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FCC Test Firm Designation	IE0002			
ISED Cab Identifier	IE0001			
Date	25 th Jan 2024			
EUT Description	Industrial RFID Reader			
FCC ID	SCC10811A			
IC ID	5137A-10811A			
Authorised by	Paul Reilly			
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TEST SUMMARY

The equipment complies with the requirements according to the following standards.

15247 Section	RSS-247 Section	TEST PARAMETERS	Test Result
15.247(a)	5.1(a)	20dB bandwidth of hopping Channel	Pass
15.247(a)	5.1(b)	Hopping Frequency Separation	Pass
1.247(a)	5.1(c)	Number of Hopping Channels	Pass
15.247(a)	5.1(c)	Average Time of Occupancy	Pass
15.247(b)	5.4	Output power	Pass
15.247(d)	5.5	Conducted Spurious Emissions	Pass
RSS Gen 6.7		99% bandwidth	Pass
15.205 15.209	RSS Gen 8.9 and 8.10	Radiated Spurious Emissions for restricted bands	Pass
15.207	RSS Gen 8.8	Conducted Emissions on the mains	Pass

RSS 247	Issue 2	Mar16 2017
RSS-Gen	Issue 5 Apr 2018 +	Amd1 Mar 2019 + Amd2 Feb 2021

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Ref doc "23E10703-1b Appendix" for the following sections

APPENDIX D: RADIATED SPURIOUS EMISSIONS WITH EXTERNAL ANTENNA
APPENDIX E: CONDUCTED EMISSIONS ON THE MAINS
APPENDIX F: BLOCK DIAGRAMS OF TEST SETUP
APPENDIX G: EUT ORIENTATION

1 EUT Description

Туре:	Industrial RFID reader
Type of radio:	Stand-alone
Transmitter Type:	RFID FHSS
Operating Frequency Range(s):	902.75-927.25 MHz
Number of Channels:	50
Channel Separation:	500KHz
PMN	B-IRX200-US
HVIN	1081-1A
FVIN	v17.1
Antenna:	Internal and port for external antenna
External Antenna Gain Max:	4.5dBi (7.5 dBiC)
External Antenna Impedance	50ohms
External Antenna Description	Patch Antenna
Test Standards	15.247 RSS-247
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2013

The EUT was an Industrial RFID Reader using frequency hopping in the 902-928MHz frequency band.

The EUT contained an internal antenna with the option of fitting an external antenna.

Software used to control the EUT

Test software (NUR RD tester version 2.0.5.2) from Nordic ID, running on a standard Windows laptop (Lenovo X250) was used control the EUT during test. This application is downloadable from Nordic ID for the purposes of testing the EUT radio interface.

1.1 EUT Operation

Operating Conditions during Test:

The EUT was powered from a dc adapter FSP 040-DAAN3 for all tests.

The same EUT sample s/n K234500061 was used for all tests.

The EUT was operated in test mode where the channel and modulation were set via USB connection to the control laptop.

The settings were 631mW for power level and continuous transmit modulated mode.

Conducted measurements were performed on the EUT with the analyser connected to the external antenna port.

Radiated measurements with the internal antenna active were performed with the connection to the external antenna port disabled.

Radiated measurements were also performed with the external antenna fitted Nordic ID Oy , part num XA20 SN N240300002 model 1081-2A

Environmental conditions

	Temperature	Relative Humidity
Test	°C	%
Conducted Emissions on Mains	20	40
Radiated Emissions <1GHz	21	47
Radiated Emissions >1GHz	22	43
Conducted Emissions	22	42

1.2 Modifications

No modifications were required in order to pass the test specifications.

1.3 Date of Test

The tests were carried out on 10th 19th 20th 23rd 24th and 25th Jan 2024.

1.4 Description of Test modes

Channel List

Channel	Freq MHz
Low Ch 0	902.75
Mid Ch 24	914.75
High Ch 49	927.25

1.5 Description of Test methods

Tests were performed manually, and no special test software was used. Preliminary tests were carried out and this report contains the worst-case results.

2 Emissions Measurements

2.1 Conducted Emissions Measurements

Radio Conducted measurements were carried out on the EUT as per section 1.1 above.

All results were measured as conducted on the antenna port except radiated spurious emissions.

2.2 Radiated Emissions Measurements

The EUT was centred on a motorized turntable, which allows 360-degree rotation.

Emissions below 1GHz were measured using an antenna positioned at a distance of 3 metres from the EUT (as measured from the closest point of the EUT). The radiated emissions were maximised by configuring the EUT, by rotating the EUT, and by raising and lowering the antenna from 1 to 4 metres. In this case the resolution bandwidth was 100kHz. A bi-conical antenna was used for frequencies below 300MHz, and a log periodic antenna was used for the 300MHz to 1GHz frequency range

Emissions in the 1GHz-3.6GHz range were measured using a horn antenna located at 3 metres distance from the EUT in a fully anechoic chamber. The radiated emissions were maximised by configuring the EUT and by rotating the EUT and by raising and lowering the antenna from 1 to 4 metres. In this case the resolution bandwidth was 1MHz and video bandwidth was 3MHz. for peak measurements. The Video bandwidth was changed to 10Hz for Average measurements (as per ANSI 63.10 2013 Section 4.1.4.2.3)

Emissions above 3.6GHz were measured using a horn antenna located at 3 metre distance from the EUT in a fully anechoic chamber. The radiated emissions were maximised by configuring the EUT and by rotating the EUT. In this case the resolution bandwidth was 1MHz and video bandwidth was 3MHz. for peak measurements. The Video bandwidth was changed to 10Hz for Average measurements (as per ANSI 63.10 2013 Section 4.1.4.2.3).

3 Results for Conducted Emissions on the Mains

The EUT was powered from the LISN through an dc adapter FSP 040-DAAN3

Detector	Frequency	Reading	Margin	Phase	
QP/ Ave	MHz	dBuV	dB	L/N	
Quasi-Peak	lasi-Peak 0.1500 45.08		-20.92	Live	
Average	0.3705	33.03	-16.67	Live	
Quasi-Peak	0.3750	38.06	-21.51	Live	
Average	0.3998	38.40	-10.46	Live	
Quasi-Peak	0.404	43.10	-15.64	Live	

Results for the Live Test

Detector	Frequency	Reading	Margin	Phase	
QP/ Ave	MHz	dBuV	dB	L/N	
Quasi-Peak	0.1500	43.15	-22.85	Neutral	
Average	0.3705	32.27	-17.43	Neutral	
Quasi-Peak	0.3750	37.06	-22.51	Neutral	
Average	0.3998	38.03	-10.83	Neutral	
Quasi-Peak	0.4043	42.90	-15.84	Neutral	

Results for the Neutral Test

Ref Appendix E for Scans

4 Conducted Measurements on the Antenna port

4.1 Bandwidth

4.1.1 20dB bandwidth

Requirement FCC 15.247(a) IC RSS-247 5.1a

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The maximum 20 dB bandwidth of the hopping channel shall be 500 kHz.

As per Ansi63.10 Section 7.8.7

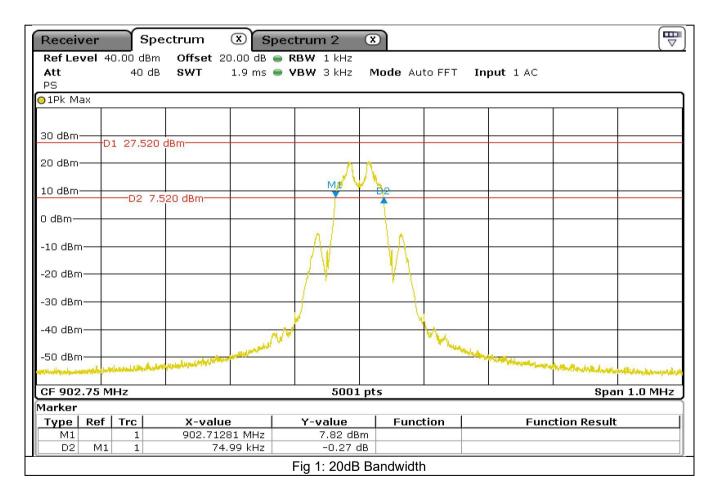
Test Method

A reference level is established by first using a resolution bandwidth that exceeds the signal bandwidth.

The resolution bandwidth is then reduced to 1% of the estimated emission

bandwidth and the video bandwidth is set to 3 times the resolution bandwidth. The markers are now moved to the -20 dB points (from the previously established reference

level) on either side of centre frequency



Channel	Channel Frequency 20dB Bandwidth		20dB Bandwidth Limit		
	MHz	KHz	KHz		
Low	902.75	74.99	500		
Mid	914.75	75.18	500		
High	927.25	75.38	500		

4.1.2 99% bandwidth

Test Method As per Ansi 63.10 Section 6.9.3

Ansi 63.10 Section 6.9.3 Occupied bandwidth—power bandwidth (99%) measurement procedure

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequence between these two frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

TEST PROCEDURE

The test was performed as a conducted measurement.

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Receiver	Spe	ctrum	Spec	trum 2	×				
Ref Level 40.).00 dB 🔵 F			~			
Att PS	35 dB	SWT	1.9 ms 👄 🎙	/BW 3 kHz	Mode Aut	OFFT In	put 1 AC		
01Pk Max									
					00	cc Bw		74.6850	62987 kHz
30 dBm	~		-						
					M1				
20 dBm					Λ				
10 dBm				T1 V	12 7				
					1				
0 dBm				1	1	ĸ			
-10 dBm			-A	1		Λ			-
				V	V	$/ \chi$			
-20 dBm					×				
-30 dBm							-		
			W			1	L a.		
-40 dBm		. NWW					VV.		
-50 dBm	and and a strength	yay -					W/W	mulacherrow	Number and the second
									A CONTRACT OF
CF 902.75 MH	z			5001	pts			Span	500.0 kHz
Marker									
	Frc	X-value		Y-value	Funct	ion	Fund	tion Result	
M1 T1	1	902.762		21.47 dB 9.32 dB		c Bw		74.6850	62987 kHz
T2	1	902.78729		9.25 dB					
				Fig 2: 99%	Bandwidth				

Bandwidth Result

Channel	Frequency	99% Bandwidth
	MHz	KHz
Low	902.75	74.685
Mid	914.75	74.785
High	927.25	74.585

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Receiver	Spe	ctrum	$\overline{\mathbf{x}}$						
Ref Level	40.00 dBm	Offset 20).00 dB 🔵 F	RBW 300 kH	z				
Att	40 dB	SWT	6.4 µs 👄 🎙	/BW 1 MH	z Mode /	Auto FFT	Input 1 AC		
PS									
😑 1Pk Max]
				N	1				
30 dBm					-				
20 dBm				-					
10 dBm									
0 dBm									
-10 dBm-									
-20 dBm									
-30 dBm									
-40 dBm									
-40 aBm									
-50 dBm—									
CF 902.75	MHz			691	pts			Spa	n 1.0 MHz
Marker									
	Trc	X-value		Y-value	Func	tion	Fund	ction Result	
M1	1	902.7	75 MHz	27.45 dB]
			Fig 3: C	Conducted (Dutput Pow	er Peak			

4.2 Output power Conducted

Frequency	Measurement	Conducted Peak	Limit	Margin
MHz	dBm	dBm	dBm	dB
902.75	27.45	27.45	30	2.55
914.75	27.87	27.87	30	2.13
927.25	27.8	27.8	30	2.2

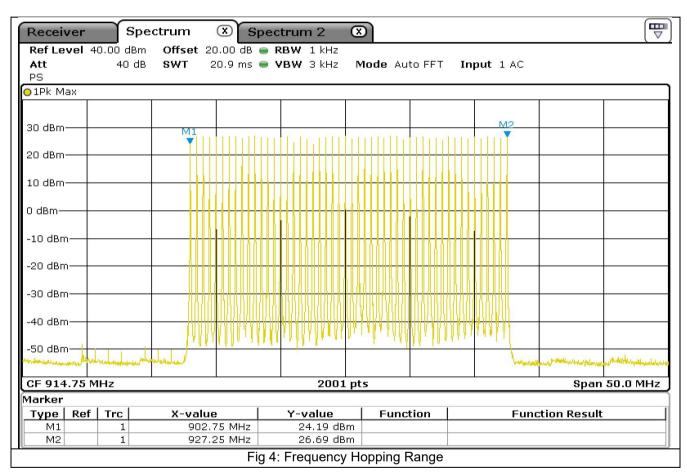
Limit

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels

4.3 Frequency Hopping Characteristics

Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

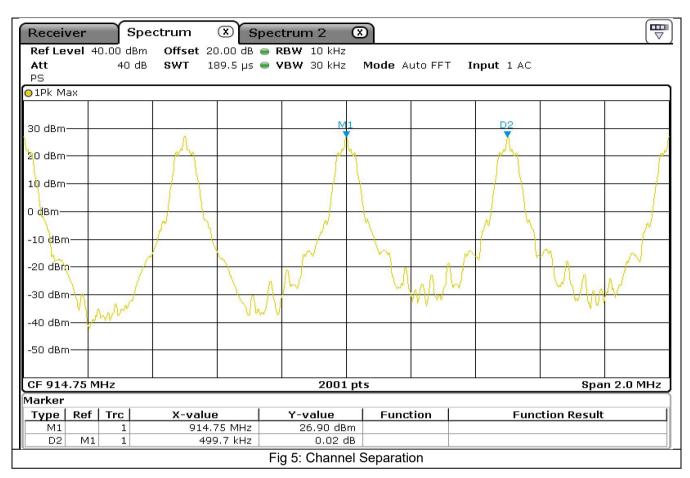


4.3.1 Frequency hopping range number of hopping Channels

Lowest channel 902.75MHz Highest channel 927.25MHz

Number of hopping channels = 50

Limit: Min 50 hopping channels if the bandwidth is less than 250KHz.



4.3.2 Frequency hopping channel separation

Channel separation = 499.7KHz

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Receiver	ectrum	× Spec	trum 2	\mathbb{X}		Ē
Ref Level 40.00 dBm	n Offset 2	0.00 dB 🖷	RBW 100 kH			(*)
Att 40 dE SGL TRG: VID	8 👄 SWT	500 ms 👄	VBW 300 kH	z Input	1 AC	
O1Pk Max						
30 dBm - M1						De
20 dBm TRG 23.00	IO dBm					
10 dBm						
10 ubin						
0 dBm						
-10 dBm						
-20 dBm						
-30 dBm						unnur human
-40 dBm						
-50 dBm						
CF 927.25 MHz			691 p	ts		50.0 ms/
Marker Type Ref Trc	X-value		Y-value	Function	Eur	nction Result
M1 1	15	6.6 as	26.31 dBm	1		
D2 M1 1	398.5	51 ms	0.14 dE	i		
		Fi	n 6: Sinale Pi	Ilse on Time		
<u>р г I – I</u>		Fi	g 6: Single P	ulse on Time		
	ectrum			ulse on Time		æ
Receiver Sp Ref Level 40.00 dBm	n Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	140	
Receiver Sp Ref Level 40.00 dBm		Spec	trum 2	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE	n Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID 1Pk Max	n Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID P1Pk Max 30 dBm	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID 1Pk Max	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID P1Pk Max 30 dBm	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID ● 1Pk Max 30 dBm Mb2 20 dBm 10 dBm	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID 9 1Pk Max 30 dBm 10 dBm 10 dBm 0 dBm	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID IPk Max 30 dBm 10 dBm 10 dBm -10 dBm	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID 9 1Pk Max 30 dBm 10 dBm 10 dBm 0 dBm	Offset 2	Spec	trum 2 (RBW 100 kH	<u>ی</u>	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID IPk Max 30 dBm 10 dBm 10 dBm -10 dBm	Offset 2 SWT O dBm O dBm O dBm	Spec	trum 2 (RBW 100 kH	3 2 2 1nput	1 AC	
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID • • 1Pk Max 30 dBm • • 1Pk Max 20 dBm • 10 dBm • • 0 dBm • • •	0 Offset 2 SWT	Spec 0.00 dB ● 25 s ●	Ctrum 2	3 2 2 1nput		
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID 9 1Pk Max 30 dBm 30 dBm 10 10 dBm 10 -10 dBm -20 dBm -20 dBm 10 dBm -40 dBm 10 dBm	0 Offset 2 SWT	Spec 0.00 dB ● 25 s ●	Ctrum 2	3 2 2 1nput		
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID • • 1Pk Max 30 dBm • • 1Pk Max 20 dBm • 10 dBm • • 0 dBm • • •	0 Offset 2 SWT	Spec 0.00 dB ● 25 s ●	Ctrum 2	3 2 2 1nput		
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID 9 1Pk Max 30 dBm 30 dBm 10 10 dBm 10 -10 dBm -20 dBm -20 dBm 10 dBm -40 dBm 10 dBm	0 Offset 2 SWT	Spec 0.00 dB ● 25 s ●	Ctrum 2	3 2 2 2 1nput		
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID 1Pk Max 30 dBm 102 20 dBm TRG 10 dBm 10 dBm -20 dBm 10 dBm -40 dBm 10 dBm -50 dBm 10 dBm	Offset 2	Spec	Etrum 2 (RBW 100 kH VBW 300 kH	Z Z Input		
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG: VID 1Pk Max 30 dBm 10/22 20 dBm TRG 10 dBm 10 -10 dBm -10 -20 dBm 10 -40 dBm 10 -50 dBm 10	N Offset 2 S SWT	Spec	Ctrum 2 () RBW 100 kH VBW 300 kH	2 2 2 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
Receiver Sp Ref Level 40.00 dBm Att 40 dE SGL TRG:VID 1Pk Max 30 dBm 102 20 dBm 1RG 23.00 10 dBm 10 dBm -20 dBm 10 dBm -40 dBm 10 dBm -50 dBm 10 dBm <	0 Offset 2 3 ● SWT 10 dBm 10 dBm	Spec	Etrum 2 (RBW 100 kH VBW 300 kH	2 2 2 2 1 1 2 1 2 1 2 1 2 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1		D3 D3 Munioum Moyouth 2.5 s/

4.3.3 Frequency hopping average time of channel occupancy

Calculation Single pulse on time = 398.551mS Max Num of pulses in 20sec window = 1 Max on time in 20secs window =1* 0.39855 secs < 0.4 secs limit

4.4 Conducted Spurious Emissions

Frequency	100KHz RBW	dBc Limit Min	Margin	Result
MHz	dBm	dB	dB	P/F
902.75	27.65	20	-	-
1085.5	-63.43	20	71.08	Pass
2708.2	-66.92	20	74.57	Pass

4.4.1 Conducted Spurious Emissions (100KHz bandwidth)

Results for Conducted Emission for Low Channel (902.75MHz)

Frequency	100KHz RBW	dBc Limit Min	Margin	Result
MHz	dBm	dB	dB	P/F
914.75	27.63	20	-	-
1829.5	-64.07	20	71.7	Pass
2744.2	-66.09	20	73.72	Pass

Results for Conducted Emission for Middle Channel (914.75MHz)

Frequency	100KHz RBW	dBc Limit Min	Margin	Result
MHz	dBm	dB	dB	P/F
927.25	27.64	20	-	-
1854.5	-59.36	20	67	Pass
2781.7	-64.24	20	71.88	Pass

Results for Conducted Emission for Middle Channel (927.25MHz)

Refer to Appendix A for Scans

4.4.2 Conducted Emissions Band Edge

Refer to Appendix B for Scans

5 Radiated Emissions

5.1 Radiated Spurious Emissions with Internal Antenna

5.1.1 Radiated Spurious Emission for 902.75MHz

Frequency	Quasi peak Level	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Quasi Peak	Average Limit	Margin	Result
MHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
119.440	-6.9	01	Horizontal	10.1	0	1.8	5.0	43.5	38.5	Pass
250.000	4.5	01	Horizontal	16	0	2.5	23.0	46.0	23.0	Pass

Final Field Strength Quasi Peak (dBuV/m) =Quasi peak Level (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB)

Calculation Example 23.5 = 9.4 + 12 - 0 + 2.1

Frequency	Reading Peak	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Peak	Average Limit	Margin for Peak v Average Limit +20dB	Result
GHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
2.708	14.4	01	Vertical	29.1	0	5.1	48.6	54.0	25.4	Pass
3.611	44.1	01	Vertical	31.7	38.2	5.8	43.4	54.0	30.6	Pass
4.514	45.1	01	Vertical	32.6	39.1	7.5	46.1	54.0	27.9	Pass
5.417	44.5	01	Vertical	34.3	39.2	8.2	47.8	54.0	26.2	Pass
8.125	45.7	01	Vertical	36.7	41.1	10.9	52.2	54.0	21.8	Pass
9.028	44.4	01	Vertical	37.8	38.9	10.2	53.5	54.0	20.5	Pass
2.708	14.8	01	Horizontal	29.1	0	5.1	49.0	54.0	25.0	Pass
3.611	44.6	01	Horizontal	31.7	38.2	5.8	43.9	54.0	30.1	Pass
4.514	45.7	01	Horizontal	32.6	39.1	7.5	46.7	54.0	27.3	Pass
5.417	43.5	01	Horizontal	34.3	39.2	8.2	46.8	54.0	27.2	Pass
8.125	46.2	01	Horizontal	36.7	41.1	10.9	52.7	54.0	21.3	Pass
9.028	43.6	01	Horizontal	37.8	38.9	10.2	52.7	54.0	21.3	Pass

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB) Calculation Example 44.7 = 43.4 = 44.1 + 31.7 - 38.2 + 5.8

Frequency	Reading Peak	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Peak	Average Limit	Margin for Peak v Average Limit +20dB	Result
GHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
2.744	14.2	01	Vertical	29.1	0	5.1	48.4	54.0	25.6	Pass
3.659	45.2	01	Vertical	31.8	38.3	6	44.7	54.0	29.3	Pass
4.574	43.8	01	Vertical	32.7	39.7	8.1	44.9	54.0	29.1	Pass
7.318	45.2	01	Vertical	36.4	40.6	10.1	51.1	54.0	22.9	Pass
8.233	45.6	01	Vertical	36.8	40.9	11	52.5	54.0	21.5	Pass
9.148	44.3	01	Vertical	37.8	38.8	10.1	53.4	54.0	20.6	Pass
2.744	14.6	01	Horizontal	29.1	0	5.1	48.8	54.0	25.2	Pass
3.659	45.2	01	Horizontal	31.8	38.3	6	44.7	54.0	29.3	Pass
4.574	44.4	01	Horizontal	32.7	39.7	8.1	45.5	54.0	28.5	Pass
7.318	44.3	O1	Horizontal	36.4	40.6	10.1	50.2	54.0	23.8	Pass
8.233	45.7	O1	Horizontal	36.8	40.9	11	52.6	54.0	21.4	Pass
9.148	43.7	01	Horizontal	37.8	38.8	10.1	52.8	54.0	21.2	Pass

5.1.2 Radiated Spurious Emission for 914.75MHz

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB) Calculation Example44.7 = 45.2 + 31.8 - 38.3 + 6

5.1.3 Radiated Spurious Emission for 927.25MHz

Frequency	Reading Peak	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Peak	Average Limit	Margin for Peak v Average Limit +20dB	Result
GHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
2.782	13.9	O1	Vertical	29.3	0	5.3	48.5	54.0	25.5	Pass
3.709	44.9	O1	Vertical	32.1	38.3	6	44.7	54.0	29.3	Pass
4.636	44.2	O1	Vertical	32.6	39.7	8.1	45.2	54.0	28.8	Pass
7.418	44.8	O1	Vertical	36.6	40.8	10.4	51.0	54.0	23.0	Pass
8.345	44.9	O1	Vertical	37.2	40.7	10.9	52.3	54.0	21.7	Pass
2.782	13.9	O1	Vertical	29.3	0	5.3	48.5	54.0	25.5	Pass
3.709	45.7	01	Horizontal	32.1	38.3	6	45.5	54.0	28.5	Pass
4.636	44.9	O1	Horizontal	32.6	39.7	8.1	45.9	54.0	28.1	Pass
7.418	44.5	O1	Horizontal	36.6	40.8	10.4	50.7	54.0	23.3	Pass
8.345	44.7	O1	Horizontal	37.2	40.7	10.9	52.1	54.0	21.9	Pass

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB) Calculation Example 48.5 = 13.9 + 29.3 - 0 + 5.3

Refer to Appendix C for Scans

5.2 Radiated Spurious Emissions with External Antenna

Frequency	Reading Peak	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Peak	Average Limit	Margin for Peak v Average Limit +20dB	Result
GHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
2.708	14.5	O1	Vertical	29.1	0	5.1	48.7	54.0	25.3	Pass
3.611	45.0	O1	Vertical	31.7	38.2	5.8	44.3	54.0	29.7	Pass
4.514	45.4	O1	Vertical	32.6	39.1	7.5	46.4	54.0	27.6	Pass
5.417	45.0	01	Vertical	34.3	39.2	8.2	48.3	54.0	25.7	Pass
8.125	46.1	O1	Vertical	36.7	41.1	10.9	52.6	54.0	21.4	Pass
9.028	44.0	O1	Vertical	37.8	38.9	10.2	53.1	54.0	20.9	Pass
2.708	13.9	O1	Horizontal	29.1	0	5.1	48.1	54.0	25.9	Pass
3.611	44.0	O1	Horizontal	31.7	38.2	5.8	43.3	54.0	30.7	Pass
4.514	45.3	O1	Horizontal	32.6	39.1	7.5	46.3	54.0	27.7	Pass
5.417	45.2	O1	Horizontal	34.3	39.2	8.2	48.5	54.0	25.5	Pass
8.125	46.0	O1	Horizontal	36.7	41.1	10.9	52.5	54.0	21.5	Pass
9.028	43.8	O1	Horizontal	37.8	38.9	10.2	52.9	54.0	21.1	Pass

5.2.1 Radiated Spurious Emission for 902.75MHz

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB) Calculation Example 48.7 = 14.5 + 29.1 - 0 + 5.1

5.2.2 Radiated Spurious Emission for 914.75MHz

Frequency	Reading Peak	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Peak	Average Limit	Margin for Peak v Average Limit +20dB	Result
GHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
2.744	13.7	01	Vertical	29.1	0	5.1	47.9	54.0	26.1	Pass
3.659	44.7	O1	Vertical	31.8	38.3	6	44.2	54.0	29.8	Pass
4.574	44.0	01	Vertical	32.7	39.7	8.1	45.1	54.0	28.9	Pass
7.318	45.1	01	Vertical	36.4	40.6	10.1	51.0	54.0	23.0	Pass
8.233	45.3	01	Vertical	36.8	40.9	11	52.2	54.0	21.8	Pass
9.148	44.0	01	Vertical	37.8	38.8	10.1	53.1	54.0	20.9	Pass
2.744	14.1	01	Horizontal	29.1	0	5.1	48.3	54.0	25.7	Pass
3.659	45.4	01	Horizontal	31.8	38.3	6	44.9	54.0	29.1	Pass
4.574	44.6	O1	Horizontal	32.7	39.7	8.1	45.7	54.0	28.3	Pass
7.318	45.0	O1	Horizontal	36.4	40.6	10.1	50.9	54.0	23.1	Pass
8.233	45.0	O1	Horizontal	36.8	40.9	11	51.9	54.0	22.1	Pass
9.148	43.7	O1	Horizontal	37.8	38.8	10.1	52.8	54.0	21.2	Pass

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB) Calculation Example 44.2 = 44.7 + 31.8 - 38.3 + 6

Frequency	Reading Peak	EUT Orientation	Antenna Polarity	Antenna Factor	Preamp Gain	Cable loss	Final Field Strength Peak	Average Limit	Margin for Peak v Average Limit +20dB	Result
GHz	dBuV/m		V/H	dB	dB	dB	dBuV/m	dBuV/m	dB	P/F
2.782	13.7	01	Vertical	29.3	0	5.3	48.3	54.0	25.7	Pass
3.709	45.5	O1	Vertical	32.1	38.3	6	45.3	54.0	28.7	Pass
4.636	44.2	O1	Vertical	32.6	39.7	8.1	45.2	54.0	28.8	Pass
7.418	45.4	O1	Vertical	36.6	40.8	10.4	51.6	54.0	22.4	Pass
8.345	45.8	O1	Vertical	37.2	40.7	10.9	53.2	54.0	20.8	Pass
2.782	14.3	O1	Vertical	29.3	0	5.3	48.9	54.0	25.1	Pass
3.709	44.9	O1	Horizontal	32.1	38.3	6	44.7	54.0	29.3	Pass
4.636	43.7	O1	Horizontal	32.6	39.7	8.1	44.7	54.0	29.3	Pass
7.418	44.9	01	Horizontal	36.6	40.8	10.4	51.1	54.0	22.9	Pass
8.345	45.7	O1	Horizontal	37.2	40.7	10.9	53.1	54.0	20.9	Pass

5.2.3 Radiated Spurious Emission for 927.25MHz

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB) Calculation Example 48.3 = 13.7 + 29.3 - 0 + 5.3

Average measurement not performed for frequencies where the peak measurement was below the average limit.

Refer to Appendix D for Scans

5.3 Output Power Radiated

5.3.1 Internal Antenna

Frequency MHz	Reading Peak dBuV/m	EUT Orientation	Antenna Polarity V/H	Antenna Factor dB	Preamp Gain dB	Cable loss dB	Final Field Strength Peak dBuV/m	Transmitted Power dBm	Limit	Margin dB	Result P/F
902.750	100.6	O1	Vertical	23.5	0	5.3	129.4	34.2	36.0	1.8	Pass
902.750	100.7	O1	Horizontal	23.5	0	5.3	129.5	34.3	36.0	1.7	Pass
914.750	101.5	O1	Vertical	23.5	0	5.4	130.4	35.2	36.0	0.80	Pass
914.750	101.5	O1	Horizontal	23.5	0	5.4	130.4	35.2	36.0	0.80	Pass
927.250	100.3	O1	Vertical	23.7	0	5.5	129.5	34.3	36.0	1.70	Pass
927.250	100.3	01	Horizontal	23.7	0	5.5	129.5	34.3	36.0	1.70	Pass

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) +Cable Loss (dB)

Calculation Example 129.4 = 100.6 + 23.5 - 0 + 5.3

Transmitted power (dBm) = Final Field Strength Peak (dBuV/m) -95.2 dB Calculation Example 34.2 = 129.4 - 95.2

Test Result: Pass

5.3.2 External Antenna

Frequency	Reading Peak dBuV/m	EUT Orientation	Antenna Polarity V/H	Antenna Factor dB	Preamp Gain dB	Cable loss dB	Final Field Strength Peak dBuV/m	Transmitted Power dBm	Limit	Margin	Result P/F
902.750	101.0	01	Vertical	23.5	0	5.3	129.8	34.6	36.0	1.4	Pass
902.750	101.4	01	Horizontal	23.5	0	5.3	130.2	35.0	36.0	1	Pass
914.750	101.9	O1	Vertical	23.5	0	5.4	130.8	35.6	36.0	0.40	Pass
914.750	102.1	01	Horizontal	23.5	0	5.4	131.0	35.8	36.0	0.20	Pass
927.250	101.1	O1	Vertical	23.7	0	5.5	130.3	35.1	36.0	0.90	Pass
927.250	101.8	O1	Horizontal	23.7	0	5.5	131.0	35.8	36.0	0.20	Pass

Final Field Strength Peak (dBuV/m) =Reading Peak (dBuV/m) + Antenna Factor (dB)- Pre-amp Gain (dB) + Cable Loss (dB)

Calculation Example 129.8 = 101 + 23.5 - 0 + 5.3

Transmitted power (dBm) = Final Field Strength Peak (dBuV/m) -95.2 dB Calculation Example 34.6 = 129.8 - 95.2

6 List of Test Equipment

Instrument	Manufacturer	Model	Serial Num	CEI Ref	Cal Date	Cal Interval Months
Microwave Preamplifier	Hewlett Packard	83017A	3123A00175	805	30-Sep-23	12
Spectrum Analyser 30Hz-40GHz	Rohde & Schwarz	FSP40	100053	850	11-Dec-21	36
Test Receiver 3.6GHz	Rohde & Schwarz	ESR	1316.3003k03- 101625-s	869	24-May-23	36
Receiver N9038A EMI 3Hz - 8.4 GHz	Keysight	MXE N9038A	MX60320104	1204	28-Feb-23	36
Antenna Horn	EMCO	3115	2363	1100	22-Feb-23	36
Fully Anechoic Chamber	CEI	FAR 3M	906	906	24-Jul-22	36
Anechoic Chamber	CEI	SAR 10M	845	845	22-Nov-22	36
Antenna Biconical	Schwarzbeck	VHBB 9124	9124 667	871	07-Oct-21	36
Antenna Log Periodic	Chase	UPA6108	1072	609	10-Sep-21	36
Antenna Horn Standard Gain 18- 26.5GHz	A-Info	LB-42-25-C-KF	J2021091103028	877	30-Jul-23	12
Cable 20m				1213	16-May-23	12
Cable purple Ktype 1.8m				917	30-Jul-23	12
Cable HF Ktype 1.5m				705	30-Jul-23	12

7 Measurement Uncertainties

Measurement	Uncertainty
Radio Frequency	+/- 5x10 ⁻⁷
Maximum Frequency Deviation	+/- 1.7 %
Conducted Emissions	+/- 1 dB
Radiated Emission 30MHz-100MHz	+/- 5.3 dB
Radiated Emission 100MHz-300MHz	+/- 4.7 dB
Radiated Emission 300MHz-1GHz	+/- 3.9 dB
Radiated Emission 1GHz-40GHz	+/- 3.8 dB
Modulation bandwidth	+/- 5x10 ⁻⁷
Duty Cycle	+/- 5 %
Power supply	±0.1 VDC
Temperature	±0.2 °C
Frequency	±0.01 ppm

The measurement uncertainties stated were calculated with a k=2 for a confidence level of over 95% as per ETS TR100 028.

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	Spectrur		S)							
	♥ 100 kHz)0 ms		1 20dB	att			
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10 dBm			1							
0 dBm			1					1		
-10 dBm			1				I I I			
-20 dBm			1				1			
-30 dBm			1				1	1		
-40 dBm		1	1					1		5
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-60 dBm			î Î	a the hard had a more of a		Juneary	muna	manum	-	mill
-70 dBm	mound	mariante							Lan	~
-80 dBm	Marte		1				I I I	1		
		1	1							
-90 dBm			1							
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•	Fig	A1: Low	v Cha	nnel Condu	cted Spuri	ous Emissi	ons 30MHz	z - 1GHz		
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	Spectrur		S)							(₩
RBV Input 1 AC 👄 Att	V 100 kHz 10 dB			00 ms	p TD Scar	1 20dB	att			
Scan O1Pk Max	10 40	FIGUI	ΠP		p iD Star	I				
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Jummer Martin	an a	and and a series of	when	mannorth	Mariant	monormat	More man	and the second second second second	aver-1a	
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-90 dBm										
Start 1.0 GHz									St	TF op 3.6 GHz
	E i ai	A 2 · L ou	(Cha	nnel Condu	atod Spuri		ons 1GHz	3 6GH7		

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					Page	27 of 36	
			Det		Trd	10DB-ATT	
· ·	Att 0 dB AUTO		ResBW			-17	
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-100							
-110							
	3.6 GHz					7 GHz	
	Fig A3: Low (Channel Conducted S	Spurious Emission	is 3.6GHz -7	GHZ		
	Fig A3: Low (Channel Conducted S				1000 3000	
		Channel Conducted S	Det	MA	Trd	10DB-ATT	
	Fig A3: Low (Att 0 dB AUTO INPUT 1	Channel Conducted S			Trd	10DB-ATT dBm	
-10	Att 0 dB AUTO INPUT 1	Channel Conducted S	Det ResBW	MA 100 kHz	Trd		
Ť	Att 0 dB AUTO INPUT 1	Channel Conducted S	Det ResBW	MA 100 kHz	Trd		
Ť	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		ı I
-10	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		ı.
-10	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		ı.
-10 -20 -30	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		1MA
-10 -20	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70 -80	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70 -80	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70 -80 -90	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70 -80 -90	Att 0 dB AUTO INPUT 1		Det ResBW	MA 100 kHz	Trd		
-10 -20 -30 -40 -50 -60 -70 -80 -90 -100	Att 0 dB AUTO INPUT 1	Channel Conducted S	Det ResBW Meas T	MA 100 kHz 100 ms	Trd Unit		lma

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Receive	er	Spe	ctrum	×								
Ref Lev	el 40	0.00 dBm	Offset	20.00 dB	e RBV	V 100 k⊢	łz					
Att		40 dB	SWT	19.1 µs	: 🖷 YB\	√ 300 kH	lz I	Mode	Auto FFT	Input 1 AC		
PS												
⊖1Pk Ma>	<											
30 dBm—										M1		
00 00.00										\sim		
20 dBm—	_									$\langle \cdot \rangle$		
10 dBm—	5			_								
0 dBm—	_									1		
6 10 1 10 10 10 10									1	1		
-10 dBm-	_											-
									1		1	
-20 dBm-	_											
									1		1	
-30 dBm-						0	2				~	
	-							~				
-40 dBm-	-											
-50 dBm-							15					
CF 902.0	л мн	z	•	- 1	I	691	pts			1	Span	3.15 MHz
Marker							-				-	
Type	Ref	Trc	X-val	ue	Y	-value	1	Func	tion	Fund	ction Result	Î
M1		1	902.7	7522 MHz		27.65 dB	lm					
D2	M1	1	-7	'52.2 kHz		-62.88 (зв					
				Fig A	5. Low C	hannel C	arrier	Power	Conducted			

Appendix B: Conducted Tests for Band Edges

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Receiver	Spe	ctrum	∞						
Ref Level	40.00 dBm			RBW 100 kHz					
Att PS	40 dB	SWT	19.1 µs 👄	VBW 300 kHz	Mode Auto	FFT I	nput 1 AC		
⊖1Pk Max									
							10000		
30 dBm							M1		
20 dBm							$ \land $		
20 ubiii-							$I = \chi$		
10 dBm									
0 dBm									
0.00							1		
-10 dBm—									
-20 dBm								L	
								$\langle \rangle$	
-30 dBm				02		1		5	
-40 dBm									
-50 dBm									
CF 902.0 N Marker	/IHZ			691 pt	is			Span	3.15 MHz
Type Re	f	X-value	.	Y-value	Function	1	Funr	ction Result	· 1
M1	1	902.752	22 MHz	27.65 dBm					
D2 M	11 1		2.2 kHz	-62.88 dB					
					· _ · · · · ·				
		Fig E	31: Low Ch	nannel Band Edg	e Conducted N	on-Hop	ping		
(Dereciver)			_	nannel Band Edg	e Conducted N	on-Hop	ping		
Receiver		ctrum	×		e Conducted N	on-Hop	ping		
	Spe 40.00 dBm 40 dB	ctrum Offset 20	×	RBW 100 kHz					
Ref Level Att PS	40.00 dBm	ctrum Offset 20	×				ping nput 1 AC		
Ref Level Att	40.00 dBm	ctrum Offset 20	×	RBW 100 kHz					V
Ref Level Att PS	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS	40.00 dBm	ctrum Offset 20	×	RBW 100 kHz					
Ref Level Att PS 1Pk Max 30 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS 1Pk Max	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS 1Pk Max 30 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level PS PIPk Max 30 dBm 20 dBm 10 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS 1Pk Max 30 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level PS PIPk Max 30 dBm 20 dBm 10 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS ● 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS ● 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz VBW 300 kHz					
Ref Level Att PS 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz					
Ref Level Att PS 1Pk Max 30 dBm 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz VBW 300 kHz					
Ref Level Att PS 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz VBW 300 kHz					
Ref Level Att PS 1Pk Max 30 dBm 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -40 dBm	40.00 dBm	ctrum Offset 20 SWT	×	RBW 100 kHz VBW 300 kHz					
Ref Level Att PS 1Pk Max 30 dBm 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -40 dBm	40.00 dBm 40 dB	ctrum Offset 20 SWT	×	RBW 100 kHz VBW 300 kHz	Mode Auto				
Ref Level Att PS ● 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	40.00 dBm 40 dB	ctrum Offset 20 SWT	×	RBW 100 kHz VBW 300 kHz	Mode Auto		nput 1 AC	Span	3.15 MHz
Ref Level Att PS ● 1Pk Max 30 dBm 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm - -20 dBm - -30 dBm - -50 dBm - -50 dBm - CF 928.0 N Marker Type Re	40.00 dBm 40 dB	Ctrum Offset 20 SWT	 Σ D.00 dB = 19.1 μs = 19.1 μs = 	RBW 100 kHz VBW 300 kHz	Mode Auto		nput 1 AC		3.15 MHz
Ref Level Att PS ● 1Pk Max 30 dBm 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm GF 928.0 N Marker Type M1	40.00 dBm 40 dB	Ctrum Offset 20 SWT	 Σ D.00 dB = 19.1 μs = 19.1 μs = 	RBW 100 kHz VBW 300 kHz	Mode Auto		nput 1 AC	Span	3.15 MHz

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Receiv	/er	Spe	ectrum	$\overline{\mathbf{x}}$						
	vel 4	0.00 dBm			RBW 100 kHz					
Att PS		40 dB	SWT	18.9 µs 👄	VBW 300 kHz	Mode	Auto FFT	Input 1 AC		
<mark>⊙</mark> 1Pk Ma	эх						•	-		
							M1			
30 dBm-								\wedge	\wedge	\wedge
20 dBm-							$ \land$	+/+	-/	- + +
							$ \uparrow \rangle$	f	$ \rangle \langle \rangle$	$\int $
10 dBm-	¥.		2							
0 dBm—							+	+	+	+
-10 dBm										$f \rightarrow 1$
-10 0011							1			1
-20 dBm							1	∛	₩ 1	$ \rightarrow $
-30 dBm	0						9	tra .		
~~~~~	$\sim$			~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1			
-40 dBm										
-50 dBm	r <u> </u>									
CF 902.	.0 MH	lz			691 j	ots			Spa	1 5.0 MHz
Marker Type	Ref	Trc	X-value	a	Y-value	Func	tion	Fun	ction Result	
M1		1	902.75	25 MHz	28.28 dBr	n				
D2	M1	1		2.5 kHz	-64.80 dl Channel Band		lucted Hopr	ning		
				у D5. L0W (		Luge Conc		Jing		
Receiv	/er	Spe	ectrum	$\odot$						E
Ref Lev	vel 4	0.00 dBm	Offset 2	0.00 dB 🔵	RBW 100 kHz	:				
Att PS		40 dB	SWT	18.9 µs 👄	<b>VBW</b> 300 kHz	Mode	Auto FFT	Input 1 AC		
01Pk Ma	эх									
30 dBm-		~	~	M1						
20 dBm-		$\Delta$	$\square$	$\square$						
		$\left( \right)$	$    \rangle$	$  \rangle \rangle$						
10 dBm-		$f \rightarrow$	+	$\uparrow$						
0 dBm—		$ \downarrow \downarrow$	$\downarrow \downarrow$	$\downarrow$						
1	11	1	$  \uparrow \rangle$	$  \langle \rangle \rangle$						
10 dBm		1								
11	111						1			
-20 dBm	₩		¥	/	\ <del> </del>					
P	- ¥		¥	/						
-20 dBm -30 dBm	- ¥			V	DZ					
P	¥				De					~~~~~
-30 dBm -40 dBm	¥ —									~~~~~
-30 dBm	¥ —				De					
-30 dBm -40 dBm	<u> </u>	łz			691				Spa	1 5.0 MHz
-30 dBm -40 dBm -50 dBm CF 928. Marker	.0 MH				691 ;	ots				n 5.0 MHz
-30 dBm -40 dBm -50 dBm CF 928. Marker Type	<u> </u>	Trc	X-value 927.24		691 ; Y-value	ots	tion	Fun	Spa ction Result	1 5.0 MHz
-30 dBm -40 dBm -50 dBm CF 928. Marker	.0 MH		927.24		691 ;	ots Func	tion	Fun		1 5.0 MHz

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Receiver					₽
	<b>RBW</b> (QPK) 120		00 ms	871_20m	
Input 1 AC 🖷		dB Preamp	ON Ste	t <b>ep</b> TD Scan	
Scan O1Pk M	Max 02QP Max			· · · · · · · · · · · · · · · · · · ·	
			1	100 MHz	
80 dBµV					
70 dBµV					
60 dBµV					
50 dBµV					
40 dBµV					
30 dBµV					MA
	mon			by many in the property with	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
		V W	Vinna	My we have a band band	P
0 dBµV		Ŵ	V	1 W. W. M.	
					т
Start 30.0 M	Hz		1 1	Stop 300.0	
		Channel Radiat	ed Emissio	ions 30MHz - 300MHz, Vertical, 3metres	

Receiver	ר						
	RBW (QPK)	120 kHz	MT 10	) ms		871_20m	
Input 1 AC 👄	Att	0 dB	Preamp	ON	Step TD Scan		
Scan O1Pk 🛛	Max <b>o</b> 2QP Ma	X					
				1	100 MHz		
80 dBµV							
70 dBµV							
60 dBµV							
50 dBµV							
40 dBµV			 				
30 dBµV			1 1 1 1 1				1
20 dBµV	Munno	m	Maria		un marine and	and a stand and	warmen and warmen
	$\sim$	~				home	where the second
0 dBµV							TF
Start 30.0 M	0.0103						Stop 300.0 MHz
	Fig C2: L	ow Chan	nel Radiated	Emis	ssions 30MHz - 3	300MHz, Horizontal, 3m	etres

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Stop 1.0 GHz

Receiver       RBW (QPK) 120 kHz       MT       100 ms       609_20m         Input 1 AC • Att       0 dB       Preamp       ON       Step TD Scan         Scan • 1Pk Max • 2QP Max       Image: Complex state of the state	
Input 1 AC ● Att     0 dB     Preamp     ON     Step TD Scan       Scan     ● 1Pk Max ● 2QP Max	· · · · · ·
Scan O1Pk MaxO2QP Max	
	Í
130 dBµV	
120 dBµV	
110 dBµV	
100 dBµV	
90 dвµV	
80 dBµV	
70 dBµV	
60 dBµV	
50 dBµV	Mham
40 dBµV	- all
30 dBuV-	mark m
20.d8pv	4
10 dBWW	1
0 dBµV	
F	
Start 300.0 MHz	Stop 1.0 GHz
Fig C3: Low Channel Radiated Emissions 300MHz - 1GHz, Vertical, 3metre	25
Receiver	
RBW (QPK) 120 kHz MT 100 ms 609_20m	· · · · · ·
Input 1 AC <ul> <li>Att</li> <li>O dB</li> <li>Preamp</li> <li>ON</li> <li>Step TD Scan</li> </ul> <li>Scan <ul> <li>1Pk Max</li> </ul> </li> <li>Q2P Max</li>	
	ĺ
130 dBµV	
120 dBµV	
110 dBµV	Manna Maria
120 dBµV—	
110 dBµV	Manne Marine Jan Marine
110 dBµV	Marine Marine Jan Marine

Fig C4: Low Channel Radiated Emissions 300MHz - 1GHz, Horizontal, 3metres

TF

Start 300.0 MHz

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Receiver Spectrum 🗴	(4
RBW 1 MHz MT 100 ms	655_ESRG
Input 1 AC  Att 0 dB Preamp ON Step TD Scar	
Scan ⊙1Pk Max⊙2Av Max	
90 dBµV	
50 dop.	
80 dBµV	
70 dBµV	
60 dBµV	
50 dBµV	and a hard the stand of the stand
	mol man and the most that the state of the s
40 dBUV	
An a strong of the strong of t	
30 dвµV	
hand	
20 dBµV	
10 dBµV	
10 UBHV	
	1
Start 1.0 GHz	Stop 3.6 GHz
Fig C5: Low Channel Radiated Emission	ns 1GHz - 3.6GHz, Vertical, 3metres
	_
Receiver Spectrum (8)	
RBW 1 MHz MT 100 ms	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC  Att 0 dB Preamp ON Step TD Scar	655_ESRG
RBW 1 MHz MT 100 ms	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC  Att 0 dB Preamp ON Step TD Scar	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ●1Pk Max●2Av Max	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC  Att 0 dB Preamp ON Step TD Scar	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ●1Pk Max●2Av Max 90 dBµV	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ●1Pk Max●2Av Max	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ●1Pk Max●2Av Max 90 dBµV- 80 dBµV-	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ●1Pk Max●2Av Max 90 dBµV	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ● 1Pk Max●2Av Max 90 dBµV- 80 dBµV- 70 dBµV-	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ●1Pk Max●2Av Max 90 dBµV- 80 dBµV-	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ●1Pk Max       ●2Av Max       90 dBµV       90 dBµV       90 dBµV         80 dBµV       60 dBµV       60 dBµV       90 dBµV       90 dBµV	655_ESRG
RBW 1 MHz MT 100 ms Input 1 AC ● Att 0 dB Preamp ON Step TD Scar Scan ● 1Pk Max●2Av Max 90 dBµV- 80 dBµV- 70 dBµV-	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ●1Pk Max       ●2Av Max       90 dBµV       90 dBµV       90 dBµV         80 dBµV       60 dBµV       60 dBµV       90 dBµV       90 dBµV	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ●1Pk Max       ●2Av Max       90 dBµV       90 dBµV       90 dBµV         80 dBµV       60 dBµV       60 dBµV       90 dBµV       90 dBµV	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ●1Pk Max       ●2Av Max       90 dBµV       90 dBµV       90 dBµV         80 dBµV       60 dBµV       60 dBµV       90 dBµV       90 dBµV	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ●1Pk Max       ●2Av Max       90 dBµV       90 dBµV       90 dBµV         80 dBµV       60 dBµV       60 dBµV       90 dBµV       90 dBµV	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ● 1Pk Max ● 2Av Max         90 dBµV       80 dBµV         80 dBµV       60 dBµV         50 dBµV       50 dBµV	655_ESRG
RBW 1 MHz         MT         100 ms           Input 1 AC         Att         0 dB         Preamp         ON         Step TD Scar           Scan         1Pk Max         2Av Max         90 dBµV	655_ESRG
RBW 1 MHz       MT       100 ms         Input 1 AC ● Att       0 dB       Preamp       ON       Step TD Scar         Scan       ● 1Pk Max       ● 2Av Max         90 dBµV	655_ESRG
RBW 1 MHz         MT         100 ms           Input 1 AC         Att         0 dB         Preamp         ON         Step TD Scar           Scan         1Pk Max         2Av Max         90 dBµV         <	655_ESRG
RBW 1 MHz         MT         100 ms           Input 1 AC         Att         0 dB         Preamp         ON         Step TD Scar           Scan         1Pk Max         2Av Max         90 dBµV	655_ESRG
RBW 1 MHz         MT         100 ms           Input 1 AC         Att         0 dB         Preamp         ON         Step TD Scar           Scan         1Pk Max         2Av Max         90 dBµV         <	655_ESRG

Fig C6: Low Channel Radiated Emissions 1GHz - 3.6GHz, Horizontal, 3metres

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	Att 0 d Preamp			Det ResBW Meas T	MA/AV 1 MHz 100 ms		655_	_805 dBµV	- 7
90							10	GĦz	
80									
70									
									1 MA
60									2AV
50									
			mannon	mmumm	winn	hormon	m	~~~~	
40	<b>F</b> •	wwwwwwwwwww							
						h	m	$\sim$	
30				man to					
00									
20									
20									
10									
10									
0									
	3.6 GHz						10	GHz	
		Fig C7: Low Chan	nel Radiated Emiss	ions 3.6GHz - 1	0GHz, Vertica	l, 3metre			
~									
/i/				Det	MA/AV	Trd	655_	805	
	Att 0 d			ResBW	1 MHz		655_	_	-
90 9	Preamp		1					dBµV	
•	Preamp			ResBW	1 MHz			_	-
•	Preamp			ResBW	1 MHz			dBµV	,
90	Preamp			ResBW	1 MHz			dBµV	, ,
90	Preamp			ResBW	1 MHz			dBµV	,
90 80	Preamp			ResBW	1 MHz			dBµV	1MA
90 80	Preamp			ResBW	1 MHz			dBµV	
90 80 70	Preamp			ResBW	1 MHz			dBµV	1MA
90 80 70	Preamp			ResBW	1 MHz			dBµV	1MA
90 80 70 60	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50 40	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50 40	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50 40 30	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50 40 30	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50 40 30 20	Preamp			ResBW	1 MHz 100 ms			dBµV	1MA
90 80 70 60 50 40 30 20	Preamp			ResBW	1 MHz 100 ms			dBµV GHZ	1MA 2AV
90 80 70 60 50 40 30 20 10	Preamp			ResBW Meas T	1 MHz 100 ms	Unit		dBµV	1MA 2AV