



# FCC TEST REPORT (PART 27)

**REPORT NO.:** RF121010C01  
**MODEL NO.:** E512  
**FCC ID:** UZI-E512  
**RECEIVED:** Oct. 11, 2012  
**TESTED:** Oct. 21 ~ Oct. 25, 2012  
**ISSUED:** Nov. 06, 2012

**APPLICANT:** BandRich Inc.

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
(H.K.) Ltd., Taoyuan Branch

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,  
New Taipei City, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121010C01	Original release	Nov. 06, 2012



# 1 CERTIFICATION

**PRODUCT:** LTE Outdoor CPE  
**MODEL NO.:** E512  
**BRAND:** BandLuxe  
**APPLICANT:** BandRich Inc.  
**TESTED:** Oct. 21 ~ Oct. 25, 2012  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**TEST STANDARDS:** **FCC Part 27**  
**FCC Part 2**

The above equipment (model: E512) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY** : Ivonne Wu , **DATE** : Nov. 06, 2012  
Ivonne Wu / Senior Specialist

**APPROVED BY** : James Lee , **DATE** : Nov. 06, 2012  
James Lee / Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

OPERATING BAND: 698–716 MHz			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1046 27.50(C)(10)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.50(d)(5)	Peak to average ratio	PASS	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -21.55dB at 33.89MHz.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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



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## 2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 06, 2012	Aug. 05, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 03, 2012	Feb. 02, 2013
Spectrum Analyzer Agilent	E4440A	MY46185282	Jan. 04, 2012	Jan. 03, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8447D	2944A10633	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8449B	3008A01964	Oct. 25, 2012	Oct. 24, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/ 4	Aug. 28, 2012	Aug. 27, 2013
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.



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### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	LTE Outdoor CPE	
<b>MODEL NO.</b>	E512	
<b>POWER SUPPLY</b>	48Vdc (adapter)	
<b>MODULATION TECHNOLOGY</b>	QPSK, 16QAM	
<b>FREQUENCY RANGE</b>	698MHz ~ 716MHz	
<b>EMISSION DESIGNATOR</b>	5MHz	QPSK: 4M50W7D
		16QAM: 4M52W7D
	10MHz	QPSK: 9M00W7D
		16QAM: 9M03W7D
<b>MAX. ERP POWER (mW)</b>	5MHz	QPSK: 941.89mW
		16QAM: 763.84mW
	10MHz	QPSK: 916.22mW
		16QAM: 826.04mW
<b>CATEGORY</b>	LTE: 3	
<b>ANTENNA TYPE</b>	PCB Antenna with 7.8dBi gain	
<b>DATA CABLE</b>	NA	
<b>I/O PORTS</b>	Refer to users' manual	
<b>ACCESSORY DEVICES</b>	Adapter	

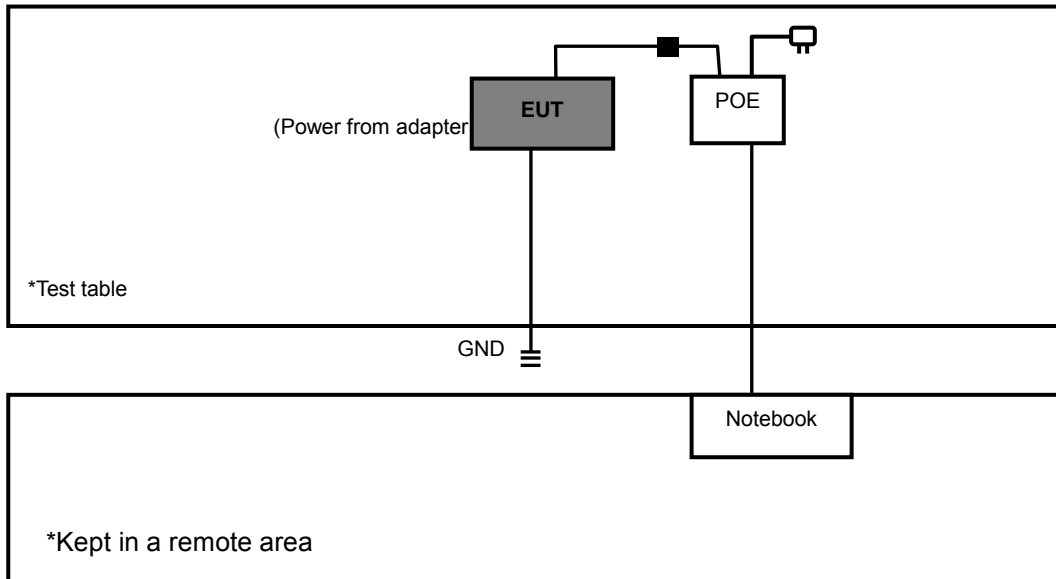
#### NOTE:

1. The EUT consumes power from the following adapter.

ADAPTER	
<b>BRAND:</b>	DVT
<b>MODEL:</b>	DSA-42D-48 1
<b>INPUT:</b>	100-240Vac, 50-60Hz, 1.2A
<b>OUTPUT:</b>	48Vdc, 1A
<b>POWER LINE:</b>	AC: 1.5m non-shielded cable without core DC: 0.6m shielded cable with one core

2. The HW version is V01.
3. The SW version is R860\_2 QC\_0\_00016744\_1\_001\_0420.
4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 CONFIGURATION OF SYSTEM UNDER TEST



### 3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	Dell	E5420	D9VMBT1	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).



### 3.4 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Z-plane for ERP and Z-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODE
ERP	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM
FREQUENCY STABILITY	23035 to 23155	23095	5MHz	QPSK
	23060 to 23130	23095	10MHz	QPSK
OCCUPIED BANDWIDTH	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM
PEAK TO AVERAGE RATIO	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM
BAND EDGE	23035 to 23155	23035, 23155	5MHz	QPSK, 16QAM
	23060 to 23130	23060, 23130	10MHz	QPSK, 16QAM
CONDUCTED EMISSION	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM
RADIATED EMISSION BELOW 1GHz	23035 to 23155	23095	5MHz	QPSK, 16QAM
	23060 to 23130	23095	10MHz	QPSK, 16QAM
RADIATED EMISSION ABOVE 1GHz	23035 to 23155	23035, 23095, 23155	5MHz	QPSK
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK

#### TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
FREQUENCY STABILITY	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
OCCUPIED BANDWIDTH	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
PEAK TO AVERAGE RATIO	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
BAND EDGE	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
CONDUCTED EMISSION	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
RADIATED EMISSION	25deg. C, 68%RH	120Vac, 60Hz	Martin Lee

### **3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**ANSI/TIA/EIA-603-C 2004**

**NOTE:** All test items have been performed and recorded as per the above standards.

## 4 TEST TYPES AND RESULTS

### 4.1 OUTPUT POWER MEASUREMENT

#### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Portable stations (hand-held devices) operating in the 698-716MHz band is limited to 3 watts ERP

#### 4.1.2 TEST PROCEDURES

##### EIRP / ERP MEASUREMENT:

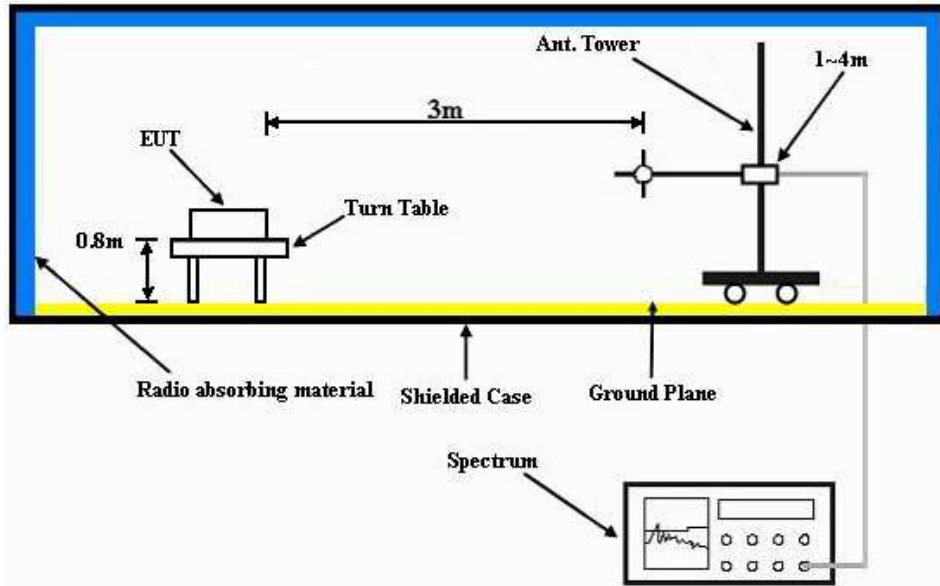
- a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RBW and VBW is 10MHz for LTE.
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. 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 a. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- e.  $E.R.P = E.I.R.P - 2.15 \text{ dB}$

##### CONDUCTED POWER MEASUREMENT:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

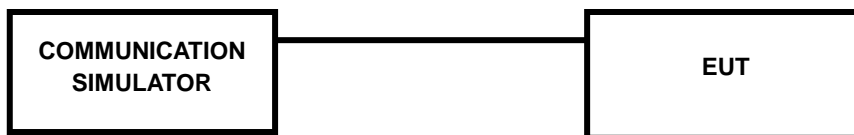
### 4.1.3 TEST SETUP

#### EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).



#### 4.1.4 TEST RESULTS

##### AVERAGE CONDUCTED OUTPUT POWER (dBm)

BW	Modulation	CH	Frequency	RB	RB Offset	MPR	Measured
			(MHz)				Power
5 MHz	QPSK	23035	701.5	1	0	0	21.87
		23095	707.5	1	0	0	21.87
		23155	713.5	1	0	0	21.77
		23035	701.5	1	12	0	21.89
		23095	707.5	1	12	0	21.91
		23155	713.5	1	12	0	21.79
		23035	701.5	1	24	0	21.93
		23095	707.5	1	24	0	20.92
		23155	713.5	1	24	0	20.87
		23035	701.5	12	0	1	20.82
		23095	707.5	12	0	1	20.8
		23155	713.5	12	0	1	20.71
		23035	701.5	12	6	1	20.83
		23095	707.5	12	6	1	20.82
		23155	713.5	12	6	1	20.74
		23035	701.5	12	12	1	20.94
		23095	707.5	12	12	1	20.84
		23155	713.5	12	12	1	20.79
	23035	701.5	25	0	1	20.78	
	23095	707.5	25	0	1	20.77	
	23155	713.5	25	0	1	20.64	
	23035	701.5	1	0	1	20.92	
	23095	707.5	1	0	1	20.64	
	23155	713.5	1	0	1	20.66	
	23035	701.5	1	12	1	20.91	
	23095	707.5	1	12	1	20.66	
	23155	713.5	1	12	1	20.65	
	23035	701.5	1	24	1	20.94	
	23095	707.5	1	24	1	20.67	
	23155	713.5	1	24	1	20.64	
	23035	701.5	12	0	2	19.87	
	23095	707.5	12	0	2	19.64	
	23155	713.5	12	0	2	19.61	
	23035	701.5	12	6	2	19.8	
	23095	707.5	12	6	2	19.57	
	23155	713.5	12	6	2	19.59	
23035	701.5	12	12	2	19.86		
23095	707.5	12	12	2	19.57		
23155	713.5	12	12	2	19.63		
23035	701.5	25	0	2	19.71		
23095	707.5	25	0	2	19.42		
23155	713.5	25	0	2	19.39		



BW	Modulation	CH	Frequency	RB	RB Offset	MPR	Measured
			(MHz)				Power
10 MHz	QPSK	23060	704	1	0	0	21.49
		23095	707.5	1	0	0	21.36
		23130	711	1	0	0	21.86
		23060	704	1	24	0	21.63
		23095	707.5	1	24	0	21.56
		23130	711	1	24	0	21.98
		23060	704	1	49	0	21.73
		23095	707.5	1	49	0	21.64
		23130	711	1	49	0	22.14
		23060	704	25	0	1	21.1
		23095	707.5	25	0	1	20.84
		23130	711	25	0	1	21.37
		23060	704	25	12	1	20.9
		23095	707.5	25	12	1	20.71
		23130	711	25	12	1	21.34
		23060	704	25	25	1	20.87
		23095	707.5	25	25	1	20.69
		23130	711	25	25	1	21.31
	23060	704	50	0	1	21	
	23095	707.5	50	0	1	20.94	
	23130	711	50	0	1	21.38	
	23060	704	1	0	1	21.27	
	23095	707.5	1	0	1	21.21	
	23130	711	1	0	1	21.42	
	23060	704	1	24	1	21.28	
	23095	707.5	1	24	1	21.23	
	23130	711	1	24	1	21.47	
	23060	704	1	49	1	21.29	
	23095	707.5	1	49	1	21.24	
	23130	711	1	49	1	21.51	
	23060	704	25	0	2	20.01	
	23095	707.5	25	0	2	19.99	
	23130	711	25	0	2	20.34	
	23060	704	25	12	2	19.96	
	23095	707.5	25	12	2	19.93	
	23130	711	25	12	2	20.14	
23060	704	25	25	2	19.95		
23095	707.5	25	25	2	19.93		
23130	711	25	25	2	20.11		
23060	704	50	0	2	20.08		
23095	707.5	50	0	2	19.97		
23130	711	50	0	2	20.31		



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### ERP (dBm)

#### CHANNEL BANDWIDTH: 5MHz QPSK (1 RB / 24 RB Offset)

MODE		TX channel 23035					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-0.93	30.44	-1.07	29.37	34.77	-5.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-18.52	9.65	-1.07	8.58	34.77	-26.19

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

MODE		TX channel 23095					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-0.56	30.81	-1.07	29.74	34.77	-5.03
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-19.03	9.14	-1.07	8.07	34.77	-26.70

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

MODE		TX channel 23255					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	713.50	-0.84	30.53	-1.07	29.46	34.77	-5.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	713.50	-19.58	8.59	-1.07	7.52	34.77	-27.25

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.



**CHANNEL BANDWIDTH: 10MHz / QPSK (1 RB / 49 RB Offset)**

MODE		TX channel 23060					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-1.20	30.17	-1.07	29.10	34.77	-5.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-16.65	11.52	-1.07	10.45	34.77	-24.32

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

MODE		TX channel 23095					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-0.68	30.69	-1.07	29.62	34.77	-5.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-16.48	11.69	-1.07	10.62	34.77	-24.15

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

MODE		TX channel 23130					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	711.00	-1.04	30.33	-1.07	29.26	34.77	-5.51
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	711.00	-16.90	11.27	-1.07	10.20	34.77	-24.57

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.





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**CHANNEL BANDWIDTH: 5MHz 16QAM (1 RB / 24 RB Offset)**

MODE		TX channel 23035					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-1.84	29.53	-1.07	28.46	34.77	-6.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-19.49	8.68	-1.07	7.61	34.77	-27.16

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

MODE		TX channel 23095					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-1.47	29.90	-1.07	28.83	34.77	-5.94
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-19.97	8.20	-1.07	7.13	34.77	-27.64

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

MODE		TX channel 23155					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	713.50	-1.71	29.66	-1.07	28.59	34.77	-6.18
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	713.50	-20.39	7.78	-1.07	6.71	34.77	-28.06

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.



**CHANNEL BANDWIDTH: 10MHz / 16QAM (1 RB / 49 RB Offset)**

<b>MODE</b>		TX channel 23130					
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-1.54	29.83	-1.07	28.76	34.77	-6.01
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-17.04	11.13	-1.07	10.06	34.77	-24.71

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

<b>MODE</b>		TX channel 23095					
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-1.13	30.24	-1.07	29.17	34.77	-5.60
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	707.50	-16.96	11.21	-1.07	10.14	34.77	-24.63

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

<b>MODE</b>		TX channel 23130					
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	711.00	-1.31	30.06	-1.07	28.99	34.77	-5.78
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	711.00	-17.32	10.85	-1.07	9.78	34.77	-24.99

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)-2.15dB.

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

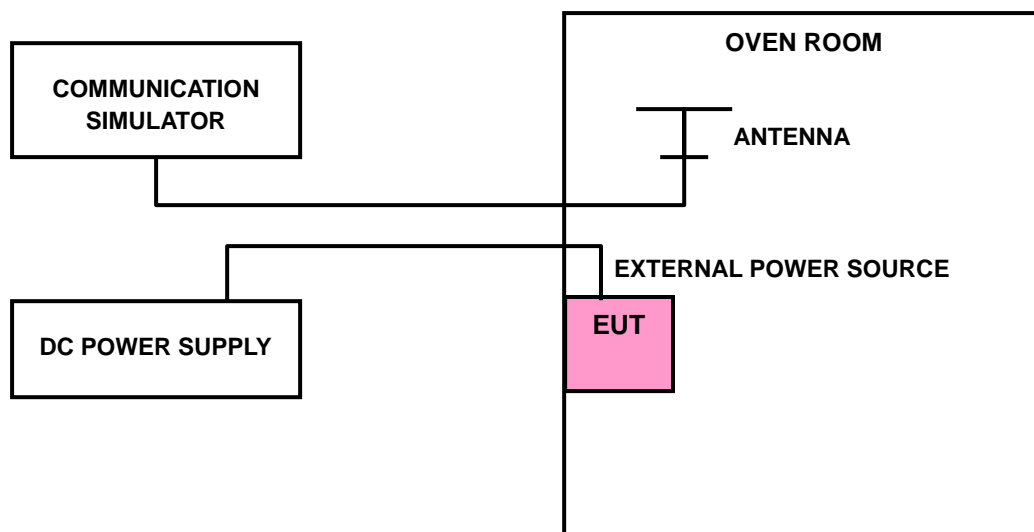
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 4.2.2 TEST PROCEDURE

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.2.3 TEST SETUP





#### 4.2.4 TEST RESULTS

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	5MHz	10MHz	
126.5	-0.014	-0.014	2.5
93.5	-0.011	-0.007	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from 93.5Vdc to 126.5Vdc.

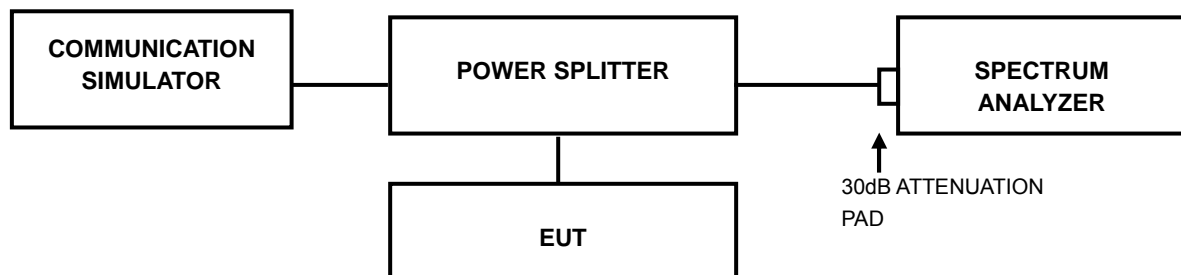
AFC FREQUENCY ERROR vs. TEMP.			
TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	5MHz	10MHz	
50	-0.021	-0.016	2.5
40	-0.014	-0.021	2.5
30	-0.017	-0.023	2.5
20	-0.007	-0.020	2.5
10	-0.014	-0.014	2.5
0	-0.006	-0.011	2.5
-10	-0.008	-0.007	2.5
-20	-0.014	-0.010	2.5
-30	-0.020	-0.020	2.5

### 4.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

#### 4.3.2 TEST SETUP



#### 4.3.3 TEST PROCEDURES

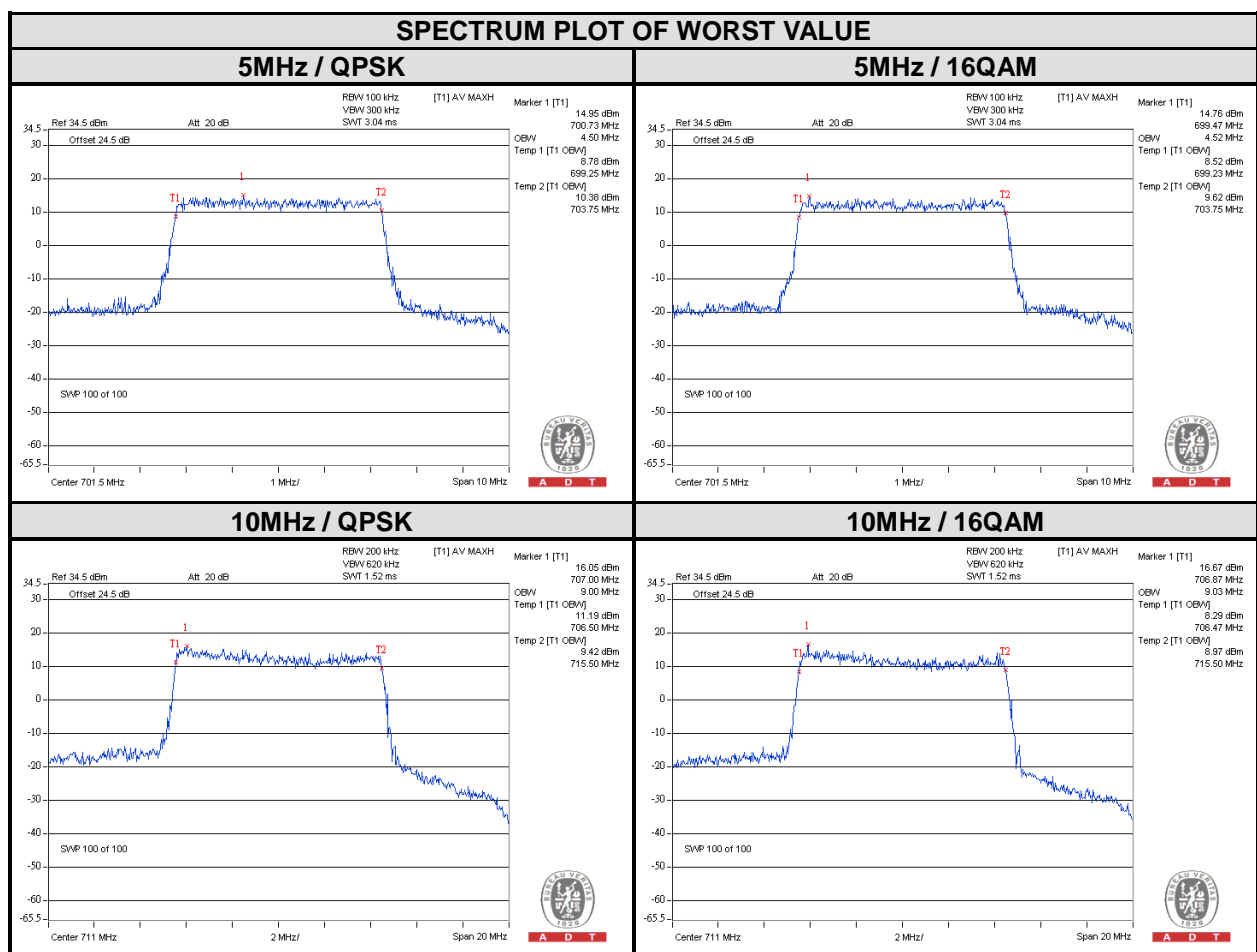
- a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



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### 4.3.4 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.50	4.52	23060	704	8.97	8.97
23095	707.5	4.48	4.48	23095	707.5	8.90	8.90
23155	713.5	4.50	4.50	23130	711	9.00	9.03

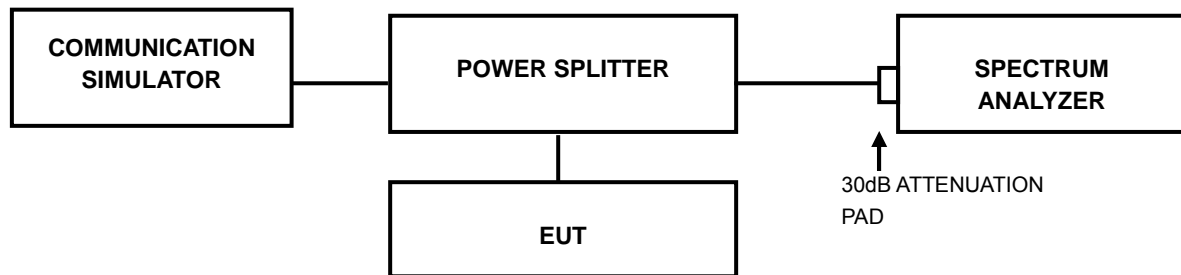


## 4.4 PEAK TO AVERAGE RATIO

### 4.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

### 4.4.2 TEST SETUP



### 4.4.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

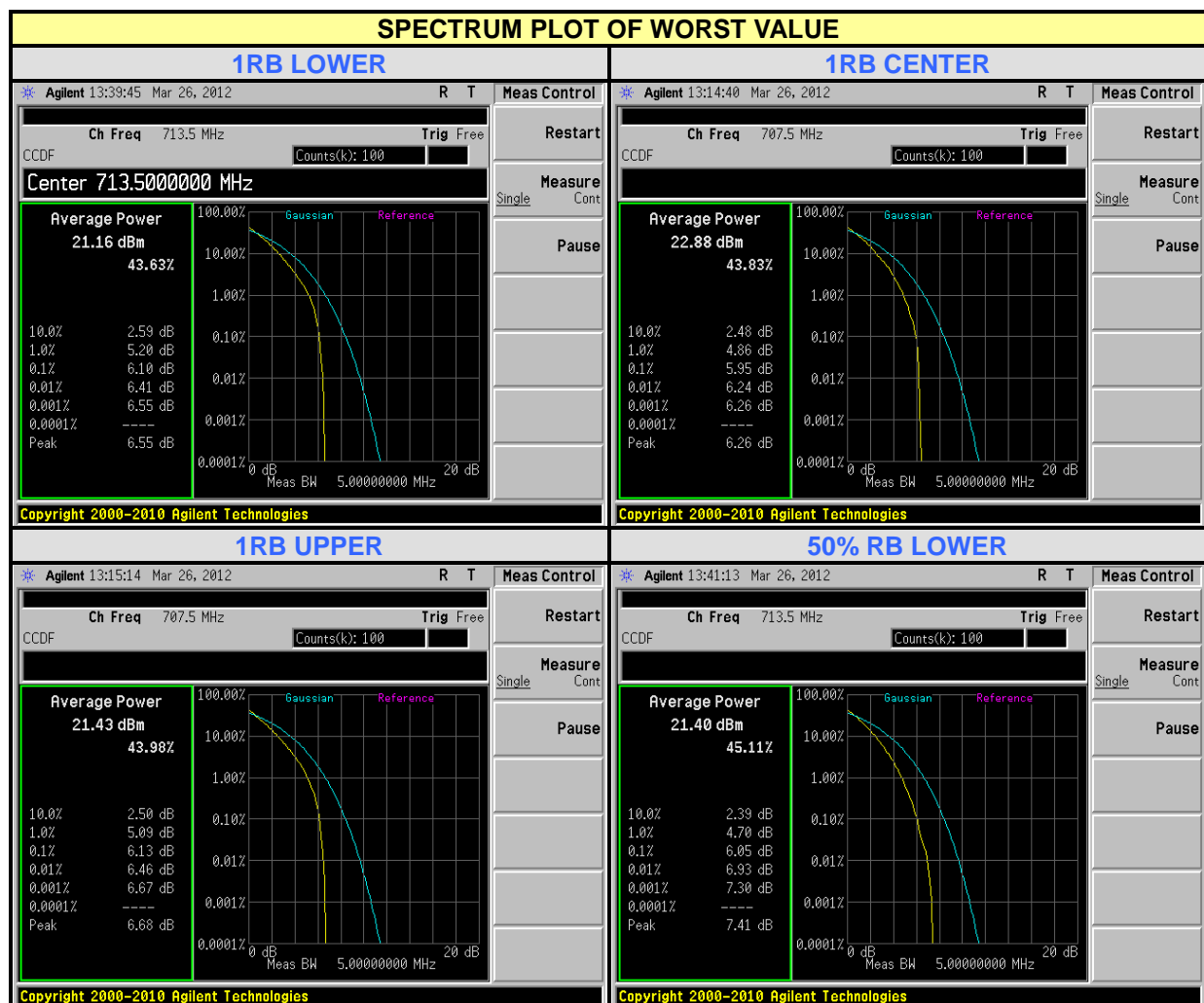


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### 4.4.4 TEST RESULTS

#### CHANNEL BANDWIDTH: 5MHz / QPSK

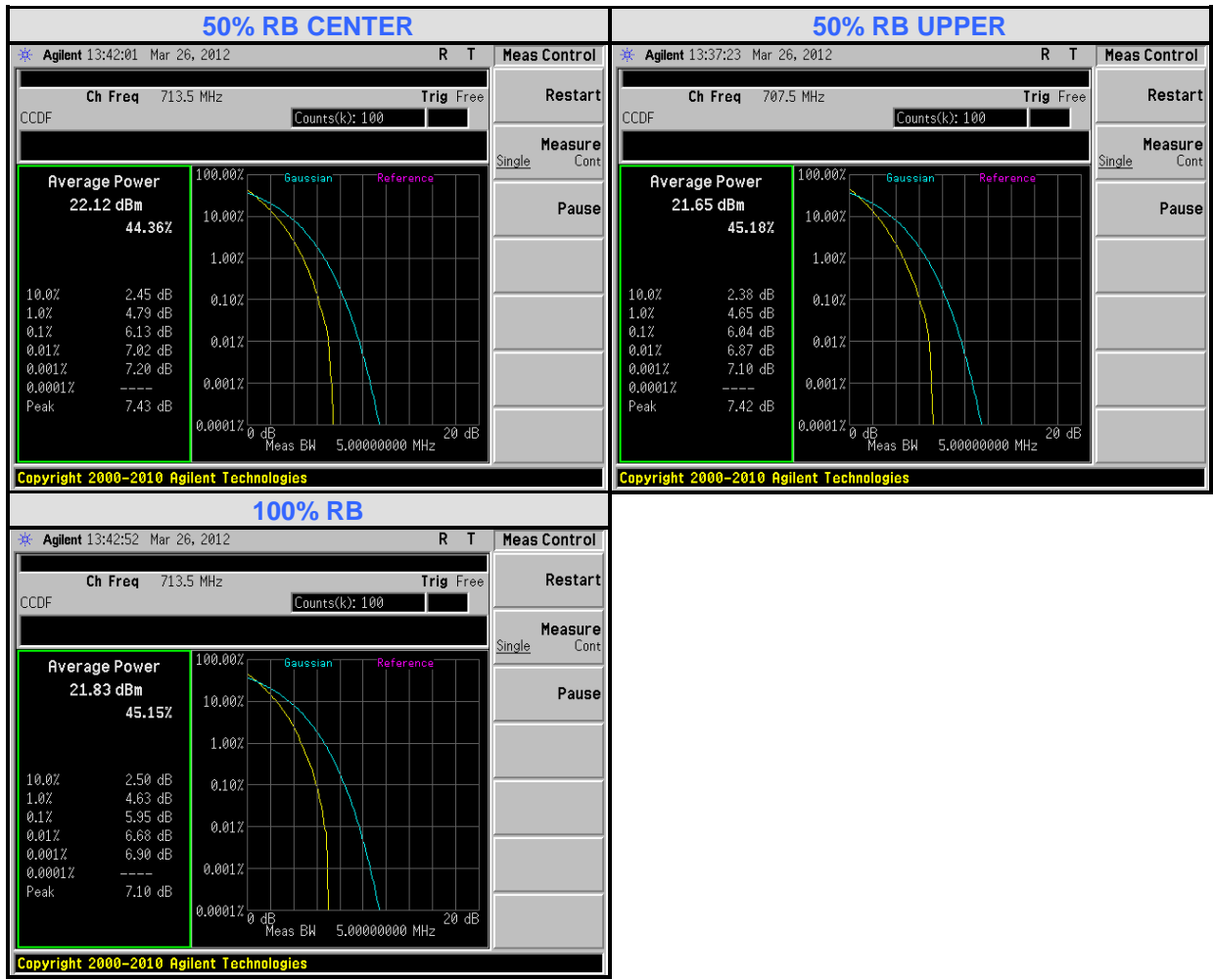
FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)						
	1RB LOWER	1RB CENTER	1RB UPPER	50% RB LOWER	50% RB CENTER	50% RB UPPER	100% RB
701.5	6.09	5.80	5.77	5.97	5.96	5.95	5.93
707.5	5.92	5.95	6.13	5.88	5.95	6.04	5.75
713.5	6.10	5.80	5.76	6.05	6.13	5.90	5.95







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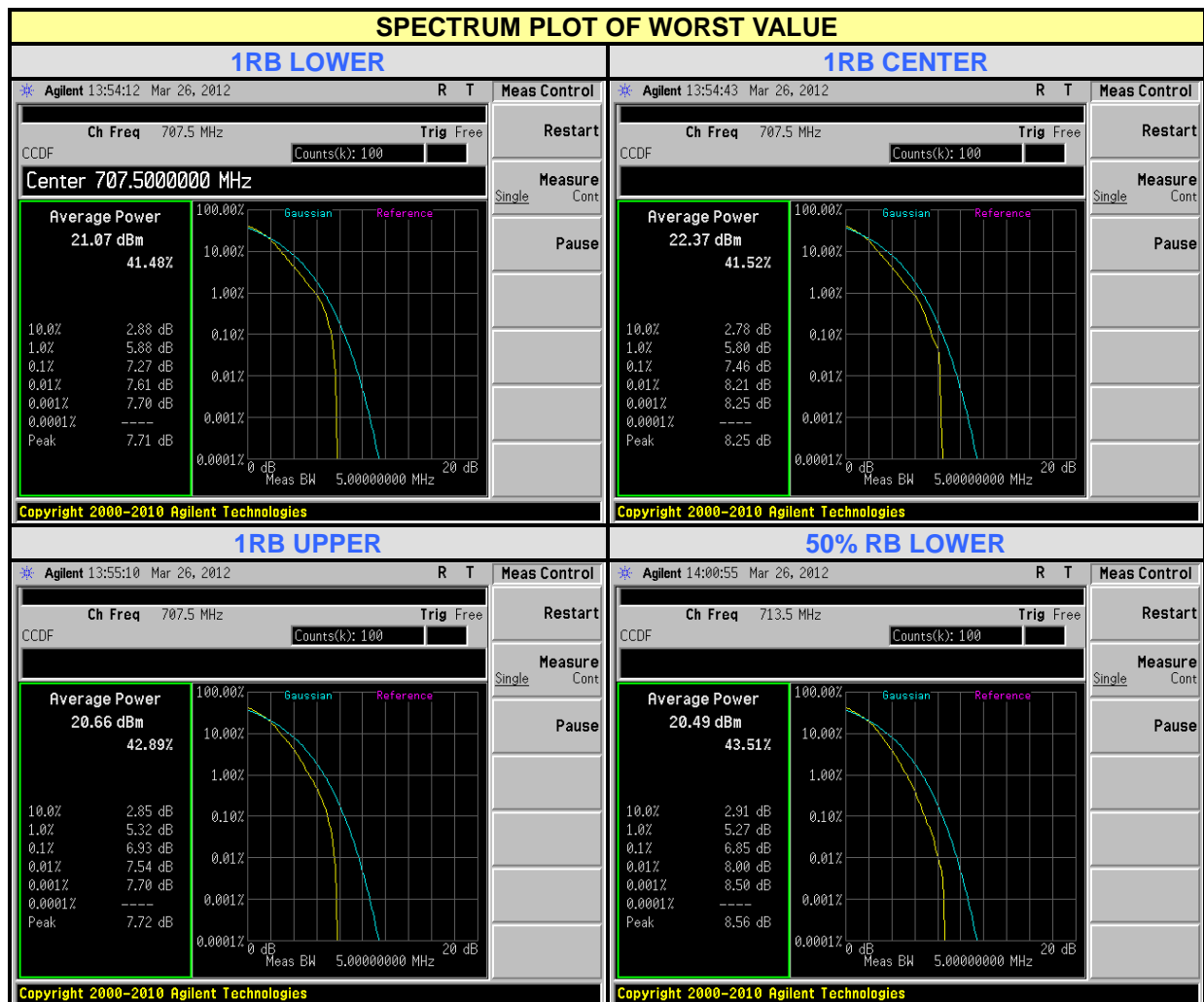




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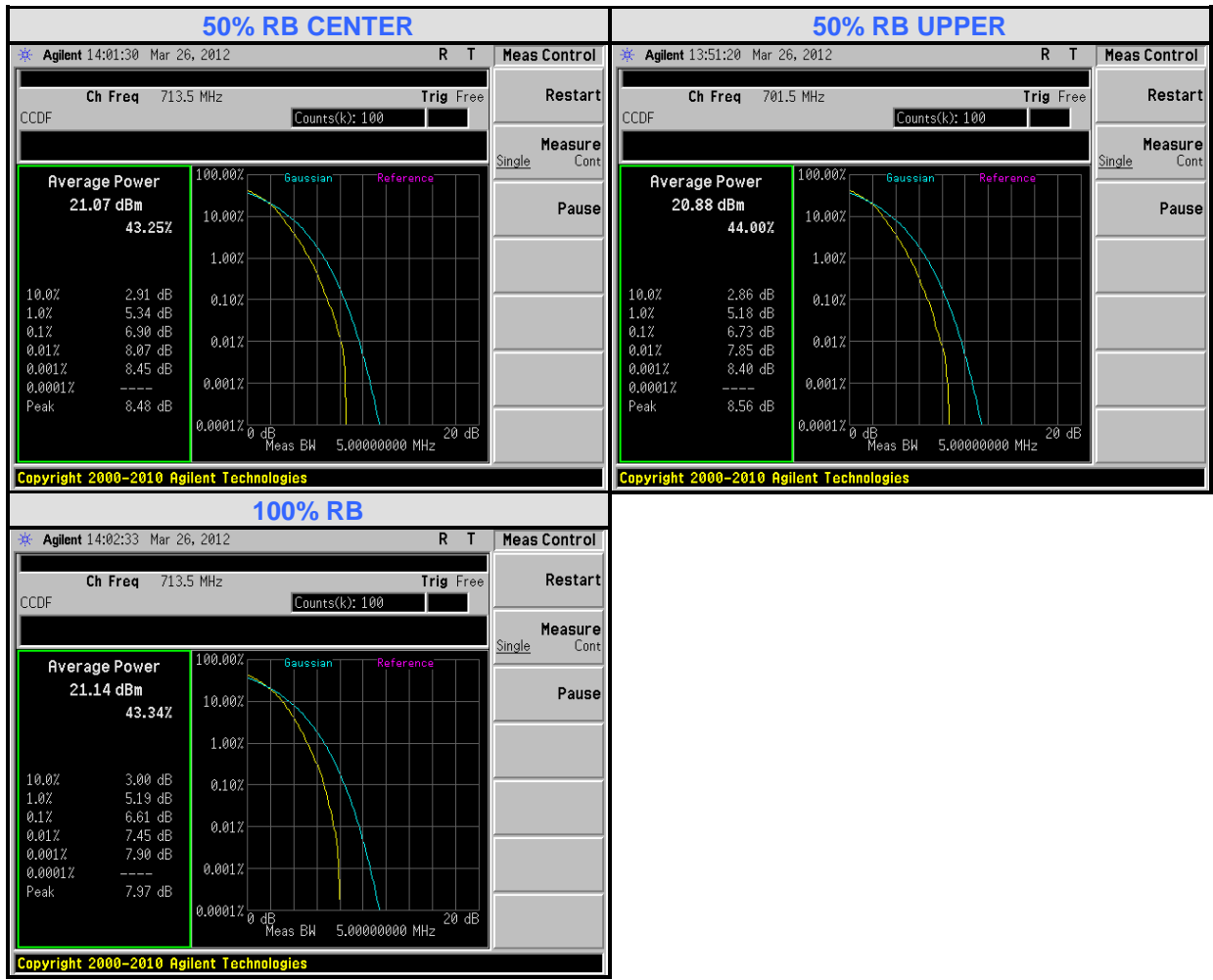
**CHANNEL BANDWIDTH: 5MHz / 16QAM**

FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)						
	1RB LOWER	1RB CENTER	1RB UPPER	50% RB LOWER	50% RB CENTER	50% RB UPPER	100% RB
701.5	7.13	7.03	6.61	6.59	6.70	6.73	6.48
707.5	7.27	7.46	6.93	6.48	6.80	6.65	6.46
713.5	6.87	7.21	6.93	6.85	6.90	6.63	6.61





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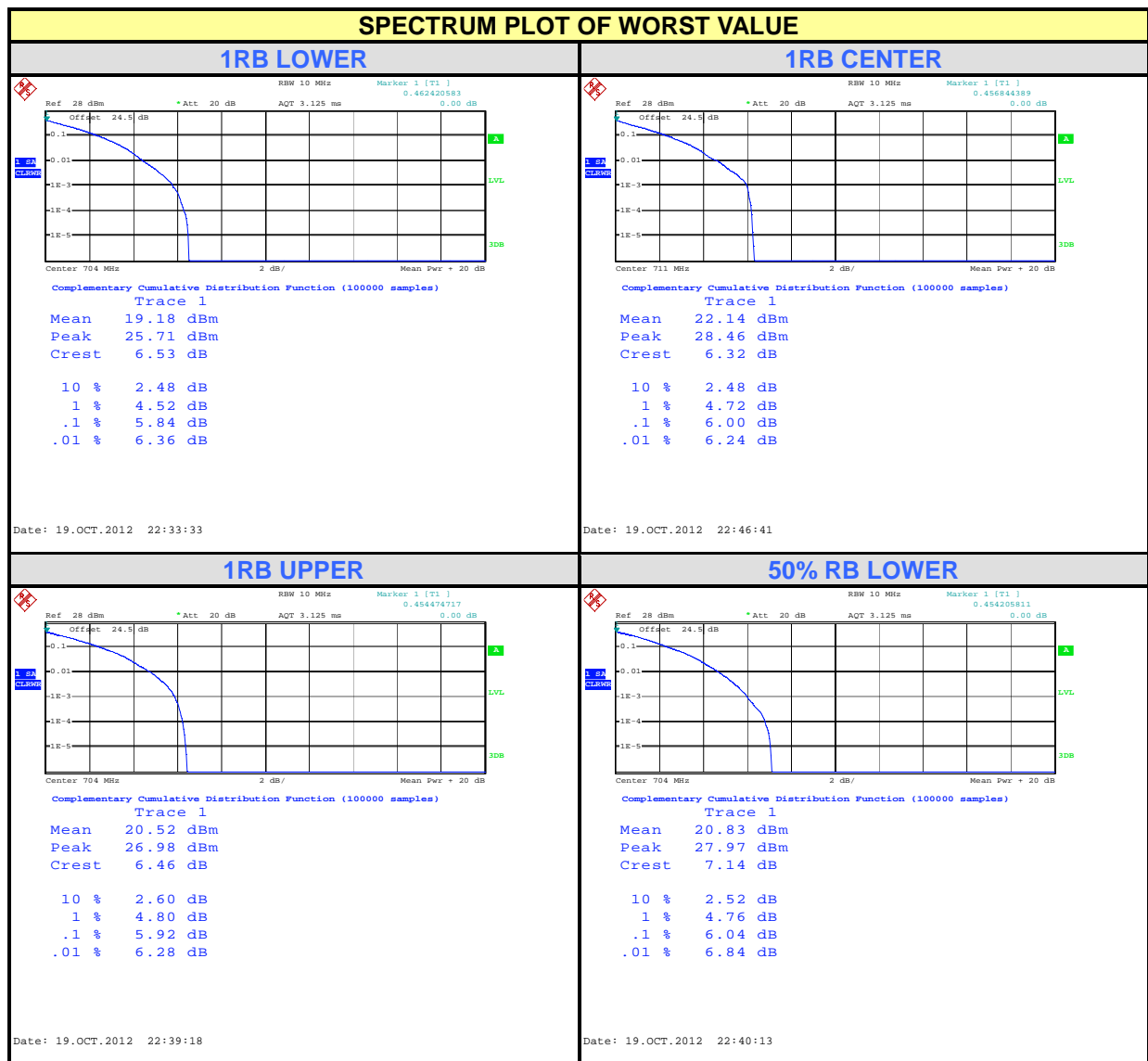




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**CHANNEL BANDWIDTH: 10MHz / QPSK**

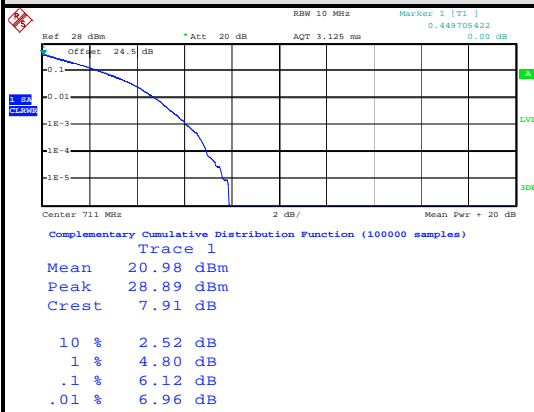
FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)						
	1RB LOWER	1RB CENTER	1RB UPPER	50% RB LOWER	50% RB CENTER	50% RB UPPER	100% RB
704	5.84	5.68	5.92	6.04	6.08	5.80	5.60
707.5	5.76	5.92	5.56	5.64	6.04	6.12	5.40
711	5.76	6.00	5.64	6.00	6.12	6.20	5.92





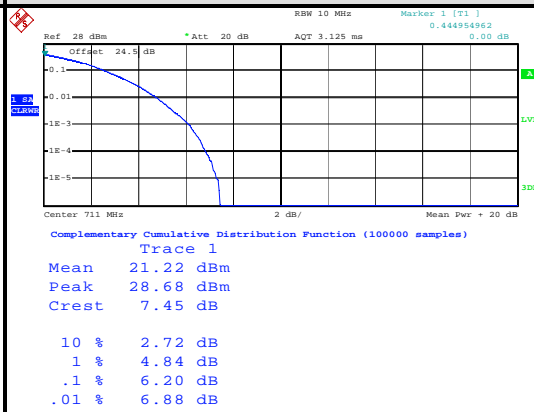
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### 50% RB CENTER



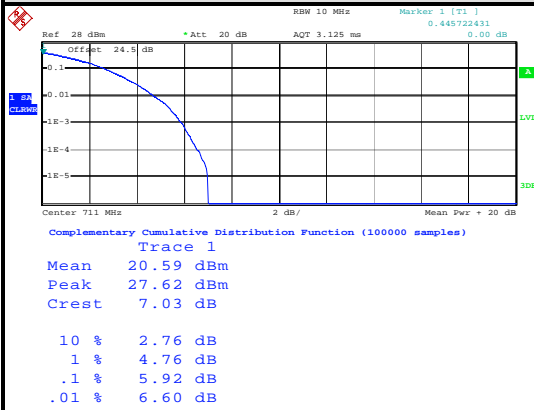
Date: 19.OCT.2012 22:49:10

### 50% RB UPPER



Date: 19.OCT.2012 22:49:45

### 100% RB



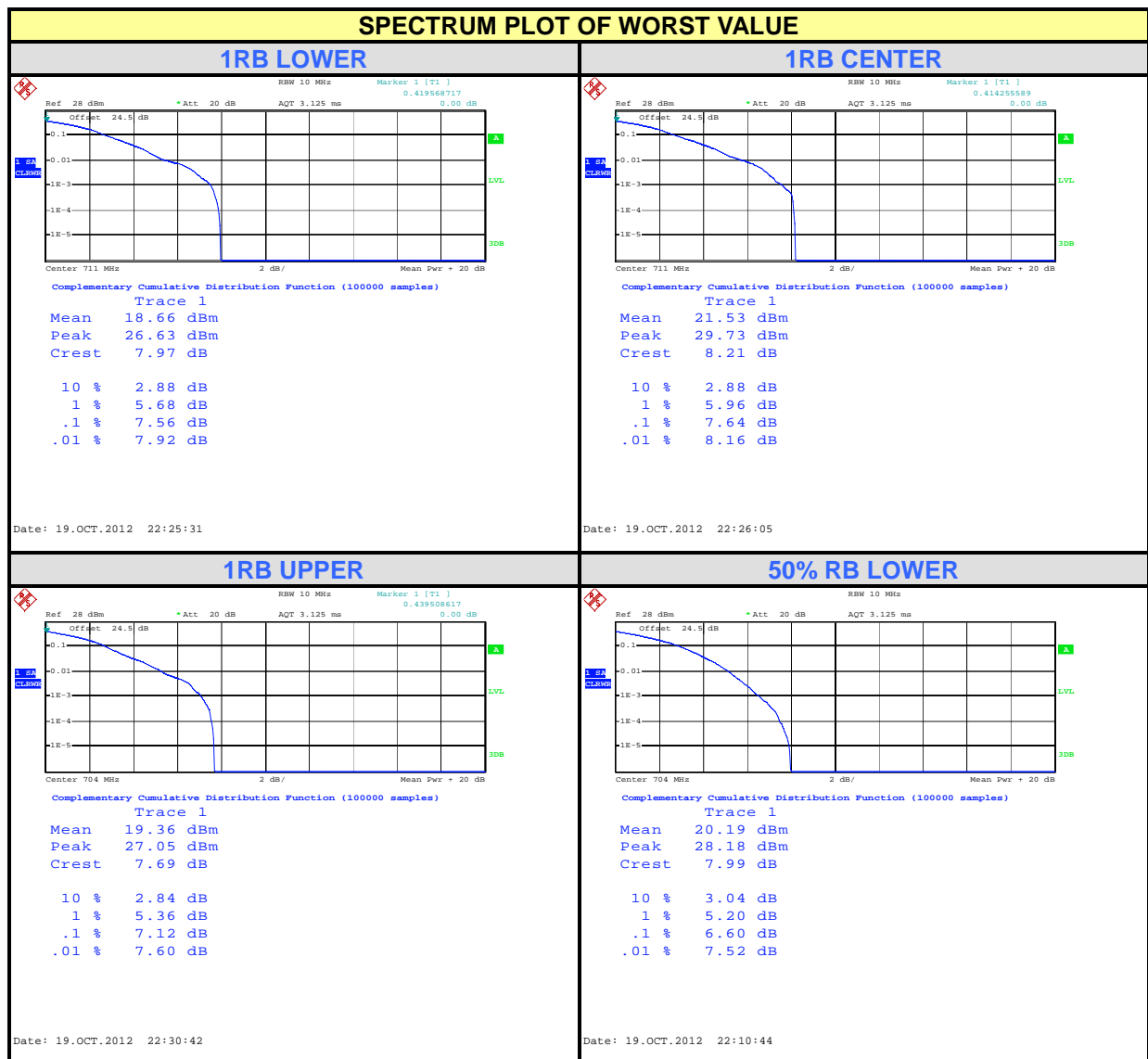
Date: 19.OCT.2012 22:50:09



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**CHANNEL BANDWIDTH: 10MHz / 16QAM**

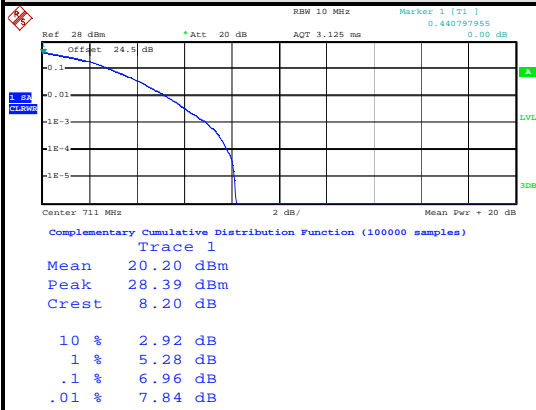
FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)						
	1RB LOWER	1RB CENTER	1RB UPPER	50% RB LOWER	50% RB CENTER	50% RB UPPER	100% RB
704	7.08	6.84	7.12	6.60	6.68	6.52	6.52
707.5	7.16	6.92	7.08	6.52	6.64	6.76	6.32
711	7.56	7.64	7.04	6.48	6.96	6.80	6.60





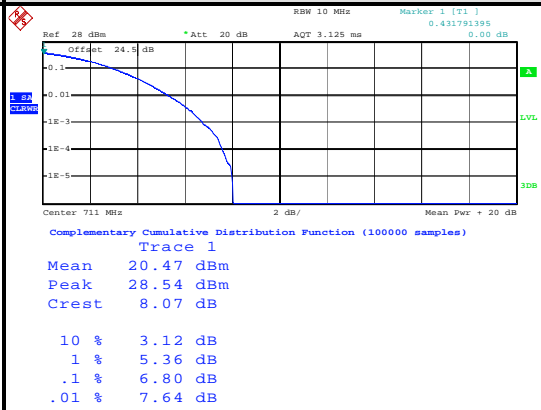
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### 50% RB CENTER



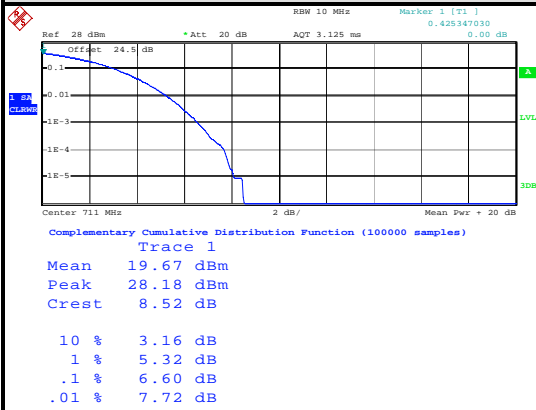
Date: 19.OCT.2012 22:27:37

### 50% RB UPPER



Date: 19.OCT.2012 22:28:07

### 100% RB



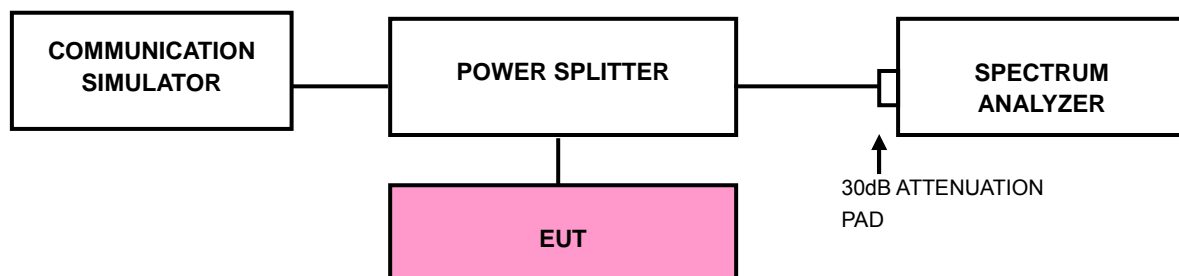
Date: 19.OCT.2012 22:28:44

## 4.5 BAND EDGE MEASUREMENT

### 4.5.1 LIMITS OF BAND EDGE MEASUREMENT

For operations in the 698-716 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. 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.

### 4.5.2 TEST SETUP



### 4.5.3 TEST PROCEDURES

- The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- The center frequency of spectrum is the band edge frequency and span is 2 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz.
- Record the max trace plot into the test report.





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### 4.5.4 TEST RESULTS

Channel Bandwidth: 5MHz / QPSK			CHANNEL 23035 1 RB LOWER			CHANNEL 23035 1 RB LOWER		
* Agilent 19:50:06 Mar 31, 2012			R	T	Marker	* Agilent 19:51:29 Mar 31, 2012		
Ch Freq 697.5 MHz			Trig Free			Ch Freq 704.05 MHz		
Channel Power			Averages: 100			Channel Power		
Ref 10 dBm			#Atten 20 dB			Ref 10 dBm		
#Avg			Log			#Avg		
10			dB/			10		
Offst			24.5			Offst		
dB			dB			dB		
Center 697.500 0 MHz			Span 1 MHz			Center 704.050 0 MHz		
#Res BW 100 kHz			#VBW 1 MHz			#Res BW 100 kHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Power Spectral Density			Channel Power		
-54.36 dBm /100.0000 kHz			-104.36 dBm/Hz			-51.92 dBm /100.0000 kHz		
						Power Spectral Density		
						-101.92 dBm/Hz		
Undefined header						Undefined header		
CHANNEL 23095 1 RB LOWER			CHANNEL 23095 1 RB LOWER			CHANNEL 23095 1 RB LOWER		
* Agilent 19:54:57 Mar 31, 2012			R	T	Marker	* Agilent 19:55:43 Mar 31, 2012		
Ch Freq 703.95 MHz			Trig Free			Ch Freq 710.05 MHz		
Channel Power			Averages: 100			Channel Power		
Ref 10 dBm			#Atten 20 dB			Ref 10 dBm		
#Avg			Log			#Avg		
10			dB/			10		
Offst			24.5			Offst		
dB			dB			dB		
Center 703.950 0 MHz			Span 1 MHz			Center 710.050 0 MHz		
#Res BW 100 kHz			#VBW 1 MHz			#Res BW 100 kHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Power Spectral Density			Channel Power		
-54.12 dBm /100.0000 kHz			-104.12 dBm/Hz			-52.89 dBm /100.0000 kHz		
						Power Spectral Density		
						-102.89 dBm/Hz		
Undefined header						Undefined header		
CHANNEL 23155 1 RB LOWER			CHANNEL 23155 1 RB LOWER			CHANNEL 23155 1 RB LOWER		
* Agilent 19:56:35 Mar 31, 2012			R	T	Marker	* Agilent 19:57:02 Mar 31, 2012		
Ch Freq 709.995 MHz			Trig Free			Ch Freq 716 MHz		
Channel Power			Averages: 100			Channel Power		
Ref 10 dBm			#Atten 20 dB			Ref 10 dBm		
#Avg			Log			#Avg		
10			dB/			10		
Offst			24.5			Offst		
dB			dB			dB		
Center 709.995 0 MHz			Span 1 MHz			Center 716.000 0 MHz		
#Res BW 100 kHz			#VBW 1 MHz			#Res BW 100 kHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Power Spectral Density			Channel Power		
-53.56 dBm /100.0000 kHz			-103.56 dBm/Hz			-48.10 dBm /100.0000 kHz		
						Power Spectral Density		
						-98.10 dBm/Hz		
Undefined header						Undefined header		



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**Channel Bandwidth: 5MHz / QPSK**

CHANNEL	23035	Full RB	CHANNEL	23035	Full RB
* Agilent 20:01:09 Mar 31, 2012 R T Marker Ch Freq 697.95 MHz Trig Free Channel Power Averages: 100 Ref 10 dBm #Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 697.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			* Agilent 20:01:45 Mar 31, 2012 R T Marker Ch Freq 704.05 MHz Trig Free Channel Power Averages: 100 Ref 10 dBm #Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 704.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power Power Spectral Density -27.35 dBm /100.0000 kHz -77.35 dBm/Hz			Channel Power Power Spectral Density -22.18 dBm /100.0000 kHz -72.18 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23095	Full RB	CHANNEL	23095	Full RB
* Agilent 20:02:47 Mar 31, 2012 R T Marker Ch Freq 703.95 MHz Trig Free Channel Power Averages: 100 Ref 10 dBm #Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 703.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			* Agilent 20:03:08 Mar 31, 2012 R T Marker Ch Freq 710.05 MHz Trig Free Channel Power Averages: 100 Center 710.050000 MHz Ref 10 dBm #Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 710.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power Power Spectral Density -27.77 dBm /100.0000 kHz -77.77 dBm/Hz			Channel Power Power Spectral Density -24.01 dBm /100.0000 kHz -74.01 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23155	Full RB	CHANNEL	23155	Full RB
* Agilent 20:04:13 Mar 31, 2012 R T Marker Ch Freq 709.95 MHz Trig Free Channel Power Averages: 100 Ref 10 dBm #Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 709.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			* Agilent 20:09:12 Mar 31, 2012 R T Marker Ch Freq 716.05 MHz Trig Free Channel Power Averages: 100 Ref 10 dBm #Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 716.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power Power Spectral Density -26.54 dBm /100.0000 kHz -76.54 dBm/Hz			Channel Power Power Spectral Density -23.51 dBm /100.0000 kHz -73.51 dBm/Hz		
Undefined header			Undefined header		



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Channel Bandwidth: 5MHz / QPSK

CHANNEL	23035	1 RB UPPER	CHANNEL	23035	1 RB UPPER
* Agilent 20:12:49 Mar 31, 2012			* Agilent 20:13:45 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 704.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 10 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Center 697.950 0 MHz			Center 704.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-57.28 dBm /100.0000 kHz			-20.38 dBm /100.0000 kHz		
-107.28 dBm/Hz			-70.38 dBm/Hz		

CHANNEL	23095	1 RB UPPER	CHANNEL	23095	1 RB UPPER
* Agilent 20:14:52 Mar 31, 2012			* Agilent 20:15:47 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Center 703.950 0 MHz			Center 710.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-57.36 dBm /100.0000 kHz			-21.51 dBm /100.0000 kHz		
-107.36 dBm/Hz			-71.51 dBm/Hz		

CHANNEL	23155	1 RB UPPER	CHANNEL	23155	1 RB UPPER
* Agilent 20:16:40 Mar 31, 2012			* Agilent 20:17:11 Mar 31, 2012		
Ch Freq 709.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Center 709.950 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-57.53 dBm /100.0000 kHz			-21.17 dBm /100.0000 kHz		
-107.53 dBm/Hz			-71.17 dBm/Hz		



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Channel Bandwidth: 5MHz / 16QAM

CHANNEL	23035	1 RB LOWER	CHANNEL	23035	1 RB LOWER
* Agilent 20:19:40 Mar 31, 2012			* Agilent 20:26:14 Mar 31, 2012		
Ch Freq 6.99795 GHz			Ch Freq 704.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Center 6.997950 GHz			Center 704.0500 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-54.05 dBm /100.0000 kHz			-51.74 dBm /100.0000 kHz		
-104.05 dBm/Hz			-101.74 dBm/Hz		

CHANNEL	23095	1 RB LOWER	CHANNEL	23095	1 RB LOWER
* Agilent 20:27:09 Mar 31, 2012			* Agilent 20:27:36 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Center 703.9500 MHz			Center 710.0500 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-53.87 dBm /100.0000 kHz			-52.69 dBm /100.0000 kHz		
-103.87 dBm/Hz			-102.69 dBm/Hz		

CHANNEL	23155	1 RB LOWER	CHANNEL	23155	1 RB LOWER
* Agilent 20:28:28 Mar 31, 2012			* Agilent 20:28:52 Mar 31, 2012		
Ch Freq 709.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Center 709.9500 MHz			Center 716.0500 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-53.67 dBm /100.0000 kHz			-51.35 dBm /100.0000 kHz		
-103.67 dBm/Hz			-101.35 dBm/Hz		



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### Channel Bandwidth: 5MHz / 16QAM

CHANNEL	23035	Full RB	CHANNEL	23035	Full RB
* Agilent 20:30:55 Mar 31, 2012			* Agilent 20:31:16 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 704.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Log 10 dB/Offst 24.5 dB			Log 10 dB/Offst 24.5 dB		
Center 697.950 0 MHz Span 1 MHz			Center 704.050 0 MHz Span 1 MHz		
#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power		Power Spectral Density	Channel Power		Power Spectral Density
-27.40 dBm /100.0000 kHz		-77.40 dBm/Hz	-22.60 dBm /100.0000 kHz		-72.60 dBm/Hz
Undefined header			Undefined header		

CHANNEL	23095	Full RB	CHANNEL	23095	Full RB
* Agilent 20:31:55 Mar 31, 2012			* Agilent 20:32:20 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Log 10 dB/Offst 24.5 dB			Log 10 dB/Offst 24.5 dB		
Center 703.950 0 MHz Span 1 MHz			Center 710.050 0 MHz Span 1 MHz		
#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power		Power Spectral Density	Channel Power		Power Spectral Density
-27.37 dBm /100.0000 kHz		-77.37 dBm/Hz	-24.44 dBm /100.0000 kHz		-74.44 dBm/Hz
Undefined header			Undefined header		

CHANNEL	23155	Full RB	CHANNEL	23155	Full RB
* Agilent 20:33:40 Mar 31, 2012			* Agilent 20:34:29 Mar 31, 2012		
Ch Freq 709.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Log 10 dB/Offst 24.5 dB			Log 10 dB/Offst 24.5 dB		
Center 709.950 0 MHz Span 1 MHz			Center 716.050 0 MHz Span 1 MHz		
#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power		Power Spectral Density	Channel Power		Power Spectral Density
-26.92 dBm /100.0000 kHz		-76.93 dBm/Hz	-24.40 dBm /100.0000 kHz		-74.40 dBm/Hz
Undefined header			Undefined header		



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### Channel Bandwidth: 5MHz / 16QAM

CHANNEL	23035	1 RB UPPER	CHANNEL	23035	1 RB UPPER
* Agilent 20:36:53 Mar 31, 2012			* Agilent 20:37:34 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 704.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
<b>Channel Power</b> <b>-57.31 dBm /100.0000 kHz</b>			<b>Channel Power</b> <b>-20.93 dBm /100.0000 kHz</b>		
<b>Power Spectral Density</b> <b>-107.31 dBm/Hz</b>			<b>Power Spectral Density</b> <b>-70.93 dBm/Hz</b>		

CHANNEL	23095	1 RB UPPER	CHANNEL	23095	1 RB UPPER
* Agilent 20:38:14 Mar 31, 2012			* Agilent 20:38:45 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
<b>Channel Power</b> <b>-57.53 dBm /100.0000 kHz</b>			<b>Channel Power</b> <b>-21.21 dBm /100.0000 kHz</b>		
<b>Power Spectral Density</b> <b>-107.53 dBm/Hz</b>			<b>Power Spectral Density</b> <b>-71.21 dBm/Hz</b>		

CHANNEL	23155	1 RB UPPER	CHANNEL	23155	1 RB UPPER
* Agilent 20:39:11 Mar 31, 2012			* Agilent 20:39:31 Mar 31, 2012		
Ch Freq 709.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
<b>Channel Power</b> <b>-57.91 dBm /100.0000 kHz</b>			<b>Channel Power</b> <b>-20.80 dBm /100.0000 kHz</b>		
<b>Power Spectral Density</b> <b>-107.91 dBm/Hz</b>			<b>Power Spectral Density</b> <b>-70.80 dBm/Hz</b>		



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### Channel Bandwidth: 10MHz / QPSK

CHANNEL	23050	1 RB LOWER	CHANNEL	23050	1 RB LOWER
* Agilent 20:53:59 Mar 31, 2012			* Agilent 20:54:26 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 697.950 0 MHz			Center 710.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-34.43 dBm /100.0000 kHz			-58.89 dBm /100.0000 kHz		
-84.43 dBm/Hz			-108.89 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23095	1 RB LOWER	CHANNEL	23095	1 RB LOWER
* Agilent 20:55:02 Mar 31, 2012			* Agilent 20:55:51 Mar 31, 2012		
Ch Freq 697.980 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 697.980 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-58.00 dBm /100.0000 kHz			-55.62 dBm /100.0000 kHz		
-108.00 dBm/Hz			-105.62 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23130	1 RB LOWER	CHANNEL	23130	1 RB LOWER
* Agilent 20:56:37 Mar 31, 2012			* Agilent 20:56:56 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 703.950 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-57.41 dBm /100.0000 kHz			-56.51 dBm /100.0000 kHz		
-107.41 dBm/Hz			-106.51 dBm/Hz		
Undefined header			Undefined header		



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### Channel Bandwidth: 10MHz / QPSK

CHANNEL	23050	Full RB	CHANNEL	23050	Full RB
* Agilent 20:46:41 Mar 31, 2012			* Agilent 20:47:39 Mar 31, 2012		
Ch Freq 697.955 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Log 10 dB/Offst 24.5 dB			Log 10 dB/Offst 24.5 dB		
Center 697.955 0 MHz Span 1 MHz			Center 710.050 0 MHz Span 1 MHz		
#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-28.87 dBm /100.0000 kHz			-30.17 dBm /100.0000 kHz		
-78.87 dBm/Hz			-80.17 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23095	Full RB	CHANNEL	23095	Full RB
* Agilent 20:49:01 Mar 31, 2012			* Agilent 20:49:54 Mar 31, 2012		
Ch Freq 697.98 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Log 10 dB/Offst 24.5 dB			Log 10 dB/Offst 24.5 dB		
Center 697.980 0 MHz Span 1 MHz			Center 716.050 0 MHz Span 1 MHz		
#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-32.73 dBm /100.0000 kHz			-33.94 dBm /100.0000 kHz		
-82.73 dBm/Hz			-83.94 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23130	Full RB	CHANNEL	23130	Full RB
* Agilent 20:51:37 Mar 31, 2012			* Agilent 20:51:20 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
Log 10 dB/Offst 24.5 dB			Log 10 dB/Offst 24.5 dB		
Center 703.950 0 MHz Span 1 MHz			Center 716.050 0 MHz Span 1 MHz		
#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			#Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-27.33 dBm /100.0000 kHz			-30.84 dBm /100.0000 kHz		
-77.33 dBm/Hz			-80.84 dBm/Hz		
Undefined header			Undefined header		





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### Channel Bandwidth: 10MHz / QPSK

CHANNEL	23050	1 RB UPPER	CHANNEL	23050	1 RB UPPER
* Agilent 21:00:39 Mar 31, 2012			* Agilent 21:01:00 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 697.950 0 MHz			Center 710.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-56.58 dBm /100.0000 kHz			-57.53 dBm /100.0000 kHz		
-106.58 dBm/Hz			-107.53 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23095	1 RB UPPER	CHANNEL	23095	1 RB UPPER
* Agilent 21:01:41 Mar 31, 2012			* Agilent 21:02:11 Mar 31, 2012		
Ch Freq 697.98 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 697.980 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-59.07 dBm /100.0000 kHz			-56.96 dBm /100.0000 kHz		
-109.07 dBm/Hz			-106.96 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23130	1 RB UPPER	CHANNEL	23130	1 RB UPPER
* Agilent 21:02:51 Mar 31, 2012			* Agilent 21:03:10 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 703.950 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-58.72 dBm /100.0000 kHz			-35.15 dBm /100.0000 kHz		
-108.72 dBm/Hz			-85.15 dBm/Hz		
Undefined header			Undefined header		



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### Channel Bandwidth: 10MHz / 16QAM

CHANNEL	23050	1 RB LOWER	CHANNEL	23050	1 RB LOWER
* Agilent 21:04:17 Mar 31, 2012			* Agilent 21:04:39 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 697.950 0 MHz			Center 710.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-34.31 dBm /100.0000 kHz			-58.68 dBm /100.0000 kHz		
-84.31 dBm/Hz			-108.68 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23095	1 RB LOWER	CHANNEL	23095	1 RB LOWER
* Agilent 21:05:24 Mar 31, 2012			* Agilent 21:05:45 Mar 31, 2012		
Ch Freq 697.98 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 697.980 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-58.55 dBm /100.0000 kHz			-57.00 dBm /100.0000 kHz		
-108.55 dBm/Hz			-107.00 dBm/Hz		
Undefined header			Undefined header		
CHANNEL	23130	1 RB LOWER	CHANNEL	23130	1 RB LOWER
* Agilent 21:06:37 Mar 31, 2012			* Agilent 21:06:59 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB			Ref 30 dBm #Atten 20 dB		
#Avg Log 10 dB/Offst 24.5 dB			#Avg Log 10 dB/Offst 24.5 dB		
Center 703.950 0 MHz			Center 716.050 0 MHz		
#Res BW 100 kHz			#Res BW 100 kHz		
#VBW 1 MHz			#VBW 1 MHz		
Sweep 1 ms (601 pts)			Sweep 1 ms (601 pts)		
Channel Power			Channel Power		
Power Spectral Density			Power Spectral Density		
-57.41 dBm /100.0000 kHz			-56.83 dBm /100.0000 kHz		
-107.41 dBm/Hz			-106.83 dBm/Hz		
Undefined header			Undefined header		



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**Channel Bandwidth: 10MHz / 16QAM**

CHANNEL	23050	Full RB	CHANNEL	23050	Full RB
* Agilent 21:09:38 Mar 31, 2012 Ch Freq 697.95 MHz Channel Power Averages: 100 Trig Free Ref 30 dBm *Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 697.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			* Agilent 21:09:56 Mar 31, 2012 Ch Freq 710.05 MHz Channel Power Averages: 100 Trig Free Ref 30 dBm *Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 710.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power <b>-28.55 dBm /100.0000 kHz</b>			Channel Power <b>-29.87 dBm /100.0000 kHz</b>		
Power Spectral Density <b>-78.58 dBm/Hz</b>			Power Spectral Density <b>-79.87 dBm/Hz</b>		
Undefined header			Undefined header		

CHANNEL	23095	Full RB	CHANNEL	23095	Full RB
* Agilent 21:10:31 Mar 31, 2012 Ch Freq 697.98 MHz Channel Power Averages: 100 Trig Free Ref 30 dBm *Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 697.980 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			* Agilent 21:10:56 Mar 31, 2012 Ch Freq 716.05 MHz Channel Power Averages: 100 Trig Free Ref 30 dBm *Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 716.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power <b>-32.85 dBm /100.0000 kHz</b>			Channel Power <b>-34.37 dBm /100.0000 kHz</b>		
Power Spectral Density <b>-82.85 dBm/Hz</b>			Power Spectral Density <b>-84.37 dBm/Hz</b>		
Undefined header			Undefined header		

CHANNEL	23130	Full RB	CHANNEL	23130	Full RB
* Agilent 21:11:26 Mar 31, 2012 Ch Freq 703.95 MHz Channel Power Averages: 100 Trig Free Ref 30 dBm *Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 703.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			* Agilent 21:12:09 Mar 31, 2012 Ch Freq 716.05 MHz Channel Power Averages: 100 Trig Free Ref 30 dBm *Atten 20 dB #Avg Log 10 dB/Offst 24.5 dB Center 716.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
Channel Power <b>-27.22 dBm /100.0000 kHz</b>			Channel Power <b>-30.65 dBm /100.0000 kHz</b>		
Power Spectral Density <b>-77.22 dBm/Hz</b>			Power Spectral Density <b>-80.65 dBm/Hz</b>		
Undefined header			Undefined header		



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### Channel Bandwidth: 10MHz / 16QAM

CHANNEL	23050	1 RB UPPER	CHANNEL	23050	1 RB UPPER
* Agilent 21:14:12 Mar 31, 2012			* Agilent 21:14:33 Mar 31, 2012		
Ch Freq 697.95 MHz			Ch Freq 710.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB #Avg 10 Log dB/Offst 24.5 dB Center 697.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			Ref 30 dBm #Atten 20 dB #Avg 10 Log dB/Offst 24.5 dB Center 710.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
<b>Channel Power</b> -56.75 dBm /100.0000 kHz			<b>Channel Power</b> -57.62 dBm /100.0000 kHz		
<b>Power Spectral Density</b> -106.75 dBm/Hz			<b>Power Spectral Density</b> -107.62 dBm/Hz		
Undefined header			Undefined header		

CHANNEL	23095	1 RB UPPER	CHANNEL	23095	1 RB UPPER
* Agilent 21:15:14 Mar 31, 2012			* Agilent 21:15:36 Mar 31, 2012		
Ch Freq 697.98 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB #Avg 10 Log dB/Offst 24.5 dB Center 697.980 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			Ref 30 dBm #Atten 20 dB #Avg 10 Log dB/Offst 24.5 dB Center 716.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
<b>Channel Power</b> -58.77 dBm /100.0000 kHz			<b>Channel Power</b> -53.89 dBm /100.0000 kHz		
<b>Power Spectral Density</b> -108.77 dBm/Hz			<b>Power Spectral Density</b> -103.89 dBm/Hz		
Undefined header			Undefined header		

CHANNEL	23130	1 RB UPPER	CHANNEL	23130	1 RB UPPER
* Agilent 21:16:23 Mar 31, 2012			* Agilent 21:16:50 Mar 31, 2012		
Ch Freq 703.95 MHz			Ch Freq 716.05 MHz		
Channel Power			Channel Power		
Averages: 100			Averages: 100		
Ref 30 dBm #Atten 20 dB #Avg 10 Log dB/Offst 24.5 dB Center 703.950 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)			Ref 30 dBm #Atten 20 dB #Avg 10 Log dB/Offst 24.5 dB Center 716.050 0 MHz Span 1 MHz #Res BW 100 kHz #VBW 1 MHz Sweep 1 ms (601 pts)		
<b>Channel Power</b> -58.83 dBm /100.0000 kHz			<b>Channel Power</b> -34.96 dBm /100.0000 kHz		
<b>Power Spectral Density</b> -108.83 dBm/Hz			<b>Power Spectral Density</b> -84.96 dBm/Hz		
Undefined header			Undefined header		

## 4.6 CONDUCTED SPURIOUS EMISSIONS

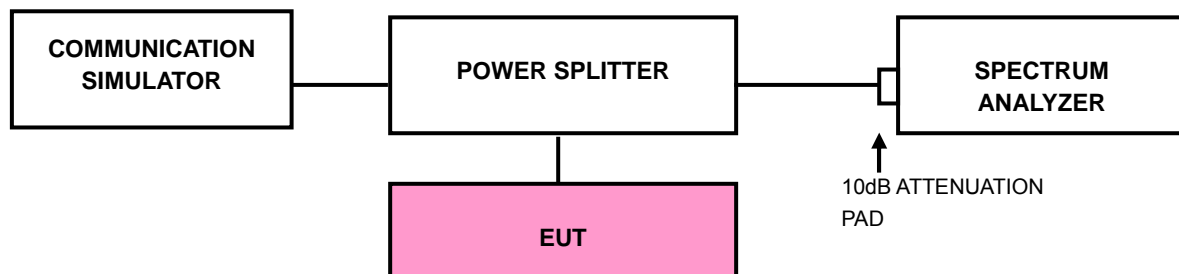
### 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to  $-13\text{dBm}$

### 4.6.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at middle operational frequency range.
- b. Measuring frequency range is from 30 MHz to 8GHz for LTE Band 13. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

### 4.6.3 TEST SETUP

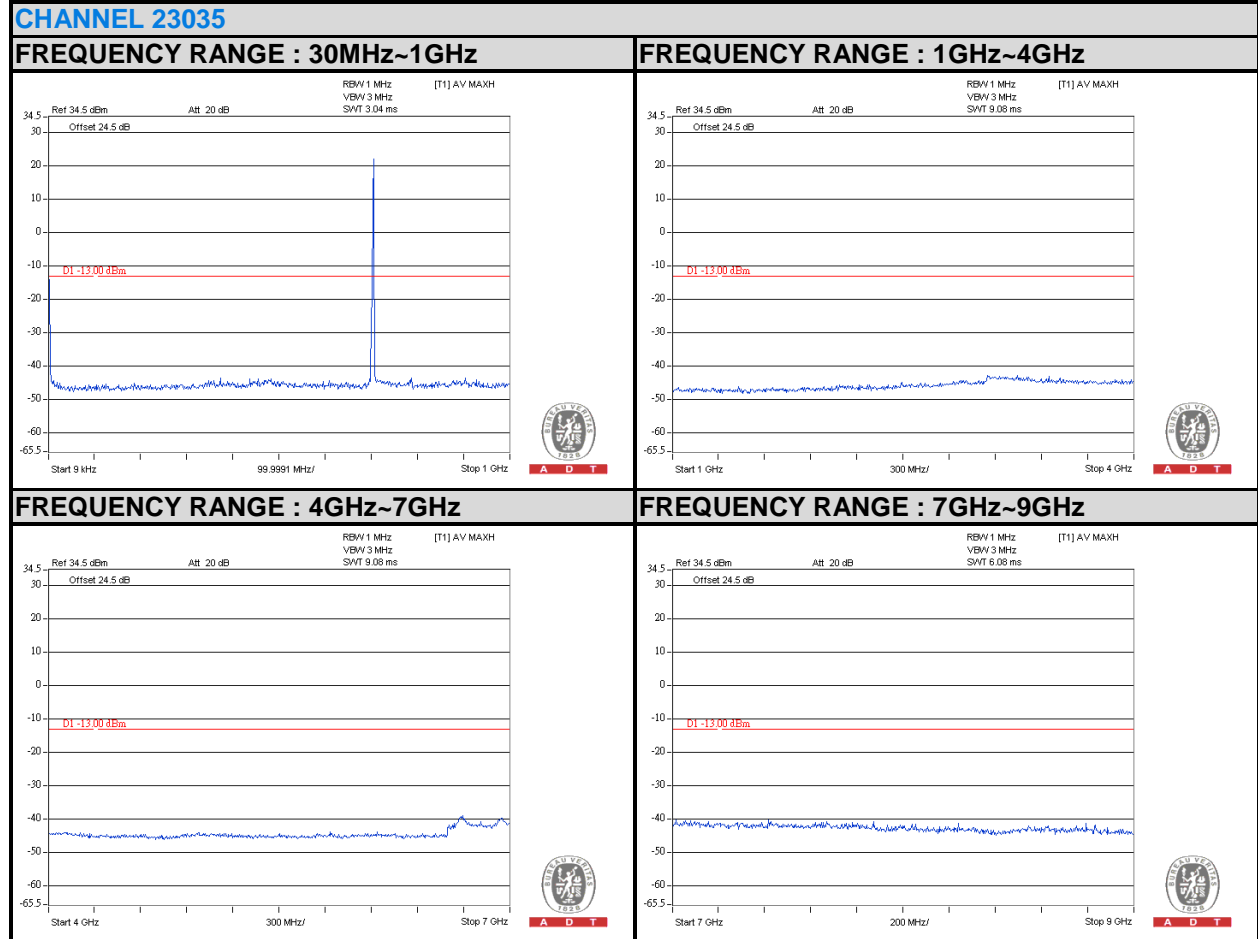




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### 4.6.4 TEST RESULTS

#### CHANNEL BANDWIDTH: 5MHz / QPSK / 1 RB AT LOWER EDGE

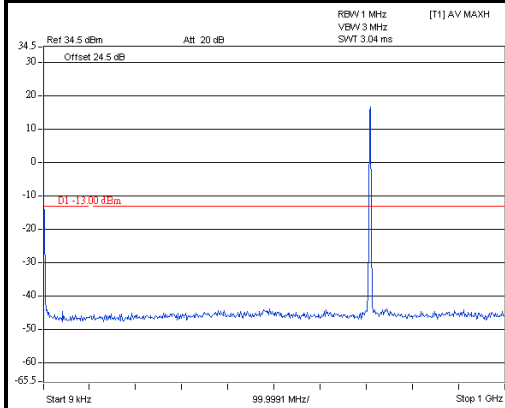




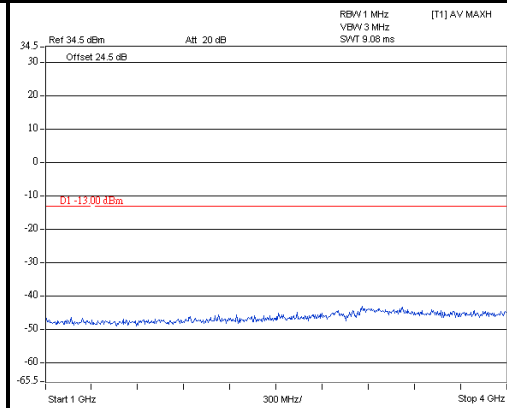
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### CHANNEL 23095

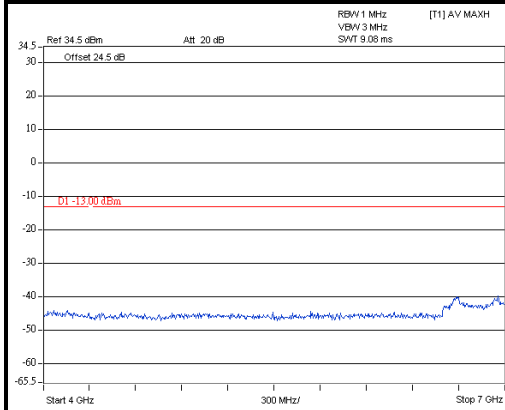
#### FREQUENCY RANGE : 30MHz~1GHz



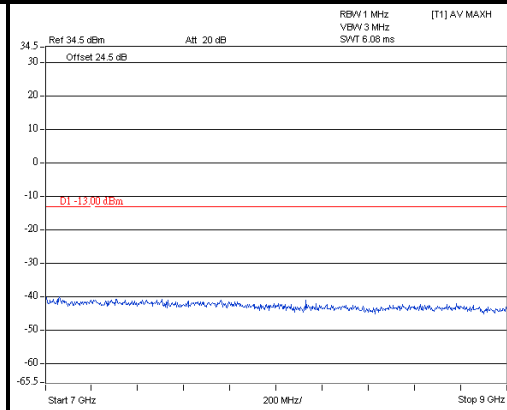
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz

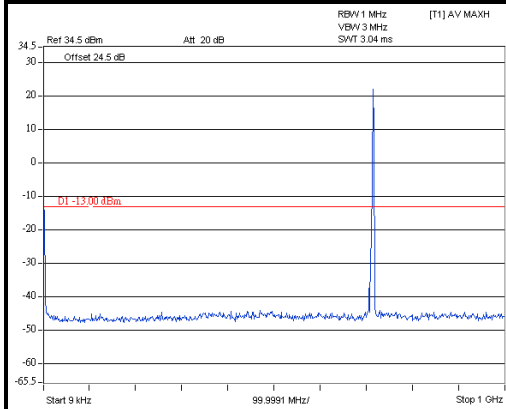




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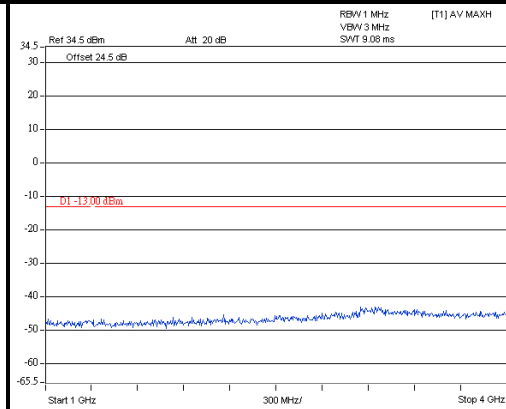
### CHANNEL 23155

#### FREQUENCY RANGE : 30MHz~1GHz



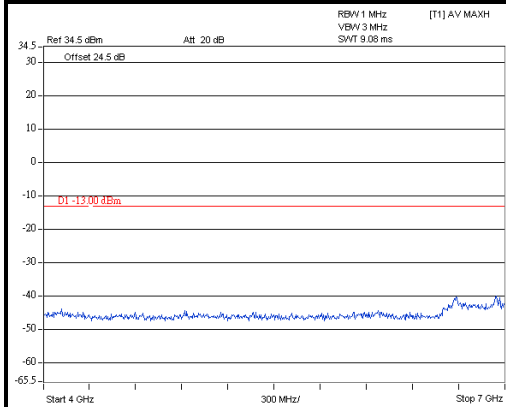
A D T

#### FREQUENCY RANGE : 1GHz~4GHz



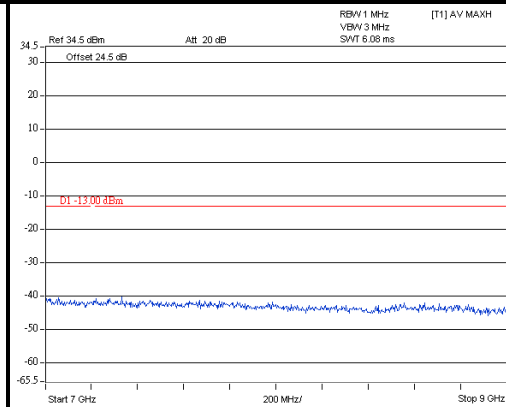
A D T

#### FREQUENCY RANGE : 4GHz~7GHz



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#### FREQUENCY RANGE : 7GHz~9GHz



A D T



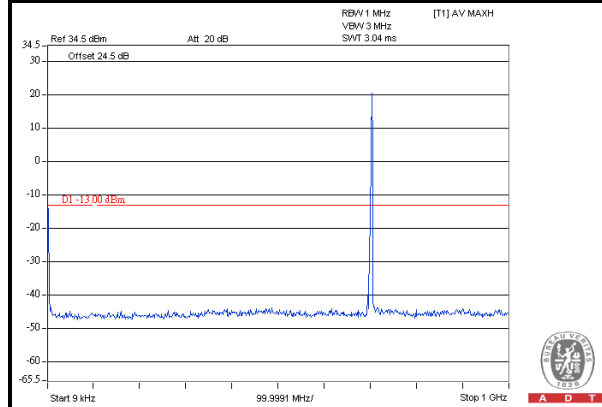


A D T

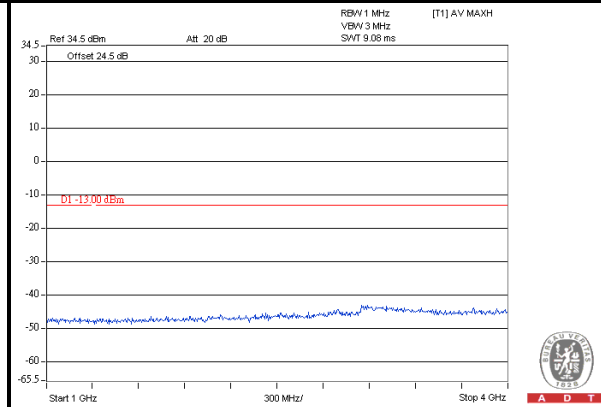
### CHANNEL BANDWIDTH: 5MHz / 16QAM / 1 RB AT LOWER EDGE

#### CHANNEL 23035

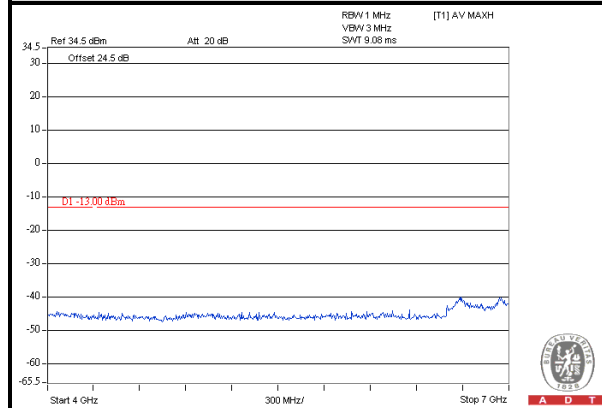
##### FREQUENCY RANGE : 30MHz~1GHz



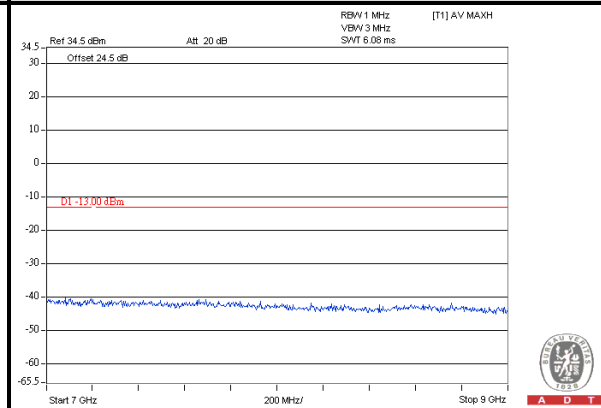
##### FREQUENCY RANGE : 1GHz~4GHz



##### FREQUENCY RANGE : 4GHz~7GHz



##### FREQUENCY RANGE : 7GHz~9GHz

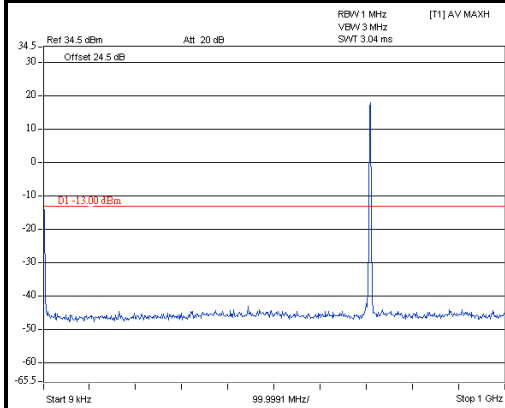




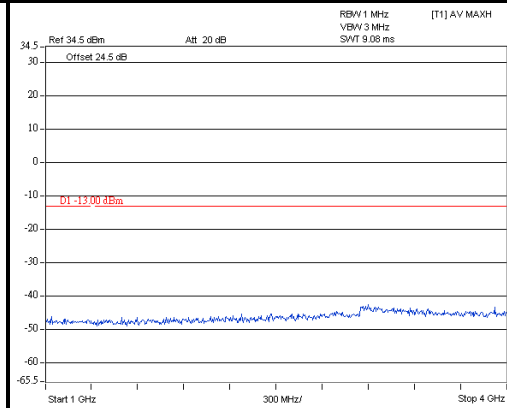
A D T

### CHANNEL 23095

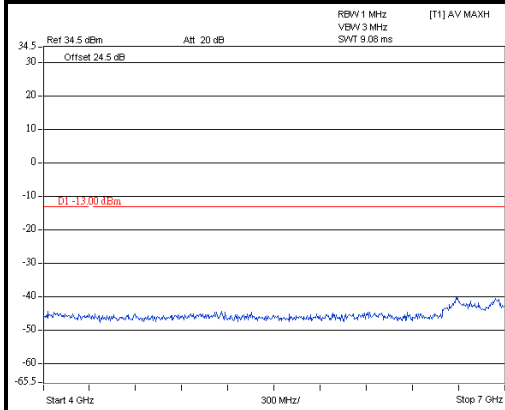
#### FREQUENCY RANGE : 30MHz~1GHz



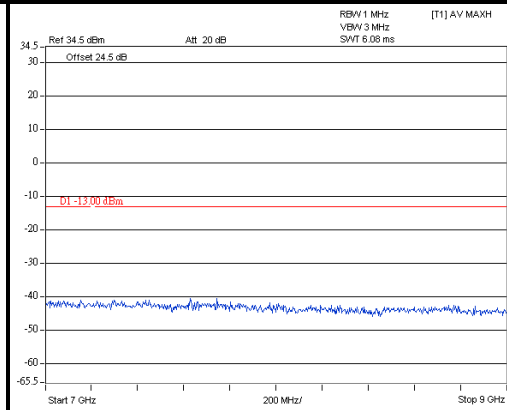
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz

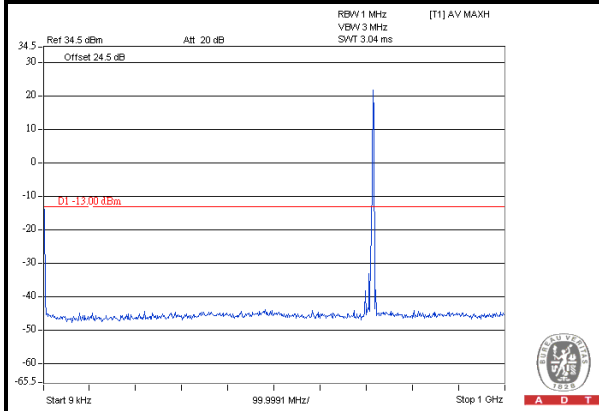




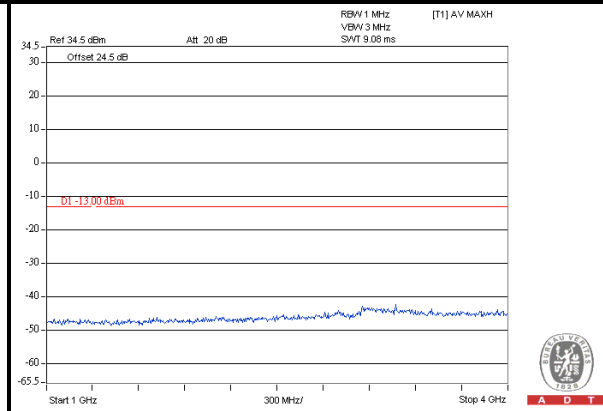
A D T

### CHANNEL 23155

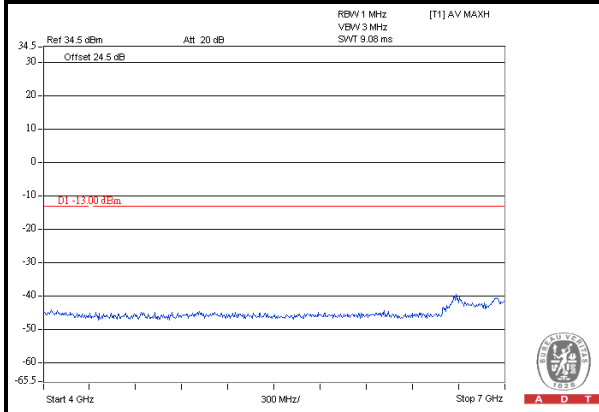
#### FREQUENCY RANGE : 30MHz~1GHz



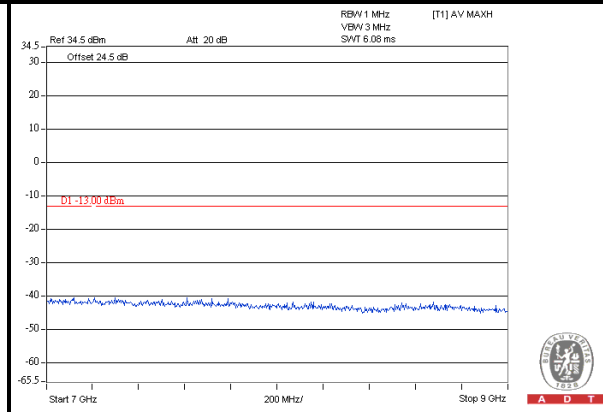
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz



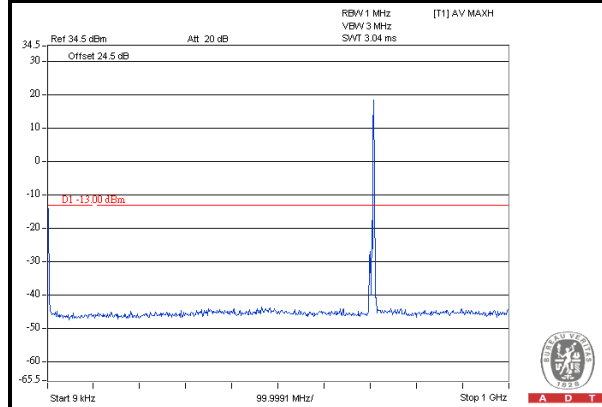


A D T

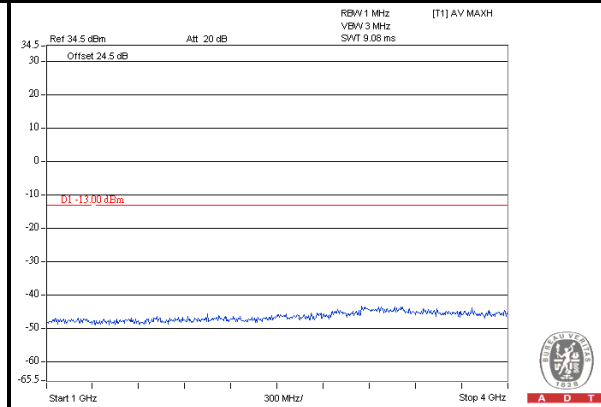
### CHANNEL BANDWIDTH: 10MHz / QPSK / 1 RB AT LOWER EDGE

#### CHANNEL 23060

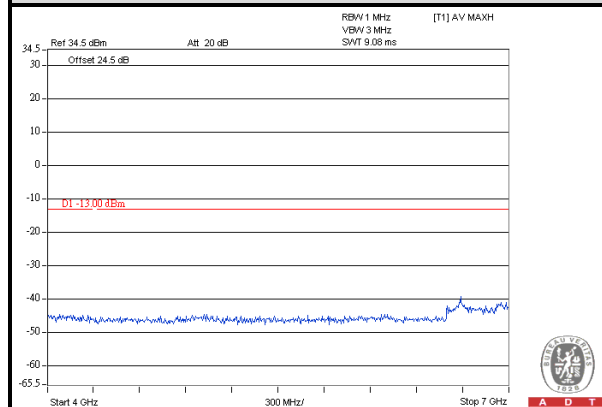
##### FREQUENCY RANGE : 30MHz~1GHz



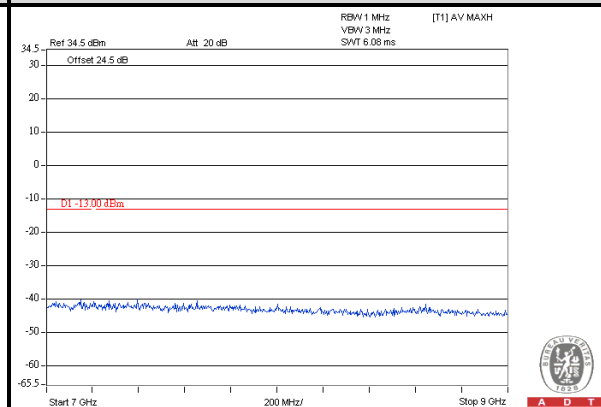
##### FREQUENCY RANGE : 1GHz~4GHz



##### FREQUENCY RANGE : 4GHz~7GHz



##### FREQUENCY RANGE : 7GHz~9GHz

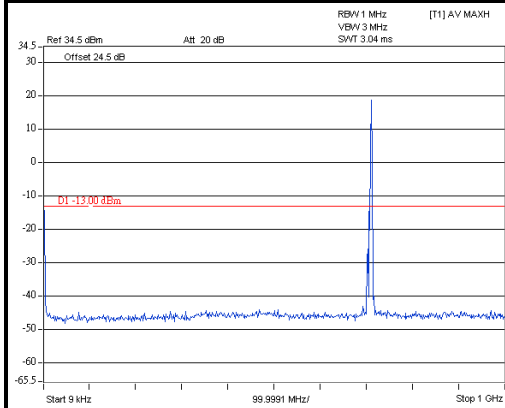




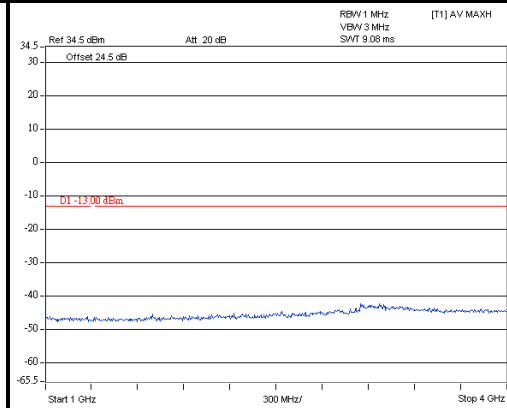
A D T

### CHANNEL 23095

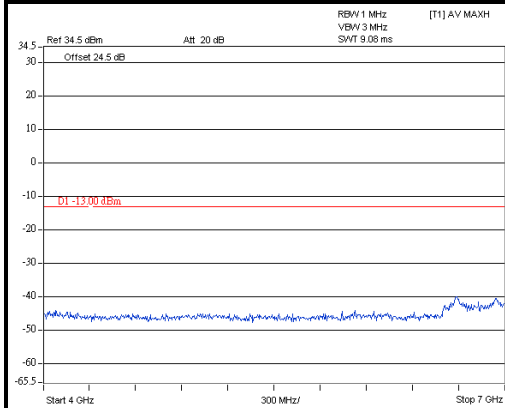
#### FREQUENCY RANGE : 30MHz~1GHz



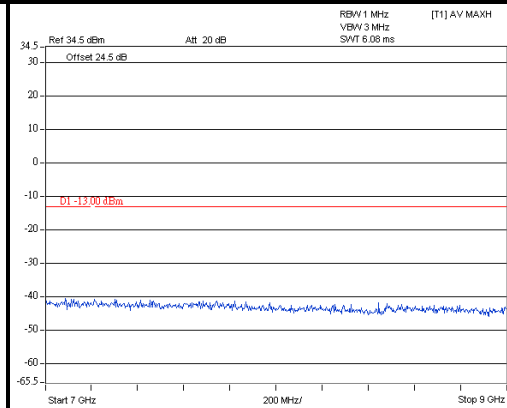
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz

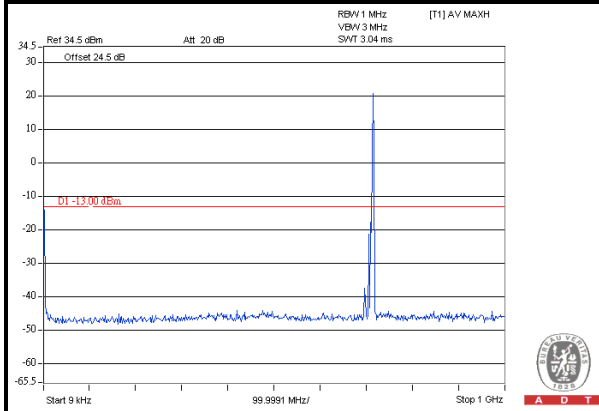




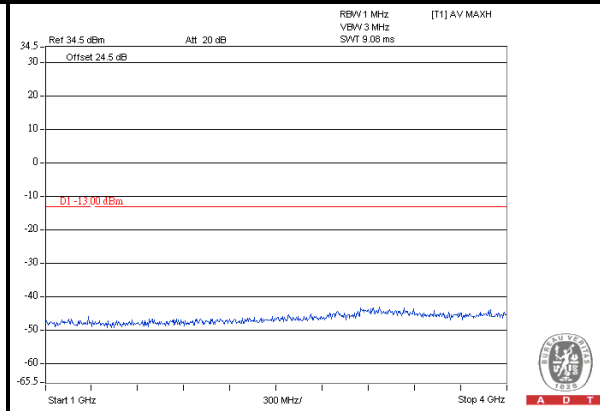
A D T

### CHANNEL 23130

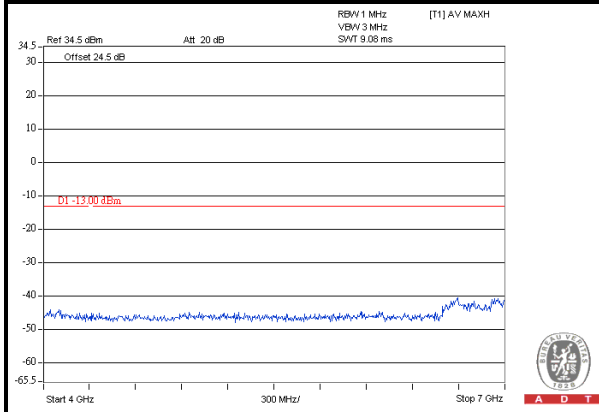
#### FREQUENCY RANGE : 30MHz~1GHz



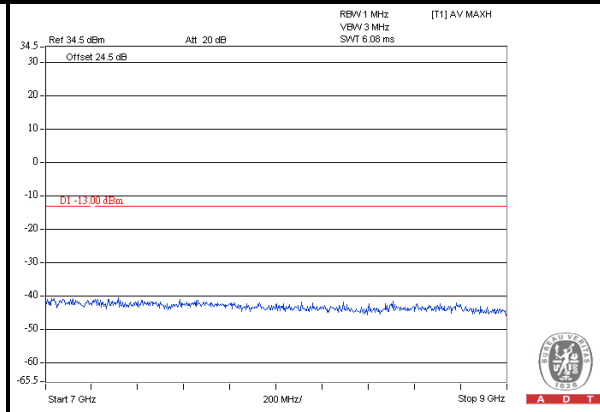
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz



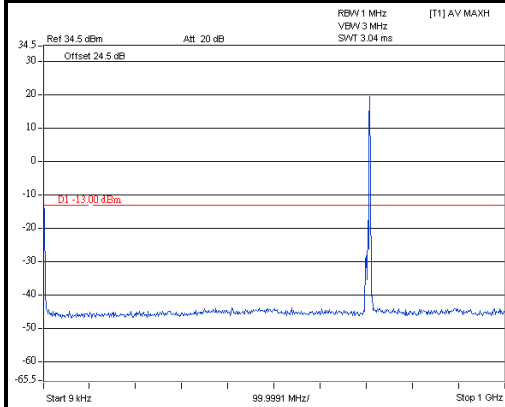


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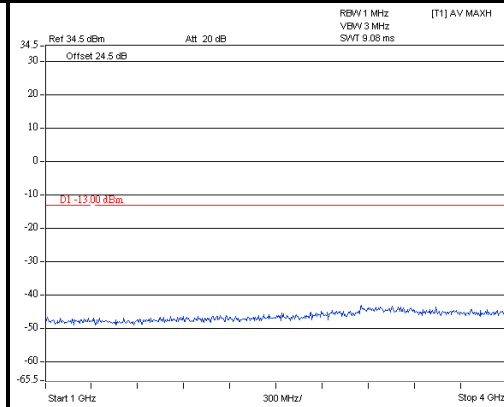
### CHANNEL BANDWIDTH: 10MHz / 16QAM / 1 RB AT LOWER EDGE

#### CHANNEL 23060

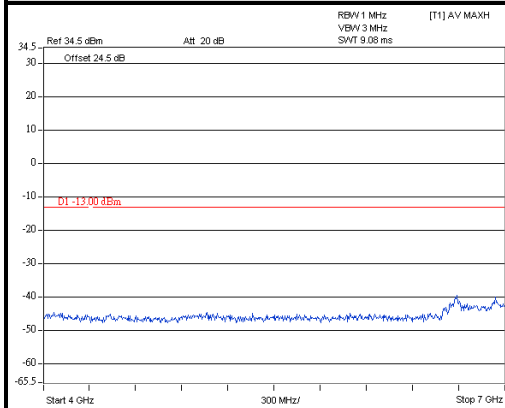
##### FREQUENCY RANGE : 30MHz~1GHz



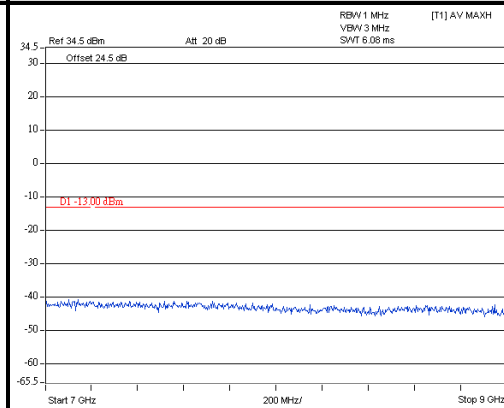
##### FREQUENCY RANGE : 1GHz~4GHz



##### FREQUENCY RANGE : 4GHz~7GHz



##### FREQUENCY RANGE : 7GHz~9GHz

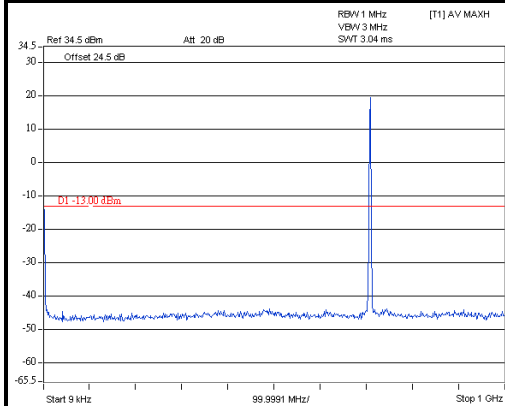




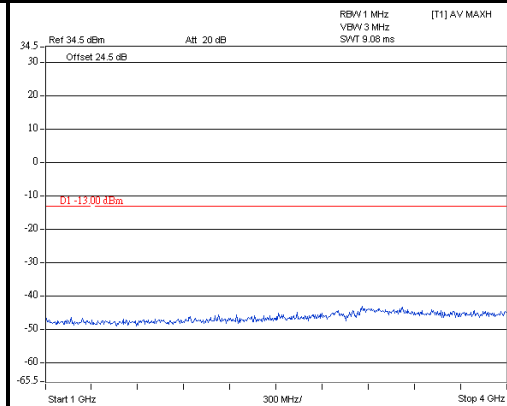
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### CHANNEL 23095

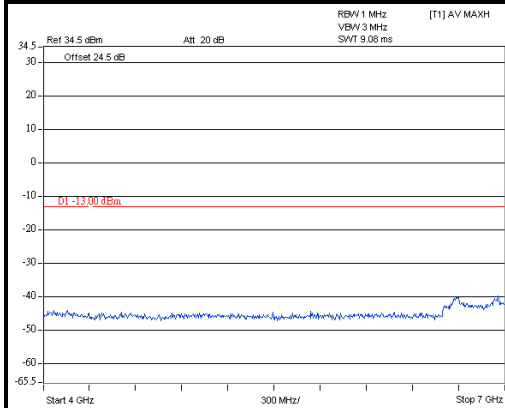
#### FREQUENCY RANGE : 30MHz~1GHz



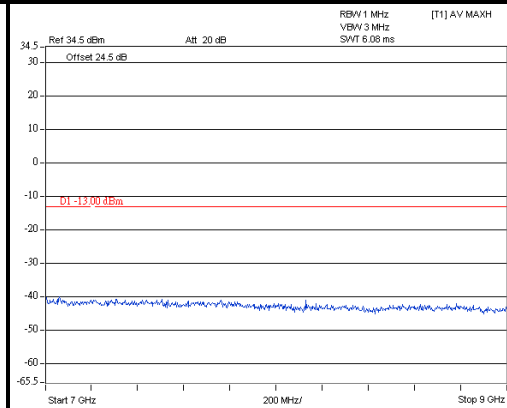
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz



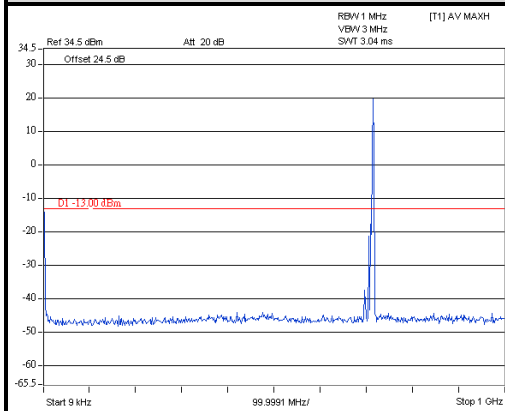




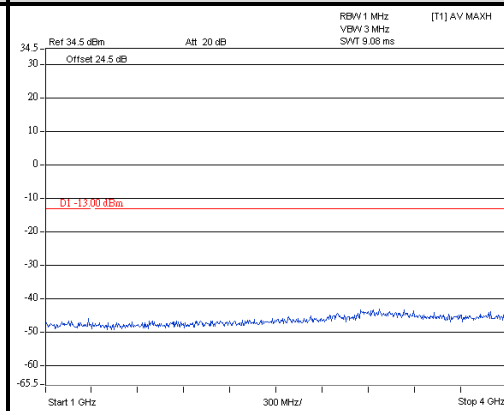
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### CHANNEL 23130

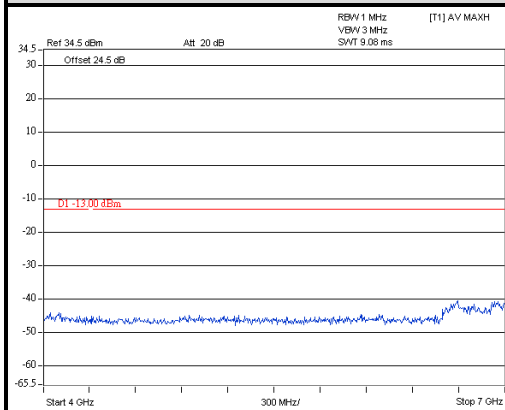
#### FREQUENCY RANGE : 30MHz~1GHz



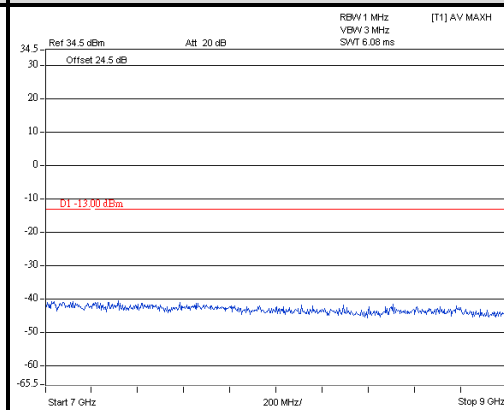
#### FREQUENCY RANGE : 1GHz~4GHz



#### FREQUENCY RANGE : 4GHz~7GHz



#### FREQUENCY RANGE : 7GHz~9GHz



## 4.7 RADIATED EMISSION MEASUREMENT

### 4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to  $-13\text{dBm}$

### 4.7.2 TEST PROCEDURES

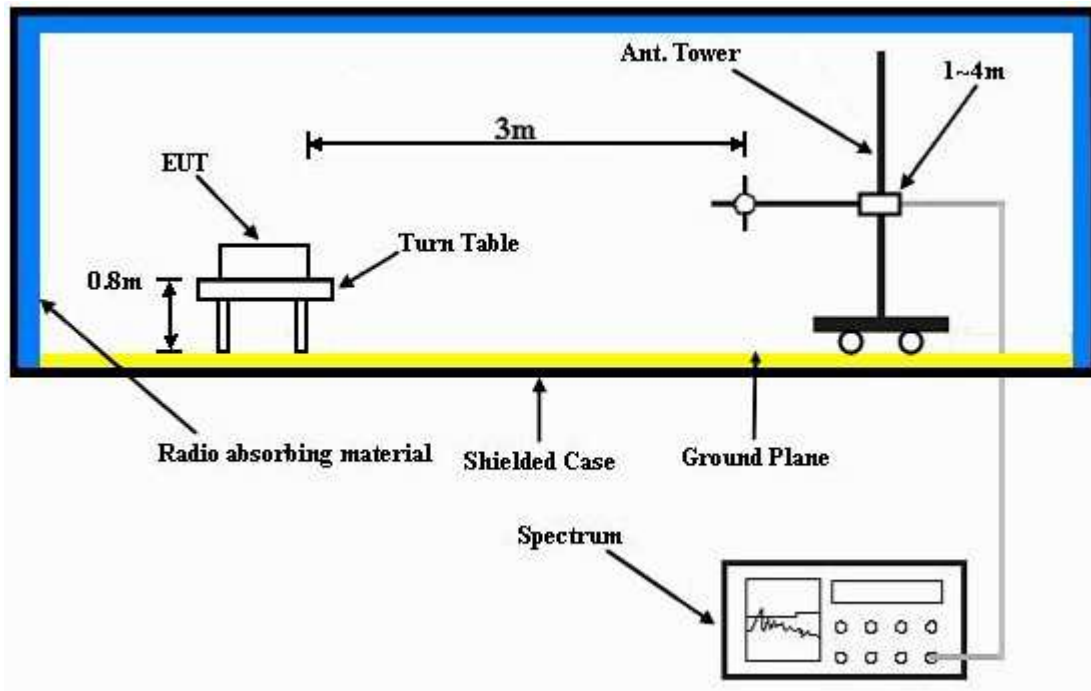
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. 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 a. Record the power level of S.G
- c.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}$ .

**NOTE:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 4.7.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.7.4 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

## 4.7.5 TEST RESULTS

### BELOW 1GHz

#### CHANNEL BANDWIDTH: 5MHz / QPSK

<b>MODE</b>	TX channel 23095	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Martin Lee		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	30	-38.94	-24.54	-12.61	-37.15	-13	-24.15
2	234.11	-44.95	-58.13	5.42	-52.71	-13	-39.71
3	465.43	-56.9	-64.01	5.02	-58.99	-13	-45.99
4	615.11	-55.24	-60.29	4.55	-55.74	-13	-42.74
5	772.57	-56.27	-57.36	4.36	-53	-13	-40
6	951.4	-58.39	-57.42	3.9	-53.52	-13	-40.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	64.99	-49.09	-51.42	-6.31	-57.73	-13	-44.73
2	98.04	-48.81	-56.42	0.92	-55.5	-13	-42.5
3	230.22	-46.74	-56.39	5.43	-50.96	-13	-37.96
4	374.07	-52.11	-59.39	5.23	-54.16	-13	-41.16
5	500.42	-57.24	-62.6	4.89	-57.71	-13	-44.71
6	801.72	-61.52	-60.46	4.02	-56.44	-13	-43.44

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



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**CHANNEL BANDWIDTH: 5MHz / 16QAM**

<b>MODE</b>	TX channel 23095	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Martin Lee		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-37.61	-23.42	-12.37	-35.79	-13	-22.79
2	232.16	-45.05	-58.41	5.43	-52.98	-13	-39.98
3	376.01	-58.14	-66.26	5.23	-61.03	-13	-48.03
4	465.43	-57.84	-64.95	5.02	-59.93	-13	-46.93
5	758.96	-55.03	-56.24	4.53	-51.71	-13	-38.71
6	966.95	-55.64	-54.5	3.91	-50.59	-13	-37.59

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	64.99	-48.82	-51.15	-6.31	-57.46	-13	-44.46
2	125.25	-50.46	-56.85	-0.03	-56.88	-13	-43.88
3	226.33	-46.46	-56.4	5.44	-50.96	-13	-37.96
4	376.01	-53.49	-60.7	5.23	-55.47	-13	-42.47
5	500.42	-57.19	-62.55	4.89	-57.66	-13	-44.66
6	801.72	-61.46	-60.4	4.02	-56.38	-13	-43.38

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



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**CHANNEL BANDWIDTH: 10MHz / QPSK**

<b>MODE</b>	TX channel 23095	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Martin Lee		

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	33.89	-36.41	-22.42	-12.13	-34.55	-13	-21.55
2	232.16	-44.8	-58.16	5.43	-52.73	-13	-39.73
3	261.32	-45.82	-58.06	5.34	-52.72	-13	-39.72
4	465.43	-57.38	-64.49	5.02	-59.47	-13	-46.47
5	615.11	-54.9	-59.95	4.55	-55.4	-13	-42.4
6	947.52	-58.48	-57.59	3.91	-53.68	-13	-40.68

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	64.99	-49.04	-51.37	-6.31	-57.68	-13	-44.68
2	232.16	-48.21	-57.92	5.43	-52.49	-13	-39.49
3	376.01	-53.53	-60.74	5.23	-55.51	-13	-42.51
4	500.42	-57.69	-63.05	4.89	-58.16	-13	-45.16
5	772.57	-59.93	-59.07	4.36	-54.71	-13	-41.71
6	935.85	-64.14	-60.29	3.92	-56.37	-13	-43.37

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



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**CHANNEL BANDWIDTH: 10MHz / 16QAM**

<b>MODE</b>	TX channel 23095	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 68%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Martin Lee		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	30	-37.96	-23.56	-12.61	-36.17	-13	-23.17
2	232.16	-44.88	-58.24	5.43	-52.81	-13	-39.81
3	465.43	-58.31	-65.42	5.02	-60.4	-13	-47.4
4	613.17	-54.69	-59.77	4.53	-55.24	-13	-42.24
5	758.96	-55.45	-56.66	4.53	-52.13	-13	-39.13
6	951.4	-59.26	-58.29	3.9	-54.39	-13	-41.39
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	98.04	-50.18	-57.79	0.92	-56.87	-13	-43.87
2	125.25	-51.94	-58.33	-0.03	-58.36	-13	-45.36
3	226.33	-46.46	-56.4	5.44	-50.96	-13	-37.96
4	376.01	-53.43	-60.64	5.23	-55.41	-13	-42.41
5	500.42	-57.45	-62.81	4.89	-57.92	-13	-44.92
6	801.72	-61.19	-60.13	4.02	-56.11	-13	-43.11

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



ABOVE 1GHz

CHANNEL BANDWIDTH: 5MHz / QPSK / 1 RB / 24 RB Offset

<b>MODE</b>	TX channel 23035	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1403.00 (PK)	-55.56	-56.8	4.7	-52.1	-13	-39.1
2	2104.50 (PK)	-56.63	-56.95	6.36	-50.59	-13	-37.59
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1403.00 (PK)	-60.09	-63.53	4.7	-58.83	-13	-45.83
2	2104.50 (PK)	-58.13	-58.53	6.36	-52.17	-13	-39.17

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

<b>MODE</b>	TX channel 23155	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1427.00 (PK)	-56.86	-58.34	4.81	-53.53	-13	-40.53
2	2140.50 (PK)	-57.11	-57.14	6.36	-50.78	-13	-37.78
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1427.00 (PK)	-60.06	-63.68	4.81	-58.87	-13	-45.87
2	2140.50 (PK)	-58.64	-58.62	6.36	-52.26	-13	-39.26

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).





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<b>MODE</b>	TX channel 23095	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Match Tsui		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00 (PK)	-55.36	-56.71	4.75	-51.96	-13	-38.96
2	2122.50 (PK)	-56.45	-56.63	6.36	-50.27	-13	-37.27
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00 (PK)	-59.59	-63.11	4.75	-58.36	-13	-45.36
2	2122.50 (PK)	-58.26	-58.45	6.36	-52.09	-13	-39.09

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



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**CHANNEL BANDWIDTH: 10MHz / QPSK / 1 RB / 49 RB Offset**

<b>MODE</b>	TX channel 23060	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Match Tsui		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1408.00 (PK)	-54.11	-55.39	4.72	-50.67	-13	-37.67
2	2112.00 (PK)	-57.02	-57.28	6.36	-50.92	-13	-37.92
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1408.00 (PK)	-57.02	-60.49	4.72	-55.77	-13	-42.77
2	2112.00 (PK)	-57.67	-57.98	6.36	-51.62	-13	-38.62

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

<b>MODE</b>	TX channel 23095	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Match Tsui		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00 (PK)	-53.61	-54.96	4.75	-50.21	-13	-37.21
2	2122.50 (PK)	-56.57	-56.75	6.36	-50.39	-13	-37.39
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1415.00 (PK)	-56.44	-59.96	4.75	-55.21	-13	-42.21
2	2122.50 (PK)	-57.33	-57.52	6.36	-51.16	-13	-38.16

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



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<b>MODE</b>	TX channel 23130	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	24deg. C, 64%RH	<b>INPUT POWER</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Match Tsui		

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1422.00 (PK)	-54.4	-55.82	4.78	-51.04	-13	-38.04
2	2133.00 (PK)	-57.61	-57.7	6.36	-51.34	-13	-38.34
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1422.00 (PK)	-57.31	-60.89	4.78	-56.11	-13	-43.11
2	2133.00 (PK)	-58.36	-58.42	6.36	-52.06	-13	-39.06

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).



## 5 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

## **6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No modifications were made to the EUT by the lab during the test.

**---END---**