FCC RADIO TEST REPORT

FCC ID	:	**A4RG020J**
Equipment	:	**Phone**
Model Name	:	**G020J**
Applicant	:	**Google LLC** **1600 Amphitheatre Parkway,** **Mountain View, California, 94043 USA**
Standard	:	**FCC 47 CFR Part 2, and 90(S)**

The product was received on Nov. 07, 2018 and testing was started from Apr. 13, 2019 and completed on Jun. 20, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FG8N0620-05C	01	Initial issue of report	Jun. 28, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046 §90.635	Conducted Output Power and Effective Radiated Power	Pass	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049 §90.209	Bandwidth Limitations	Reporting only	-
3.5	§2.1051 §90.691	Emission masks – In-band emissions	Pass	-
3.6	§2.1051 §90.691	Emission masks – Out of band emissions	Pass	-
3.7	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	Pass	-
4.2	§2.1053 §90.691	Field Strength of Spurious Radiation	Pass	Under limit 41.71 dB at 3280.000 MHz

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Feature of Equipment Under Test

Product Feature	
Equipment	Phone
Model Name	G020J
FCC ID	A4RG020J
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC/GNSS/WPC WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE 60 GHz Low Power Transmitter
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

EUT Information List	
No.	S/N
#1	92UBA06699
#2	958BA00AJH

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	817.9 MHz ~ 823.1 MHz
Rx Frequency	862.9 MHz ~ 868.1 MHz
Maximum Output Power to Antenna	24.94 dBm
Antenna Type / Gain	**<For Ant. 0_C>** CDMA2000 B10: ILA Antenna type with gain 1.2 dBi **<For Ant. 1>** CDMA2000 B10: ILA Antenna type with gain -3.7 dBi
Type of Modulation	CDMA2000 : QPSK CDMA2000 1xEV-DO : QPSK/8PSK

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH03-HY
Test Engineer	Benjamin Lin
Temperature	21~24℃
Relative Humidity	51~55%

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH12-HY
Test Engineer	Jack Cheng, Lance Chiang, Chuan Chu
Temperature	22-26℃
Relative Humidity	54-60%

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW0007

1.5 Applied Standards

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

- FCC 47 CFR Part 2, 90
- ANSI / TIA-603-E
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

Remark:

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

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z with Accessory (Earphone or Adapter).

<Adapter Mode>

LTE Band 26
Y plane for Ant. 0_C
Y plane for Ant. 1

Radiated emissions were investigated as following frequency range:

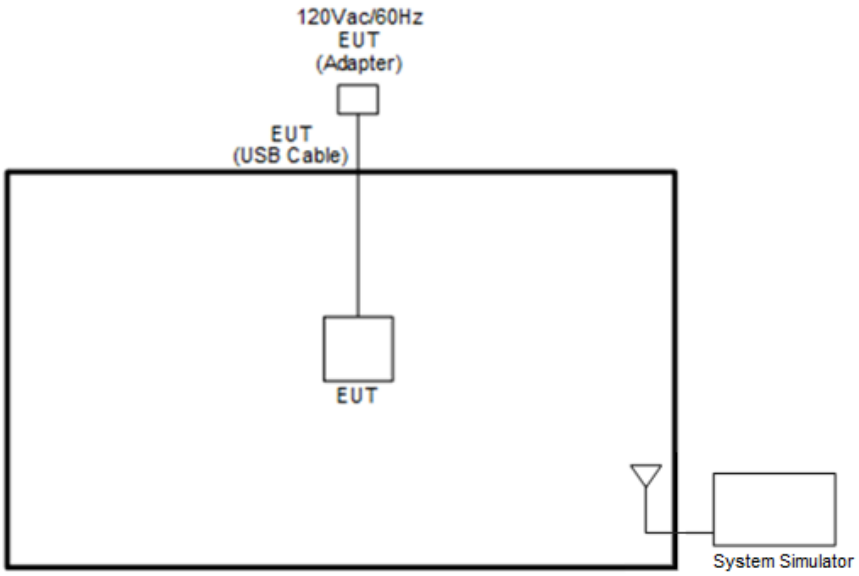
1. 30 MHz to 9000 MHz for CDMA BC10.

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
CDMA2000 BC10	■ 1xRTT Link	■ 1xRTT Link ■ 1xEV-DO Link

Remark: All the radiated test cases were performed with Adapter 1.

2.2 Connection Diagram of Test System

<For Adapter Mode>



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.2 dB and a 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

Frequency List				
Band	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
CDMA2000 BC10	Channel	476	580	684
	Frequency	817.9	820.5	823.1

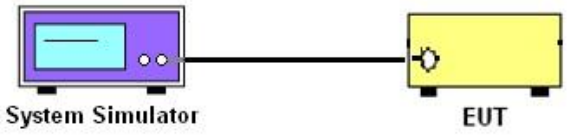
3 Conducted Test Items

3.1 Measuring Instruments

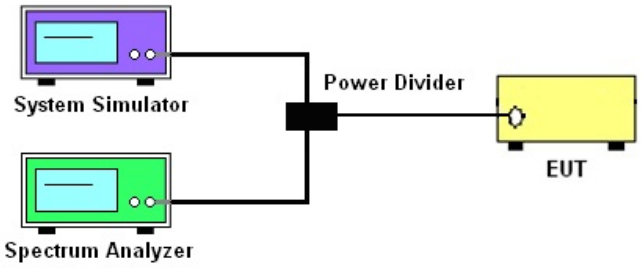
See list of measuring instruments of this test report.

3.1.1 Test Setup

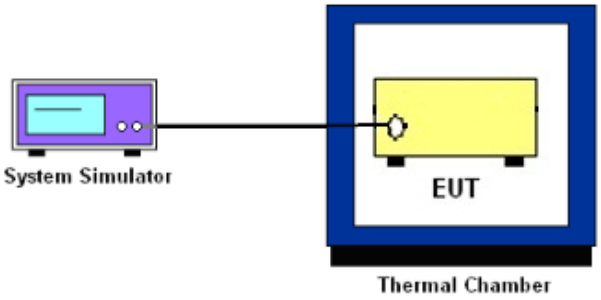
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge, and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power Measurement

3.2.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

Reporting only

3.3.2 Test Procedures

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.4 Bandwidth Limitations Measurement

3.4.1 Description of (Occupied) Bandwidth Limitations Measurement

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

3.4.2 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW≥ 3*RBW, sample detector, trace maximum hold.
4. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW≥ 3*RBW, peak detector, trace maximum hold.

3.5 Emissions Mask Measurement

3.5.1 Description of Emissions Mask Measurement

Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of FCC Part 90.691.(a)(1)

(a). Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

3.5.2 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via power divider.
2. The emissions mask of low and high channels for the highest RF powers were measured.
3. The measured RBW and the VBW set 3 times of RBW are then set in spectrum analyzer, and the RBW correction factor 10log (1% of OBW/measured RBW)(dB) was compensated, if required.
4. The test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.

3.6 Emissions Mask – Out Of Band Emissions Measurement

3.6.1 Description of Conducted Spurious Emissions Out of band emissions measurement

The power of any emission FCC Part 90.691 (a)(2) on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.6.2 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.3 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

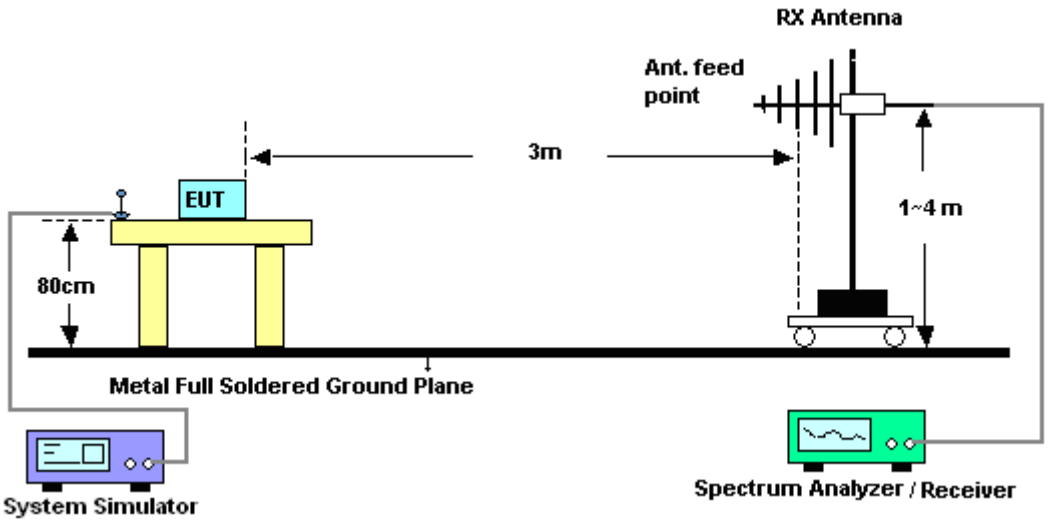
4 Radiated Test Items

4.1 Measuring Instruments

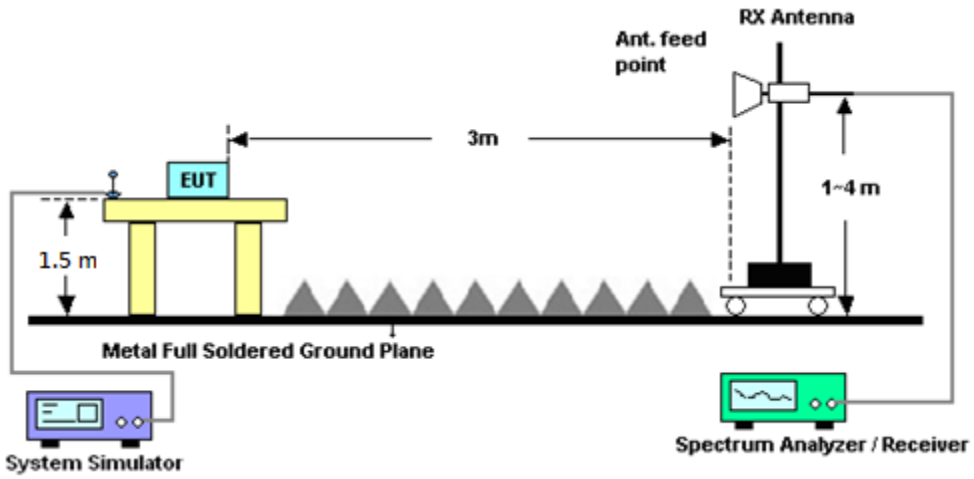
See list of measuring instruments of this test report.

4.1.1 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

4.2 Field Strength of Spurious Radiation Measurement

4.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43+10log10(P[Watts]) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.2.2 Test Procedures

1. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 29, 2018	Apr. 13, 2019~ May 23, 2019	Jun. 28, 2019	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Dec. 06, 2017	Apr. 13, 2019~ May 23, 2019	Dec. 05, 2019	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V; Current:0~5A	Dec. 06, 2017	Apr. 13, 2019~ May 23, 2019	Dec. 05, 2019	Conducted (TH03-HY)
Base Station(Measure)	Rohde & Schwarz	CMU200	117995	GSM / GPRS / WCDMA / CDMA	Aug. 10, 2018	Apr. 13, 2019~ May 23, 2019	Aug. 09, 2019	Conducted (TH03-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	May 28, 2019~ Jun. 20, 2109	Jan. 06, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802 N1D01N-06	47020&06	30MHz to 1GHz	Oct. 13, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-121 2	1GHz ~ 18GHz	Oct. 19, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 18, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-132 6	1GHz ~ 18GHz	Oct. 30, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 29, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz ~ 40GHz	Dec. 05, 2018	May 28, 2019~ Jun. 20, 2109	Dec. 04, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	May 28, 2019~ Jun. 20, 2109	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A023 75	1GHz~26.5Ghz	May 28, 2018	May 28, 2019~ Jun. 20, 2109	May 26, 2020	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 0055007	1GHz~18GHz	Apr. 01, 2019	May 28, 2019~ Jun. 20, 2109	Mar. 31, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	May 28, 2019~ Jun. 20, 2109	Dec. 05, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 26, 2018	May 28, 2019~ Jun. 20, 2109	Dec. 25, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz~44GHz	Dec. 19, 2018	May 28, 2019~ Jun. 20, 2109	Dec. 18, 2019	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP161243	N/A	May 11, 2019	May 28, 2019~ Jun. 20, 2109	May 10, 2020	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	175727	100kHz~40GHz	Dec. 23, 2018	May 28, 2019~ Jun. 20, 2109	Dec. 23, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WLK4-1000-1 530-6000-40S S	SN11	1 GHz Lowpass	Sep. 16, 2018	May 28, 2019~ Jun. 20, 2109	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-108 0-1200-1500- 60SS	SN2	1.2G High Pass	Sep. 16, 2018	May 28, 2019~ Jun. 20, 2109	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60ST	SN2	3GHz High Pass	Mar. 20, 2019	May 28, 2019~ Jun. 20, 2109	Mar. 19, 2020	Radiation (03CH12-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Notch Filter	EWT	EWT-14-0041	D1	DCS 1800	Nov. 01, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 31, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCT698/798-10/40 8SSK	SN1	AWS Band	Nov. 01, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 31, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCG824/849-40/8SS	SN35	CDMA 850	Nov. 07, 2018	May 28, 2019~ Jun. 20, 2109	Nov. 06, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 13, 2019	May 28, 2019~ Jun. 20, 2109	Mar. 12, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	May 28, 2019~ Jun. 20, 2109	Oct. 15, 2019	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	May 28, 2019~ Jun. 20, 2109	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 28, 2019~ Jun. 20, 2109	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 28, 2019~ Jun. 20, 2109	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	May 28, 2019~ Jun. 20, 2109	N/A	Radiation (03CH12-HY)

6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.36

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.70

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.98

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

Conducted Power (*Unit: dBm)			
Band	CDMA 2000 BC10		
Channel	476	580	684
Frequency	817.9	820.5	823.1
1xRTT RC1 SO55	24.66	24.62	24.53
1xRTT RC3 SO55	24.62	24.59	24.52
1xRTT RC3 SO32 (+ F-SCH)	24.61	24.59	24.54
1xRTT RC3 SO32 (+SCH)	24.56	24.58	24.57
1xEVDO RTAP 153.6Kbps	24.69	24.64	24.60
1xEVDO RETAP 4096Bits	24.67	24.63	24.58

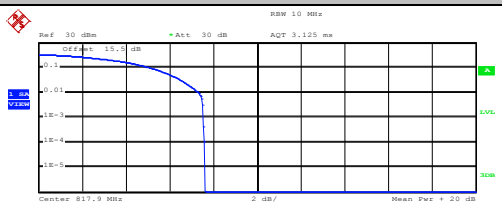
A2. CDMA

Peak-to-Average Ratio

Mode	CDMA BC10	CDMA BC10	Limit: 13dB
Mod.	1xRTT	1xEV-DO Rev. A	Result
Lowest CH	7.56	8.48	PASS
Middle CH	8.40	8.00	
Highest CH	8.60	8.40	

CDMA BC10 (1xRTT)

Lowest Channel



Complementary Cumulative Distribution Function (100000 samples)

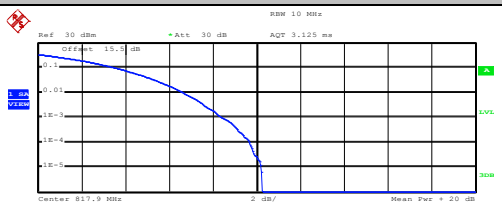
Trace 1

Mean 18.45 dBm
Peak 26.06 dBm
Crest 7.62 dB

10 % 5.24 dB
1 % 7.32 dB
.1 % 7.56 dB
.01 % 7.60 dB

Date: 5.MAY.2019 13:29:36

Lowest Channel



Complementary Cumulative Distribution Function (100000 samples)

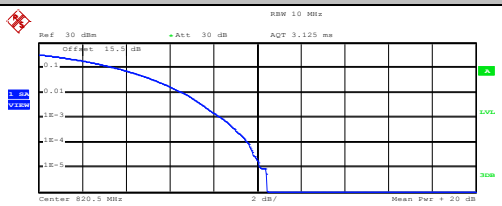
Trace 1

Mean -29.64 dBm
Peak -19.37 dBm
Crest 10.27 dB

10 % 3.68 dB
1 % 6.68 dB
.1 % 8.48 dB
.01 % 9.68 dB

Date: 6.MAY.2019 09:54:32

Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

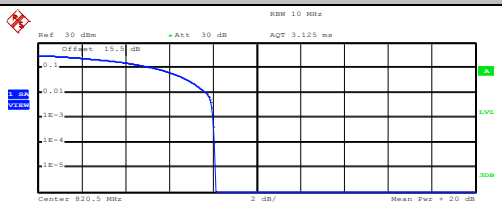
Trace 1

Mean -29.62 dBm
Peak -19.16 dBm
Crest 10.46 dB

10 % 3.64 dB
1 % 6.64 dB
.1 % 8.40 dB
.01 % 9.60 dB

Date: 5.MAY.2019 13:30:23

Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

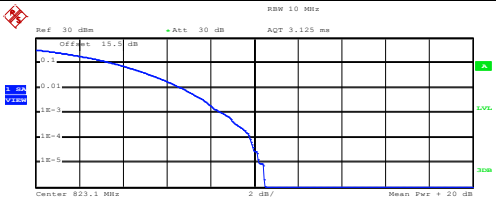
Trace 1

Mean 10.44 dBm
Peak 18.58 dBm
Crest 8.14 dB

10 % 5.44 dB
1 % 7.68 dB
.1 % 8.00 dB
.01 % 8.08 dB

Date: 6.MAY.2019 09:55:07

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

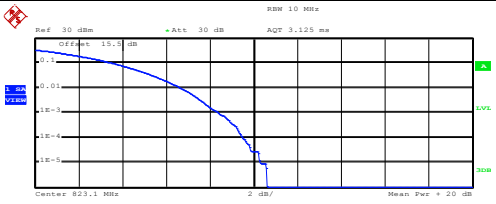
Trace 1

Mean -29.70 dBm
Peak -19.23 dBm
Crest 10.47 dB

10 % 3.64 dB
1 % 6.72 dB
.1 % 8.60 dB
.01 % 9.80 dB

Date: 5.MAY.2019 13:30:50

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

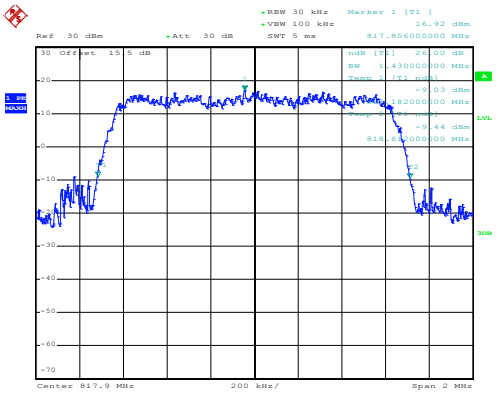
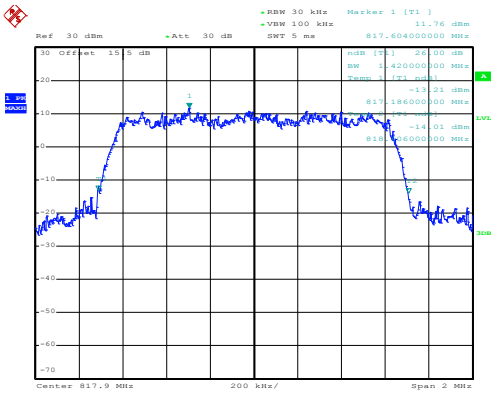
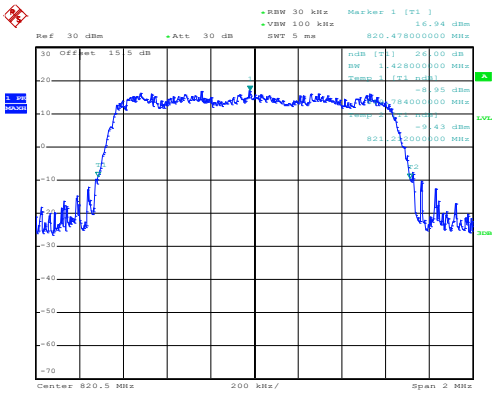
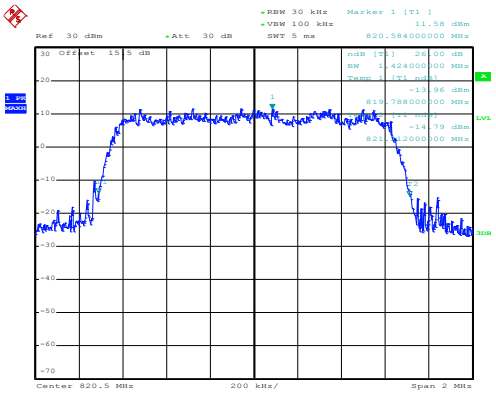
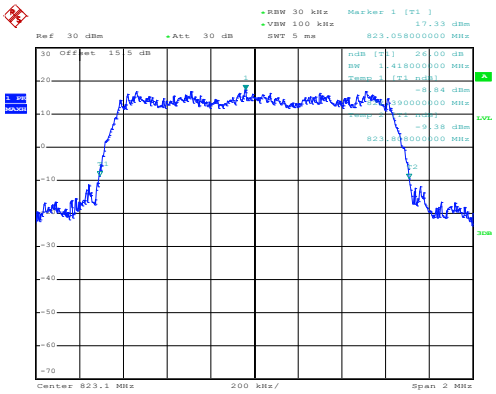
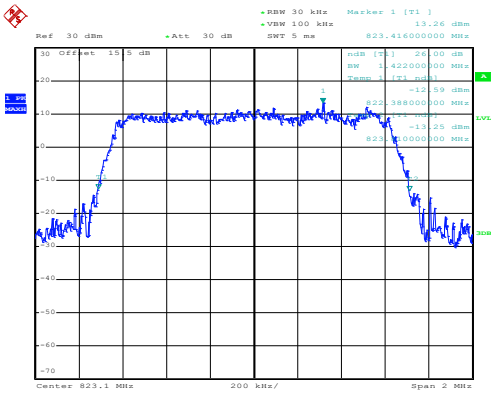
Mean -29.64 dBm
Peak -19.02 dBm
Crest 10.62 dB

10 % 3.68 dB
1 % 6.72 dB
.1 % 8.40 dB
.01 % 9.52 dB

Date: 6.MAY.2019 09:55:49

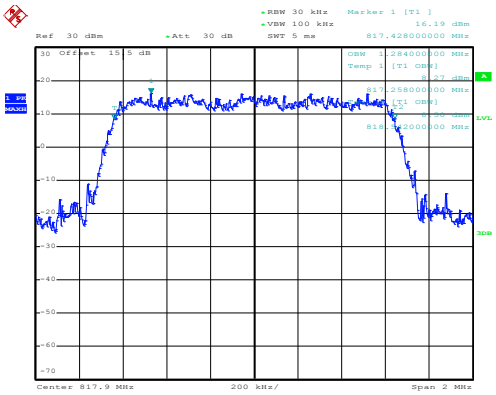
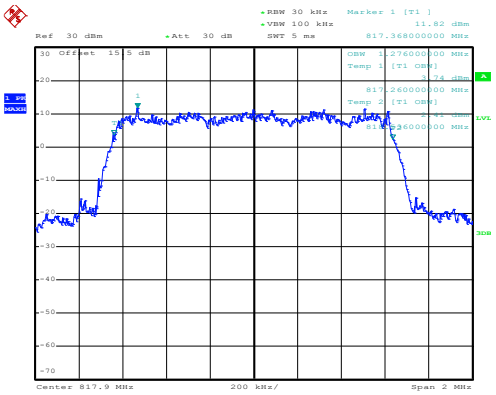
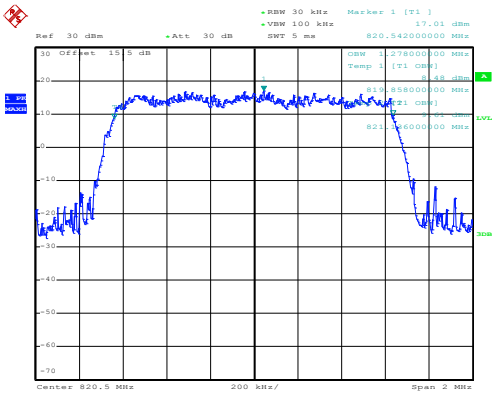
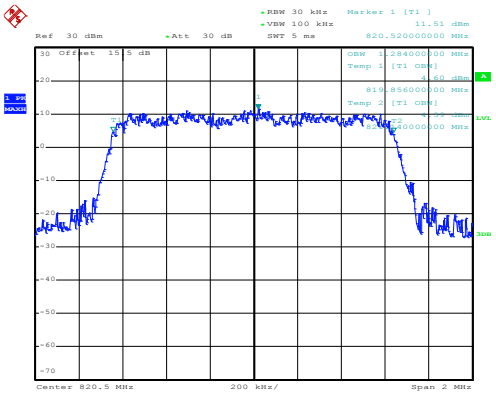
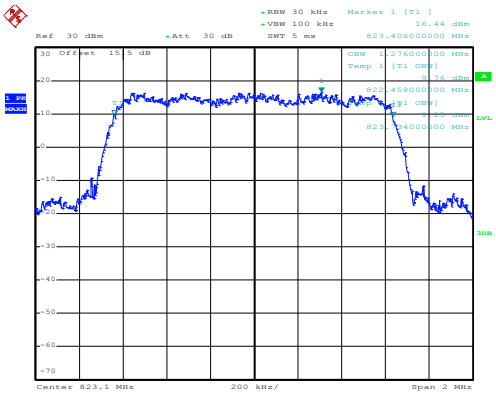
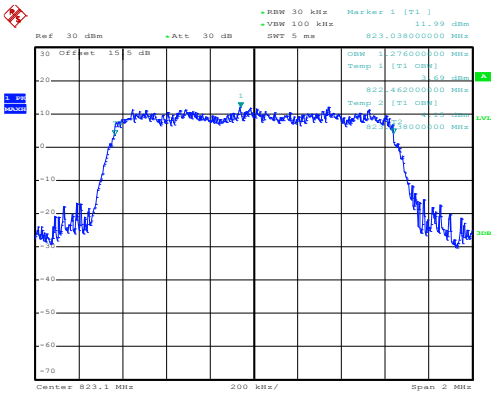
26dB Bandwidth

Mode	CDMA BC10 26dB BW(MHz)	CDMA BC10 26dB BW(MHz)
Mod.	1xRTT	1xEV-DO Rev. A
Lowest CH	1.430	1.420
Middle CH	1.428	1.424
Highest CH	1.418	1.422

CDMA BC10 (1xRTT)	CDMA BC10 (1xEV-DO Rev. A)
Lowest Channel	**Lowest Channel**
	
Date: 5.MAY.2019 13:18:17	Date: 6.MAY.2019 09:44:43
Middle Channel	**Middle Channel**
	
Date: 5.MAY.2019 13:19:17	Date: 6.MAY.2019 09:45:35
Highest Channel	**Highest Channel**
	
Date: 5.MAY.2019 13:20:05	Date: 6.MAY.2019 09:46:23

Occupied Bandwidth

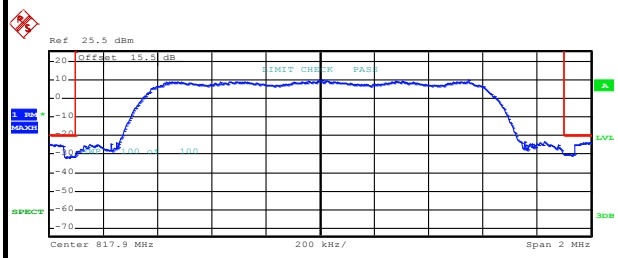
Mode	CDMA BC10 99%OBW(MHz)	CDMA BC10 99%OBW(MHz)
Mod.	1xRTT	1xEV-DO Rev. A
Lowest CH	1.284	1.276
Middle CH	1.278	1.284
Highest CH	1.276	1.276

CDMA BC10 (1xRTT)	CDMA BC10 (1xEV-DO Rev. A)
Lowest Channel	**Lowest Channel**
	
Date: 5.MAY.2019 13:21:20	Date: 6.MAY.2019 09:48:22
Middle Channel	**Middle Channel**
	
Date: 5.MAY.2019 13:22:03	Date: 6.MAY.2019 09:49:12
Highest Channel	**Highest Channel**
	
Date: 5.MAY.2019 13:22:52	Date: 6.MAY.2019 09:50:00

Conducted Band Edge

CDMA BC10 (1xRTT)

Lowest Band Edge

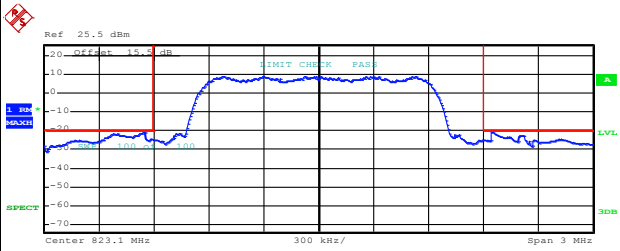


Tx Channel
Bandwidth 1.4 MHz Power 23.55 dBm

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	ΔLimit [dB]
-1.000 M	-937.500 k	100.00 k	816.900000 M	-24.56	-48.11	-4.56
-937.500 k	-900.000 k	30.00 k	816.996000 M	-30.74	-54.29	-10.74
900.000 k	937.500 k	30.00 k	818.800000 M	-30.14	-53.68	-10.14
937.500 k	1.000 M	100.00 k	818.880000 M	-23.85	-47.40	-3.85

Date: 7.MAY.2019 08:15:33

Highest Band Edge



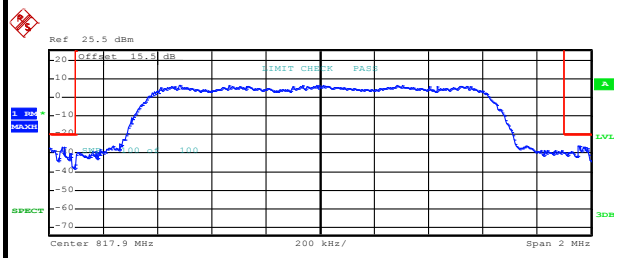
Tx Channel
Bandwidth 1.4 MHz Power 22.98 dBm

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	ΔLimit [dB]
-1.500 M	-937.500 k	100.00 k	822.146000 M	-20.75	-43.73	-0.75
-937.500 k	-900.000 k	30.00 k	822.188000 M	-24.49	-47.46	-4.49
900.000 k	937.500 k	30.00 k	824.006000 M	-24.92	-47.89	-4.92
937.500 k	1.500 M	100.00 k	824.054000 M	-21.11	-44.08	-1.11

Date: 7.MAY.2019 08:29:40

CDMA BC10 (1xEV-DO Rev. A)

Lowest Band Edge

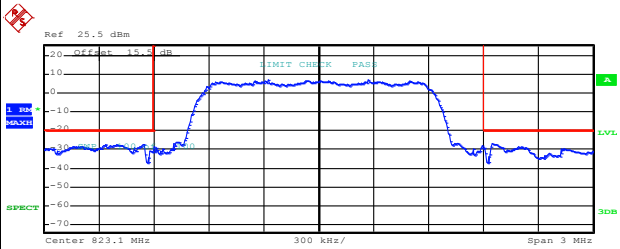


Tx Channel
Bandwidth 1.4 MHz Power 20.28 dBm

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	ΔLimit [dB]
-1.000 M	-937.500 k	100.00 k	816.948000 M	-26.91	-47.20	-6.91
-937.500 k	-900.000 k	30.00 k	816.980000 M	-30.33	-50.61	-10.33
900.000 k	937.500 k	30.00 k	818.808000 M	-29.43	-49.71	-9.43
937.500 k	1.000 M	100.00 k	818.852000 M	-25.99	-46.27	-5.99

Date: 6.MAY.2019 16:11:58

Highest Band Edge



Tx Channel
Bandwidth 1.4 MHz Power 20.72 dBm

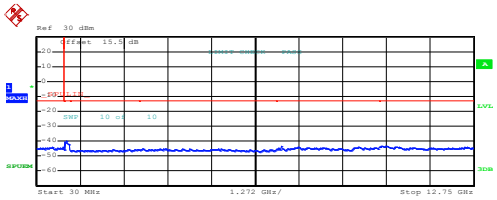
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	ΔLimit [dB]
-1.500 M	-937.500 k	100.00 k	822.140000 M	-27.22	-47.94	-7.22
-937.500 k	-900.000 k	30.00 k	822.182000 M	-31.01	-51.72	-11.01
900.000 k	937.500 k	30.00 k	824.006000 M	-29.39	-50.11	-9.39
937.500 k	1.500 M	100.00 k	824.048000 M	-26.98	-47.70	-6.98

Date: 6.MAY.2019 16:28:01

Conducted Spurious Emission

CDMA BC10 (1xRTT)

Lowest Channel

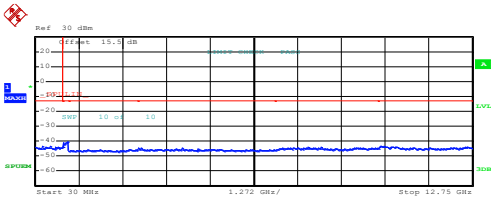


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Limit [dB]
30.000 M	813.250 M	100.00 k	797.193375 M	-44.21	-31.21
827.750 M	1.000 G	100.00 k	893.894000 M	-40.13	-27.13
1.000 G	3.000 G	100.00 k	1.455000 G	-45.09	-32.09
3.000 G	7.000 G	100.00 k	3.716000 G	-44.95	-31.95
7.000 G	10.000 G	100.00 k	7.151500 G	-43.63	-30.63
10.000 G	12.750 G	100.00 k	10.207625 G	-43.48	-30.48

Date: 5.MAY.2019 13:24:11

CDMA BC10 (1xEV-DO Rev. A)

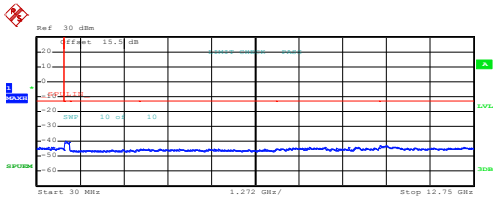
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Limit [dB]
30.000 M	813.250 M	100.00 k	469.011625 M	-43.43	-30.43
827.750 M	1.000 G	100.00 k	978.038125 M	-40.69	-27.69
1.000 G	3.000 G	100.00 k	2.952000 G	-45.48	-32.48
3.000 G	7.000 G	100.00 k	4.304000 G	-44.46	-31.46
7.000 G	10.000 G	100.00 k	8.359000 G	-43.93	-30.93
10.000 G	12.750 G	100.00 k	10.107250 G	-43.25	-30.25

Date: 6.MAY.2019 09:51:50

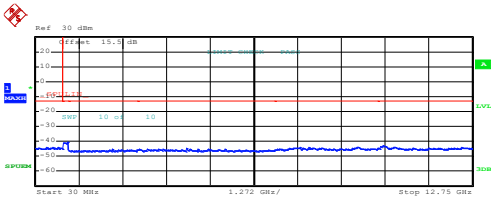
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Limit [dB]
30.000 M	813.250 M	100.00 k	358.573375 M	-43.92	-30.92
827.750 M	1.000 G	100.00 k	863.922500 M	-40.05	-27.05
1.000 G	3.000 G	100.00 k	2.837000 G	-44.91	-31.91
3.000 G	7.000 G	100.00 k	3.624000 G	-45.13	-32.13
7.000 G	10.000 G	100.00 k	9.379000 G	-43.73	-30.73
10.000 G	12.750 G	100.00 k	10.031625 G	-42.62	-29.62

Date: 5.MAY.2019 13:25:57

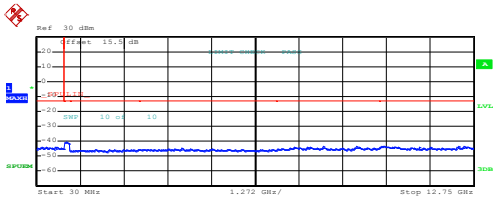
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Limit [dB]
30.000 M	813.250 M	100.00 k	366.405875 M	-43.97	-30.97
827.750 M	1.000 G	100.00 k	990.612375 M	-40.67	-27.67
1.000 G	3.000 G	100.00 k	2.258000 G	-45.22	-32.22
3.000 G	7.000 G	100.00 k	4.438000 G	-44.42	-31.42
7.000 G	10.000 G	100.00 k	7.738000 G	-43.86	-30.86
10.000 G	12.750 G	100.00 k	10.145750 G	-42.85	-29.85

Date: 6.MAY.2019 09:52:52

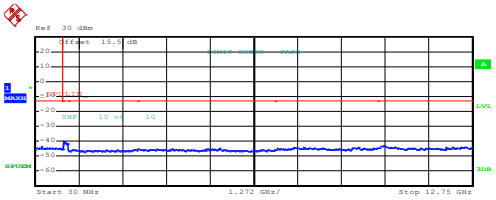
Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Limit [dB]
30.000 M	813.250 M	100.00 k	611.171500 M	-43.72	-30.72
827.750 M	1.000 G	100.00 k	897.683500 M	-40.76	-27.76
1.000 G	3.000 G	100.00 k	2.995000 G	-45.47	-32.47
3.000 G	7.000 G	100.00 k	4.242000 G	-44.65	-31.65
7.000 G	10.000 G	100.00 k	9.332500 G	-43.35	-30.35
10.000 G	12.750 G	100.00 k	10.145750 G	-43.22	-30.22

Date: 5.MAY.2019 13:27:02

Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Limit [dB]
30.000 M	813.250 M	100.00 k	199.573625 M	-43.48	-30.48
827.750 M	1.000 G	100.00 k	835.845750 M	-39.99	-26.99
1.000 G	3.000 G	100.00 k	1.205000 G	-45.26	-32.26
3.000 G	7.000 G	100.00 k	5.402000 G	-44.76	-31.76
7.000 G	10.000 G	100.00 k	9.434500 G	-44.18	-31.18
10.000 G	12.750 G	100.00 k	10.187000 G	-42.88	-29.88

Date: 6.MAY.2019 09:53:55

Frequency Stability

Test Conditions	Middle Channel	CDMA BC10 (1xRTT)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0085	PASS
40	Normal Voltage	0.0061	
30	Normal Voltage	0.0049	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0158	
0	Normal Voltage	0.0061	
-10	Normal Voltage	0.0049	
-20	Normal Voltage	0.0024	
-30	Normal Voltage	0.0037	
20	Maximum Voltage	0.0012	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0012	

Note:

1. Normal Voltage = 3.85V. ；Battery End Point (BEP) = 3.5 V.；Maximum Voltage =4.4 V

2. The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of Radiated Test

<For Adapter Mode>

<Ant. 0_C>

CDMA (BC10 1xRTT)

CDMA2000 BC1									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1632	-60.59	-13	-47.59	-70.63	-66.13	0.91	8.60	H
	2456	-56.81	-13	-43.81	-71.14	-64.16	1.14	10.64	H
	3271	-55.41	-13	-42.41	-71.11	-63.89	1.32	11.95	H
									H
									H
									H
	1632	-61.46	-13	-48.46	-71.03	-67.00	0.91	8.60	V
	2456	-56.65	-13	-43.65	-71.11	-64.00	1.14	10.64	V
	3271	-54.87	-13	-41.87	-71.04	-63.35	1.32	11.95	V
									V
									V
									V
Middle	1640	-60.42	-13	-47.42	-70.51	-65.98	0.92	8.63	H
	2464	-56.26	-13	-43.26	-70.58	-63.62	1.14	10.65	H
	3280	-55.66	-13	-42.66	-71.36	-64.16	1.32	11.97	H
									H
									H
									H
	1640	-61.20	-13	-48.20	-70.75	-66.76	0.92	8.63	V
	2464	-56.55	-13	-43.55	-71	-63.91	1.14	10.65	V
	3280	-54.96	-13	-41.96	-71.13	-63.46	1.32	11.97	V
									V
									V
									V

Highest	1648	-60.67	-13	-47.67	-70.77	-66.26	0.92	8.66	H
	2469	-56.58	-13	-43.58	-70.9	-63.94	1.14	10.66	H
	3296	-55.45	-13	-42.45	-71.12	-63.99	1.32	12.01	H
									H
									H
									H
									H
	1648	-61.28	-13	-48.28	-70.84	-66.87	0.92	8.66	V
	2469	-56.36	-13	-43.36	-70.81	-63.72	1.14	10.66	V
	3296	-55.06	-13	-42.06	-71.19	-63.60	1.32	12.01	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

<Ant. 1>

CDMA (BC10 1xRTT)

CDMA2000 BC1									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1632	-60.58	-13	-47.58	-70.62	-66.12	0.91	8.60	H
	2456	-56.78	-13	-43.78	-71.11	-64.13	1.14	10.64	H
	3271	-55.20	-13	-42.20	-70.9	-63.68	1.32	11.95	H
									H
									H
									H
	1632	-61.02	-13	-48.02	-70.59	-66.56	0.91	8.60	V
	2456	-56.39	-13	-43.39	-70.85	-63.74	1.14	10.64	V
	3271	-55.03	-13	-42.03	-71.2	-63.51	1.32	11.95	V
									V
									V
									V
Middle	1640	-60.12	-13	-47.12	-70.21	-65.68	0.92	8.63	H
	2464	-56.78	-13	-43.78	-71.1	-64.14	1.14	10.65	H
	3280	-55.17	-13	-42.17	-70.87	-63.67	1.32	11.97	H
									H
									H
									H
									H
	1640	-61.19	-13	-48.19	-70.74	-66.75	0.92	8.63	V
	2464	-56.58	-13	-43.58	-71.03	-63.94	1.14	10.65	V
	3280	-54.71	-13	-41.71	-70.88	-63.21	1.32	11.97	V
									V
									V
									V
									V

Highest	1648	-60.80	-13	-47.80	-70.9	-66.39	0.92	8.66	H
	2473	-56.52	-13	-43.52	-70.84	-63.88	1.14	10.66	H
	3296	-55.78	-13	-42.78	-71.45	-64.32	1.32	12.01	H
									H
									H
									H
									H
	1648	-61.11	-13	-48.11	-70.67	-66.70	0.92	8.66	V
	2472	-56.71	-13	-43.71	-71.21	-64.07	1.14	10.66	V
	3296	-55.42	-13	-42.42	-71.5	-63.96	1.32	12.01	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.