RF-EXPOSURE REPORT

FCC 47 CFR Part 2.1091
ISED RSS-102

Maximum permissible exposure

Report Reference No	G0M-2302-1931-TFC091MP-V01
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 ISED Testing Laboratory site: 3470A
Applicant	Access Ltd
Address	18-19 Suttons Business Park Earley Reading RG6 1AZ Reading UNITED KINGDOM
Test Specification	According to FCC rules
Standard	FCC 47 CFR 2.1091
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Full-Page Document Imager & MRTD Reader with Contactless Capabilities
Model(s)	OCR640-E-NCRCO02-01
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	Rev.3
Software Version(s)	Version.0039
FCC-ID	ZEROCR640E
Test Result	**PASSED**

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of performance	2024-10-18	
Date of receipt of test item	See test sample identification table on page 8	
Report:		
Compiled by	Stephan Liebich	
Tested by (+ signature) (Responsible for Test)	Burkhard Pudell	
Approved by (+ signature) (Test Lab Engineer)	Radwan Jaafar	
Date of Issue	2024-10-18	
Total number of pages	24	
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.

The above equipment has been tested by Eurofins Product Service GmbH, and found compliance with the requirements of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Compliance of electromagnetic emission from electronic and electrical equipment with the basic restrictions usually is determined by measurements and, in some cases, calculation of the exposure level. If the electrical power used by or radiated by the equipment is sufficiently low, the electromagnetic fields emitted will be incapable of producing exposures that exceed the basic restrictions.

Any relevant compliance assessment procedure which is consistent with the state of the art, reproducible and gives valid results can be used.

For transmitters intended for use with more than one antenna configuration option, the combination of transmitter and antenna(s) which generates the highest available antenna power and/or average total radiated power shall be assessed.
Additional Comments:
None

ADDITIONAL VARIANTS

Additional Variants (not tested and not evaluated variants)		
Not-tested Variant	**Description**	
1	Product Type Description	Full-Page Document Imager & MRTD Reader with Contactless Capabilities
	Model name	OCR640-E-DESKTOP
	Brand name	None
	Hardware Version	Rev.5
	Software Version	Version.0039
2	Product Type Description	Full-Page Document Imager & MRTD Reader with Contactless Capabilities
	Model name	OCR640-E
	Brand name	None
	Hardware Version	Rev.5
	Software Version	Version.0039
Comment: Those named additional variants above have not been tested. Those additional variants of the series have been declared by the manufacturer. The test report explicitly states that those variants were neither tested nor assessed nor evaluated.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2024-10-18	Initial Release	--

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EIRP	Equivalent Isotropic Radiated Power
EUT	Equipment Under Test
MPE	Maximum Permissible Exposure

REPORT INDEX

1 Equipment (Test Item) Under Test

Description	Full-Page Document Imager & MRTD Reader with Contactless Capabilities			
Model	OCR640-E-NCRCO02-01			
Additional Model(s)	None			
Brand Name(s)	None			
Sample Identification	EUT #	Sample-ID	Serial Number	Date of receipt
	EUT 1	48084	1852243171	2023-06-28
Hardware Version(s)	Rev.3			
Software Version(s)	Version.0039			
Antenna 1	Type	Integrated		
	Model	Loop antenna		
	Manufacturer	Access-IS		
	Gain	unspecified		
Antenna 2	Type	Integrated		
	Model	Loop antenna		
	Manufacturer	Access-IS		
	Gain	unspecified		
Supply Voltage	V_{NOM}	120 VAC		
AC/DC-Adaptor	Model	GSM25B24		
	Manufacturer	Meanwell		
	Input voltage[V]	100-240 VAC		
	Output voltage[V]	24 V DC		
	Output current[A]	1.04 A		
FCC ID	ZEROCR640E			
Equipment type	End Product			
Environment	General public			

1.1 Photos – Equipment External

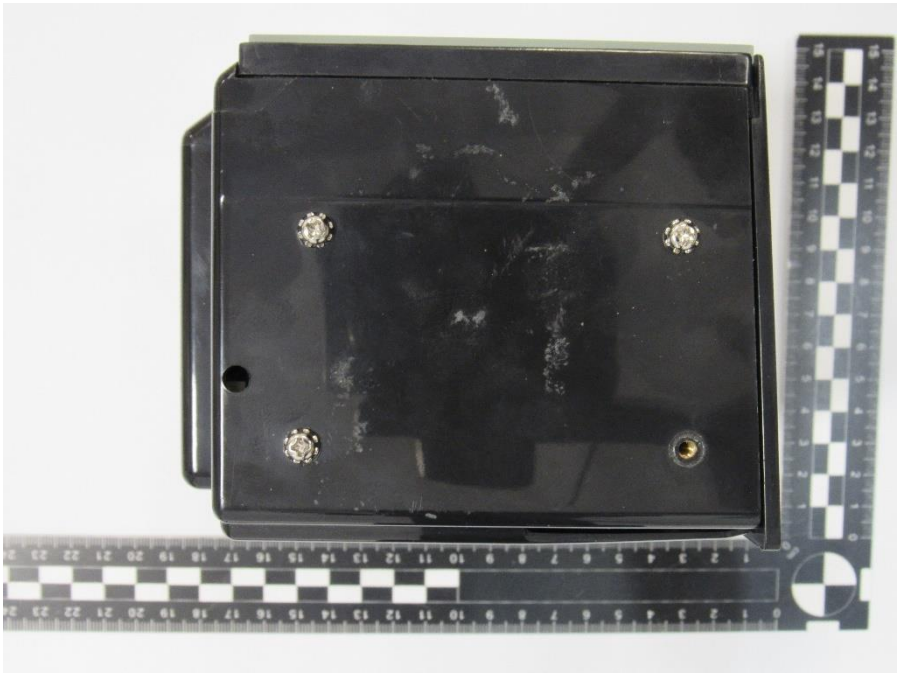
EUT Top view

EUT Bottom view

EUT Front view

EUT Back view

EUT Left view

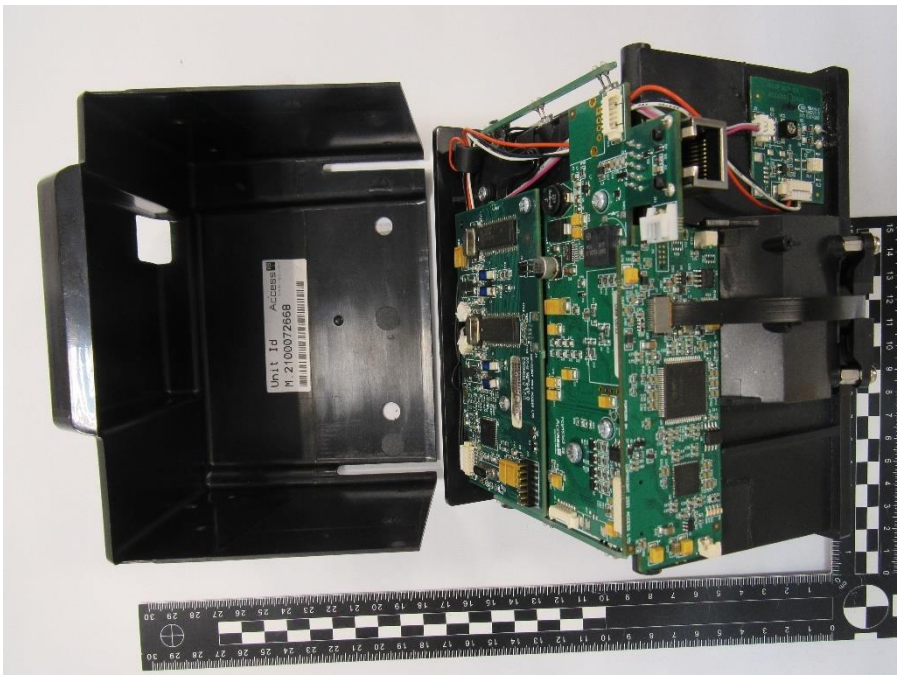


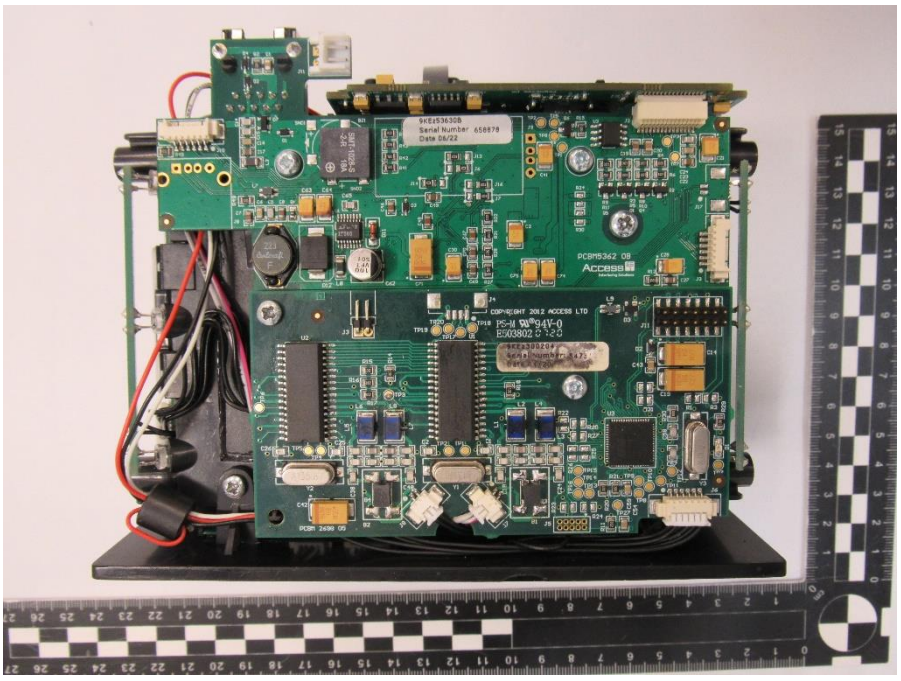
EUT Right View

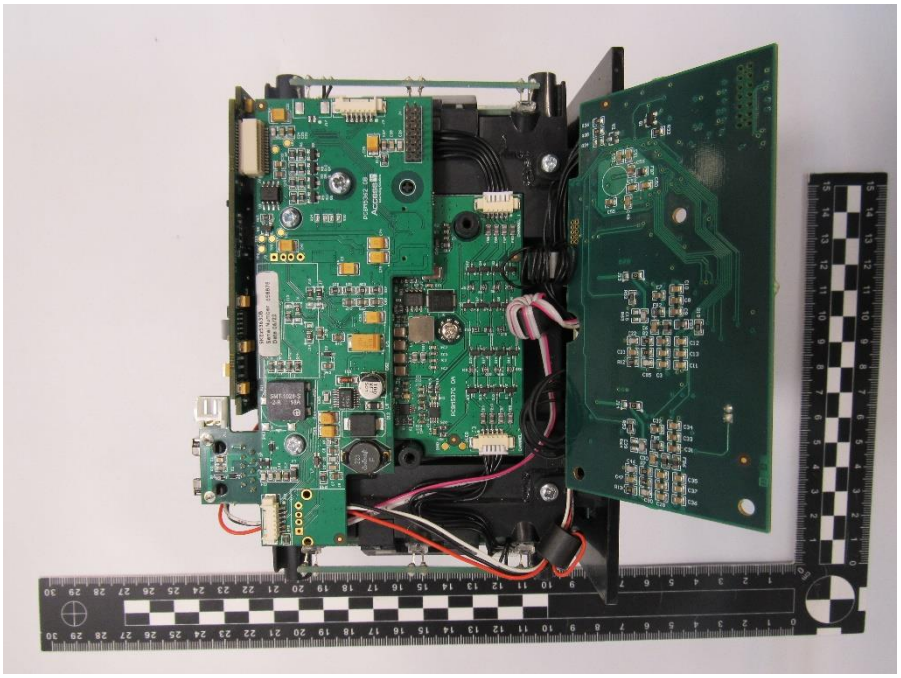
Support equipment

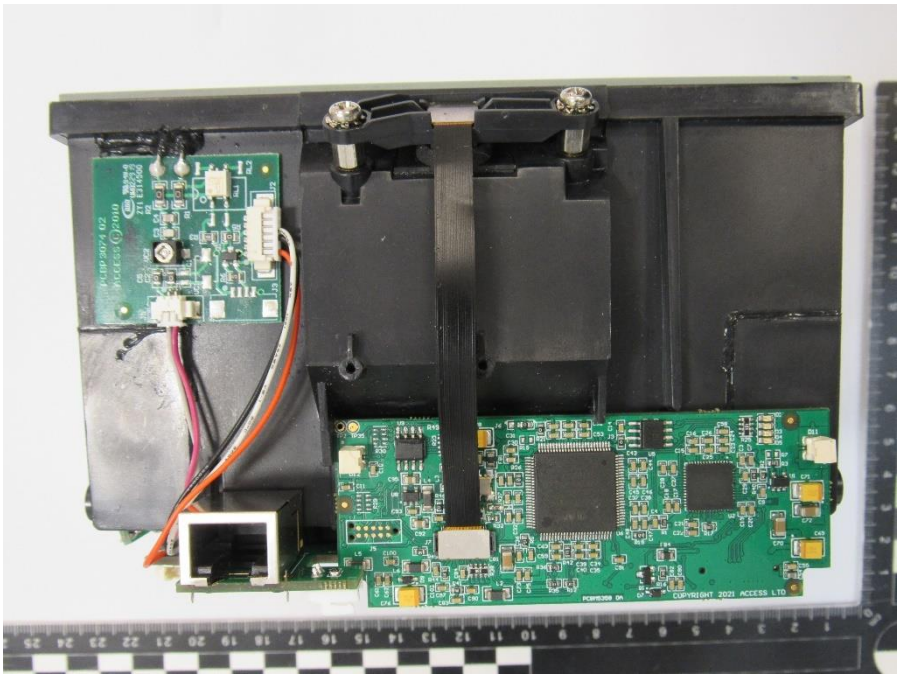

AC/DC Adapter

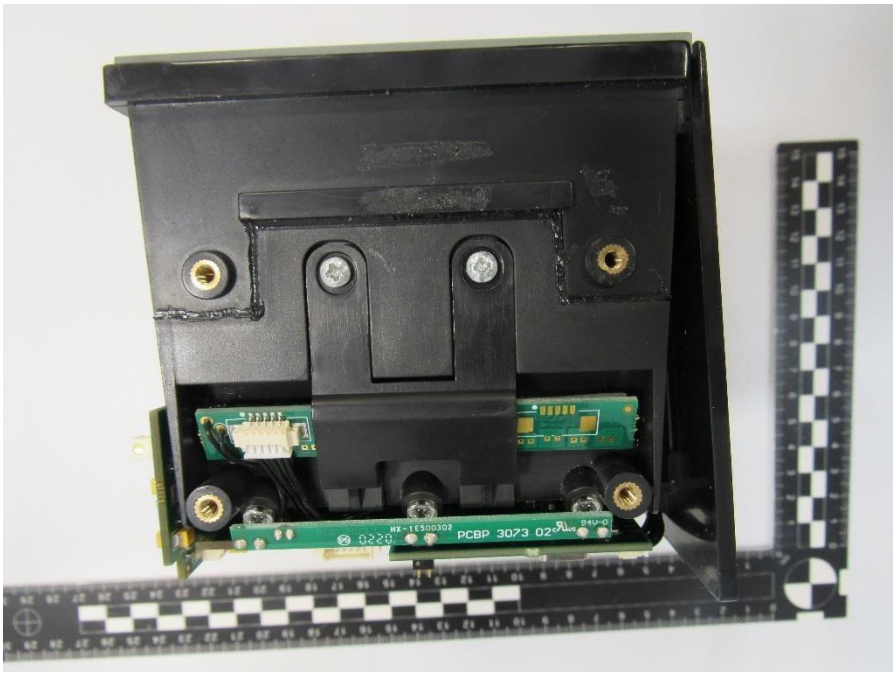

1.2 Photos – Equipment Internal

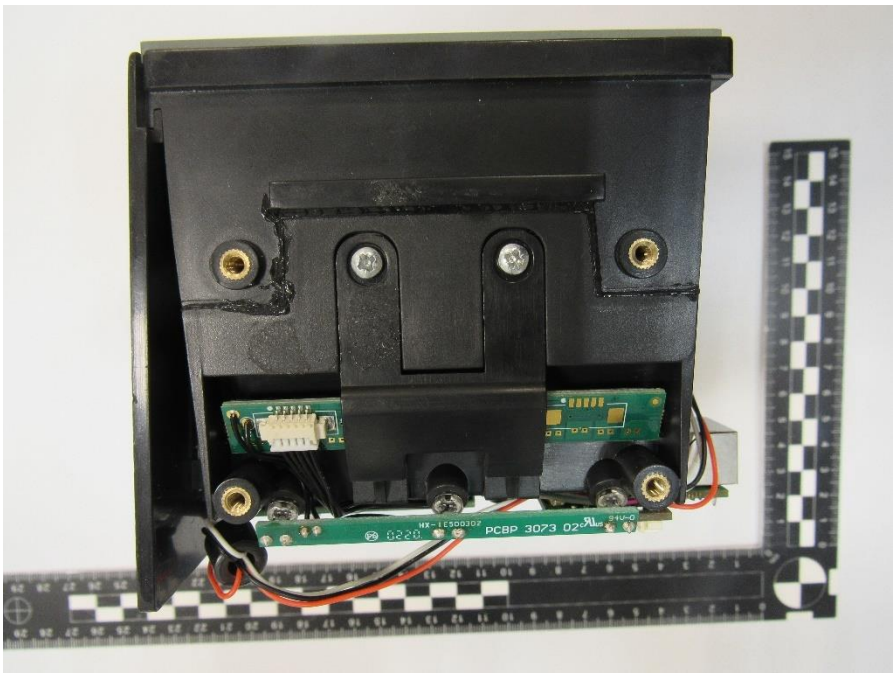
EUT Open


PCB Top view


PCB Internal.view


EUT Internal back view


EUT Internal left view


EUT Internal Right view


1.3 Power density radiation sources

None

1.4 Field strength radiation sources

Mode	Operating Frequency [MHz]	Maximum electric field strength [V/m]	Maximum magnetic field strength [A/m]	Measurement distance [m]
RFID 13.56 MHz	13.56	2.2	0.06	0.2
Comment: --				

1.5 Concurrent Sources

No concurrent radiation sources

2 Result Summary

FCC MPE Evaluation - Single radiation sources					
Product Standard Reference	**Requirement**	**Reference Method**	**Mode**	**Distance [m]**	**Verdict**
47 CFR 2.1091	Maximum permissible exposure	FCC KDB 447498	RFID 13.56 MHz	0.20	PASS
Comment: --					

3 Radiated Field Measurement

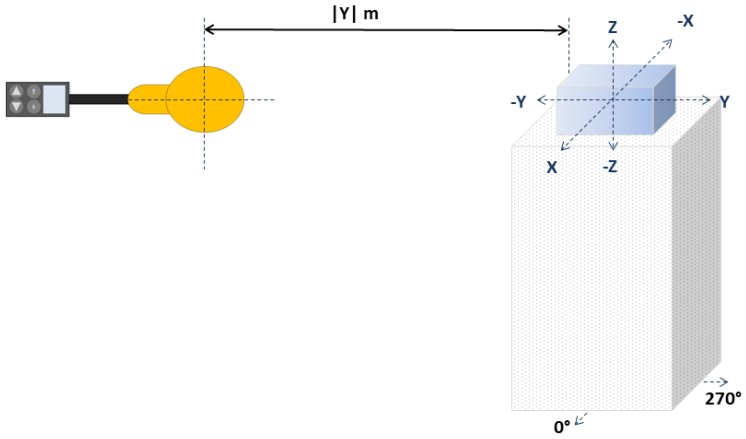
3.1 Test Conditions and Results – Electric and magnetic field strength

3.1.1 Information

Test Information	
Measurement Method	Radiated only
Measurement Uncertainty	2.277 dB
Operator	Godson Ekezie Offorji supervised by Stephan Liebich
Date	2024-10-16

3.1.2 Setup

Exposition of measurements along six planes in 3D space



All shown planes in 3D space represent the dimensions of the Equipment Under Test. The point of origin is equal to the location of the RFID system respectively the centre of the antenna in the Equipment Under Test. The Y/Z-plane (+x) is shown as the front of the Equipment Under Test (display).

3.1.3 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-Anechoic chamber	Frankonia Germany EMC Solutions GmbH	AC 1	EF01012	2023-09	2024-09
Magnetic field probe HF3061	Narda Safety Test Solutions GmbH - Supplier	2402/05B	EF00999	2022-01	2025-01
Broadband Field Meter NBM-550	Narda Safety Test Solutions GmbH - Supplier	2401/01B	EF00998	2022-01	2025-01
EM Radiation Monitor	Narda Safety Test Solutions GmbH - Supplier	EMR-20	EF00058	2024-01	2026-01

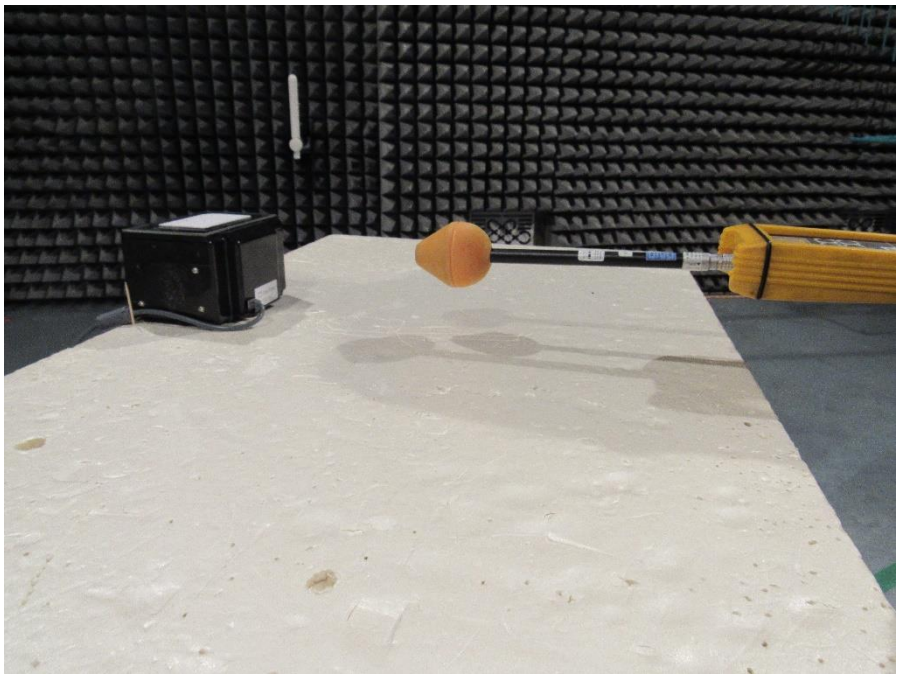
3.1.4 Procedure

Test Procedure
1. EUT transmitter is activated in test mode under normal conditions. 2. The perimeter of the EUT is scanned with an electric and magnetic field probe at a fixed distance. 3. The electric and magnetic field strength is measured. 4. The maximum field strength values are recorded.

3.1.5 Results

Test Results			
Measurement position	Distance x or y or z [m]	Max. electric field strength [V/m]	Max. magnetic field strength [A/m]
Y/Z plane +x	0.2	1.3	0.015
Y/Z plane -x	0.2	2.0	0.020
X/Z plane +y	0.2	1.9	0.047
X/Z plane -y	0.2	1.5	0.050
X/Y plane +z	0.2	2.2	0.060
X/Y plane -z	0.2	0.5	0.023

3.1.6 Photos – Test Setup

E-Field


H-Field


4 RF-Exposure classification

RF-Exposure Categories	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

RF-Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / Uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

5 RF-Exposure limits

FCC Limits – General Population / Uncontrolled Exposure				
Frequency range [MHz]	**Electric field strength [V/M]**	**Magnetic field strength [A/M]**	**Power density [W/m²]**	**Averaging time [min]**
0.3 – 1.34	614	1.63	1000	30
1.34 – 30	824/f	2.19/f	1800/f²	30
30 – 300	27.5	0.073	2	30
300 – 1500	-	-	f/150	30
1500 – 100000	-	-	10.0	30

FCC Limits – Occupational / Controlled Exposure				
Frequency range [MHz]	**Electric field strength [V/M]**	**Magnetic field strength [A/M]**	**Power density [W/m²]**	**Averaging time [min]**
0.3 – 3.0	614	1.63	1000	6
3.0 – 30	1842/f	4.89/f	9000/f²	6
30 – 300	61.4	0.163	10.0	6
300 – 1500	-	-	f/30	6
1500 – 100000	-	-	50	6

6 RF-Exposure Evaluation

Evaluation Relations
$$\lambda[m] = \frac{c\left[\frac{m}{s}\right]}{f[Hz]} \; ; \; R_{FF}[m] \geq \frac{2 \cdot D[m]^2}{\lambda[m]}$$ $$S[W/m^2] = \frac{P_{E.I.R.P.}[W]}{4\pi R[m]^2} \; ; \; R[m] = \sqrt{\frac{P_{E.I.R.P.}[W]}{4\pi S[W/m^2]}}$$ $$DCC\ [dB] = 10 \cdot Log_{10}\left(\frac{DC[\%]}{100}\right)$$ $$\sum_{i=1}^{N} \frac{S_i\left[\frac{W}{m^2}\right]}{S_{Li}\left[\frac{W}{m^2}\right]} + \sum_{j=1}^{M}\left(\frac{E_j\left[\frac{V}{m}\right]}{E_{Lj}\left[\frac{V}{m}\right]}\right)^2 + \sum_{k=1}^{O}\left(\frac{H_k\left[\frac{A}{m}\right]}{H_{Lk}\left[\frac{A}{m}\right]}\right)^2 < 1$$

Evaluation Procedure
Standalone operation evaluation: For each radio and frequency band the worst case transmission mode with the highest peak conducted or radiated power is evaluated at the frequency that results in the most restrictive rf-exposure limit. From the peak power values, antenna gains and duty cycles taken from the reference documents, the source average radiated power values are calculated. From the average radiated power the power densities at antenna far-field distance is calculated. The distance from the radiation source for compliance power density is calculated. If the separation distance is lower than the far-field distance, the far-field distance is given as compliance separation distance because the plane wave power density assessment is only valid in the far-field of the radiation source. For radiation sources for which the average electric and magnetic fields are measured using field probes, the measured field strength values are compared to the reference limits. For those sources no calculations are performed. Compliance with the reference values is determined with the near field measurements. Concurrent operation evaluation: First the evaluation distance is set to an appropriate value. For all radiation sources for which power densities are calculated, the power densities at the evaluation distance are calculated and for all other sources the electric or magnetic field strengths are measured using field probes. Finally the ratios of the power densities and/or field strength values and the corresponding limits are calculated and summed and the sum is compared to the maximum of 1.

7 Single Source Evaluation Results - FCC

RFID 13.56 MHz	
Evaluation distance [m]	0.20
Transmission Mode	
Transmission Frequency (f) [MHz]	13.56
Electric field strength	
Compliance field strength limit [V/m]	60.77
Measured field strength [V/m]	2.20
Squared field strength ratio	0.00
Magnetic field strength	
Compliance field strength limit [A/m]	0.16
Measured field strength [A/m]	0.06
Squared field strength ratio	0.14
Compliance	
Verdict	PASS
Comment: --	

=== End of test report ===