CTK Co., Ltd.
386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea
Tel: +82-31-339-9970 Fax: +82-31-339-9855
www.e-ctk.com

TEST REPORT For FCC

Test Report No.	:	2008010027
Date of Issue	:	January 23, 2008
FCC ID	:	NLMURP-SU110
Model/Type No.	:	URP-SU110
Kind of Product	:	UHF RFID Handheld READER
Applicant	:	SAMSUNG TECHWIN CO., LTD
Applicant Address	:	145-3 Sangdaewon 1 dong, Chungwon-ku, Sungnam City, Kyungki-do, Korea
Manufacturer	:	SAMSUNG TECHWIN CO., LTD
Manufacturer Address	:	145-3 Sangdaewon 1 dong, Chungwon-ku, Sungnam City, Kyungki-do, Korea
Contact Person	:	Moon Soo - Choi / Engineer
Telephone	:	+82-31-280-8073
Received Date	:	December 27, 2007
Test period	:	Start : January 7, 2008 End : January 18, 2008
Test Results	:	☒ In Compliance ☐ Not in Compliance

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

Tested by

Kyu-Chul, Shin
Test Engineer
Date: January 23, 2008

Reviewed by

Young-Joon, Park
Technical Manager
Date: January 23, 2008

REPORT REVISION HISTORY

Date	Revision	Page No
January 23, 2008	Issued (2008010027)	All

This report shall not be reproduced except in full, without the written approval of CTK Co., Ltd. This document may be altered or revised by CTK Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by CTK Co., Ltd. will constitute fraud and shall nullify the document.

TABLE OF CONTENTS

1.0 General Product Description

Equipment model name	: URP-SU110
Serial number	: Prototype
EUT condition	: Pre-production, not damaged
Antenna type	: Chip antenna Gain 0dBi
Frequency Range	: 2412Mhz ~ 2462MHz(DSSS/OFDM)
RF output power	: 17.75 dBm Peak Conducted (802.11b) : 18.80 dBm Peak Conducted (802.11g)
Number of channels	: 11(DSSS/OFDM)
Type of Modulation	: CCK, DQPSK, DBPSK for DSSS : 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate	: 11/5.5/2/1Mbps for 802.11b : 54/48/36/24/18/12/9/6Mbps for 802.11g
Power Source	: Li-Polymer Battery (DC 4.2V)

1.1 Tested Frequency

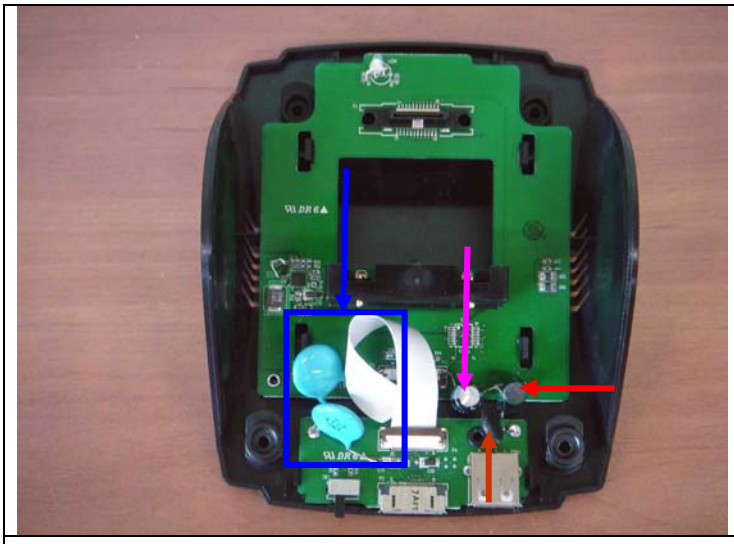
	LOW	MID	HIGH
Frequency (MHz) For 802.11b	2412	2437	2462
Frequency (MHz) For 802.11g	2412	2437	2462

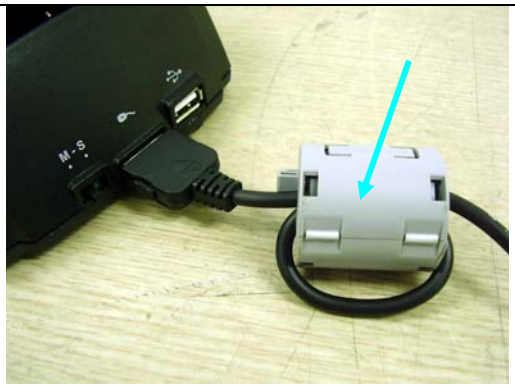
1.2 Model Differences

Not applicable

1.3 Device Modifications

The following modifications were necessary for compliance:





0.47 uF x 2 — 22 uF
0.2 uH
thermistor
Core

Location	Manufacturer	Part number	Turn number
DC IN	TDK	ZCAT3035-1330	1

*Manufacturer does debugging directly and applied

1.4 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
I.T.E. POWER SUPPLY	AULT KOREA Corp.	JPW150	KA0500F51	-
Personal Computer	SAMSUNG ELECTRONICS Co., Ltd.	DM-V60	493J96BLB00311Y	DoC
USB Mouse	MICROSOFT CORPORATION	Optical Mouse USB/PS2 Compatible	69657-492-4974533-40420	DoC
PS/2 Mouse	SYSGRATION	SAGM002	304009601	DoC
PS/2 Keyboard	HEWLETT-PACKARD COMPANY	5219	BN50702141	DoC
LCD Monitor	TIANJIN SAMSUNG ELECTRONICS DISPLAY	GH17US	N372HVEX225526	DoC
Adaptor	Anam Instruments (Shen Zhen) Co., Ltd.	AP0414-UV	-	-

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.	93250
JAPAN	**VCCI**	10 meter Open Area Test Site and one conducted site.	R-948, C-986
KOREA	**MIC**	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	
Europe	**GLAS**	EMC EN 55011, EN 55022, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 50130-4, EN 55024, EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	No.13000796-02

2.0 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500kHz	Conducted	
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(d)	Transmitter Power Spectral Density	< 8dBm @ 3kHz		C
				C
15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.207	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 Technical Characteristic Test

2.1.1 6dB Bandwidth

Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

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 6dB 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 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz (VBW ≥ RBW)

Trace = max hold

Span = 40 MHz

Sweep = auto

Detector function = peak

Measurement Data:

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	10.00	Complies
	2437	6	10.08	Complies
	2462	11	10.00	Complies
802.11g	2412	1	16.64	Complies
	2437	6	16.64	Complies
	2462	11	16.64	Complies

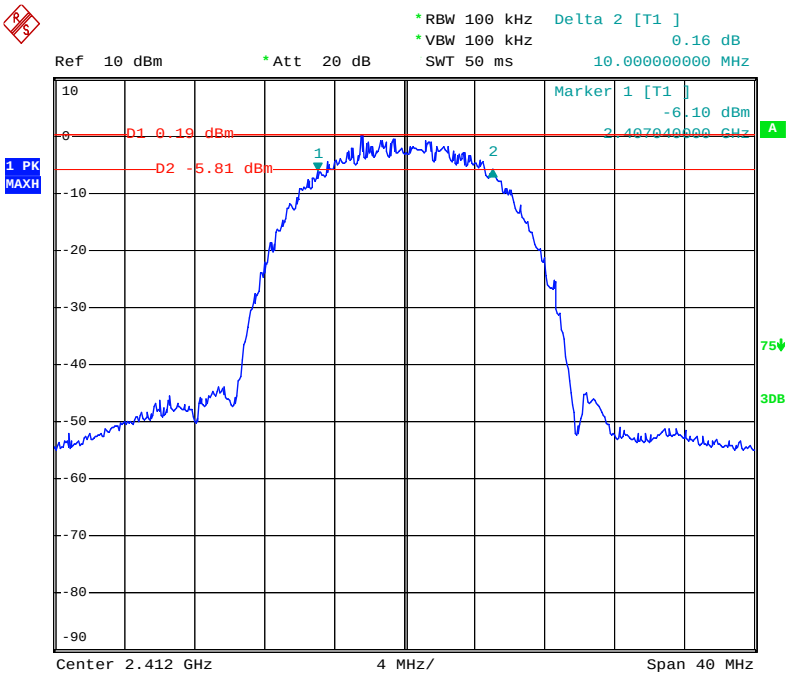
- See next pages for actual measured spectrum plots.

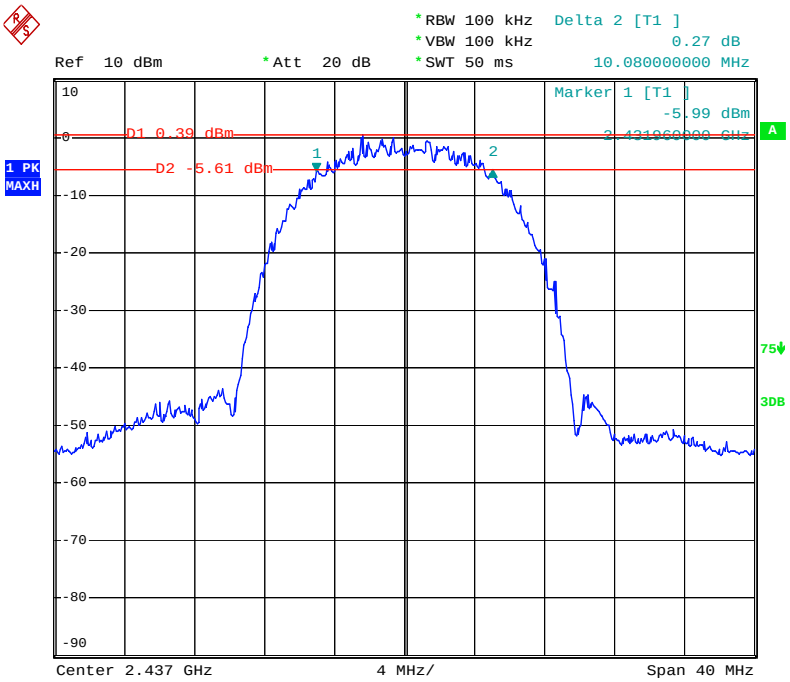
Minimum Standard:

6 dB Bandwidth > 500kHz

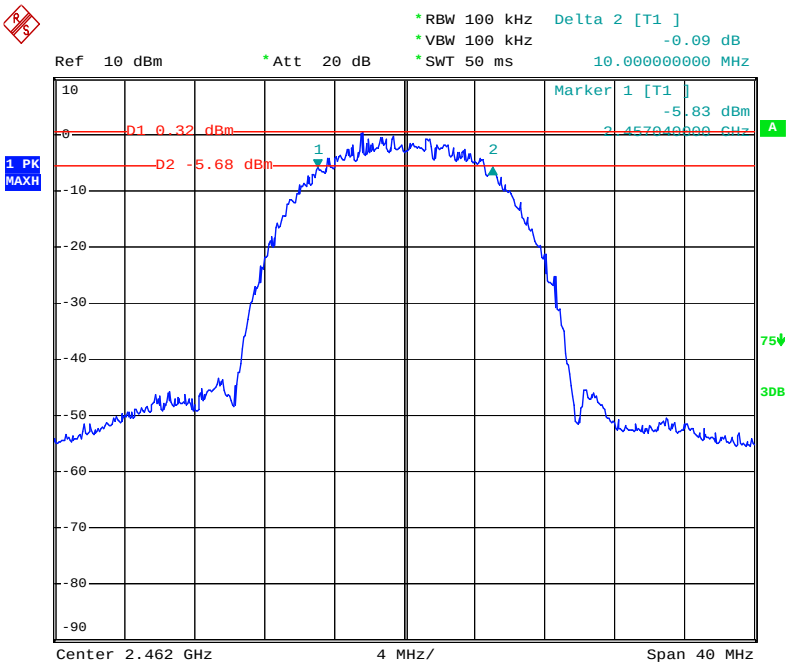
See next pages for actual measured spectrum plots.

802.11b

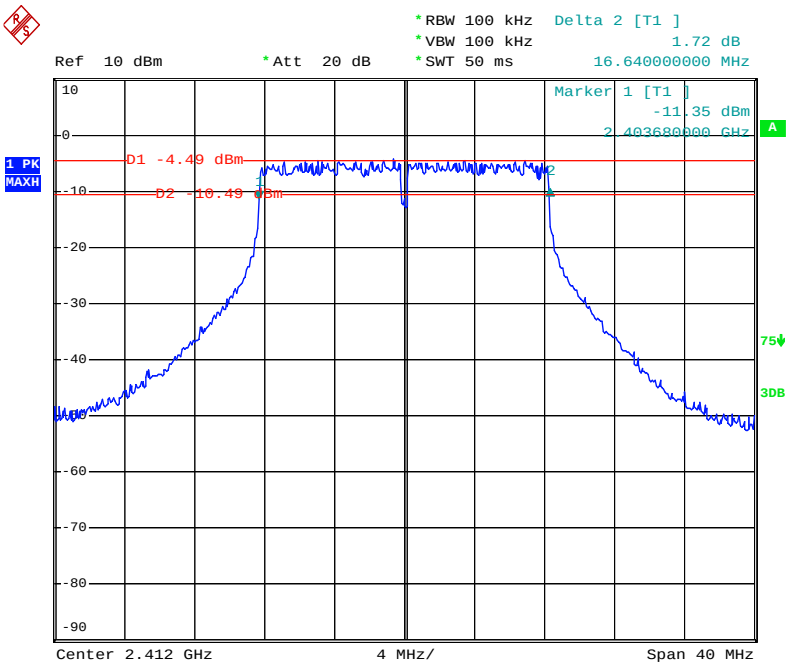


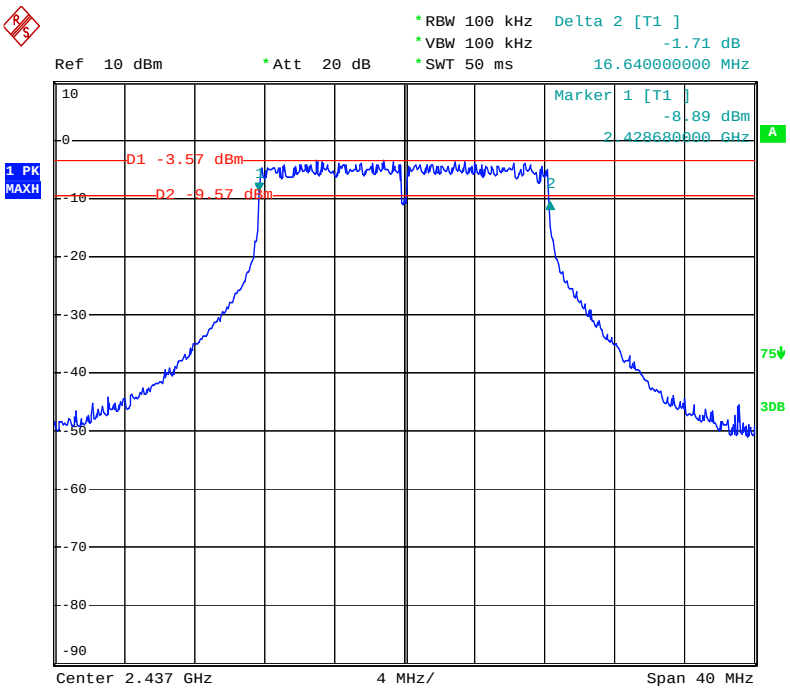


802.11b

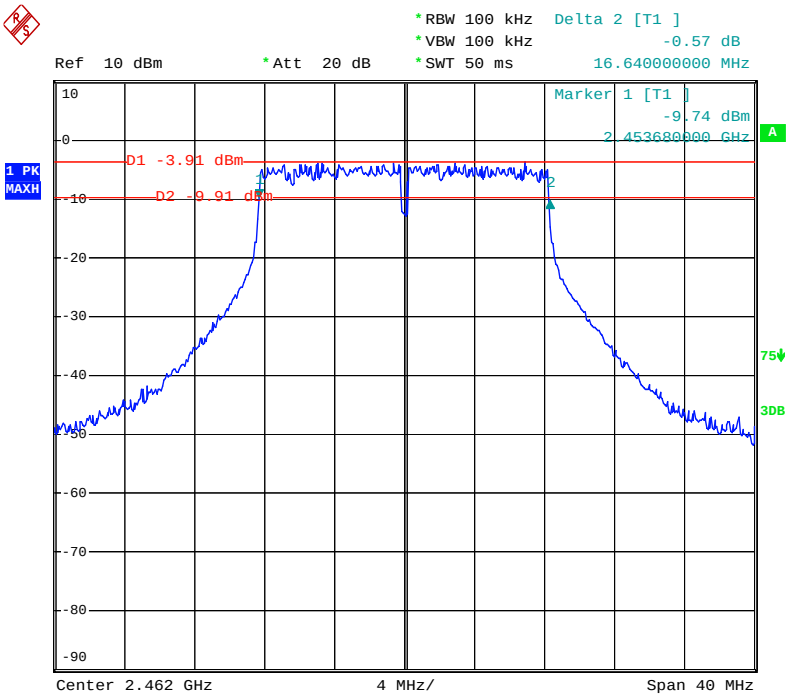


802.11g





802.11g



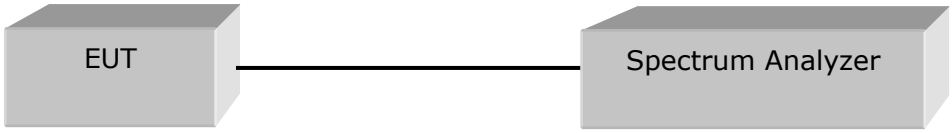
2.1.2 Maximum peak Conducted Output Power

Test Location

RF Test Room

Test Procedures

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Limit

< 1 W

Test Results

802.11b mode

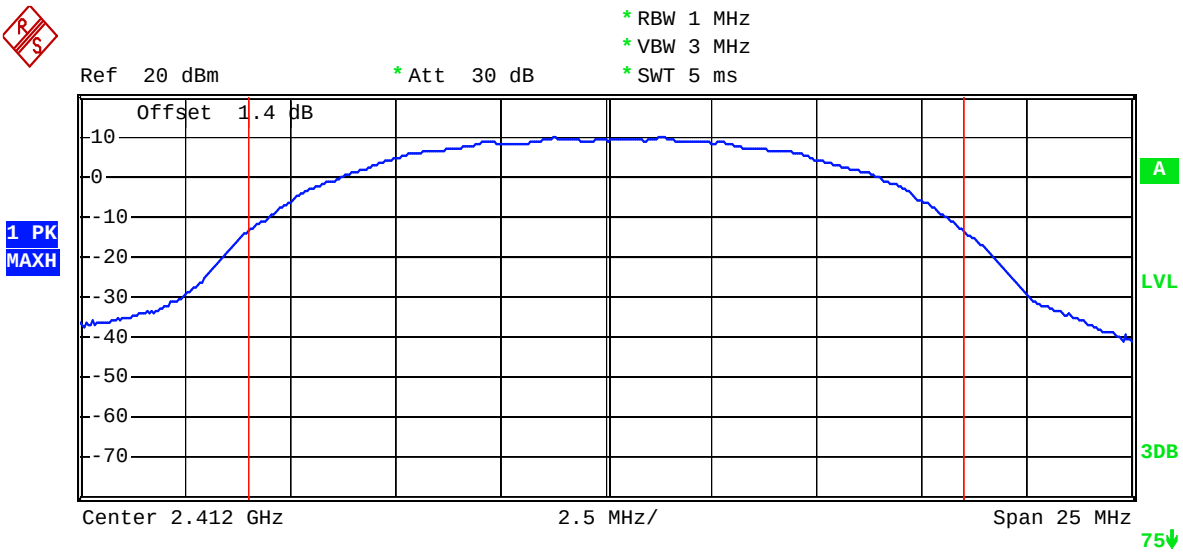
Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	17.67	30dBm	Complies
2437	Middle	17.64	30dBm	Complies
2462	High	17.75	30dBm	Complies

802.11g mode

Frequency (MHz)	Channel No.	Peak output power(dBm)	Peak output power(mW)	Result
2412	Low	18.18	30dBm	Complies
2437	Middle	18.09	30dBm	Complies
2462	High	18.80	30dBm	Complies

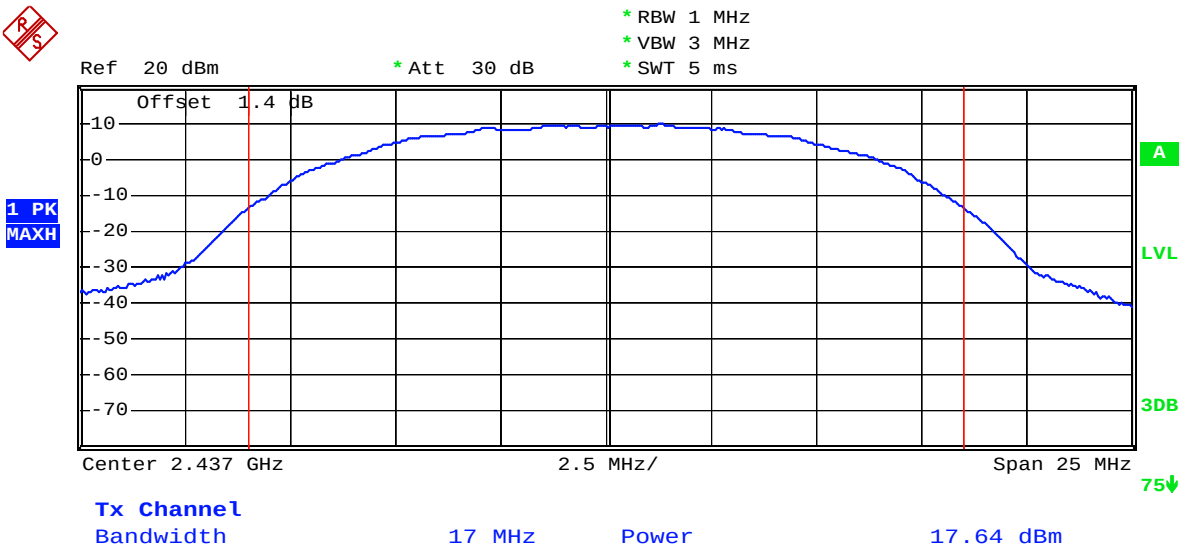
See next pages for actual measured spectrum plots.

Peak Conducted Output Power – 802.11b



Tx Channel

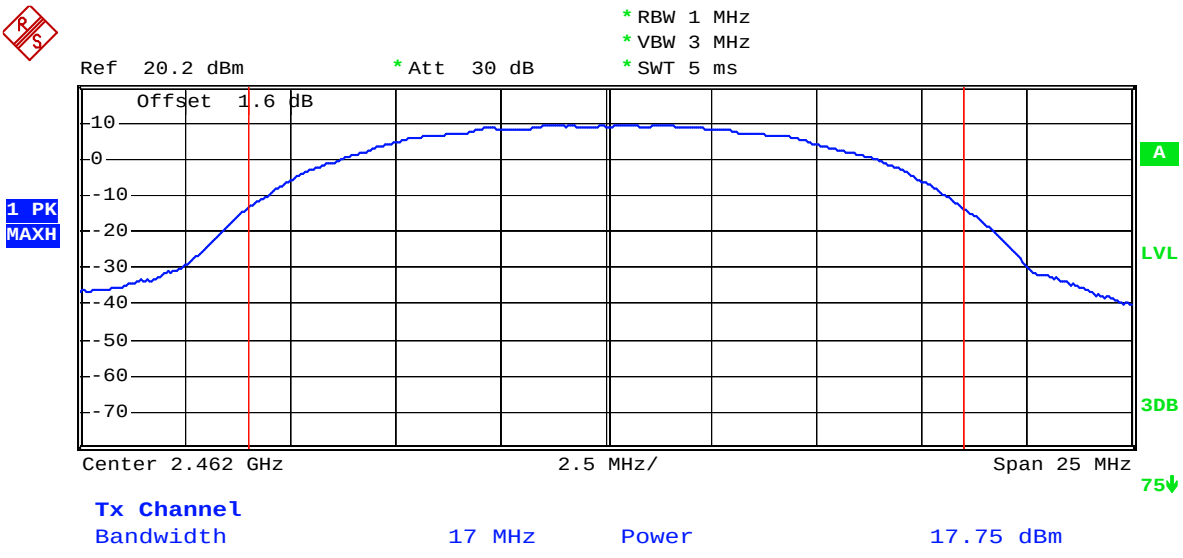
Bandwidth	17 MHz	Power	17.67 dBm



Tx Channel

Bandwidth	17 MHz	Power	17.64 dBm

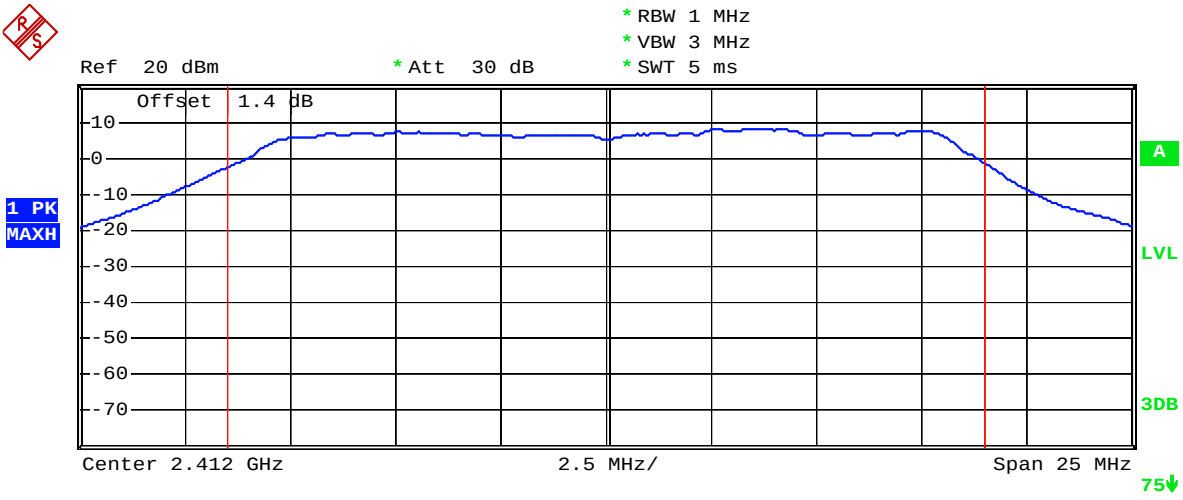
Peak Conducted Output Power – 802.11b



Tx Channel

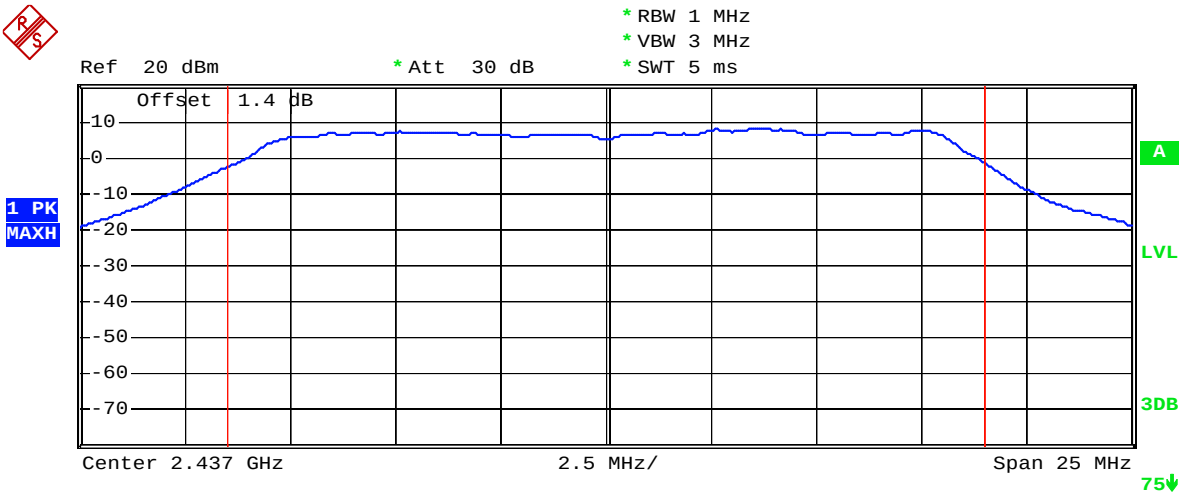
Bandwidth	17 MHz	Power	17.75 dBm

Peak Conducted Output Power – 802.11g



Tx Channel

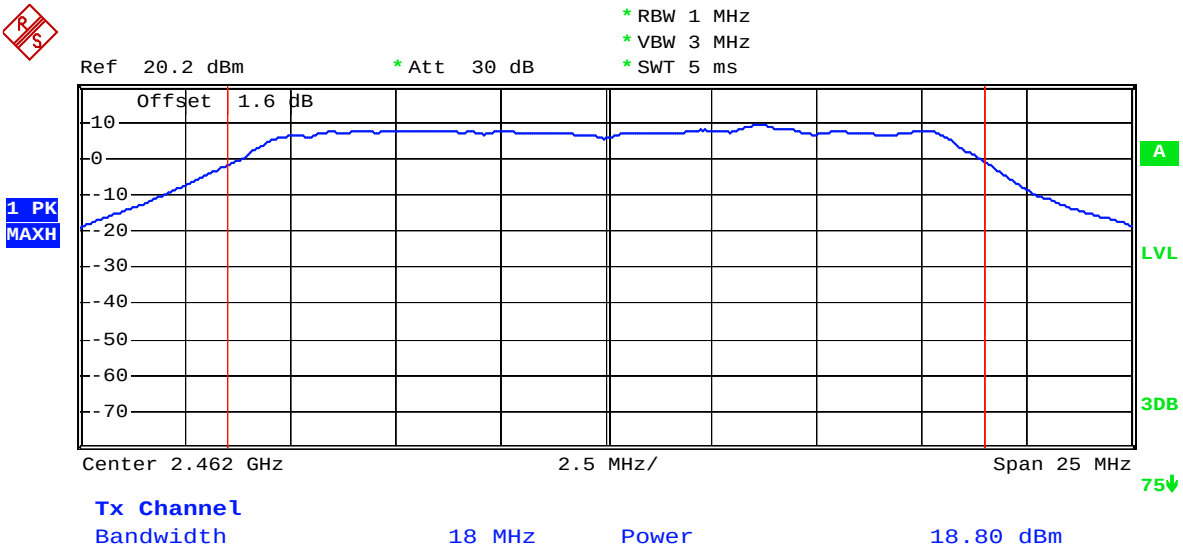
Bandwidth	18 MHz	Power	18.18 dBm



Tx Channel

Bandwidth	18 MHz	Power	18.09 dBm

Peak Conducted Output Power – 802.11g



2.1.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz VBW = (VBW ≥ RBW)

Sweep = 100KHz(Span/3KHz) Span = 300 KHz

Detector function = peak Trace = max hold

Measurement Data:

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-14.69	Complies
	2437	6	-14.33	Complies
	2462	11	-14.11	Complies
802.11g	2412	1	-24.11	Complies
	2437	6	-19.50	Complies
	2462	11	-21.95	Complies

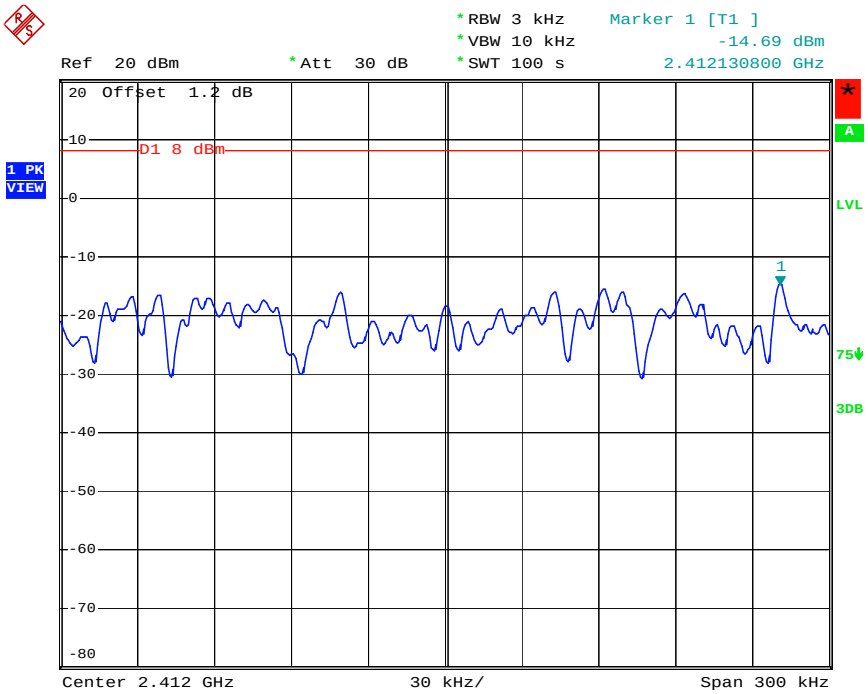
- See next pages for actual measured spectrum plots.

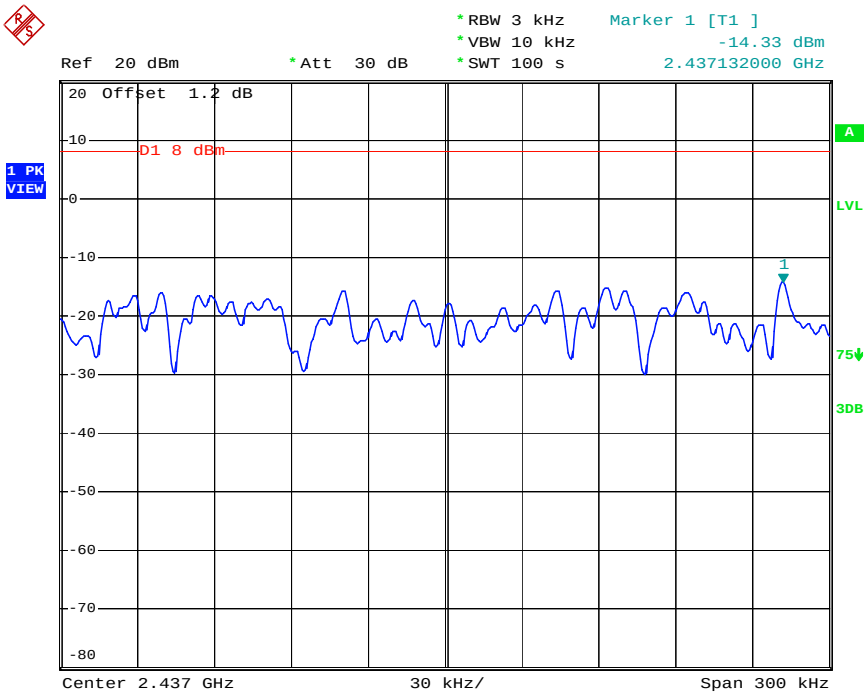
Minimum Standard:

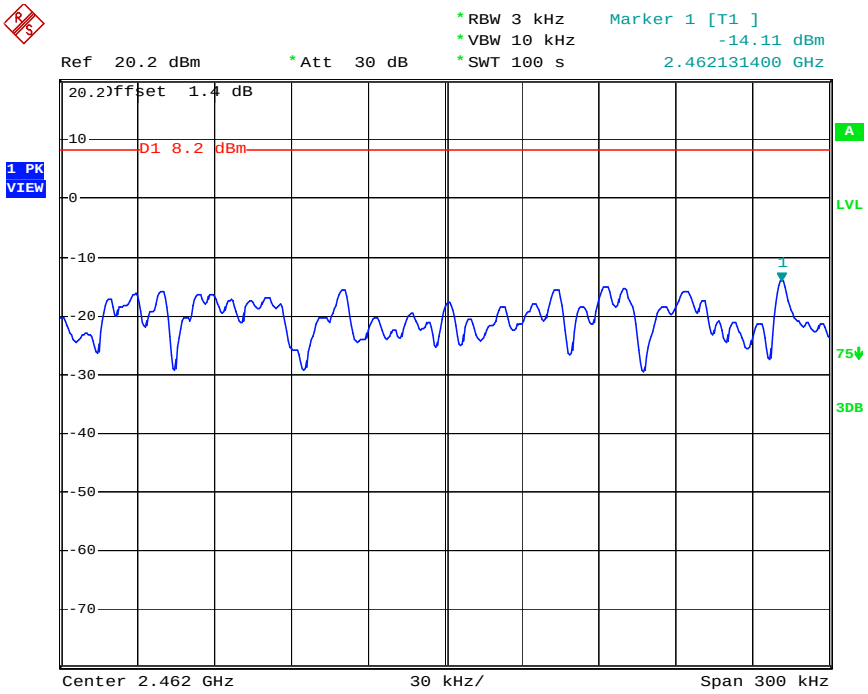
Power Spectral Density	< 8dBm @ 3kHz BW

See next pages for actual measured spectrum plots.

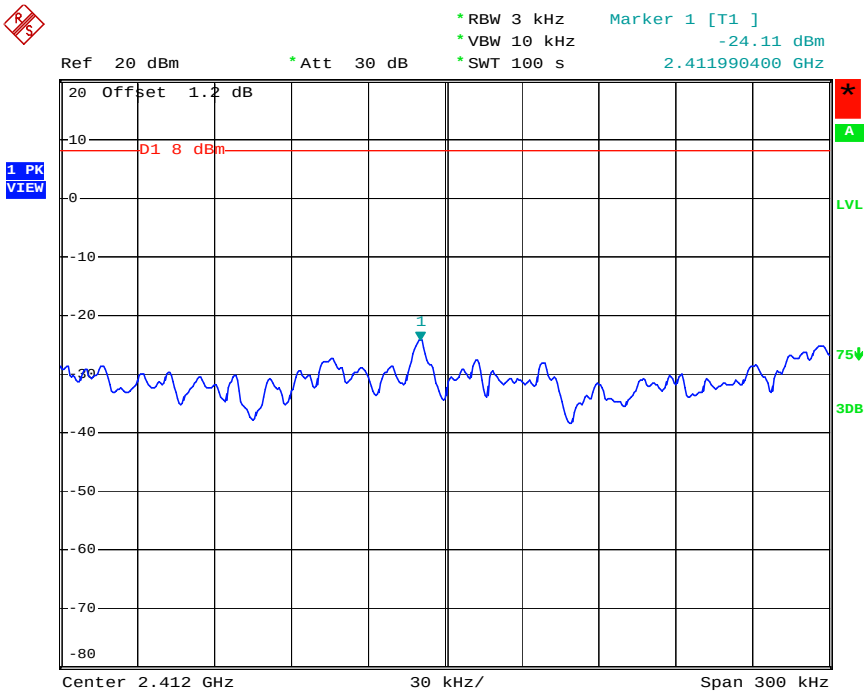
802.11b Power Density Measurement

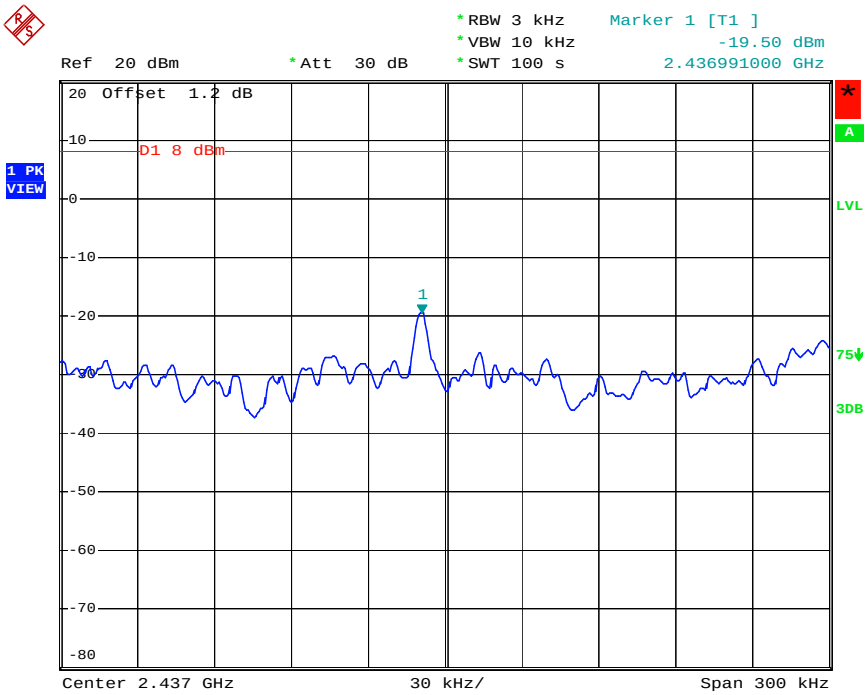


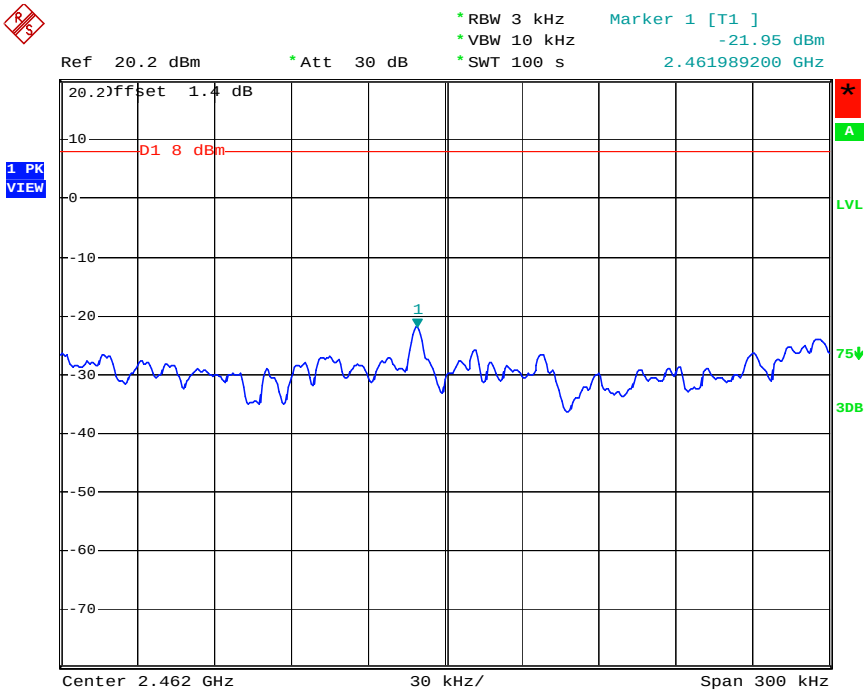




802.11g Power Density Measurement







2.1.4 Band - edge

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz	VBW = 100 kHz
Span = 40 MHz	Detector function = peak
Trace = max hold	Sweep = auto

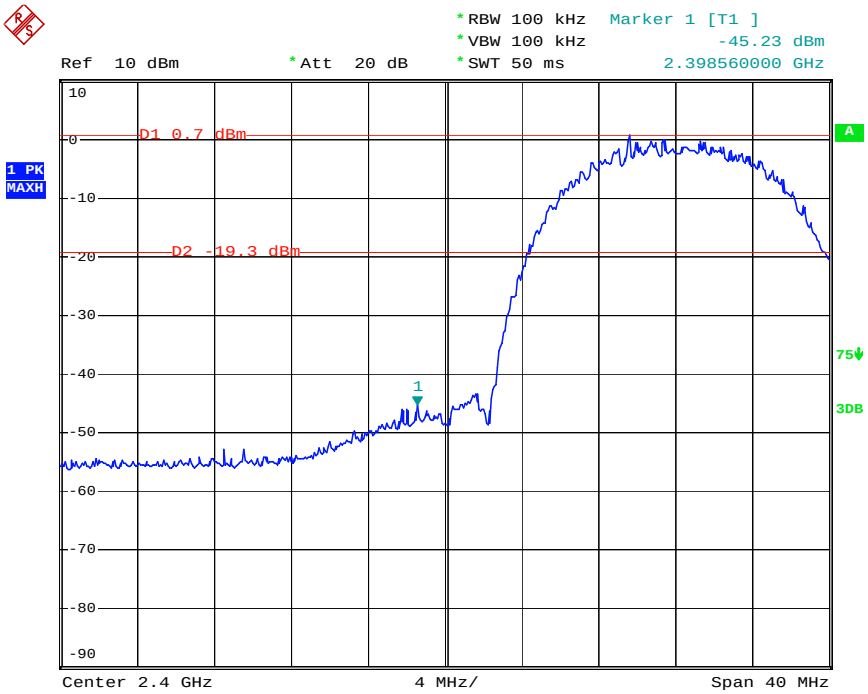
Measurement Data: Complies

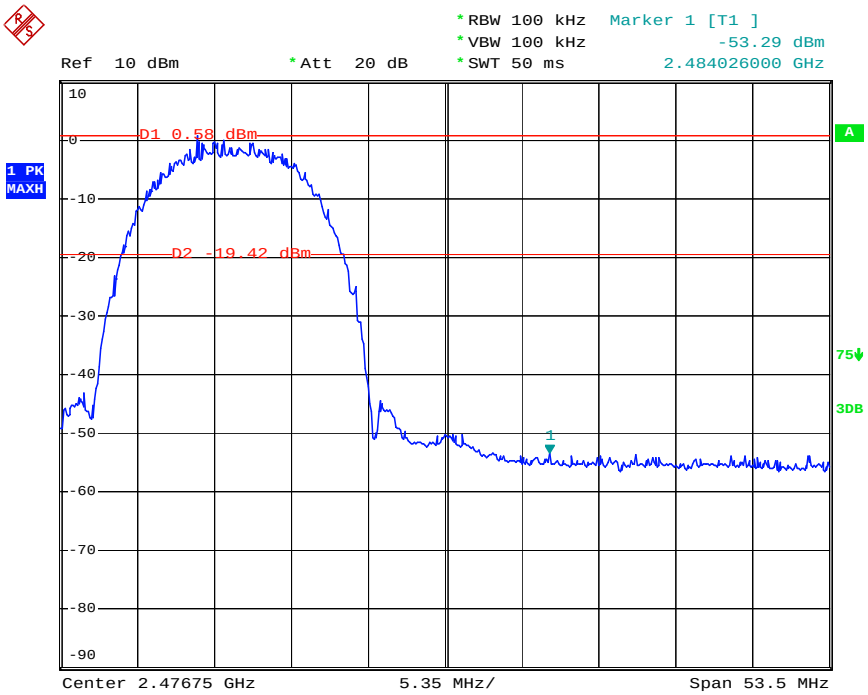
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc

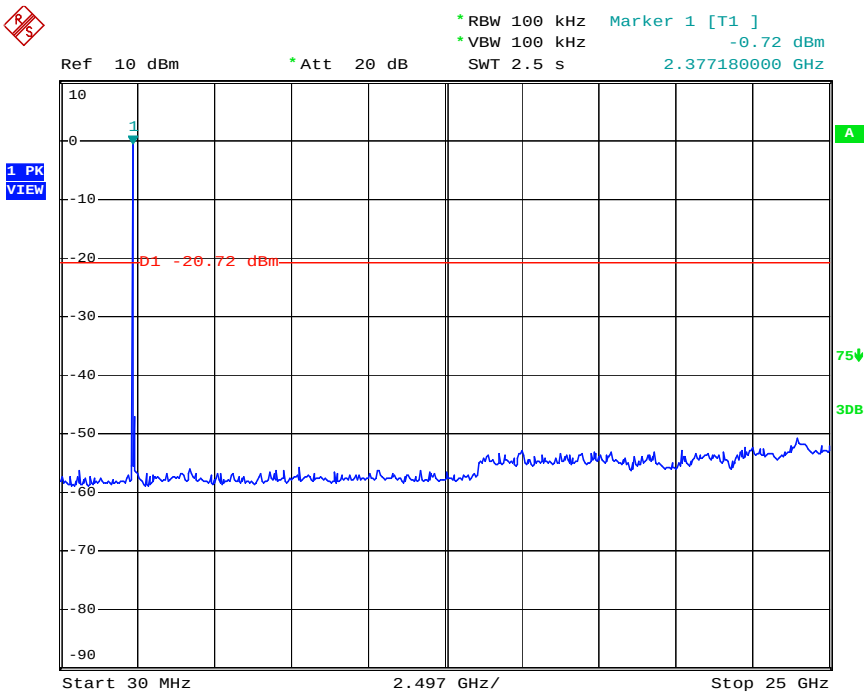
See next pages for actual measured spectrum plots.

802.11b Band-edge Measurements

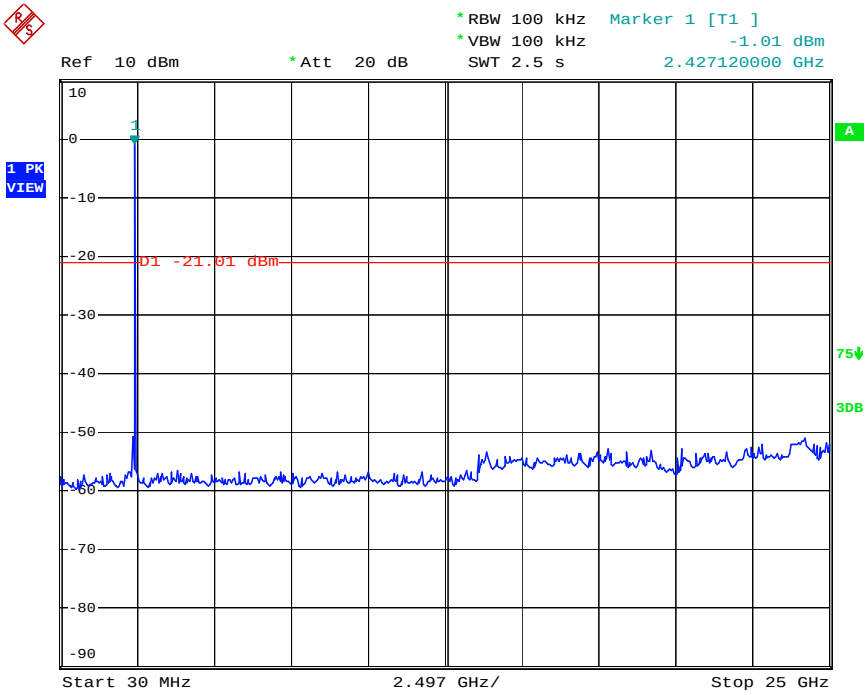




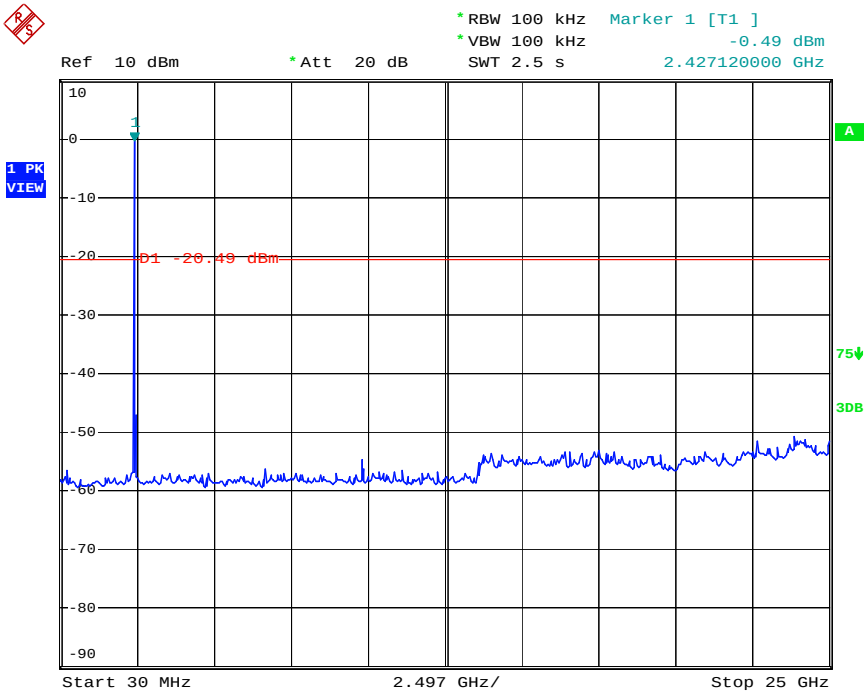
Band – edge (at 20 dB blow) – Low channel (802.11b)
Frequency Range = 30 MHz ~ 10th harmonic



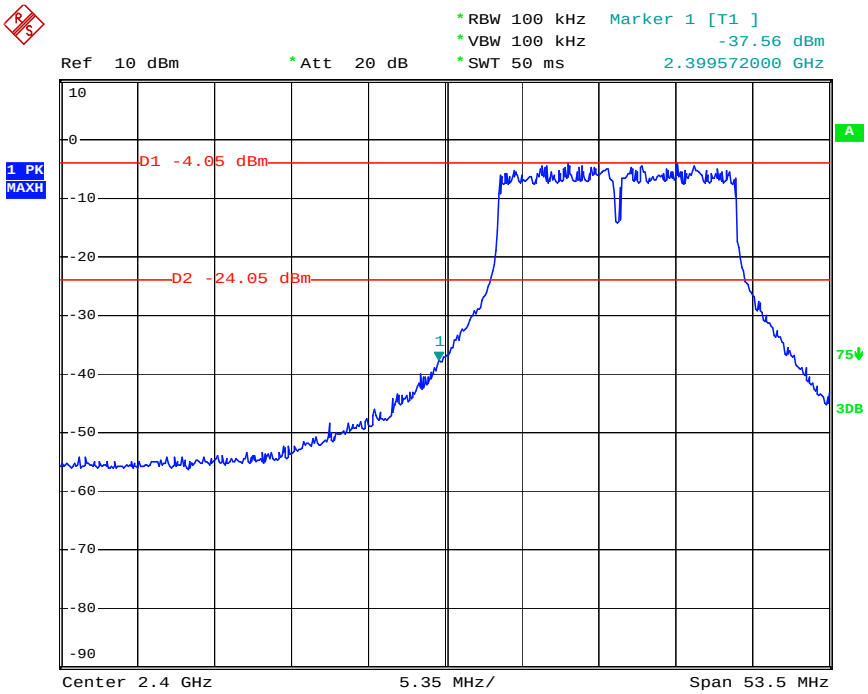
Band – edge (at 20 dB blow) – Mid channel (802.11b)
Frequency Range = 30 MHz ~ 10th harmonic

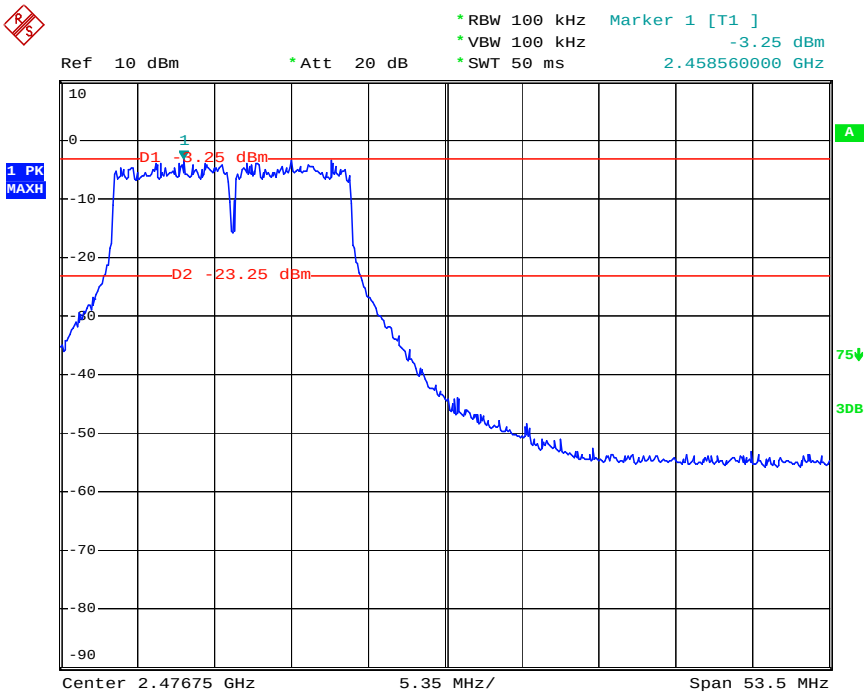


Band – edge (at 20 dB blow) – High channel(802.11b)
Frequency Range = 30 MHz ~ 10th harmonic

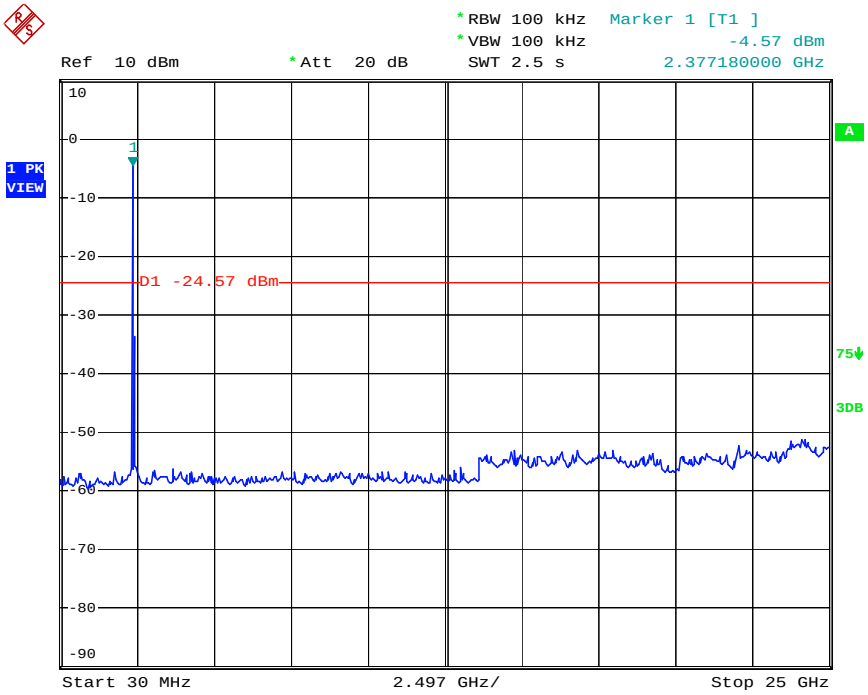


802.11g Band-edge Measurements

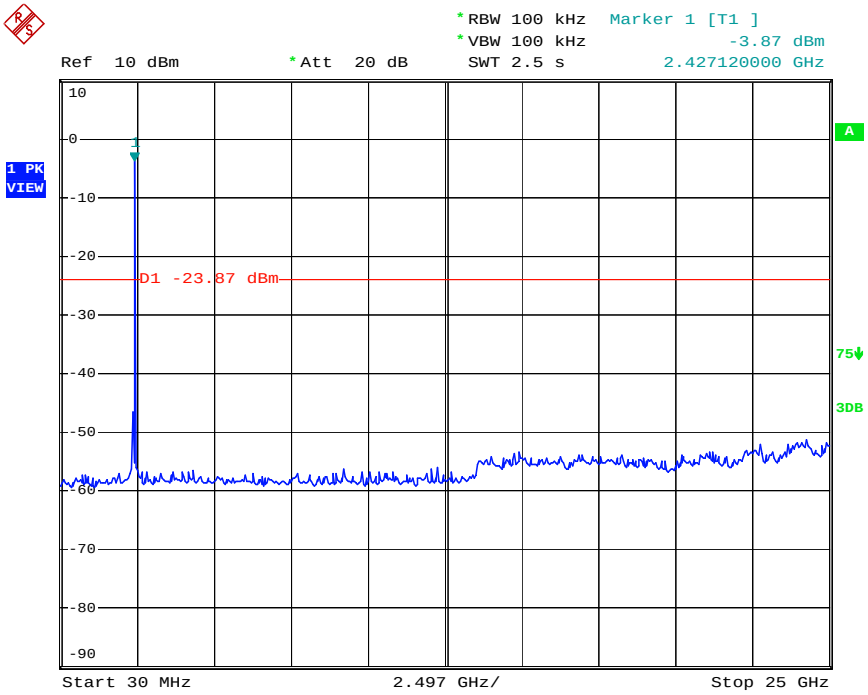




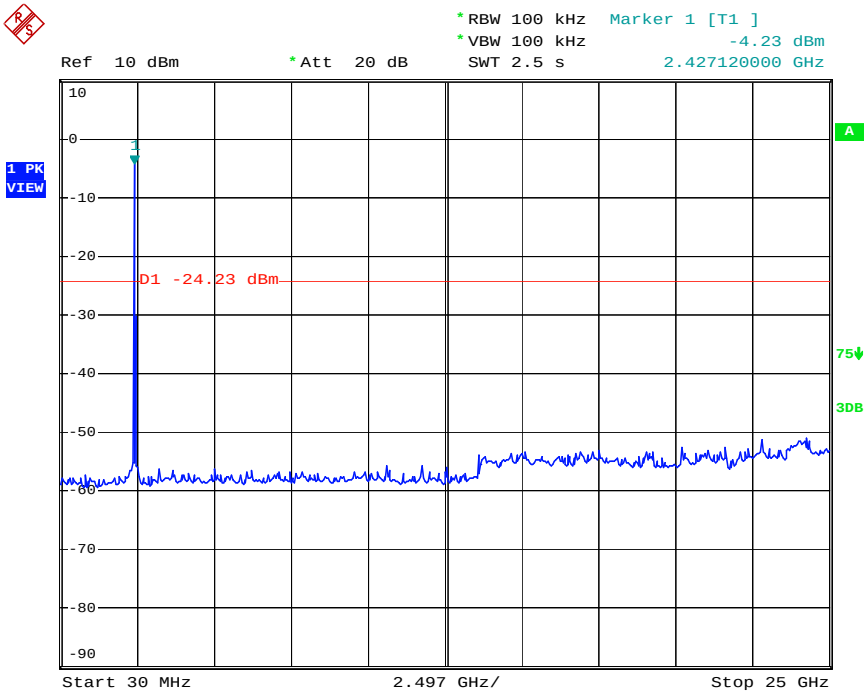
Band – edge (at 20 dB blow) – Low channel (802.11g)
Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – Mid channel(802.11g)
Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – High channel(802.11g)
Frequency Range = 30 MHz ~ 10th harmonic



2.1.5 Field Strength of Emissions

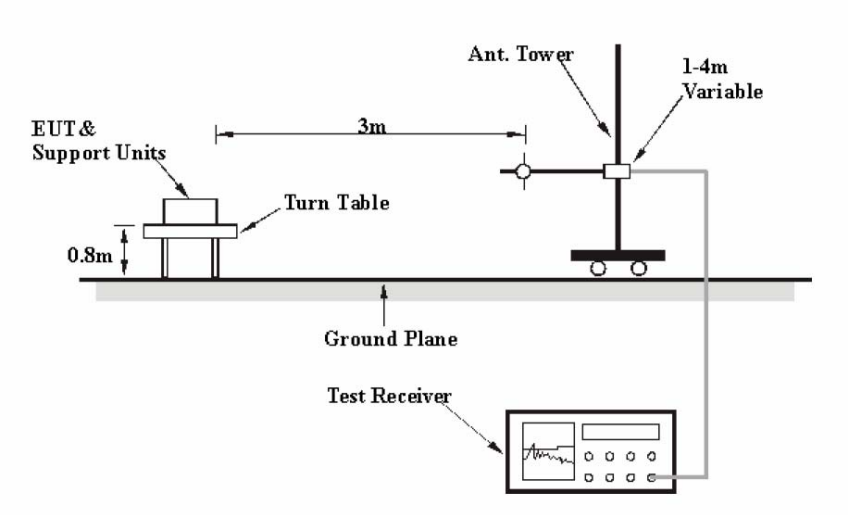
Test Location

☒ 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:
Center frequency = the worst channel
Frequency Range =30 MHz ~ 10th harmonic
RBW = 120 kHz (30 MHz ~ 1 GHz) VBW ≥ RBW
= 1 MHz (1 GHz ~ 10th harmonic)
Span = 100 MHz Detector function = Quasi-peak
Trace = max hold



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	UHF RFID Handheld READER	Measurement Detail	
Model	URP-SU110	Frequency Range	Below 1000MHz
Channel	-	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
956.25	42.5	3.6	Quasi-Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
253.10	30.5	V	1.0	9.8	1.9	46.0	42.2	3.8
294.25	25.3	H	1.5	10.9	2.3	46.0	38.5	7.5
762.15	17.1	H	2.0	19.5	4.1	46.0	40.7	5.3
800.00	17.1	V	1.8	19.8	4.4	46.0	41.3	4.8
875.50	16.9	V	2.0	20.8	4.6	46.0	42.3	3.7
956.25	16.3	V	2.0	21.6	4.6	46.0	42.5	3.6

H : Horizontal, V : Vertical

Remark :
The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Z axis) and the worst case was recorded.

Test Results

EUT	UHF RFID Handheld READER	Measurement Detail	
Model	URP-SU110	Frequency Range	1-25GHz
Channel	Channel 1	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data – 802.11b

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

Test Data – 802.11g

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

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

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

Test Results

EUT	UHF RFID Handheld READER	Measurement Detail	
Model	URP-SU110	Frequency Range	1-25GHz
Channel	Channel 6	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data – 802.11b

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

Test Data – 802.11g

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

Test Results

EUT	UHF RFID Handheld READER	Measurement Detail	
Model	URP-SU110	Frequency Range	1-25GHz
Channel	Channel 11	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data – 802.11b

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

Test Data – 802.11g

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

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

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

2.1.6 AC Conducted 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

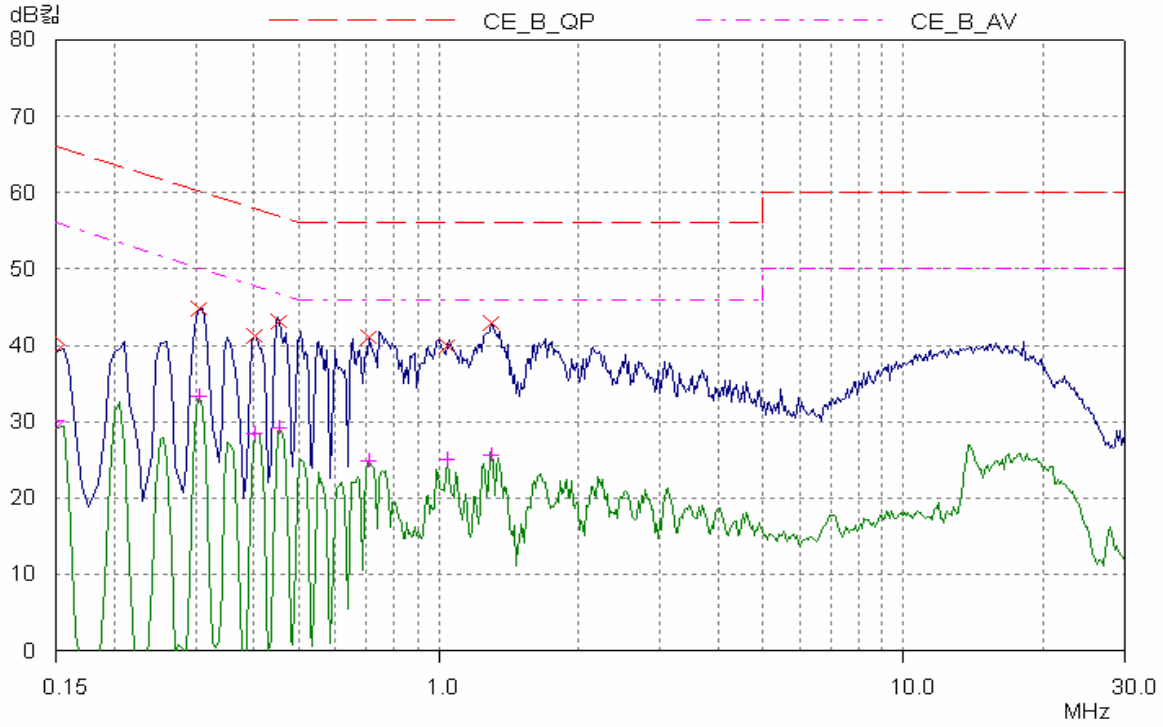
Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
16.45	48.1	11.9	Quasi-peak

Test Data

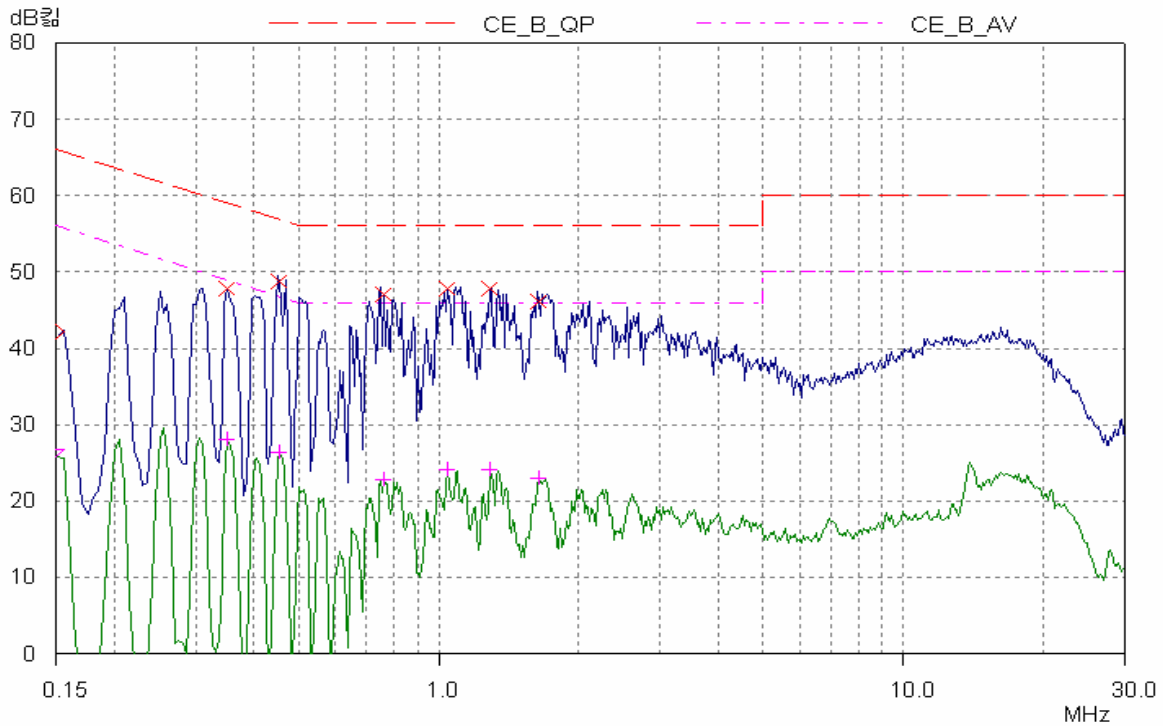
Frequency	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
1.78	0.2	0.2	N	56.0	35.1	35.5	20.5	46.0	25.8	26.2	19.8
2.00	0.2	0.2	N	56.0	35.2	35.6	20.4	46.0	25.6	26.0	20.0
15.60	0.6	0.2	H	60.0	41.2	42.0	18.0	50.0	26.7	27.5	22.5
16.45	0.6	0.2	N	60.0	47.3	48.1	11.9	50.0	35.3	36.1	13.9
16.49	0.6	0.2	N	60.0	47.1	47.9	12.1	50.0	35.1	35.9	14.1
16.57	0.7	0.2	H	60.0	46.9	47.8	12.2	50.0	34.7	35.6	14.4

'H': HOT, 'N': NEUTRAL

[HOT]



[NEUTRAL]



APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Spectrum Analyzer	Agilent	8564E	3551A0041	2008-11-01
2	Spectrum Analyzer	HP	E4403B	US39440619	2008-09-03
3	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2008-11-19
4	EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2008-03-07
5	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2008-06-12
6	LOOP ANTENNA	EMCO	6502	9107-2652	2008-10-17
7	LOOP ANTENNA	EMCO	6502	9607-3020	2008-03-06
8	System Power Supply	HP	6032A	3440A-10521	2008-07-16
9	EPM Series Power Meter	HP	E4418A	GB38272734	2008-11-03
10	Power Sensor	HP	8481A	331BA92056	2008-11-03
11	Power Sensor	HP	8482B	331BA05406	2008-11-03
12	Audio Analyzer	HP	8903B	2747A03432	2008-11-01
13	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2008-11-01
14	SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2008-11-22
15	Modulation Analyzer	HP	8901B	3438A05228	2008-11-08
16	Attenuator	HP	8494A	3308A33351	2008-11-06
17	Attenuator	HP	8496A	3308A15142	2008-11-06
18	Temp&Humi Chamber	Kunpoong	KP-1000	2002KP050041	2009-01-21
19	Temp&Humi Chamber	Kunpoong	KP-RC2000	2002KP650042	2009-01-21
20	EMC Analyzer	Agilent	E7405A	MY45110859	2008-01-09
21	Horn Antenna	ETS-Lindgren	3115	00078894	2008-11-29
22	Horn Antenna	ETS-Lindgren	3115	00078895	2008-11-29
23	Horn Antenna	ETS-Lindgren	3116	00062504	2008-11-27
24	Horn Antenna	ETS-Lindgren	3116	00062916	2008-11-27
25	Dipole Antenna	SCHWARZBECK	VHA 9103	VHA91032557	2009-11-27
26	Dipole Antenna	SCHWARZBECK	UHA 9105	UHA91052417	2009-11-27
27	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2008-02-28
28	PREAMPLIFIER	Agilent	8449B	3008A02307	2008-11-05
29	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2008-02-09
30	Band Reject Filter	Wainwright Instruments	WRCG824	-	2008-04-16
31	Band Reject Filter	Wainwright Instruments	WRCG1750	-	2008-04-13

APPENDIX B – MPE CALCULATION

** MPE Calculations **

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G EIRP = 18.80 dBm	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$G = Log^{-1}$ (dB antenna gain / 10)

$G = Log^{-1}$ (-3.07/ 10)

G = 1.00

Power density at the specific separation:

$S = PG/(4R^2\pi)$ $S = (75.85 * 1) / (4 * 20^2 * \pi)$ $S = 0.0151$ mW/cm^2	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm^2 .
The power density at 20cm does not exceed the 1 mW/cm^2 limit.

Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$ $R = \sqrt{(75.85 * 1/ 4\pi)}$ R = 2.46 cm	Where, P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)