EMI – TEST REPORT

- FCC Part 15.209 -

Type / Model Name	:	M260SE
Product Description	:	Handheld Data Terminal (RFID)
Applicant	:	ACD Elektronik GmbH
Address	:	Engelberg 2
		88480 ACHSTETTEN
		GERMANY
Manufacturer	:	ACD Elektronik GmbH
Address	:	Engelberg 2
		88480 ACHSTETTEN
		GERMANY

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. :	**T41434-00-01JP**	09. November 2016 Date of issue

Deutsche Akkreditierungsstelle D-PL-12030-01-00

FCC ID: O2FM260SE

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (February, 2016)

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (February, 2016)

Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.215	Additional provisions to the general radiated emission limitations

RSS-Gen Issue 4, Nov 2014	General Requirements and Information for the Certification of Radio Apparatus
ANSI C63.10: 2013	Testing Unlicensed Wireless Devices

2 SUMMARY

2.1 Test results

FCC Rule Part	RSS Rule Part	Description	Result
15.207	RSS Gen, 8.8	AC power line conducted emissions	N/A*
15.225	RSS Gen, 8.9	Field strength of fundamental	passed
15.209	RSS Gen, 8.9	Spurious emissions	passed
15.215	RSS-Gen, 6.6	Occupied bandwidth	passed

*Device is battery operated

2.2 GENERAL REMARKS:

The EUT was tested together with a TAG supplied by client.

2.3 FINAL ASSESSMENT:

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 23 August 2016

Testing concluded on : 09 September 2016

Checked by:

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Klaus Gegenfurtner
2016.11.09 09:34:19 +01'00'

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Teamleader Radio

Issued by:

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2016.11.09 09:29:28 +01'00'

Jürgen Pessinger
Radio Team

3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EUT – Detailed photos see attachment B

3.2 Power supply system utilised

Power supply voltage : 7.4 V DC LiPO Battery

3.3 Short description of the equipment under test (EUT)

The EuT is a mobile handheld Data Terminal with an integrated RFID reader, operating at 1258 kHz. The product is used by trained personal only and is not intended to be used by general public

Number of tested samples: 1
Serial number: 158100001600

EUT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- Continous tag reading mode at 125 kHz

EUT configuration:

The following peripheral devices and interface cables were connected during the measurements:

- TAG Model : IPC02-50P, Pepperl+Fuchs
- - Model : -
- Model :

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 % The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	**Range**	**Confidence Level (%)**	**Calculated Uncertainty**
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
20 dB Bandwidth	Center frequency of EuT	95%	± 2.5 x 10^{-7}
99% Occupied Bandwidth	Center frequency of EuT	95%	± 2.5 x 10^{-7}
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Peak conducted output power	Center frequency of EuT	95%	± 3.53 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB

4.4 Measurement protocol for FCC and IC

4.4.1 General information

4.4.1.1 Test methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The Open Area test sites are listed Open Sites under the Canadian Test-Sites File-No:

IC 3009A-1 (OATS1)

In compliance with RSS 210 testing for RSS compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

4.4.1.2 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.1.3 Details of test procedures

The test methods used comply with CISPR Publication 22, EN 55022 - " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

5 TEST CONDITIONS AND RESULTS

5.1 Field strength of the fundamental wave

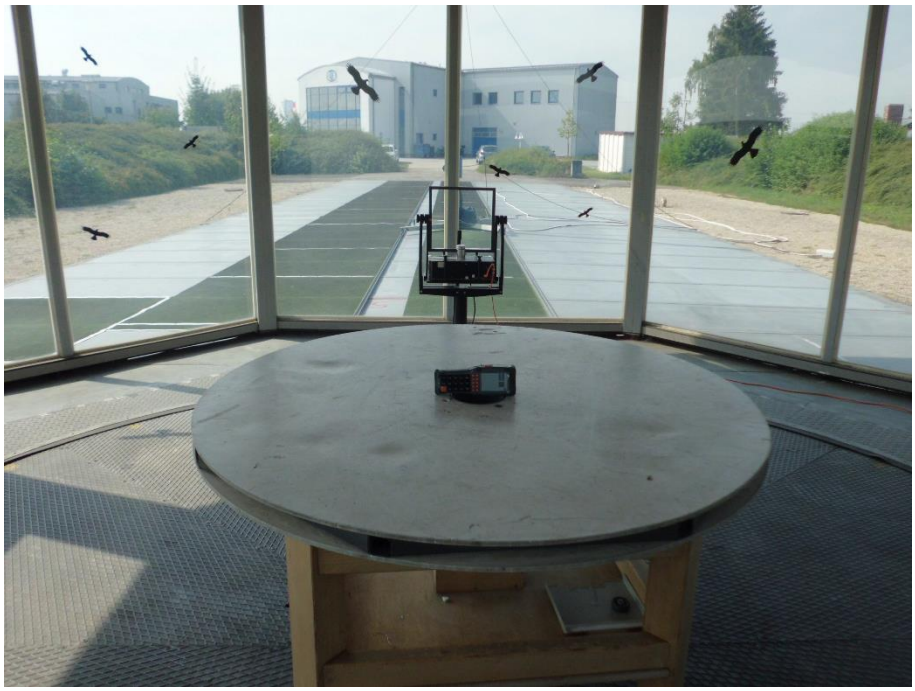
For test instruments and accessories used see section 6 Part **CPR 1**.

5.1.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.1.2 Photo documentation of the test set-up



5.1.3 Applicable standard

FCC Part 15, Section 15.209 and RSS-Gen 8.9

Instrument settings:

9 kHz – 150 kHz	RBW:	200 Hz
150 kHz - 30 MHz	RBW:	9 kHz
30 MHz – 1000 MHz:	RBW:	120 kHz

5.1.4 Test result

a) Result at a measurement distance of 3m

Frequency (kHz)	Level (dBµV)	Ant. factor (dB 1/m)	Field strength dB(µV/m)
125	55.9	20.0	75.9

b) Result extrapolated to a distance of 300 m

Frequency (kHz)	Level Av@3m (dBµV)	Ant. factor (dB/m)	Field strength Av@3m dB(µV/m)	Distance corr. 3m to 300m (dB)	Corrected level Pk@300m dB(µV/m)	Limit AV@300m dB(µV/m)	Delta (dB)
125	55.9	20	75.9	-80	-4.1	25.6	-29.3

Limit according to FCC Part 15, Section 15.209 and RSS-Gen, Section 8.9:

Frequency	Field strength		Measurement distance
(MHz)	(µV/m)	dB(µV/m)	(metres)
0.009-0.490	2400/F(kHz)	--	300

The requirements are **FULFILLED.**

Remarks: The test was performed in all three orthogonal axes. The shown value indicates highest measured result.

5.2 Spurious emissions

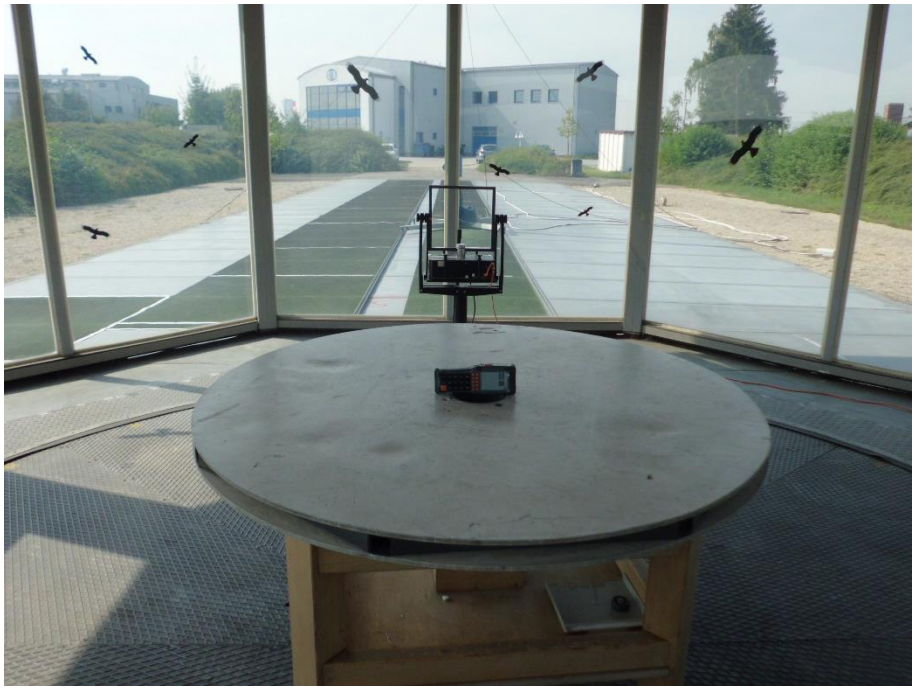
For test instruments and accessories used see section 6 Part **SER 1**, **SER 2**.

5.2.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.2.2 Photo documentation of the test set-up



5.2.1 Applicable standard

FCC Part 15, Section 15.209 and RSS-Gen 8.9

Instrument settings:

9 kHz – 150 kHz	RBW:	200 Hz
150 kHz - 30 MHz	RBW:	9 kHz
30 MHz – 1000 MHz:	RBW:	120 kHz

5.2.2 Test result

Results at a measurement distance of 3m

9 kHz < f < 30 MHz
No unwanted emissions from the EuT could be measured in this frequency range.

30 MHz < f < 1 GHz:

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
56,80	9,4	8,5	14,9	13,9	24,3	22,4	40,0	-15,7
72,00	16,4	14,7	13,4	12,8	29,8	27,5	40,0	-10,2
120,00	18,1	18,5	12,4	12,9	30,5	31,4	43,5	-12,1
168,00	16,0	19,0	14,1	14,8	30,1	33,8	43,5	-9,7
192,00	13,6	21,4	12,1	12,8	25,7	34,2	43,5	-9,3
216,00	21,7	30,0	12,1	12,6	33,8	42,6	46,0	-3,4
264,00	16,3	19,4	14,7	14,7	31,0	34,1	46,0	-11,9
312,00	20,4	27,2	17,3	16,8	37,7	44,0	46,0	-2,0
336,00	19,6	24,5	18,0	17,6	37,6	42,1	46,0	-3,9
344,50	20,3	23,4	18,2	17,8	38,5	41,2	46,0	-4,8
370,50	20,7	21,2	19,0	18,6	39,7	39,8	46,0	-6,2
384,00	19,9	22,5	19,4	19,1	39,3	41,6	46,0	-4,4
432,00	22,3	21,3	20,7	20,4	43,0	41,7	46,0	-3,0
504,00	20,9	9,4	22,6	22,4	43,5	31,8	46,0	-2,5
576,00	16,8	12,4	24,8	24,6	41,6	37,0	46,0	-4,4
744,00	4,8	11,2	28,1	27,6	32,9	38,8	46,0	-7,2
768,10	4,8	8,4	28,7	28,2	33,5	36,6	46,0	-9,4
888,15	3,9	5,5	30,9	30,5	34,8	36,0	46,0	-10,0
910,00	-0,7	-0,8	31,2	30,8	30,5	30,0	46,0	-15,5

Limit according to FCC Part 15, Section 15.209 and RSS-Gen, Section 8.9:

Frequency	Field strength of spurious emissions		Measurement distance
(MHz)	(µV/m)	dB(µV/m)	(metres)
0.009 - 0.490	2400/F(kHz)	--	300
0.490 - 1.705	24000/F (kHz)	--	30
1.705 - 30.0	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

The requirements are **FULFILLED.**

Remarks: The test was performed in all three orthogonal axes. The shown value indicates highest measured result.

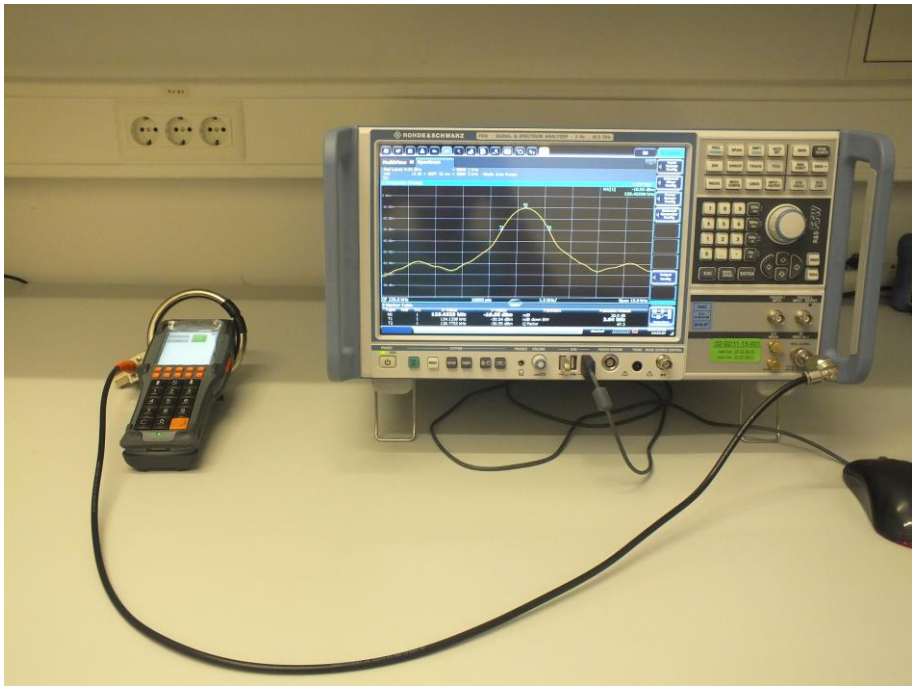
5.3 Occupied Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.3.1 Description of the test location

Test location: AREA 4

5.3.2 Photo documentation of the test set-up



5.3.3 Applicable standard

FCC Part 15, Section 15.215 and RSS-Gen, 6.6

5.3.4 Test result

Measured Bandwidth	result (kHz)	Limit (kHz)
20dB	2,71	--
99%	2,39	--

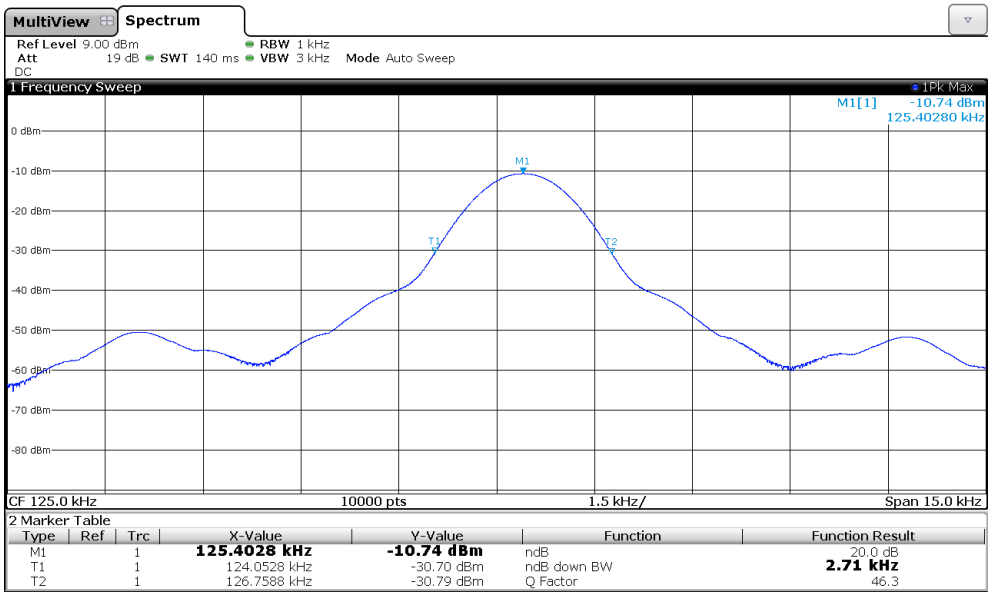
No limit defined.

The requirements are **FULFILLED.**

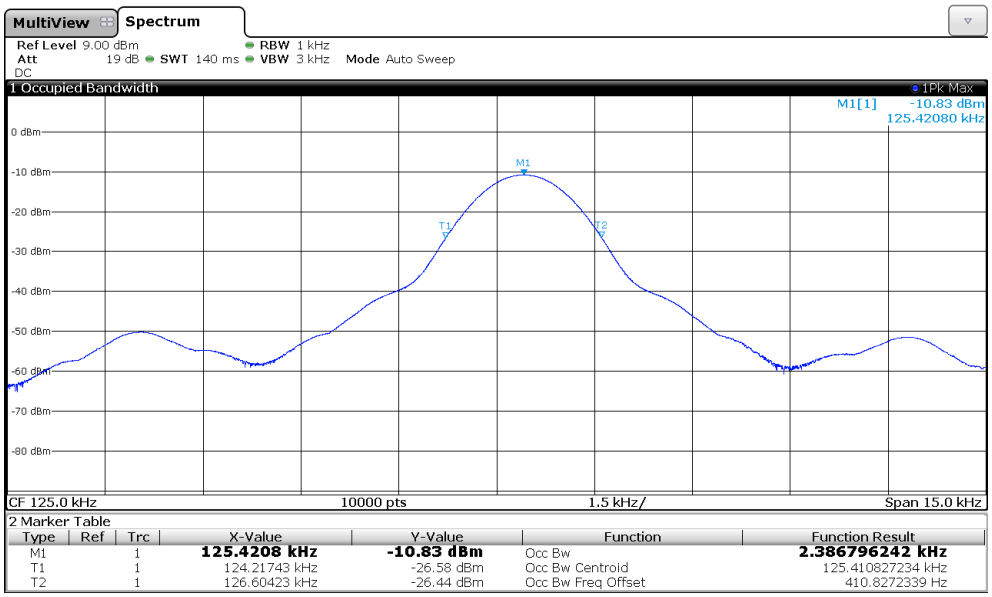
Remarks: For detailed test result please refer to following test protocol.

5.3.5 Test protocol

20 dB bandwidth



OBW 99%



6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
CPR 1	ESR 3	01-02/03-13-001	10/08/2017	10/08/2016		
	FMZB 1516	01-02/24-01-018	21/01/2017	21/01/2016		
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
MB	ESR 3	01-02/03-13-001	10/08/2017	10/08/2016		
	FSW43	02-02/11-15-001	25/07/2017	25/07/2016		
	HFRAE 5161 _ 50 kHz-120	02-02/24-11-004				
SER 1	ESR 3	01-02/03-13-001	10/08/2017	10/08/2016		
	FMZB 1516	01-02/24-01-018	21/01/2017	21/01/2016		
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 2	ESVS 30	02-02/03-05-006	04/07/2017	04/07/2016		
	VULB 9168	02-02/24-05-005	20/04/2017	20/04/2016	01/03/2017	01/09/2016
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				