RADIO TEST REPORT

Report No.: STS2105068W01

Issued for

4G NET INC

3000 NW 72 AVENUE MIAMI Florida United States 33122

Product Name:	Mobile phone
Brand Name:	UNIQCELL
Model Name:	A1
Series Model:	A2, A3, A3Pro
FCC ID:	2AWCN-A1
Test Standard:	FCC Part 22H and 24E

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

Applicant's Name .....:	4G NET INC
Address.....:	3000 NW 72 AVENUE MIAMI FIorida United States 33122
Manufacturer's Name .....:	METELL TECHNOLOGY CO.,LIMITED
Address.....:	7 / F, Building B, Tefa Industrial Park, Guangming District, Shenzhen, China

Product Description

Product Name .....:	Mobile phone
Brand Name .....:	UNIQCELL
Model Name.....:	A1
Series Model .....:	A2, A3, A3Pro
Test Standards .....:	FCC Part 22H and 24E
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 May 2021
Date (s) of performance of tests :	14 May 2021 ~ 04 June 2021
Date of Issue .....:	04 June 2021
Test Result .....:	Pass

Testing Engineer : Chris chen

(Chris Chen)

Technical Manager : Sean She

(Sean she)

Authorized Signatory : Vita

(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	04 June 2021	STS2105068W01	ALL	Initial Issue

1 INTRODUCTION

1.1 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
2.1049	Conducted Output Power	Reporting Only	PASS	
2.0146 24.232	Peak-to-Average Ratio	< 13 dB	PASS	
2.1046 22.913 24.232	Effective Radiated Power/Equivalent Isotropic Radiated Power	< 7 Watts max. ERP(Part 22) < 2 Watts max. EIRP(Part 24)	PASS	
2.1049 22.917 24.238	Occupied Bandwidth	Reporting Only	PASS	
2.1055 22.355 24.235	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24)	PASS	
2.1051 22.917 24.238	Spurious Emission at Antenna Terminals	< 43+10log10(P[Watts])	PASS	
2.1053 22.917 24.238	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	
2.1051 22.917 24.238	Band Edge	< 43+10log10(P[Watts])	PASS	

1.2 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

1.3 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement data shown here in meets or exceeds the UCISPR measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified 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:	Mobile phone
Trade Name:	UNIQCELL
Model Name:	A1
Series Model:	A2, A3, A3Pro
Model Difference:	In addition to the different model names, A2 and A1 have different memory/GSM antenna/BT antenna/cameras /display sizes; A3 and A3Pro and A1 only have different model names
Tx Frequency:	GSM/GPRS: 850: 824 MHz ~ 849MHz 1900: 1850 MHz ~ 1910MHz
Rx Frequency:	GSM/GPRS: 850: 869 MHz ~ 894 MHz 1900: 1930 MHz ~ 1990MHz
Max RF Output Power:	GSM850:31.32dBm, PCS1900:26.05dBm GPRS850(1-Slot):31.20dBm, GPRS1900(1-Slot):26.04dBm GPRS850(2-Slot):30.78dBm, GPRS1900(2-Slot):25.63dBm GPRS850(3-Slot):30.35dBm, GPRS1900(3-Slot):25.22dBm GPRS850(4-Slot):29.87dBm, GPRS1900(4-Slot):24.82dBm
Type of Emission:	GSM(850): 246KGXW; PCS(1900): 245KGXW GPRS(850): 244KGXW; GPRS(1900): 243KGXW
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:	A1: GSM850: -0.81dBi, GSM1900: 0.78dBi A2: GSM850: -0.82dBi, GSM1900: 0.77dBi
Battery parameter:	Rated Voltage:3.7V Charge Limit Voltage:4.2V Capacity: 1000mAh
Adapter:	Input: AC100-240V50/60Hz 0.15A Output:DC5.0V, 500mA
GPRS Class:	Multi-Class12
Extreme Vol. Limits:	DC 3.4V~ DC 4.2V(Normal: DC 3.7V)
Extreme Temp. Tolerance:	-30℃ to +50℃
Hardware version number:	H3995_MB_V2.0
Software version number:	SUPERCON50_6464_11B_PCB01_gprs_MT6250_S00.K16_S02.bin
*** Note: The High Voltage 4.2V and Low Voltage 3.4V 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.

2. 30 MHz to 10th harmonic for GSM1900.

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	GSM LINK GPRS CLASS 12 LINK	GSM LINK GPRS CLASS 12 LINK
GSM 1900	GSM LINK GPRS CLASS 12 LINK	GSM LINK GPRS CLASS 12 LINK

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	BULUN	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
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

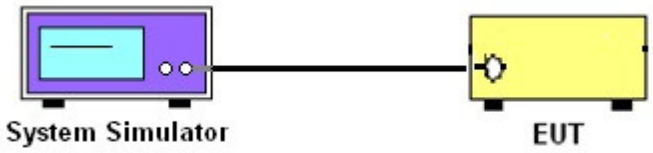
1. The transmitter output port was connected to the system simulator.

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 §24.232(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, equipment employed must be authorized in accordance with the provisions of §24.51. 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

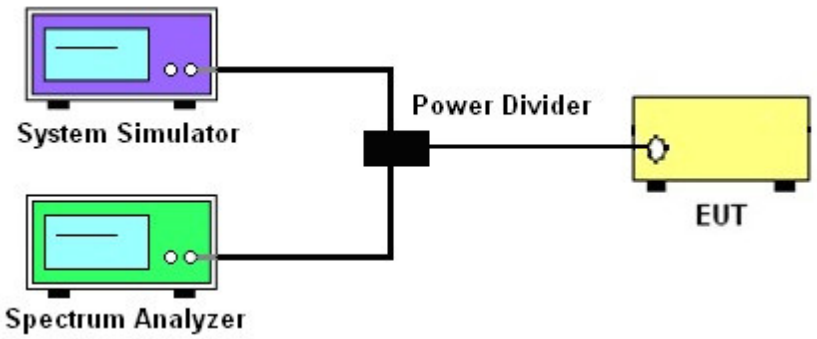
1. The testing follows FCC KDB 971168 v03r01 section.

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

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 D01 Section 5.2.2 (for GSM/GPRS/EDGE) 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.

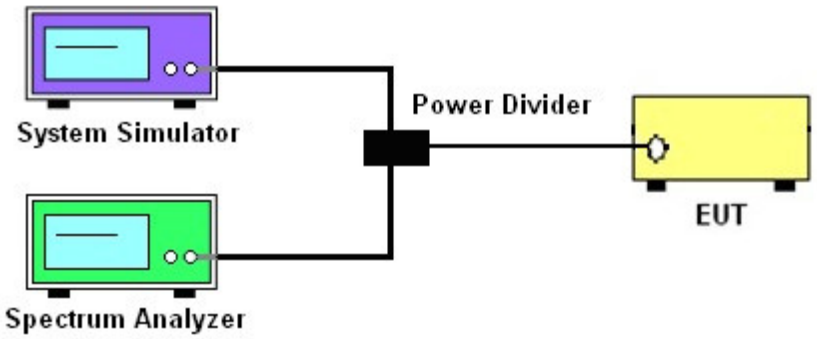
The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) 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

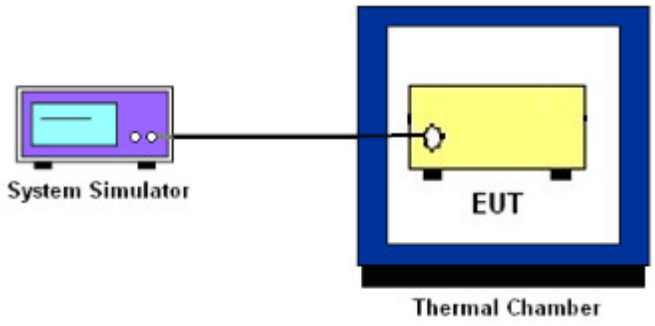
Temperature Variation

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

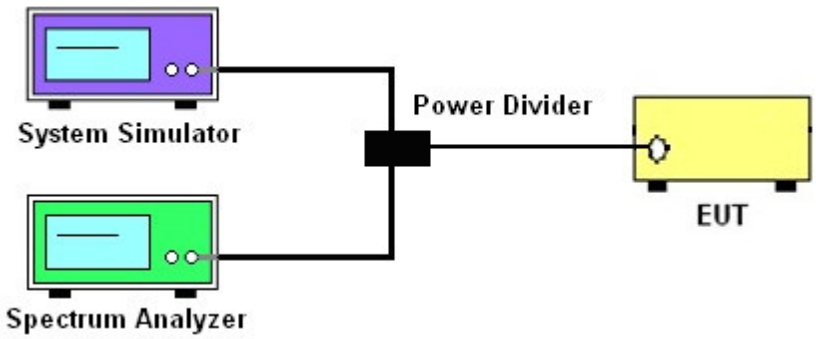
1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.5.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated 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.

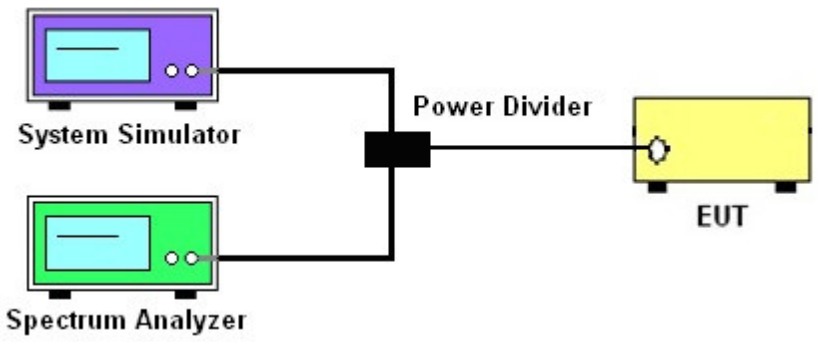
5. The band edges of low and high channels for the highest RF powers were measured.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

= 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.

The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP/ERP was calculated with the correction factor, ERP/EIRP = P.SG + GT – LC

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, t ypically dBW or dBm);

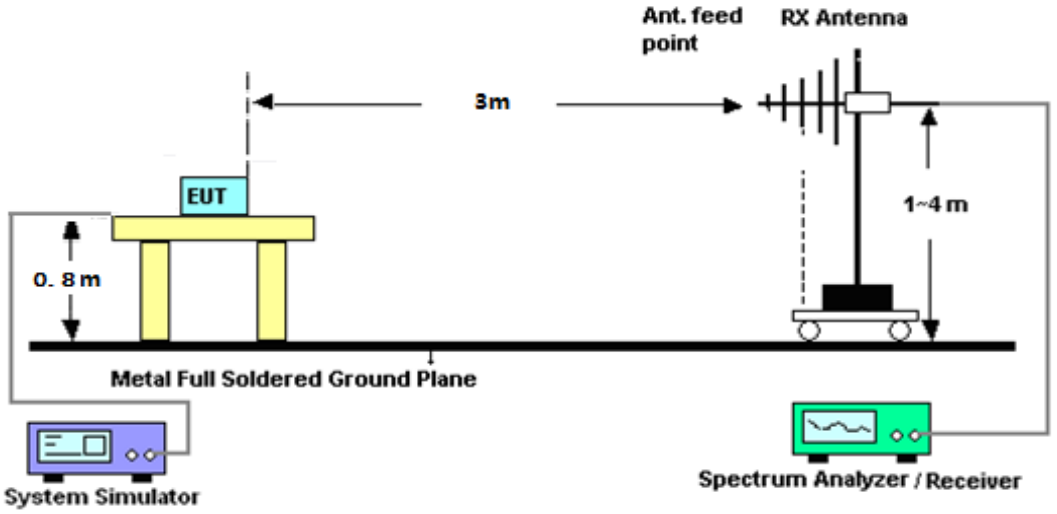
P.SG = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

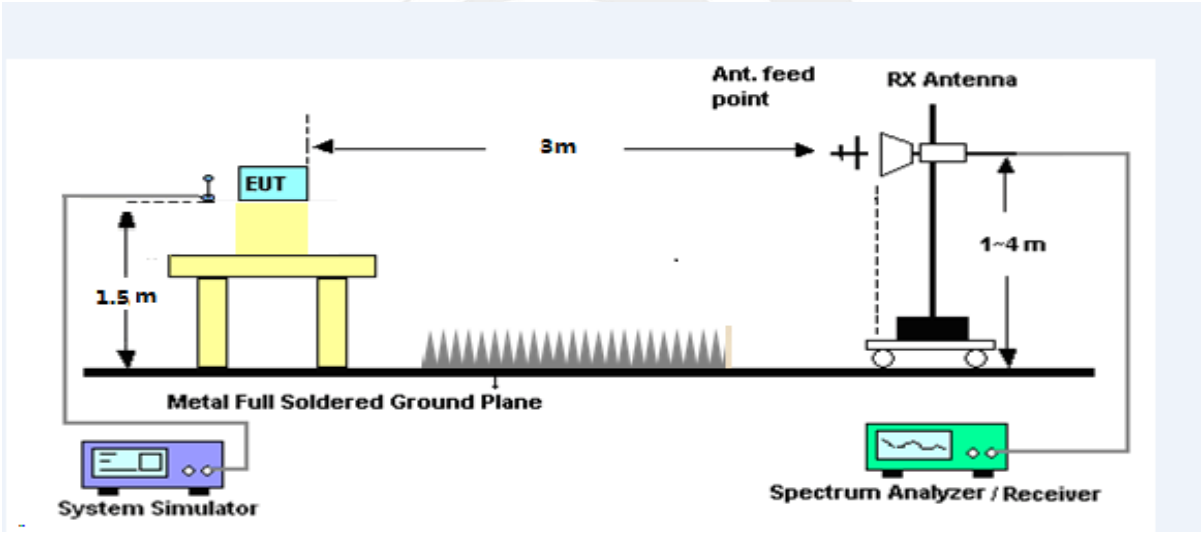
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

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:

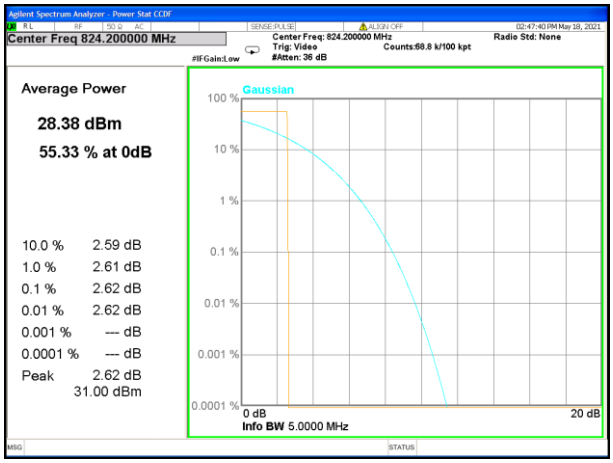
GSM 850		
Mode	Frequency (MHz)	AVG Power(dBm)
GSM (GMSK,1-Slot)	824.2	31.32
	836.6	31.08
	848.8	30.73
GPRS (GMSK,1-Slot)	824.2	31.20
	836.6	30.97
	848.8	30.62
GPRS (GMSK,2-Slot)	824.2	30.78
	836.6	30.51
	848.8	30.21
GPRS (GMSK,3-Slot)	824.2	30.35
	836.6	30.11
	848.8	29.76
GPRS (GMSK,4-Slot)	824.2	29.87
	836.6	29.64
	848.8	29.32

PCS 1900:

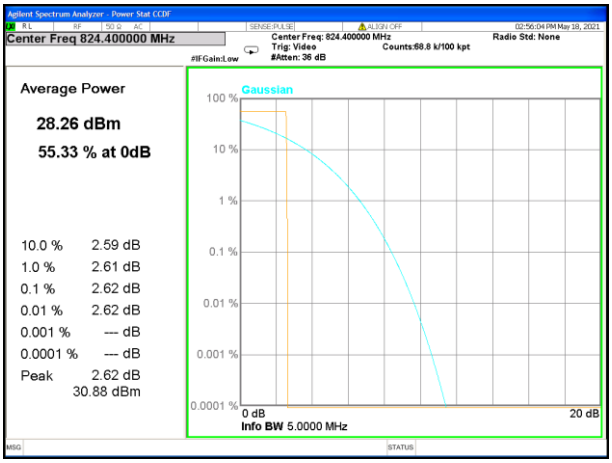
PCS 1900		
Mode	Frequency (MHz)	AVG Power(dBm)
GSM (GMSK,1-Slot)	1850.2	26.05
	1880.0	24.45
	1909.8	22.81
GPRS (GMSK,1-Slot)	1850.2	26.04
	1880.0	24.37
	1909.8	22.70
GPRS (GMSK,2-Slot)	1850.2	25.63
	1880.0	23.97
	1909.8	22.29
GPRS (GMSK,3-Slot)	1850.2	25.22
	1880.0	23.51
	1909.8	21.87
GPRS (GMSK,4-Slot)	1850.2	24.82
	1880.0	23.02
	1909.8	21.43

A2. PEAK-TO-AVERAGE RADIO

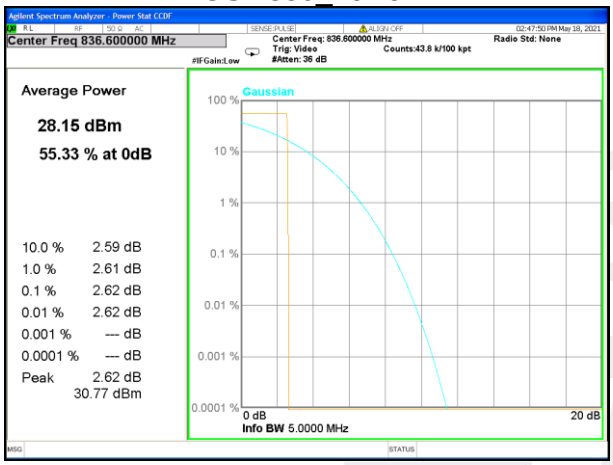
GSM 850		
Mode	Frequency (MHz)	PAR
GSM 850	824.2	2.62
	836.6	2.62
	848.8	2.63
GPRS 850	824.2	2.62
	836.6	2.61
	848.8	2.63
PCS 1900		
Mode	Frequency (MHz)	PAR
PCS1900	1850.2	2.64
	1880	2.61
	1909.8	2.61
GPRS1900	1850.2	2.64
	1880	2.61
	1909.8	2.61



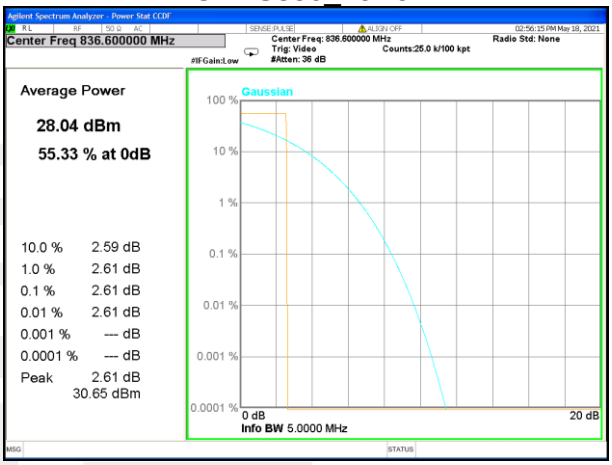
GSM850_Lower



GPRS850_Lower



GSM850_Middle



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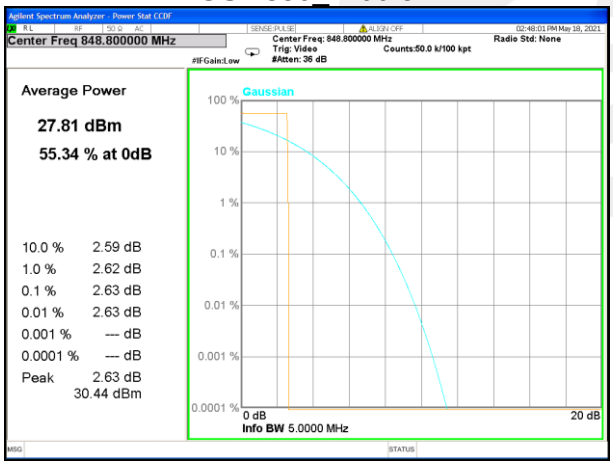

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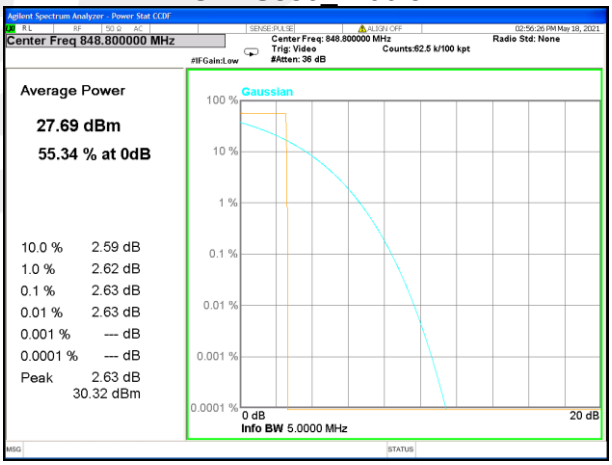

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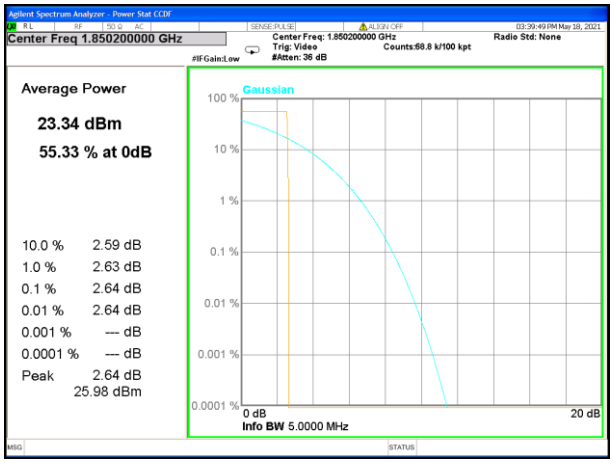
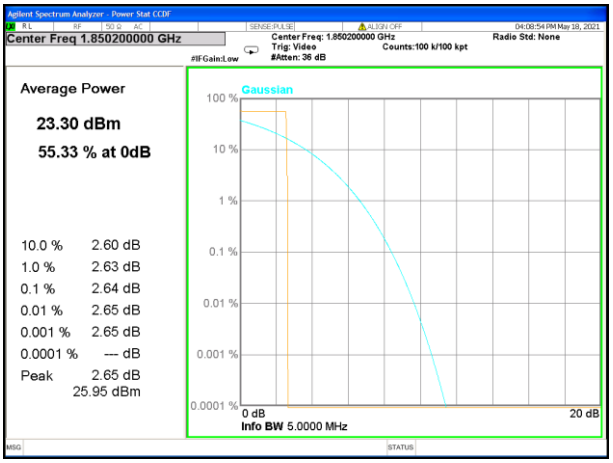
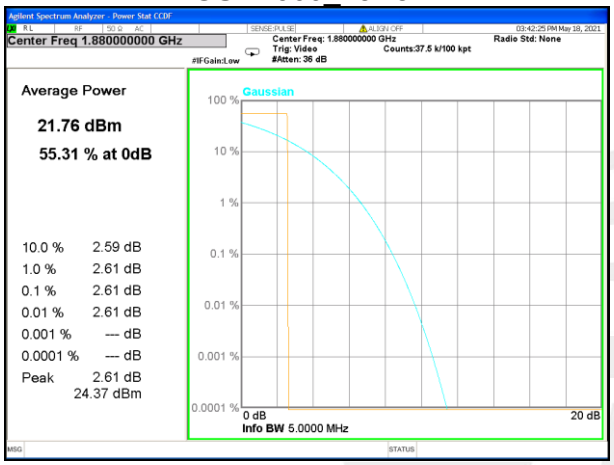


GSM1900_Lower



GPRS1900_Lower



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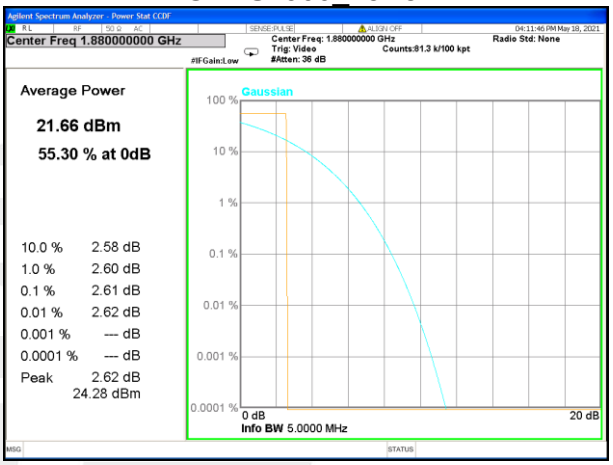

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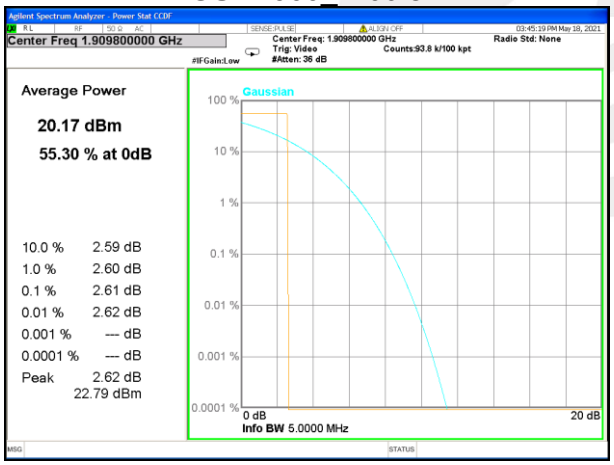
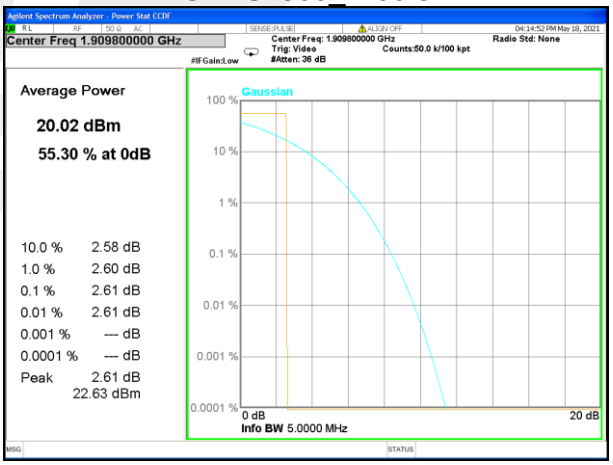


GSM1900_Higher



GPRS1900_Higher

A3. TRANSMITTER RADIATED POWER (EIRP/ERP)

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

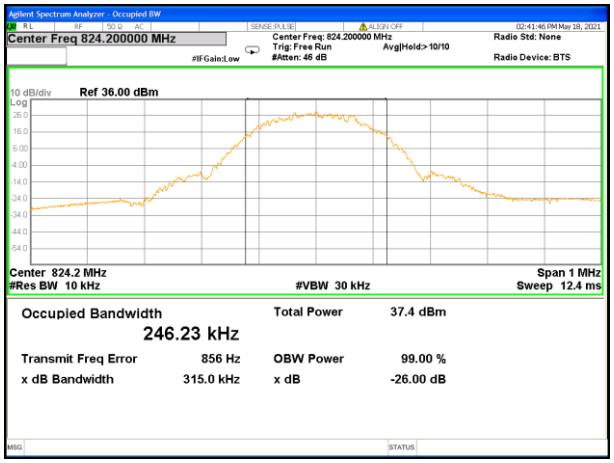
Radiated Power (ERP) for GSM 850 MHZ								
Mode	Frequency	Result					Polarization	Conclusion
		S G.Level (dBm)	Cable loss	Gain(dBi)	correction factor(dB)	PMeas E.R.P(dBm)	Of Max. ERP	
GSM850	824.2	24.90	0.44	6.5	2.15	28.81	Horizontal	Pass
	824.2	26.78	0.44	6.5	2.15	30.69	Vertical	Pass
	836.6	24.35	0.45	6.5	2.15	28.25	Horizontal	Pass
	836.6	26.32	0.45	6.5	2.15	30.22	Vertical	Pass
	848.8	24.31	0.46	6.5	2.15	28.20	Horizontal	Pass
	848.8	26.18	0.46	6.5	2.15	30.07	Vertical	Pass
GPRS850	824.2	24.53	0.44	6.5	2.15	28.44	Horizontal	Pass
	824.2	26.73	0.44	6.5	2.15	30.64	Vertical	Pass
	836.6	23.96	0.45	6.5	2.15	27.86	Horizontal	Pass
	836.6	26.29	0.45	6.5	2.15	30.19	Vertical	Pass
	848.8	24.15	0.46	6.5	2.15	28.04	Horizontal	Pass
	848.8	26.17	0.46	6.5	2.15	30.06	Vertical	Pass

Radiated Power (EIRP) for PCS 1900 MHZ							
Mode	Frequency	Result				Polarization	Conclusion
		S G.Level (dBm)	Cable loss	Gain (dBi)	PMeas E.I.R.P.(dBm)	Of Max. EIRP	
PCS1900	1850.2	15.77	2.41	10.35	23.71	Horizontal	Pass
	1850.2	17.48	2.41	10.35	25.42	Vertical	Pass
	1880	14.09	2.42	10.35	22.02	Horizontal	Pass
	1880	15.97	2.42	10.35	23.90	Vertical	Pass
	1909.8	12.06	2.43	10.35	19.98	Horizontal	Pass
	1909.8	14.03	2.43	10.35	21.95	Vertical	Pass
GPRS1900	1850.2	14.98	2.41	10.35	22.92	Horizontal	Pass
	1850.2	17.14	2.41	10.35	25.08	Vertical	Pass
	1880	13.05	2.42	10.35	20.98	Horizontal	Pass
	1880	15.43	2.42	10.35	23.36	Vertical	Pass
	1909.8	11.66	2.43	10.35	19.58	Horizontal	Pass
	1909.8	13.78	2.43	10.35	21.70	Vertical	Pass

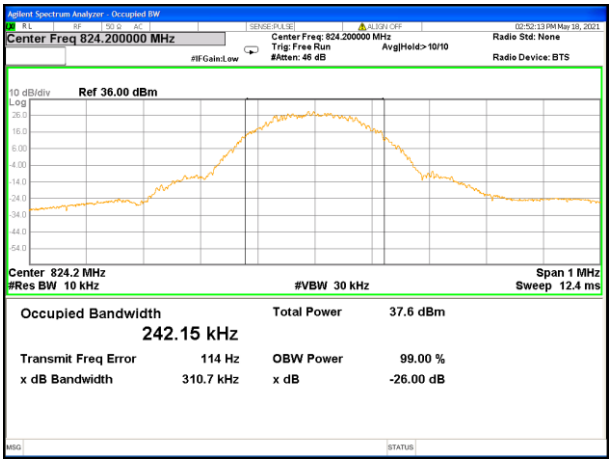
A4. OCCUPIED BANDWIDTH (99% OCCUPIED BANDWIDTH/26dB BANDWIDTH)

GSM Bandwidth [KHz]						
Mode	Lowest		Middle		Highest	
	99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
GSM850	0.24623	0.315	0.245	0.318	0.24542	0.313
GPRS850	0.24215	0.311	0.242	0.3155	0.24409	0.313

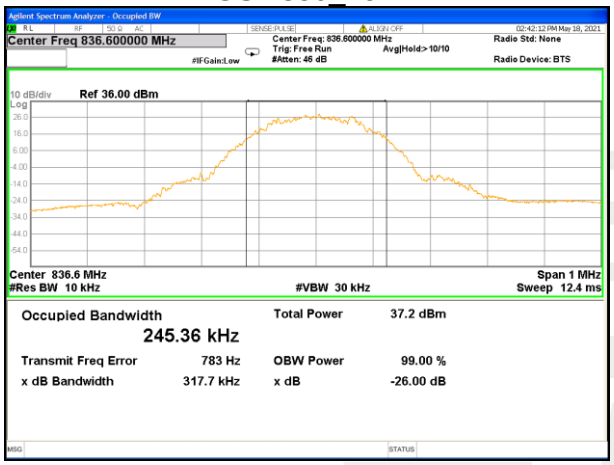
GSM Bandwidth [KHz]						
Mode	Lowest		Middle		Highest	
	99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
GSM1900	0.24492	0.316	0.242	0.311	0.24484	0.32
GPRS1900	0.24217	0.314	0.24192	0.303	0.24334	0.314



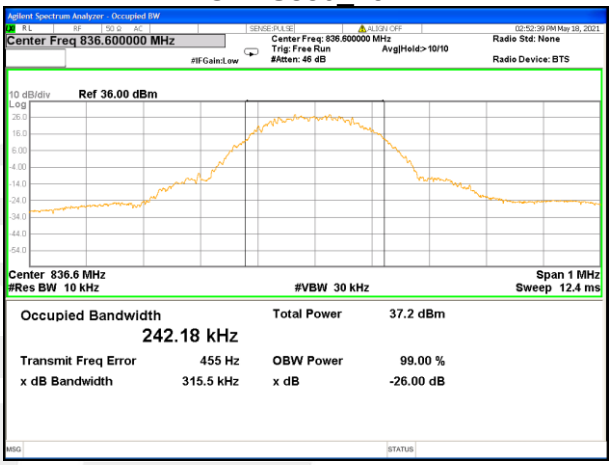
GSM850_Low



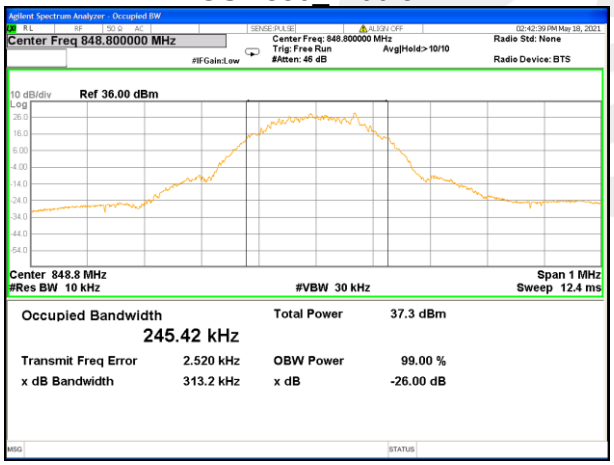
GPRS850_Low



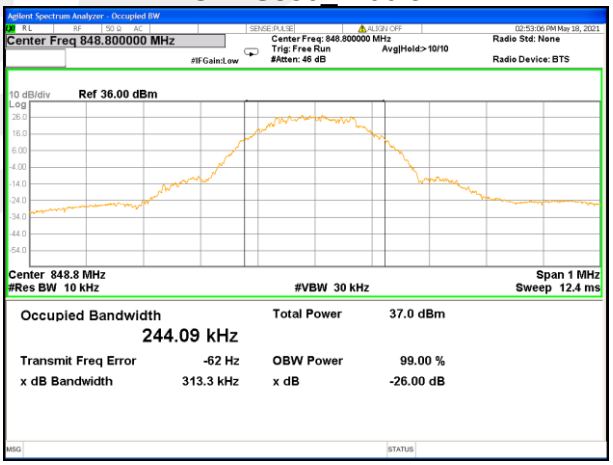
GSM850_Middle



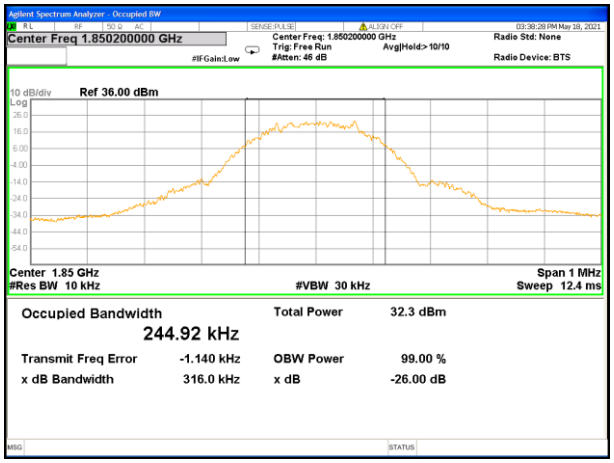
GPRS850_Middle



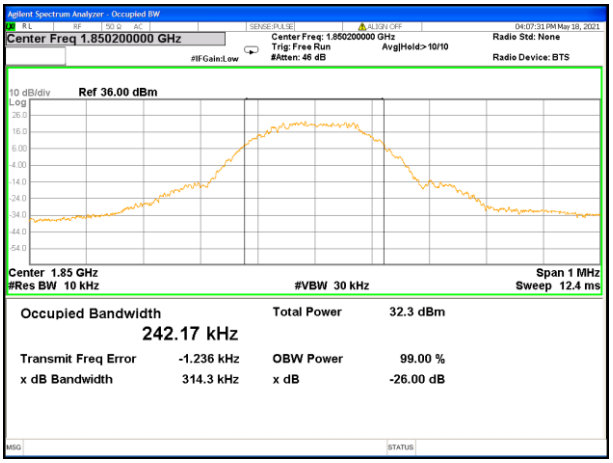
GSM850_High



GPRS850_High



GSM1900_Low



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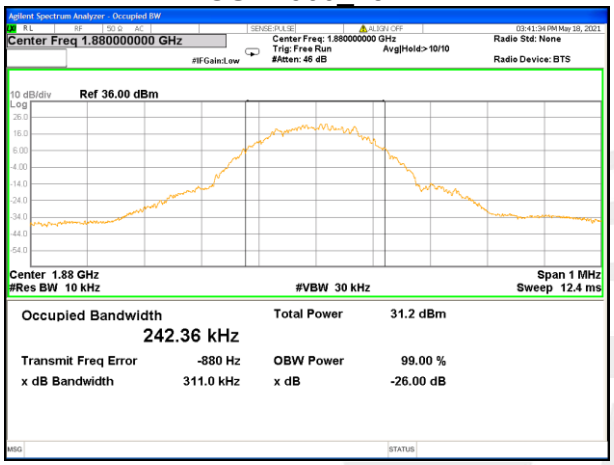

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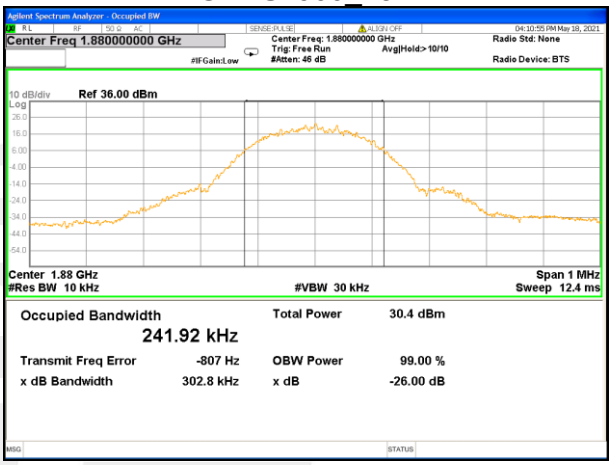

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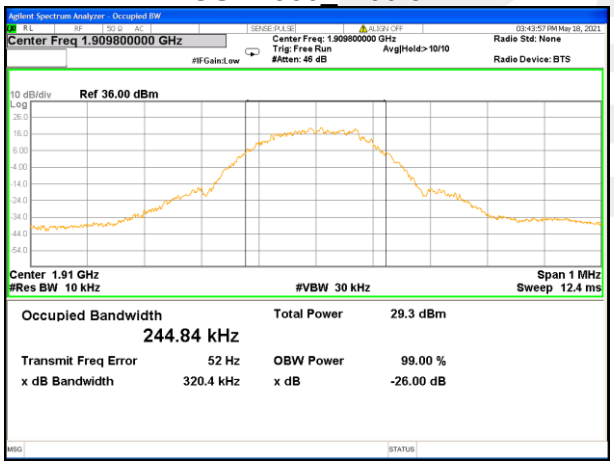

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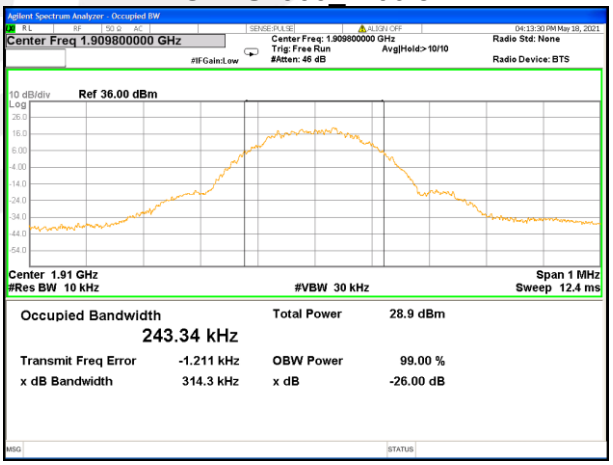


GPRS1900_High

A5. FREQUENCY STABILITY

Normal Voltage = 3.7V; Battery End Point (BEP) = 3.4V; Maximum Voltage =4.2V

GSM 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	32.09	0.038	2.5ppm	PASS
40		32.09	0.038		
30		28.46	0.034		
20		18.62	0.022		
10		11.98	0.014		
0		28.89	0.035		
-10		33.90	0.041		
-20		26.89	0.032		
-30		15.73	0.019		
20	Maximum Voltage	34.02	0.041		
20	BEP	19.62	0.023		

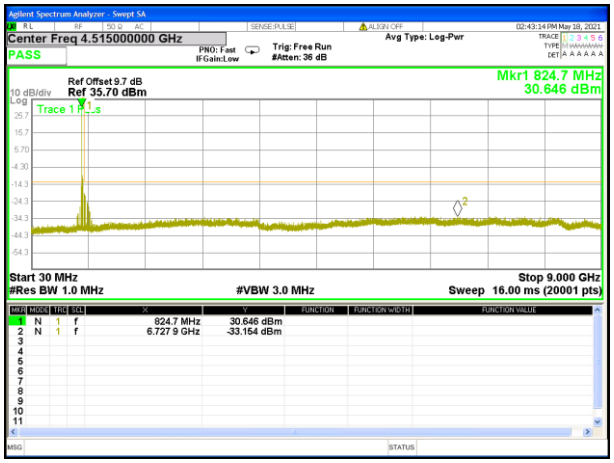
GPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	27.80	0.033	2.5ppm	PASS
40		31.87	0.038		
30		11.59	0.014		
20		16.42	0.020		
10		34.68	0.041		
0		29.00	0.035		
-10		12.06	0.014		
-20		16.64	0.020		
-30		21.63	0.026		
20	Maximum Voltage	24.49	0.029		
20	BEP	17.50	0.021		

GSM 1900 / 1880MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	23.25	0.012	Within Authorized Band	PASS
40		24.97	0.013		
30		36.27	0.019		
20		18.77	0.010		
10		34.53	0.018		
0		15.94	0.008		
-10		13.34	0.007		
-20		30.74	0.016		
-30		24.66	0.013		
20	Maximum Voltage	22.11	0.012		
20	BEP	19.17	0.010		

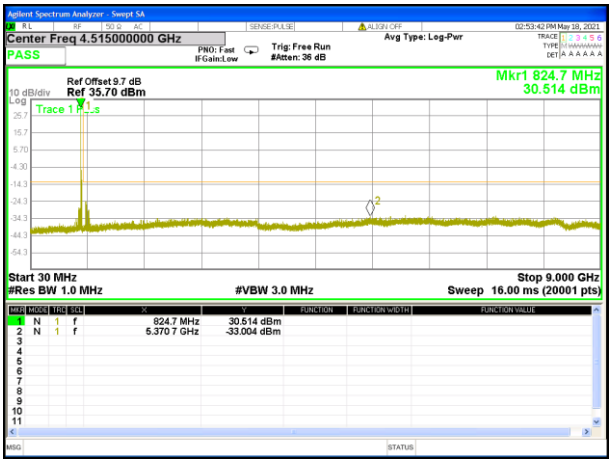
GPRS 1900 / 1880MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	20.75	0.011	Within Authorized Band	PASS
40		16.22	0.009		
30		35.45	0.019		
20		12.09	0.006		
10		20.05	0.011		
0		31.83	0.017		
-10		22.32	0.012		
-20		26.68	0.014		
-30		28.96	0.015		
20	Maximum Voltage	22.70	0.012		
20	BEP	21.54	0.011		

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

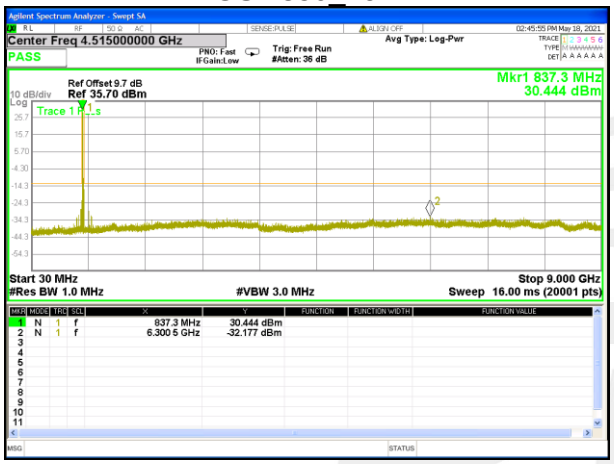
A6. SPURIOUS EMISSIONS AT ANTENNA TERMINALS



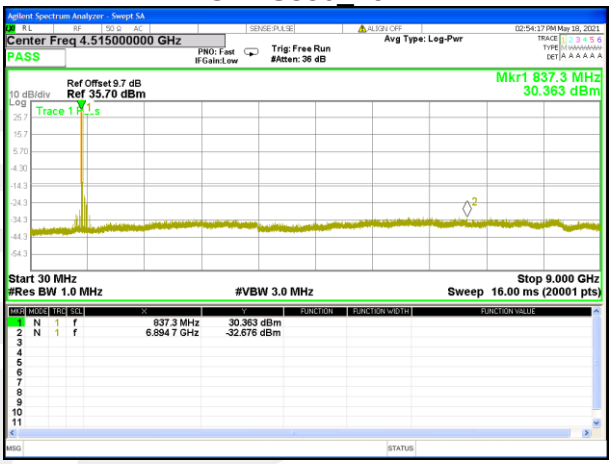
GSM850_Low



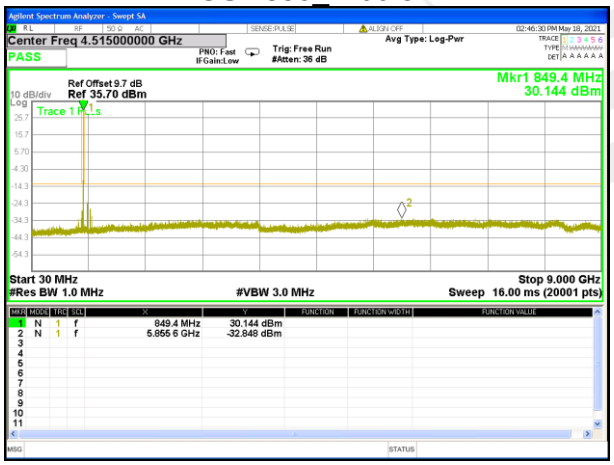
GPRS850_Low



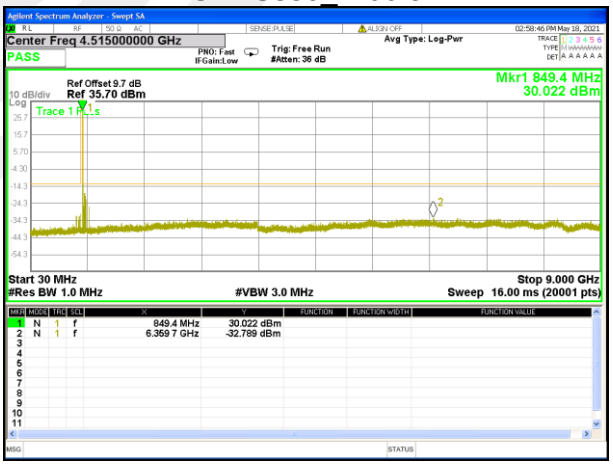
GSM850_Middle



GPRS850_Middle



GSM850_High

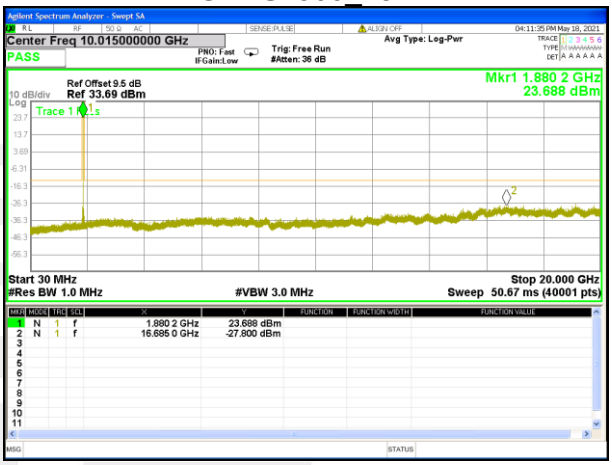


GPRS850_High

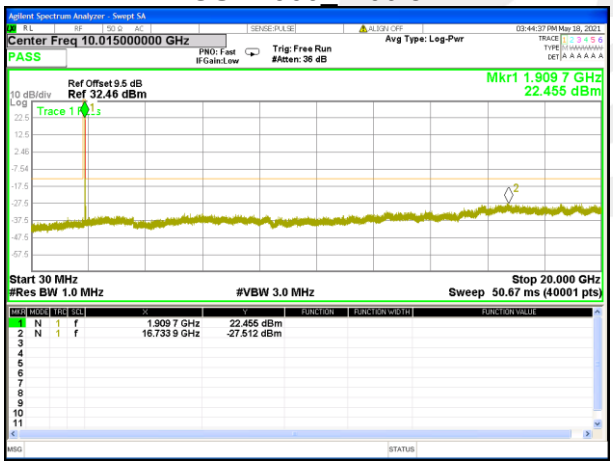
GSM1900_Low

GPRS1900_Low

GSM1900_Middle



GPRS1900_Middle



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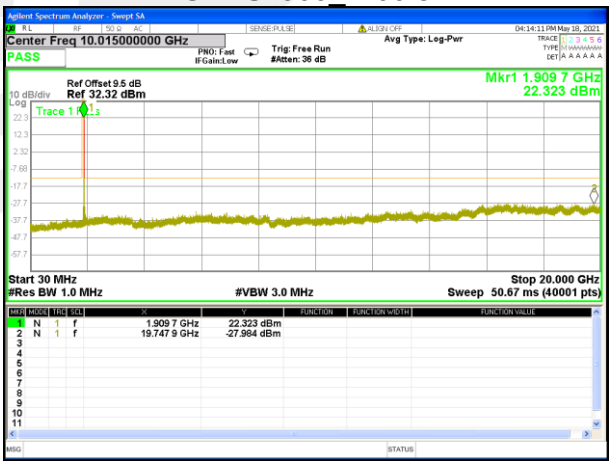
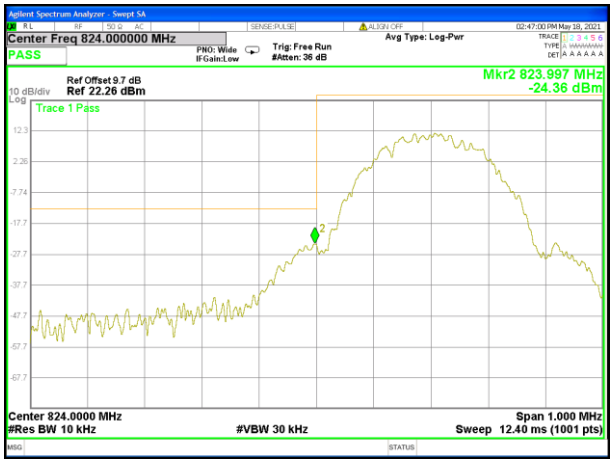
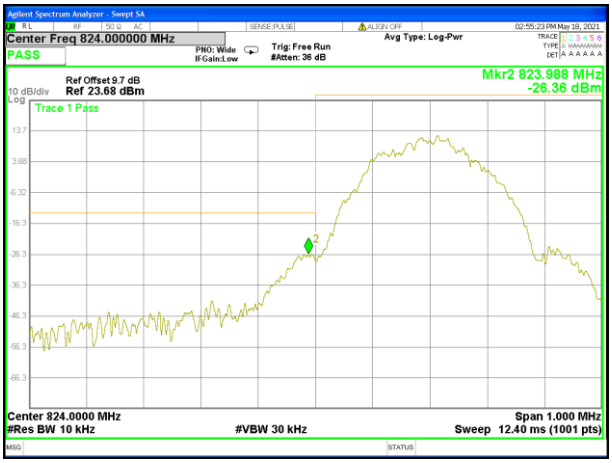


GPRS1900_High

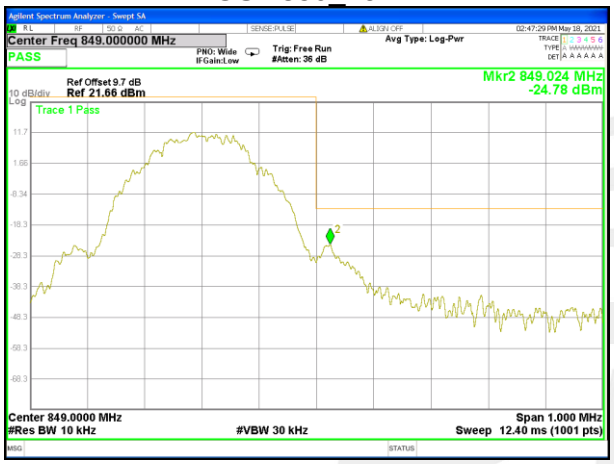
A7. BAND EDGE



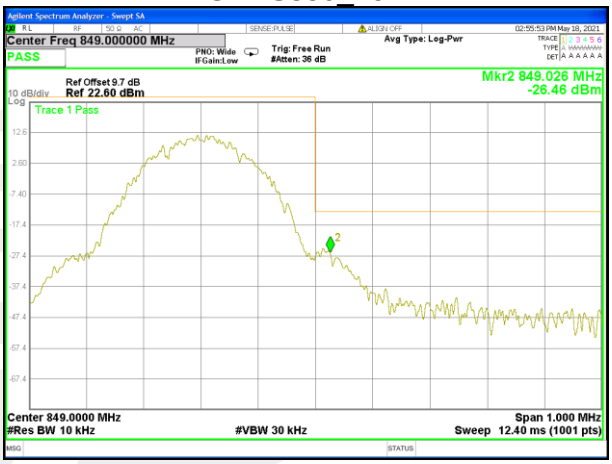
GSM850_Low



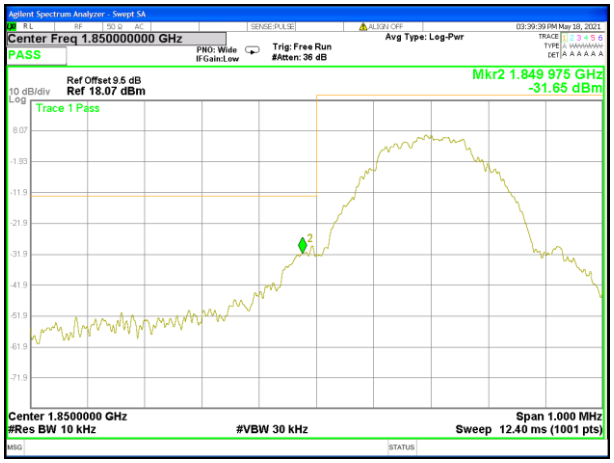
GPRS850_Low



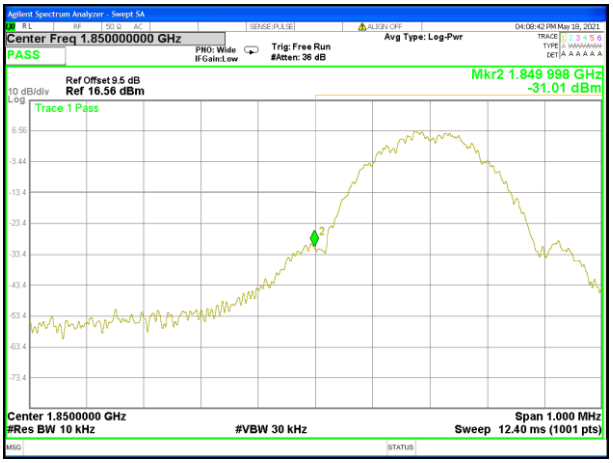
GSM850_High



GPRS850_High



GSM1900_Low



GPRS1900_Low

GSM1900_High

GPRS1900_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.

Test Model: A1

GSM 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
1648.24	-41.08	9.40	4.75	-36.43	-13.00	-23.43	H
2472.58	-39.71	10.60	8.39	-37.50	-13.00	-24.50	H
3296.91	-31.26	12.00	11.79	-31.05	-13.00	-18.05	H
1648.08	-43.70	9.40	4.75	-39.05	-13.00	-26.05	V
2472.57	-44.97	10.60	8.39	-42.76	-13.00	-29.76	V
3296.54	-42.57	12.00	11.79	-42.36	-13.00	-29.36	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
1673.05	-41.01	9.50	4.76	-36.27	-13.00	-23.27	H
2509.50	-39.60	10.70	8.40	-37.30	-13.00	-24.30	H
3346.34	-31.09	12.20	11.80	-30.69	-13.00	-17.69	H
1672.93	-44.13	9.40	4.75	-39.48	-13.00	-26.48	V
2509.55	-45.18	10.60	8.39	-42.97	-13.00	-29.97	V
3346.06	-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
1697.21	-41.06	9.60	4.77	-36.23	-13.00	-23.23	H
2546.42	-39.94	10.80	8.50	-37.64	-13.00	-24.64	H
3394.96	-31.83	12.50	11.90	-31.23	-13.00	-18.23	H
1697.65	-44.58	9.60	4.77	-39.75	-13.00	-26.75	V
2546.06	-44.56	10.80	8.50	-42.26	-13.00	-29.26	V
3394.84	-43.15	12.50	11.90	-42.55	-13.00	-29.55	V

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
1648.30	-40.55	9.40	4.75	-35.90	-13.00	-22.90	H
2472.69	-39.28	10.60	8.39	-37.07	-13.00	-24.07	H
3296.46	-31.03	12.00	11.79	-30.82	-13.00	-17.82	H
1648.08	-43.29	9.40	4.75	-38.64	-13.00	-25.64	V
2472.50	-45.29	10.60	8.39	-43.08	-13.00	-30.08	V
3296.60	-42.72	12.00	11.79	-42.51	-13.00	-29.51	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
1672.80	-40.65	9.50	4.76	-35.91	-13.00	-22.91	H
2509.77	-40.22	10.70	8.40	-37.92	-13.00	-24.92	H
3345.97	-31.05	12.20	11.80	-30.65	-13.00	-17.65	H
1673.21	-44.56	9.40	4.75	-39.91	-13.00	-26.91	V
2509.43	-44.18	10.60	8.39	-41.97	-13.00	-28.97	V
3346.09	-43.03	12.20	11.82	-42.65	-13.00	-29.65	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
1697.57	-40.25	9.60	4.77	-35.42	-13.00	-22.42	H
2546.25	-39.62	10.80	8.50	-37.32	-13.00	-24.32	H
3394.90	-31.55	12.50	11.90	-30.95	-13.00	-17.95	H
1697.56	-44.12	9.60	4.77	-39.29	-13.00	-26.29	V
2546.31	-44.60	10.80	8.50	-42.30	-13.00	-29.30	V
3395.02	-42.64	12.50	11.90	-42.04	-13.00	-29.04	V

DCS 1900: (30-20000)MHz							
The Worst Test Results for Channel 512/1850.2MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3700.21	-34.04	12.60	12.93	-34.37	-13.00	-21.37	H
5550.26	-34.55	13.10	17.11	-38.56	-13.00	-25.56	H
7400.68	-33.44	11.50	22.20	-44.14	-13.00	-31.14	H
3700.42	-35.39	12.60	12.93	-35.72	-13.00	-22.72	V
5550.32	-33.88	13.10	17.11	-37.89	-13.00	-24.89	V
7400.90	-31.80	11.50	22.20	-42.50	-13.00	-29.50	V
The Worst Test Results for Channel 661/1880.0MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3760.07	-33.49	12.60	12.93	-33.82	-13.00	-20.82	H
5640.04	-34.95	13.10	17.11	-38.96	-13.00	-25.96	H
7520.23	-32.21	11.50	22.20	-42.91	-13.00	-29.91	H
3760.28	-34.82	12.60	12.93	-35.15	-13.00	-22.15	V
5639.85	-33.87	13.10	17.11	-37.88	-13.00	-24.88	V
7519.89	-32.00	11.50	22.20	-42.70	-13.00	-29.70	V
The Worst Test Results for Channel 810/1909.8MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3819.24	-33.52	12.60	12.93	-33.85	-13.00	-20.85	H
5729.26	-34.92	13.10	17.11	-38.93	-13.00	-25.93	H
7639.28	-32.80	11.50	22.20	-43.50	-13.00	-30.50	H
3819.46	-35.27	12.60	12.93	-35.60	-13.00	-22.60	V
5729.42	-34.54	13.10	17.11	-38.55	-13.00	-25.55	V
7639.04	-33.07	11.50	22.20	-43.77	-13.00	-30.77	V

GPRS1900: (30-20000)MHz							
The Worst Test Results for Channel 512/1850.2MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3700.16	-33.74	12.60	12.93	-34.07	-13.00	-21.07	H
5550.48	-35.16	13.10	17.11	-39.17	-13.00	-26.17	H
7400.76	-32.83	11.50	22.20	-43.53	-13.00	-30.53	H
3700.21	-35.45	12.60	12.93	-35.78	-13.00	-22.78	V
5550.61	-34.00	13.10	17.11	-38.01	-13.00	-25.01	V
7400.67	-33.04	11.50	22.20	-43.74	-13.00	-30.74	V
The Worst Test Results for Channel 661/1880.0MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3760.24	-34.36	12.60	12.93	-34.69	-13.00	-21.69	H
5640.05	-34.02	13.10	17.11	-38.03	-13.00	-25.03	H
7520.01	-33.61	11.50	22.20	-44.31	-13.00	-31.31	H
3759.89	-35.33	12.60	12.93	-35.66	-13.00	-22.66	V
5639.99	-35.06	13.10	17.11	-39.07	-13.00	-26.07	V
7520.11	-32.10	11.50	22.20	-42.80	-13.00	-29.80	V
The Worst Test Results for Channel 810/1909.8MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3819.43	-33.97	12.60	12.93	-34.30	-13.00	-21.30	H
5729.02	-35.24	13.10	17.11	-39.25	-13.00	-26.25	H
7638.99	-32.38	11.50	22.20	-43.08	-13.00	-30.08	H
3819.38	-35.95	12.60	12.93	-36.28	-13.00	-23.28	V
5729.31	-33.99	13.10	17.11	-38.00	-13.00	-25.00	V
7638.98	-33.20	11.50	22.20	-43.90	-13.00	-30.90	V

Test Model: A2

GSM 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
1648.23	-41.35	9.40	4.75	-36.70	-13.00	-23.70	H
2472.24	-40.08	10.60	8.39	-37.87	-13.00	-24.87	H
3296.48	-32.08	12.00	11.79	-31.87	-13.00	-18.87	H
1648.19	-43.69	9.40	4.75	-39.04	-13.00	-26.04	V
2472.53	-44.47	10.60	8.39	-42.26	-13.00	-29.26	V
3296.71	-43.54	12.00	11.79	-43.33	-13.00	-30.33	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
1673.18	-40.23	9.50	4.76	-35.49	-13.00	-22.49	H
2509.64	-40.38	10.70	8.40	-38.08	-13.00	-25.08	H
3346.11	-31.96	12.20	11.80	-31.56	-13.00	-18.56	H
1672.89	-43.24	9.40	4.75	-38.59	-13.00	-25.59	V
2509.77	-44.05	10.60	8.39	-41.84	-13.00	-28.84	V
3346.32	-43.50	12.20	11.82	-43.12	-13.00	-30.12	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
1697.49	-41.54	9.60	4.77	-36.71	-13.00	-23.71	H
2546.49	-40.06	10.80	8.50	-37.76	-13.00	-24.76	H
3394.95	-31.35	12.50	11.90	-30.75	-13.00	-17.75	H
1697.53	-44.07	9.60	4.77	-39.24	-13.00	-26.24	V
2546.50	-44.03	10.80	8.50	-41.73	-13.00	-28.73	V
3395.07	-43.62	12.50	11.90	-43.02	-13.00	-30.02	V

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
1648.41	-41.06	9.40	4.75	-36.41	-13.00	-23.41	H
2472.39	-39.91	10.60	8.39	-37.70	-13.00	-24.70	H
3296.54	-31.12	12.00	11.79	-30.91	-13.00	-17.91	H
1648.26	-43.45	9.40	4.75	-38.80	-13.00	-25.80	V
2472.27	-44.19	10.60	8.39	-41.98	-13.00	-28.98	V
3296.77	-43.56	12.00	11.79	-43.35	-13.00	-30.35	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
1673.18	-40.59	9.50	4.76	-35.85	-13.00	-22.85	H
2509.86	-40.26	10.70	8.40	-37.96	-13.00	-24.96	H
3346.43	-31.75	12.20	11.80	-31.35	-13.00	-18.35	H
1673.08	-44.57	9.40	4.75	-39.92	-13.00	-26.92	V
2509.77	-45.36	10.60	8.39	-43.15	-13.00	-30.15	V
3345.96	-42.88	12.20	11.82	-42.50	-13.00	-29.50	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
1697.22	-40.79	9.60	4.77	-35.96	-13.00	-22.96	H
2546.37	-40.48	10.80	8.50	-38.18	-13.00	-25.18	H
3394.91	-31.26	12.50	11.90	-30.66	-13.00	-17.66	H
1697.44	-43.15	9.60	4.77	-38.32	-13.00	-25.32	V
2546.27	-44.54	10.80	8.50	-42.24	-13.00	-29.24	V
3395.05	-43.47	12.50	11.90	-42.87	-13.00	-29.87	V

DCS 1900: (30-20000)MHz							
The Worst Test Results for Channel 512/1850.2MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3700.04	-34.73	12.60	12.93	-35.06	-13.00	-22.06	H
5550.67	-34.34	13.10	17.11	-38.35	-13.00	-25.35	H
7400.68	-32.50	11.50	22.20	-43.20	-13.00	-30.20	H
3700.09	-35.26	12.60	12.93	-35.59	-13.00	-22.59	V
5550.26	-34.39	13.10	17.11	-38.40	-13.00	-25.40	V
7400.95	-32.45	11.50	22.20	-43.15	-13.00	-30.15	V
The Worst Test Results for Channel 661/1880.0MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3759.79	-34.83	12.60	12.93	-35.16	-13.00	-22.16	H
5639.94	-34.90	13.10	17.11	-38.91	-13.00	-25.91	H
7519.95	-32.36	11.50	22.20	-43.06	-13.00	-30.06	H
3759.95	-34.75	12.60	12.93	-35.08	-13.00	-22.08	V
5639.88	-34.31	13.10	17.11	-38.32	-13.00	-25.32	V
7520.05	-32.31	11.50	22.20	-43.01	-13.00	-30.01	V
The Worst Test Results for Channel 810/1909.8MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3819.71	-34.22	12.60	12.93	-34.55	-13.00	-21.55	H
5729.26	-34.98	13.10	17.11	-38.99	-13.00	-25.99	H
7638.93	-32.49	11.50	22.20	-43.19	-13.00	-30.19	H
3819.46	-34.54	12.60	12.93	-34.87	-13.00	-21.87	V
5729.45	-34.37	13.10	17.11	-38.38	-13.00	-25.38	V
7639.25	-32.36	11.50	22.20	-43.06	-13.00	-30.06	V

GPRS1900: (30-20000)MHz							
The Worst Test Results for Channel 512/1850.2MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3700.10	-34.83	12.60	12.93	-35.16	-13.00	-22.16	H
5550.29	-34.53	13.10	17.11	-38.54	-13.00	-25.54	H
7400.78	-33.53	11.50	22.20	-44.23	-13.00	-31.23	H
3700.10	-35.66	12.60	12.93	-35.99	-13.00	-22.99	V
5550.41	-34.77	13.10	17.11	-38.78	-13.00	-25.78	V
7400.99	-32.07	11.50	22.20	-42.77	-13.00	-29.77	V
The Worst Test Results for Channel 661/1880.0MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3760.17	-33.92	12.60	12.93	-34.25	-13.00	-21.25	H
5639.86	-35.27	13.10	17.11	-39.28	-13.00	-26.28	H
7520.07	-32.38	11.50	22.20	-43.08	-13.00	-30.08	H
3760.05	-34.76	12.60	12.93	-35.09	-13.00	-22.09	V
5640.21	-35.22	13.10	17.11	-39.23	-13.00	-26.23	V
7520.24	-31.73	11.50	22.20	-42.43	-13.00	-29.43	V
The Worst Test Results for Channel 810/1909.8MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
3819.66	-34.19	12.60	12.93	-34.52	-13.00	-21.52	H
5729.02	-35.33	13.10	17.11	-39.34	-13.00	-26.34	H
7638.94	-33.01	11.50	22.20	-43.71	-13.00	-30.71	H
3819.59	-35.80	12.60	12.93	-36.13	-13.00	-23.13	V
5729.37	-34.27	13.10	17.11	-38.28	-13.00	-25.28	V
7639.37	-32.95	11.50	22.20	-43.65	-13.00	-30.65	V

APPENDIX-PHOTOS OF TEST SETUP

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

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