RADIO TEST REPORT

Report No.: STS2104059W01

Issued for

ABSOLUTE SOLUTION CO., LTD

111/11 Soi Kubon35-37, Kubon Rd. Bangchan Klongsamwa, Bangkok, 10510, Thailand

Product Name:	Core board module 4G
Brand Name:	SHADOW
Model Name:	ABSL-G
Series Model:	XY6762CA-C
FCC ID:	2AZVC-ABSL-G
Test Standard:	FCC Part 22

Shenzhen STS Test Services Co., Ltd.
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TEST RESULT CERTIFICATION

Applicant's Name ..... :	ABSOLUTE SOLUTION CO., LTD
Address ..... :	111/11 Soi Kubon35-37, Kubon Rd. Bangchan Klongsamwa, Bangkok, 10510, Thailand
Manufacturer's Name ..... :	ABSOLUTE SOLUTION CO., LTD
Address ..... :	111/11 Soi Kubon35-37, Kubon Rd.Bangchan Klongsamwa, Bangkok, 10510, Thailand

Product Description

Product Name ..... :	Core board module 4G
Brand Name ..... :	SHADOW
Model Name ..... :	ABSL-G
Series Model ..... :	XY6762CA-C
Test Standards ..... :	FCC Part 22
Test Procedure ..... :	KDB 971168 D01 v03r01,ANSI C63.26(2015)

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test..... :	
Date of receipt of test item..... :	14 Apr. 2021
Date (s) of performance of tests .:	14 Apr. 2021 ~ 08 May 2021
Date of Issue ..... :	08 May 2021
Test Result ..... :	Pass

Testing Engineer : 

(Chris Chen)

Technical Manager : 

(Sean she)

Authorized Signatory : 

(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	08 May 2021	STS2104059W01	ALL	Initial Issue

SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

The radiated emission testing was performed according to the procedures of KDB 971168 D01 v03r01 and ANSI C63.26(2015)

FCC Rules	Test Description	Test Limit	Test Result	Reference
2.1046	Conducted Output Power	Reporting Only	PASS	
22.913d	Peak-to-Average Ratio	< 13 dB	PASS	
2.1046 22.913	Effective Radiated Power/Equivalent Isotropic Radiated Power	< 7 Watts max. ERP(Part 22)	PASS	
2.1049 22.917	Occupied Bandwidth	Reporting Only	PASS	
2.1055 22.355	Frequency Stability	< 2.5 ppm (Part 22)	PASS	
2.1051 22.917	Spurious Emission at Antenna Terminals	< 43+10log10(P[Watts])	PASS	
2.1053 22.917	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	
2.1051 22.917	Band Edge	< 43+10log10(P[Watts])	PASS	

1 INTRODUCTION

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China
FCC test Firm Registration Number: 625569
IC test Firm Registration Number: 12108A
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements ofANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 toindicate a 95% level of confidence. The measurement data shown herein meets or exceeds the UCISPRmeasurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly tospecified limits to determine compliance.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 9K-30MHz	±2.84dB
4	All emissions, radiated 30M-1GHz	±4.39dB
5	All emissions, radiated 1G-6GHz	±5.10dB
6	All emissions, radiated>6G	±5.48dB
7	Conducted Emission (9KHz-150KHz)	±2.79dB
8	Conducted Emission (150KHz-30MHz)	±2.80dB

2 PRODUCT INFORMATION

Product Name	Core board module 4G
Trade Name	SHADOW
Model Name	ABSL-G
Series Model	XY6762CA-C
Model Difference	Only different in model name
Tx Frequency:	GPRS/EDGE: 850: 824 MHz ~ 849MHz WCDMA: Band V: 824 MHz ~ 849 MHz
Rx Frequency:	GPRS/EDGE: 850: 869 MHz ~ 894 MHz WCDMA: Band V: 869 MHz ~ 894 MHz
Max RF Output Power:	GPRS850(1-Slot):30.61dBm GPRS850(2-Slot):30.20dBm GPRS850(3-Slot):29.71dBm GPRS850(4-Slot):29.24dBm EDGE 850(1-Slot):29.06dBm EDGE 850(2-Slot):28.35dBm EDGE 850(3-Slot):27.62dBm EDGE 850(4-Slot):26.91dBm WCDMA Band V:22.21dBm
Type of Emission:	GPRS(850): 248KGXW EDGE(850): 245KG7W WCDMA850: 4M18F9W
Modulation Characteristics:	GMSK for GPRS; GMSK and 8PSK for EDGE WCDMA: QPSK; HSDPA:QPSK/16QAM; HSUPA:BPSK
SIM Card:	SIM 1 and SIM 2 is a chipset unit and tested as single chipset, SIM 1 is used to tested.
Antenna:	PIFA
Antenna gain:	GSM 850/ WCDMA 850: 2.8dBi
Power Rating:	Input: 3.45~4.35V
GPRS/EDGE Class:	Multi-Class12
Extreme Vol. Limits:	DC 3.45V~ DC 4.35(Normal: DC 3.8V)
Extreme Temp. Tolerance:	-30℃ to +50℃
Hardware version number:	K367-MB-V1.1
Software version number:	K367-XY6762CA-C.1616.01.P0.66.V1.1-userdebug
*** Note: The High Voltage 3.45V and Low Voltage 4.35V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.*	

3 TEST CONFIGURATION OF EQUIPMENT UNDER TEST

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 and ANSI C63.26 2015 Power Meas. License Digital Systems with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10th harmonic for GSM850 and WCDMA Band V.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

	TEST MODES	
BAND	RADIATED TCS	CONDUCTED TCS
GSM 850	GPRS/EDGE CLASS 12 LINK	GPRS/EDGE CLASS 12 LINK
WCDMA BAND V	RMC 12.2KBPS LINK	RMC 12.2KBPS LINK

RF Function	Band	Mode	Modulation	Power Class	Ant Gain(dBi)	Ant Type	SIM Card
GSM	850	GPRS (Class12)	GMSK	4	GSM850:6dBi	PIFA	2 SIM 1 is used to tested.
		EDGE(Class12)	GMSK, 8PSK	E2			
RF Function	Band	Mode	Modulation	Power Class	Ant Gain(dBi)	Ant Type	SIM Card
WCDMA	5	WCDMA	QPSK	3	WCDMA Band5:6dBi	PIFA	2 SIM 1 is used to tested.
		HSDPA	QPSK, 16QAM				
		HSUPA	BPSK				

4 MEASUREMENT INSTRUMENTS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2020.10.12	2021.10.11
Signal Analyzer	R&S	FSV 40-N	101823	2020.10.10	2021.10.09
Signal Generator	Agilent	83752A	3610A02740	2020.10.10	2021.10.09
Wireless Communications Test Set	R&S	CMW 500	133884	2021.03.04	2022.03.03
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2019.10.15	2021.10.14
Bilog Antenna	TESEQ	CBL6111D	45873	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1343	2020.10.12	2022.10.11
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2020.10.12	2022.10.11
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2020.10.12	2021.10.11
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2020.10.12	2021.10.11
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2020.10.10	2021.10.09
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
Test SW	BALUN	BL410-E/18.905			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Universal Radio communication tester	R&S	CMU200	119907	2020.10.12	2021.10.11
Wireless Communications Test Set	R&S	CMW 500	133884	2021.03.04	2022.03.03
Signal Analyzer	Agilent	N9020A	MY52440124	2021.03.04	2022.03.03
Temperature& Humidity test chamber	Safety test	AG80L	171200018	2021.03.04	2022.03.03
Programmable power supply	Agilent	E3642A	MY40002025	2020.10.12	2021.10.11
Temperature & Humidity	SW-108	SuWei	N/A	2021.03.04	2022.03.03
Temperature & Humidity	HH660	Mieo	N/A	2019.10.17	2020.10.16
Test SW	FARAD	LZ-RF /LzRf-3A3			

Equipment with a calibration date of “NCR” shown in this list was not used to make direct calibrated measurements.

5 TEST ITEMS

5.1 CONDUCTED OUTPUT POWER

TEST OVERVIEW

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.

TEST PROCEDURES

1. The transmitter output port was connected to the system simulator.

2. Set eut at maximum power through the 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.

TEST SETUP

TEST RESULT

Note: Test data See Appendix 1.

5.2 PEAK TO AVERAGE RATIO

TEST OVERVIEW

According to §22.913(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 db.

TEST PROCEDURES

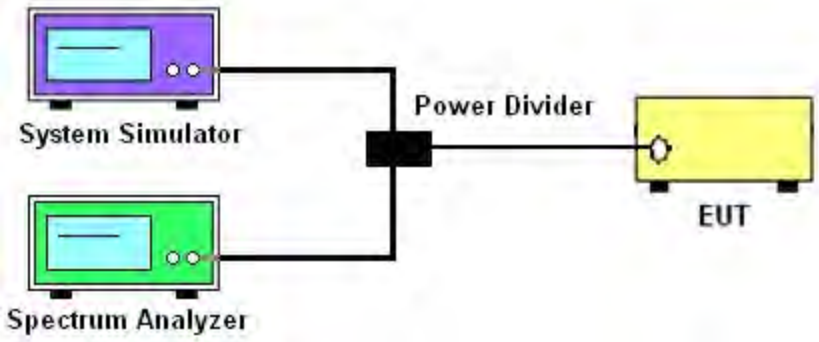
1. The testing follows FCCKDB 971168 v03r01 section.

2. The eut was connected to the spectrum analyzer and peak and av system simulator& spectrum analysis reads.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Set the test probe and measure average power of the spectrum analysis.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 2.

5.3 TRANSMITTER RADIATED POWER (EIRP/ERP)

TEST OVERVIEW

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI C63.26 2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

TEST PROCEDURE

1. The testing follows FCC KDB 971168 Section 5.8 and ANSI C63.26-2015 Section 5.2.
2. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.
3. 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.
4. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
5. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a nonradiating cable. The absolute levels of the spurious emissions were measured by the substitution.
6. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to ANSI C63.26-2015. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.

EIRP=S.G Level+ Gain-Cable loss; ERP=S.G Level+ Gain-Cable loss-2.15.

TEST RESULT

Note: Test data See Appendix 3.

5.4 OCCUPIED BANDWIDTH

TEST OVERVIEW

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

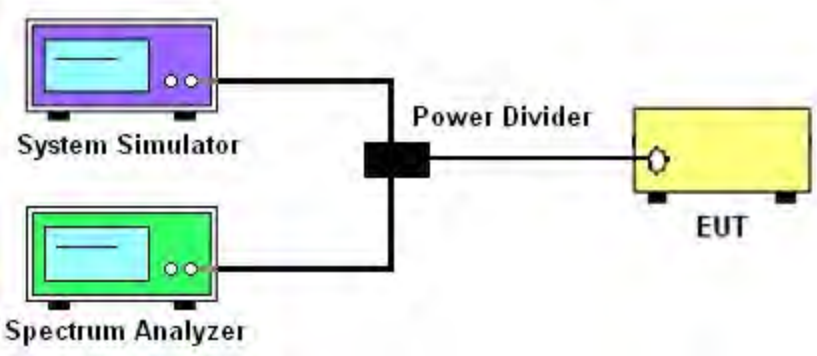
The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 Db below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

All modes of operation were investigated and the worst case configuration results are reported in this section.

TEST PROCEDURE

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7.The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

TEST SETUP



TEST RESULT

Note: Test data See Appendix 4.

5.5 FREQUENCY STABILITY

TEST OVERVIEW

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26 2015. The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

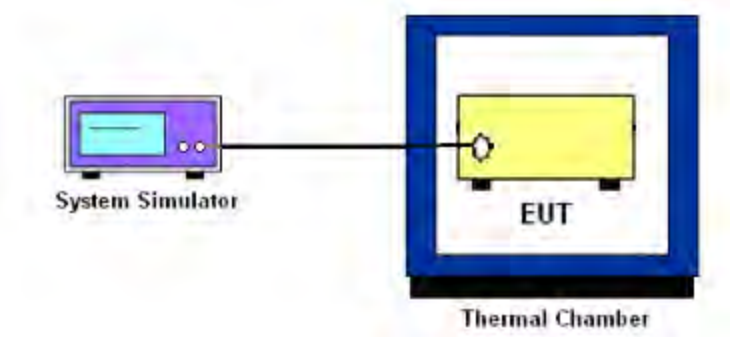
Temperature Variation

1. The testing follows FCC KDB 971168 D01 section 9.0
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps 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.

Voltage Variation

1. The testing follows FCC KDB 971168 D01 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 5.

5.6 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

TEST OVERVIEW

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of 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.

TEST PROCEDURE

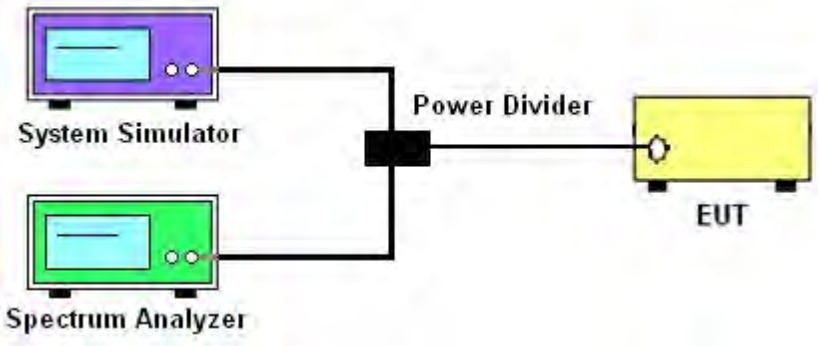
1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.5.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

= P(W) - [43 + 10log(P)] (dB)

= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 6.

5.7 BAND EDGE

TEST OVERVIEW

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

TEST PROCEDURE

1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.7.
2. Start and stop frequency were set such that the band edge would be placed in the center of the Plot.
3. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
4. 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.

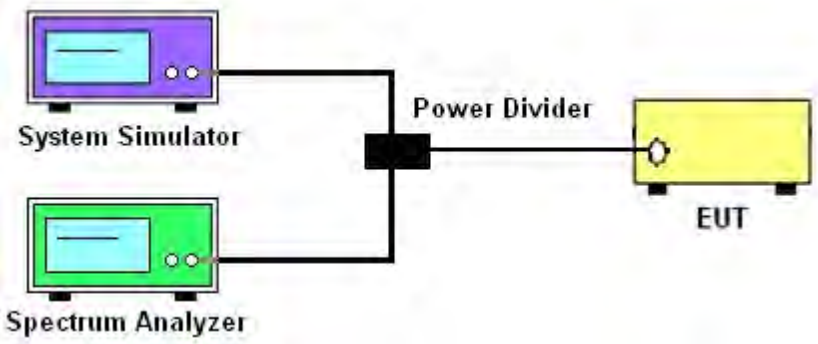
5. The band edges of low and high channels for the highest RF powers were measured.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

= P(W) - [43 + 10log(P)] (dB)

= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

TEST SETUP



TEST RESULT

Note: Test data See Appendix 7.

5.8 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

TEST OVERVIEW

Radiated spurious emissions measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signalsoperating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas.Measurements on signals operating above 1GHz are performed using vertically and horizontally polarizedhorn antennas. All measurements are performed as peak measurements while the EUT isoperating at maximum power and at the appropriate frequencies.

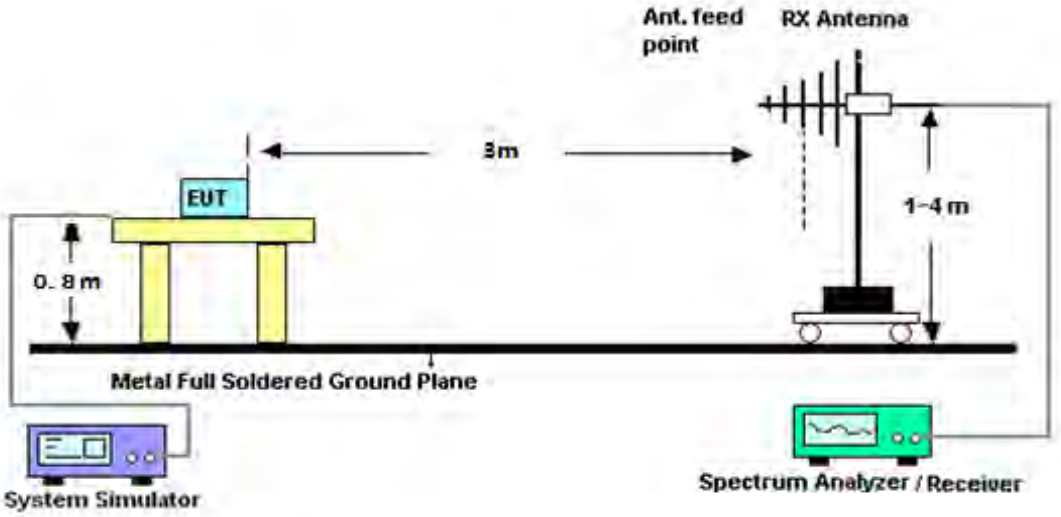
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

TEST PROCEDURE

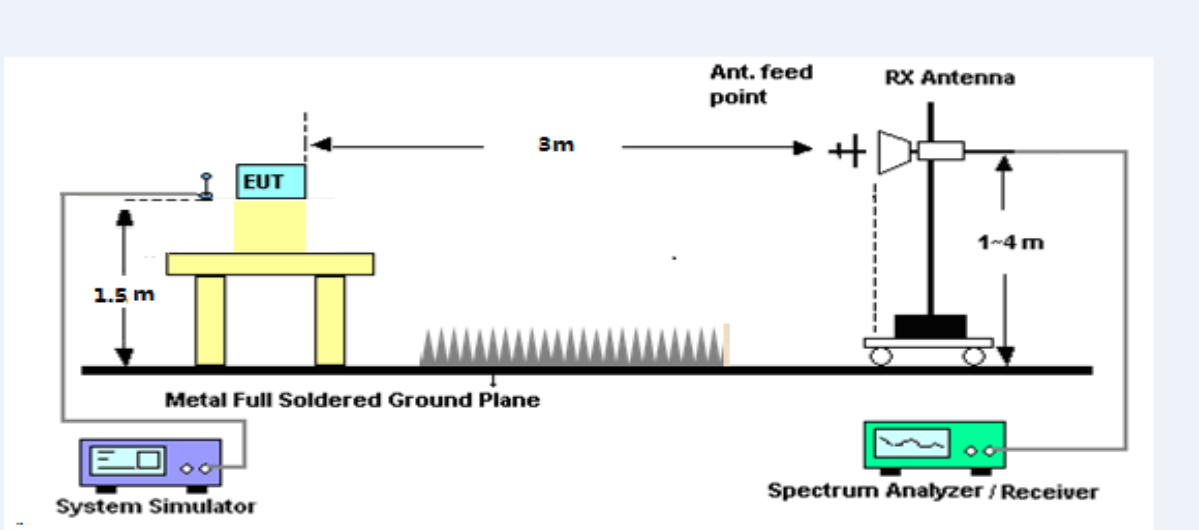
1. The testing FCC KDB 971168 D01 Section 5.8 and ANSI C63.26-2015-Section 5.5.
2. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5.No. of sweep points > 2 x span/RBW
6. Detector = Peak
7. Trace mode = max hold
8. The trace was allowed to stabilize
9. Effective Isotropic Spurious Radiation was measured by substitution method according to TIA/EIA-603-E. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.
PMea=S.G Level+ Ant-Cable loss; Margin=PMea-Limit.

TEST SETUP

For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



TEST RESULT

Note: Test data See Appendix 8.

APPENDIX A.TESTRESULT

A1. CONDUCTED OUTPUT POWER

GSM 850:

GSM 850		
Mode	Frequency (MHz)	AVG Power(dBm)
GPRS (GMSK,1-Slot)	824.2	30.49
	836.6	30.54
	848.8	30.61
GPRS (GMSK,2-Slot)	824.2	30.09
	836.6	30.07
	848.8	30.20
GPRS (GMSK,3-Slot)	824.2	29.63
	836.6	29.58
	848.8	29.71
GPRS (GMSK,4-Slot)	824.2	29.17
	836.6	29.09
	848.8	29.24
EGPRS (8PSK,1-Slot)	824.2	28.15
	836.6	29.00
	848.8	29.06
EGPRS (8PSK,2-Slot)	824.2	27.40
	836.6	28.27
	848.8	28.35
EGPRS (8PSK,3-Slot)	824.2	26.63
	836.6	27.53
	848.8	27.62
EGPRS (8PSK,4-Slot)	824.2	25.93
	836.6	26.82
	848.8	26.91

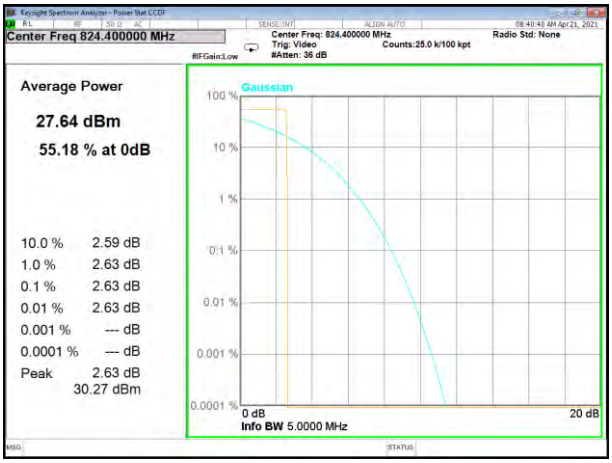
UMTS BAND V

UMTS BAND 5		
Mode	Frequency(MHz)	AVG Power
WCDMA 850 RMC	826.4	22.21
	836.6	21.86
	846.6	21.71
HSDPA Subtest 1	826.4	21.38
	836.6	21.92
	846.6	22.04
HSDPA Subtest 2	826.4	20.92
	836.6	21.50
	846.6	21.58
HSDPA Subtest 3	826.4	20.43
	836.6	21.04
	846.6	21.20
HSDPA Subtest 4	826.4	20.06
	836.6	20.63
	846.6	20.88
HSUPA Subtest 1	826.4	21.42
	836.6	21.71
	846.6	22.04
HSUPA Subtest 2	826.4	20.55
	836.6	20.75
	846.6	21.05
HSUPA Subtest 3	826.4	20.54
	836.6	20.33
	846.6	20.58
HSUPA Subtest 4	826.4	20.24
	836.6	20.00
	846.6	20.18
HSUPA Subtest 5	826.4	18.76
	836.6	18.55
	846.6	18.72

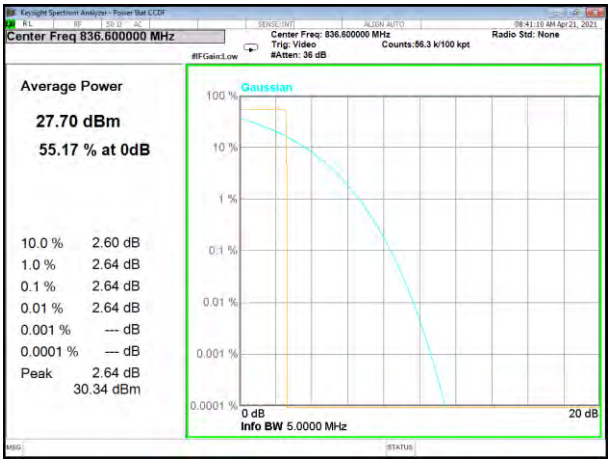
A2. PEAK-TO-AVERAGE RADIO

GSM 850		
Mode	Frequency (MHz)	PAR
GPRS 850	824.2	2.63
	836.6	2.64
	848.8	2.64
EGPRS 850	824.2	6.02
	836.6	6.71
	848.8	5.91

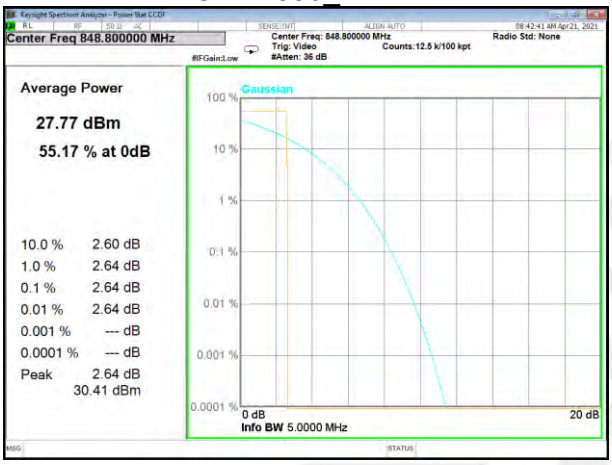
UMTS Band 5		
Mode	Frequency (MHz)	PAR
WCDMA 850 RMC	826.4	3.11
	836.6	3.09
	846.6	3.34
HSDPA 850	826.4	3.54
	836.6	3.73
	846.6	3.64
HSUPA 850	826.4	3.49
	836.6	3.51
	846.6	3.92



GPRS850_Lower



GPRS850_Middle



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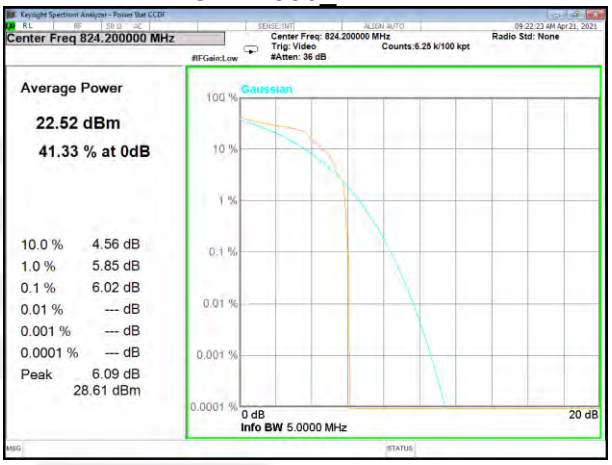

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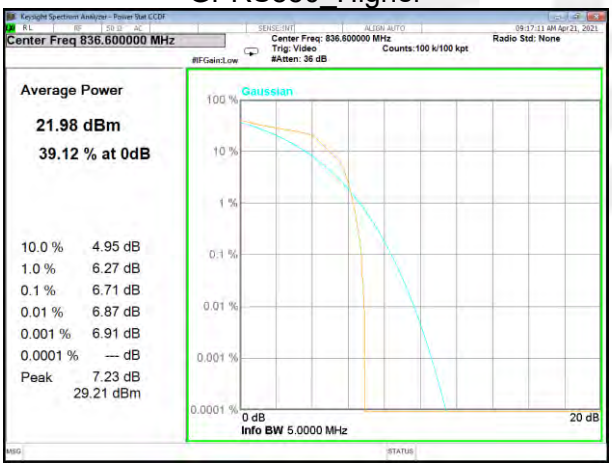

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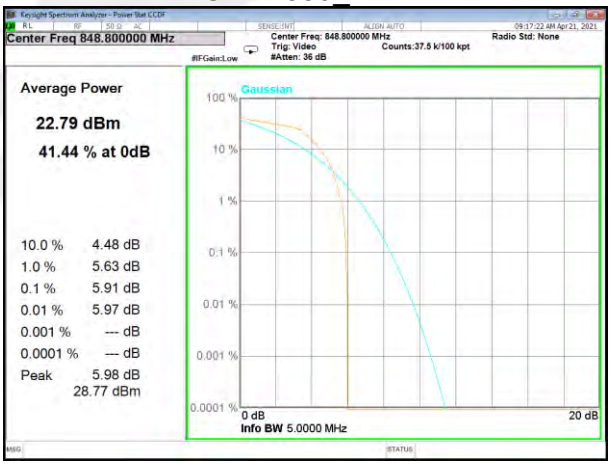
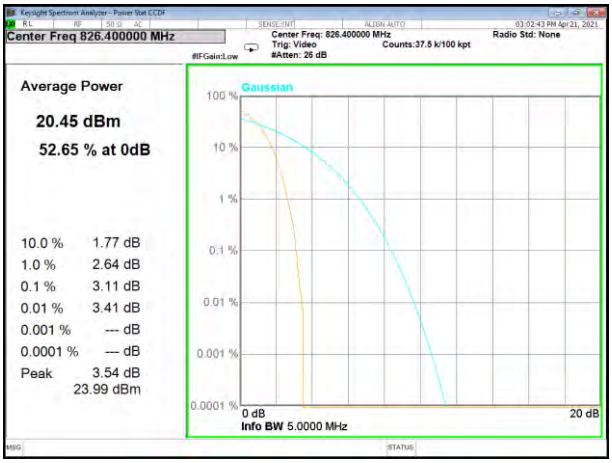
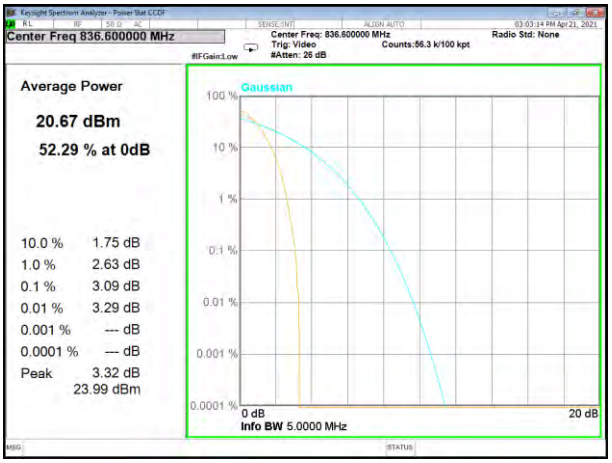


EGPRS850_Higher



WCDMA Band 5_Low



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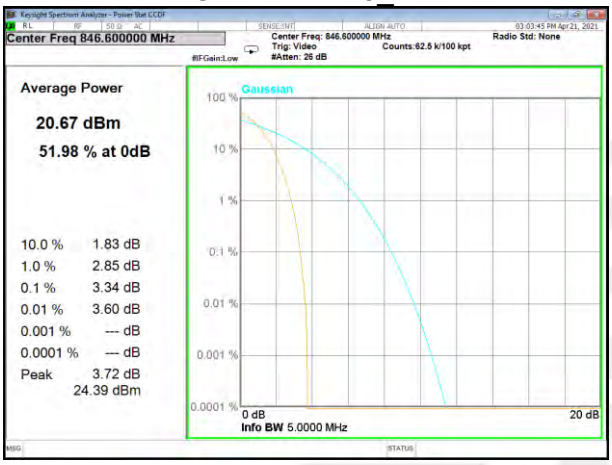
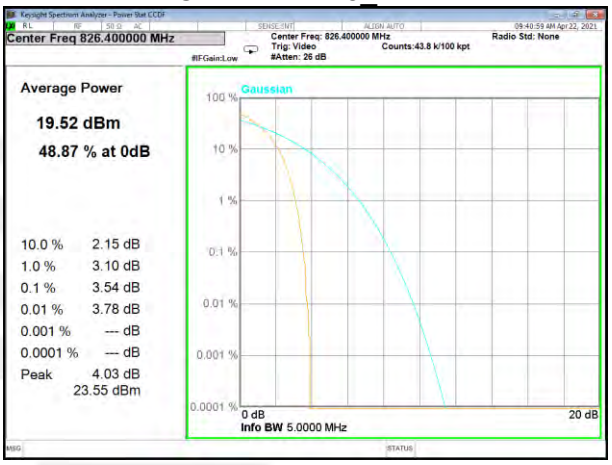
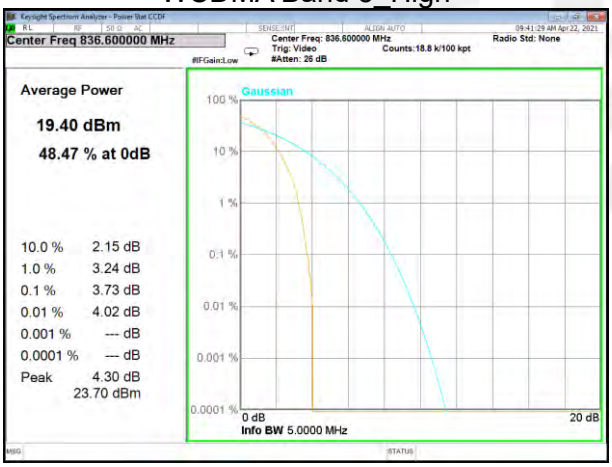


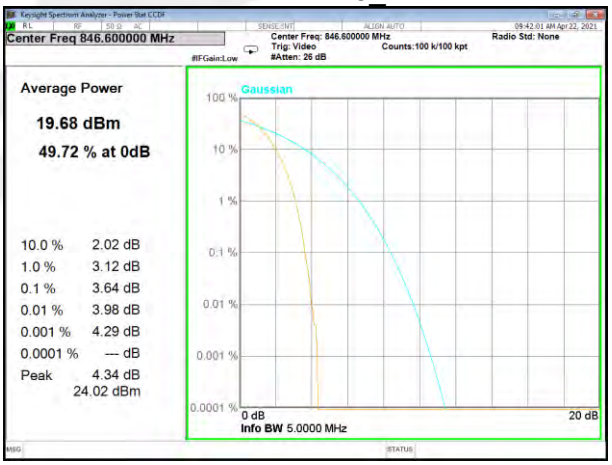
WCDMA Band 5_High



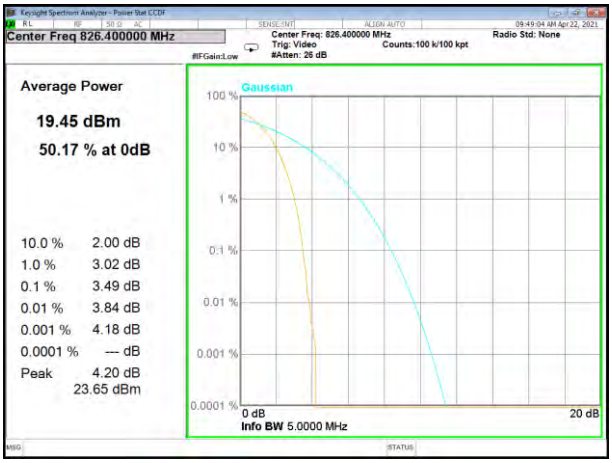
HSDPA Band 5_Low



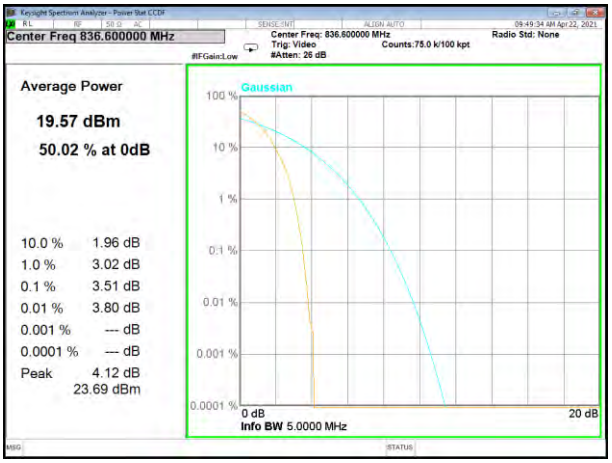
HSDPA Band 5_Middle



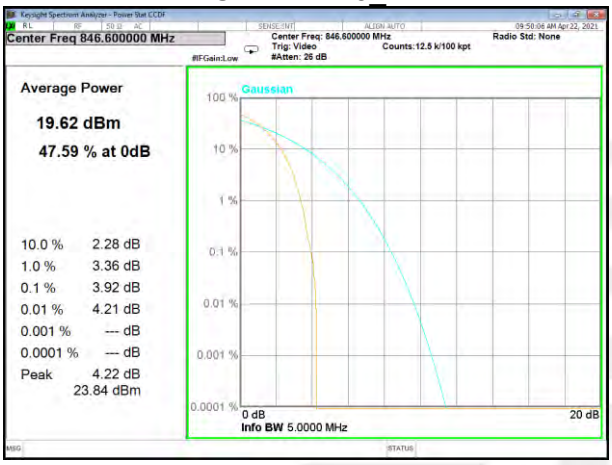
HSDPA Band 5_High



HSUPA Band 5_Low



HSUPA Band 5_Middle



HSUPA Band 5_High

A3. TRANSMITTER RADIATED POWER (EIRP/ERP)

Note:Test is divided into three directions, X/Y/Z. X pattern for the worst.

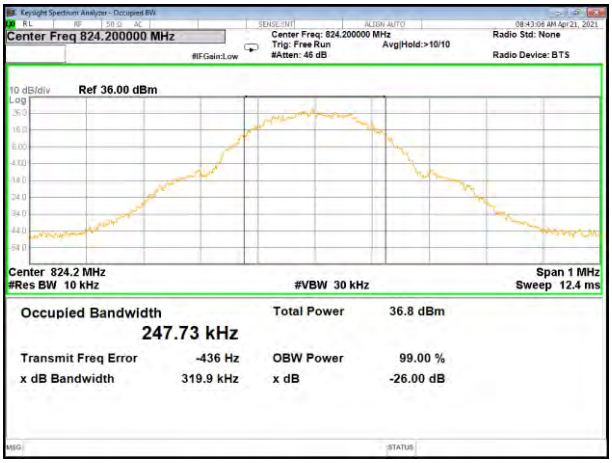
Radiated Power (ERP) for GSM 850 MHZ								
Mode	Frequency	Result						Conclusion
		S G.Level (dBm)	Cable loss	Gain(dBi)	correction factor(dB)	PMeas E.R.P(dBm)	Polarization Of Max. ERP	
GPRS850	824.2	23.90	0.44	6.5	2.15	27.81	Horizontal	Pass
	824.2	26.02	0.44	6.5	2.15	29.93	Vertical	Pass
	836.6	23.66	0.45	6.5	2.15	27.56	Horizontal	Pass
	836.6	25.92	0.45	6.5	2.15	29.82	Vertical	Pass
	848.8	23.71	0.46	6.5	2.15	27.60	Horizontal	Pass
	848.8	26.06	0.46	6.5	2.15	29.95	Vertical	Pass
EGPRS850	824.2	21.15	0.44	6.5	2.15	25.06	Horizontal	Pass
	824.2	23.51	0.44	6.5	2.15	27.42	Vertical	Pass
	836.6	21.85	0.45	6.5	2.15	25.75	Horizontal	Pass
	836.6	24.32	0.45	6.5	2.15	28.22	Vertical	Pass
	848.8	21.97	0.46	6.5	2.15	25.86	Horizontal	Pass
	848.8	24.46	0.46	6.5	2.15	28.35	Vertical	Pass
Limit	ERP<7W=38.45dBm							

Radiated Power (ERP) for WCDMA Band 5								
Mode	Frequency	Result						Conclusion
		S G.Level (dBm)	Cable loss	Gain (dBi)	correction factor(dB)	PMeas E.R.P(dBm)	Polarization Of Max. ERP	
WCDMA	826.4	15.96	0.44	6.5	2.15	19.87	Horizontal	Pass
	826.4	17.73	0.44	6.5	2.15	21.64	Vertical	Pass
	836.6	15.37	0.45	6.5	2.15	19.27	Horizontal	Pass
	836.6	17.30	0.45	6.5	2.15	21.20	Vertical	Pass
	846.4	15.33	0.46	6.5	2.15	19.22	Horizontal	Pass
	846.4	17.27	0.46	6.5	2.15	21.16	Vertical	Pass
HSUPA	826.4	15.11	0.44	6.5	2.15	19.02	Horizontal	Pass
	826.4	16.82	0.44	6.5	2.15	20.73	Vertical	Pass
	836.6	15.52	0.45	6.5	2.15	19.42	Horizontal	Pass
	836.6	17.28	0.45	6.5	2.15	21.18	Vertical	Pass
	846.4	15.77	0.46	6.5	2.15	19.66	Horizontal	Pass
	846.4	17.58	0.46	6.5	2.15	21.47	Vertical	Pass
HSDPA	826.4	15.05	0.44	6.5	2.15	18.96	Horizontal	Pass
	826.4	16.77	0.44	6.5	2.15	20.68	Vertical	Pass
	836.6	15.30	0.45	6.5	2.15	19.20	Horizontal	Pass
	836.6	17.28	0.45	6.5	2.15	21.18	Vertical	Pass
	846.4	15.77	0.46	6.5	2.15	19.66	Horizontal	Pass
	846.4	17.55	0.46	6.5	2.15	21.44	Vertical	Pass
Limit	ERP<7W=38.45dBm							

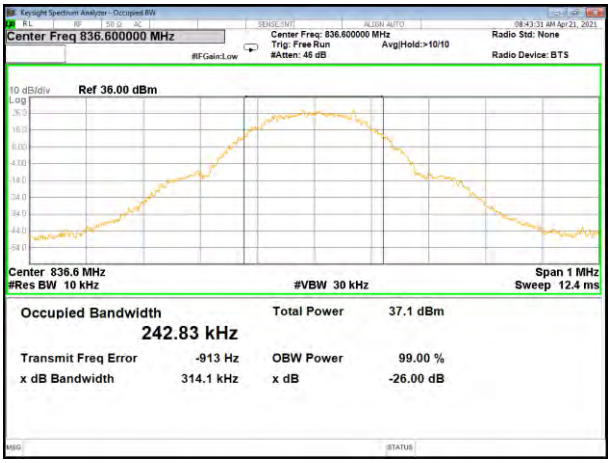
A4. OCCUPIED BANDWIDTH (99% OCCUPIED BANDWIDTH/26dB BANDWIDTH)

GSM Bandwidth [KHz]						
Mode	Lowest		Middle		Highest	
	99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
GPRS850	247.73	319.9	242.83	314.1	246.35	321.2
EGPRS850	242.06	304.2	244.48	313.2	242.36	315.8

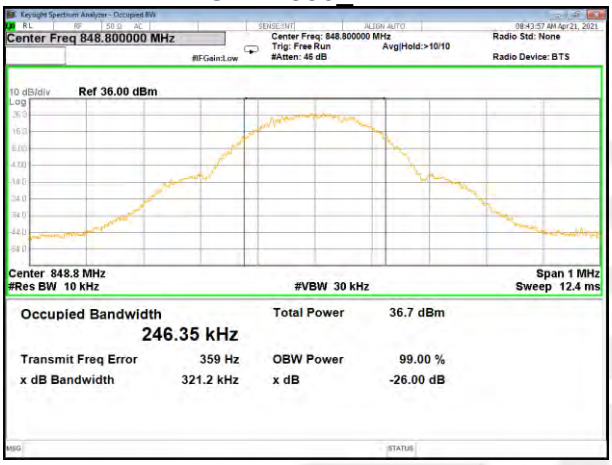
WCDMA Bandwidth [MHz]						
Mode	Lowest		Middle		Highest	
	99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
WCDMA 5	4.1818	4.681	4.165	4.662	4.142	4.646
HSDPA 5	4.181	4.674	4.172	4.662	4.1593	4.648
HSUPA 5	4.183	4.676	4.169	4.665	4.16	4.654



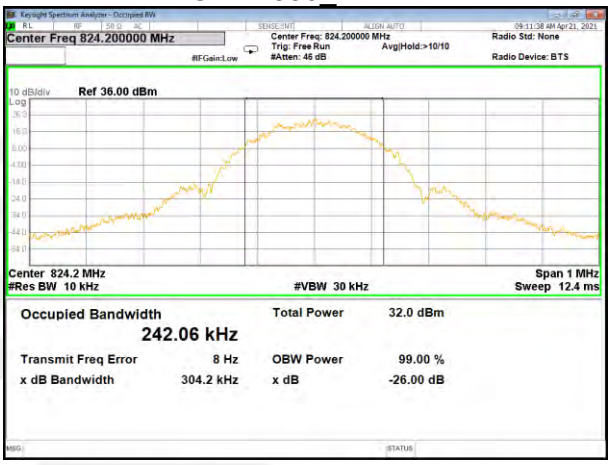
GPRS850_Low



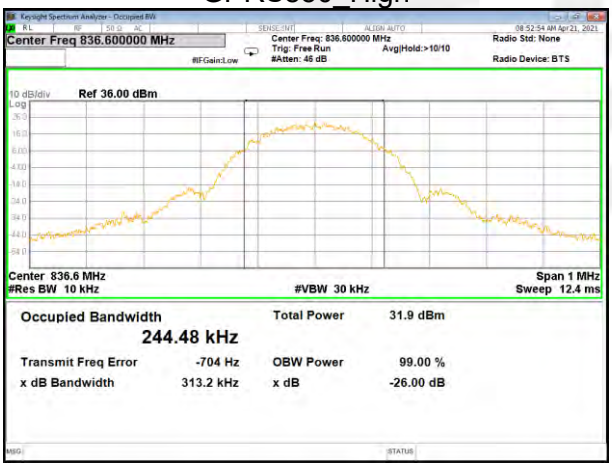
GPRS850_Middle



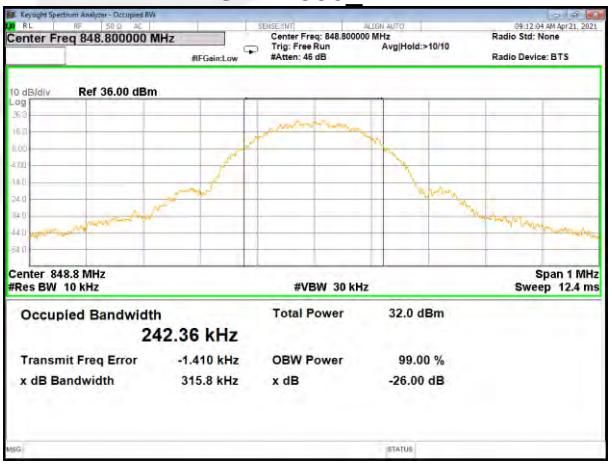
GPRS850_High



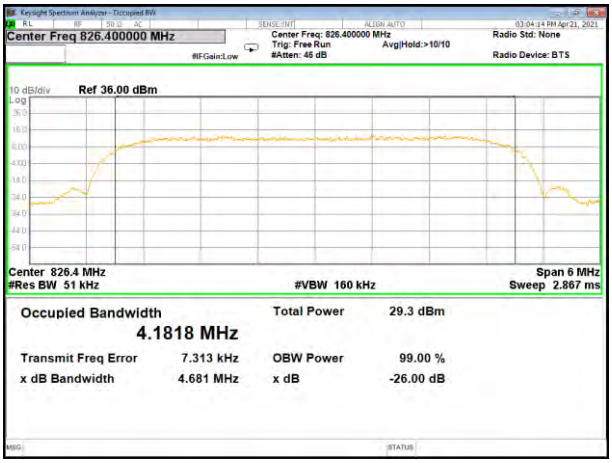
EGPRS850_Low



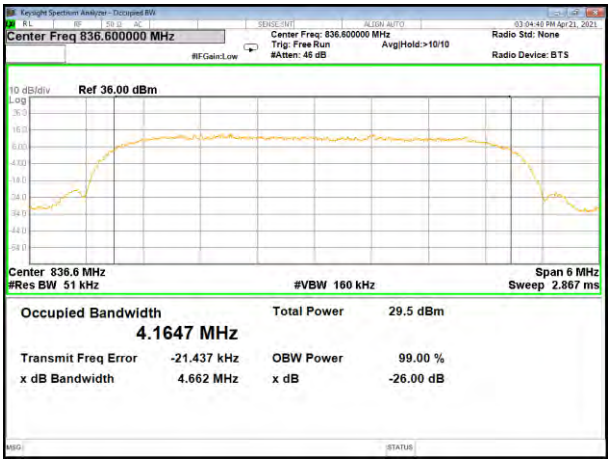
EGPRS850_Middle



EGPRS850_High



WCDMA_Band 5_Low



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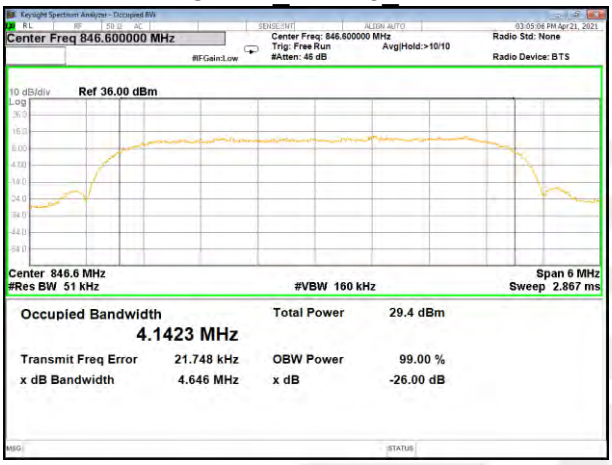
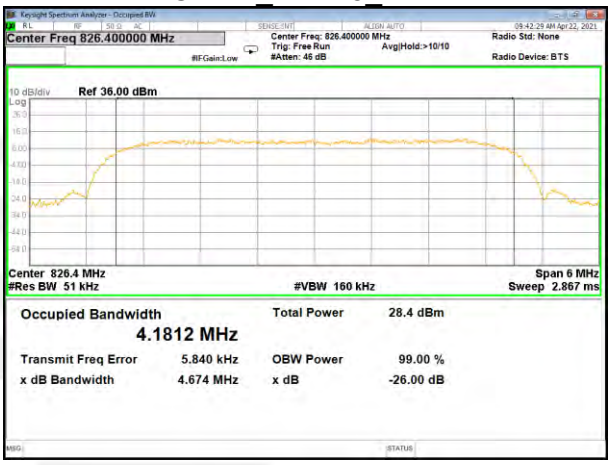
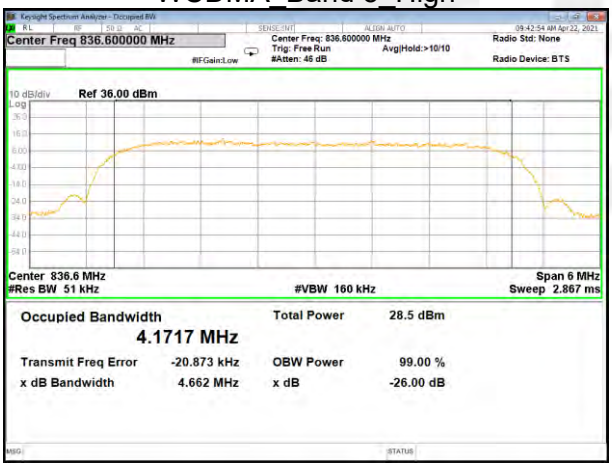


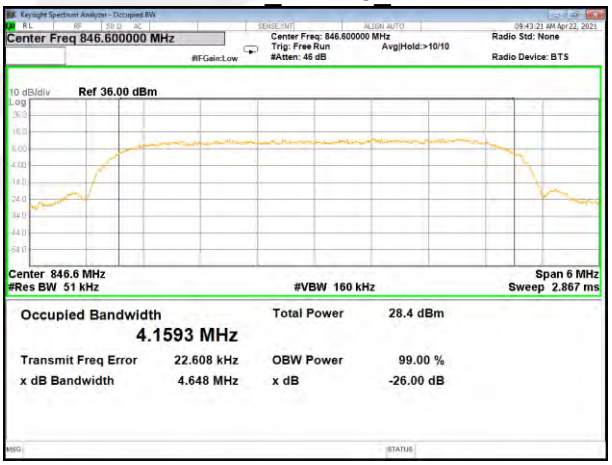
WCDMA_Band 5_High



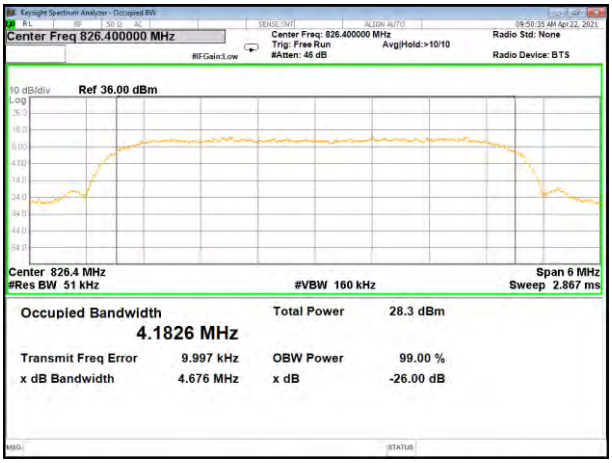
HSDPA_Band 5_Low



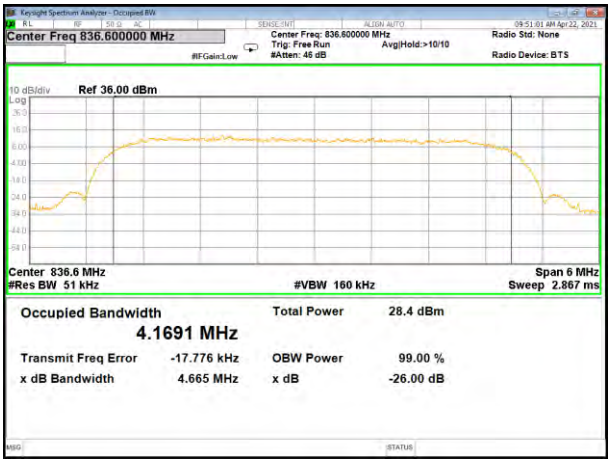
HSDPA_Band 5_Middle



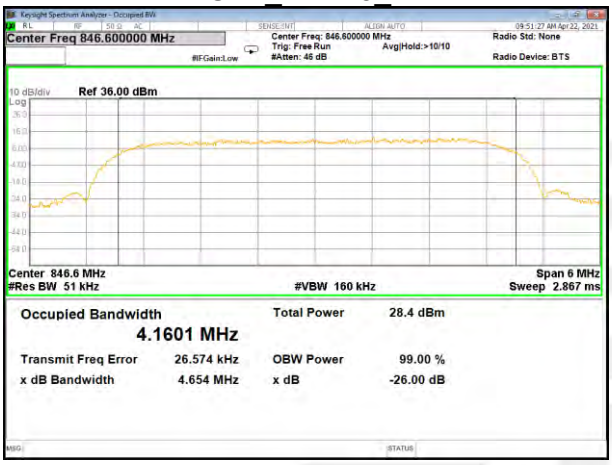
HSDPA_Band 5_High



HSUPA_Band 5_Low



HSUPA_Band 5_Middle



HSUPA_Band 5_High

A5. FREQUENCY STABILITY

Normal Voltage = 3.8V; Battery End Point (BEP) = 4.35V; Maximum Voltage =3.45V

GPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	33.55	0.040	2.5ppm	PASS
40		11.96	0.014		
30		29.47	0.035		
20		35.92	0.043		
10		32.94	0.039		
0		18.39	0.022		
-10		13.29	0.016		
-20		25.64	0.031		
-30		25.06	0.030		
20	Maximum Voltage	30.93	0.037		
20	BEP	13.77	0.016		

EGPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	30.45	0.036	2.5ppm	PASS
40		33.28	0.040		
30		26.96	0.032		
20		17.87	0.021		
10		32.44	0.039		
0		19.68	0.024		
-10		23.13	0.028		
-20		12.82	0.015		
-30		11.71	0.014		
20	Maximum Voltage	17.19	0.021		
20	BEP	15.22	0.018		

UMTS Band 5 / 836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	27.49	0.033	2.5ppm	PASS
40		25.62	0.031		
30		25.25	0.030		
20		28.17	0.034		
10		17.48	0.021		
0		22.47	0.027		
-10		11.78	0.014		
-20		19.91	0.024		
-30		18.00	0.022		
20	Maximum Voltage	21.84	0.026		
20	BEP	20.69	0.025		

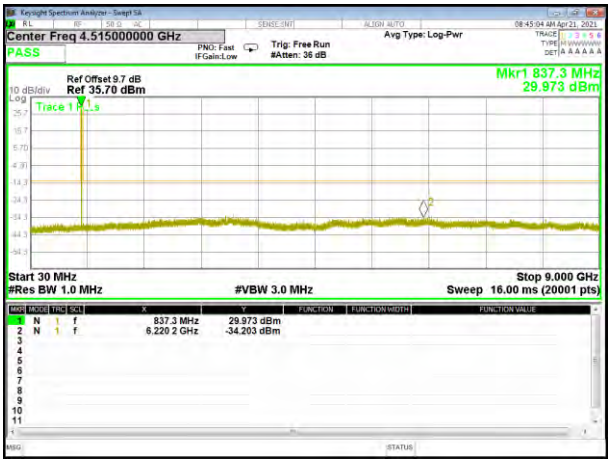
HSDPA Band 5 / 836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev.	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	27.94	0.033	2.5ppm	PASS
40		30.02	0.036		
30		18.65	0.022		
20		15.01	0.018		
10		31.36	0.037		
0		12.20	0.015		
-10		11.71	0.014		
-20		26.23	0.031		
-30		22.36	0.027		
20	Maximum Voltage	20.00	0.024		
20	BEP	35.39	0.042		

HSUPA Band 5 / 836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	20.74	0.025	2.5ppm	PASS
40		36.09	0.043		
30		29.54	0.035		
20		16.48	0.020		
10		13.65	0.016		
0		18.63	0.022		
-10		36.42	0.044		
-20		24.38	0.029		
-30		13.34	0.016		
20	Maximum Voltage	23.91	0.029		
20	BEP	21.58	0.026		

1. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

A6. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

GPRS850_Low



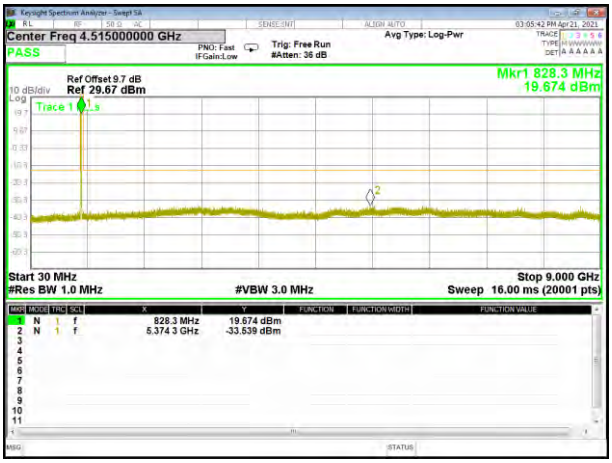
GPRS850_Middle

GPRS850_High

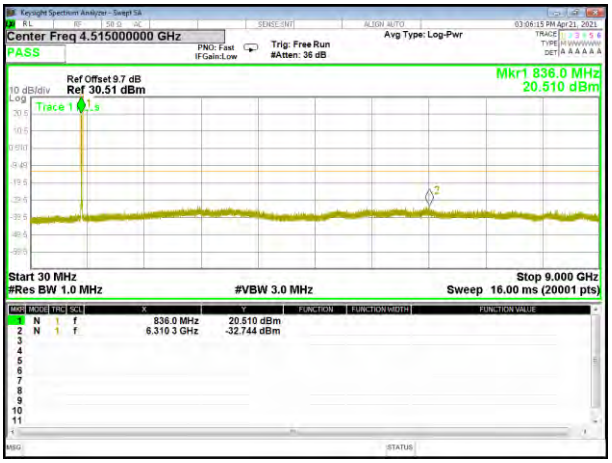
EGPRS850_Low

EGPRS850_Middle

EGPRS850_High



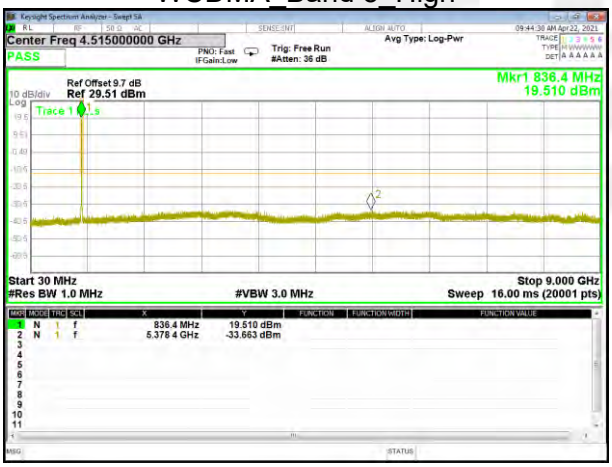
WCDMA_Band 5_Low



WCDMA_Band 5_Middle

WCDMA_Band 5_High

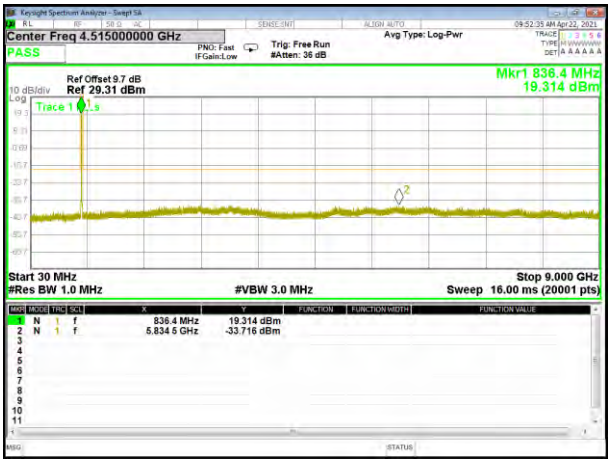
HSDPA_Band 5_Low



HSDPA_Band 5_Middle

HSDPA_Band 5_High

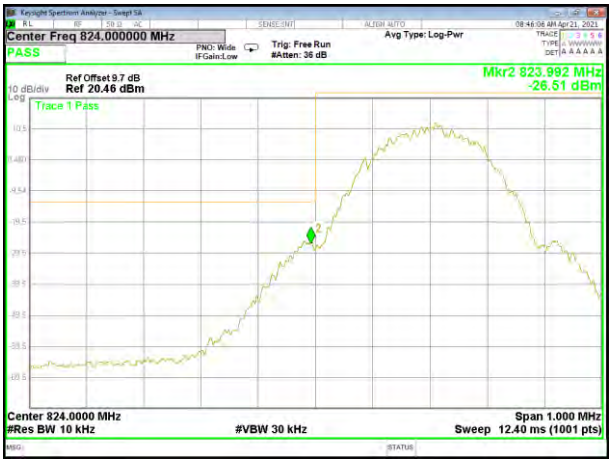
HSUPA_Band 5_Low



HSUPA_Band 5_Middle

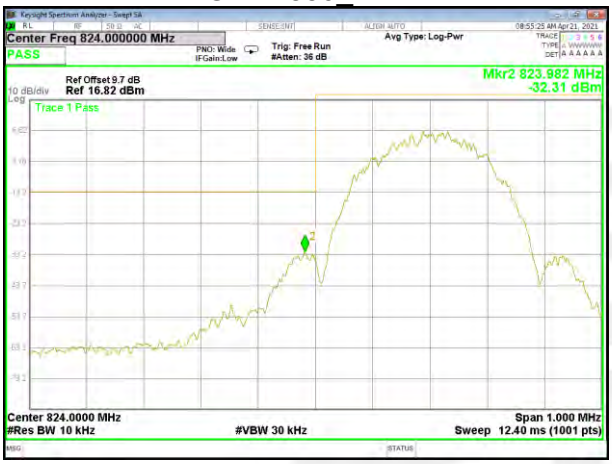
HSUPA_Band 5_High

A7. BAND EDGE



GPRS850_Low

GPRS850_High



EGPRS850_Low

EGPRS850_High

WCDMA_Band 5_Low

WCDMA_Band 5_High

HSDPA_Band 5_Low

HSDPA_Band 5_High

HSUPA_Band 5_Low

HSUPA_Band 5_High

A8. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

Note: (1) Spurious emissions which are attenuated by more than 20dB below the permissible value for frequeny below 1000MHz.

(2) Above 3.5GHz amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value

(3)Test is divided into three directions, X/Y/Z. X pattern for the worst.

GPRS 850: (30-9000)MHz							
The Worst Test Results Channel 128/824.2 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1648.20	-40.34	9.40	4.75	-35.69	-13.00	-22.69	H
2472.29	-40.11	10.60	8.39	-37.90	-13.00	-24.90	H
3296.72	-31.43	12.00	11.79	-31.22	-13.00	-18.22	H
1648.03	-43.14	9.40	4.75	-38.49	-13.00	-25.49	V
2472.23	-45.21	10.60	8.39	-43.00	-13.00	-30.00	V
3296.55	-43.10	12.00	11.79	-42.89	-13.00	-29.89	V
The Worst Test Results Channel 190/836.6 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1672.82	-41.50	9.50	4.76	-36.76	-13.00	-23.76	H
2509.87	-40.46	10.70	8.40	-38.16	-13.00	-25.16	H
3345.97	-31.75	12.20	11.80	-31.35	-13.00	-18.35	H
1673.20	-44.27	9.40	4.75	-39.62	-13.00	-26.62	V
2509.58	-44.34	10.60	8.39	-42.13	-13.00	-29.13	V
3346.10	-42.62	12.20	11.82	-42.24	-13.00	-29.24	V
The Worst Test Results Channel 251/848.8 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1697.66	-40.24	9.60	4.77	-35.41	-13.00	-22.41	H
2546.24	-40.50	10.80	8.50	-38.20	-13.00	-25.20	H
3395.16	-32.18	12.50	11.90	-31.58	-13.00	-18.58	H
1697.18	-43.44	9.60	4.77	-38.61	-13.00	-25.61	V
2546.49	-44.23	10.80	8.50	-41.93	-13.00	-28.93	V
3395.15	-43.28	12.50	11.90	-42.68	-13.00	-29.68	V

EGPRS 850: (30-9000)MHz							
The Worst Test Results Channel 128/824.2 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1648.43	-40.43	9.40	4.75	-35.78	-13.00	-22.78	H
2472.52	-40.65	10.60	8.39	-38.44	-13.00	-25.44	H
3296.44	-31.89	12.00	11.79	-31.68	-13.00	-18.68	H
1648.06	-44.52	9.40	4.75	-39.87	-13.00	-26.87	V
2472.50	-45.18	10.60	8.39	-42.97	-13.00	-29.97	V
3296.50	-43.64	12.00	11.79	-43.43	-13.00	-30.43	V
The Worst Test Results Channel 190/836.6 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1672.90	-41.09	9.50	4.76	-36.35	-13.00	-23.35	H
2509.73	-39.30	10.70	8.40	-37.00	-13.00	-24.00	H
3346.30	-31.59	12.20	11.80	-31.19	-13.00	-18.19	H
1672.88	-43.58	9.40	4.75	-38.93	-13.00	-25.93	V
2509.45	-44.54	10.60	8.39	-42.33	-13.00	-29.33	V
3346.07	-43.98	12.20	11.82	-43.60	-13.00	-30.60	V
The Worst Test Results Channel 251/848.8 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1697.23	-40.52	9.60	4.77	-35.69	-13.00	-22.69	H
2546.09	-39.91	10.80	8.50	-37.61	-13.00	-24.61	H
3395.03	-31.24	12.50	11.90	-30.64	-13.00	-17.64	H
1697.22	-44.01	9.60	4.77	-39.18	-13.00	-26.18	V
2546.46	-44.21	10.80	8.50	-41.91	-13.00	-28.91	V
3394.85	-42.82	12.50	11.90	-42.22	-13.00	-29.22	V

WCDMA Band 5: (30-9000)MHz							
The wost testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1652.12	-40.31	9.40	4.75	-35.66	-13.00	-22.66	H
2479.54	-40.22	10.60	8.39	-38.01	-13.00	-25.01	H
3305.43	-31.68	12.00	11.79	-31.47	-13.00	-18.47	H
1652.20	-43.83	9.40	4.75	-39.18	-13.00	-26.18	V
2479.51	-43.97	10.60	8.39	-41.76	-13.00	-28.76	V
3305.76	-42.98	12.00	11.79	-42.77	-13.00	-29.77	V
The Worst Test Results Channel 4183/836.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1673.17	-40.47	9.40	4.75	-35.82	-13.00	-22.82	H
2509.57	-40.36	10.60	8.39	-38.15	-13.00	-25.15	H
3345.99	-32.26	12.00	11.79	-32.05	-13.00	-19.05	H
1673.12	-43.18	9.40	4.75	-38.53	-13.00	-25.53	V
2509.87	-44.78	10.60	8.39	-42.57	-13.00	-29.57	V
3346.16	-43.18	12.00	11.79	-42.97	-13.00	-29.97	V
The Worst Test Results Channel 4233/846.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1693.61	-41.43	9.40	4.75	-36.78	-13.00	-23.78	H
2539.24	-39.76	10.60	8.39	-37.55	-13.00	-24.55	H
3385.99	-31.94	12.00	11.79	-31.73	-13.00	-18.73	H
1693.21	-44.42	9.40	4.75	-39.77	-13.00	-26.77	V
2539.42	-45.12	10.60	8.39	-42.91	-13.00	-29.91	V
3386.33	-42.79	12.00	11.79	-42.58	-13.00	-29.58	V

HSUPA Band 5: (30-9000)MHz							
The wost testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1652.43	-40.56	9.40	4.75	-35.91	-13.00	-22.91	H
2479.55	-40.28	10.60	8.39	-38.07	-13.00	-25.07	H
3305.55	-32.13	12.00	11.79	-31.92	-13.00	-18.92	H
1652.27	-44.04	9.40	4.75	-39.39	-13.00	-26.39	V
2479.57	-45.35	10.60	8.39	-43.14	-13.00	-30.14	V
3305.64	-43.23	12.00	11.79	-43.02	-13.00	-30.02	V
The Worst Test Results Channel 4183/836.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1673.22	-41.17	9.40	4.75	-36.52	-13.00	-23.52	H
2509.82	-40.63	10.60	8.39	-38.42	-13.00	-25.42	H
3346.23	-32.15	12.00	11.79	-31.94	-13.00	-18.94	H
1673.18	-43.74	9.40	4.75	-39.09	-13.00	-26.09	V
2509.55	-44.23	10.60	8.39	-42.02	-13.00	-29.02	V
3346.19	-43.52	12.00	11.79	-43.31	-13.00	-30.31	V
The Worst Test Results Channel 4233/846.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1693.62	-40.88	9.40	4.75	-36.23	-13.00	-23.23	H
2539.26	-39.25	10.60	8.39	-37.04	-13.00	-24.04	H
3386.28	-31.53	12.00	11.79	-31.32	-13.00	-18.32	H
1693.38	-43.27	9.40	4.75	-38.62	-13.00	-25.62	V
2539.07	-45.24	10.60	8.39	-43.03	-13.00	-30.03	V
3386.20	-42.70	12.00	11.79	-42.49	-13.00	-29.49	V

HSDPA Band 5: (30-9000)MHz							
The wost testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1652.22	-41.10	9.40	4.75	-36.45	-13.00	-23.45	H
2479.47	-40.02	10.60	8.39	-37.81	-13.00	-24.81	H
3305.79	-32.03	12.00	11.79	-31.82	-13.00	-18.82	H
1652.28	-43.72	9.40	4.75	-39.07	-13.00	-26.07	V
2479.57	-45.28	10.60	8.39	-43.07	-13.00	-30.07	V
3305.88	-42.99	12.00	11.79	-42.78	-13.00	-29.78	V
The Worst Test Results Channel 4183/836.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1673.25	-41.46	9.40	4.75	-36.81	-13.00	-23.81	H
2509.48	-39.80	10.60	8.39	-37.59	-13.00	-24.59	H
3346.02	-30.87	12.00	11.79	-30.66	-13.00	-17.66	H
1673.09	-43.82	9.40	4.75	-39.17	-13.00	-26.17	V
2509.48	-44.98	10.60	8.39	-42.77	-13.00	-29.77	V
3346.36	-43.41	12.00	11.79	-43.20	-13.00	-30.20	V
The Worst Test Results Channel 4233/846.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
1693.64	-41.17	9.40	4.75	-36.52	-13.00	-23.52	H
2539.07	-39.33	10.60	8.39	-37.12	-13.00	-24.12	H
3386.29	-32.04	12.00	11.79	-31.83	-13.00	-18.83	H
1693.33	-44.06	9.40	4.75	-39.41	-13.00	-26.41	V
2539.46	-44.02	10.60	8.39	-41.81	-13.00	-28.81	V
3386.27	-42.54	12.00	11.79	-42.33	-13.00	-29.33	V

APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※