APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

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TEST REPORT CONTAINING:

EXHIBIT ATTACHMENTS:

April 9, 2003

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

SUBJECT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

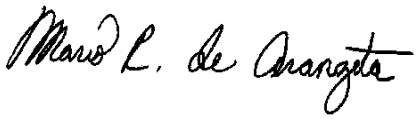
To Whom It May Concern:

The attached application is for a direct sequence spread spectrum assembly, made up of a PCMIA card, single board computer, power supply, water-tight case, and antennas as specified in this report. Mesh Networks purchase standard antennas from the manufacturer. This device is different than most 802.11 devices in that its network protocol uses quad division multiple access. QDMA is a DSSS technology, operating in the 2400 to 2483.5 MHz ISM band that utilizes a CSMA/CA (carrier sensed multiple access/collision avoidance) protocol, but the channelization is different from 802.11. QDMA has 4 concurrently available 20 MHz channels – one of which is dedicated as a reservation and overhead channel, the other 3 for data transport.

Under normal operation a terminal will use the reservation channel (default channel 0 (2410 MHz}) for command and control information, and data channels (default 1 {2430 MHz}, 2 {2450 MHz}, and 3 {2470 MHz}) for transferring information.

Thus under normal operation the terminal will use the reservation channel (0) (2410 MHz) to request the ability to send network update information on a data channel (1,2, or 3). When the overall system traffic is low the terminal will default to using channel 3 for data transfer to provide the greatest separation of active channels, which reduces interference. As the system become more loaded terminals will choose channel 1, 2, or 3 depending on the RF transmissions in its vicinity. This will have the effect of making the use of the channels appear random as the timing of transmission by all terminals, and therefore choice of channel is random.

Sincerely,



Mario R. de Aranzeta C.E.T.

MRD/sh
Encl.

EMC Equipment List

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
X	3-Meter OATS	TEI	N/A	N/A	Listed 12/22/99	12/22/02
	3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
	Receiver, Beige Tower					
	Spectrum Analyzer (Tan)	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
	RF Preselector (Tan)	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
	Quasi-Peak Adapter (Tan)	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
X	Receiver, Blue Tower					
X	Spectrum Analyzer (Blue)	HP	8568B	2928A04729 2848A18049	CHAR 10/22/01	10/22/03
X	RF Preselector (Blue)	HP	85685A	2926A00983	CHAR 10/22/01	10/22/03
X	Quasi-Peak Adapter (Blue)	HP	85650A	2811A01279	CHAR 10/22/01	10/22/03
X	Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
	Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
	Biconnical Antenna	Eaton	94455-1	1057	CHAR 3/15/00	3/15/02
	BiconiLog Antenna	EMCO	3143	9409-1043		
X	Log-Periodic Antenna	Electro-Metrics	LPA-25	1122	CAL 10/2/01	10/2/03
	Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/03
	Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CHAR 10/16/01	10/16/03
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/21/01	3/21/04
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 11/24/00	11/24/03
	Double-Ridged Horn Antenna	Electro-Metrics	RGA-180	2319	CAL 12/19/01	12/19/03
	Horn Antenna	Electro-Metrics	EM-6961	6246	CAL 3/21/01	3/21/03
	Horn Antenna	ATM	19-443-6R	None	No Cal Required	
	Passive Loop Antenna	EMC Test Systems	EMCO 6512	9706-1211	CHAR 7/10/01	7/10/03

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Line Impedance Stabilization . . .	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
	Line Impedance Stabilization . . .	Electro-Metrics	EM-7820	2682	CAL 3/16/01	3/16/03
	Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 5/25/99	5/25/01
	Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CAL 12/12/01	12/12/03
	Oscilloscope	Tektronix	2230	300572	CHAR 2/1/01	2/1/03
	Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/04
	AC Voltmeter	HP	400FL	2213A14499	CAL 10/9/01	10/9/03
	AC Voltmeter	HP	400FL	2213A14261	CHAR 10/15/01	10/15/03
	AC Voltmeter	HP	400FL	2213A14728	CHAR 10/15/01	10/15/03
X	Digital Multimeter	Fluke	77	35053830	CHAR 1/8/02	1/8/04
	Digital Multimeter	Fluke	77	43850817	CHAR 1/8/02	1/8/04
	Digital Multimeter	HP	E2377A	2927J05849	CHAR 1/8/02	1/8/04
	Multimeter	Fluke	FLUKE-77-3	79510405	CAL 9/26/01	9/26/03
	Peak Power Meter	HP	8900C	2131A00545	CHAR 1/26/01	1/26/03
	Digital Thermometer	Fluke	2166A	42032	CAL 1/16/02	1/16/04
	Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/04
X	Temp/Humidity gauge	EXTech	44577F	E000901	CHAR 1/22/02	1/22/04
	Frequency Counter	HP	5352B	2632A00165	CAL 11/28/01	11/28/03
	Power Sensor	Agilent Technologies	84811A	2551A02705	CAL 1/26/01	1/26/03
	Service Monitor	IFR	FM/AM 500A	5182	CAL 11/22/00	11/22/02
	Comm. Serv. Monitor	IFR	FM/AM 1200S	6593	CAL 5/12/02	5/12/04
	Signal Generator	HP	8640B	2308A21464	CAL 11/15/01	11/15/03
	Modulation Analyzer	HP	8901A	3435A06868	CAL 9/5/01	9/5/03

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Near Field Probe	HP	HP11940A	2650A02748	CHAR 2/1/01	2/1/03
	BandReject Filter	Lorch Microwave	5BR4-2400/ 60-N	Z1	CHAR 3/2/01	3/2/03
	BandReject Filter	Lorch Microwave	6BR6-2442/ 300-N	Z1	CHAR 3/2/01	3/2/03
	BandReject Filter	Lorch Microwave	5BR4-10525/ 900-S	Z1	CHAR 3/2/01	3/2/03
	High Pas Filter	Microlab	HA-10N		CHAR 10/4/01	10/4/03
	Audio Oscillator	HP	653A	832-00260	CHAR 3/1/01	3/1/03
	Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	3/2/03
	Frequency Counter	HP	5385A	3242A07460	CHAR 12/11/01	12/11/03
	Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
	Amplifier	HP	11975A	2738A01969	CHAR 3/1/01	3/1/03
	Egg Timer	Unk			CHAR 8/31/01	8/31/03
	Measuring Tape, 20M	Kraftixx	0631-20		CHAR 2/1/02	2/1/04
	Measuring Tape, 7.5M	Kraftixx	7.5M PROFI		2/1/02	2/1/04
	Coaxial Cable #51	Insulated Wire Inc.	NPS 2251-2880	Timco #51	CHAR 1/23/02	1/23/04
	Coaxial Cable #64	Semflex Inc.	60637	Timco #64	CHAR 1/24/02	1/24/04
	Coaxial Cable #65	General Cable Co.	E9917 RG233/U	Timco #65	CHAR 1/23/02	1/23/04
	Coaxial Cable #106	Unknown	Unknown	Timco #106	CHAR 1/23/02	1/23/04

TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal data transmission on a network.

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The ambient temperature of the UUT was 76°F with a humidity of 55%.

BANDWIDTH 6.0dB: The measurements were made with the spectrum analyzer's resolution bandwidth(RBW)=1.0MHz and the video bandwidth(VBW) =3.0MHz and the span set as shown on plot.

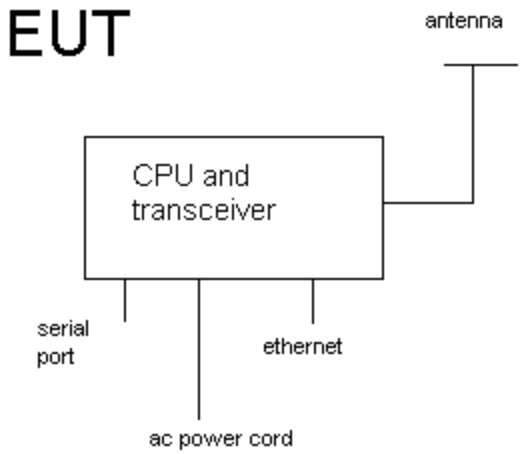
POWER OUTPUT: The RF power output was measured at the antenna feed point using a peak power meter.

ANTENNA CONDUCTED EMISSIONS: The RBW=100kHz, VBW=300kHz and the span set to 10.0MHz and the spectrum was scanned from 30MHz to the 10^{th} Harmonic of the fundamental. Above 1.0GHz the resolution bandwidth was 1.0MHz and the VBW = 3.0MHz and the span to 50MHz.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth (RBW) of the spectrum analyzer was 100kHz up to 1GHz and 1.0MHz above 1GHz with an appropriate sweep speed. The VBW above 1.0GHz was = 3.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 83°F with a humidity of 40%.

PRODUCT DESCRIPTION:

The QJEIAPWR63000303 is a direct sequence spread spectrum radio that operates in the 2410 to 2470 MHz frequency band.



Antennas:

Antenna p/n	Type/Connector	Gain (dBi)
MaxRad	Omni	4 dBi
MaxRad	Omni	8 dBi
Hyperlink	Omni	7.5 dBi
Hyperlink	Omni	8 dBi
Antennex	Omni	3 dBi
MaxRad	Omni	0 dBi

APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NO.: 15.107(a)

REQUIREMENTS:

FREQUENCY	LEVEL			
__MHz___	_uV_			
0.450-30	250			
0.150-0.50	66 to 56 dBuV	QP	56 to 46	Ave
0.50-5.0	56	QP	46	Ave
5.0-30.0	60	QP	50	Ave

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

TEST DATA:

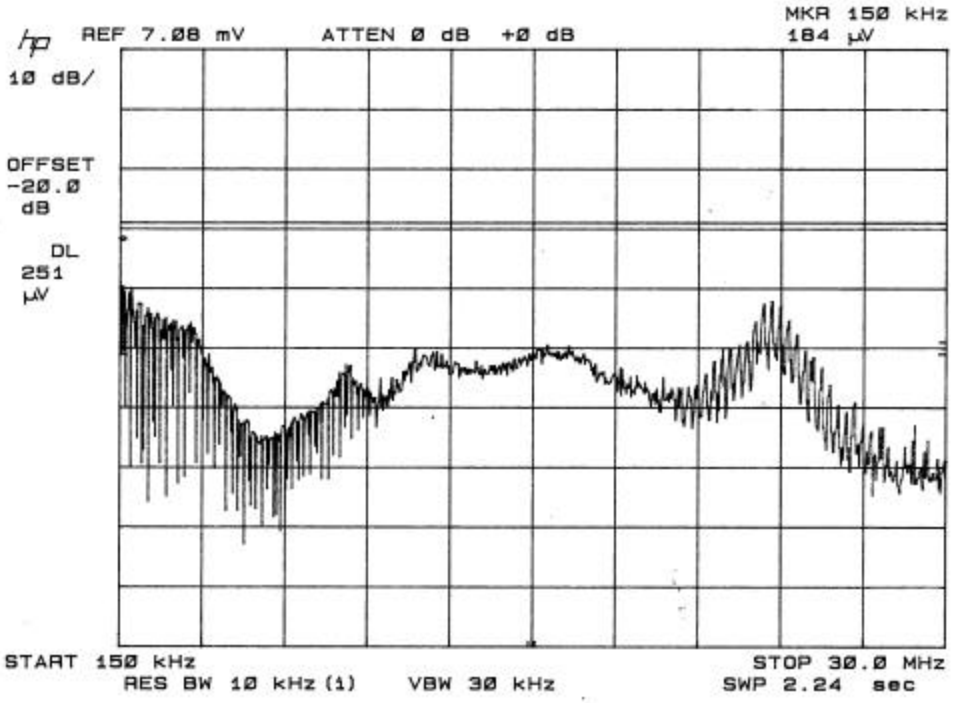
THE HIGHEST EMISSION READ FOR LINE 1 WAS 184 uV @ 150 kHz.

THE HIGHEST EMISSION READ FOR LINE 2 WAS 180 uV @ 150 kHz.

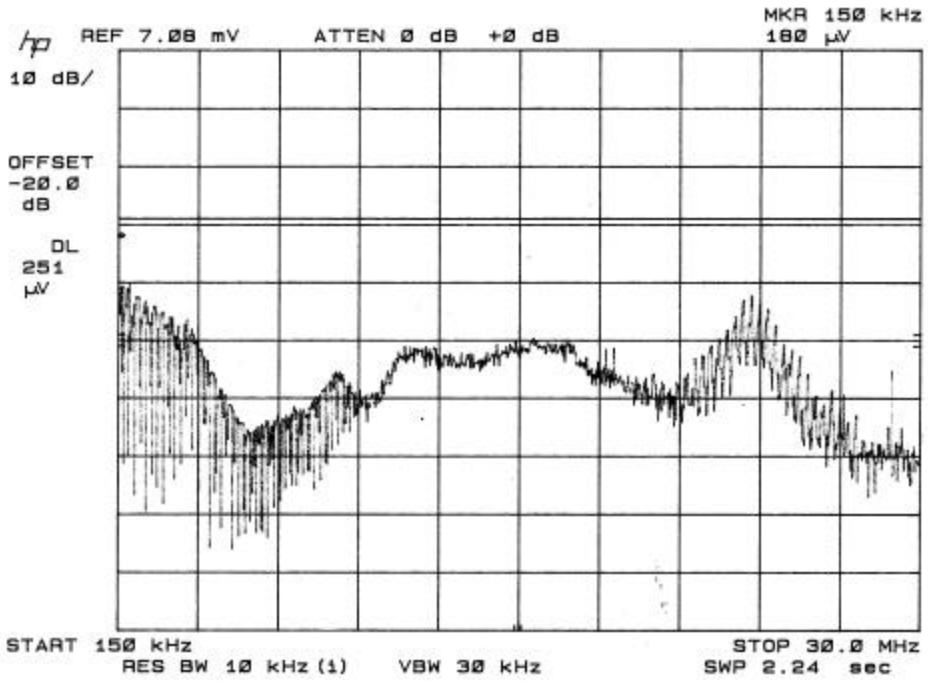
THE PLOTS IN THE FOLLOWING PAGES REPRESENT THE EMISSIONS TAKEN FOR THIS DEVICE.

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

POWERLINE CONDUCTED PLOT – LINE 1



POWERLINE CONDUCTED LINE 2



APPLICANT: MESH NETWORKS

FCC ID: QJEWMC63000902

NAME OF TEST: 6.0dB BANDWIDTH

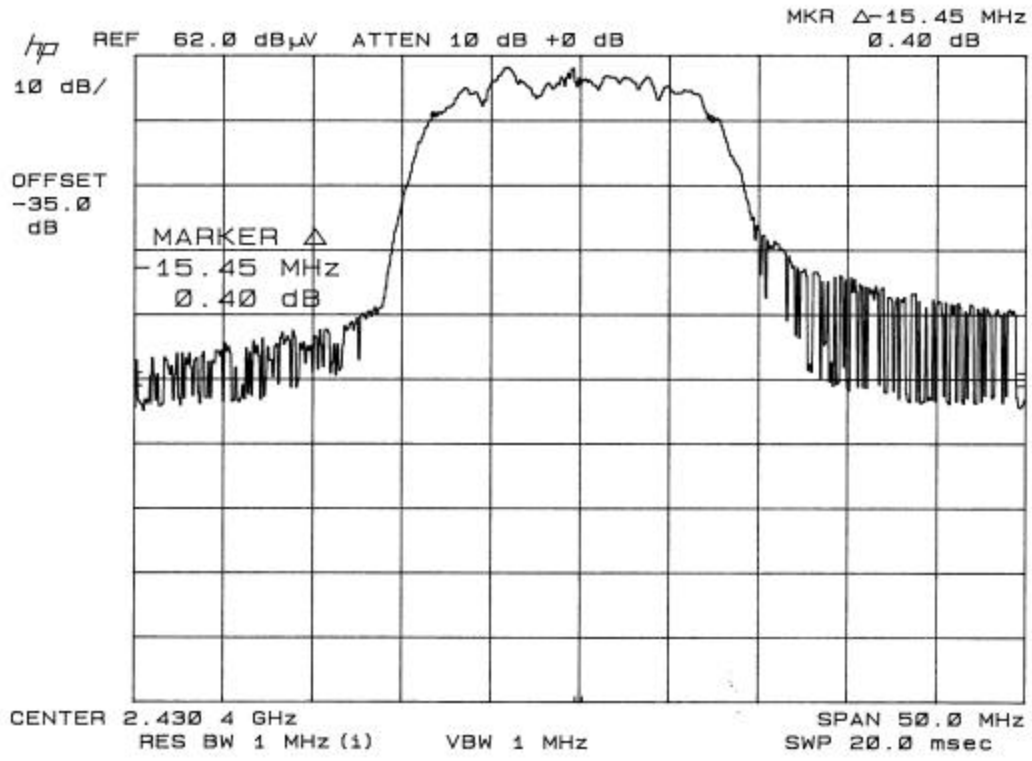
RULES PART NO.: 15.247(a)(2)

REQUIREMENTS: The 6.0dB bandwidth must be greater than 500 kHz.

MEASUREMENT: The 6.0dB bandwidth measured @ 2430.00 MHz was 15.45 MHz.

MEASUREMENT

DATA:



APPLICANT: MESH NETWORKS

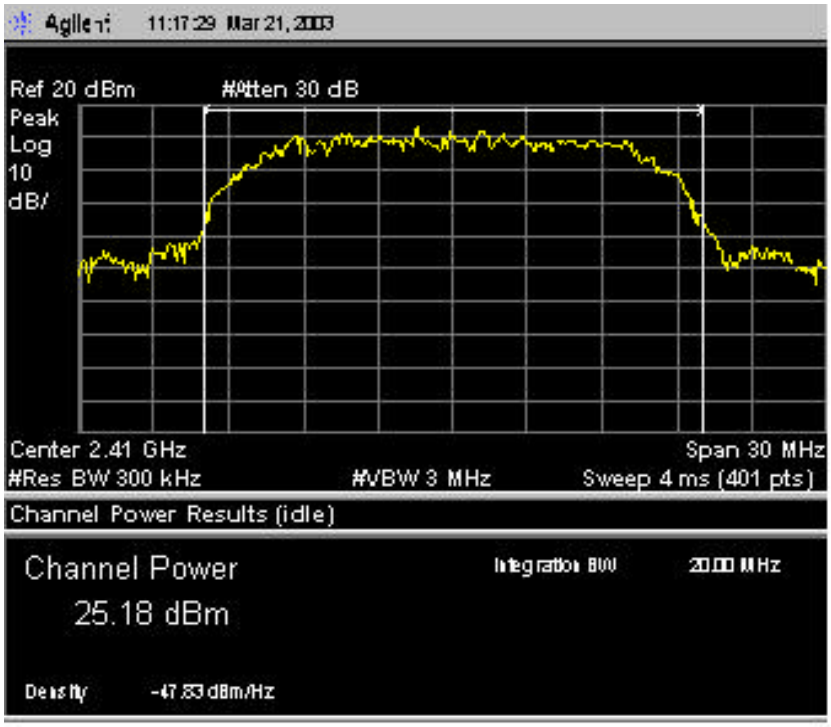
FCC ID: QJEIAPWR63000303

NAME OF TEST: POWER OUTPUT

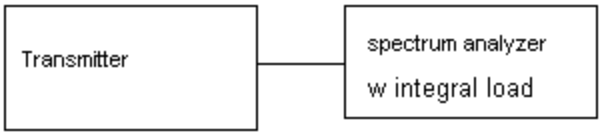
RULES PART NO.: 15.247(b) 1.0Watt or +30dBm

MEASUREMENT: 330 mWATTS or 25.18 dBm @ 2410.0MHz

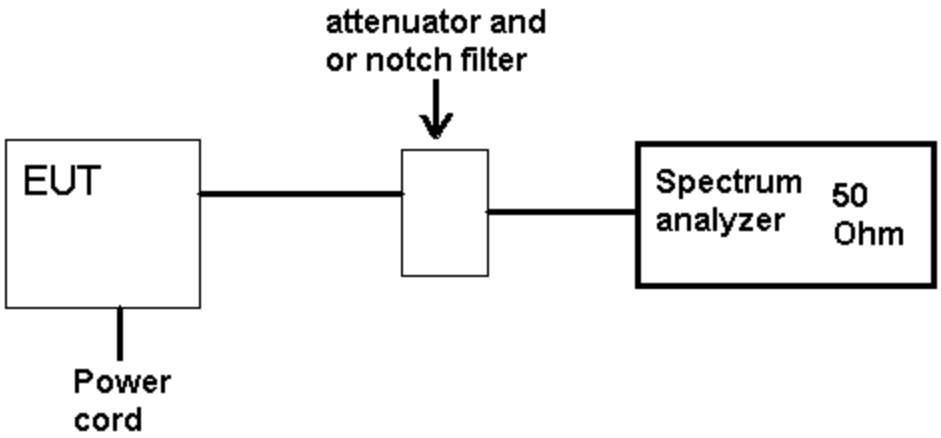
15.247(c) Method of Measuring RF Power output: The 99% power bandwidth method was used using an Agilent spectrum analyzer. The output of the EUT is terminated in a 50 ohm load. Three channels were tested and the highest power reported.



Test Setup Diagram



15.247(c) Method of Measuring RF Conducted Spurious Emissions



NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

REQUIREMENTS: Emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

Three channels were measured and the worst cases presented. The spectrum was scanned to the tenth harmonic.

TF	EF	M reading	dB below carrier
2470	2470	10	0
	4940	-37	47
	7410	-51	61
	9880	-69	79
	12350	-72	82
	14820	-70	80
	17290	-70	80
	19760	-70	80
	22230	-70	80
	24700	-70	80

TF	EF	M reading	dB below carrier
2412	2412	11.8	0
	4824	-36.5	48.3
	7236	-61	72.8
	9648	-71.5	83.3
	12060	-73	84.8
	14472	-70	81.8
	16884	-70	81.8
	19296	-70	81.8
	21708	-70	81.8
	24120	-70	81.8
	2100	-62	73.8
	2600	-55	66.8

15.247(c),15.205 &15.209(b) Field_strength_of_spurious_emissions:

REQUIREMENTS:

FIELD STRENGTH	FIELD STRENGTH	S15.209
of Fundamental:	of Harmonics	30 - 88 MHz 40 dBuV/m @3M
902-928MHz		88 -216 MHz 43.5
2.4-2.4835GHz		216 -960 MHz 46
127.38dBuV/m @3m	54 dBuV/m @3m	ABOVE 960 MHz 54dBuV/m

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 50 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

REQUIREMENTS: Emissions that fall in the restricted bands (15.205) must be less than 74 dBuV/m peak and 54 dBuV/m average otherwise the spurious and harmonics must be attenuated by at least 20dB.

TEST DATA:

MaxRad Antenna PEAK – 4 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	ANT. POLARITY	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2410.00	2410.00	80.4	V	3.33	28.90	0.00	112.63	14.75
2410.00	4824.00	14.7	V	5.95	33.82	-4.88	49.59	4.41
2450.00	2446.00	78.8	V	3.36	28.93	0.00	111.09	16.29
2450.00	4900.00	14.9	V	6.06	35.02	-4.88	51.10	22.90
2470.00	2470.00	78.8	V	3.38	28.95	0.00	111.13	16.25
2470.00	4940.00	14.9	V	6.12	35.13	-4.88	51.27	22.73

Hyperlink Antenna Peak – 7.5 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	ANT. POLARITY	Coax Loss Db	Correction Factor Db	Pulsed Cfactor Db	Field Strength dBuV/m	Margin Db
2410.00	2410.00	77.2	V	3.33	28.90	0.00	109.43	17.95
2470.00	2470.00	77.3	V	3.38	28.95	0.00	109.63	17.75
2410.00	4824.00	13.1	V	5.95	33.82	-4.88	47.99	26.01
2470.00	4940.00	13.5	V	6.12	35.13	-4.88	49.87	4.13
2410.00	2348.00	28.5	V	3.28	28.85	-4.88	55.75	18.25

Hyperlink Antenna Average – 7.5 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	ANT. POLARITY	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2,410.0	2348.88	-1.49	V	3.28	28.85	-4.88	25.76	28.24

Antennex Antenna Peak – 3 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2410.00	2412.00	56.2	V	3.33	30.67	0.00	90.20	37.18
2410.00	4820.00	8.2	V	5.95	33.82	-4.88	43.09	30.91
2470.00	2466.00	52.2	V	3.37	30.81	0.00	86.38	41.00
2470.00	4940.00	8.1	V	6.12	35.13	-4.88	44.47	29.53
2450.00	2446.00	52.9	V	3.36	30.76	0.00	87.02	40.36
2450.00	4900.00	8.5	V	6.06	35.02	-4.88	44.70	29.30

MaxRad Antenna Peak – 0 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2410.00	2412.00	53.20	V	3.33	30.67	0.00	87.20	40.18
2410.00	4820.00	8.1	V	5.95	33.82	-4.88	42.99	31.01
2450.00	2446.00	53.20	V	3.36	30.76	0.00	87.32	40.06
2450.00	4900.00	8.5	V	6.06	35.02	-4.88	44.70	29.30
2470.00	2466.00	52.80	V	3.37	30.81	0.00	86.98	40.40
2470.00	4940.00	8.4	V	6.12	35.13	-4.88	44.77	29.23

MaxRad Antenna Peak – 8 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2410.00	2412.00	79.3	V	3.33	30.67	0.00	113.30	14.08
2410.00	4820.00	13.5	V	5.95	33.82	-4.88	48.39	25.61
2450.00	2446.00	79.0	V	3.37	30.81	0.00	113.18	14.20
2450.00	4900.00	14.0	V	6.06	35.02	-4.88	50.20	23.80
2470.00	2470.00	78.7	V	3.36	30.76	0.00	112.82	14.56
2470.00	4940.00	14.6	V	6.12	35.13	-4.88	50.97	23.03

Hyperlink Antenna Peak – 8 dBi

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Pulsed CFactor dB	Field Strength dBuV/m	Margin dB
2410.00	2412.00	75.8	V	3.33	30.67	0.00	109.80	17.58
2410.00	4820.00	13.4	V	5.95	33.82	-4.88	48.29	25.71
2450.00	2446.00	75.1	V	3.36	30.76	0.00	109.22	18.16
2450.00	4900.00	13.2	V	6.06	35.02	-4.88	49.40	24.60
2470.00	2470.00	75.1	V	3.37	30.81	0.00	109.28	18.10
2470.00	4940.00	13.5	V	6.12	35.13	-4.88	49.87	24.13

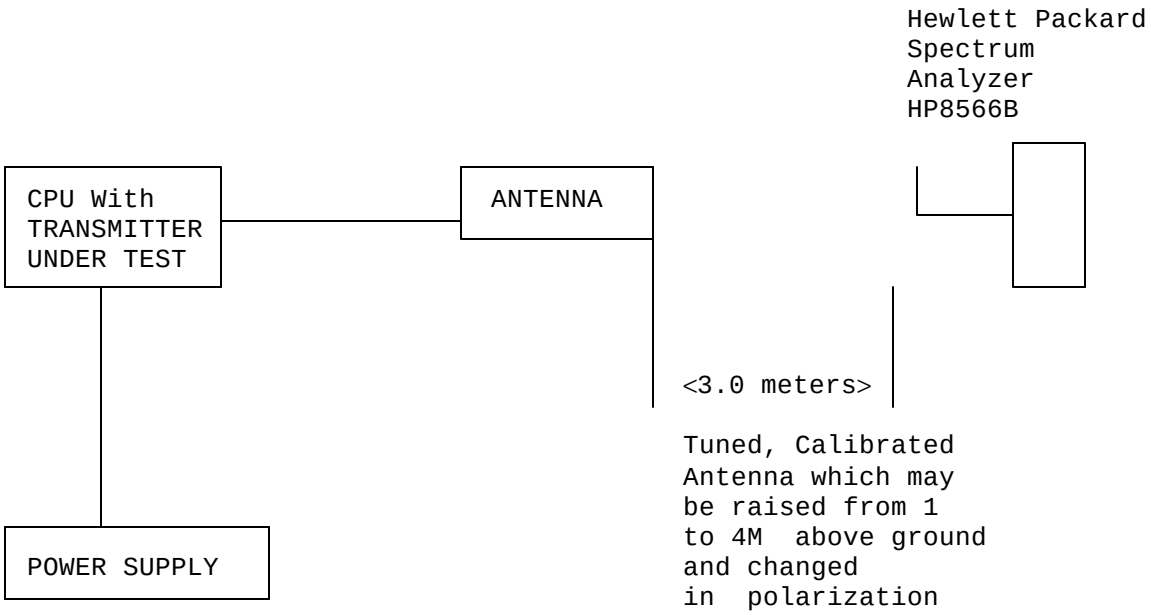
15.247(c),15.205 &15.209(b) Field strength of spurious emissions Continued:

Three channels in the band were measured and the worst case is presented above.

No emissions were noted below 1000 MHz.

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992 & the FCC/OET Guidance on Measurements for Direct Sequence Spread Spectrum Systems – Public Notice 54797 Dated July 12, 1995. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

Method of Measuring Radiated Spurious Emissions



Equipment placed 80cm above ground on a rotatable platform.

APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

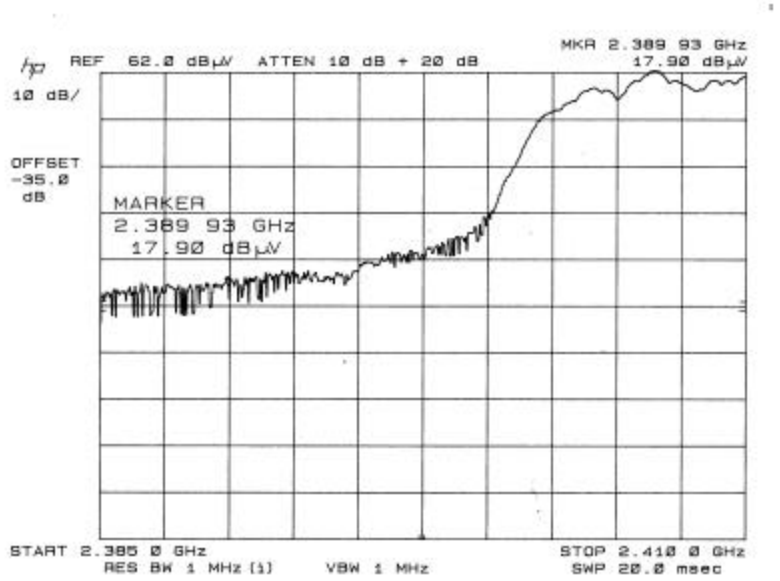
MaxRad Antenna – 4 dBi – Peak:

Frequency: 2390 MHz		**Frequency: 2483.80 MHz**	
+17.90	dBuV from Plot	+21.50	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.31	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+20.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+66.94	dBuV	+70.87	dBuV

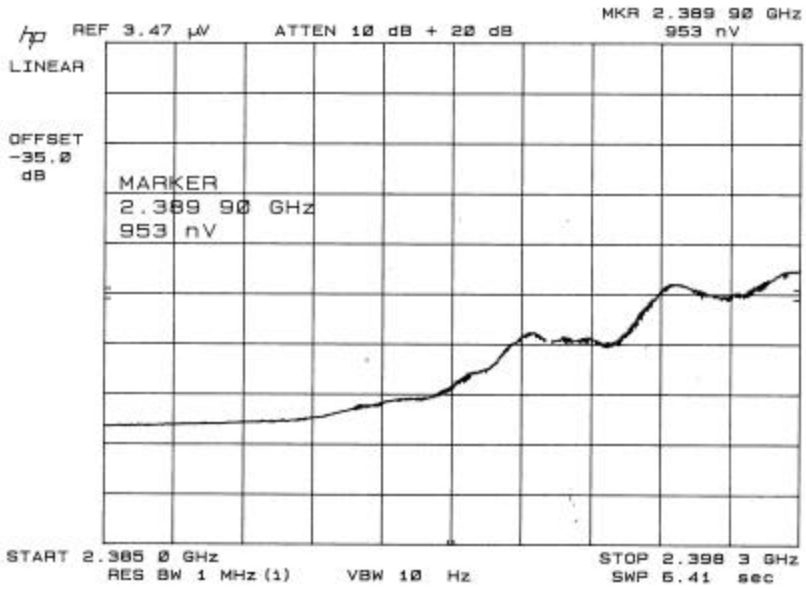
MaxRad Antenna – 4 dBi – Average:

Frequency: 2390 MHz		**Frequency: 2483.90 MHz**	
- 0.42	dBuV from Plot	+ 0.39	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.31	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+20.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+48.62	dBuV	+49.76	dBuV

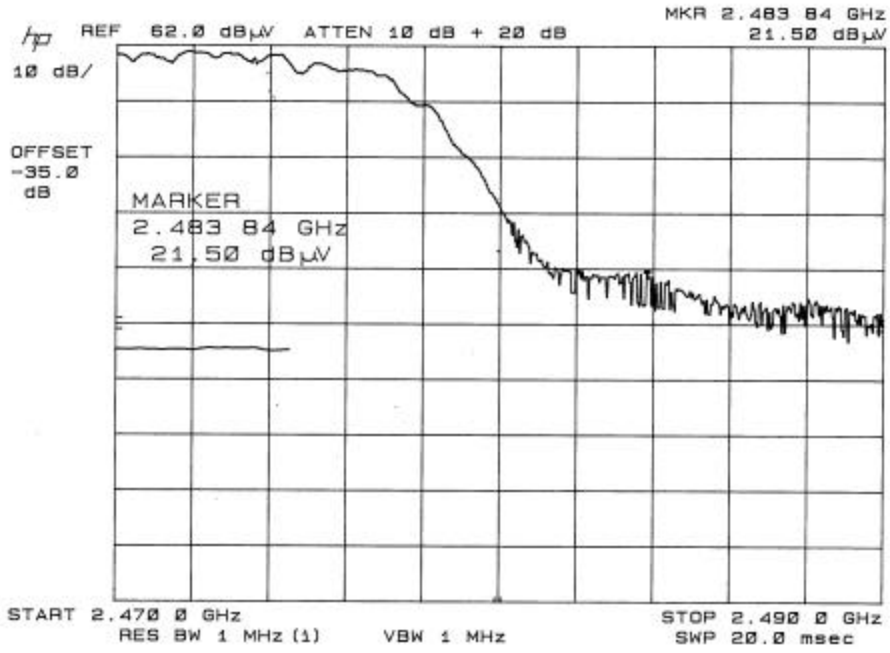
BANDEDGE PLOT – MAXRAD ANTENNA – PEAK



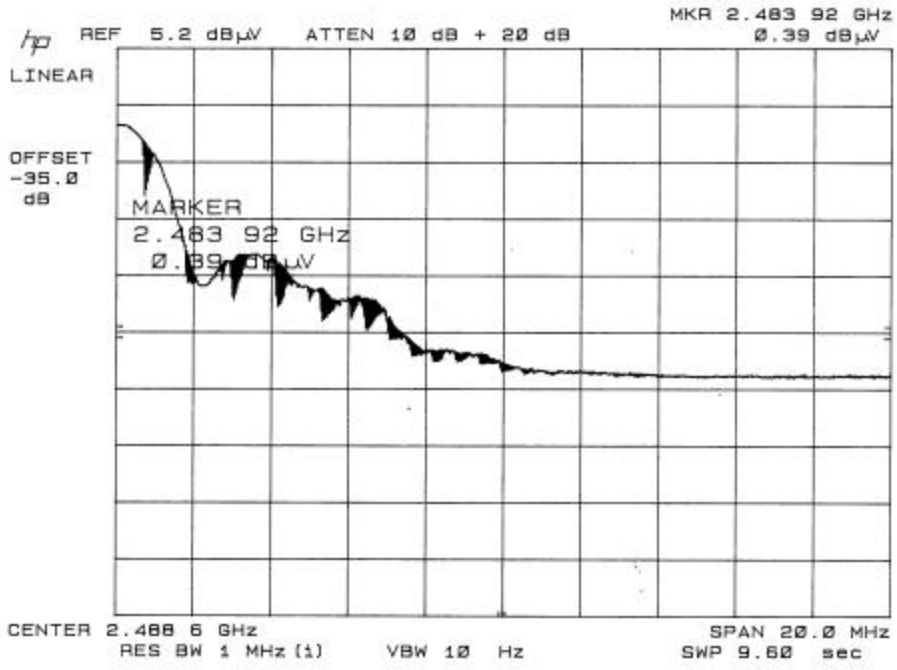
BANDEDGE PLOT – MAXRAD ANTENNA – AVERAGE



BANDEDGE PLOT – MAXRAD ANTENNA – PEAK



BANDEDGE PLOT – MAXRAD ANTENNA – AVERAGE



APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

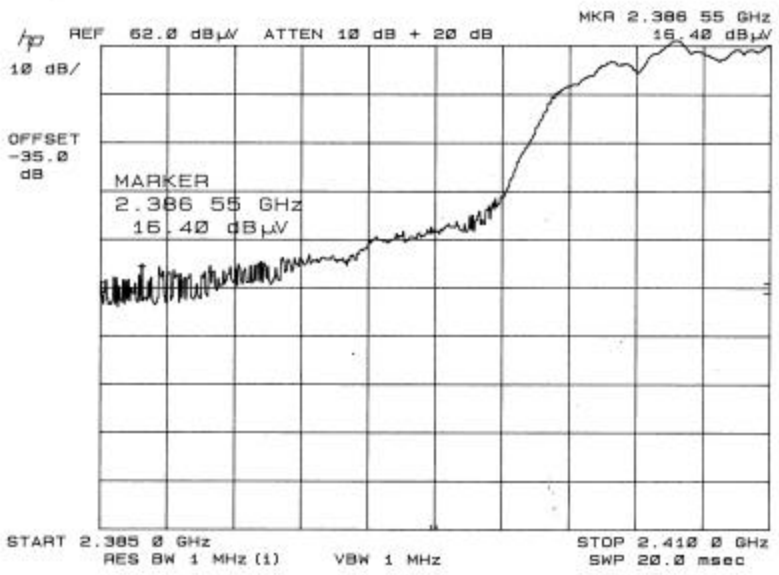
Hyperlink Antenna – 7.5 dBi – Peak:

Frequency: 2386.5 MHz		**Frequency: 2483.7 MHz**	
+16.40	dBuV from Plot	+14.20	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.30	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+30.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+65.43	dBuV	+73.57	dBuV

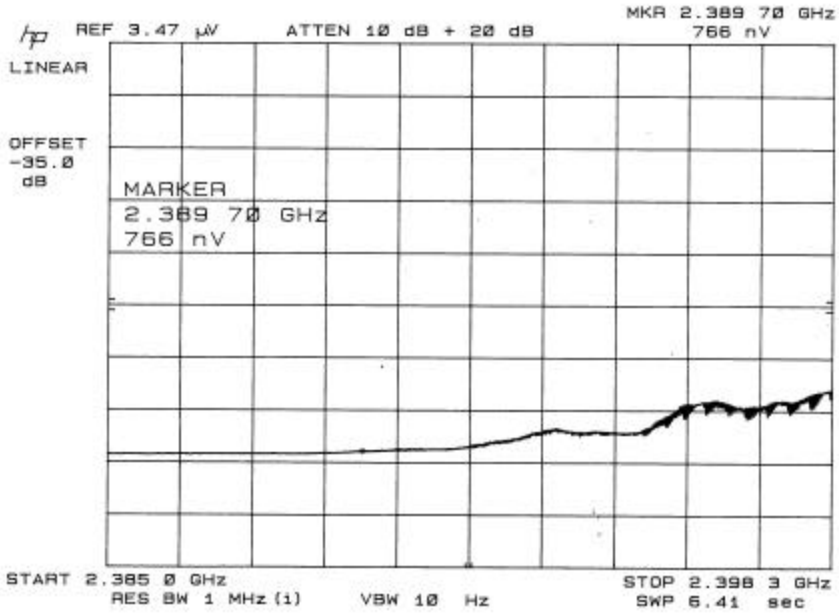
Hyperlink Antenna – 7.5 dBi – Average:

Frequency: 2389.7 MHz		**Frequency: 2483.7 MHz**	
- 2.32	dBuV from Plot	+ 1.87	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.30	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+20.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+46.71	dBuV	+51.24	dBuV

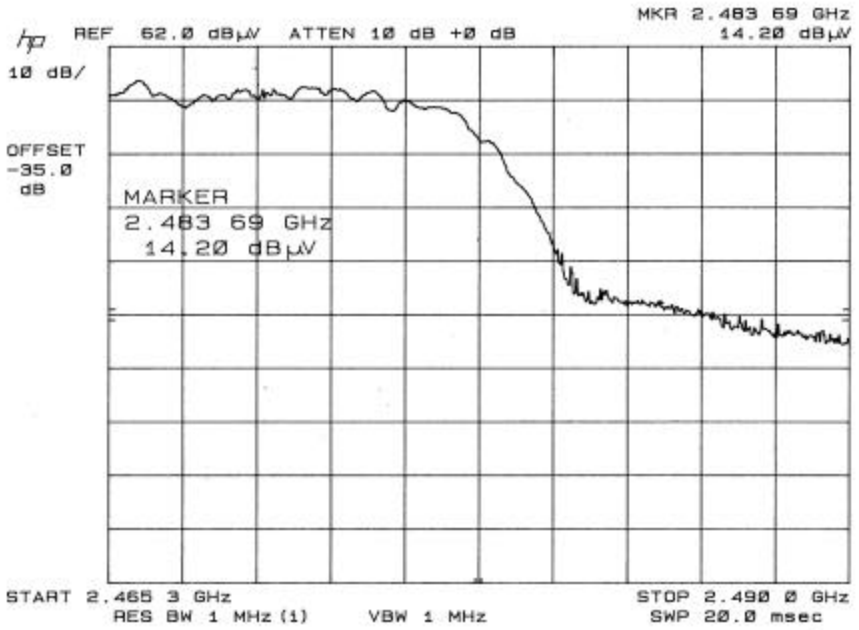
BANDEDGE PLOT – HYPERLINK ANTENNA – PEAK



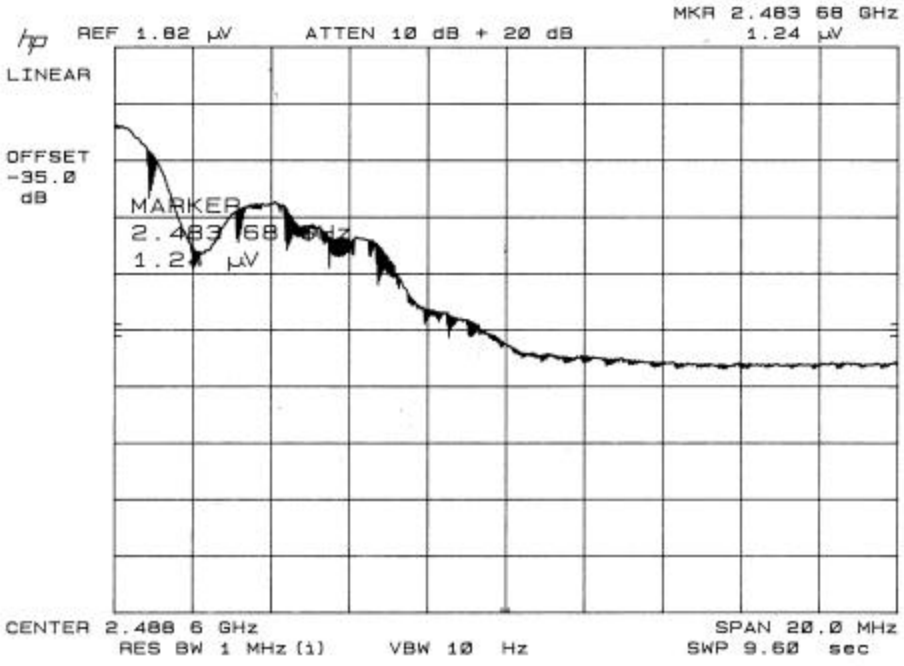
BANDEDGE PLOT – HYPERLINK ANTENNA – AVERAGE



BANDEDGE PLOT – HYPERLINK ANTENNA - PEAK



BANDEDGE PLOT – HYPERLINK ANTENNA - AVERAGE



APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

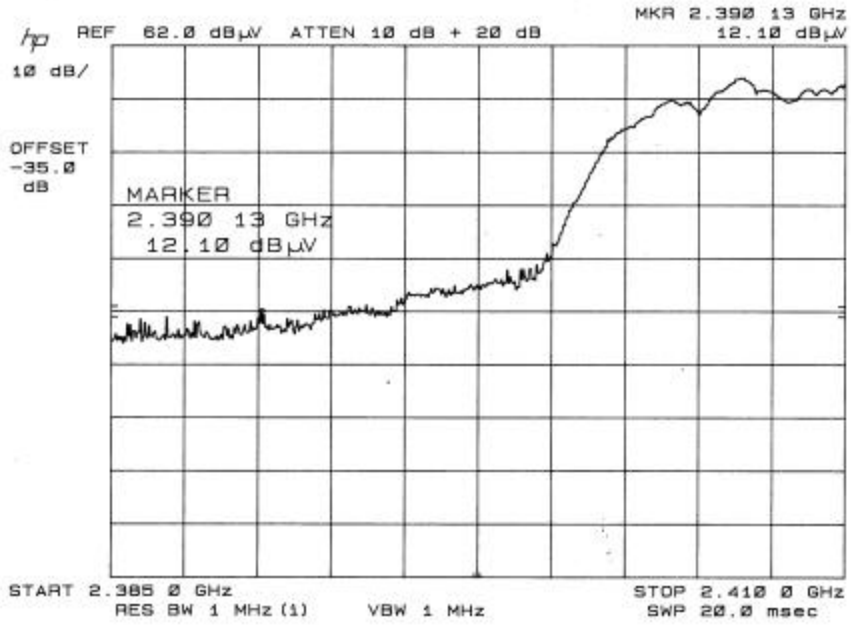
MaxRad Antenna – 8 dBi – Peak:

Frequency: 2390 MHz		**Frequency: 2483.6 MHz**	
+12.10	dBuV from Plot	+13.60	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.30	Coax Loss	+ 3.39	Coax Loss
+30.00	dB Pad	+30.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+71.13	dBuV	+72.97	dBuV

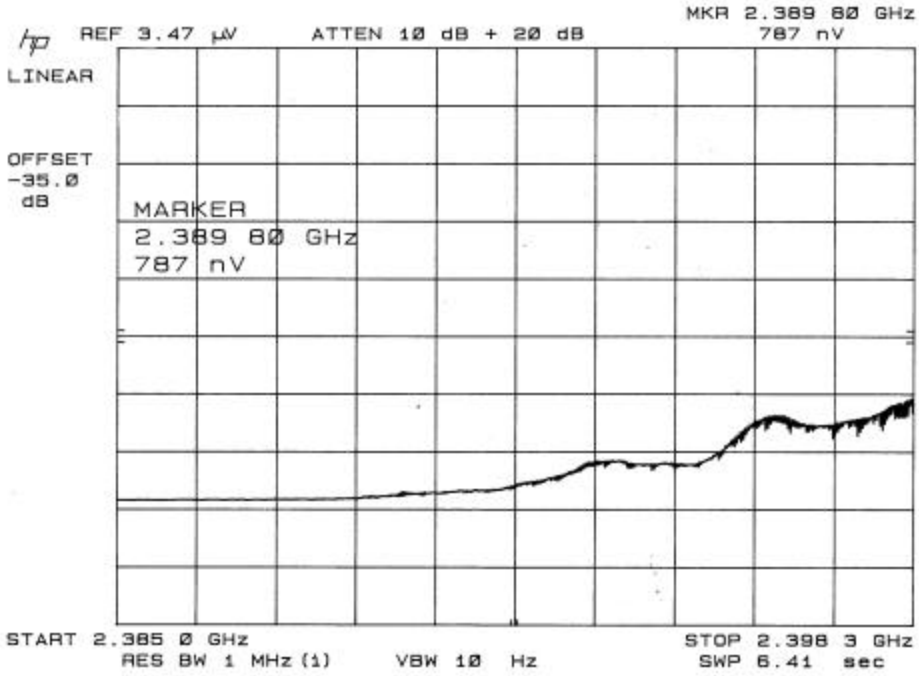
MaxRad Antenna – 8 dBi – Average:

Frequency: 2389.8 MHz		**Frequency: 2484.8 MHz**	
- 2.08	dBuV from Plot	+ 1.68	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.30	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+20.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+46.95	dBuV	+51.05	dBuV

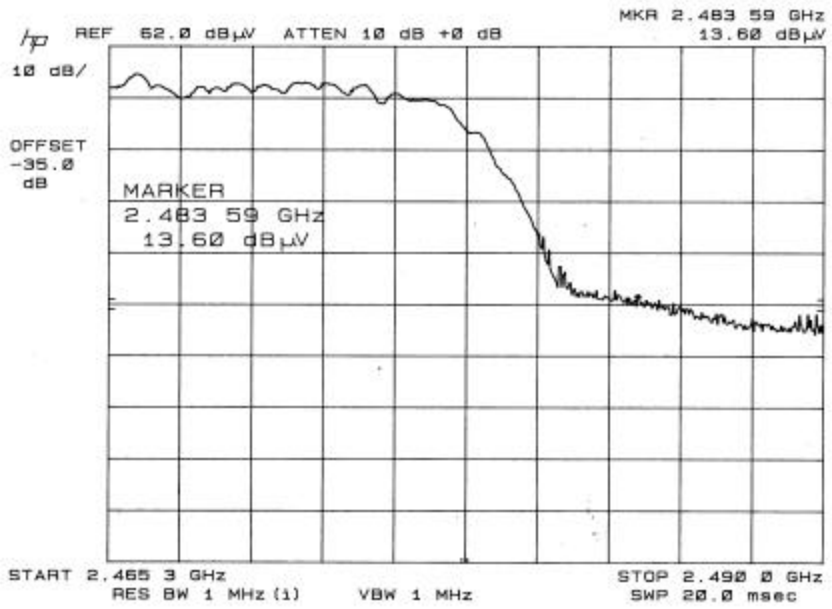
BANDEDGE PLOT – MAXRAD ANTENNA – PEAK



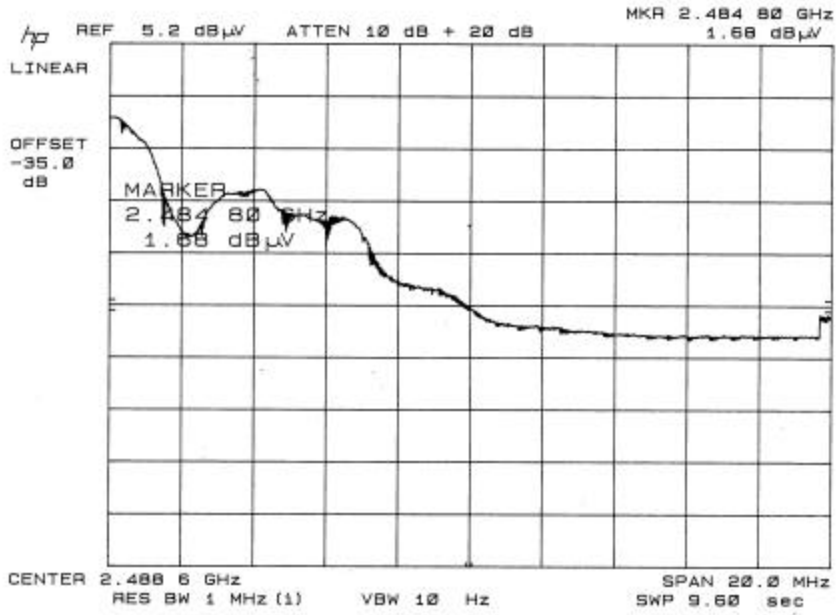
BANDEDGE PLOT – MAXRAD ANTENNA – AVERAGE



BANDEDGE PLOT – MAXRAD ANTENNA – PEAK



BANDEDGE PLOT – MAXRAD ANTENNA – AVERAGE



APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

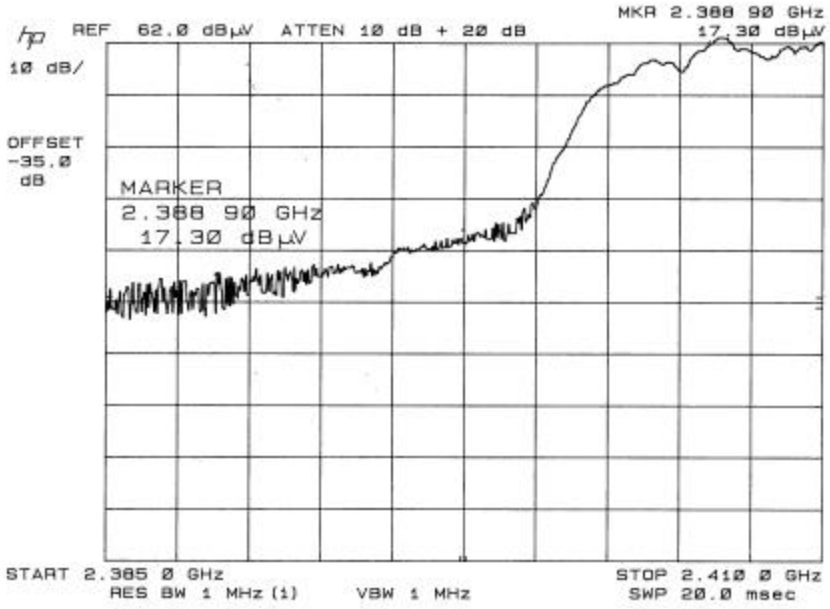
Hyperlink Antenna – 8 dBi – Peak:

Frequency: 2389 MHz		**Frequency: 2483.9 MHz**	
+17.30	dBuV from Plot	+14.40	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.30	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+30.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+66.33	dBuV	+73.77	dBuV

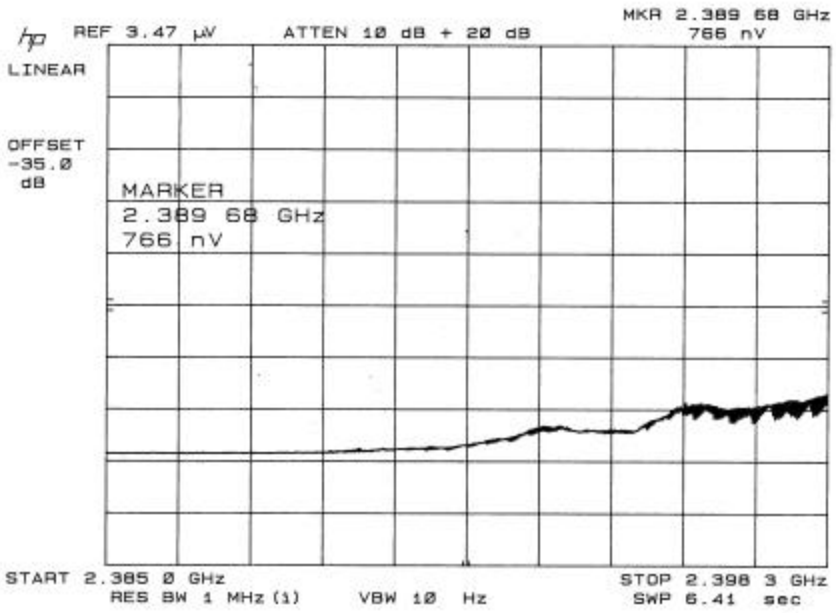
Hyperlink Antenna – 8 dBi – Average:

Frequency: 2389.7 MHz		**Frequency: 2483.5 MHz**	
- 2.32	dBuV from Plot	+ 1.08	dBuV from Plot
+30.61	ACF	+30.86	ACF
+ 3.30	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+20.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+46.71	dBuV	+50.45	dBuV

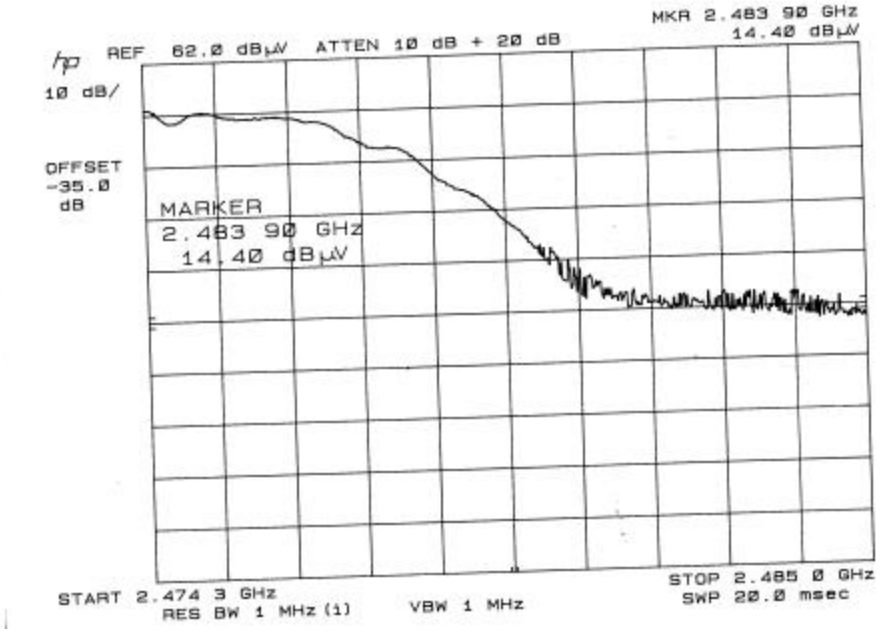
BANDEDGE PLOT - HYPERLINK ANTENNA – PEAK



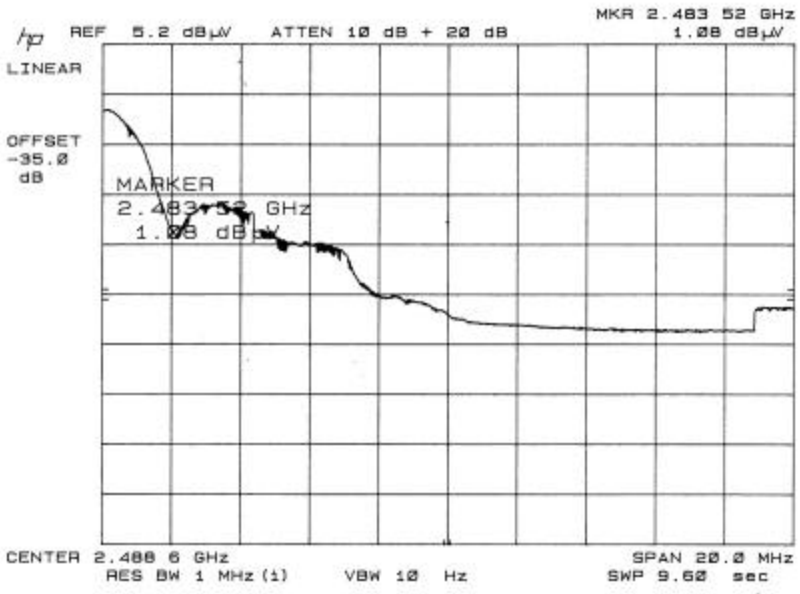
BANDEDGE PLOT - HYPERLINK ANTENNA – AVERAGE



BANDEDGE PLOT - HYPERLINK ANTENNA – PEAK



BANDEDGE PLOT - HYPERLINK ANTENNA – AVERAGE



APPLICANT: MESH NETWORKS

FCC ID: QJEWMC63000303

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

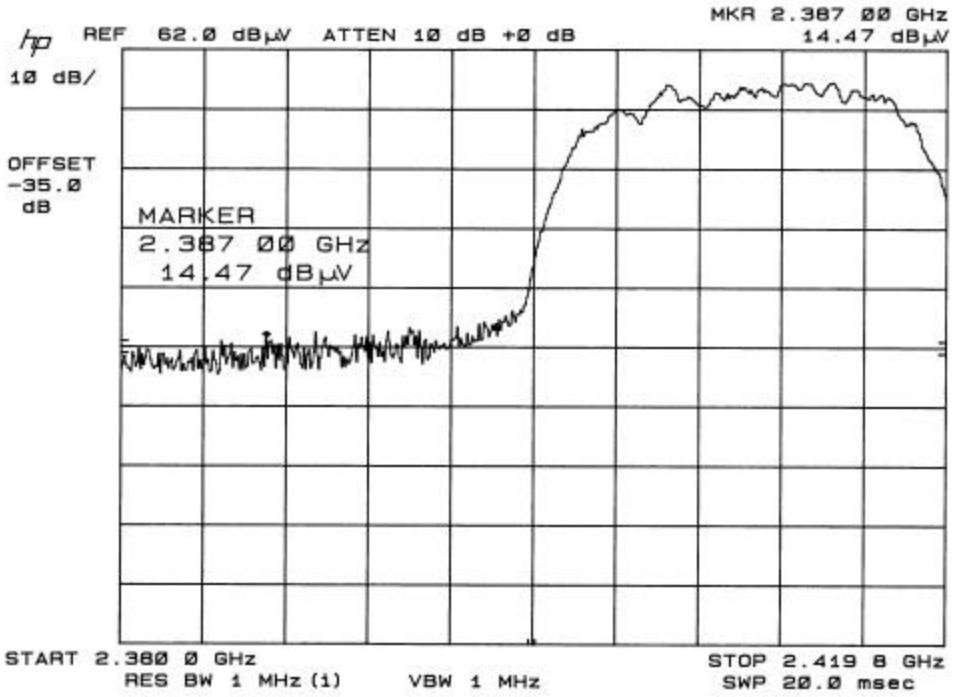
Antennex Antenna – 3 dBi – Peak:

Frequency: 2387 MHz		**Frequency: 2387 MHz**		
+14.10	dBuV from Plot	+ 14.47	dBuV from Plot	
+30.61	ACF	+ 30.61.	ACF	
+ 3.31	Coax Loss	+ 3.31.	Coax Loss	
+20.00	dB Pad	+ 20.00	dB Pad	
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor	
+63.14	dBuV	+ 63.51	dBuV	

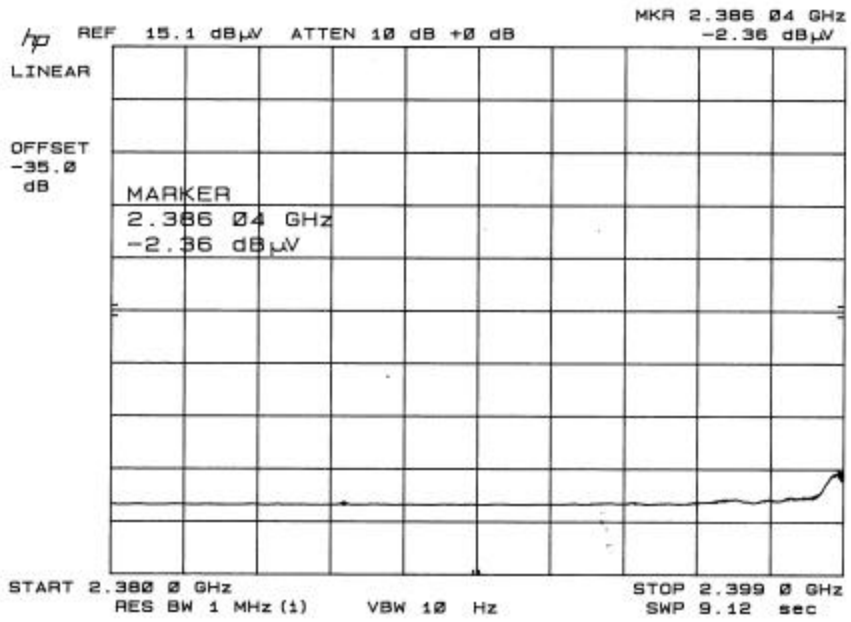
Antennex Antenna – 3 dBi – Average:

Frequency: 2386 MHz		**Frequency: 2483.50 MHz**	
- 2.36	dBuV from Plot	- 2.03	dBuV from Plot
+30.60	ACF	+30.86	ACF
+ 3.31	Coax Loss	+ 3.39	Coax Loss
+20.00	dB Pad	+20.00	dB Pad
- 4.88	Pulsed CFactor	- 4.88	Pulsed CFactor
+46.67	dBuV	+47.34	dBuV

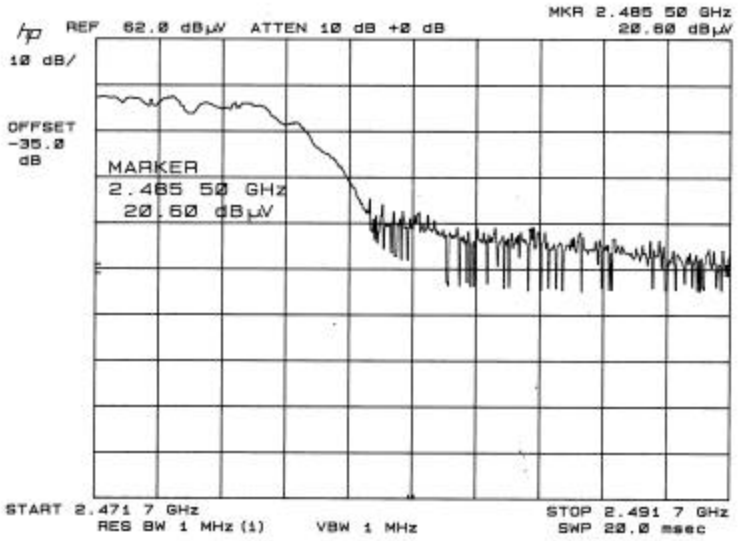
BANDEDGE PLOT – ANTENNEX ANTENNA – PEAK



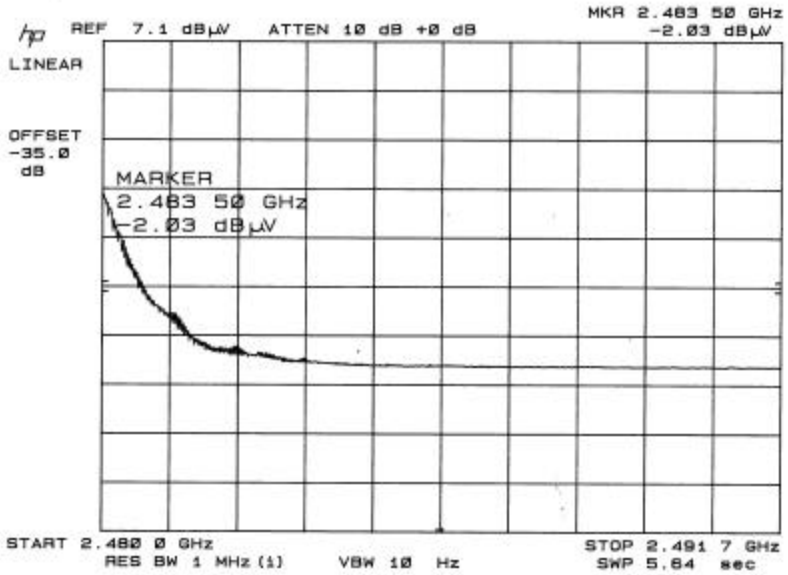
BANDEDGE PLOT – ANTENNEX ANTENNA – AVERAGE



BANDEDGE PLOT – ANTENNEX ANTENNA – PEAK



BANDEDGE PLOT – ANTENNEX ANTENNA – AVERAGE



APPLICANT: MESH NETWORKS

FCC ID: QJEWMC63000303

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

MaxRad Antenna – 0 dBi – Peak:

Frequency: 2386 MHz

+12.90	dBuV from Plot
+30.60	ACF
+ 3.31	Coax Loss
+20.00	dB Pad
- 4.88	Pulsed CFactor
+61.93	dBuV

Frequency: 2485.5 MHz

+20.60	dBuV from Plot
+30.86	ACF
+ 3.39	Coax Loss
+20.00	dB Pad
- 4.88	Pulsed CFactor
+69.97	dBuV

MaxRad Antenna – 3 dBi – Average:

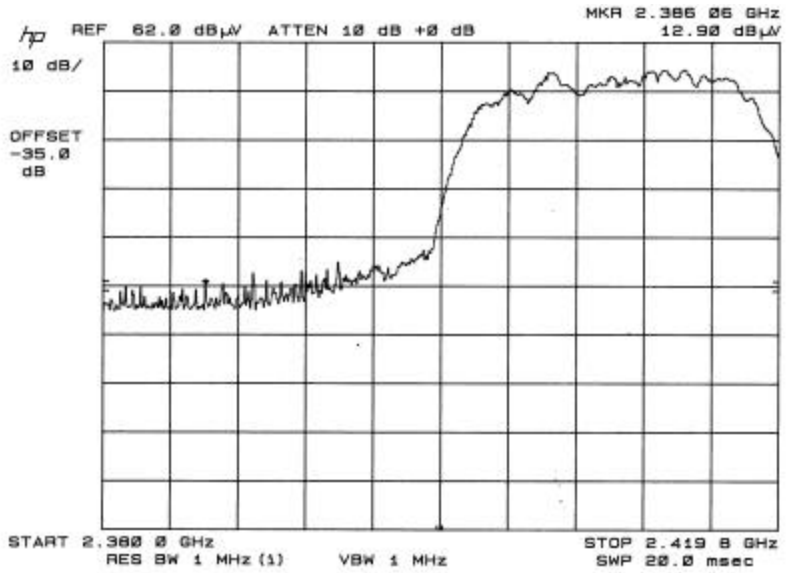
Frequency: 2388 MHz

- 2.43	dBuV from Plot
+30.61	ACF
+ 3.31	Coax Loss
+20.00	dB Pad
- 4.88	Pulsed CFactor
+46.61	dBuV

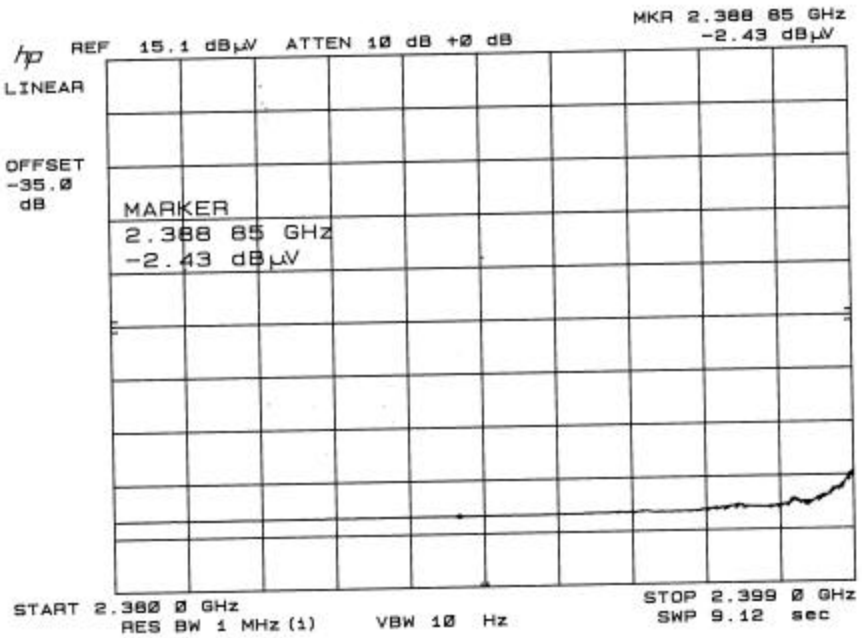
Frequency: 2483.65 MHz

- 1.85	dBuV from Plot
+30.86	ACF
+ 3.39	Coax Loss
+20.00	dB Pad
- 4.88	Pulsed CFactor
+47.52	dBuV

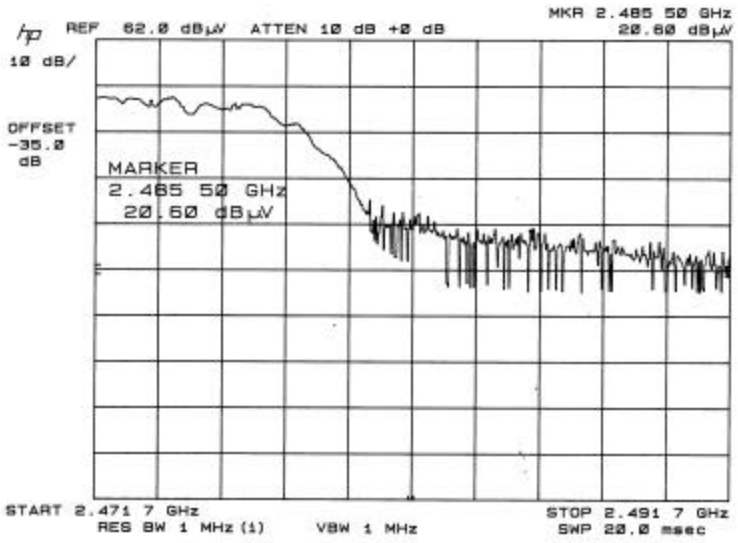
BANDEDGE PLOT – MAXRAD ANTENNA – PEAK



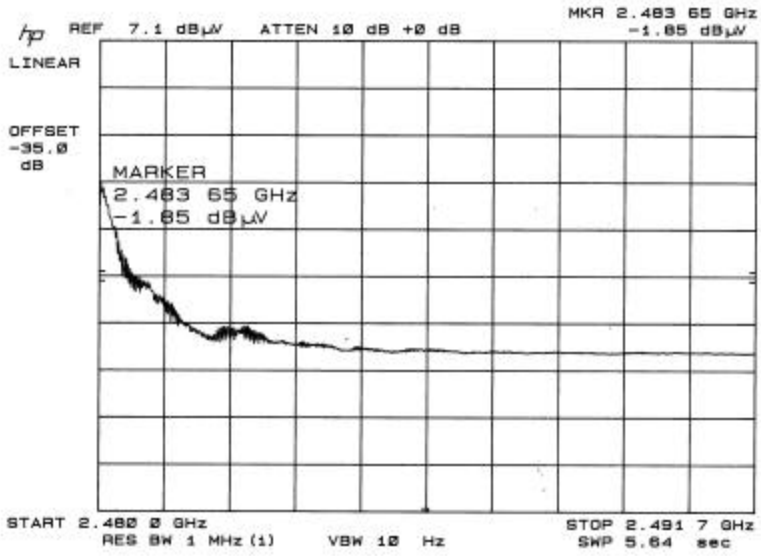
BANDEDGE PLOT – MAXRAD ANTENNA – AVERAGE



BANDEDGE PLOT – MAXRAD ANTENNA – PEAK



BANDEDGE PLOT – MAXRAD ANTENNA – AVERAGE



APPLICANT: MESH NETWORKS

FCC ID: QJEIAPWR63000303

NAME OF TEST: POWER SPECTRAL DENSITY

RULES PART NO.: 15.247(d)

REQUIREMENTS: The peak level measured must be no greater than +8.0 dBm.

DATA: The plot of the worst case is shown on the following page.

The level at 2410.00 MHz was –121.30 dBm.

-121.30 dBm
+ 20.00 dB Attn.
+ 35.00 dB Correction Factor
-66.30 dBm

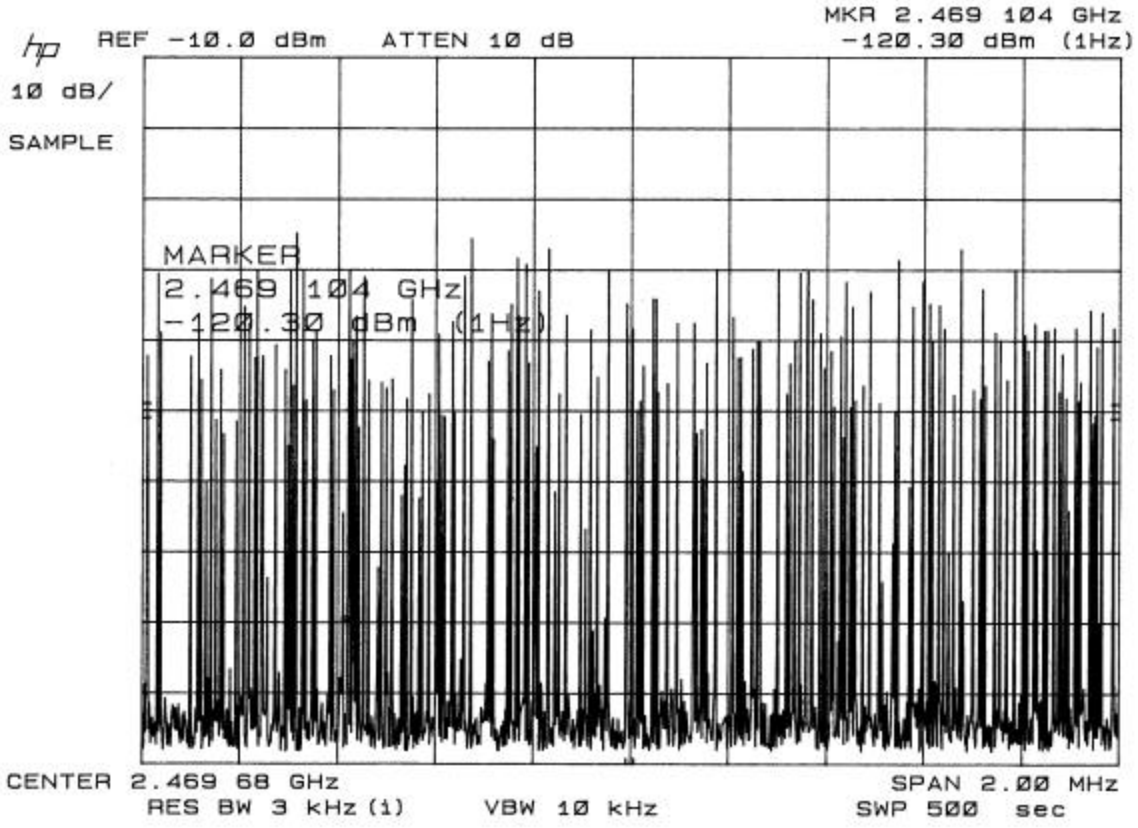
The level at 2426.32 MHz was –120.80 dBm.

-120.80 dBm
+ 20.00 dB Attn.
+ 35.00 dB Correction Factor
-65.80 dBm

The level at 2469.68 MHz was –120.30 dBm.

-120.30 dBm
+ 20.00 dB Attn.
+ 35.00 dB Correction Factor
-65.30 dBm

POWER SPECTRAL DENSITY PLOT



MPE CALCULATION

$W := 330$ power in Watts $D := .571$ duty factor in decimal % (1=100%)

$E := 30$ exposure time in minutes $U := 30$ use 6 for controlled and 30 for uncontrolled

$$Wexp := W \cdot D \cdot \left(\frac{E}{U} \right)$$

$$PC := \frac{E}{U}$$

$PC := 1$ percent on time

$Wexp = 188.43$ Watts

$Po := 188.43$ mWatts $f := 2440$

$dBd := 2$

$S := 1$ for all frequencies over 1500 MHz

$G := dBd + 2.15$

$$Gn := 10^{\frac{G}{10}}$$

Gain numeric

$Gn = 2.6$

$$R := \sqrt{\frac{(Po \cdot Gn)}{4 \cdot \pi \cdot S}}$$

$$Rinches := \frac{R}{2.54}$$

$R = 6.244$ distance in centimeters required for compliance

$Rinches = 2.458$

MPE CALUCATION

$W := 330$ power in Watts $D := .571$ duty factor in decimal % (1=100%)

$E := 30$ exposure time in minutes $U := 30$ use 6 for controlled and 30 for uncontrolled

$$Wexp := W \cdot D \cdot \left(\frac{E}{U} \right)$$

$$PC := \frac{E}{U}$$

$PC := 1$ percent on time

$Wexp = 188.43$ Watts

$Po := 188.43$ mWatts $f := 2440$

$dBd := 5.35$

$S := 1$ for all frequencies over 1500 MHz

$G := dBd + 2.15$

$$Gn := 10^{\frac{G}{10}}$$

Gain numeric

$Gn = 5.623$

$$R := \sqrt{\frac{(Po \cdot Gn)}{4 \cdot \pi \cdot S}}$$

$$Rinches := \frac{R}{2.54}$$

$R = 9.183$ distance in centimeters required for compliance

$Rinches = 3.615$

MPE CALCULATION

$W := 330$ power in Watts $D := .571$ duty factor in decimal % (1=100%)

$E := 30$ exposure time in minutes $U := 30$ use 6 for controlled and 30 for uncontrolled

$$Wexp := W \cdot D \cdot \left(\frac{E}{U} \right)$$

$$PC := \frac{E}{U}$$

$PC := 1$ percent on time

$Wexp = 188.43$ Watts

$Po := 188.43$ mWatts $f := 2440$

$dBd := 6$

$S := 1$ for all frequencies over 1500 MHz

$G := dBd + 2.15$

$$Gn := 10^{\frac{G}{10}}$$

Gain numeric

$Gn = 6.531$

$$R := \sqrt{\frac{(Po \cdot Gn)}{4 \cdot \pi \cdot S}}$$

$$Rinches := \frac{R}{2.54}$$

$R = 9.896$ distance in centimeters required for compliance

$Rinches = 3.896$