Report On

FCC and Industry Canada Testing of the
Symbol Technologies Inc DS3578 Scanner
In accordance with FCC CFR 47 Part 15C
and Industry Canada RSS-210

COMMERCIAL-IN-CONFIDENCE

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REPORT ON

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Document 75912884 Report 02 Issue 1

April 2011

PREPARED FOR

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Authorised Signatory

DATED 21 April 2011

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 CFR 47 Part 15C and RSS-210. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

B Airs A Guy

UKAS TESTING 0141

Product Service

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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Symbol Technologies Inc DS3578 Scanner
In accordance with FCC CFR 47 Part 15C
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Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of Symbol Technologies Inc DS3578 Scanner to the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210.

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	Symbol Technologies Inc
Manufacturing Description	Handheld Scanner
Model Number(s)	DS3578
Serial Number(s)	MIN25A34B M1N29F24C
Software Version	Rev A
Hardware Version	Rev A
Number of Samples Tested	Two
Test Specification/Issue/Date	FCC CFR 47 Part 15C: 2010 Industry Canada RSS-210 Issue 8:2010
Incoming Release Date	Application Form 11 February 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	NP5308873 19 October 2011
Start of Test	18 March 2011
Finish of Test	31 March 2011
Name of Engineer(s)	B Airs A Guy
Related Document(s)	ANSI C63.4: 2003

Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15C and Industry Canada RSS-210 is shown below.

Configuration 1: DS3578							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.1	15.247 (a)(1)	A8.1(a)	20dB Bandwidth	2402MHz Tx	0	Pass	ANSI C63.4
				2441MHz Tx	0	Pass	
				2480MHz Tx	0	Pass	
				Hopping on all channels		N/A	
2.2	15.247 (a)(1)	A8.1(b)	Channel Separation	2402MHz Tx		N/A	ANSI C63.4
				2441MHz Tx	0	Pass	
				2480MHz Tx		N/A	
				Hopping on all channels		N/A	
2.3	15.247 (a)(1)(iii)	A8.1(d)	Channel Dwell Time	2402MHz Tx		N/A	ANSI C63.4
				2441MHz Tx	0	Pass	
				2480MHz Tx		N/A	
				Hopping on all channels		N/A	
2.4	15.247 (a)(1)(iii)	A8.1(d)	Number of Hopping Channels	2402MHz Tx		N/A	ANSI C63.4
				2441MHz Tx		N/A	
				2480MHz Tx		N/A	
				Hopping on all channels	0	Pass	
2.5	15.247 (b)(3)	A8.4(2)	Maximum Peak Conducted Output Power	2402MHz Tx	0	Pass	ANSI C63.4
				2441MHz Tx	0	Pass	
				2480MHz Tx	0	Pass	
				Hopping on all channels		N/A	
2.6	15.247 (b)(4)	A8.4(4)	EIRP Peak Power	2402MHz Tx	0	Pass	ANSI C63.4
				2441MHz Tx	0	Pass	
				2480MHz Tx	0	Pass	
				Hopping on all channels		N/A	
2.7	15.247(d)	A8.2 (a)	Radiated Emissions (Enclosure Port)	2402MHz Tx	0	Pass	ANSI C63.4
				2441MHz Tx	0	Pass	
				2480MHz Tx	0	Pass	
				Hopping on all channels		N/A	

Product Service

Configuration 1: DS3578							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.8	15.247(d)	A8.5	Spurious Emissions	2402MHz Tx		Pass	ANSI C63.4
				2441MHz Tx		Pass	
				2480MHz Tx		Pass	
				Hopping on all channels	0	N/A	
2.9	15.247 (d)	A8.5, 2.2	Band Edge Measurements	2402MHz Tx	0	Pass	ANSI C63.4
				2441MHz Tx		N/A	
				2480MHz Tx	0	Pass	
				Hopping on all channels		N/A	

N/A – Not Applicable

Product Service

1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	DS3578
Part Number	
Technical Description (Please provide a brief description of the intended use of the equipment)	This device is a hand held bar code reader using a Bluetooth radio to communicate to the charging cradle. The device uses a Broadcom Bluetooth radio capable of EDR transfer rates. The Bluetooth profiles will include Cradle, SPP, HID, profiles.

POWER SOURCE					
☐	AC mains		State voltage		
AC supply frequency		(Hz)			
	VAC				
	Max Current				
	Hz				
☐	Single phase		☐	Three phase	
And / Or					
☒	External DC supply				
	Nominal voltage		5 V	Max Current	0.85 A
	Extreme upper voltage		V		
	Extreme lower voltage		V		
Battery					
☒	Nickel Cadmium		☐	Lead acid (Vehicle regulated)	
☐	Alkaline		☐	Leclanche	
☐	Lithium		☐	Other Details :	
3.6		Volts nominal.			
End point voltage as quoted by equipment manufacturer				3.35-5	V

Product Service

FREQUENCY INFORMATION					
Frequency Range	2400 to2483.5	MHz			
Channel Spacing (where applicable)					
Test Frequencies*	Bottom	2402	MHz	Channel Number (if applicable)	0
	Middle	2441	MHz	Channel Number (if applicable)	39
	Top	2480	MHz	Channel Number (if applicable)	78
If alternate test modes are available resulting in different test frequencies please specify which mode is applicable:					
POWER CHARACTERISTICS					
Maximum TX power	0.1	W			
Minimum TX power		W (if variable)			
Is transmitter intended for :					
Continuous duty				☐ Yes	☐ No
Intermittent duty				☒ Yes	☐ No
If intermittent state DUTY CYCLE					
Transmitter ON	seconds				
Transmitter OFF	seconds				

Product Service

ANTENNA CHARACTERISTICS				
☐	Antenna connector	State impedance		Ohm
☒	Temporary antenna connector	State impedance	50	Ohm
☒	Integral antenna	Gain	2.5	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
(if applicable) 2
(if applicable) 3
If more than three classes of emission, list separately:

EXTREME CONDITIONS					
Extreme test voltages (Max)	5	V	Extreme test voltages (Min)	3.35	V
Nominal DC Voltage	5	V	DC Maximum Current	0.85	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.

Signature:  Name: Zhang XinJian

Position held: Regulatory Manager Date: 10 March 2011

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Symbol Technologies Inc DS3578 Scanner. A full technical description can be found in the manufacturer's documentation.

1.4.2 Test Configuration

Configuration 1: DS3578

The EUT was configured in accordance with FCC CFR 47 Part 15 and Industry Canada RSS-210.

1.4.3 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 - 2402MHz Tx

Mode 2 - 2441MHz Tx

Mode 3 - 2480MHz Tx

Mode 4 – Hopping on all channels

Testing was performed in the worst case. The worst case was deemed as the packet type which produced the highest level of conducted average power. This packet type was 2DH5

Information on the specific test modes utilised are detailed in the test procedure for each individual test.

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 or test laboratories as appropriate.

The EUT was powered from a battery supply for radiated spurious emissions and EIRP testing and from a DC power supply for all other tests.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Symbol Technologies Inc DS3578 Scanner
In accordance with FCC CFR 47 Part 15C
and Industry Canada RSS-210

Product Service

2.1 20dB BANDWIDTH

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)
Industry Canada, RSS-210, Clause A8.1 (a)

2.1.2 Equipment Under Test

DS3578 Scanner, S/N: MIN25A34B

2.1.3 Date of Test and Modification State

23 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.

The EUT was transmitted at maximum power via a cable to the Spectrum Analyser. The Analyser settings were adjusted to display the resultant trace on screen. The peak point of the trace was measured and the markers positioned to give the -20dBc points of the displayed spectrum.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.1.6 Environmental Conditions

	23 March 2011
Ambient Temperature	25.0°C
Relative Humidity	25.0%

Product Service

2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for 20dB Bandwidth.

The test results are shown below.

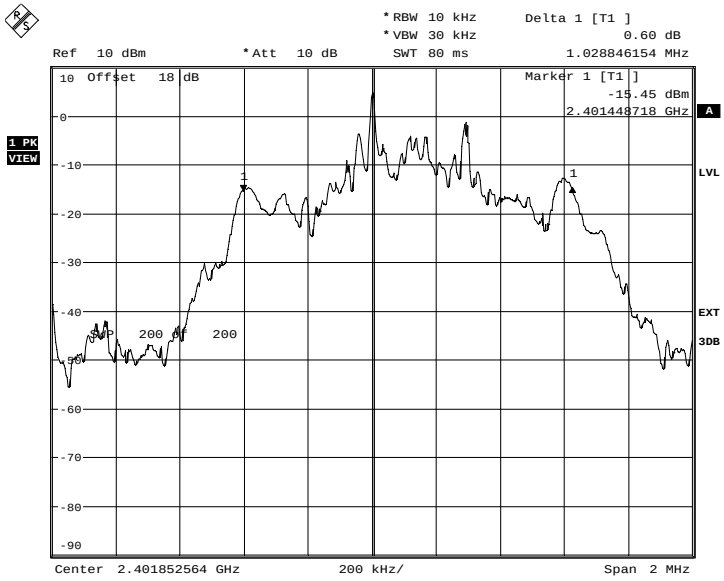
Configuration 1 – Modes 1, 2 and 3

3.6 V DC Supply

Frequency (MHz)	Data Rate (Mbps)	20dB Bandwidth (kHz)
2402	2DH5	1028.8
2441	2DH5	1038.5
2480	2DH5	1035.3

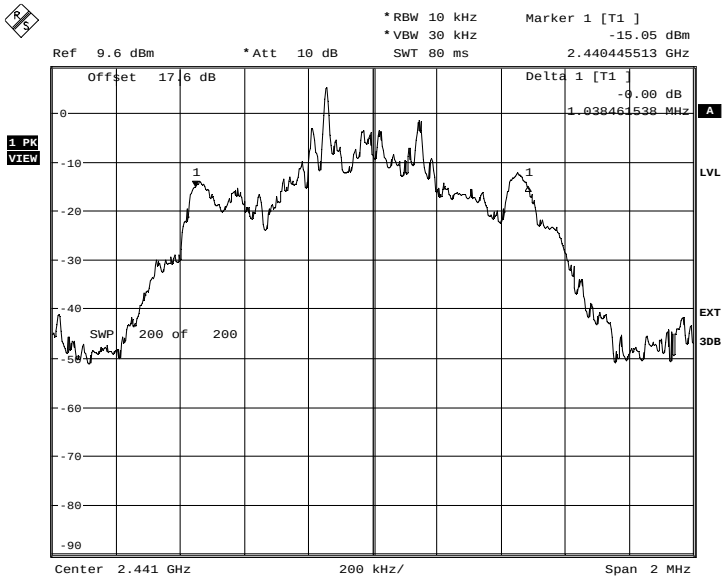
Product Service

Configuration 1 – Mode 1



Date: 23.MAR.2011 16:14:55

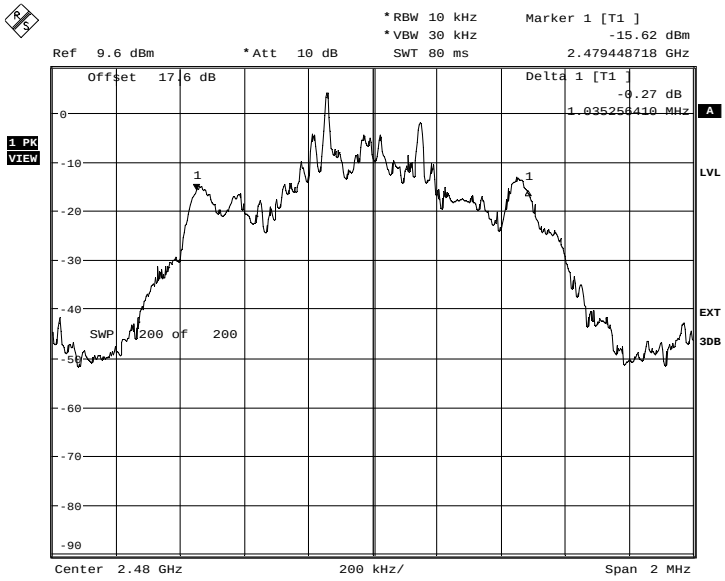
Configuration 1 – Mode 2



Date: 23.MAR.2011 16:18:14

Product Service

Configuration 1 – Mode 3



Date: 23.MAR.2011 16:20:56

Limit Clause

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

2.2 CHANNEL SEPARATION

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)
Industry Canada, RSS-210, Clause A8.1 (b)

2.2.2 Equipment Under Test

DS3578 Scanner, S/N: MIN25A34B

2.2.3 Date of Test and Modification State

18 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.

The EUT was transmitted at maximum power into a Spectrum Analyser. The trace was set to Max Hold to store several adjacent channels on screen. Using the marker delta function, the markers were positioned to show the separation between adjacent channels.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 4

2.2.6 Environmental Conditions

	18 March 2011
Ambient Temperature	24.0°C
Relative Humidity	31.0%

Product Service

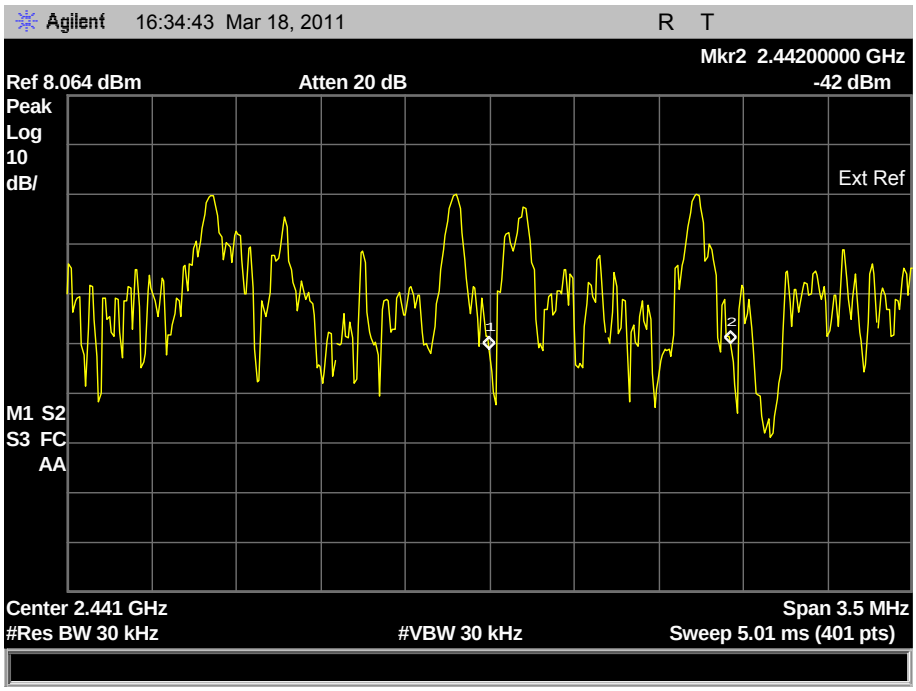
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for Channel Separation.

The test results are shown below.

Configuration 1 - Mode 4

3.6 V DC Supply



Limit Clause

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125 W.

The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

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2.3 CHANNEL DWELL TIME

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)(iii)
Industry Canada, RSS-210, Clause A8.1 (d)

2.3.2 Equipment Under Test

DS3578 Scanner, S/N: MIN25A34B

2.3.3 Date of Test and Modification State

18 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 .

DH1

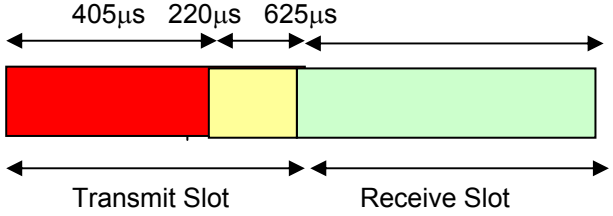
The Bluetooth system hops at a rate of 1600 times per second. Thus, this equates to 1600 timeslots in 1 second.

The DH1 data rate operates on a Transmit on 1 timeslot and Receive on 1 timeslot basis. Thus, in 1 second, there are 800 Transmit timeslots and 800 Receive timeslots.

Thus:

$$1 \text{ Timeslot} = \frac{1}{1600} = 625\mu s$$

In 1 transmit timeslot, the transmit on time is only 405μs. 220μs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.



DH1 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle

So, with 800 Tx and 800 Rx timelsots, the transmitter is on for 800 x 405μs = 0.324 seconds.

$$\therefore \quad \frac{\text{Total Tx Time On}}{\text{No of Channels}} = \frac{0.324}{80} = 4.05\text{ms}$$

So, in 32 seconds, the transmitter dwell time per channel is:

32 x 4.05ms = 0.1296 seconds

DH3

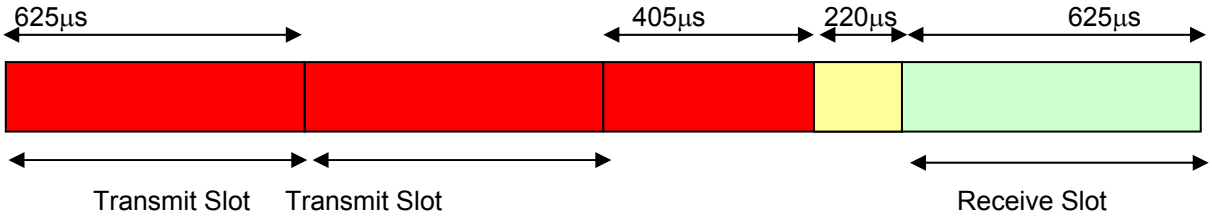
With data rate DH3, the data payload is higher and can use up to 3 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 3 slots, (ie. no receive slot in-between the 3 transmit slots). The 220μs off time for synthesizer re-tuning at the end of a slot is only used on the final slot. Thus, for one cycle, there are 3 transmit timeslots. 2 are 625μs long and the final slot is transmitting for 405μs.

The DH3 data rate operates on a Transmit on 3 timeslots and Receives on 1 timeslot basis, (assuming maximum data payload). The frequency-hopping rate is the same. Thus, in 1 second, there are 1200 Transmit timeslots and 400 Receive timeslots.

Thus:

$$1\text{ Timeslot} = \frac{1}{1600} = 625\mu\text{s}$$

The first 2 Transmit timeslots are transmitting for the complete 625μs. In the third transmit slot, the transmit on time is only 405μs. 220μs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.



Product Service

DH3 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle, (Maximum Payload)

Thus, the transmitter for one complete transmit and receive cycle would be on for:

Tx (2 x 625μs) + (1 x 405μs) = 1.655ms

So:

800 x 625μs = 0.5 seconds
400 x 405μs = 0.162 seconds

Thus: 0.5 + 0.162 = 0.662 seconds

$$\therefore \quad \frac{\text{Total Tx Time On}}{\text{No Of Channels}} = \frac{0.662}{80} = 8.275\text{ms}$$

So, in 32 seconds, the transmitter dwell time per channel is:

32 x 8.275ms = 0.2648 seconds

DH5

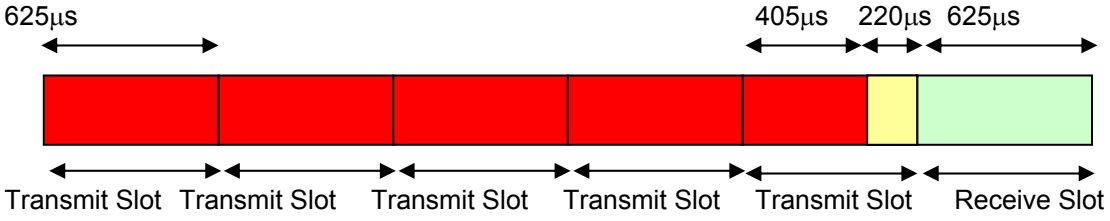
With data rate DH5, the data payload is higher and can use up to 5 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 5 slots, (ie. no receive slot in-between the 5 transmit slots). The 220μs off time for synthesizer re-tuning at the end of a slot is only used on the final slot. Thus, for one cycle, there are 5 transmit timeslots. 4 are 625μs long and the final slot is transmitting for 405μs.

The DH5 data rate operates on a Transmit on 5 timeslots and Receives on 1 timeslot basis, (assuming maximum data payload). The frequency-hopping rate is the same. Thus, in 1 second, there are 1333.3 Transmit timeslots and 266.7 Receive timeslots.

Thus:

$$1\text{ Timeslot} = \frac{1}{1600} = 625\mu\text{s}$$

The first 4 Transmit timeslots are transmitting for the complete 625μs. In the fifth transmit slot, the transmit on time is only 405μs. 220μs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.



Product Service

DH5 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle, (Maximum Payload)

Thus, the transmitter for one complete transmit and receive cycle would be on for:

Tx (2 x 625μs) + (1 x 405μs) = 2.905ms

So:

1066.7 x 625μs = 0.666 seconds
266.7 x 405μs = 0.108 seconds

Thus: 0.666 + 0.108 = 0.774 seconds

$\therefore$ $\frac{\text{Total Tx Time On}}{\text{No Of Channels}} = \frac{0.774}{80} = 9.675\text{ms}$

So, in 32 seconds, the transmitter dwell time per channel is:

32 x 9.675ms = 0.31 seconds

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 2

2.3.6 Environmental Conditions

	18 March 2011
Ambient Temperature	24.0°C
Relative Humidity	31.0%

Product Service

2.3.7 Test Results

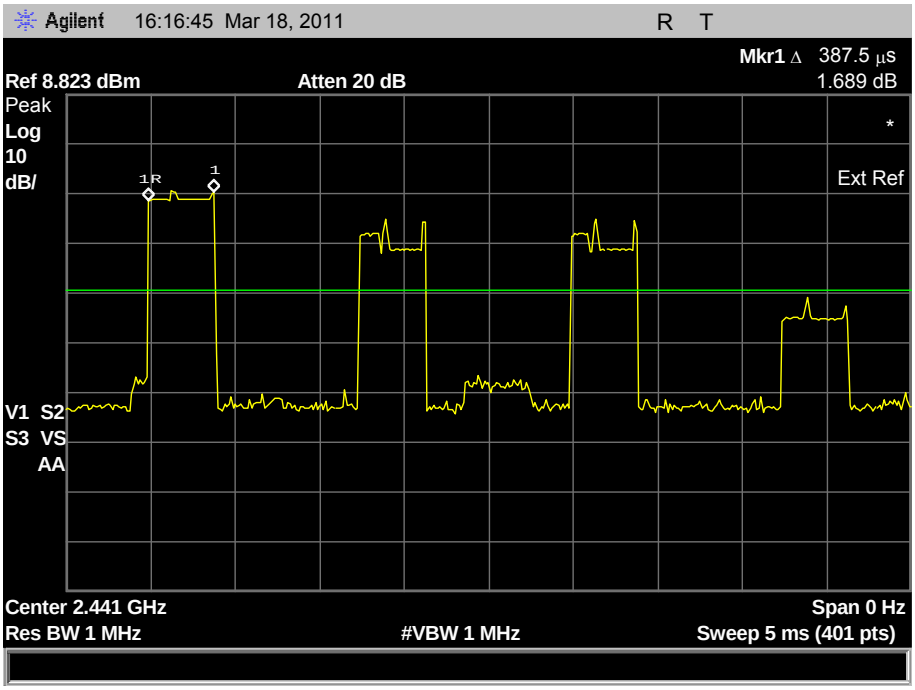
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for Channel Dwell Time.

The test results are shown below.

Configuration 1 - Mode 2

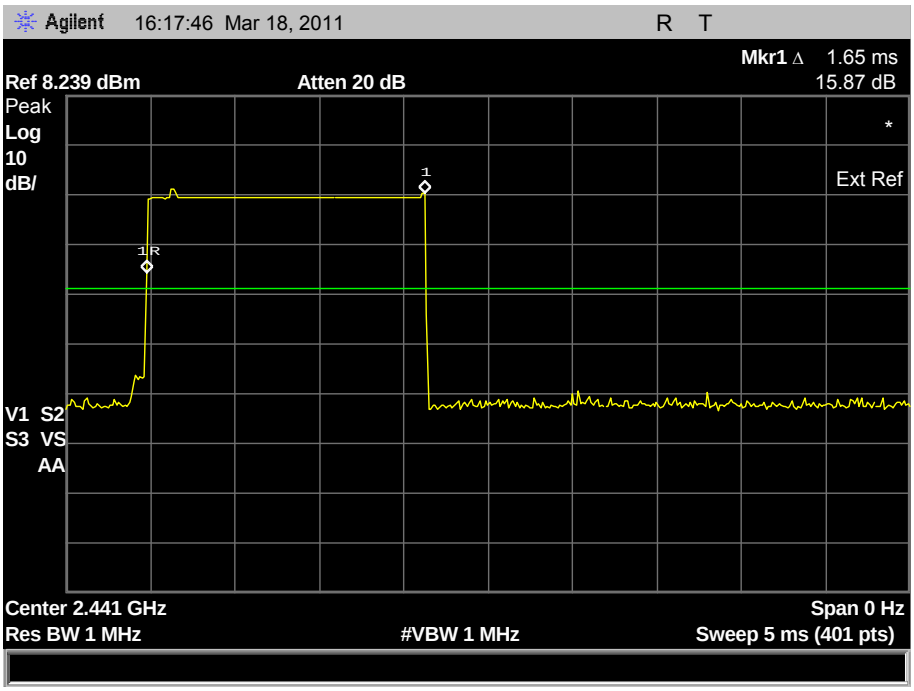
3.6 V DC Supply

2DH1

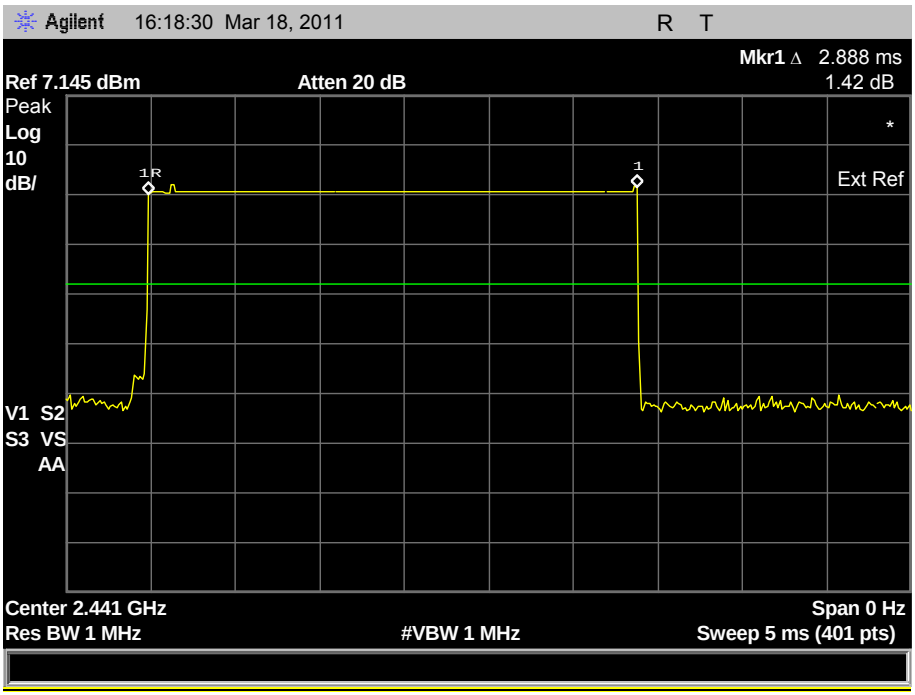


Product Service

2DH3



2DH5



Limit Clause

Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that a minimum of 15 hopping channels are used.

Product Service

2.4 NUMBER OF HOPPING CHANNELS

2.4.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (a)(1)(iii)
Industry Canada, RSS-210, Clause A8.1 (d)

2.4.2 Equipment Under Test

DS3578 Scanner, S/N: MIN25A34B

2.4.3 Date of Test and Modification State

18 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 .

The EUT was connected to a Spectrum Analyser via a cable. The EUT was set to transmit on maximum power and hopping on all channels. The span was adjusted to show the individual channels. The display trace was set to Max Hold and the plots recorded.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 4

2.4.6 Environmental Conditions

	18 March 2011
Ambient Temperature	24.0°C
Relative Humidity	31.0%

Product Service

2.4.7 Test Results

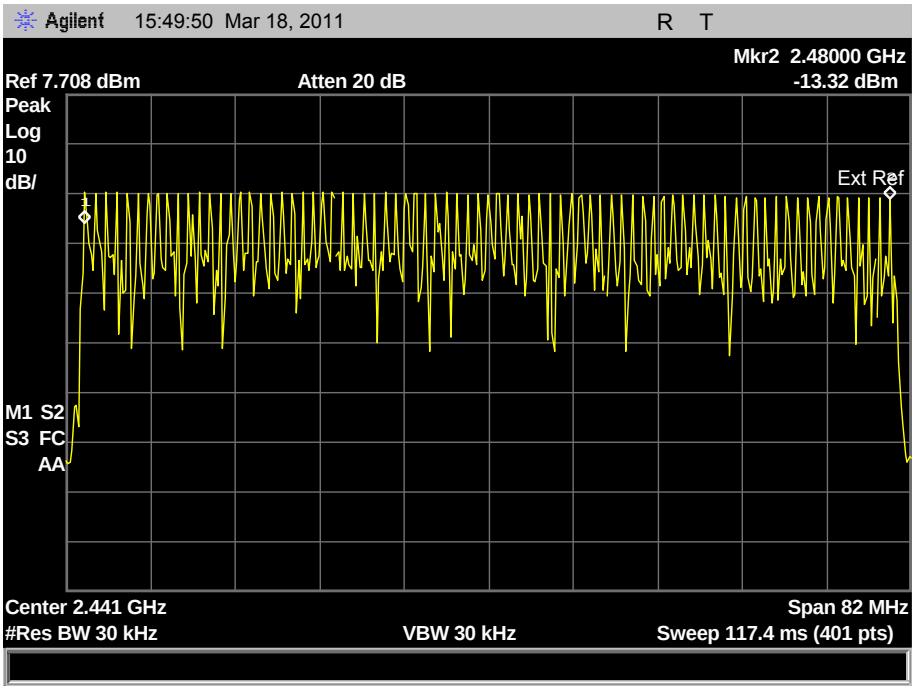
For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for Number of Hopping Channels.

The test results are shown below.

Configuration 1 – Mode 4

3.6 V DC Supply

0 to 79



Limit

≥ 15 channels

Product Service

2.5 MAXIMUM PEAK CONDUCTED OUTPUT POWER

2.5.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(3)
Industry Canada, RSS-210, Clause A8.4 (2)

2.5.2 Equipment Under Test

DS3578 Scanner, S/N: MIN25A34B

2.5.3 Date of Test and Modification State

24 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.

The EUT was transmitted at maximum power via a cable to the Peak Power Analyser. The Analyser settings were adjusted to display the resultant trace on screen and a reference level offset was entered to account for the measurement path loss. The measurement bandwidth was set according to the signal being measured and the peak and average levels were recorded.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.5.6 Environmental Conditions

	24 March 2011
Ambient Temperature	24.0°C
Relative Humidity	34.0%

Product Service

2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C for Maximum Peak Conducted Output Power.

The test results are shown below.

Configuration 1 - Modes 1, 2 & 3

3.6 V DC Supply

Modulation Data Rate	Maximum Peak Conducted Output Power					
	dBm			mW		
	2402 MHz	2441 MHz	2480 MHz	2402 MHz	2441 MHz	2480 MHz
2DH1	7.91	8.11	7.39	6.180	6.471	5.483
2DH3	7.70	7.97	7.31	5.888	6.266	5.383
2DH5	7.70	7.89	7.38	5.888	6.152	5.470

Limit Clause

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Product Service

2.6 EIRP PEAK POWER

2.6.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (b)(4)
Industry Canada RSS-210, Clause A8.4 (4)

2.6.2 Equipment Under Test

DS3578 Scanner, S/N: M1N29F24C

2.6.3 Date of Test and Modification State

30 to 31 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.6.6 Environmental Conditions

	30 March 2011	31 March 2011
Ambient Temperature	21.0°C	19.4°C
Relative Humidity	36.0%	31.0%

Product Service

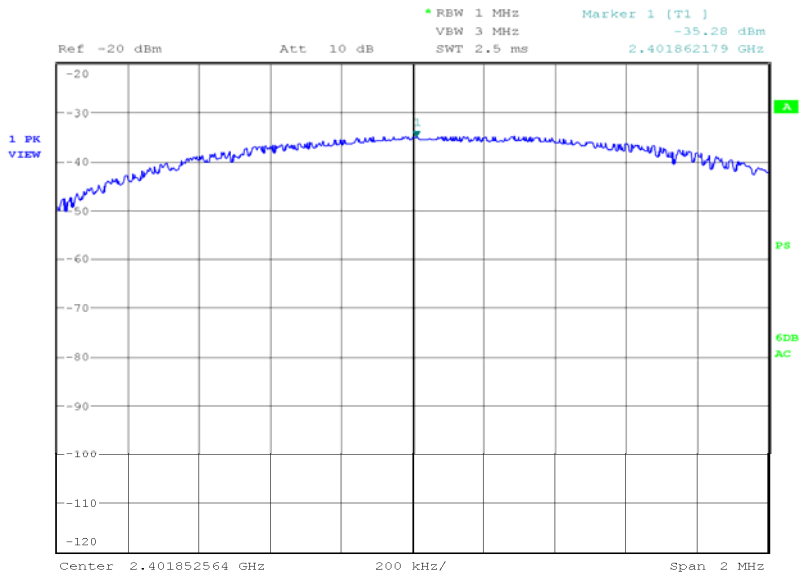
2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for EIRP Peak Power.

The test results are shown below.

Configuration 1 - Mode 1

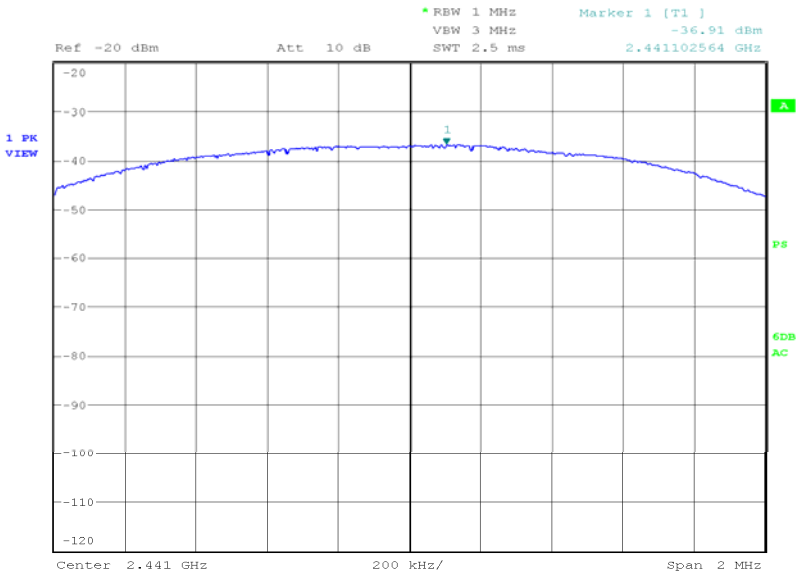
Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.402	5.88	36.0	3.87	4000



Product Service

Configuration 1 - Mode 2

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.441	4.13	36.0	2.59	4000

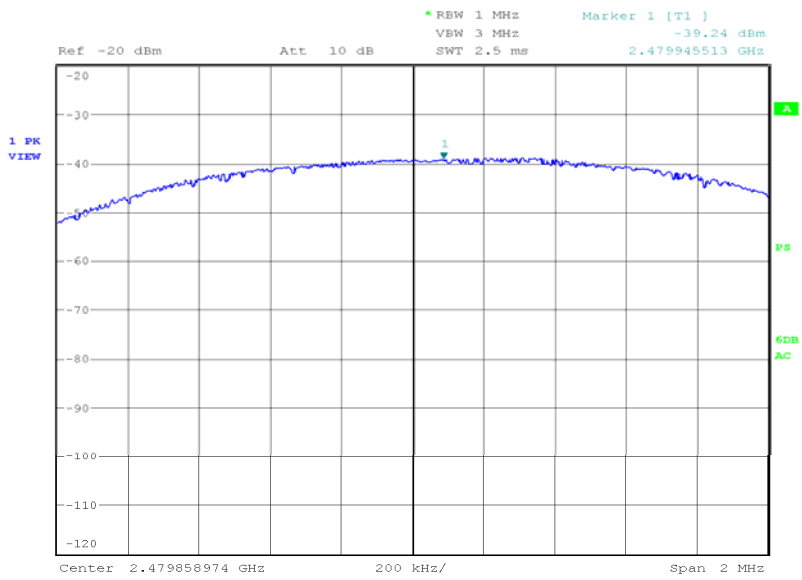


Date: 30.MAR.2011 22:25:48

Product Service

Configuration 1 - Mode 3

Freq GHz	Result EIRP dBm	Limit EIRP dBm	Result EIRP mW	Limit EIRP mW
2.480	0.92	36.0	1.24	4000



Date: 30.MAR.2011 23:00:11

Product Service

2.7 RADIATED EMISSIONS (ENCLOSURE PORT)

2.7.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)
Industry Canada RSS-210, Clause A8.2 (a)

2.7.2 Equipment Under Test

DS3578 Scanner, S/N: M1N29F24C

2.7.3 Date of Test and Modification State

30 to 31 March 2011 - Modification State 0

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 Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Emissions within the restricted bands defined in 15.205 were measured in accordance with 15.209. Emissions measured below 1GHz employed a quasi peak detector, in accordance with 15.35(a). Emissions measured above 1GHz employed an average detector as defined in 15.35(b). The peak level of the emission was also measured to ensure that a difference of 20dB from the average level was not exceeded, as defined in 15.35(b). Emissions identified within the range 30MHz – 1GHz were then formally measured using a CISPR Quasi-Peak detector. Other emissions from 30MHz to 25GHz excluding the restricted bands were measured using a peak detector.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2
- Mode 3

Product Service

2.7.6 Environmental Conditions

	30 March 2011	31 March 2011
Ambient Temperature	21.0°C	19.4°C
Relative Humidity	36.0%	31.0%

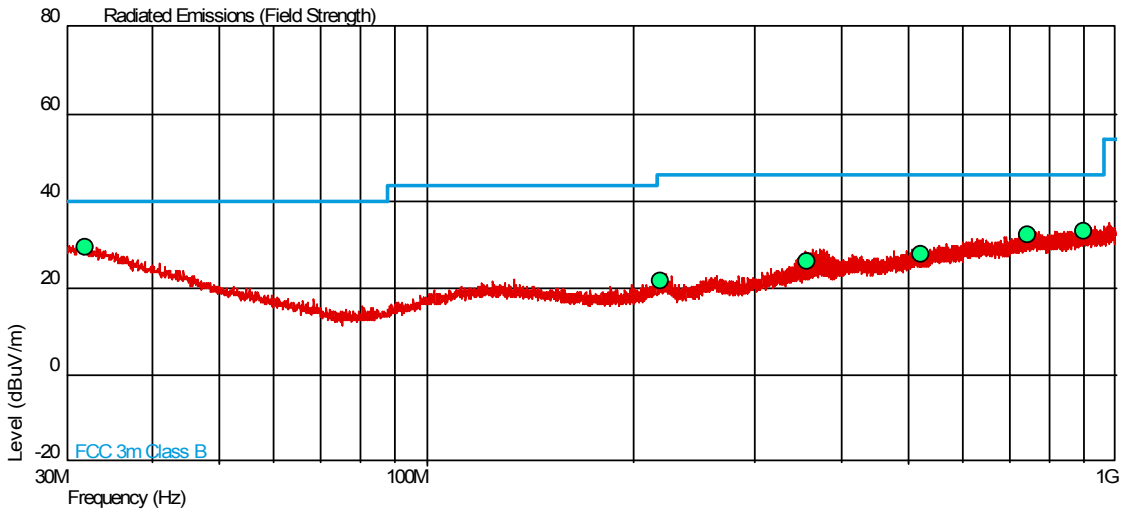
2.7.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
32.003	29.2	28.84	40.0	100	-10.8	-71.16	162	2.18	Horizontal
217.996	21.9	12.44	46.0	200	-24.1	-187.56	31	2.62	Vertical
357.709	26.3	20.65	46.0	200	-19.7	-179.35	83	1.00	Horizontal
523.255	27.9	24.83	46.0	200	-18.1	-175.17	148	1.00	Horizontal
745.605	32.2	40.73	46.0	200	-13.8	-159.27	360	1.00	Vertical
899.353	33.2	45.70	46.0	200	-12.8	-154.30	16	2.90	Vertical

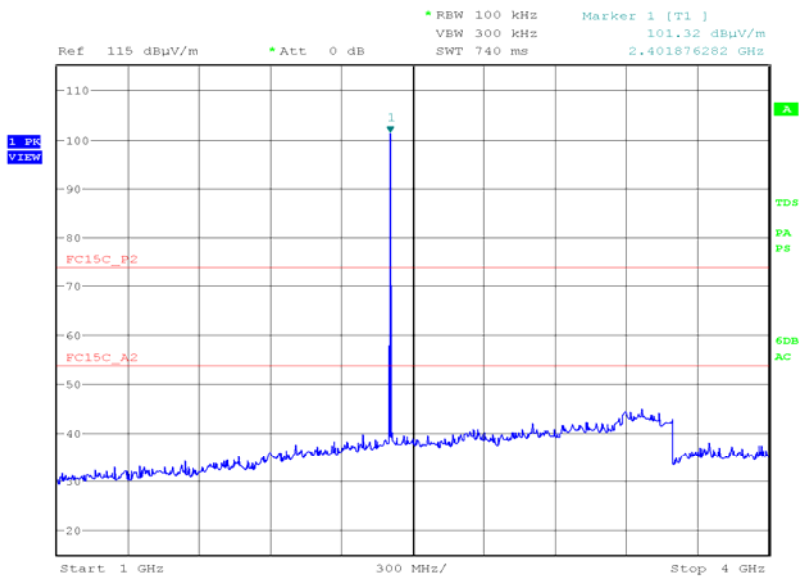
Product Service

1GHz to 25GHz

No emissions were detected in either polarity therefore reciever sensitivity values are presented in table and plot form.

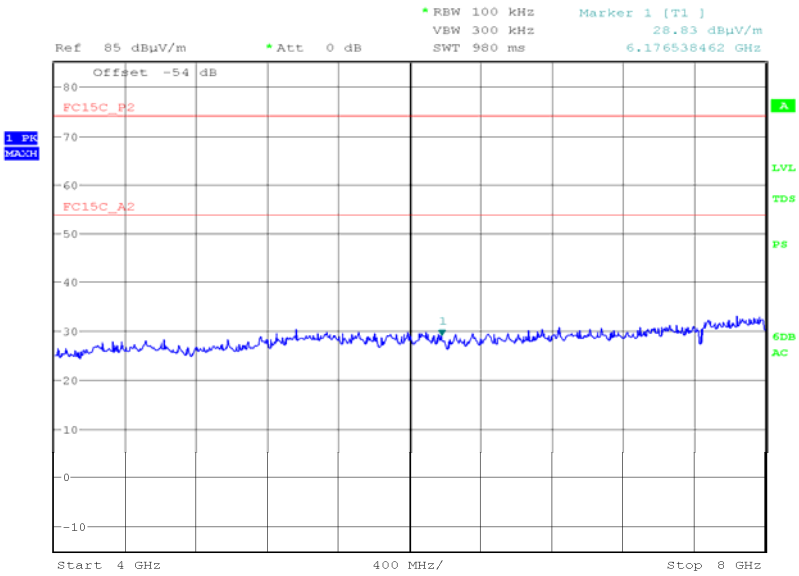
Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.806	Vertical	125	98	58.0	51.0	74.0	54.0
3.400	Vertical	100	0-360	45.0	51.0	74.0	54.0
7.820	Vertical	100	0-360	33.1	51.0	74.0	54.0
8.100	Vertical	100	0-360	33.3	51.0	74.0	54.0
11.940	Vertical	100	0-360	37.3	51.0	74.0	54.0
17.820	Vertical	100	0-360	43.8	51.0	74.0	54.0
23.590	Vertical	100	0-360	42.9	51.0	74.0	54.0

1GHz to 4GHz



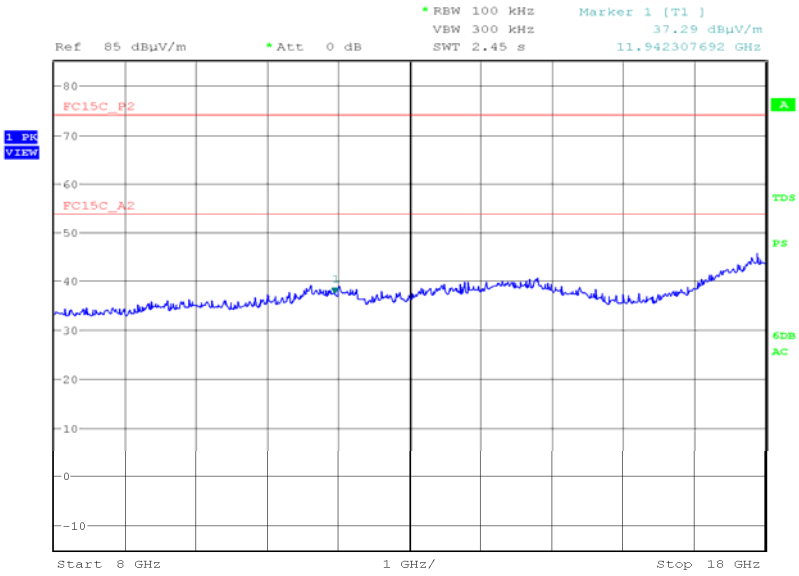
Product Service

4GHz to 8GHz



Date: 31.MAR.2011 01:09:53

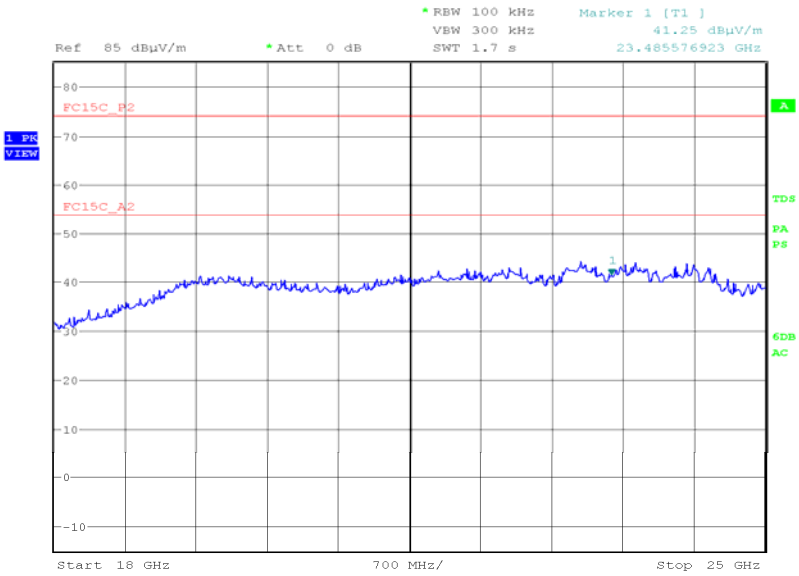
8GHz to 18GHz



Date: 31.MAR.2011 01:26:42

Product Service

18GHz to 25GHz

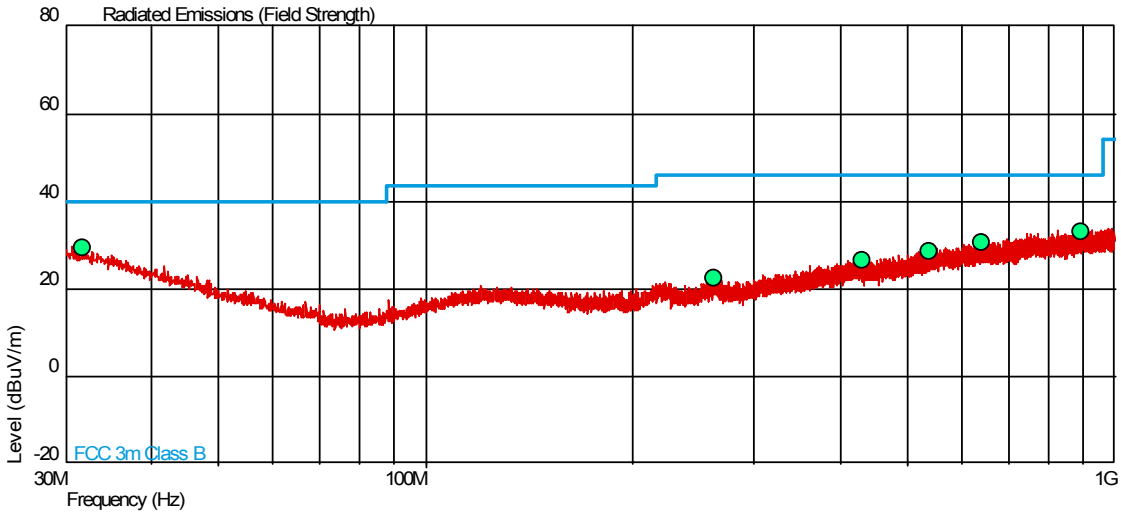


Date: 31.MAR.2011 01:58:53

Product Service

Configuration 1 - Mode 2

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dBµV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
31.798	29.2	28.84	40.0	100	-10.8	-71.16	147	1.54	Vertical
261.302	22.3	13.03	46.0	200	-23.7	-186.97	83	1.00	Horizontal
431.088	26.6	21.38	46.0	200	-19.4	-178.62	52	1.00	Horizontal
538.202	28.6	26.91	46.0	200	-17.4	-173.09	360	3.78	Vertical
642.448	30.8	34.67	46.0	200	-15.2	-165.33	1	1.00	Vertical
896.655	33.0	44.67	46.0	200	-13.0	-155.33	287	2.12	Horizontal

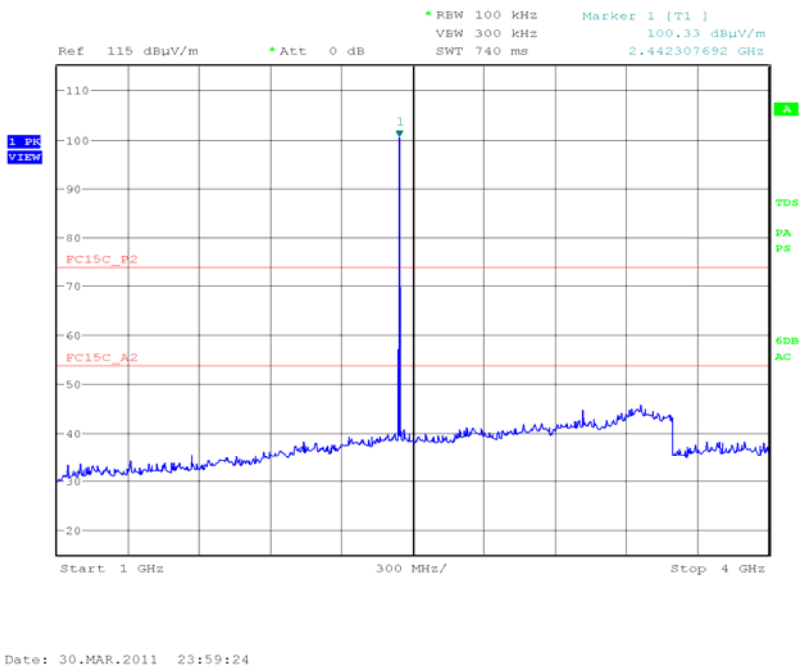
Product Service

1GHz to 25GHz

No emissions were detected in either polarity therefore reciever sensitivity values are presented in table an plot form.

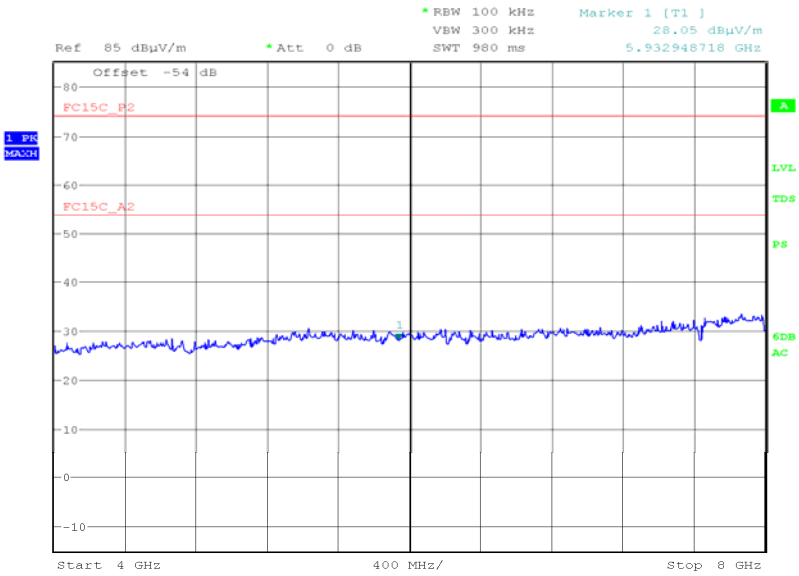
Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.806	Vertical	125	98	58.0	51.0	74.0	54.0
3.400	Vertical	100	0-360	45.0	51.0	74.0	54.0
7.820	Vertical	100	0-360	33.1	51.0	74.0	54.0
8.100	Vertical	100	0-360	33.3	51.0	74.0	54.0
11.940	Vertical	100	0-360	37.3	51.0	74.0	54.0
17.820	Vertical	100	0-360	43.8	51.0	74.0	54.0
23.590	Vertical	100	0-360	42.9	51.0	74.0	54.0

1GHz to 4GHz



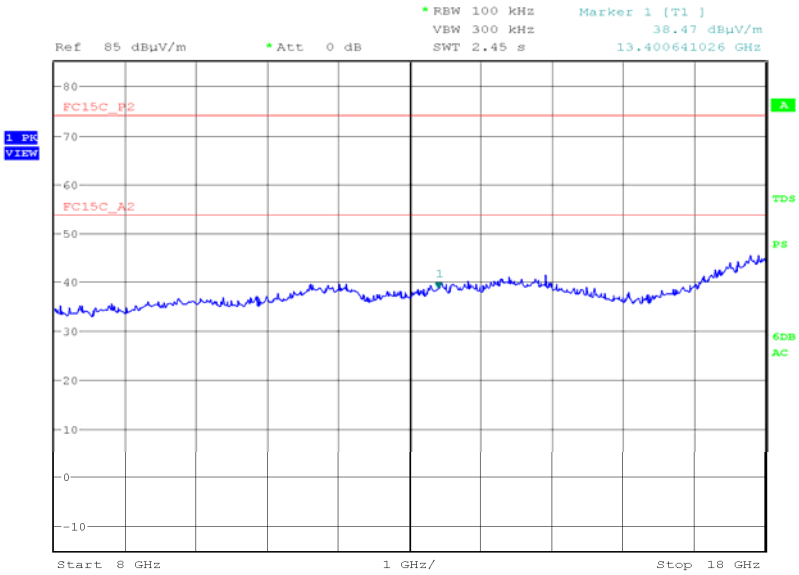
Product Service

1GHz to 8GHz



Date: 31.MAR.2011 01:05:25

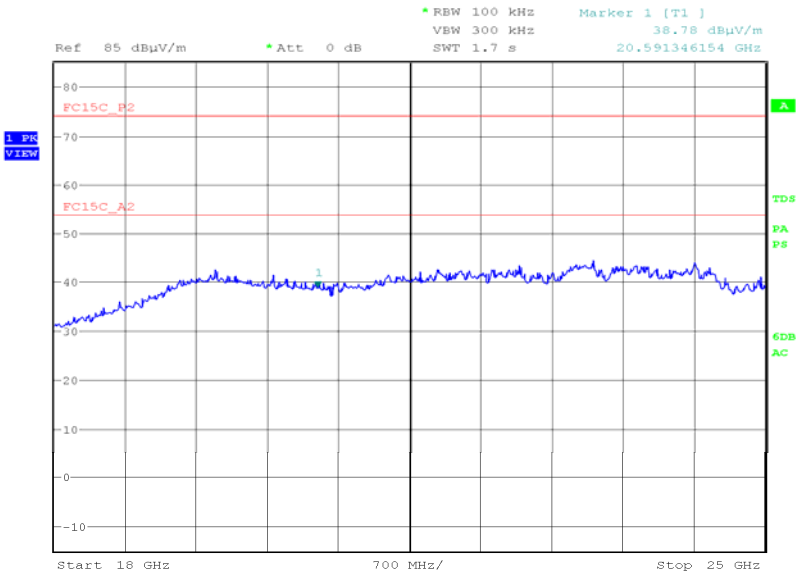
8GHz to 18GHz



Date: 31.MAR.2011 01:36:13

Product Service

18GHz to 25GHz

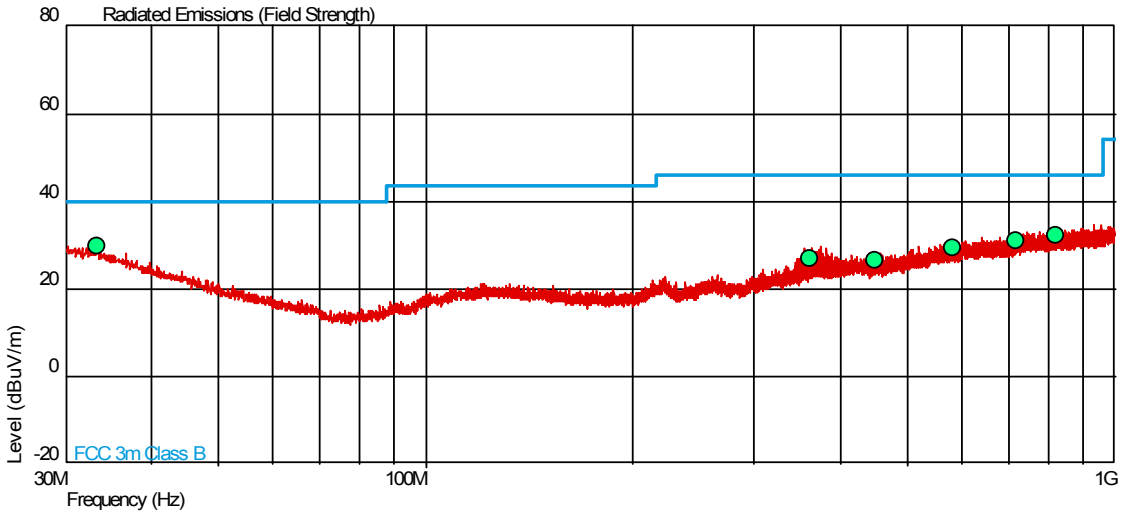


Date: 31.MAR.2011 01:55:32

Product Service

Configuration 1 - Mode 3

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP Limit (uV/m)	QP Margin (dBµV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
33.342	29.8	30.90	40.0	100	-10.2	-69.10	184	1.00	Vertical
361.412	26.9	22.13	46.0	200	-19.1	-177.87	78	1.00	Horizontal
448.115	26.5	21.13	46.0	200	-19.5	178.87	83	1.00	Horizontal
583.348	29.4	29.51	46.0	200	-16.6	-170.49	36	1.00	Vertical
717.422	31.1	35.89	46.0	200	-14.9	-164.11	141	3.86	Vertical
821.237	32.4	41.69	46.0	200	-13.6	-158.31	355	1.00	Horizontal

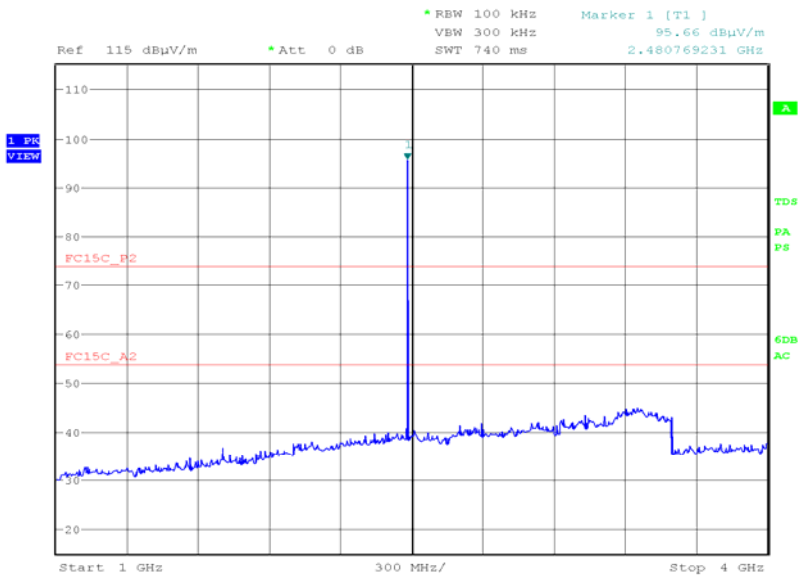
Product Service

1GHz to 25GHz

No emissions were detected in either polarity therefore reciever sensitivity values are presented in table an plot form.

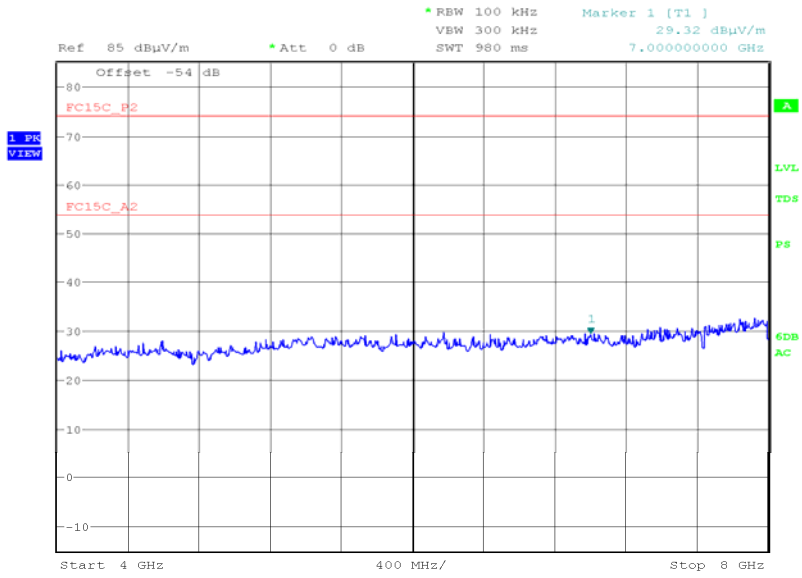
Freq. GHz	Ant Pol V/H	Ant Hgt cm	EUT Arc Deg	Final Peak dBµV/m	Final Average dBµV/m	Peak Limit dBµV/m	Average Limit dBµV/m
4.806	Vertical	125	98	58.0	51.0	74.0	54.0
3.400	Vertical	100	0-360	45.0	51.0	74.0	54.0
7.820	Vertical	100	0-360	33.1	51.0	74.0	54.0
8.100	Vertical	100	0-360	33.3	51.0	74.0	54.0
11.940	Vertical	100	0-360	37.3	51.0	74.0	54.0
17.820	Vertical	100	0-360	43.8	51.0	74.0	54.0
23.590	Vertical	100	0-360	42.9	51.0	74.0	54.0

1GHz to 4GHz



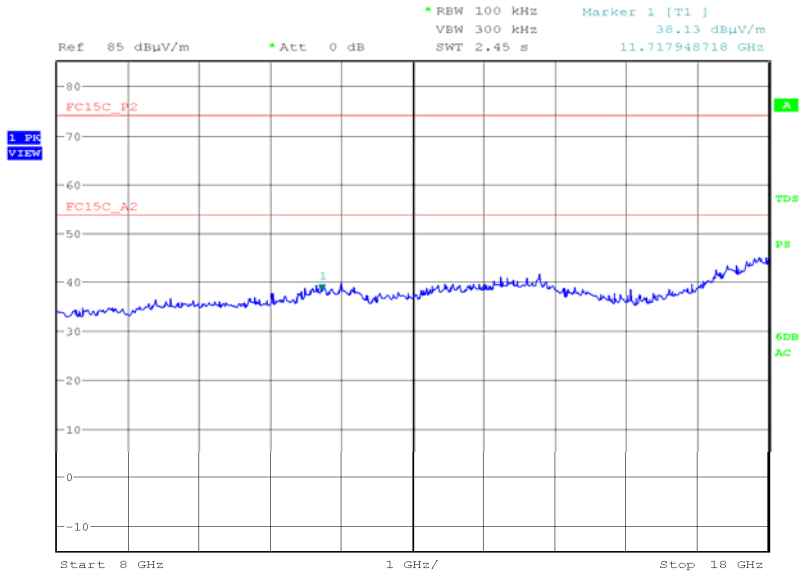
Product Service

4GHz to 8GHz



Date: 31.MAR.2011 00:55:27

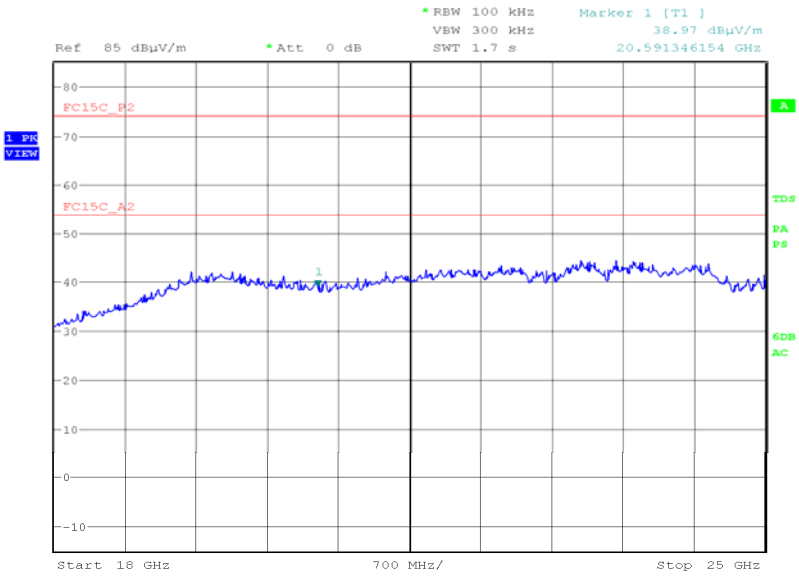
8GHz to 18GHz



Date: 31.MAR.2011 01:40:08

Product Service

18GHz to 25GHz



Date: 31.MAR.2011 01:51:21

2.8 SPURIOUS EMISSIONS

2.8.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)
Industry Canada, RSS-210, Clause A8.5

2.8.2 Equipment Under Test

DS3578 Scanner, S/N: MIN25A34B

2.8.3 Date of Test and Modification State

23 March 2011 - Modification State 0

2.8.4 Test Equipment Used

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

2.8.5 Test Method and Operating Modes

The test was applied in accordance with FCC CFR 47 Part 15.

In accordance with Part 15.247(d), the Spurious Conducted Emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 9 kHz to 25 GHz. The EUT was set to transmit on full power. The resolution and video bandwidths were set to 100 kHz in accordance with Part 15.247. The spectrum analyser detector was set to Max Hold.

With the EUT transmitting at maximum power, the Spectrum Analyser was set to Max Hold and the fundamental peak measured in a RBW and VBW of 100 kHz. This level was used to determine the limit line as displayed on the plots of -20dBc.

The maximum path loss across each measurement band was used as the reference level offset to ensure worst case results.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2
- Mode 3

2.8.6 Environmental Conditions

	23 March 2011
Ambient Temperature	25.0°C
Relative Humidity	25.0%

Product Service

2.8.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for Spurious Emissions.

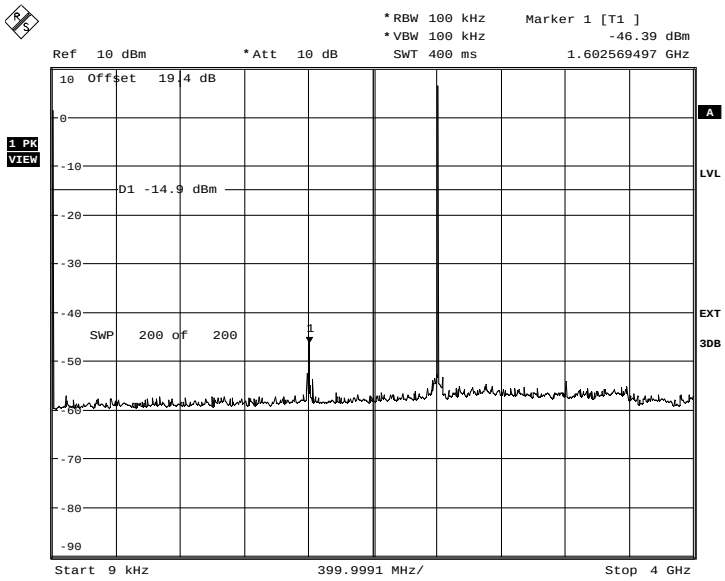
The test results are shown below.

3.6 V DC Supply

Configuration 1 – Mode 1

2DH5

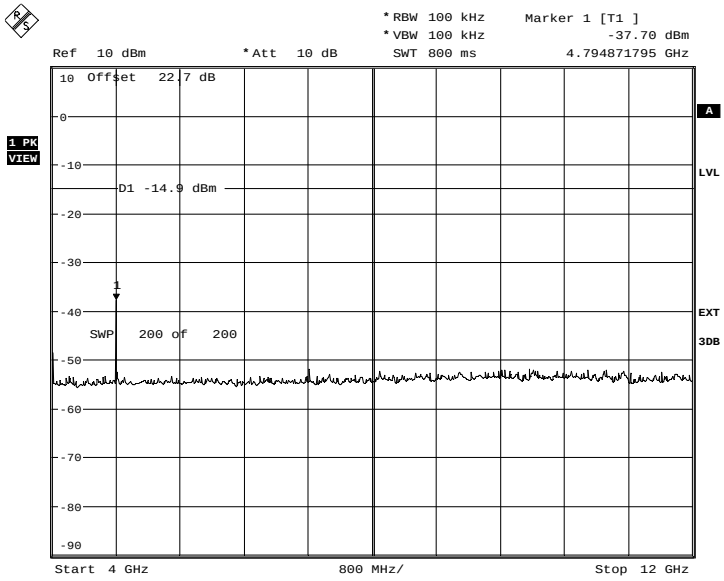
9kHz to 4GHz



Date: 23.MAR.2011 14:41:02

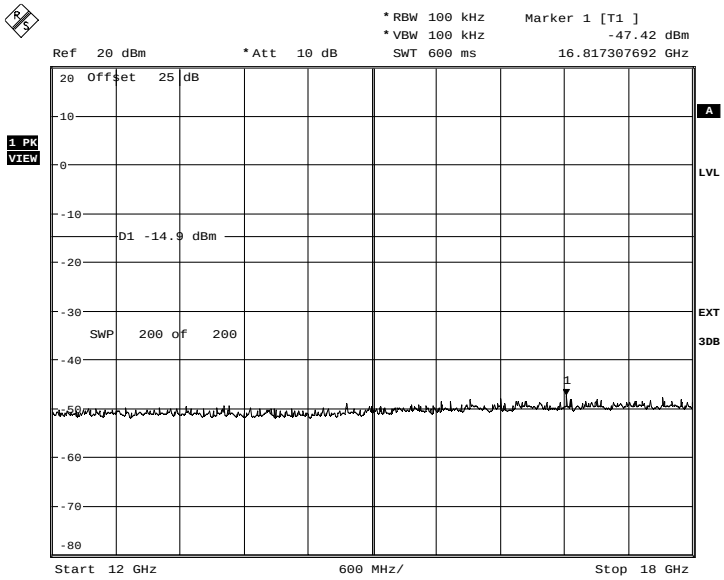
Product Service

4GHz to 12GHz



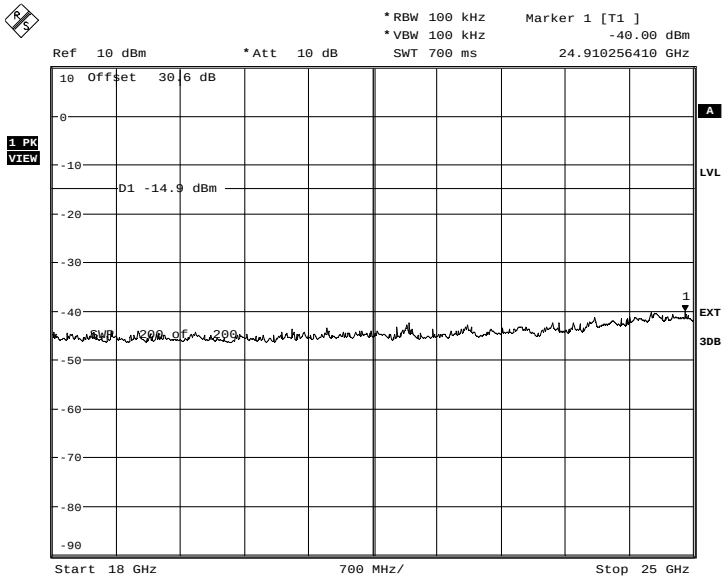
Date: 23.MAR.2011 14:17:59

12GHz to 18GHz



Date: 23.MAR.2011 14:57:21

18GHz to 25GHz

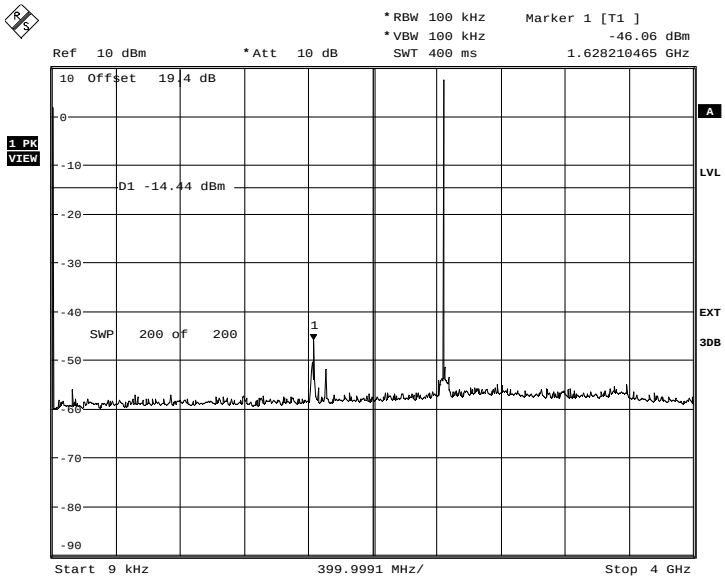


Date: 23.MAR.2011 15:49:18

Configuration 1 – Mode 2

2DH5

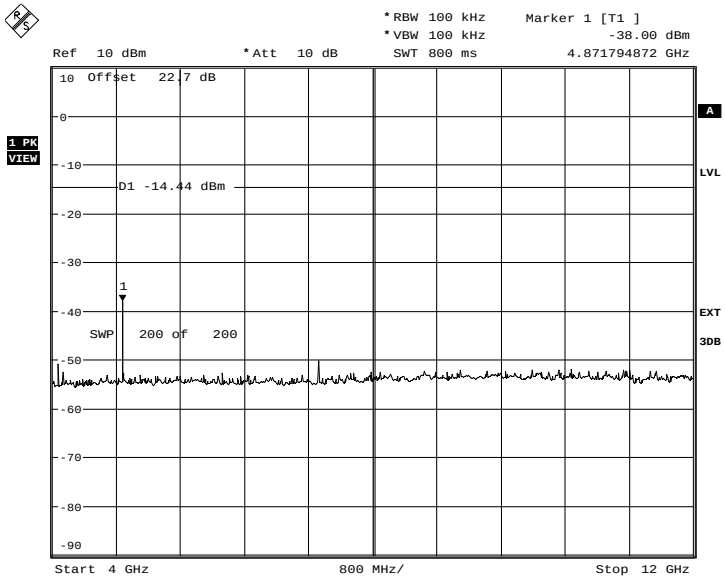
9kHz to 4GHz



Date: 23.MAR.2011 14:45:23

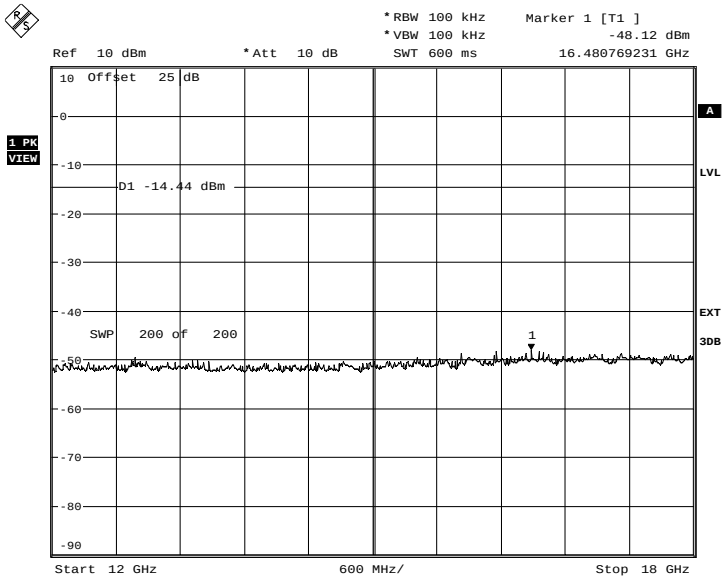
Product Service

4GHz to 12GHz



Date: 23.MAR.2011 14:25:47

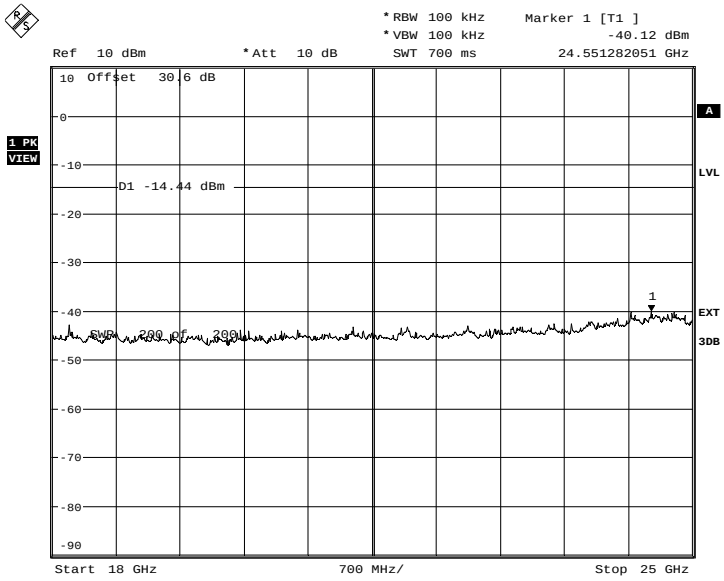
12GHz to 18GHz



Date: 23.MAR.2011 15:02:00

Product Service

18GHz to 25GHz

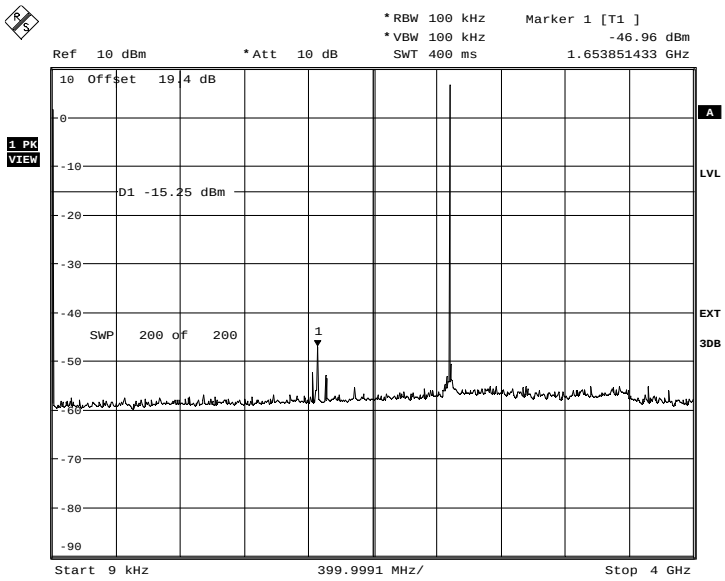


Date: 23.MAR.2011 15:57:13

Configuration 1 – Mode 3

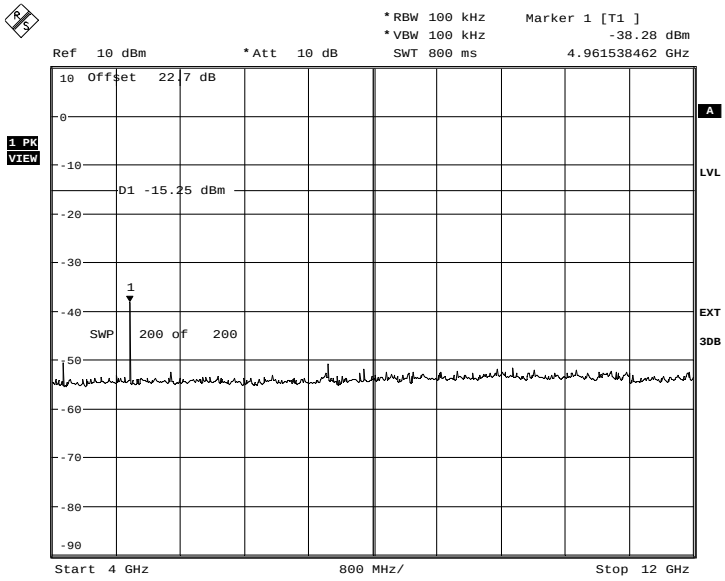
2DH5

9kHz to 4GHz



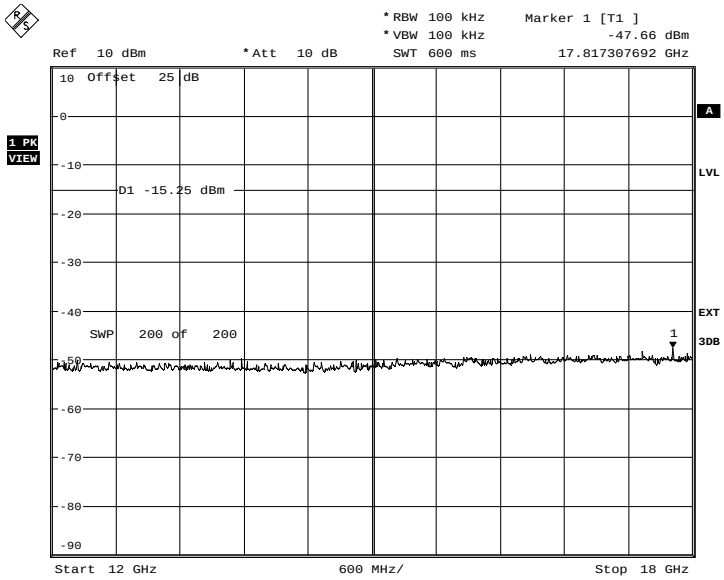
Date: 23.MAR.2011 14:49:53

4GHz to 12GHz



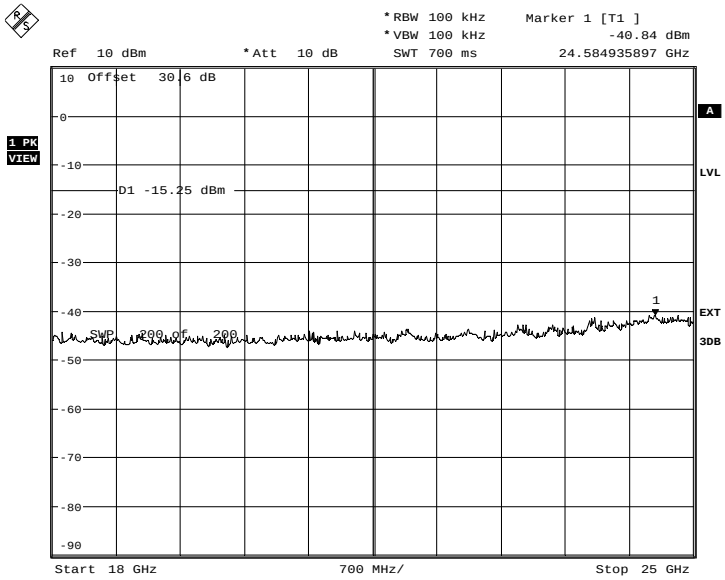
Date: 23.MAR.2011 14:31:48

12GHz to 18GHz



Date: 23.MAR.2011 15:06:43

18GHz to 25GHz



Date: 23.MAR.2011 16:01:50

Limit Clause

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

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 instead of 20 dB.

Product Service

2.9 BAND EDGE EMISSIONS

2.9.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.247 (d)
Industry Canada RSS-210, Clause A8.5, 2.2

2.9.2 Equipment Under Test

DS3578 Scanner, S/N: M1N29F24C

2.9.3 Date of Test and Modification State

30 to 31 March 2011 - Modification State 0

2.9.4 Test Equipment Used

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

2.9.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 3

2.9.6 Environmental Conditions

	30 March 2011	31 March 2011
Ambient Temperature	21.0°C	19.4°C
Relative Humidity	36.0%	31.0%

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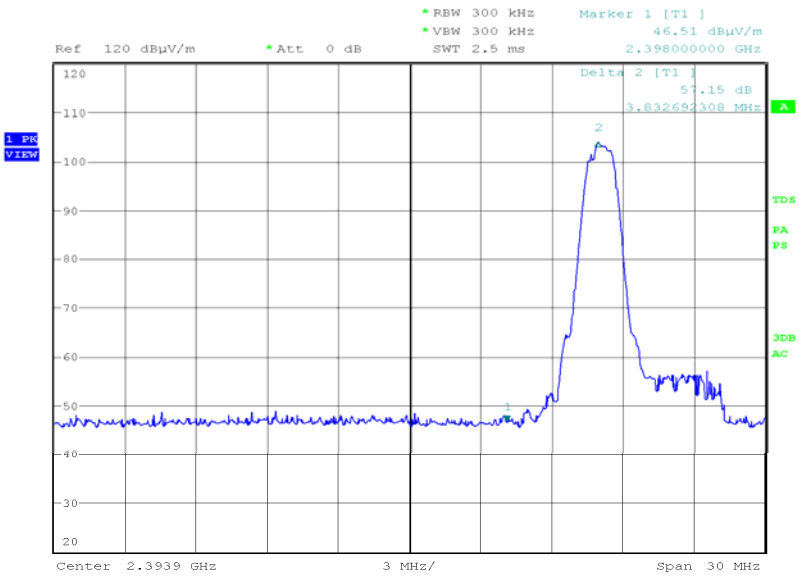
2.9.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and Industry Canada RSS-210 for Band Edge Emissions.

The test results are shown below.

Configuration 1 - Mode 1

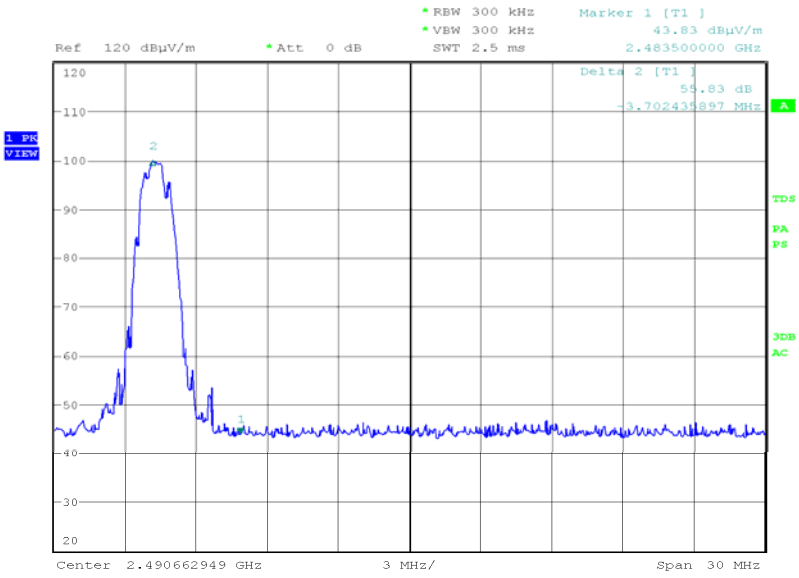
Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.402	Horizontal	46.96	74.0	39.41	54.0



Product Service

Configuration 1 - Mode 3

Freq in GHz	Polarisation	Final Peak dBµV/m	Peak Limit dBµV/m	Final Average dBµV/m	Average Limit dBµV/m
2.480	Horizontal	44.67	74.0	37.04	54.0



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 – 20dB Bandwidth					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Signal Generator	Rohde & Schwarz	SMR40	1002	12	22-Jul-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Multimeter	Iso-tech	IDM101	2424	12	3-Sep-2011
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	13-Oct-2011
1360MHz Coaxial sleeve Antenna	TUV		3534	-	TU
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (2m)	Rhophase	NPS-1803-2000-NPS	3698	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012
Section 2.2 - Channel Separation					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Attenuator (10dB)	Weinschel	47-10-34	481	12	26-Mar-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Multimeter	Iso-tech	IDM101	2424	12	3-Sep-2011
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	2-Jun-2011
Power Meter	Rohde & Schwarz	NRP	3491	-	TU
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z51	3492	12	15-Apr-2011
Signal Generator, 9kHz to 3GHz	Rohde & Schwarz	SMA 100A	3494	12	25-Jan-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (2m)	Rhophase	NPS-1803-2000-NPS	3698	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3877	12	22-Feb-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012

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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 - Channel Dwell Time					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Attenuator (10dB)	Weinschel	47-10-34	481	12	26-Mar-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Multimeter	Iso-tech	IDM101	2424	12	3-Sep-2011
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	2-Jun-2011
Power Meter	Rohde & Schwarz	NRP	3491	-	TU
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z51	3492	12	15-Apr-2011
Signal Generator, 9kHz to 3GHz	Rohde & Schwarz	SMA 100A	3494	12	25-Jan-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (2m)	Rhophase	NPS-1803-2000-NPS	3698	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3877	12	22-Feb-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012
Section 2.4 - Number of Hopping Channels					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Attenuator (10dB)	Weinschel	47-10-34	481	12	26-Mar-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Multimeter	Iso-tech	IDM101	2424	12	3-Sep-2011
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	2-Jun-2011
Power Meter	Rohde & Schwarz	NRP	3491	-	TU
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z51	3492	12	15-Apr-2011
Signal Generator, 9kHz to 3GHz	Rohde & Schwarz	SMA 100A	3494	12	25-Jan-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (2m)	Rhophase	NPS-1803-2000-NPS	3698	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3877	12	22-Feb-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Maximum Peak Conducted Output Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	11-Feb-2012
Dual programable power supply	Thurlby	T-1000	418	-	TU
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Multimeter	Iso-tech	IDM101	2424	12	3-Sep-2011
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Signal Generator, 9kHz to 3GHz	Rohde & Schwarz	SMA 100A	3494	12	25-Jan-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (2m)	Rhophase	NPS-1803-2000-NPS	3698	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012
Section 2.6, 2.7 and 2.9 – EIRP Peak Power, Radiated Emissions (Enclosure Port) and Band Edge Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Nov-2011
Antenna (Bilog)	Schaffner	CBL6143	287	24	19-Jan-2012
DRG	EMCO	3115	793	12	14-Aug-2011
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2011
Pre-Amplifier	Phase One	PSO4-0087	1534	12	22-Sep-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Antenna Mast	EMCO	1050	1707	-	TU
Turntable Controller	Various	RH253	1708	-	TU
Antenna (Double Ridge Guide)	EMCO	3115	1711	12	14-Aug-2011
Open Area Site 2	TUV	OATS2	1850	36	11-Sep-2011
Turntable Interface	Various	RH-253.6	1855	-	TU
Bilog Antenna	Schaffner	CBL6143	1858	24	9-Aug-2012
Antenna Tower 6M	EMCO	1050	1859	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	17-Sep-2011
4GHz HPF	Sematron	F-100-4000-5-R	2245	-	TU
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	2-Jul-2011
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011

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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.8 - Spurious Emissions					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Signal Generator	Rohde & Schwarz	SMR40	1002	12	22-Jul-2011
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	11-Sep-2011
Multimeter	Iso-tech	IDM101	2424	12	3-Sep-2011
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	6-Sep-2011
Hygrometer	Rotronic	I-1000	3220	12	27-Apr-2011
Attenuator (10dB, 20W)	Lucas Weinschel	1	3225	12	13-Oct-2011
Power Splitter	Aeroflex / Weinschel	1534	3247	12	31-Mar-2011
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Jan-2012
'N' - 'N' RF Cable (2m)	Rhophase	NPS-1803-2000-NPS	3698	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
Combiner/Splitter	Weinschel	1506A	3880	12	22-Feb-2012

TU – Traceability Unscheduled
O/P Mon – Output monitored using calibrated equipment.

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3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude EM Clamp Method of Test CDN Method of Test BCI Clamp Method of Test Direct Injection Method of Test	 3.1dB• 1.2dB• 1.1dB• 1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°
Channel Occupancy/Separation	19.1kHz	N/A
Maximum Output Power	Not Applicable	±0.5dB
Number of Channels	Not Applicable	N/A
20dB Bandwidth	19.1kHz	±0.5dB

Worst case error for both Time and Frequency measurement 12 parts in 10^6.

* In accordance with CISPR 16-4-2
† In accordance with UKAS Lab 34
• In accordance with EN61000-4-6

Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

UKAS TESTING 0141

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).