Report On

FCC Testing of the
SRT Marine Technology Ltd AIS-SART Mercury 409-0002
In accordance with FCC CFR 47 Part 80

COMMERCIAL-IN-CONFIDENCE

FCC ID: UYW-4090002

Document 75917539 Report 04 Issue 2 November 2012

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COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC Testing of the
SRT Marine Technology Ltd AIS-SART Mercury 409-0002
In accordance with FCC CFR 47 Part 80

Document 75917539 Report 04 Issue 2

November 2012

PREPARED FOR

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Bath
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PREPARED BY

Natalie Bennett
Senior Administrator (Technical)

APPROVED BY

Mark Jenkins
Authorised Signatory

DATED 08 November 2012

This report has been up-issued to Issue 2 to correct the FCC ID.

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 80. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

M Russell B Airs S Bennett T Guy

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Product Service

SECTION 1

REPORT SUMMARY

FCC Testing of the
SRT Marine Technology Ltd AIS-SART Mercury 409-0002
In accordance with FCC CFR 47 Part 80

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the SRT Marine Technology Ltd AIS-SART Mercury 409-0002 to the requirements of FCC CFR 47 Part 80.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	SRT Marine Technology Ltd
Model Number(s)	409-0002
Serial Number(s)	40900023120003 – MMSI: 970460003 40900023120010 – MMSI: 970460010 40900023120009 – MMSI: 970460009
Number of Samples Tested	3
Test Specification/Issue/Date	FCC CFR 47 Part 80 (2011)
Incoming Release Date	Application Form 03 September 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	POR002829 19 December 2011
Start of Test	10 August 2012
Finish of Test	27 September 2012
Name of Engineer(s)	M Russell B Airs S Bennett T Guy

Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 80 is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Transmit				
2.1	80.205	Bandwidths	Pass	
2.2	80.209	Transmitter Frequency Tolerances	Pass	
2.3	80.211	Emission Limitations	Pass	
2.4	80.213	Modulation Requirements	Pass	
2.5	80.213 (a)(2)	Transmitter Frequency Deviation	Pass	
2.6	80.215	Transmitter Power	Pass	
2.8	80.215 (e)(g)(1)(2)(3)	Transmitter Carrier Power Reduction	Pass	
Idle				
2.7	80.217 (b)	Suppression of Interface Aboard Ships	Pass	

Product Service

1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	Mercury AIS SART
Part Number	409-0002
Technical Description (Please provide a brief description of the intended use of the equipment)	Search and Rescue transponder . used on board ships and in life rafts.

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	V	Max Current	A	
	Extreme upper voltage	V			
	Extreme lower voltage	V			
Battery					
☐	Nickel Cadmium	☐	Lead acid (Vehicle regulated)		
☐	Alkaline	☐	Leclanche		
☒	Lithium	☐	Other Details :		
6	Volts nominal.				
End point voltage as quoted by equipment manufacturer		6	V		

FREQUENCY INFORMATION					
Frequency Range	161.975 to 162.025	MHz			
Channel Spacing (where applicable)	25 KHz				
Test Frequencies*	Bottom	161.975	MHz	Channel Number (if applicable)	AIS1
	Middle		MHz	Channel Number (if applicable)	
	Top	162.025	MHz	Channel Number (if applicable)	AIS2
If alternate test modes are available resulting in different test frequencies please specify which mode is applicable:					
POWER CHARACTERISTICS					
Maximum TX power	4.5	W			
Minimum TX power	1/2	W (if variable)			
Is transmitter intended for :					
Continuous duty				☐ Yes	☒ No
Intermittent duty				☒ Yes	☐ No
If intermittent state DUTY CYCLE					
Transmitter ON	0.024 seconds				
Transmitter OFF	seconds				

Product Service

ANTENNA CHARACTERISTICS				
☐	Antenna connector	State impedance		Ohm
☐	Temporary antenna connector	State impedance		Ohm
☒	Integral antenna	Gain	3	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	12K5GXW
(if applicable) 2	
(if applicable) 3	
If more than three classes of emission, list separately:	

EXTREME CONDITIONS			
Extreme test voltages (Max)	V	Extreme test voltages (Min)	V
Nominal DC Voltage	V	DC Maximum Current	A
Maximum temperature	°C	Minimum temperature	°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: Richard McMahon

Position held: Certification Engineer Date: 15.10.12

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a SRT Marine Technology Ltd AIS-SART Mercury 409-0002. 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 6 V DC supply.

FCC Accreditation
90987 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

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: 40900023120010 – MMSI: 970460010			
0	As supplied by manufacturer.	N/A	N/A
1	A low pass filter was fitted and harmonic trap to suppress the unwanted emission	SRT Marine	As supplied 10 September 2012
Serial Number: 40900023120009 – MMSI: 970460009			
0	As supplied by manufacturer.	N/A	N/A
1	A low pass filter was fitted and harmonic trap to suppress the unwanted emission	SRT Marine	As supplied 10 September 2012

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
SRT Marine Technology Ltd AIS-SART Mercury 409-0002
In accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 80

2.1 BANDWIDTHS

2.1.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.205

2.1.2 Equipment Under Test and Modification State

409-0002 S/N: 40900023120003 – MMSI: 970460003 - Modification State 0

2.1.3 Date of Test

10 August 2012

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 EUT was connected to a spectrum analyser via a cable and attenuators. The EUT was configured to transmit three different packet data loads at maximum power.

The trace was set to max hold until a sufficient number of sweeps was observed. The 99% occupied bandwidth function was selected on the spectrum analyser and the result and the trace were recorded.

2.1.6 Environmental Conditions

Ambient Temperature	22.7°C
Relative Humidity	38.6%

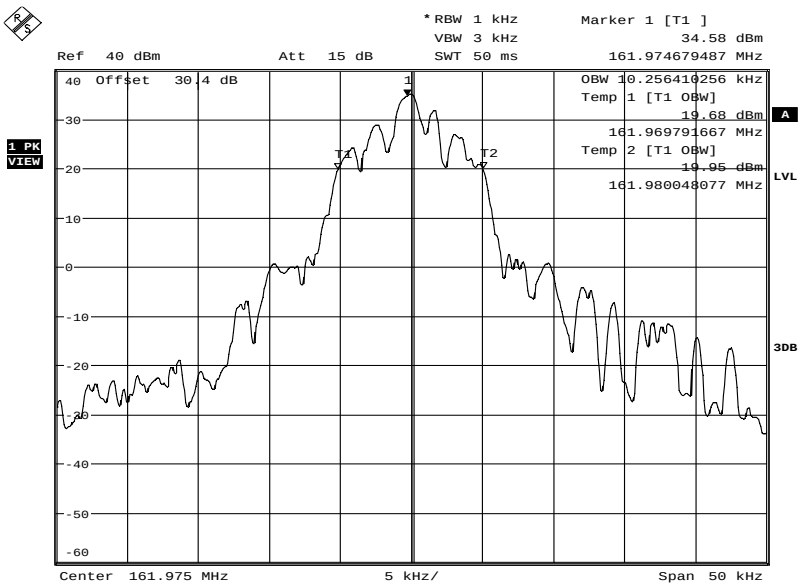
2.1.7 Test Results

Transmit

Frequency	Test Signal	Authorised Bandwidth	Result (kHz)
161.975 MHz	01010101	16 kHz	10.256
	00001111	16 kHz	9.855
	PRS	16 kHz	9.695
162.025 MHz	01010101	16 kHz	9.935
	00001111	16 kHz	9.695
	PRS	16 kHz	9.615

161.975 MHz

01010101



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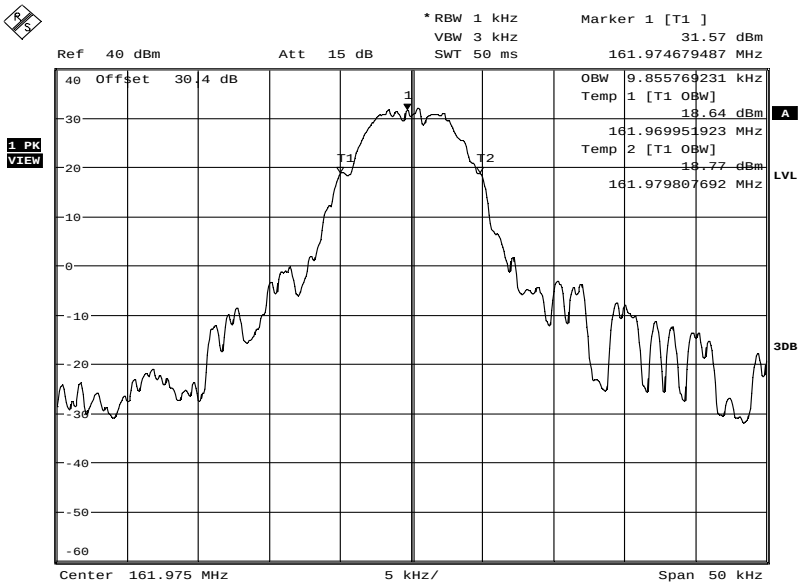

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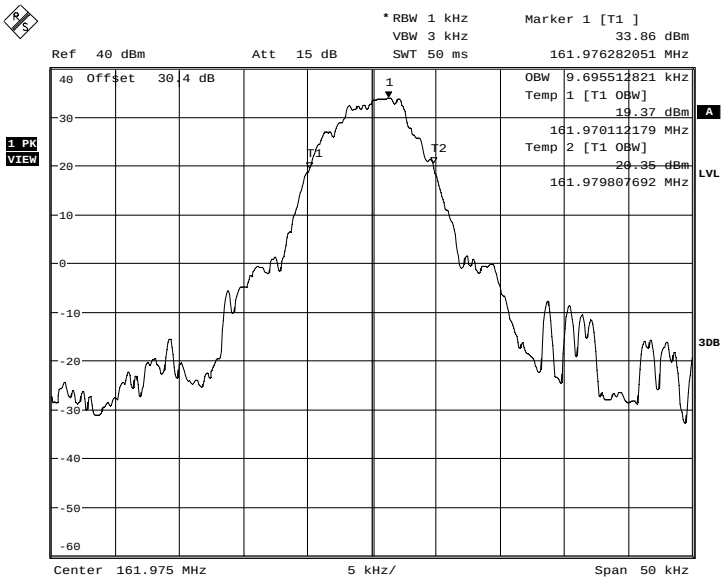
PRS



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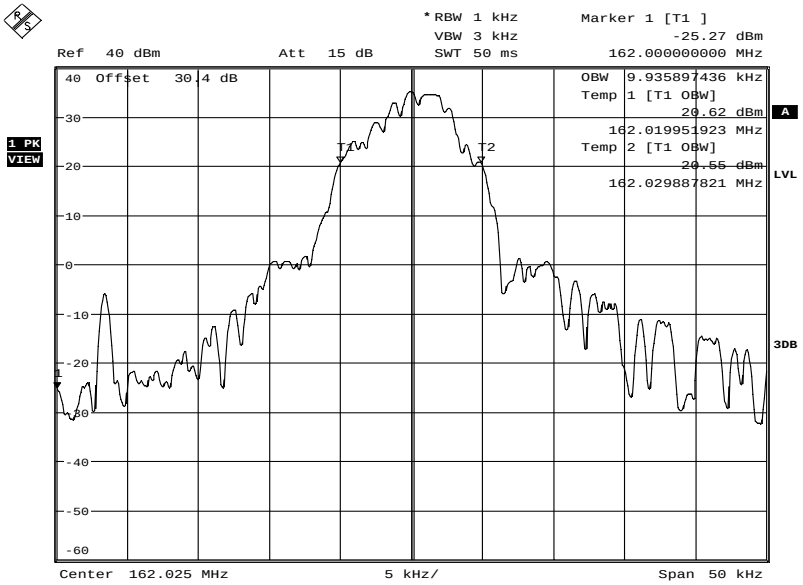
162.025 MHz

01010101



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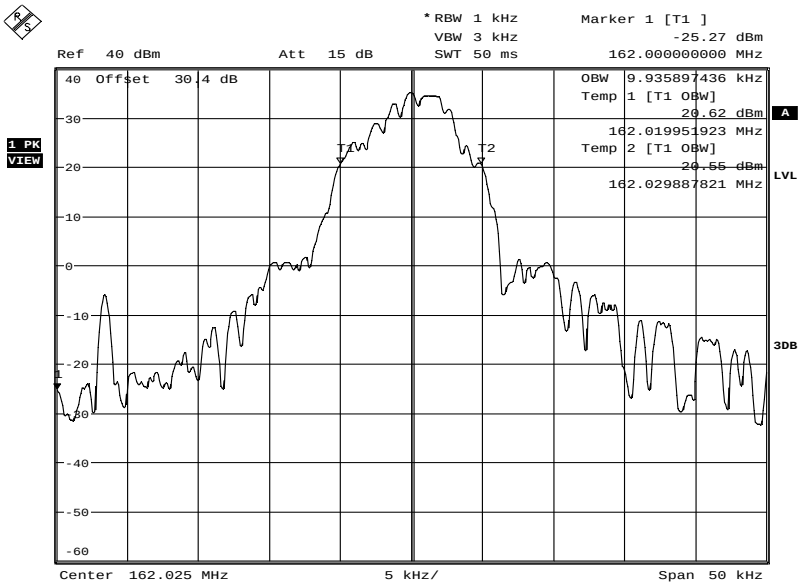

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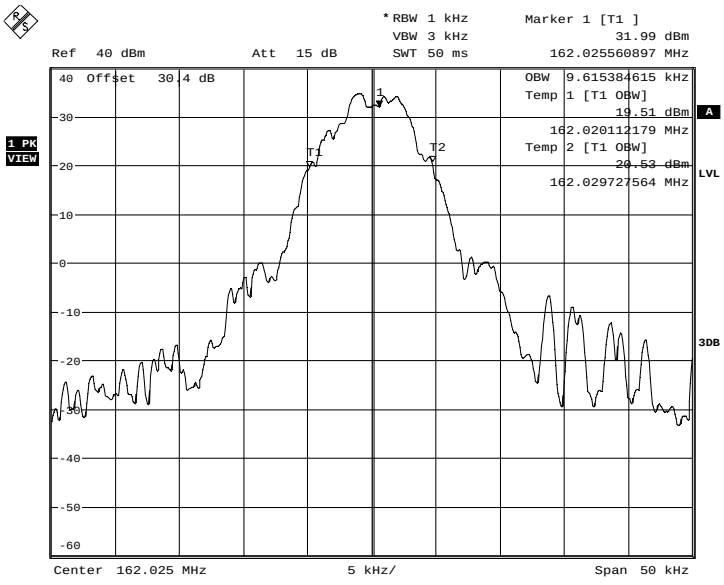


Date: 9.AUG.2012 13:54:22

Limit Clause

(d) The nominal authorised channel bandwidth for voice is 20 kHz
(e) For data modulation, an authorised bandwidth of 16 kHz is permitted.
± 5 KHz.

2.2 TRANSMITTER FREQUENCY TOLERANCES

2.2.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.209

2.2.2 Equipment Under Test and Modification State

409-0002:2 S/N: 40900023120010 – MMSI: 970460010 - Modification State 1

2.2.3 Date of Test

20 September 2012

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 EUT was connected to a spectrum analyser via a 30 dB attenuator with an external high stability frequency reference connected.

The EUT was transmitted unmodulated and the trace set to max hold with a 100 Hz resolution bandwidth.

The marker was then used to measure the peak response and the result recorded in the table on the following page.

The EUT was connected to a spectrum analyser via a 30 dB attenuator with an external high stability frequency reference connected. The EUT was transmitted unmodulated and the trace set to max hold with a 100 Hz resolution bandwidth. The marker was then used to measure the peak response and the result recorded in the table on the following page.

2.2.6 Environmental Conditions

Ambient Temperature	24.8°C
Relative Humidity	32.2%

Product Service

2.2.7 Test Results

Transmit

161.975 MHz

Temperature	Frequency Error (ppm)
	6 V DC
-20°C	-0.3
-10°C	-0.2
0°C	-0.2
+10°C	0.3
+20°C	-0.25
+30°C	-0.4
+40°C	-0.49
+50°C	-0.69
+55°C	-0.65

162.025 MHz

Temperature	Frequency Error (ppm)
	6 V DC
-20°C	-0.4
-10°C	-0.2
0°C	-0.2
+10°C	0.4
+20°C	-0.2
+30°C	-0.4
+40°C	-0.59
+50°C	-0.59
+55°C	-0.69

Frequency	Maximum Frequency Error (Hz)
161.975 MHz	-112
162.025 MHz	112

Limit Clause

No limit is defined 80.209. Therefore limit from ITU 1371 is used.

±3ppm.

2.3 EMISSION LIMITATIONS

2.3.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.211

2.3.2 Equipment Under Test and Modification State

409-0002:2 S/N: 40900023120010 – MMSI: 970460010 - Modification State 1

2.3.3 Date of Test

13 September 2012, 19 September 2012 & 25 September 2012

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

Conducted

The EUT transmitting on full power, was connected to a Spectrum Analyser via 50dB of attenuation in the 9kHz – 300MHz frequency range and via a 30dB attenuator with 300MHz High Pass Filter in the 300MHz – 2GHz frequency range.

The EUT was checked (for bottom and top channels of the EUT) against the specification limit for all emissions >250% removed from the assigned frequency, between 9kHz – 2GHz frequency range.

The Path Loss for each frequency range was recorded and the worst case loss was entered as a Reference Level Offset.

Product Service

Radiated

A preliminary profile of the Spurious Radiated Emissions was obtained up to the 10th harmonic 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.

The EUT was set to transmit on maximum power with both channels operating simultaneously.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

2.3.6 Environmental Conditions

Ambient Temperature	22.8 - 24.3°C
Relative Humidity	31.7 - 40.0%

Product Service

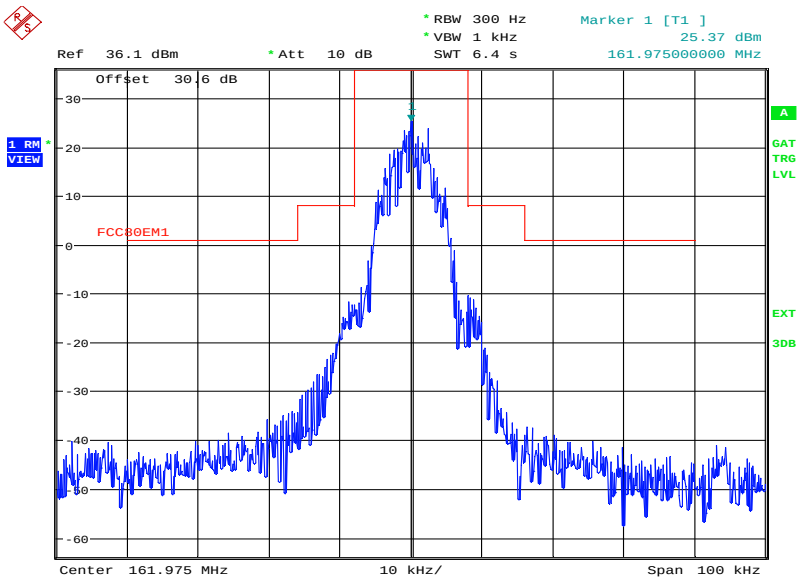
2.3.7 Test Results

Transmit

6 V DC Supply

Conducted

161.975 MHz



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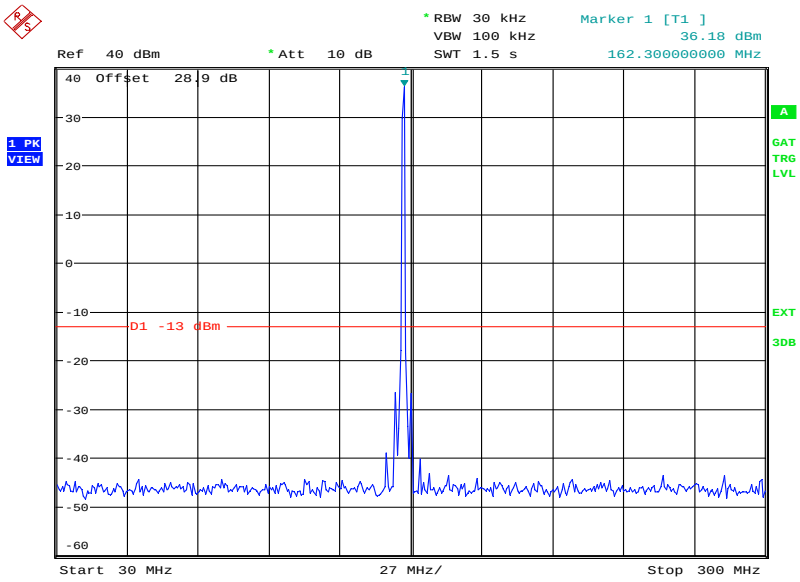
Product Service

30 MHz to 300 MHz



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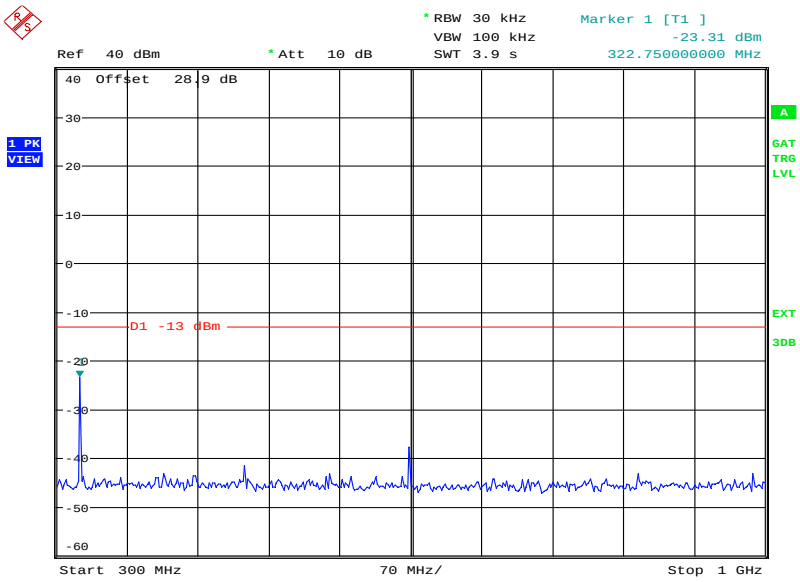
300 MHz to 1 GHz



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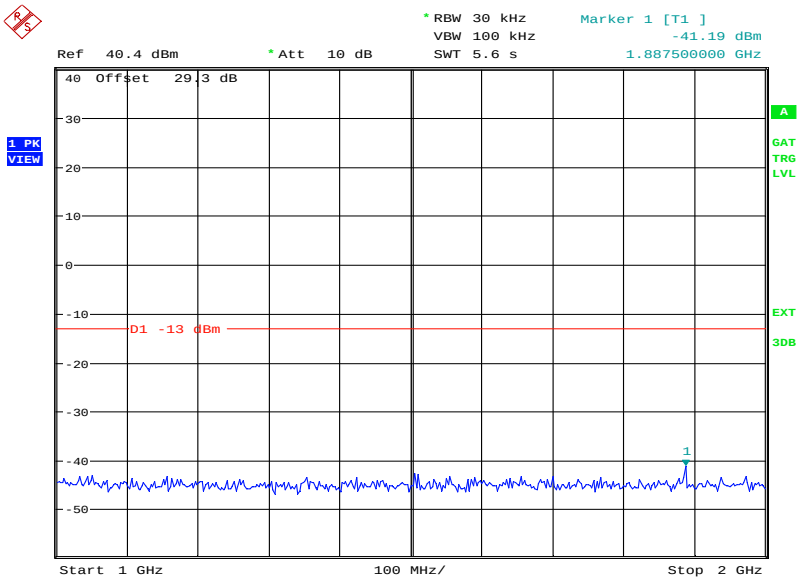
Product Service

1 GHz to 2 GHz



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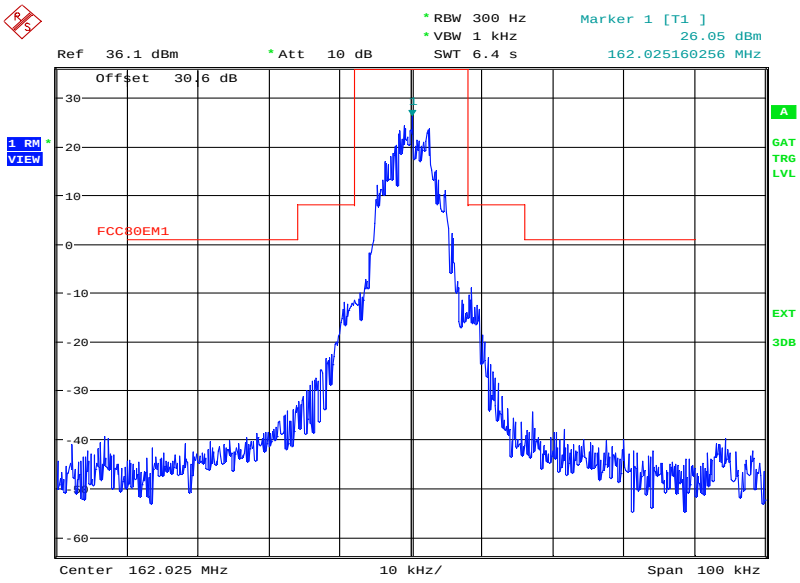
162.025 MHz



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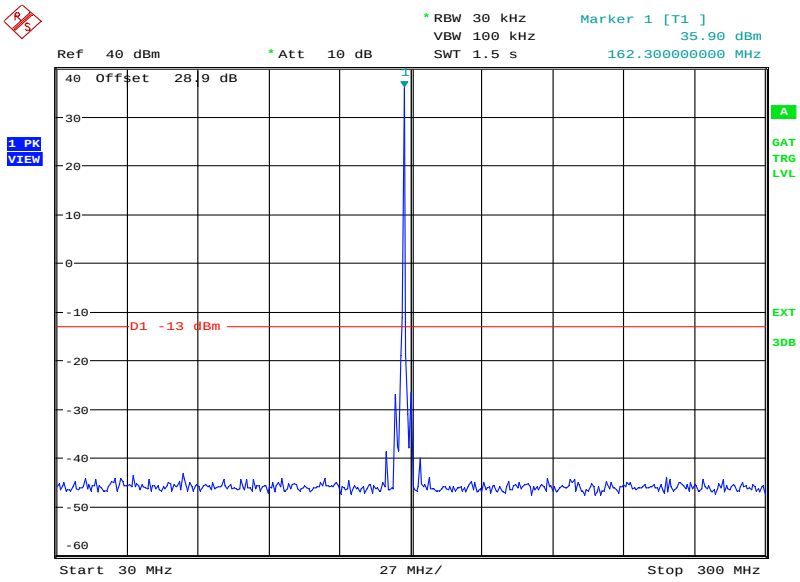
Product Service

30 MHz to 300 MHz



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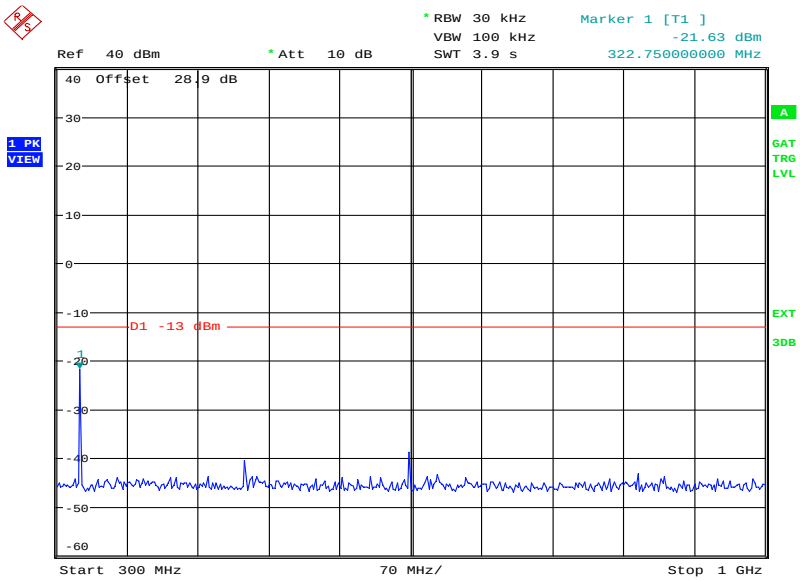
300 MHz to 1 GHz



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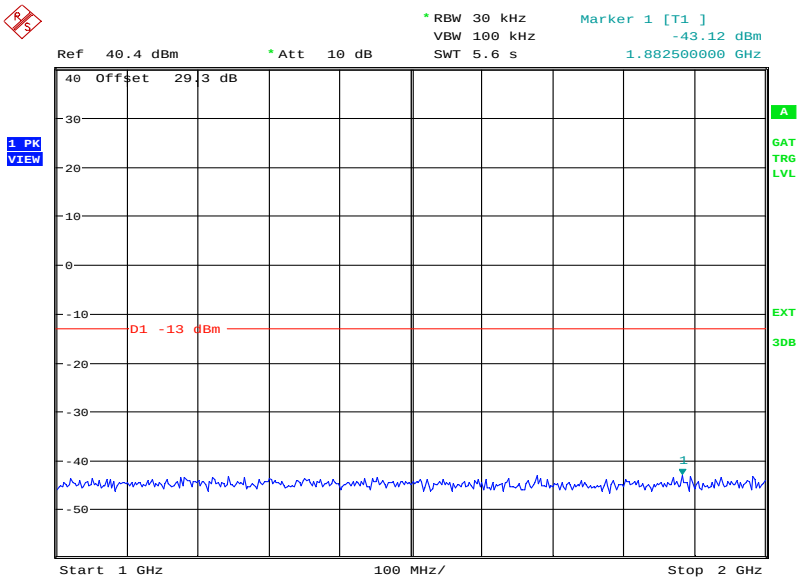
Product Service

1 GHz to 2 GHz



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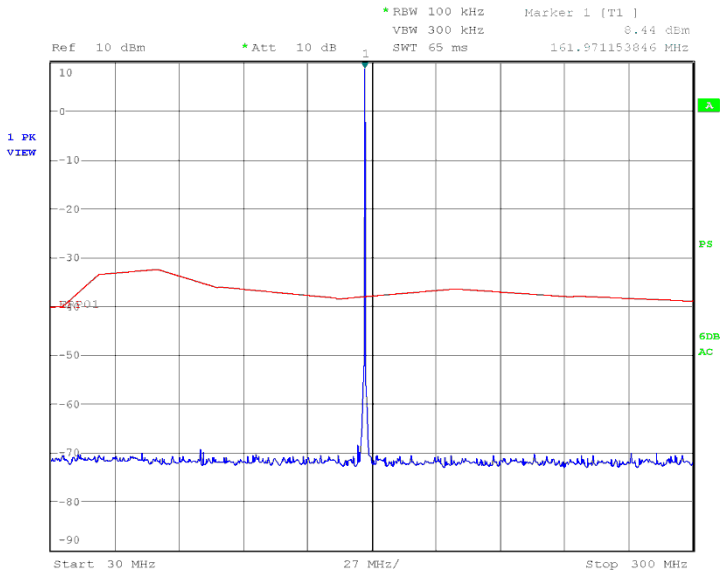
Radiated

30 MHz to 300 MHz



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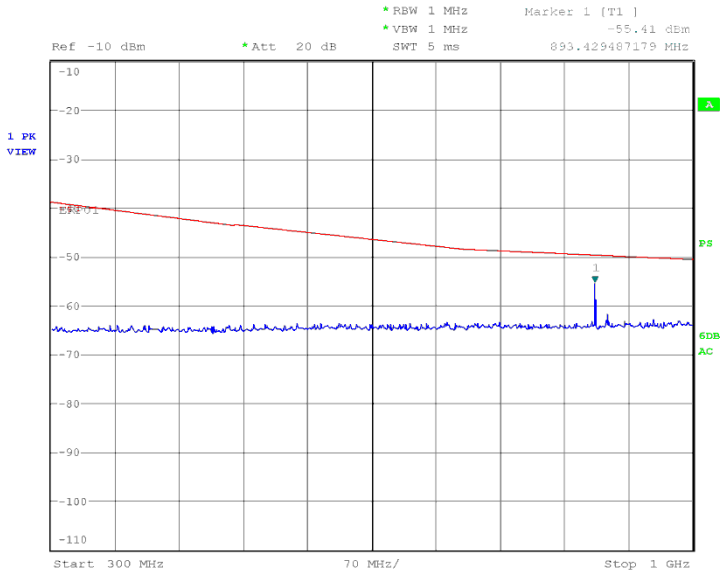
Product Service

300 MHz to1 GHz



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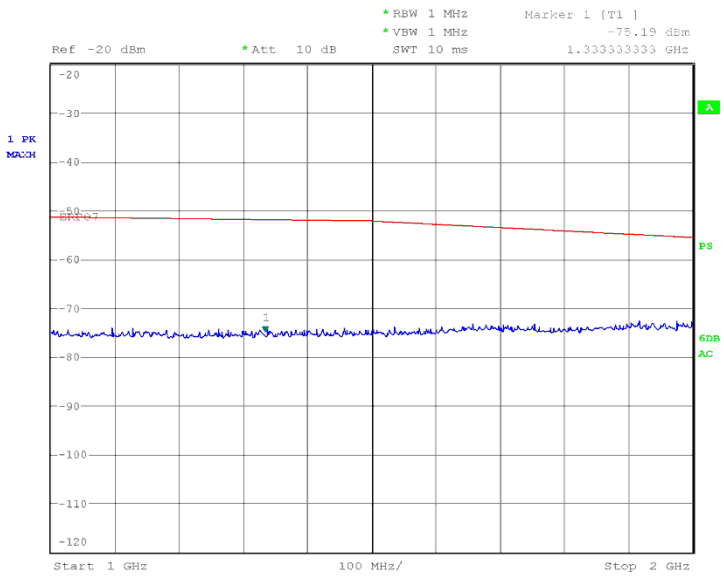
1 GHz to2 GHz



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Limit Clause 80.211

Emission Mask

On any frequency removed from the assigned frequency by more than 50 % up to and including 100 % of the authorized bandwidth: At least 25 dB

On any frequency removed from the assigned frequency by more than 100 % up to and including 250 % of the authorized bandwidth: At least 35 dB

Outside the Emission Mask

>250 % of authorised bandwidth 43+10 Log P **OR** -13 dBm

2.4 MODULATION REQUIREMENTS

2.4.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.213

2.4.2 Equipment Under Test and Modification State

409-0002 S/N: 40900023120003 – MMSI: 970460003 - Modification State 0

2.4.3 Date of Test

10 August 2012

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 EUT was configured to transmit three different packet data loads. These were 11110000, 10101010 and PRBS. The traces were recorded as shown below.

2.4.6 Environmental Conditions

Ambient Temperature	22.7°C
Relative Humidity	38.6%

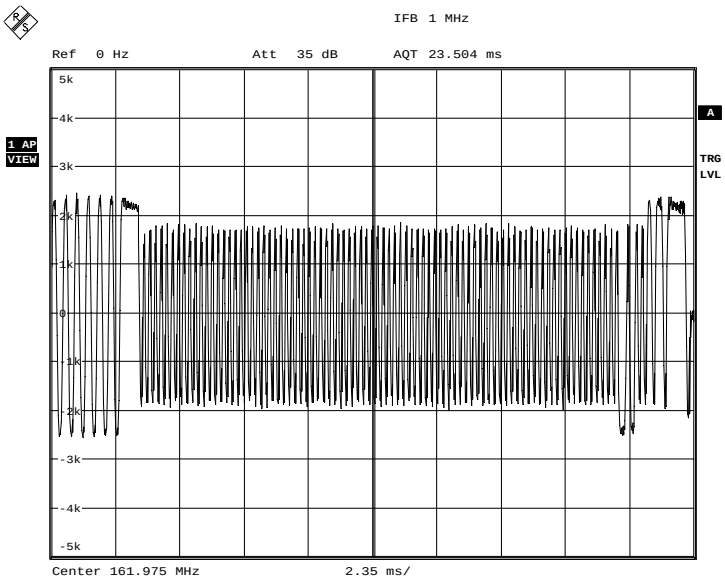
Product Service

2.4.7 Test Results

Transmit

161.975 MHz

01010101



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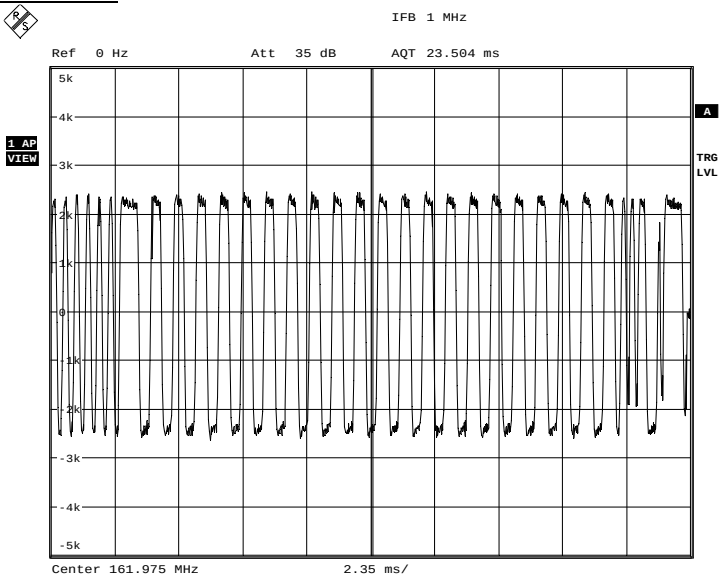

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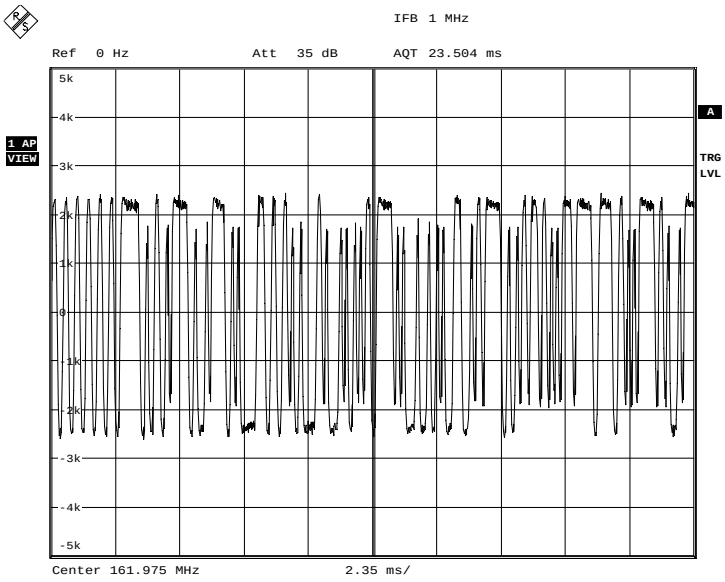
PRS



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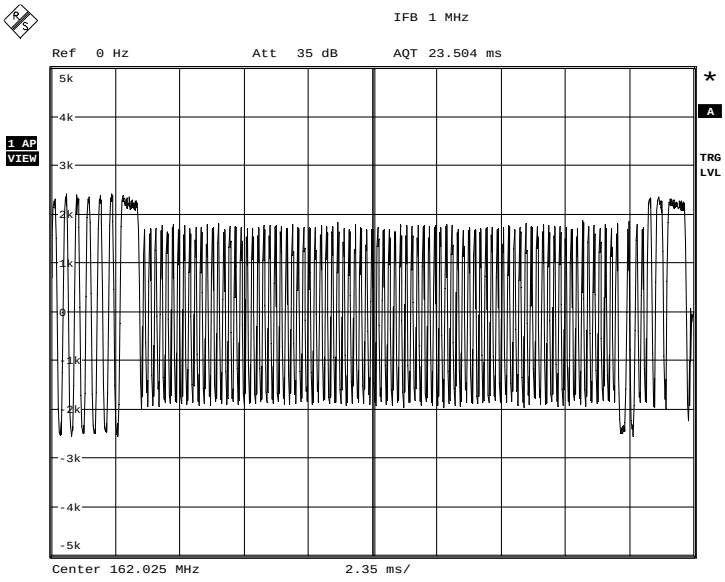
162.025 MHz

01010101



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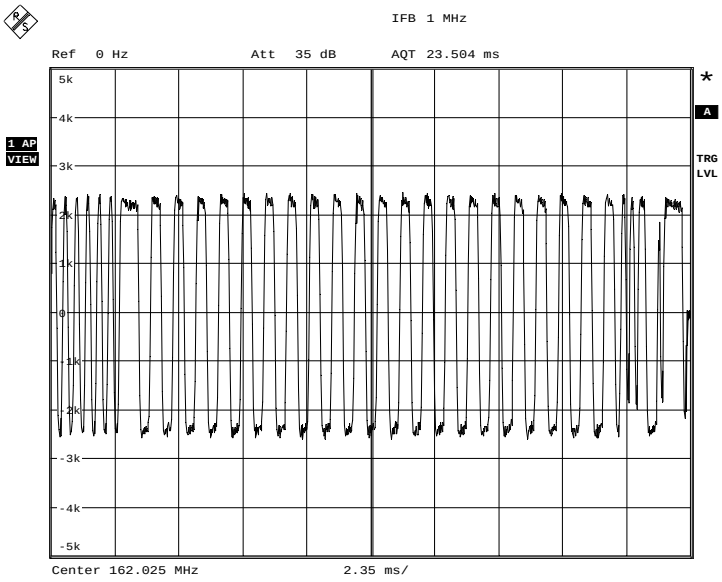

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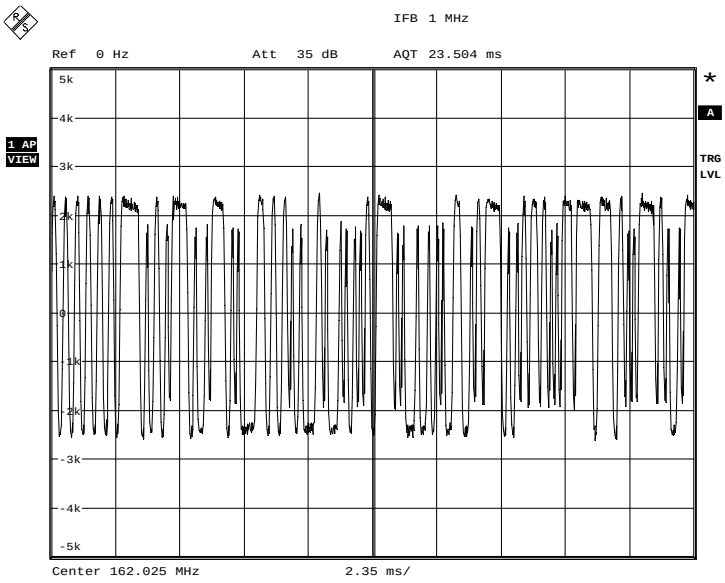
PRS



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Limit Clause

When phase or frequency modulation is used in the 156-162 MHz bands the peak modulation must be maintained between 75 and 100 percent. A frequency deviation of ±5 kHz is defined as 100 percent peak modulation.

Ship and cost station transmitters operating in the 156-162 MHz and 216-220 MHz bands must be capable of proper operation with a frequency deviation that does not exceed ±5 kHz.

2.5 TRANSMITTER FREQUENCY DEVIATION

2.5.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.213 (a)(2)

2.5.2 Equipment Under Test and Modification State

409-0002:2 S/N: 40900023120010 – MMSI: 970460010 - Modification State 1

2.5.3 Date of Test

17 September 2012

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 EUT was configured to transmit three different packet data loads at maximum power. These were 11110000, 10101010 and PRBS. The maximum deviation was recorded using the modulation analysis function on the spectrum analyser and compared with the specification limits.

2.5.6 Environmental Conditions

Ambient Temperature	24.8°C
Relative Humidity	33.0%

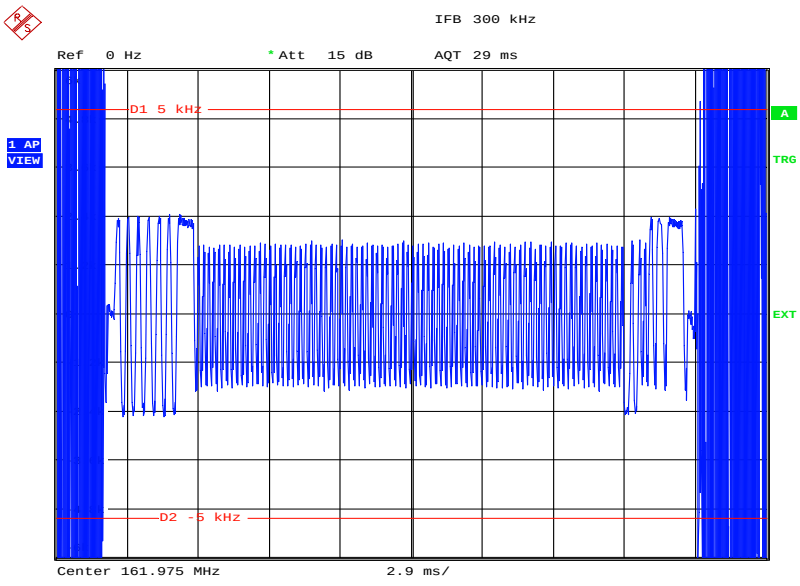
Product Service

2.5.7 Test Results

Transmit

Confirm that the frequency deviation does not exceed 5 kHz	**Yes**

AIS 1 – 01010101



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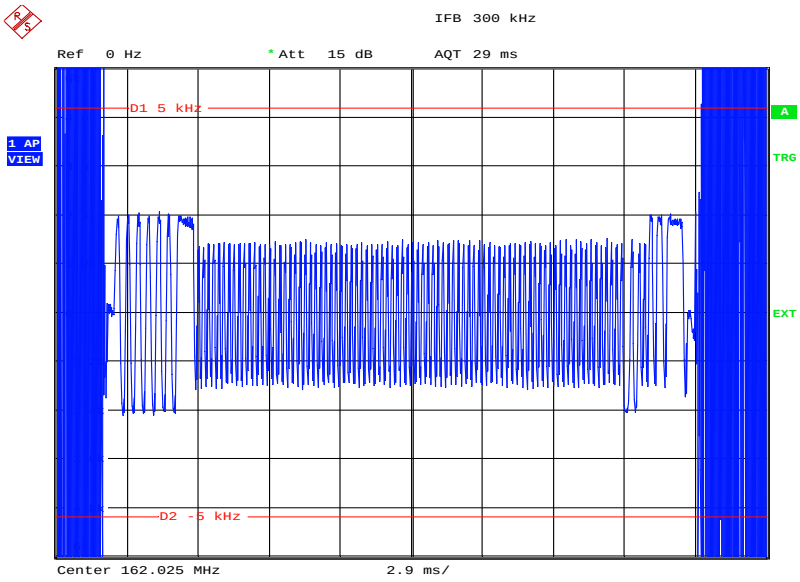
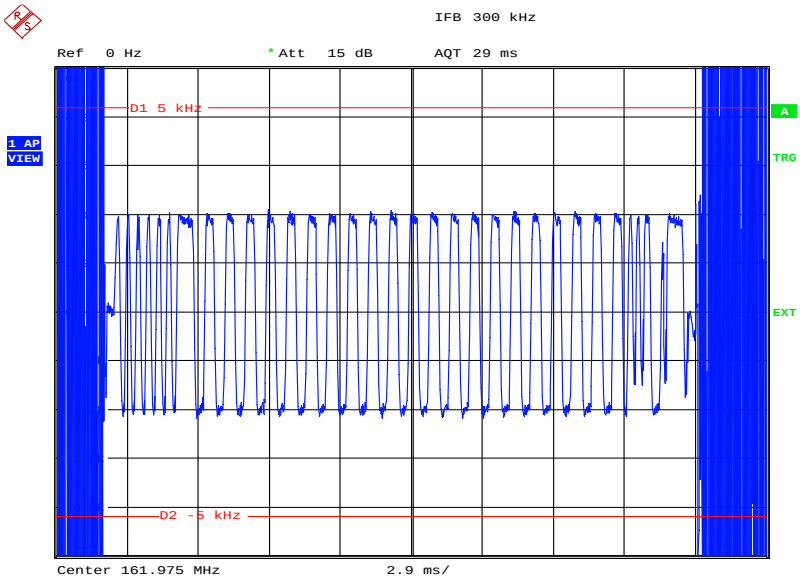
Product Service

AIS 2 – 01010101



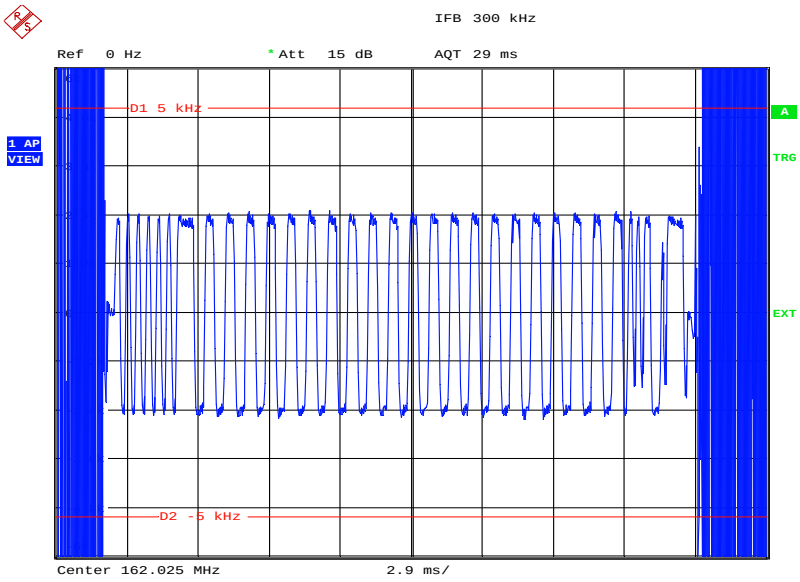
Date: 17.SEP.2012 16:21:41

AIS 1 – 00001111



Date: 17.SEP.2012 16:25:20

AIS 2 – 00001111



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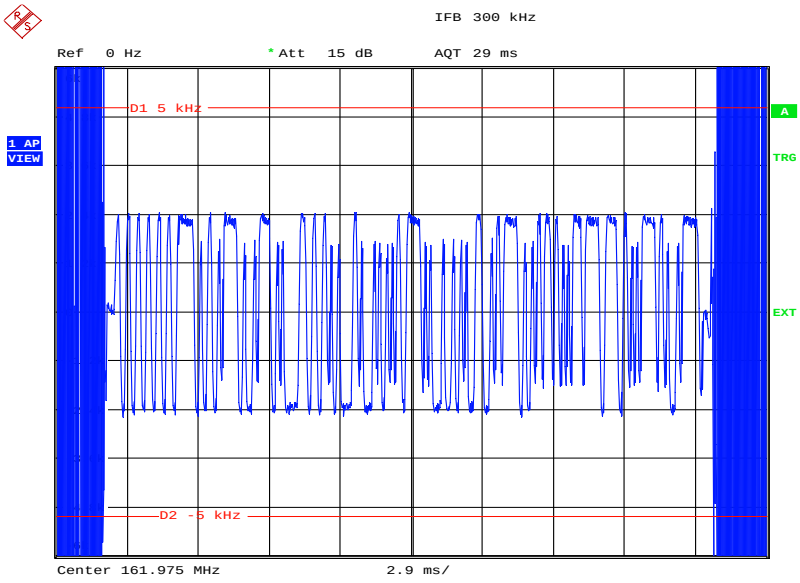
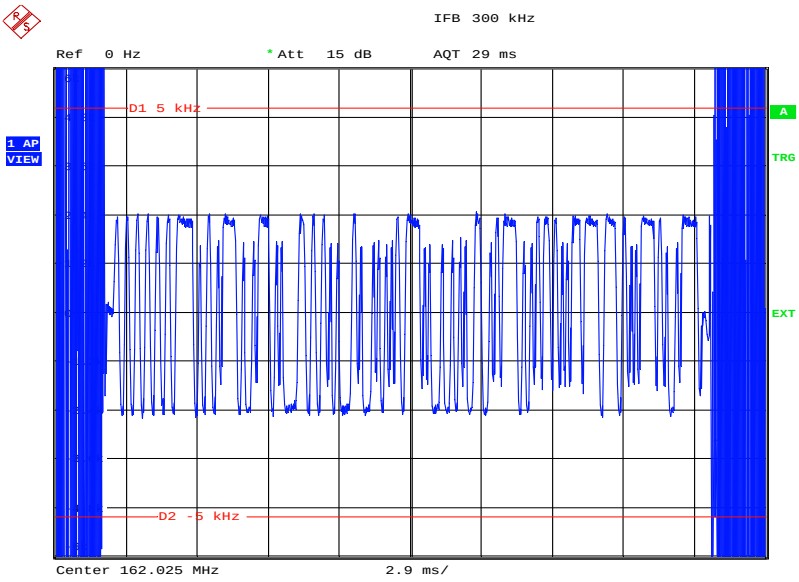
AIS 1 – PRBS



Date: 17.SEP.2012 16:19:34

AIS 1 – PRBS



Date: 17.SEP.2012 16:20:29

Limit Clause 80.213 (a)(2)

When phase or frequency modulation is used in the 156–162 MHz band the peak modulation must be maintained between 75 and 100 percent. A frequency deviation of ±5 kHz is defined as 100 percent peak modulation.

2.6 TRANSMITTER POWER

2.6.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.215

2.6.2 Equipment Under Test and Modification State

409-0002 S/N: 40900023120003 – MMSI: 970460003 - Modification State 0

2.6.3 Date of Test

13 August 2012

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 EUT was connected to a spectrum analyser via a cable and a 30 dB attenuator. The EUT was set to transmit at maximum power with a modulated and un-modulated carrier. A resolution bandwidth of 1 MHz and a video bandwidth of 10 MHz were used using an RMS detector and average trace. The results are shown in the table on the following page.

2.6.6 Environmental Conditions

Ambient Temperature	22.7°C
Relative Humidity	38.6%

Product Service

2.6.7 Test Results

Transmit

161.975 MHz

Result (dBm)	Result (W)
33.54	2.259
33.55	2.265
36.10	4.074
36.10	4.074

162.025 MHz

Result (dBm)	Result (W)
33.55	2.265
33.55	2.265
36.02	3.999
36.08	4.055

Limit Clause 80.215 (c)(2)

10 W

2.7 TRANSMITTER CARRIER POWER REDUCTION

2.7.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.215 (e)(g)(1)(2)(3)

2.7.2 Equipment Under Test and Modification State

409-0002 S/N: 40900023120003 – MMSI: 970460003 - Modification State 0

2.7.3 Date of Test

13 August 2012

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 maximum measured erp was compared with the limit in Clause 80.215(e)(1) to ensure that the measured power was less than 10W.

2.7.6 Environmental Conditions

Ambient Temperature	22.7°C
Relative Humidity	38.6%

Product Service

2.7.7 Test Results

Transmit

Carrier power: 36.10 dBm / 4.07 W

Limit Clause 80.215 (e)(1)

156.000 MHz to 162.000 MHz	≤10W

2.8 SUPPRESSION OF INTERFACE ABOARD SHIPS

2.8.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.217 (b)

2.8.2 Equipment Under Test and Modification State

409-0002:2 S/N: 40900023120009 – MMSI: 970460009 - Modification State 1

2.8.3 Date of Test

27 September 2012

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 Procedure

The EUT was connected to a spectrum analyser via a 10 dB attenuator. The spectrum was measured between 9 kHz to 2 GHz. A resolution bandwidth of 100 kHz was used below 1 GHz and 1 MHz was used above 1 GHz. The traces were recorded as shown on the following pages.

2.8.6 Environmental Conditions

Ambient Temperature	17.8°C
Relative Humidity	54.0%

Product Service

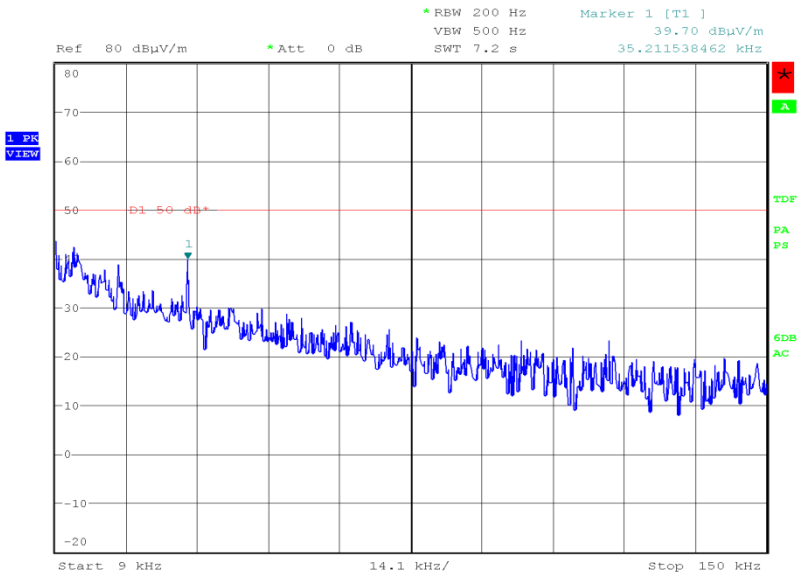
2.8.7 Test Results

Idle

Radiated

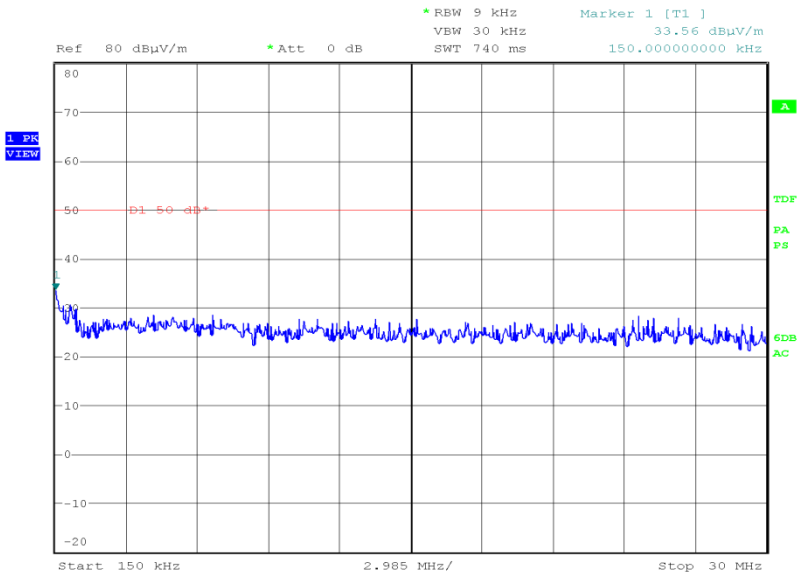
GPS

9 kHz to 150 KHz



Date: 27.SEP.2012 15:12:14

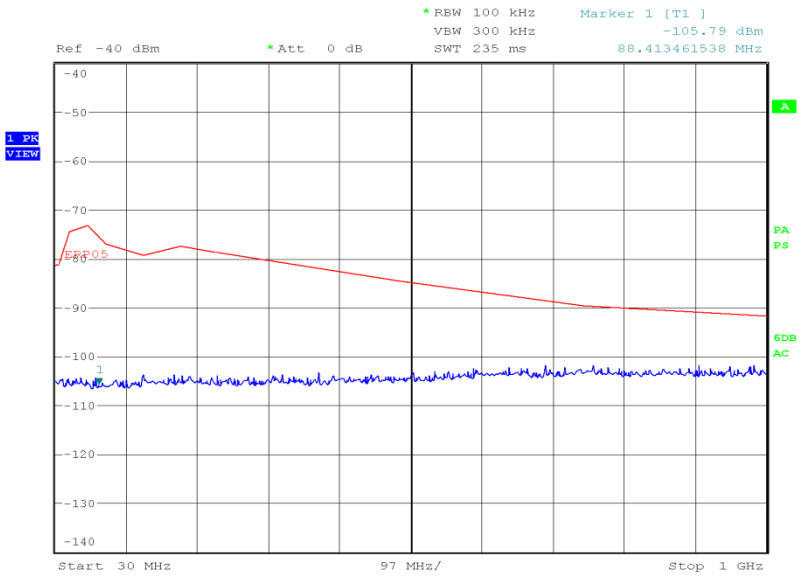
150 kHz to 30 MHz



Date: 27.SEP.2012 15:04:14

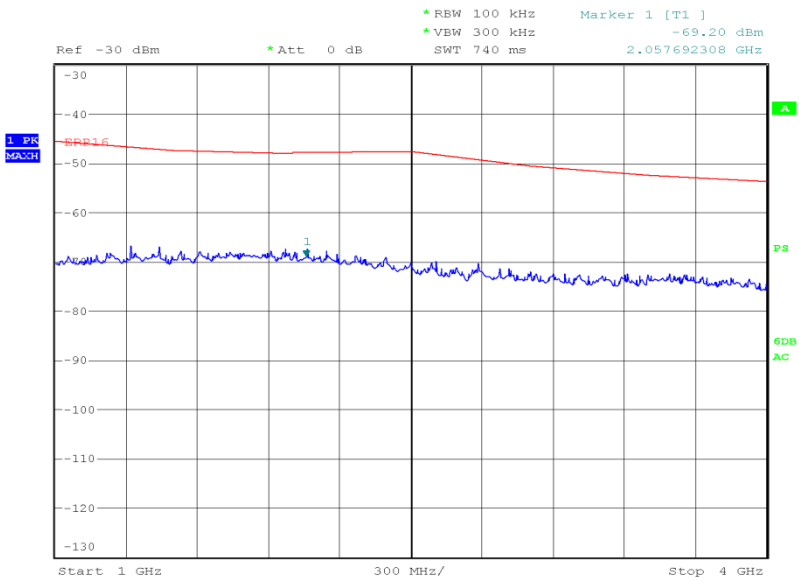
Product Service

30 MHz to 1 GHz



Date: 15.SEP.2012 16:59:37

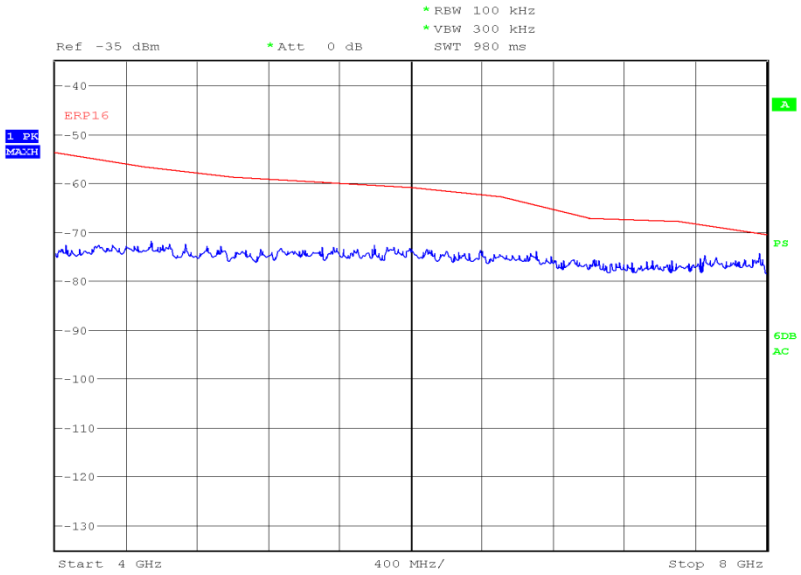
1 GHz to 4 GHz



Date: 15.SEP.2012 17:20:43

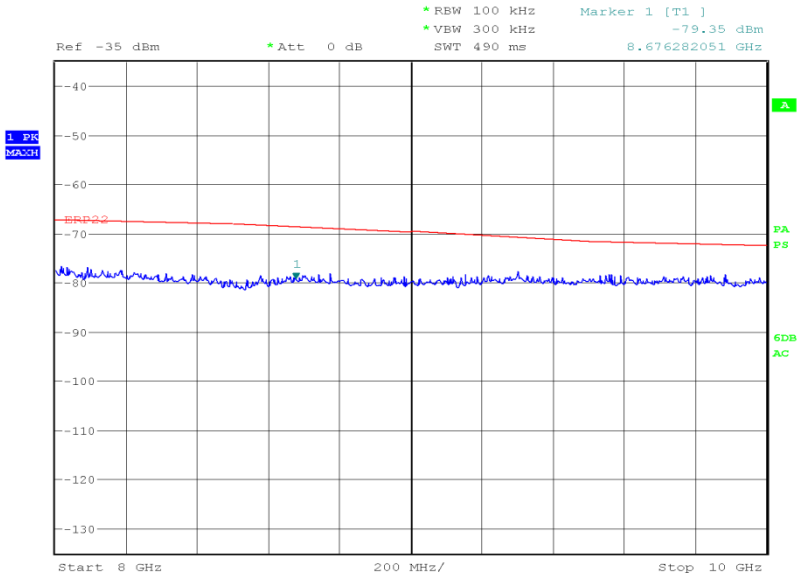
Product Service

4 GHz to 8 GHz



Date: 15.SEP.2012 17:19:16

8 GHz to 10 GHz



Date: 15.SEP.2012 17:35:01

Limit Clause

The EUT shall deliver not more than the following amounts of power, to an artificial antenna having electrical characteristics equivalent to those of the average receiving antenna(s) use on shipboard:

Frequency of interfering emissions	Field intensity in µV/m
Below 30 MHz	0.1
30 to 100 MHz	0.3
100 to 300 MHz	1.0
Over 300 MHz	3.0

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 – Bandwidths					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	27-Jun-2013
Section 2.2 - Transmitter Frequency Tolerances					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Attenuator (20dB, 150W)	Narda	769-20	3367	12	28-May-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
Section 2.3 – Emission Limitations					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Signal Generator	Rohde & Schwarz	SML01	1590	12	13-Apr-2013
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Tunable Notch Filter	Wainwright	WRCD 130.0/170.0-0.05/50-5EEK	3412	-	TU
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	27-Jun-2013

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 – Modulation Requirements					
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	27-Jun-2013
Section 2.5 – Transmitter Frequency Deviation					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
Multimeter	Fluke	75 Mk3	455	12	16-Jan-2013
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Attenuator (30dB, 150W)	Narda	769-30	3369	12	28-May-2013
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	12-Jan-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	27-Jun-2013
Section 2.6 and 2.7– Transmitter Power and Transmitter Carrier Power Reduction					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
True RMS Multimeter	Fluke	79 Series III	411	12	25-Jul-2013
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	19-Jan-2013
Hygrometer	Rotronic	I-1000	2891	12	21-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	-	TU
Thermocouple Thermometer	Fluke	51	3172	12	30-Jul-2013
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-May-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	27-Jun-2013

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.8 – Suppression of Interface Aboard Ships					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	8-Dec-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	20-Oct-2012
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	11-Oct-2013
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	-	TU

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
Transmitter Power	± 0.70 dB
Transmitter Frequency Tolerances	± 11 Hz
Emission Limitations	Radiated: ± 3.08 dB Conducted: ± 3.454 dB
Bandwidths	± 58.05 Hz
Modulation Requirements	± 1.2 dB
Suppression of Interface Aboard Ships	-
Transmitter Carrier Power Reduction	-
Transmitter Frequency Deviation	± 88.5 Hz

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.

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