

Radio Test Report

Report No.: CTA231102003W05

Issued for

Trackimo INC.

680 Central Ave, Cedarhurst, New York 11516, USA

Product Name: NickWatch V1

Brand Name: Trackimo, Tracki, Watchinu

Model Name: NICKW001-2

Series Model(s): NICKW001-5, NICKW001-6,
NICKW001-7, NICKW001-8,
NICKW001-9, NICKW001-10

FCC ID: 2AAI6-NICKW001-2

Test Standard: FCC Part 22H and 24E

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Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

TEST REPORT

Applicant's Name: Trackimo INC.
Address: 680 Central Ave, Cedarhurst, New York 11516, USA
Manufacturer's Name: Trackimo INC.
Address: 680 Central Ave, Cedarhurst, New York 11516, USA

Product Description

Product Name: NickWatch V1
Brand: Trackimo, Tracki, Watchinu
Model Number: NICKW001-2
Series Model(s): NICKW001-5, NICKW001-6, NICKW001-7, NICKW001-8,
NICKW001-9, NICKW001-10
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 CTA, 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.....:

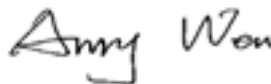
Date of receipt of test item.....: 25 Aug. 2022
Date (s) of performance of tests.: 25 Aug. 2022 ~ 31 Oct. 2022
Date of Issue: 31 Oct. 2022
Test Result: Pass

Testing Engineer :



(Zoey Cao)

Technical Manager :



(Amy Wen)

Authorized Signatory :



(Eric Wang)

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Rev.	Issue Date	Report No.	Effect Page	Contents
00	31 Oct. 2022	CTA231102003W05	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 24.232d	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 INTRODUCTION

Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

FCC test Firm Registration Number: 517856

IC test Firm Registration Number: 27890

A2LA Certificate No.: 6534.01

IC CAB ID: CN0127

1.2 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 herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Test	Range	Measurement Uncertainty
Radiated Emission	30~1000MHz	4.06 dB
Radiated Emission	1~18GHz	5.14 dB
Radiated Emission	18-40GHz	5.38 dB
Conducted Disturbance	0.15~30MHz	2.14 dB
Output Peak power	30MHz~18GHz	0.55 dB
Power spectral density	/	0.57 dB
Spectrum bandwidth	/	1.1%
Radiated spurious emission (30MHz-1GHz)	30~1000MHz	4.10 dB
Radiated spurious emission (1GHz-18GHz)	1~18GHz	4.32 dB
Radiated spurious emission (18GHz-40GHz)	18-40GHz	5.54 dB

2 PRODUCT INFORMATION

Product Name	NickWatch V1
Brand	Trackimo, Tracki, Watchinu
Model Number	NICKW001-2
Series Model(s)	NICKW001-5, NICKW001-6, NICKW001-7, NICKW001-8, NICKW001-9, NICKW001-10
Model Difference	The difference only in the model name and brand name.
Tx Frequency:	GSM/GPRS/EDGE: 850: 824 MHz ~ 849MHz 1900: 1850 MHz ~ 1910MHz WCDMA: Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz
Rx Frequency:	GSM/GPRS/EDGE: 850: 869 MHz ~ 894 MHz 1900: 1930 MHz ~ 1990MHz WCDMA: Band V: 869 MHz ~ 894 MHz Band II: 1930 MHz ~ 1990 MHz
Max RF Output Power:	GSM850:32.89dBm, PCS1900:29.80dBm GPRS850(1-Slot):32.80dBm, GPRS1900(1-Slot):29.72dBm GPRS850(2-Slot):30.83dBm, GPRS1900(2-Slot):27.60dBm GPRS850(3-Slot):28.77dBm, GPRS1900(3-Slot):25.98dBm GPRS850(4-Slot):26.58dBm, GPRS1900(4-Slot):23.93dBm EDGE 850(1-Slot):25.87dBm, EDGE 1900(1-Slot):23.73dBm EDGE 850(2-Slot):26.14dBm, EDGE 1900(2-Slot):23.07dBm EDGE 850(3-Slot):25.01dBm, EDGE 1900(3-Slot):22.69dBm EDGE 850(4-Slot):22.15dBm, EDGE 1900(4-Slot):19.16dBm WCDMA Band V:22.56dBm, WCDMA Band II:22.59dBm
Type of Emission:	GSM(850): 250KGXW; PCS(1900): 253KGXW GPRS(850): 251KGXW; GPRS(1900): 249KGXW EDGE(850): 250KG7W; EDGE(1900): 249KG7W WCDMA850: 4M16F9W WCDMA1900: 4M18F9W
Modulation Characteristics:	GMSK for GSM/GPRS; GMSK and 8PSK for EDGE WCDMA: QPSK; HSDPA:QPSK/16QAM; HSUPA:BPSK
SIM Card:	Built-in card.
Antenna:	PIFA
Antenna gain:	GSM 850: -4.5dBi ,PCS 1900:-4.5dBi, WCDMA 850: -3.4dBi, WCDMA1900: -3.4dBi
Battery parameter:	Rated Voltage: 3.85V Charge Limit Voltage: 4.35V Capacity: 460mAh
Ratings	DC 5V 500mA

GPRS/EDGE Class:	Multi-Class12
Extreme Vol. Limits:	DC 3.35V~ DC 4.35V(Normal: DC 3.85V)
Extreme Temp. Tolerance:	-30℃ to +50℃
Hardware version number:	UW02 AUO V0.3
Software version number:	0.2
** Note: The High Voltage 4.35V and Low Voltage 3.35V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage, the antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.	

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.
2. 30 MHz to 10th harmonic for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

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

	TEST MODES	
	RADIATED TCS	CONDUCTED TCS
BAND		
GSM 850	GSM LINK GPRS/EDGE CLASS 12 LINK	GSM LINK GPRS/EDGE CLASS 12 LINK
GSM 1900	GSM LINK GPRS/EDGE CLASS 12 LINK	GSM LINK GPRS/EDGE CLASS 12 LINK
WCDMA BAND V	RMC 12.2KBPS LINK	RMC 12.2KBPS LINK
WCDMA BAND II	RMC 12.2KBPS LINK	RMC 12.2KBPS LINK

4 MEASUREMENT INSTRUMENTS

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2023/08/02	2024/08/01
LISN	R&S	ENV216	CTA-314	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESPI	CTA-307	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESCI	CTA-306	2023/08/02	2024/08/01
Spectrum Analyzer	Agilent	N9020A	CTA-301	2023/08/02	2024/08/01
Spectrum Analyzer	R&S	FSP	CTA-337	2023/08/02	2024/08/01
Vector Signal generator	Agilent	N5182A	CTA-305	2023/08/02	2024/08/01
Analog Signal Generator	R&S	SML03	CTA-304	2023/08/02	2024/08/01
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	R&S	CTA-302	2023/08/02	2024/08/01
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2023/08/02	2024/08/01
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2024/10/16
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2024/10/12
Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2024/10/16
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/07	2024/08/06
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2023/08/02	2024/08/01
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2023/08/02	2024/08/01
Directional coupler	NARDA	4226-10	CTA-303	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2023/08/02	2024/08/01
Automated filter bank	Tonscend	JS0806-F	CTA-404	2023/08/02	2024/08/01
Power Sensor	Agilent	U2021XA	CTA-405	2023/08/02	2024/08/01
Amplifier	Schwarzbeck	BBV9719	CTA-406	2023/08/02	2024/08/01

Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date
EMI Test Software	Tonscend	TS®JS32-RE	5.0.0.2	N/A	N/A
EMI Test Software	Tonscend	TS®JS32-CE	5.0.0.1	N/A	N/A
RF Test Software	Tonscend	TS®JS1120-3	3.1.65	N/A	N/A
RF Test Software	Tonscend	TS®JS1120	3.1.46	N/A	N/A

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&TRANSMITTER RADIATED POWER

TEST OVERVIEW

CONDUCTED OUTPUT POWER:

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.

TRANSMITTER RADIATED POWER (EIRP/ERP)

Determining ERP and/or EIRP from conducted RF output power measurements according to ANSI C63.26 2015 Section 5.2.5.5.

In many cases, RF output power limits are specified in terms of the ERP or the EIRP. Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating frequency is greater than 1 GHz. Both are defined as the product of the power supplied to the antenna and its gain (relative to a dipole antenna in the case of ERP, and relative to an isotropic antenna in the case of EIRP); however, when working in decibels (i.e., logarithmic scale), the ERP and EIRP represent the sum of the transmit antenna gain (in dBd or dBi, respectively) and the conducted RF output power (expressed in dB relative to watts or milliwatts).

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

$$(1) \text{ ERP or EIRP} = P_{\text{Meas}} + GT$$

$$\text{ERP} = \text{EIRP} - 2.15$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

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

For devices utilizing multiple antennas, see 6.4 for guidance with respect to determining the effective array transmit antenna gain term to be used in the above equation.

The following equations demonstrate the mathematical relationship between ERP and EIRP:

a) $\text{ERP} = \text{EIRP} - 2.15$, where ERP and EIRP are expressed in consistent units.

b) $\text{EIRP} = \text{ERP} + 2.15$, where ERP and EIRP are expressed in consistent units.

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

GSM 850							
Mode	Frequency (MHz)	Conduction AVG Power(dBm)	Ant Gain (dBi)	ERP (dBm)	ERP Limit (W)	ERP Limit (dBm)	Conclusion
GSM (GMSK,1-Slot)	824.2	32.82	-4.50	26.17	7.00	38.45	PASS
	836.6	32.78	-4.50	26.13	7.00	38.45	PASS
	848.8	32.89	-4.50	26.24	7.00	38.45	PASS
GPRS (GMSK,1-Slot)	824.2	32.72	-4.50	26.07	7.00	38.45	PASS
	836.6	32.67	-4.50	26.02	7.00	38.45	PASS
	848.8	32.80	-4.50	26.15	7.00	38.45	PASS
GPRS (GMSK,2-Slot)	824.2	30.83	-4.50	24.18	7.00	38.45	PASS
	836.6	30.65	-4.50	24.00	7.00	38.45	PASS
	848.8	30.80	-4.50	24.15	7.00	38.45	PASS
GPRS (GMSK,3-Slot)	824.2	28.77	-4.50	22.12	7.00	38.45	PASS
	836.6	28.61	-4.50	21.96	7.00	38.45	PASS
	848.8	28.73	-4.50	22.08	7.00	38.45	PASS
GPRS (GMSK,4-Slot)	824.2	26.58	-4.50	19.93	7.00	38.45	PASS
	836.6	26.43	-4.50	19.78	7.00	38.45	PASS
	848.8	26.55	-4.50	19.90	7.00	38.45	PASS
EGPRS (8PSK,1-Slot)	824.2	25.55	-4.50	18.90	7.00	38.45	PASS
	836.6	25.34	-4.50	18.69	7.00	38.45	PASS
	848.8	25.87	-4.50	19.22	7.00	38.45	PASS
EGPRS (8PSK,2-Slot)	824.2	26.14	-4.50	19.49	7.00	38.45	PASS
	836.6	25.67	-4.50	19.02	7.00	38.45	PASS
	848.8	25.48	-4.50	18.83	7.00	38.45	PASS
EGPRS (8PSK,3-Slot)	824.2	25.01	-4.50	18.36	7.00	38.45	PASS
	836.6	24.29	-4.50	17.64	7.00	38.45	PASS
	848.8	24.40	-4.50	17.75	7.00	38.45	PASS
EGPRS (8PSK,4-Slot)	824.2	22.15	-4.50	15.50	7.00	38.45	PASS
	836.6	21.40	-4.50	14.75	7.00	38.45	PASS
	848.8	21.85	-4.50	15.20	7.00	38.45	PASS

PCS 1900							
Mode	Frequency (MHz)	Conduction AVG Power(dBm)	Ant Gain (dBi)	EIRP (dBm)	EIRP Limit (W)	EIRP Limit (dBm)	Conclusion
GSM (GMSK,1-Slot)	1850.2	29.71	-4.50	25.21	2.00	33.01	PASS
	1880.0	29.80	-4.50	25.30	2.00	33.01	PASS
	1909.8	29.65	-4.50	25.15	2.00	33.01	PASS
GPRS (GMSK,1-Slot)	1850.2	29.69	-4.50	25.19	2.00	33.01	PASS
	1880.0	29.72	-4.50	25.22	2.00	33.01	PASS
	1909.8	29.59	-4.50	25.09	2.00	33.01	PASS
GPRS (GMSK,2-Slot)	1850.2	27.60	-4.50	23.10	2.00	33.01	PASS
	1880.0	27.53	-4.50	23.03	2.00	33.01	PASS
	1909.8	27.42	-4.50	22.92	2.00	33.01	PASS
GPRS (GMSK,3-Slot)	1850.2	25.98	-4.50	21.48	2.00	33.01	PASS
	1880.0	25.92	-4.50	21.42	2.00	33.01	PASS
	1909.8	25.80	-4.50	21.30	2.00	33.01	PASS
GPRS (GMSK,4-Slot)	1850.2	23.93	-4.50	19.43	2.00	33.01	PASS
	1880.0	23.86	-4.50	19.36	2.00	33.01	PASS
	1909.8	23.74	-4.50	19.24	2.00	33.01	PASS
EGPRS (8PSK,1-Slot)	1850.2	21.54	-4.50	17.04	2.00	33.01	PASS
	1880.0	23.11	-4.50	18.61	2.00	33.01	PASS
	1909.8	23.73	-4.50	19.23	2.00	33.01	PASS
EGPRS (8PSK,2-Slot)	1850.2	21.80	-4.50	17.30	2.00	33.01	PASS
	1880.0	22.70	-4.50	18.20	2.00	33.01	PASS
	1909.8	23.07	-4.50	18.57	2.00	33.01	PASS
EGPRS (8PSK,3-Slot)	1850.2	20.26	-4.50	15.76	2.00	33.01	PASS
	1880.0	21.72	-4.50	17.22	2.00	33.01	PASS
	1909.8	22.69	-4.50	18.19	2.00	33.01	PASS
EGPRS (8PSK,4-Slot)	1850.2	17.56	-4.50	13.06	2.00	33.01	PASS
	1880.0	19.05	-4.50	14.55	2.00	33.01	PASS
	1909.8	19.16	-4.50	14.66	2.00	33.01	PASS

Radiated Power (EIRP) for WCDMA Band 2							
Mode	Frequency (MHz)	Conduction AVG Power(dBm)	Ant Gain (dBi)	EIRP (dBm)	EIRP Limit(W)	EIRP Limit (dBm)	Conclusion
WCDMA	1852.40	22.42	-3.40	19.02	2.00	33.01	PASS
	1880.00	22.46	-3.40	19.06	2.00	33.01	PASS
	1907.40	22.59	-3.40	19.19	2.00	33.01	PASS
HSDPA Subtest 1	1852.40	21.93	-3.40	18.53	2.00	33.01	PASS
	1880.00	21.66	-3.40	18.26	2.00	33.01	PASS
	1907.40	21.16	-3.40	17.76	2.00	33.01	PASS
HSDPA Subtest 2	1852.40	21.43	-3.40	18.03	2.00	33.01	PASS
	1880.00	22.40	-3.40	19.00	2.00	33.01	PASS
	1907.40	22.20	-3.40	18.80	2.00	33.01	PASS
HSDPA Subtest 3	1852.40	21.92	-3.40	18.52	2.00	33.01	PASS
	1880.00	21.82	-3.40	18.42	2.00	33.01	PASS
	1907.40	22.56	-3.40	19.16	2.00	33.01	PASS
HSDPA Subtest 4	1852.40	22.46	-3.40	19.06	2.00	33.01	PASS
	1880.00	22.09	-3.40	18.69	2.00	33.01	PASS
	1907.40	21.89	-3.40	18.49	2.00	33.01	PASS
HSUPA Subtest 1	1852.40	21.77	-3.40	18.37	2.00	33.01	PASS
	1880.00	21.95	-3.40	18.55	2.00	33.01	PASS
	1907.40	21.51	-3.40	18.11	2.00	33.01	PASS
HSUPA Subtest 2	1852.40	21.98	-3.40	18.58	2.00	33.01	PASS
	1880.00	21.80	-3.40	18.40	2.00	33.01	PASS
	1907.40	22.20	-3.40	18.80	2.00	33.01	PASS
HSUPA Subtest 3	1852.40	22.37	-3.40	18.97	2.00	33.01	PASS
	1880.00	21.91	-3.40	18.51	2.00	33.01	PASS
	1907.40	22.37	-3.40	18.97	2.00	33.01	PASS
HSUPA Subtest 4	1852.40	22.12	-3.40	18.72	2.00	33.01	PASS
	1880.00	22.21	-3.40	18.81	2.00	33.01	PASS
	1907.40	22.28	-3.40	18.88	2.00	33.01	PASS
HSUPA Subtest 5	1852.40	22.10	-3.40	18.70	2.00	33.01	PASS
	1880.00	22.17	-3.40	18.77	2.00	33.01	PASS
	1907.40	22.24	-3.40	18.84	2.00	33.01	PASS

Radiated Power (ERP) for WCDMA Band 5							
Mode	Frequency (MHz)	Conduction AVG Power(dBm)	Ant Gain (dBi)	ERP (dBm)	ERP Limit(W)	ERP Limit (dBm)	Conclusion
WCDMA	826.40	22.56	-3.40	17.01	7.00	38.45	PASS
	836.60	22.51	-3.40	16.96	7.00	38.45	PASS
	846.40	22.55	-3.40	17.00	7.00	38.45	PASS
HSDPA Subtest 1	826.40	22.02	-3.40	16.47	7.00	38.45	PASS
	836.60	21.40	-3.40	15.85	7.00	38.45	PASS
	846.40	21.17	-3.40	15.62	7.00	38.45	PASS
HSDPA Subtest 2	826.40	20.89	-3.40	15.34	7.00	38.45	PASS
	836.60	21.88	-3.40	16.33	7.00	38.45	PASS
	846.40	21.30	-3.40	15.75	7.00	38.45	PASS
HSDPA Subtest 3	826.40	21.17	-3.40	15.62	7.00	38.45	PASS
	836.60	21.33	-3.40	15.78	7.00	38.45	PASS
	846.40	21.86	-3.40	16.31	7.00	38.45	PASS
HSDPA Subtest 4	826.40	21.49	-3.40	15.94	7.00	38.45	PASS
	836.60	21.42	-3.40	15.87	7.00	38.45	PASS
	846.40	21.19	-3.40	15.64	7.00	38.45	PASS
HSUPA Subtest 1	826.40	21.75	-3.40	16.20	7.00	38.45	PASS
	836.60	21.80	-3.40	16.25	7.00	38.45	PASS
	846.40	21.38	-3.40	15.83	7.00	38.45	PASS
HSUPA Subtest 2	826.40	21.80	-3.40	16.25	7.00	38.45	PASS
	836.60	21.68	-3.40	16.13	7.00	38.45	PASS
	846.40	21.88	-3.40	16.33	7.00	38.45	PASS
HSUPA Subtest 3	826.40	21.80	-3.40	16.25	7.00	38.45	PASS
	836.60	21.38	-3.40	15.83	7.00	38.45	PASS
	846.40	21.80	-3.40	16.25	7.00	38.45	PASS
HSUPA Subtest 4	826.40	21.59	-3.40	16.04	7.00	38.45	PASS
	836.60	21.59	-3.40	16.04	7.00	38.45	PASS
	846.40	21.67	-3.40	16.12	7.00	38.45	PASS
HSUPA Subtest 5	826.40	21.64	-3.40	16.09	7.00	38.45	PASS
	836.60	21.78	-3.40	16.23	7.00	38.45	PASS
	846.40	21.49	-3.40	15.94	7.00	38.45	PASS

5.2 PEAK TO AVERAGE RATIO

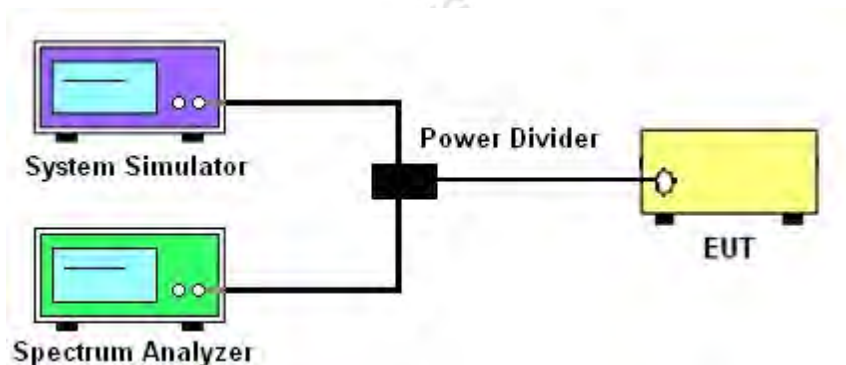
TEST OVERVIEW

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: The test data please reference to attachment “STS2208339W05_Appendix GSM” and “STS2208339W05_Appendix WCDMA”.

5.3 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.

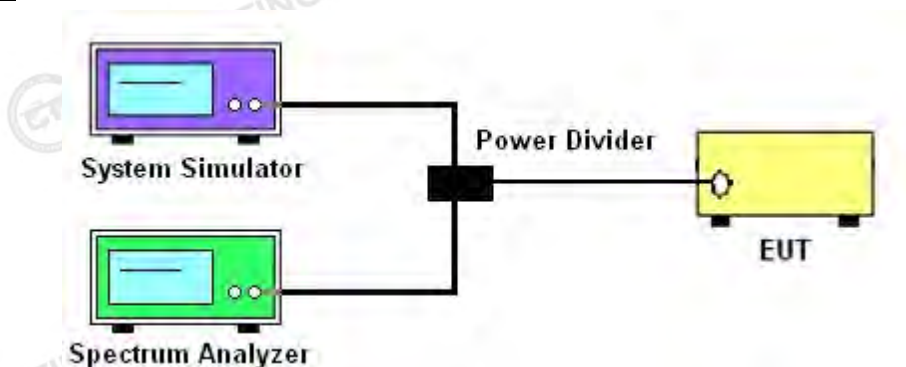
The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 Db below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) 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 $\geq 3 \times$ 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: The test data please reference to attachment “STS2208339W05_Appendix GSM” and “STS2208339W05_Appendix WCDMA”.

5.4 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 $+50^{\circ}\text{C}$ 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 $\pm 0.00025\%$ (± 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

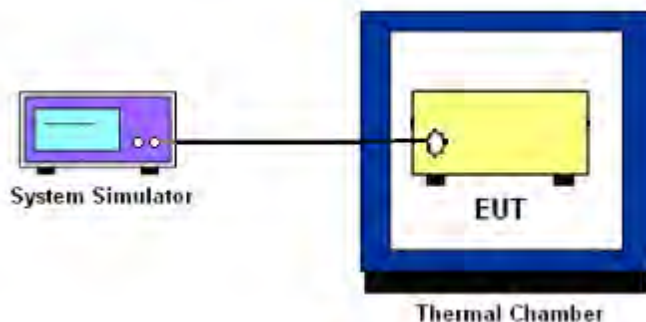
Temperature Variation

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 $25 \pm 5^{\circ}\text{C}$ 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

GSM 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	20.28	0.024	2.5ppm	PASS
40		17.13	0.020		
30		34.93	0.042		
20		33.58	0.040		
10		18.72	0.022		
0		25.05	0.030		
-10		30.27	0.036		
-20		27.87	0.033		
-30		34.05	0.041		
20	Maximum Voltage	27.66	0.033		
20	BEP	13.49	0.016		

GPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	17.31	0.021	2.5ppm	PASS
40		15.79	0.019		
30		33.78	0.040		
20		21.64	0.026		
10		12.52	0.015		
0		27.13	0.032		
-10		19.55	0.023		
-20		19.28	0.023		
-30		24.72	0.030		
20	Maximum Voltage	18.77	0.022		
20	BEP	18.33	0.022		

EGPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	26.48	0.032	2.5ppm	PASS
40		17.50	0.021		
30		18.96	0.023		
20		28.88	0.035		
10		29.71	0.036		
0		22.31	0.027		
-10		18.70	0.022		
-20		14.95	0.018		
-30		30.25	0.036		
20	Maximum Voltage	15.11	0.018		
20	BEP	27.89	0.033		

GSM 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	24.77	0.013	Within Authorized Band	PASS
40		19.90	0.011		
30		13.36	0.007		
20		24.82	0.013		
10		16.05	0.009		
0		28.18	0.015		
-10		22.38	0.012		
-20		22.17	0.012		
-30		23.17	0.012		
20	Maximum Voltage	30.73	0.016		
20	BEP	33.89	0.018		

GPRS 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	11.55	0.006	Within Authorized Band	PASS
40		20.35	0.011		
30		19.84	0.011		
20		28.65	0.015		
10		25.75	0.014		
0		27.93	0.015		
-10		20.19	0.011		
-20		21.12	0.011		
-30		19.84	0.011		
20	Maximum Voltage	18.64	0.010		
20	BEP	19.51	0.010		

EGPRS 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	34.49	0.018	Within Authorized Band	PASS
40		27.94	0.015		
30		19.24	0.010		
20		29.55	0.016		
10		33.94	0.018		
0		31.81	0.017		
-10		32.26	0.017		
-20		25.74	0.014		
-30		12.01	0.006		
20	Maximum Voltage	16.24	0.009		
20	BEP	24.07	0.013		

UMTS Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	21.35	0.011	Within Authorized Band	PASS
40		14.50	0.008		
30		30.85	0.016		
20		27.99	0.015		
10		26.01	0.014		
0		20.06	0.011		
-10		34.16	0.018		
-20		15.45	0.008		
-30		11.56	0.006		
20	Maximum Voltage	30.75	0.016		
20	BEP	23.89	0.013		

HSDPA Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	16.16	0.009	Within Authorized Band	PASS
40		27.54	0.015		
30		14.29	0.008		
20		32.53	0.017		
10		34.00	0.018		
0		12.15	0.006		
-10		24.45	0.013		
-20		21.64	0.012		
-30		23.40	0.012		
20	Maximum Voltage	30.03	0.016		
20	BEP	26.96	0.014		

HSUPA Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	23.26	0.012	Within Authorized Band	PASS
40		34.25	0.018		
30		18.96	0.010		
20		23.17	0.012		
10		23.96	0.013		
0		34.17	0.018		
-10		22.89	0.012		
-20		31.12	0.017		
-30		30.72	0.016		
20	Maximum Voltage	13.28	0.007		
20	BEP	13.82	0.007		

UMTS Band 5 / 836.6MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	35.44	0.042	2.5ppm	PASS
40		35.23	0.042		
30		17.61	0.021		
20		25.63	0.031		
10		15.33	0.018		
0		30.92	0.037		
-10		13.52	0.016		
-20		17.50	0.021		
-30		32.27	0.039		
20	Maximum Voltage	20.10	0.024		
20	BEP	19.27	0.023		

HSDPA Band 5 / 836.6MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	30.54	0.037	2.5ppm	PASS
40		34.04	0.041		
30		20.22	0.024		
20		15.88	0.019		
10		32.40	0.039		
0		32.06	0.038		
-10		18.31	0.022		
-20		14.17	0.017		
-30		17.09	0.020		
20	Maximum Voltage	33.93	0.041		
20	BEP	20.69	0.025		

HSUPA Band 5 / 836.6MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	31.19	0.037	2.5ppm	PASS
40		34.63	0.041		
30		29.50	0.035		
20		28.49	0.034		
10		22.25	0.027		
0		32.09	0.038		
-10		21.02	0.025		
-20		29.56	0.035		
-30		22.29	0.027		
20	Maximum Voltage	36.03	0.043		
20	BEP	13.23	0.016		

5.5 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 5.7.
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.

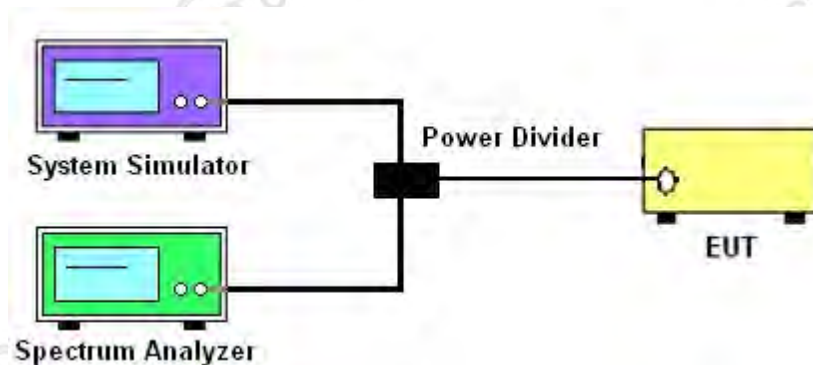
7. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm}.$$

TEST SETUP



TEST RESULT

Note: The test data please reference to attachment "STS2208339W05_Appendix GSM" and "STS2208339W05_Appendix WCDMA".

5.6 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.

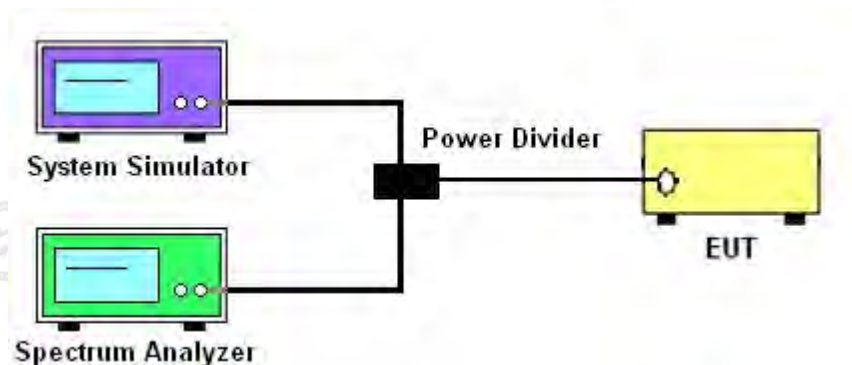
The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P[\text{Watts}])$, where P is the transmitter power in Watts.

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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

TEST SETUP



TEST RESULT

Note: The test data please reference to attachment “STS2208339W05_Appendix GSM” and “STS2208339W05_Appendix WCDMA”.

5.7 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 signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power and at the appropriate frequencies.

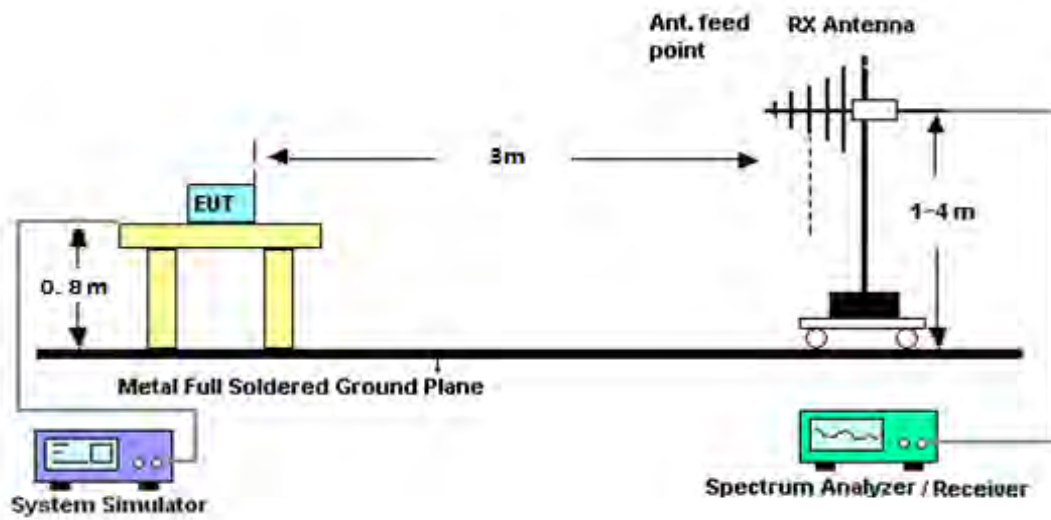
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

TEST PROCEDURE

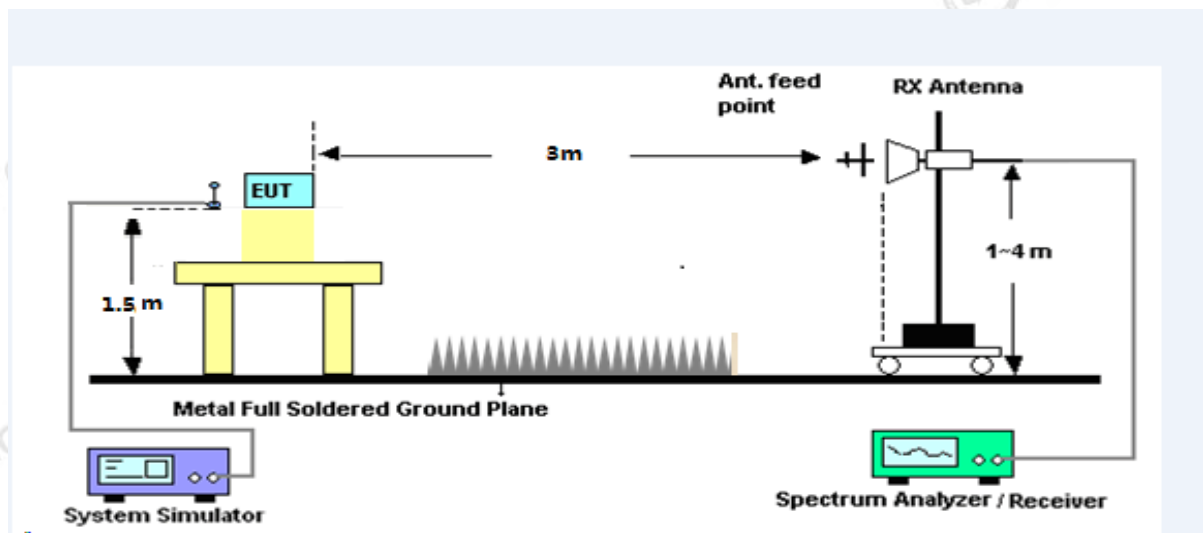
1. The testing FCC KDB 971168 D01 Section 5.8 and ANSI C63.26-2015-Section 5.5.
2. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $> 2 \times$ span/RBW
6. Detector = Peak
7. Trace mode = max hold
8. The trace was allowed to stabilize
9. Effective Isotropic Spurious Radiation was measured by substitution method according to TIA/EIA-603-D. 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.
 $P_{Mea} = S.G \text{ Level} + \text{Ant-Cable loss}$; $\text{Margin} = P_{Mea} - \text{Limit}$.

TEST SETUP

For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



TEST RESULT

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

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
1648.20	-41.57	9.40	4.75	-36.92	-13.00	-23.92	H
2472.22	-39.78	10.60	8.39	-37.57	-13.00	-24.57	H
3296.49	-31.55	12.00	11.79	-31.34	-13.00	-18.34	H
1648.17	-43.17	9.40	4.75	-38.52	-13.00	-25.52	V
2472.57	-45.04	10.60	8.39	-42.83	-13.00	-29.83	V
3296.91	-43.77	12.00	11.79	-43.56	-13.00	-30.56	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
1672.88	-40.77	9.50	4.76	-36.03	-13.00	-23.03	H
2509.56	-39.61	10.70	8.40	-37.31	-13.00	-24.31	H
3346.05	-31.36	12.20	11.80	-30.96	-13.00	-17.96	H
1673.04	-44.11	9.40	4.75	-39.46	-13.00	-26.46	V
2509.86	-45.23	10.60	8.39	-43.02	-13.00	-30.02	V
3346.35	-43.52	12.20	11.82	-43.14	-13.00	-30.14	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
1697.37	-41.21	9.60	4.77	-36.38	-13.00	-23.38	H
2546.08	-40.53	10.80	8.50	-38.23	-13.00	-25.23	H
3395.10	-31.52	12.50	11.90	-30.92	-13.00	-17.92	H
1697.54	-44.23	9.60	4.77	-39.40	-13.00	-26.40	V
2546.27	-44.47	10.80	8.50	-42.17	-13.00	-29.17	V
3395.34	-43.65	12.50	11.90	-43.05	-13.00	-30.05	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
1648.22	-40.89	9.40	4.75	-36.24	-13.00	-23.24	H
2472.71	-39.99	10.60	8.39	-37.78	-13.00	-24.78	H
3296.48	-32.28	12.00	11.79	-32.07	-13.00	-19.07	H
1648.02	-44.45	9.40	4.75	-39.80	-13.00	-26.80	V
2472.57	-45.18	10.60	8.39	-42.97	-13.00	-29.97	V
3296.63	-43.21	12.00	11.79	-43.00	-13.00	-30.00	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
1672.81	-41.48	9.50	4.76	-36.74	-13.00	-23.74	H
2509.79	-40.49	10.70	8.40	-38.19	-13.00	-25.19	H
3346.05	-32.30	12.20	11.80	-31.90	-13.00	-18.90	H
1673.01	-43.94	9.40	4.75	-39.29	-13.00	-26.29	V
2509.76	-44.13	10.60	8.39	-41.92	-13.00	-28.92	V
3346.26	-43.79	12.20	11.82	-43.41	-13.00	-30.41	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
1697.39	-40.64	9.60	4.77	-35.81	-13.00	-22.81	H
2546.24	-39.24	10.80	8.50	-36.94	-13.00	-23.94	H
3395.16	-31.32	12.50	11.90	-30.72	-13.00	-17.72	H
1697.40	-44.53	9.60	4.77	-39.70	-13.00	-26.70	V
2546.23	-45.38	10.80	8.50	-43.08	-13.00	-30.08	V
3395.29	-43.26	12.50	11.90	-42.66	-13.00	-29.66	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
1648.03	-40.94	9.40	4.75	-36.29	-13.00	-23.29	H
2472.30	-40.27	10.60	8.39	-38.06	-13.00	-25.06	H
3296.89	-31.52	12.00	11.79	-31.31	-13.00	-18.31	H
1648.19	-43.99	9.40	4.75	-39.34	-13.00	-26.34	V
2472.47	-44.78	10.60	8.39	-42.57	-13.00	-29.57	V
3296.64	-43.93	12.00	11.79	-43.72	-13.00	-30.72	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
1673.04	-40.43	9.50	4.76	-35.69	-13.00	-22.69	H
2509.73	-40.28	10.70	8.40	-37.98	-13.00	-24.98	H
3345.97	-31.39	12.20	11.80	-30.99	-13.00	-17.99	H
1673.12	-43.74	9.40	4.75	-39.09	-13.00	-26.09	V
2509.45	-45.37	10.60	8.39	-43.16	-13.00	-30.16	V
3346.44	-43.48	12.20	11.82	-43.10	-13.00	-30.10	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
1697.62	-41.39	9.60	4.77	-36.56	-13.00	-23.56	H
2546.56	-39.57	10.80	8.50	-37.27	-13.00	-24.27	H
3395.07	-32.18	12.50	11.90	-31.58	-13.00	-18.58	H
1697.34	-44.26	9.60	4.77	-39.43	-13.00	-26.43	V
2546.54	-44.04	10.80	8.50	-41.74	-13.00	-28.74	V
3395.10	-43.82	12.50	11.90	-43.22	-13.00	-30.22	V

PCS 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
3700.16	-34.82	12.60	12.93	-35.15	-13.00	-22.15	H
5550.66	-34.37	13.10	17.11	-38.38	-13.00	-25.38	H
7400.95	-32.75	11.50	22.20	-43.45	-13.00	-30.45	H
3700.41	-35.64	12.60	12.93	-35.97	-13.00	-22.97	V
5550.40	-34.17	13.10	17.11	-38.18	-13.00	-25.18	V
7400.63	-32.61	11.50	22.20	-43.31	-13.00	-30.31	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
3760.06	-34.23	12.60	12.93	-34.56	-13.00	-21.56	H
5640.13	-35.09	13.10	17.11	-39.10	-13.00	-26.10	H
7519.97	-32.83	11.50	22.20	-43.53	-13.00	-30.53	H
3760.14	-35.33	12.60	12.93	-35.66	-13.00	-22.66	V
5639.90	-34.45	13.10	17.11	-38.46	-13.00	-25.46	V
7519.98	-31.81	11.50	22.20	-42.51	-13.00	-29.51	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
3819.62	-34.00	12.60	12.93	-34.33	-13.00	-21.33	H
5729.45	-34.59	13.10	17.11	-38.60	-13.00	-25.60	H
7638.87	-33.23	11.50	22.20	-43.93	-13.00	-30.93	H
3819.77	-35.62	12.60	12.93	-35.95	-13.00	-22.95	V
5729.35	-33.90	13.10	17.11	-37.91	-13.00	-24.91	V
7639.23	-33.14	11.50	22.20	-43.84	-13.00	-30.84	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	-33.72	12.60	12.93	-34.05	-13.00	-21.05	H
5550.60	-34.91	13.10	17.11	-38.92	-13.00	-25.92	H
7400.71	-32.60	11.50	22.20	-43.30	-13.00	-30.30	H
3700.15	-34.88	12.60	12.93	-35.21	-13.00	-22.21	V
5550.53	-33.82	13.10	17.11	-37.83	-13.00	-24.83	V
7400.81	-31.98	11.50	22.20	-42.68	-13.00	-29.68	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
3759.98	-33.49	12.60	12.93	-33.82	-13.00	-20.82	H
5639.85	-35.41	13.10	17.11	-39.42	-13.00	-26.42	H
7520.21	-32.65	11.50	22.20	-43.35	-13.00	-30.35	H
3760.31	-35.28	12.60	12.93	-35.61	-13.00	-22.61	V
5640.04	-34.17	13.10	17.11	-38.18	-13.00	-25.18	V
7520.13	-32.36	11.50	22.20	-43.06	-13.00	-30.06	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
3819.61	-33.58	12.60	12.93	-33.91	-13.00	-20.91	H
5729.15	-34.58	13.10	17.11	-38.59	-13.00	-25.59	H
7638.96	-32.41	11.50	22.20	-43.11	-13.00	-30.11	H
3819.35	-34.94	12.60	12.93	-35.27	-13.00	-22.27	V
5729.08	-34.92	13.10	17.11	-38.93	-13.00	-25.93	V
7638.91	-32.57	11.50	22.20	-43.27	-13.00	-30.27	V

EGPRS 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
3700.17	-34.58	12.60	12.93	-34.91	-13.00	-21.91	H
5550.20	-34.65	13.10	17.11	-38.66	-13.00	-25.66	H
7400.66	-32.83	11.50	22.20	-43.53	-13.00	-30.53	H
3700.11	-34.97	12.60	12.93	-35.30	-13.00	-22.30	V
5550.56	-34.72	13.10	17.11	-38.73	-13.00	-25.73	V
7400.90	-31.92	11.50	22.20	-42.62	-13.00	-29.62	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
3760.05	-34.79	12.60	12.93	-35.12	-13.00	-22.12	H
5639.95	-35.44	13.10	17.11	-39.45	-13.00	-26.45	H
7519.85	-32.69	11.50	22.20	-43.39	-13.00	-30.39	H
3760.29	-35.22	12.60	12.93	-35.55	-13.00	-22.55	V
5639.90	-34.17	13.10	17.11	-38.18	-13.00	-25.18	V
7519.90	-32.19	11.50	22.20	-42.89	-13.00	-29.89	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
3819.27	-34.93	12.60	12.93	-35.26	-13.00	-22.26	H
5729.18	-34.11	13.10	17.11	-38.12	-13.00	-25.12	H
7639.13	-32.57	11.50	22.20	-43.27	-13.00	-30.27	H
3819.70	-34.56	12.60	12.93	-34.89	-13.00	-21.89	V
5729.49	-35.06	13.10	17.11	-39.07	-13.00	-26.07	V
7638.97	-32.40	11.50	22.20	-43.10	-13.00	-30.10	V

WCDMA Band 2: (30-20000)MHz							
The Worst Test Results for Channel 9262/1852.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3704.49	-34.65	12.60	12.93	-34.98	-13.00	-21.98	H
5557.68	-34.76	13.10	17.11	-38.77	-13.00	-25.77	H
7409.77	-33.33	11.50	22.20	-44.03	-13.00	-31.03	H
3704.35	-35.58	12.60	12.93	-35.91	-13.00	-22.91	V
5557.50	-33.89	13.10	17.11	-37.90	-13.00	-24.90	V
7409.90	-31.81	11.50	22.20	-42.51	-13.00	-29.51	V
The Worst Test Results for Channel 9400/1880MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3759.95	-34.69	12.60	12.93	-35.02	-13.00	-22.02	H
5640.07	-34.21	13.10	17.11	-38.22	-13.00	-25.22	H
7520.03	-32.67	11.50	22.20	-43.37	-13.00	-30.37	H
3760.15	-34.55	12.60	12.93	-34.88	-13.00	-21.88	V
5640.00	-34.68	13.10	17.11	-38.69	-13.00	-25.69	V
7520.31	-32.73	11.50	22.20	-43.43	-13.00	-30.43	V
The Worst Test Results for Channel 9538/1907.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3815.69	-33.62	12.60	12.93	-33.95	-13.00	-20.95	H
5722.32	-34.67	13.10	17.11	-38.68	-13.00	-25.68	H
7630.14	-33.29	11.50	22.20	-43.99	-13.00	-30.99	H
3815.32	-34.64	12.60	12.93	-34.97	-13.00	-21.97	V
5722.06	-33.82	13.10	17.11	-37.83	-13.00	-24.83	V
7629.99	-32.19	11.50	22.20	-42.89	-13.00	-29.89	V

HSUPA Band 2: (30-20000)MHz							
The Worst Test Results for Channel 9262/1852.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3704.38	-33.90	12.60	12.93	-34.23	-13.00	-21.23	H
5557.20	-34.05	13.10	17.11	-38.06	-13.00	-25.06	H
7409.86	-32.76	11.50	22.20	-43.46	-13.00	-30.46	H
3704.46	-35.39	12.60	12.93	-35.72	-13.00	-22.72	V
5557.30	-34.84	13.10	17.11	-38.85	-13.00	-25.85	V
7409.83	-31.95	11.50	22.20	-42.65	-13.00	-29.65	V
The Worst Test Results for Channel 9400/1880MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3760.03	-34.74	12.60	12.93	-35.07	-13.00	-22.07	H
5640.08	-35.03	13.10	17.11	-39.04	-13.00	-26.04	H
7519.99	-33.01	11.50	22.20	-43.71	-13.00	-30.71	H
3759.87	-35.32	12.60	12.93	-35.65	-13.00	-22.65	V
5640.16	-35.11	13.10	17.11	-39.12	-13.00	-26.12	V
7520.25	-32.23	11.50	22.20	-42.93	-13.00	-29.93	V
The Worst Test Results for Channel 9538/1907.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3815.37	-34.32	12.60	12.93	-34.65	-13.00	-21.65	H
5722.21	-34.79	13.10	17.11	-38.80	-13.00	-25.80	H
7630.15	-32.85	11.50	22.20	-43.55	-13.00	-30.55	H
3815.67	-35.09	12.60	12.93	-35.42	-13.00	-22.42	V
5722.43	-33.78	13.10	17.11	-37.79	-13.00	-24.79	V
7630.33	-32.39	11.50	22.20	-43.09	-13.00	-30.09	V

HSDPA Band 2: (30-20000)MHz							
The Worst Test Results for Channel 9262/1852.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3704.36	-34.58	12.60	12.93	-34.91	-13.00	-21.91	H
5557.20	-35.47	13.10	17.11	-39.48	-13.00	-26.48	H
7409.82	-33.42	11.50	22.20	-44.12	-13.00	-31.12	H
3704.06	-35.34	12.60	12.93	-35.67	-13.00	-22.67	V
5557.41	-34.46	13.10	17.11	-38.47	-13.00	-25.47	V
7409.53	-33.19	11.50	22.20	-43.89	-13.00	-30.89	V
The Worst Test Results for Channel 9400/1880MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3759.92	-34.74	12.60	12.93	-35.07	-13.00	-22.07	H
5640.06	-34.71	13.10	17.11	-38.72	-13.00	-25.72	H
7520.12	-32.78	11.50	22.20	-43.48	-13.00	-30.48	H
3759.87	-35.98	12.60	12.93	-36.31	-13.00	-23.31	V
5640.30	-33.93	13.10	17.11	-37.94	-13.00	-24.94	V
7519.95	-32.38	11.50	22.20	-43.08	-13.00	-30.08	V
The Worst Test Results for Channel 9538/1907.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3815.69	-34.71	12.60	12.93	-35.04	-13.00	-22.04	H
5722.46	-34.51	13.10	17.11	-38.52	-13.00	-25.52	H
7630.32	-33.16	11.50	22.20	-43.86	-13.00	-30.86	H
3815.36	-34.92	12.60	12.93	-35.25	-13.00	-22.25	V
5722.25	-34.44	13.10	17.11	-38.45	-13.00	-25.45	V
7630.29	-32.80	11.50	22.20	-43.50	-13.00	-30.50	V

WCDMA Band 5: (30-9000)MHz							
The worst testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
1652.48	-41.32	9.40	4.75	-36.67	-13.00	-23.67	H
2479.49	-40.36	10.60	8.39	-38.15	-13.00	-25.15	H
3305.74	-31.09	12.00	11.79	-30.88	-13.00	-17.88	H
1652.15	-43.96	9.40	4.75	-39.31	-13.00	-26.31	V
2479.56	-44.36	10.60	8.39	-42.15	-13.00	-29.15	V
3305.81	-43.97	12.00	11.79	-43.76	-13.00	-30.76	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
1672.86	-40.69	9.40	4.75	-36.04	-13.00	-23.04	H
2509.83	-39.57	10.60	8.39	-37.36	-13.00	-24.36	H
3346.30	-31.09	12.00	11.79	-30.88	-13.00	-17.88	H
1673.23	-44.39	9.40	4.75	-39.74	-13.00	-26.74	V
2509.46	-44.48	10.60	8.39	-42.27	-13.00	-29.27	V
3346.12	-42.64	12.00	11.79	-42.43	-13.00	-29.43	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
1693.66	-40.23	9.40	4.75	-35.58	-13.00	-22.58	H
2539.13	-40.62	10.60	8.39	-38.41	-13.00	-25.41	H
3385.88	-31.12	12.00	11.79	-30.91	-13.00	-17.91	H
1693.49	-44.55	9.40	4.75	-39.90	-13.00	-26.90	V
2539.40	-44.92	10.60	8.39	-42.71	-13.00	-29.71	V
3385.98	-43.60	12.00	11.79	-43.39	-13.00	-30.39	V

HSUPA Band 5: (30-9000)MHz							
The worst testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
1652.43	-41.58	9.40	4.75	-36.93	-13.00	-23.93	H
2479.53	-39.40	10.60	8.39	-37.19	-13.00	-24.19	H
3305.57	-30.86	12.00	11.79	-30.65	-13.00	-17.65	H
1652.20	-43.71	9.40	4.75	-39.06	-13.00	-26.06	V
2479.63	-44.04	10.60	8.39	-41.83	-13.00	-28.83	V
3305.68	-43.72	12.00	11.79	-43.51	-13.00	-30.51	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
1672.94	-40.55	9.40	4.75	-35.90	-13.00	-22.90	H
2509.66	-39.19	10.60	8.39	-36.98	-13.00	-23.98	H
3346.18	-31.51	12.00	11.79	-31.30	-13.00	-18.30	H
1673.26	-44.08	9.40	4.75	-39.43	-13.00	-26.43	V
2509.63	-44.76	10.60	8.39	-42.55	-13.00	-29.55	V
3346.13	-43.84	12.00	11.79	-43.63	-13.00	-30.63	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
1693.47	-40.35	9.40	4.75	-35.70	-13.00	-22.70	H
2539.13	-40.22	10.60	8.39	-38.01	-13.00	-25.01	H
3385.97	-30.88	12.00	11.79	-30.67	-13.00	-17.67	H
1693.65	-43.91	9.40	4.75	-39.26	-13.00	-26.26	V
2539.25	-44.26	10.60	8.39	-42.05	-13.00	-29.05	V
3385.96	-43.42	12.00	11.79	-43.21	-13.00	-30.21	V

HSDPA Band 5: (30-9000)MHz							
The worst testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
1652.43	-40.14	9.40	4.75	-35.49	-13.00	-22.49	H
2479.27	-39.21	10.60	8.39	-37.00	-13.00	-24.00	H
3305.64	-31.05	12.00	11.79	-30.84	-13.00	-17.84	H
1652.21	-44.57	9.40	4.75	-39.92	-13.00	-26.92	V
2479.39	-44.60	10.60	8.39	-42.39	-13.00	-29.39	V
3305.44	-42.71	12.00	11.79	-42.50	-13.00	-29.50	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
1673.00	-40.20	9.40	4.75	-35.55	-13.00	-22.55	H
2509.67	-39.18	10.60	8.39	-36.97	-13.00	-23.97	H
3346.38	-31.37	12.00	11.79	-31.16	-13.00	-18.16	H
1673.08	-43.71	9.40	4.75	-39.06	-13.00	-26.06	V
2509.90	-44.59	10.60	8.39	-42.38	-13.00	-29.38	V
3346.04	-42.57	12.00	11.79	-42.36	-13.00	-29.36	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
1693.38	-41.28	9.40	4.75	-36.63	-13.00	-23.63	H
2539.19	-39.47	10.60	8.39	-37.26	-13.00	-24.26	H
3385.91	-31.22	12.00	11.79	-31.01	-13.00	-18.01	H
1693.64	-43.38	9.40	4.75	-38.73	-13.00	-25.73	V
2539.16	-44.23	10.60	8.39	-42.02	-13.00	-29.02	V
3386.13	-43.55	12.00	11.79	-43.34	-13.00	-30.34	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*****