REPORT ON THE EMC TESTING OF A
SRT Marine Technology Ltd
SRT Poseidon Class A Transponder
WITH RESPECT TO THE UN/INTENTIONAL RADIATOR REQUIREMENTS OF
THE FCC RULES CFR 47:2008
PART 15.109 CLASS B LIMIT
And
RSS-GEN ISSUE 2:2007
SECTION 6
ON BEHALF OF SRT Marine Technology Ltd

Report Number: 7623/2
Issue: 2
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ON BEHALF OF SRT Marine Technology Ltd

TEST DATE: 9th February 2010

Report By: M. Cosci

Approved By: S. Youngman

Date: 24th March 2010

Distribution:

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SUMMARY

TEST REPORT NO:	7623/2 Issue 2
PROJECT ID:	25-0265-7623
PURPOSE OF TEST:	Radio Frequency Interference Emissions Certification
TEST SPECIFICATION(S):	FCC RULES CFR 47:2008 PART 15.109 CLASS B LIMIT AND RSS-GEN ISSUE 2:2007 SECTION 6
EQUIPMENT UNDER TEST:	SRT Poseidon Class A Transponder
EQUIPMENT SERIAL NO:	TLA2
TEST RESULT:	Measured as COMPLIANT Given the modifications (if any) described in Section 5 (Note uncertainty values in Appendix B)
MANUFACTURER/AGENT:	SRT Marine Technology Ltd Wireless House Westfield Industrial estate Bath Somerset BA3 4BS
CLIENT CONTACT:	Nathan Emery TEL: +44 (0) 1761 409500 FAX: +44 (0) 1761 410093
ORDER NO:	1051
TESTED BY:	M. Cosci
DATE OF TEST:	9th February 2010

The results contained herein relate only to the items tested.

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1 INTRODUCTION

This report presents the results of EMC tests carried out on equipment type SRT Poseidon Class A Transponder, in accordance with the FCC RULES CFR 47:2008 PART 15.109 CLASS B LIMIT and RSS-GEN ISSUE 2:2007 SECTION 6.

The testing was carried out for SRT Marine Technology Ltd by TRaC EMC & Safety Ltd, an independent test house, at their EMC test facility located at Ringwood, Hampshire, England.

TRaC EMC & Safety Ltd is appointed as a CAB & TCB for FCC part 15 testing.

The test site is FCC listed and is calibrated as recommended in Document ANSI C63.4:2003

This report also details the configuration of the equipment under test, the test methods used and any relevant modifications where appropriate.

The equipment and peripherals were operated as specified in ANSI C63.4:2003 Document.

2 SYSTEM UNDER TEST

2.1 Equipment Under Test (EUT)

SRT Poseidon Class A Transponder

Manufacturer: SRT Marine Technology Ltd

Build Level: Full Build

Serial No: TLA2

Software Revision: V39.0

Highest frequency generated or used in the
EUT or on which the EUT operates or tunes: 214MHz

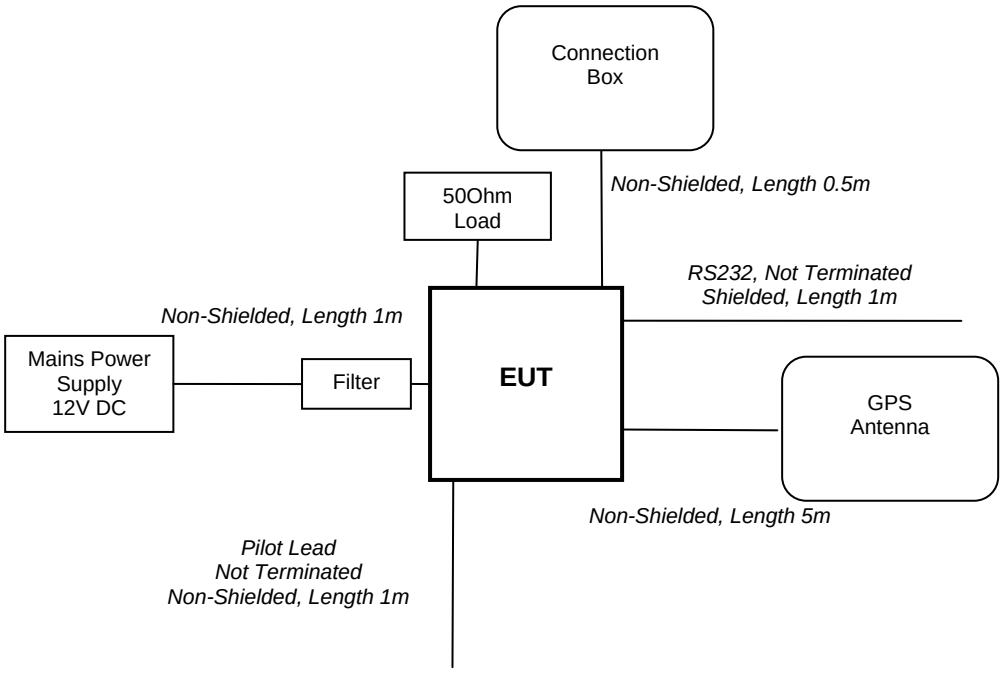
2.2 System Equipment

No support equipment required.

2.3 Modes of Operation of EUT During Testing

The EUT was set in RX mode (LO's active, RX ccts, Display On & baseband ccts).

2.4 Block Diagram of EUT Configuration



NOTE: All cables unshielded unless otherwise stated.
Cable lengths are as shown in diagram.

3 TEST CONDITIONS

3.1 Radiated Emissions

3.1.1 General

This test measures radiated electromagnetic emissions that may emanate from EUT enclosures and cables. This test ensures the protection of broadcast and telecommunication services used in the vicinity of the EUT.

Method – Testing at Ringwood

The test setup used complies with all the dimension requirements set out in ANSI C63.4:2003. The open area test site (OATS) meets the site attenuation measurements required by ANSI C63.4:2003.

An initial scan is carried out in a screened room in order to establish a frequency list that is attributable to the EUT. Any emissions measurements that fall within 20dBµV/m of the limit line are then maximised on the OATS by rotating the equipment through 360° and raising/lowering the antenna through 1-4m height for each frequency of interest.

3.1.2 Radiated Emission Test Parameters

Frequency Range	30MHz – 1GHz
Frequency Step Size	50kHz
Measurement Bandwidth	120kHz
Detectors	Peak (scan) Quasi-peak (final measurements)
Quasi-peak Detector Dwell	Minimum 2s per frequency point
EUT Measurement Height	0.8m Insulated Table & 0.1m Insulated Support/Pallet
Line Voltage	12V
Line Frequency	DC

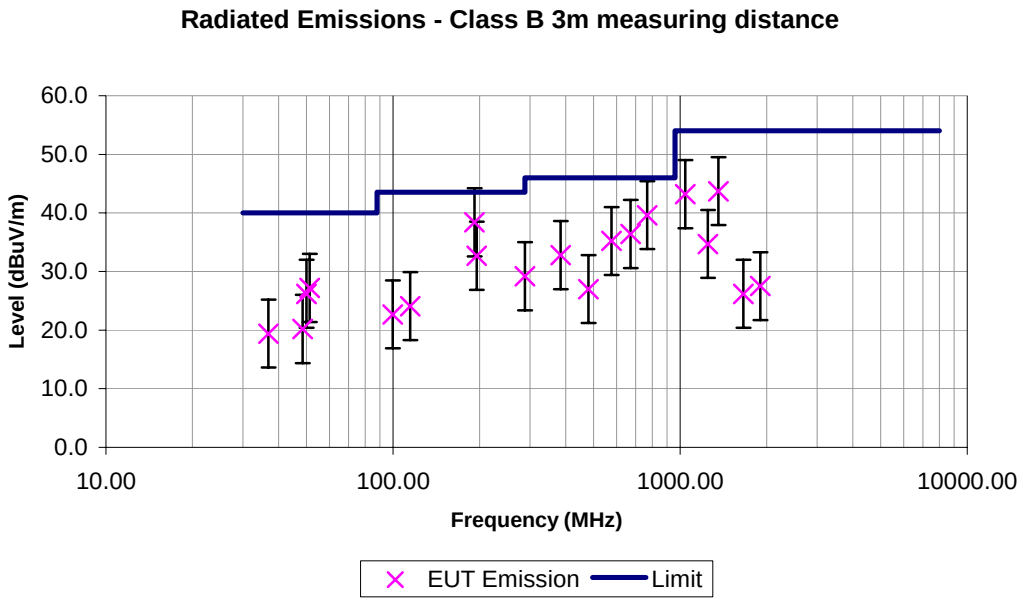
Frequency Range	1GHz – 5th Harmonic or 18GHz
Frequency Step Size	50kHz
Measurement Bandwidth	1MHz
Detectors	Average (scan & final measurements)
Quasi-peak Detector Dwell	Minimum 2s per frequency point
EUT Measurement Height	0.8m Insulated Table & 0.1m Insulated Support/Pallet
Line Voltage	12V
Line Frequency	DC

3.1.3 Test Equipment

The following test equipment was used:

Type of Equipment	*Maker/ Supplier*	*Model Number*	*Serial Number*	*Plant Number*	*Actual Equipment Used*
Bilog Antenna	Chase	CBL6111A	1667	BA4	☐
Bilog Antenna	Chase	CBL6111A	2025	BA8	☒
Bilog Antenna	Chase	CBL6111A	1733	BA3	☒
Horn Antenna	Electro-Metrics	3115	5167	DRG2	☒
Antenna	Electro-Metrics	3115	9701-5093	DRGFS	☐
Receiver	Rohde & Schwarz	ESHS10	844077/019	RX22	☐
Receiver/Analyser	Rohde & Schwarz	ESMI	838494/012	RX14	☐
Receiver/Analyser	Rohde & Schwarz	ESIB7	100108	RX20	☐
Receiver/Analyser	Rohde & Schwarz	ESIB26	100242	RX21	☒
Receiver	Chase	UHR4000	6114	RX11	☒
Test Site	TRaC Ringwood	OATS	None	OTS2	☒
Pre-Amplifier	Chase	CPA9231	1358	PA7	☐
Pre-Amplifier	Hewlett Packard	8449B	3008A00176	PA5	☐
Pre-Amplifier	Hewlett Packard	8447F	3113A06198	PA6	☐

3.1.4 EUT Test Results



Frequency (MHz)	*Level (dBµV/m)*	*Limit*	*Antenna Polarisation*	*Angle (°)*	*Notes*	*Margin (dB)*
36.85	19.4	40.0	Vertical	0		20.6
48.50	20.2	40.0	Vertical			19.8
49.90	26.2	40.0	Vertical	0		13.8
51.20	27.2	40.0	Vertical	0		12.8
99.70	22.7	43.5	Vertical	0		20.8
114.70	24.1	43.5	Vertical	0		19.4
192.00	38.4	43.5	Vertical	0	*	5.1
195.80	32.7	43.5	Vertical	0		10.8
288.00	29.2	43.5	Vertical	0		14.3
384.00	32.8	46.0	Vertical	0		13.2
480.00	27.0	46.0	Vertical	0		19.0
576.00	35.2	46.0	Vertical	0		10.8
672.00	36.4	46.0	Vertical	0		9.6
768.00	39.6	46.0	Vertical	0		6.4
1040.92	43.2	54.0	Vertical	0		10.8
1249.10	34.7	54.0	Vertical	0		19.3
1359.70	43.7	54.0	Vertical	0		10.3
1661.60	26.2	54.0	Vertical	0		27.8
1903.60	27.5	54.0	Vertical	0		26.5

Error bars shown on the above graph represent measurement uncertainty for this test, for each frequency point, the EUT is said to either:

- Pass.
- Pass within limits of uncertainty.
- Fail within limits of uncertainty.
- Fail.

\# In the notes section represents a measurement performed at 3m that has been transposed for display on the graph to a measurement distance of 10m. This is performed when the noise floor at the frequency of interest is too high to take a measurement at 10m.

* In the notes section highlights a pass within limits of uncertainty.

3.1.5 Sample Calculation

The radiated emission levels used in the report are calculated thus:

FREQUENCY (MHz)	*MEASURED VALUE (dBµV)*	*ANTENNA FACTOR (dB/m)*	*CABLE FACTOR (dB)*	*EMISSION LEVEL (dBµV/m)*
36.85	2	15.9	0.9	= 19.4
51.2	17.1	8.4	1.1	= 27.2
99.7	9.8	10.8	1.5	= 22.7
192	27.2	8.5	2.1	= 38.4
480	5.9	16.8	3.7	= 27
768	12.5	21.5	5	= 39.6

4 LIST OF MODIFICATIONS

The following modifications were incorporated in the equipment during testing:

None.

5 CONCLUSIONS

5.1 Result of Testing

The SRT Marine Technology Ltd, SRT Poseidon Class A transponder meets the requirements of the FCC RULES CFR 47:2008 PART 15.109 CLASS B LIMIT and RSS-GEN ISSUE 2:2007 SECTION 6 in the configuration tested defined in Section 2 of this report and incorporating any modifications detailed in Section 4 of this report.

Note should be taken of modifications (if any) as described in Section 4 of this report.

5.2 Conformity in Production

TRaC EMC & Safety Ltd has based this test report on results from the equipment sample(s) provided.

The manufacturer is advised that they may have an obligation to demonstrate that production samples are in conformity with the Standards noted.

The EMC performance reported above was achieved after incorporation of any modifications as detailed in Section 5 of this report.

APPENDIX A

SCAN DATA GRAPHS

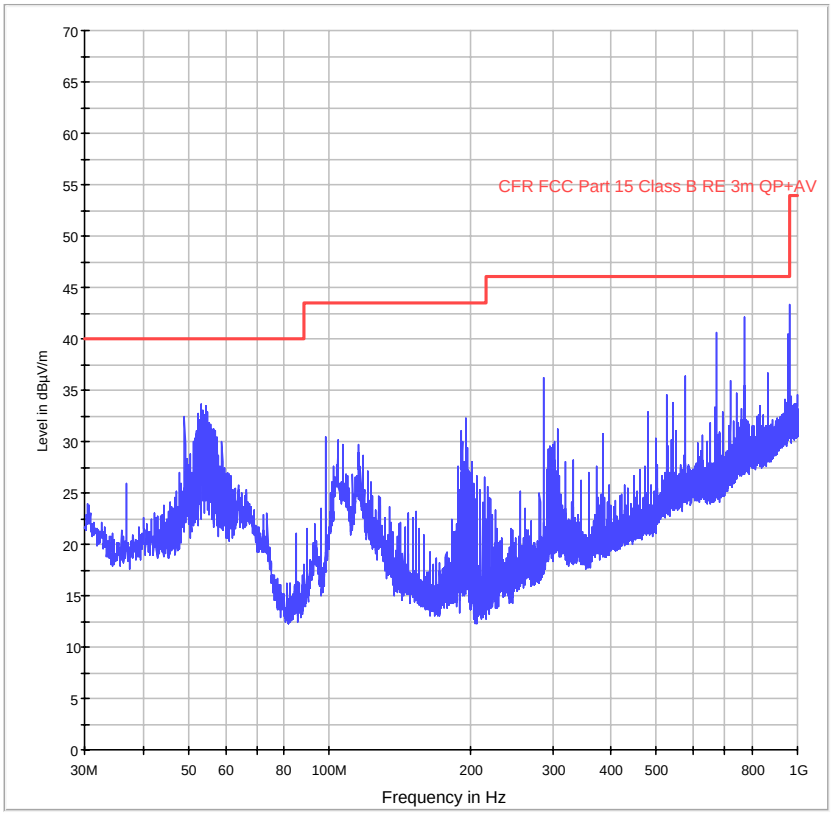
GRAPH A1 **RADIATED E-FIELD EMISSIONS**

EUT Information

Description:

TRaC Project Number:	25-0265-7623
Manufacturer:	SRT Marine Technology
Model Name:	SRT Poseidon Class A Transponder
Model Number:	NS
Serial Number:	TLA2
Specification:	FCC CFR47:2008 Part 15B Class B
Test Location:	Room 3
Test Engineer:	MC
Antenna Polarisation:	Vertical
EUT Mode:	Operational
Modification State:	0
Comment:	None

Radiated Emissions Pre-scan @ 1m 30MHz-1GHz ESIB26



Scan Setup: Radiated Emissions Pre-scan @ 3m 30MHz-1GHz ESIB26 [EMI radiated]

Hardware Setup:	EN 550XX RE 30MHz-6GHz ESIB26
Level Unit:	dBµV/m

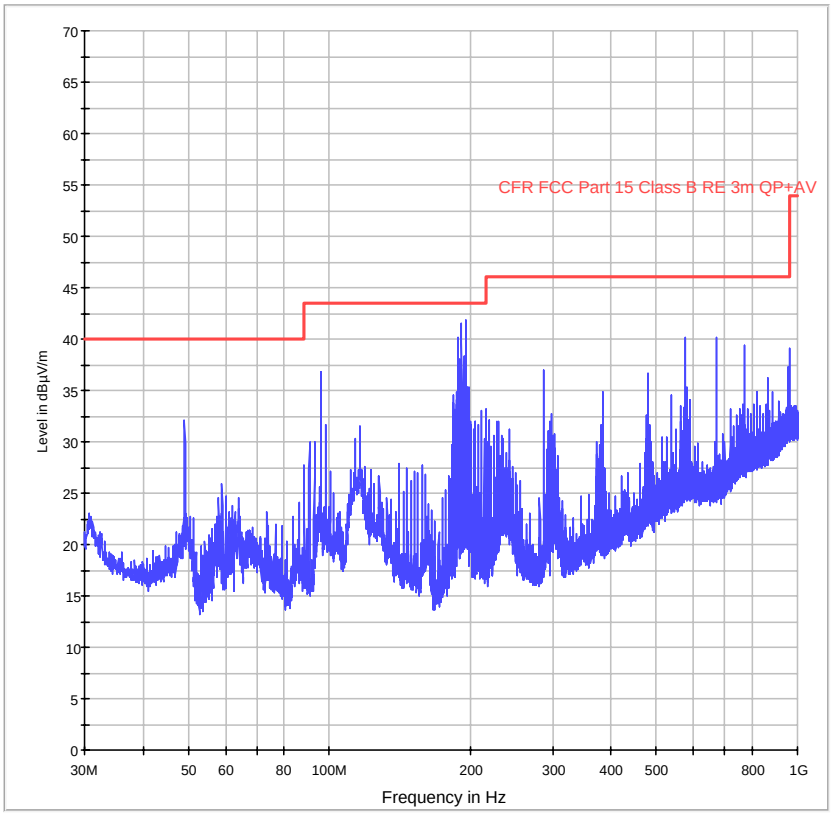
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0.01 s	RX21 Rohde & Schwarz ESIB26

EUT Information

Description:

TRaC Project Number:	25-0265-7623
Manufacturer:	SRT Marine Technology
Model Name:	SRT Poseidon Class A Transponder
Model Number:	NS
Serial Number:	TLA2
Specification:	FCC CFR47:2008 Part 15B Class B
Test Location:	Room 3
Test Engineer:	MC
Antenna Polarisation:	Horizontal
EUT Mode:	Operational
Modification State:	0
Comment:	None

Radiated Emissions Pre-scan @ 1m 30MHz-1GHz ESIB26



Scan Setup: Radiated Emissions Pre-scan @ 3m 30MHz-1GHz ESIB26 [EMI radiated]

Hardware Setup:	EN 550XX RE 30MHz-6GHz ESIB26
Level Unit:	dBµV/m

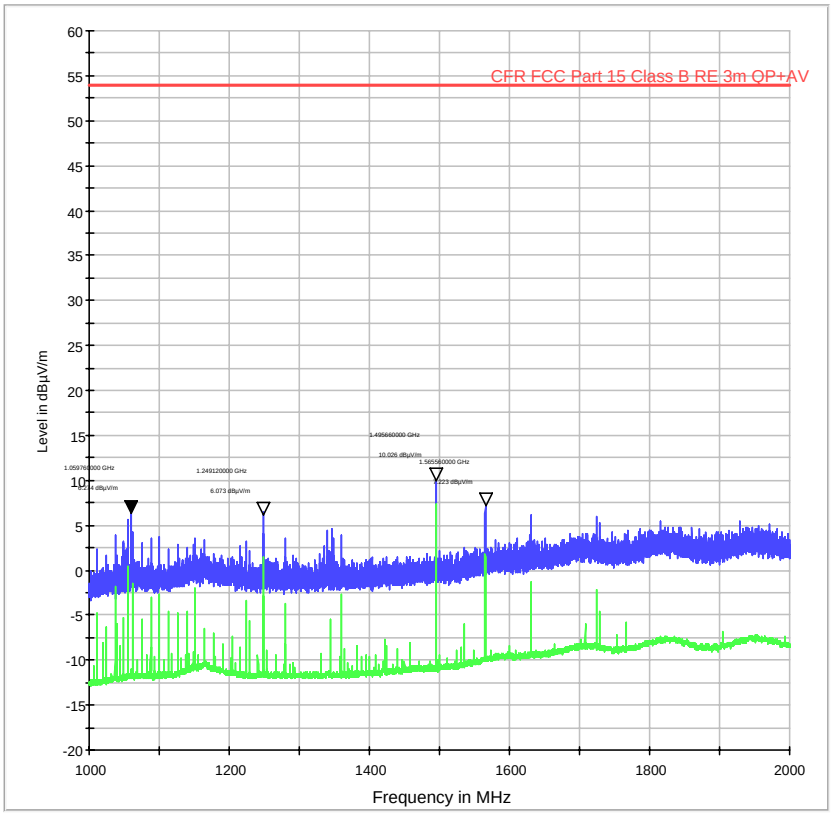
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	MaxPeak	120 kHz	0.01 s	RX21 Rohde & Schwarz ESIB26

EUT Information

Description:

TRaC Project Number:	25-0265-7623
Manufacturer:	SRT Marine Technology
Model Name:	SRT Poseidon Class A Transponder
Model Number:	NS
Serial Number:	TLA2
Specification:	FCC CFR47:2008 Part 15B Class B
Test Location:	Room 3
Test Engineer:	MC
Antenna Polarisation:	Vertical
EUT Mode:	Operational
Modification State:	0
Comment:	None

Radiated Emissions Pre-scan @ 1m 1-2GHz ESIB26



Scan Setup: Radiated Emissions Pre-scan @ 3m 1-6GHz ESIB26 [EMI radiated]

Hardware Setup:	EN 550XX RE 30MHz-6GHz ESIB26
Level Unit:	dBµV/m

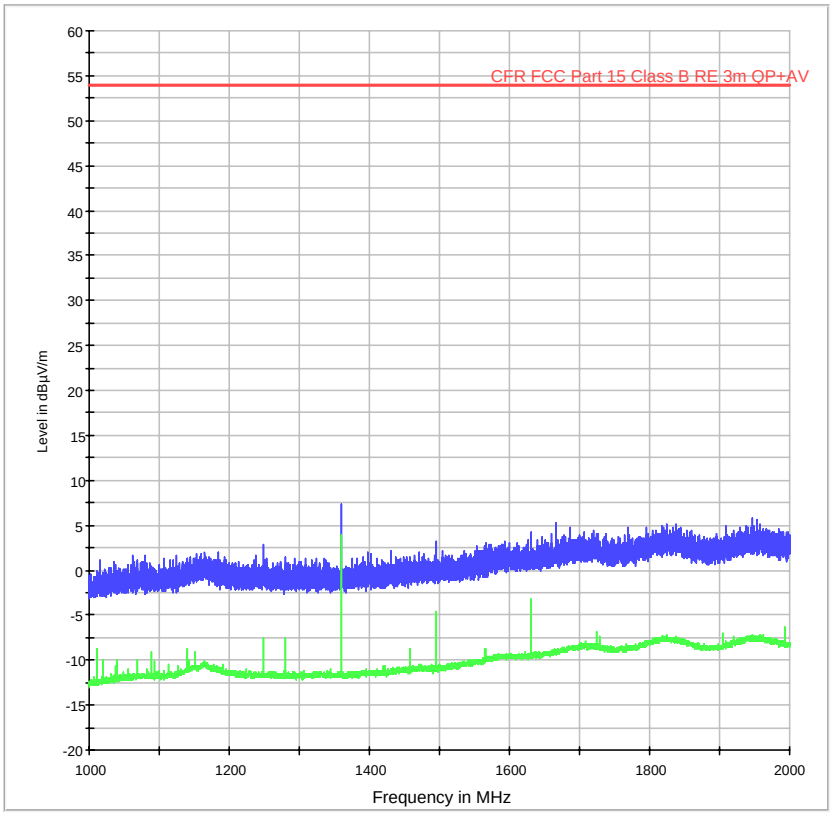
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
1 GHz - 2 GHz	MaxPeak	120 kHz	0.01 s	RX21 Rohde & Schwarz ESIB26

EUT Information

Description:

TRaC Project Number:	25-0265-7623
Manufacturer:	SRT Marine Technology
Model Name:	SRT Poseidon Class A Transponder
Model Number:	NS
Serial Number:	TLA2
Specification:	FCC CFR47:2008 Part 15B Class B
Test Location:	Room 3
Test Engineer:	MC
Antenna Polarisation:	Horizontal
EUT Mode:	Operational
Modification State:	0
Comment:	None

Radiated Emissions Pre-scan @ 1m 1-2GHz ESIB26



Scan Setup: Radiated Emissions Pre-scan @ 3m 1-6GHz ESIB26 [EMI radiated]

Hardware Setup:	EN 550XX RE 30MHz-6GHz ESIB26
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
1 GHz - 2 GHz	MaxPeak	120 kHz	0.01 s	RX21 Rohde & Schwarz ESIB26

1 APPENDIX B

MEASUREMENT UNCERTAINTY

Radiated Emissions

[1] Radiated Emissions 30MHz to 1GHz using Bilog CBL6111A Antenna = **±5.8dB**

Cable Calibrations

[1] Cable calibration up to 18GHz = **±0.4dB**

2 APPENDIX C

PHOTOGRAPHS

Photograph C1: **RADIATED E-FIELD DISTURBANCE**

The graph below is provided to indicate the emission frequencies detected in relationship to the ambient noise floor. For the final maximised emission values please refer to Section 3.2.

APPENDIX D

ADDITIONAL INFORMATION

ADDITIONAL INFORMATION

NB: The contents of this page and the attached manufacturers/clients declaration are not covered by the scope of the laboratory's UKAS accreditation.

The following page(s) have been issued by the client following a change in EUT Model/Type number designation from that shown on the photographs contained within this report and as originally specified during the testing phase.