

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27 SUBPART **B, C & SUBPART L REQUIREMENT** OF

	01
Applicant:	Sharp Corporation, Mobile Communication B.U. 2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi, Hiroshima 739-0192, Japan
Manufacturer:	Sharp Corporation 1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan
Product Name:	Smart Phone
Report Number:	ER/2018/80045
FCC ID:	APYHRO00265
FCC Rule Part:	2 , 22H & 24E & 27B, C & L
Issue Date:	Sep. 06, 2018
Date of Test:	Aug. 13, 2018
Date of EUT Received:	Aug. 01, 2018
We hereby cortify that	

#### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Marcus

Tested By:

Approved By:

Marcus Tseng / Engineer

Jim Chang / Manager







# **Revision History**

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/80045	Rev.00	Initial creation of document	All	Sep. 06, 2018	Elle Chang

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# **1. GENERAL PRODUCT INFORMATION**

# **1.1. Product Description**

#### General:

Product Name:	Smart Phone
Hardware Version:	DVT
Software Version:	N/A
Power Supply:	3.85V from Rechargeable Li-ion Battery
IMEI:	004401116440815 / 004401116440393

#### 1.2. GSM / WCDMA / LTE: Cellular Phone Standards Frequency Range

Operating Frequency (MHz)				
GSM/GPRS 850 824.2 - 848.8				
GSM/GPRS 1900	1850.2	-	1909.8	

Operating Frequency (MHz)			
WCDMA / HSPA+ Band V 826.4 - 846.6			

LTE Band	BW (MHz)	Operation Frequency (MHz)				
	1.4	824.7	-	848.3		
5	3	825.5	-	847.5		
5	5	826.5	-	846.5		
	10	829.0	-	844.0		
	1.4	699.7	-	715.3		
12	3	700.5	-	714.5		
12	5	701.5	-	713.5		
	10	704.0	-	711.0		
17	5	706.5	-	713.5		
17	10	709.0	-	711.0		



#### 1.3. Type of Emission & Max ERP/EIRP Power Measurement Result:

	ERP / EIRP (dBm)		(W)	Type of Emission
GSM 850	23.77	ERP	0.238	244KGXW
GPRS 850	25.48	ERP	0.353	251KGXW
GSM 1900	25.35	EIRP	0.343	243KGXW
GPRS 1900	27.08	EIRP	0.511	247KGXW

	ERP / EIRP (dBm)		(W)	Type of Emission
WCDMA Band V	23.07	ERP	0.203	4M13F9W
HSDPA Band V	20.94	ERP	0.124	4M12F9W
HSUPA Band V	19.08	ERP	0.081	4M12F9W

LTE Band	BW (MHz)	Modulation		ERP / EIRP (dBm)		Type of Emission
	1.4	QPSK	20.7	ERP	0.118	1M11G7D
	1.4	16QAM	21.34	ERP	0.136	1M10D7W
	3	QPSK	20.37	ERP	0.109	2M70G7D
5	3	16QAM	21.52	ERP	0.142	2M71D7W
5	5	QPSK	20.4	ERP	0.110	4M52G7D
	5	16QAM	21.29	ERP	0.135	4M50D7W
	10	QPSK	20.48	ERP	0.112	9M02G7D
	10	16QAM	21.15	ERP	0.130	9M00D7W
	5	QPSK	22.04	ERP	0.160	4M52G7D
17	5	16QAM	22.59	ERP	0.182	4M51D7W
17	10	QPSK	22.4	ERP	0.174	9M01G7D
	10	16QAM	23.59	ERP	0.229	8M99D7W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
	1.4	QPSK	22.33	ERP	0.171	1M11G7D
	1.4	16QAM	23.43	ERP	0.220	1M10D7W
	3	QPSK	22.74	ERP	0.188	2M70G7D
12	3	16QAM	23.37	ERP	0.217	2M70D7W
12	5	QPSK	22.38	ERP	0.173	4M52G7D
	5	16QAM	22.97	ERP	0.198	4M51D7W
	10	QPSK	22.07	ERP	0.161	9M01G7D
	10	16QAM	23.22	ERP	0.210	8M98D7W

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#### 1.4. Test Methodology of Applied Standards

CC 47 CFR Part 2, 22, 24, 27.

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

TS 151 010-1 is used to set, and measure the output power.

Note: All test items have been performed and record as per the above standards.

#### 1.5. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 code 0513)

FCC Registration Numbers are: 509634 / TW0001

#### 1.6. Special Accessories

No special accessories were used during testing.

#### 1.7. Equipment Modifications

There were no modifications incorporated into the EUT.



# 2. SYSTEM TEST CONFIGURATION

#### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

#### 2.3. Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port

According to measurement procured ANSI C63.26-2015, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

#### 2.3.2 Radiated Emissions (ERP/EIRP)

According to measurement procured ANSI C63.26-2015, The EUT is a placed on as turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

#### 2.4. Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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#### Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	0.2	21	21.2
High Band (Above 1 GHz)	0.5	21.36	21.86

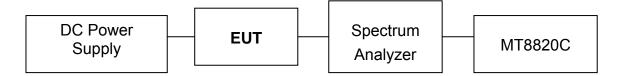
## 2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850		324
GSM 1900		375
WCDMA B5	2 95	634
LTE Band 5	3.85	609.380
LTE Band 12		615.670
LTE Band 17		618.160

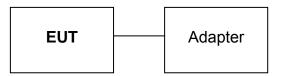


#### 2.6. Configuration of Tested System

#### Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)



#### Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



#### **Remote Side**



#### Table 2-1 Equipment Used in

ltem	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyer	Anritsu	MT8820C	6201465317	shielded	Un-shielded

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# 3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)(5) §24.232(c) §27.50(c)(10) §27.50(h)(2)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occuupied Bandwidth	Compliant
§2.1051 §22.917(a)	Out of Band Emissions at Antenna	
§24.238(a) §27.53(g)	Terminals and Band Edge /	Compliant
§27.53(m)(4)	Emission mask requirements	
§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(m)(4)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §22.913	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant



# 4. DESCRIPTION OF TEST MODES

#### 4.1. The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

BAND	ERP/EIRP	RADIATED EMISSION
GSM/GPRS 850	H-plan	H-plan
GSM/GPRS 1900	H-plan	H-plan
WCDMA/HSPA Band V	H-plan	H-plan
LTE Band 5	H-plan	H-plan
LTE Band 12	H-plan	H-plan
LTE Band 17	H-plan	H-plan

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#### **GSM/GPRS MODE**

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	128 to 251	128, 190, 251	GSM/GPRS 850
EIRP	512 to 810	512, 661, 810	GSM/GPRS 1900
FREQUENCY STABILITY	128 to 251	190	GPRS 850
	512 to 810	661	GPRS 1900
OCCUPIED BANDWIDTH	128 to 251	190	GSM/GPRS 850
	512 to 810	661	GSM/GPRS 1900
PEAK TO AVERAGE RATIO	128 to 251	128, 190, 251	GSM/GPRS 850
	512 to 810	512, 661, 810	GSM/GPRS 1900
BAND EDGE	128 to 251	128, 251	GSM/GPRS 850
	512 to 810	512, 810	GSM/GPRS 1900
CONDCUDETED EMISSION	128 to 251	128, 190, 251	GSM/GPRS 850
	512 to 810	512, 661, 810	GSM/GPRS 1900
RADIATED EMISSION	128 to 251	128, 190, 251	GPRS 850
	512 to 810	512, 661, 810	GPRS 1900

#### WCDMA/HSPA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
FREQUENCY STABILITY	4132 to 4233	4183	WCDMA Band V
OCCUPIED BANDWIDTH	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
PEAK TO AVERAGE RATIO	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
BAND EDGE	4132 to 4233	4132, 4233	WCDMA Band V
CONDCUDETED EMISSION	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
RADIATED EMISSION	4132 to 4233	4132, 4183, 4233	WCDMA Band V

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#### LTE Band 5 MODE

TEST ITEM	AVAILABLE	TESTED	CHANNEL	MODULATION	MODE
TESTTIEW	CHANNEL	CHANNEL	BANDWIDTH	MODULATION	WODE
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
ERP	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM,	1 RB/ 0,14 RB Offest
EKP	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM,	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	20450 to 20600	20525	10MHz	QPSK	Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM,	Full RB
OCCUPIED BAND-	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM,	Full RB
WIDTH	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM,	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM,	Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	16QAM	Full RB
PEAK TO AVERAGE	20415 to 20635	20415, 20525, 20635	3MHz	16QAM	Full RB
RATIO	20425 to 20625	20425, 20525, 20625	5MHz	16QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	16QAM	Full RB
	20470 to 20643	20470, 20643	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
BAND EDGE	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK	1 RB, 0 RB Offest
CONDCUDETED	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB, 0 RB Offest
EMISSION	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB, 0 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	20415 to 20635	20415, 20525, 20635	3MHz	16QAM	1 RB, 0 RB Offest



#### LTE Band 12 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
ERP	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM,	1 RB/ 0,14 RB Offest
EKP	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM,	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23060 to 23130	23095	10MHz	QPSK	Full RB
	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM,	Full RB
OCCUPIED	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM,	Full RB
BANDWIDTH	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM,	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM,	Full RB
	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	Full RB
PEAK TO AV-	23025 to 23165	23025, 23095, 23165	3MHz	16QAM	Full RB
ERAGE RATIO	23035 to 23155	23035, 23095, 23155	5MHz	16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	Full RB
	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
BAND EDGE	23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCU-	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB, 0 RB Offest
DETED EMIS-	23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB, 0 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB, 0 RB Offest
SION	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	1 RB, 0 RB Offest

#### LTE Band 17 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
EKP	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM,	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23780 to 23800	23790	10MHz	QPSK	Full RB
OCCUPIED BAND-	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM,	Full RB
WIDTH	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM,	Full RB
PEAK TO AVERAGE	23755 to 23825	23755, 23790, 23825	5MHz	16QAM	Full RB
RATIO	23780 to 23800	23780, 23790, 23800	10MHz	16QAM	Full RB
BAND EDGE	23755 to 23825	23755, 23825	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
BAND EDGE	23780 to 23800	23780, 23800	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCUDETED	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB, 0 RB Offest
EMISSION	23780 to 23800	23780, 23790, 23800	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	23755 to 23825	23755, 23790, 23825	5MHz	16QAM	1 RB, 0 RB Offest

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#### 5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization =+/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.70 dB
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

Radiated Spurious Emission:

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty (Polarization : <b>Vertical</b> )	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Magguramantungartaintu	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty (Polarization : <b>Horizontal</b> )	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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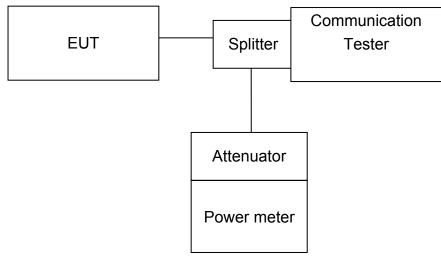


# 6. RF CONDUCTED OUTPUT POWER MEASUREMENT

### 6.1. Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

#### 6.2. Test Set-up



Note: Measurement setup for testing on Antenna connector

#### 6.3. Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCD-MA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

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#### 6.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communi- cation Analyer	Anritsu	MT8820C	6201107337	2018/06/15	2019/06/14
Radio Communi- cation Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
DC Power Supply	DHA	DPS-3003	9411005787	2018/08/14	2019/08/13
Attenuator	Marvelous	MVE2213-10	RF31	2017/12/26	2018/12/25
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25
Coaxial Cables	Woken	00100A1F1A185C	RF231	2017/12/26	2018/12/25

#### 6.5. Measurement Result

#### **RF Conducted Output Power**

#### GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	824.2	128	32.49	32.49	38.50	-6.01
GSM 836.6	836.6	190	32.64	32.64	38.50	-5.86
	848.8	251	32.79	32.79	38.50	-5.71
	1850.2	512	29.16	29.16	33.00	-3.84
GSM 1900	1880.0	661	28.99	28.99	33.00	-4.01
	1909.8	810	29.14	29.14	33.00	-3.86

#### GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

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EUT Mode	Frequency (MHz)	СН	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)	Average Burst Power (1DN 3UP) Class 12 (dBm)	Average Burst Power (1DN 4UP) Class 12 (dBm)
	824.2	128	32.49	30.17	28.24	26.85
GPRS 850	836.6	190	32.64	29.97	28.33	26.94
	848.8	251	32.79	30.38	28.41	27.03
	1850.2	512	29.16	27.00	25.12	24.12
GPRS 1900	1880.0	661	28.99	26.79	25.09	24.04
1700	1909.8	810	29.14	26.89	24.94	23.95

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#### WCDMA MODE:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

#### **Results:**

WCDMA/HSUPA/HSDPA

Band V Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	826.4	4132	23.08	23.08	38.50	-15.42
WCDMA	836.6	4183	22.94	22.94	38.50	-15.56
	846.6	4233	23.11	23.11	38.50	-15.39
	826.4	4132	22.35	22.35	38.50	-16.15
HSDPA	836.6	4183	22.19	22.19	38.50	-16.31
	846.6	4233	22.28	22.28	38.50	-16.22
	826.4	4132	22.28	22.28	38.50	-16.22
HSUPA	836.6	4183	22.15	22.15	38.50	-16.35
	846.6	4233	22.15	22.15	38.50	-16.35

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# LTE Result: FDD Band 5

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				824.7	20407	22.95
			0	836.5	20525	22.92
				848.3	20643	23.17
				824.7	20407	23.05
		1 RB	2	836.5	20525	23.18
				848.3	20643	23.30
				824.7	20407	23.07
			5	836.5	20525	23.01
				848.3	20643	23.31
			_	824.7	20407	23.07
	QPSK		0	836.5	20525	23.12
				848.3	20643	23.33
				824.7	20407	23.23
		3 RB	2	836.5	20525	23.16
				848.3	20643	23.35
				824.7	20407	23.28
			3	836.5	20525	23.19
				848.3	20643	23.32
				824.7	20407	22.21
		6F	RB	836.5	20525	22.12
1.4				848.3	20643	22.21
			0	824.7	20407	22.17
				836.5	20525	22.26
				848.3	20643	21.65
				824.7	20407	21.83
		1 RB	2	836.5	20525	22.10
				848.3	20643	22.22
				824.7	20407	22.22
			5	836.5	20525	21.50
				848.3	20643	21.66
				824.7	20407	21.84
	16-QAM		0	836.5	20525	22.18
				848.3	20643	22.26
				824.7	20407	22.32
		3 RB	2	836.5	20525	22.13
				848.3	20643	22.19
				824.7	20407	22.31
			3	836.5	20525	22.23
				848.3	20643	22.25
				824.7	20407	20.99
		6F	RB	836.5	20525	20.80
				848.3	20643	20.91

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BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				825.5	20415	22.88
			0	836.5	20525	22.62
				847.5	20635	23.12
				825.5	20415	23.04
		1 RB	7	836.5	20525	23.01
				847.5	20635	23.22
				825.5	20415	22.77
			14	836.5	20525	22.82
				847.5	20635	23.35
				825.5	20415	22.22
	QPSK		0	836.5	20525	22.30
				847.5	20635	22.38
				825.5	20415	22.22
		8 RB	4	836.5	20525	22.22
				847.5	20635	22.26
			7	825.5	20415	22.18
				836.5	20525	22.20
				847.5	20635	22.35
				825.5	20415	22.22
		15	RB	836.5	20525	22.19
3				847.5	20635	22.35
Ŭ			0	825.5	20415	22.50
				836.5	20525	21.87
				847.5	20635	22.40
			7	825.5	20415	22.31
		1 RB		836.5	20525	21.87
				847.5	20635	21.99
				825.5	20415	21.76
			14	836.5	20525	21.43
				847.5	20635	21.83
				825.5	20415	21.24
	16-QAM		0	836.5	20525	21.01
				847.5	20635	21.43
				825.5	20415	21.09
		8 RB	4	836.5	20525	20.97
				847.5	20635	21.21
				825.5	20415	21.15
			7	836.5	20525	20.99
				847.5	20635	21.34
			I		20415	20.94
		15	RB	836.5	20525	20.98
				847.5	20635	21.06

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BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				826.5	20425	22.75
			0	836.5	20525	22.63
				846.5	20625	22.80
				826.5	20425	23.14
		1 RB	12	836.5	20525	23.32
				846.5	20625	23.57
				826.5	20425	22.77
			24	836.5	20525	22.78
				846.5	20625	23.11
				826.5	20425	22.17
	QPSK		0	836.5	20525	22.18
				846.5	20625	22.18
			6	826.5	20425	22.26
		12 RB		836.5	20525	22.25
				846.5	20625	22.39
			13	826.5	20425	22.13
				836.5	20525	22.21
				846.5	20625	22.34
				826.5	20425	22.20
		25	RB	836.5	20525	22.24
5			-	846.5	20625	22.28
C C			0	826.5	20425	21.73
				836.5	20525	22.01
				846.5	20625	21.54
			12	826.5	20425	21.47
		1 RB		836.5	20525	22.24
				846.5	20625	22.64
				826.5	20425	21.52
			24	836.5	20525	21.90
				846.5	20625	21.78
				826.5	20425	21.15
	16-QAM		0	836.5	20525	20.99
				846.5	20625	21.31
				826.5	20425	21.03
		12 RB	6	836.5	20525	21.33
				846.5	20625	21.23
				826.5	20425	21.06
			13	836.5	20525	21.13
				846.5	20625	21.33
		·		826.5	20425	21.03
		25	RB	836.5	20525	21.06
				846.5	20625	21.16

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BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				829	20450	22.77
			0	836.5	20525	23.01
				844	20600	22.92
				829	20450	23.24
		1 RB	25	836.5	20525	23.62
				844	20600	23.45
				829	20450	23.06
			49	836.5	20525	22.74
				844	20600	22.98
				829	20450	22.23
	QPSK		0	836.5	20525	22.28
				844	20600	22.25
				829	20450	22.21
		25 RB	12	836.5	20525	22.29
				844	20600	22.29
			25	829	20450	22.28
			25	836.5	20525	22.23
				844	20600	22.27
		50		829	20450	22.27
		50	RB	836.5	20525	22.32
10				844	20600	22.32
			0	829	20450	21.85
				836.5	20525	21.87
				844 829	20600 20450	22.21 21.86
		1 RB	25	836.5		21.00
		TIND	25	844	20525 20600	22.09
				829	20000	22.30
			49	836.5	20430	21.75
			10	844	20525	22.31
				829	20000	21.10
	16-QAM		0	836.5	20525	21.35
				844	20600	21.42
				829	20450	21.32
		25 RB	12	836.5	20525	21.29
				844	20600	21.29
				829	20450	21.11
			25	836.5	20525	21.28
				844	20600	21.16
				829	20450	21.19
		500	RB	836.5	20525	21.26
				844	20600	21.30



#### FDD Band 12

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				699.7	23017	22.78
			0	707.5	23095	23.02
				715.3	23173	22.91
				699.7	23017	23.07
		1 RB	2	707.5	23095	23.05
				715.3	23173	23.00
			-	699.7	23017	22.82
			5	707.5	23095	23.04
				715.3	23173	23.12
	QPSK		0	699.7 707.5	23017 23095	22.96 22.99
QFSK	QI OIX		0	715.3	23095	23.03
				699.7	23017	23.03
		3 RB	2	707.5	23095	23.04
		0 NB		715.3	23173	23.16
				699.7	23017	23.13
		3	707.5	23095	23.26	
				715.3	23173	23.15
				699.7	23017	22.09
		6F	RB	707.5	23095	22.21
1.4				715.3	23173	22.02
1.4			0	699.7	23017	22.02
				707.5	23095	22.14
				715.3	23173	21.51
			2	699.7	23017	22.22
		1 RB		707.5	23095	21.72
				715.3	23173	22.10
			_	699.7	23017	21.85
			5	707.5	23095	22.12
				715.3	23173	21.74
	10.0014		0	699.7	23017	21.96
	16-QAM		0	707.5	23095	21.90
				715.3	23173	21.63
		3 RB	2	699.7	23017	22.05
		JKD	2	707.5	23095	22.03
				715.3 699.7	23173 23017	22.01 21.71
			3	707.5	23017	21.71
				715.3	23095	22.30
				699.7	23017	20.98
		6RB		707.5	23095	21.06
		•			23173	20.67

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u></u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction form exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or ap-pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. <u>SGS Taiwan Ltd.</u> <u>No.134.WuKungRoad.NewTaipeif/dustrialPark WukuDistrict NewTaipeifCity.Taiwan24803/新 the 5. Big M </u>

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BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				700.5	23025	22.89
			0	707.5	23095	22.82
				714.5	23165	22.81
				700.5	23025	23.03
		1 RB	7	707.5	23095	23.17
				714.5	23165	23.08
				700.5	23025	22.94
			14	707.5	23095	22.64
				714.5	23165	23.19
				700.5	23025	22.15
	QPSK		0	707.5	23095	22.08
				714.5	23165	22.15
				700.5	23025	22.12
		8 RB	4	707.5	23095	22.08
				714.5	23165	22.04
			7	700.5	23025	22.03
				707.5	23095	22.19
				714.5	23165	22.07
			(500		23025	22.03
		15RB		707.5	23095	22.13
3				714.5	23165	22.06
· ·			0	700.5	23025	21.62
				707.5	23095	22.09
				714.5	23165	21.49
				700.5	23025	22.02
		1 RB	7	707.5	23095	21.65
				714.5	23165	21.78
				700.5	23025	21.52
			14	707.5	23095	21.59
				714.5	23165	21.90
				700.5	23025	21.14
	16-QAM		0	707.5	23095	21.17
				714.5	23165	20.81
				700.5	23025	21.21
		8 RB	4	707.5	23095	21.19
				714.5	23165	20.70
				700.5	23025	21.19
		7	707.5	23095	21.16	
				714.5	23165	20.97
				700.5	23025	21.02
		15	RB	707.5	23095	20.87
<u> </u>				714.5	23165	20.77



5 0	BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
5         713.5         23155         22.75           1 RB         12         701.5         23035         23.31           12         707.5         23095         23.00           701.5         23035         22.34           701.5         23035         22.74           701.5         23035         22.76           701.5         23035         22.05           701.5         23035         22.06           701.5         23035         22.06           701.5         23035         22.01           701.5         23035         22.06           701.5         23035         22.06           701.5         23035         22.06           701.5         23035         22.06           701.5         23035         22.06           701.5         23035         22.12           701.5         23035         22.10           701.5         23035         22.00           701.5         23035         22.03           701.5         23035         21.9           701.5         23035         21.9           701.5         23035         21.9           701.5 <td></td> <td></td> <td></td> <td></td> <td>701.5</td> <td>23035</td> <td>22.70</td>					701.5	23035	22.70
5         1 RB         12         701.5         23035         23.31           1 RB         12         707.5         23095         23.00           701.5         23035         22.90         701.5         23035         22.90           24         707.5         23095         22.74         701.5         23035         22.90           701.5         23035         22.05         701.5         23035         22.05         701.5         23035         22.05           701.5         23035         22.05         701.5         23035         22.05         701.5         23035         22.05         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         22.05         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         22.12         701.5         23035         21.03         701.5         23035         21.03         701.5         23035         21.03         701.5         23035         21.03         701.5				0	707.5	23095	22.99
5         1 RB         12         707.5         23095         23.00           713.5         23155         23.44           701.5         23095         22.90           24         707.5         23095         22.74           713.5         23155         22.76           701.5         23035         22.05           707.5         23035         22.05           701.5         23035         22.06           701.5         23035         22.12           701.5         23035         22.12           701.5         23035         22.12           701.5         23035         22.12           701.5         23035         22.16           701.5         23035         22.16           701.5         23035         21.98           701.5         23035         21.98           701.5         23035         21.98           701.5         23035         21.99           701.5         23035         21.91           701.5         23035         21.92           701.5         23035         21.92           701.5         23035         21.94           701.5<					713.5	23155	22.75
5         713.5         23155         23.44           701.5         23035         22.90           24         701.5         23035         22.76           701.5         23095         22.74         713.5         23155         22.76           701.5         23095         22.05         701.5         23095         22.06           713.5         23155         22.06         713.5         23155         22.12           701.5         23095         22.16         707.5         23095         22.10           701.5         23035         22.12         701.5         23035         22.12           701.5         23035         22.10         701.5         23035         22.10           701.5         23035         22.10         701.5         23035         22.10           701.5         23035         22.10         701.5         23035         22.10           701.5         23035         22.10         701.5         23035         22.10           701.5         23035         21.94         701.5         23035         21.92           13         701.5         23035         21.92         701.5         23035         22.37					701.5	23035	23.31
OPSK         701.5         23035         22.90           0         707.5         23095         22.74           713.5         23155         22.06           701.5         23035         22.06           707.5         23095         22.06           701.5         23035         22.06           707.5         23095         22.16           713.5         23155         22.01           707.5         23095         22.16           701.5         23035         22.20           701.5         23035         22.12           707.5         23095         22.06           701.5         23035         21.98           13         707.5         23095         22.00           701.5         23035         21.99           707.5         23095         22.00           701.5         23035         21.99           707.5         23095         22.00           701.5         23035         21.99           701.5         23035         21.09           701.5         23035         21.02           701.5         23035         21.02           701.5         230			1 RB	12	707.5	23095	23.00
Second State         24         707.5         23095         22.74           713.5         23155         22.76         701.5         23095         22.06           701.5         23095         22.01         701.5         23095         22.01           701.5         23095         22.01         701.5         23095         22.01           701.5         23095         22.01         701.5         23095         22.12           701.5         23095         22.01         701.5         23095         22.02           701.5         23095         22.03         713.5         23155         22.00           701.5         23095         22.03         713.5         23155         22.00           701.5         23095         21.99         707.5         23095         21.99           25RB         707.5         23095         21.04         713.5         23155         22.00           701.5         23035         21.99         701.5         23035         21.99           701.5         23035         21.39         701.5         23035         21.70           713.5         23155         2305         21.37         713.5         23155 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>23.44</td></td<>							23.44
OPSK         713.5         23155         22.76           0         701.5         23035         22.05           701.5         23095         22.01           713.5         23155         22.01           701.5         23095         22.12           701.5         23095         22.12           701.5         23095         22.12           701.5         23095         22.12           701.5         23095         22.10           701.5         23095         22.10           701.5         23095         22.10           701.5         23095         22.10           701.5         23095         21.94           701.5         23095         21.94           701.5         23035         21.99           707.5         23095         21.94           701.5         23035         21.94           701.5         23035         21.94           701.5         23035         21.99           701.5         23035         21.08           701.5         23035         21.08           701.5         23035         21.91           701.5         23035							
QPSK         0         701.5         23035         22.05           12 RB         0         707.5         23095         22.06           713.5         23155         22.01         701.5         23035         22.12           701.5         23035         22.12         701.5         23035         22.12           701.5         23035         22.16         707.5         23095         22.03           713.5         23155         22.03         713.5         23155         22.03           701.5         23035         21.98         701.5         23035         21.98           13         707.5         23095         22.03         713.5         23155         22.00           701.5         23035         21.99         701.5         23035         21.99           25RB         701.5         23035         21.94         701.5         23035         21.94           701.5         23035         21.94         701.5         23035         22.16           1 RB         12         701.5         23035         22.19         701.5         23035         22.23           701.5         23035         21.94         707.5         23095				24			
QPSK         0         707.5         23095         22.06           713.5         23155         22.01         713.5         23155         22.01           12 RB         6         707.5         23095         22.12         707.5         23095         22.12           713.5         23155         22.00         713.5         23155         22.00           713.5         23095         22.03         713.5         23095         22.03           701.5         23095         22.03         713.5         23095         22.03           707.5         23095         22.03         713.5         23155         22.00           25RB         701.5         23035         21.94         713.5         23155         22.00           701.5         23035         21.94         713.5         23155         22.00           701.5         23035         21.94         713.5         23055         21.94           701.5         23035         21.94         713.5         23155         22.23           701.5         23035         21.02         713.5         23055         21.70           713.5         23155         22.13         707.5         23095							
5         713.5         23155         22.01           12 RB         6         701.5         23035         22.12           701.5         23095         22.16         713.5         23155         22.20           13         701.5         23035         21.98         701.5         23095         22.10           701.5         23035         21.98         701.5         23035         22.10           701.5         23035         22.10         701.5         23035         22.10           713.5         23155         22.03         713.5         23035         21.99           25RB         701.5         23035         21.99         707.5         23095         21.94           713.5         23155         22.00         713.5         23155         22.00           701.5         23035         21.94         701.5         23035         21.68           1 RB         12         707.5         23095         22.10         713.5         23155         22.46           16-QAM         1         RB         12         701.5         23035         21.02         707.5         23095         21.02           16-QAM         1         RB <td></td> <td>0001</td> <td></td> <td>0</td> <td></td> <td></td> <td></td>		0001		0			
5         701.5         23035         22.12           12 RB         6         707.5         23095         22.16           713.5         23155         22.20         701.5         23035         21.98           13         707.5         23095         22.10         701.5         23035         21.98           701.5         23035         22.10         701.5         23035         22.10           701.5         23035         22.10         701.5         23035         22.10           701.5         23035         21.99         701.5         23035         21.99           25RB         701.5         23035         21.94         713.5         23155         22.00           701.5         23035         21.94         713.5         23155         22.00         2005         21.94           701.5         23035         21.94         701.5         23035         21.68         701.5         23035         22.46           1 RB         12 RB         1 RB         12         701.5         23035         21.02           701.5         23035         21.02         707.5         23095         21.02           701.5         23035		QPSK		0			
12 RB         6         707.5         23095         22.16           713.5         23155         22.20           13         707.5         23095         22.03           701.5         23095         22.03         701.5         23095         22.03           713.5         23155         22.00         701.5         23095         22.03           713.5         23155         22.10         701.5         23095         21.98           707.5         23095         21.99         707.5         23095         21.99           701.5         23035         21.99         707.5         23095         21.99           707.5         23095         21.99         707.5         23095         21.99           701.5         23035         21.98         707.5         23095         21.70           713.5         23155         21.39         701.5         23035         22.46           707.5         23095         21.79         701.5         23035         21.99           701.5         23035         21.02         707.5         23095         21.91           713.5         23155         21.37         701.5         23035         21.02							
5         713.5         23155         22.20           13         701.5         23035         21.98           13         707.5         23095         22.03           713.5         23155         22.10           701.5         23035         21.98           707.5         23095         22.03           713.5         23155         22.10           701.5         23035         21.99           701.5         23035         21.94           701.5         23035         21.94           713.5         23155         22.00           701.5         23035         21.94           713.5         23155         22.00           701.5         23035         21.68           701.5         23035         21.68           701.5         23035         21.70           713.5         23155         21.39           701.5         23035         22.49           701.5         23035         21.99           713.5         23155         21.37           701.5         23035         21.02           701.5         23035         21.02           701.5         23035			40.00	0			
5         701.5         23035         21.98           13         707.5         23095         22.03           713.5         23155         22.10           707.5         23095         21.99           25RB         707.5         23095         21.94           713.5         23155         22.00         713.5         23095         21.94           707.5         23095         21.94         713.5         23035         21.94           707.5         23095         21.94         713.5         23155         22.00           701.5         23035         21.68         707.5         23095         21.70           713.5         23155         21.39         701.5         23035         22.46           707.5         23095         22.23         713.5         23155         21.70           713.5         23155         21.39         701.5         23035         21.02           24         707.5         23095         21.70         713.5         23155         21.37           713.5         23155         21.39         701.5         23035         21.02           16-QAM         12 RB         6         701.5			12 RB	6			
13         707.5         23095         22.03           713.5         23155         22.10           713.5         23035         21.99           25RB         707.5         23095         21.94           713.5         23155         22.00           707.5         23095         21.94           713.5         23155         22.00           707.5         23095         21.94           713.5         23155         22.00           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         21.68           707.5         23095         22.23           713.5         23155         22.46           707.5         23095         21.79           701.5         23035         21.02           707.5         23095         21.02           707.5         23035         21.02           701.5         23035 <td< td=""><td></td><td></td><td rowspan="2"></td><td></td><td></td><td></td><td></td></td<>							
5         713.5         23155         22.10           25RB         701.5         23035         21.99           707.5         23095         21.94           713.5         23155         22.00           707.5         23095         21.94           713.5         23155         22.00           707.5         23095         21.94           713.5         23155         22.00           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         22.46           707.5         23095         22.23           713.5         23155         22.49           701.5         23035         21.59           24         707.5         23095         21.79           713.5         23155         21.37           701.5         23035         21.02           707.5         23095         21.02           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.03           701.5         230				10			
5         701.5         23035         21.99           5         707.5         23095         21.94           713.5         23155         22.00           701.5         23035         21.94           713.5         23155         22.00           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         22.46           701.5         23035         22.46           701.5         23035         22.46           701.5         23035         21.59           24         707.5         23095         22.23           713.5         23155         21.39           24         707.5         23095         21.79           713.5         23155         21.37           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.03           701.5         23035         21.03           701.5         23035         21.02           13				13			
5         25RB         707.5         23095         21.94           713.5         23155         22.00           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         22.46           707.5         23095         22.23           713.5         23155         22.49           701.5         23035         21.59           24         707.5         23095         21.79           713.5         23155         21.37           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.03           701.5         23035         21.03           701.5         23035         21.02           12 RB         6         707.5         23095         21.02      <							
5         713.5         23155         22.00           701.5         23035         21.68           707.5         23095         21.70           713.5         23155         21.39           701.5         23035         22.46           701.5         23035         22.46           701.5         23035         22.23           713.5         23155         22.49           707.5         23095         22.23           713.5         23155         22.49           707.5         23095         21.79           713.5         23155         22.49           707.5         23095         21.79           713.5         23155         21.37           707.5         23095         21.02           707.5         23095         21.02           707.5         23035         21.02           701.5         23035         20.93           713.5         23155         20.85           701.5         23035         21.02           707.5         23095         21.06           713.5         23155         21.12           707.5         23035         20.92			25RB				
5         701.5         23035         21.68           0         707.5         23095         21.70           713.5         23155         21.39           701.5         23035         22.46           707.5         23095         22.23           713.5         23155         22.49           701.5         23035         22.49           707.5         23095         22.23           713.5         23155         22.49           701.5         23035         21.59           24         707.5         23095         21.79           713.5         23155         21.37           701.5         23035         21.02           707.5         23095         20.93           713.5         23155         20.85           701.5         23035         21.02           701.5         23035         21.02           701.5         23035         21.03           713.5         23155         21.03           701.5         23035         21.02           12 RB         6         707.5         23035         21.02           13         701.5         23035         20.91 <td></td> <td></td> <td></td> <td></td> <td></td>							
1 RB         0         707.5         23095         21.70           713.5         23155         21.39           701.5         23035         22.46           707.5         23095         22.23           701.5         23035         22.46           707.5         23095         22.23           713.5         23155         22.49           707.5         23095         22.23           713.5         23155         22.49           707.5         23095         21.79           713.5         23155         21.37           701.5         23035         21.02           701.5         23035         21.02           707.5         23095         20.93           713.5         23155         20.85           713.5         23035         21.02           701.5         23035         21.03           713.5         23155         21.12           701.5         23035         21.02           13         707.5         23095         20.91           713.5         23155         21.03         20.92           13         707.5         23035         20.91	5						
1 RB         713.5         23155         21.39           1 RB         12         701.5         23035         22.46           707.5         23095         22.23         713.5         23155         22.49           713.5         23155         22.49         713.5         23035         21.59           24         707.5         23095         21.79         713.5         23155         21.37           701.5         23035         21.79         713.5         23155         21.37           701.5         23035         21.02         701.5         23035         21.02           701.5         23035         21.02         701.5         23035         21.02           16-QAM         0         707.5         23095         20.93           112 RB         0         701.5         23035         21.02           701.5         23035         21.03         713.5         23155         21.03           12 RB         6         707.5         23095         20.91         713.5         23035         20.92           13         707.5         23095         20.91         713.5         23055         21.03           701.5         230				0			
1 RB         12         701.5         23035         22.46           707.5         23095         22.23           713.5         23155         22.49           701.5         23035         21.59           24         707.5         23095         21.79           713.5         23155         21.79           713.5         23155         21.37           707.5         23095         21.79           713.5         23155         21.37           707.5         23035         21.02           707.5         23095         20.93           713.5         23155         20.93           713.5         23155         20.93           713.5         23095         20.93           713.5         23035         21.02           707.5         23095         21.03           713.5         23155         21.03           707.5         23095         21.04           13         707.5         23035         20.91           713.5         23155         21.03           701.5         23035         20.91           713.5         23035         21.03           701.5							
1 RB         12         707.5         23095         22.23           713.5         23155         22.49           701.5         23095         21.59           24         707.5         23095         21.79           713.5         23155         21.37           713.5         23035         21.02           701.5         23035         21.02           713.5         23155         21.37           701.5         23035         21.02           701.5         23095         20.93           713.5         23155         20.85           701.5         23035         21.02           701.5         23035         21.03           713.5         23155         21.03           701.5         23035         21.02           12 RB         6         707.5         23095         21.06           713.5         23155         21.12         701.5         23035         20.91           13         707.5         23095         20.91         713.5         23155         21.03           25RB         701.5         23095         21.02         701.5         23095         21.02 <td></td> <td></td> <td></td> <td rowspan="3">12</td> <td></td> <td></td> <td></td>				12			
16-QAM         0         713.5         23155         22.49           16-QAM         0         701.5         23035         21.59           12 RB         0         701.5         23035         21.02           13         701.5         23035         21.02           13         701.5         23035         21.02           13         701.5         23035         21.02           13         701.5         23035         21.02           13         701.5         23035         21.03           713.5         23155         20.85         20.93           713.5         23035         21.03         21.03           701.5         23035         21.03         21.03           701.5         23035         21.03         21.03           701.5         23035         20.92         21.04           13         707.5         23095         20.91           713.5         23155         21.03         701.5           25RB         701.5         23035         21.02			1 00				
16-QAM         701.5         23035         21.59           16-QAM         0         707.5         23095         21.79           713.5         23155         21.37           701.5         23035         21.02           713.5         23095         20.93           701.5         23095         20.93           713.5         23155         20.85           701.5         23035         21.02           707.5         23095         20.93           713.5         23155         20.85           701.5         23035         21.03           701.5         23035         21.02           701.5         23035         21.03           701.5         23035         21.03           707.5         23095         21.03           701.5         23035         20.92           13         707.5         23095         20.91           713.5         23155         21.03           701.5         23035         21.03           701.5         23035         21.03           701.5         23035         21.03           701.5         23035         21.02			IKD				
16-QAM         24         707.5         23095         21.79           16-QAM         0         701.5         23035         21.02           12 RB         0         707.5         23095         20.93           701.5         23035         21.02         701.5         23095         20.93           12 RB         6         707.5         23095         21.02           701.5         23035         21.03         713.5         23155         20.85           12 RB         6         707.5         23095         21.03           701.5         23035         21.03         713.5         23155         21.03           13         707.5         23035         20.92         713.5         23035         20.92           13         707.5         23095         20.91         713.5         23155         21.03           25RB         701.5         23035         21.02         701.5         23095         21.02							
16-QAM         713.5         23155         21.37           16-QAM         0         701.5         23035         21.02           12 RB         0         707.5         23095         20.93           713.5         23155         20.85         713.5         23035         21.02           12 RB         6         707.5         23095         21.03           701.5         23035         21.03         713.5         23155         21.03           12 RB         6         707.5         23095         21.06           713.5         23155         21.12         713.5         23155         21.12           13         707.5         23035         20.92         713.5         23035         20.92           13         707.5         23095         20.91         713.5         23155         21.03           25RB         701.5         23035         21.02         701.5         23095         21.02				24			
16-QAM         0         701.5         23035         21.02           12 RB         0         707.5         23095         20.93           12 RB         6         701.5         23035         21.02           13         701.5         23095         20.93           713.5         23155         20.85           701.5         23095         21.03           707.5         23095         21.03           707.5         23095         21.06           713.5         23155         21.12           701.5         23035         20.92           13         701.5         23095         20.91           713.5         23155         21.03           701.5         23035         21.03           707.5         23095         20.91           713.5         23155         21.03           701.5         23035         21.03           701.5         23035         21.03           701.5         23035         21.02				24			
16-QAM         0         707.5         23095         20.93           12 RB         6         701.5         23035         21.03           12 RB         6         707.5         23095         21.03           13         707.5         23095         21.06           713.5         23155         21.12           13         701.5         23035         20.92           13         707.5         23095         20.91           713.5         23155         21.03           707.5         23095         20.92           13         707.5         23095         20.91           713.5         23155         21.03           701.5         23035         21.03           707.5         23095         21.03           701.5         23035         21.03           701.5         23035         21.19           25RB         707.5         23095         21.02							
713.5         23155         20.85           12 RB         6         701.5         23035         21.03           713.5         23095         21.06         713.5         23155         21.12           13         701.5         23035         20.92         13           701.5         23035         20.92         13         701.5         23095         20.91           13         707.5         23095         20.91         713.5         23155         21.03           25RB         701.5         23035         21.02         21.02         10		16-OAM		0			
12 RB         6         701.5         23035         21.03           12 RB         6         707.5         23095         21.06           713.5         23155         21.12           713.5         23035         20.92           13         707.5         23095         20.92           13         707.5         23095         20.91           713.5         23155         21.03           701.5         23035         20.91           713.5         23155         21.03           701.5         23035         21.03           701.5         23035         21.03           701.5         23035         21.03           25RB         707.5         23095         21.02		10-02/101		0			
12 RB         6         707.5         23095         21.06           713.5         23155         21.12           701.5         23035         20.92           13         707.5         23095         20.91           713.5         23155         21.03           707.5         23095         20.91           713.5         23155         21.03           701.5         23035         21.19           25RB         707.5         23095         21.02							
713.5         23155         21.12           13         701.5         23035         20.92           13         707.5         23095         20.91           713.5         23155         21.03           707.5         23035         20.91           713.5         23155         21.03           701.5         23035         21.19           25RB         707.5         23095         21.02			12 RB	6			
701.5         23035         20.92           13         707.5         23095         20.91           713.5         23155         21.03           25RB         707.5         23095         21.19				Ŭ			
13         707.5         23095         20.91           713.5         23155         21.03           701.5         23035         21.19           25RB         707.5         23095         21.02							
713.5         23155         21.03           701.5         23035         21.19           25RB         707.5         23095         21.02				13			
701.5         23035         21.19           25RB         707.5         23095         21.02							
25RB 707.5 23095 21.02							
			25	RB			
			_0		713.5	23155	21.02



BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				704	23060	22.58
			0	707.5	23095	22.66
				711	23130	22.99
				704	23060	23.19
		1 RB	25	707.5	23095	22.97
				711	23130	23.46
				704	23060	22.73
			49	707.5	23095	22.73
				711	23130	22.99
				704	23060	21.94
	QPSK		0	707.5	23095	22.03
				711	23130	21.98
				704	23060	21.97
		25 RB	12	707.5	23095	21.98
				711	23130	22.02
			25	704	23060	21.98
				707.5	23095	22.03
				711	23130	22.06
				704	23060	22.02
		50RB		707.5	23095	22.03
10				711	23130	22.32
10			0	704	23060	21.77
				707.5	23095	21.49
				711	23130	22.20
				704	23060	21.75
		1 RB	25	707.5	23095	22.00
				711	23130	22.23
				704	23060	21.71
			49	707.5	23095	21.69
				711	23130	21.96
				704	23060	21.03
	16-QAM		0	707.5	23095	21.08
				711	23130	21.12
				704	23060	20.91
		25 RB	12	707.5	23095	20.93
				711	23130	21.40
				704	23060	21.13
			25	707.5	23095	21.00
				711	23130	20.89
				704	23060	20.87
		50	RB	707.5	23095	20.80
				711	23130	20.85



#### FDD Band 17

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				706.5	23755	23.08
			0	710	23790	22.59
				713.5	23825	22.40
				706.5	23755	23.51
		1 RB	12	710	23790	23.13
			-	713.5	23825	23.43
			0.4	706.5	23755	22.59
			24	710	23790	22.74
				713.5	23825	23.53
	QPSK		0	706.5 710	23755	22.03
	QFSK		0	710	23790	21.78
				713.5	23825 23755	21.84 22.36
		12 RB	6	700.5	23790	22.01
		12110	Ũ	713.5	23825	22.24
			13	706.5	23755	22.08
				710	23790	22.06
				713.5	23825	22.33
			l	706.5	23755	22.14
		25	RB	710	23790	21.82
_				713.5	23825	22.12
5			0	706.5	23755	22.01
				710	23790	21.84
		1 RB		713.5	23825	21.37
			12	706.5	23755	22.86
				710	23790	22.38
				713.5	23825	22.62
				706.5	23755	21.39
			24	710	23790	22.28
				713.5	23825	22.77
				706.5	23755	21.00
	16-QAM		0	710	23790	21.07
				713.5	23825	21.01
				706.5	23755	21.09
		12 RB	6	710	23790	21.25
				713.5	23825	21.19
				706.5	23755	20.96
			13	710	23790	21.11
				713.5	23825	21.13
				706.5	23755	21.23
		25	RB	710	23790	21.24
				713.5	23825	21.13

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BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)
				709	23780	22.96
			0	710	23790	22.68
				711	23800	22.40
				709	23780	23.58
		1 RB	25	710	23790	23.23
				711	23800	23.14
				709	23780	22.89
			49	710	23790	22.94
				711	23800	23.45
				709	23780	22.20
	QPSK		0	710	23790	21.90
				711	23800	21.73
				709	23780	22.38
		25 RB	12	710	23790	22.06
				711	23800	21.98
			25	709	23780	22.14
				710	23790	22.11
				711	23800	22.13
				709	23780	22.14
		50	RB	710	23790	21.96
10				711	23800	21.79
10				709	23780	22.11
			0	710	23790	21.74
				711	23800	21.30
			25	709	23780	22.31
		1 RB		710	23790	22.75
				711	23800	22.65
				709	23780	22.00
			49	710	23790	22.38
				711	23800	22.88
				709	23780	21.34
	16-QAM		0	710	23790	21.23
				711	23800	21.07
				709	23780	21.24
		25 RB	12	710	23790	21.29
				711	23800	21.49
				709	23780	21.02
			25	710	23790	21.41
				711	23800	21.56
				709	23780	21.25
		50	RB	710	23790	21.20
				710	23800	21.45



#### **HSDPA Release 6 MODE:**

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing.

#### **HSDPA SUB-TEST Setting**

Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	βc	βd	β₀ (SF)	βc/βd	βнs (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

#### **Results:**

Mode	Sub test	Av	g. Power (dE Channel	3m)	Power Class 3 Limitation (dBm)	Comments
	1031	4132.00	4183.00	4233.00		
	1	22.35	22.19	22.28	20.3dBm – 25.7dBm	Pass
HSDPA V	2	21.99	21.82	21.91	20.3dBm – 25.7dBm	Pass
	3	21.79	21.62	21.71	19.8dBm – 25.7dBm	Pass
	4	21.80	21.62	21.71	19.8dBm – 25.7dBm	Pass

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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#### HSPA (HSDPA & HSUPA) Release 6 MODE

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing **HSPA SUB-TEST Setting** 

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub- test	βc	βa	β <sub>d</sub> (SF)	βс∕βа	βнs	ßec	βed	β <sub>ed</sub> (SF)	β <sub>ed</sub> (Code s)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps )
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/22 5	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	β <sub>ed</sub> 1: 47/15 β <sub>ed</sub> 2: 47/15		2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.

#### **Results:**

Mode	Sub test	Av	rg. Power (dB Channel	m)	Power Class 3 Limitation (dBm)	Comments	
	1051	4132.00	4183.00	4233.00			
	1	22.28	22.15	22.15	18.8dBm – 25.7dBm	Pass	
	2	20.28	20.13	20.13	16.8dBm – 25.7dBm	Pass	
HSUPA V	3	21.25	21.15	21.22	17.8dBm – 25.7dBm	Pass	
	4	20.24	20.14	20.20	16.8dBm – 25.7dBm	Pass	
	5	22.20	22.10	22.20	18.8dBm – 25.7dBm	Pass	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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### **Minimum Communications Power Measurement**

#### PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.84	27.65	25.6	23.68	21.67	19.54	17.53	15.62	13.49
								_	
PCL	9	10	11	12	13	14	15		
Output power (dBm)	11.42	9.29	7.44	5.28	3.47	1.22	-0.21		

Note: The EUT output power was controlled by simulator. Set Communication Tester MT8820C PCL as above, and get the mobile phone output power reading.

#### WCDMA/HSDPA/HSUPA band V

The EUT output power was controlled by simulator. Set Communication Tester MT8820C function key "UE Power Control" and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. Then record the read (see page 15 for measurement data). The min. power was measures by a function key "minimum power" then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



# 7. EFFECTIVE RADIATED POWER AND EQUIVALENT ISOTROPIC RADIATED POWER MEASUREMENT

#### 7.1. Standard Applicable

According to FCC §2.1046

FCC 22.913(a) Mobile station is limited to 7W ERP.

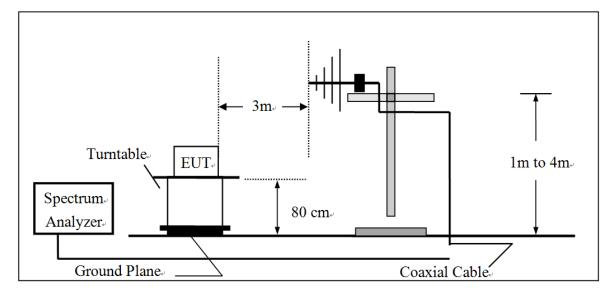
FCC 24.232(b) Mobile and portable stations are limited to 2W EIRP.

FCC 27.50(c)(10) Portable stations (hand-held devices) are limited to 3W ERP.

FCC 27, 50(h)(2) Mobile and other user stations. Mobile stations are limited to 2W EIRP

#### 7.2. Test SET-UP

(A) Radiated Power Test Set-Up, Frequency Below1000MHz



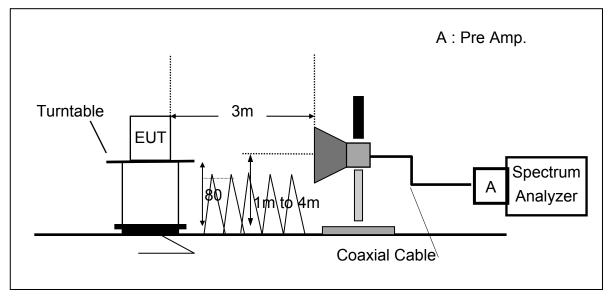
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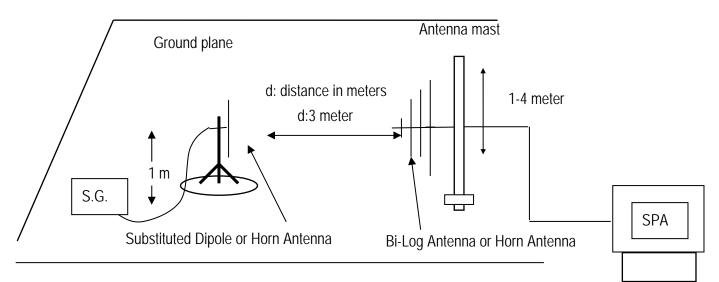
SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



#### Radiated Power Test Set-UP Frequency Over 1 GHz (B)



(C) Substituted Method Test Set-UP





#### 7.3. Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 971168 D01
- 2. The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
- 3. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated
- 4. The testing follows the Measurement Procedure of FCC KDB 971168 D01
- 5. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
- 6. ERP = S.G. output (dBm) + Antenna Gain (dBd) Cable Loss (dB)
- 7. EIRP = S.G. output (dBm) + Antenna Gain (dBi) Cable Loss (dB)
- 8. Spectrum setting:

(1) Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and VBW > =3xRBW.

(2) KDB 971168 D01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.

Set frequency = nominal signal center frequency;

Set span = 2 X occupied BW;

Set RBW ≈ 1~5% of the span, not to exceed 1 MHz

Set VBW =  $3 \times RBW$ ;

Select average power (RMS) detector

Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt integration time (ex. Point = 601 points, then sweet time =  $601*10^{-3}$  = 6s.

Activate trace averaging routine over a minimum of 10 sweeps;

Activate marker/span pair and set span = signal or channel bandwidth;

Activate the band/interval power marker function;

Record the band power level;

Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.

The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of 10\*log (TBW/RBW), where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

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#### 7.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWAZBECK	VULB9168	378	2017/12/29	2018/12/28
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2017/08/04	2019/08/03
Horn Antenna	Schwarzbeck	BBHA9170	184	2017/12/12	2018/12/11
Loop Antenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/09/25
3m Site NSA	SGS	966 chamber	N/A	2018/01/02	2019/01/01
Spectrum Analyzer	Agilent	E4446A	MY51100003	2018/05/15	2019/05/14
EMI Test Receiver	R&S	ESCI7	100335	2018/02/02	2019/02/01
Pre-Amplifier	HP	8449B	3008A00578	2018/01/02	2019/01/01
Pre-Amplifier	HP	8447D	2944A07676	2018/01/02	2019/01/01
Pre-Amplifier	EMC Instru- ments	EMC184045B	980135	2017/10/27	2018/10/26
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	2018/01/02	2019/01/01
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966_RX	9	2018/01/02	2019/01/01



	EUT	Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit	
	MHz		V/H	dBm	dBd	dB	dBm	dBm	
	924.2	100	V	19.38	3.45	-3.11	19.72	38.45	
	824.2	128	Н	17.75	3.45	-3.11	18.09	38.45	
GSM	836.6	190	V	15.94	3.45	-3.32	16.07	38.45	
850		190	Н	21.86	3.45	-3.32	21.99	38.45	
	040.0	254	V	23.48	3.46	-3.17	23.77	38.45	
	848.8	251	Н	21.23	3.46	-3.17	21.52	38.45	
	824.2	128	V	21.04	3.45	-3.11	21.38	38.45	
	024.2	120	Н	20.12	3.45	-3.11	20.46	38.45	
GPRS	836.6	100	V	20.57	3.45	-3.32	20.7	38.45	
850	030.0	190	Н	24.15	3.45	-3.32	24.28	38.45	
	040.0	251	V	25.18	3.46	-3.16	25.48	38.45	
	848.8		Н	22.97	3.46	-3.16	23.27	38.45	

## 7.5. Measurement Result: (Peak) –using option of peak measurement

Remark : (1) The RBW, VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

EUT			Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit		
	MHz		V/H	dBm	dBi	dB	dBm	dBm		
GSM 1900	1950.2	510	V	17.03	9.77	-4.66	22.14	33.00		
	1850.2	512	Н	16.76	9.77	-4.66	21.87	33.00		
	1880.0	661	V	15.61	9.86	-4.7	20.77	33.00		
		001	Н	20.19	9.86	-4.7	25.35	33.00		
	1909.8	810	V	17.8	9.94	-4.72	23.02	33.00		
			Н	19.74	9.94	-4.72	24.96	33.00		
	1950.0	540	V	20.59	9.77	-4.66	25.7	33.00		
	1850.2	512	Н	21.97	9.77	-4.66	27.08	33.00		
GPRS	1000.0	664	V	18.89	9.86	-4.7	24.05	33.00		
1900	1880.0	661	Н	20.66	9.86	-4.7	25.82	33.00		
	1000.9	810	V	19.76	9.94	-4.72	24.98	33.00		
	1909.8		Н	21.32	9.94	-4.72	26.54	33.00		

Remark :	(1) The RBW, VBW of SPA for frequency RBW=300 KHz, VBW=1MHz
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	EUT		Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit		
	MHz		V/H	dBm	dBd	dB	dBm	dBm		
	926.4	1120	V	22.79	3.45	-3.17	23.07	38.45		
	826.4	4132	Н	21.46	3.45	-3.19	21.72	38.45		
WCDMA	836.6	4183	V	22.32	3.45	-3.31	22.46	38.45		
Band V		4105	Н	20.6	3.45	-3.31	20.74	38.45		
	846.6	4233	V	20.07	3.46	-3.34	20.19	38.45		
		7200	Н	18.9	3.46	-3.34	19.02	38.45		
	826.4	4132	V	20.67	3.45	-3.18	20.94	38.45		
			Н	18.19	3.45	-3.18	18.46	38.45		
HSDPA	836.6	4183	V	17.79	3.45	-3.3	17.94	38.45		
Band V			Н	17.31	3.45	-3.31	17.45	38.45		
	846.6	4233	V	17.2	3.46	-3.34	17.32	38.45		
	040.0	4200	Н	16.97	3.46	-3.33	17.1	38.45		
	826.4	4132	V	18.82	3.45	-3.19	19.08	38.45		
	020.4	4152	Н	17.27	3.45	-3.18	17.54	38.45		
HSUPA	836.6	4183	V	17.5	3.46	-3.34	17.62	38.45		
Band V	030.0	4183	Н	16.45	3.45	-3.31	16.59	38.45		
	846.6	4233	V	16.96	3.46	-3.32	17.1	38.45		
	0-0.0	7200	Н	16.16	3.46	-3.32	16.3	38.45		

Remark: (1)The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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	EUT		Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit		
	MHz		V/H	dBm	dBd	dB	dBm	dBm		
	824.7	20407	V	19.66	3.45	-3.17	19.94	38.45		
LTE	024.7	20407	Н	16.21	3.45	-3.17	16.49	38.45		
BAND 5 BW: 1.4M	926 E	20525	V	20.54	3.45	-3.29	20.7	38.45		
QPSK	836.5	20525	Н	16.58	3.45	-3.28	16.75	38.45		
RB: 1,0	848.3	20643	V	19.21	3.46	-3.35	19.32	38.45		
	040.3	20043	Н	15.91	3.46	-3.36	16.01	38.45		
LTE BAND 5 BW: 1.4M	824.7	20407	V	18.65	3.45	-3.11	18.99	38.45		
		20407	Н	15.47	3.45	-3.11	15.81	38.45		
	836.5	20525	V	19.63	3.45	-3.3	19.78	38.45		
QPSK			Н	16.58	3.45	-3.29	16.74	38.45		
RB: 1,5	848.3	20643	V	19.25	3.46	-3.3	19.41	38.45		
			Н	17.47	3.46	-3.3	17.63	38.45		
	824.7	20407	V	19.38	3.45	-3.17	19.66	38.45		
LTE			Н	16.1	3.45	-3.17	16.38	38.45		
BAND 5 BW: 1.4M	836.5	20525	V	20.49	3.45	-3.29	20.65	38.45		
16QAM	050.5	20323	Н	17.92	3.45	-3.29	18.08	38.45		
RB: 1,0	848.3	20643	V	19.88	3.46	-3.35	19.99	38.45		
	0+0.0	20040	Н	16.66	3.46	-3.35	16.77	38.45		
	824.7	20407	V	19.51	3.45	-3.1	19.86	38.45		
	024.7	20-107	Н	15.36	3.45	-3.1	15.71	38.45		
BAND 5 BW: 1.4M	836.5	20525	V	21.19	3.45	-3.3	21.34	38.45		
16QAM	000.0	20020	Н	17.51	3.45	-3.3	17.66	38.45		
RB: 1,5	848.3	20643	V	19.86	3.46	-3.27	20.05	38.45		
Demorts :	0-0.0	20040	Н	17.85	3.46	-3.28	18.03	38.45		

Remark :	(1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz
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	EUT			Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit			
	MHz		V/H	dBm	dBd	dB	dBm	dBm			
	905 F	20445	V	20.09	3.45	-3.17	20.37	38.45			
LTE	825.5	20415	Н	15.42	3.45	-3.17	15.7	38.45			
BAND 5 BW: 3M	836.5	20525	V	20.19	3.45	-3.28	20.36	38.45			
QPSK	630.5	20525	Н	17.06	3.45	-3.28	17.23	38.45			
RB: 1,0	847.5	20635	V	18.98	3.46	-3.42	19.02	38.45			
, -	047.5	20055	Н	17.47	3.46	-3.42	17.51	38.45			
	825.5	20415	V	19.49	3.45	-3.16	19.78	38.45			
LTE BAND 5 BW: 3M QPSK	025.5	20413	Н	15.79	3.45	-3.16	16.08	38.45			
	836.5	20525	V	20.04	3.45	-3.31	20.18	38.45			
			Н	17.31	3.45	-3.31	17.45	38.45			
RB: 1,14	847.5	20635	V	19.15	3.46	-3.29	19.32	38.45			
			Н	17.02	3.46	-3.3	17.18	38.45			
	825.5	20415	V	20.55	3.45	-3.17	20.83	38.45			
LTE	025.5	20413	Н	16.88	3.45	-3.17	17.16	38.45			
BAND 5 BW: 3M	836.5	20525	V	21.35	3.45	-3.28	21.52	38.45			
16QAM	000.0	20525	Н	18.02	3.45	-3.28	18.19	38.45			
RB: 1,0	847.5	20635	V	19.52	3.46	-3.43	19.55	38.45			
	047.5	20055	Н	17.36	3.46	-3.42	17.4	38.45			
	825.5	20415	V	19.68	3.45	-3.15	19.98	38.45			
LTE	025.5	20415	Н	15.9	3.45	-3.16	16.19	38.45			
BAND 5 BW: 3M	836.5	20525	V	21.01	3.45	-3.31	21.15	38.45			
16QAM	030.0	20020	Н	18.33	3.45	-3.31	18.47	38.45			
RB: 1,14	947 5	00005	V	20.47	3.46	-3.3	20.63	38.45			
	847.5	20635	Н	18.32	3.46	-3.29	18.49	38.45			
Remark :							1_				

Remark :	( 1 )The RBW,VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz
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	EUT		Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit		
	MHz		V/H	dBm	dBd	dB	dBm	dBm		
	826.5	20425	V	19.58	3.45	-3.18	19.85	38.45		
LTE	020.5	20420	Н	15.54	3.45	-3.18	15.81	38.45		
BAND 5 BW: 5M	836.5	20525	V	20.21	3.45	-3.26	20.4	38.45		
QPSK	030.5	20525	Н	17.02	3.45	-3.27	17.2	38.45		
RB: 1,0	946 5	20625	V	19.36	3.46	-3.4	19.42	38.45		
	846.5	20025	Н	17.35	3.46	-3.4	17.41	38.45		
	826.5	20425	V	19.27	3.45	-3.19	19.53	38.45		
	020.0	20423	Н	16.24	3.45	-3.18	16.51	38.45		
BAND 5 BW: 5M	836.5	20525	V	19.72	3.45	-3.32	19.85	38.45		
QPSK			Н	17.05	3.45	-3.32	17.18	38.45		
RB: 1,24	846.5	20625	V	19.73	3.46	-3.28	19.91	38.45		
			Н	16.84	3.46	-3.3	17	38.45		
	826.5	20425	V	20.66	3.45	-3.17	20.94	38.45		
LTE	020.5	20425	Н	17.17	3.45	-3.17	17.45	38.45		
BAND 5 BW: 5M	836.5	20525	V	20.83	3.45	-3.27	21.01	38.45		
16QAM	000.0	20020	Н	17.62	3.45	-3.26	17.81	38.45		
RB: 1,0	846.5	20625	V	19.37	3.46	-3.4	19.43	38.45		
	0+0.0	20020	Н	17.89	3.46	-3.4	17.95	38.45		
	826.5	20425	V	19.54	3.45	-3.18	19.81	38.45		
	020.0	20720	Н	15.42	3.45	-3.18	15.69	38.45		
BAND 5 BW: 5M	836.5	20525	V	21.16	3.45	-3.32	21.29	38.45		
16QAM	000.0	20020	Н	18.71	3.45	-3.32	18.84	38.45		
RB: 1,24	846.5	20625	V	20.35	3.46	-3.29	20.52	38.45		
Demonstration 1	0-0.0	20020	Н	17.93	3.46	-3.29	18.1	38.45		

Remark : (1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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	EUT		Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit		
	MHz		V/H	dBm	dBd	dB	dBm	dBm		
	829.0	20450	V	19.69	3.45	-3.18	19.96	38.45		
LTE	029.0	20450	Н	-5.01	3.45	-3.18	-4.74	38.45		
BAND 5 BW: 10M	836.5	20525	V	20.26	3.45	-3.23	20.48	38.45		
QPSK	030.5	20020	Н	16.78	3.45	-3.24	16.99	38.45		
RB: 1,0	844.0	20600	V	19.2	3.46	-3.33	19.33	38.45		
	044.0	20000	Н	16.51	3.46	-3.33	16.64	38.45		
	829.0	20450	V	19.62	3.45	-3.25	19.82	38.45		
	029.0	20430	Н	16.74	3.45	-3.25	16.94	38.45		
BAND 5 BW: 10M	836.5	20525	V	19.18	3.46	-3.35	19.29	38.45		
QPSK			Н	16.49	3.46	-3.35	16.6	38.45		
RB: 1,49	844.0	20600	V	18.19	3.46	-3.33	18.32	38.45		
			Н	16.9	3.46	-3.32	17.04	38.45		
	829.0	20450	V	20.64	3.45	-3.18	20.91	38.45		
LTE	029.0	20430	Н	16.91	3.45	-3.18	17.18	38.45		
BAND 5 BW: 10M	836.5	20525	V	15.9	3.45	-3.23	16.12	38.45		
16QAM	000.0	20020	Н	17.61	3.45	-3.23	17.83	38.45		
RB: 1,0	844.0	20600	V	20.83	3.46	-3.33	20.96	38.45		
	044.0	20000	Н	17.68	3.46	-3.34	17.8	38.45		
	829.0	20450	V	20.95	3.45	-3.25	21.15	38.45		
	023.0	20430	Н	17.06	3.45	-3.25	17.26	38.45		
BAND 5 BW: 10M	836.5	20525	V	20.86	3.46	-3.35	20.97	38.45		
16QAM	000.0	20020	Н	17.2	3.46	-3.35	17.31	38.45		
RB: 1,49	844.0	20600	V	17.77	3.46	-3.28	17.95	38.45		
Demonstration 1	0.77.0	20000	Н	18.09	3.46	-3.31	18.24	38.45		

Remark :	(1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz
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	EUT		Measurement							
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit		
	MHz		V/H	dBm	dBd	dB	dBm	dBm		
	699.7	23017	V	20.34	3.67	-2.1	21.91	24.77		
LTE	099.7	23017	Н	14	3.67	-2.09	15.58	24.77		
BAND 12 BW: 1.4M	707.5	23095	V	20.47	3.65	-1.82	22.3	24.77		
QPSK	707.5	23095	Н	15.66	3.65	-1.83	17.48	24.77		
RB: 1,0	715.3	23173	V	20.75	3.62	-2.3	22.07	24.77		
	715.3	23173	Н	15.52	3.62	-2.31	16.83	24.77		
	699.7	23017	V	20.04	3.68	-2.26	21.46	24.77		
LTE	099.7	23017	Н	15	3.67	-2.03	16.64	24.77		
BAND 12 BW: 1.4M	707.5	23095	V	20.56	3.65	-1.88	22.33	24.77		
QPSK			Н	15.31	3.65	-1.87	17.09	24.77		
RB: 1,5	715.3	23173	V	20.66	3.62	-2.36	21.92	24.77		
			Н	15.37	3.62	-2.37	16.62	24.77		
	699.7	23017	V	19.71	3.67	-2.11	21.27	24.77		
	099.7		Н	14.52	3.67	-2.09	16.1	24.77		
BAND 12 BW: 1.4M	707.5	23095	V	21.49	3.65	-1.81	23.33	24.77		
16QAM	707.5	20090	Н	16.69	3.65	-1.81	18.53	24.77		
RB: 1,0	715.3	23173	V	21.66	3.62	-2.31	22.97	24.77		
	710.0	20170	Н	15.69	3.62	-2.3	17.01	24.77		
	699.7	23017	V	20.97	3.68	-2.26	22.39	24.77		
	000.1	20017	H	15.08	3.67	-2.04	16.71	24.77		
BAND 12 BW: 1.4M	707.5	23095	V	21.65	3.65	-1.87	23.43	24.77		
16QAM	101.0	20000	Н	16.01	3.65	-1.89	17.77	24.77		
RB: 1,5	715.3	23173	V	20.97	3.62	-2.36	22.23	24.77		
Demonstration 1	110.0	20170	Н	15.61	3.62	-2.37	16.86	24.77		

Remark :	(1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz
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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	700.5	23025	V	19.53	3.67	-2.12	21.08	24.77
LTE	700.5	20020	Н	14.37	3.67	-2.11	15.93	24.77
BAND 12 BW: 3M	707.5	23095	V	20.91	3.66	-1.83	22.74	24.77
QPSK	707.5	23095	Н	15.19	3.66	-1.83	17.02	24.77
RB: 1,0	714.5	23165	V	20.74	3.63	-2.21	22.16	24.77
	714.0	23105	Н	14.84	3.63	-2.23	16.24	24.77
	700.5	23025	V	20.21	3.68	-2.19	21.7	24.77
LTE	700.5	23023	Н	14.66	3.67	-2.16	16.17	24.77
BAND 12 BW: 3M QPSK	707.5	23095	V	20.63	3.65	-1.92	22.36	24.77
	101.5	20090	Н	14.84	3.65	-1.94	16.55	24.77
RB: 1,14	714.5	23165	V	20.26	3.62	-2.35	21.53	24.77
			Н	14.59	3.62	-2.35	15.86	24.77
	700.5	23025	V	20.27	3.67	-2.11	21.83	24.77
	700.5	23023	Н	14.69	3.67	-2.11	16.25	24.77
BAND 12 BW: 3M	707.5	23095	V	21.53	3.66	-1.82	23.37	24.77
16QAM	707.5	20000	Н	15.57	3.66	-1.83	17.4	24.77
RB: 1,0	714.5	23165	V	21.06	3.63	-2.21	22.48	24.77
	714.5	20100	Н	16.11	3.63	-2.21	17.53	24.77
	700.5	23025	V	21.79	3.67	-2.18	23.28	24.77
	700.0	20020	Н	15.42	3.67	-2.17	16.92	24.77
BAND 12 BW: 3M	707.5	23095	V	21.23	3.65	-1.93	22.95	24.77
16QAM	101.5	20000	н	16.13	3.65	-1.93	17.85	24.77
RB: 1,14	714.5	23165	V	20.39	3.62	-2.37	21.64	24.77
Demonstration 1		20100	Н	15.78	3.62	-2.37	17.03	24.77

Remark : (1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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	EUT				Measur	ement			
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit	
	MHz		V/H	dBm	dBd	dB	dBm	dBm	
	701.5	22025	V	19.99	3.67	-2.11	21.55	24.77	
LTE	701.5	23035	Н	14.16	3.67	-2.08	15.75	24.77	
BAND 12 BW: 5M	707.5	23095	V	20.61	3.66	-1.89	22.38	24.77	
QPSK	707.5	23095	Н	15	3.66	-1.89	16.77	24.77	
RB: 1,0	713.5	23155	V	20.73	3.64	-2.08	22.29	24.77	
	715.5	23100	Н	14.59	3.63	-2.1	16.12	24.77	
	701.5	701 5	23035	V	20.43	3.67	-2.03	22.07	24.77
LTE	701.5	23033	Н	14.41	3.67	-2.05	16.03	24.77	
BAND 12 BW: 5M QPSK	707.5	23095	V	20.13	3.64	-1.97	21.8	24.77	
	101.0	20090	Н	15.1	3.64	-2	16.74	24.77	
RB: 1,24	713.5	23155	V	20.57	3.62	-2.35	21.84	24.77	
			Н	15.43	3.62	-2.36	16.69	24.77	
	701.5	23035	V	20.41	3.67	-2.1	21.98	24.77	
	701.5	20000	Н	14.41	3.67	-2.09	15.99	24.77	
BAND 12 BW: 5M	707.5	23095	V	21.21	3.66	-1.9	22.97	24.77	
16QAM	101.5	20000	Н	15.83	3.66	-1.9	17.59	24.77	
RB: 1,0	713.5	23155	V	20.68	3.64	-2.09	22.23	24.77	
	710.0	20100	н	15.22	3.64	-2.09	16.77	24.77	
	701.5	23035	V	21.13	3.67	-2.02	22.78	24.77	
	701.0	20000	н	15.41	3.65	-1.82	17.24	24.77	
BAND 12 BW: 5M	707.5	23095	V	21.12	3.64	-1.99	22.77	24.77	
16QAM	101.0	20000	Н	15.48	3.64	-1.99	17.13	24.77	
RB: 1,24	713.5	23155	V	21.12	3.62	-2.36	22.38	24.77	
Demonstration 1	110.0	20100	Н	15.98	3.62	-2.37	17.23	24.77	

Remark : (1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	704.0	23060	V	19.27	3.67	-2.09	20.85	24.77
LTE	704.0	20000	Н	14.53	3.67	-2.07	16.13	24.77
BAND 12 BW: 10M	707.5	23095	V	19.74	3.67	-2.09	21.32	24.77
QPSK	707.5	23095	Н	14.01	3.65	-1.8	15.86	24.77
RB: 1,0	711.0	23130	V	19.95	3.65	-1.8	21.8	24.77
	711.0	23130	Н	14.2	3.65	-1.8	16.05	24.77
	704.0	23060	V	20.32	3.65	-1.9	22.07	24.77
LTE	704.0	23000	Н	13.69	3.65	-1.9	15.44	24.77
BAND 12 BW: 10M QPSK RB: 1,49	707.5	23095	V	20.45	3.63	-2.12	21.96	24.77
	707.5	23093	Н	14.58	3.63	-2.13	16.08	24.77
	711.0	23130	V	19.18	3.62	-2.34	20.46	24.77
			Н	13.45	3.62	-2.37	14.7	24.77
	704.0	23060	V	20.19	3.67	-2.08	21.78	24.77
LTE	704.0		Н	13.71	3.67	-2.07	15.31	24.77
BAND 12 BW: 10M	707.5	23095	V	20.99	3.67	-2.07	22.59	24.77
16QAM	707.5	20090	Н	14.84	3.65	-1.82	16.67	24.77
RB: 1,0	711.0	23130	V	21.39	3.66	-1.83	23.22	24.77
	711.0	23130	Н	15.24	3.66	-1.83	17.07	24.77
	704.0	23060	V	20.18	3.65	-1.91	21.92	24.77
	704.0	20000	Н	15.86	3.65	-1.9	17.61	24.77
BAND 12 BW: 10M	707.5	23095	V	20.66	3.63	-2.12	22.17	24.77
16QAM	101.5	23095	Н	15.44	3.63	-2.13	16.94	24.77
RB: 1,49	711.0	23130	V	20.02	3.62	-2.34	21.3	24.77
,	711.0		Н	14.71	3.62	-2.34	15.99	24.77
Remark :			H		3.62			24.7

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	EUT				Measur	ement			
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit	
	MHz		V/H	dBm	dBd	dB	dBm	dBm	
	706.5	23755	V	19.2	3.65	-1.86	20.99	34.77	
LTE	700.5	20700	Н	14.07	3.65	-1.86	15.86	34.77	
BAND 17 BW: 5M	710.0	23790	V	20.26	3.65	-1.87	22.04	34.77	
QPSK	710.0	23790	Н	14.3	3.65	-1.88	16.07	34.77	
RB: 1,0	713.5	23825	V	19.95	3.64	-2.09	21.5	34.77	
	710.0		Н	14.14	3.64	-2.08	15.7	34.77	
	706.5	706 5	23755	V	20.13	3.65	-1.92	21.86	34.77
LTE	700.5	20100	Н	14.34	3.65	-1.94	16.05	34.77	
BAND 17 BW: 5M QPSK	710.0	23790	V	19.77	3.63	-2.14	21.26	34.77	
	710.0	20100	Н	13.88	3.63	-2.15	15.36	34.77	
RB: 1,24	713.5	23825	V	19.79	3.62	-2.36	21.05	34.77	
			Н	14.43	3.62	-2.36	15.69	34.77	
	706.5	23755	V	20.79	3.65	-1.85	22.59	34.77	
	700.5	20700	Н	15.41	3.65	-1.87	17.19	34.77	
BAND 17 BW: 5M	710.0	23790	V	20.67	3.65	-1.87	22.45	34.77	
16QAM	710.0	23730	Н	14.97	3.65	-1.87	16.75	34.77	
RB: 1,0	713.5	23825	V	20.55	3.64	-2.09	22.1	34.77	
	710.0	20020	Н	15.48	3.64	-2.09	17.03	34.77	
	706.5	23755	V	20.56	3.65	-1.93	22.28	34.77	
	100.0	20100	Н	15.92	3.65	-1.92	17.65	34.77	
BAND 17 BW: 5M	710.0	23790	V	20.69	3.63	-2.14	22.18	34.77	
16QAM	110.0	23/90	н	15.22	3.63	-2.15	16.7	34.77	
RB: 1,24	713.5	23825	V	20.58	3.62	-2.35	21.85	34.77	
Dements	110.0	20020	Н	15.63	3.62	-2.37	16.88	34.77	

Remark : (1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	709.0	23780	V	1.82	3.65	-1.88	3.59	34.77
LTE	709.0	23700	Н	14.85	3.65	-1.87	16.63	34.77
BAND 17 BW: 10M	710.0	23790	V	20.36	3.66	-1.87	22.15	34.77
QPSK	710.0	23790	Н	14.33	3.66	-1.86	16.13	34.77
RB: 1,0	711.0	23800	V	20.56	3.65	-1.81	22.4	34.77
	711.0		Н	14.5	3.66	-1.81	16.35	34.77
	709.0	23780	V	19.93	3.63	-2.21	21.35	34.77
LTE	709.0	20700	Н	15.18	3.63	-2.22	16.59	34.77
BAND 17 BW: 10M QPSK	710.0	23790	V	20.7	3.62	-2.27	22.05	34.77
	710.0	20100	Н	14.57	3.62	-2.29	15.9	34.77
RB: 1,49	711.0	23800	V	19.92	3.62	-2.34	21.2	34.77
			Н	14.62	3.62	-2.35	15.89	34.77
	709.0	23780	V	15.48	3.65	-1.86	17.27	34.77
	709.0	23700	Н	15.55	3.65	-1.9	17.3	34.77
BAND 17 BW: 10M	710.0	23790	V	21.31	3.66	-1.88	23.09	34.77
16QAM	710.0	23790	Н	16.2	3.66	-1.87	17.99	34.77
RB: 1,0	711.0	23800	V	21.76	3.66	-1.83	23.59	34.77
	711.0	20000	Н	16.29	3.65	-1.8	18.14	34.77
	709.0	23780	V	21.81	3.63	-2.2	23.24	34.77
	103.0	20100	Н	14.52	3.62	-2.25	15.89	34.77
BAND 17 BW: 10M	710.0	23790	V	21.49	3.62	-2.27	22.84	34.77
16QAM	110.0	23/90	Н	15.96	3.62	-2.29	17.29	34.77
RB: 1,49	711.0	23800	V	20.69	3.62	-2.35	21.96	34.77
Demonstration	711.0	20000	Н	14.74	3.62	-2.34	16.02	34.77

Remark : (1) The RBW, VBW of SPA for frequency RBW= 8MHz , VBW= 8MHz

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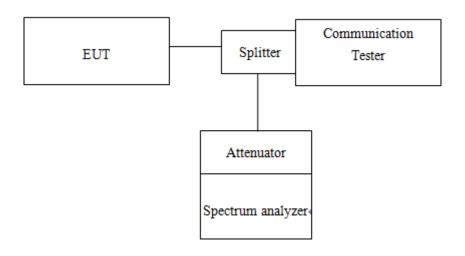


# 8. OCCUPIED BANDWIDTH MEASUREMENT

## 8.1. Standard Applicable

The occupied bandwidth 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.

## 8.2. Test Set-up



## 8.3. Measurement Procedure

## 99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 \* Signal BW, set % Power = 99%.

## 99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about  $1\% \sim 5\%$  of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW=  $1\% \sim 5\%$ , VBW= 3 RBW, with span > 2 \* Signal BW, set % Power = 99%.

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## 8.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
EXA Spectrum Ana- lyzer	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Cham- ber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Su- hner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

## 8.5. Measurement Result

Freq.		99% BW	99% BW	26 dB BW	26 dB BW
	СН	(MHz)	(MHz)	(MHz)	(MHz)
(MHz)		GSM	GPRS	GSM	GPRS
		850	850	850	850
824.2	128	0.24414	0.24477	0.31035	0.31165
836.6	190	0.23864	0.25158	0.30456	0.31777
848.8	251	0.23961	0.24354	0.30744	0.31224

		99%	99%	26 dB	26 dB
Freq. (MHz)	СН	BW	BW	BW	BW
		(MHz)	(MHz)	(MHz)	(MHz)
		GSM	GPRS	GSM	GPRS
		1900	1900	1900	1900
1850.2	512	0.24315	0.24782	0.30266	0.31322
1880.0	661	0.24030	0.24762	0.30914	0.32405
1909.8	810	0.24042	0.24557	0.30571	0.32174

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Freq. (MHz)	СН	99% BW (MHz) WCDMA V	99% BW (MHz) HSDPA V	99% BW (MHz) HSUPA V	26 dB BW (MHz) WCDMA V	26 dB BW (MHz) HSDPA V	26 dB BW (MHz) HSUPA V
826.40	4132	4.1103	4.1092	4.1110	4.6846	4.6739	4.6874
836.60	4183	4.0958	4.0952	4.1143	4.6871	4.6678	4.6736
846.60	4233	4.1258	4.1226	4.1218	4.6904	4.6818	4.7048

	LTE BA	ND 5 Chan	nel bandwi	dth: 1.4MH	Z			LTE BA	ND 5 Chan	nel bandwid	th: 3MHz		
Freq.	СН	99% B	W (MHz)	26 dB E	3W (MHz)		Freq.	СН	99% BV	V (MHz)	26 dB B	N (MHz)	
(MHz)	СП	QPSK	16QAM	QPSK	16QAM		(MHz)	СП	QPSK	16QAM	QPSK	16QAM	
824.7	20407	1.1072	1.1001	1.3222	1.3198		825.5	20415	2.7017	2.7099	3.0021	2.9943	
836.5	20525	1.1009	1.1008	1.2957	1.2963		836.5	20525	2.6993	2.7027	2.9874	2.9911	
848.3	20643	1.1026	1.1022	1.2978	1.3084		847.5	20635	2.6984	2.7047	2.9888	2.9946	
	LTE BA	ND 5 Cha	nnel bandw	idth: 5MHz				LTE BA	ND 5 Chanr	el bandwid	th: 10MHz		
Freq.	СН	99% B	W (MHz)	26 dB E	3W (MHz)		Freq.	СН	99% BV	V (MHz)	26 dB B	N (MHz)	
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM		(MHz)	CIT	QPSK	16QAM	QPSK	16QAM	
826.5	20425	4.5093	4.5022	5.0135	5.0243		829.0	20450	9.0234	8.9982	10.020	9.923	
836.5	20525	4.4929	4.4944	5.0001	5.0006		836.5	20525	8.9514	8.9504	9.824	9.735	
846.5	20625	4.5200	4.5046	5.0523	5.0455		844.0	20600	9.0206	8.9911	9.900	9.798	
	lte ban	D 12 Chan	nel bandwi	dth: 1.4MF	Z		LTE BAND 12 Channel bandwidth: 3MHz						
Freq.	СН	99% B\	N (MHz)	26 dB E	6 dB BW (MHz)		Freq.	СН	99% BW (MHz) 26 dB BW (M		SW (MHz)		
(MHz)	Сп	QPSK	16QAM	QPSK	16QAM		(MHz)	СП	QPSK	16QAM	QPSK	16QAM	
699.7	23017	1.1061	1.1017	1.2505	1.2868		700.5	23025	2.6995	2.7044	2.9818	2.9982	
707.5	23095	1.0973	1.1008	1.2465	1.2509		707.5	23095	2.6813	2.6995	2.8923	2.9954	
715.3	23173	1.1030	1.0943	1.2726	1.2352		714.5	23165	2.6999	2.7044	2.9956	2.9971	
	LTE BAN	VD 12 Cha	nnel bandw	idth: 5MHz	7			LTE BA	ND 12 Char	nel bandwi	dth: 10MHz	· · · · · · · · · · · · · · · · · · ·	
Freq.	СН	99% BW (MHz) 26 dB BW (MHz)		BW (MHz)		Freq.	СН	99% B\	N (MHz)	26 dB E	BW (MHz)		
(MHz)	СН	QPSK	16QAM	QPSK	16QAM		(MHz)	СП	QPSK	16QAM	QPSK	16QAM	
701.5	23035	4.5214	4.5027	5.0156	5.0254		704.0	23060	8.9919	8.9777	9.834	9.810	

· · ·		4. 0.1		<b>Q</b> . O.(		、 ,		ů.		<b>u</b> . on	
701.5	23035	4.5214	4.5027	5.0156	5.0254	704.0	23060	8.9919	8.9777	9.834	9.810
707.5	23095	4.4943	4.4864	5.0145	4.9739	707.5	23095	8.9456	8.9180	9.755	9.727
713.5	23155	4.5191	4.5148	5.0388	5.0477	711.0	23130	9.0143	8.9601	9.937	9.823
	LTE BAN	ND 17 Cha	nnel bandw	<i>i</i> idth: 5MHz	2		LTE BAI	ND 17 Char	inel bandwid	dth: 10MHz	<u>Z</u>
_											

	LIE BAIND 17 Channel bandwidth: 51VIHZ						LIE BAND 17 Channel bandwidth: TUIVIHZ					
Freq.	СН	99% BW (MHz		26 dB BW (MHz)		Freq.	CH	99% BW (MHz)		26 dB BW (MHz)		
(MHz)	CH	QPSK	16QAM	QPSK	16QAM		(MHz)	CIT	QPSK	16QAM	QPSK	16QAM
706.5	23755	4.5002	4.4873	4.9850	5.0095		709.0	23780	8.9386	8.9268	9.776	9.809
710.0	23790	4.5067	4.4877	5.0136	4.9924		710.0	23790	8.9868	8.9614	9.869	9.801
713.5	23825	4.5209	4.5118	5.0335	5.0099		711.0	23800	9.0111	8.9888	9.921	9.931

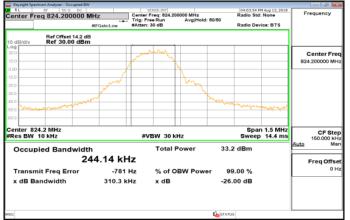
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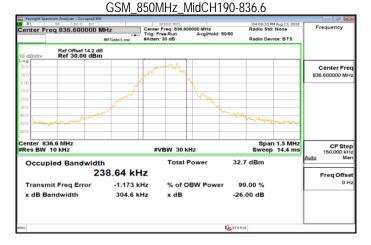
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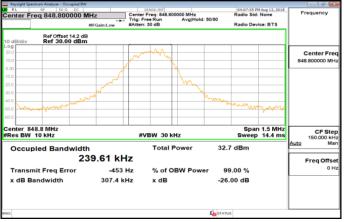
## Report No.: ER/2018/80045 Page 52 of 156

#### GSM\_850MHz\_LowCH128-824.2



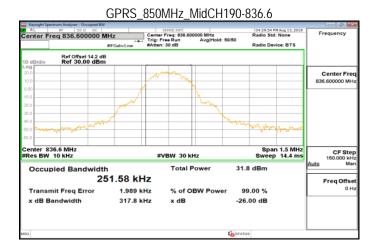


#### GSM 850MHz HighCH251-848.8

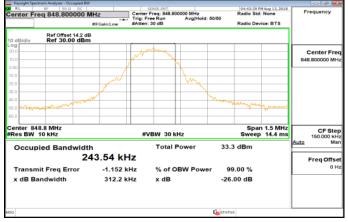


#### GPRS\_850MHz\_LowCH128-824.2





#### GPRS 850MHz HighCH251-848.8



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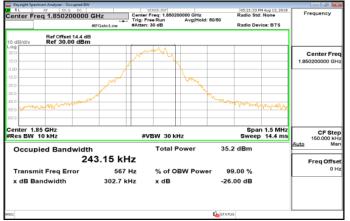
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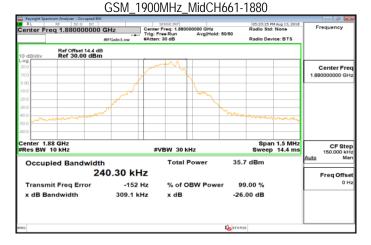
f (886-2) 2298-0488



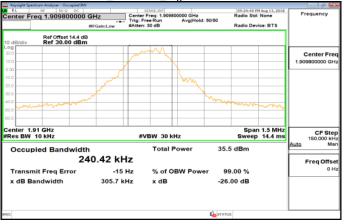
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#### GSM\_1900MHz\_LowCH512-1850.2

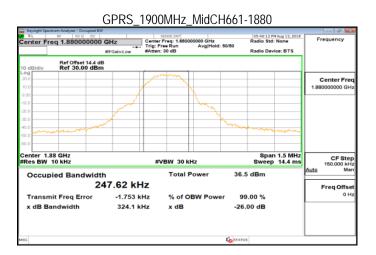




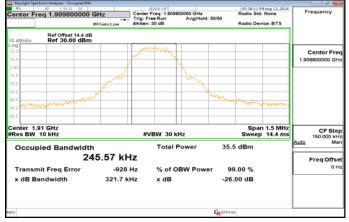
#### GSM 1900MHz HighCH810-1909.8



#### GPRS\_1900MHz\_LowCH512-1850.2 05:42:44 PM Aug 13 Radio Std: None enter Freq 1.850200000 GHz 00 GHz Frequency Radio Device: BTS Ref Offset 14.4 dB Ref 30.00 dBm Center Fre 1.85 GHz W 10 kHz Span 1.5 MH weep 14.4 m CF Step #VBW 30 kHz Occupied Bandwidth Total Power 35.7 dBm 247.82 kHz Freq Offs Transmit Freg Error -3.768 kHz % of OBW Power 99.00 % x dB Bandwidth 313.2 kHz -26.00 dB x dB



## GPRS 1900MHz HighCH810-1909.8



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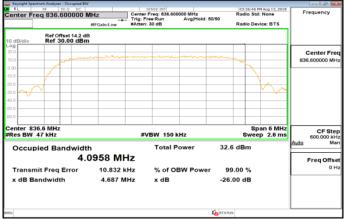
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#### WCDMA\_B5\_LowCH4132-826.4

	trum Analyzer - Occupied BV	v			
RL	10 50 Ω DC	Cont	er Freg: 826.400000 MHz	03:32:41 PM A	Frequency
Senter Fre	eq 826.400000	Trig:	Free Run Avg Hold:	50/50	
		#FGain:Low #Atte	m: 30 dB	Radio Device	BTS
	Ref Offset 14.2 d				
10 dB/div	Ref 30.00 dBr				
Log					
20.0					Center Free
10.0				man and a second	826.400000 MH
0.00					
10.0					
-20.0					
30.0				V	
40.0					
-60.0					
-60.0					
Center 82	C 4 8411-			0	C 101-
Res BW			VBW 150 kHz	Sweep	6 MHz CF Ste
inca bit .	47 KHZ		FUEL ISO KITZ	oweep	2.6 ms 600.000 kH
Occup	ied Bandwidt	h	Total Power	33.4 dBm	Auto Ma
		 1103 MHz			
	4.				FreqOffse
Transm	it Freq Error	-16.176 kHz	% of OBW Powe	r 99.00 %	0 H
				00.00.40	
x dB Ba	ndwidth	4.685 MHz	x dB	-26.00 dB	
15G				5 STATUS	
				•	



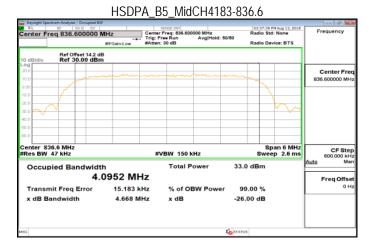
## WCDMA\_B5\_MidCH4183-836.6

#### WCDMA B5 HighCH4233-846.6

	trum Analyzer - Occupied BV					- 2
enter Fre	Eq 846.600000	Trig	sense:int ter Freq: 846.600000 MHz : Free Run Avg Ho ien: 30 dB	ld: 50/50	Radio Std: None Radio Device: BTS	Frequency
0 dB/div	Ref Offset 14.2 di Ref 30.00 dBn					
00 10.0 1.00						Center Fre 846.600000 MH
	√					
0.0						-
enter 84 Res BW			#VBW 150 kHz		Span 6 MH Sweep 2.6 m	S 600.000 kł
Occup	ied Bandwidt 4.	հ 1258 MHz	Total Power	33	.6 dBm	Auto Ma
	iit Freq Error Indwidth	8.870 kHz 4.690 MHz	% of OBW Pow x dB		99.00 % 6.00 dB	01
3				10 STA	TUS	

#### HSDPA\_B5\_LowCH4132-826.4

Kanalahat Sanaa	ctrum Analyzer - Occupied BV	_	—			
RL RL	IU 50 Ω DC		SENSE:INT	03:33:49 F	M Aug 13, 2018	
Center Fr	eq 826.400000 I	WHz Cente	r Freq: 826.400000 MHz	Radio Std	: None	Frequency
			FreeRun Avg Hold: n:30 dB	Radio Dev	vice: BTS	
10 dB/div	Ref Offset 14.2 di Ref 30.00 dBn					
20.0						Center Fre
10.0	mon	man	montantener	remm		826.400000 MH
0.00				- T_		
10.0	1					
20.0	$\sim$					
30.0	~				P m	
0.0						
50.0						
60.0						
enter 82 Res BW		4	VBW 150 kHz		an 6 MHz p 2.6 ms	CF Ste 600.000 ki
Occup	ied Bandwidt	h	Total Power	32.8 dBm		Auto Ma
	4.	1092 MHz				Freq Offs
Transm	nit Freg Error	-18.131 kHz	% of OBW Powe	r 99.00 %		01
	andwidth	4.674 MHz	x dB	-26.00 dB		
		4.074 MHZ	A GD	-20.00 00		
93				STATUS		



#### HSDPA B5 HighCH4233-846.6

Keysight Spect	rum Analyzer - Occupied BW					MAug 13, 2018	
	a 846.600000 N	Hz	Center Freq: 846.60		Radio Std:		Frequency
		#FGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold: 50/	50 Radio Dev	ice: BTS	
10 dB/div	Ref Offset 14.2 dE Ref 30.00 dBm						
20.0 10.0		an and the second		him			Center Free 846.600000 MH
10.00							
30.0	√	_				han	
40.0							
60.0							
Center 846 Res BW 4			#VBW 150	kHz		an 6 MHz p 2.6 ms	CF Ste 600.000 kH
Occupi	ied Bandwidt	h	Total F	ower	32.6 dBm		<u>Auto</u> Ma
	4.1	1226 MH	z				Freq Offse
Transmi	it Freq Error	5.139 ki	Hz % of O	BW Power	99.00 %		0 H
x dB Ba	ndwidth	4.682 MI	Hz xdB		-26.00 dB		
90				¢,	STATUS		

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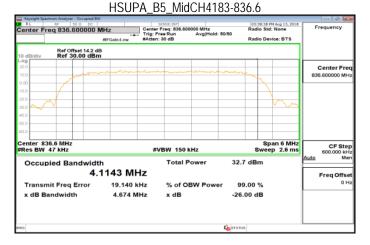
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#### HSUPA B5 LowCH4132-826.4

Keysight Spect	trum Analyzer - Occupied BV	/			- 2 ×
Center Fre	eq 826.400000 I	Trig	sense:int iter Freq: 826,400000 MHz g: Free Run Avg Hold ten: 30 dB	03:34:44 PH Aug 13, 20 Radio Std: None : 50/50 Radio Device: BTS	Frequency
10 dB/div	Ref Offset 14.2 dl Ref 30.00 dBn	в	ten: 30 dB	Radio Device: B I S	
20.0 10.0 -10.0				mana and a second	Center Freq 826.400000 MHz
-20.0					~
-60.0 -60.0 Center 820				Span 6 Mi	
#Res BW	ied Bandwidt		#VBW 150 kHz Total Power	Sweep 2.6 n 32.6 dBm	600.000 kHz Auto Man
	it Freq Error andwidth	-20.196 kHz 4.687 MHz	% of OBW Powe x dB	er 99.00 % -26.00 dB	0 Hz
MSG				<b>E</b> STATUS	L

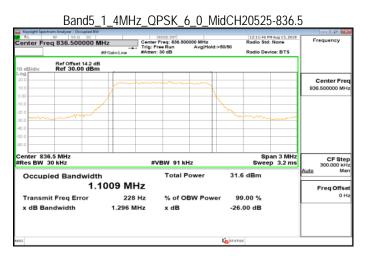


#### HSUPA B5 HighCH4233-846.6

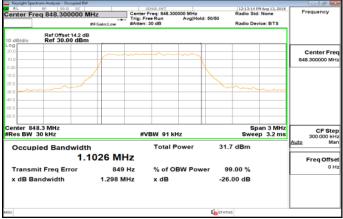
Keysight Spectrum Analyzer - Occupied BV				
RL NF 50 Ω DC	MH <sub>7</sub> Cente	Freq: 846,600000 MHz	03:44:39 PM A	Frequency
Sericer 1164 040.0000001	Trig:	Free Run Avg Hold: n: 30 dB	50/50 Radio Device	BTS
Ref Offset 14.2 di 0 dB/div Ref 30.00 dBn				
	•			
	man man man	manne	man	Center Fre
				846.600000 MH
.00				
/				
				- m
0.0				
0.0				
enter 846.6 MHz Res BW 47 kHz		VBW 150 kHz	Span Sweep	6 MHz CF Ste
Kes DW 47 KHZ		FARA 120 KHZ	aweep	2.0 ms 600.000 kH
Occupied Bandwidt	h	Total Power	32.8 dBm	Photo Ma
4.	1218 MHz			Freq Offs
Transmit Freg Error	3.177 kHz	% of OBW Powe	r 99.00 %	01
x dB Bandwidth	4.705 MHz	x dB	-26.00 dB	
X db Ballawidai	4.705 11112		-20.00 00	
3			STATUS	
2			10 STATUS	

#### 12:10:45 PM Aug 13 Radio Std: None enter Freq 824.700000 MHz Center Freq: 824.700 00 MHz Avg|Hold: 50/5 Frequency Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 824.700000 MH r 824.7 MHz BW 30 kHz Span 3 MH CF Step #VBW 91 kHz Occupied Bandwidth Total Power 31.9 dBm 1.1072 MHz Freq Offs Transmit Freg Error -1.087 kHz % of OBW Power 99.00 % x dB Bandwidth 1.322 MHz -26.00 dB x dB

Band5\_1\_4MHz\_QPSK\_6\_0\_LowCH20407-824.7



## Band5 1 4MHz QPSK 6 0 HighCH20643-848.3



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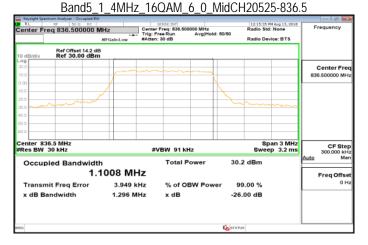
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#### Band5\_1\_4MHz\_16QAM\_6\_0\_LowCH20407-824.7

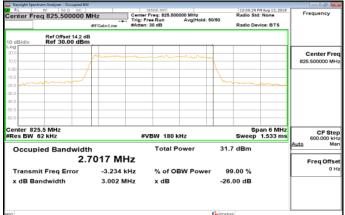
Keysight Spectr	rum Analyzer - Occupied BW		SENSE:INT		PM Aug 13, 2018	
	g 824.700000 M		nter Freq: 824.700000 MHz	Radio St	d: None	Frequency
			g:FreeRun Avg Hol tten:30 dB		vice: BTS	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm					
20.0						Center Fred
10.0						824.700000 MHz
0.00						
10.0	mon	~		mm		
20.0					- and	
30.0						
50.0						
60.0						
Center 824 Res BW 3			#VBW 91 kHz		pan 3 MHz ep 3.2 ms	CF Step 300.000 kH
Occupi	ed Bandwidth	1	Total Power	30.3 dBm		Auto Mar
	1.1	001 MHz				Freq Offse
Transmi	it Freq Error	1.209 kHz	% of OBW Pow	ver 99.00 %		0 H:
x dB Ba	ndwidth	1.320 MHz	x dB	-26.00 dB		
so				STATUS		



#### Band5\_1\_4MHz\_16QAM\_6\_0\_HighCH20643-848.3

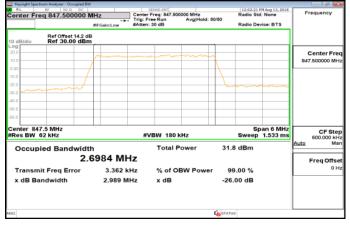
Reysight Spect	trum Analyzer - Occupied BW		SENSE: INT		12:16:43 PM Aug 13, 20	
	eq 848.300000 N		r Freq: 848,300000 MHz		Radio Std: None	Frequency
			FreeRun Avg Hold n: 30 dB	1:>00/00	Radio Device: BTS	
) dB/div	Ref Offset 14.2 dE Ref 30.00 dBm					
10						Center Fre
			- martine			848.300000 MH
0						
.0						
						~
0						
.0						
.0						
enter 84 tes BW		*	VBW 91 kHz		Span 3 MH Sweep 3.2 m	IZ CF Ste 300.000 kH
Occup	ied Bandwidt	h	Total Power	30.4	dBm	Auto Ma
	1.1	1022 MHz				Freq Offs
Transm	it Freq Error	5.064 kHz	% of OBW Pow	er 99	.00 %	01
x dB Ba	ndwidth	1.308 MHz	x dB	-26.0	0 dB	

#### Band5\_3MHz\_QPSK\_15\_0\_LowCH20415-825.5



#### Band5\_3MHz\_QPSK\_15\_0\_MidCH20525-836.5 :01:38 PM Aug nter Freq 836.500 Frequency io Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 36.500000 MH Span 6 MHz Sweep 1.533 ms er 836.5 MHz BW 62 kHz CF Step #VBW 180 kHz Occupied Bandwidth Total Power 31.8 dBm 2.6993 MHz Freq Offs Transmit Freg Error 4.604 kHz % of OBW Power 99.00 % x dB Bandwidth 2.987 MHz -26.00 dB x dB

#### Band5 3MHz QPSK 15 0 HighCH20635-847.5



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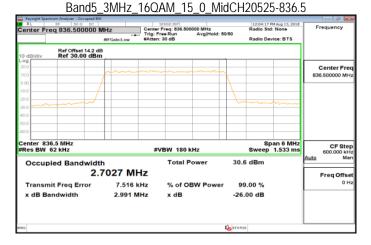
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#### Band5\_3MHz\_16QAM\_15\_0\_LowCH20415-825.5

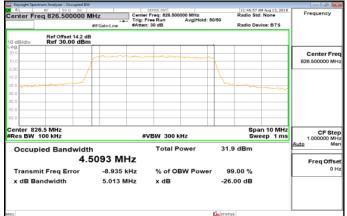
Keysight Spec	ctrum Analyzer - Occupied BW		1						
	eq 825.500000 N	MHz	Center Fr	eq: 825.500			Radio Sto	PM Aug 13, 2018 I: None	Frequency
		#FGain:Low	Trig: Free #Atten: 3		Avg Hold:	50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm								
20.0		000000000							Center Freq
10.0		1							825.500000 MHz
10.00	1					N			
20.0	man								
30.0									
40.0						_	_		
60.0						-			
60.0						-			
Center 82 #Res BW			#VE	W 180 k	Hz			an 6 MHz 1.533 ms	CF Step 600.000 kHz
Occur	oied Bandwidt	h		Total P	ower	31	.0 dBm		Auto Man
		7099 МН	z						Freq Offset
Transn	nit Freq Error	-1.278 kl	Ηz	% of OE	W Powe	r 9	9.00 %		0 Hi
x dB Ba	andwidth	2.994 MI	Ηz	x dB		-26	5.00 dB		
19G						5 STAT			
9/3						40 STAT	05		

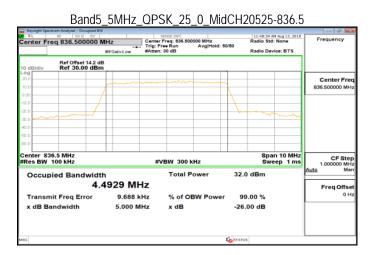


#### Band5\_3MHz\_16QAM\_15\_0\_HighCH20635-847.5

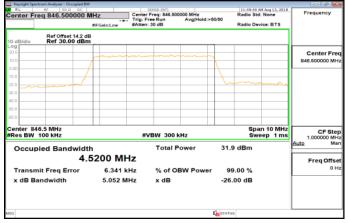
Keysight Spect	trum Analyzer - Occupied BW		SENSE:INT			12.05.20	PM Aug 13, 2018	
	eq 847.500000 M	Hz	Center Freq: 847			Radio Sto	d: None	Frequency
		#IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold	: 50/50	Radio De	vice: BTS	
dB/div	Ref Offset 14.2 dB Ref 30.00 dBm							
9						_		Center Fre
						-		847.500000 MH
.0								
0	a manufacture				L 7		mm	
.0								
.0								
.0						-		
nter 84 es BW			#VBW 18	0 KHz			oan 6 MHz 1.533 ms	CF Ste 600.000 kH
Occup	ied Bandwidth		Tota	I Power	31	.1 dBm		Auto Ma
	2.7	047 MH	Iz					Freq Offs
Transm	nit Freq Error	6.901 k	Hz %of	OBW Pow	er 9	9.00 %		01
x dB Ba	andwidth	2.995 M	Hz xdB		-26	5.00 dB		
5					<b>E</b> STAT	us		

#### Band5\_5MHz\_QPSK\_25\_0\_LowCH20425-826.5





#### Band5 5MHz QPSK 25 0 HighCH20625-846.5



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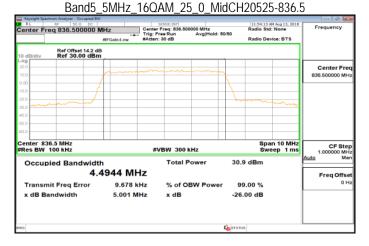
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#### Band5 5MHz 16QAM 25 0 LowCH20425-826.5

Keysight Spectrum An	alyzer - Occupied BW									C = 2
Center Freq 82		Hz	Center Fr	eq: 826.500	000 MHz		Radio	Std: No	13, 2018 ne	Frequency
		#IFGain:Low	#Atten: 3	Run 0 dB	Avg Hold:	50/50	Radio	Device:	BTS	
10 dB/div Re	f Offset 14.2 dB of 30.00 dBm									
20.0							_			Center Freq
10.0						7				826.500000 MHz
10.00										
20.0	man									
30.0						-				
40.0						-	-			
-60.0						-				
60.0										
Center 826.5 M #Res BW 100 k			#VE	W 300 k	Hz				0 MHz 1 ms	CF Step 1.000000 MH
Occupied	Bandwidth	1		Total P	ower	31	.4 dBm			Auto Mar
	4.5	5022 MH	Ιz							Freq Offse
Transmit Fr	eq Error	-6.644 k	Hz	% of OE	W Powe	r 9	9.00 %			0 H
x dB Bandw	idth	5.024 M	IHz	x dB		-26	5.00 dB			
150						<b>I</b> STAT	US			

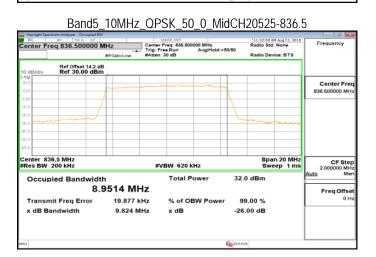


#### Band5\_5MHz\_16QAM\_25\_0\_HighCH20625-846.5

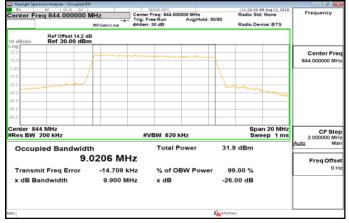
Keysight Spectrum Analyzer - Occupied B RL RF 50 Ω DC	w	SENSE: INT		11:56:09 AM Aug 13, 2018	
enter Freg 846.500000		er Freq: 846,500000 MHz		Radio Std: None	Frequency
	#FGain:Low #Att	Free Run Avg Hold an: 30 dB	: 50/50	Radio Device: BTS	
dB/div Ref 30.00 dB					
9					Center Fre
0					846.500000 MH
0	1				
			4		
munmont			~	and the second second	
0					
0					
0					
.0					
enter 846.5 MHz les BW 100 kHz		#VBW 300 kHz		Span 10 MHz Sweep 1 ms	CF Ste 1.000000 MH
Occupied Bandwid	th	Total Power	30.8	dBm	Auto Ma
4	.5046 MHz				Freq Offs
Transmit Freg Error	6.603 kHz	% of OBW Pow	er 99	.00 %	01
x dB Bandwidth	5.045 MHz	x dB	-26.	00 dB	
			e1		
5					

#### :31:00 AM Aug 13 enter Freq 829.000000 MHz Center Freq: 821 Trig: Free Run 00 MHz Avg|Hold: 50/5 Frequency Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 29.000000 MH r 829 MHz BW 200 kHz Span 20 MH Sweep 1 m CF Step 2.000000 #VBW 620 kHz Occupied Bandwidth Total Power 31.8 dBm 9.0234 MHz Freq Offs Transmit Freg Error 1.607 kHz % of OBW Power 99.00 % x dB Bandwidth 10.02 MHz -26.00 dB x dB

Band5\_10MHz\_QPSK\_50\_0\_LowCH20450-829



#### Band5 10MHz QPSK 50 0 HighCH20600-844



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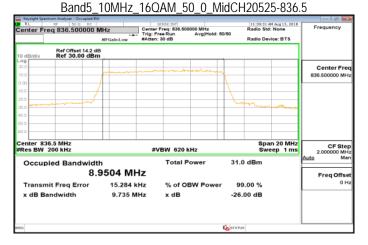
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#### Band5 10MHz 16QAM 50 0 LowCH20450-829

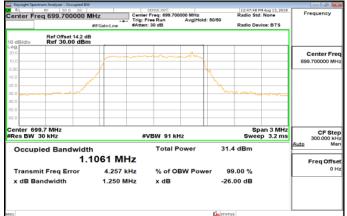
	Analyzer - Occupied BW									
Center Freq	50 Ω DC 829.000000 M	Hz	Center Fr	eq: 829.000				24 AM Aug Std: Nor		Frequency
		#IFGain:Low	#Atten: 3		Avg Hold: 8	50/50	Radio	Device:	втя	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm									
20.0							-			Center Freq
10.0						۲_	-		_	829.00000 MHz
-10.0						$\mathbf{\Lambda}$			_	
-10.0	man									
-30.0	-							m		
-40.0						-	-	_		
-60.0						-	-		_	
-60.0										
Center 829 M #Res BW 20			#VE	W 620 k	Hz			pan 2 weep	0 MHz 1 ms	CF Step 2.000000 MHz
Occupie	d Bandwidth	1		Total P	ower	31.	6 dBm			Auto Man
	8.9	982 MH	lz							Freq Offset
Transmit	Freq Error	-7.814 k	Hz	% of OE	BW Power	9	9.00 %			0 Hz
x dB Band	dwidth	9.923 M	Hz	x dB		-26	.00 dB			
MSG							38			

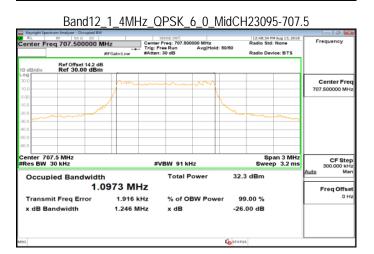


## Band5\_10MHz\_16QAM\_50\_0\_HighCH20600-844

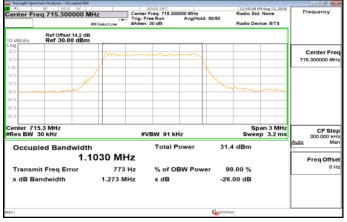
RF 50 Ω DC		SENSE:INT	11:91:9	1 AM Aug 13, 2018	Frequency
eq 844.000000 l				itd: None	Frequency
				evice: BTS	
					Center Fre
		and a second			844.000000 MH
	<u> </u>				
	(		1		
montal			hanne a		
				monan	
				I	
4 MHz			S	oan 20 MHz	CF Ste
200 kHz		#VBW 620 kHz	S	weep 1 ms	2.000000 MI
ied Bandwidt	th	Total Power	31.2 dBm		Auto Ma
8.	9911 MHz				Freq Offs
nit Freg Error	-23.418 kHz	% of OBW Powe	r 99.00 %		01
	0.790 MHZ	A GB	-20.00 dB		
			STATUS		
	Nº         50.8         200           eq 844.000000         Ref 000000         000           Ref 30.00 dBr         14.2 d         d           4 MHz         200 kHz         200 kHz	eg 844.00000 MHz references of the second se	Boo BC     Backet BY     Boo BC     Backet BY     Boo BC     Backet BY     Backet	Boo box     Box	BY     100 000 MHz     Center Free Sk4.00000 MHz     Center Free Sk4.00000 MHz     Center Free Sk4.00000 MHz     Radio Ske: New Radio Ske: New Radio Ske: New Radio Ske: New Radio Device: BTS       Ref Offset 14.2 dB     Ref 30.00 dBm     American Ske: New Radio Device: BTS       Ref 30.00 dBm     Market 13 dB     Ref 30.00 dBm       4 MHz     Span 20 MHz     Span 20 MHz       200 kHz     #VBW 620 kHz     Sweep 1 ms       Job Bandwidth     Total Power     31.2 dBm       8.89911 MHz     % of OBW Power     99.00 %       Nit Free Error     -23.418 kHz     % of OBW Power     99.00 %

#### Band12\_1\_4MHz\_QPSK\_6\_0\_LowCH23017-699.7





## Band12 1 4MHz QPSK 6 0 HighCH23173-715.3



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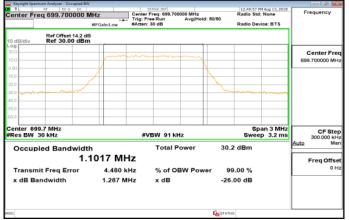
台灣檢驗科技股份有限公司

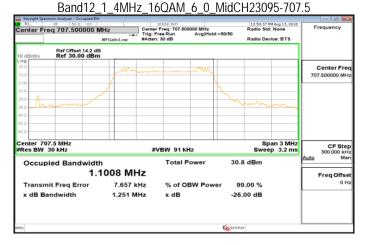
f (886-2) 2298-0488



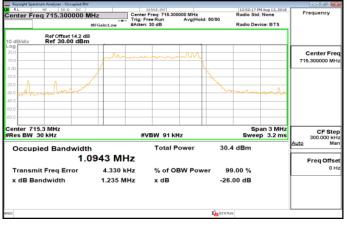
## Report No.: ER/2018/80045 Page 60 of 156

#### Band12\_1\_4MHz\_16QAM\_6\_0\_LowCH23017-699.7

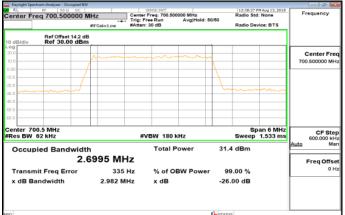




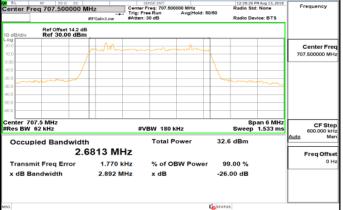
#### Band12\_1\_4MHz\_16QAM\_6\_0\_HighCH23173-715.3



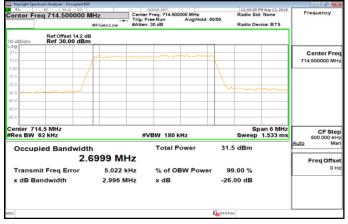
#### Band12\_3MHz\_QPSK\_15\_0\_LowCH23025-700.5







#### Band12 3MHz QPSK 15 0 HighCH23165-714.5



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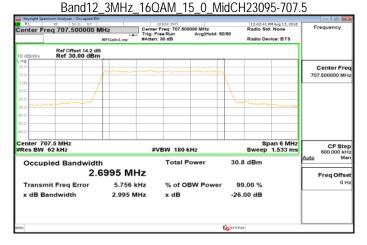
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#### Band12\_3MHz\_16QAM\_15\_0\_LowCH23025-700.5

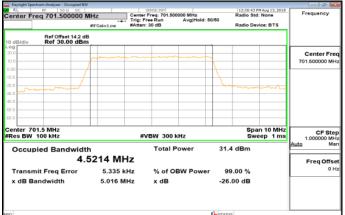
Keysight Spec	trum Analyzer - Occupied BW						
	eq 700.500000 N	IHz	Center Freq: 700.50	0000 MHz	Radio Std	M Aug 13, 2018	Frequency
		#IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold:>50/5	0 Radio Dev	rice: BTS	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm						
20.0							Center Free
10.0		m					700.500000 MH
0.00	/	(					
10.0	/				+		
20.0	- Income and				hanne -	~~~~	
30.0					-		
40.0							
60.0							
60.0							
Center 70 Res BW			#VBW 180	kHz		an 6 MHz 1.533 ms	CF Step 600.000 kH
Occup	oled Bandwidth	ı	Total F	Power	30.8 dBm		Auto Mar
	2.7	7044 MH	z				Freq Offse
Transn	nit Freq Error	4.483 ki	z % of O	BW Power	99.00 %		0 H
x dB Ba	andwidth	2.998 MI	lz xdB		-26.00 dB		
50				ri-	STATUS		



#### Band12\_3MHz\_16QAM\_15\_0\_HighCH23165-714.5

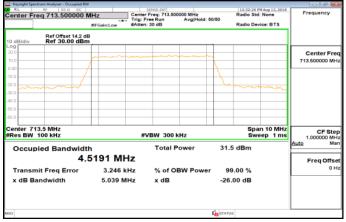
	ctrum Analyzer - Occupied BW							
RL Center Fr	™ 50 Ω DC req 714.500000 N		sense:INT enter Freq: 714.50			Radio Sto	PM Aug 13, 2018 d: None	Frequency
		the Tr	ig: Free Run tten: 30 dB	Avg Hold:>	50/50	Radio De	vice: BTS	
0 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm							
20.0								Center Free
10.0		mon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1			714.500000 MH
					-			
0.0					+			
0.0					+			
0.0							m	
0.0					-			
0.0					-			
0.0					-			
enter 71 Res BW			#VBW 180	kHz			oan 6 MHz 1.533 ms	CF Ste 600.000 kH
Occup	oied Bandwidt	1	Total	Power	30	4 dBm		Auto Ma
		7044 MHz						Freq Offse
Transm	nit Freg Error	9.377 kHz	% of C	BW Powe	9	9.00 %		0 H
	andwidth	2.997 MHz			-26	6.00 dB		
		2.007 11112	XUD		-2.0			
a					1 STAT	us		

#### Band12\_5MHz\_QPSK\_25\_0\_LowCH23035-701.5



#### Band12\_5MHz\_QPSK\_25\_0\_MidCH23095-707.5 12:31:43 PM Aug 1 Radio Std: March nter Freq 707.500000 MHz Frequency tio Device: BTS Ref Offset 14.2 dE Ref 30.00 dBm Center Fre 707.500000 MH er 707.5 MHz BW 100 kHz Span 10 MH Sweep 1 m CF Step 1.000000 MH #VBW 300 kHz Occupied Bandwidth Total Power 31.7 dBm 4.4943 MHz Freq Offse Transmit Freg Error 2.062 kHz % of OBW Power 99.00 % x dB Bandwidth 5.014 MHz -26.00 dB x dB

#### Band12 5MHz QPSK 25 0 HighCH23155-713.5



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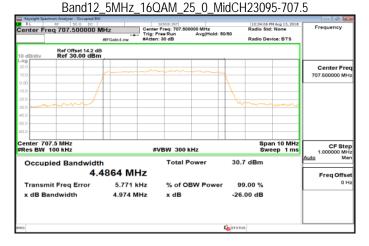
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#### Band12\_5MHz\_16QAM\_25\_0\_LowCH23035-701.5

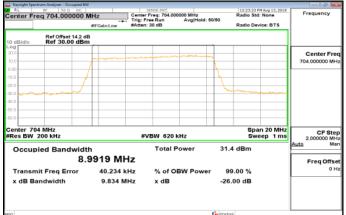
	m Analyzer - Occupied BW		1							
	a 701.500000 N	Hz	Center Fr	eq: 701.500	000 MHz		Radio S	td: None	2018	Frequency
		#IFGain:Low	#Atten: 3		Avg Hold: I	50/50	Radio D	evice: BT	s	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm									
20.0										Center Free
10.0		m				1			-11	701.500000 MH
0.00	/					1			-1	
10.0	1						-			
20.0						1			~~~	
40.0										
50.0										
60.0								_	-1	
Center 701. Res BW 10			#VE	W 300 k	Hz			an 10 M veep 1		CF Step 1.000000 MH
Occupie	ed Bandwidth	1		Total P	ower	30.	5 dBm			Auto Ma
	4.5	5027 MH	lz						- 1	Freq Offse
Transmit	Freq Error	10.720 k	Hz	% of O	3W Power	r 91	9.00 %			0 H
x dB Ban	dwidth	5.025 M	IHz	x dB		-26	.00 dB		[	
90						<b>S</b> TATU				

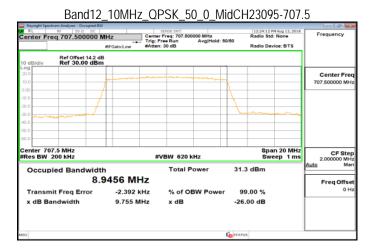


#### Band12\_5MHz\_16QAM\_25\_0\_HighCH23155-713.5

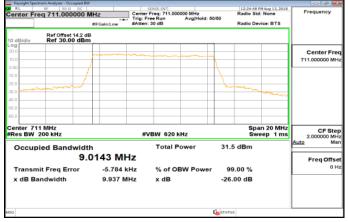
Keysight Spec	trum Analyzer - Occupied BW			CINT			12:34:57	PM Aug 13, 2018	
	eq 713.500000 N	IHz	Center Free	: 713.500			Radio St	td: None	Frequency
		#IFGain:Low	#Atten: 30	dB	Avg Hold:>	50/50	Radio D	evice: BTS	
) dB/div	Ref Offset 14.2 dE Ref 30.00 dBm								
9 <b>9</b>							_		Center Fre
			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						713.500000 MH
		(				A -		-	
						$\left  \right\rangle$		-	
.0	mont						mon	-	
.0						-		- m	
0						-		-	
0						-			
.0						-			
	3.5 MHz 100 kHz		#VBV	V 300 k	Hz			an 10 MHz veep 1 ms	CF Ste 1.000000 MH
Occup	ied Bandwidt	1	-	Total P	ower	30	.6 dBm		Auto Ma
	4.5	5148 MH	z						Freq Offs
Transm	nit Freg Error	8.534 k	Hz 9	6 of OE	W Power	9	9.00 %		01
	andwidth	5.048 M		dB			6.00 dB		
		0.040 1				-2.			
						<b>1</b> STAT	45		

#### Band12\_10MHz\_QPSK\_50\_0\_LowCH23060-704





## Band12 10MHz QPSK 50 0 HighCH23130-711



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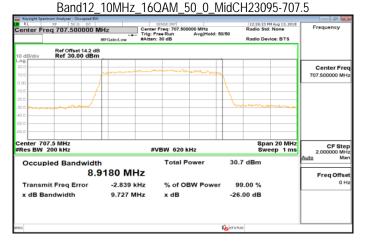
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#### Band12 10MHz 16QAM 50 0 LowCH23060-704

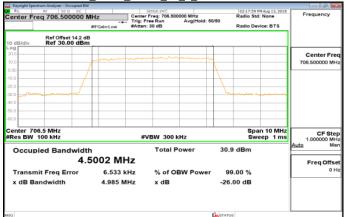
Keysight Spectrum Analyzer - Occupied B	w			- 2 ×
RL 10 50 Ω DC		r Freq: 704.000000 MHz	12:25:40 PM Aug 13, 201 Radio Std: None	Frequency
	Trig:	Free Run Avg Hold: 5 n: 30 dB	0/50 Radio Device: BTS	
Ref Offset 14.2 d 10 dB/div Ref 30.00 dBr				
20.0				Center Freq
10.0	wannen	and the second sec		704.000000 MHz
0.00			1 I	
10.0	r l			
20.0			- manuna mark	
40.0				
50.0				
60.0				-11
Center 704 MHz Res BW 200 kHz	4	VBW 620 kHz	Span 20 MH Sweep 1 m	2.000000 MH
Occupied Bandwidt	th	Total Power	30.6 dBm	Auto Mar
	9777 MHz			Freq Offset
Transmit Freq Error	27.802 kHz	% of OBW Power	99.00 %	0 Ha
x dB Bandwidth	9.810 MHz	x dB	-26.00 dB	
so			STATUS	

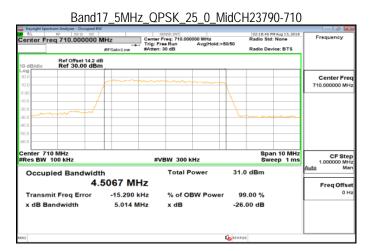


#### Band12\_10MHz\_16QAM\_50\_0\_HighCH23130-711

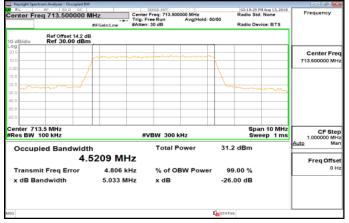
Keysight Spectrum Analyzer - Occupied BW RL IV 50 Q DC		anna ann		5 PM Aug 13, 2018	- 2
enter Freg 711.000000 M	MHz Cente	Freq: 711.000000 MHz	Radio S	td: None	Frequency
	Trig: I	ree Run Avg Hold : 30 dB		evice: BTS	
Ref Offset 14.2 df 0 dB/div Ref 30.00 dBn					
99					Center Fre
1.0	hanne		~~		711.000000 MH
	/		- <u>\</u>		
0					
0					
monter			mouran	manne	
.0					
.0					
enter 711 MHz			Sp	an 20 MHz	CF Ste
Res BW 200 kHz	#	VBW 620 kHz	S\	weep 1 ms	2.000000 MH
Occupied Bandwidt	h	Total Power	30.7 dBm	A	<u>uto</u> Ma
	9601 MHz			Ē	Freq Offs
Transmit Freg Error	-3.807 kHz	% of OBW Powe	er 99.00 %		0 F
x dB Bandwidth	9.823 MHz	x dB	-26.00 dB	E F	
x up bandwiddi	0.020 11112	A 00	-20.00 00		
5			STATUS	L	
			-		

#### Band17\_5MHz\_QPSK\_25\_0\_LowCH23755-706.5





#### Band17 5MHz QPSK 25 0 HighCH23825-713.5



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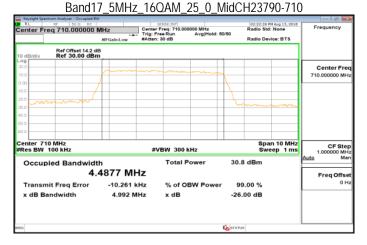
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#### Band17\_5MHz\_16QAM\_25\_0\_LowCH23755-706.5

Center Fre	eq 706.500000 M		Center Fr	NSE:INT					
							Radio Std: None Frequency		
		MFGain:Low	#Atten: 3		Avg Hold: 5	0/50	Radio Device: BTS		
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm								
20.0									Center Fre
10.0		~~~~~							706.500000 MH
1.00						λ.			L
0.0						$\left  \right\rangle$			
20.0									
0.0								-un	
10.0 50.0									
50.0									
Center 706 Res BW 1			#VE	300 k	Hz			10 MHz ep 1 ms	CF Ste 1.000000 MH
Occupi	ied Bandwidth			Total P	ower	30.9	dBm		Auto Ma
	4.4	873 MH	lz						Freq Offs
Transmi	it Freq Error	14.349 k	Hz	% of OE	BW Power	99	.00 %		01
x dB Ba	ndwidth	5.009 M	Hz	x dB		-26.	00 dB		
ic i						5 STATUS			

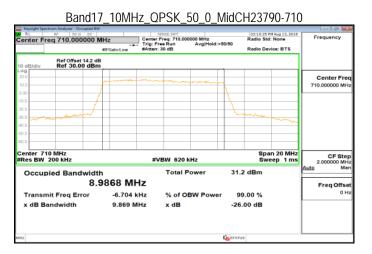


#### Band17\_5MHz\_16QAM\_25\_0\_HighCH23825-713.5

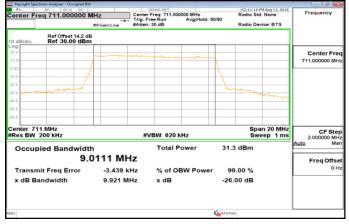
RF 50 Ω DC		CTACT ANT			02-22-00 01	Aug 12 2018			
		enter Freq: 713.50			Radio Std:	None	Frequency		
			Avg Hold: bi	0/50	Radio Devi				
							Center Fre		
	hand						713.500000 MH		
/				X					
www.				1	man	mm			
3.5 MHz 100 kHz		#VBW 300	kHz				CF Ste 1.000000 MH		
ied Bandwidt	ı	Total F	ower	30.7	/ dBm		Auto Mi		
4.5	5118 MHz	:					Freq Offs		
it Freg Error	4.503 kH	s % of O	BW Power	99	.00 %		01		
ndwidth	5.010 MH	x dB		-26.	00 dB				
				5 STATUS	5				
	eq 713.500000 N Ref 007set 14.2 dB Ref 30.00 dBm 3.5 MHz 100 kHz led BandwidtI 4, { it Freq Error	Ref 015x 414.2 dB Ref 015x 414.	Ref 015:500000 MHz Center Free 713:50 BrGaint.com Ref 015:50 MK Stern: 30 60 Ref 015:et 14:2 dB Ref 030:00 dBm Stern: 30 60 Stern: 30 60 MK Stern: 30 60 Stern: 30 60 MK Stern: 30 60 Stern: 40 MK Stern: 40 MK Stern	Ref 076et 14.2 dB Ref 076et 14.2 dB	Pag 713.500000 MHz Bit GainLow Bit GainLow Bit GainLow Argi Pres 200 Argi Pr	Ref 015:500000 MHz arGainLow Content Free 713:50000 MHz arGainLow Ref 016:54:14.20 Ref 30:00 MHz arGainLow Ref 016:54:14.20 Ref 016:55:14.20 Ref 016:55:15:15:15:15:15:15:15:15:15:15:15:15:	Red is Stat: None Red in Stat: None Red is Stat:		

#### Band17\_10MHz\_QPSK\_50\_0\_LowCH23780-709





#### Band17 10MHz QPSK 50 0 HighCH23800-711



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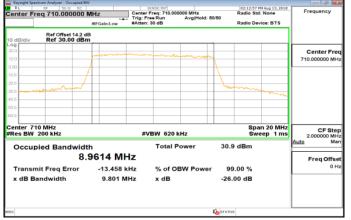
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#### Band17 10MHz 16QAM 50 0 LowCH23780-709

	strum Analyzer - Occupied BV	v				
RL Enter En	eq 709.000000 I	MHZ	Center Freq: 709.000	000 MHz	02:12:15 PM Aug 13, 201 Radio Std: None	Frequency
	64 703.000000	#IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold: 50/50	Radio Device: BTS	
0 dB/div	Ref Offset 14.2 d Ref 30.00 dBn					
20.0						Center Free
0.0		part and	and the second second	mannen		709.000000 MH
.00						
0.0		(				
0.0					man	
1.0					and the second second	
0.0						
0.0						
0.0						
enter 70 Res BW			#VBW 620 k	Hz	Span 20 MH Sweep 1 m	
Occup	ied Bandwidt	h	Total P	ower 3	0.8 dBm	Auto Mar
	8.	9268 MH	z			Freq Offse
Transm	nit Freq Error	-10.108 k	Hz % of OE	BW Power	99.00 %	0 H
x dB Ba	andwidth	9.809 MI	Hz xdB		26.00 dB	
3				<b>1</b> 00 81		



## Band17\_10MHz\_16QAM\_50\_0\_MidCH23790-710

#### Band17\_10MHz\_16QAM\_50\_0\_HighCH23800-711

Keysight Spectrum Analyzer - Occupied BV RL RF 50 Q DC	v	SENSE:INT	02:13:4	5 PM Aug 13, 2018		
enter Freg 711.000000	MHz Cente	r Freq: 711.000000 MHz	Radio S	Radio Std: None Freque		
		Free Run Avg Hold: 5 n: 30 dB		evice: BTS		
Ref Offset 14.2 d dB/div Ref 30.00 dBr						
9					Center Fre	
.0		- marine and the marked			711.000000 MH	
10	/		A			
	/					
.0						
mmmmmmm			- many	- mare		
.0						
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.0						
enter 711 MHz				an 20 Mills		
tes BW 200 kHz	#	VBW 620 kHz		oan 20 MHz weep 1 ms	CF Ste 2.000000 MH	
Occupied Bandwidt	h	Total Power	31.2 dBm		Auto Ma	
8.	9888 MHz				Freq Offs	
Transmit Freg Error	-11.016 kHz	% of OBW Power	99.00 %		01	
x dB Bandwidth	9.931 MHz	x dB	-26.00 dB			
	0.001 11112		-20.00 00			
			STATUS			
			NO OTATOS			

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# 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

## 9.1. Standard Applicable

FCC §22.917(a), §24.238(a), Out of band emissions. 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.

FCC §27.53(g)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. 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.

FCC §27.53(h) (3)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz 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. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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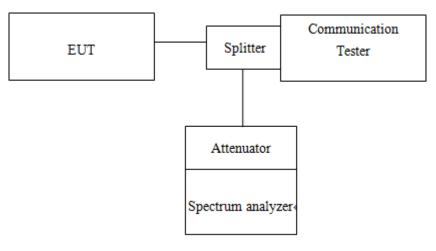


FCC §27.53(m) (4)

For mobile digital stations, 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 that 43 + 10 log (P) dB on all freguencies 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.

Measurement procedure. Compliance with these rules is based on the use of measurement nstrumentation employing a resolution bandwidth of 1 megahertz or greater. 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

## 9.2. Test SET-UP



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# 9.3. Measurement Procedure Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

## Band Edge

- 1. To connect Antenna Port of EUT to Spectrum.
- The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
EXA Spectrum Analyz- er	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Chamber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

# 9.4. Measurement Equipment Used

## 9.5. Measurement Result:

Refer to next pages.

# NOTE: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

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## Band Edge GSM\_850MHz\_LowCH128-824.2





## GPRS\_850MHz\_LowCH128-824.2



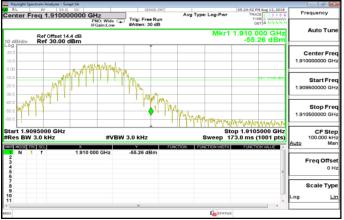








#### GSM\_1900MHz\_HighCH810-1909.8



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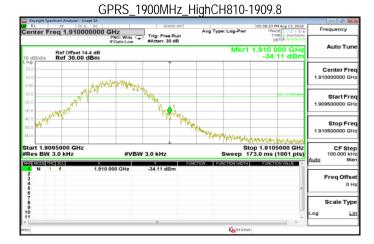
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#### GPRS\_1900MHz\_LowCH512-1850.2



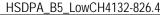


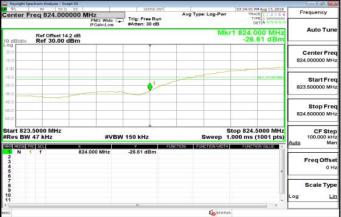
#### WCDMA B5 LowCH4132-826.4

🔤 Keysight Spectrum Analy		100000000000000000000000000000000000000			0 0 2
Center Freq 824	4.000000 MHz	Trig: Free Run	Avg Type: Log-Pwr	03:32:57 PH Aug 13, 2018 TRACE 1 7 3 4 5 6 TYPE 0 WWWWW	Frequency
	IFGain:Low	#Atten: 30 dB		1 824.000 MHz	Auto Tune
	set 14.2 dB 0.00 dBm		MIK	-26.33 dBm	
20.0					Center Free 824.000000 MH
0.00 -10.0 -20.0		1		CL1 -1 > 3h allin	Start Free 823.500000 MH
40.0					Stop Free
60.0 Start 823.5000 M #Res BW 47 kHz		150 kHz		top 824.5000 MHz .000 ms (1001 pts)	824.500000 MH CF Step 100.000 kH
MAR MOLES THE SEC.	X	Y	Sweep 1		Auto Ma
1 N 1 f 2 3 4 5	824.000 MHz	-26.33 dBm			Freq Offse 0 H
4 6 7 8 9					Scale Type
11 *		н			
90			Co STATU		

#### WCDMA\_B5\_HighCH4233-846.6







#### HSDPA B5 HighCH4233-846.6

0 0 0	and the second second second second	12		wlyzer - Swept SA	
Frequency	03:43:57 PN Aug 13, 2018 TRACE 1 2 3 4 5 6 TIPE 5 WWWWWW DET A NO 16 0 1	Avg Type: Log-Pwr	Trig: Free Run	49.000000 MHz PN0: Wide C	Center Free
Auto Tun	1 849.000 MHz -27.45 dBm	Mkr	#Atten: 30 dB	IFGain:Low Offset 14.2 dB 30.00 dBm	10 dB/div
Center Free 849.000000 MH					20.0
Start Fre 848.500000 MH	CLT-1>01 dBr		1		0.00 10.0 20.0
Stop Fre 849.500000 MH					40.0 50.0 60.0
CF Ste 100.000 kH	top 849.5000 MHz 000 ms (1001 pts)	S Sweep 1.	150 kHz		Start 848.50 Res BW 47
Auto Ma	FUNCTION VALUE	ON FUNCTION WOTH	-27.45 dBm	849.000 MHz	1 N 1 2 3
он					4 6 7
Scale Type					8 9 10
-					11
		Co STATUS			190

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