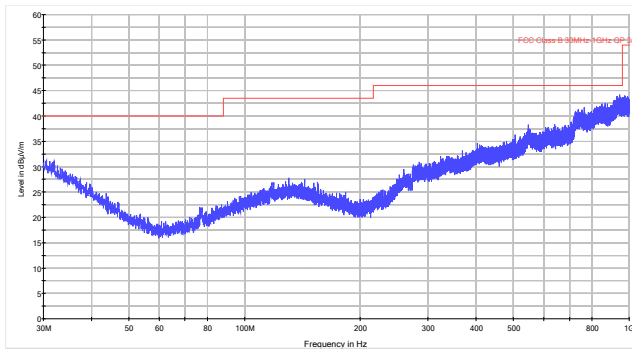
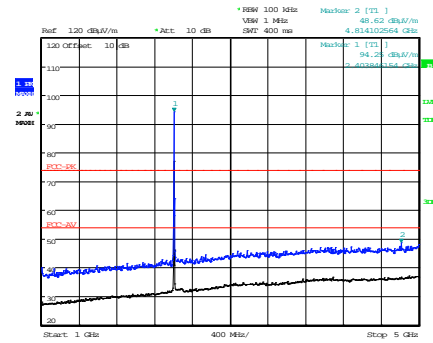


Radiated Transmitter Emissions 2405MHz – Half Wave Antenna

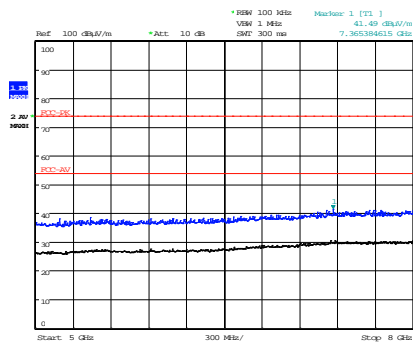


30MHz -1GHz



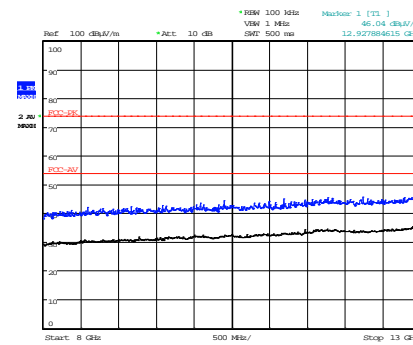
1GHz - 5GHz

Date: 11.APR.2014 12:47:53



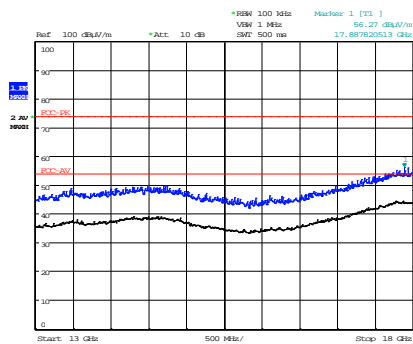
Date: 11.APR.2014 12:40:27

5GHz - 8GHz



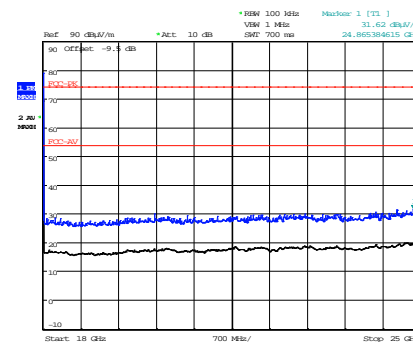
Date: 11.APR.2014 12:39:03

8GHz - 13GHz



Date: 11.APR.2014 12:38:34

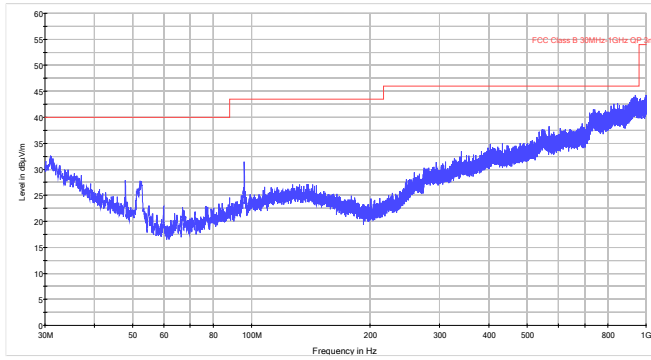
13GHz - 18GHz



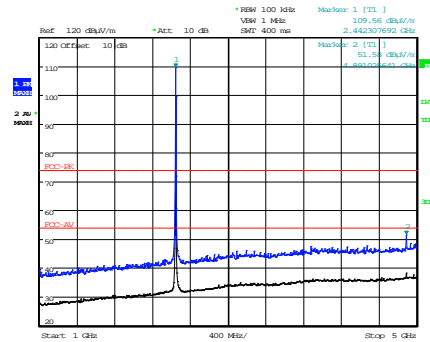
Date: 14.APR.2014 15:10:58

18GHz – 25GHz

Radiated Transmitter Emissions 2445MHz – Half Wave Antenna

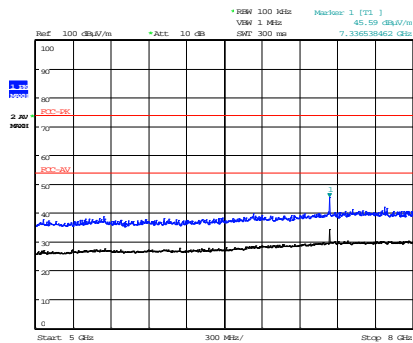


30MHz -1GHz



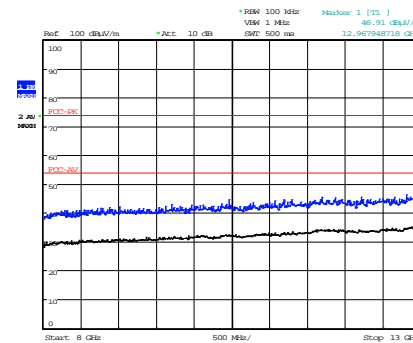
1GHz - 5GHz

Date: 11.APR.2014 12:53:12



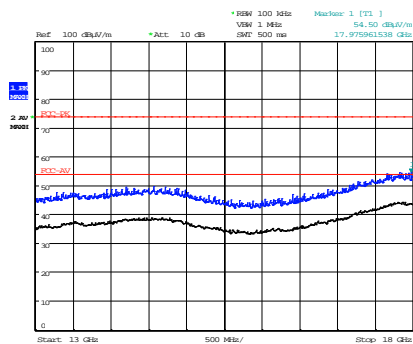
Date: 11.APR.2014 14:00:14

5GHz - 8GHz



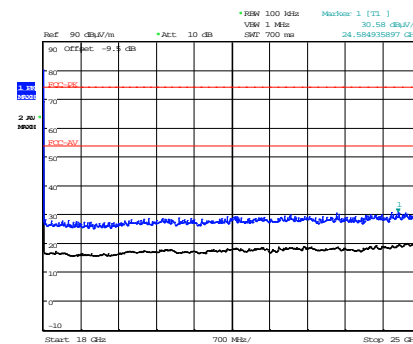
Date: 11.APR.2014 13:59:17

8GHz - 13GHz



Date: 11.APR.2014 13:58:52

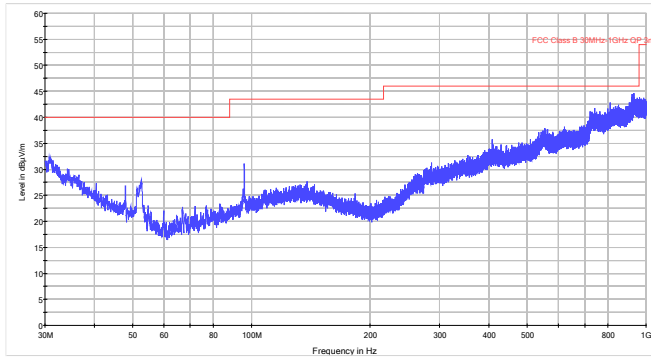
13GHz - 18GHz



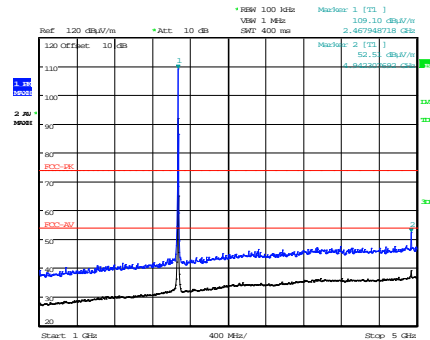
Date: 14.APR.2014 15:09:19

18GHz - 25GHz

Radiated Transmitter Emissions 2470MHz – Half Wave Antenna

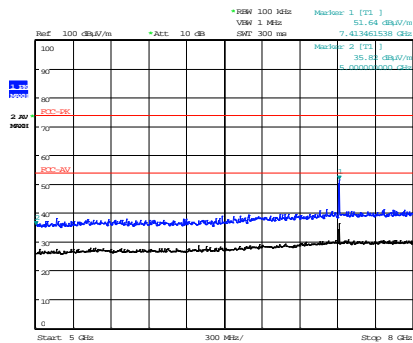


30MHz -1GHz



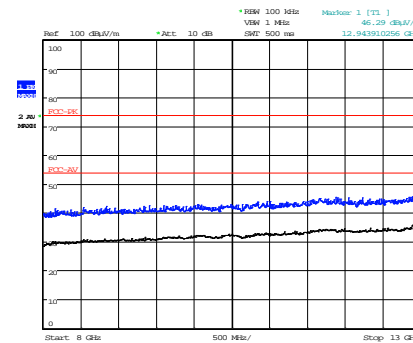
1GHz - 5GHz

Date: 11.APR.2014 14:10:49



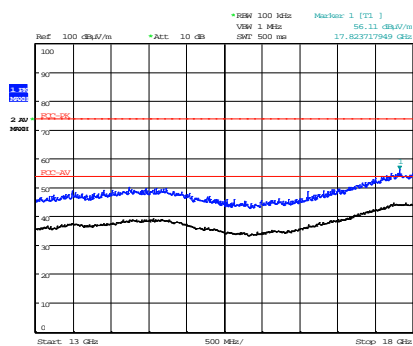
Date: 11.APR.2014 13:52:32

5GHz - 8GHz



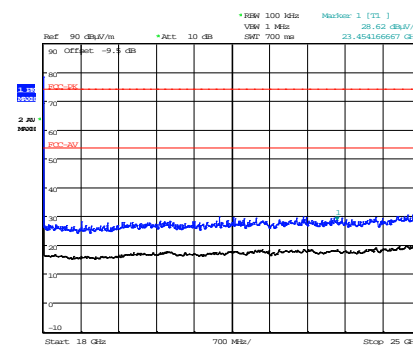
Date: 11.APR.2014 13:53:02

8GHz - 13GHz



Date: 11.APR.2014 13:53:35

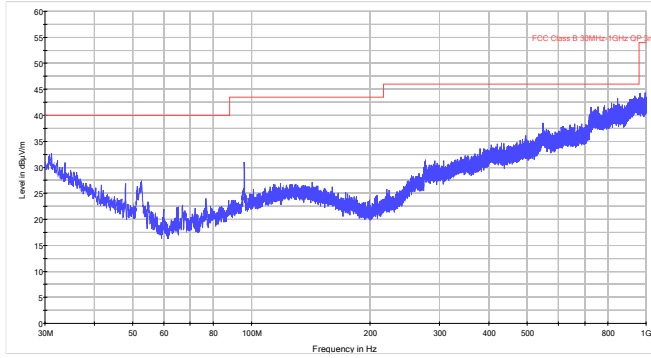
13GHz - 18GHz



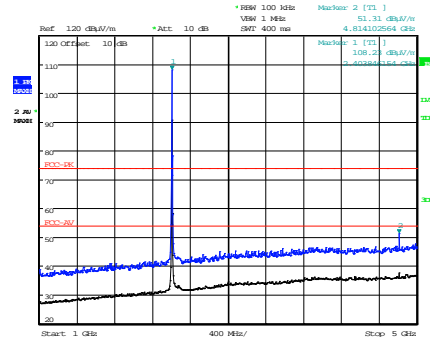
Date: 14.APR.2014 15:08:38

18GHz - 25GHz

Radiated Transmitter Emissions 2405MHz – Quarter Wave Antenna

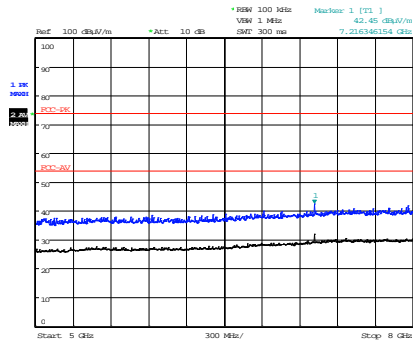


30MHz -1GHz



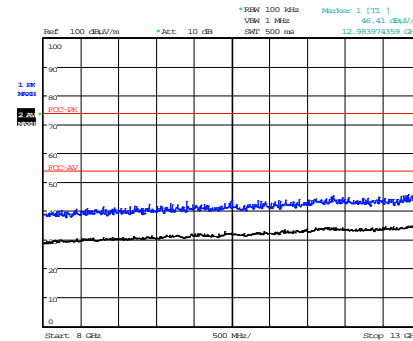
1GHz - 5GHz

Date: 11.APR.2014 14:33:53



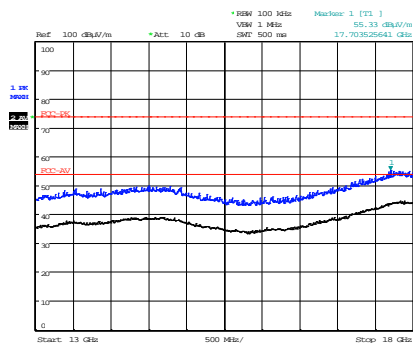
5GHz - 8GHz

Date: 11.APR.2014 16:04:41



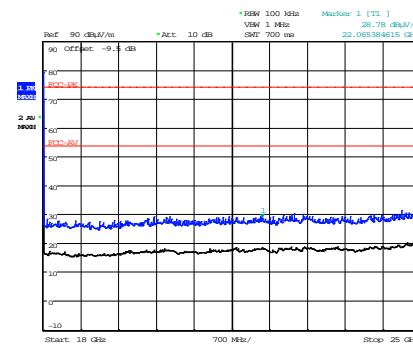
8GHz - 13GHz

Date: 11.APR.2014 16:05:40



13GHz - 18GHz

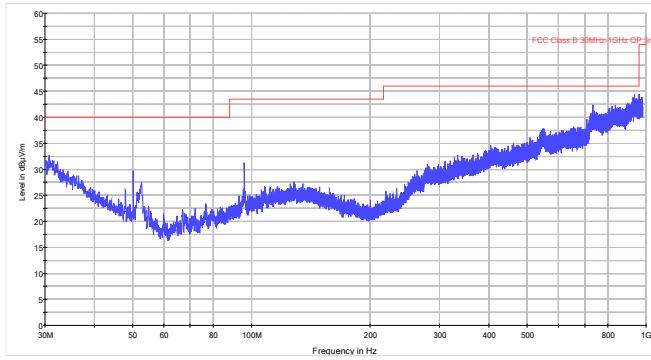
Date: 11.APR.2014 16:08:21



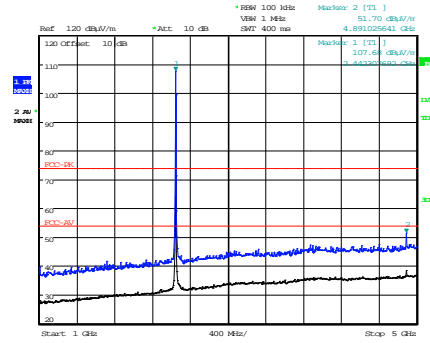
18GHz - 25GHz

Date: 14.APR.2014 15:12:20

Radiated Transmitter Emissions 2445MHz – Quarter Wave Antenna

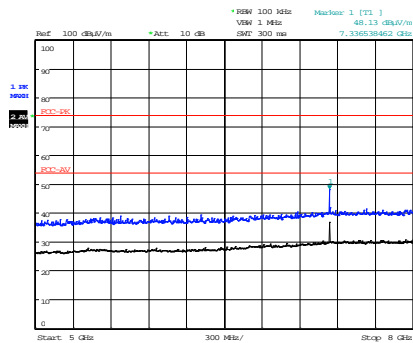


30MHz -1GHz



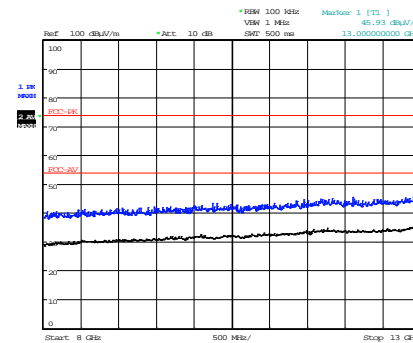
1GHz - 5GHz

Date: 11.APR.2014 14:33:05



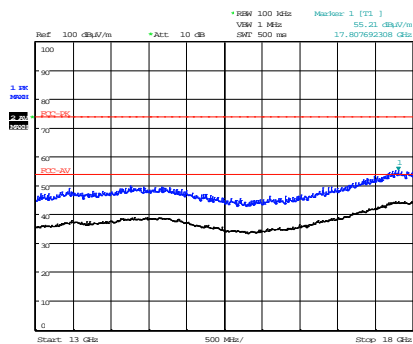
5GHz - 8GHz

Date: 11.APR.2014 16:02:49



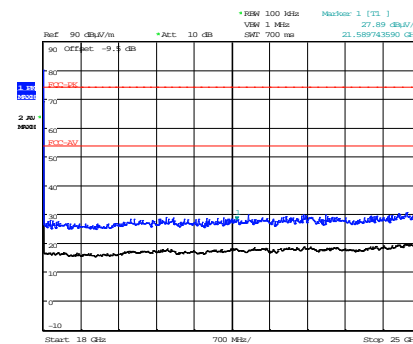
8GHz - 13GHz

Date: 11.APR.2014 16:18:35



13GHz - 18GHz

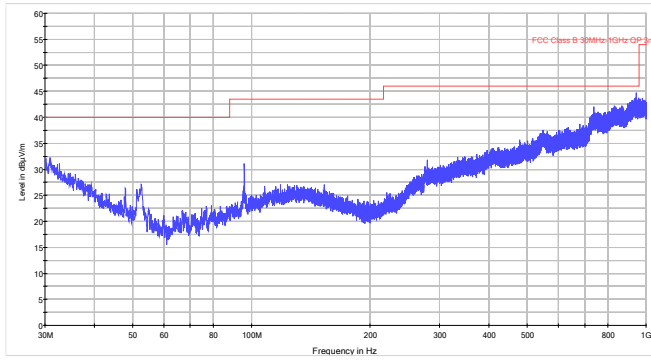
Date: 11.APR.2014 16:10:04



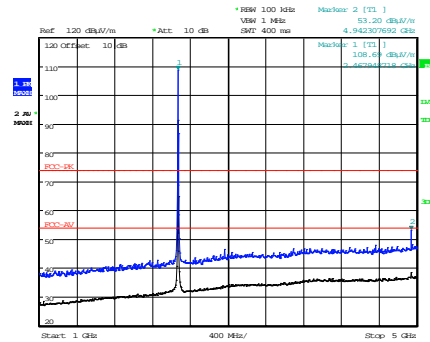
18GHz - 25GHz

Date: 14.APR.2014 15:12:36

Radiated Transmitter Emissions 2470MHz – Quarter Wave Antenna

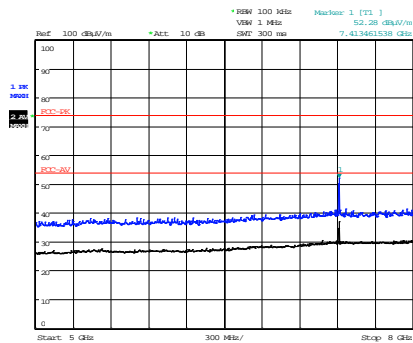


30MHz -1GHz



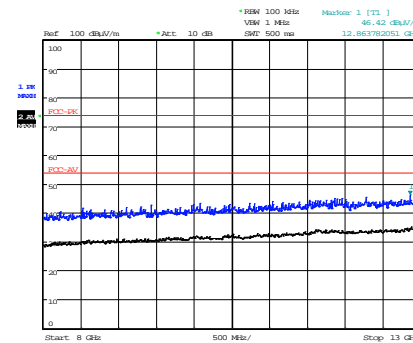
1GHz - 5GHz

Date: 11.APR.2014 14:30:28



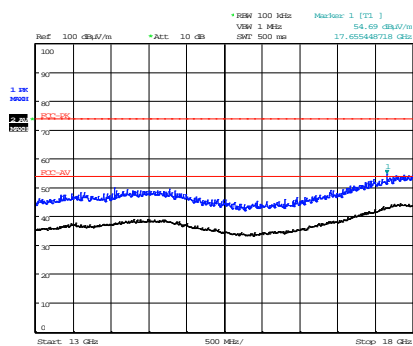
Date: 11.APR.2014 15:59:10

5GHz - 8GHz



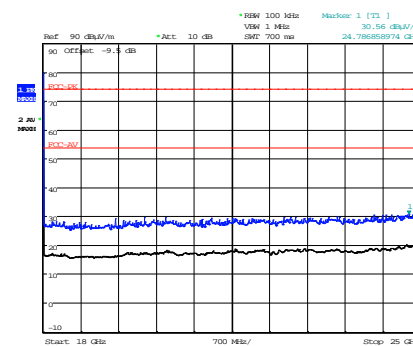
Date: 11.APR.2014 15:56:12

8GHz - 13GHz



Date: 11.APR.2014 16:16:39

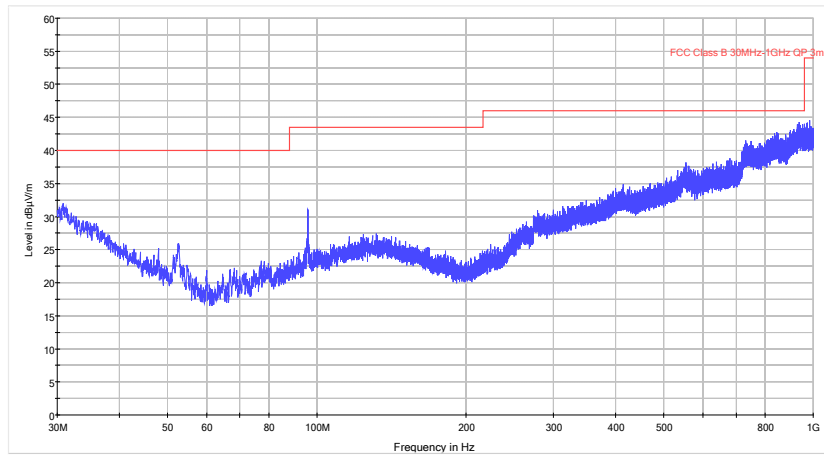
13GHz - 18GHz



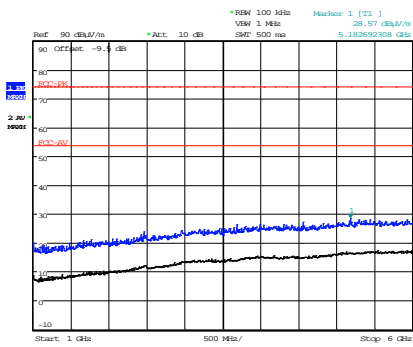
Date: 14.APR.2014 15:13:31

18GHz - 25GHz

Unintentional Radiated Emissions 2405MHz – Chip Antenna

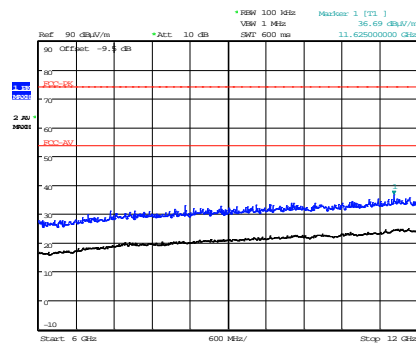


30MHz -1GHz



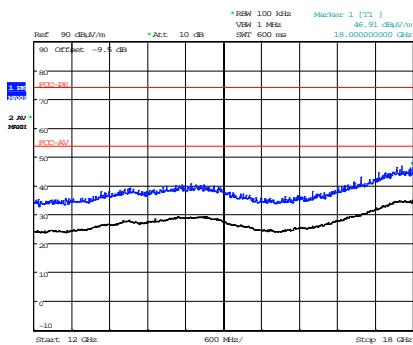
Date: 14.APR.2014 14:00:37

1GHz - 6GHz



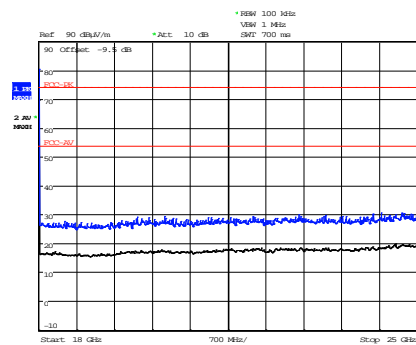
Date: 14.APR.2014 14:00:06

6GHz - 12GHz



Date: 14.APR.2014 13:59:47

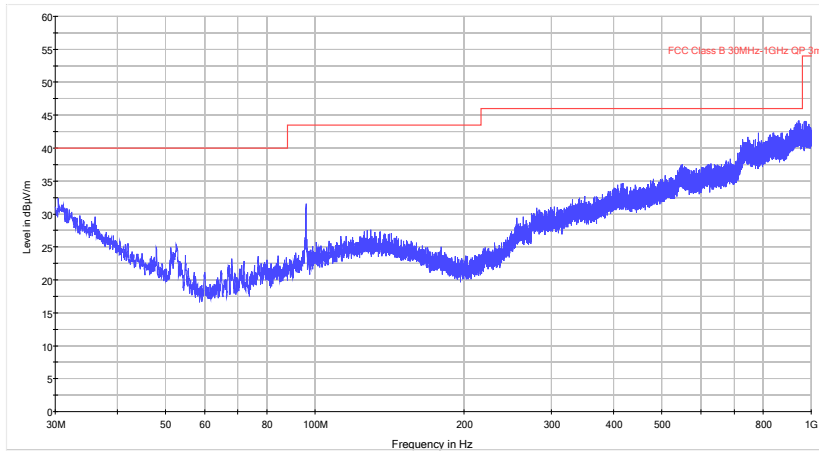
12GHz - 18GHz



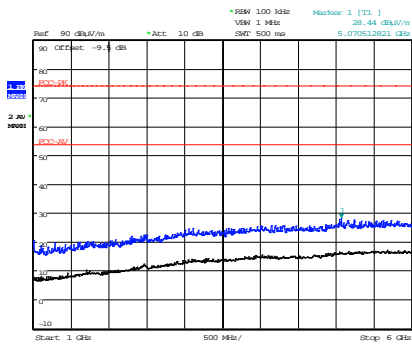
Date: 14.APR.2014 14:49:04

18GHz - 25GHz

Unintentional Radiated Emissions 2445MHz – Chip Antenna

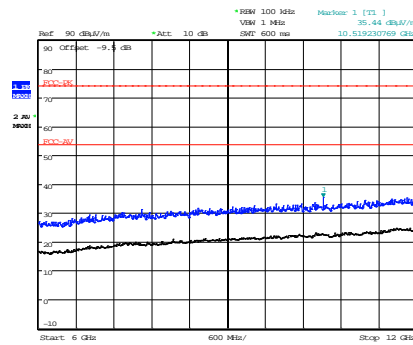


30MHz -1GHz



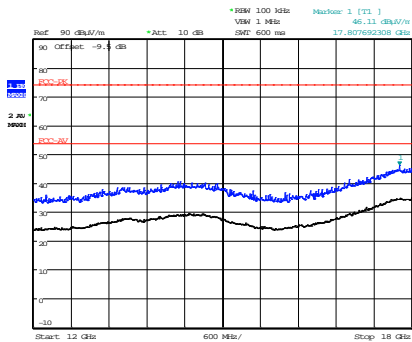
Date: 14.APR.2014 14:07:30

1GHz - 6GHz



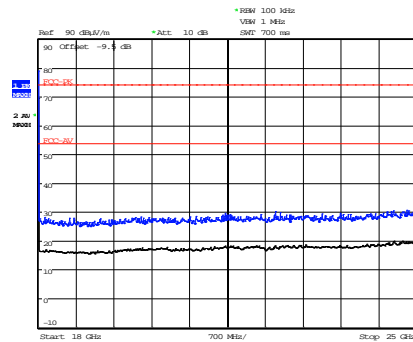
Date: 14.APR.2014 14:15:55

6GHz - 12GHz



Date: 14.APR.2014 14:05:38

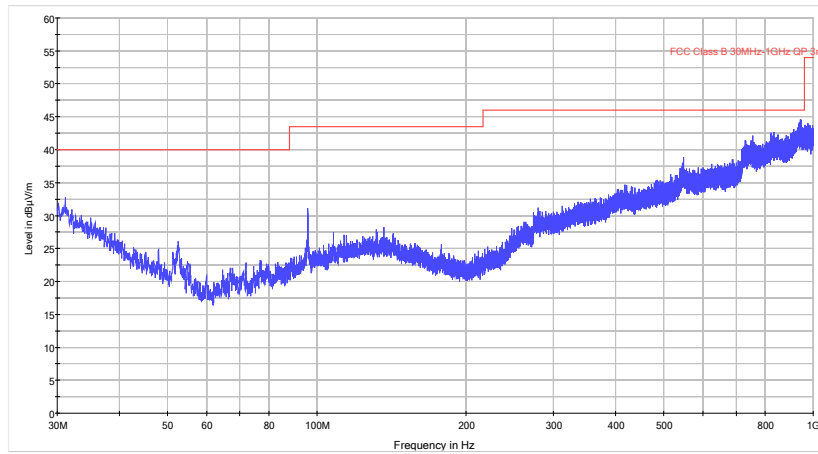
12GHz - 18GHz



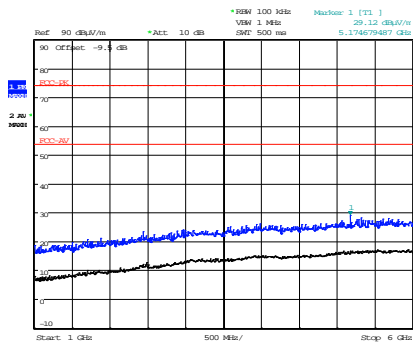
Date: 14.APR.2014 14:48:22

18GHz - 25GHz

Unintentional Radiated Spurious Emissions 2480MHz – Chip Antenna

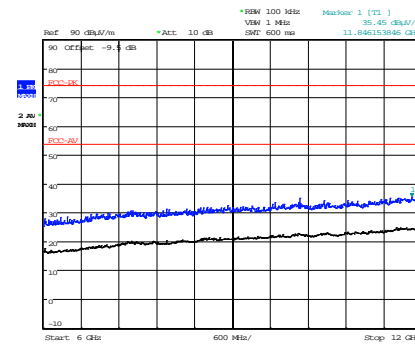


30MHz -1GHz



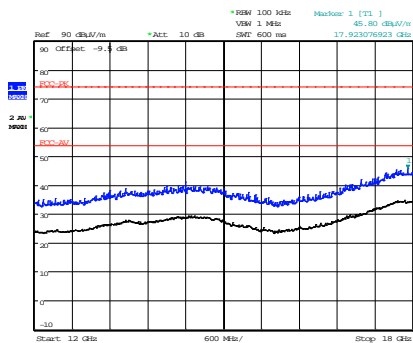
Date: 14.APR.2014 14:15:04

1GHz - 6GHz



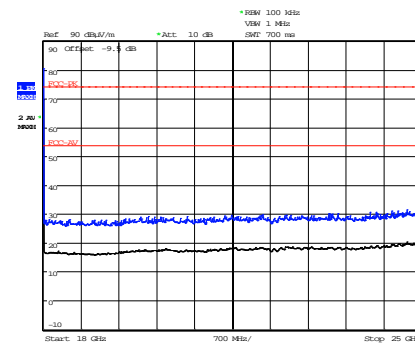
Date: 14.APR.2014 14:02:37

6GHz - 12GHz



Date: 14.APR.2014 14:04:39

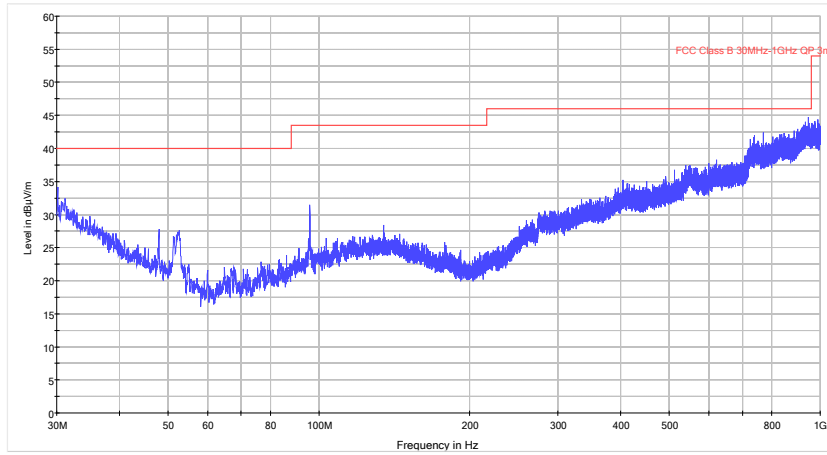
12GHz - 18GHz



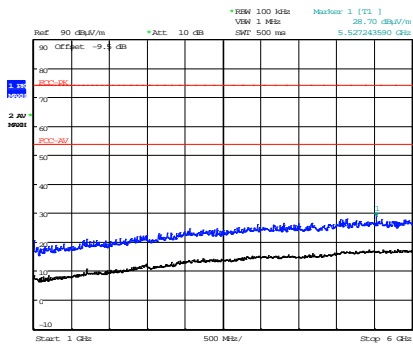
Date: 14.APR.2014 14:48:05

18GHz - 25GHz

Unintentional Radiated Emissions 2405MHz – Half Wave Antenna

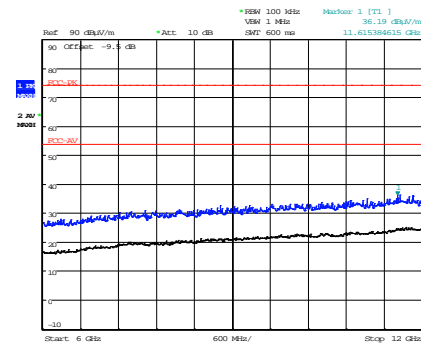


30MHz -1GHz



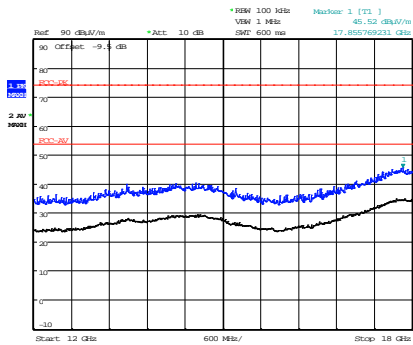
Date: 14.APR.2014 14:19:06

1GHz - 6GHz



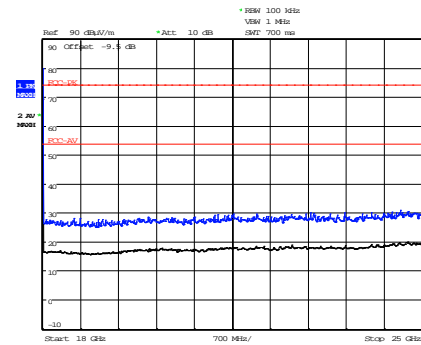
Date: 14.APR.2014 14:19:22

6GHz - 12GHz



Date: 14.APR.2014 14:19:37

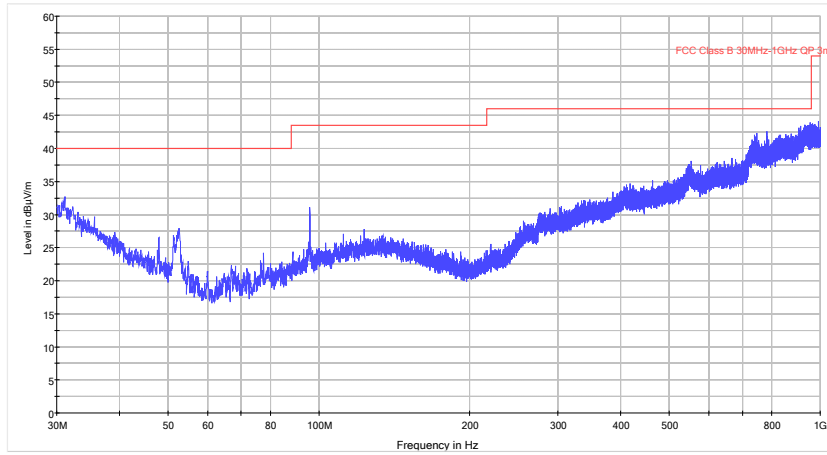
12GHz - 18GHz



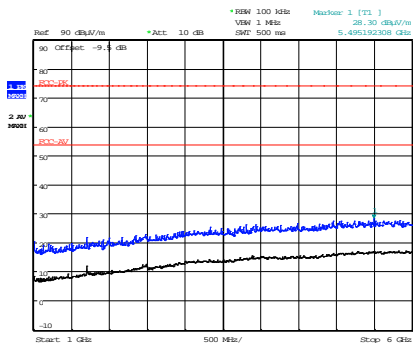
Date: 14.APR.2014 14:53:53

18GHz - 25GHz

Unintentional Radiated Emissions 2445MHz – Half Wave Antenna

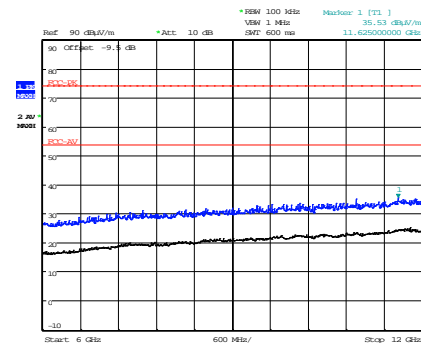


30MHz -1GHz



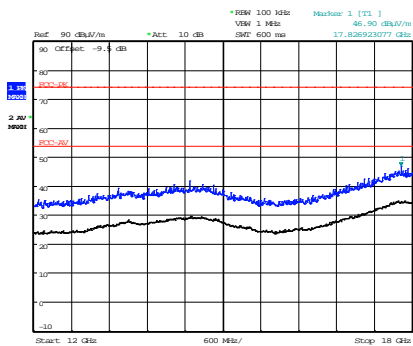
Date: 14.APR.2014 14:21:05

1GHz - 6GHz



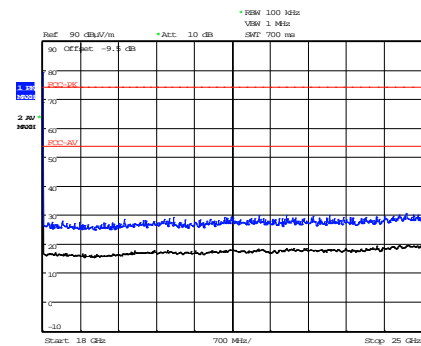
Date: 14.APR.2014 14:21:21

6GHz - 12GHz



Date: 14.APR.2014 14:21:37

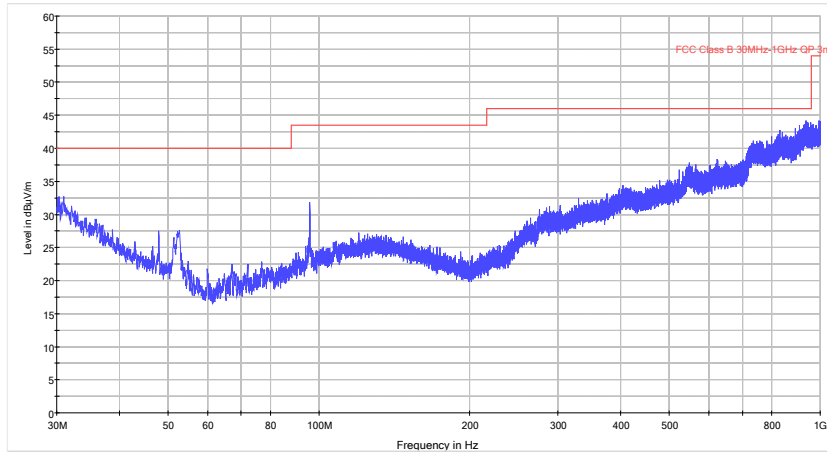
12GHz - 18GHz



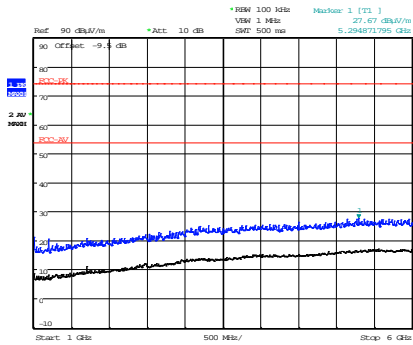
Date: 14.APR.2014 14:54:41

18GHz - 25GHz

Unintentional Radiated Spurious Emissions 2480MHz – Half Wave Antenna

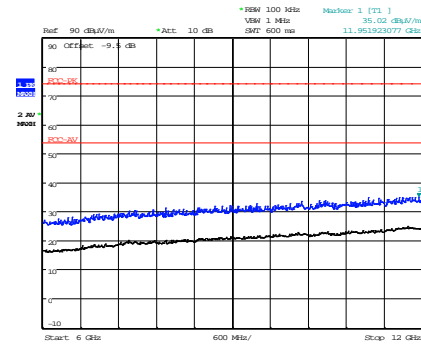


30MHz -1GHz



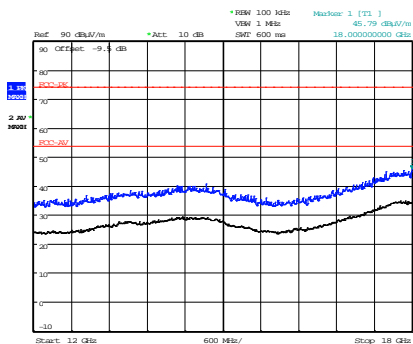
Date: 14.APR.2014 14:22:47

1GHz - 6GHz



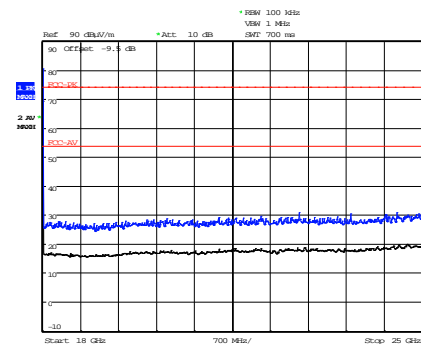
Date: 14.APR.2014 14:23:02

6GHz - 12GHz



Date: 14.APR.2014 14:23:18

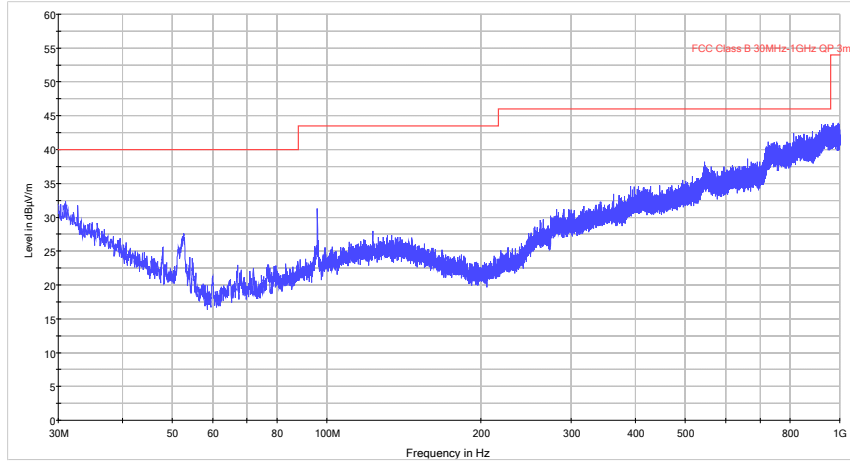
12GHz - 18GHz



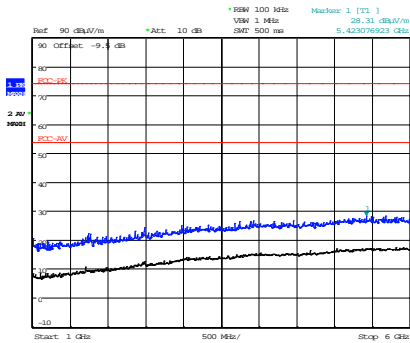
Date: 14.APR.2014 14:54:55

18GHz - 25GHz

Unintentional Radiated Emissions 2405MHz – Quarter Wave Antenna

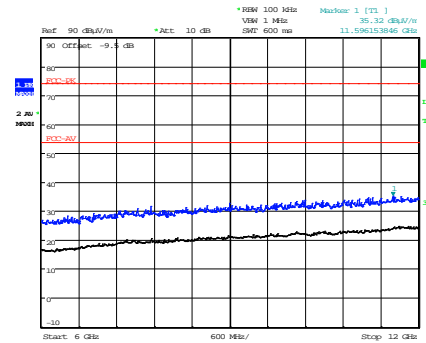


30MHz -1GHz



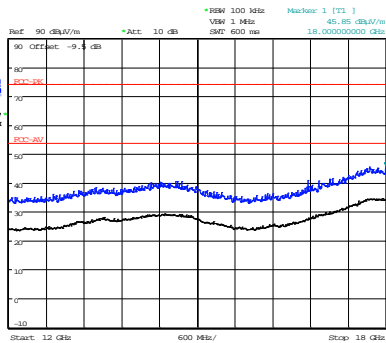
Date: 14.APR.2014 14:25:55

1GHz - 6GHz



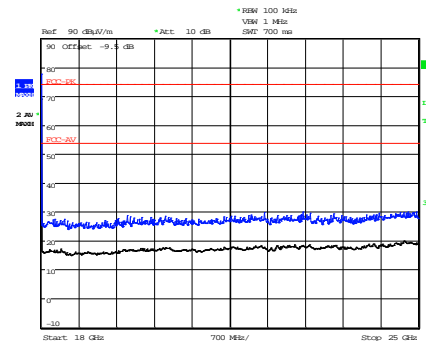
Date: 14.APR.2014 14:26:09

6GHz - 12GHz



Date: 14.APR.2014 14:26:28

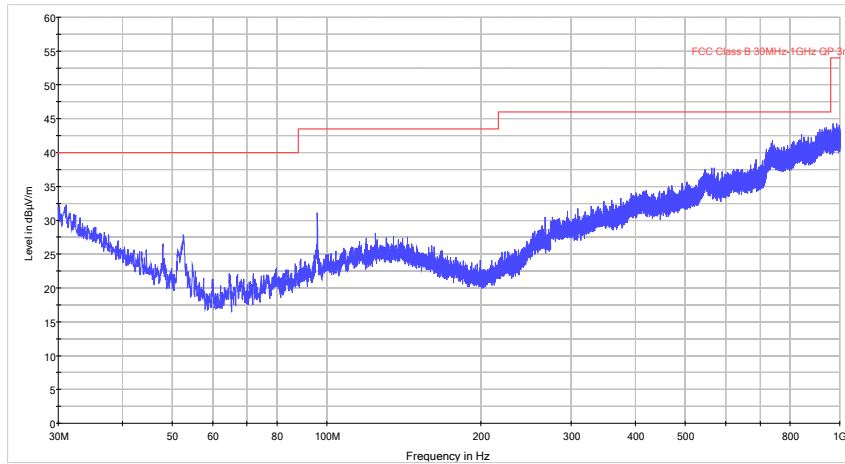
12GHz - 18GHz



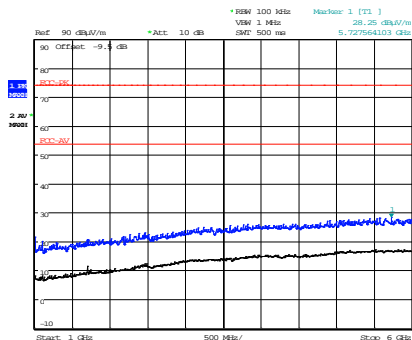
Date: 14.APR.2014 14:57:12

18GHz - 25GHz

Unintentional Radiated Emissions 2445MHz – Half Wave Antenna

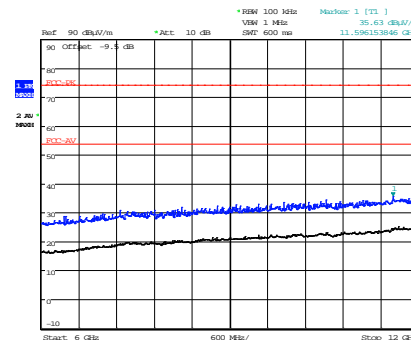


30MHz -1GHz



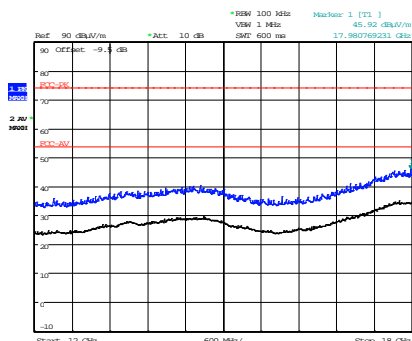
Date: 14.APR.2014 14:27:57

1GHz - 6GHz



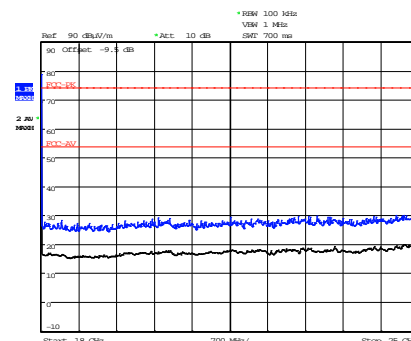
Date: 14.APR.2014 14:28:14

6GHz - 12GHz



Date: 14.APR.2014 14:28:31

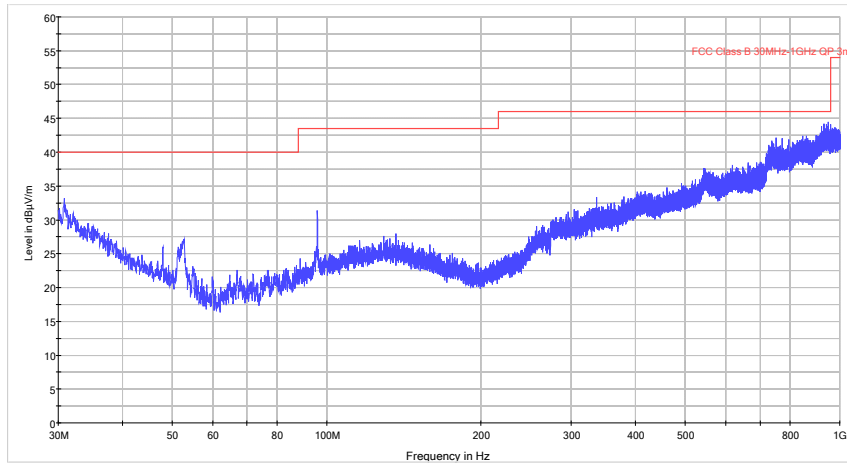
12GHz - 18GHz



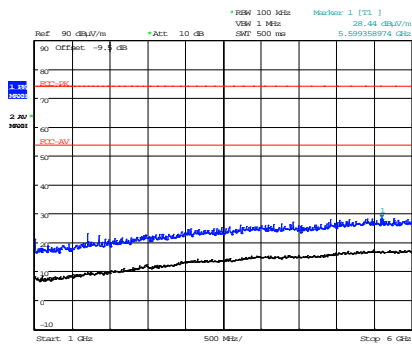
Date: 14.APR.2014 14:56:36

18GHz - 25GHz

Unintentional Radiated Spurious Emissions 2480MHz – Half Wave Antenna

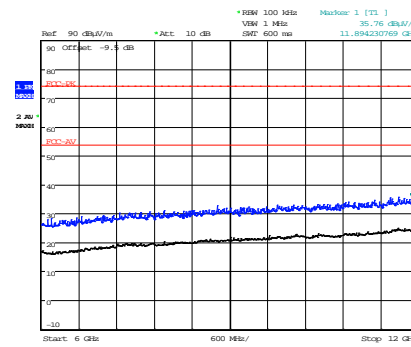


30MHz -1GHz



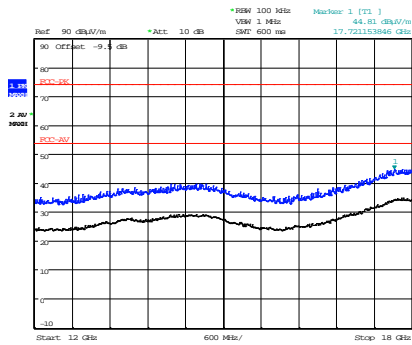
Date: 14.APR.2014 14:34:12

1GHz - 6GHz



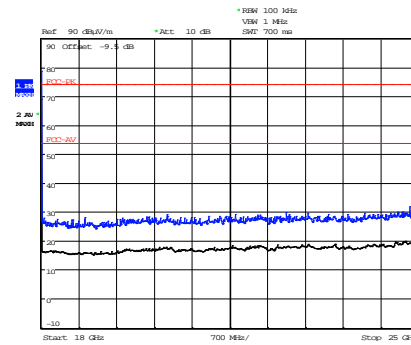
Date: 14.APR.2014 14:34:26

6GHz - 12GHz



Date: 14.APR.2014 14:34:40

12GHz - 18GHz



Date: 14.APR.2014 14:56:24

18GHz - 25GHz

Appendix C:**Additional Test and Sample Details**

This appendix contains details of:

1. The samples submitted for testing.
2. Details of EUT operating mode(s)
3. Details of EUT configuration(s) (see below).
4. EUT arrangement (see below).

Throughout testing, the following numbering system is used to identify the sample and it's modification state:

Sample No: Sxx Mod w

where:

xx	= sample number	eg. S01
w	= modification number	eg. Mod 2

The following terminology is used throughout the test report:

Support Equipment (SE) is any additional equipment required to exercise the EUT in the applicable operating mode. Where relevant SE is divided into two categories:

SE in test environment: The SE is positioned in the test environment and is not isolated from the EUT (e.g. on the table top during REFE testing).

SE isolated from the EUT: The SE is isolated via filtering from the EUT. (e.g. equipment placed externally to the ALSR during REFE testing).

EUT configuration refers to the internal set-up of the EUT. It may include for example:

- Positioning of cards in a chassis.
- Setting of any internal switches.
- Circuit board jumper settings.
- Alternative internal power supplies.

Where no change in EUT configuration is **possible**, the configuration is described as "single possible configuration".

EUT arrangement refers to the termination of EUT ports / connection of support equipment, and where relevant, the relative positioning of samples (EUT and SE) in the test environment.

For further details of the test procedures and general test set ups used during testing please refer to the related document "EMC Test Methods - An Overview", which can be supplied by TRaC Global Ltd upon request.

C1) Test samples

The following samples of the apparatus were submitted by the client for testing :

Sample No.	Description	Identification
S07	sETRX357-LRS Module with Chip Antenna	DoM : 3302304
S09	sETRX357HR-LRS Module with Antenna Port	DoM : 3301306
S01	Half-wave Antenna (with SMA connector)	None
S05	Quarter-wave Antenna (with SMA connector)	None

The following samples of the apparatus were submitted by the client as support equipment (SE)

Sample No.	Description	Identification
S02	Telegesis Host Board	R303
-	Mini-USB cable	None

The following equipment was supplied by TRaC and used as support equipment (SE)

Sample No.	Description	Identification
-	hp Laptop	CNU7523BKR

C2) EUT Operating Mode During Testing.

During testing, the EUT was exercised as described in the following tables:

Test	Description of Operating Mode: Transmit
With Chip Antenna - All tests, except as described below	The Following EUT settings were entered via Telegesis Terminal: Settxpowmode 0 1 Settxpower -7 (-8 was used on ch25 and -1A on ch26) Setchannel (11 / 19 / 24 / 25 / 26 were used) TxStream
With Quarter Wave Antenna - All tests, except as described below	The Following EUT settings were entered via Telegesis Terminal: Settxpowmode 0 1 Settxpower -8 (-9 was used on ch25 and -1A on ch26) Setchannel (11 / 19 / 24 / 25 / 26 were used) TxStream
With Half Wave Antenna - All tests, except as described below	The Following EUT settings were entered via Telegesis Terminal: Settxpowmode 0 1 Settxpower -9 (-0A was used on ch25 and -2B on ch26) Setchannel (11 / 19 / 24 / 25 / 26 were used) TxStream

Test	Description of Operating Mode: Transmit
Conducted Spurious Emissions	The Following EUT settings were entered via Telegesis Terminal: Settxpowmode 0 1 Settxpower -7 (-8 was used on ch25 and -1A on ch26) Setchannel (11 / 19 / 24 / 25 / 26 were used) TxStream

Test	Description of Operating Mode: Receive/Standby mode
Receiver Spurious Emissions	EUT in permanent receive mode on bottom, middle and top channels in turn.

C3) EUT Configuration Information.

The EUT was submitted for testing in one single possible configuration.

Three antennas were supplied and were used for radiated testing.

C4) List of EUT Ports

The tables below describe the termination of EUT ports:

Sample : S02
 Tests : Radiated Electric Field Emissions

Port	Description of Cable Attached	Cable length	Equipment Connected
Module	None	-	Module under test (S07 / S09)
Mini USB	Mini USB lead	1m	hp Laptop

Sample : S02
 Tests : RF Antenna Port Conducted Spurious Emissions, 6dB Bandwidth, Power Spectral Density and Conducted Fundamental Carrier Power

Port	Description of Cable Attached	Cable length	Equipment Connected
Module	None	-	Module under test (S07 / S09)
Mini USB	Mini USB lead	1m	hp Laptop

Sample : S09
 Tests : Radiated Electric Field Emissions

Port	Description of Cable Attached	Cable length	Equipment Connected
Module	None	-	S02
Antenna Port	Coax uFL to SMA cable	10cm	Antenna (S01 / S05)

Sample : S09
 Tests : RF Antenna Port Conducted Spurious Emissions, 6dB Bandwidth, Power Spectral Density and Conducted Fundamental Carrier Power

Port	Description of Cable Attached	Cable length	Equipment Connected
Module	None	-	S02
Antenna Port	Coax uFL to SMA cable	10cm	Antenna (S01 / S05)

S07 was fitted with a Chip antenna and had no other connections when fitted into S02.

C5 Details of Equipment Used

For Radiated Measurements:

TRAC REF/RFG No.	Type	Description	Manufacturer	Date Calibrated.
UH191	CBL611/A	Bilog	Chase	13/11/2012
L138	3115	1-18GHz Horn	EMCO	17/10/2013
L352	ESVS10	Receiver	R&S	13/01/2014
L572	8449B	Pre Amp	Agilent	11/02/2014
UH281	FSU46	Spectrum Analyser	R&S	26/02/2014
L300	20240-20	Horn 18-26GHz (&UH330)	Flann	10/02/2014
REF909	FSU26	Spectrum Analyser	R&S	12/02/2014
REF940	ATS	Radio Chamber - PP	Rainford EMC	09/07/2013
REF977	SH4141	High Pass Filter	BSC	25/02/2013

For Conducted Measurements

TRAC REF/RFG No.	Type	Description	Manufacturer	Date Calibrated.
REF909	FSU26	Spectrum Analyser	R&S	12/02/2014
REF916	SMBV100A	Signal Generator	R&S	19/02/2014

Appendix D:

Additional Information

The following antenna data sheets were provided.



Rufa 2.4 GHz SMD Antenna

Part No. A5839 / A5887

Product Specification

1 Features

- Designed for 2.4 GHz applications: Bluetooth®, Wi-Fi® (802.11b/g), ZigBee®, etc.
- Easy to integrate
- Low profile design for use with no ground beneath the antenna
- High efficiency
- Light weight
- Intended for SMD mounting
- Supplied in tape on reel

2 Description

Rufa is intended for use with all 2.4 GHz applications. The antenna uses a ground plane in order to radiate efficiently, but this ground plane must not extend underneath the antenna itself.

The antenna is available in two versions with the feed locations on the right or left hand side of the antenna.

3 Applications

- Mobile phones
- PDAs
- PNDs
- Headsets
- PMPs / MP3s
- Laptops
- PC-Cards
- Sensors



Antennas for Wireless M2M Applications

1
Product Specification AE020157-O

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

4 Part numbers

Rufa Left: A5839



Rufa Right: A5887



5 General data

Product name	Rufa 2.4 GHz
Part Number	A5839 (Left)
	A5887 (Right)
Frequency	2.4 – 2.5 GHz
Polarization	Linear
Operating temperature	-40 °C to +85 °C
Impedance with matching	50 Ω
Weight	0.1 g
Antenna type	SMD
Dimensions	12.8 x 3.9 x 1.1 [mm]

6 Electrical characteristics

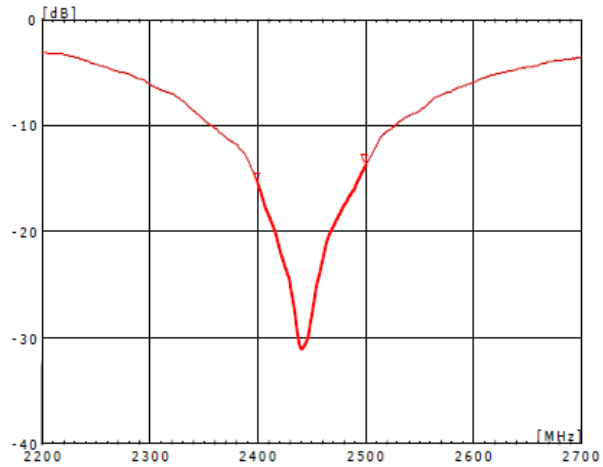
	Typical performance	Conditions
Peak gain	2.1 dBi	All data measured on Antenova's reference boards, part numbers A5839-U1 and A5887-U1 Data given for the 2.4 – 2.5 GHz frequency range
Average gain	-1.2 dBi	
Average efficiency	75%	
Maximum Return Loss	-11 dB	
Maximum VSWR	1.8:1	

Antennas for Wireless M2M Applications

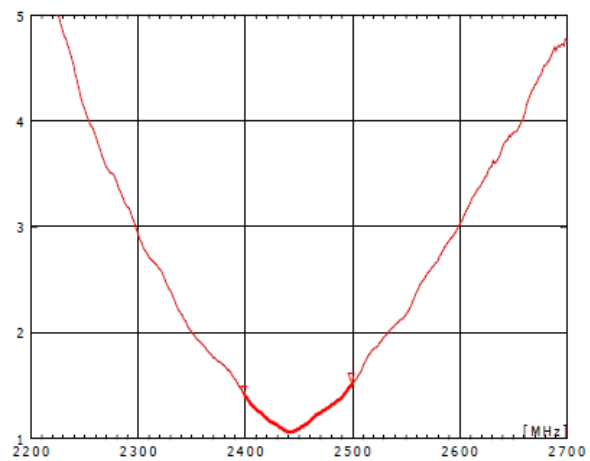
Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

7 Electrical performance

7-1 Return Loss



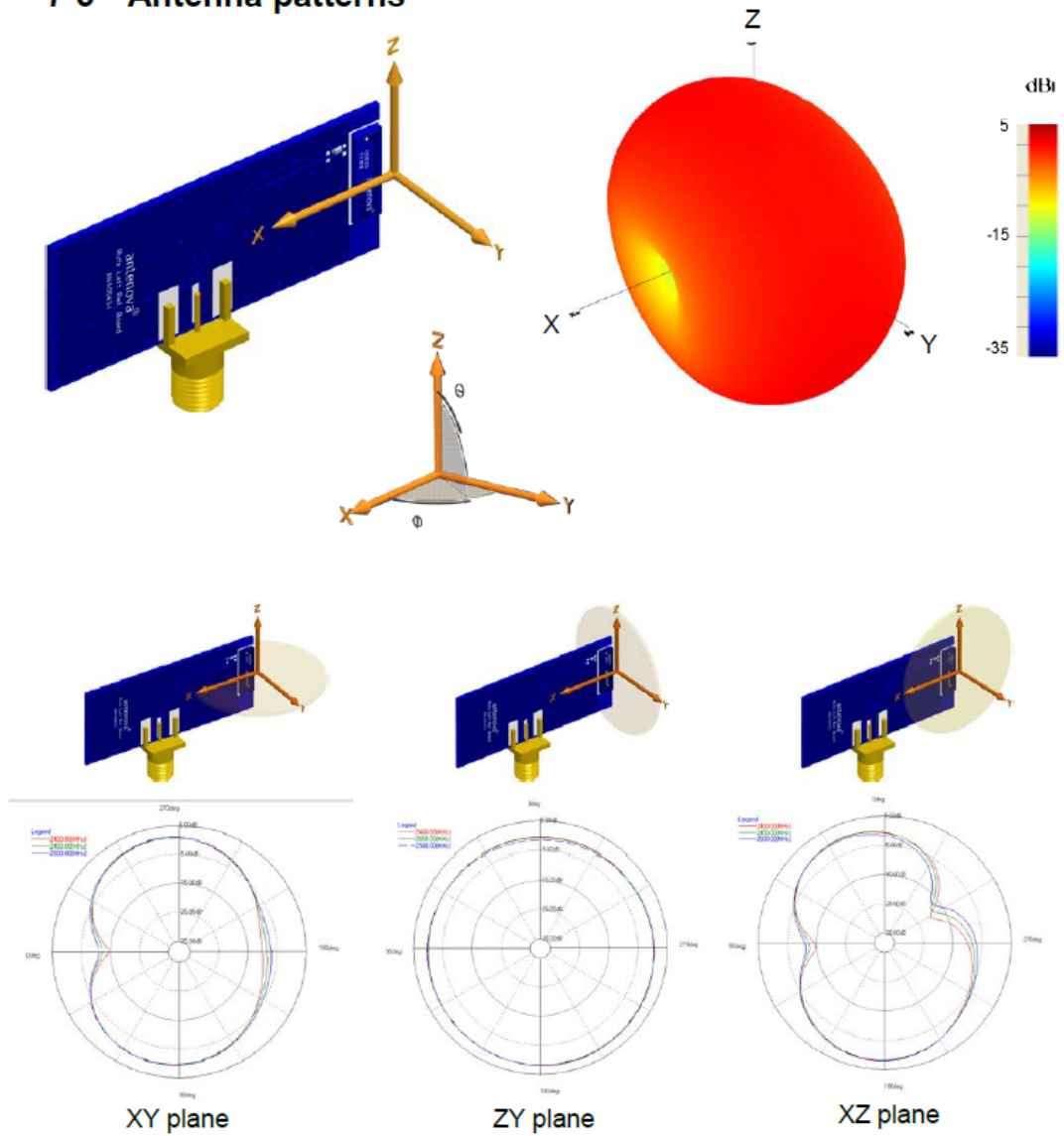
7-2 VSWR



Antennas for Wireless M2M Applications

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

7-3 Antenna patterns

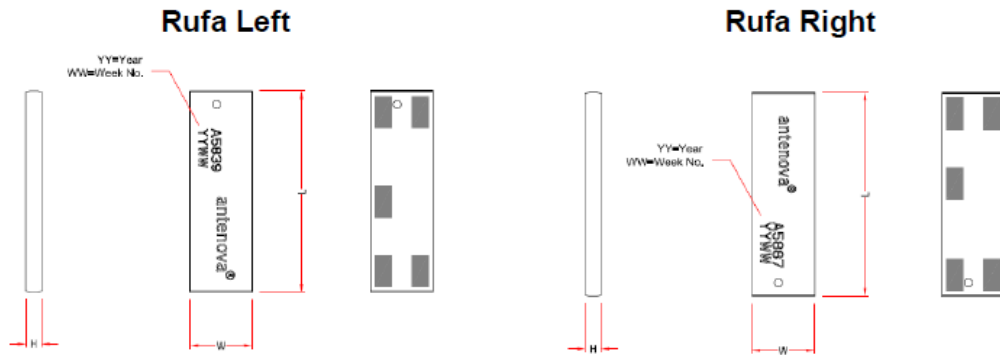


Patterns show combined polarisations
measured on reference board A5839-U1

Antennas for Wireless M2M Applications

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

8 Antenna dimensions



L	W	H
Length	Width	Height
12.8 ± 0.2	3.9 ± 0.2	1.1 ± 0.2

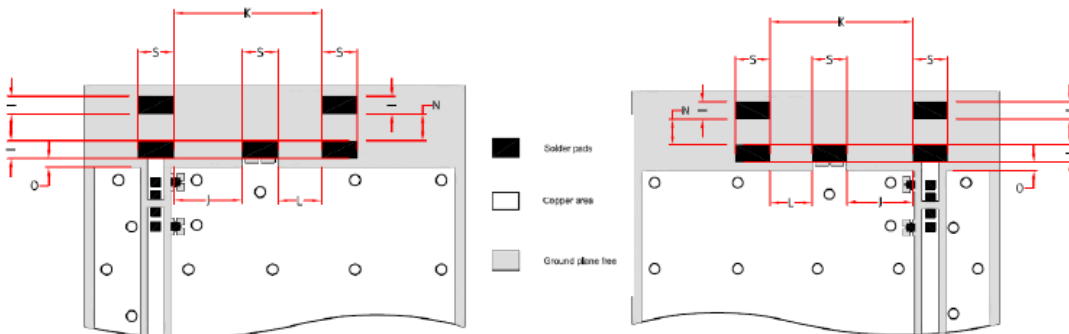
Dimensions in mm

9 Antenna footprint

Rufa Left (Part No: A5839)

Rufa Right (Part No: A5887)

* CAD files of the antenna footprint are available from Antenova M2M on request.



Please contact sales@antenova-m2m.com for further details.

I	S	K	J	N	L	O
1.0 ± 0.1	2.0 ± 0.1	8.1 ± 0.1	3.7 ± 0.1	1.3 ± 0.1	2.4 ± 0.1	0.5 ± 0.1

Dimensions in mm

Antennas for Wireless M2M Applications

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

10 Electrical interface

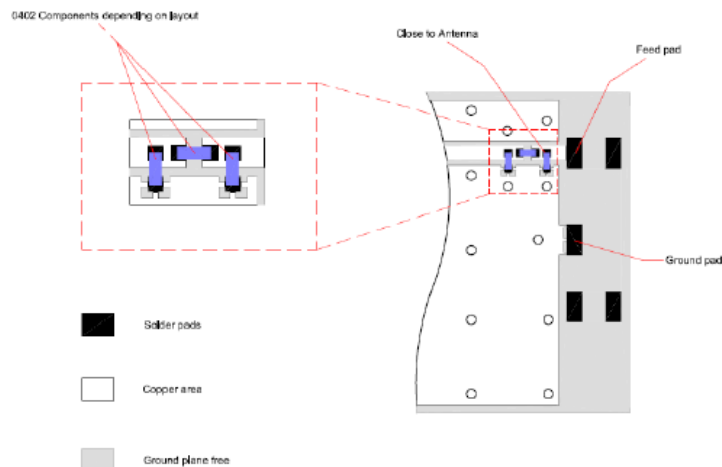
10-1 Transmission lines

- All transmission lines should be designed to have a characteristic impedance of 50 Ω
- The length of the transmission lines should be kept to a minimum
- Any other parts of the RF system like transceivers, power amplifiers, etc, should also be designed to have an impedance of 50 Ω

Once the material for the PCB has been chosen (PCB thickness and dielectric constant), a coplanar transmission line can easily be designed using any of the commercial software packages for transmission line design. For the chosen PCB thickness, copper thickness and substrate dielectric constant, the program will calculate the appropriate transmission line width and gaps on either side of the track so the characteristic impedance of the coplanar transmission line is 50 Ω .

10-2 Matching circuit

The antenna requires a matching circuit that must be optimized for each customer's product. The matching circuit will require up to three components and the following pad layout should be designed into the device so the correct circuit can be installed:



The antenna feed pad and the antenna ground pad are indicated in the drawing above. Additional pads are for mechanical attachment only and should not be grounded.

Antennas for Wireless M2M Applications

6

Product Specification AE020157-O

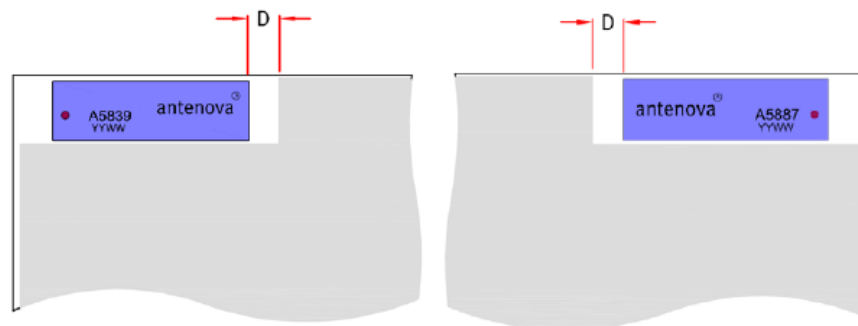
Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

In addition to the matching circuit, a separate DC blocking capacitor will also be required between the radio and the antenna matching circuit.

Note: The component values for the matching circuit will vary depending on the size of the PCB and surrounding components. The impedance of the antenna should be measured before selecting suitable matching components. Antenova M2M offers this service on request. Contact sales@antenova-m2m.com for further information.

10-3 Antenna placement

Antenova M2M strongly recommends placing the antenna near the edge of the board. Maximum antenna performance is achieved by placing the antenna towards one of the corners of the PCB and with the feed point of the antenna as close to same corner of the PCB as possible.



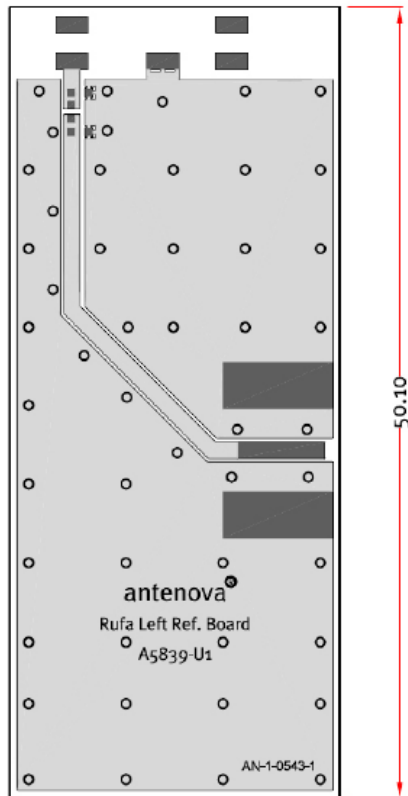
Additional ground and components near the antenna should be at a distance of at least 2 mm. Where possible the antenna should be clear of ground from both sides, although the antenna can work well with a minimum clearance of $D \geq 2$ mm as shown in the drawing above.

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

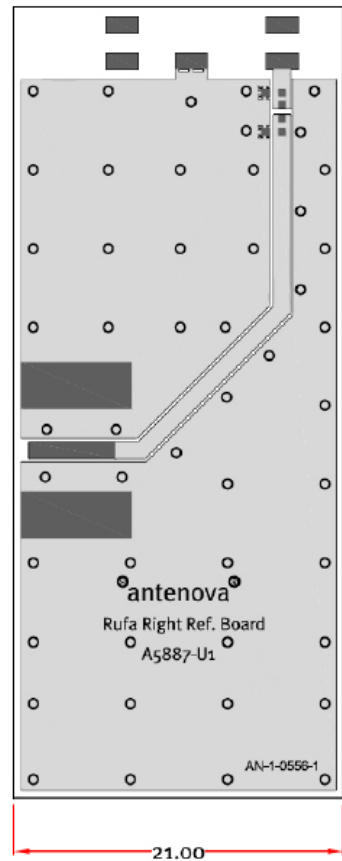
10-4 Reference boards

The reference boards have been designed for evaluation purposes of Rufa 2.4 GHz and they include a SMA female connector

Rufa Left



Rufa Right



Dimensions in mm

To order a reference board contact sales@antenna-m2m.com.

Antennas for Wireless M2M Applications

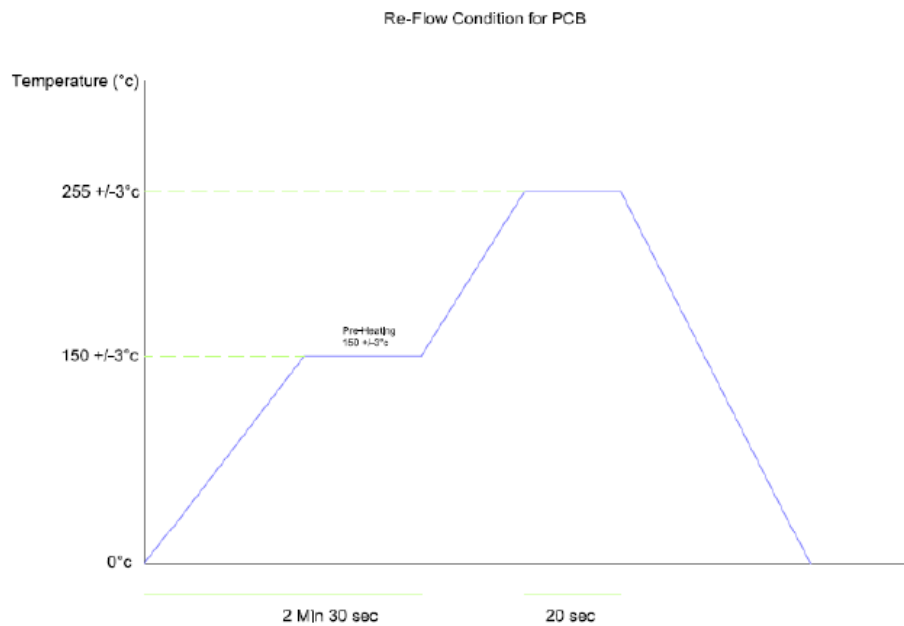
Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

11 Soldering

This antenna is suitable for lead free soldering.

The reflow profile should be adjusted to suit the device, oven and solder paste, while observing the following conditions:

- The maximum temperature should not exceed 240 °C
- However for lead free soldering, a maximum temperature of 255 °C for no more than 20 seconds is permitted.
- The antenna should not be exposed to temperatures exceeding 120 °C more than 3 times during the soldering process.



12 Hazardous material regulation conformance

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available from Antenova's website.

Antennas for Wireless M2M Applications

9

Product Specification AE020157-O

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

13 Packaging

13-1 Optimal storage conditions for packaged reels

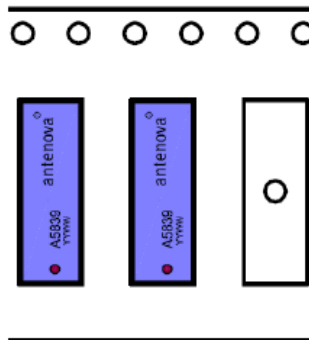
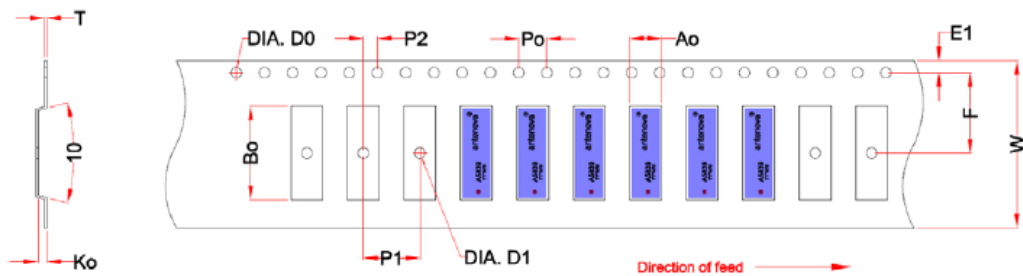
Temperature	-10°C to 40°C
Humidity	Less than 75% RH
Shelf Life	18 Months
Storage place	Away from corrosive gas and direct sunlight
Packaging	Reels should be stored in unopened sealed manufacturer's plastic packaging.

Note: Storage of open reels of antennas is not recommended due to possible oxidization of pads on antennas. If short term storage is necessary, then it is highly recommended that the bag containing the antenna reel is re-sealed and stored in like storage conditions as in above table.

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

13-2 Tape characteristics

Rufa Left
[Part Number: A5839]



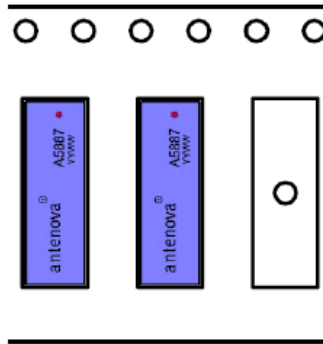
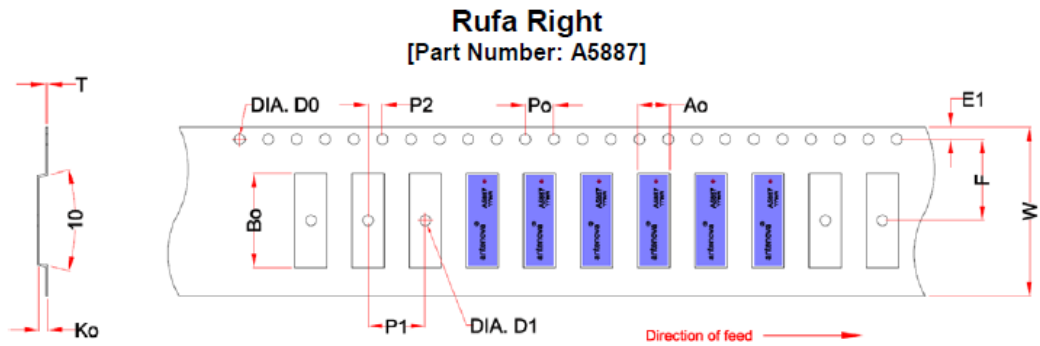
W	F	E1	P0	P1	P2	A0	B0	K0	T	D0	D1
24 ± 0.2	11.5 ± 0.1	1.75 ± 0.1	4 ± 0.1	8 ± 0.1	2 ± 0.1	4.3 ± 0.1	13.1 ± 0.1	1.4 ± 0.1	0.3 ± 0.05	Min 1.5	Min 1.5

Dimensions in mm

Quantity	Leading Space	Trailing Space
1000 pcs / reel	50 blank antenna holders	37 blank antenna holders

Antennas for Wireless M2M Applications

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887



W	F	E1	P0	P1	P2	A0	B0	K0	T	D0	D1
24 ± 0.2	11.5 ± 0.1	1.75 ± 0.1	4 ± 0.1	8 ± 0.1	2 ± 0.1	4.3 ± 0.1	13.1 ± 0.1	1.4 ± 0.1	0.3 ± 0.05	Min 1.5	Min 1.5

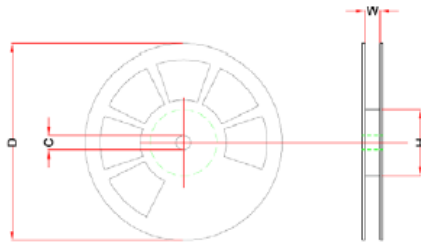
Dimensions in mm

Quantity	Leading Space	Trailing Space
1000 pcs / reel	50 blank antenna holders	37 blank antenna holders

Antennas for Wireless M2M Applications

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887

13-3 Reel dimensions



Width (W)	Reel Diameter (D)	Hub Diameter (H)	Shaft Diameter (C)
24 mm	180 mm (7")	60 mm (2")	13 mm

13-4 Box dimensions



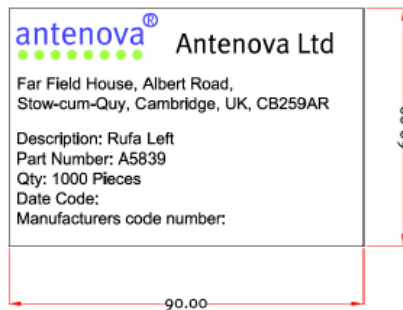
Width (W)	Breadth (B)	Thickness (H)
203 mm	188 mm	40 mm

13-5 Bag properties

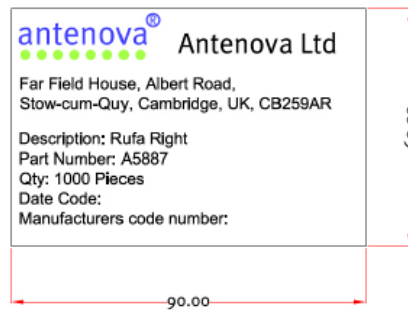
Reels are supplied in protective plastic packaging

13-6 Reel label information

Rufa Left



Rufa Right



Dimensions in mm

Antennas for Wireless M2M Applications

Rufa 2.4 GHz SMD Antenna
Part No. A5839 / A5887



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Certificate No: 4598

Antennas for Wireless M2M Applications

14

Product Specification AE020157-O
Release Date 08 February 2013

Product Specification



BT-Stubby

2.4 GHz 1/4 Wave
Stubby Antenna

Features

- 1/4 Wave Stubby Antenna
- Straight SMA Connector
- Groundplane Dependent
- Ideal for fixed and mobile devices

Specifications

Radiating element	1/4 Wave Helical
Frequency range	2.4 - 2.5 GHz
Peak gain	0 dBI
Polarisation	Linear
Return Loss	-14 dB
Impedance	50 Ohm
Cable / Connector	SMA-Male
Dimensions	33 x 8.3 mm (max)

Ordering Options

FBTS35024-SM-ST	BT-Stubby with SMA-Male ST Connector
-----------------	--------------------------------------

Specifications subject to change without notice.

5 Little Balmer
Buckingham Industrial Park
Buckingham
MK18 1TF
UK

Tel: +44 (0)1280 824055
Fax: +44 (0)1280 817179
Email: sales@ead-ltd.com
Web: www.ead-ltd.com

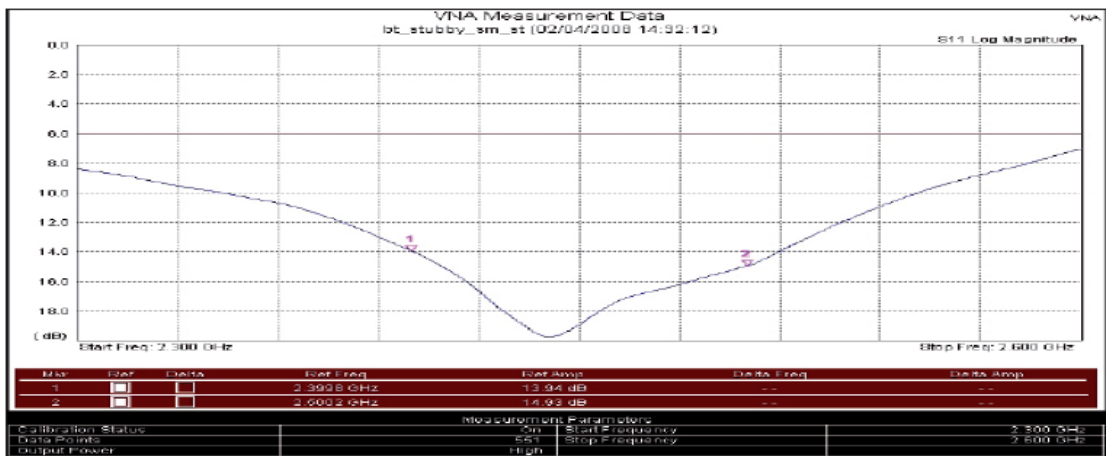
EAD 
embedded antenna design ltd
Delivering Antenna Innovation

www.ead-ltd.com

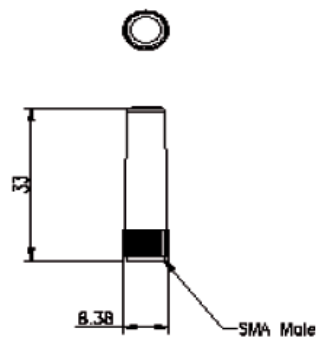


BT-Stubby | 2.4 GHz Stubby ST Antenna

Return Loss



Outline Drawing



Specifications subject to change without notice.

5 Little Balmer
Buckingham Industrial Park
Buckingham
MK18 1TF
UK

Tel: +44 (0)1280 824055
Fax: +44 (0)1280 817179
Email: sales@ead-ltd.com
Web: www.ead-ltd.com

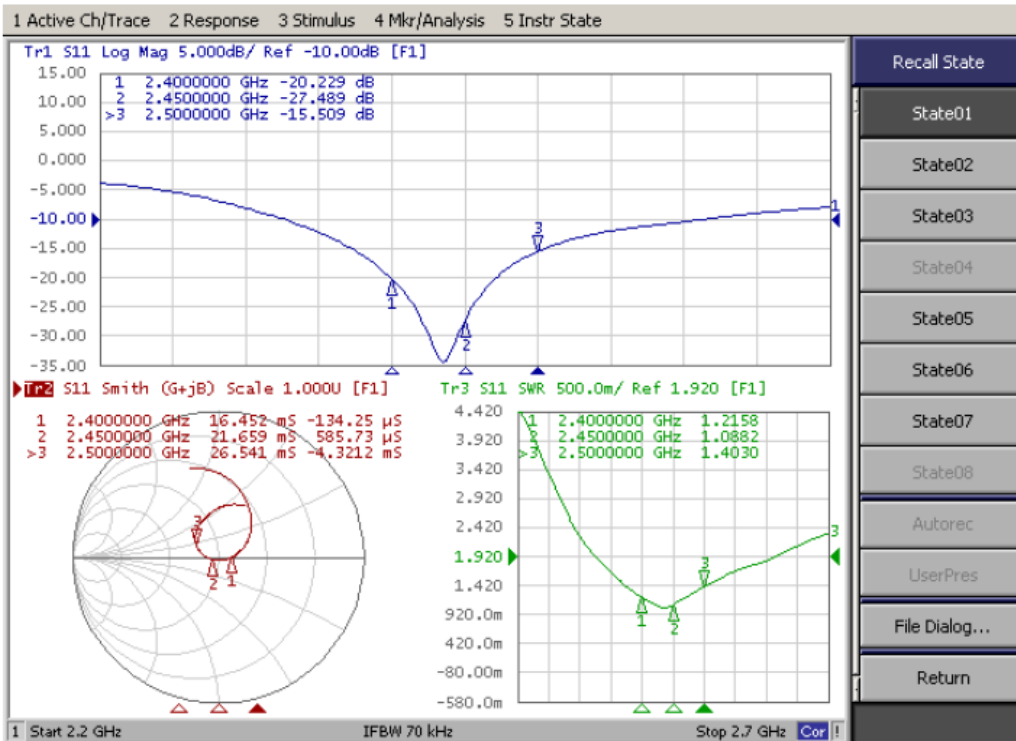
EAD
embedded antenna design ltd
Delivering Antenna Innovation

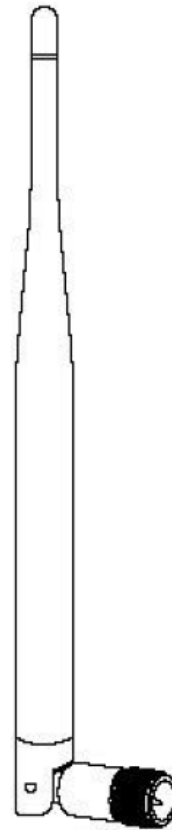
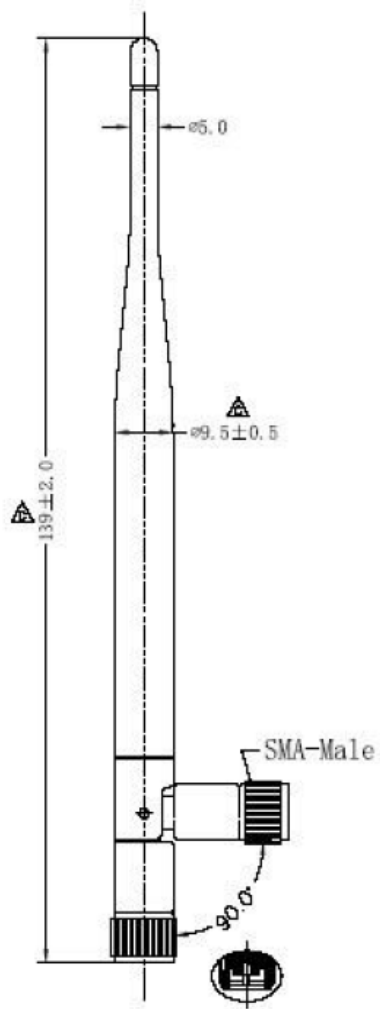
倍增器天线 AP Antenna

单号:

型号 Model CJ-2400-6603

主要技术参数	Main Technical Specifications	
频率范围	Frequency	2400-2500MHz
驻波比	VSWR	≤1.5
增益	Gain ← Peak Gain	2.0 dBi
极化形式	Polarization Type	Vertical
最大功率	Rated power	50w
输入阻抗	Input Impedance	50 Ω
接口形式	Connector Type	SMA male
天线尺寸	Dimensions	Φ10X138 (mm)
重量	Weight	10.4g





MECHANICAL

Antenna Cover:PU

Antenna Base:PC UL94V-0

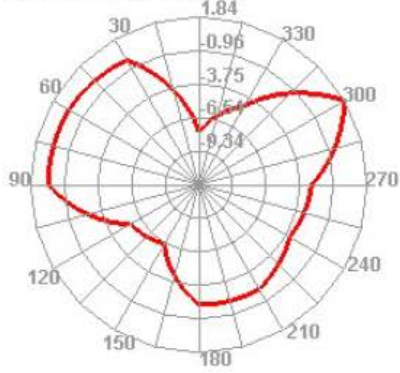
ELECTRICAL

FRQUENEY:2.4GHZ

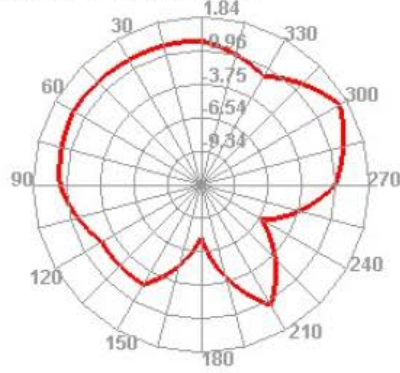
Connector:SMA-Male

Color:Black

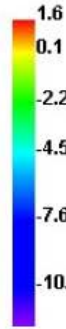
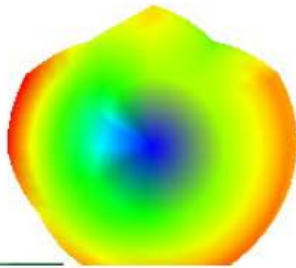
2400.000MHz E1



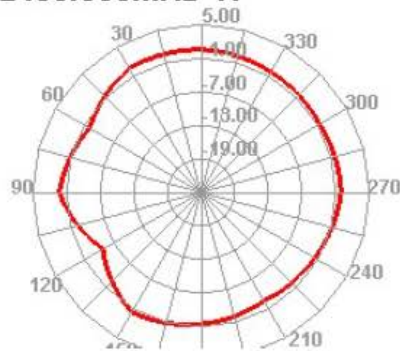
2400.000MHz E2



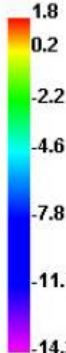
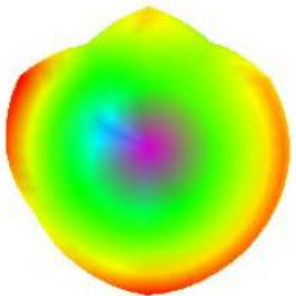
2450.000MHz



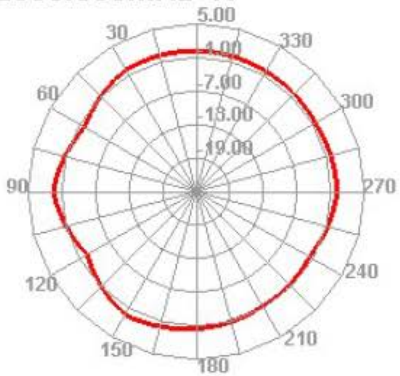
2450.000MHz H



2500.000MHz



2500.000MHz H



Appendix E:

Photographs and Figures

The following photographs are included to support this assessment:

1. Radiated test set-up Chip Antenna – Wide view
2. Radiated test set-up Chip Antenna – Close view
3. Radiated test set-up Quarter-wave Antenna – Wide view
4. Radiated test set-up Quarter-wave Antenna – Close view
5. Radiated test set-up Half-wave Antenna – Wide view
6. Radiated test set-up Half-wave Antenna – Close view

Photograph 1



Photograph 2



Photograph 3



Photograph 4



Photograph 5



Photograph 6



Appendix F:**MPE Calculation**

OET Bulletin No. 65, Supplement C 01-01

47 CFR §§1.1307 and 2.1091 & RSS - 102

2.1091 Radio frequency radiation exposure evaluation: mobile devices.

For purposes of these requirements mobile devices are defined by the FCC as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimetres is normally maintained between radiating structures and the body of the user or nearby persons. These devices are normally evaluated for exposure potential with relation to the MPE limits. As the 20cm separation specified under FCC rules may not be achievable under normal operation of the EUT, an RF exposure calculation is needed to show the minimum distance required to be less than 1 mW/cm² power density limit, as required under FCC rules and 10W/m² power density limit, as required under IC rules.

$$1\text{mW/cm}^2 \quad \equiv \quad 10\text{W/m}^2$$

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{EIRP}{4\pi R^2} \quad \text{re - arranged} \quad R = \sqrt{\frac{EIRP}{S 4\pi}}$$

where:

S = power density

R = distance to the centre of radiation of the antenna

EIRP = EUT Maximum power

Note:

The EIRP measurement was performed using the peak conducted power measurement in conjunction with the maximum declared antenna gain.

Result

Prediction Frequency (MHz)	Maximum EIRP (mW)	Power density limit (S) (mW/cm ²)	Distance (R) cm required to be less than 1mW/cm ² (cm)
2445	81.66	1	2.6

