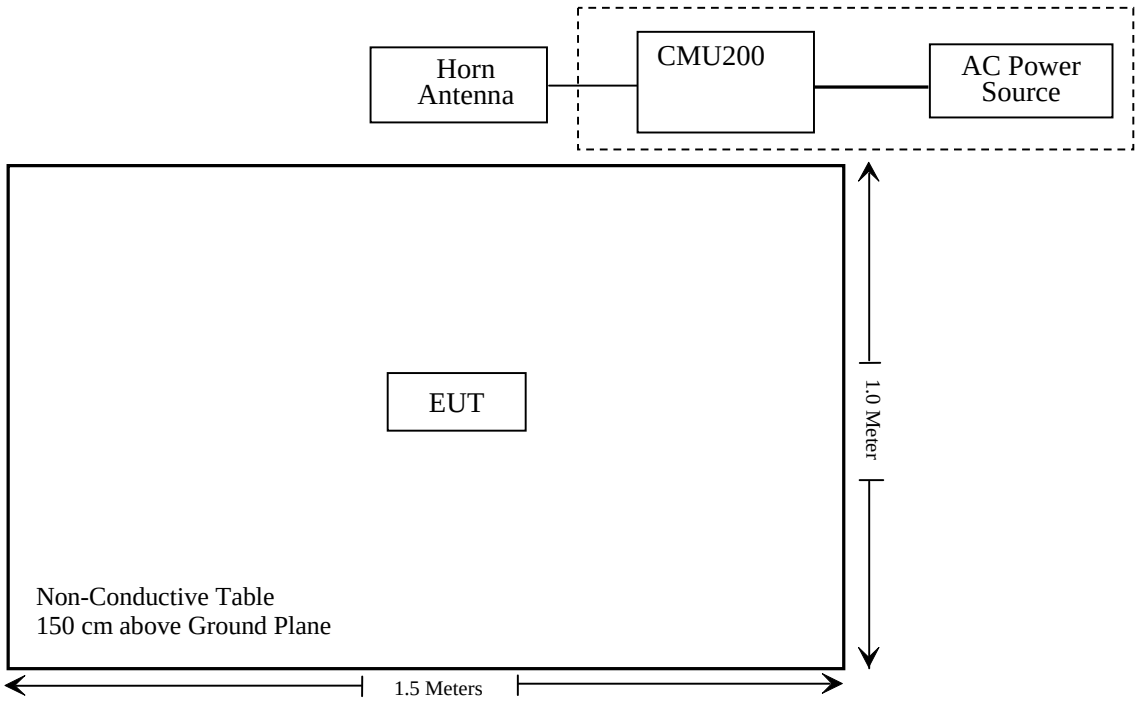
Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1093	RF Exposure Information	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);	Spurious Radiated Emissions	Compliance
§ 22.917 (a); § 24.238 (a);	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235;	Frequency stability	Compliance

Compliance*: Please refer to SAR report released by BACL, report number: RSZ170713002-20.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-17	2017-12-16
Rohde & Schwarz	Signal analyzer	FSIQ26	8386001028	2017-04-24	2018-04-24
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-02-14	2018-02-14
HP	Amplifier	HP8447E	1937A01046	2017-05-21	2017-11-19
Anritsu	Signal Generator	68369B	004114	2016-12-05	2017-12-05
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2016-12-07	2017-12-07
COM POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2017-04-24	2018-04-24
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2014-12-29	2017-12-28
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2014-12-29	2017-12-28
Ducommun technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2017-04-24	2018-04-24
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2016-12-05	2017-12-05
Anritsu	Signal Generator	68369B	004114	2016-12-05	2017-12-05
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2016-11-22	2017-11-22
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR

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

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1307, §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ170713002-20.

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.

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

Applicable Standards

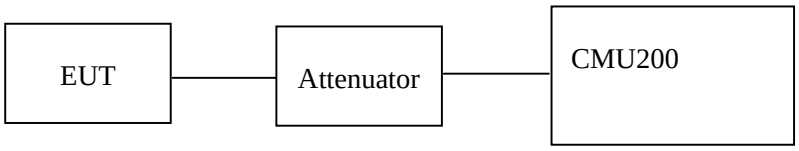
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

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 CMU200 through sufficient attenuation.



Radiated method:

TIA603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kobe Li on 2017-08-10.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.27	38.45
	190	836.6	32.34	38.45
	251	848.8	32.23	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.26	31.52	29.25	27.98	38.45
	190	836.6	32.32	31.48	29.20	27.86	38.45
	251	848.8	32.22	31.27	28.92	27.61	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	25.57	24.24	22.19	20.65	38.45
	190	836.6	25.55	24.26	22.23	20.66	38.45
	251	848.8	25.50	24.17	22.10	20.62	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2		21.87	22.18	21.20
		HSDPA	1	20.47	20.56	20.98
			2	20.56	20.46	20.54
			3	20.55	20.46	20.37
			4	20.45	20.66	20.24
		HSUPA	1	20.38	20.46	20.59
			2	20.24	20.41	20.46
			3	20.75	20.31	20.25
			4	20.37	20.75	20.31
			5	20.34	20.47	20.37

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.42	33
	661	1880.0	28.57	33
	810	1909.8	28.50	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.47	27.60	25.72	24.55	33
	661	1880.0	28.60	27.71	25.87	24.68	33
	810	1909.8	28.54	27.65	25.80	24.65	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.02	22.54	20.17	18.44	33
	661	1880.0	24.34	22.95	20.55	18.90	33
	810	1909.8	24.37	23.12	20.71	19.08	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2		21.89	21.35	21.96
		HSDPA	1	20.33	20.91	20.71
			2	20.21	20.74	20.98
			3	20.15	20.36	20.67
			4	20.14	20.64	20.12
		HSUPA	1	20.15	20.36	20.71
			2	20.36	20.65	20.11
			3	20.35	20.47	20.36
			4	20.11	20.31	20.10
			5	20.36	20.45	20.11

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.15	13
	Middle	0.15	13
	High	0.16	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.18	13
	Middle	0.16	13
	High	0.19	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.55	13
	Middle	2.45	13
	High	2.89	13
HSDPA (16QAM)	Low	2.29	13
	Middle	2.25	13
	High	2.68	13
HSUPA (BPSK)	Low	2.34	13
	Middle	2.33	13
	High	2.66	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.16	13
	Middle	0.15	13
	High	0.17	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.17	13
	Middle	0.18	13
	High	0.20	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	1.99	13
	Middle	2.11	13
	High	3.01	13
HSDPA (16QAM)	Low	1.85	13
	Middle	1.92	13
	High	2.56	13
HSUPA (BPSK)	Low	1.88	13
	Middle	2.00	13
	High	2.60	13

Radiated Power

GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	88.45	165	1.6	H	28.4	0.5	0.0	28.0	38.45	10.50
836.6	89.29	344	1.8	V	30.2	0.5	0.0	29.8	38.45	8.68
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	84.18	102	1.9	H	14.1	1.30	8.50	21.30	33	11.70
1880.00	89.84	236	1.3	V	19.6	1.30	8.50	26.80	33	6.20

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	85.50	196	2.0	H	25.5	0.5	0.0	25.0	38.45	13.45
836.6	83.67	246	1.5	V	24.6	0.5	0.0	24.2	38.45	14.30
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	82.72	68	1.9	H	13.6	1.30	8.50	20.80	33	12.20
1880.00	85.73	203	1.1	V	16.4	1.30	8.50	23.60	33	9.40

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, WCDMA Band V (Part 22H), Middle Channel										
836.6	79.21	51	1.5	H	19.2	0.5	0.0	18.7	38.45	19.74
836.6	78.91	311	2.3	V	19.8	0.5	0.0	19.4	38.45	19.06
EIRP, WCDMA Band II (Part 24E), Middle Channel										
1880.00	87.32	278	1.4	H	17.3	1.30	8.50	24.50	33	8.50
1880.00	84.34	273	1.0	V	14.1	1.30	8.50	21.30	33	11.70

Note:
All above data were tested with no amplifier.
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

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

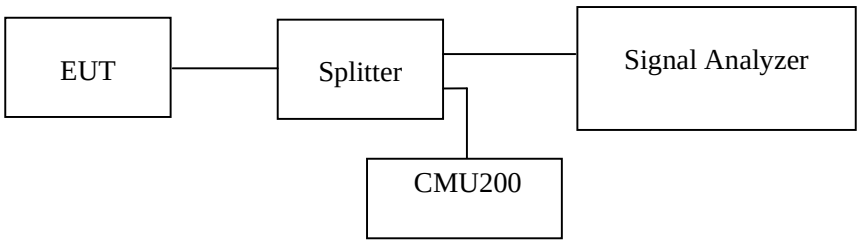
Applicable Standards

FCC 47 §2.1049, §22.917, §22.905, §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 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.
.



Test Data

Environmental Conditions

Temperature:	23~25 ℃
Relative Humidity:	52~55 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Kobe Li on 2017-08-09 and 2017-08-15.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	246.8	320.5

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
EGPRS	836.6	248.4	314.1

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.20	4.78
HSUPA (BPSK)	836.6	4.17	4.71
HSDPA (16QAM)	836.6	4.17	4.71

PCS Band (Part 24E)

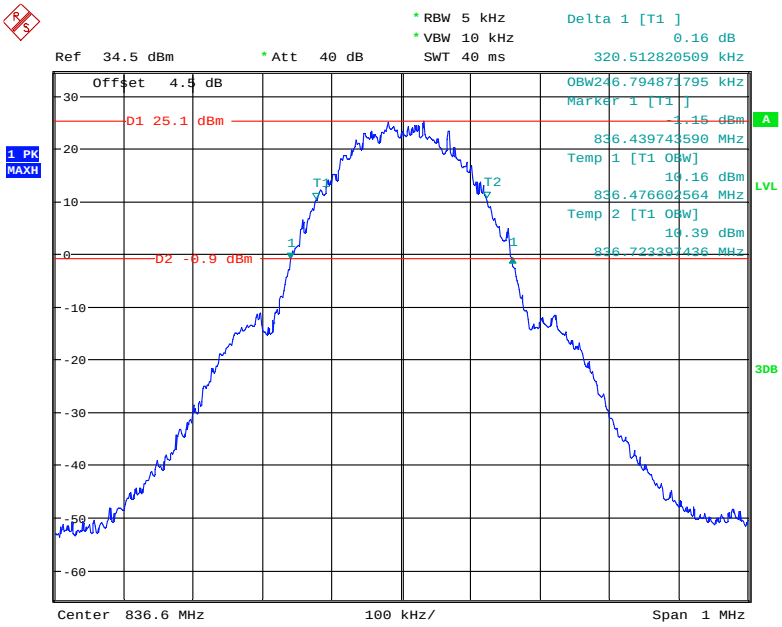
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	245.2	322.1

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
EGPRS	1880.0	253.2	331.7

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.17	4.73
HSUPA (BPSK)	1880.0	4.17	4.71
HSDPA (16QAM)	1880.0	4.17	4.73

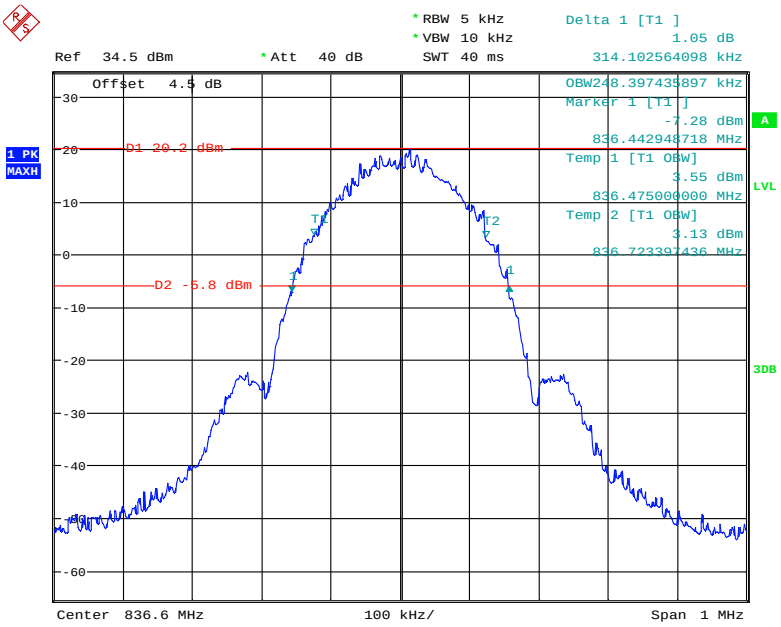
Cellular Band (Part 22H)

26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode



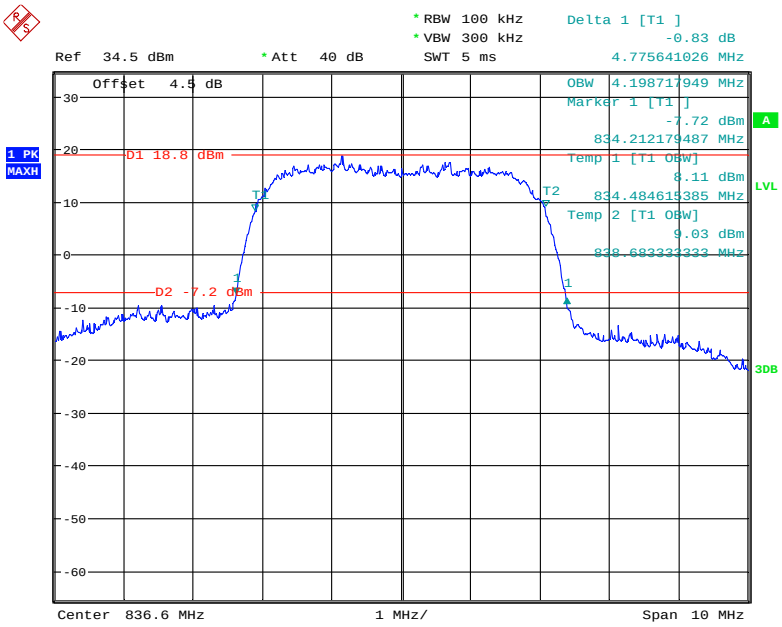
Date: 9.AUG.2017 13:52:14

26 dB Emissions & 99% Occupied Bandwidth for EGPRS (EDGE) Mode



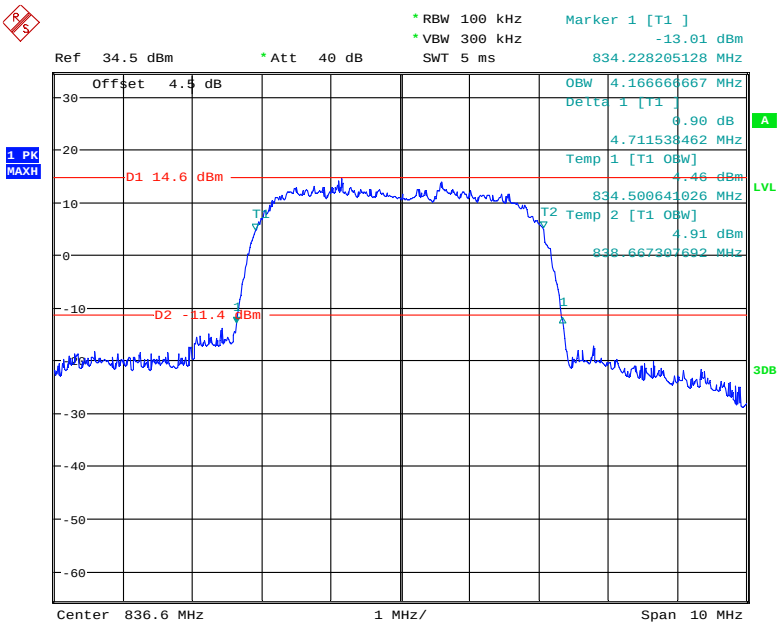
Date: 9.AUG.2017 14:04:34

26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode



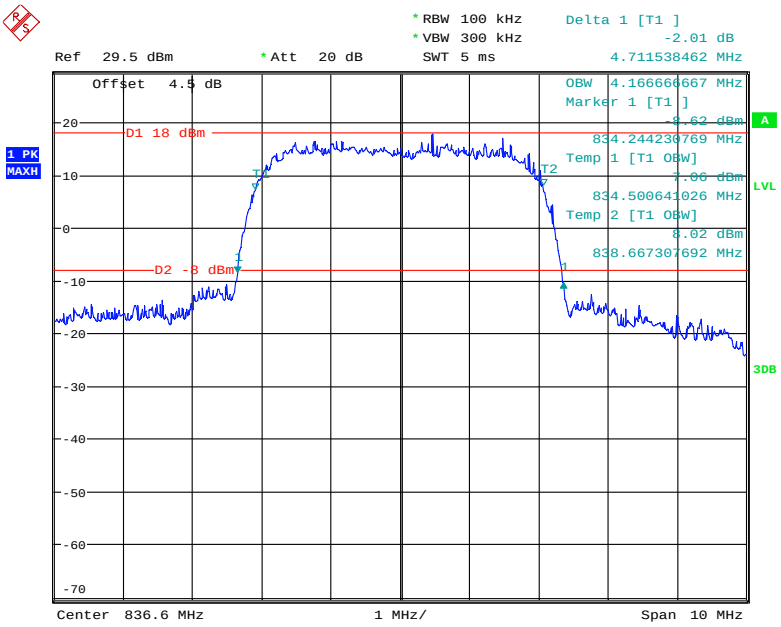
Date: 9.AUG.2017 15:05:43

26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 9.AUG.2017 14:20:58

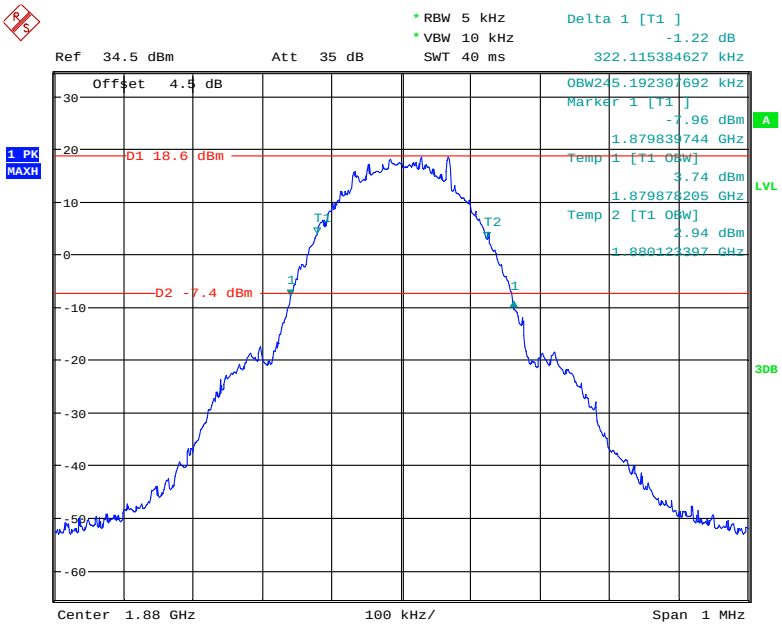
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 15.AUG.2017 20:04:56

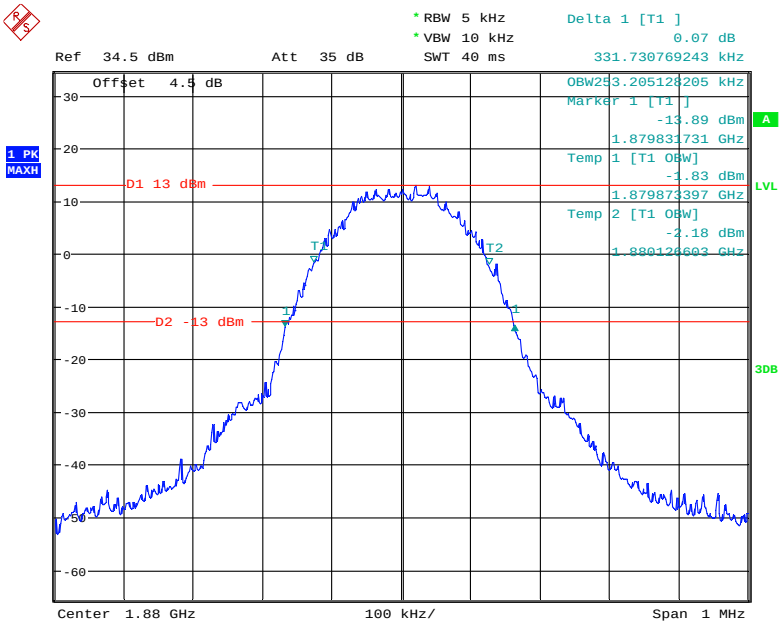
PCS Band (Part 24E)

26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode



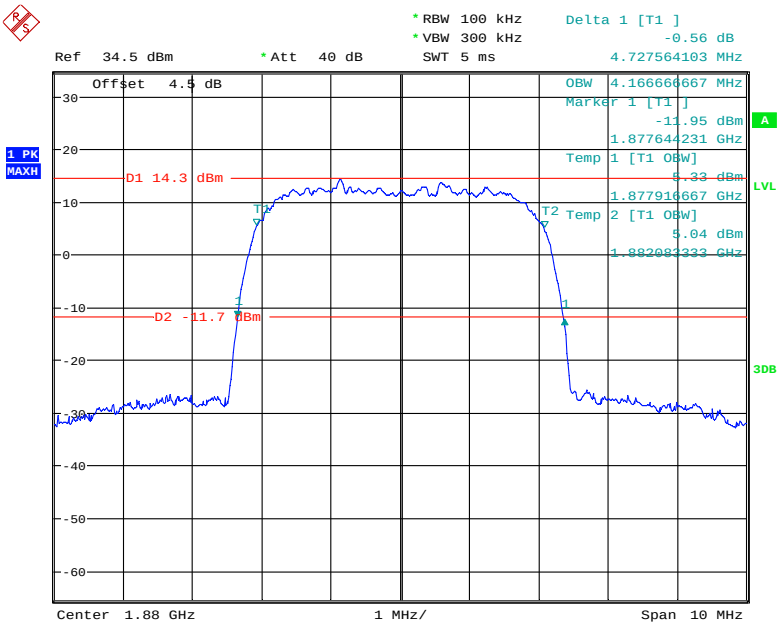
Date: 9.AUG.2017 13:28:39

26 dB Emissions & 99% Occupied Bandwidth for EGPRS (EDGE) Mode



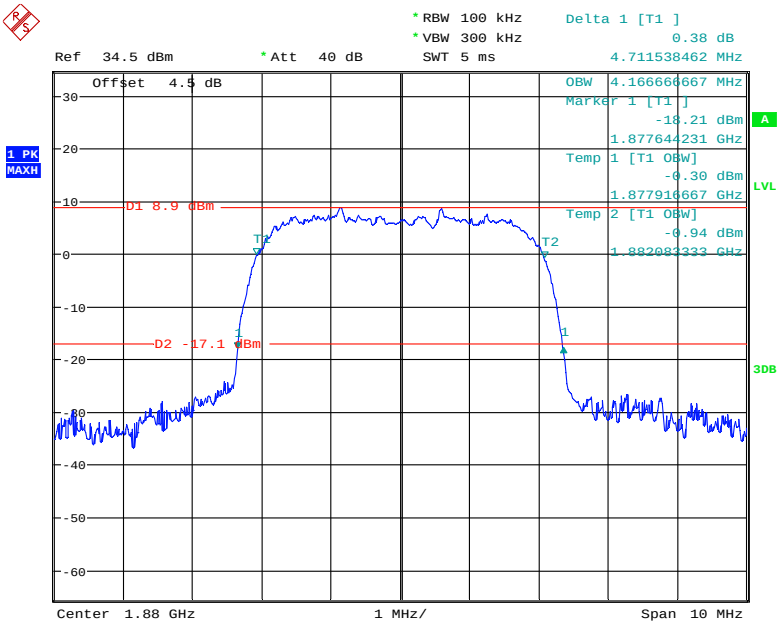
Date: 9.AUG.2017 13:32:14

26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode



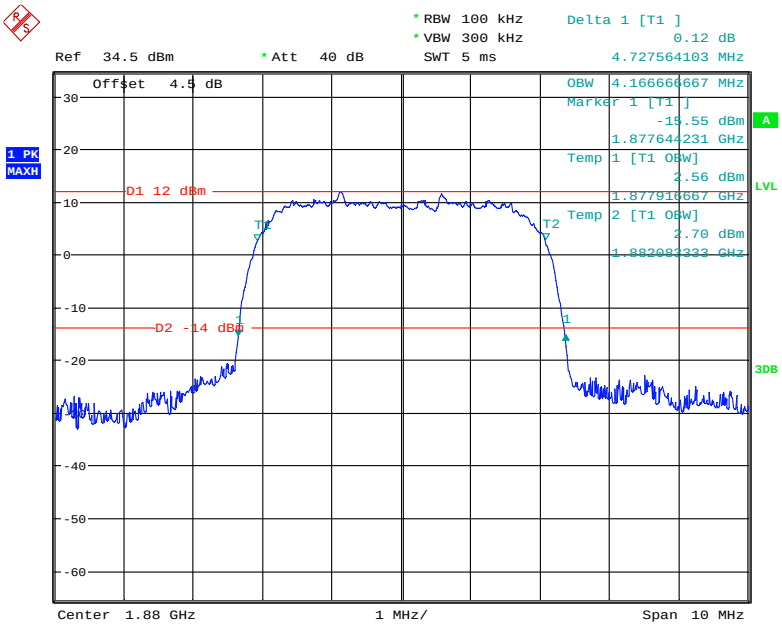
Date: 9.AUG.2017 15:22:59

26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 9.AUG.2017 14:18:52

26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 9.AUG.2017 14:54:35

§ 2.1051; § 22.917 (a); § 24.238 (a) SPURIOUS EMISSIONS AT ANTENNA TERMINALS

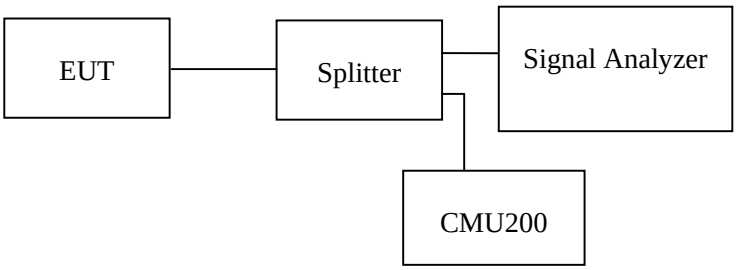
Applicable Standards

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 10^{th} harmonic.



Test Data

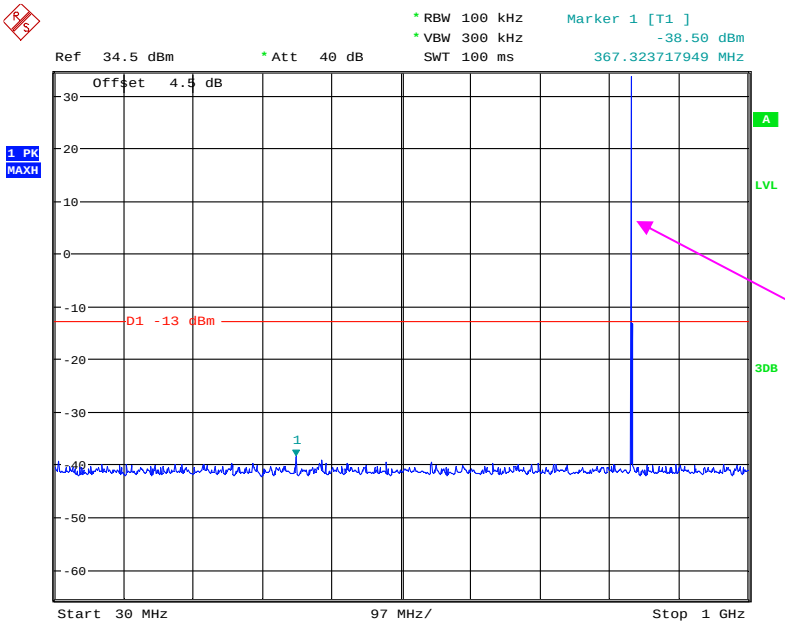
Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Kobe Li on 2017-08-09.

Cellular Band (Part 22H)

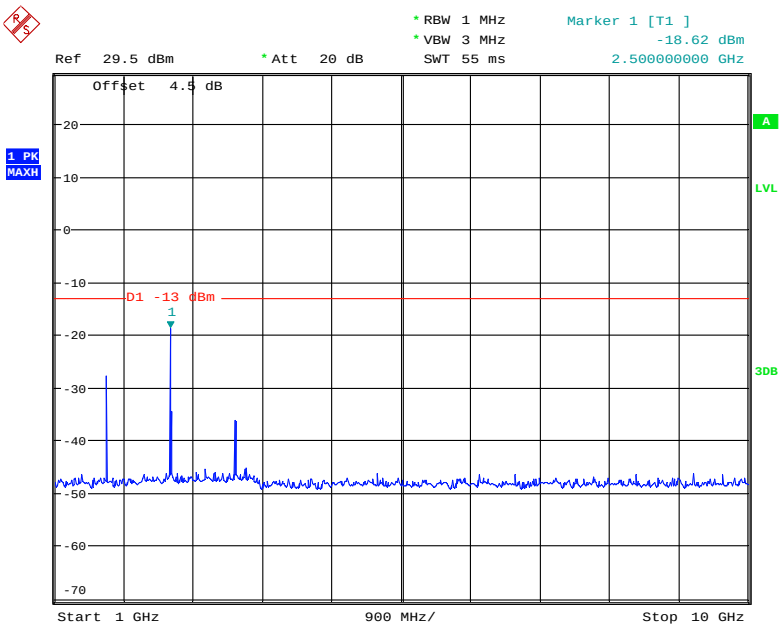
30 MHz – 1 GHz (GSM Mode)



Fundamental test

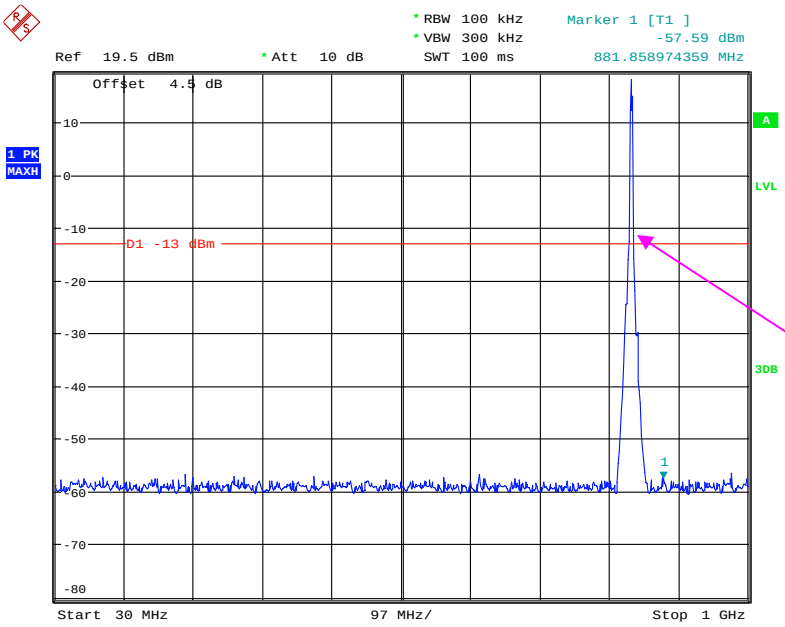
Date: 9.AUG.2017 13:47:36

1 GHz – 10 GHz (GSM Mode)



Date: 9.AUG.2017 13:49:56

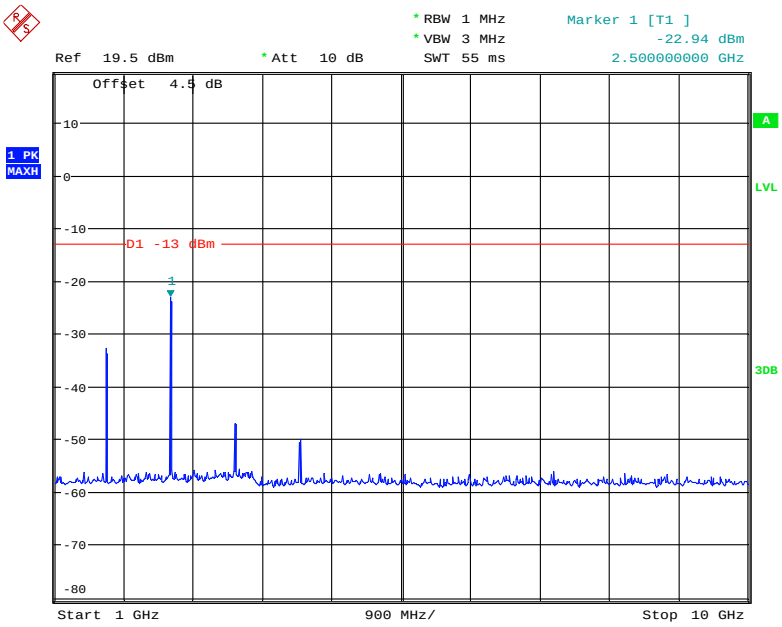
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 9.AUG.2017 15:55:29

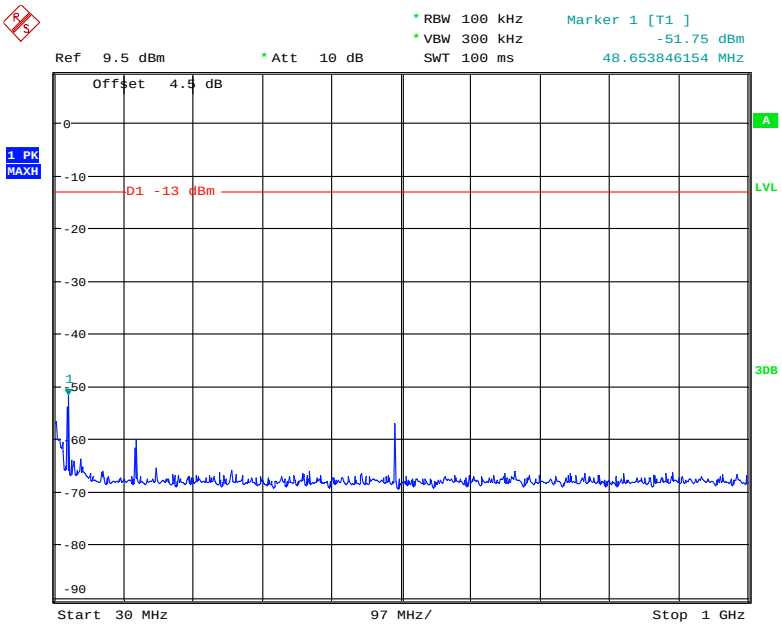
1 GHz – 10 GHz (WCDMA Mode)



Date: 9.AUG.2017 15:54:40

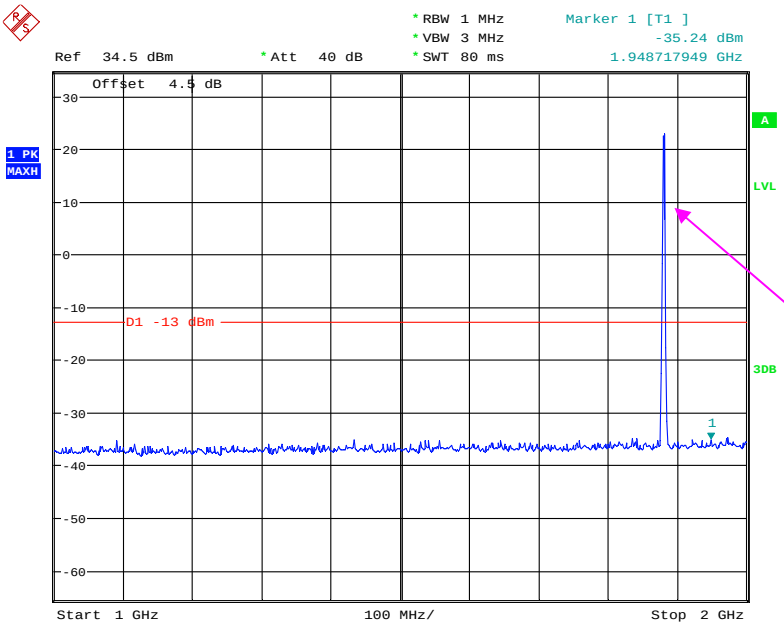
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 9.AUG.2017 13:39:04

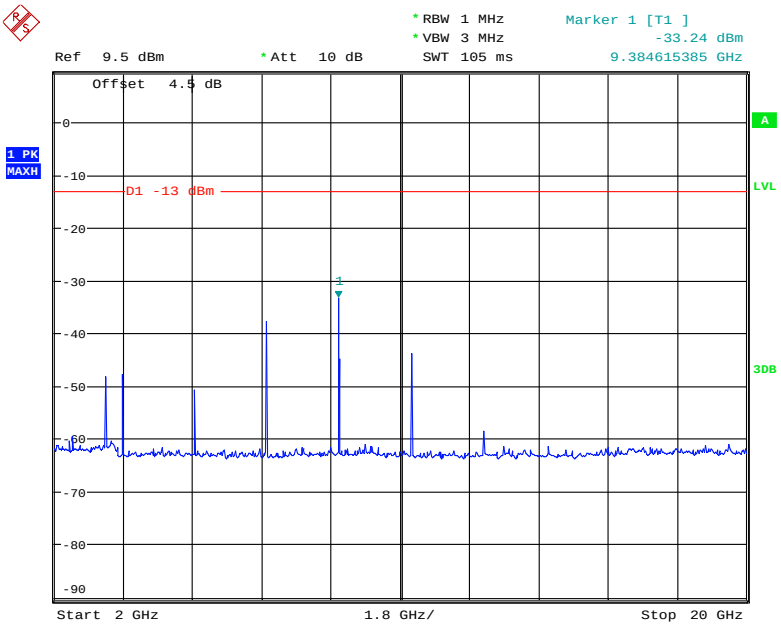
1 GHz – 2 GHz (GSM Mode)



Fundamental test

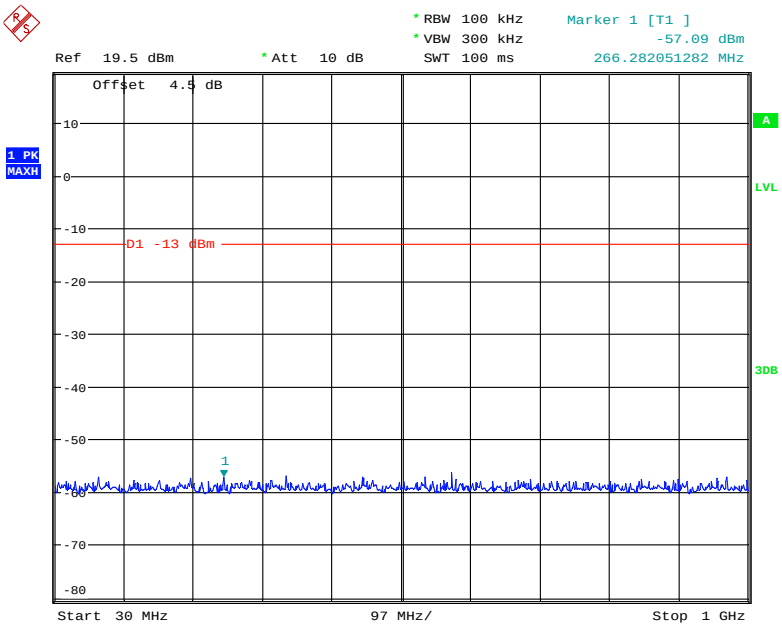
Date: 9.AUG.2017 13:34:46

2 GHz – 20 GHz (GSM Mode)



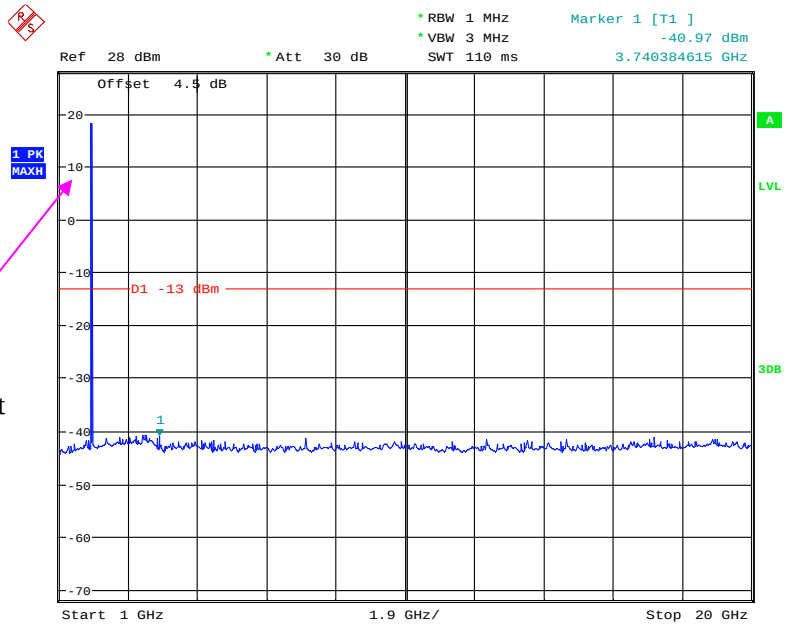
Date: 9.AUG.2017 13:38:09

30 MHz – 1 GHz (WCDMA Mode)



Date: 9.AUG.2017 15:53:24

1 GHz – 20 GHz (WCDMA Mode)



Fundamental test

Date: 9.AUG.2017 15:52:46

FCC § 2.1053; § 22.917 (a); § 24.238 (a) SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917(a) and § 24.238(a)

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 (TX pwr in Watts/0.001) – the absolute level

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

Spurious attenuation limit in dB = 55 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kobe Li on 2017-08-07.

Test mode: Transmitting

Test mode: Transmitting (Pre-scan with Low, Middle, High channel, and the worse case data as below)

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM 850 Mode										
399.88	32.65	159	1.6	H	-34.6	0.67	0	-35.27	-13	22.27
399.88	33.96	352	1.7	V	-33.3	0.67	0	-33.97	-13	20.97
1673.20	53.46	209	2.0	H	-53.6	1.30	9.10	-45.80	-13	32.80
1673.20	57.29	183	2.0	V	-49.2	1.30	9.10	-41.40	-13	28.40
2509.80	63.52	19	1.1	H	-40.0	2.60	9.30	-33.30	-13	20.30
2509.80	64.69	202	1.3	V	-38.2	2.60	9.30	-31.50	-13	18.50
WCDMA 850 Mode										
399.88	33.26	51	2.2	H	-34	0.67	0	-34.67	-13	21.67
399.88	34.68	297	2.0	V	-32.6	0.67	0	-33.27	-13	20.27
1673.20	50.11	88	1.3	H	-57.0	1.30	9.10	-49.20	-13	36.20
1673.20	49.32	93	1.9	V	-57.2	1.30	9.10	-49.40	-13	36.40
2509.80	48.86	188	1.2	H	-54.7	2.60	9.30	-48.00	-13	35.00
2509.80	49.28	67	1.0	V	-53.6	2.60	9.30	-46.90	-13	33.90

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM 1900 Mode										
399.88	32.15	359	1.8	H	-35.1	0.67	0	-35.77	-13	22.77
399.88	34.65	216	1.6	V	-32.6	0.67	0	-33.27	-13	20.27
3760.00	52.22	300	1.3	H	-49.0	1.50	9.70	-40.80	-13	27.80
3760.00	52.54	210	2.4	V	-48.2	1.50	9.70	-40.00	-13	27.00
WCDMA 1900 Mode										
399.88	32.56	85	1.5	H	-34.7	0.67	0	-35.37	-13	22.37
399.88	35.63	185	1.5	V	-31.6	0.67	0	-32.27	-13	19.27
3760.00	52.97	36	1.6	H	-48.3	1.50	9.70	-40.10	-13	27.10
3760.00	54.89	98	1.0	V	-45.9	1.50	9.70	-37.70	-13	24.70

Note:
1) Absolute Level = Substituted Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

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

Applicable Standards

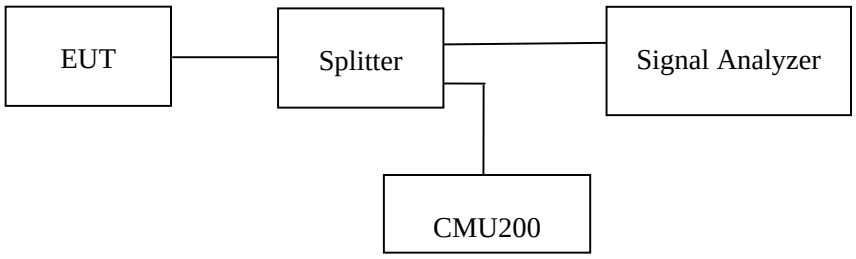
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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



Test Data

Environmental Conditions

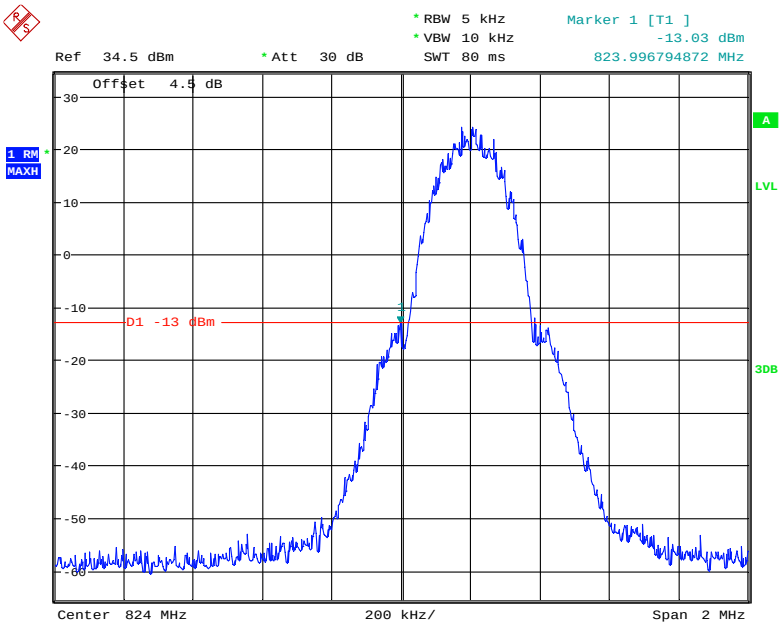
Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.5 kPa

The testing was performed by Kobe Li on 2017-08-09.

EUT operation mode: Transmitting

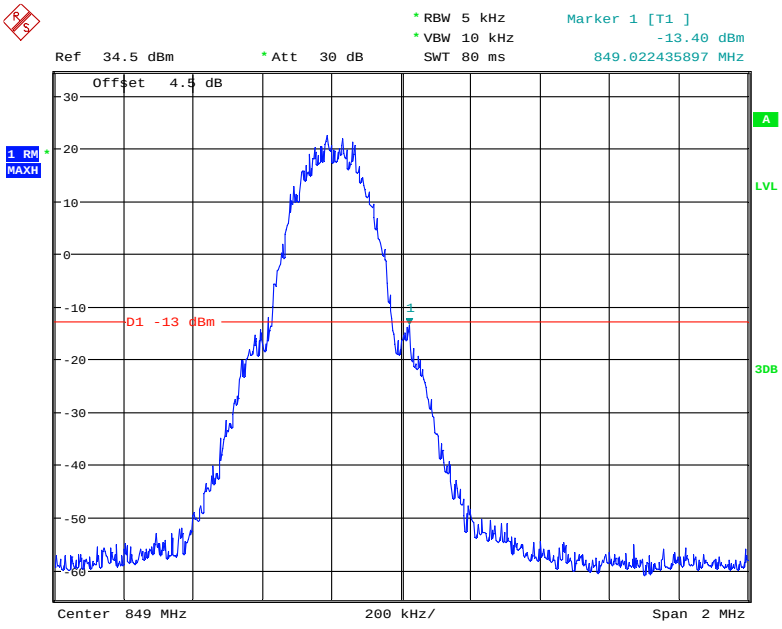
Test Result: Compliance. Please refer to the following plots.

Cellular Band, Left Band Edge for GSM (GMSK) Mode



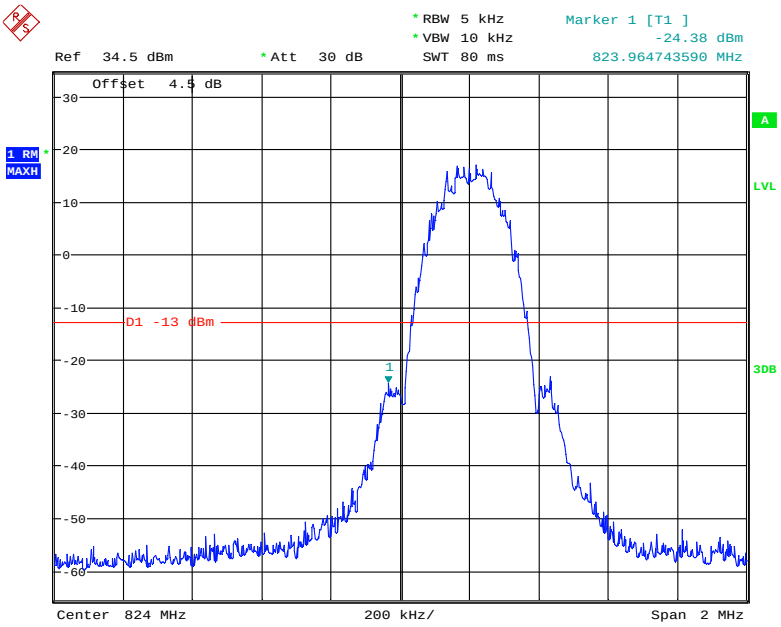
Date: 9.AUG.2017 13:54:28

Cellular Band, Right Band Edge for GSM (GMSK) Mode



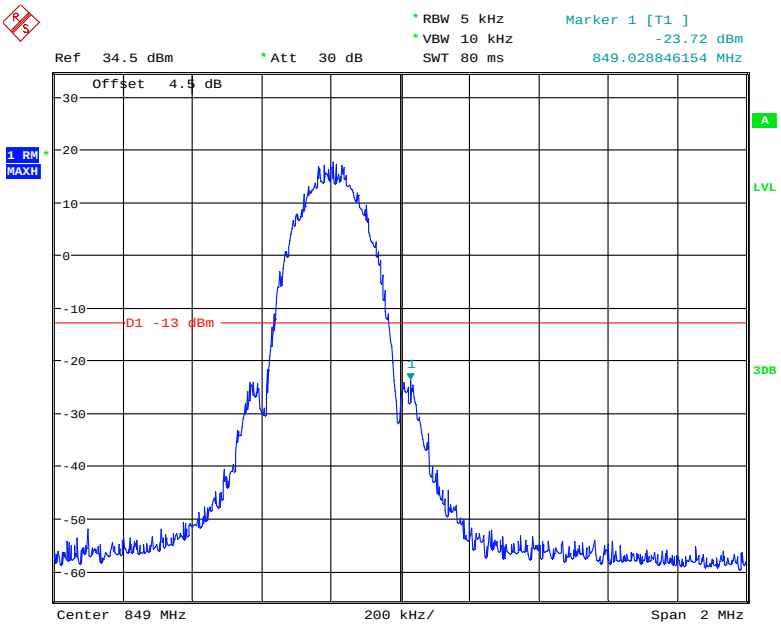
Date: 9.AUG.2017 13:54:59

Cellular Band, Left Band Edge for EGPRS (EDGE) Mode



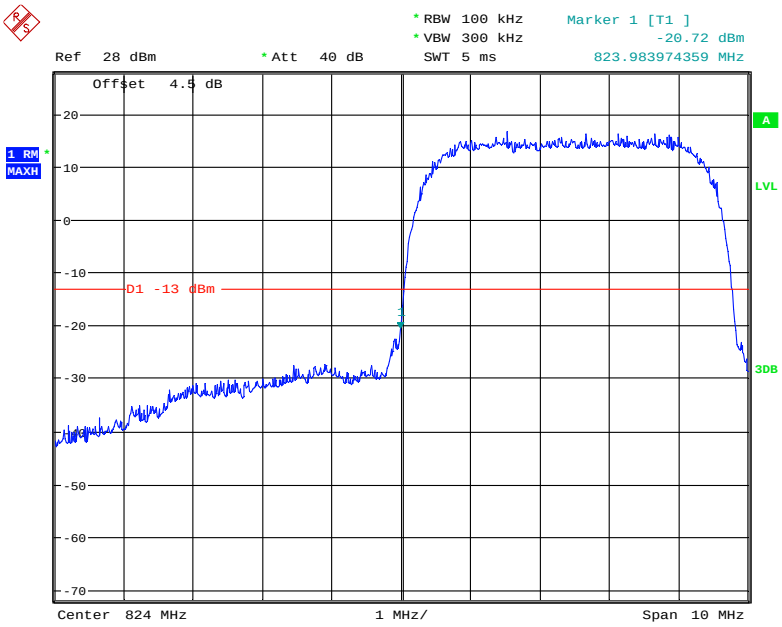
Date: 9.AUG.2017 13:58:02

Cellular Band, Right Band Edge for EGPRS (EDGE) Mode



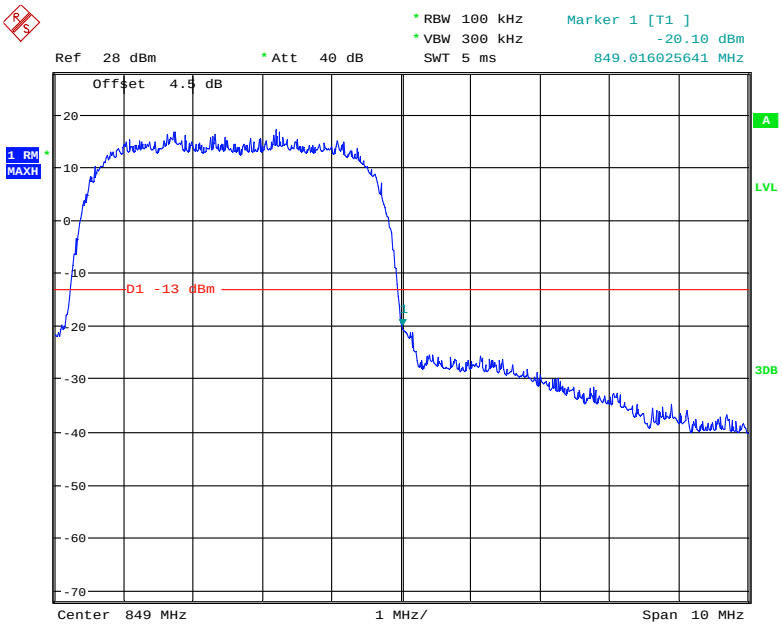
Date: 9.AUG.2017 13:57:08

Cellular Band, Left Band Edge for RMC (BPSK) Mode



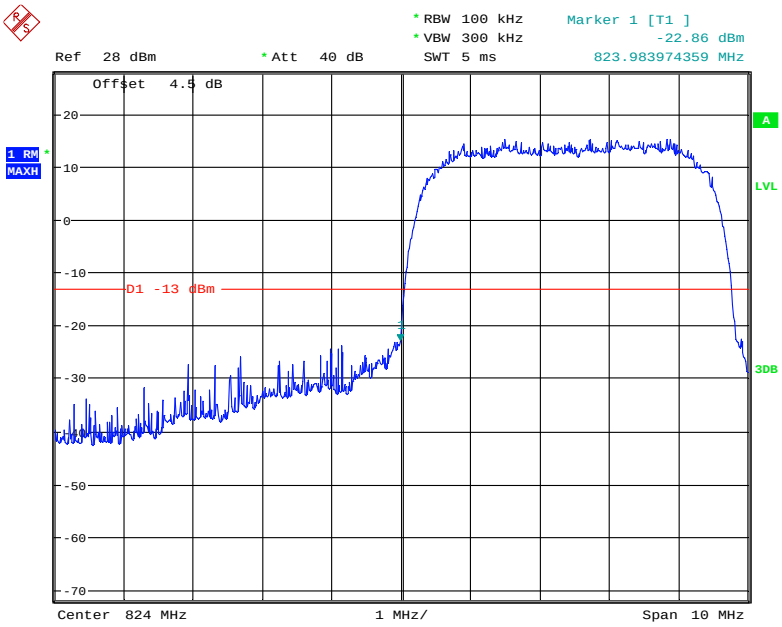
Date: 9.AUG.2017 15:40:05

Cellular Band, Right Band Edge for RMC (BPSK) Mode



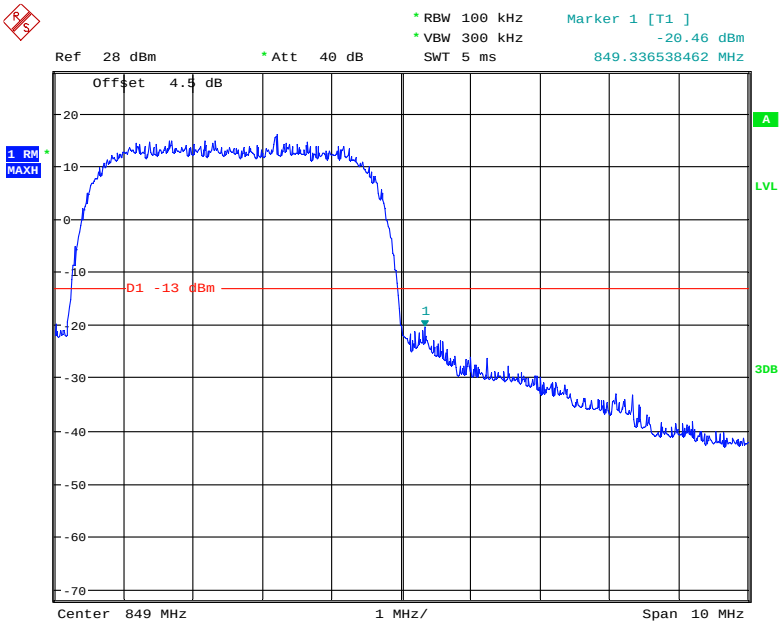
Date: 9.AUG.2017 15:39:21

Cellular Band, Left Band Edge for HSDPA (16QAM) Mode



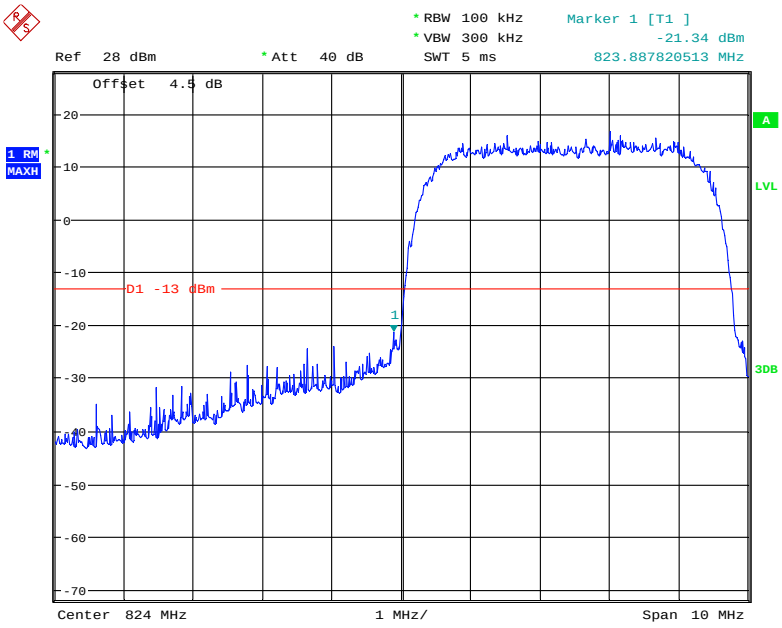
Date: 9.AUG.2017 15:46:06

Cellular Band, Right Band Edge for HSDPA (16QAM) Mode



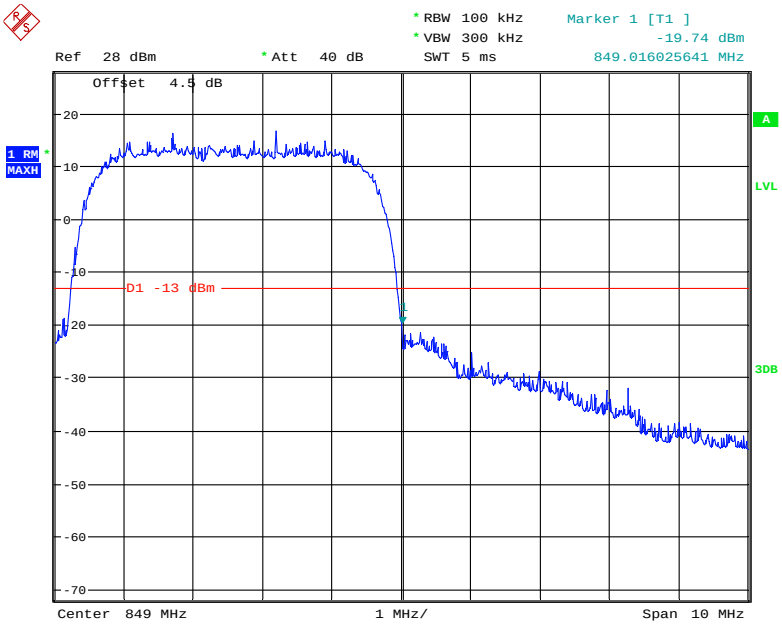
Date: 9.AUG.2017 15:45:21

Cellular Band, Left Band Edge for HSUPA (BPSK) Mode



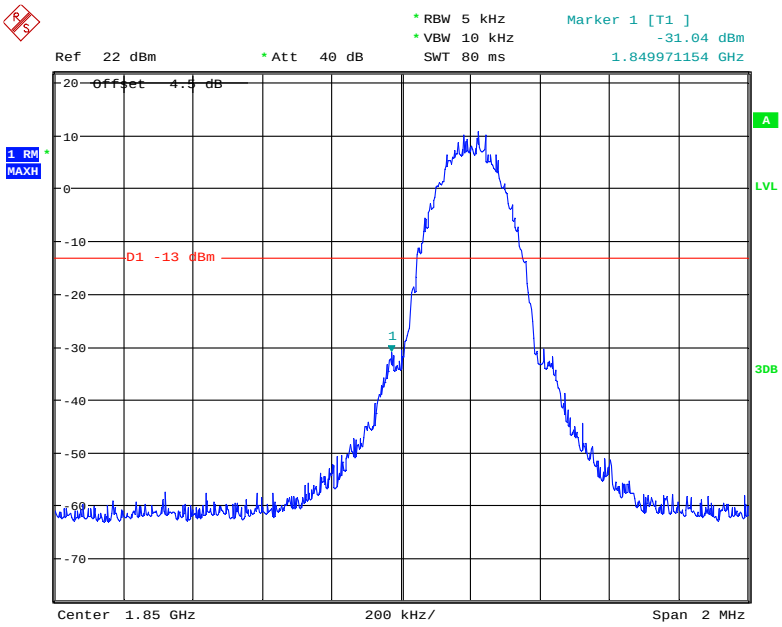
Date: 9.AUG.2017 15:47:03

Cellular Band, Right Band Edge for HSUPA (BPSK) Mode



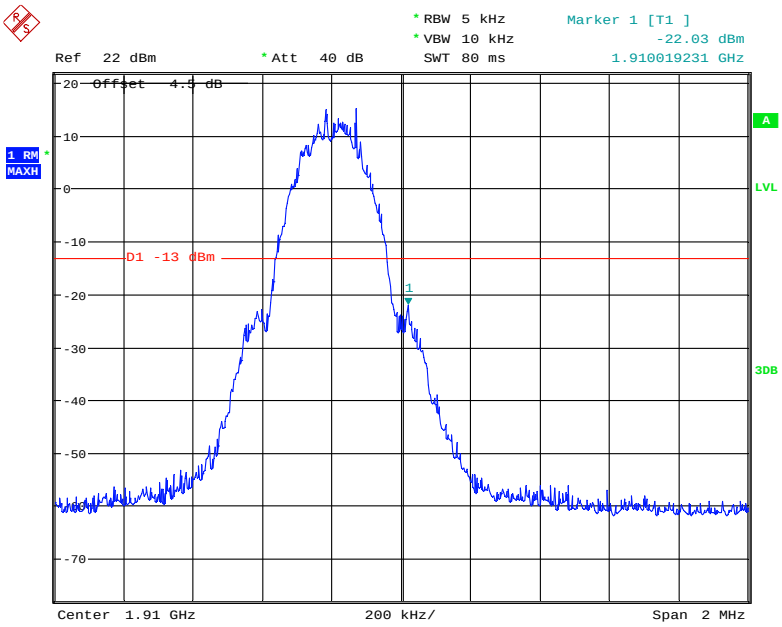
Date: 9.AUG.2017 15:48:13

PCS Band, Left Band Edge for GSM (GMSK) Mode



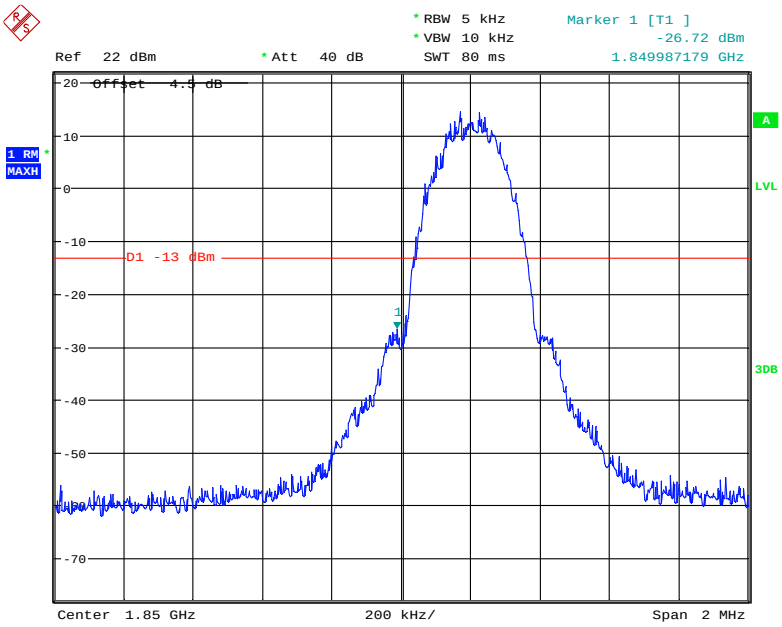
Date: 9.AUG.2017 15:35:13

PCS Band, Right Band Edge for GSM (GMSK) Mode



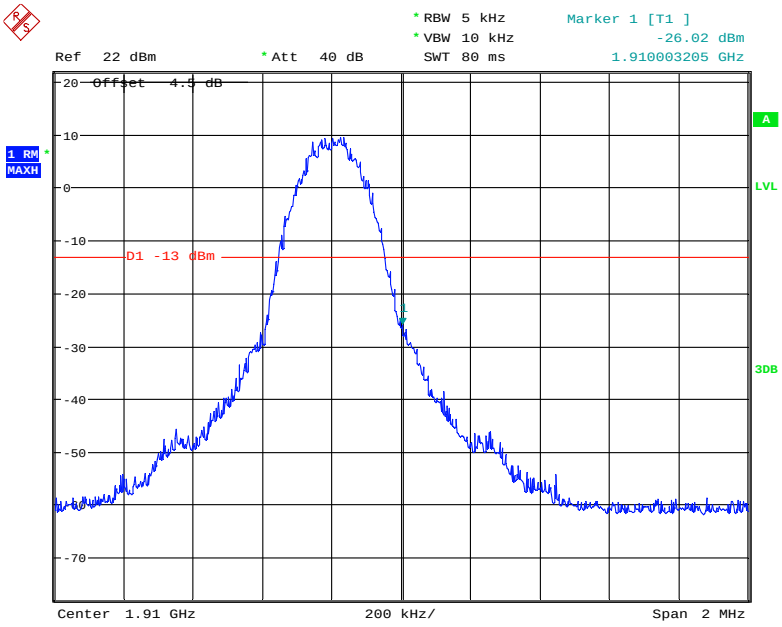
Date: 9.AUG.2017 13:11:19

PCS Band, Left Band Edge for EGPRS (EDGE) Mode



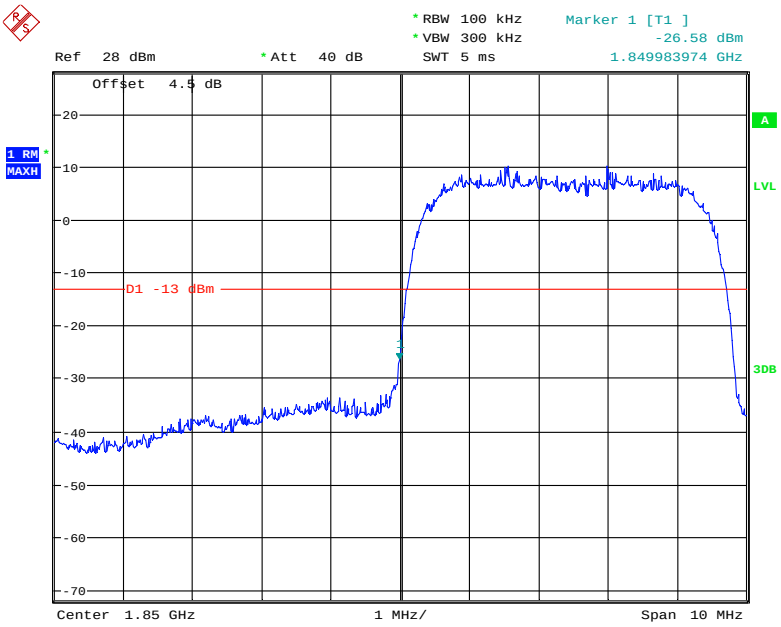
Date: 9.AUG.2017 12:00:38

PCS Band, Right Band Edge for EGPRS (EDGE) Mode



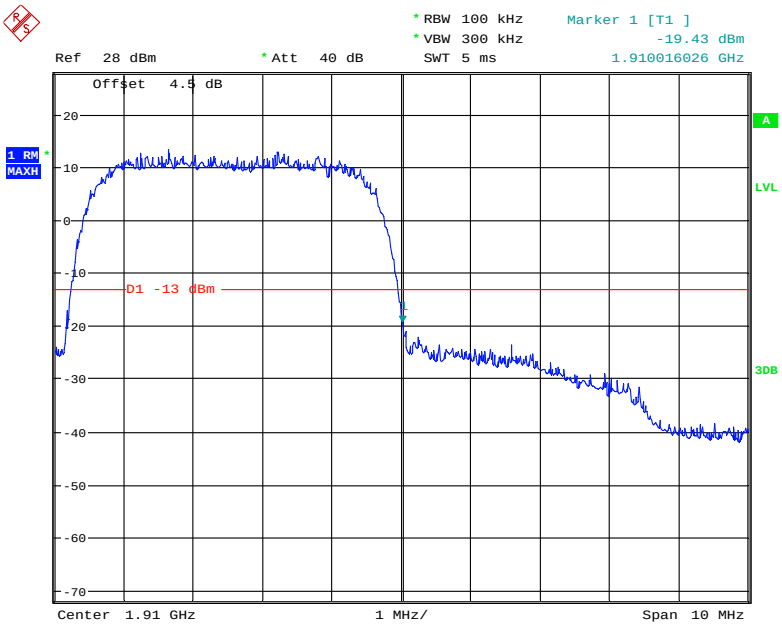
Date: 9.AUG.2017 12:03:20

PCS Band, Left Band Edge for RMC (BPSK) Mode



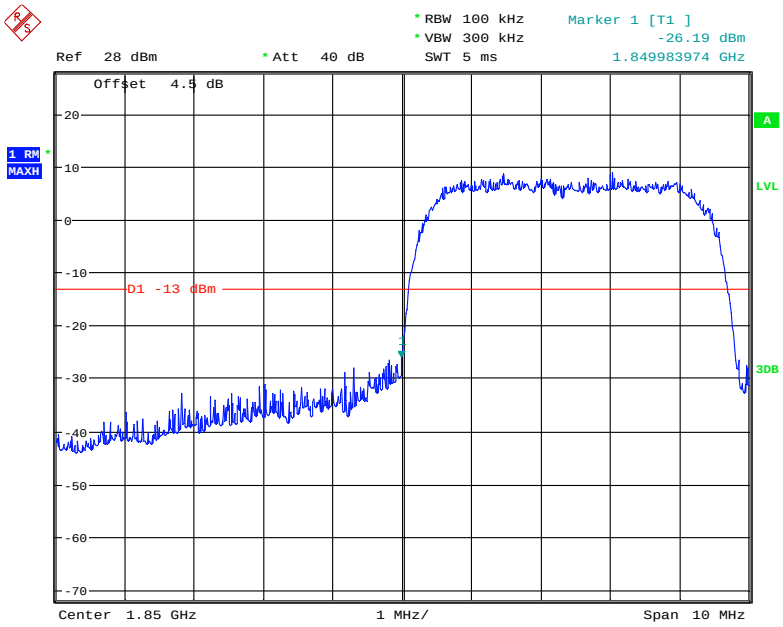
Date: 9.AUG.2017 15:37:48

PCS Band, Right Band Edge for RMC (BPSK) Mode



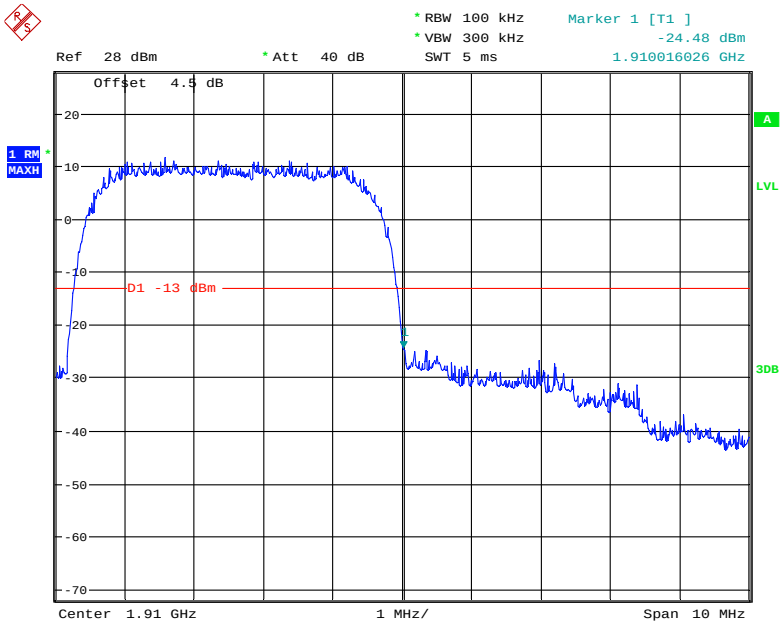
Date: 9.AUG.2017 15:38:34

PCS Band, Left Band Edge for HSDPA (16QAM) Mode



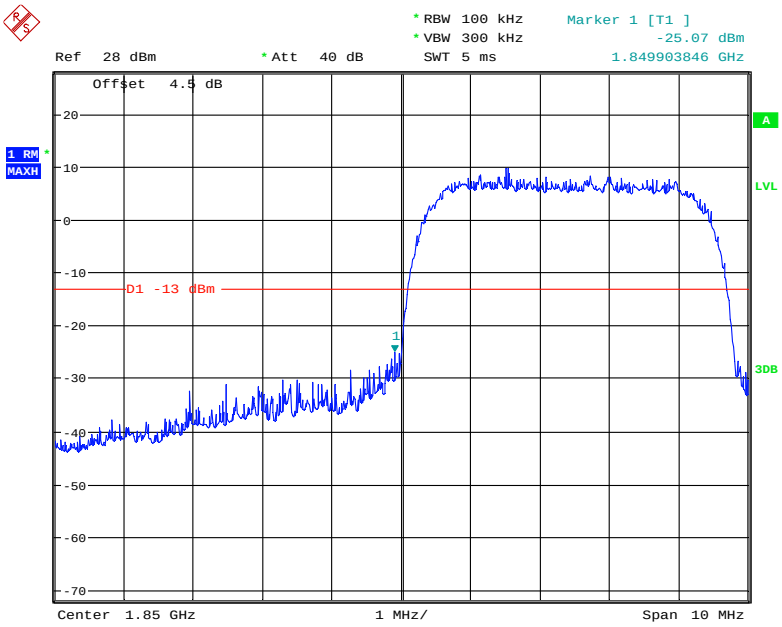
Date: 9.AUG.2017 15:43:41

PCS Band, Right Band Edge for HSDPA (16QAM) Mode



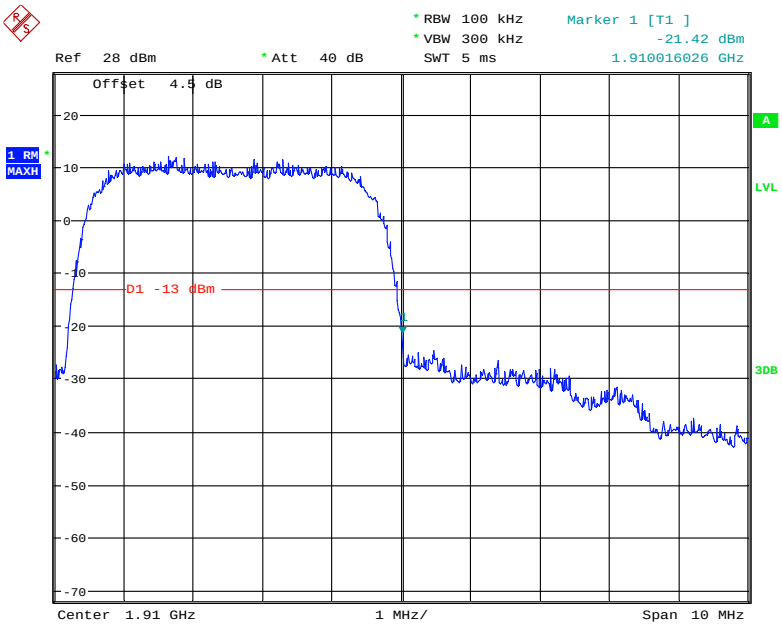
Date: 9.AUG.2017 15:44:32

PCS Band, Left Band Edge for HSUPA (BPSK) Mode



Date: 9.AUG.2017 15:49:39

PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 9.AUG.2017 15:49:09

FCC § 2.1055; § 22.355; § 24.235; - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055, §22.355, §24.235.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

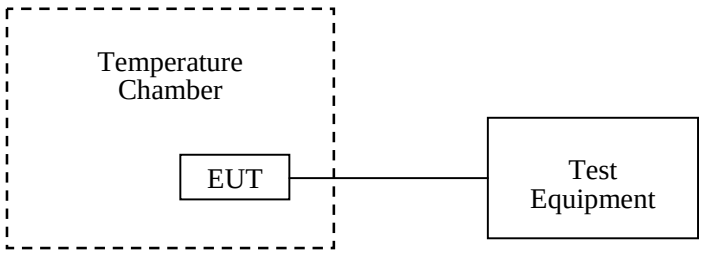
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Kobe Li on 2017-08-08.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	1	0.0012	2.5
-20		2	0.0024	2.5
-10		4	0.0048	2.5
0		6	0.0072	2.5
10		5	0.0060	2.5
20		2	0.0024	2.5
30		3	0.0036	2.5
40		1	0.0012	2.5
50		6	0.0072	2.5
25	V min.= 3.6	6	0.0072	2.5
	V max.= 4.35	8	0.0096	2.5

EDGE Mode

Middle Channel, f_o =836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	7	0.0084	2.5
-20		6	0.0072	2.5
-10		1	0.0012	2.5
0		5	0.0060	2.5
10		3	0.0036	2.5
20		5	0.0060	2.5
30		3	0.0036	2.5
40		2	0.0024	2.5
50		5	0.0060	2.5
25	V min.= 3.6	3	0.0036	2.5
	V max.= 4.35	5	0.0060	2.5

WCDMA Mode

Middle Channel, f_o=836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-15	-0.0179	2.5
-20		-8	-0.0096	2.5
-10		-6	-0.0072	2.5
0		-11	-0.0131	2.5
10		-15	-0.0179	2.5
20		-4	-0.0048	2.5
30		-10	-0.0120	2.5
40		1	0.0012	2.5
50		-2	-0.0024	2.5
25	V min.= 3.6	6	0.0072	2.5
	V max.= 4.35	11	0.0131	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-2	-0.0011	pass
-20		3	0.0016	pass
-10		5	0.0027	pass
0		1	0.0005	pass
10		3	0.0016	pass
20		4	0.0021	pass
30		3	0.0016	pass
40		4	0.0021	pass
50		3	0.0016	pass
25	V min.= 3.6	4	0.0021	pass
	V max.= 4.35	5	0.0027	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	3	0.0016	pass
-20		3	0.0016	pass
-10		4	0.0021	pass
0		3	0.0016	pass
10		3	0.0016	pass
20		3	0.0016	pass
30		4	0.0021	pass
40		6	0.0032	pass
50		3	0.0016	pass
25	V min.= 3.6	5	0.0027	pass
	V max.= 4.35	7	0.0037	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	1	0.000532	pass
-20		2	0.001064	pass
-10		-1	-0.000532	pass
0		1	0.000532	pass
10		-2	-0.001064	pass
20		-2	-0.001064	pass
30		2	0.001064	pass
40		-2	-0.001064	pass
50		-1	-0.000532	pass
25	V min.= 3.6	-2	-0.001064	pass
	V max.= 4.35	1	0.000532	pass

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