

FCC TEST REPORT FCC 47 CFR Part 90 Private Land Mobile Radio Services (PMR)	
Report Reference No.	G0M-1807-7536-TFC090PMR-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	  A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Test Firm Designation Number: DE0008 IC OATS Filing assigned code: 3470A-2
Applicant's name	Kamstrup A/S
Address	Industrivej 28 8660 Skanderborg Denmark
Test specification:	
Standard	47 CFR Part 90I
Equipment under test (EUT):	
Product description	Kamstrup READy Collector Top
Model No.	Kamstrup READy Collector Top
Additional Model(s)	None
Brand Name(s)	None
Hardware version	RF board: 55501542 G1, CPU board: 55501543 F1, Complete box: Top box A5
Firmware / Software version	50981479 F1
	FCC-ID: OUY-READYAMI IC: N/A
Test result	Passed

Possible test case verdicts:

- neither assessed nor tested : N/N
- required by standard but not appl. to test object : N/A
- required by standard but not tested : N/T
- not required by standard for the test object : N/R
- test object does meet the requirement : P (Pass)
- test object does not meet the requirement : F (Fail)

Testing:

Test Lab Temperature : 20 – 23 °C

Test Lab Humidity : 32 – 38 %

Date of receipt of test item : 2018-09-13

Date (s) of performance of tests : 2018-09-13

Compiled by : Wilfried Treffke

Tested by (+ signature) : Wilfried Treffke
(Responsible for Test)

Approved by (+ signature) : Toralf Jahn
(Deputy Head of Lab)

Date of issue : 2018-09-21

Total number of pages : 16



General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Additional comments:

Version History

Version	Issue Date	Remarks	Revised by
01	2018-09-14	Initial Release	
02	2018-09-21	Replaced document: G0M-1807-7536-TFC090PMR-V01 Replaced by: G0M-1807-7536-TFC090PMR-V02 Reason: Typo because of number of antennas	W. Treffke

REPORT INDEX

1	EQUIPMENT (TEST ITEM) DESCRIPTION	5
1.1	Photos - Equipment external	7
1.2	Photos - Equipment internal	9
1.3	Photos – Test setup	11
1.4	Supporting Equipment Used During Testing	12
1.5	Test Modes	12
1.6	Test Equipment Used During Testing	13
2	RESULT SUMMARY	14
3	TEST CONDITIONS AND RESULTS	15
3.1	Spurious emissions radiated	15

1 Equipment (Test item) Description

Description	Kamstrup READy Collector Top	
Model	Kamstrup READy Collector Top	
Additional Model(s)	None	
Brand Name(s)	None	
Serial number	73375076	
Hardware version	RF board: 55501542 G1, CPU board: 55501543 F1, Complete box: Top box A5	
Software / Firmware version	50981479 F1	
PMN	None	
HVIN	Kamstrup READy Collector Top	
FVIN	None	
HMN	None	
FCC-ID	OUI-READYAMI	
IC	N/A	
Equipment type	End Product	
Radio type	PMR	
Number of Radios	2 (Transmitter No. 0 and No. 1)	
Operating frequency range	450.025 – 469.975 MHz	
Assigned frequency band	421 – 512 MHz	
Main test frequencies	F _{LOW}	451.025 MHz
	F _{MID}	460.65 MHz
	F _{HIGH}	469.975 MHz
Modulations	4-GFSK	
Emission designator	F1D	
Channel bandwidth	12.5 kHz	
Authorized bandwidth	11.25 kHz	
Channel spacing	12.5 kHz	
Number of antennas	2	

Antenna 1	Type	external, rod antenna
	Model	CLX 70-3LW/h
	Manufacturer	Procom
	Gain	5 dBi
Antenna 2	Type	external, rod antenna
	Model	CLX 70-3LW/h
	Manufacturer	Procom
	Gain	5 dBi
Manufacturer	Kamstrup A/S Industrivej 28 8660 Skanderborg Denmark	
Power supply	V _{NOM}	24 VDC
	V _{MIN}	N/A
	V _{MAX}	N/A
AC/DC-Adaptor	Model	none
	Vendor	none
	Input	none
	Output	none
Temperature	T _{NOM}	20°C
	T _{MIN}	N/A
	T _{MAX}	N/A

1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Laboratory power supply	Statron	2224.2	
CBL	Power cable			.
CBL	Ethernet			
CBL	Ground cable			EUT ground connected to chamber ground
*Note: Use the following abbreviations: AE : Auxiliary/Associated Equipment, or SIM : Simulator (Not Subjected to Test) CABL : Connecting cables				

1.5 Test Modes

Mode #	Description	
Transmit unmodulated	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone mode Modulation = none Duty cycle = 100% Power level = maximum

1.6 Test Equipment Used During Testing

Measurement Software			
Description	Manufacturer	Name	Version
EMC Test Software	Dare Instruments	Radimation	2015.2.4

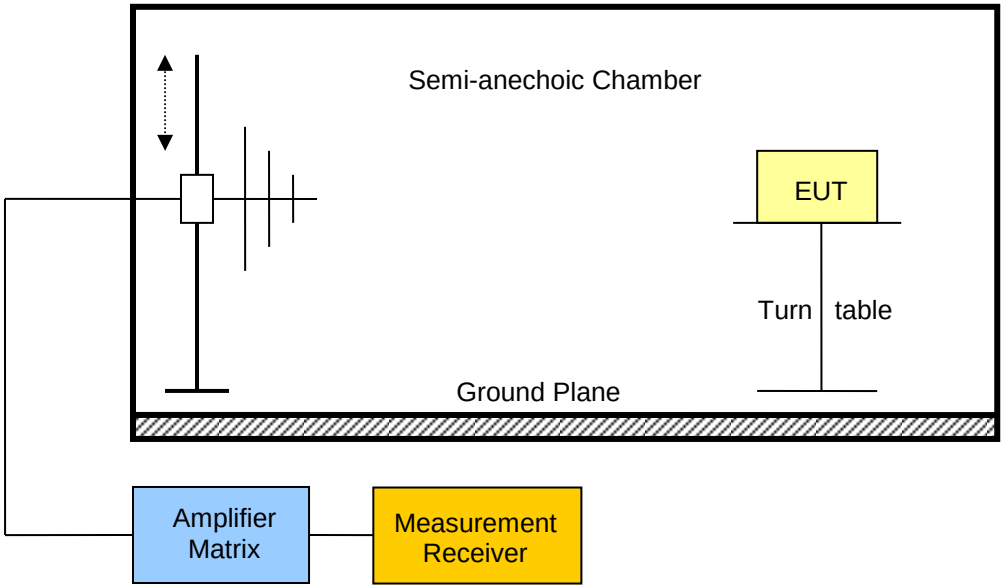
Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
MXE EMI Receiver	Keysight Technologies	N9038A-526/WXP	EF01070	2018-08	2019-08
Biconical Antenna	R&S	HK 116	EF00203	2018-06	2020-06
LPD Antenna	R&S	HL 223	EF00187	2016-05	2019-05
Horn Antenna	R&S	BBHA 9120D	EF00018	2016-09	2019-09

2 Result Summary

FCC 47 CFR Part 90I				
Product Specific Standard Section	Requirement – Test	Reference Method	Result	Remarks
FCC 90.205 FCC 2.1046	Power	ANSI C63.26-2015 5.2	N/T	
FCC 90.209 FCC 90.210 FCC 2.1049	Authorized bandwidth Emission masks Occupied bandwidth	FCC 90.210 ANSI C63.26-2015 5.4	N/T	
FCC 90.210 FCC 2.1051	Spurious emissions at antenna terminal	FCC 90.210 ANSI C63.26-2015 5.7	N/T	
FCC 90.210 FCC 2.1053	Spurious emissions radiated	FCC 90.210 ANSI C63.26-2015 5.5	PASS	
FCC 90.213 FCC 2.1055	Frequency stability	ANSI C63.26-2015 5.6	N/T	
FCC 90.214	Transient frequency behavior	ANSI C63.26-2015 6.5	N/T	
Remarks:				

3 Test Conditions and Results

3.1 Spurious emissions radiated

Spurious emissions radiated acc. to FCC 90.210		Verdict: PASS
Test according referenced standards	Reference Method	
	FCC 15.210(d), FCC 2.1053	
Test according to measurement reference	Reference Method	
	FCC 90.210, ANSI C63.26-2015 5.5	
Test frequency range	Tested frequencies	
	30 MHz – 10 th Harmonic	
EUT test mode	Transmit unmodulated	
Limits		
On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation..		
Test setup		
		
Test procedure		
1. EUT antenna output connected to 50 Ohm load. 2. EUT set to transmit mode 3. Maximum emission level is measured by rotating the EUT and adjusting the antenna height for vertical polarization 4. The EUT is replaced by a substitution antenna and generator 5. The power level is set to obtain the same power reading 6. Measurement is repeated for horizontal polarization		

Test results Transmitter 0					
Channel	Emission [MHz]	Level [dbm]	Pol.	Limit [dBm]	Margin [dB]
F _{LOW}	1351	-42.40	hor	-20.00	-22.43
F _{LOW}	1351	-42.50	ver	-20.00	-22.54
F _{LOW}	1803	-46.70	hor	-20.00	-26.68
F _{LOW}	1803	-51.50	ver	-20.00	-31.46
F _{MID}	1381	-31.80	hor	-20.00	-11.79
F _{MID}	1381	-36.00	ver	-20.00	-15.98
F _{MID}	1842	-51.00	hor	-20.00	-30.98
F _{MID}	2301	-49.30	hor	-20.00	-29.35
F _{HIGH}	1408	-45.30	hor	-20.00	-25.33
F _{HIGH}	1408	-44.20	ver	-20.00	-24.21
Test results Transmitter 1					
Channel	Emission [MHz]	Level [dbm]	Pol.	Limit [dBm]	Margin [dB]
F _{LOW}	1351	-32.70	hor	-20.00	-12.73
F _{LOW}	1351	-29.40	ver	-20.00	-09.37
F _{LOW}	1803	-50.20	hor	-20.00	-30.17
F _{LOW}	1803	-53.00	ver	-20.00	-33.02
F _{MID}	1381	-28.30	hor	-20.00	-08.30
F _{MID}	1381	-34.10	ver	-20.00	-14.07
F _{MID}	1842	-45.70	hor	-20.00	-25.75
F _{HIGH}	1408	-37.60	hor	-20.00	-17.57
F _{HIGH}	1408	-41.50	ver	-20.00	-21.46
Comments:					