

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

POSITIVE

Test Report No. :	T44481-01-01FX	06. May 2020	
		Date of issue	



The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

CSA Group Bayern GmbH Ohmstrasse 1-4 · 94342 STRASSKIRCHEN · GERMANY Tel.: +49(0)9424-94810 · Fax: +49(0)9424-9481440 File No. T44481-01-01FX, page 1 of 29



Contents

1	<u>TEST STANDARDS</u>	3
2	EQUIPMENT UNDER TEST	4
2.1	Photo documentation of the EUT – Detailed photos see ATTACHMENT A1 and A2	4
2.2	Equipment type	4
2.3		4
2.4		4
2.5	Operation frequency and channel plan	4
2.6	Transmit operating modes	4
2.7	Antenna	5
2.8	Power supply system utilised	5
2.9	Peripheral devices and interface cables	5
2.1	0 Determination of worst case conditions for final measurement	5
3	TEST RESULT SUMMARY	6
3.1	Final assessment	6
4	TEST ENVIRONMENT	7
4.1	Address of the test laboratory	7
4.2	Environmental conditions	7
4.3	Statement of the measurement uncertainty	8
4.4	Measurement protocol for FCC and ISED	9
5	TEST CONDITIONS AND RESULTS	11
5.1	UWB Bandwidth	11
5.2	Radiated Emissions 9 kHz to 40 GHz	13
5.3	Radiated Emissions at 1164-1240 MHz and 1559-1610 MHz	21
5.4	Peak Power radiated	26
5.5	Antenna application	28
6	USED TEST EQUIPMENT AND ACCESSORIES	29

ATTACHMENT A1, A2 and B as separate supplements



1 <u>TEST STANDARDS</u>

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (September 2019)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (September 2019)

Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
Part 15, Subpart C, Section 15.205	Restricted bands of operation
Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements

FCC Rules and Regulations Part 15, Subpart F – Ultra Wideband Operation (October 2019)

Part 15, Subpart F, Section 15.503	Definitions
Part 15, Subpart F, Section 15.505	Cross reference
Part 15, Subpart F, Section 15.517	Technical requirements for indoor UWB systems
Part 15, Subpart F, Section 15.521	Technical requirements applicable to all UWB devices
ANSI C63.10: 2013	Testing Unlicensed Wireless Devices
ETSI TR 100 028 V1.3.1: 2001-03	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the Measurement of Mobile Radio Equipment Characteristics—Part 1 and Part 2
KDB 393764 D01 v02 (January 29, 2018)	Ultra-Wideband (UWB) Devices – Frequently Asked Questions
KDB 178919 D01 v06 (October 16, 2015)	Permissive Change Policy



2 EQUIPMENT UNDER TEST

2.1 Photo documentation of the EUT – Detailed photos see ATTACHMENT A1 and A2

2.2 Equipment type

Fixed UWB Device for Indoor Use

2.3 Short description of the equipment under test (EUT)

The EUT is a fully certified hand-held UWB device under FCC ID: 2ALC5-KNX-IREC2. The manufacturer changes the antenna of the device. The test report shows the further compliance of the EUT in the framework of a Class 2 Permissive Change (C2PC).

The technology is used in sports as well as industrial environments. Kinexon Anchors communicate with each other and nearby Tags to obtain information on the Tag positions.

Additionally, the EUT has an integrated WLAN and Bluetooth low energy module with integrated antennas.

Number of tested samples:	2
Serial number:	40084, 40063
Firmware version:	4.27.0

EUT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

2.4 Variants of the EUT

There are no variants.

2.5 Operation frequency and channel plan

The operating frequency band is 3100 MHz to 10600 MHz.

Channel plan USA:

Channel number	f _c (MHz)
Channel 3	4492.8
Channel 5	6489.6

2.6 Transmit operating modes

Modulation: variable pulse position modulation (PPM) in combination with binary phase shift keying (BPSK).

Data rate: 6.8 Mbit/s



2.7 Antenna

Number	Characteristic	Model number	Plug	f-range (GHz)	Gain (dBi)	Average Gain (dBi)
1	directional	ES-0042	RSMA	3.1 – 10.3	9.0	9.0

The following antennas shall be used with the EUT:

2.8 Power supply system utilised

Power supply voltage, V_{nom} : 48 V DC (PoE)

2.9 Peripheral devices and interface cables

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

-	Laptop	Model : Fujitsu notebook	
-	PoE switch	Model : Cisco PoE	
-	Mini PC	Model : Intel NUC6i5SYH	

2.10 Determination of worst case conditions for final measurement

Measurements are made in all three orthogonal axes with horizontal and vertical antenna positions to determine the worst case condition.

2.10.1 Test jig

No test jig is used.

2.10.2 Test software

Special test software is used for continuous transmission and free power setting.



TEST RESULT SUMMARY 3

UWB device using digital modulation:

Operating in the 3100 MHz - 10600 MHz:

FCC Rule Part	Description	Result
15.207(a)	AC power line conducted emissions	not applicable
15.517(b)	UWB Bandwidth	not applicable
15.209(a) 15.517(c)	Radiated Emissions 9 kHz to 40 GHz	not applicable
15.517(d)	Radiated Emissions at 1164-1240 MHz and 1559-1610 MHz	not applicable
15.517(e)	Peak Power radiated	not applicable

15.207(a)	Not applicable, C2PC with different antenna
15 517/b)	Not applicable C2PC with different aptenna

Not applicable, C2PC with different antenna 15.517(b)

3.1 Final assessment

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

: 08 April 2020

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

Testing commenced on

: <u>26 November 2019</u>

Testing concluded on

Checked by:

Tested by:

Klaus Gegenfurtner Teamleader Radio

Franz-Xaver Schrettenbrunner Radio Team



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 power line conducted emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
EBW and OBW	2400 MHz to 3000 MHz	95%	± 2.5 x 10 ⁻⁷
Maximum peak conducted output power	2400 MHz to 3000 MHz	95%	± 0.62 dB
Power spectral density	2400 MHz to 3000 MHz	95%	± 0.62 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB
Conducted Spurious Emissions	10000 MHz to 40000 MHz	95%	± 3.47 dB
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
Field strength of the fundamental	100 kHz to 100 MHz	95%	± 3.53 dB



4.4 Measurement protocol for FCC and ISED

4.4.1 General information

CSA Group Bayern GmbH is recognized as wireless testing laboratory under the CAB identifier:

FCC: DE 0011 ISED: DE0009

4.4.2 General Standard information

The test methods used comply with ANSI C63.10 - "Testing Unlicensed Wireless Devices".

4.4.2.1 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.

4.4.2.2 Radiated emission (electrical field 30 MHz - 1 GHz)

Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m nonconducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The setup of the equipment under test is established in accordance with ANSI C63.10.The interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so that they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit margin listed in the measurement protocol.

The resolution bandwidth setting: 30 MHz – 1000 MHz: RBW: 120 kHz

Example:

10.							
Frequency	Level	+	Factor	=	Level -	Limit	=
Delta							
(MHz)	(dBµV)		(dB)		(dBµV/m)	(dBµV/m)	(dB)
719.0	75.0	+	32.6	=	107.6 -	110.0	= -2.4



4.4.2.3 Radiated emission (electrical field 1 GHz - 40 GHz)

Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The setup of the equipment under test is established in accordance with ANSI C63.10.The interface cables that are closer than 40 centimetres to the ground plane are bundled in the centre in a serpentine fashion so that they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the centre of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit

margin listed in the measurement protocol.



5 TEST CONDITIONS AND RESULTS

5.1 UWB Bandwidth

For test instruments and accessories used see section 6 Part CPR 3.

5.1.1 Description of the test location

Test location: Anechoic chamber 1

5.1.2 Photo documentation of the test set-up – see ATTACHMENT B

5.1.3 Applicable standard

According to FCC Part 15, Section 15.517(b):

The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

According to FCC Part 15, Section 15.503(d):

Ultra-wideband (UWB) transmitter. An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

5.1.4 Description of Measurement

The measurement was performed radiated at a distance of 3 m. The bandwidth was measured at an amplitude level reduced from the reference level of a modulated channel by a ratio of -10 dB.

Spectrum analyser settings: RBW: 1 MHz, VBW: 3 MHz, Detector: Peak

5.1.5 Test result

C	hannel	lowest frequency f _L (MHz)	highest frequency f _H (MHz)	permitted frequency range (GHz)	UWB bandwidth (MHz)	required UWB bandwidth (MHz)	result
	3	4299.03	4801.91	3.1 – 10.6	502.88	> 500	passed
	5	6235.55	6743.61	3.1 – 10.6	510.06	> 500	passed

The requirements are **FULFILLED**.

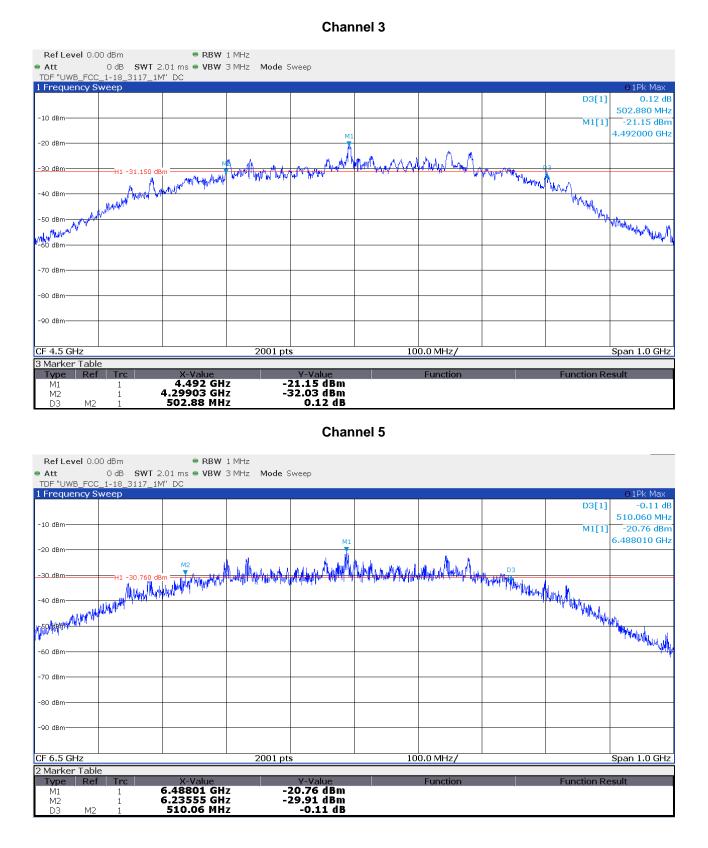
Remarks:

For detailed test results please refer to following test protocols.





5.1.6 Test protocols EBW





5.2 Radiated Emissions 9 kHz to 40 GHz

For test instruments and accessories used see section 6 Part SER 2 and SER 3.

5.2.1 Description of the test location

Test location:	OATS 1
Test location:	Anechoic chamber 1

5.2.2 Photo documentation of the test set-up – see ATTACHMENT B

5.2.3 Applicable standard

According to FCC Part 15, Section 15.517(c):

The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

5.2.4 Analyser settings

9 kHz – 150 kHz	RBW: 200 Hz			
150 kHz - 30 MHz	RBW: 9 kHz			
30 MHz – 960 MHz	RBW: 120 kHz	Detector: QP		
960 MHz – 40 GHz	RBW: 1 MHz	VBW: 3 MHz	Detector: RMS	Sweeptime: 1ms per MHz

5.2.5 Test result

5.2.5.1 Measurement 9 kHz to 30 MHz

Note: Pre-measurements have shown, there are no detectable emissions in this frequency range.

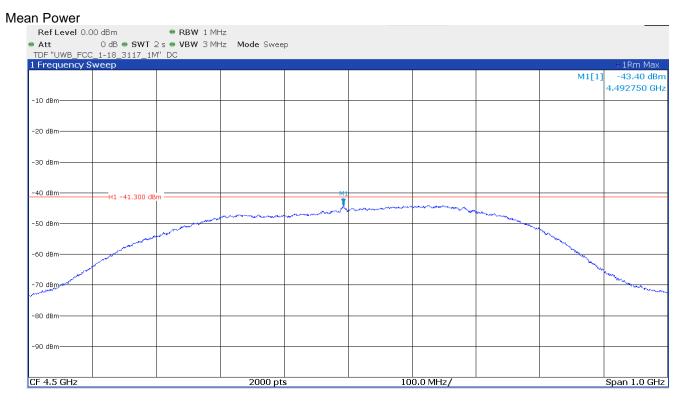
5.2.5.2 Measurement 30 MHz to 960 MHz

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)
38.40	19.9	2.4	14.4	13.2	34.3	15.6	40.0	-5.7
81.50	22.1	21.2	10.7	10.6	32.8	31.8	40.0	-7.2
111.60	6.4	8.7	10.9	11.7	17.3	20.4	43.5	-23.1
125.00	11.2	12.6	12.7	13.2	23.9	25.8	43.5	-17.7
250.00	14.3	19.1	13.8	14.0	28.1	33.1	46.0	-12.9
345.60	11.8	13.1	18.2	17.9	30.0	31.0	46.0	-15.0
384.00	13.8	7.0	19.4	19.1	33.2	26.1	46.0	-12.8
614.40	0.8	6.0	25.7	25.5	26.5	31.5	46.0	-14.5
882.40	-1.3	-0.3	30.8	30.4	29.5	30.1	46.0	-15.9

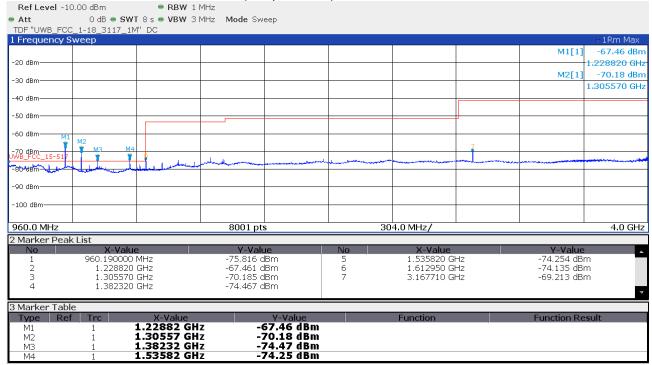


5.2.5.3 Measurement 960 MHz to 40 GHz

Channel 3

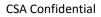


960 MHz to 4 GHz: UWB on and device on (sample 40084)



CSA Group Bayern GmbH Ohmstrasse 1-4 · 94342 STRASSKIRCHEN · GERMANY Tel.: +49(0)9424-94810 · Fax: +49(0)9424-9481440

File No. T44481-01-01FX, page 14 of 29





Ref Level -10. Att Input TDF Input1 "UWB	0 dB ● SWT 1 AC PS 31-18FCC"	8 s 🖷 VBW		1ode Auto	Sweep				Frequency 2.4	
Frequency Sv	veep								M5[1	●1Rm Ma -66.80 d
-20 dBm									1JCM	3.167800 (
									M1[1	
									-	1.228820 (
-40 dBm										
-60 dBm								MS		
<u> </u>	M2 ▼ M3 M4							1		
WB FCC 15517	Muselles	I had been	- Allen and a sold for	morement	and the second second	manne	-			- mananananananananananananananananananan
-9040Bm		4								
100 dBm										
				000 1-						1.0.1
960.0 MHz Markar Dook	List		8	000 pts		3	04.0 MHz/			4.0 (
Marker Peak		2		Y-Value	2	No	X-Valu	Je	Y-Va	lue
1	1.228850 0			67.409 dE		2	3.167990		-66.803	
Marker Table Type Ref M1 M2	Trc 1	X-Value L.22882 (L.30557 (GHz	-67	Y-Value 7.41 dBm 30 dBm		Function		Function R	esult
M3		1.38232			.77 dBm					
M4 M5 /Hz to 4 G	Hz: UWB	1.53582 3.1678 off and c	GHz GHz device of	-75 -66	.16 dBm .80 dBm					
M4 M5 MHz to 4 G Ref Level -10. Att IDF "UWB_FCC_	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm					- 18m M
M4 M5 MHz to 4 G Ref Level -10. Att IDF "UWB_FCC_	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				M5[1	1
M4 M5 MHz to 4 C Ref Level -10. Att TDF "UWB_FCC_ Frequency Sw	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				M5[1	-72.63
M4 M5 MHz to 4 C Ref Level -10. Att TDF "UWB_FCC_ Frequency Sw	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				M5[1 M1[1	-72.63 3.167800 -78.77
M4 M5 MHz to 4 G Ref Level -10. Att TDF "UWB_FCC_ Frequency Sy 20 dBm	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				-	-72.63 3.167800 -78.77
M4 M5 MHz to 4 G Ref Level -10. Att TDF "UWB_FCC_ Frequency Sy 20 dBm	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				-	-72.63 3.167800 -78.77
M4 M5 MHz to 4 G Ref Level -10. Att TDF "UWB_FCC_ Frequency Sy 20 dBm	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				-	-72.63 3.167800 -78.77
M4 M5 MHz to 4 C Ref Level -10. Att rDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm				-	-72.63 (3.167800 -78.77 (
M4 M5 MHz to 4 C Ref Level -10. Att DF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 60 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm			MS	-	-72.63 (3.167800 -78.77 (
M4 M5 MHz to 4 G Ref Level -10. Att TDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 40 dBm 40 dBm 40 dBm	1 1 6Hz: UWB .00 dBm 0 dB • swt 1-18_3117_1M	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm			M5	-	-72.63 3.167800 -78.77
M4 M5 Ref Level -10. Att DF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 50 dBm 90 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm			M5	-	-72.63 (3.167800 -78.77 (
M4 M5 MHz to 4 G Ref Level -10. Att TDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 40 dBm 40 dBm 40 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm			M5	-	3.167800
M4 M5 MHz to 4 C Ref Level -10. Att IDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 60 dBm 60 dBm wB_FCC_15-517 80 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	off and c • RBW	GHz GHz device of 1 MHz	-75 -66	.16 dBm .80 dBm			MS	-	-72.63 (3.167800 -78.77 (
M4 M5 MHz to 4 C Ref Level -10. Att TDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 60 dBm WB_FCC_15-5 <i>W</i> 80 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	off and c • RBW	GHZ GHZ device of 1 MHz 3 MHz M	-75 -66	.16 dBm .80 dBm			MS	-	-72.63 (3.167800 -78.77 (1.228820
M4 M5 MHz to 4 C Ref Level -10. Att TDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 40 dBm 60 dBm 100 dBm 100 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	off and c • RBW	GHZ GHZ device of 1 MHz 3 MHz M	-75 -66	.16 dBm .80 dBm	3		M5	-	-72.63 (3.167800 -78.77 (1.228820
M4 M5 MHz to 4 C Ref Level -10. Att IDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 40 dBm 60 dBm 100 dBm 100 dBm 100 dBm 260.0 MHz Marker Peak	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	L.53582 (3.1678 (0 RBW 8 s • VBW " DC	GHZ GHZ device of 1 MHz 3 MHz M	-75 -66	5.16 dBm .80 dBm	3			M1[1	-72.63 (-3.167800 -78.77 (1.228820
M4 M5 MHz to 4 C Ref Level -10. Att TDF "UWB_FCC_ Frequency Sv 20 dBm 40 dBm 40 dBm 60 dBm 100 dBm 100 dBm	1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	Coff and c • RBW • RBW • S • VBW • DC	GHZ GHZ device of 1 MHz 3 MHz Mi	-75 -66	5.16 dBm .80 dBm		04.0 MHz/		-	-72.63 -3.167800 -78.77 1.228820
M4 M5 MHz to 4 C Ref Level -10. Att TDF "UWB_FCC_ Frequency Sw -20 dBm -40 dBm	1 1 3 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	Coff and c • RBW • RBW • S • VBW • DC	GHZ GHZ device of 1 MHz 3 MHz Mi 3 MHz Mi 8 8 -7	-75 -66	5.16 dBm .80 dBm	3 No			M1[1	-72.63 (-3.167800 -78.77 (1.228820 -78.77 (1.228820) -78.77 (1.228820 -78.77 (1.228820) -78.77 (1.239) -78.77 (1.239) -79.77 (1.2

Note: The emission points M1 - M5 are not a result of UWB transmission but of the device itself. They comply with the general limit of \$15.209.



Hz to 18 G		4.841					
RefLevel 10 Att	0.00 dBm • RBW 10 dB • SWT 28 s • VBW						
	C_1-18_3117_1M" DC	S MILZ MODE Sweep					
1 Frequency							●1Rm Max
						M1[1]	-45.17 dB
							4.648250 GF
0 dBm							
-10 dBm							
-20 dBm							
-30 dBm							
148_E66-15-517							
-50 dBm							
- <mark>60 dBm</mark>							
-70 dBm							
-80 dBm							
4.0 GHz		28000 pts	1	.4 GHz/			18.0 GH
2 Marker Pea	k List						
No	X-Value	Y-Value	No	X-Valu	e	Y-Va	lue
1	4.609750 GHz	-45.262 dBm	6	4.628250 (-45.442	
2 3	4.611750 GHz 4.612750 GHz	-45.345 dBm -45.346 dBm	7 8	4.629250 (4.644750 (-45.447 -45.443	
4	4.618250 GHz	-45.423 dBm	9	4.645750 (-45.394	
5	4.626250 GHz	-45.274 dBm	10	4.648250 0		-45.167	

18 GHz to 40 GHz at 20 cm distance

Ref Level -8.78 dBm Offset -6.99 dB ● RBW 1 MHz ● Att 0 dB ● SWT 4. TDF "Cable_50-11-14","EIRP40_1" DC 1 Frequency Sweep 44 s 🖷 VBW 3 MHz 🛛 Mode Sweep o1Rm Max M1[1] -61.43 dBm 9.000750 GHz -20 dBm--30 dBm--40 dBm-M1 -60 dBm-~~~ -70 dBm--80 dBm--90 dBm -100 dBm-40.0 GHz 18.0 GHz 44000 pts 2.2 GHz/

File No. T44481-01-01FX, page 16 of 29



Channel 5



Ref Level 0.	.00 dBm	• RBW 1 MHz						-	
 Att 	0 dB 👄 SWT 2 s		Mode Swee	р					
	C_1-18_3117_1M"	DC							o 1Des May
1 Frequency	Sweep							M1[1]	● 1Rm Max -41.45 dBm
									6.489750 GHz
-10 dBm									01103700 0112
20 000									
-20 dBm									
-30 dBm									
				M1					
40 dBm	H1 -41.300 dBm			Ť					
		and the second		manner	and the second	and the second s	m		
-50 dBm	and	Water Contraction of the Contrac					and a second		
	and the second sec							man	
-60 dBm	and the second s							- The second	
ou donn								~	~
my more and									man
-70 dBm									- marken
-80 dBm									
-90 dBm									
CF 6.5 GHz			2000 pts		10	0.0 MHz/			Span 1.0 GHz
			2000 pt:	•	10				Span 1.0 GHz
Ref Level -1 Att TDF "UWB_FC		RBW 1 MH	Ηz						
	C_1-18_3117_1M"	8 s e VBW 3 MH DC	Hz Mode Swi	еер					
1 Frequency	C_1-18_3117_1M"		Hz Mode Swi	еер					∘1Rm Max
	C_1-18_3117_1M"		Hz Mode Swi	eep				M5[1]	-69.11 dBm
1 Frequency	C_1-18_3117_1M"		Hz Mode Sw	еер					-69.11 dBm 3.167800 GHz
	C_1-18_3117_1M"		Hz Mode Sw	eep					-69.11 dBm 3.167800 GHz -67.47 dBm
	C_1-18_3117_1M"		Hz Mode Sw	eep					-69.11 dBm 3.167800 GHz
-20 dBm	C_1-18_3117_1M"		Hz Mode Sw	eep					-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M"		Hz Mode Swi	eep					-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M" Sweep		Hz Mode Swi	eep			MS		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M" Sweep		Hz Mode Sw	eep			M5		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M" Sweep		Hz Mode Sw				M5		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M" Sweep		Hz Mode Sw				MS		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M" Sweep		Hz Mode Sw	eep			M5		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm	C_1-18_3117_1M" Sweep		Hz Mode Sw	eep			M5		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm -40 dBm -60 dBm <u>UWB_FCC_15-51</u> -80 dBm	C_1-18_3117_1M" Sweep		Hz Mode Sw	eep			M5		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm -40 dBm -60 dBm <u>UWB_FCC_15-51</u> -80 dBm	C_1-18_3117_1M" Sweep		Hz Mode Swi		30	4.0 MHz/	M5		-69.11 dBm 3.167800 GHz -67.47 dBm
-20 dBm -40 dBm -60 dBm -60 dBm -100 dBm -100 dBm -100 dBm -100 dBm -2 Marker Pez	C_1-18_3117_1M" Sweep		8001 pts			•	M5	M1[1]	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dBm -100 dBm -100 dBm -100 dBm -2 Marker Pea No	C_1-18_3117_1M" Sweep M2 M3 M4 M4 M4 M4 M4 M4 M4 M4 M4 M4		8001 pts	S	No	X-Value		M1[1]	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dBm -100 dBm -100 dBm -100 dBm -2 Marker Pea No	C_1-18_3117_1M" Sweep	DC	8001 pts 	s Bm Bm Bm	No 4 5	•	z	M1[1] M1[1] -74.391 dBi -74.391 dBi -74.075 dBi	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dBm -100 dBm -100 dBm -100 dBm -2 Marker Pez	C_1-18_3117_1M" Sweep		8001 pts	s Bm Bm Bm		X-Value 1.536200 GH	z z	V-Value -74.391 dB	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dBm -100 dBm -100 dBm -100 dBm -2 Marker Pea No	C_1-18_3117_1M" Sweep Sweep M3 M4 M2 M3 M4 M4 M2 M3 M4 M4 M3 M4 M4 M4 M4 M4 M3 M4 M4 M4 M4 M4 M4 M4 M4 M4 M4		8001 pts 	s Bm Bm Bm	No 4 5	X-Value 1.536200 G⊢ 1.612950 G⊢	z z	M1[1] M1[1] -74.391 dBi -74.391 dBi -74.075 dBi	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dB	C_1-18_3117_1M" Sweep Sweep M2 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M3 M4 M4 M3 M4 M4 M3 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M3 M4 M4 M4 M4 M4 M4 M4 M4 M4 M4	DC	8001 pts 	s Bm Bm Bm Bm Bm	No 4 5	X-Value 1.536200 G⊢ 1.612950 G⊢ 3.168090 G⊢	z z	V-Value -74.391 dBr -74.075 dBr -68.579 dBr	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dB	C_1-18_3117_1M" Sweep Sweep M2 M3 M4 List X-Value 1.228820 GH 1.305570 GH 1.305570 GH 1.382320 GH 1.382320 GH	DC	8001 pts -67.466 d -70.123 d -74.260 d	IE Bm Bm Bm Bm Y-Value	No 4 5	X-Value 1.536200 G⊢ 1.612950 G⊢	z z	M1[1] M1[1] -74.391 dBi -74.391 dBi -74.075 dBi	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm WB_FCC_15-51 -80 dBm -100 dBm -100 dBm 2 Marker Pea No 1 2 3 Marker Tab Type Re M1	C_1-18_3117_1M" Sweep Sweep I I I I I I I I I I I I I I I I I I	DC	8001 pts -67.466 d -70.123 d -74.260 d	s Ie Bm Bm Bm Bm Sm Sm Sm Sm Sm Sm Sm Sm Sm Sm Sm Sm Sm	No 4 5	X-Value 1.536200 G⊢ 1.612950 G⊢ 3.168090 G⊢	z z	V-Value -74.391 dBr -74.075 dBr -68.579 dBr	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -100 dB	C_1-18_3117_1M" Sweep Sweep M2 M3 M4 M4 M3 M4 M4 M4 M4 M4 M4 M4 M4 M4 M4	DC	8001 pts 	s Y-Value 57.47 dBm 70.12 dBm 74.26 dBm	No 4 5	X-Value 1.536200 G⊢ 1.612950 G⊢ 3.168090 G⊢	z z	V-Value -74.391 dBr -74.075 dBr -68.579 dBr	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz
-20 dBm -40 dBm -60 dBm -60 dBm -60 dBm -100 dBm	C_1-18_3117_1M" Sweep Sweep KList K-Value 1.22820 GH 1.305570 GH 1.305570 GH 1.382320 GH 1.38230 GH 1.38200 GH 1.3820 GH 1.38200 GH 1.38200 GH 1.38200 GH 1.38	DC	8001 pts -67.466 d -70.123 d -74.260 d	s IE Bm Bm Bm Sm Y-Value 57.47 dBm 70.12 dBm	No 4 5	X-Value 1.536200 G⊢ 1.612950 G⊢ 3.168090 G⊢	z z	V-Value -74.391 dBr -74.075 dBr -68.579 dBr	-69.11 dBm 3.167800 GHz -67.47 dBm 1.228820 GHz 4.0 GHz 4.0 GHz



RefLevel -10 Att	0 dB 🖷 SW1	「 8 s ● VBW		1ode Auto Sweep				Frequency 2.48	300000 G
Input TDF Input1 "UW	VB1-18FCC"	Off Notc	h Off						
l Frequency S	Sweep								●1Rm Ma
-20 dBm								M5[1]	-64.79 d 3.167800 0
-20 0611-								M1[1]	-67.47 d
-40 dBm									1.228820 (
60 dBm							M5		
-60 dBm	M2 ▼ M3 M4						1		
WB FCC 15517 *8048m	Andrew	delande de sendore	and and a share when a share wh	un and the second second	James and and a start of the st				
-100 dBm									
960.0 MHz			8	000 pts		304.0 MHz/			4.0 0
2 Marker Peal No			1	Y-Value	No	X-Val		Y-Va	
1	1.228850 0		-(67.473 dBm	2	3.167990		-64.794	
Marker Tabl									
Type Ref		X-Value 1.22882 (Y-Value -67.47 dl		Function		Function Re	esult
M2		1.30557 (-71.38 di					
M3	1	1.38232 (GHz	-75.61 di	Bm				
	1 GHz: UWB		<mark>sн</mark> z levice of	-75.23 dl -64.79 dl					
M5 MHz to 4 (Ref Level -10 Att	1 GHz: UWB 0.00 dBm	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l					
M5 MHz to 4 (Ref Level -10 Att	1 GHz: UWB 0.00 dBm 0 dB ● sw1 C_1-18_3117_1M	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l				-	
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S	1 GHz: UWB 0.00 dBm 0 dB ● sw1 C_1-18_3117_1M	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l				M5[1]	
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC	1 GHz: UWB 0.00 dBm 0 dB ● sw1 C_1-18_3117_1M	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l				M5[1]	-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S	1 GHz: UWB 0.00 dBm 0 dB ● sw1 C_1-18_3117_1M	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l					-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -1(Att TDF "UWB_FCC Frequency S	1 GHz: UWB 0.00 dBm 0 dB ● sw1 C_1-18_3117_1M	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l					-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -1(Att TDF "UWB_FCC Frequency S	1 GHz: UWB 0.00 dBm 0 dB ● sw1 C_1-18_3117_1M	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l			M5		-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -60 dBm WB_FCC_15-5 MR	1 GHz: UWB 0.00 dBm 0 dB ● SW1 C_1-18_3117_1M Sweep	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l			M5		-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -1(Att TDF "UWB_FCC Frequency S -20 dBm	1 GHz: UWB 0.00 dBm 0 dB ● SW1 C_1-18_3117_1M Sweep	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l					-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -60 dBm WB_FCC_15-5 MR	1 GHz: UWB 0.00 dBm 0 dB ● SW1 C_1-18_3117_1M Sweep	3.1678 (off and c • RBW	GHZ device of 1 MHz	- 64.79 d l					-72.63 d 3.167800 (-78.77 d
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -40 dBm -40 dBm -100 dBm -100 dBm -100 dBm	1 GHz: UWB 0.00 dBm 0 dB • SW1 C_1-18_3117_1M Sweep	3.1678 (off and c • RBW	SHz device of 1 MHz 3 MHz Mo	- 64.79 d l		304.0 MHz/			-72.63 d 3.167800 (-78.77 d 1.228820 (
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S -20 dBm -40	1 GHz: UWB 0.00 dBm 0 dB • SW1 C_1-18_3117_1M Sweep	3.1678 (off and c • RBW r 8 s • VBW " DC	SHz levice of ' 1 MHz ' 3 MHz Mo	-64.79 dl		· · ·		M1[1]	-72.63 d 3.167800 (-78.77 d 1.228820 (
M5 MHz to 4 (Ref Level -10 Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -40 dBm -40 dBm -100 dBm -100 dBm -100 dBm	1 GHz: UWB 0.00 dBm 0 dB • SW1 C_1-18_3117_1M Sweep	3.1678 (off and c • RBW r 8 s • VBW " DC	SHz device of ' 1 MHz Mo	-64.79 dl		304.0 MHz/			-72.63 d 3.167800 (-78.77 d 1.228820 (
M5 MHz to 4 (Ref Level -1(Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -60 dBm -60 dBm -100 dB	1 GHz: UWB 0 dB • swi C_1-18_3117_1M weep M2 M3 M4 M2 M3 M4 K List X-Value 3.168090 G	3.1678 (off and c • RBW r 8s • VBW " DC	SHz device of 1 MHz Mo	-64.79 dl	Bm	X-Value		Y-Value	-72.63 d 3.167800 (-78.77 d 1.228820 (
M5 MHz to 4 (Ref Level -1(Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -40 dBm -60 dBm -60 dBm -100 dBm	1 GHz: UWB 0 dB • sw1 C_1-18_3117_1M weep M2 M3 M4 M2 M3 M4 k List X-Value 3.168090 G	3.1678 (off and c	SHz device of 1 MHz Mo	-64.79 dl	Bm	· · ·		M1[1]	-72.63 d 3.167800 (-78.77 d 1.228820 (
M5 MHz to 4 (Ref Level -1(Att TDF "UWB_FCC Frequency S -20 dBm -40 dBm -60 dBm -60 dBm -100 dB	1 GHz: UWB 0.00 dBm 0 dB • SWI C_1-18_3117_1M Sweep 4 M2 M3 M4 M2 M3 M4 K List X-Value 3.168090 G	3.1678 (off and c • RBW r 8s • VBW " DC	GHZ SHZ SHZ SHZ SHZ	-64.79 dl	Bm No Bm	X-Value		Y-Value	-72.63 d 3.167800 (-78.77 d 1.228820 (

Note: The emission points M1 - M5 are not a result of UWB transmission but of the device itself. They comply with the general limit of \$15.209.





Ref Level 2.0	00 dBm 🗧 🖷	RBW 1 MHz							
Att	2 dB 👄 SWT 28 s 👄	VBW 3 MHz	Mode Swe	зер					
	C_1-18_3117_1M" DC								
l Frequency S	weep								●1Rm Max
J dBm								M2[1]	
-10 dBm								141517	12.978560 GH
-10 UBIII-								MILI	-42.80 dB 6.488750 GI
20 dBm									0.488730 0
20 0011									
30 dBm									
40 dBm	M1								
VB_FCC_15-517									
50 dBm				t L		M2			
60 dBm									
						- Hold Mark			m
70 dBm		~							
30 dBm									
90 dBm									
.0 GHz	<u> </u>		28000 p	ts		1.4 GHz/			18.0 GH
Marker Pea	< List								
No	X-Value		Y-Va		No	X-Valu		Y-Va	
1 2	6.487250 GHz 6.488750 GHz		-43.739 -42.804		6	6.505250 (6.521750 (-43.683 -43.826	dBm
2 3	6.492750 GHz		-43.725	dBm	8	6.641250 (GHz	-44.133	dBm
4 5	6.494250 GHz 6.503750 GHz		-43.998 -43.979	dBm dBm	9 10	6.642750 (6.659250 (-43.926 -44.144	
	0.000700 0112		43.979	donn	10	0.039230 (44.144	ubin
Hz to 40 (GHz at 20 cm d	istance							
Ref Level -8	.78 dBm Offset -6.9								
		44 s 👄 VBW	3 MHz Mo	de Sweep					
Att		2							o1Rm Ma
TDF "Cable_50							M1[-61.70 dB
TDF "Cable_50							WIT [
TDF "Cable_50 Frequency S							(WIL)		
TDF "Cable_50									
TDF "Cable_50 Frequency S									
TDF "Cable_50 Frequency S 20 dBm-									38.974250 Gł
TDF "Cable_50 Frequency S									

	-11-14","EIRP40_								
1 Frequency S	weep						_		●1Rm Max
							M1[-61.70 dBm
								;	38.974250 GHz
-20 dBm									
-30 dBm									
-40 dBm									
50.40.0									
-50 dBm									
0110_10_10_01.0									
-60 dBm									M1
									\sim
						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim$	-
-70 dBm		and the second s							
-80 dBm									
00 40									
-90 dBm									
-100 dBm									
			14000						40.0.011
18.0 GHz			44000 pt	.5	2	.2 GHz/			40.0 GHz



#### Limits:

Limit according §15.209(a) in the frequency range 9 kHz 960 MHz:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Limit according §15.517(c) in the frequency range 960 MHz to 40 GHz:

Frequency in MHz	EIRP in dBm
960-1610	-75.3
1610-1990	-53.3
1990-3100	-51.3
3100-10600	-41.3
Above 10600	-51.3

The requirements are **FULFILLED.** 

Remarks:

None.



### 5.3 Radiated Emissions at 1164-1240 MHz and 1559-1610 MHz

For test instruments and accessories used see section 6 Part SER 3.

#### 5.3.1 Description of the test location

Test location: Anechoic chamber 1

#### 5.3.2 Photo documentation of the test set-up – see ATTACHMENT B

#### 5.3.3 Applicable standard

According to FCC Part 15, Section 15.517(d):

In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz.

#### 5.3.4 Analyser settings

RBW: 1 kHz,	VBW: 3 kHz,	Detector: RMS,	Sweep time: 1 ms/1kHz,
-------------	-------------	----------------	------------------------

#### 5.3.5 Test result

#### Channel 3

#### 1164 MHz to 1240 MHz: UWB on and device on (sample 40084)

				n (sample -	+0004)					
Ref Level -30	0.00 dBm	RBW 1	l kHz							
🕨 Att	2 dB 🖷 SW1	f 10 s 👄 VBW 3	3 kHz <b>Mode</b> Sv	veep						
TDF "UWB_FCC,	_1-18_3117_1M	1" DC								
1 Frequency Sv	weep									O1Rm Max
								M	1[1]	-76.04 dBr
										22880140 GF
-40 dBm										22000140 01
-50 dBm										
00 00.00										
-60 dBm										
-70 dBm								M		
-80 dBm										
	——H1 -85.300 dB	m								
-90 dBm			2							
				5				7		
-100 dBm				4		6				2
				. alla son and state		Lease Language 1	بالترجيب المراجع	All and the second s	and the second	
معطيحيط بألفا وختافه ويروا فأربه فروية	ويقاد العروفان وأقعالها العسرة	distant and the states of the	tender seite site terfel, entlike site		in the state of the state of the state of the	n magantan ayang na si sa masi ka si Uk dan A su sa su	the provide the provide the provide the	disease traineds, debalar	allifeldenced	destaught families anteger
Shift a burbanta and	Concerning the polytical	and the second second second second	and the second se	1						
-120 dBm										
			10000	-						
1.164 GHz			10000 pt	ts	/	'.6 MHz/				1.24 GH
2 Marker Peak										
No	X-Valu		Y-Va		No	X-Valu			Y-Va	
1	1.187518 0		-95.901		6	1.216269 0			02.793	
2	1.187982 0		-90.872		7	1.225017 0			-95.671	
3	1.190399 ( 1.198652 (		-94.201 -100.816		8 9	1.228801 C 1.237519 C			-76.041 .00.050	
4 5	1.1986520		-100.816 -96.876		10	1.237519 0			.00.050 .01.603	
J	1.133331 (	21 12	-90.070	UDHI	10	1.728880 (	31.12	-1	.01.003	UDITI



Ref Level -3 Att Input TDF Input1 "UV	2 dB ● SWT 10 s ● VBV 1 AC PS Off Not VB1-18FCC"		o Sweep			F	requency	1.20	)20000 G
1 Frequency S	Sweep								●1Rm Ma
							M	1[1]	-80.16 d
-40 dBm								1.	22880140 0
-50 dBm									
-60 dBm									
-70 dBm									
							м	11	
-80 dBm							- 1		
	H1 -85.300 dBm						_		
-90 dBm		1 0.2	4	5	5 7	8			10
	and the second s	parent in the parent of the first state	ana di <mark>kanal Kanadak</mark>			an Linne, st. An. or a Hight Justic	in a far a part de la consection de la cons La constant de la consection de la consectio	ters.PDp.Jpp.Sp.	in the internal particular
100,dBmitheritlet		an an the first first of the first of the second	aliteration of a second se	a a la superior de la	Maria and Arite	a la hondala a ser a	har the state of the	1	and the second disk is really
here the second strategies and the second	and a large state								
110 dBm									
120 dBm									
1.164 GHz		10000 pts			.6 MHz/				1.24 0
	List	10000 pts		/					1.240
Marker Peal	X-Value	Y-Value	<u>م</u>	No	X-Valu			Y-Val	ue
1	1.187982 GHz	-91.525 dE		6	1.209763 0		-	92.453	
2	1.192010 GHz	-93.773 dE		7	1.214088 0			91.768	
3 4	1.193332 GHz 1.197733 GHz	-93.671 dE -92.681 dE		8	1.222805 C 1.228801 C			92.248 80.164	
5	1.202749 GHz	-92.001 dL -91.458 dE						91.479	
	240 MHz: UWB off a				<u>    1.237519 (</u>		_	_	_
Ref Level -3 Att	0.00 dBm ● RB¥ 2 dB ● SWT 10 s ● VB¥	and device off							_
Ref Level -30 Att TDF "UWB_FCC	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off					_	_	-
Ref Level -30 Att TDF "UWB_FCC	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off						11[1]	01Rm Ma
Ref Level -30 Att TDF "UWB_FCC	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off						1[1]	●1Rm Ma -106.66 d
Ref Level -30 Att TDF "UWB_FCC Frequency S	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							<mark>01</mark> Rm Ma -106.66 d 22880140 (
Ref Level -30 Att TDF "UWB_FCC Frequency S	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm-	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm-	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level - 30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm	0.00 dBm • RB¥ 2 dB • SWT 10 s • VB¥ C_1-18_3117_1M" DC	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           80 dBm	0.00 dBm ● RB¥ 2 dB ● SWT 10 s ● VB¥ C_1-18_3117_1M" DC weep	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           -50 dBm           -60 dBm           -70 dBm           -80 dBm	0.00 dBm ● RB¥ 2 dB ● SWT 10 s ● VB¥ C_1-18_3117_1M" DC weep	and device off							●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           80 dBm           90 dBm           100 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet						1.	●1Rm Ma -106.66 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           80 dBm           90 dBm           100 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet			5			1.	0 1Rm Ma -106.66 d 22880140 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           90 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet			5			1.	0 1Rm Ma -106.66 d 22880140 C
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           90 dBm	0.00 dBm ● RB¥ 2 dB ● SWT 10 s ● VB¥ C_1-18_3117_1M" DC weep	and device off V 1 kHz V 3 kHz Mode Sweet			5			1.	0 1Rm Ma -106.66 d 22880140 C
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           60 dBm           90 dBm           90 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet			5			1.	0 1Rm Ma -106.66 d 22880140 C
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           60 dBm           90 dBm           90 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet			5			1.	0 1Rm Ma -106.66 d 22880140 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           100 dBm           120 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet						1.	01Rm Ma -106.66 d 22880140 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           120 dBm           120 dBm           120 dBm	0.00 dBm ● RBY 2 dB ● SWT 10 s ● VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet			5			1.	01Rm Ma -106.66 d 22880140 d
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           120 dBm           120 dBm	0.00 dBm • RBY 2 dB • SWT 10 s • VBY 2_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet							0 1Rm Ma -106.66 d 22880140 d 
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           120 dBm           120 dBm           120 dBm           120 dBm           121 dBm	0.00 dBm ● RBY 2 dB ● SWT 10 s ● VBY C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet	2p					1.	0 1Rm Ma -106.66 d 22880140 d 
Ref Level -30           Att           TDF "UWB_FCC           Frequency S           -40 dBm           -50 dBm           -60 dBm           -70 dBm           -80 dBm           -90 dBm           -100 dBm           -120 dBm	0.00 dBm • RBV 2 dB • SWT 10 s • VBV 2_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet V 3 kHz Mode Sweet V 1 kHz V	ep			6 7 	M	1. 	0 1Rm Ma -106.66 d 22880140 d 
Ref Level -30           Att           TDF "UWB_FCC           -40 dBm           -50 dBm           -60 dBm           -70 dBm           -80 dBm           -90 dBm           -100 dBm           -120 dBm	0.00 dBm ● RBV 2 dB ● SWT 10 s ● VBV C_1-18_3117_1M" DC weep 	and device off V 1 kHz V 3 kHz Mode Sweet A b state of the second sec	ep			e BHz BHz BHz		1. 	0 1Rm Ma -106.66 d 22880140 ( 22880140 ( 2288010 ( 2288010 ( 2280) ( 228

Note: The emission point M1 is not a result of UWB transmission but of the device itself. It complies with the general limit of §15.209.



9 MHz to 1	610 MHz (l	JWB on)							
Ref Level -3			I kHz						
<ul> <li>Att</li> </ul>			3 kHz <b>Mode</b> Sv	ween					
	C_1-18_3117_1M			меер					
1 Frequency S		. 50							●1Rm Ma
						1		M1[1]	-86,29 dF
									58397730 G
-40 dBm								1.	58397730 0
-50 dBm									
50 dbm									
-60 dBm									
-70 dBm									
-80 dBm									
oo abiii				M1					
	H1 -85.300 dB	m ———							
-90 dBm									
-100 dBm					7	0		<b>₩</b>	
والمتعالية المتحد المتألية	a sa ang sa sa ang bili sa tikin	الأرابين بحد والمعادية	ومرارية والمرابع	أللمعد بمنفاط المعال	الأنبي المنازع والمناط	Million and the firm of the	<b>wali la handaratara</b>	ويعاقف ويترو والمالي	
41.1 OudBine to a fear b		te inden sin tritte find and te tra-	in a name an addite all di sander de l	and and a second state of the	a allen an die date terte der nater alle	and the state of a state of the	n an saide is statistication alla Sense suite in statistication	יין דין יאונן אן אואראטערעטיין יי איז דין געריאינון אן אואראטערעטיין יי	an an an ann an an an an an an an an an
other all correction	The second second second	to the set of each matrice	<ul> <li>Find the second theory</li> </ul>	and the district of a	Leave at least 1 and	na da ser la ser entradade	a contra como con	e o conde actuale for e e	l
100 10									
-120 dBm									
1.559 GHz			10000 p	ts	-	5.1 MHz/			1.61 G
2 Marker Pea	kliet		10000			,			
No No	X-Valu	0	Y-Va	lue	No	X-Valu	0	Y-Va	
1	1.559997 (		-100.576		6	1.584110 (		-103.924	
2	1.560043 0		-103.369		7	1.588746 0		-103.304	
3	1.562522 0	GHz	-103.305	5 dBm	8	1.593830 0	GHz	-103.535	dBm
4	1.574399 (		-91.642		9	1.599976 (		-100.949	
5	1.583977 0	GHz	-86.294	1 dBm	10	1.599996 (	GHz	-100.677	dBm

#### Channel 5

#### 1164 MHz to 1240 MHz: UWB on and device on (sample 40084)

Ref Level -30	0.00 dBm	<ul> <li>RBW 1</li> </ul>	kHz						
Att		10 s 👄 VBW 3	kHz <b>Mode</b> Sv	veep					
	<u>1-18_3117_1</u>	1" DC							
1 Frequency S	weep					Í.		1	o1Rm Max
								M1[1]	-76.57 dBm
-40 dBm								1	.22880140 GHz
40 dbm									
-50 dBm									
-50 uBm									
-60 dBm									
-70 dBm								M1	
								1	
-80 dBm									
	H1 -85.300 dB	m ———	2						
-90 dBm			1						
			1 3					Z	
-100 dBm				4 5		6			
		. E. alam			المتعادية والمتعادية والمتعادية	an and a state of the state of	Accession of March 2 and a class	In the line of the late life in the	مايندى ومراجع المتعريق والمعالية
110 dBm	anarati ang			and the second state of th	and the property of the field of the second s	an an an tart are de allasi sanda l'este sidadellar	according a little design of the liter	na si masaka aya kati a bida	The play and a sector of the sector of the
and the function of the second s	and the state of the	and a state	a successive com	[					
-120 dBm									
120 0000									
1.164 GHz			10000 pt	S	7	'.6 MHz/			1.24 GHz
2 Marker Peak	< List								
No	X-Valu		Y-Va		No	X-Value		Y-V <i>a</i>	
1	1.187518 0		-97.951		6 7	1.212515 0		-101.568	
2 3	1.187982 ( 1.190399 (		-88.818 -96.498		8	1.225017 G 1.228801 G		-96.746 -76.572	
4	1.198531 0		-99.549		9	1.237519 G		-101.458	
5	1.199997 0		-99.091		10	1.239996 0		-100.694	



Ref Level -30 Att Input TDF Input1 "UW	2 dB • SWT 10 s • V 1 AC PS Off N B1-18FCC"	BW 1 kHz BW 3 kHz Mode Auto Swe lotch Off	ер		Freq	uency 1.2	020000 G
1 Frequency S	weep						●1Rm Ma
						M1[1]	-80.16 df
-40 dBm						1	.22880140 G
-50 dBm							
-60 dBm							
00 00.0							
-70 dBm							
/o ubiii							
00 40						M1	
-80 dBm							
	H1 -85.300 dBm		-	_			10
-90 dBm		2,3,4	the the second second by	ske a Barty tealistication tiles, him and	an a se o latin la thurson	الحرارية المراجع	the second second
	والمعد فألبا وسأناء وبالرجان الأمرار واستأسأ فيعمدوها وحدي	a de la de frança de la desta de la sela de la sera de la desta de la desta de la desta de la desta de la dest Recentra de la desta de la d	and the second state of th	and the production of the basis of the second second	In property and party of the	dentral lan order out	a start of the start of the start
100,dBmt	The particular of the local data and the second statements of the secon						
No. If Comments							
110 dBm				+ +			1
120 dBm							
1.164 GHz		10000 pts		7.6 MHz/			1.24 0
Marker Peak	List	10000 pt3		710101127			11210
No	X-Value	Y-Value	No	X-Value		Y-Va	alue
1	1.187982 GHz	-91.525 dBm	6	1.209763 GH		-92.453	
2	1.192010 GHz	-93.773 dBm	7	1.214088 GH		-91.768	
3	1.193332 GHz	-93.671 dBm	8	1.222805 GH 1.228801 GH		-92.248	
4 5	1.197733 GHz	-92.681 dBm	9			-80.164	
MHz to 1	1.202749 GHz 240 MHz: UWB of 0.00 dBm • R	-91.458 dBm	10	1.237519 GH		-91.479	0 dBm
MHz to 1 Ref Level -30 Att	<b>240 MHz: UWB of</b> 1.00 dBm • R 2 dB • <b>SWT</b> 10 s • V	ff and device off				-91.479	I dBm
MHz to 1 Ref Level -30 Att TDF "UWB_FCC	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				-91.479	
MHz to 1 Ref Level -30 Att IDF "UWB_FCC	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz					O 1Rm Ma
MHz to 1 Ref Level -30 Att TDF "UWB_FCC	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	0 1Rm Ma -106.66 d
MHz to 1. Ref Level -30 Att TDF "UWB_FCC Frequency S	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1. Ref Level -30 Att TDF "UWB_FCC Frequency S	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
• MHz to 1/ Ref Level -30 • Att TDF "UWB_FCC Frequency S	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
• MHz to 1/ Ref Level -30 • Att TDF "UWB_FCC Frequency S	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1. Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1. Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1. Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 60 dBm	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1. Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 60 dBm	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 12 Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm	<b>240 MHz: UWB of</b> .00 dBm	ff and device off BW 1 kHz				M1[1]	0 1Rm Ma -106.66 d
MHz to 1/.           Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1/ Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 70 dBm 80 dBm	<b>240 MHz: UWB of</b> 1.00 dBm	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1/ Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 70 dBm 80 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep	ff and device off BW 1 kHz				M1[1]	01Rm Ma -106.66 d
MHz to 1/ Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 70 dBm 80 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep	ff and device off BW 1 kHz BW 3 kHz Mode Sweep				M1[1]	01Rm Ma -106.66 d
MHz to 1/. Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 70 dBm 80 dBm 90 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep	ff and device off BW 1 kHz		1.237519 GH		M1[1] 1	01Rm Ma -106.66 d
• MHz to 1/. Ref Level -30 • Att TDF "UWB_FCC • Frequency S • 40 dBm • 50 dBm • 60 dBm • 70 dBm • 90 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm Mk -106.66 d .22880140 0
• MHz to 1/. Ref Level -30 • Att TDF "UWB_FCC • Frequency S • 40 dBm • 50 dBm • 60 dBm • 70 dBm • 90 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH		M1[1] 1	0 1Rm Mk -106.66 d .22880140 0
MHz to 1/ Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm Mk -106.66 d .22880140 0
MHz to 1/.           Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           80 dBm           90 dBm           100 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm Mi -106.66 d .22880140 d
MHz to 1/ Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 60 dBm 70 dBm 90 dBm 90 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm Mk -106.66 d .22880140 0
MHz to 1/.           Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           100 dBm           120 dBm	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm Mi -106.66 d .22880140 d
MHz to 1/.           Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           120 dBm           120 dBm	240 MHz: UWB of 1.00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm Mi -106.66 d .22880140 d
MHz to 1: Ref Level -30 Att TDF "UWB_FCC Frequency S 40 dBm 50 dBm 60 dBm 70 dBm 90 dBm 100 dBm 100 dBm 120 dBm 120 dBm	240 MHz: UWB of 1.00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep		1.237519 GH	Z	M1[1] 1	0 1Rm M -106.66 d .22880140 d
MHz to 1/.           Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           120 dBm           120 dBm           120 dBm           Marker Peak           No	240 MHz: UWB of .00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm H1 -85.300 dBm	ff and device off BW 1 kHz BW 3 kHz Mode Sweep	10	1.237519 GH		M1[1] 1	0 1Rm Mi -106.66 d .22880140 d 
MHz to 1/.           Ref Level -30           Att           TDF "UWB_FCC           Frequency S           40 dBm           50 dBm           60 dBm           70 dBm           90 dBm           100 dBm           120 dBm	240 MHz: UWB of 1.00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm H1 -85.300 dBm 	ff and device off BW 1 kHz BW 3 kHz Mode Sweep	10	1.237519 GH		M1[1] 1 	0 1 Rm Mi -106.66 d .22880140 d 
• MHz to 1:           Ref Level -30           • Att           TDF "UWB_FCC           • Frequency S           • 40 dBm           • 40 dBm           • 50 dBm           • 60 dBm           • 60 dBm           • 70 dBm           • 90 dBm           • 100 dBm           • 120 dBm           • 1164 GHz           • Marker Peak           No	240 MHz: UWB of 1.00 dBm • R 2 dB • SWT 10 s • V _1-18_3117_1M" DC weep H1 -85.300 dBm H1 -85.300 dBm Ultrad of up to the to the total List X-Value 1.187518 GHz	ff and device off BW 1 kHz BW 3 kHz Mode Sweep 10000 pts 10000 pts	10	1.237519 GH		M1[1] 1	0 1Rm Ma -106.66 d .22880140 0 

Note: The emission point M1 is not a result of UWB transmission but of the device itself. It complies with the general limit of §15.209.



9 MHz to 1	610 MHz (l	JWB on)							
Ref Level -30		● RBW :	1 kHz						
Att			3 kHz <b>Mode</b> Sv	veep					
1 Frequency S	_1-18_3117_1M	' DC							O1Rm Ma
I Frequency S	weep							M1[1]	-85.38 d
									58397730 (
-40 dBm								1.	56597750
-50 dBm									
-60 dBm									
-70 dBm									
-80 dBm				M1					
	H1 -85.300 dBr	n							
-90 dBm									
-100 dBm				7				9	10
- I			white could be at the				the stars of the		Lui III
ini pangala pada ini kata dan kata ini kata kata kata kata kata kata kata kat	an a far ann ann an ann ann an ann an ann ann	an ar an tag a sa san a dan dan dapaga Tagada	n proje generale stranske se seriet Konde v fil bed fil fil findere v deland	All and a stand of the stand of		an and hopemised bloc	hear and the state of the state of	Hilly, "Andry Diden Anne Utilig Persentation and a tradition of the	
TTTP ddile (Provi lin	and hand of kindless of the	a seconda a constanta.	and an end of the second	the second second second	an and allowed a de	hand of deadloads on the	and the state of the state of the state	a har a transfer of the college	ب يتبليه العرباليد ا
-120 dBm									
120 00.00									
1.559 GHz			10000 pt	ts	•	5.1 MHz/			1.61 0
2 Marker Peal No	<u>× List</u> X-Value		Y-Va	huo	No	X-Value		Y-Va	
1	1.559997 G		-100.732		6	1.583977 0		-85.385	
2 3	1.560043 0	θHz	-103.057	' dBm	7	1.584110 0	βHz	-101.092	dBm
3 4	1.567132 C 1.571987 C		-102.619 -103.802		8	1.599966 0 1.600002 0		-100.763 -100.462	
4 5	1.574399 0		-103.802 -92.330		10	1.608044 0		-100.462	

Limit according §15.519(c) in the frequency

Frequency in MHz	EIRP in dBm
1164-1240	-85.3
1559-1610	-85.3

The requirements are **FULFILLED.** 

None.

Remarks:

CSA Group Bayern GmbH Ohmstrasse 1-4 · 94342 STRASSKIRCHEN · GERMANY Tel.: +49(0)9424-94810 · Fax: +49(0)9424-9481440

File No. T44481-01-01FX, page 25 of 29



### 5.4 Peak Power radiated

For test instruments and accessories used see section 6 Part CPR 3.

#### 5.4.1 Description of the test location

Test location: Anechoic chamber 1

#### 5.4.2 Photo documentation of the test set-up – see ATTACHMENT B

#### 5.4.3 Applicable standard

According to FCC Part 15, Section 15.517(e):

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs,  $f_M$ . That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in §15.521.

#### 5.4.4 Analyser settings

RBW: 50 MHz, VBW: 80 MHz, Detector: Peak, Trace Mode: Max hold

#### 5.4.5 Test result

#### Channel 3

Frequency S	C_1-18_3117_1M Sweep								o1Pk Ma≻
								M1[1]	-2.64 dB
									4.494750 G
)-dBm	H1 0.000 dBm			M					
				- Andrew Contraction	Annan Minsullin	manual de provision alle and here	m		
10 dBm			and an and a second	adjugar - the stands					
		Jan 1997					and the second second	a manufacture	
00 JB	Charlen and the							and the	
20 dBm	a ware a start the							MANA MA	
and the second	4								Margare .
30 dBm									and a second and a
after the contract									
40 dBm									
50 ID									
50 dBm									
60 dBm									
70 dBm									
80 dBm									



#### Channel 5

TDF "UWB_FCC Frequency S	weep								o1Pk Max
				M1				M1[1]	-0.50 dBr 6.482750 GH
)-dBm	——H1 0.000 dBm		an in the star half if the more	NII Niinin maring an a share	and the second and the second and the second	www.www.www.www.www.www.www.www.www.ww			
10 dBm	and the state of the second	And the second s	and day and distance of the solutions	and blue a bu		an a saint ann an saint	Contraction of the state of the	Man and	
20 dBm	WH PHENNIN							Martin Martin Martin	
and the marked the mark of the later									have been and the second
30 dBm									the state of the s
40 dBm									
50 dBm									
So upin									
60 dBm									
70 dBm									
80 dBm									
F 6.5 GHz limit marg requireme	in: nts are <b>FUI</b>		2000 pt dB at 6482		10	0.0 MHz/			Span 1.0 GH
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg					10	0.0 MHz/			Span 1.0 GH;
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH;
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH;
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH:
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH
limit marg requireme	nts are <b>FUI</b>				10	0.0 MHz/			Span 1.0 GH



### 5.5 Antenna application

#### 5.5.1 Applicable standard

According to FCC Part 15C, Section 15.203:

None.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit that broken antennas can be replaced by the user, but the use of a standard antenna jack is prohibited.

The EUT has two mounted antennas, Reverse Polarity SMA connectors are used.

All supplied antennas meet the requirements of part 15.203 and 15.204.

Remarks:



# 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 3	FSW43	02-02/11-15-001	08/04/2020	08/04/2019	
	AMF-6D-01002000-22-10P	02-02/17-15-004			
	3117	02-02/24-05-009	06/06/2020	06/06/2019	
	18N-20	02-02/50-17-003			
	NMS111-GL200SC01-NMS11	02-02/50-17-012			
	BAM 4.5-P	02-02/50-17-024			
	NCD	02-02/50-17-025			
	KK-SF106-2X11N-6,5M	02-02/50-18-016			
SER 2	ESVS 30	02-02/03-05-006	19/08/2020	19/08/2019	
SEK 2	VULB 9168	02-02/03-03-000	19/08/2020	19/08/2019	
	NW-2000-NB	02-02/24-03-003	19/07/2020	19/07/2019	
	KK-EF393/U-16N-21N20 m	02-02/50-12-018			
	KK-SD 7/8-2X21N-33,0M	02-02/50-12-018			
	KK-5D_//0-2A2110-55,000	02-02/30-13-020			
SER 3	FSW43	02-02/11-15-001	08/04/2020	08/04/2019	
	JS4-18004000-30-5A	02-02/17-05-017			
	AMF-6D-01002000-22-10P	02-02/17-15-004			
	3117	02-02/24-05-009	06/06/2020	06/06/2019	
	BBHA 9170	02-02/24-05-014	12/06/2021	12/06/2018	14/01/2021 14/01/2020
	KMS102-0.2 m	02-02/50-11-020			
	18N-20	02-02/50-17-003			
	NMS111-GL200SC01-NMS11	02-02/50-17-012			
	BAM 4.5-P	02-02/50-17-024			
	NCD	02-02/50-17-025			
	KK-SF106-2X11N-6,5M	02-02/50-18-016			