



RF Exposure Evaluation Report

APPLICANT	NAVICO RBU ITALIA S.R.L.
ADDRESS	VIA ROMITA, 26 MONTAGNANA VAL di PESA, MONTESPERTOLI, FIRENZE 50025 ITALY
FCC ID	2AJJ3SRTLAN30S
IC	21849-SRTLAN30S
MODEL NUMBER	SRTLAN30S
PRODUCT DESCRIPTION	S-BAND RADAR
DATE SAMPLE RECEIVED	10/31/2018
FINAL TEST DATE	02/04/2018
PREPARED BY	Franklin Rose

Report Number	Report Version	Description	Issue Date
2004AUT18 MPE_TestReport	Rev1	Initial Issue	02/04/2018

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.



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GENERAL REMARKS

Summary

The device under test does:

- ☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.
- ☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Designation #: US1070

Prepared by:



Name and Title	Franklin Rose, EMC Project Manager / EMC Specialist
Date	02/04/2018

Applicant: NAVICO RBU ITALIA S.R.L.
FCC ID: 2AJJ3SRTLAN30S
IC: 21849-SRTLAN30S
Report: 2004AUT18_MPE TestReport_Rev1

GENERAL INFORMATION

EUT Description	S-BAND RADAR		
Model Number	SRTLAN30S		
EUT Power Source	☒ 110–120 VAC	☐ DC Power (12 V)	☐ Battery Operated
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☒ Fixed	☐ Mobile	☐ Portable
Antenna Connector	7/16 DIN Connector		
Test Conditions	The temperature was 26°C Relative humidity of 50%.		
Modification to the EUT	No Modification to EUT.		
Applicable Standards	FCC CFR 47 Part 2.1091		
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA. Designation #: US1070		

ANTENNA INFORMATION

This information was provided by the client:

	6 ft X-Band	9 ft X-Band	12 ft X-Band	12 ft S-Band
Antenna type	End-fed-slotted wave guide			
Polarization	Horizontal			
Antenna length/swing circle (ft/mm)	6 / 1800	9 / 2650	12 / 3618	12 / 3695
Gain (dB)	≥ 29	≥ 31	≥ 32.5	≥ 27
Horizontal beam width at -3 dB	1.3°	0.9°	0.7°	1,9
Vertical beam width at -3 dB	22°	22°	22°	24
Horizontal side lobes (dB):				
- within 10°	- 27	- 27	- 27	- 23
- outside 10°	- 30	- 30	- 30	- 30
VSWR	Lower than 1.20			

Manufacturer-Provided Antenna	Type	Max Gain (dBi)
12 ft. S-Band	End-fed Slotted Waveguide	27.0

MPE CALCULATION

The minimum separation distance is calculated as follows:

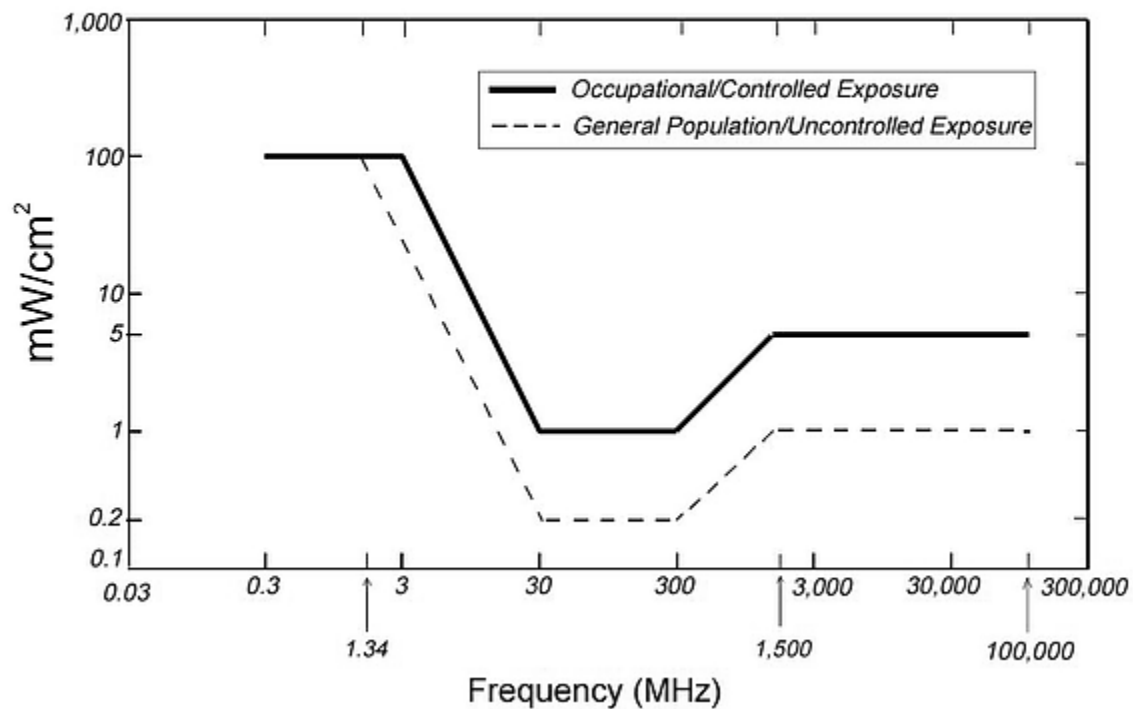
$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power density: } P_d (mW/cm^2) = \frac{E^2}{3770}$$

MPE LIMITS

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)

Plane-wave Equivalent Power Density



MPE DATA

FCC MPE Calculation: 12 ft. S-Band Antenna

Inside Beam (< 1.9° Horizontal Polarity, < 24° Vertical Polarity)

1. **General Uncontrolled Exposure Environment:** The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.1310, Table 1B.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	27.0 dBi
Coax Loss	2.20 dB
Transmit Frequency	3060 MHz
Power Density	1.00 mW/cm ²
Minimum Separation Distance	387.0 cm

2. **General Controlled Exposure Environment:** The limit for controlled exposure environment is shown in FCC rule Part 1.1310, Table 1A.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	27.0 dBi
Coax Loss	2.20 dB
Maximum Transmit Frequency	3060 MHz
Power Density	5.00 mW/cm ²
Minimum Separation Distance	173.1 cm

MPE CALCULATION

Outside Beam (> 10° Horizontal Polarity, > 24° Vertical Polarity)

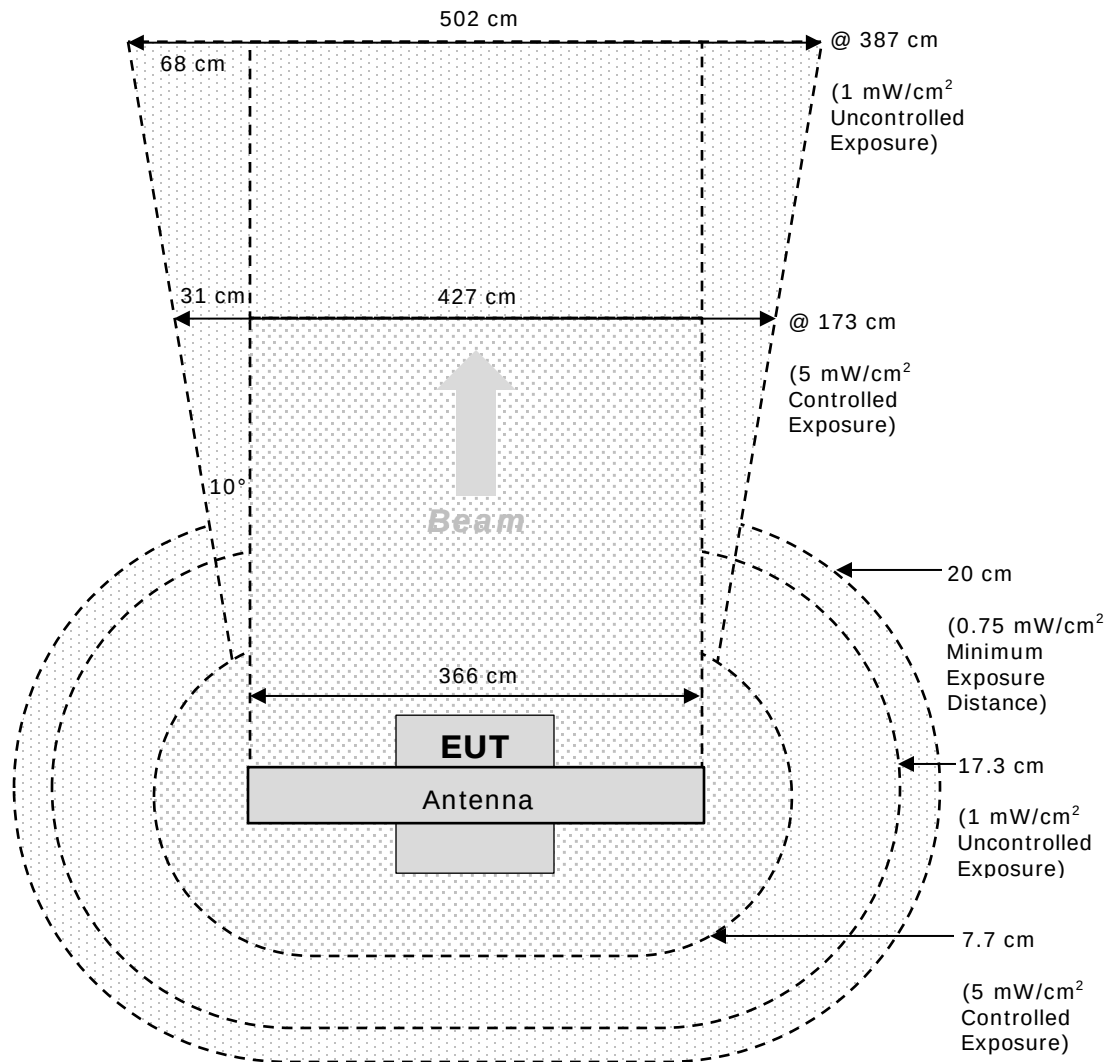
3. **General Uncontrolled Exposure Environment:** The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.1310, Table 1B.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	0 dBi
Coax Loss	2.20 dB
Transmit Frequency	3060 MHz
Power Density	0.75 mW/cm ²
Minimum Separation Distance	20 cm

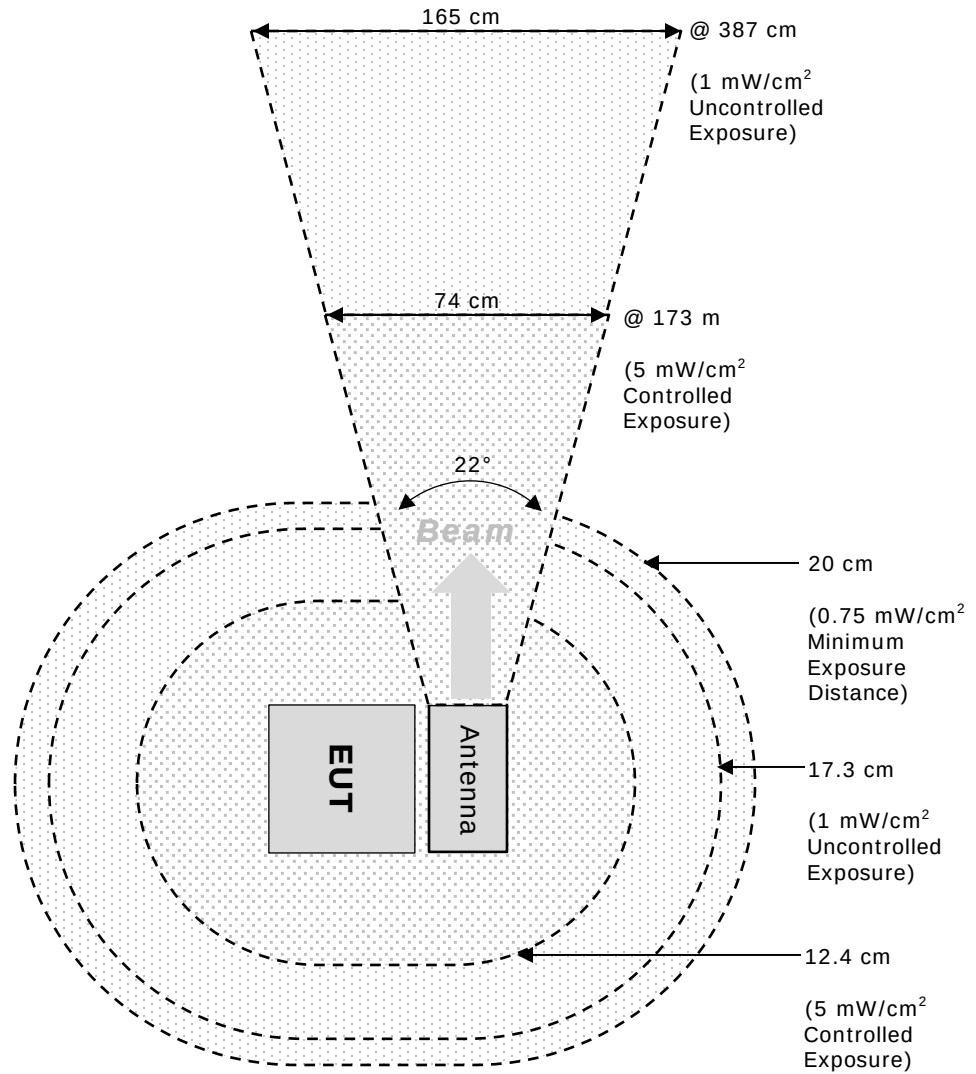
4. **General Controlled Exposure Environment:** The limit for controlled exposure environment is shown in FCC rule Part 1.1310, Table 1A.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	0 dBi
Coax Loss	2.20 dB
Maximum Transmit Frequency	3060 MHz
Power Density	0.75 mW/cm ²
Minimum Separation Distance	20 cm

FCC MPE Diagram, 12 ft. S-Band Antenna, Top View



FCC MPE Diagram, 12 ft. S-Band Antenna, Side View



IC MPE Calculation: 12 ft. S-Band Antenna

Inside Beam (< 1.9° Horizontal Polarity, < 24° Vertical Polarity)

1. **General Uncontrolled Exposure Environment:** The limit for general uncontrolled exposure environment is shown in RSS-102, Issue 5, Table 4.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	27.0 dBi
Coax Loss	2.20 dB
Transmit Frequency	3060 MHz
Power Density	6.314 W/m ²
Minimum Separation Distance	487.0 cm

2. **General Controlled Exposure Environment:** The limit for controlled exposure environment is shown in RSS-102, Issue 5, Table 6.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	27.0 dBi
Coax Loss	2.20 dB
Maximum Transmit Frequency	3060 MHz
Power Density	35.707 W/m ²
Minimum Separation Distance	204.8 cm

MPE CALCULATION

Outside Beam (> 10° Horizontal Polarity, > 24° Vertical Polarity)

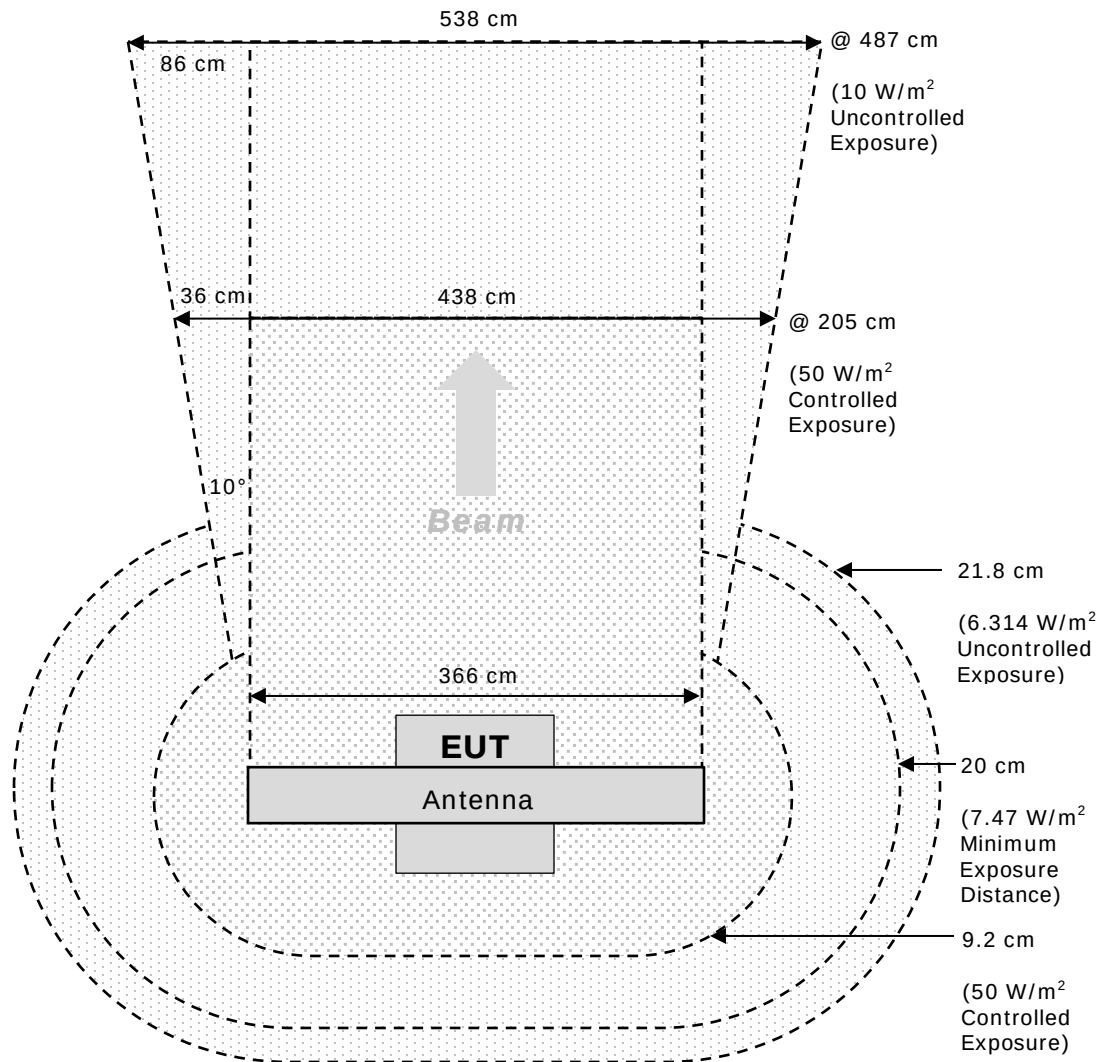
3. **General Uncontrolled Exposure Environment:** The limit for general uncontrolled exposure environment is shown in RSS-102, Issue 5, Table 4.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	0 dBi
Coax Loss	2.20 dB
Transmit Frequency	3060 MHz
Power Density	6.314 W/m ²
Minimum Separation Distance	21.8 cm

4. **General Controlled Exposure Environment:** The limit for controlled exposure environment is shown in RSS-102, Issue 5, Table 6.

Variable	Value
Max Power	29668.80 W
Duty Cycle (at full power)	0.021 %
Max Antenna Gain	0 dBi
Coax Loss	2.20 dB
Maximum Transmit Frequency	3060 MHz
Power Density	7.47 W/m ²
Minimum Separation Distance	20 cm

IC MPE Diagram, 12 ft. X-Band Antenna, Top View



IC MPE Diagram, 12 ft. X -Band Antenna, Side View

