

THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun

Kyunggi-Do, 469-803, Korea

T820318835092F820318835169 email thrukang@kornet.net

APPLICANT: DASAN ELECTRON

FCC ID: WF2DA-911WH

NAME OF TEST: FIELD STRENGTH OF SPURIOUS EMISSIONS

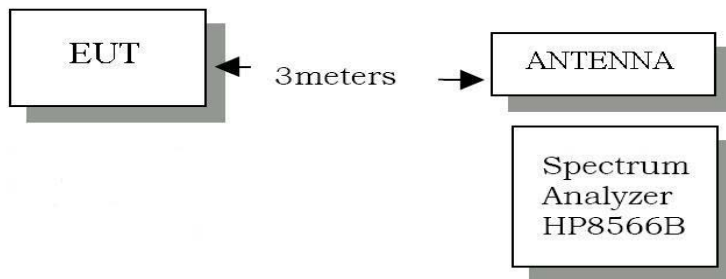
Rules Part No.: 15.247(c), 15.205 & 15.209(b)

Requirements:

(Fundamental) Frequency	(Field Strength) Limits
902 - 928MHz	127.37dBuV/m
2.4 - 2.4835GHz	54 dBuV/m @ 3m
30 - 88 MHz	40 dBuV/m @3m
88 -216 MHz	43.5 dBuV/m @3m
216 -960 MHz	46 dBuV/m @3m
ABOVE 960 MHz	54dBuV/m

Emissions that fall in the restricted bands (15.205) must be less than or equal to 500 uV/m (54dBuV/m). Spurious not in a restricted band must be 20 dBc.

Test Setup



Equipment placed 80cm above ground on a rotatable platform.

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Test Data:

Low : 2401.056MHz

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)	Mode
1	4802.11	3.5	H	33.7	4.6	41.8	-12.2	54.0	PK
2	7203.16	13.9	H	36.1	5.7	55.8	1.8	54.0	PK
3	4802.11	4.1	V	33.7	4.6	42.4	-11.6	54.0	PK
4	7203.16	12.9	V	36.1	5.7	54.8	0.8	54.0	PK

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)	Mode
1	7203.16	10.0	H	36.1	5.7	51.9	-2.1	54.0	AV
2	7203.16	9.1	V	36.1	5.7	51.0	-3.0	54.0	AV

Mid : 2441.664MHz

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)	Mode
1	4883.33	4.5	H	33.9	4.6	43.1	-10.9	54.0	PK
2	7325.00	12.9	H	36.2	5.8	54.9	0.9	54.0	PK
3	4883.33	5.2	V	33.9	4.6	43.8	-10.2	54.0	PK
4	7325.00	11.8	V	36.2	5.8	53.8	-0.2	54.0	PK

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)	Mode
1	7325.00	9.1	H	36.2	5.8	51.1	-2.9	54.0	AV
2	7325.00	8.1	V	36.2	5.8	50.1	-3.9	54.0	AV

High : 2480.272MHz

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)	Mode
1	4964.54	6.0	H	34.2	4.7	44.8	-9.2	54.0	PK
2	7446.81	13.0	H	36.3	5.9	55.1	1.1	54.0	PK
3	4964.54	7.1	V	34.2	4.7	45.9	-8.1	54.0	PK
4	7446.81	13.3	V	36.3	5.9	55.4	1.4	54.0	PK

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)	Mode
1	7446.81	8.0	H	36.3	5.9	50.1	-3.9	54.0	AV
2	7446.81	7.5	V	36.3	5.9	49.6	-4.4	54.0	AV

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NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

Rule Parts No.: Part 15.205

Requirements: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54dBuV/m). Emissions not in the restricted band must be 20 dBc.

Test Data

Result :

1. Reading dBuV + Step Atten Value(20dB) - PAM-0118 Preamplicifier Gain(46.4dB)
2. 1 + ANT Factor + Cable Loss

Low

PK : $50.30 + 20 - 46.4 = 23.9\text{dBuV}$
 AV : $39.10 + 20 - 46.4 = 12.7\text{dBuV}$

High

PK : $50.50 + 20 - 39.30 = 24.1\text{dBuV}$
 AV : $39.30 + 20 - 46.40 = 12.9\text{dBuV}$

No	Emission Frequency (MHz)	Meter Reading dBuV/m	Ant. Polaritry	Correction Factor dB	Cable Loss dB	Field Strength (dBuV/m)	Margin (dBuV)	Limit (dBuV/m)
	Low							
PK	2394.63	23.9	V	27.8	3.3	55.0	1.0	54.0
AV	2394.63	12.7	V	27.8	3.3	43.8	-10.2	54.0
	HIGH							
PK	2476.66	24.1	V	27.9	3.3	55.3	1.3	54.0
AV	2476.66	12.9	V	27.9	3.3	44.1	-9.9	54.0

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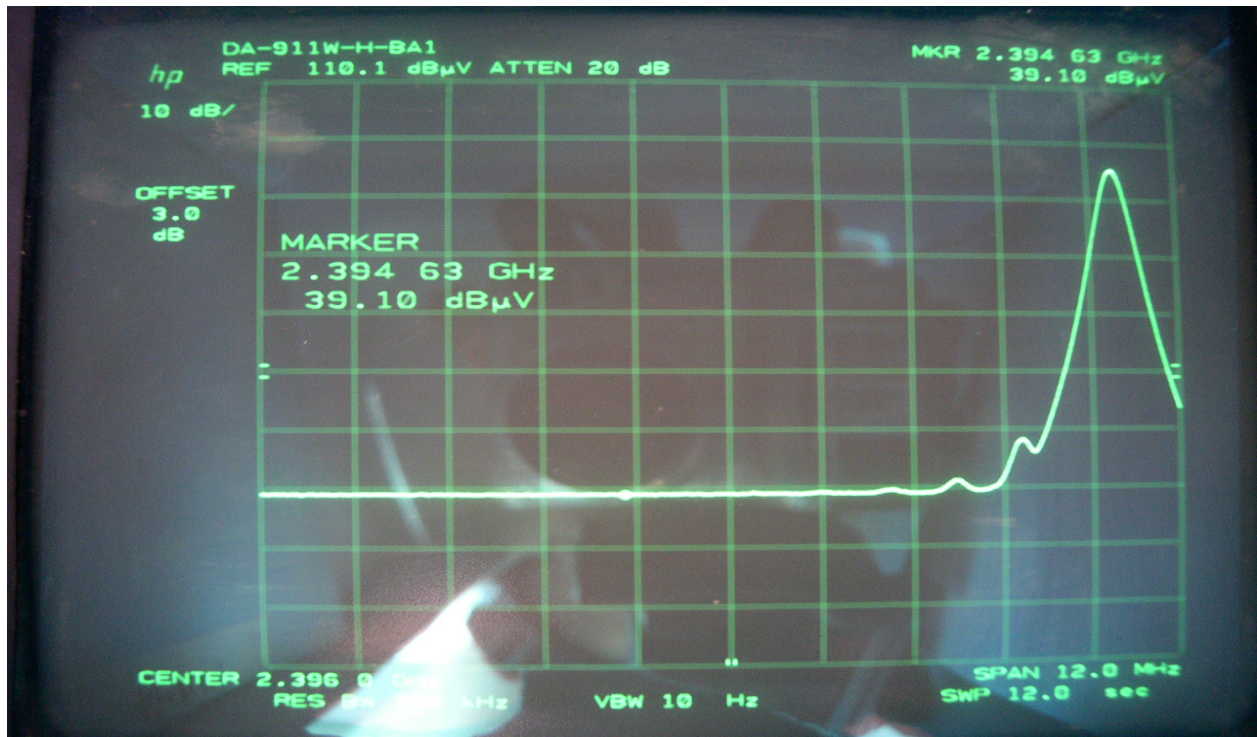
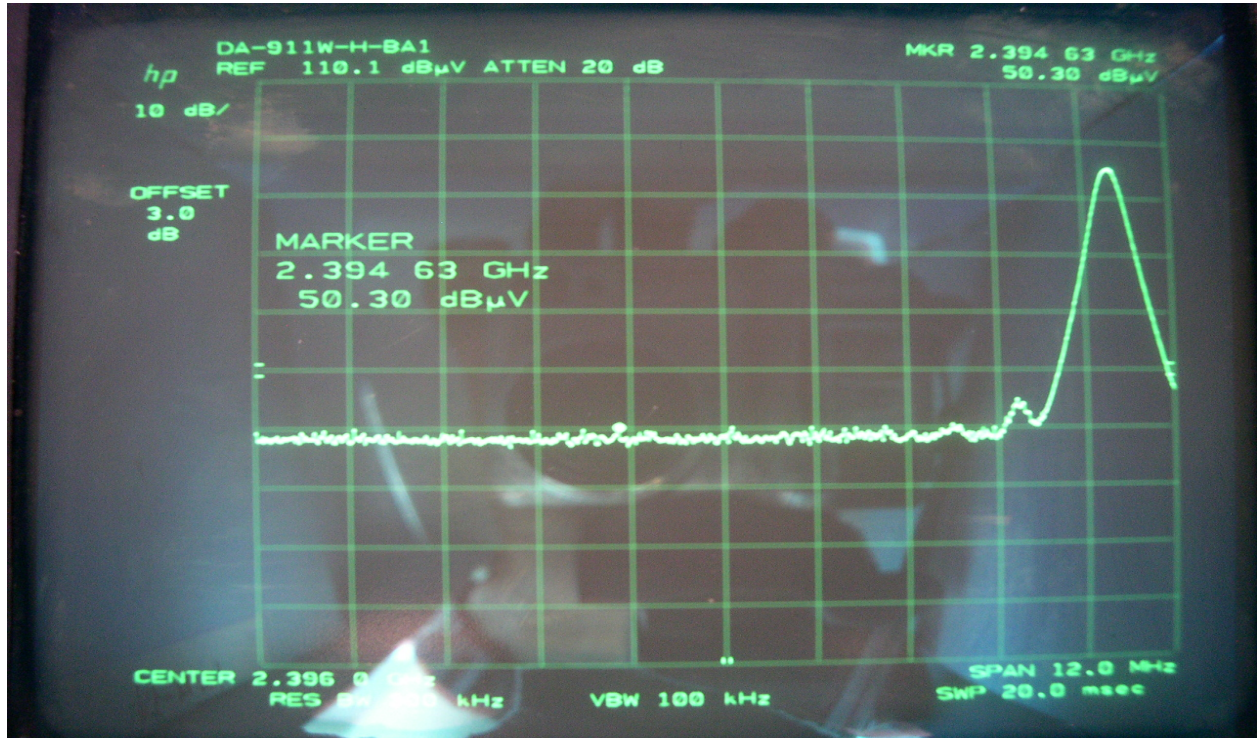
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Low channel



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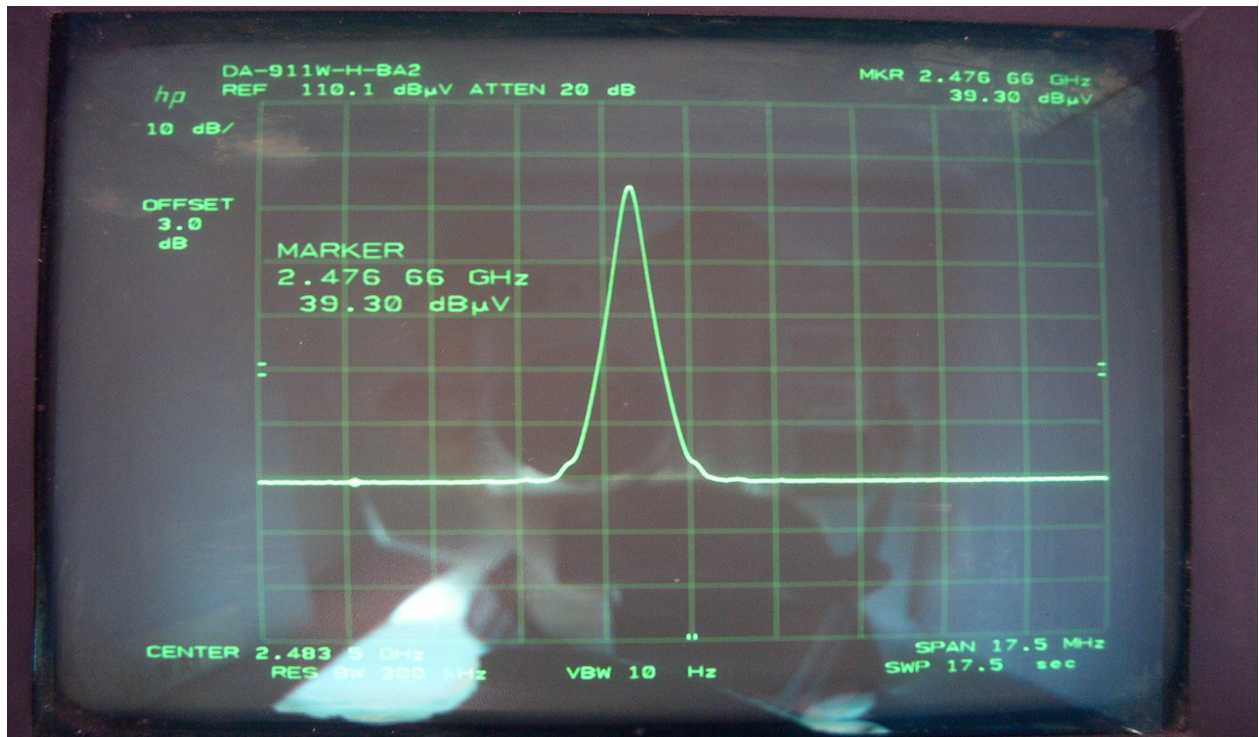
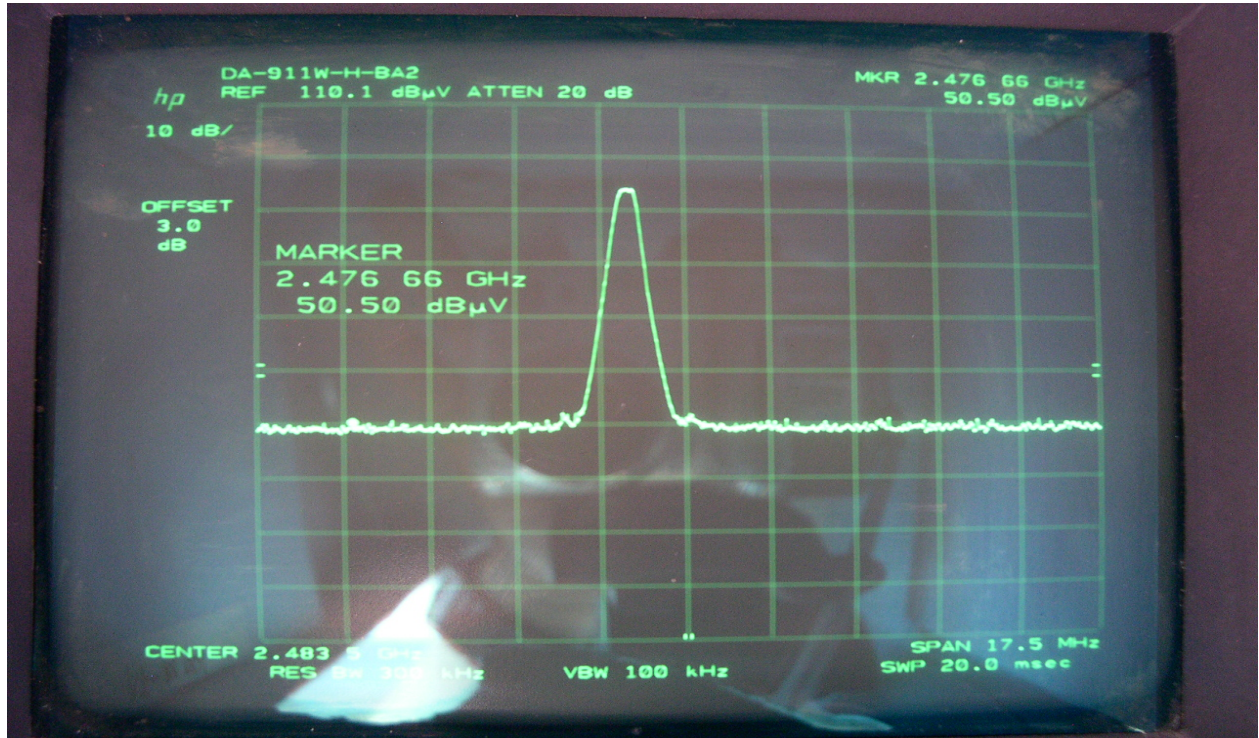
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High channel



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APPLICANT: DASAN ELECTRON

FCC ID: WF2DA-911WH

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NO.: 15.207

REQUIREMENTS:

	QUASI-PEAK	AVERAGE
.15 - 0.5 MHz	66-56 dBuV	56-46 dBuV
0.5 - 5.0	56	46
5.0 - 30.	60	50

TEST PROCEDURE: ANSI STANDARD C63.4-1992. The spectrum was scanned from .15 to 30 MHz.

The highest emission read for Line 1 was

The highest emission read for Line 2 was

THE GRAPHS ON THE FOLLOWING PAGES REPRESENT THE EMISSIONS READ FOR POWER LINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

"Not Applicable"

APPLICANT: DASAN ELECTRON

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TEST Equipment List

No	Description	Manufacturer	Model No.	Serial No.	Due Cal.	Used
1	Test Receiver	Rohde & Schwarz	ESHS 10	862970/018	2009.05.13	<input type="checkbox"/>
2	Test Receiver	Rohde & Schwarz	ESVS 10	826008/014	2009.06.20	<input type="checkbox"/>
3	Spectrum Analyzer	Hewlett Packard	8566B	2311A02394	2009.06.10	<input checked="" type="checkbox"/>
4	Spectrum Display	Hewlett Packard	85662A	2542A12429	2009.06.10	<input checked="" type="checkbox"/>
5	Preamplifier	Hewlett Packard	8447F	2805A02570	2009.05.26	<input type="checkbox"/>
6	Preamplifier	A.H. Systems	PAM-0118	164	2009.04.28	<input checked="" type="checkbox"/>
7	Biconical Antenna	Eaton Corp.	94455-1	0977	2008.07.01	<input type="checkbox"/>
8	Biconical Antenna	EMCO	3104C	9111-2468	2008.07.07	<input checked="" type="checkbox"/>
9	Log Periodic Antenna	EMCO	3146	2051	2010.06.05	<input checked="" type="checkbox"/>
10	Horn Antenna	A.H. Systems	SAS-571	414	2008.07.17	<input checked="" type="checkbox"/>
11	Loop Antenna	Rohde & Schwarz	HFH2-Z2.335.4711.52	826532/006	2009.01.31	<input type="checkbox"/>
12	Dipole Antenna	Rohde & Schwarz	VHAP	574	2008.12.12	<input type="checkbox"/>
13	Dipole Antenna	Rohde & Schwarz	VHAP	575	2008.12.12	<input type="checkbox"/>
14	Dipole Antenna	Rohde & Schwarz	UHAP	546	2008.12.12	<input type="checkbox"/>
15	Dipole Antenna	Rohde & Schwarz	UHAP	547	2008.12.12	<input type="checkbox"/>
16	Signal Generator	Hewlett Packard	8673D	2708A00448	2009.06.10	<input type="checkbox"/>
17	Spectrum Analyzer	Advantest Corp.	R3261C	61720208	2009.06.10	<input checked="" type="checkbox"/>
18	LISN	EMCO	3825/2	9111-1912	2008.12.12	<input type="checkbox"/>
19	LISN	Kyoritsu	KNW-242	8-923-2	2009.06.05	<input type="checkbox"/>
20	Modulation Analyzer	Hewlett Packard	8901B	3438A05094	2009.05.29	<input type="checkbox"/>
21	Waveform Generator	Hewlett Packard	33120A	US34001190	2009.05.29	<input type="checkbox"/>
22	Audio analyzer	Hewlett Packard	8903B	3011A12915	2009.05.29	<input type="checkbox"/>
23	Digital Oscilloscope	Tektronix	TDS 340A	B012287	2009.06.16	<input type="checkbox"/>

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NAME OF TEST: RF EXPOSURE REQUIREMENT

§15.247 (e), §1.1307 (b)(2), §1.1310, & §2.1093	
Frequency Range (MHz)	Power Density (mW/cm ²)
Limits for Occupational/Controlled Exposures	
0.3 - 3.0	*(100)
3.0 - 30	*(900/f ₂)
30 - 300	1.0
300 - 1500	f/300
1500 - 100,000	5.0
Limits for General Population/Uncontrolled Exposure	
0.3 - 3.0	*(100)
3.0 - 30	*(180/f ₂)
30 - 300	0.2
300 - 1500	f/1500
1500 - 100,000	1.0
f = frequency in MHz * = Plane-wave equivalent power density	

MPE Calculation

The calculations on the next page are based on the following:

An output power of 1.928mW

A gain of 0 dBi

A value for the general population exposure limit of 1 mW/cm² which in the formula is designated as S=1 or as calculated from 1500/1500=1

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Po :=1.928 mWatts

dBi :=0 antenna gain

f :=1500 Frequency in MHz

G :=dBd + 2.15 gain in dBi

G = 2.15

$$G_n := 10^{\frac{G}{10}} \quad \text{gain numeric}$$

$$S := \frac{f}{1500}$$

300 for controlled
1500 for uncontrolled

Gn = 1.641

S = 1

$$R := \sqrt{\frac{(P_o \cdot G_n)}{(4 \cdot \pi \cdot S)}}$$

R :=0.502 distance in centimeters
Required for compliance

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