

# Radio Test Report

Report No.: STS2312301W05

Issued for

Buddi Limited

Talbot House 17 Church Street Rickmansworth, WD3 1DE  
United Kingdom

Product Name: Clip

Brand Name: buddi

Model Name: 3530003

Series Model(s): Click

FCC ID: ZDL353C

Test Standards: 47 CFR Part 2, 22, 24

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.



## TEST REPORT

**Applicant's Name** ..... Buddi Limited  
**Address** ..... Talbot House 17 Church Street Rickmansworth, WD3 1DE United Kingdom  
**Manufacturer's Name** ..... Buddi Limited  
**Address** ..... Talbot House 17 Church Street Rickmansworth, WD3 1DE United Kingdom

### Product Description

**Product Name** ..... Clip  
**Brand Name** ..... buddi  
**Model Name** ..... 3530003  
**Series Model(s)** ..... Click

**Test Standards** ..... 47 CFR Part 2, 22, 24

**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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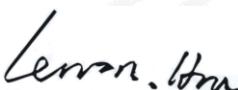
**Date of Test** ..... :

Date of receipt of test item ..... : 01 Dec. 2023

Date (s) of performance of tests : 01 Dec. 2023 ~ 13 Dec. 2023

Date of Issue ..... : 13 Dec. 2023

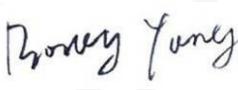
Test Result ..... : Pass

Testing Engineer : 

(Lennon Hou)

Technical Manager : 

(Chris Chen)

Authorized Signatory : 

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	13 Dec. 2023	STS2312301W05	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
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

### 1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

### 1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements 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 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	$\pm 1.197\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.896\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.84\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 3.94\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.59\text{dB}$
6	All emissions, radiated >6G	$\pm 5.22\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.14\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.54\text{dB}$



## 2 PRODUCT INFORMATION

Product Name	Clip
Brand Name	buddi
Model Name	3530003
Series Model(s)	Click
Model Difference	Only the model name difference.
Tx Frequency:	GSM850: 824-849 MHz GSM1900: 1850-1910 MHz WCDMA B2: 1850-1910 MHz WCDMA B5: 824-849 MHz
Rx Frequency:	GSM850: 824-849 MHz GSM1900: 1850-1910 MHz WCDMA B2: 1930-1990 MHz WCDMA B5: 869-894 MHz
Max RF Output Power:	GSM850: 31dBm;GSM1900:31.76dBm WCDMA B2: 21.77dBm,WCDMA B5:22.65 dBm
Modulation Characteristics:	GMSK for GPRS; GMSK and 8PSK for EDGE WCDMA: QPSK; HSDPA:QPSK/16QAM; HSUPA:BPSK
SIM Card:	Built in card.
Antenna:	SMD
Antenna gain:	GSM850: 1dBi;GSM1900:2.5dBi WCDMA B2: 2.5dBi,WCDMA B5:1dBi
Battery parameter:	Charging head: Input: 100-240V~ 50/60Hz 0.3A Output: DC 5V 1.2A Two charging methods: Model: 3630000 Input: DC 5V, 2000mA Output: 5V, 800mA Model: 3510001 Input: 5V, 1000mA Output: 5V, 800mA
Adapter:	Rated Voltage: 3.7V Charge Limit Voltage: 4.2V Capacity: 750mAh
GPRS/EDGE Class:	Multi-Class12
Extreme Vol. Limits:	DC 3.5V ~ DC 4.2V (Normal: DC 4V)
Hardware version number:	V14.0
Software version number:	1.41.2
<p><b>** Note: The High Voltage DC 4.2V and Low Voltage DC 3.5V 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.</b></p>	

### 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 WCDMA Band IV.
3. 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:

<b>TEST MODES</b>		
<b>BAND</b>	<b>RADIATED TCS</b>	<b>CONDUCTED TCS</b>
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

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2023.03.03	2024.03.02
Wireless Communications Test Set	R&S	CMW 500	117239	2023.03.01	2024.02.29
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2023.02.28	2024.02.27
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2023.09.28	2024.09.27
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2023.09.26	2024.09.25
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Video Controller	SKET	FCS C-3	N/A	N/A	N/A
Bilog Antenna	TESEQ	CBL6111D	34678	2022.09.30	2024.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2023.09.24	2025.09.23
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	N/A	N/A	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC Power Supply	Zhaoxin	RXN 605D	20R605D11010081	N/A	N/A
Test SW	EMC Test Software	15.2.0.339			
	EZ-EMC	Ver.STSLAB-03A1 RE			
RF Connected Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2023.03.03	2024.03.02
Wireless Communications Test Set	R&S	CMW 500	131428	2023.03.01	2024.02.29
Signal Analyzer	Agilent	N9020A	MY52440124	2023.03.01	2024.02.29
RF Automatic Test System	Maiwei	MW200-SFCB	N/A	N/A	N/A
Temperature & Humidity Test Chamber	Safety test	AG80L	171200018	2023.03.01	2024.02.29
Programmable Power Supply	Agilent	E3642A	MY40002025	2023.09.26	2024.09.25
Test SW	MTS 8200	2.0.0.0			

## 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 (ERP/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:

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

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

where

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

PMeas 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:

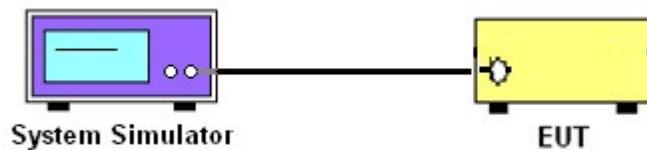
a)  $\text{ERP} = \text{EIRP} - 2.15$ , where ERP and EIRP are expressed in consistent units.

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

GPRS 850							
Mode	Frequency (MHz)	Conduction AVG Power(dBm)	Ant Gain (dBi)	ERP (dBm)	ERP Limit (W)	ERP Limit (dBm)	Conclusion
GPRS (GMSK,1-Slot)	824.2	31.71	1.00	30.56	7.00	38.45	PASS
	836.6	32.01	1.00	30.86	7.00	38.45	PASS
	848.8	32.15	1.00	31.00	7.00	38.45	PASS
GPRS (GMSK,2-Slot)	824.2	31.53	1.00	30.38	7.00	38.45	PASS
	836.6	31.81	1.00	30.66	7.00	38.45	PASS
	848.8	31.99	1.00	30.84	7.00	38.45	PASS
GPRS (GMSK,3-Slot)	824.2	31.32	1.00	30.17	7.00	38.45	PASS
	836.6	31.42	1.00	30.27	7.00	38.45	PASS
	848.8	31.61	1.00	30.46	7.00	38.45	PASS
GPRS (GMSK,4-Slot)	824.2	29.89	1.00	28.74	7.00	38.45	PASS
	836.6	30.08	1.00	28.93	7.00	38.45	PASS
	848.8	30.21	1.00	29.06	7.00	38.45	PASS
EGPRS (8PSK,1-Slot)	824.2	26.96	1.00	25.81	7.00	38.45	PASS
	836.6	26.62	1.00	25.47	7.00	38.45	PASS
	848.8	26.54	1.00	25.39	7.00	38.45	PASS
EGPRS (8PSK,2-Slot)	824.2	26.25	1.00	25.10	7.00	38.45	PASS
	836.6	26.69	1.00	25.54	7.00	38.45	PASS
	848.8	26.31	1.00	25.16	7.00	38.45	PASS
EGPRS (8PSK,3-Slot)	824.2	25.30	1.00	24.15	7.00	38.45	PASS
	836.6	25.18	1.00	24.03	7.00	38.45	PASS
	848.8	25.53	1.00	24.38	7.00	38.45	PASS
EGPRS (8PSK,4-Slot)	824.2	24.10	1.00	22.95	7.00	38.45	PASS
	836.6	23.88	1.00	22.73	7.00	38.45	PASS
	848.8	23.66	1.00	22.51	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
GPRS (GMSK,1-Slot)	1850.2	29.26	2.50	31.76	2.00	33.01	PASS
	1880.0	29.09	2.50	31.59	2.00	33.01	PASS
	1909.8	28.82	2.50	31.32	2.00	33.01	PASS
GPRS (GMSK,2-Slot)	1850.2	29.16	2.50	31.66	2.00	33.01	PASS
	1880.0	28.94	2.50	31.44	2.00	33.01	PASS
	1909.8	28.72	2.50	31.22	2.00	33.01	PASS
GPRS (GMSK,3-Slot)	1850.2	28.88	2.50	31.38	2.00	33.01	PASS
	1880.0	28.74	2.50	31.24	2.00	33.01	PASS
	1909.8	28.49	2.50	30.99	2.00	33.01	PASS
GPRS (GMSK,4-Slot)	1850.2	27.80	2.50	30.30	2.00	33.01	PASS
	1880.0	27.69	2.50	30.19	2.00	33.01	PASS
	1909.8	27.52	2.50	30.02	2.00	33.01	PASS
EGPRS (8PSK,1-Slot)	1850.2	26.43	2.50	28.93	2.00	33.01	PASS
	1880.0	26.22	2.50	28.72	2.00	33.01	PASS
	1909.8	26.27	2.50	28.77	2.00	33.01	PASS
EGPRS (8PSK,2-Slot)	1850.2	26.18	2.50	28.68	2.00	33.01	PASS
	1880.0	26.25	2.50	28.75	2.00	33.01	PASS
	1909.8	26.21	2.50	28.71	2.00	33.01	PASS
EGPRS (8PSK,3-Slot)	1850.2	25.80	2.50	28.30	2.00	33.01	PASS
	1880.0	25.71	2.50	28.21	2.00	33.01	PASS
	1909.8	25.96	2.50	28.46	2.00	33.01	PASS
EGPRS (8PSK,4-Slot)	1850.2	24.67	2.50	27.17	2.00	33.01	PASS
	1880.0	24.56	2.50	27.06	2.00	33.01	PASS
	1909.8	24.19	2.50	26.69	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	21.62	2.50	24.12	2.00	33.01	PASS
	1880.00	21.77	2.50	24.27	2.00	33.01	PASS
	1907.60	21.19	2.50	23.69	2.00	33.01	PASS
HSDPA Subtest 1	1852.40	20.65	2.50	23.15	2.00	33.01	PASS
	1880.00	20.36	2.50	22.86	2.00	33.01	PASS
	1907.60	19.36	2.50	21.86	2.00	33.01	PASS
HSDPA Subtest 2	1852.40	19.22	2.50	21.72	2.00	33.01	PASS
	1880.00	20.57	2.50	23.07	2.00	33.01	PASS
	1907.60	20.25	2.50	22.75	2.00	33.01	PASS
HSDPA Subtest 3	1852.40	19.46	2.50	21.96	2.00	33.01	PASS
	1880.00	19.44	2.50	21.94	2.00	33.01	PASS
	1907.60	20.00	2.50	22.50	2.00	33.01	PASS
HSDPA Subtest 4	1852.40	19.82	2.50	22.32	2.00	33.01	PASS
	1880.00	19.07	2.50	21.57	2.00	33.01	PASS
	1907.60	18.51	2.50	21.01	2.00	33.01	PASS
HSUPA Subtest 1	1852.40	19.68	2.50	22.18	2.00	33.01	PASS
	1880.00	20.48	2.50	22.98	2.00	33.01	PASS
	1907.60	19.82	2.50	22.32	2.00	33.01	PASS
HSUPA Subtest 2	1852.40	20.77	2.50	23.27	2.00	33.01	PASS
	1880.00	20.07	2.50	22.57	2.00	33.01	PASS
	1907.60	19.85	2.50	22.35	2.00	33.01	PASS
HSUPA Subtest 3	1852.40	20.37	2.50	22.87	2.00	33.01	PASS
	1880.00	19.88	2.50	22.38	2.00	33.01	PASS
	1907.60	20.58	2.50	23.08	2.00	33.01	PASS
HSUPA Subtest 4	1852.40	19.92	2.50	22.42	2.00	33.01	PASS
	1880.00	19.22	2.50	21.72	2.00	33.01	PASS
	1907.60	19.81	2.50	22.31	2.00	33.01	PASS
HSUPA Subtest 5	1852.40	19.05	2.50	21.55	2.00	33.01	PASS
	1880.00	20.08	2.50	22.58	2.00	33.01	PASS
	1907.60	19.16	2.50	21.66	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	22.27	1.00	21.12	7.00	38.45	PASS
	836.40	22.47	1.00	21.32	7.00	38.45	PASS
	846.60	22.65	1.00	21.50	7.00	38.45	PASS
HSDPA Subtest 1	826.40	21.30	1.00	20.15	7.00	38.45	PASS
	836.40	20.80	1.00	19.65	7.00	38.45	PASS
	846.60	19.91	1.00	18.76	7.00	38.45	PASS
HSDPA Subtest 2	826.40	19.72	1.00	18.57	7.00	38.45	PASS
	836.40	21.56	1.00	20.41	7.00	38.45	PASS
	846.60	21.30	1.00	20.15	7.00	38.45	PASS
HSDPA Subtest 3	826.40	20.08	1.00	18.93	7.00	38.45	PASS
	836.40	19.80	1.00	18.65	7.00	38.45	PASS
	846.60	21.75	1.00	20.60	7.00	38.45	PASS
HSDPA Subtest 4	826.40	21.56	1.00	20.41	7.00	38.45	PASS
	836.40	20.45	1.00	19.30	7.00	38.45	PASS
	846.60	20.19	1.00	19.04	7.00	38.45	PASS
HSUPA Subtest 1	826.40	20.38	1.00	19.23	7.00	38.45	PASS
	836.40	20.96	1.00	19.81	7.00	38.45	PASS
	846.60	20.51	1.00	19.36	7.00	38.45	PASS
HSUPA Subtest 2	826.40	21.31	1.00	20.16	7.00	38.45	PASS
	836.40	20.43	1.00	19.28	7.00	38.45	PASS
	846.60	20.72	1.00	19.57	7.00	38.45	PASS
HSUPA Subtest 3	826.40	21.33	1.00	20.18	7.00	38.45	PASS
	836.40	20.91	1.00	19.76	7.00	38.45	PASS
	846.60	21.66	1.00	20.51	7.00	38.45	PASS
HSUPA Subtest 4	826.40	20.64	1.00	19.49	7.00	38.45	PASS
	836.40	20.85	1.00	19.70	7.00	38.45	PASS
	846.60	21.34	1.00	20.19	7.00	38.45	PASS
HSUPA Subtest 5	826.40	20.91	1.00	19.76	7.00	38.45	PASS
	836.40	21.71	1.00	20.56	7.00	38.45	PASS
	846.60	20.77	1.00	19.62	7.00	38.45	PASS

## 5.2 PEAK TO AVERAGE RATIO

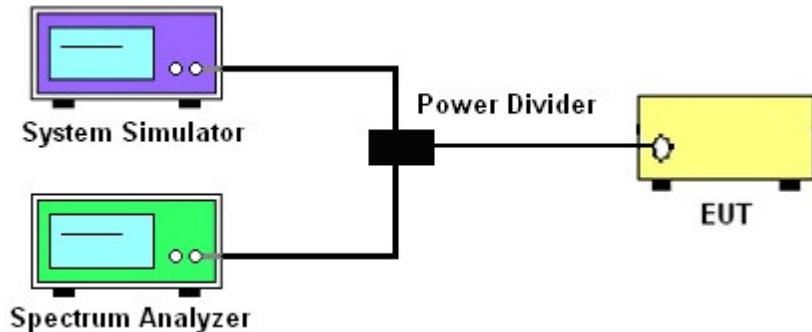
### TEST OVERVIEW

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 "STS2312301W04\_Appendix GSM" and "STS2312301W04\_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.

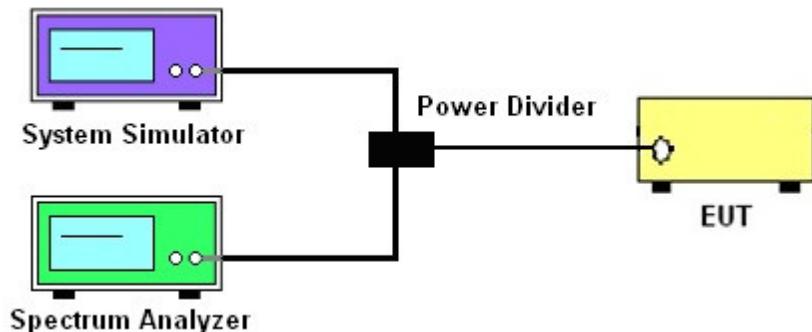
The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) 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 "STS2312301W04\_Appendix GSM" and "STS2312301W04\_Appendix WCDMA" and.

## 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°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  $\pm 0.00025\%$  ( $\pm 2.5$  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

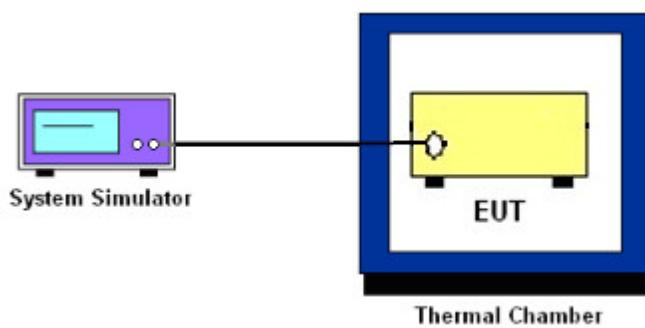
#### Temperature Variation

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

GPRS 850 /836.6MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	12.41	0.015	2.5ppm	PASS
40		11.69	0.014		
30		16.42	0.020		
20		18.95	0.023		
10		12.52	0.015		
0		16.65	0.020		
-10		33.66	0.040		
-20		22.44	0.027		
-30		32.91	0.039		
20	Maximum Voltage	20.87	0.025		
20	BEP	14.33	0.017		

EGPRS 850 /836.6MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	32.89	0.039	2.5ppm	PASS
40		34.55	0.041		
30		22.47	0.027		
20		24.02	0.029		
10		27.41	0.033		
0		20.07	0.024		
-10		14.28	0.017		
-20		32.91	0.039		
-30		17.78	0.021		
20	Maximum Voltage	14.54	0.017		
20	BEP	31.31	0.037		

GPRS 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	20.29	0.011	Within Authorized Band	PASS
40		16.32	0.009		
30		31.22	0.017		
20		22.00	0.012		
10		24.52	0.013		
0		23.26	0.012		
-10		27.49	0.015		
-20		34.15	0.018		
-30		33.69	0.018		
20	Maximum Voltage	17.56	0.009		
20	BEP	19.21	0.010		



EGPRS 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	17.91	0.010	Within Authorized Band	PASS
40		16.03	0.009		
30		13.44	0.007		
20		21.63	0.012		
10		13.38	0.007		
0		17.71	0.009		
-10		21.64	0.012		
-20		13.54	0.007		
-30		30.41	0.016		
20	Maximum Voltage	13.66	0.007		
20	BEP	33.78	0.018		

UMTS Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	28.77	0.015	Within Authorized Band	PASS
40		23.55	0.013		
30		31.28	0.017		
20		15.45	0.008		
10		21.71	0.012		
0		18.19	0.010		
-10		35.25	0.019		
-20		26.37	0.014		
-30		22.93	0.012		
20	Maximum Voltage	12.89	0.007		
20	BEP	35.97	0.019		

HSDPA Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	22.05	0.012	Within Authorized Band	PASS
40		35.81	0.019		
30		36.06	0.019		
20		25.48	0.014		
10		34.46	0.018		
0		23.58	0.013		
-10		26.62	0.014		
-20		29.77	0.016		
-30		35.61	0.019		
20	Maximum Voltage	26.00	0.014		
20	BEP	27.82	0.015		

HSUPA Band 2 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	28.07	0.015	Within Authorized Band	PASS
40		14.34	0.008		
30		27.97	0.015		
20		24.30	0.013		
10		25.28	0.013		
0		28.12	0.015		
-10		35.01	0.019		
-20		17.00	0.009		
-30		17.05	0.009		
20	Maximum Voltage	20.51	0.011		
20	BEP	29.87	0.016		

UMTS Band 5 / 836.4MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	29.50	0.035	2.5ppm	PASS
40		18.14	0.022		
30		27.80	0.033		
20		23.69	0.028		
10		30.49	0.036		
0		16.38	0.020		
-10		23.88	0.029		
-20		28.86	0.034		
-30		33.89	0.041		
20	Maximum Voltage	14.59	0.017		
20	BEP	33.25	0.040		

HSDPA Band 5 / 836.4MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)		(ppm)		
50	Normal Voltage	26.90	0.032	2.5ppm	PASS
40		27.17	0.032		
30		35.41	0.042		
20		24.87	0.030		
10		24.76	0.030		
0		13.16	0.016		
-10		22.80	0.027		
-20		30.35	0.036		
-30		26.20	0.031		
20	Maximum Voltage	30.92	0.037		
20	BEP	35.52	0.042		



HSUPA Band 5 / 836.4MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	25.07	0.030	2.5ppm	PASS
40		11.99	0.014		
30		29.81	0.036		
20		21.82	0.026		
10		12.09	0.014		
0		13.48	0.016		
-10		17.85	0.021		
-20		27.88	0.033		
-30		31.62	0.038		
20	Maximum Voltage	21.40	0.026		
20	BEP	20.01	0.024		

## 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.

For Band 7:

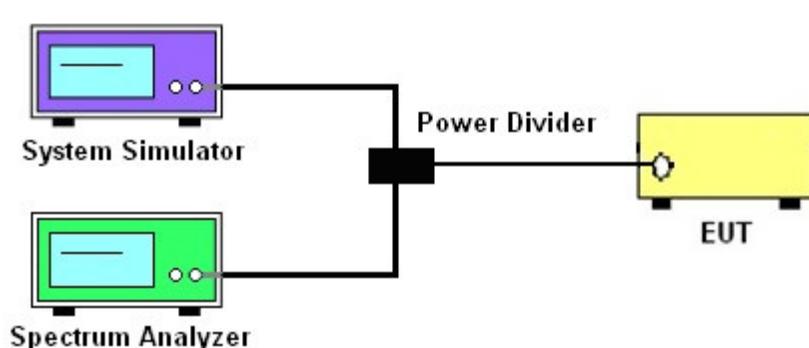
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least  $55 + 10 \log(P)$  dB.

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)  
 $= P(W) - [43 + 10\log(P)]$  (dB)  
 $= [30 + 10\log(P)]$  (dBm) -  $[43 + 10\log(P)]$  (dB)  
 $= -13$  dBm.

### TEST SETUP



### TEST RESULT

Note: The test data please reference to attachment "STS2312301W04\_Appendix GSM" and "STS2312301W04\_Appendix WCDMA".



## 5.6 BAND EDGE

### TEST OVERVIEW

#### 1. §22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

#### 2. §24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

#### 3. §27.53 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

#### 4. §27.53(m)(4)

For operations in the 2500 MHz ~ 2570 MHz band this section, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

#### 5. §27.53 (g)

For operations in the 698 -746 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

## TEST PROCEDURE

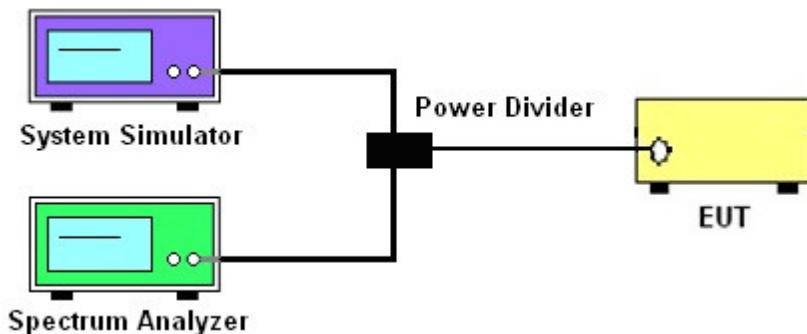
1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.7
  2. Start and stop frequency were set such that the band edge would be placed in the center of the Plot.
  3. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
  4. The RF output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

$$\begin{aligned} &= P(W) - [43 + 10\log(P)] \text{ (dB)} \\ &= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} \\ &= -13 \text{ dBm.} \end{aligned}$$

Band 7:

$$\begin{aligned} &= P(W) - [55 + 10\log(P)] \text{ (dB)} \\ &= [30 + 10\log(P)] \text{ (dBm)} - [55 + 10\log(P)] \text{ (dB)} \\ &= -25 \text{ dBm.} \end{aligned}$$

## TEST SETUP



## TEST RESULT

Note: The test data please reference to attachment "STS2312301W04\_Appendix GSM" and "STS2312301W04\_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.

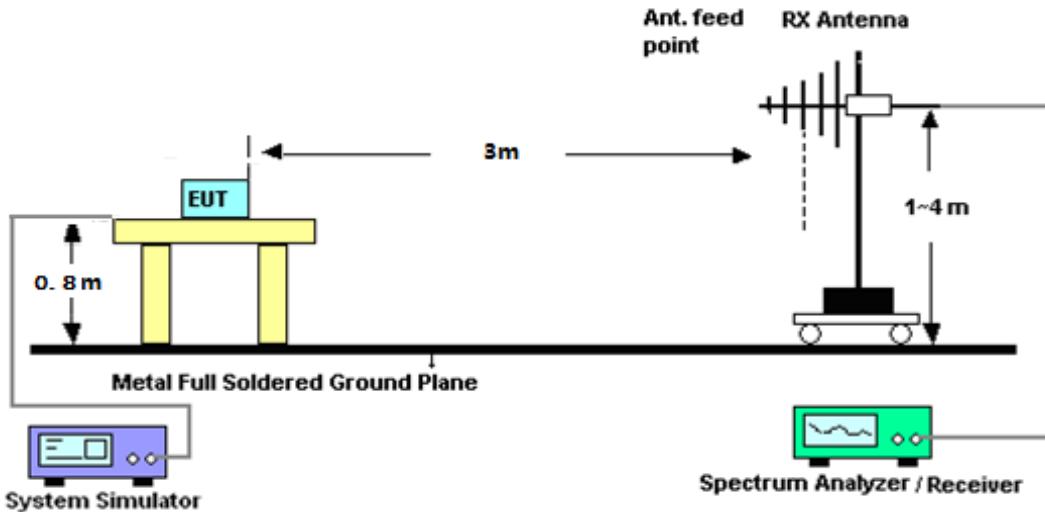
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

### TEST PROCEDURE

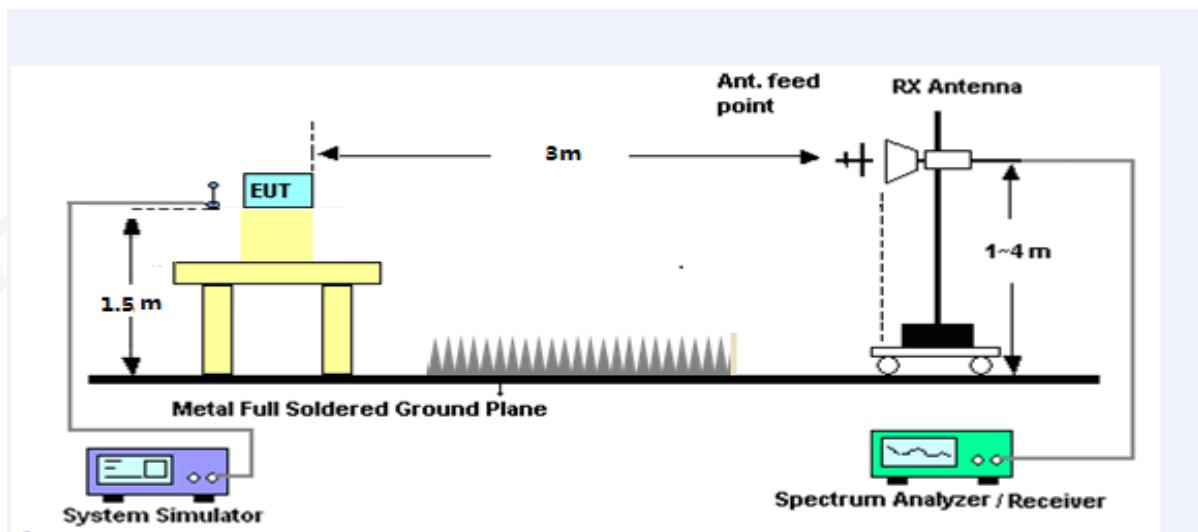
1. The testing FCC KDB 971168 D01 Section 5.8 and ANSI C63.26-2015-Section 5.5.
2. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
3. VBW  $\geq$  3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $>$  2 x span/RBW
6. Detector = Peak
7. Trace mode = max hold
8. The trace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

## TEST SETUP

For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz





## TEST RESULT

- Note:** (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.

GPRS 850: (30-9000)MHz							
The Worst Test Results Channel 128/824.2 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1648.43	-40.72	9.40	4.75	-36.07	-13.00	-23.07	H
2472.57	-40.09	10.60	8.39	-37.88	-13.00	-24.88	H
3296.58	-31.44	12.00	11.79	-31.23	-13.00	-18.23	H
1648.43	-43.26	9.40	4.75	-38.61	-13.00	-25.61	V
2472.57	-44.48	10.60	8.39	-42.27	-13.00	-29.27	V
3296.58	-43.27	12.00	11.79	-43.06	-13.00	-30.06	V
The Worst Test Results Channel 190/836.6 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1673.27	-40.82	9.50	4.76	-36.08	-13.00	-23.08	H
2509.92	-40.08	10.70	8.40	-37.78	-13.00	-24.78	H
3346.19	-31.67	12.20	11.80	-31.27	-13.00	-18.27	H
1673.27	-43.39	9.40	4.75	-38.74	-13.00	-25.74	V
2509.92	-43.99	10.60	8.39	-41.78	-13.00	-28.78	V
3346.19	-43.31	12.20	11.82	-42.93	-13.00	-29.93	V
The Worst Test Results Channel 251/848.8 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1697.63	-41.20	9.60	4.77	-36.37	-13.00	-23.37	H
2546.56	-39.72	10.80	8.50	-37.42	-13.00	-24.42	H
3395.04	-32.33	12.50	11.90	-31.73	-13.00	-18.73	H
1697.63	-44.64	9.60	4.77	-39.81	-13.00	-26.81	V
2546.56	-44.21	10.80	8.50	-41.91	-13.00	-28.91	V
3395.04	-42.59	12.50	11.90	-41.99	-13.00	-28.99	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	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1648.23	-40.69	9.40	4.75	-36.04	-13.00	-23.04	H
2472.64	-39.73	10.60	8.39	-37.52	-13.00	-24.52	H
3296.51	-31.23	12.00	11.79	-31.02	-13.00	-18.02	H
1648.23	-44.52	9.40	4.75	-39.87	-13.00	-26.87	V
2472.64	-44.52	10.60	8.39	-42.31	-13.00	-29.31	V
3296.51	-43.70	12.00	11.79	-43.49	-13.00	-30.49	V
The Worst Test Results Channel 190/836.6 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1673.21	-41.60	9.50	4.76	-36.86	-13.00	-23.86	H
2509.80	-39.38	10.70	8.40	-37.08	-13.00	-24.08	H
3346.44	-30.89	12.20	11.80	-30.49	-13.00	-17.49	H
1673.21	-44.63	9.40	4.75	-39.98	-13.00	-26.98	V
2509.80	-44.07	10.60	8.39	-41.86	-13.00	-28.86	V
3346.44	-43.83	12.20	11.82	-43.45	-13.00	-30.45	V
The Worst Test Results Channel 251/848.8 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1697.67	-41.26	9.60	4.77	-36.43	-13.00	-23.43	H
2546.32	-39.41	10.80	8.50	-37.11	-13.00	-24.11	H
3395.32	-31.59	12.50	11.90	-30.99	-13.00	-17.99	H
1697.67	-43.81	9.60	4.77	-38.98	-13.00	-25.98	V
2546.32	-45.25	10.80	8.50	-42.95	-13.00	-29.95	V
3395.32	-42.60	12.50	11.90	-42.00	-13.00	-29.00	V



GPRS1900: (30-20000)MHz							
The Worst Test Results for Channel 512/1850.2MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3700.43	-33.96	12.60	12.93	-34.29	-13.00	-21.29	H
5550.50	-35.21	13.10	17.11	-39.22	-13.00	-26.22	H
7400.79	-33.46	11.50	22.20	-44.16	-13.00	-31.16	H
3700.43	-35.46	12.60	12.93	-35.79	-13.00	-22.79	V
5550.50	-33.79	13.10	17.11	-37.80	-13.00	-24.80	V
7400.79	-32.81	11.50	22.20	-43.51	-13.00	-30.51	V
The Worst Test Results for Channel 661/1880.0MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3760.09	-34.03	12.60	12.93	-34.36	-13.00	-21.36	H
5640.26	-35.39	13.10	17.11	-39.40	-13.00	-26.40	H
7519.97	-32.16	11.50	22.20	-42.86	-13.00	-29.86	H
3760.09	-35.73	12.60	12.93	-36.06	-13.00	-23.06	V
5640.26	-34.26	13.10	17.11	-38.27	-13.00	-25.27	V
7519.97	-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	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3819.40	-33.56	12.60	12.93	-33.89	-13.00	-20.89	H
5729.15	-34.15	13.10	17.11	-38.16	-13.00	-25.16	H
7639.05	-32.90	11.50	22.20	-43.60	-13.00	-30.60	H
3819.40	-35.09	12.60	12.93	-35.42	-13.00	-22.42	V
5729.15	-34.23	13.10	17.11	-38.24	-13.00	-25.24	V
7639.05	-31.85	11.50	22.20	-42.55	-13.00	-29.55	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	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3700.21	-33.53	12.60	12.93	-33.86	-13.00	-20.86	H
5550.59	-34.05	13.10	17.11	-38.06	-13.00	-25.06	H
7400.82	-32.86	11.50	22.20	-43.56	-13.00	-30.56	H
3700.21	-34.72	12.60	12.93	-35.05	-13.00	-22.05	V
5550.59	-34.95	13.10	17.11	-38.96	-13.00	-25.96	V
7400.82	-32.21	11.50	22.20	-42.91	-13.00	-29.91	V
The Worst Test Results for Channel 661/1880.0MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3760.22	-33.98	12.60	12.93	-34.31	-13.00	-21.31	H
5639.87	-34.70	13.10	17.11	-38.71	-13.00	-25.71	H
7520.03	-32.86	11.50	22.20	-43.56	-13.00	-30.56	H
3760.22	-35.79	12.60	12.93	-36.12	-13.00	-23.12	V
5639.87	-33.91	13.10	17.11	-37.92	-13.00	-24.92	V
7520.03	-32.28	11.50	22.20	-42.98	-13.00	-29.98	V
The Worst Test Results for Channel 810/1909.8MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3819.67	-33.71	12.60	12.93	-34.04	-13.00	-21.04	H
5729.04	-35.01	13.10	17.11	-39.02	-13.00	-26.02	H
7639.18	-32.38	11.50	22.20	-43.08	-13.00	-30.08	H
3819.67	-35.36	12.60	12.93	-35.69	-13.00	-22.69	V
5729.04	-33.86	13.10	17.11	-37.87	-13.00	-24.87	V
7639.18	-31.75	11.50	22.20	-42.45	-13.00	-29.45	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	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3704.48	-34.66	12.60	12.93	-34.99	-13.00	-21.99	H
5557.38	-34.32	13.10	17.11	-38.33	-13.00	-25.33	H
7409.51	-32.75	11.50	22.20	-43.45	-13.00	-30.45	H
3704.48	-35.41	12.60	12.93	-35.74	-13.00	-22.74	V
5557.38	-34.95	13.10	17.11	-38.96	-13.00	-25.96	V
7409.51	-31.90	11.50	22.20	-42.60	-13.00	-29.60	V
The Worst Test Results for Channel 9400/1880MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3759.87	-34.83	12.60	12.93	-35.16	-13.00	-22.16	H
5640.08	-34.08	13.10	17.11	-38.09	-13.00	-25.09	H
7520.00	-32.30	11.50	22.20	-43.00	-13.00	-30.00	H
3759.87	-34.85	12.60	12.93	-35.18	-13.00	-22.18	V
5640.08	-34.22	13.10	17.11	-38.23	-13.00	-25.23	V
7520.00	-32.78	11.50	22.20	-43.48	-13.00	-30.48	V
The Worst Test Results for Channel 9538/1907.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3815.64	-33.77	12.60	12.93	-34.10	-13.00	-21.10	H
5722.87	-34.88	13.10	17.11	-38.89	-13.00	-25.89	H
7630.28	-32.22	11.50	22.20	-42.92	-13.00	-29.92	H
3815.64	-35.44	12.60	12.93	-35.77	-13.00	-22.77	V
5722.87	-34.25	13.10	17.11	-38.26	-13.00	-25.26	V
7630.28	-33.13	11.50	22.20	-43.83	-13.00	-30.83	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	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3704.10	-34.64	12.60	12.93	-34.97	-13.00	-21.97	H
5557.43	-34.28	13.10	17.11	-38.29	-13.00	-25.29	H
7409.73	-32.67	11.50	22.20	-43.37	-13.00	-30.37	H
3704.10	-35.71	12.60	12.93	-36.04	-13.00	-23.04	V
5557.43	-34.90	13.10	17.11	-38.91	-13.00	-25.91	V
7409.73	-32.47	11.50	22.20	-43.17	-13.00	-30.17	V
The Worst Test Results for Channel 9400/1880MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3760.19	-34.42	12.60	12.93	-34.75	-13.00	-21.75	H
5639.98	-34.05	13.10	17.11	-38.06	-13.00	-25.06	H
7519.85	-32.93	11.50	22.20	-43.63	-13.00	-30.63	H
3760.19	-34.99	12.60	12.93	-35.32	-13.00	-22.32	V
5639.98	-33.96	13.10	17.11	-37.97	-13.00	-24.97	V
7519.85	-31.89	11.50	22.20	-42.59	-13.00	-29.59	V
The Worst Test Results for Channel 9538/1907.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3815.62	-34.16	12.60	12.93	-34.49	-13.00	-21.49	H
5722.66	-34.84	13.10	17.11	-38.85	-13.00	-25.85	H
7630.23	-32.51	11.50	22.20	-43.21	-13.00	-30.21	H
3815.62	-35.06	12.60	12.93	-35.39	-13.00	-22.39	V
5722.66	-34.34	13.10	17.11	-38.35	-13.00	-25.35	V
7630.23	-32.06	11.50	22.20	-42.76	-13.00	-29.76	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	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3704.01	-34.39	12.60	12.93	-34.72	-13.00	-21.72	H
5557.57	-35.22	13.10	17.11	-39.23	-13.00	-26.23	H
7409.62	-33.15	11.50	22.20	-43.85	-13.00	-30.85	H
3704.01	-35.15	12.60	12.93	-35.48	-13.00	-22.48	V
5557.57	-33.89	13.10	17.11	-37.90	-13.00	-24.90	V
7409.62	-32.00	11.50	22.20	-42.70	-13.00	-29.70	V
The Worst Test Results for Channel 9400/1880MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3759.91	-34.10	12.60	12.93	-34.43	-13.00	-21.43	H
5640.22	-34.78	13.10	17.11	-38.79	-13.00	-25.79	H
7519.91	-32.33	11.50	22.20	-43.03	-13.00	-30.03	H
3759.91	-35.51	12.60	12.93	-35.84	-13.00	-22.84	V
5640.22	-35.18	13.10	17.11	-39.19	-13.00	-26.19	V
7519.91	-31.82	11.50	22.20	-42.52	-13.00	-29.52	V
The Worst Test Results for Channel 9538/1907.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3815.58	-33.54	12.60	12.93	-33.87	-13.00	-20.87	H
5722.76	-34.73	13.10	17.11	-38.74	-13.00	-25.74	H
7630.45	-33.48	11.50	22.20	-44.18	-13.00	-31.18	H
3815.58	-34.79	12.60	12.93	-35.12	-13.00	-22.12	V
5722.76	-34.99	13.10	17.11	-39.00	-13.00	-26.00	V
7630.45	-32.88	11.50	22.20	-43.58	-13.00	-30.58	V



WCDMA Band 5: (30-9000)MHz							
The wost testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1652.93	-41.17	9.40	4.75	-36.52	-13.00	-23.52	H
2479.43	-40.48	10.60	8.39	-38.27	-13.00	-25.27	H
3305.75	-31.66	12.00	11.79	-31.45	-13.00	-18.45	H
1652.93	-43.90	9.40	4.75	-39.25	-13.00	-26.25	V
2479.43	-45.12	10.60	8.39	-42.91	-13.00	-29.91	V
3305.75	-43.68	12.00	11.79	-43.47	-13.00	-30.47	V
The Worst Test Results Channel 4182/836.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1672.58	-41.26	9.40	4.75	-36.61	-13.00	-23.61	H
2509.20	-40.37	10.60	8.39	-38.16	-13.00	-25.16	H
3345.43	-32.10	12.00	11.79	-31.89	-13.00	-18.89	H
1672.58	-44.15	9.40	4.75	-39.50	-13.00	-26.50	V
2509.20	-44.47	10.60	8.39	-42.26	-13.00	-29.26	V
3345.43	-43.34	12.00	11.79	-43.13	-13.00	-30.13	V
The Worst Test Results Channel 4233/846.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1693.60	-40.39	9.40	4.75	-35.74	-13.00	-22.74	H
2539.63	-40.22	10.60	8.39	-38.01	-13.00	-25.01	H
3386.25	-31.42	12.00	11.79	-31.21	-13.00	-18.21	H
1693.60	-43.42	9.40	4.75	-38.77	-13.00	-25.77	V
2539.63	-44.71	10.60	8.39	-42.50	-13.00	-29.50	V
3386.25	-43.10	12.00	11.79	-42.89	-13.00	-29.89	V



HSUPA Band 5: (30-9000)MHz							
The wost testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1652.67	-40.69	9.40	4.75	-36.04	-13.00	-23.04	H
2479.41	-40.57	10.60	8.39	-38.36	-13.00	-25.36	H
3305.72	-31.50	12.00	11.79	-31.29	-13.00	-18.29	H
1652.67	-43.54	9.40	4.75	-38.89	-13.00	-25.89	V
2479.41	-44.32	10.60	8.39	-42.11	-13.00	-29.11	V
3305.72	-42.93	12.00	11.79	-42.72	-13.00	-29.72	V
The Worst Test Results Channel 4182/836.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1672.78	-40.91	9.40	4.75	-36.26	-13.00	-23.26	H
2509.41	-39.57	10.60	8.39	-37.36	-13.00	-24.36	H
3345.59	-31.42	12.00	11.79	-31.21	-13.00	-18.21	H
1672.78	-43.32	9.40	4.75	-38.67	-13.00	-25.67	V
2509.41	-44.25	10.60	8.39	-42.04	-13.00	-29.04	V
3345.59	-43.38	12.00	11.79	-43.17	-13.00	-30.17	V
The Worst Test Results Channel 4233/846.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1693.39	-40.98	9.40	4.75	-36.33	-13.00	-23.33	H
2539.69	-39.92	10.60	8.39	-37.71	-13.00	-24.71	H
3386.29	-32.18	12.00	11.79	-31.97	-13.00	-18.97	H
1693.39	-44.57	9.40	4.75	-39.92	-13.00	-26.92	V
2539.69	-44.91	10.60	8.39	-42.70	-13.00	-29.70	V
3386.29	-42.80	12.00	11.79	-42.59	-13.00	-29.59	V



HSDPA Band 5: (30-9000)MHz							
The wost testresults channel 4132/826.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1652.61	-40.46	9.40	4.75	-35.81	-13.00	-22.81	H
2479.02	-40.40	10.60	8.39	-38.19	-13.00	-25.19	H
3305.82	-32.08	12.00	11.79	-31.87	-13.00	-18.87	H
1652.61	-44.36	9.40	4.75	-39.71	-13.00	-26.71	V
2479.02	-44.39	10.60	8.39	-42.18	-13.00	-29.18	V
3305.82	-42.63	12.00	11.79	-42.42	-13.00	-29.42	V
The Worst Test Results Channel 4182/836.4MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1672.65	-41.15	9.40	4.75	-36.50	-13.00	-23.50	H
2509.11	-40.44	10.60	8.39	-38.23	-13.00	-25.23	H
3345.62	-31.62	12.00	11.79	-31.41	-13.00	-18.41	H
1672.65	-43.46	9.40	4.75	-38.81	-13.00	-25.81	V
2509.11	-45.20	10.60	8.39	-42.99	-13.00	-29.99	V
3345.62	-42.52	12.00	11.79	-42.31	-13.00	-29.31	V
The Worst Test Results Channel 4233/846.6MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1693.59	-40.37	9.40	4.75	-35.72	-13.00	-22.72	H
2539.77	-39.99	10.60	8.39	-37.78	-13.00	-24.78	H
3386.22	-31.24	12.00	11.79	-31.03	-13.00	-18.03	H
1693.59	-43.90	9.40	4.75	-39.25	-13.00	-26.25	V
2539.77	-44.33	10.60	8.39	-42.12	-13.00	-29.12	V
3386.22	-42.64	12.00	11.79	-42.43	-13.00	-29.43	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\*\*\*\*\*