



**FCC 47 CFR PART 22
FCC 47 CFR PART 24**

CERTIFICATION TEST REPORT

For

WisePOS 4G

MODEL NUMBER: WisePOS 4G

FCC ID: 2AB7X-WISEPOS4G

REPORT NUMBER: 4788704908.1-4

ISSUE DATE: December 17, 2018

Prepared for

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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/26/2018	Initial Issue	
V1	12/17/2018	Updated GSM Band-edge plots.	Jacky Jiang

Summary of Test Results			
Standard(s) Section FCC	Description	Requirements	Result
§22.913(a)(5)	Effective(Isotropic) Radiated Power of Transmitter	FCC: ERP < 7 W	PASS
§24.232(c)	Effective(Isotropic) Radiated Power of Transmitter	EIRP < 2 W	PASS
§24.232(d)	Peak to Average Radio	< 13dB	PASS
§2.1049(h)	Occupied Bandwidth	OBW: No limit EBW: No limit	PASS
§2.1051, §22.917(a) §24.238(a)	Band Edge Compliance	$\leq 43 + 10 \log_{10}(P[W]) / 1\% \cdot \text{EBW}$, in 1 MHz bands immediately outside and adjacent to the frequency block.	PASS
§2.1051, §22.917(a) §24.238(a)	Spurious Emission at Antenna Terminal	$\leq 43 + 10 \log_{10}(P[W]) / 100 \text{ kHz}$, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges.	PASS
§2.1053, §22.917(a) §24.238(a)	Radiated Spurious Emissions	$\leq 43 + 10 \log_{10}(P[W])$	PASS
§2.1055, §22.355, §24.235,	Frequency Stability	$\leq \pm 2.5 \text{ ppm}$ (Part 22) Emission must remain in band (Part 24, 27)	PASS

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: BBPOS International Limited

Address: Suite 1903-04, Tower 2, Nina Tower, 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong

Manufacturer Information

Company Name: BBPOS International Limited

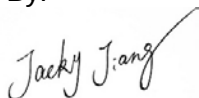
Address: Suite 1903-04, Tower 2, Nina Tower, 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong

EUT Description

Product Name WisePOS 4G
Brand Name BBPOS
Model Name WisePOS 4G
FCC ID 2AB7X-WISEPOS4G
Date Tested October 9, 2018~ November 6, 2018
December 17, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR PART 22 Subpart H	PASS
FCC 47 CFR PART 24 Subpart E	PASS

Tested By:



Jacky Jiang
Engineer Project Associate

Checked By:



Shawn Wen
Laboratory Leader

Approved By:



Stephen Guo
Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26-2015 & KDB971168, FCC CFR 47 Part 2, Part 22, Part 24.

3. FACILITIES AND ACCREDITATIO

Accreditation Certificate	A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules IC(Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. <u>Facility Name:</u> Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

4. CALIBRATION AND UNCERTAINTY

MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.32dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	4.10dB(1-6GHz)
	4.40dB (6GHz-18Gz)
	3.54dB (18GHz-26Gz)
Bandwidth	1.1%
Stop Transmitting Time Test	0.6%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1 DESCRIPTION OF EUT

Equipment	WisePOS 4G
Model Name	WisePOS 4G
Power Input	5V/1A
Hardware Version	K960_MB_P2_V01
Software Version	960ABR9J1_BB_V001

5.2 TECHNICAL INFORMATION

Frequency Bands	☐ GSM 850	824 ~849MHz (Uplink)	☐ GSM 1900	1850 ~1910MHz (Uplink)
	☒ GPRS 850		☒ GPRS 1900	
	☒ EGPRS 850	869~894MHz (Downlink)	☒ EGPRS 1900	1930~1990MHz (Downlink)
Modulation Mode	GPRS		GMSK	
	EGPRS		GMSK/8PSK	
Power Class	GSM 850	4	GSM 1900	1
GSM Release Version	GSM Release 99			
Multislot Class	GPRS	12	EGPRS	12
HSCSD Multislot MS	☐ Support		☒ Not Support	
R-GSM MS	☐ Support		☒ Not Support	

	☒ WCDMA Band II	1850 MHz ~ 1910 MHz (Uplink)	
		1930 MHz ~ 1990 MHz (Downlink)	
	☒ WCDMA Band V	824 MHz ~ 849 MHz (Uplink)	
		869 MHz ~ 894 MHz (Downlink)	
Modulation Mode	QPSK		
WCDMA Release Version	Release 99		
HSDPA Release Version	Release 5	HSPA Release Version	6
DC-HSDPA Category	24	/	/

5.3 MAXIMUM OUTPUT POWER

ERP/EIRP RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

22.913(a)(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

ERP/EIRP TEST PROCEDURE

ANSI C63.26:2015/ KDB 971168 D01 Section 5.6

$$\text{ERP/ EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

where:

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

PMeas = measured transmitter output power or PSD, in dBm or dBW;

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

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

The transmitter has a maximum radiated ERP / EIRP output powers as follows:

Mode	Modulation	Conducted(Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP	
					(dBm)	(W)
GSM850	GPRS	31.41	-3.2	7	28.21	0.404
	EDGE	21.17	-3.2		17.97	0.038
WCDMA Band5	REL99	22.20	-3.2	7	19.00	0.048
	HSDPA	21.47	-3.2		18.27	0.041

Mode	Modulation	Conducted(Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP	
					(dBm)	(W)
GSM1900	GPRS	28.97	-1.0	2	27.97	0.627
	EDGE	26.21	-1.0		25.21	0.332
WCDMA Band2	REL99	22.57	-1.0	2	21.57	0.144
	HSDPA	21.62	-1.0		20.62	0.115

5.4 OPERATING CONDITION OF EUT

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (Y plane).

Worst-case modes:

Test Mode	Test Modes Description
GSM/TM1	GSM/GPRS,GMSK Modulation
GSM/TM2	EDGE,8PSK Modulation
UMTS/TM1	WCDMA REL99
UMTS/TM2	WCDMA HSDPA

Note: If no any other statement, UMTS/TM1 shall be used RCM 12.2K mode.

Note: For simultaneous transmission of multiple channels in the 2.4 / 5GHz and cellular bands, no noticeable emission was found.

5.5 TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	25 °C
Voltage :	VL	3.23V
	VN	3.8V
	VH	4.35V
	End Voltage	3.0V

Note: VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

TN= Normal Temperature

5.6 TEST CHANNEL LIST

Bands	Channel	Frequency	
		Channel Number	Frequency(MHz)
GPRS/EDGE 850	Low	128	824.2
	Mid	190	836.6
	High	251	848.8
GPRS/EDGE1900	Low	512	1850.2
	Mid	661	1880.0
	High	810	1909.8
WCDMA Band 2	Low	9262	1852.4
	Mid	9400	1880.0
	High	9538	1907.6
WCDMA Band 5	Low	4132	826.4
	Mid	4182	836.4
	High	4233	846.6

5.7 DESCRIPTION OF AVAILABLE ANTENNAS

Band	Antenna Type	Antenna Gain (dBi)
GPRS/EDGE 850	PIFA	-3.2
GPRS/EDGE1900	PIFA	-1.0
WCDMA Band 2	PIFA	-1.0
WCDMA Band 5	PIFA	-3.2

5.8 DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	N/A	N/A	N/A	N/A

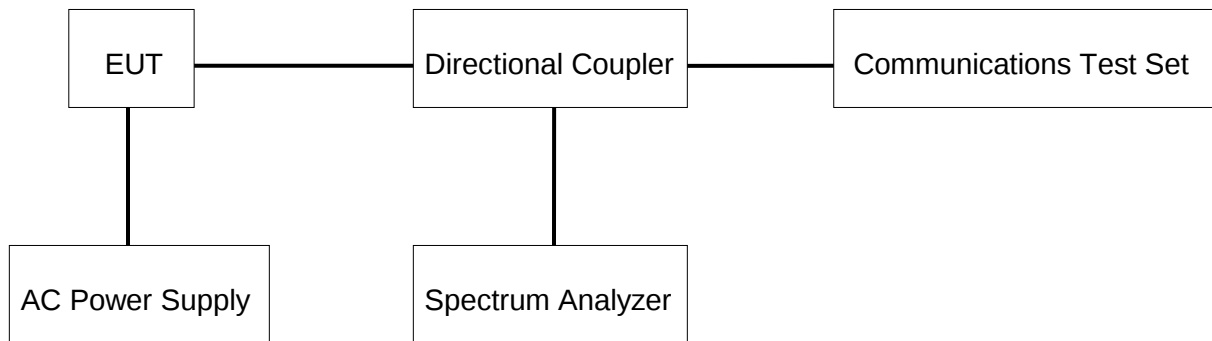
I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	N/A	N/A	0.5	N/A

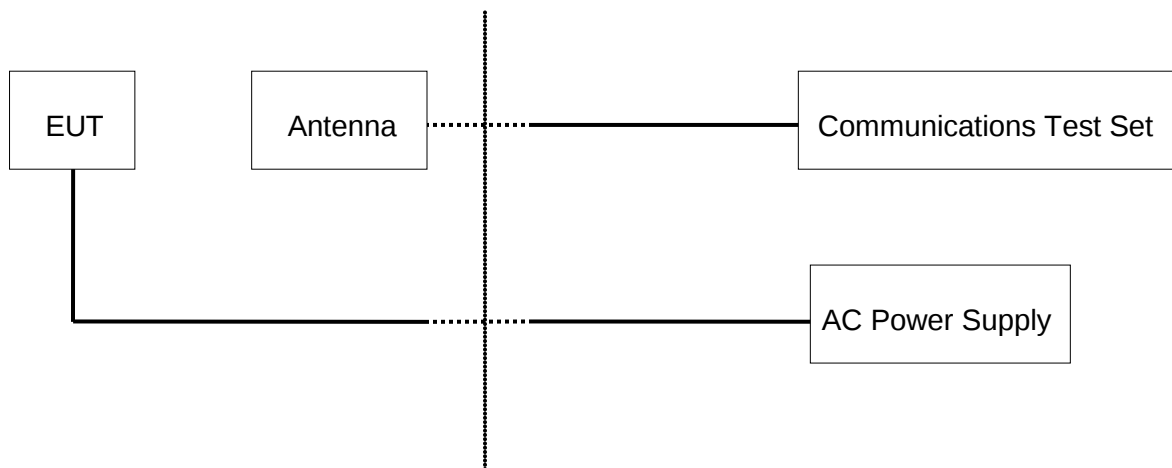
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Headphone	SONY	MDR-ZX310	/
	Adapter	XIAOMI	MDY-08-EF	5V/1A

CONDUCTED TEST SETUP



RADIATED TEST SETUP



5.9 MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions							
Instrument							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☒	EMI Test Receiver	R&S	ESR3	101961	Dec.20, 2016	Dec.12, 2017	Dec.11, 2018
☒	Two-Line V-Network	R&S	ENV216	101983	Dec.20, 2016	Dec.12, 2017	Dec.11, 2018
☒	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Feb.10, 2017	Dec.12, 2017	Dec.11, 2018
☒	Wideband Radio Communication Tester	R&S	CMW500	155523	Dec.13, 2017	Dec.11, 2018	Dec.10, 2019
Software							
Used	Description			Manufacturer	Name	Version	
☒	Test Software for Conducted disturbance			Farad	EZ-EMC	Ver. UL-3A1	
Radiated Emissions							
Instrument							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☒	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Feb. 24, 2017	Dec.12, 2017	Dec.11, 2018
☒	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2016	Jan.09, 2019
☒	Preamplifier	HP	8447D	2944A09099	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018
☒	EMI Measurement Receiver	R&S	ESR26	101377	Dec. 20, 2016	Dec.12, 2017	Dec.11, 2018
☒	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2016	Jan. 09, 2019
☒	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2016	Jan.06, 2019
☒	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Jan. 14, 2017	Dec.12, 2017	Dec.11, 2018
☒	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec. 20, 2016	Dec.12, 2017	Dec.11, 2018
☒	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2016	Mar. 26, 2019
Software							
Used	Description			Manufacturer	Name	Version	
☒	Test Software for Radiated disturbance			Farad	EZ-EMC	Ver. UL-3A1	
Other instruments							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☒	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.12, 2017	Dec.11, 2018	Dec.10, 2019
☒	Power Meter	Keysight	N9031A	MY55416024	Dec.13, 2017	Dec.11, 2018	Dec.10, 2019
☒	Thermostatic and Humidistatic Box	SANMOOD	SG-80-CC-2	2088	Feb.14,2017	Dec.22,2017	Dec.22,2018

6. TEST RESULTS

6.1 OUTPUT POWER VERIFICATION

GSM850		Max Burst Average Power (dBm)		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GPRS/EDGE (GMSK)	1 Tx Slot	31.38	31.41	31.33
	2 Tx Slot	31.33	31.29	31.19
	3 Tx Slot	30.53	30.77	30.66
	4 Tx Slot	29.52	29.81	29.71
EDGE (8PSK)	1 Tx Slot	26.96	27.06	27.17
	2 Tx Slot	26.21	26.29	26.38
	3 Tx Slot	24.54	24.62	24.72
	4 Tx Slot	23.42	23.50	23.60
GSM1900		Max Burst Average Power (dBm)		
		512CH	661CH	810CH
		1850.2MHz	1880MHz	1909.8MHz
GPRS/EDGE (GMSK)	1 Tx Slot	28.77	28.89	28.57
	2 Tx Slot	28.97	28.75	28.47
	3 Tx Slot	27.42	27.59	27.87
	4 Tx Slot	26.33	26.52	26.80
EDGE (8PSK)	1 Tx Slot	26.21	26.02	25.89
	2 Tx Slot	25.51	25.35	25.27
	3 Tx Slot	23.93	23.78	23.79
	4 Tx Slot	22.72	22.77	22.80

Band	WCDMA II		
Tx Channel	9262	9400	9538
Frequency	1852.4	1880	1907.6
RMC 12.2K	22.56	22.55	22.50
RMC 64K	22.45	22.46	22.51
RMC 144K	22.41	22.39	22.57
RMC 384K	22.55	22.45	22.42
HSDPA Subtest-1	21.62	21.61	21.56
HSDPA Subtest-2	21.60	21.59	21.52
HSDPA Subtest-3	21.13	21.09	21.03
HSDPA Subtest-4	21.09	21.07	21.03
HSUPA Subtest-1	19.51	19.51	19.54
HSUPA Subtest-2	19.51	19.51	19.54
HSUPA Subtest-3	20.54	20.53	20.47
HSUPA Subtest-4	19.04	19.03	18.98
HSUPA Subtest-5	21.13	21.08	21.07
HSPA+ Subtest-1	21.53	21.52	21.40
DC-HSDPA Subtest-1	21.53	21.52	21.40

DC-HSDPA Subtest-2	21.27	21.27	21.05
DC-HSDPA Subtest-3	21.13	21.09	21.03
DC-HSDPA Subtest-4	21.10	21.07	21.03

Band	WCDMA V		
Tx Channel	4132	4182	4233
Frequency	826.4	836.4	846.6
RMC 12.2K	22.14	22.01	22.07
RMC 64K	22.08	21.99	21.99
RMC 144K	22.20	21.99	21.87
RMC 384K	22.07	21.89	21.87
HSDPA Subtest-1	21.47	21.35	21.18
HSDPA Subtest-2	21.41	21.30	21.11
HSDPA Subtest-3	20.92	20.80	20.89
HSDPA Subtest-4	20.89	20.79	20.61
HSUPA Subtest-1	19.20	19.18	19.02
HSUPA Subtest-2	19.36	19.06	19.08
HSUPA Subtest-3	20.41	20.28	20.10
HSUPA Subtest-4	18.96	18.80	18.63
HSUPA Subtest-5	20.90	20.92	20.72
HSPA+ Subtest-1	21.33	20.18	20.03
DC-HSDPA Subtest-1	20.98	21.00	20.80
DC-HSDPA Subtest-2	20.69	20.80	20.39
DC-HSDPA Subtest-3	20.89	20.79	20.61
DC-HSDPA Subtest-4	22.14	22.01	22.07

6.2 PEAK TO AVERAGE RADIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

Test Spec

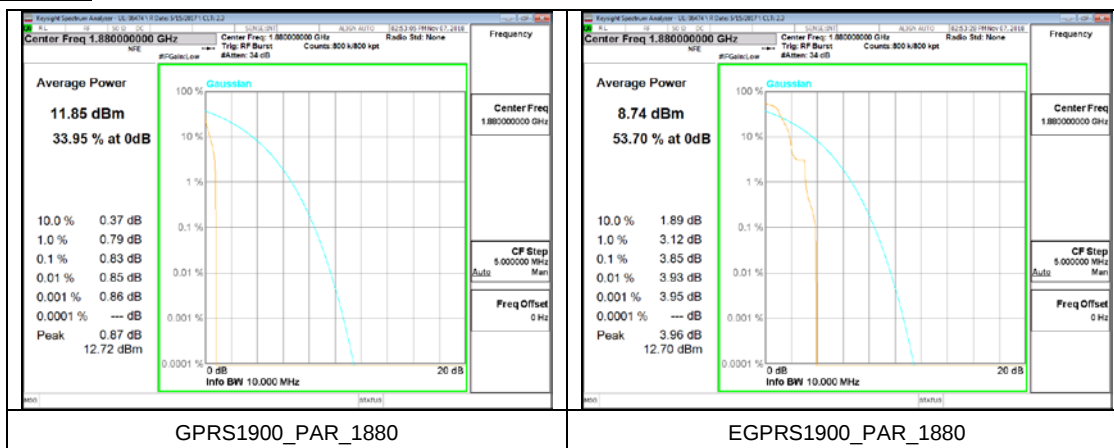
In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

RESULTS

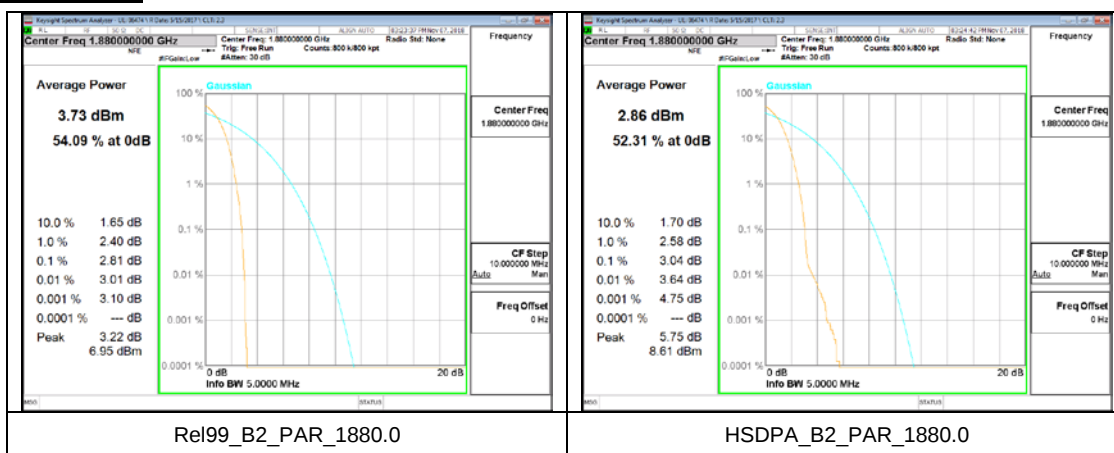
See the following pages.

Mode	Channel	F (MHz)	Modulation	Measured (dB)	Limit (dB)	Verdict
GSM1900	Mid	1880	GPRS	0.87	13	PASS
			EDGE	3.96	13	PASS
WCDMA Band 2	Mid	1880	REL 99	3.22	13	PASS
			HSDPA	5.75	13	PASS

GSM MODE



WCDMA MODE



6.3 OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

RESULTS

The table shows the worst case results, for the other results please See the following pages.

GSM

Mode	Channel	f(MHz)	Modulation	-26dB BW (KHz)
GSM850	High	848.8	GPRS	317.6
			EDGE	328.7
GSM1900	Low	1850.2	GPRS	318.1
	High	1909.8	EDGE	347.0

WCDMA

Mode	Channel	f(MHz)	Modulation	-26dB BW (MHz)
BAND 2	Mid	1880.0	REL 99	4.706
	Low	1852.4	HSDPA	4.685
BAND 5	Mid	836.6	REL 99	4.727
			HSDPA	4.695

GSM MODE





WCDMA MODE





6.4 FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
GPRS 850MHz	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
			Hz	ppm	ppm
	VN	-30	4.55	0.0054	2.5
		-20	1.08	0.0013	
		-10	-2.70	-0.0032	
		0	1.56	0.0018	
		+10	3.92	0.0046	
		+20	1.21	0.0014	
		+30	3.75	0.0044	
		+40	-1.85	-0.0022	
		+50	0.49	0.0006	
	VL	TN	1.43	0.0017	
	VH		-2.00	-0.0024	
	End Point		5.49	0.066	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
GPRS 1900MHz	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
			Hz	ppm	ppm
	VN	-30	5.89	0.0031	2.5
		-20	-2.05	-0.0011	
		-10	1.01	0.0005	
		0	2.11	0.0011	
		+10	2.98	0.0016	
		+20	0.56	0.0003	
		+30	3.75	0.0020	
		+40	-1.46	-0.0008	
		+50	0.52	0.0003	
	VL	TN	1.22	0.0006	
	VH		-1.19	-0.0006	
	End Point		3.76	0.0020	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
WCDMA Band 2 REL99	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
			Hz	ppm	ppm
	VN	-30	2.01	0.0011	2.5
		-20	1.33	0.0007	
		-10	-1.08	-0.0006	
		0	-2.16	-0.0011	
		+10	-5.90	-0.0031	
		+20	7.02	0.0037	
		+30	-3.50	-0.0019	
		+40	9.00	0.0048	
		+50	-6.52	-0.0035	
	VL	TN	3.42	0.0018	
	VH		5.58	0.0030	
	End Point		5.01	0.0027	

Test Mode	Test Conditions		Frequency Deviation Middle Channel		
WCDMA Band5 REL99	Power (VDC)	Temperature (°C)	Frequency Error	Frequency Error	Limit
			Hz	ppm	ppm
	VN	-30	5.01	0.0060	2.5
		-20	-4.71	-0.0056	
		-10	-1.19	-0.0014	
		0	2.33	0.0028	
		+10	-4.31	-0.0052	
		+20	-7.09	-0.0085	
		+30	3.88	0.0046	
		+40	2.64	0.0032	
		+50	-7.33	-0.0088	
	VL	TN	4.66	0.0056	
	VH		-5.21	-0.0062	
	End Point		6.12	0.0073	

6.5 BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

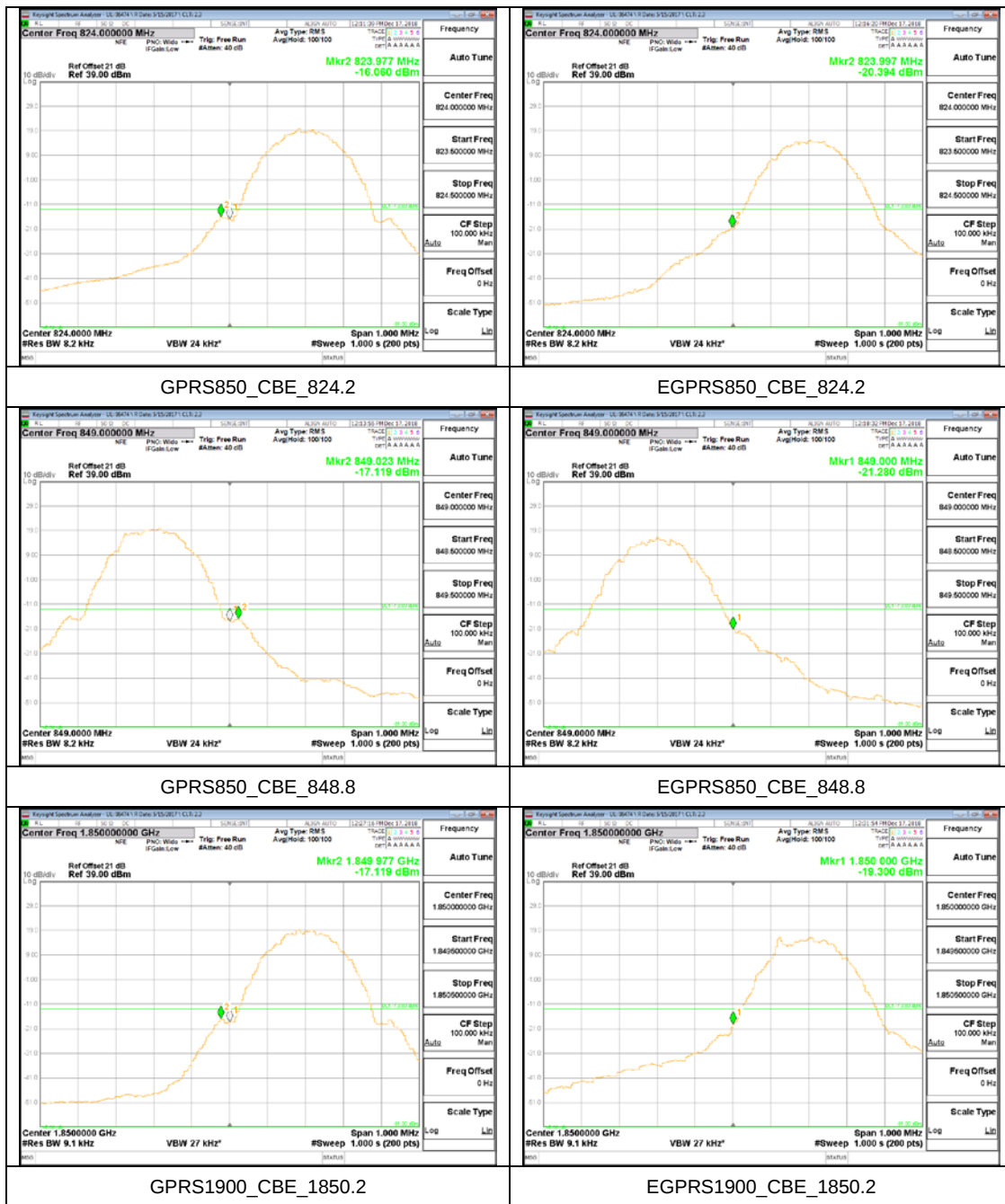
GSM/WCDMA

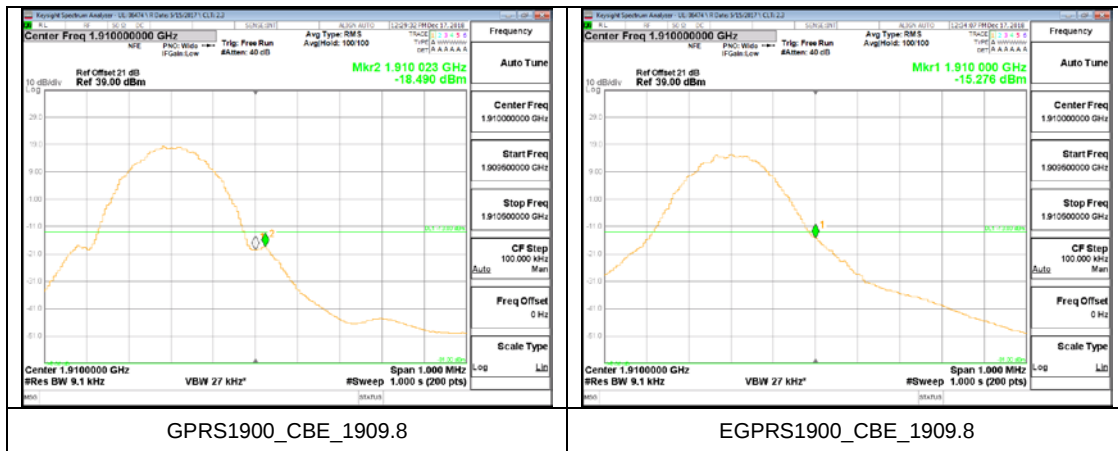
- a) Set the RBW = 1 ~ 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points $\geq 2 \times$ Span/RBW;
- g) Trace mode = Average (100);

RESULTS

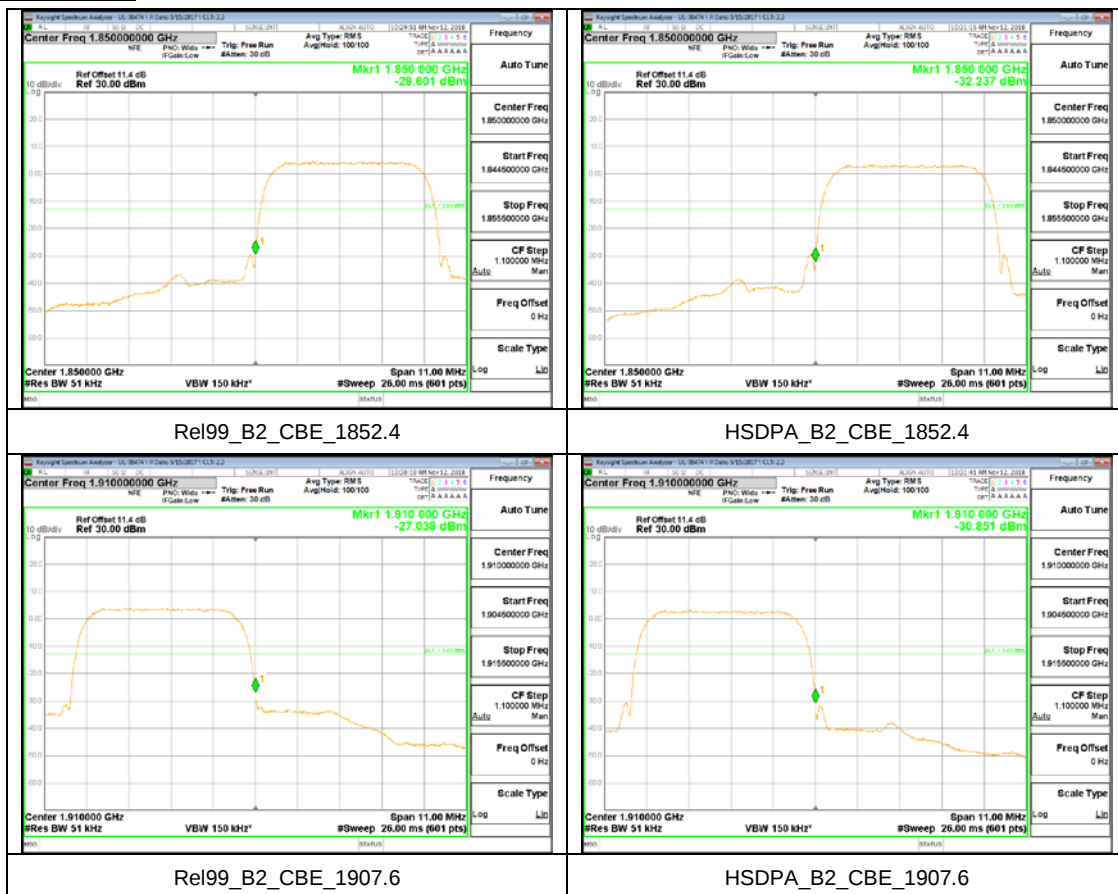
See the following pages.

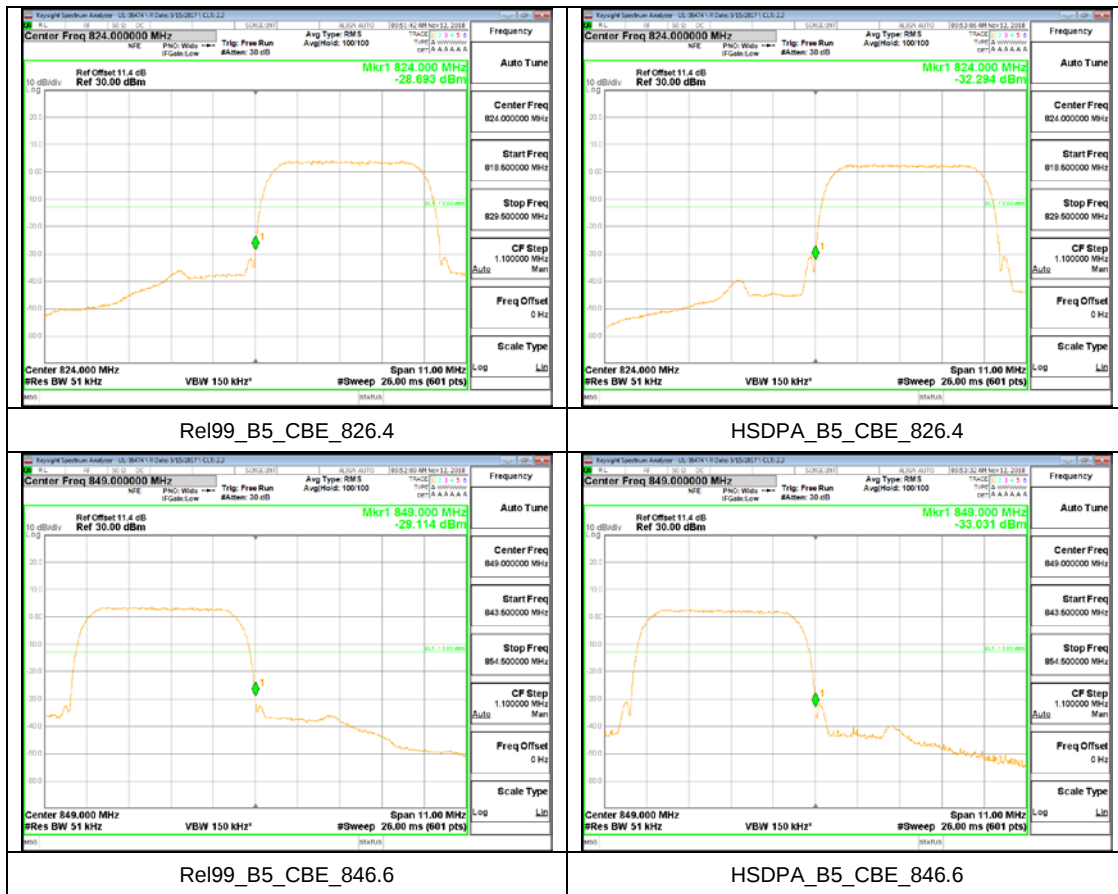
GSM MODE





WCDMA MODE





6.6 CONDUCTED OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.917, §24.238

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

- a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz
(Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points = Max (40001);
- g) Trace mode = average(LTE 5), Maxhold(LTE Band41);

Note : Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

RESULTS

See the following pages.

GSM

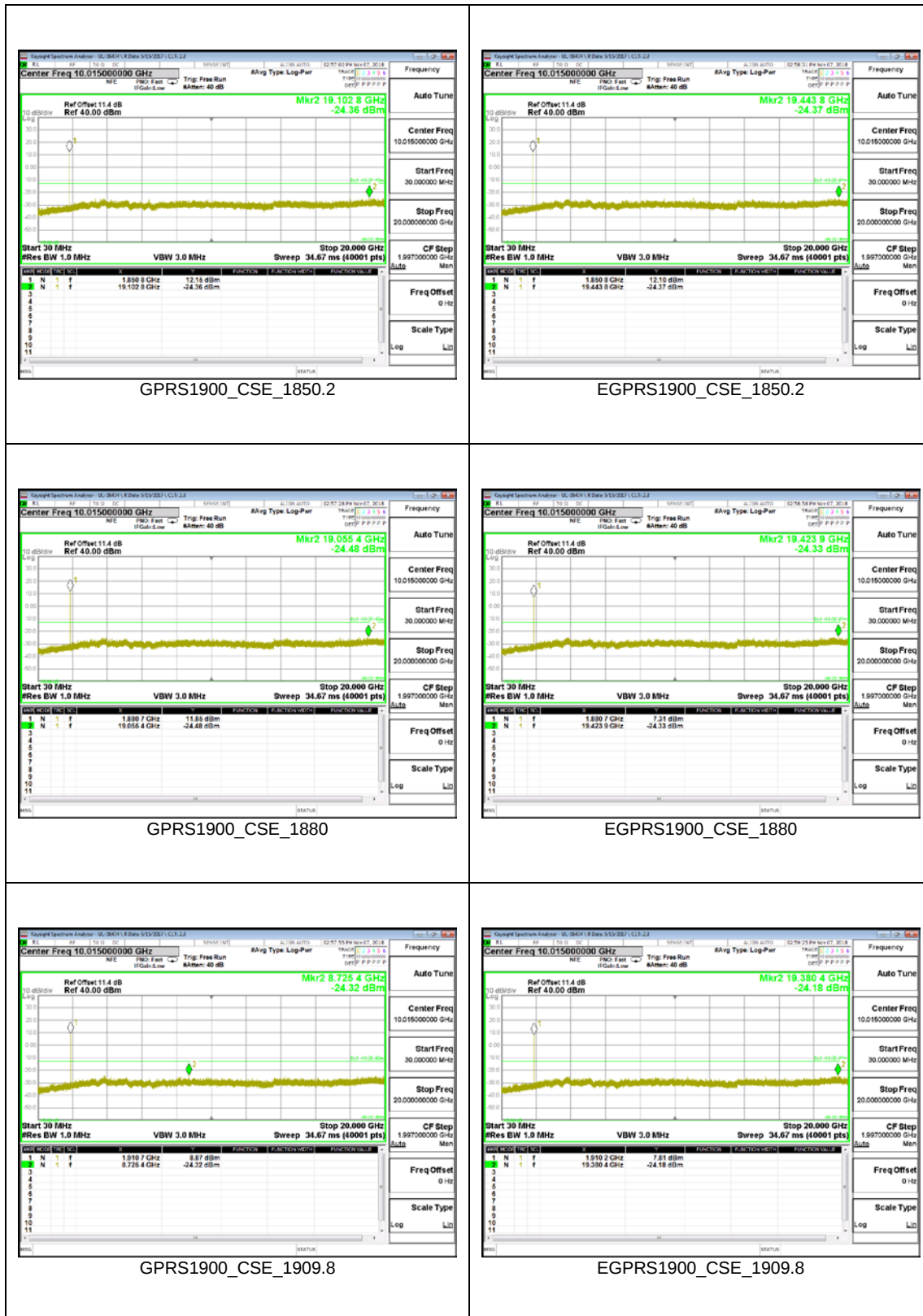
Mode	Channel	F (MHz)	Modulation	The maximum Emissions (dBm)	Limit (dBm)	Verdict
GSM850	High	848.8	GPRS	-23.09	-13	PASS
			EDGE	-23.84	-13	PASS
GSM1900	High	1909.8	GPRS	-24.32	-13	PASS
	High	1909.8	EDGE	-24.18	-13	PASS

WCDMA

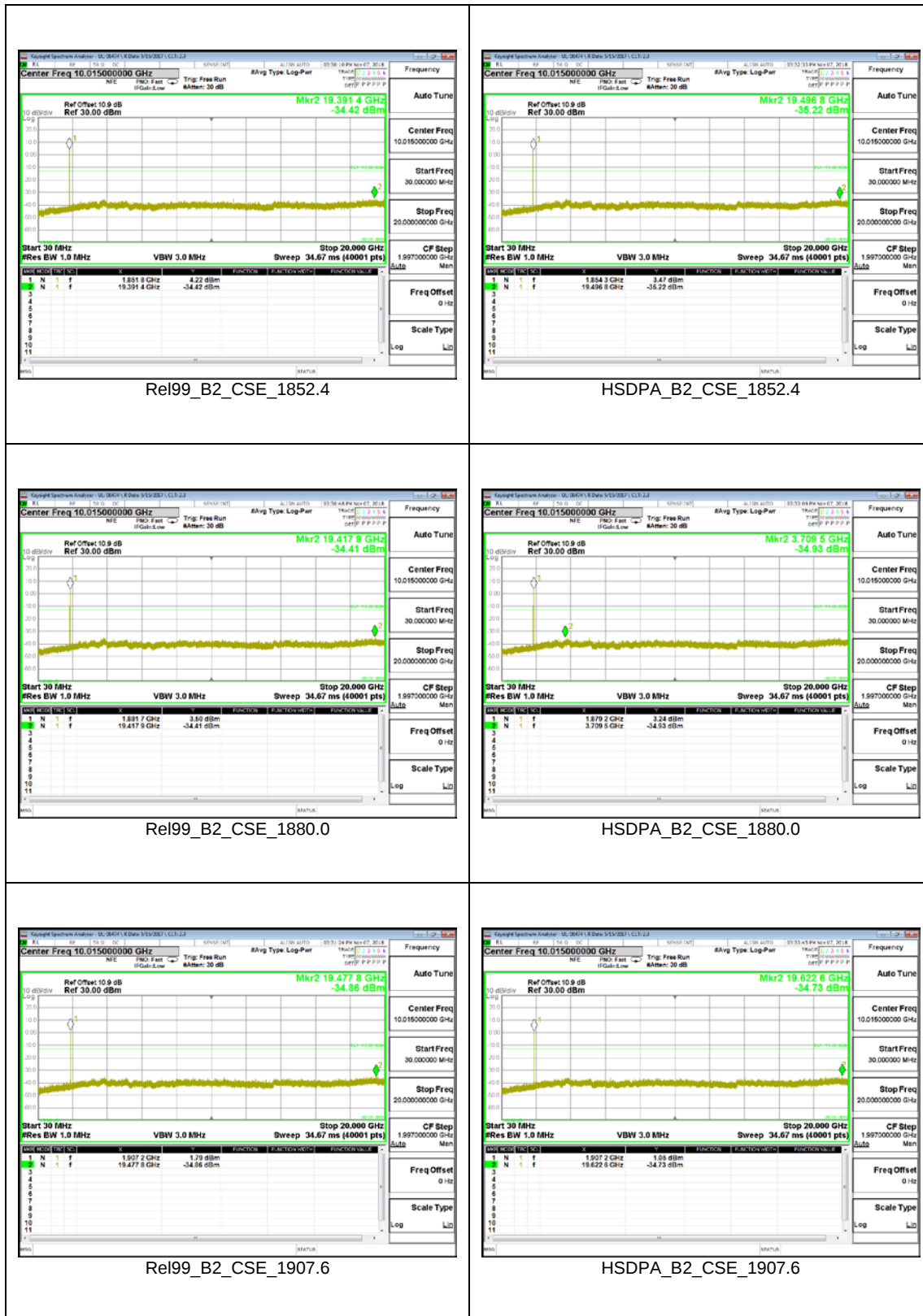
Mode	Channel	F (MHz)	Modulation	The maximum Emissions (dBm)	Limit (dBm)	Verdict
Band 2	Mid	1880.0	REL 99	-34.41	-13	PASS
	High	1907.6	HSDPA	-34.73	-13	PASS
Band 5	Low	826.4	REL 99	-34.05	-13	PASS
	High	846.6	HSDPA	-34.11	-13	PASS

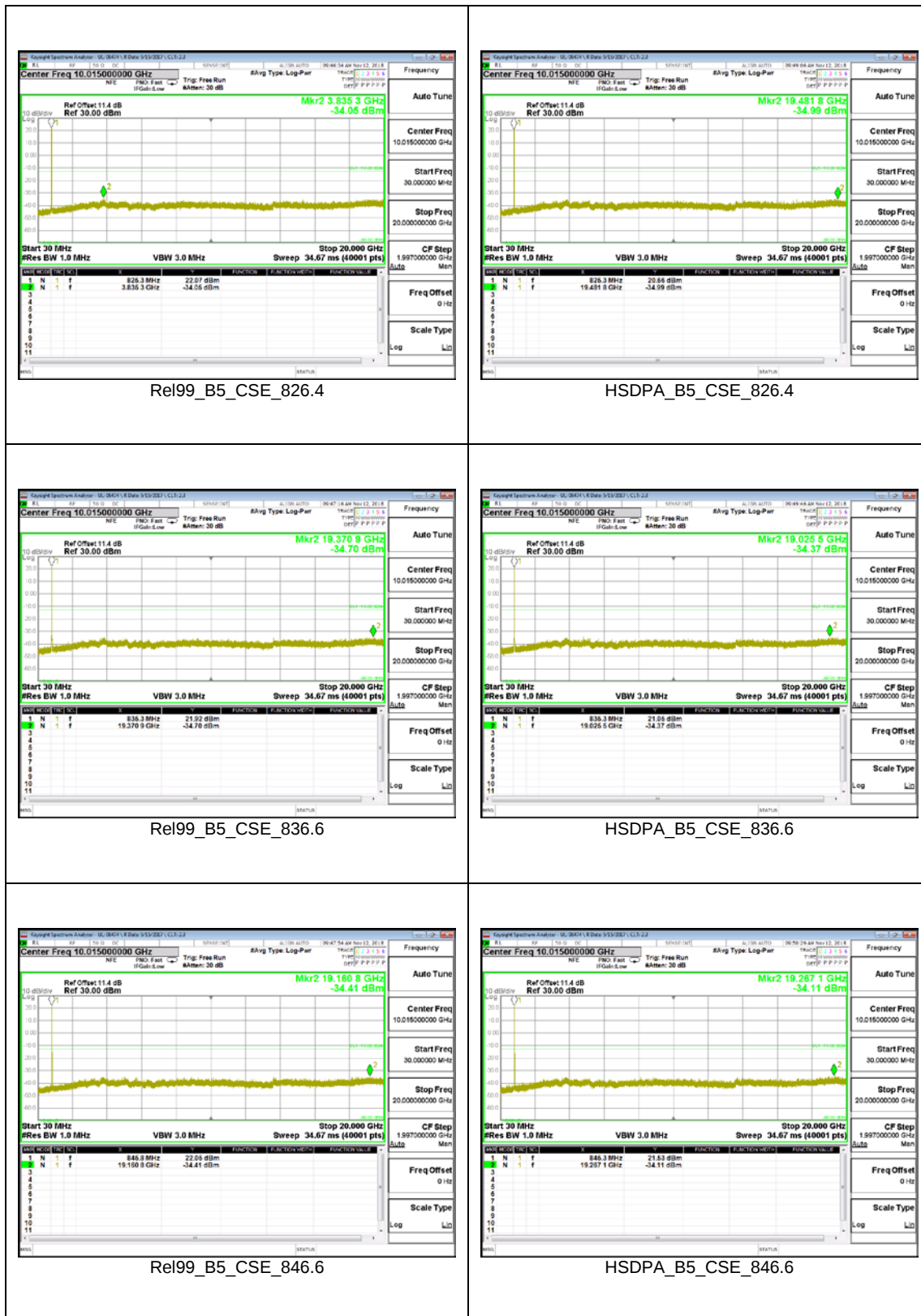
GSM Mode





WCDMA Mode





6.7 FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

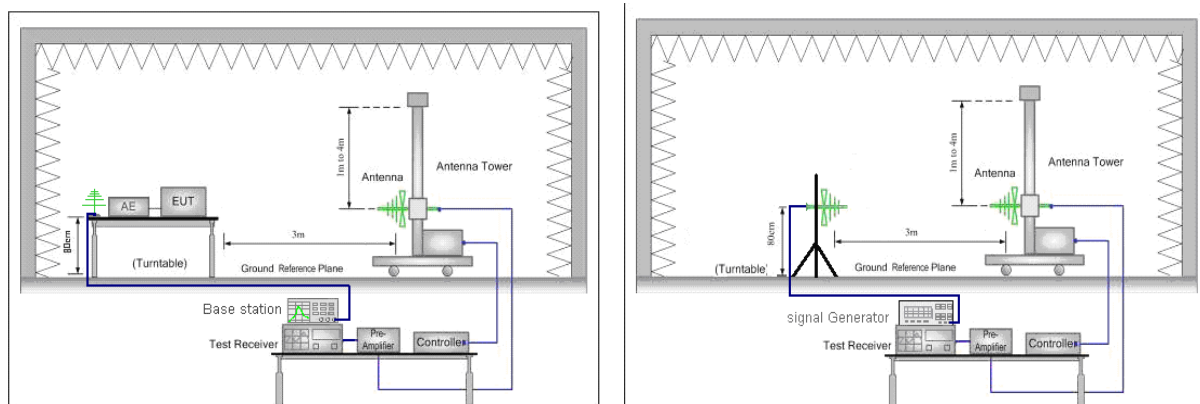
LIMIT

Part 22.917(a) ,§24.238(a)

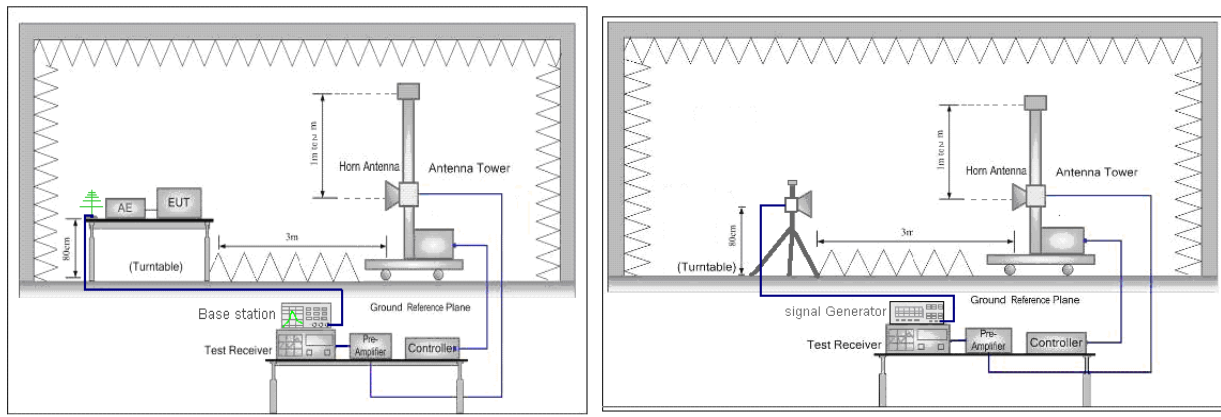
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST SETUP

Test Setup for Below 1G



Test Setup for Above 1G



TEST PROCEDURE

KDB 971168 D01 Section 7

Below 1GHz test procedure as below:

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.

4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Calculate power in dBm by the following formula:
$$\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$

Where:

P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$. The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power [Watts]})$.

Above 1GHz test procedure as below:

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Calculate power in dBm by the following formula:
$$\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$$
$$\text{EIRP} = \text{ERP} + 2.15\text{dB}$$

Where: P_g is the generator output power into the substitution antenna.

11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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

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

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

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

NOTE 1: Radiated spurious emissions were investigated below 30MHz, 30MHz – 1GHz and above 1GHz. There were no emissions found on below 30MHz.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site.

Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

RESULTS

See the following pages.

6.7.1 Radiated spurious emissions 30MHz to 1GHz

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
121.18	-40.61	-13.00	-27.61	Horizontal
171.62	-34.28	-13.00	-21.28	Horizontal
281.23	-35.92	-13.00	-22.92	Horizontal
393.75	-32.63	-13.00	-19.63	Horizontal
570.29	-29.83	-13.00	-16.83	Horizontal
691.54	-26.32	-13.00	-13.32	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
157.07	-36.62	-13.00	-23.62	Vertical
187.14	-34.63	-13.00	-21.63	Vertical
320.03	-35.72	-13.00	-22.72	Vertical
430.61	-32.64	-13.00	-19.64	Vertical
618.79	-26.84	-13.00	-13.84	Vertical
773.99	-24.90	-13.00	-11.90	Vertical

GPRS850				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
31.94	-73.44	-13.00	-60.44	Horizontal
57.16	-77.41	-13.00	-64.41	Horizontal
72.68	-81.44	-13.00	-68.44	Horizontal
186.17	-79.13	-13.00	-66.13	Horizontal
250.19	-78.85	-13.00	-65.85	Horizontal
417.03	-76.07	-13.00	-63.07	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
30.97	-72.36	-13.00	-59.36	Vertical
39.70	-79.27	-13.00	-66.27	Vertical
169.68	-78.11	-13.00	-65.11	Vertical
290.93	-79.70	-13.00	-66.70	Vertical
375.32	-74.08	-13.00	-61.08	Vertical
626.55	-71.63	-13.00	-58.63	Vertical

GPRS1900				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
55.22	-76.34	-13.00	-63.34	Horizontal
185.29	-70.37	-13.00	-57.37	Horizontal
294.81	-70.92	-13.00	-57.92	Horizontal
490.73	-66.92	-13.00	-53.92	Horizontal
686.69	-62.17	-13.00	-49.17	Horizontal
881.66	-42.76	-13.00	-29.76	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
123.12	-75.00	-13.00	-62.00	Vertical
196.84	-69.61	-13.00	-56.61	Vertical
280.26	-70.44	-13.00	-57.44	Vertical
396.66	-67.52	-13.00	-54.52	Vertical
673.03	-62.19	-13.00	-49.19	Vertical
881.66	-35.81	-13.00	-22.81	Vertical

WCDMA Band 2				
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WCDMA Band 5				
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6.7.2 Radiated spurious emissions above 1GHz

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1648.00	-27.69	-13.00	-14.69	Horizontal
2467.00	-23.97	-13.00	-10.97	Horizontal
3295.00	-46.47	-13.00	-33.47	Horizontal
4123.00	-36.10	-13.00	-23.10	Horizontal
4942.00	-41.93	-13.00	-28.93	Horizontal
5770.00	-41.83	-13.00	-28.83	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1648.00	-34.43	-13.00	-21.43	Vertical
2467.00	-30.29	-13.00	-17.29	Vertical
3295.00	-45.24	-13.00	-32.24	Vertical
4123.00	-41.47	-13.00	-28.47	Vertical
4942.00	-45.72	-13.00	-32.72	Vertical
5770.00	-43.31	-13.00	-30.31	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666.00	-32.34	-13.00	-19.34	Horizontal
2503.00	-23.44	-13.00	-10.44	Horizontal
3349.00	-42.37	-13.00	-29.37	Horizontal
4186.00	-38.30	-13.00	-25.30	Horizontal
5023.00	-42.16	-13.00	-29.16	Horizontal
5860.00	-42.36	-13.00	-29.36	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666.00	-32.93	-13.00	-19.93	Vertical
2503.00	-27.89	-13.00	-14.89	Vertical
3340.00	-44.35	-13.00	-31.35	Vertical
4186.00	-40.76	-13.00	-27.76	Vertical
5023.00	-46.50	-13.00	-33.50	Vertical
7534.00	-47.79	-13.00	-34.79	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1693.00	-35.06	-13.00	-22.06	Horizontal
2548.00	-25.21	-13.00	-12.21	Horizontal
3394.00	-44.74	-13.00	-31.74	Horizontal
4240.00	-45.61	-13.00	-32.61	Horizontal
5095.00	-45.74	-13.00	-32.74	Horizontal
5941.00	-44.89	-13.00	-31.89	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1693.00	-31.03	-13.00	-18.03	Vertical
2548.00	-29.67	-13.00	-16.67	Vertical
3394.00	-48.80	-13.00	-35.80	Vertical
4240.00	-45.97	-13.00	-32.97	Vertical
5095.00	-46.84	-13.00	-33.84	Vertical
5941.00	-47.99	-13.00	-34.99	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1648.00	-28.42	-13.00	-15.42	Horizontal
2467.00	-23.86	-13.00	-10.86	Horizontal
3295.00	-50.81	-13.00	-37.81	Horizontal
4123.00	-39.77	-13.00	-26.77	Horizontal
4942.00	-43.16	-13.00	-30.16	Horizontal
5770.00	-43.86	-13.00	-30.86	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1648.00	-25.95	-13.00	-12.95	Vertical
2467.00	-31.67	-13.00	-18.67	Vertical
3295.00	-46.52	-13.00	-33.52	Vertical
4123.00	-42.92	-13.00	-29.92	Vertical
4942.00	-48.05	-13.00	-35.05	Vertical
5770.00	-45.07	-13.00	-32.07	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666.00	-33.84	-13.00	-20.84	Horizontal
2503.00	-26.39	-13.00	-13.39	Horizontal
3349.00	-49.40	-13.00	-36.40	Horizontal
4186.00	-43.48	-13.00	-30.48	Horizontal
5023.00	-45.16	-13.00	-32.16	Horizontal
5860.00	-44.39	-13.00	-31.39	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666	-31.00	-13.00	-18.00	Vertical
2503	-27.42	-13.00	-14.42	Vertical
3340	-49.43	-13.00	-36.43	Vertical
4186	-46.12	-13.00	-33.12	Vertical
5023	-47.46	-13.00	-34.46	Vertical
5860	-46.51	-13.00	-33.51	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1693.00	-35.06	-13.00	-22.06	Horizontal
2548.00	-25.21	-13.00	-12.21	Horizontal
3394.00	-44.74	-13.00	-31.74	Horizontal
4240.00	-45.61	-13.00	-32.61	Horizontal
5095.00	-45.74	-13.00	-32.74	Horizontal
5941.00	-44.89	-13.00	-31.89	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1693.00	-31.03	-13.00	-18.03	Vertical
2548.00	-29.67	-13.00	-16.67	Vertical
3394.00	-48.80	-13.00	-35.80	Vertical
4240.00	-45.97	-13.00	-32.97	Vertical
5095.00	-46.84	-13.00	-33.84	Vertical
5941.00	-47.99	-13.00	-34.99	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666.00	-32.34	-13.00	-19.34	Horizontal
2503.00	-23.44	-13.00	-10.44	Horizontal
3349.00	-42.37	-13.00	-29.37	Horizontal
4186.00	-38.30	-13.00	-25.30	Horizontal
5023.00	-42.16	-13.00	-29.16	Horizontal
5860.00	-42.36	-13.00	-29.36	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666.00	-32.93	-13.00	-19.93	Vertical
2503.00	-27.89	-13.00	-14.89	Vertical
3340.00	-44.35	-13.00	-31.35	Vertical
4186.00	-40.76	-13.00	-27.76	Vertical
5023.00	-46.50	-13.00	-33.50	Vertical
7534.00	-47.79	-13.00	-34.79	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1326.00	-43.74	-13.00	-30.74	Horizontal
1748.00	-33.78	-13.00	-20.78	Horizontal
1850.00	23.94	-13.00	/	Horizontal
1930.00	-29.61	-13.00	-16.61	Horizontal
2522.00	-35.16	-13.00	-22.16	Horizontal
2828.00	-32.63	-13.00	-19.63	Horizontal
3690.00	-27.28	-13.00	-14.28	Horizontal
5550.00	-39.82	-13.00	-26.82	Horizontal
7395.00	-46.31	-13.00	-33.31	Horizontal
9255.00	-40.08	-13.00	-27.08	Horizontal
12300.00	-45.33	-13.00	-32.33	Horizontal
14445.00	-43.93	-13.00	-30.93	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1602.00	-41.98	-13.00	-28.98	Vertical
1764.00	-33.55	-13.00	-20.55	Vertical
1850.00	24.20	-13.00	/	Vertical
1948.00	-27.00	-13.00	-14.00	Vertical
2286.00	-37.07	-13.00	-24.07	Vertical
2854.00	-33.25	-13.00	-20.25	Vertical
3690.00	-27.15	-13.00	-14.15	Vertical
5550.00	-42.86	-13.00	-29.86	Vertical
7395.00	-47.11	-13.00	-34.11	Vertical
9255.00	-41.14	-13.00	-28.14	Vertical
13785.00	-45.25	-13.00	-32.25	Vertical
16920.00	-43.47	-13.00	-30.47	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1256.00	-42.58	-13.00	-29.58	Horizontal
1760.00	-22.55	-13.00	-9.55	Horizontal
1880.00	25.65	-13.00	/	Horizontal
1948.00	-30.13	-13.00	-17.13	Horizontal
2452.00	-35.73	-13.00	-22.73	Horizontal
2866.00	-32.66	-13.00	-19.66	Horizontal
3750.00	-28.03	-13.00	-15.03	Horizontal
5640.00	-44.75	-13.00	-31.75	Horizontal
7515.00	-44.16	-13.00	-31.16	Horizontal
9405.00	-39.81	-13.00	-26.81	Horizontal
11685.00	-45.86	-13.00	-32.86	Horizontal
15195.00	-44.97	-13.00	-31.97	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1516.00	-42.27	-13.00	-29.27	Vertical
1764.00	-26.85	-13.00	-13.85	Vertical
1880.00	26.09	-13.00	/	Vertical
1948.00	-22.64	-13.00	-9.64	Vertical
2468.00	-35.70	-13.00	-22.70	Vertical
2832.00	-32.54	-13.00	-19.54	Vertical
3750.00	-27.91	-13.00	-14.91	Vertical
5640.00	-45.31	-13.00	-32.31	Vertical
7515.00	-43.46	-13.00	-30.46	Vertical
9405.00	-39.27	-13.00	-26.27	Vertical
13110.00	-44.32	-13.00	-31.32	Vertical
17715.00	-42.74	-13.00	-29.74	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1758.00	-25.94	-13.00	-12.94	Horizontal
1910.00	25.54	-13.00	/	Horizontal
1948.00	-29.92	-13.00	-16.92	Horizontal
1990.00	-31.92	-13.00	-18.92	Horizontal
2314.00	-36.65	-13.00	-23.65	Horizontal
2756.00	-32.13	-13.00	-19.13	Horizontal
3810.00	-26.06	-13.00	-13.06	Horizontal
5730.00	-39.19	-13.00	-26.19	Horizontal
7635.00	-39.48	-13.00	-26.48	Horizontal
9555.00	-41.19	-13.00	-28.19	Horizontal
14400.00	-44.40	-13.00	-31.40	Horizontal
16860.00	-42.98	-13.00	-29.98	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1764.00	-28.68	-13.00	-15.68	Vertical
1910.00	24.55	-13.00	/	Vertical
1948.00	-22.67	-13.00	-9.67	Vertical
1990.00	-22.92	-13.00	-9.92	Vertical
2408.00	-36.24	-13.00	-23.24	Vertical
2856.00	-32.69	-13.00	-19.69	Vertical
3810.00	-26.26	-13.00	-13.26	Vertical
5730.00	-42.72	-13.00	-29.72	Vertical
7635.00	-42.60	-13.00	-29.60	Vertical
9540.00	-42.31	-13.00	-29.31	Vertical
12225.00	-45.57	-13.00	-32.57	Vertical
16890.00	-42.87	-13.00	-29.87	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1418.00	-42.31	-13.00	-29.31	Horizontal
1746.00	-29.30	-13.00	-16.30	Horizontal
1850.00	22.74	-13.00	/	Horizontal
1948.00	-29.25	-13.00	-16.25	Horizontal
2348.00	-35.30	-13.00	-22.30	Horizontal
2866.00	-33.06	-13.00	-20.06	Horizontal
3690.00	-29.87	-13.00	-16.87	Horizontal
5550.00	-43.76	-13.00	-30.76	Horizontal
7215.00	-48.12	-13.00	-35.12	Horizontal
9255.00	-41.75	-13.00	-28.75	Horizontal
12300.00	-45.08	-13.00	-32.08	Horizontal
14655.00	-43.40	-13.00	-30.40	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1748.00	-25.78	-13.00	-12.78	Vertical
1850.00	24.84	-13.00	/	Vertical
1930.00	-22.70	-13.00	-9.70	Vertical
2362.00	-36.54	-13.00	-23.54	Vertical
2424.00	-34.64	-13.00	-21.64	Vertical
2714.00	-33.32	-13.00	-20.32	Vertical
3690.00	-29.93	-13.00	-16.93	Vertical
5550.00	-46.85	-13.00	-33.85	Vertical
7170.00	-47.84	-13.00	-34.84	Vertical
10470.00	-46.25	-13.00	-33.25	Vertical
14010.00	-44.25	-13.00	-31.25	Vertical
17805.00	-41.93	-13.00	-28.93	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1760.00	-22.84	-13.00	-9.84	Horizontal
1880.00	24.17	-13.00	/	Horizontal
1948.00	-29.72	-13.00	-16.72	Horizontal
2382.00	-36.02	-13.00	-23.02	Horizontal
2680.00	-34.44	-13.00	-21.44	Horizontal
2862.00	-32.64	-13.00	-19.64	Horizontal
3750.00	-31.87	-13.00	-18.87	Horizontal
5640.00	-47.42	-13.00	-34.42	Horizontal
7455.00	-47.74	-13.00	-34.74	Horizontal
10260.00	-46.95	-13.00	-33.95	Horizontal
14130.00	-43.29	-13.00	-30.29	Horizontal
17775.00	-42.87	-13.00	-29.87	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1748.00	-26.86	-13.00	-13.86	Vertical
1836.00	-30.74	-13.00	-17.74	Vertical
1880.00	25.13	-13.00	/	Vertical
1948.00	-22.81	-13.00	-9.81	Vertical
2490.00	-35.81	-13.00	-22.81	Vertical
2864.00	-32.21	-13.00	-19.21	Vertical
3750.00	-30.73	-13.00	-17.73	Vertical
5640.00	-46.10	-13.00	-33.10	Vertical
7515.00	-47.99	-13.00	-34.99	Vertical
11505.00	-45.33	-13.00	-32.33	Vertical
14415.00	-44.07	-13.00	-31.07	Vertical
17820.00	-42.46	-13.00	-29.46	Vertical

Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1358.00	-43.14	-13.00	-30.14	Horizontal
1756.00	-24.59	-13.00	-11.59	Horizontal
1910.00	23.40	-13.00	/	Horizontal
1990.00	-31.12	-13.00	-18.12	Horizontal
2626.00	-34.39	-13.00	-21.39	Horizontal
2862.00	-32.82	-13.00	-19.82	Horizontal
3810.00	-32.65	-13.00	-19.65	Horizontal
5730.00	-47.28	-13.00	-34.28	Horizontal
7635.00	-43.72	-13.00	-30.72	Horizontal
11340.00	-46.23	-13.00	-33.23	Horizontal
13995.00	-44.08	-13.00	-31.08	Horizontal
16875.00	-43.66	-13.00	-30.66	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1758.00	-23.52	-13.00	-10.52	Vertical
1884.00	-24.98	-13.00	-11.98	Vertical
1910.00	24.53	-13.00	/	Vertical
1948.00	-22.92	-13.00	-9.92	Vertical
1990.00	-22.39	-13.00	-9.39	Vertical
2840.00	-32.74	-13.00	-19.74	Vertical
3810.00	-29.92	-13.00	-16.92	Vertical
5730.00	-48.78	-13.00	-35.78	Vertical
7635.00	-44.99	-13.00	-31.99	Vertical
11295.00	-45.60	-13.00	-32.60	Vertical
13920.00	-43.77	-13.00	-30.77	Vertical
16980.00	-42.93	-13.00	-29.93	Vertical

GPRS1900 Mid Channel					EGPRS1900 High Channel				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1250.00	-43.54	-13.00	-30.54	Horizontal	1424.00	-41.88	-13.00	-28.88	Horizontal
1746.00	-30.96	-13.00	-17.96	Horizontal	1758.00	-27.12	-13.00	-14.12	Horizontal
1760.00	-30.39	-13.00	-17.39	Horizontal	1878.00	22.18	-13.00	/	Horizontal
1850.00	20.86	-13.00	/	Horizontal	2178.00	-37.68	-13.00	-24.68	Horizontal
2334.00	-36.48	-13.00	-23.48	Horizontal	2690.00	-34.35	-13.00	-21.35	Horizontal
2854.00	-32.89	-13.00	-19.89	Horizontal	2846.00	-32.91	-13.00	-19.91	Horizontal
3690.00	-32.61	-13.00	-19.61	Horizontal	3750.00	-35.73	-13.00	-22.73	Horizontal
7395.00	-47.41	-13.00	-34.41	Horizontal	6870.00	-50.41	-13.00	-37.41	Horizontal
10560.00	-47.17	-13.00	-34.17	Horizontal	9420.00	-48.44	-13.00	-35.44	Horizontal
13950.00	-42.46	-13.00	-29.46	Horizontal	12195.00	-45.92	-13.00	-32.92	Horizontal
15150.00	-44.63	-13.00	-31.63	Horizontal	14445.00	-44.47	-13.00	-31.47	Horizontal
16890.00	-43.66	-13.00	-30.66	Horizontal	17775.00	-42.91	-13.00	-29.91	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1748.00	-27.88	-13.00	-14.88	Vertical	1216.00	-44.00	-13.00	-31.00	Vertical
1852.00	23.50	-13.00	/	Vertical	1540.00	-42.53	-13.00	-29.53	Vertical
1932.00	-36.47	-13.00	-23.47	Vertical	1878.00	22.96	-13.00	/	Vertical
2162.00	-37.57	-13.00	-24.57	Vertical	1960.00	-36.41	-13.00	-23.41	Vertical
2374.00	-35.85	-13.00	-22.85	Vertical	2664.00	-33.58	-13.00	-20.58	Vertical
2822.00	-32.67	-13.00	-19.67	Vertical	2856.00	-32.74	-13.00	-19.74	Vertical
3705.00	-31.84	-13.00	-18.84	Vertical	3750.00	-32.77	-13.00	-19.77	Vertical
7275.00	-48.06	-13.00	-35.06	Vertical	10455.00	-46.56	-13.00	-33.56	Vertical
10410.00	-45.95	-13.00	-32.95	Vertical	13785.00	-45.19	-13.00	-32.19	Vertical
12185.00	-45.49	-13.00	-32.49	Vertical	15000.00	-43.00	-13.00	-30.00	Vertical
14715.00	-43.56	-13.00	-30.56	Vertical	16905.00	-43.20	-13.00	-30.20	Vertical
17730.00	-42.91	-13.00	-29.91	Vertical	17790.00	-43.18	-13.00	-30.18	Vertical
WCDMA Band2 REL99 Low Channel					WCDMA Band2 REL99 Mid Channel				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1410.00	-43.55	-13.00	-30.55	Horizontal	1406.00	-43.54	-13.00	-30.54	Horizontal
1748.00	-30.66	-13.00	-17.66	Horizontal	1606.00	-41.73	-13.00	-28.73	Horizontal
1906.00	21.89	-13.00	/	Horizontal	1748.00	-35.60	-13.00	-22.60	Horizontal
2160.00	-37.77	-13.00	-24.77	Horizontal	1854.00	18.80	-13.00	/	Horizontal
2290.00	-36.40	-13.00	-23.40	Horizontal	2162.00	-36.50	-13.00	-23.50	Horizontal
2860.00	-32.83	-13.00	-19.83	Horizontal	2856.00	-32.44	-13.00	-19.44	Horizontal
3810.00	-32.68	-13.00	-19.68	Horizontal	3690.00	-34.62	-13.00	-21.62	Horizontal
6570.00	-50.95	-13.00	-37.95	Horizontal	6420.00	-50.56	-13.00	-37.56	Horizontal
9225.00	-47.43	-13.00	-34.43	Horizontal	8175.00	-48.20	-13.00	-35.20	Horizontal
11355.00	-46.17	-13.00	-33.17	Horizontal	12225.00	-45.33	-13.00	-32.33	Horizontal
13770.00	-45.02	-13.00	-32.02	Horizontal	14445.00	-43.85	-13.00	-30.85	Horizontal
16755.00	-43.24	-13.00	-30.24	Horizontal	17055.00	-43.04	-13.00	-30.04	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1504.00	-42.50	-13.00	-29.50	Vertical	1434.00	-42.79	-13.00	-29.79	Vertical
1764.00	-29.81	-13.00	-16.81	Vertical	1750.00	-27.70	-13.00	-14.70	Vertical
1906.00	22.11	-13.00	/	Vertical	1854.00	21.50	-13.00	/	Vertical
2146.00	-37.13	-13.00	-24.13	Vertical	2120.00	-37.49	-13.00	-24.49	Vertical
2698.00	-33.74	-13.00	-20.74	Vertical	2484.00	-34.73	-13.00	-21.73	Vertical
2862.00	-33.18	-13.00	-20.18	Vertical	2850.00	-32.82	-13.00	-19.82	Vertical
3810.00	-32.98	-13.00	-19.98	Vertical	3705.00	-33.05	-13.00	-20.05	Vertical
6345.00	-50.08	-13.00	-37.08	Vertical	7530.00	-48.28	-13.00	-35.28	Vertical
9300.00	-47.51	-13.00	-34.51	Vertical	11520.00	-46.22	-13.00	-33.22	Vertical
12270.00	-45.83	-13.00	-32.83	Vertical	13630.00	-44.72	-13.00	-31.72	Vertical
14400.00	-44.01	-13.00	-31.01	Vertical	16905.00	-43.12	-13.00	-30.12	Vertical
16875.00	-43.43	-13.00	-30.43	Vertical	17805.00	-42.68	-13.00	-29.68	Vertical
WCDMA Band2 REL99 High Channel					WCDMA Band2 HSDPA Low Channel				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1374.00	-43.05	-13.00	-30.05	Horizontal	1528.00	-42.16	-13.00	-29.16	Horizontal
1762.00	-28.45	-13.00	-15.45	Horizontal	1764.00	-33.25	-13.00	-20.25	Horizontal
1890.00	20.39	-13.00	/	Horizontal	1906.00	19.52	-13.00	/	Horizontal
2158.00	-37.55	-13.00	-24.55	Horizontal	2220.00	-36.68	-13.00	-23.68	Horizontal
2424.00	-35.73	-13.00	-22.73	Horizontal	2522.00	-35.13	-13.00	-22.13	Horizontal
2842.00	-32.50	-13.00	-19.50	Horizontal	2760.00	-33.50	-13.00	-20.50	Horizontal
3750.00	-37.74	-13.00	-24.74	Horizontal	3810.00	-34.82	-13.00	-21.82	Horizontal
7425.00	-48.43	-13.00	-35.43	Horizontal	6585.00	-50.90	-13.00	-37.90	Horizontal
10410.00	-46.94	-13.00	-33.94	Horizontal	8270.00	-48.50	-13.00	-35.50	Horizontal
13845.00	-44.50	-13.00	-31.50	Horizontal	12345.00	-45.96	-13.00	-32.96	Horizontal
16080.00	-44.95	-13.00	-31.95	Horizontal	14460.00	-44.52	-13.00	-31.52	Horizontal
17715.00	-42.78	-13.00	-29.78	Horizontal	16980.00	-43.26	-13.00	-30.26	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1764.00	-27.27	-13.00	-14.27	Vertical	1482.00	-42.54	-13.00	-29.54	Vertical
1878.00	22.27	-13.00	/	Vertical	1764.00	-27.72	-13.00	-14.72	Vertical
1960.00	-35.49	-13.00	-22.49	Vertical	1908.00	21.05	-13.00	/	Vertical
2284.00	-36.70	-13.00	-23.70	Vertical	2152.00	-37.08	-13.00	-24.08	Vertical
2688.00	-34.50	-13.00	-21.50	Vertical	2602.00	-34.39	-13.00	-21.39	Vertical
2856.00	-32.81	-13.00	-19.81	Vertical	2852.00	-32.10	-13.00	-19.10	Vertical
3750.00	-34.12	-13.00	-21.12	Vertical	3810.00	-36.12	-13.00	-23.12	Vertical
8310.00	-48.06	-13.00	-35.06	Vertical	7350.00	-48.90	-13.00	-35.90	Vertical
11145.00	-46.95	-13.00	-33.95	Vertical	9255.00	-47.86	-13.00	-34.86	Vertical
13545.00	-45.64	-13.00	-32.64	Vertical	11505.00	-45.80	-13.00	-32.80	Vertical
16035.00	-44.79	-13.00	-31.79	Vertical	13890.00	-44.40	-13.00	-31.40	Vertical
17235.00	-43.28	-13.00	-30.28	Vertical	16875.00	-43.43	-13.00	-30.43	Vertical

WCDMA Band2 HSDPA Mid Channel					WCDMA Band2 HSDPA High Channel				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1648.00	-42.88	-13.00	-29.88	Horizontal	1675.00	-44.74	-13.00	-31.74	Horizontal
3637.00	-56.53	-13.00	-43.53	Horizontal	4177.00	-53.79	-13.00	-40.79	Horizontal
5492.00	-53.18	-13.00	-40.18	Horizontal	5187.00	-54.40	-13.00	-41.40	Horizontal
7300.00	-49.61	-13.00	-36.61	Horizontal	7264.00	-49.77	-13.00	-36.77	Horizontal
8461.00	-50.17	-13.00	-37.17	Horizontal	8236.00	-50.55	-13.00	-37.55	Horizontal
9415.00	-48.77	-13.00	-35.77	Horizontal	9217.00	-50.11	-13.00	-37.11	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1648.00	-43.02	-13.00	-30.02	Vertical	1675.00	-43.22	-13.00	-30.22	Vertical
2478.00	-52.87	-13.00	-39.87	Vertical	2494.00	-53.86	-13.00	-40.86	Vertical
3304.00	-55.96	-13.00	-42.96	Vertical	4177.00	-53.07	-13.00	-40.07	Vertical
4996.00	-52.94	-13.00	-39.94	Vertical	7300.00	-49.79	-13.00	-36.79	Vertical
7255.00	-49.21	-13.00	-36.21	Vertical	8452.00	-50.07	-13.00	-37.07	Vertical
9271.00	-48.93	-13.00	-35.93	Vertical	9388.00	-48.84	-13.00	-35.84	Vertical
WCDMA Band5 REL99 Low Channel					WCDMA Band5 REL99 Mid Channel				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1684.00	-42.70	-13.00	-29.70	Horizontal	1648.00	-43.48	-13.00	-30.48	Horizontal
2530.00	-47.49	-13.00	-34.49	Horizontal	2494.00	-56.20	-13.00	-43.20	Horizontal
4222.00	-53.73	-13.00	-40.73	Horizontal	5401.00	-53.27	-13.00	-40.27	Horizontal
6571.00	-52.33	-13.00	-39.33	Horizontal	7264.00	-49.68	-13.00	-36.68	Horizontal
7453.00	-49.87	-13.00	-36.87	Horizontal	8506.00	-50.37	-13.00	-37.37	Horizontal
9379.00	-49.22	-13.00	-36.22	Horizontal	9550.00	-49.85	-13.00	-36.85	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1684.00	-43.34	-13.00	-30.34	Vertical	1648.00	-44.40	-13.00	-31.40	Vertical
2530.00	-53.95	-13.00	-40.95	Vertical	2494.00	-54.86	-13.00	-41.86	Vertical
3376.00	-55.18	-13.00	-42.18	Vertical	5527.00	-53.58	-13.00	-40.58	Vertical
4996.00	-53.21	-13.00	-40.21	Vertical	7255.00	-49.71	-13.00	-36.71	Vertical
7309.00	-49.96	-13.00	-36.96	Vertical	8290.00	-50.37	-13.00	-37.37	Vertical
9370.00	-49.65	-13.00	-36.65	Vertical	9379.00	-49.78	-13.00	-36.78	Vertical
WCDMA Band5 REL99 High Channel					WCDMA Band5 HSDPA Low Channel				
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1675.00	-46.64	-13.00	-33.64	Horizontal	1684.00	-46.07	-13.00	-33.07	Horizontal
2503.00	-55.82	-13.00	-42.82	Horizontal	2530.00	-50.26	-13.00	-37.26	Horizontal
5671.00	-53.09	-13.00	-40.09	Horizontal	5644.00	-52.89	-13.00	-39.89	Horizontal
7354.00	-50.13	-13.00	-37.13	Horizontal	7480.00	-49.40	-13.00	-36.40	Horizontal
8299.00	-50.47	-13.00	-37.47	Horizontal	8407.00	-50.27	-13.00	-37.27	Horizontal
9514.00	-49.54	-13.00	-36.54	Horizontal	9478.00	-48.39	-13.00	-35.39	Horizontal
Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization	Frequency (MHz)	Level (dB)	Limit Line (dB)	Over Limit (dB)	Polarization
1666.00	-43.61	-13.00	-30.61	Vertical	1684.00	-39.69	-13.00	-26.69	Vertical
2494.00	-54.42	-13.00	-41.42	Vertical	2539.00	-47.70	-13.00	-34.70	Vertical
4996.00	-53.15	-13.00	-40.15	Vertical	4699.00	-54.85	-13.00	-41.85	Vertical
7185.00	-49.18	-13.00	-36.18	Vertical	4996.00	-52.44	-13.00	-39.44	Vertical
8245.00	-50.42	-13.00	-37.42	Vertical	7273.00	-49.37	-13.00	-36.37	Vertical
9235.00	-49.60	-13.00	-36.60	Vertical	9325.00	-49.70	-13.00	-36.70	Vertical
WCDMA Band5 HSDPA Mid Channel					WCDMA Band5 HSDPA High Channel				

END OF REPORT