



IEC 62287-1: 2013-04

TEST REPORT

For

**Garmin International Inc.**

1200 E. 151st Street, Olathe, KS 66062, United States

**Model: A01654**

<b>Report Type:</b> Original Report	<b>Product Type:</b> MARINE VHF RADIO
<b>Report Number:</b> RDG161009002-18	
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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Garmin International Inc.*'s product, model number: *A01654* or the "EUT" in this report was a *MARINE VHF RADIO*, which was measured approximately: 192 mm (L) × 168 mm (W) × 96 mm (H), rated with input voltage: DC 12V.

*\* All measurement and test data in this report was gathered from production sample serial number: 161009001 (Assigned by Kunshan BACL). The EUT supplied by the applicant was received on 2016-10-09.*

### Objective

This test report is prepared on behalf of *Garmin International Inc.* in accordance with IEC 62287.

The objective is to determine the compliance of EUT with IEC 62287-1: 2013-04.

### Related Submittal(s)/Grant(s)

No related submittal(s).

### Test Methodology

All tests and measurements indicated in this document were performed in accordance with the IEC 62287-1 First edition 2013-04, Maritime navigation and radiocommunication equipment and systems – Class B shipborne equipment of the automatic identification system (AIS) – Part 1: Carrier-sense time division multiple access (CSTDMA) techniques.

### Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

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### Description of Test Configuration

The EUT has been configured under typical operating condition in accordance with IEC 62287-1.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
YISHITE	DC Power Supply	MCH-303D-II	14070562

## SUMMARY OF TEST RESULTS

IEC 62287-1: 2013-04	Description of Test	Result
§9.2.1	Vibration	Compliance
§9.2.2	Shock	Compliance
§9.4	Undervoltage test (brown out)	Compliance
§10.1.1	Quality assurance	Compliance
§10.1.2	Safety of operation	Compliance
§10.1.3	Additional features	Compliance
§10.2.1.2	Receive class A position reports	Compliance
§10.2.1.3	Receive class B "CS" position report	Compliance
§10.2.1.5	RX performance test	Compliance
§10.9.4.1	Display interface	Compliance
§11.2.1	Sensitivity	Compliance
§11.2.2	Error behaviour at high input levels	Compliance
§11.2.3	Co-channel rejection	Compliance
§11.2.4	Adjacent channel selectivity	Compliance
§11.2.5	Spurious response rejection	Compliance
§11.2.6	Intermodulation response rejection	Compliance
§11.2.7	Blocking or desensitisation	Compliance
§11.3.1	Spurious emissions from the receiver	Compliance
§12.8.1	Received messages	Compliance
§13.3.5	Other conditions	Note*

Note 1: a brief summary of the tests carried out in accordance with IEC 62287 standards.

Note 2: There is no transmitter function on the AIS 1(161.975MHz) and AIS 2(162.025 MHz) channels.

Note\*: The fulfilment of all other conditions of 7.4.3 shall be self-certified by the manufacturer.

**TEST EQUIPMENT LIST**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
CMI	Vibration Tester	ACT2000-S06L	N/A	2016-06-03	2017-06-03
ESPEC	Temperature & Humidity Chamber	ESL-04KA	N/A	2015-12-14	2016-12-14
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-21
HP	Signal Generator	E4421B	US38440505	2016-11-11	2017-11-10
Agilent	MXG X-Series Signal Generators	N5182B	N/A	2016-06-03	2017-06-03
Maritime Communications test Box	Futronic	MKII	1597	2016-09-03	2017-09-03
ROHDETT&SCHWARA	Signal Analyzer	SMBV10A	N/A	2016-11-15	2017-09-15
HEWLETT&PACKARD	Signal Analyzer	E4421B	HTD000391	2016-10-12	2017-10-12
MOS	DC Regulated Power Supply	QJ3020E	HTD000333	2016-10-12	2017-10-12

## IEC 62287-1 §9.2.1 –VIBRATION

### Results required

Verify that the EUT stays operational throughout the test; a successful performance check shall be carried out at the end of the test period.

### Method of measurement

The vibration test shall be done using sweep range and amplitude as defined in IEC 60945 at a sweep rate of 0.2 octaves per minute (which is about 40 min per sweep).

One sweep up (2 Hz to 100 Hz) shall be followed by a sweep down (100 Hz to 2 Hz) for each axis keeping the EUT operational throughout.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.



## IEC 62287-1 §9.2.2 –SHOCK

### Results required

There shall be no external indications of damage and there shall be no detectable degradation in performance during the performance check.

### Method of measurement

The EUT shall be mounted in the normal operating orientation and shall be kept operational during the shocks. The EUT shall be mechanically connected to the shock machine by its normal means of attachment. The peak acceleration shall be  $100\text{m/s}^2$ , pulse shape shall be half sine and duration 25ms.

The shock pulse shall be measured by an accelerometer placed at the EUT fixing point nearest to the centre of the table surface. To carry out the measurement proceed as follows.

- a) Carry out a performance check.
- b) Apply three successive upward shocks with the EUT operative.
- c) Check for external indications of damage.
- d) Carry out a second performance check.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.

**IEC 62287-1 §9.4 –UNDERVOLTAGE TEST (BROWN OUT)****Results required**

Confirm the following.

- a) The unit shall not enter into any undefined or undesirable state as verified by a performance check.
- b) The EUT shall recover and be fully operational as verified by a performance check.

**Method of measurement**

Operate the EUT at the nominal supply voltage as indicated by the manufacturer.

- a) Gradually reduce the supply voltage to 40 % of the nominal supply voltage over a time period of 30 s.
- b) Gradually increase the supply voltage back to 80 % of the nominal supply voltage over a time period of 30 s.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.

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**IEC 62287-1 §10.1.1 – QUALITYTY ASSURANCE**

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**Results required**

Manufacturers shall have a quality control system audited by a competent authority to ensure continuous compliance with the requirements of this standard. Alternatively, the manufacturer may use final product verification procedures where a competent authority verifies compliance with the requirements of this standard before the product is put to the market.

NOTE: The ISO 9000 series, as applicable, meets the requirements of a quality control system.

**Method of measurement**

By inspection of documentation.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.

**IEC 62287-1 §10.1.2 – SAFETY OF OPERATION****Results required**

It shall not be possible for the operator to augment, amend or erase any program software in the equipment required for operation in accordance with the equipment standard. Data used during operation and stored in the system shall be protected in such a way, that necessary modifications and amendments by the user cannot affect its integrity and correctness.

**Method of measurement**

By inspection.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.

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**IEC 62287-1 §10.1.3 –ADDITIONAL FEATURES**

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**Results required**

Where equipment provides a facility that is additional to the minimum requirements of this standard, the operation and, as far as is reasonably practicable, the malfunction of such an additional facility shall not degrade the performance of the equipment.

**Method of measurement**

Operate the EUT in standard test environment. Repeat tests that might be affected by the additional feature.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** No degrade the performance of the equipment.

**IEC 62287-1 §10.2.1.2 –RECEIVE CLASS A POSITION REPORTS****Results required**

Confirm that EUT receives continuously under conditions 10.2.1.2.1 a), b) and c) and, where provided, outputs the received messages on the external interface or display.

**Method of measurement**

Set up standard test environment.

- a) Switch on test targets, then start operation of the EUT.
- b) Start operation of the EUT, then switch on test targets.
- c) Transmit test targets using the same time periods on channel A and channel B.

Check the VDL communication, test output, and where provided, display or external interface of the EUT.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.

**IEC 62287-1 §10.2.1.3 –RECEIVE CLASS B”CS” POSITION REPORTS****Results required**

Confirm that EUT receives the Class B”CS” test target continuously and, where provided, outputs the received Messages 18 and 24 on the external interface.

**Method of measurement**

Set up standard test environment. Simulate at least one additional Class B”CS” test target (bit stuffing shall not increase 4 bit).

Check the VDL communication, test output, and display or external interface of the EUT.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** OK and Compliance with requirement.

## IEC 62287-1 §10.2.1.5 –RX PERFORMANCE TEST

### Results required

Confirm that EUT continuously receives messages and, where provided, outputs the received messages on the external interface with a loss of not more than 5 %.

### Method of measurement

Set up standard test environment. Simulate additional targets so that 9 of 10 time periods are used.

Check the VDL communication, test output, and where provided, display or external interface of the EUT.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result:** 0.2% and Compliance with requirement.



## IEC 62287-1 §10.9.4.1 –DISPLAY INTERFACE

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### Results required

The interface shall be compliant with IEC 61162 series protocol and the manufacturer's documentation of interface hardware.

### Method of measurement

Set up standard test environment and operate EUT in autonomous mode. Apply a safety related broadcast Message 14 through the VDL to the EUT.

Check the output on the display interface.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

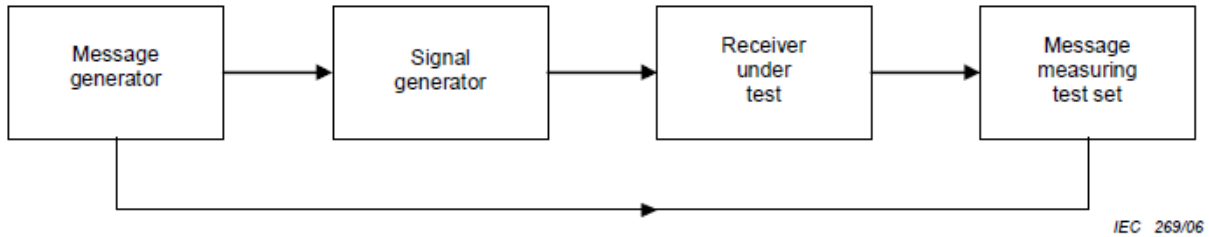
**Test Result:** OK and Compliance with requirement.

**IEC 62287-1 §11.2.1 –SENSITIVITY**

**Results required**

The *PER* shall not exceed 20 %.

**Method of measurement**



**Figure 12 – Measurement arrangement**

The measurement procedure shall be as follows (see also Figure 12):

- a) the signal generator shall be at the nominal frequency of the receiver and shall be modulated to generate test signal number 5;
  - b) the signal level at the input of the receiver shall be set to -107dBm;
  - c) the message measuring test set shall be monitored and the packet error rate observed;
- The *PER* shall be derived by the following formula:

$$PER = (P_{TX} - P_{RX})/P_{TX} \times 100 (\%)$$

where

$P_{RX}$  is the number of packets received without errors;

$P_{TX}$  is the number of transmitted packets.

- d) the test shall be repeated at the nominal carrier frequency  $\pm 500$  Hz and the level at the input to the receiver adjusted to -104dBm under normal conditions;
- e) the test shall be carried out on the lowest TDMA frequency declared by the manufacturer and AIS 2 (162.025 MHz);
- f) repeat under extreme conditions, at the nominal carrier frequency only. The signal generator shall be adjusted so that the level at the input to the receiver is -101dBm.

**Test Data**

**Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test mode:** Receiver

Channel Frequency	Temperature	Voltage	SENSITIVITY INPUT LEVELS	Result	Limit
MHz	°C	V <sub>DC</sub>	dBm	PER (%)	PER (%)
AIS 1 161.975	-15	10.8	-101	1.20	20
		12.0	-101	1.20	20
		15.6	-101	1.20	20
	25	10.8	-101	0.50	20
		12.0	-107	0.50	20
		15.6	-101	0.50	20
	55	10.8	-101	1.30	20
		12.0	-101	1.30	20
		15.6	-101	1.30	20
AIS 2 162.025	-15	10.8	-101	1.35	20
		12.0	-101	1.35	20
		15.6	-101	1.35	20
	25	10.8	-101	0.60	20
		12.0	-107	0.60	20
		15.6	-101	0.60	20
	55	10.8	-101	1.50	20
		12.0	-101	1.50	20
		15.6	-101	1.50	20

Channel Frequency	Condition	Frequency Offset	SENSITIVITY INPUT LEVELS	Result	Limit
MHz	/	kHz	dBm	PER (%)	PER (%)
AIS 1 161.975	Normal	500	-104	2.20	20
		-500	-104	2.50	20
AIS 2 162.025	Normal	500	-104	3.30	20
		-500	-104	3.50	20

**Test Result:** Compliance

## IEC 62287-1 §11.2.2 –ERROR BEHAVIOUR AT HIGH INPUT LEVELS

### Results required

The *PER* shall not exceed 2 % under a) and 10 % under b).

### Method of measurement

The measurement configuration for receiver sensitivity (11.2.1) shall be used.

The signal generator shall be at the nominal frequency of the receiver and shall be modulated to generate test signal number 5. The test shall be carried out on the lowest TDMA frequency declared by the manufacturer and AIS 2 (162.025 MHz). The message measuring test set shall be monitored and the packet error rate observed as follows.

- a) The level of the input signal shall be adjusted to a level of -77dBm.
- b) The level of the input signal shall be adjusted to a level of -7dBm.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

### Test Result: Compliance

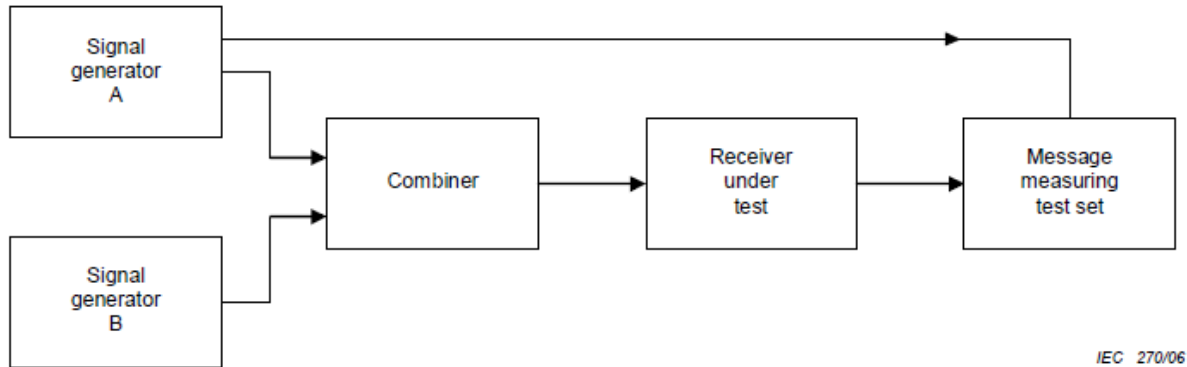
Channel Frequency	SENSITIVITY INPUT LEVELS	Result	Limit
MHz	dBm	PER (%)	PER (%)
AIS 1 161.975	-7	0.5	10
	-77	0.3	2
AIS 2 162.025	-7	0.6	10
	-77	0.4	2

## IEC 62287-1 §11.2.3 –CO-CHANNEL REJECTION

### Results required

The *PER* shall not exceed 20 %.

### Method of measurement



**Figure 13 – Measurement arrangement with two generators**

The measurement procedure shall be as follows (see also Figure 13):

- a) two generators A and B, shall be connected to the receiver via a combining network;
- b) the wanted signal, provided by signal generator A, shall be at the nominal frequency of the receiver and shall be modulated to generate test signal number 5;
- c) the unwanted signal, provided by generator B, shall also be at the nominal frequency of the receiver. Generator B shall be modulated to generate test signal number 4, either continuously or in the same time period as that used by generator A for test signal number 5. The content of the wanted and unwanted signals shall not be synchronised;
- d) the level of the wanted signal from generator A shall be adjusted to -101 dBm;
- e) the level of the unwanted signal from generator B shall be adjusted to -111 dBm;
- f) the message measuring test set shall be monitored and the packet error rate (*PER*) observed;
- g) the measurement shall be repeated for displacements of the unwanted signal of  $\pm 1$  kHz from the nominal frequency of the receiver and the *PER* again observed;

*NOTE: This value represents twice the allowable transmit frequency tolerance.*

- h) the test shall be carried out on the lowest TDMA frequency declared by the manufacturer and AIS 2 (162.025 MHz).

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-26.*

**Test Result: Compliance**

Item	Channel (MHz)	Frequency offset	Result	Limit
		kHz	PER (%)	PER (%)
Co-channel rejection	AIS 1 161.975	+1	3.5	20
		-1	3.8	20
	AIS 2 162.025	+1	4.2	20
		-1	4.5	20

## IEC 62287-1 §11.2.4 –ADJACENT CHANNEL SELECTIVITY

### Results required

The *PER* shall not exceed 20 %.

### Method of measurement

The measurement procedure shall be as follows:

- the measurement configuration for co-channel rejection (11.2.3) shall be used;
- the wanted signal, provided by signal generator A, shall be at the nominal frequency of the receiver and shall be modulated to generate test signal number 5;
- the unwanted signal, provided by generator B, shall be frequency modulated with a 400 Hz sine wave giving a deviation of  $\pm 3$  kHz. Generator B shall be at a frequency 25 kHz above that of the wanted signal;
- the level of the wanted signal from generator A shall be adjusted to a level of -101 dBm;
- the level of the unwanted signal from generator B shall be adjusted to -31 dBm;
- the message measuring test set shall be monitored and the packet error rate observed;
- repeat the above measurement with the unwanted signal 25 kHz below the wanted signal;
- the test shall be carried out on the lowest TDMA frequency declared by the manufacturer and AIS 2 (162.025 MHz).

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	24 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-27.*

#### Test Result: Compliance

Item	Channel (MHz)	Frequency offset	Result	Limit
		kHz	PER (%)	PER (%)
Adjacent channel selectivity	AIS 1 161.975	+25	8.2	20
		-25	8.5	20
	AIS 2 162.025	+25	9.4	20
		-25	9.8	20

**IEC 62287-1 §11.2.5 –SPURIOUS RESPONSE REJECTION**

**Results required**

At any frequency separated from the nominal frequency of the receiver by two channels or more, the spurious responses shall not result in a PER of greater than 20 %.

**Method of measurement**

The initial evaluation of the unit shall be performed over the “limited frequency range” and shall then be performed at the frequencies identified from this test and at “specific frequencies of interest” (as defined below).

To determine the frequencies at which spurious responses can occur the following calculations shall be made:

a) calculation of the "limited frequency range":

the limits of the limited frequency range ( $LFR_{HI}$   $LFR_{LO}$ ) are determined by the following calculations:

$$LFR_{HI} = f_{LOH} + (IF_1 + IF_2 + \dots + IF_N + sr/2)$$

$$LFR_{LO} = f_{LOL} - (IF_1 + IF_2 + \dots + IF_N + sr/2)$$

b) calculation of Specific Frequencies of Interest ( $SFI$ ) outside the limited frequency range: these are determined by the following calculations:

$$SFI_1 = (K \times f_{LOH}) \pm IF_1$$

$$SFI_2 = (K \times f_{LOL}) \pm IF_1$$

where  $K$  is an integer from 2 to 4.

**Test Data**

**Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-27.*

**Test Result:** Compliance

Item	Channel (MHz)	Result	Limit
		PER (%)	PER (%)
Spurious response rejection	AIS 1 161.975	5.5	20
	AIS 2 162.025	5.0	20

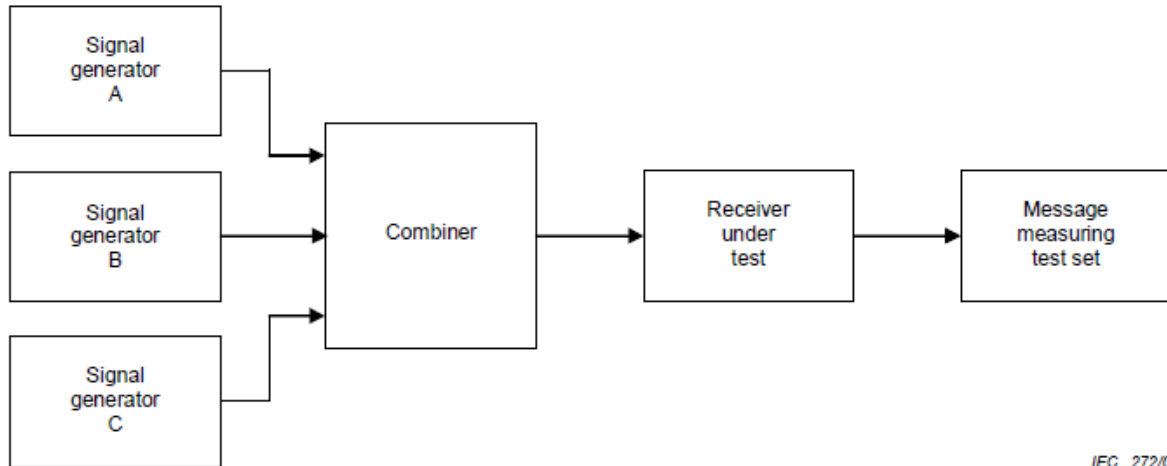


**IEC 62287-1 §11.2.6 –INTERMODULATION RESPONSE REJECTION**

**Results required**

The *PER* shall not exceed 20 %.

**Method of measurement**



IEC 272/06

**Figure 15 – Measurement arrangement for intermodulation**

The measurement procedure shall be as follows (see also Figure 15):

- a) three signal generators shall be connected to the receiver via a combining network;
- b) the wanted signal, provided by signal generator A, shall be at the nominal frequency of the receiver and shall be modulated to generate test signal number 5;
- c) the unwanted signal from generator B shall be unmodulated;
- d) the unwanted signal from generator C shall be frequency modulated with a 400 Hz sine wave giving a deviation of  $\pm 3$  kHz;
- e) the signal level from generator A (wanted) shall be set for -101 dBm at the receiver input;
- f) the signal level from generators B and C shall be set for -36 dBm at the receiver input;
- g) the frequencies of generators A, B, C shall be set as per test #1 of Table 23;
- h) the message measuring test set shall be monitored and the packet error rate observed;
- i) repeat the measurement with frequencies set as per tests #2, #3 and #4 of Table 23.

**Table 23 – Frequencies for inter-modulation test**

	Generator A Wanted AIS signal	Generator B Unmodulated ( $\pm 50$ kHz)	Generator C Modulated ( $\pm 100$ kHz)
Test #1	162,025 MHz	162,075 MHz	162,125 MHz
Test #2	162,025 MHz	161,975 MHz	161,925 MHz
Test #3	$F_{TDMAlo}$	$F_{TDMAlo} + 50$ kHz	$F_{TDMAlo} + 100$ kHz
Test #4	$F_{TDMAlo}$	$F_{TDMAlo} - 50$ kHz	$F_{TDMAlo} - 100$ kHz
NOTE $F_{TDMAlo}$ is the lowest frequency on which the EUT can operate according to the manufacturer's specification.			

**Test Data****Environmental Conditions**

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-27.*

**Test Result: Compliance**

Item	Channel (MHz)	Frequency offset	Result	Limit
			PER (%)	PER (%)
Intermodulation response rejection	AIS 1 161.975	upper	4.0	20
		down	4.5	20
	AIS 2 162.025	upper	5.2	20
		down	5.8	20

## IEC 62287-1 §11.2.7 –BLOCKING OR DESENSITISATION

### Results required

The maximum packet error rate shall not exceed 20 %.

### Method of measurement

The measurement procedure shall be as follows:

- a) two generators A and B, shall be connected to the receiver via a combining network (see Figure 13);
- b) the wanted signal, provided by signal generator A, shall be at the nominal frequency of the receiver and shall be modulated to generate test signal number 5;
- c) the unwanted signal from generator B shall be unmodulated and shall be at a frequency 0.5 MHz to 10 MHz away from the nominal frequency of the receiver. Measurements shall be carried out at frequencies of the unwanted signal at approximately  $\pm 500$  kHz,  $\pm 1$  MHz,  $\pm 2$  MHz,  $\pm 5$  MHz and  $\pm 10$  MHz, avoiding those frequencies at which spurious responses could occur (see C.4.6);
- d) initially, signal generator B (unwanted signal) shall be switched off (maintaining the output impedance). The level of the wanted signal from generator A shall be adjusted to -101 dBm at the receiver input;
- e) the RF signal level for signal generator B (unwanted signal) shall be adjusted to -23 dBm when the frequency setting is less than  $\pm 5$  MHz. For frequency settings of  $\pm 5$  MHz or higher the RF level shall be adjusted to -15 dBm;
- f) the test shall be repeated for all the frequencies defined in step c);
- g) the test shall be carried out on the lowest frequency on which the EUT can operate according to the manufacturer's specification and AIS 2 (162.025 MHz).

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-27.*

### Test Result: Compliance

Item	Channel (MHz)	Frequency offset	Result	Limit
		MHz	PER (%)	PER (%)
Blocking or Desensitisation	AIS 1 161.975	<5	5.2	20
		>5	5.8	20
	AIS 2 162.025	<5	6.3	20
		>5	6.6	20

**IEC 62287-1 §11.3.1 –SPURIOUS EMISSIONS FROM THE RECEIVER**

**Results required**

The power of any spurious emission in the specified range at the antenna terminal shall not exceed -57 dBm (2 nW) in the frequency range 9 kHz to 1 GHz and -47 dBm (20 nW) in the frequency range 1 GHz to 4 GHz.

**Method of measurement**

The receiver shall be connected to a 50 Ω attenuator. The output of the attenuator shall be connected to a spectrum analyser or selective voltmeter having an input impedance of 50 Ω. If the detecting device is not calibrated in terms of power input, the level of any detected components shall be determined by a substitution method using a signal generator. The measurement shall extend over the frequency range 9 kHz to 4 GHz.

The receiver shall be switched on, and the measuring receiver shall be tuned over the frequency range 9 kHz to 4 GHz.

At each frequency at which a spurious component is detected, the power level shall be recorded as the spurious level delivered into the specified load

**Test Data**

**Environmental Conditions**

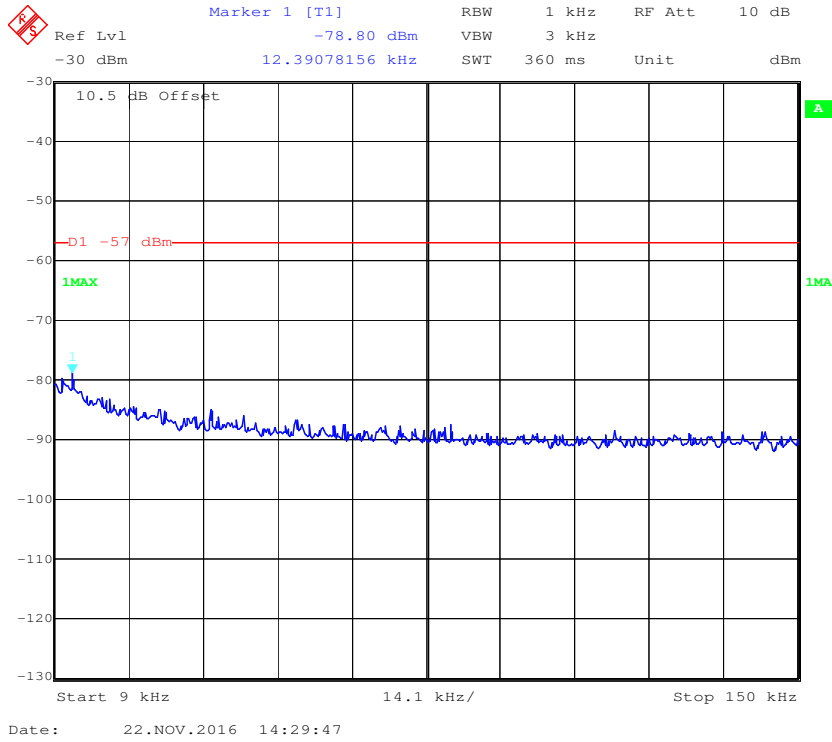
<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-22.*

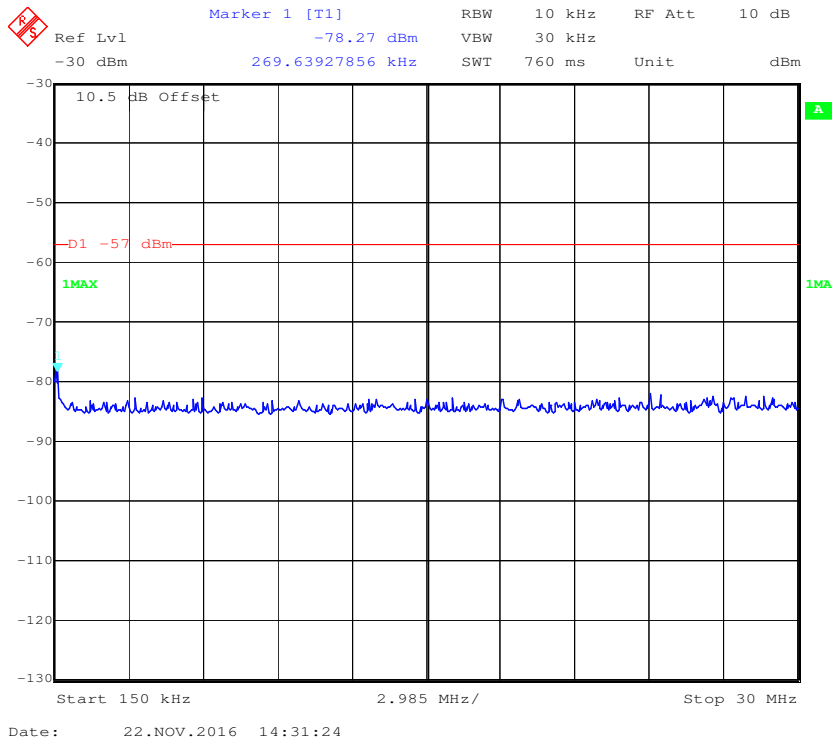
**Test mode:** Receiver

**Test Result:** Compliance

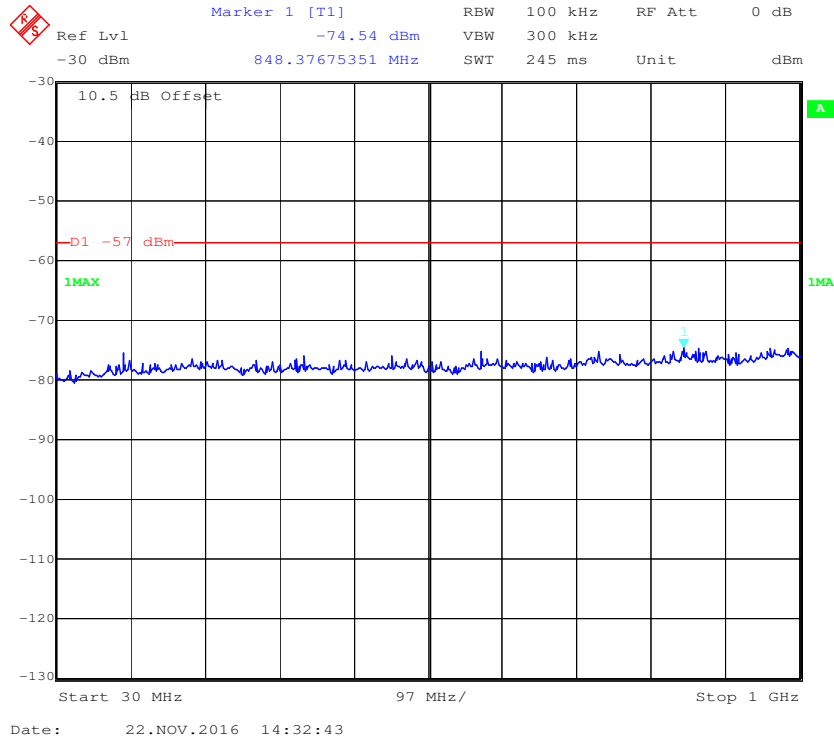
9 kHz – 150 kHz



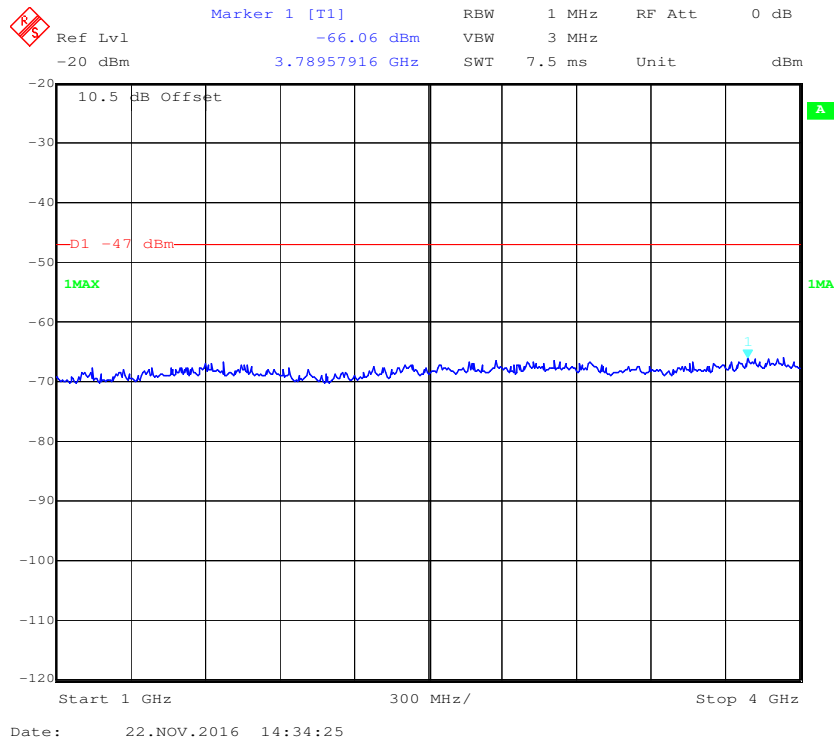
150 kHz – 30 MHz



30 MHz – 1 GHz



1 GHz – 4 GHz



## IEC 62287-1 §12.8.1 –RECEIVED MESSAGES

### Results required

Confirm that EUT responds as appropriate. Check that EUT outputs the corresponding sentences with correct field contents and format via the PI where provided.

Verify that the EUT does not process addressed messages.

### Method of measurement

Set up standard test environment and operate EUT in autonomous mode. Apply messages according to Table 11 to the VDL. Record messages output by the PI of EUT where provided.

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	23 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Nefertari Xu on 2016-11-27.*

**Test Result:** OK and Compliance with requirement.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***