Report On

FCC Testing of the
ASH Wireless Electronics Ltd SWB BASE
In accordance with FCC 47 CFR Part 15C

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2AF3J-XOBASE001

Document 75932139 Report 01 Issue 1 November 2015

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REPORT ON

FCC Testing of the
ASH Wireless Electronics Ltd SWB BASE
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Document 75932139 Report 01 Issue 1

November 2015

PREPARED FOR

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PREPARED BY

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APPROVED BY

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Authorised Signatory

DATED 26 November 2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler

M Choudhury

UKAS TESTING 0141

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Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
ASH Wireless Electronics Ltd SWB BASE
In accordance with FCC 47 CFR Part 15C

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the ASH Wireless Electronics Ltd SWB BASE to the requirements of FCC 47 CFR Part 15C.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	ASH Wireless Electronics Ltd
Model Number(s)	AC22-P0004
Serial Number(s)	SN08 SN06
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C (2014)
Incoming Release Date	Application Form 25 September 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO-000129 24 September 2015
Start of Test	5 October 2015
Finish of Test	10 November 2015
Name of Engineer(s)	G Lawler M Choudhury
Related Document(s)	ANSI C63.10: 2013 KDB 558074 D01 v03r03

Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Transmit				
2.1	15.207	AC Line Conducted Emissions	Pass	
2.2	15.247 (a)(2)	6 dB Bandwidth	Pass	
2.3	15.247 (b)(4)	Peak EIRP	Pass	
2.4	15.247 (d), 15.205 and 15.209	Spurious Radiated Emissions	Pass	
2.5	15.205	Restricted Band Edges	Pass	
2.6	15.247 (d)	Authorised Band Edges	Pass	
2.7	15.247 (e)	Power Spectral Density	Pass	

Product Service

1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	SWB BASE
Part Number	AC22-P0004
Hardware Version	Rev A
Software Version	2.0
FCC ID (if applicable)	2AF3J-XOBASE001
Industry Canada ID (if applicable)	N/A
Technical Description (Please provide a brief description of the intended use of the equipment)	This is a mains powered base station used to send configuration commands to the wristbands with which it communicates wirelessly over the ISM band.

POWER SOURCE			
☒	AC mains	State voltage 110V	
AC supply frequency	60 (Hz)		
110	VAC		
	Max Current		
60	Hz		
☒	Single phase	☐	Three phase
And / Or			
☐	External DC supply		
	Nominal voltage	V	Max Current A
	Extreme upper voltage	V	
	Extreme lower voltage	V	
Battery			
☐	Nickel Cadmium	☐	Lead acid (Vehicle regulated)
☐	Alkaline	☐	Leclanche
☐	Lithium	☐	Other Details :
	Volts nominal.		
End point voltage as quoted by equipment manufacturer		V	

Product Service

FREQUENCY INFORMATION						
Frequency Range	2445 to2460		MHz			
Channel Spacing (where applicable)						
Receiver Frequency Range (if different)	to		MHz			
Channel Spacing (if different)						
Test Frequencies*	Bottom	2445	MHz	Channel Number (if applicable)	19	
	Middle		MHz	Channel Number (if applicable)		
	Top	2460	MHz	Channel Number (if applicable)	22	
Intermediate Frequencies			MHz			
Highest Internally Generated Frequency :			2460 MHz			

POWER CHARACTERISTICS				
Maximum TX power	0.01	W		
Minimum TX power	fixed	W (if variable)		
Is transmitter intended for :				
Continuous duty			☐ Yes	☐ No
Intermittent duty			☒ Yes	☐ No
If intermittent state DUTY CYCLE				
Transmitter ON	700 micro seconds			
Transmitter OFF	500 micro seconds			

ANTENNA CHARACTERISTICS						
☐	Antenna connector			State impedance		Ohm
☐	Temporary antenna connector			State impedance		Ohm
☒	Integral antenna	Type	PCB	State impedance	2	dBi
☐	External antenna	Type		State impedance		dBi

MODULATION CHARACTERISTICS			
☐	Amplitude	☐	Frequency
☒	Phase	☐	Other (please provide details):
Can the transmitter operate un-modulated?		☐ Yes	☒ No

CLASS OF EMISSION USED	
ITU designation or Class of Emission:	
1	2G445G2D / 2G460G2D
(if applicable) 2	
(if applicable) 3	
If more than three classes of emission, list separately:	

BATTERY POWER SUPPLY	
Model name/number	Identification/Part number
Manufacturer	Country of Origin

ANCILLARIES (If applicable)	
Model name/number	Identification/Part number
Manufacturer	Country of Origin

EXTREME CONDITIONS					
Extreme test voltages (Max)	15	V	Extreme test voltages (Mix)	8	V
Nominal DC Voltage	12	V	DC Maximum Current	400mA	A
Maximum temperature	50	°C	Minimum temperature	0	°C

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Name: Steve Williams

Position held: Technical Director Date: 25/09/2015

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a ASH Wireless Electronics Ltd SWB BASE. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 110 V AC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: SN08			
0	As supplied by manufacturer.	N/A	N/A
1	Added low pass filter o the output, removed the 1.8nH inductor and replaced with 9.0nH in series with 0.5pF in the antenna feed line.	Steve Williams	13/10/2015
2	Screening can was fitted over the plug-in board.	Steve Williams	13/10/2015

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Product Service

SECTION 2

TEST DETAILS

FCC Testing of the
ASH Wireless Electronics Ltd SWB BASE
In accordance with FCC 47 CFR Part 15C

2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.207

2.1.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN08 - Modification State 0

2.1.3 Date of Test

12 October 2015

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The test was performed in accordance with ANSI C63.10, clause 6.2.

Remarks

A mains supply cable of 1 m length was used to supply mains power to the EUT from the LISN.

All final measurements were assessed against the Class B emission limits in Clause 15.207 of FCC 47 CFR Part 15.

2.1.6 Environmental Conditions

Ambient Temperature	21.6°C
Relative Humidity	34.0%

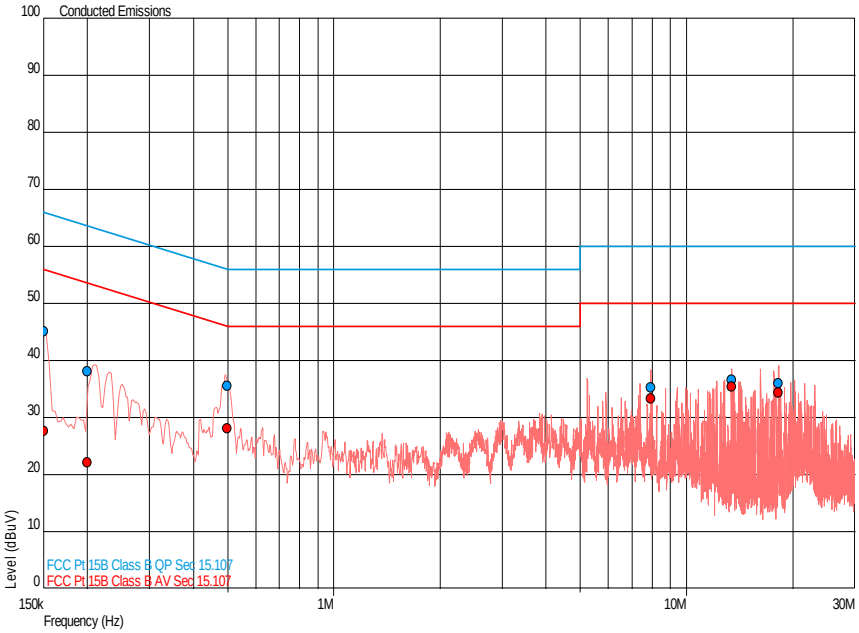
Product Service

2.1.7 Test Results

Transmit, Live Line, AC Line Conducted Emissions Result

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.150	45.1	66.0	-20.9	27.7	56.0	-28.3
0.200	38.2	63.6	-25.4	22.1	53.6	-31.5
0.499	35.6	56.0	-20.4	28.1	46.0	-17.9
7.924	35.3	60.0	-24.7	33.4	50.0	-16.6
13.420	36.7	60.0	-23.3	35.5	50.0	-14.5
18.240	36.0	60.0	-24.0	34.4	50.0	-15.6

Transmit, Live Line, AC Line Conducted Emissions Plot

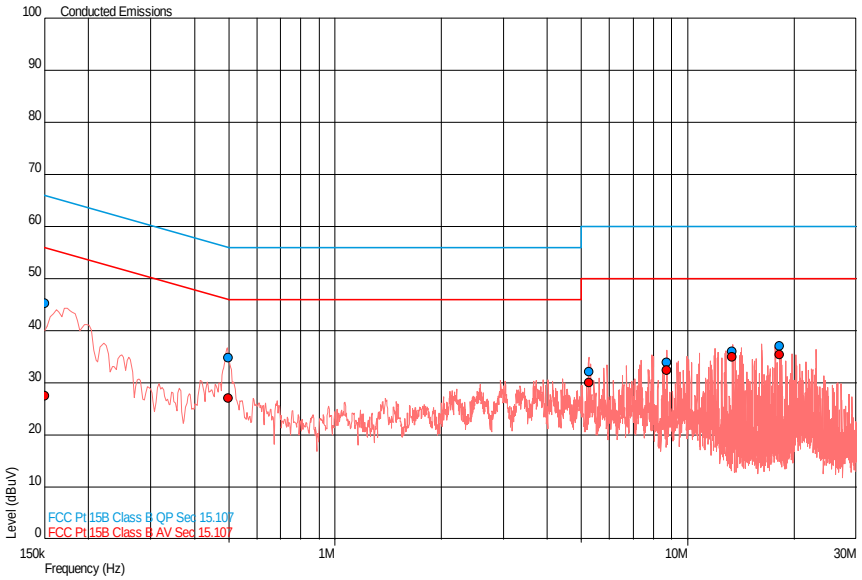


Product Service

Transmit, Neutral Line, AC Line Conducted Emissions Result

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.150	45.3	66.0	-20.7	27.5	56.0	-28.5
0.498	34.9	56.0	-21.2	27.1	46.0	-18.9
5.237	32.2	60.0	-27.8	30.1	50.0	-19.9
8.717	34.0	60.0	-26.0	32.5	50.0	-17.5
13.358	36.1	60.0	-23.9	35.0	50.0	-15.0
18.244	37.2	60.0	-22.8	35.4	50.0	-14.6

Transmit, Neutral Line, AC Line Conducted Emissions Plot



FCC 47 CFR Part 15, Limit Clause 15.207

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

2.2 6 dB BANDWIDTH

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)

2.2.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN06 - Modification State 0

2.2.3 Date of Test

5 October 2015

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

The test was performed in accordance with KDB 558074 D01 v03r03, clause 8.2.

Remarks

Preliminary checks were performed to determine the data rate with the widest bandwidth.

2.2.6 Environmental Conditions

Ambient Temperature	25.1°C
Relative Humidity	56.5 - 56.6%

Product Service

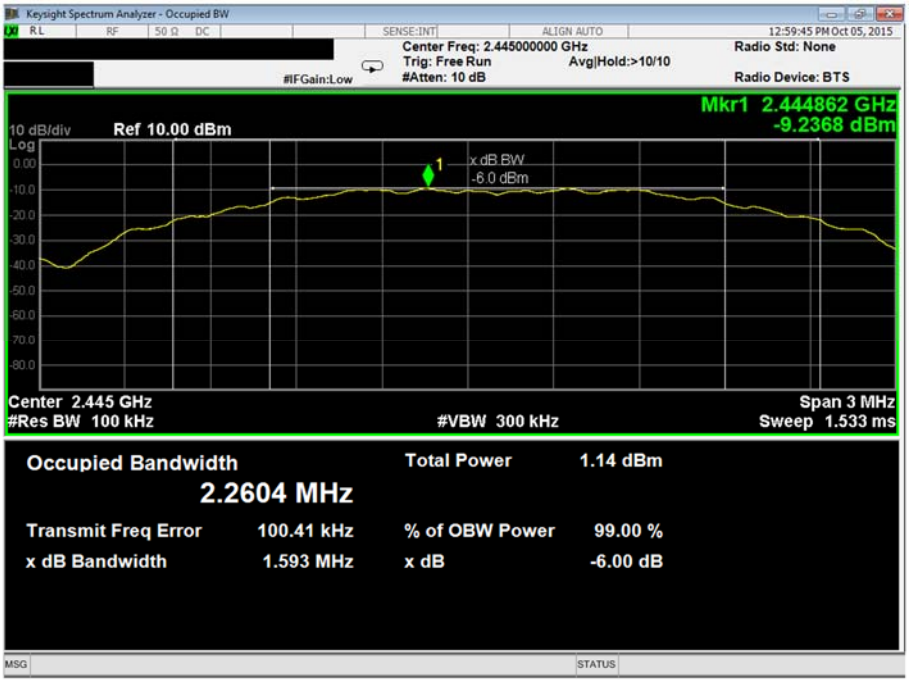
2.2.7 Test Results

110 V AC Supply

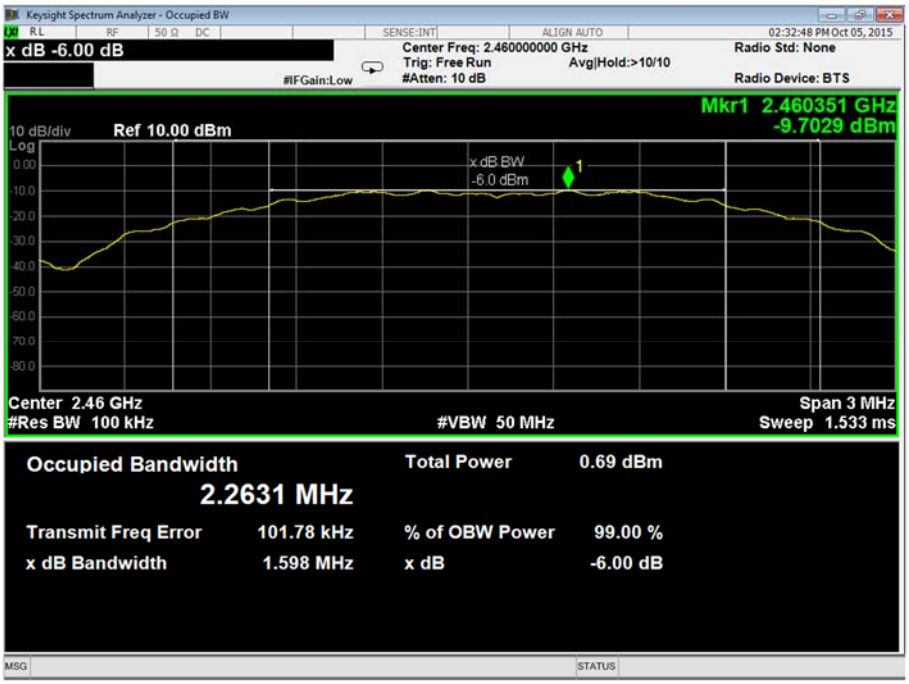
Transmit, DSSS, Phase Modulation, 6 dB Bandwidth Results

2445 MHz	2460 MHz
kHz	kHz
1593	1598

Transmit, 2445 MHz, DSSS, Phase Modulation, 6 dB Bandwidth Plot



Transmit, 2460 MHz, DSSS, Phase Modulation, 6 dB Bandwidth Plot



FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

The minimum 6 dB Bandwidth shall be at least 500 kHz.

2.3 PEAK EIRP

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)(4)

2.3.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN08 - Modification State 1

2.3.3 Date of Test

18 October 2015

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Procedure

The test was performed in accordance with ANSI C63.10, Clauses 6.3 and 11.9.1.

Remarks

The plots on the following pages are for illustration purposes only. The final measured result is obtained after a substitution procedure.

2.3.6 Environmental Conditions

Ambient Temperature	20.7°C
Relative Humidity	40.0%

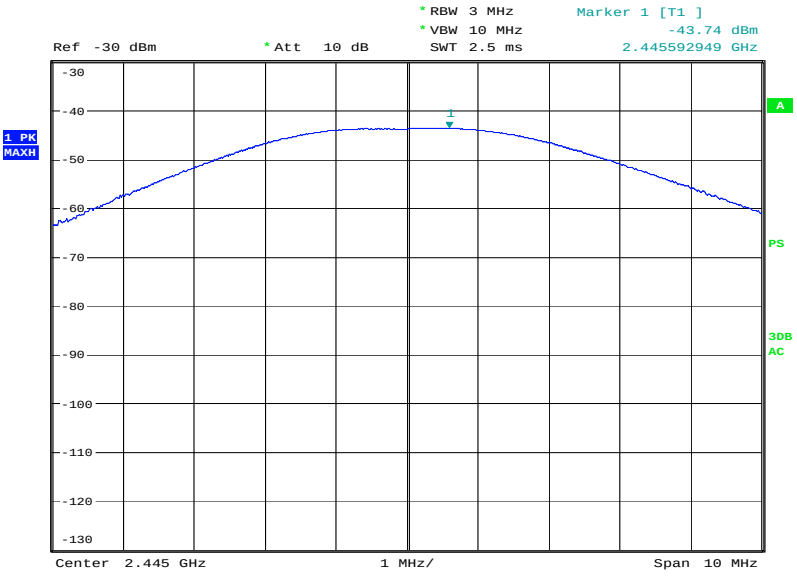
Product Service

2.3.7 Test Results

Transmit, EIRP Peak Power Results

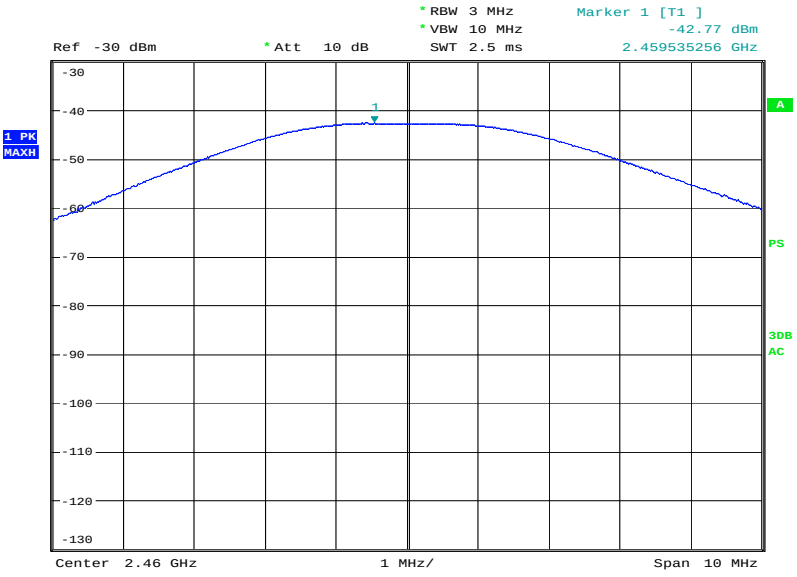
2445 MHz		2460 MHz	
dBm	mW	dBm	mW
-1.55	0.70	-2.17	0.61

Transmit, 2445 MHz, EIRP Peak Power Plot



Date: 18.OCT.2015 13:04:44

Transmit, 2460 MHz, EIRP Peak Power Plot



Date: 18.OCT.2015 12:21:34

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(4)

36.0 dBm or 4000 mW

2.4 SPURIOUS RADIATED EMISSIONS

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d), 15.205 and 15.209

2.4.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN08 - Modification State 2

2.4.3 Date of Test

14 October 2015, 18 October 2015 & 10 November 2015

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

The test was performed in accordance with ANSI C63.10 clauses 4.1.4.2.2, 6.3, 6.5, 6.6, 11.11 and 11.12.1.

2.4.6 Environmental Conditions

Ambient Temperature	20.7 - 22.3°C
Relative Humidity	34.0 - 45.0%

Product Service

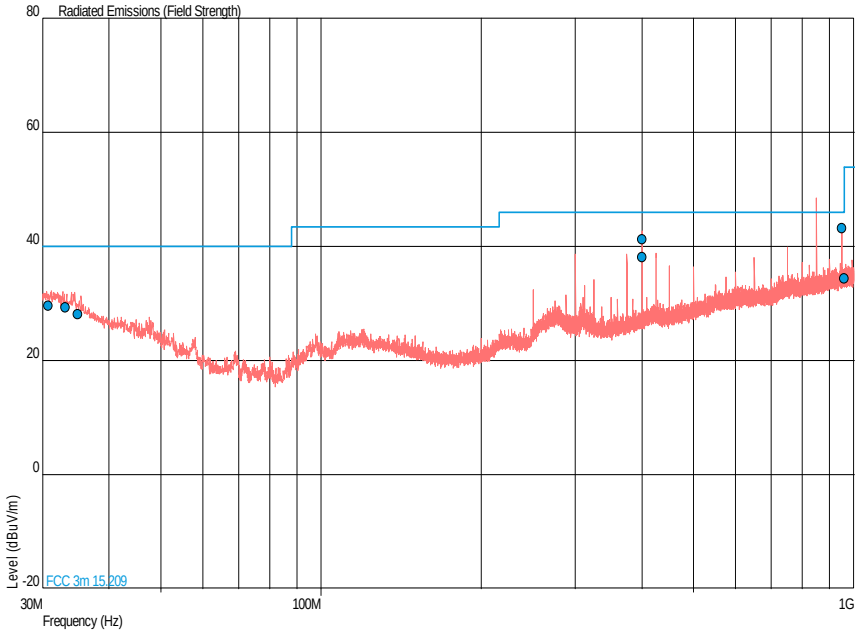
2.4.7 Test Results

110 V AC Supply

Transmit, 2445 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.757	29.6	-10.4	30.2	-69.8	251	1.00	Vertical
33.169	29.3	-10.7	29.2	-70.8	39	1.00	Horizontal
34.919	28.1	-11.9	25.4	-74.6	161	1.00	Horizontal
399.993	41.3	-4.7	116.1	-83.9	138	1.00	Horizontal
400.013	38.2	-7.8	81.3	-118.7	134	1.32	Vertical
950.012	43.2	-2.8	144.5	-55.5	232	1.00	Horizontal
960.000	34.4	-11.6	52.5	-147.5	164	1.15	Horizontal

Transmit, 2445 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot



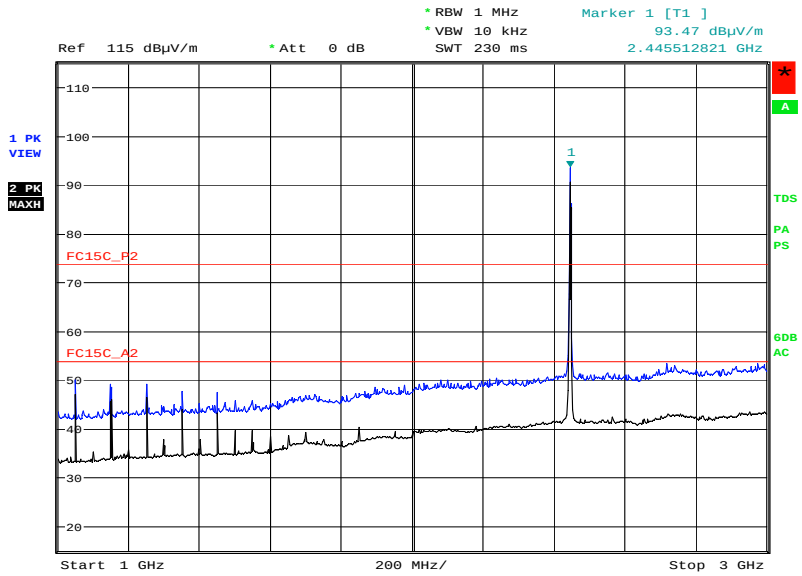
Product Service

Transmit, 2445 MHz, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
1050.013	50.81	46.91	347.14	221.56	221	1.15	Vertical
1150.160	50.54	45.50	336.51	188.36	189	1.00	Vertical
4891.139	57.59	50.35	757.70	329.23	265	1.92	Vertical
4912.197	50.00	49.57	316.23	300.95	61	1.92	Horizontal
7336.649	60.53	52.75	1062.92	434.01	271	2.32	Vertical

No other emissions were detected within 10 dB of the limit.

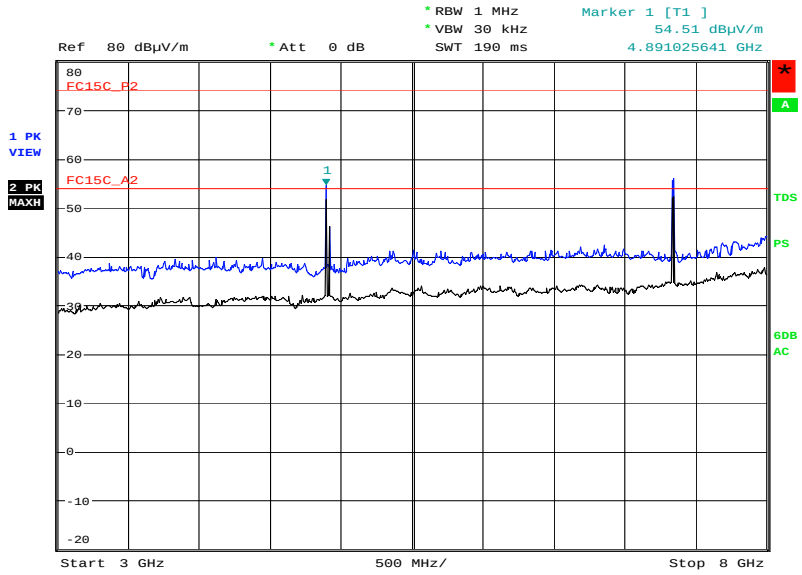
Transmit, 2445 MHz, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



Date: 18.OCT.2015 13:26:55

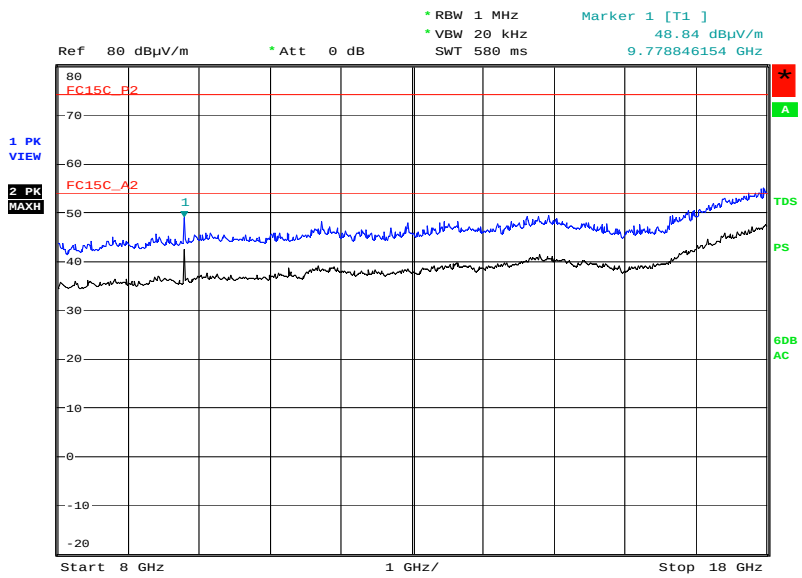
Product Service

Transmit, 2445 MHz, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



Date: 14.OCT.2015 19:01:43

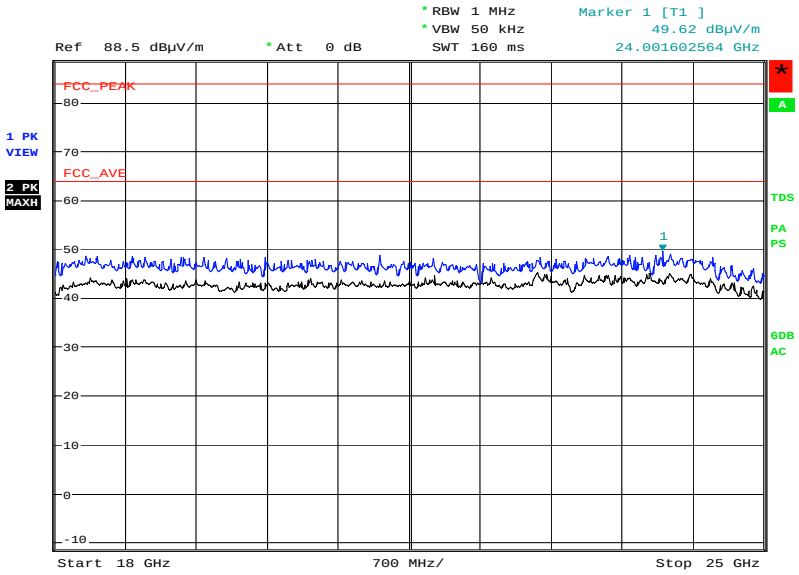
Transmit, 2445 MHz, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot



Date: 14.OCT.2015 22:39:32

Product Service

Transmit, 2445 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot

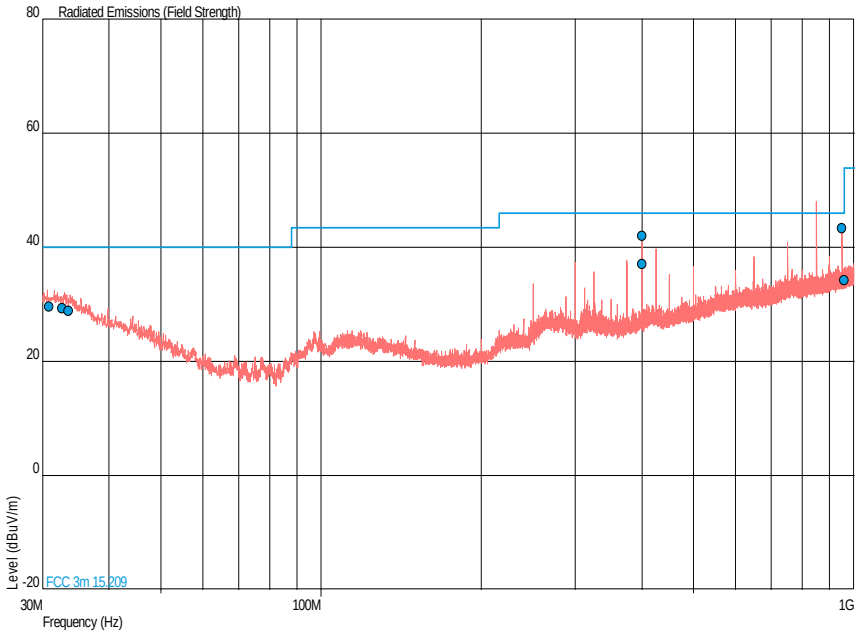


Date: 10.NOV.2015 22:49:24

Transmit, 2460 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	QP Level (dBµV/m)	QP Margin (dBµV/m)	QP Level (µV/m)	QP Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.865	29.7	-10.3	30.5	-69.5	255	2.11	Vertical
32.635	29.3	-10.7	29.2	-70.8	311	1.00	Horizontal
33.607	28.9	-11.1	27.9	-72.1	0	3.99	Vertical
399.986	42.1	-3.9	127.4	-72.6	122	1.00	Horizontal
400.031	37.2	-8.8	72.4	-127.6	133	1.36	Vertical
950.007	43.4	-2.6	147.9	-52.1	229	1.00	Horizontal
960.000	34.3	-11.7	51.9	-148.1	0	1.00	Vertical

Transmit, 2460 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

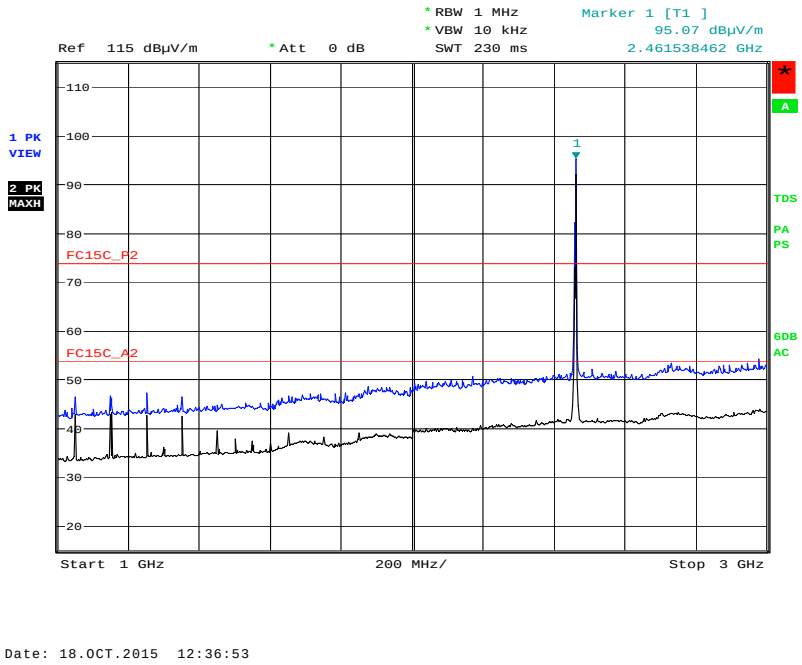


Transmit, 2460 MHz, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

Frequency (MHz)	Final Peak (dBµV/m)	Final Average (dBµV/m)	Final Peak (µV/m)	Final Average (µV/m)	Angle (°)	Height (m)	Polarisation
1050.025	50.45	46.51	333.04	211.59	210	1.20	Vertical
1150.000	50.96	44.89	353.18	175.59	189	1.00	Vertical
4921.185	58.23	50.63	815.64	340.02	264	1.80	Vertical
7378.884	59.92	51.96	990.83	396.28	268	1.00	Vertical

No other emissions were detected within 10 dB of the limit.

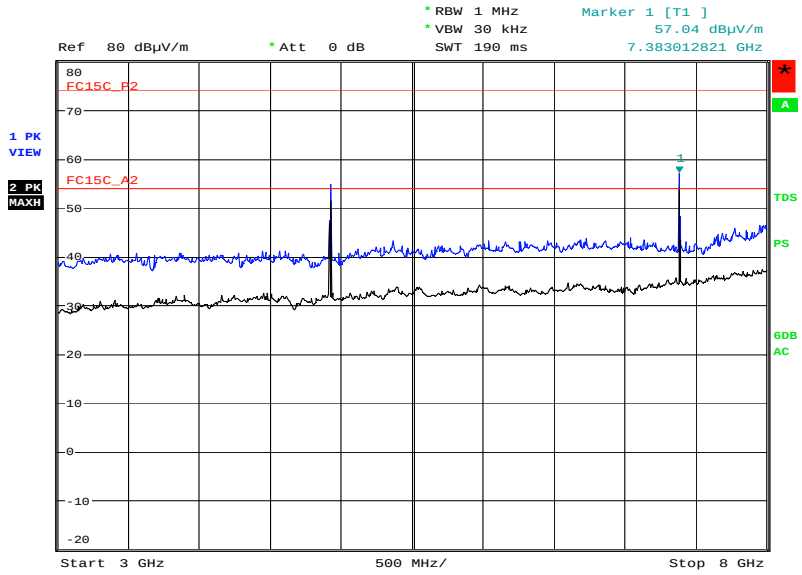
Transmit, 2460 MHz, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



Date: 18.OCT.2015 12:36:53

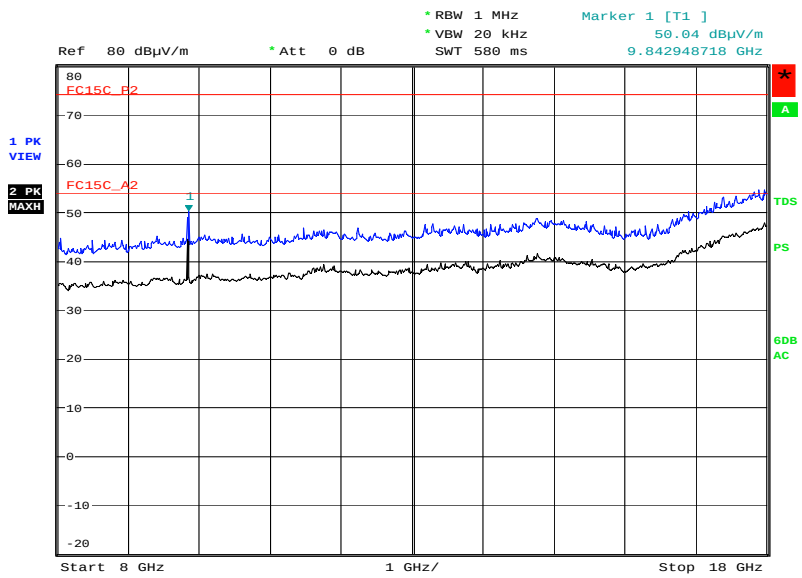
Product Service

Transmit, 2460 MHz, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



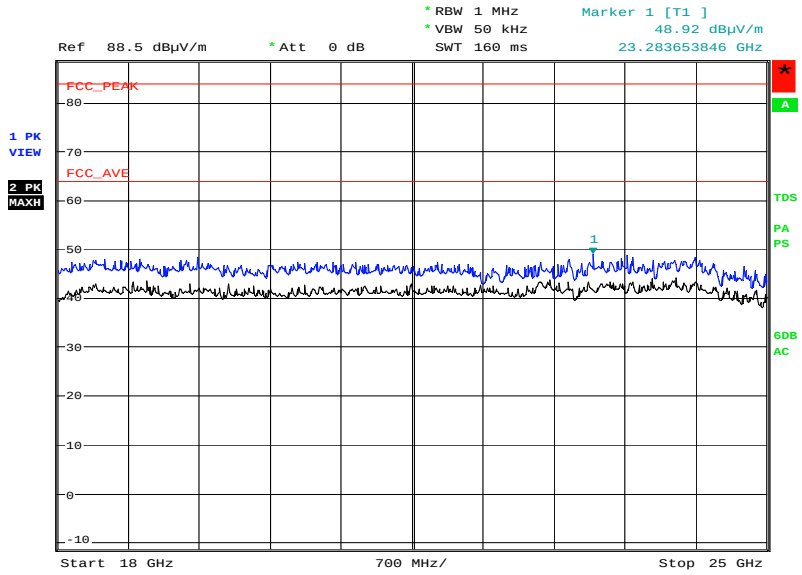
Date: 14.OCT.2015 20:42:40

Transmit, 2460 MHz, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot



Date: 14.OCT.2015 22:32:52

Transmit, 2460 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



Date: 10.NOV.2015 23:08:58

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength			Measurement Distance (m)
	(µV/m)	Average (dBµV/m)	Peak (dBµV/m)	
30-88	100	40.0	60.0	3
88-216	150	43.5	63.5	3
216-960	200	46.0	66.0	3
Above 960	500	54.0	74.0	3

2.5 RESTRICTED BAND EDGES

2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205

2.5.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN08 - Modification State 1

2.5.3 Date of Test

18 October 2015

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Procedure

The test was performed in accordance with ANSI C63.10 clauses 4.1.4.2.3, 6.3, 6.6 and 6.10.5.

2.5.6 Environmental Conditions

Ambient Temperature	20.7°C
Relative Humidity	40.0%

Product Service

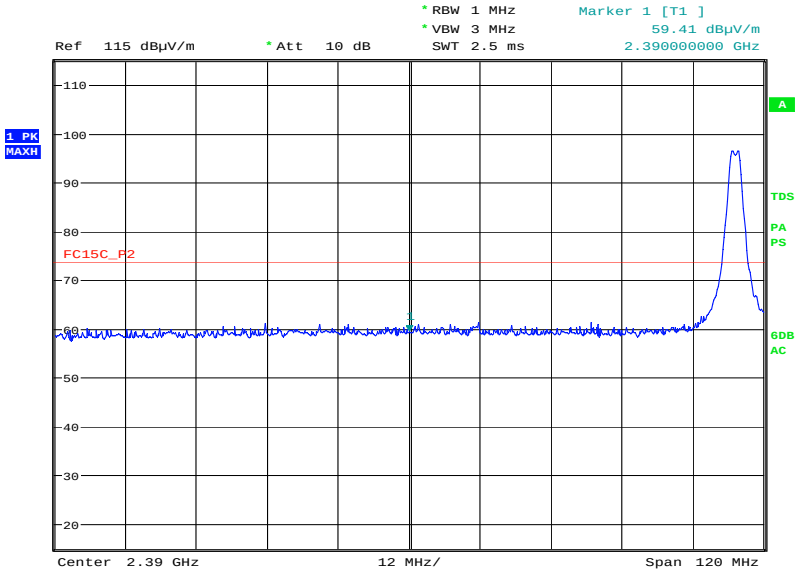
2.5.7 Test Results

110 V AC Supply

Transmit, Phase Modulation, Restricted Band Edges Results

2445 MHz		2460 MHz	
Measured Frequency 2390 MHz		Measured Frequency 2483.5 MHz	
dBµV/m		dBµV/m	
Final Peak	Final Average	Final Peak	Final Average
59.41	48.45	59.67	48.15

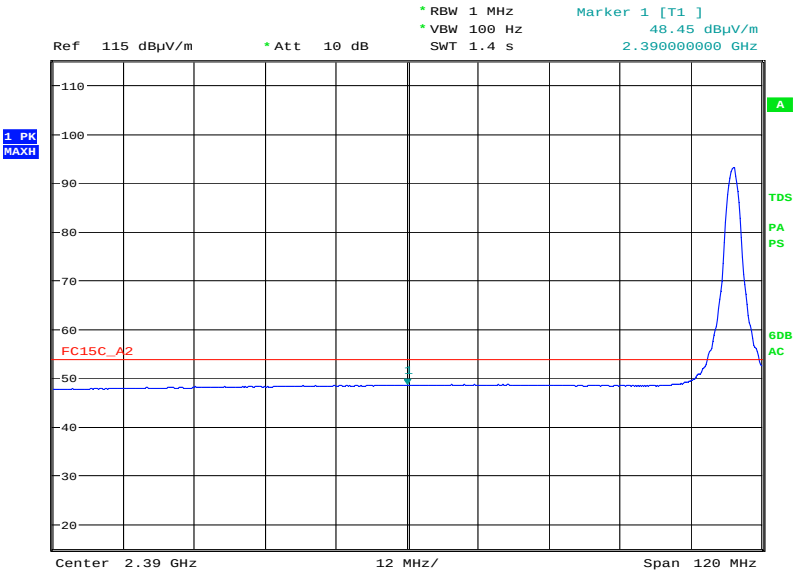
Transmit, 2445 MHz, Measured Frequency 2390 MHz, Phase Modulation, Final Peak, Restricted Band Edges Plot



Date: 18.OCT.2015 13:09:09

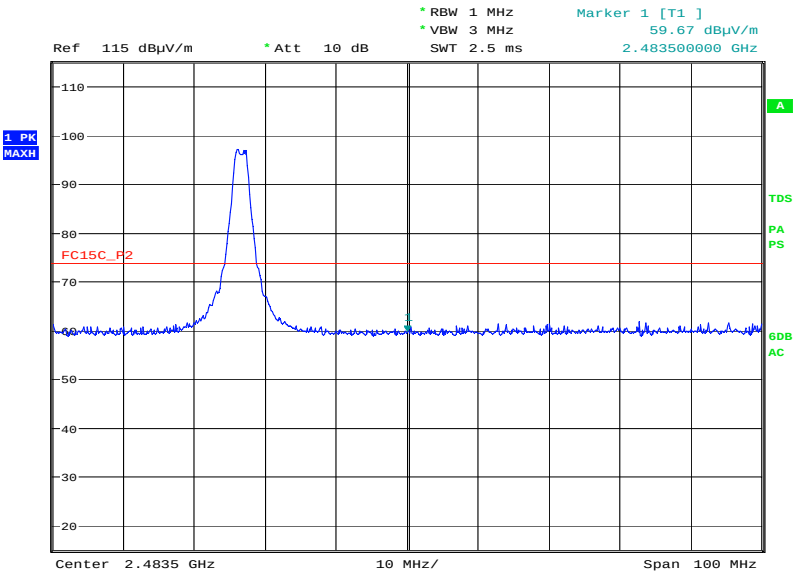
Product Service

Transmit, 2445 MHz, Measured Frequency 2390 MHz, Phase Modulation, Final Average, Restricted Band Edges Plot



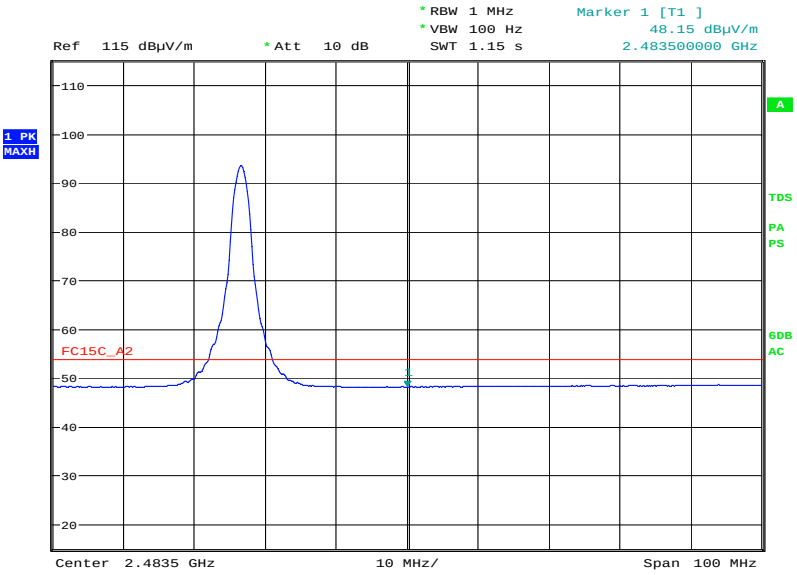
Date: 18.OCT.2015 13:09:39

Transmit, 2460 MHz, Measured Frequency 2483.5 MHz, Phase Modulation, Final Peak, Restricted Band Edges Plot



Date: 18.OCT.2015 12:32:20

Transmit, 2460 MHz, Measured Frequency 2483.5 MHz, Phase Modulation, Final Average, Restricted Band Edges Plot



Date: 18.OCT.2015 12:28:59

FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54

2.6 AUTHORISED BAND EDGES

2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)

2.6.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN08 - Modification State 1

2.6.3 Date of Test

18 October 2015

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Procedure

The test was performed in accordance with ANSI C63.10 clauses 6.3, 6.6 and 6.10.4.

2.6.6 Environmental Conditions

Ambient Temperature	20.7°C
Relative Humidity	40.0%

Product Service

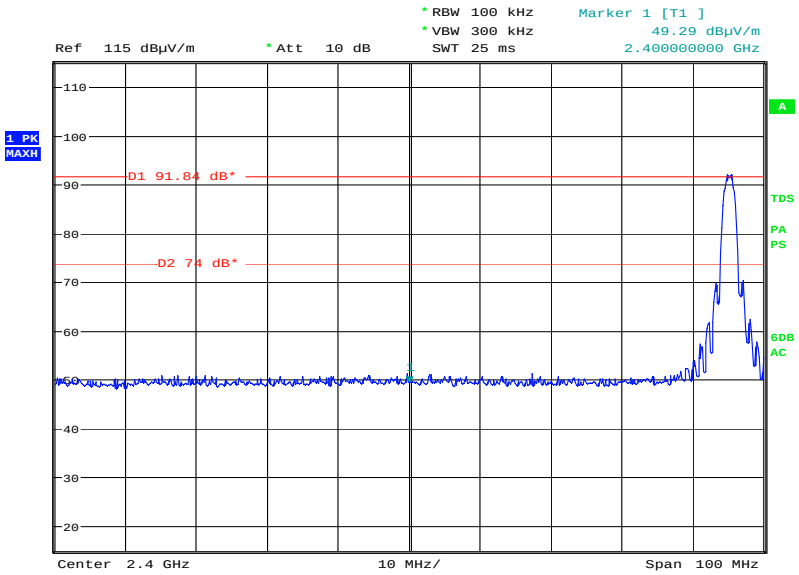
2.6.7 Test Results

110 V AC Supply

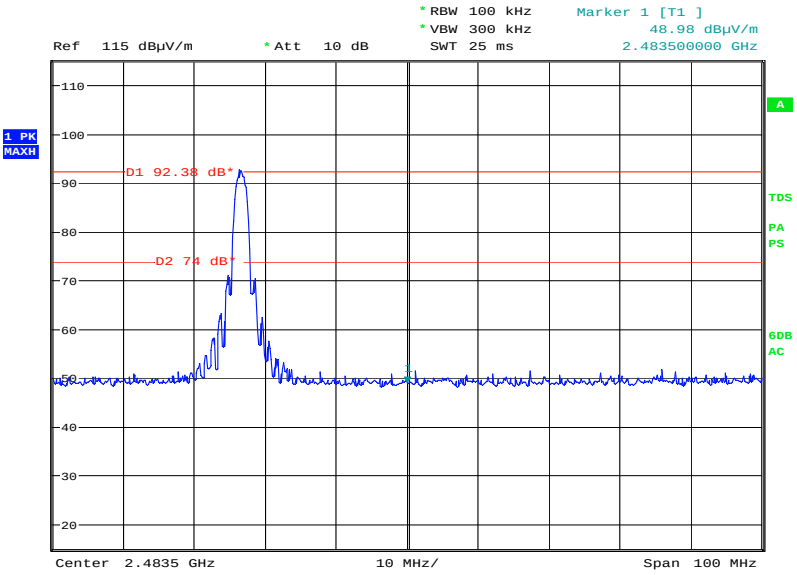
Transmit, Phase Modulatio, Authorised Band Edges Results

2445 MHz	2460 MHz
Measured Frequency 2400.00 MHz	Measured Frequency 2483.50 MHz
dBµV/m	dBµV/m
Final Peak	Final Peak
49.29	48.98

Transmit, 2445 MHz, Measured Frequency 2400.00 MHz, Phase Modulation, Final Peak, Authorised Band Edges Plot



Transmit, 2460 MHz, Measured Frequency 2483.50 MHz, Phase Modulation, Final Peak, Authorised Band Edges Plot



Date: 18.OCT.2015 12:27:51

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

2.7 POWER SPECTRAL DENSITY

2.7.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)

2.7.2 Equipment Under Test and Modification State

AC22-P0004 S/N: SN06 - Modification State 0

2.7.3 Date of Test

7 October 2015 & 8 October 2015

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.5 Test Procedure

The test was performed in accordance with KDB 558074 D01 v03r03, clause 10.2.

2.7.6 Environmental Conditions

Ambient Temperature	22.8 - 24.9°C
Relative Humidity	39.3 - 40.2%

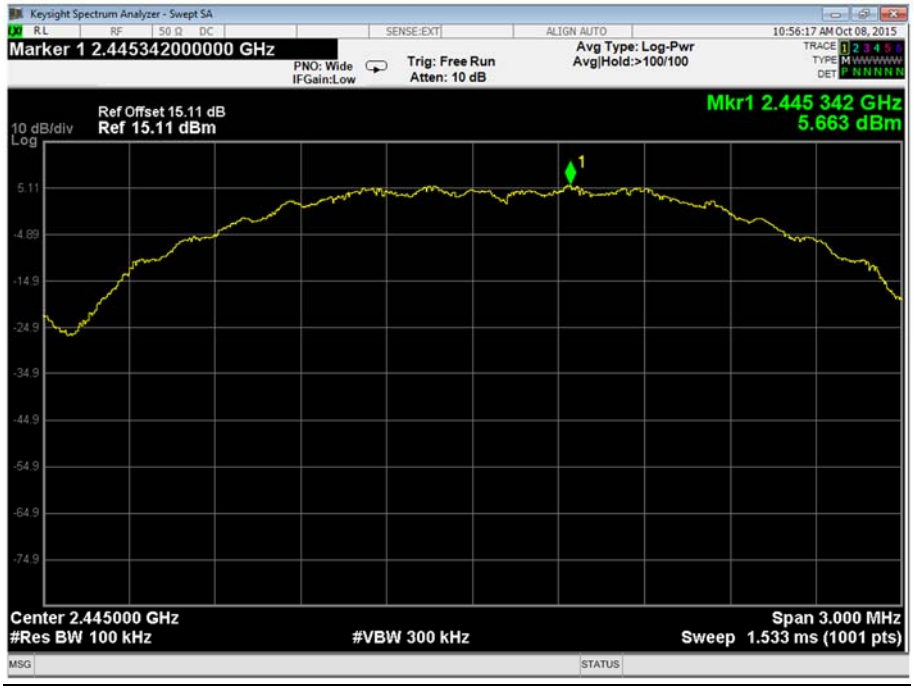
2.7.7 Test Results

110 V AC Supply

Transmit, DSSS, Power Spectral Density Results

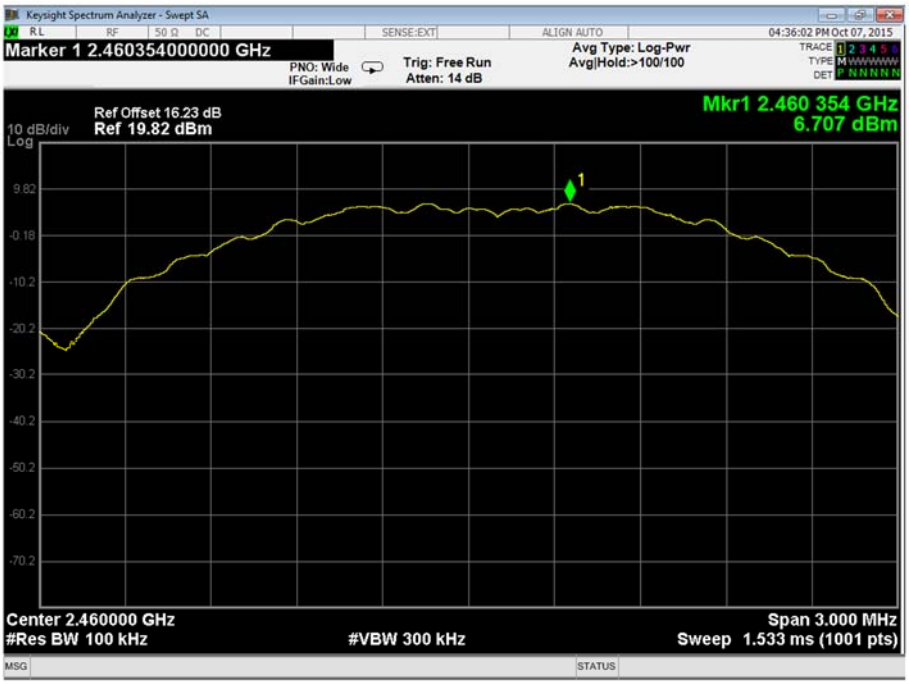
2445 MHz	2460 MHz
dBm	dBm
5.663 dBm	6.707 dBm

Transmit, 2445 MHz, DSSS, Power Spectral Density Plot



Product Service

Transmit, 2460 MHz, DSSS, Power Spectral Density Plot



FCC 47 CFR Part 15, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - AC Line Conducted Emissions					
Transient Limiter	Hewlett Packard	11947A	15	12	16-Dec-2015
LISN (1 Phase)	Chase	MN 2050	336	12	1-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Hygromer	Rotronic	A1	2138	12	3-Dec-2015
Multimeter	Iso-tech	IDM101	2417	12	29-Sep-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-2016
Section 2.2 - 6dB Bandwidth					
Power Supply Unit	Farnell	LB30-4	158	-	O/P Mon
Multimeter	Iso-tech	IDM101	2424	12	29-Sep-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	16-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4521	12	27-Jan-2016
Section 2.3 - Peak EIRP					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	28-Nov-2015
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	3-Dec-2015
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	17-Jul-2016
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	18-Feb-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Multimeter	Fluke	177	3833	12	16-Jun-2016
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 - Spurious Radiated Emissions					
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	26-Nov-2015
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	28-Nov-2015
Antenna (Bilog)	Schaffner	CBL6143	287	24	3-Feb-2016
Pre-Amplifier	Phase One	PS04-0086	1533	12	30-Jul-2016
Pre-Amplifier	Phase One	PSO4-0087	1534	12	23-Dec-2015
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	3-Dec-2015
Filter (Hi Pass)	Lorch	9HP7-7000-SR	2833	12	5-Feb-2016
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	11-Aug-2016
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	18-Feb-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Multimeter	Fluke	177	3833	12	16-Jun-2016
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	15-Apr-2016
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	24-Mar-2016
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4412	12	24-Mar-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU
0.5m SMA Cable (Rx)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	19-Feb-2016
Section 2.5 - Restricted Band Edges					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	3-Dec-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Multimeter	Fluke	177	3833	12	16-Jun-2016
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU
Section 2.6 - Authorised Band Edges					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	3-Dec-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Multimeter	Fluke	177	3833	12	16-Jun-2016
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000-KPS	4527	-	TU

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.7- Power Spectral Density					
Power Supply Unit	Farnell	LB30-4	158	-	O/P Mon
Multimeter	Iso-tech	IDM101	2424	12	29-Sep-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	16-Feb-2016
1 metre SMA Cable	IW Microwave	3PS-1806LC-394-3PS	4521	12	27-Jan-2016

TU – Traceability Unscheduled
O/P MON – Output Monitored with Calibrated Equipment

Product Service

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
6 dB Bandwidth	± 212.114 kHz
AC Line Conducted Emissions	± 3.2 dB
Power Spectral Density	± 3.0 dB
Peak EIRP	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB
Authorised Band Edges	Conducted: ± 3.08 dB Radiated: 30 MHz to 1 GHz: ± 5.1 dB Radiated: 1 GHz to 40 GHz: ± 6.3 dB
Restricted Band Edges	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB

Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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