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6 March 2014

Prüfbericht / *Test Report* Nr. / No. 70464-37519-01 (Edition 1)

Auftraggeber *Applicant*	Weatherdock AG Germany
Geräteart *Type of equipment*	AIS Transmitter
Typenbezeichnung *Type designation*	easyONE (AIS-MOB)
Seriennummer / *Serial number*	A109
Auftragsnummer / *Order No.*	1984
Prüfgrundlage *Test standards*	IEC 61 097-14:2010, Section 7

Note:

The test data of this report is related only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.

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Summary

Prüfergebnisse / *Test Results*	Auftragsnummer / *Order No.* **1984**

Die Prüfungen wurden nach folgenden Vorschriften durchgeführt:
Tests were performed according to:
IEC 61 097-14:2010 FDIS, Section 7

Durchgeführte Prüfung ***Test performed***	**Prüfergebnis** ***Test result***			
	Erfüllt *Passed*	Nicht erfüllt *Not Passed*	Nicht zutreffend *Not applicable*	Nicht durchgeführt *Not performed*
Frequenzfehler / *Frequency error*	☒	☐	☐	☐
Sendeleistung leitungsgebunden / *Conducted power*	☒	☐	☐	☐
Sendeleistung gestrahlt / *Radiated power*	☒	☐	☐	☐
Spektrumsmaske / *Modulation spectrum slotted transmission*	☒	☐	☐	☐
Modulationsgenauigkeit / *Transmitter test sequence and modulation accuracy*	☒	☐	☐	☐
Zeitverlauf der Sendeleistung / *Transmitter output power versus time function*	☒	☐	☐	☐
Nebenaussendungen / *Spurious emissions of the transmitter*	☒	☐	☐	☐

Bemerkungen / *Remarks:*

Die Prüfergebnisse beziehen sich ausschließlich auf das zur Prüfung vorgestellte Prüfmuster. Ohne schriftliche Genehmigung des Prüflabors darf der Prüfbericht auszugsweise nicht vervielfältigt werden. *The test results relate only to the individual item which has been tested. Without the written approval of the test laboratory this report may not be reproduced in extracts.*

Datum / *Date*	Geprüft von / *Tested by*	Freigabe durch / *Checked by*
2014-03-06	Steindl Martin Martin Steindl Responsible for testing	Johann Roidt Laboratory manager

Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

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1 Administrative Data

Application details	
Applicant:	Weatherdock AG Germany Sigmundstraße 180 D-90431 Nürnberg
Contact person:	Nr. Norman Jörns
Order number:	1984
Receipt of EUT:	2014-03-03
Return of EUT:	2014-03-03
Date(s) of test:	2014-03-03
Note(s):	Mr. Jörns, representing the applicant attended all tests. The EUT was in care of Mr. Jörns all the time. This test reports covers the radio spectrum matters of the GPS receiver of the EUT, only.
Responsible for testing:	Mr. Martin Steindl
Responsible for test report:	Mr. Martin Steindl
Test report checked by:	Mr. Johann Roidt

Report details	
Report number:	70464-37519-01
Edition:	1
Issue date:	2014-03-06

2 Details about the Test Laboratory

Details about the Test Laboratory	
Company name:	TÜV SÜD Product Service GmbH
Address:	Äußere Frühlingstraße 45 D-94315 Straubing Germany
Contact:	Mr. Johann Roidt Phone: +49 9421 5522-0 Fax: +49 9421 5522-99

3 Description of the Equipment Under Test

Equipment characteristics	
Type designation:	easyONE (AIS-MOB)
Parts of the system:	
Options and accessories:	
Type of equipment:	AIS Transmitter
Serial number:	A109
Manufacturer:	Weatherdock AG
Frequency range:	162.025 MHz
Operating Frequency:	162.025 MHz
Rated Carrier Power:	500 mW
Power supply:	Battery supply (lithium) Nominal: 6.0 V
Version of EUT:	As received; Test for “transmitter test sequence and modulation accuracy” performed with modifications according to documentation of applicant.

4 Operation Mode and Configuration of EUT

Operation Mode(s)
Transmitting, Modulation as stated.

List of ports and cables				
No.	*Description*	*Classification*[1]	*Cable type*	*Cable length*
S1	GMDSS Antenna	signal/control port	Unshielded	33 cm

List of devices connected to EUT				
No.	*Description*	*Type designation*	*Serial no. or ID*	*Manufacturer*

List of support devices				
No.	*Description*	*Type designation*	*Serial no. or ID*	*Manufacturer*
	---			

[1] Ports shall be classified as ac power, dc power or signal/control port.

5 Referenced Regulations

International publication	*Title*
IEC 61 097:14	Global Maritime Distress and Safety Systems (GMDSS) – Part 14: AIS search and rescue transmitter (AIS-SART) – Operational and performance requirements, methods of testing and required test results.

6 Measurement Uncertainty Values

Radio Testing			
Test	k_p	*Expanded Uncertainty*	*Note*
RF-Frequency error	1.96	$\pm 1 \cdot 10^{-7}$	7
RF-Power, conducted carrier	1.96	+0.077 dB / -0.078 dB	7
RF-Power uncertainty for given BER	1.96	+0.94 dB / -1.05	7
RF power, conducted, spurious emissions	1.96	+1.4 dB / -1.6 dB	7
RF power, radiated			
25 MHz – 4 GHz	1.96	+3.6 dB / -5.2 dB	8
1 GHz – 18 GHz	1.96	+3.8 dB / -5.6 dB	8
18 GHz – 26.5 GHz	1.96	+3.5 dB / -4.5 dB	8
26.5 GHz – 66 GHz	1.96	+4.0 dB / -6.5 dB	8
Spectral Power Density, conducted	1.96	+1.4 dB / -1.6 dB	5
Maximum frequency deviation			
300 Hz – 6 kHz	2	±2,89 %	2
6 kHz – 25 kHz	2	±0.2 dB	2
Maximum frequency deviation for FM	2	±2,89 %	2
Adjacent channel power 25 MHz – 1 Ghz	2	±2.31 %	2
Temperature	2	±0.39 K	4
(Relative) Humidity	2	±2.28 %	2
DC- and low frequency AC voltage			
DC voltage	2	±0.01 %	2
AC voltage up to 1 kHz	2	±1.2 %	2
Time	2	±0.6 %	2

Radio Interference Emission Testing			
Test	k_p	*Expanded Uncertainty*	*Note*
Conducted Voltage Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
100 kHz to 200 MHz (50Ω/5µH AMN)	2	± 3.6 dB	1
Discontinuous Conducted Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
Conducted Current Emission			
9 kHz to 200 MHz	2	± 3.5 dB	1
Magnetic Fieldstrength			
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB	1
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB	1
Radiated Emission			
Test distance 1 m (ALSE)			
9 kHz to 150 kHz	2	± 4.6 dB	1
150 kHz to 30 MHz	2	± 4.1 dB	1
30 MHz to 200 MHz	2	± 5.2 dB	1
200 MHz to 2 GHz	2	± 4.4 dB	1
2 GHz to 3 GHz	2	± 4.6 dB	1
Test distance 3 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 5.0 dB	1
1 GHz to 6 GHz	2	± 4.6 dB	1
Test distance 10 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 4.9 dB	1

Radio Interference Emission Testing (continued)			
Test	k_p	*Expanded Uncertainty*	*Note*
Radio Interference Power			
30 MHz to 300 MHz	2	± 3.5 dB	1
Harmonic Current Emissions			4
Voltage Changes, Voltage Fluctuations and Flicker			4

Immunity Testing			
Test	k_p	*Expanded Uncertainty*	*Note*
Electrostatic Discharges			4
Radiated RF-Field			
Pre-calibrated field level	2	+32.2 / -24.3 %	5
Dynamic feedback field level	2.05	+21.2 / -17.5 %	3
Electrical Fast Transients (EFT) / Bursts			4
Surges			4
Conducted Disturbances, induced by RF-Fields			
via CDN	2	+15.1 / -13.1 %	6
via EM clamp	2	+42.6 / -29.9 %	6
via current clamp	2	+43.9 / -30.5 %	6
Power Frequency Magnetic Field	2	+20.7 / -17.1 %	2
Pulse Magnetic Field			4
Voltage Dips, Short Interruptions and Voltage Variations			4
Oscillatory Waves			4
Conducted Low Frequency Disturbances			
Voltage setting	2	± 0.9 %	2
Frequency setting	2	± 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Note 1:
The expanded uncertainty reported according to CISPR 16-4-2:2003-11 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%

Note 2:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%

Note 3:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2.05, providing a level of confidence of p = 95.45%

Note 4:
It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95%confidence.

Note 5:
The expanded uncertainty reported according to IEC 61000-4-3 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%

Note 6:
The expanded uncertainty reported according to IEC 61000-4-6 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%

Note 7:
The expanded uncertainty reported according ETSI TR 100 028 V1.4.1 (all parts) to is based on a standard uncertainty multiplied by a coverage factor of k_p = 1.96, providing a level of confidence of p = 95.45%

Note 8:
The expanded uncertainty reported according to ETSI TR 102 273 V1.2.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45%

7 Test Results

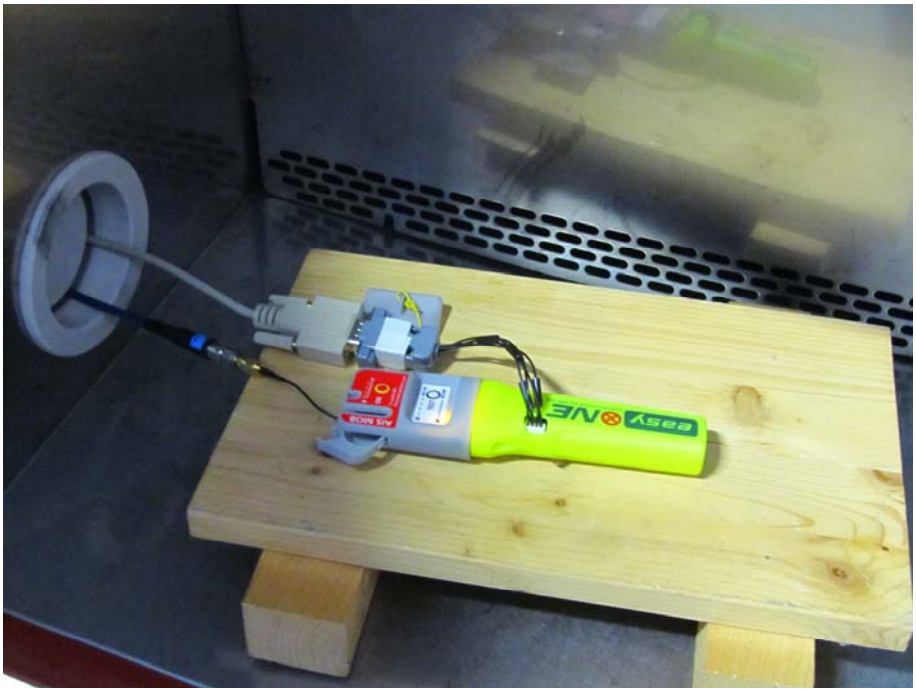
Physical Radio Tests

IEC 61 097-14:2010			
Section(s)	*Test performed*	*Page*	*Test Result*
7.1	General description	---	---
7.2	Frequency error	16	Test passed
7.3	Conducted power	21	Value Noted [2]
7.4	Radiated power	26	Test passed
7.5	Modulation spectrum slotted transmission	29	Test passed
7.6	Transmitter test sequence and modulation accuracy	32	Test passed
7.7	Transmitter output power versus time function	44	Test passed
7.8	Spurious emissions from the transmitter	49	Test passed

[2] See “Radiated Power” for details

7.1 Frequency error

7.1.1 Test Setup



7.1.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESPI7	1711	836914/0002	Rohde & Schwarz
☒	Attenuator	4776-10	1638	9412	Narda
☒	Temperature test chamber	HT 4010	1271	07065550	Heraeus

7.1.3 Test Results

Results for frequency error test are documented as listed below.

Frequency error

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Non shielded room

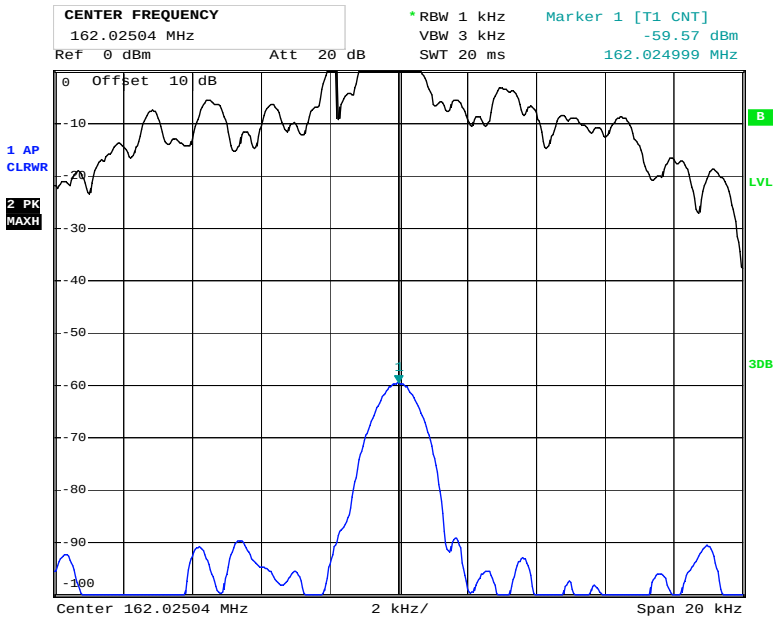
Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097:2010, Section 7.1
Betriebsart / *Operation mode:*	Transmitting continuously with unmodulated carrier
Kommentar / *Comment:*	

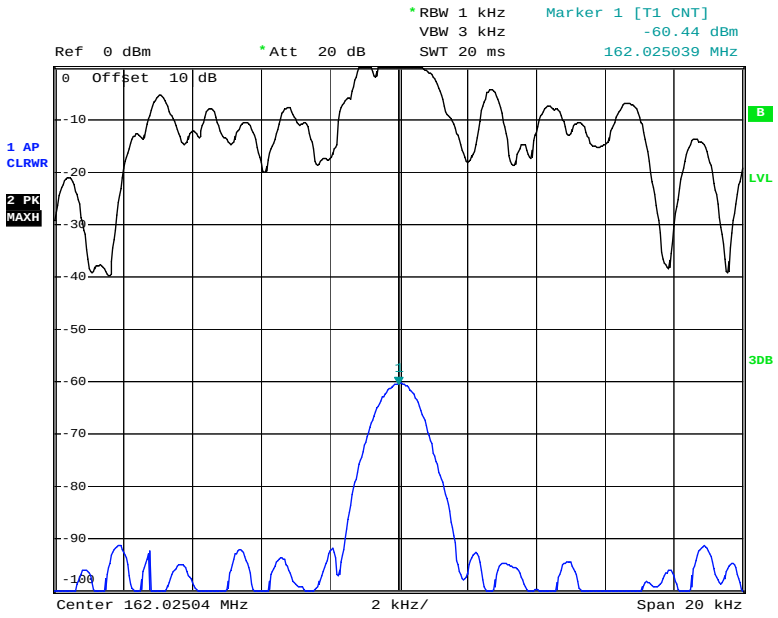
Temperature	*Frequency*	*Frequency error*	*Limit*	*Result*	*Note*
+20 °C	162.024999 MHz	-0.001 kHz	±0.5 kHz	Passed	
-20 °C	162.025039 MHz	+0.039 kHz	±1.0 kHz	Passed	
+55 °C	162.024987 MHz	-0.013 kHz	±1.0 kHz	Passed	

Note(s):



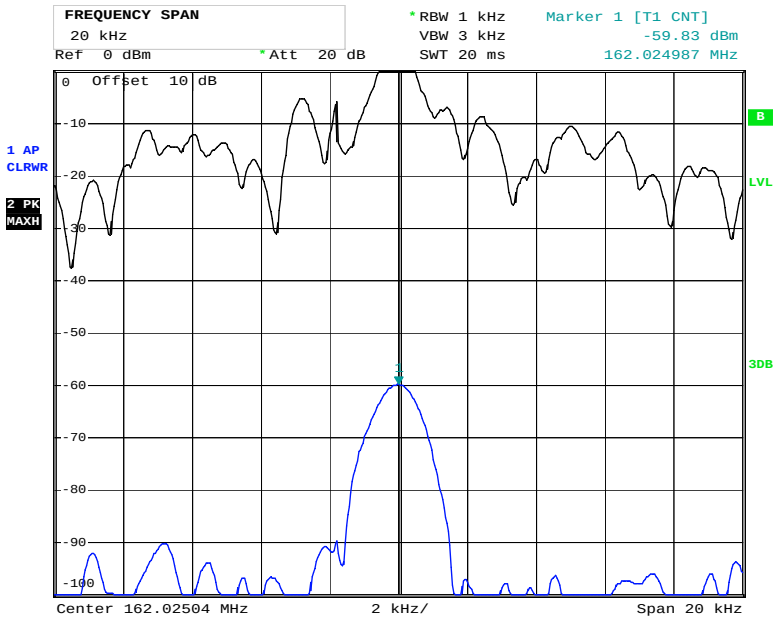
Date: 3.MAR.2014 13:27:56

Temperature: +20 °C



Date: 3.MAR.2014 13:54:41

Temperature: -20 °C

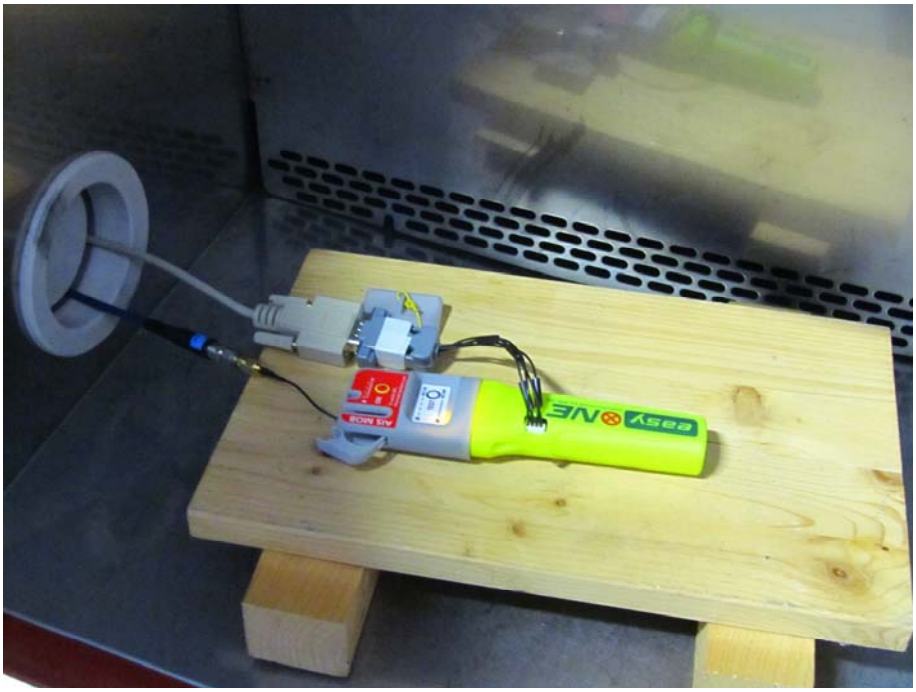


Date: 3.MAR.2014 14:38:10

Temperature: +55 °C

7.2 Conducted power

7.2.1 Test Setup



7.2.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESPI7	1711	836914/0002	Rohde & Schwarz
☒	Attenuator	4776-10	1638	9412	Narda
☒	Temperature test chamber	HT 4010	1271	07065550	Heraeus

7.2.3 Test Results

Results for conducted power test are documented as listed below.

Conducted power

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Non shielded room

Prüfergebnis / *Test Result*

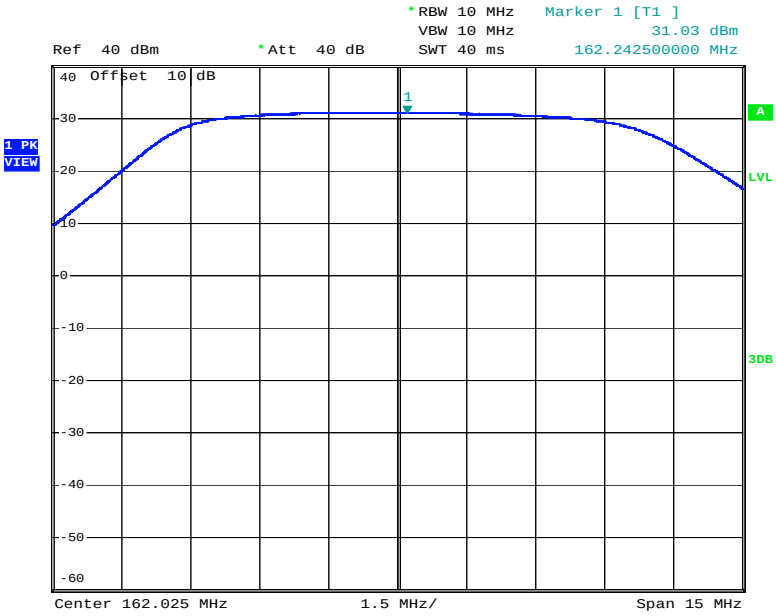
Values noted

Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097:2010, Section 7.3
Betriebsart / *Operation mode:*	Transmitting continuously telegrams
Kommentar / *Comment:*	

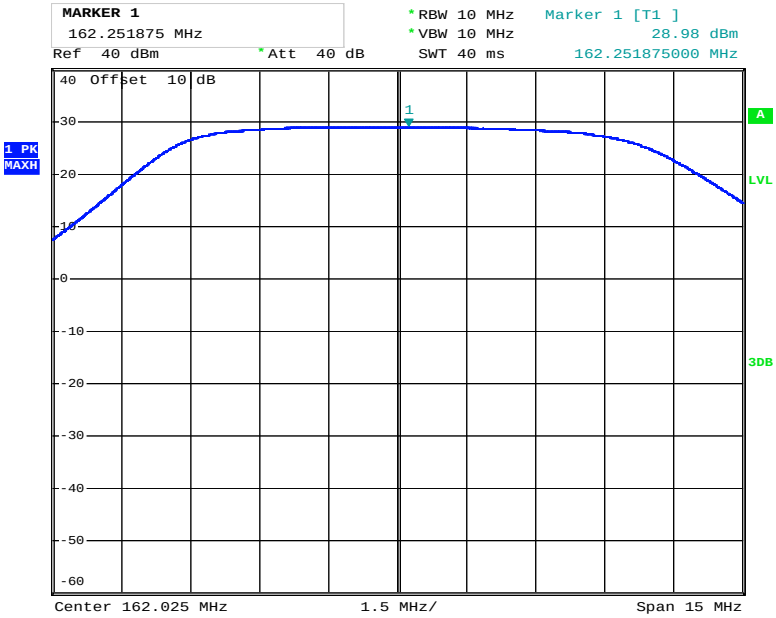
Temperature	*Conducted carrier power*	*Note*
+20 °C	31.0 dBm	
-20 °C	29.0 dBm	
+55 °C	31.9 dBm	

Note(s):



Date: 3.MAR.2014 13:00:52

Temperature: +20 °C



Date: 3.MAR.2014 13:50:44

Temperature: -20 °C

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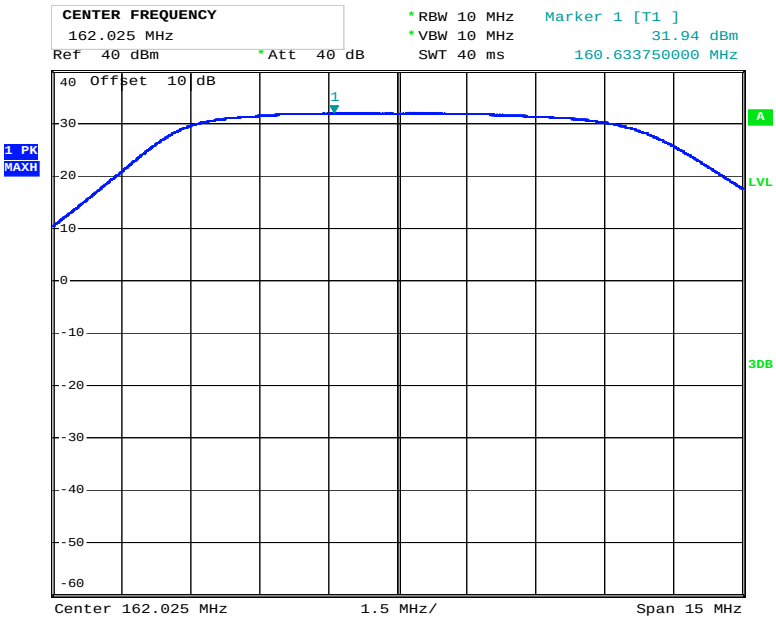
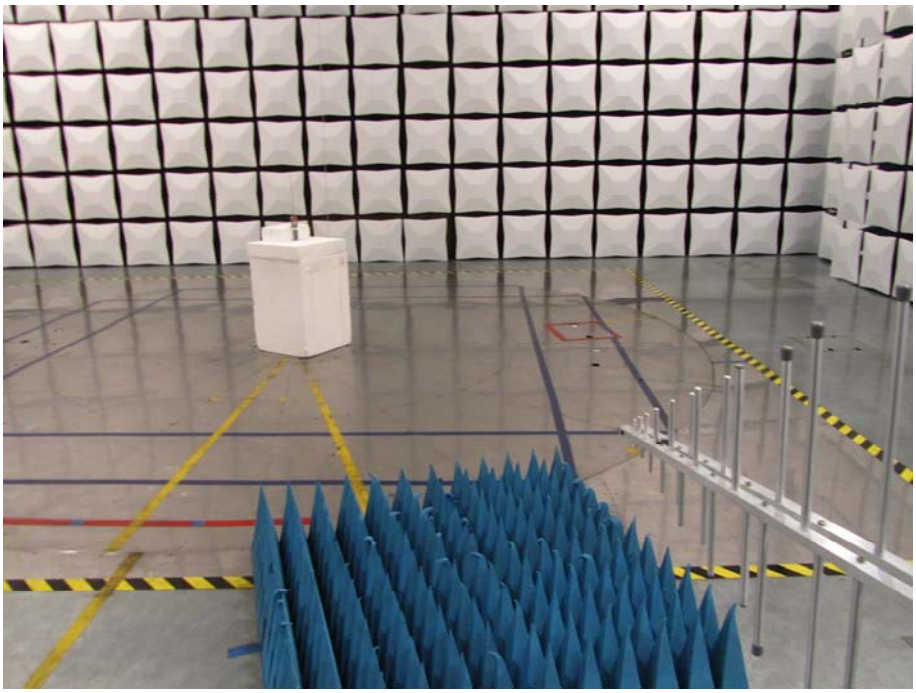


Date: 3.MAR.2014 14:35:18

Temperature: +55 °C

7.3 Radiated power

7.3.1 Test Setup



7.3.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESU8	2044	100232	Rohde & Schwarz
☒	TRILOG Broadband Antenna	VULB 9163	2058	9163-408	Schwarzbeck
☒	Semi anechoic room	No. 8	2057	---	Albatross

7.3.3 Test Results

Results for radiated power test are documented as listed below.

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Radiated power

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Semi anechoic room, cabin no. 8

Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097-14:2010, Section 7.4
Betriebsart / *Operation mode:*	Transmitting telegrams continuously
Kommentar / *Comment:*	The minimum limit given by the standard is 500 mW (27 dBm) based on a nominal radiated output power of 1 W (30 dBm). Since the EUT has a nominal carrier power of 500 mW (27 dBm) to comply with the requirements for Short Range Devices (SRD) the limit is reduced in accordance with the applicant accordingly to 250 mW (24 dBm).

Azimuth	P_R	*Tolerance to maximum*	*Power minimum limit*	*Tolerance limit*	*Result*	*Note*
-90°	27.2 dBm	-0.0 dB	> 24 dBm	> -3 dB	Passed	1
0°	26.8 dBm	-0.4 dB	> 24 dBm	> -3 dB	Passed	1
+90°	26.5 dBm	-0.7 dB	> 24 dBm	> -3 dB	Passed	1
+180°	27.0 dBm	-0.2 dB	> 24 dBm	> -3 dB	Passed	1

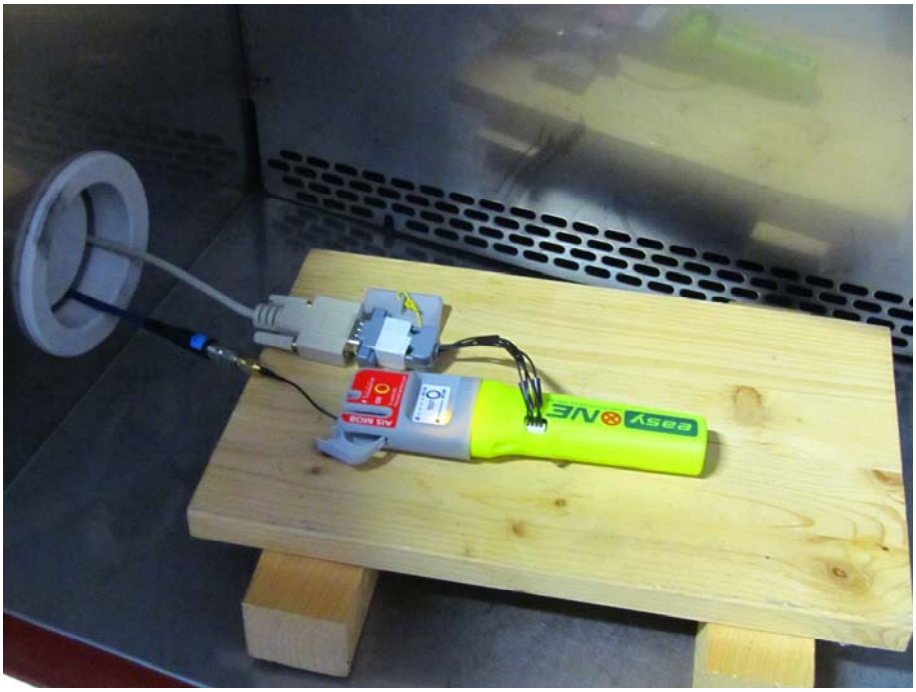
Note(s):
1

Temperature	P_C	P_R *(minimum)*	*Power minimum limit*	*Result*	*Note*
+20 °C	31.0 dBm	26.5 dBm	> 24 dBm	Passed	
Calculated Gain $G = P_R - P_{20} - P_d = -4.5$ dB					1
-20 °C	29.0 dBm	24.5 dBm	> 24 dBm	Passed	
+55 °C	31.9 dBm	27.4 dBm	> 24 dBm	Passed	

Note(s):
1 $P_d = 0$ dB

7.4 Modulation spectrum slotted transmission

7.4.1 Test Setup



7.4.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESPI7	1711	836914/0002	Rohde & Schwarz
☒	Attenuator	4776-10	1638	9412	Narda
☒	Temperature test chamber	HT 4010	1271	07065550	Heraeus

7.4.3 Test Results

Results for modulation spectrum slotted transmission test are documented as listed below.

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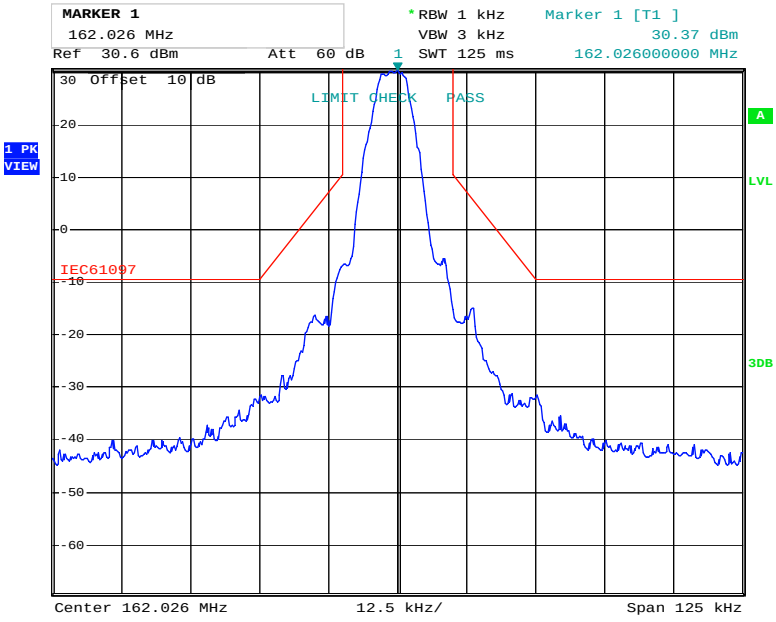
Modulation spectrum slotted transmission

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Non shielded room

Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

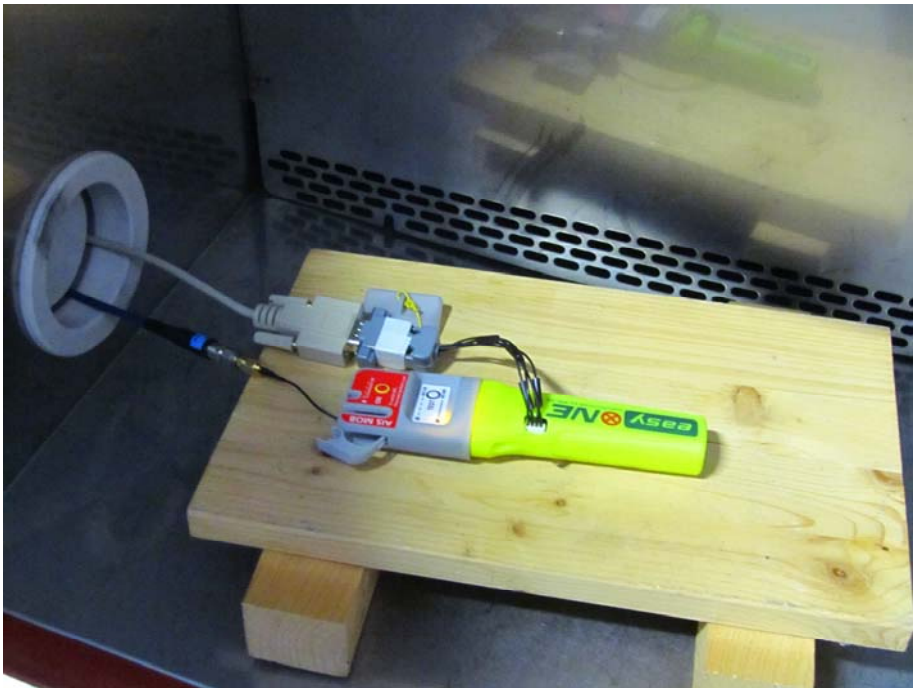
Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097-14, Section 7.5
Betriebsart / *Operation mode:*	Transmitting telegrams continuously
Kommentar / *Comment:*	



7.5 Transmitter test sequence and modulation accuracy

7.5.1 Test Setup



7.5.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESMI	1569	839379/013 839587/006	Rohde & Schwarz
☒	Attenuator	4776-10	1638	9412	Narda
☒	Temperature test chamber	HT 4010	1271	07065550	Heraeus

7.5.3 Test Results

Results for transmitter test sequence and modulation accuracy test are documented as listed below.

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Transmitter test sequence and modulation accuracy

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Non shielded room

Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097-14, Section 7.6
Betriebsart / *Operation mode:*	Transmitting continuously with test signals 1 and 2
Kommentar / *Comment:*	

Limit definition					*Note*
Period from center to center of each bit	*Test signal 1*		*Test signal 2*		
	Normal conditions	*Extreme conditions*	*Normal conditions*	*Extreme conditions*	
Bit 0 to 1	< 3.4 kHz				
Bit 2 to 3	2.4 kHz ± 480 Hz				
Bit 4 to 31	2.4 kHz ± 240 Hz	2.4 kHz ± 480 Hz	2.4 kHz ± 240 Hz	2.4 kHz ± 480 Hz	
Bit 32 to 199	1.74 kHz ± 240 Hz	1.74 kHz ± 480 Hz	2.4 kHz ± 240 Hz	2.4 kHz ± 480 Hz	

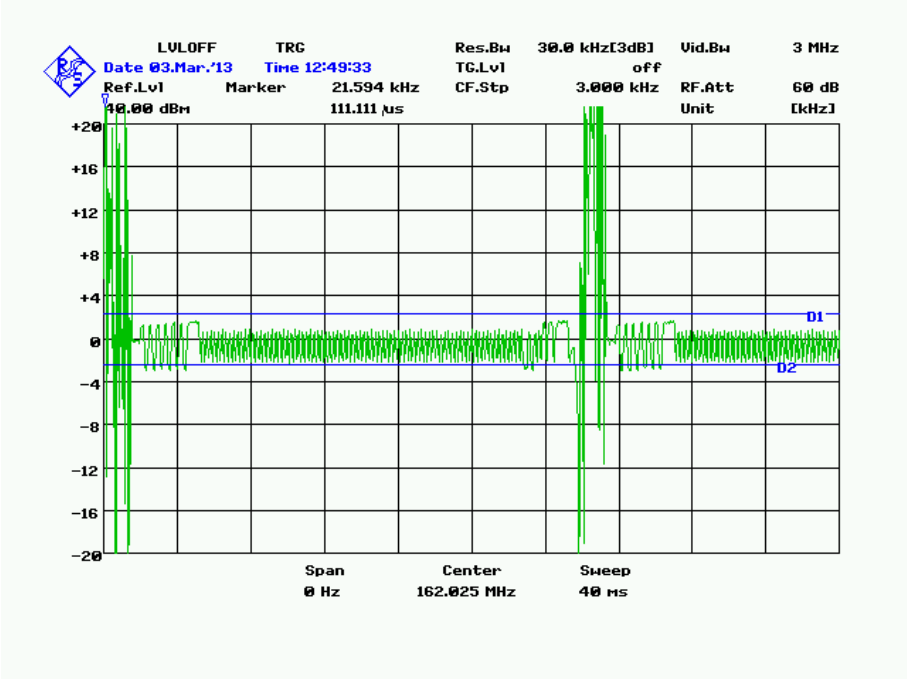
Note(s):

Temperature	*Test signal*	*Result*	*Note*
+20 °C	1	Passed	1
+20 °C	2	Passed	1
-20 °C	1	Passed	1
-20 °C	2	Passed	1
+55 °C	1	Passed	1
+55 °C	2	Passed	1

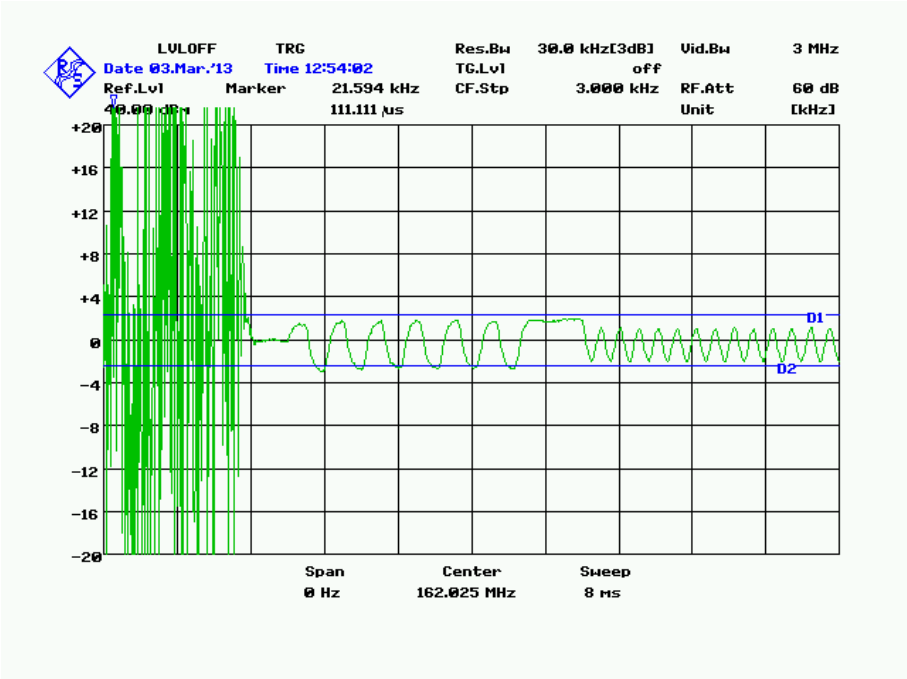
Note(s):
1 See plots for details

Nominal test conditions: +20 °C

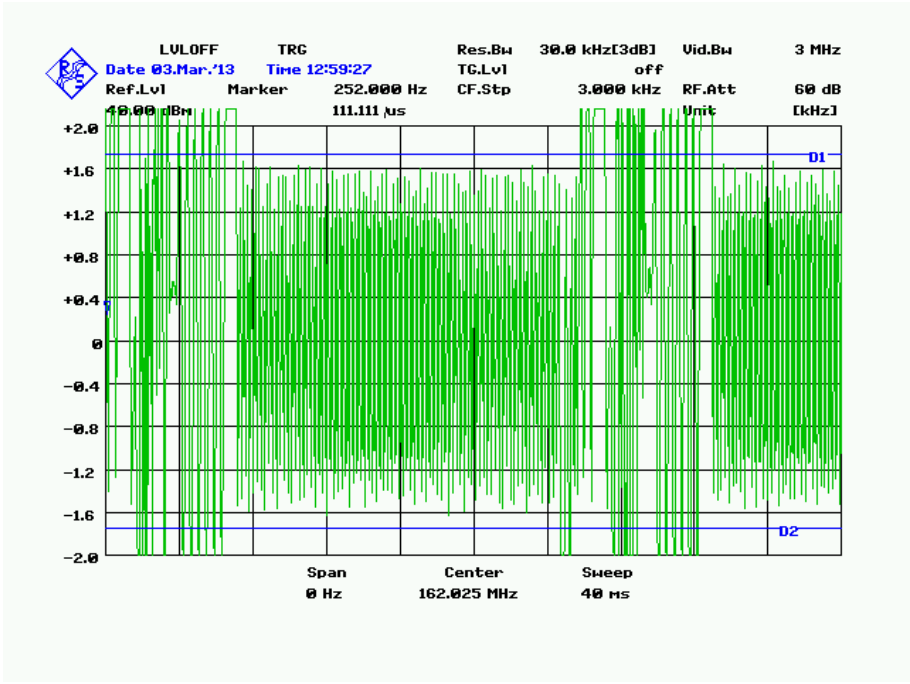
Test signal 1



Display lines at ±2.4 kHz

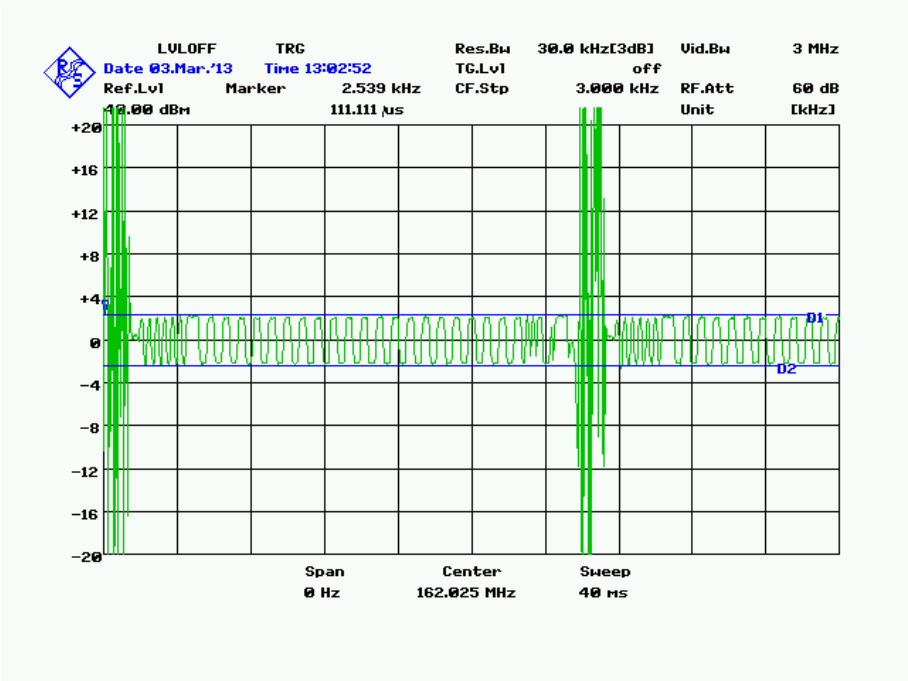


Display lines at ±2.4 kHz

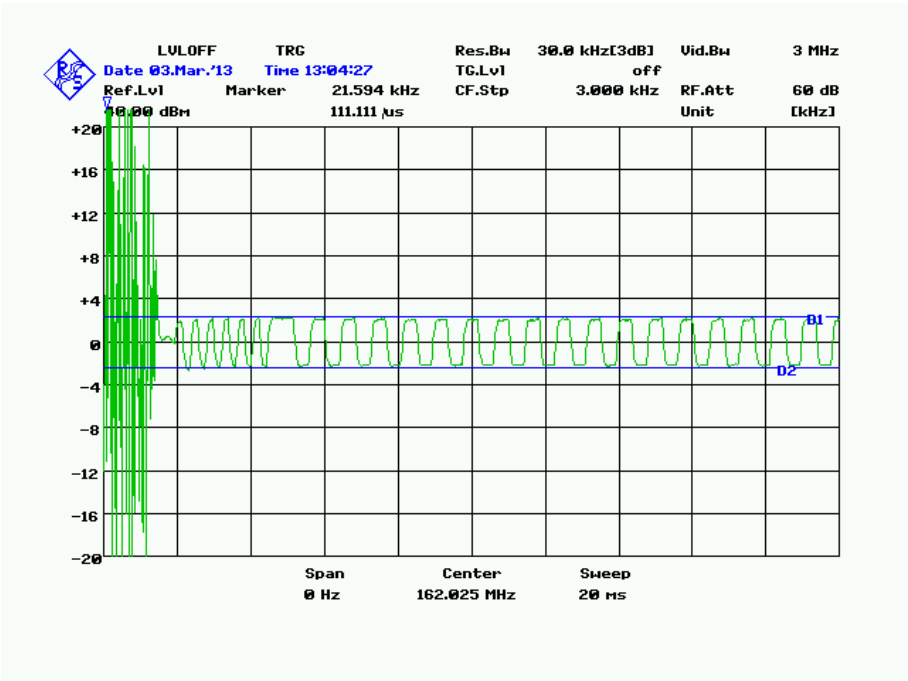


Display lines at ±1.74 kHz

Test signal 2



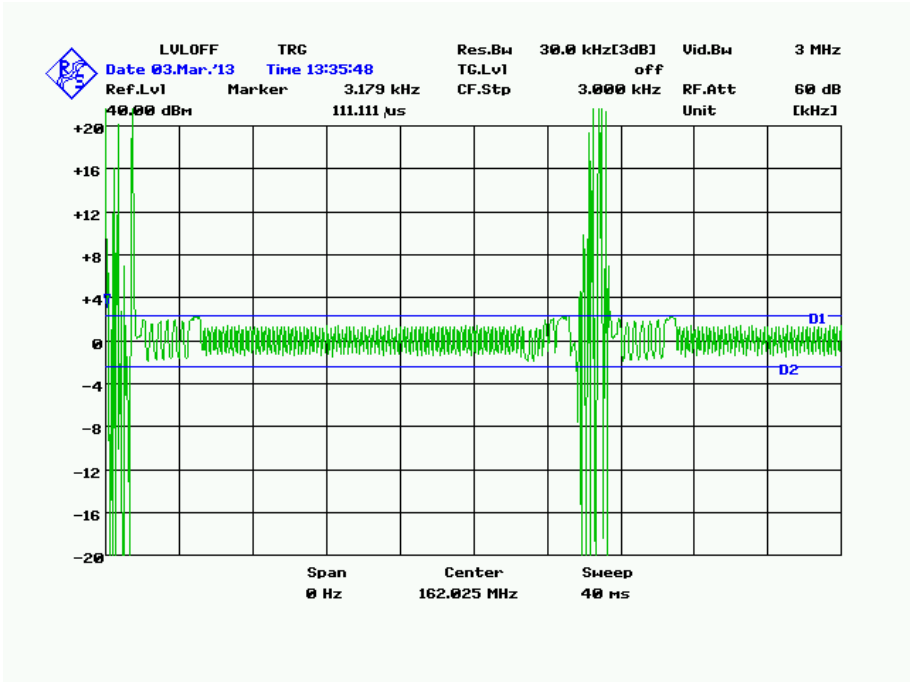
Display lines at ±2.4 kHz



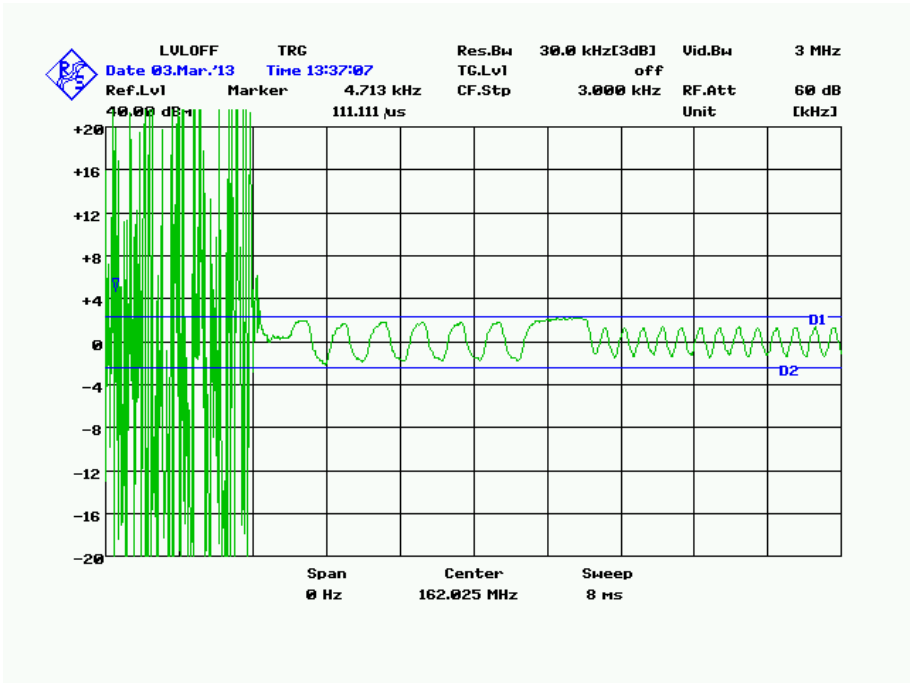
Display lines at ±2.4 kHz

Extreme test conditions: -20 °C

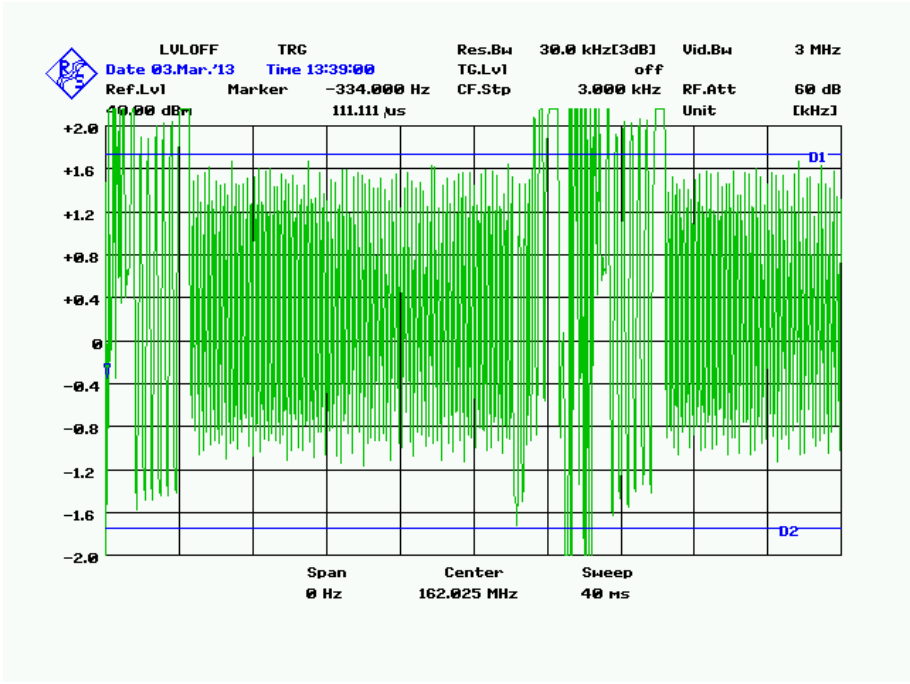
Test signal 1



Display lines at ±2.4 kHz

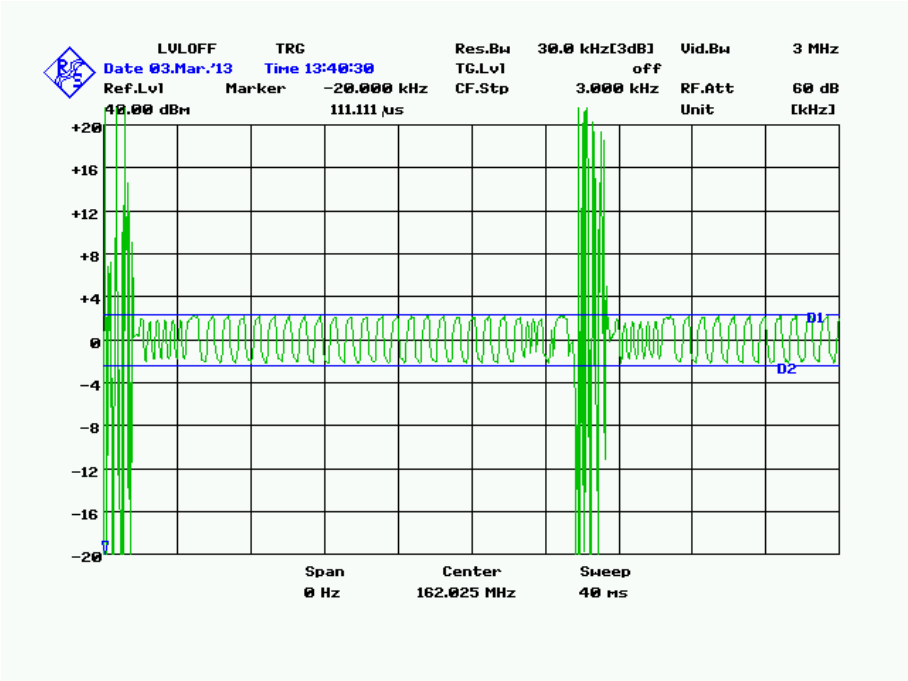


Display lines at ±2.4 kHz

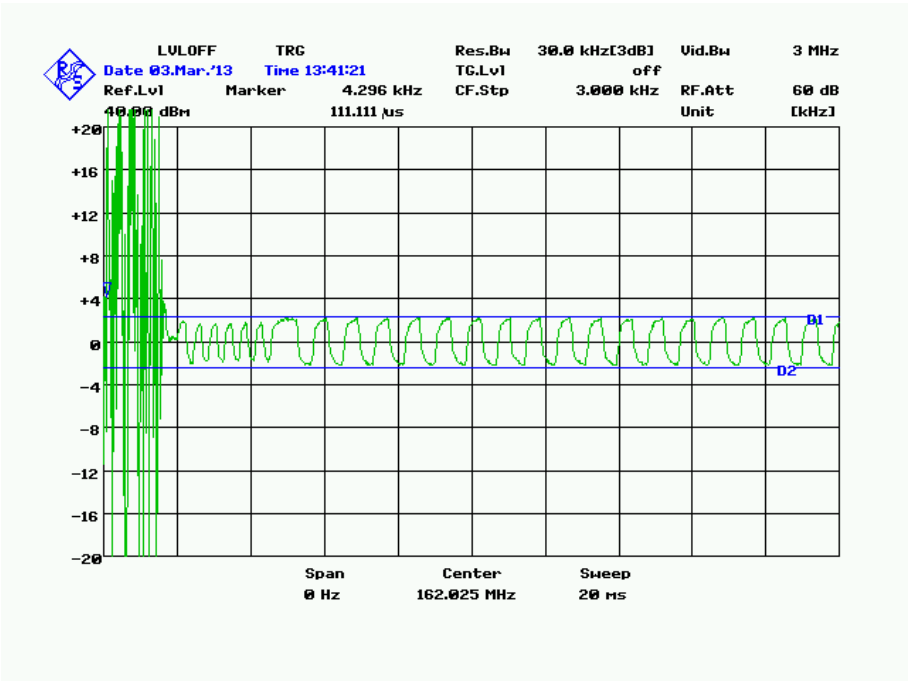


Display lines at ±1.74 kHz

Test signal 2



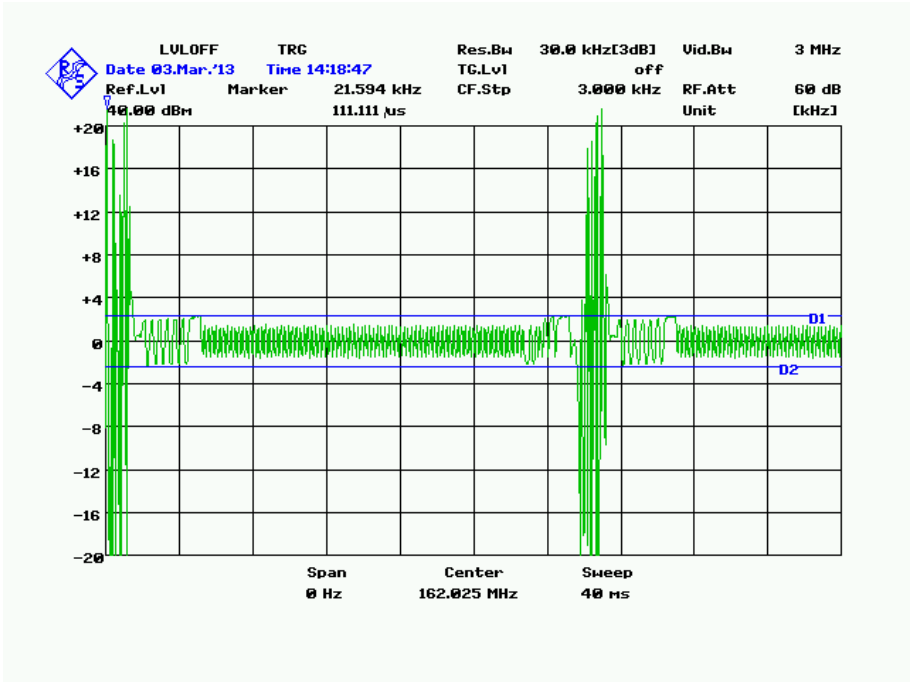
Display lines at ±2.4 kHz



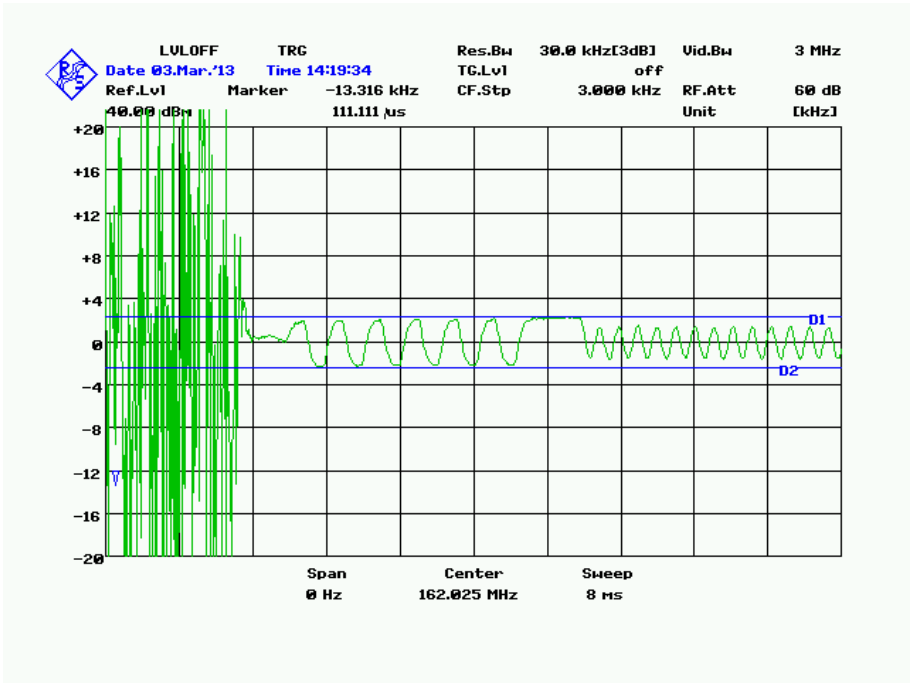
Display lines at ±2.4 kHz

Extreme test conditions: +55 °C

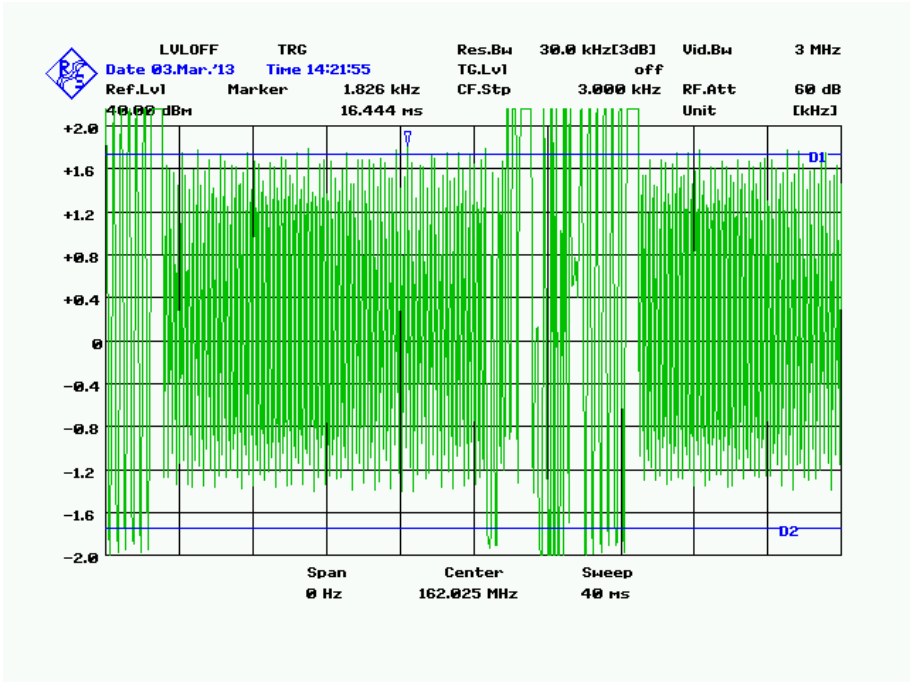
Test signal 1



Display lines at ±2.4 kHz

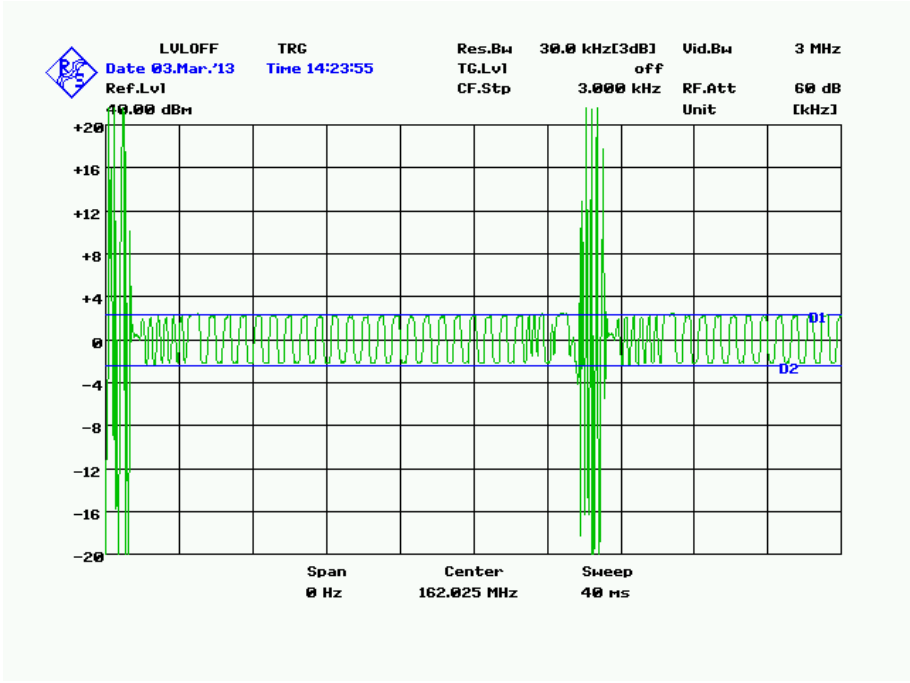


Display lines at ±2.4 kHz

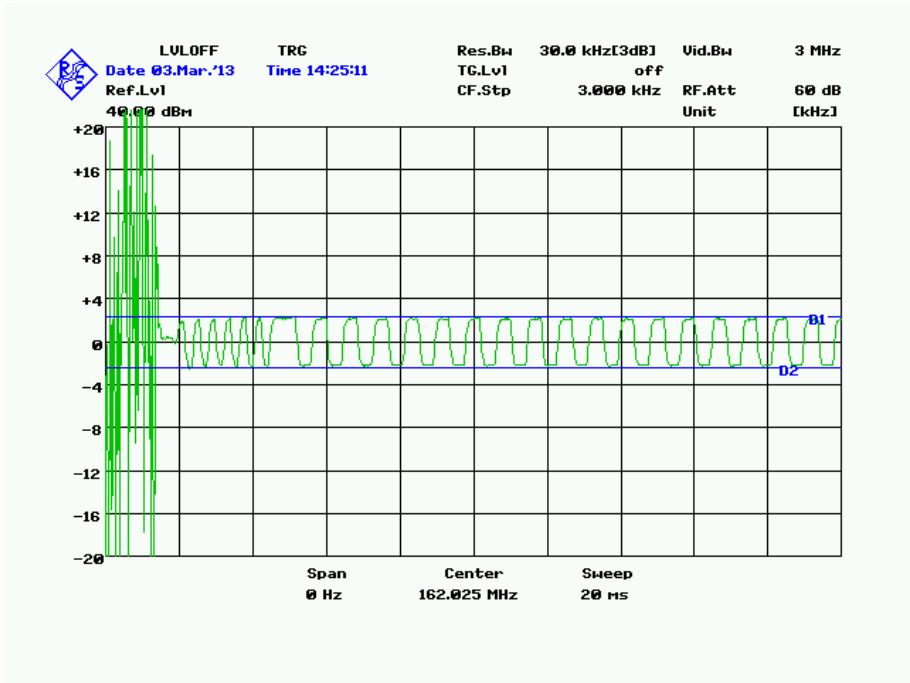


Display lines at ±1.74 kHz

Test signal 2



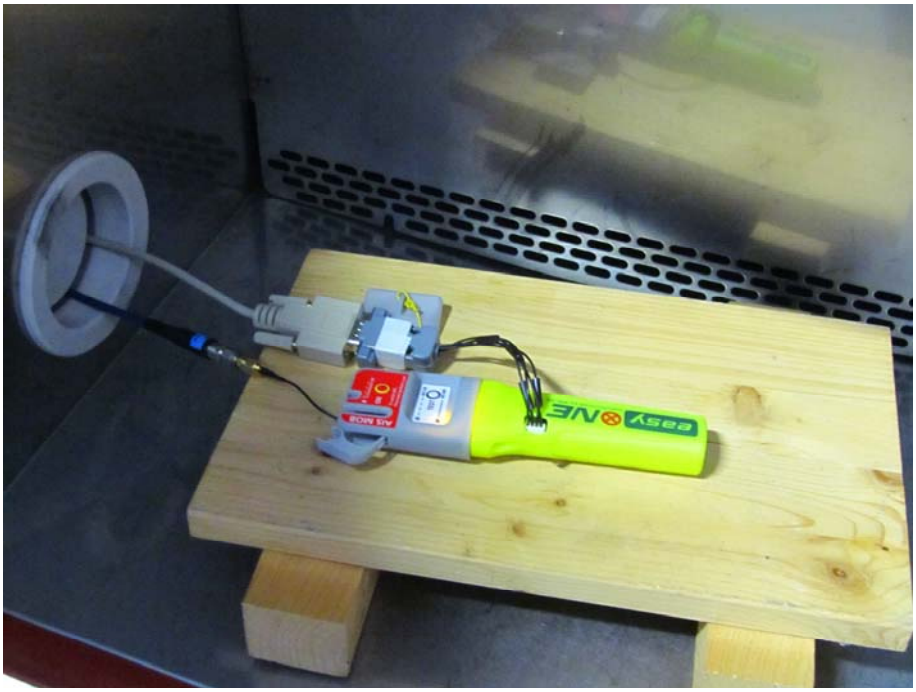
Display lines at ±2.4 kHz



Display lines at ±2.4 kHz

7.6 Transmitter output power versus time function

7.6.1 Test Setup



7.6.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESPI7	1711	836914/0002	Rohde & Schwarz
☒	Attenuator	4776-10	1638	9412	Narda
☒	Temperature test chamber	HT 4010	1271	07065550	Heraeus

7.6.3 Test Results

Results for transmitter output power versus time function test are documented as listed below.

TÜV SÜD Product Service GmbH
Äußere Frühlingstraße 45
94315 Straubing
Germany

Phone: +49 9421 5522-0
Fax: +49 9421 5522-99
Web: www.tuev-sued.de

Transmitter output power versus time function

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Non shielded room

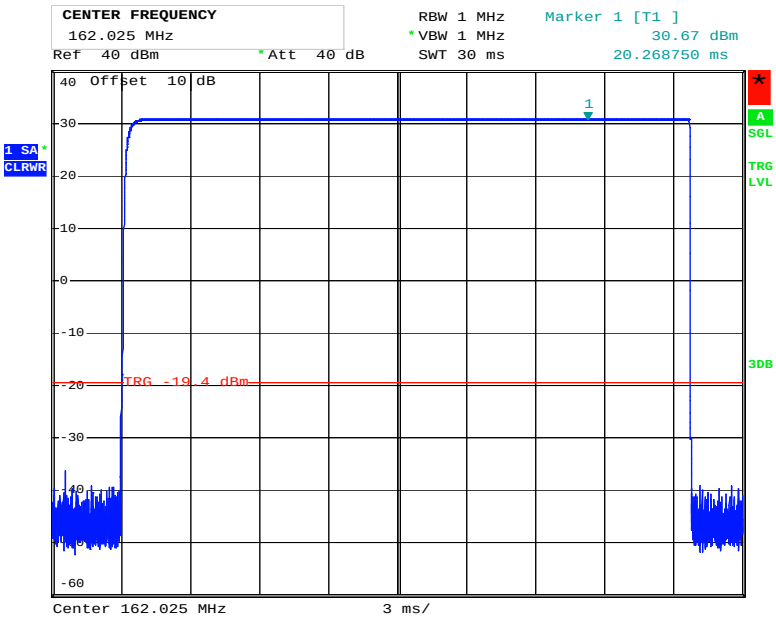
Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097-14, Section 7.7
Betriebsart / *Operation mode:*	Transmitting telegrams continuously
Kommentar / *Comment:*	Limits are calculated for a steady state power of P_{SS} = 30.7 dBm. See plots for details

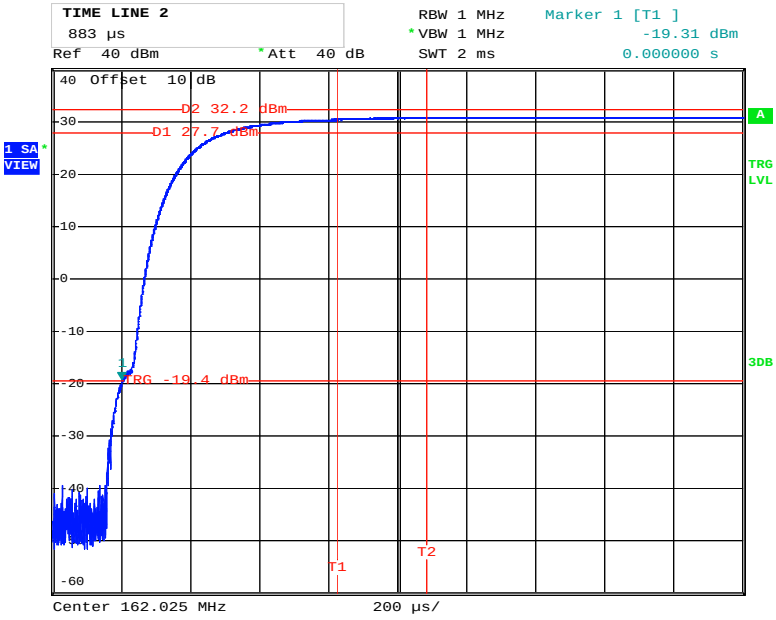
Limit definition				*Note*
Reference		*Bits*	*Time*	*Definition*	
T_0		0	0 ms	Start of transmission slot shall NOT exceed -50 dB of P_{SS} before T_0	1
T_A		0 to 6	0 ms to 0.625 ms	Power exceeds -50 dB of P_{SS}	1
T_B	T_{B1}	6	0.625 ms	Power shall be within +1.5 dB to -3 dB of P_{SS}	1
	T_{B2}	8	0.833 ms	Power shall be within +1.5 dB to -1 dB of P_{SS}	1
T_E		233	24.271 ms	Power shall remain within +1.5 dB to -3 dB of P_{SS} during the Period T_{B2} to T_E	1
T_F		241	25.104 ms	Power shall be -50 dB of P_{SS} and stay below this	1
T_G		256	26.667 ms	Start of next transmission time period	1, 2

Note(s):
1 See plots for details
2 Normal duty cycle is one telegram in one minute.



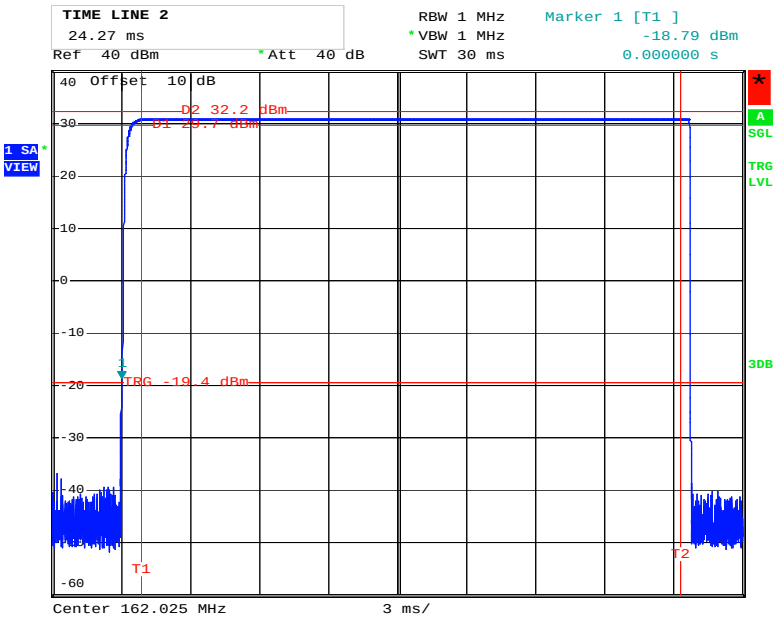
Date: 3.MAR.2014 15:14:12

P_{SS} = 30.7 dBm, Trigger level set to -50 dB of P_{SS}

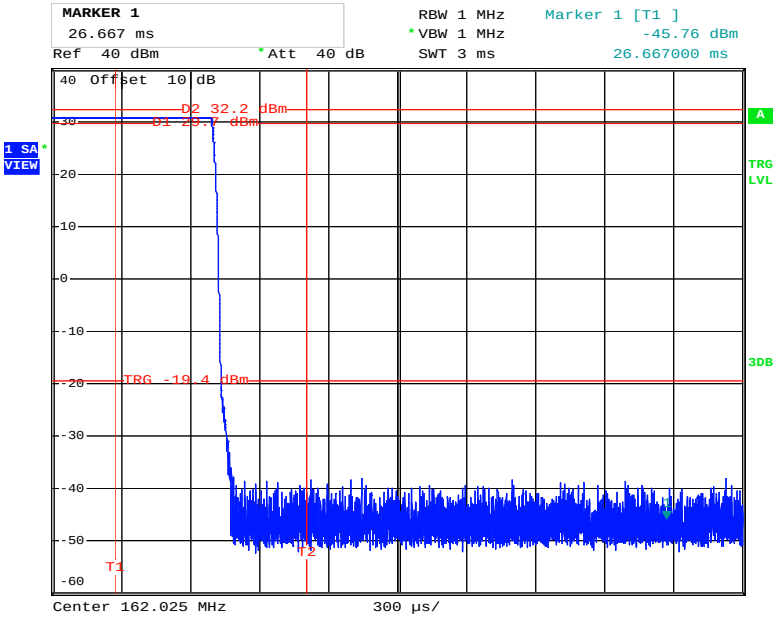


Date: 3.MAR.2014 15:17:52

T_1 = 0.625 ms, T_2 = 0.833 ms



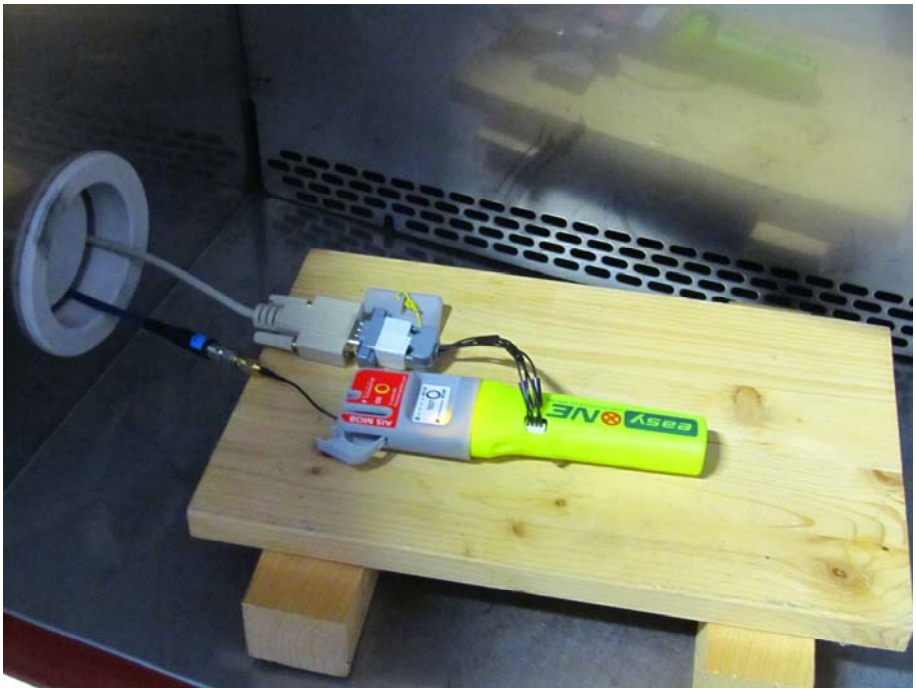
T_1 = 0.833 ms, T_2 = 24.271 ms



T_1 = 24.271 ms, T_2 = 25.104 ms,
Trigger offset = 24 ms

7.7 Spurious emission from the transmitter

7.7.1 Test Setup



7.7.2 Test Equipment List

	Type	*Designation*	*Inv.-no.*	*Serial No. or ID*	*Manufacturer*
☒	EMI test receiver	ESPI7	1711	836914/0002	Rohde & Schwarz
☒	Attenuator	4776-10	1638	9412	Narda
☒	Temperature test chamber	HT 4010	1271	07065550	Heraeus

7.7.3 Test Results

Results for spurious emission from the transmitter test are documented as listed below.

TÜV SÜD Product Service GmbH
Äußere Frühlingstraße 45
94315 Straubing
Germany

Phone: +49 9421 5522-0
Fax: +49 9421 5522-99
Web: www.tuev-sued.de

Spurious emissions from the transmitter

Prüfdatum / *Date of test:*	2014-03-03
Prüfer / *Operator:*	Martin Steindl
Messplatz / *Test site:*	Non shielded room

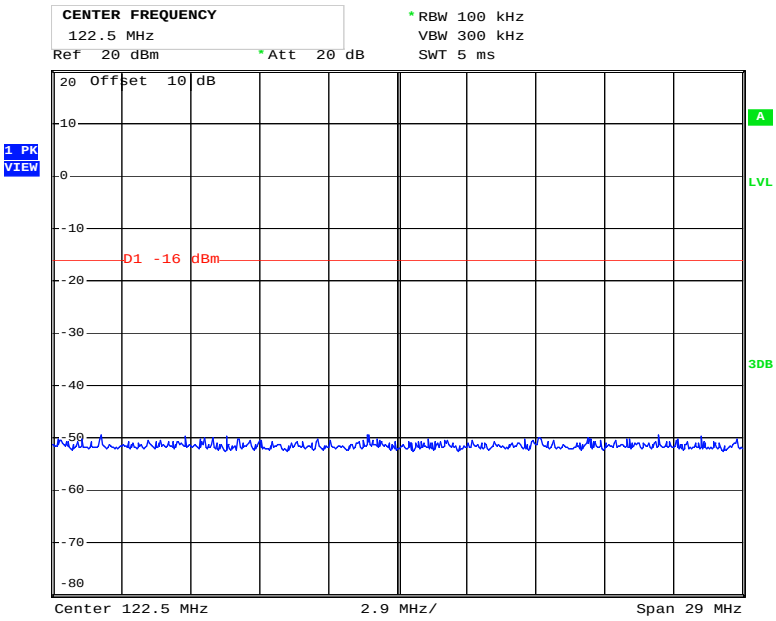
Prüfergebnis / *Test Result*
☒ **Erfüllt / *Passed***
☐ **Nicht erfüllt / *Not passed***

Luftdruck / *Barometric pressure:*	954.8 hPa
Relative Luftfeuchtigkeit / *Relative humidity:*	33.4 %
Temperatur / *Ambient temperature:*	20.5 °C

Prüfgrundlage / *Specifications:*	IEC 61 097-14, Section 7.7
Betriebsart / *Operation mode:*	Transmitting telegrams continuously
Kommentar / *Comment:*	

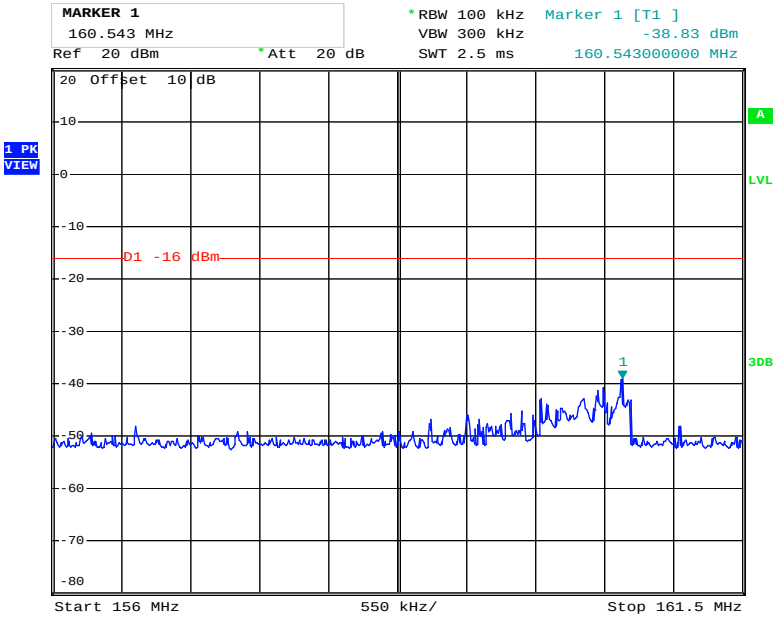
Frequency range	*Emission*	*Limit*	*Result*	*Note*
108 MHz to 137 MHz	< 40 dBm	< 25 µW (-16 dBm)	Passed	1
156.0 MHz to 161.5 MHz	-38.8 dBm	< 25 µW (-16 dBm)	Passed	1
406.0 MHz to 406.1 MHz	-49.0 dBm	< 25 µW (-16 dBm)	Passed	1
1525 MHz to 1610 MHz	-48.5 dBm	< 25 µW (-16 dBm)	Passed	1

Note(s):
1 See plots for details



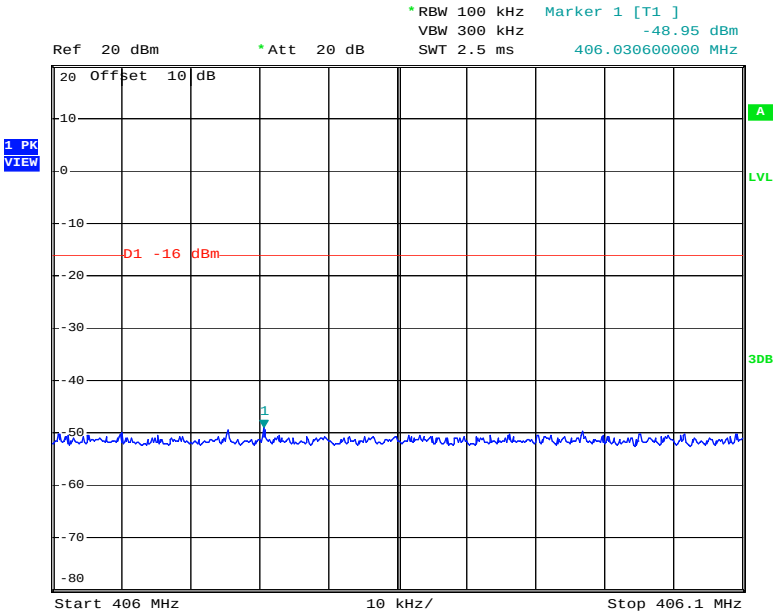
Date: 3.MAR.2014 11:28:32

108 MHz to 137 MHz

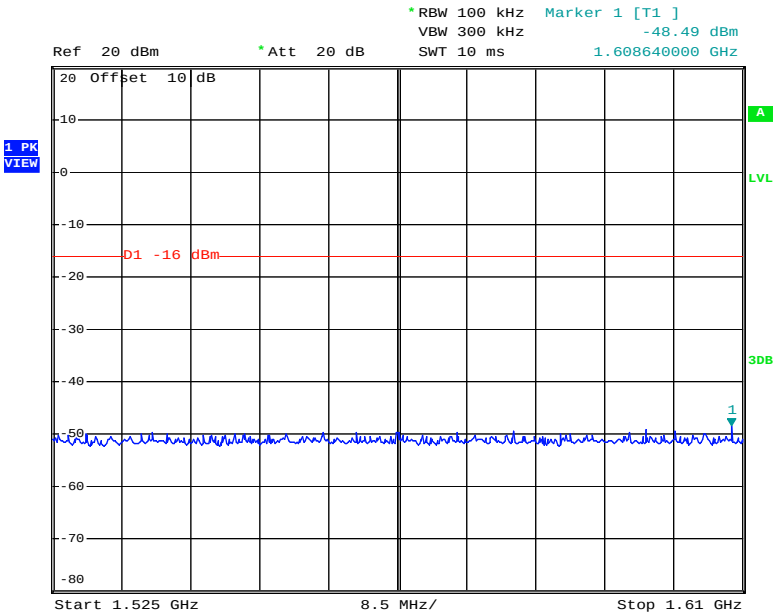


Date: 3.MAR.2014 11:31:55

156.0 MHz to 161.5 MHz



406.0 MHz to 406.1 MHz



1525 MHz to 1610 MHz

8 Test Equipment List with Calibration Data

Type	*Inv.-No.*	*Type Designation*	*Serial Number*	*Manufacturer*	*Calibration Organization*	*Last Calibration*	*Next Calibration*
EMI test receiver	1569	ESMI	839699/006	Rohde & Schwarz	Rohde & Schwarz	11/2012	11/2014
EMI test receiver	1711	ESPI7	836914/0002	Rohde & Schwarz	Rohde & Schwarz	11/2012	05/2014
EMI test receiver	2044	ESU8	100232	Rohde & Schwarz	Rohde & Schwarz	07/2012	01/2014
TRILOG Broadband Antenna	2058	VULB 9163	9163-408	Schwarzbeck	Rohde & Schwarz	11/2012	05/2014
Attenuator	1638	4776-10	9412	Narda	TÜV SÜD PS-EMC-STR	08/2013	11/2015
Multimeter	1975	Fluke 77 III	92370108	Fluke	ZMK	08/2013	08/2015
Temperature test chamber	1271	HT 4010	07065550	Heraeus	TÜV SÜD PS-EMC-STR	06/2013	06/2015

Note 1: No calibration required.
Note 2: Not calibrated separately but with the whole test system when recording calibration data.
Note 3: No calibration required. Devices are checked before use.
Note 4: No calibration required. Devices are checked by calibrated equipment during test.

9 Revision History

Revision History			
Edition	*Date*	*Issued by*	*Modifications*
1	2014-03-06	M. Steindl (gz)	First Edition