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TEST REPORT For FCC

Test Report No. : 2010110047
Date of Issue : November 23, 2010
FCC ID : YZ2SMRF900-2
Model/Type No. : SMRF900-II
Kind of Product : CARU-M
Applicant : JAVA INFORMATION TECHNOLOGY CO.,LTD.
Applicant Address : #6 Susung B/D 558-14, Samdo1-Dong, Jeju-Si, Jeju-Do, Korea
Manufacturer : JAVA INFORMATION TECHNOLOGY CO.,LTD.
Manufacturer Address : #6 Susung B/D 558-14, Samdo1-Dong, Jeju-Si, Jeju-Do, Korea
Contact Person : Ki-Du, Joo / Development Manager
Telephone : +82-70-4015-6646
Received Date : November 05, 2010
Test period : Start : November 18, 2010 End : November 23, 2010
Test Results : In Compliance Not in Compliance

The test results presented in this report relate only to the object tested.

Tested by

Young-taek, Lee
Test Engineer
Date: November 23, 2010

Reviewed by

Young-Joon, Park
Technical Manager
Date: November 23, 2010



REPORT REVISION HISTORY

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1.0 General Product Description

Equipment model name : SMRF900-II
Serial number : Prototype
EUT condition : Pre-production, not damaged
Antenna type : Patch antenna Gain 6.39 dBi
Frequency Range : 902.5 MHz - 927.0 MHz
RF power : 29.52 dBm - Conducted
Number of channels : 50 CH
Channel Spacing : 0.5 MHz
Channel Access Protocol : Frequency Hopping
Type of Modulation : ASK
Power Source : DC 7.5 V

1.1 Tested Frequency

	LOW	MID	HIGH
Frequency (MHz)	902.5	914.5	927.0

1.2 Model Differences

Not applicable

1.3 Device Modifications

The following modifications was applied by the applicant:



Ferrite Core			
Location	Manufacturer	Part no.	Tuns
DC IN	TDK	ZCAT2132-1130	2

1.4 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
NOTEBOOK COMPUTER	SAMSUNG Electronics Co., Ltd.	NT-R60Y	Z9GJ93GS302109B	DoC
AC/DC ADAPTOR	LI SHIN INTERNATIONAL ENTERPRISE CORP.	AD-6019	CNBA4400238AD2VH93E1986	-
WLAN DIPOLE ANTENNA	WINiZEN Co., Ltd.	W5E-WO-03	-	-
PATCH ANTENNA 1	NetHom Co., Ltd.	NT-919-CPO	-	-
PATCH ANTENNA 2	NetHom Co., Ltd.	NT-919-CPO	-	-

1.5 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.6 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.7 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 805871
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986, T-1843
KOREA	KCC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
International	KOLAS	EMC	



2.0 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	Carrier Frequency Separation	> 25 kHz	Conducted	C
15.247(a)	Number of Hopping Frequencies	> 50 hops		C
15.247(a)	Occupied Bandwidth	< 500 KHz		C
15.247	Time of Occupancy	< 0.4 seconds		C
15.247(b)	Transmitter Output Power	< 1Watt		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.247 /15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.207 /15.107	AC Conducted Emissions	EN 55022	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

- FCC Part 15.247, ANSI C63.4-2003

2.1 Transmitter Requirements

2.1.1 Carrier Frequency Separation

Test Location

RF Test Room

Test Procedures

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = 5 MHz

RBW = 100 kHz (\geq 1% of the span) Sweep = auto

VBW = 100 kHz (\geq RBW) Detector function = peak

Trace = max hold

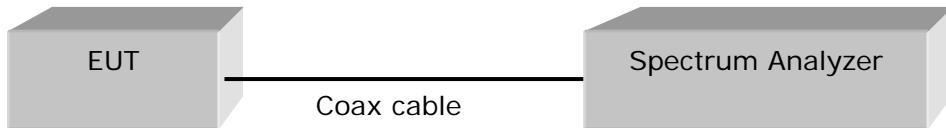


Figure 1 : Measurement setup for the carrier frequency separation

Limit

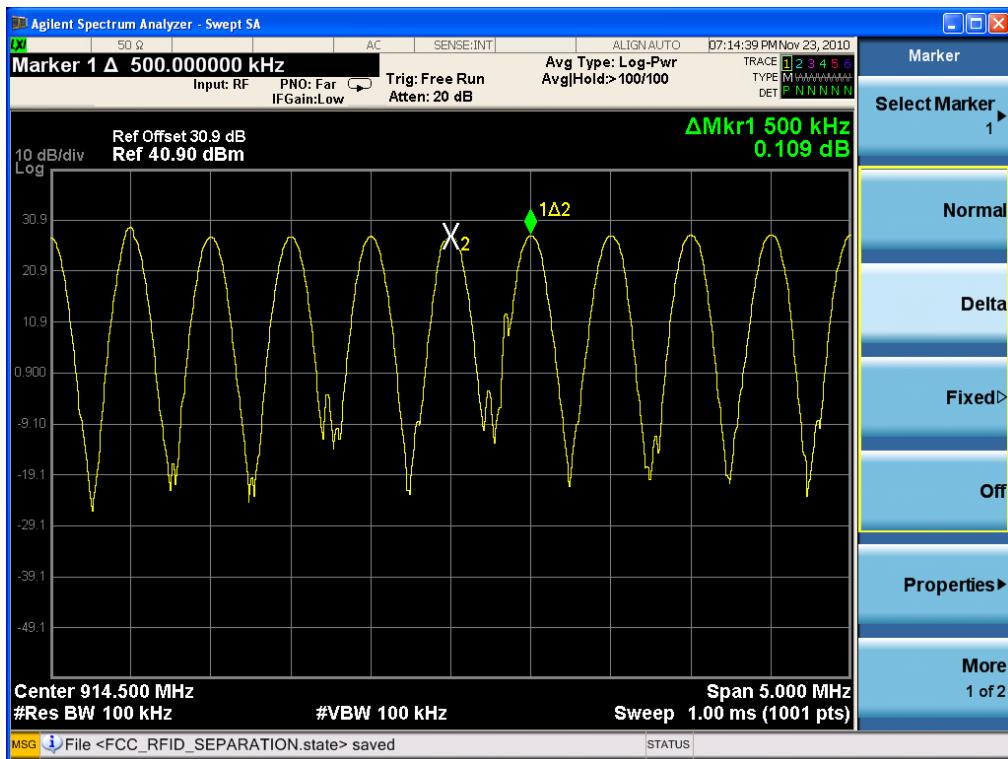
The EUT shall have hopping channel carrier frequencies separated minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Test Results

Carrier Frequency Separation (kHz)	\geq 25 kHz or 20 dB BW (kHz)	Margin (kHz)	Result
500	56.18	443.82	Complies

See next pages for actual measured spectrum plots.

Carrier Frequency Separation



2.1.2 Number of Hopping Frequencies

Test Location

RF Test Room

Test Procedures

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Frequency range Start = 900 MHz, Stop = 930 MHz

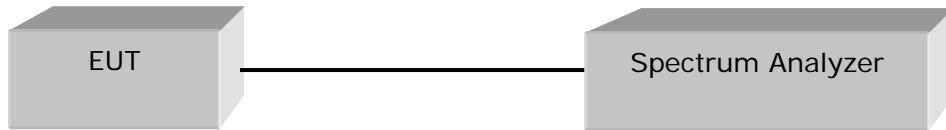
RBW = 300 kHz (\geq 1% of the span)

Sweep = auto

VBW = 300 kHz (\geq RBW)

Detector function = peak

Trace = max hold



Limit

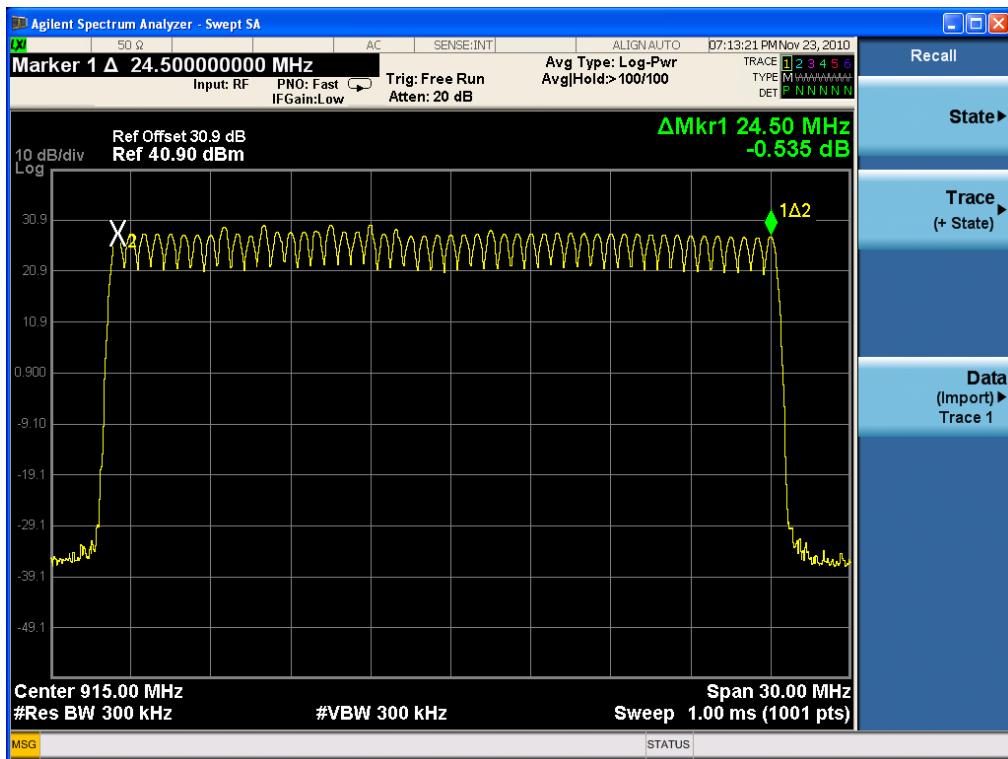
The EUT in the 902MHz - 928MHz band shall use at least 50 channels.

Test Results

Total number of Hopping Channels	Result
50	Complies

See next pages for actual measured spectrum plots.

Number of Hopping Frequencies



2.1.3 Occupied Bandwidth

Test Location

RF Test Room

Test Procedures

The bandwidth at 20 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 500kHz

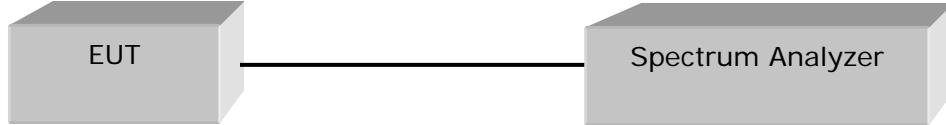
RBW = 3 kHz (\geq 1% of the span)

Sweep = auto

VBW = 10 kHz (\geq RBW)

Detector function = peak

Trace = max hold



Limit

The maximum allowed 20dB bandwidth of the hopping channel is 500 kHz

Test Results

Frequency (MHz)	20dB bandwidth (KHz)	99% bandwidth (KHz)	Result
902.5	56.18	66.95	Complies
914.5	54.52	63.17	Complies
927.0	54.70	65.28	Complies

See next pages for actual measured spectrum plots.

Low Channel



Mid Channel



High Channel



2.1.4 Time of Occupancy (Dwell Time)

Test Location

RF Test Room

Test Procedures

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function enabled.

The spectrum analyzer is set to:

Center frequency = the highest, middle, and the lowest channels

Span = zero

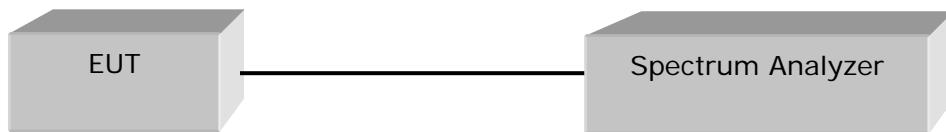
RBW = 3 kHz

Trace = max hold

VBW = 10 KHz (\geq RBW)

Detector function = peak

Sweep = as necessary to capture the entire dwell time per hopping channel



Limit

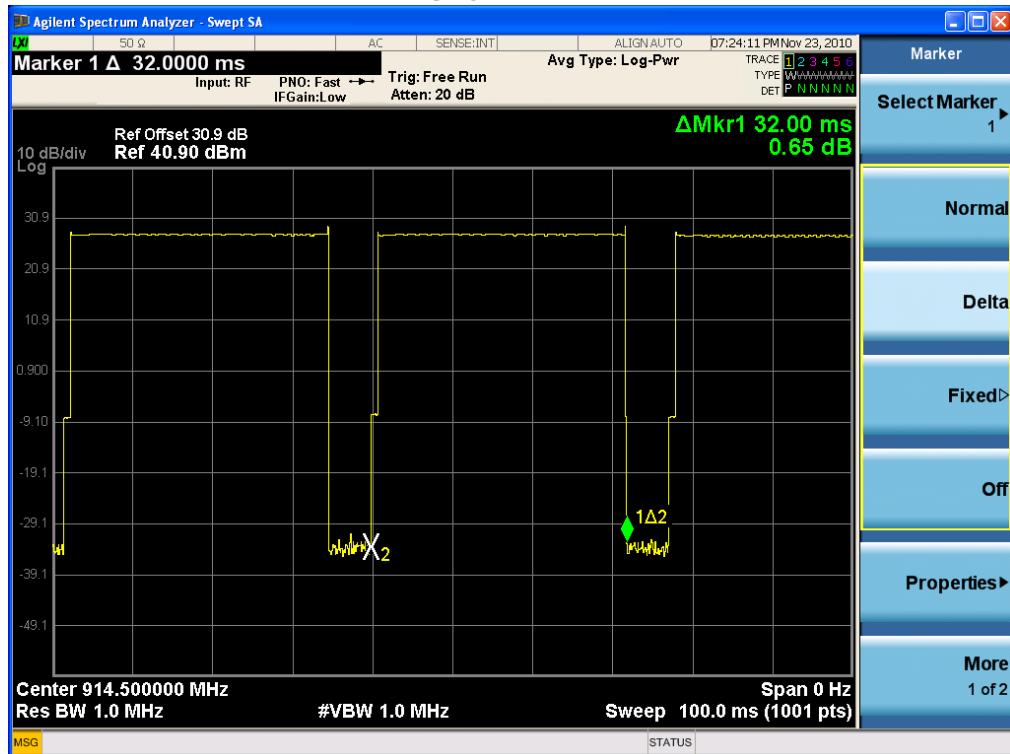
The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period .

Test Results

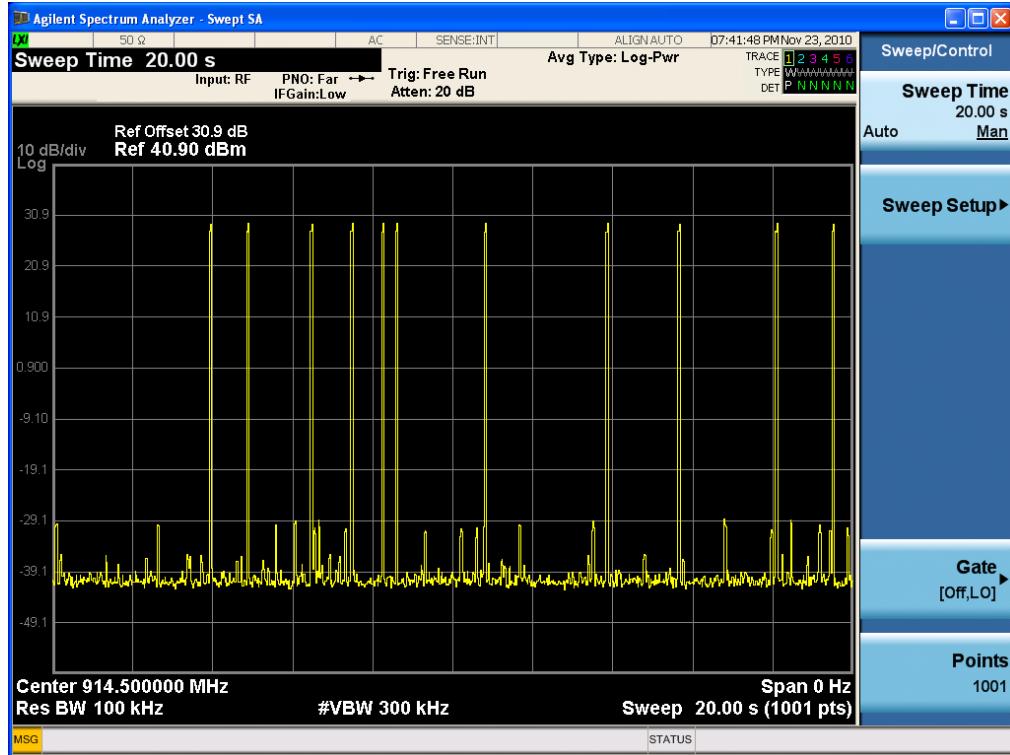
Pulse Width (sec)	Number of Pulses in 20 seconds	Time of Occupancy (sec)	Limit (sec)	Margin (sec)
0.032	11	0.352	0.4	0.048

See next pages for actual measured spectrum plots.

PULSE WIDTH



NUMBER OF PULSES



2.1.5 Maximum peak Conducted Output Power

Test Location

RF Test Room

Test Procedures

The maximum peak conducted output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function disabled at the highest, middle and the lowest available channels.

The spectrum analyzer is set to:

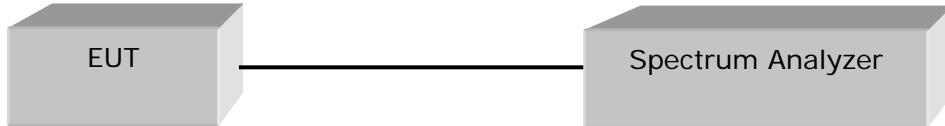
Center frequency = the highest, middle, and the lowest channels

Span = 2 MHz (approximately 5 times of the 20 dB bandwidth)

RBW = 1 MHz (greater than the 20 dB bandwidth of the EUT)

VBW = 1 MHz (\geq RBW) Detector function = peak

Trace = max hold Sweep = auto



Limit

The maximum peak output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operation in the 902-928 MHz band, employing at least 50 hopping channels: 1 watt

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Gain : 6.39 dBi

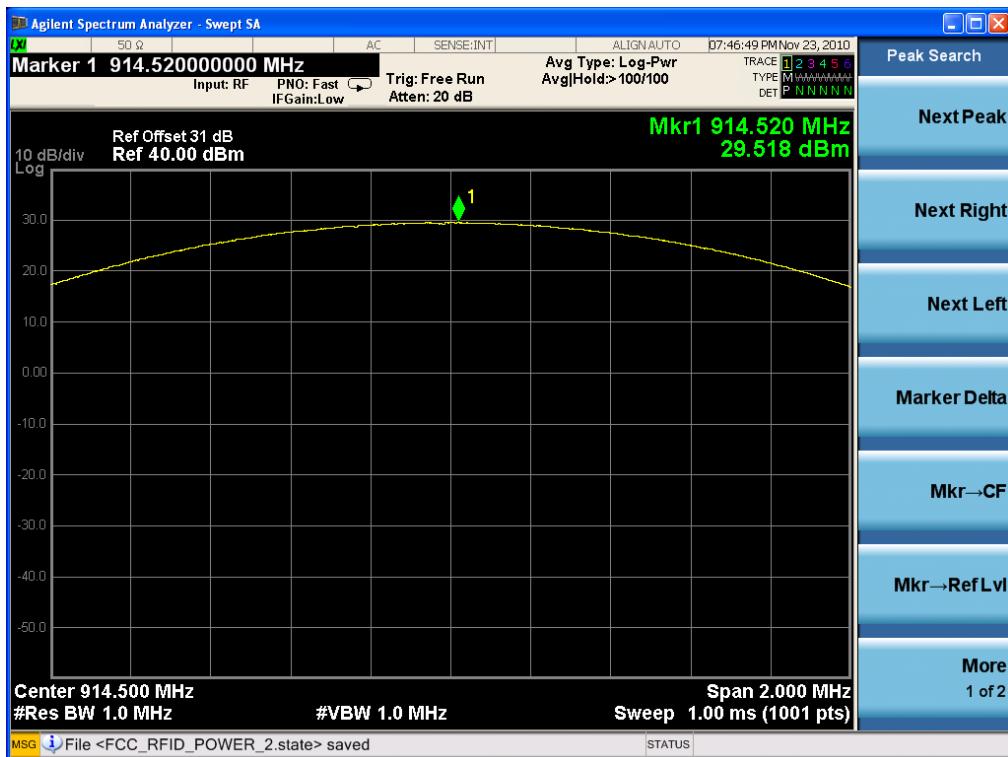
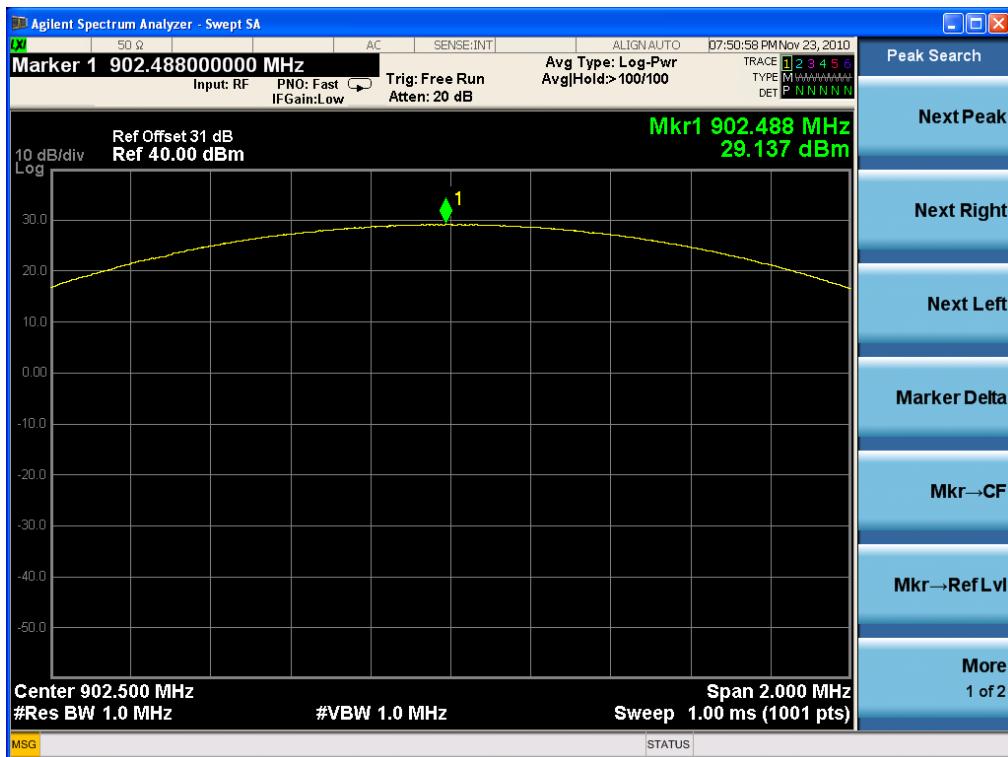
Limit : 30 dBm – (6.39 - 6) dBi = 29.61 dBm

Test Results

Frequency (MHz)	Peak output power(dBm)	Peak output power(mW)	Limit (dBm)	Margin (dB)	Result
902.5	29.14	819.79	29.61	0.47	Complies
914.5	29.52	894.95	29.61	0.09	Complies
927.0	27.91	618.44	29.61	1.70	Complies

See next pages for actual measured spectrum plots.

Maximum peak Conducted Output Power





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2.1.6 Band-edge

Test Location

RF Test Room

Test Procedures

The bandwidth at 20 dB down from the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function disabled at the highest, middle and the lowest available channels.

The spectrum analyzer is set to:

Center frequency = the highest, middle, and the lowest channels

RBW = 100 kHz

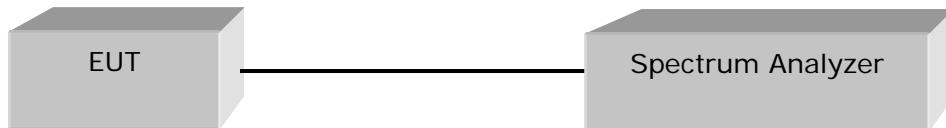
VBW = 300 kHz (\geq RBW)

Span = 5 MHz

Trace = max hold

Detector function = peak

Sweep = auto



Limit

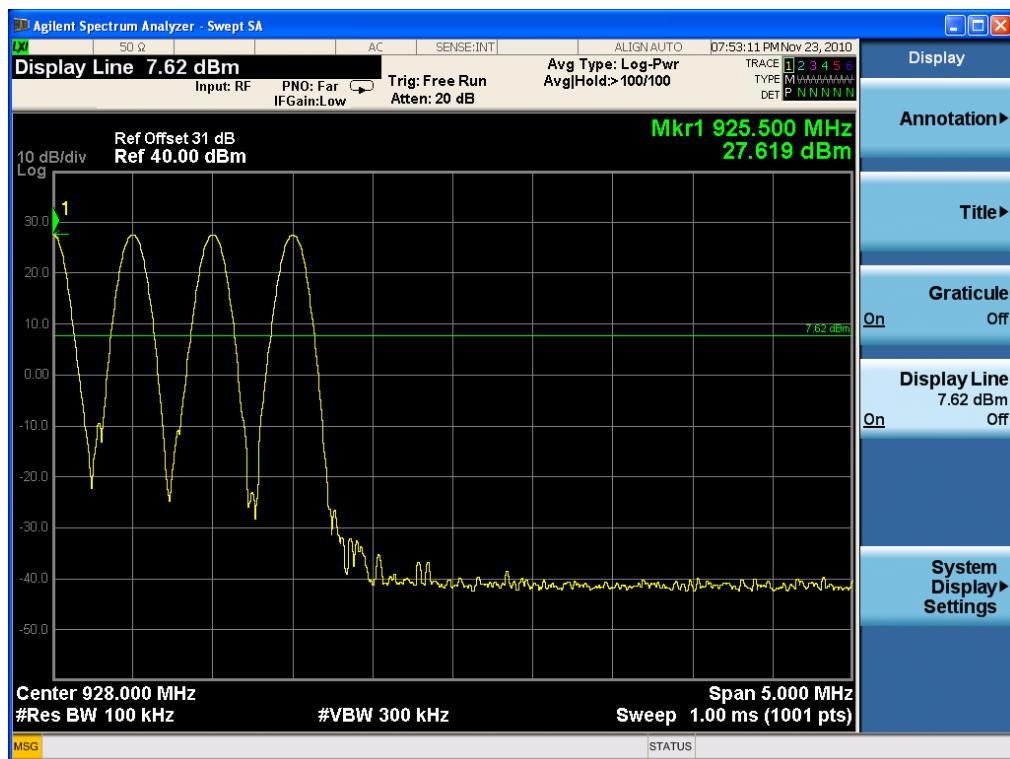
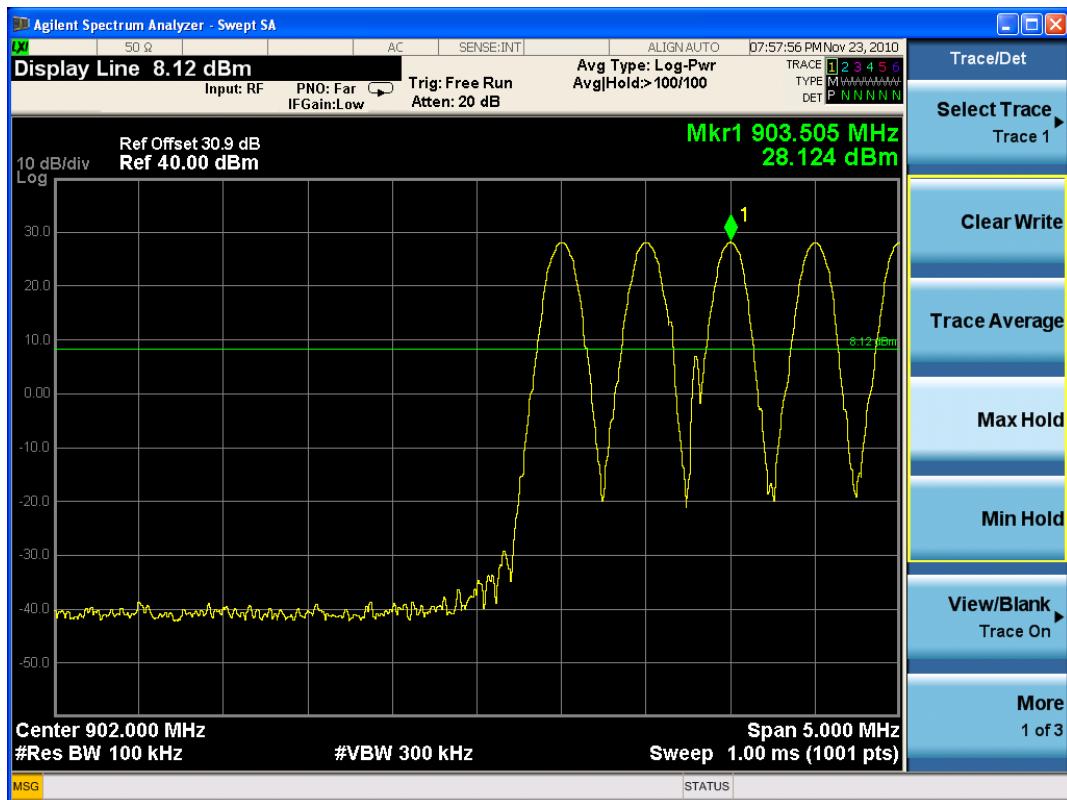
> 20 dBc

Test Results

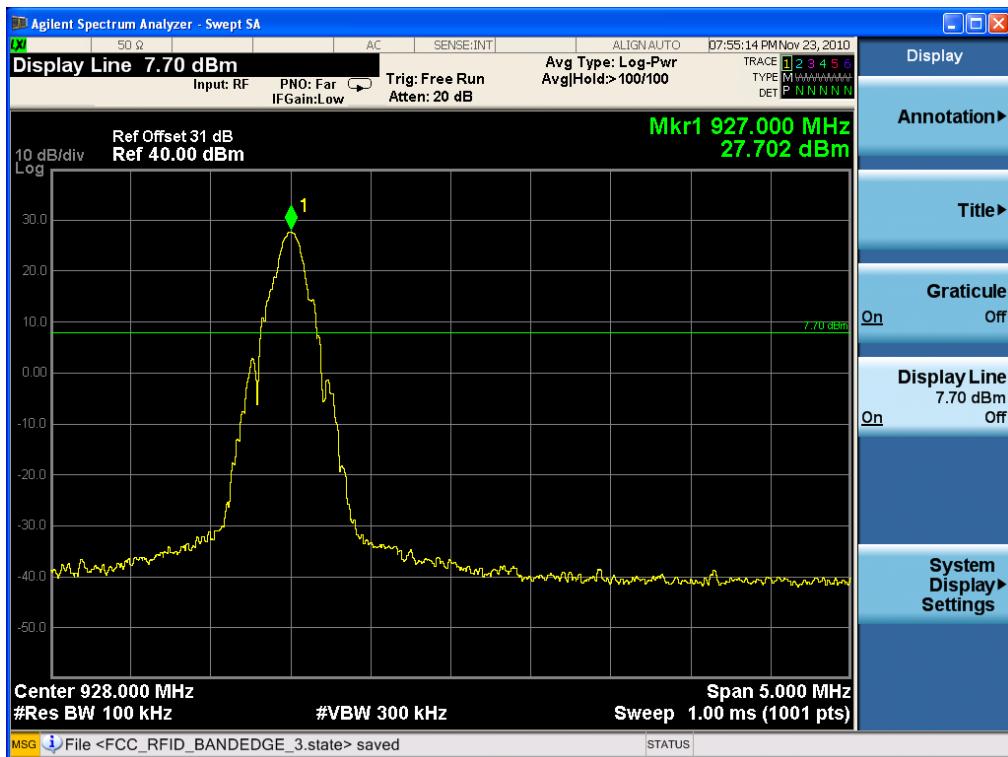
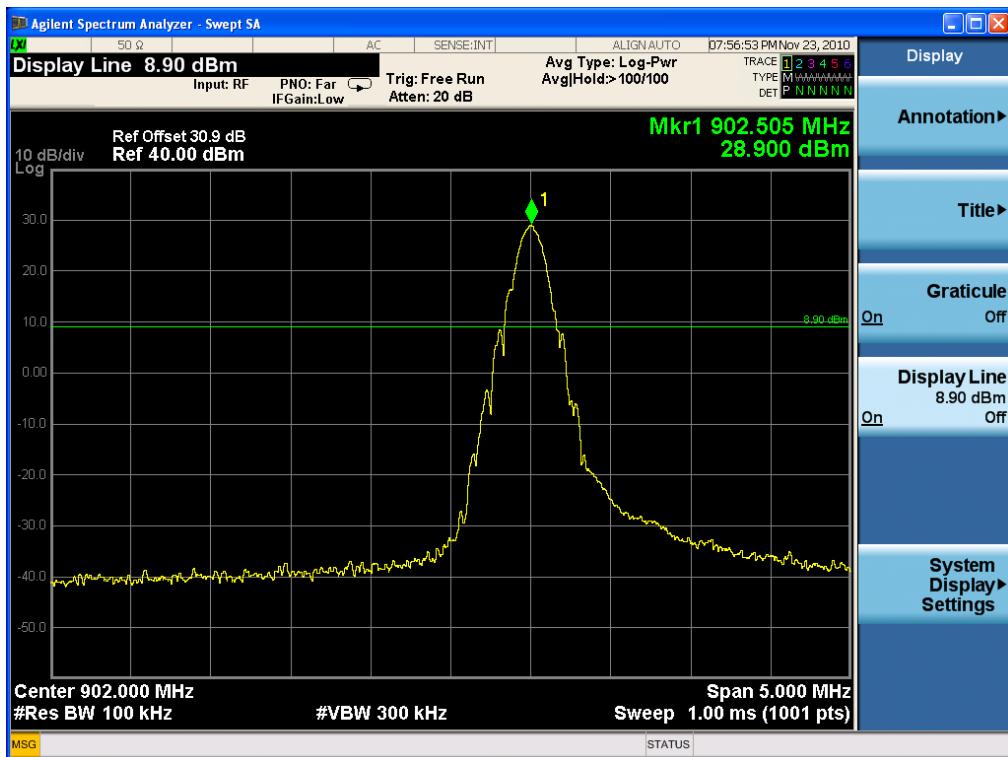
All conducted emission in any 100 kHz bandwidth outside of the spectrum band was at least 20 dB lower than the highest inband spectral density.
Therefore the applying equipment meets the requirement.

See next pages for actual measured spectrum plots.

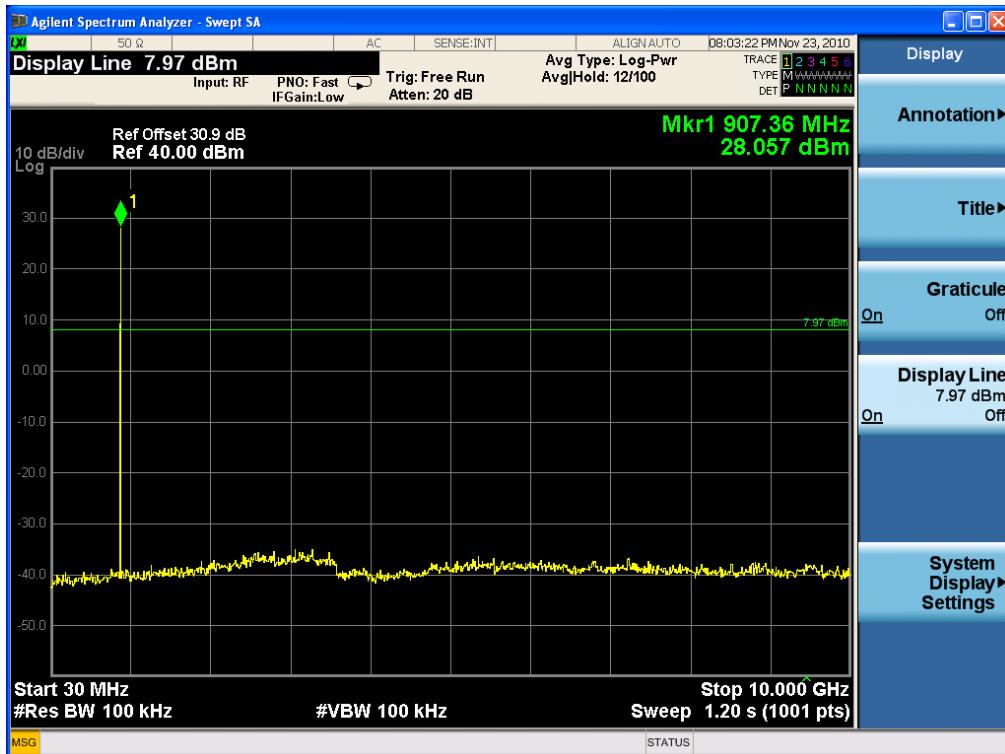
Band – edge (with Hopping)



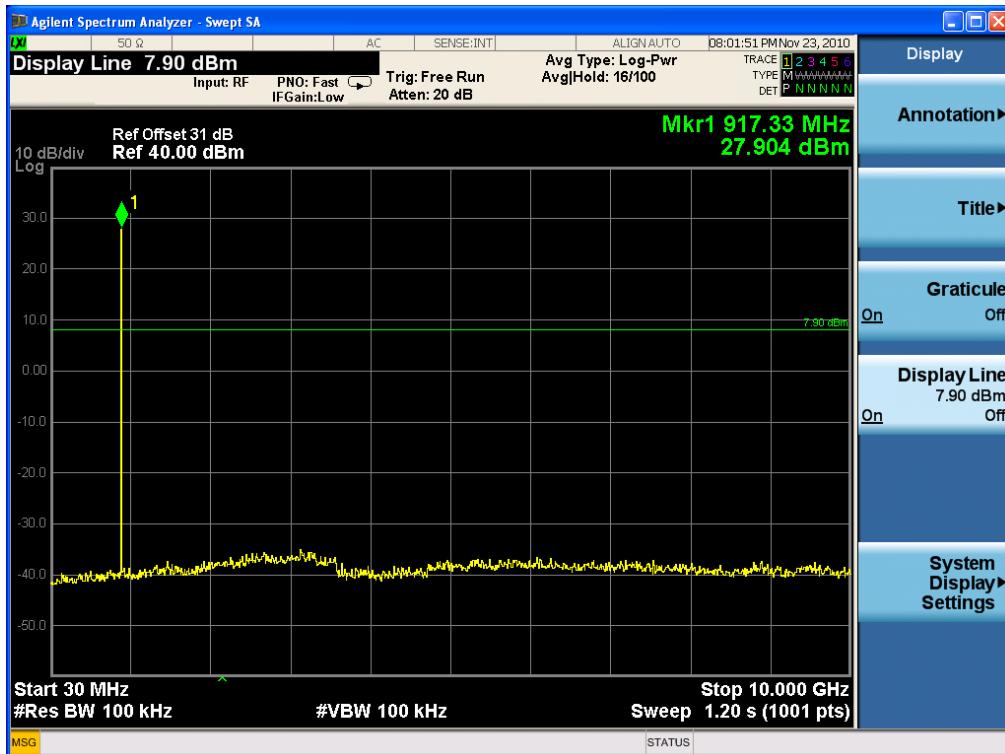
Band – edge (without Hopping)



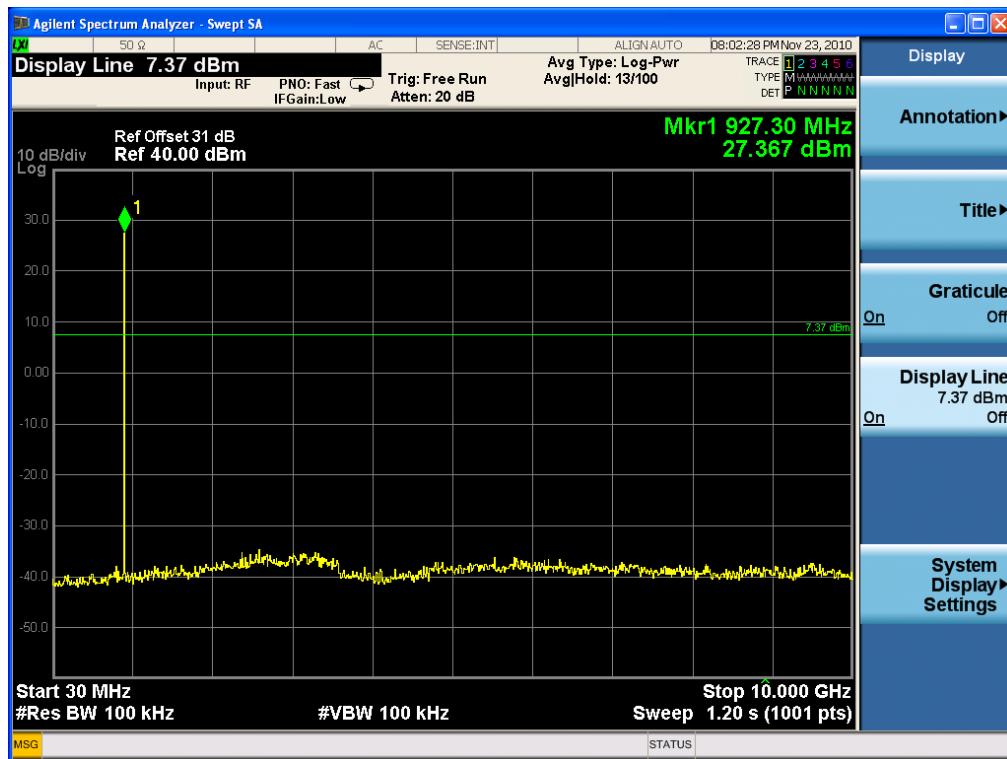
Band – edge (at 20 dB blow) – Low channel
Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – Mid channel
Frequency Range = 30 MHz ~ 10th harmonic



**Band – edge (at 20 dB blow) – High channel
Frequency Range = 30 MHz ~ 10th harmonic**



2.1.7 Field Strength of Emissions

Test Location

Testing was performed at a test distance of 3 meter Open Area Test Site

Test Procedures

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

Below 1GHz :

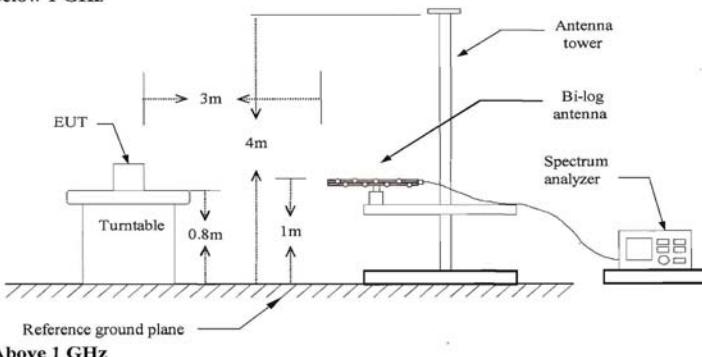
RBW=100KHz/VBW=300KHz/Sweep=AUTO

Above 1GHz:

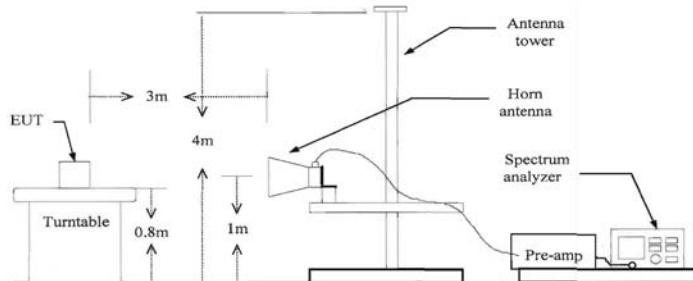
(a) PEAK: RBW=VBW=1MHz/Sweep=AUTO

(b) AVERAGE: RBW=1MHz/VBW=10Hz/Sweep=AUTO

Below 1 GHz



Above 1 GHz



Limit

- 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

** Except as provided in 15.209(g). fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.



Test Results

EUT	CARU-M	Measurement Detail		
Model	SMRF900-II	Frequency Range		Below 1000MHz
Channel	Hopping mode(Worst Case)	Detector function		Quasi-Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
396.44	42.8	3.2	Quasi-Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
50.12	24.5	V	1.0	8.1	0.3	40.0	32.9	7.1
144.16	23.5	V	2.4	8.0	1.3	43.5	32.8	10.7
313.21	25.3	H	1.5	11.7	2.5	46.0	39.5	6.5
348.38	26.3	V	1.3	12.7	2.6	46.0	41.6	4.4
350.00	17.7	V	1.0	12.7	2.6	46.0	33.0	13.0
396.44	26.1	V	1.0	13.9	2.8	46.0	42.8	3.2

H : Horizontal, V : Vertical

Result = Reading + Antenna + Cable

**Test Results**

EUT	CARU-M	Measurement Detail	
Model	SMRF900-II	Frequency Range	1-10GHz
Frequency	902.5 MHz	Detector function	Average/Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark			
			Antenna	Amp. Gain	Cable	
2708.22	48.1/49.5	5.9/24.5				Average/Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
1805.00	51.7	53.1	V	1.3	25.4	35.6	6.6	54.0	74.0	48.1	49.5	5.9	24.5 #N/A

Restricted band edge test data

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
No emissions were detected at a level greater than 20dB below limit.													



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Test Results

EUT	CARU-M	Measurement Detail	
Model	SMRF900-II	Frequency Range	1-10GHz
Frequency	914.5 MHz	Detector function	Average/Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2742.78	48.3/49.7	5.7/24.3	Average/Peak

Test Data

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
1829.00	51.9 53.3	V	1.5	25.4	35.6	6.6	54.0 74.0	48.3 49.7	5.7 #N/A 24.3

Restricted band edge test data

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



Test Results

EUT	CARU-M	Measurement Detail	
Model	SMRF900-II	Frequency Range	1-10GHz
Frequency	927.0 MHz	Detector function	Average/Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
1854.5	47.1/48.4	6.9/25.6	Average/Peak

Test Data

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
1854.00	50.7 / 52.0	V	1.5	25.4	35.6	6.6	54.0 / 74.0	47.1 / 48.4	6.9 / 25.6 #N/A

Restricted band edge test data

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

2.1.8 Conducted Voltage Emissions

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency.

Test Results

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
0.1995	51.4	2.2	Average



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Test Data-Hopping mode(Worst Case) [HOT]

Final Result 1

Frequency (MHz)	QuasiPeak (dB _{RF})	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB _{RF})
0.199500	59.3	1000.0	9.000	On	L1	10.1	4.3	63.6
0.199500	59.3	1000.0	9.000	On	L1	10.1	4.3	63.6
0.267000	53.4	1000.0	9.000	On	L1	10.1	7.8	61.2
0.330000	47.1	1000.0	9.000	On	L1	10.1	12.4	59.5
0.663000	41.3	1000.0	9.000	On	L1	10.1	14.7	56.0
2.121000	39.6	1000.0	9.000	On	L1	9.9	16.4	56.0
8.421000	46.6	1000.0	9.000	On	L1	9.8	13.4	60.0
8.421000	44.4	1000.0	9.000	On	L1	9.8	15.6	60.0
12.196500	40.5	1000.0	9.000	On	L1	9.9	19.5	60.0
29.404500	40.1	1000.0	9.000	On	L1	10.1	19.9	60.0

Final Result 2

Frequency (MHz)	Average (dB _{RF})	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB _{RF})
0.199500	50.7	1000.0	9.000	On	L1	10.1	2.9	53.6
0.199500	50.7	1000.0	9.000	On	L1	10.1	2.9	53.6
0.267000	44.9	1000.0	9.000	On	L1	10.1	6.3	51.2
1.725000	32.8	1000.0	9.000	On	L1	9.9	13.2	46.0
2.188500	33.6	1000.0	9.000	On	L1	9.9	12.4	46.0
2.652000	32.9	1000.0	9.000	On	L1	9.9	13.1	46.0
3.048000	31.9	1000.0	9.000	On	L1	9.8	14.1	46.0
8.421000	39.9	1000.0	9.000	On	L1	9.8	10.1	50.0
8.421000	36.4	1000.0	9.000	On	L1	9.8	13.6	50.0
11.724000	36.7	1000.0	9.000	On	L1	9.9	13.3	50.0

[NEUTRAL]

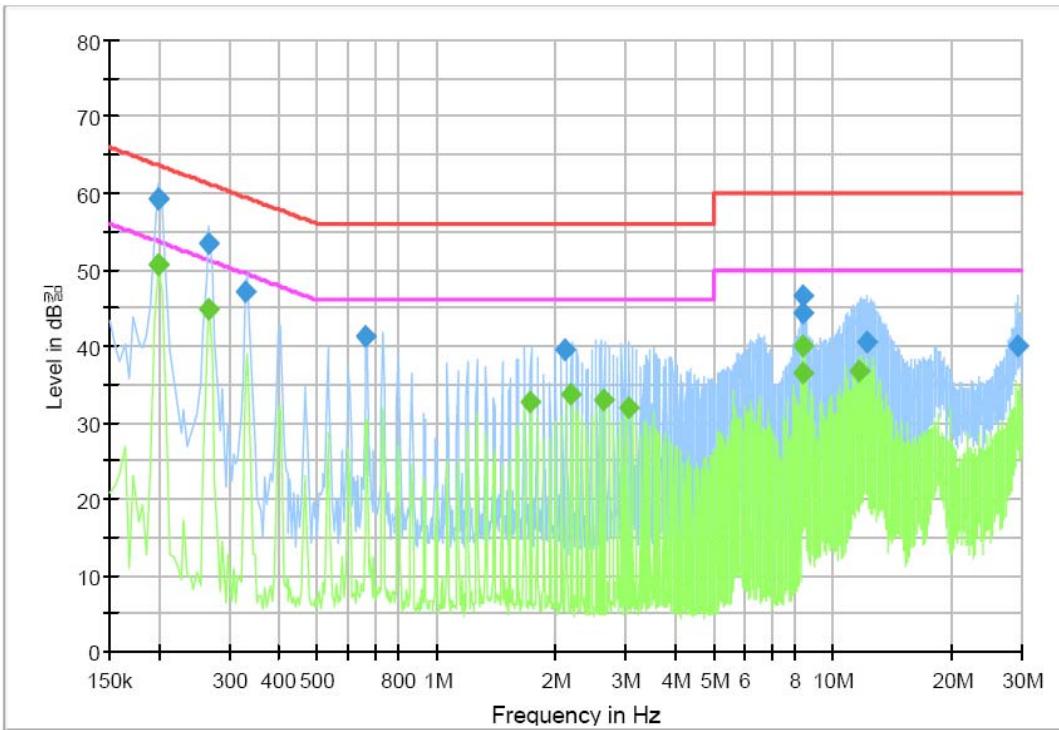
Final Result 1

Frequency (MHz)	QuasiPeak (dB _{RF})	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB _{RF})
0.199500	58.8	1000.0	9.000	On	N	10.0	4.8	63.6
0.199500	58.8	1000.0	9.000	On	N	10.0	4.8	63.6
0.262500	54.1	1000.0	9.000	On	N	10.0	7.3	61.4
0.330000	49.4	1000.0	9.000	On	N	10.1	10.1	59.5
0.658500	43.7	1000.0	9.000	On	N	10.1	12.3	56.0
0.726000	44.3	1000.0	9.000	On	N	10.1	11.7	56.0
1.648500	41.0	1000.0	9.000	On	N	9.9	15.0	56.0
8.448000	47.1	1000.0	9.000	On	N	9.8	12.9	60.0
8.448000	47.0	1000.0	9.000	On	N	9.8	13.0	60.0
12.138000	45.8	1000.0	9.000	On	N	9.9	14.2	60.0

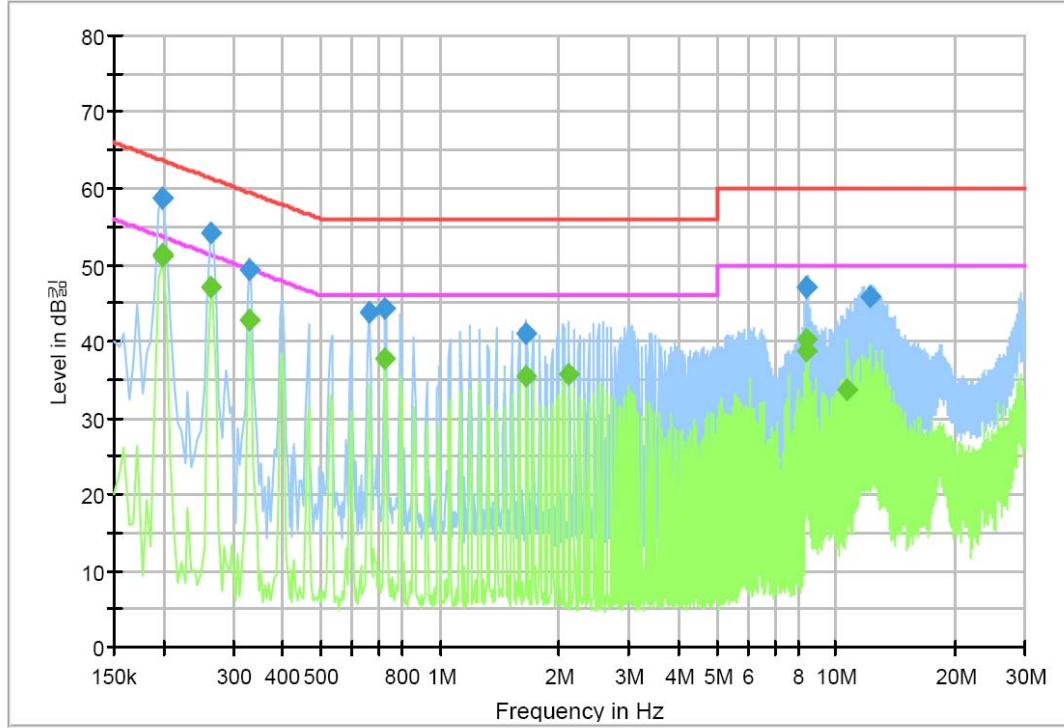
Final Result 2

Frequency (MHz)	Average (dB _{RF})	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB _{RF})
0.199500	51.4	1000.0	9.000	On	N	10.0	2.2	53.6
0.199500	51.1	1000.0	9.000	On	N	10.0	2.5	53.6
0.262500	47.0	1000.0	9.000	On	N	10.0	4.4	51.4
0.330000	42.7	1000.0	9.000	On	N	10.1	6.8	49.5
0.726000	37.8	1000.0	9.000	On	N	10.1	8.2	46.0
1.648500	35.5	1000.0	9.000	On	N	9.9	10.5	46.0
2.112000	35.7	1000.0	9.000	On	N	9.9	10.3	46.0
8.448000	40.3	1000.0	9.000	On	N	9.8	9.7	50.0
8.448000	38.6	1000.0	9.000	On	N	9.8	11.4	50.0
10.684500	33.6	1000.0	9.000	On	N	9.9	16.4	50.0

[HOT]



[NEUTRAL]



**APPENDIX A – Test Equipment Used For Tests**

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2011-11-12
2	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2011-11-12
3	EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2011-07-12
4	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2011-11-18
5	LOOP ANTENNA	EMCO	6502	9107-2652	2012-10-29
6	Attenuator	HP	8498A	1801A06913	2011-11-15
7	EPM Series Power Meter	HP	E4418A	GB38272734	2011-11-12
8	Power Sensor	HP	8487A	3318A03524	2011-07-12
9	Audio Analyzer	HP	8903B	2747A03432	2011-11-12
10	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2011-11-12
11	SYNTHEZIZED SWEEPER	HP	8341B	2819A01563	2011-11-12
12	Modulation Analyzer	HP	8901B	3438A05228	2011-11-16
13	Attenuator	HP	8494A	3308A33351	2011-11-15
14	Temp&Humi Chamber	Kunpoong	KP-1000	2002KP050041	2011-01-25
15	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2011-11-12
16	EMC Analyzer	Agilent	E7405A	MY45110859	2011-01-25
17	Horn Antenna	ETS-Lindgren	3115	00078894	2010-12-18
18	Horn Antenna	ETS-Lindgren	3115	00078895	2010-12-18
19	Dipole Antenna	SCHWARZBECK	VHA 9103	VHA91032557	2010-11-27
20	Dipole Antenna	SCHWARZBECK	UHA 9105	UHA91052417	2010-11-27
21	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2011-03-31
22	PREAMPLIFIER	Agilent	8449B	3008A02307	2011-11-16
23	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2011-02-23
24	Field Strength Meter	Rohde & Schwarz	ESHS30	862024/001	2011-03-08
25	LISN	Rohde & Schwarz	ESH3-Z5	100207	2010-12-15
26	LISN	EMCO	3825/2	9206-1971	2010-12-16