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Reference P110210-F30

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### Radio measurements on AIR 5322 B258A

Product name: AIR 5322 B258A Product number: KRD 901 200/2

**RISE Research Institutes of Sweden AB** 

Vehicles and Automation – EMC-ICT

Performed by

Examined by

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## Summary

Standard Listed part of	Compliant
FCC CFR 47 part 30 Subpart C	
2.1046/ 30.202 RF power output	Yes
2.1049 Occupied bandwidth	Yes
2.1053/ 30.203 Field strength of spurious radiation	Yes

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# Description of the test object

Equipment:	Radio equipment AIR 5322 B258A Product number: KRD 901 200/2 containing KRX 101 03/1 Rev. R1A with FCC ID: TA8AKRX10103
Hardware revision state:	R1A
Tested configuration:	3GPP NR TDD
Frequency range:	TX/ RX: 24.25 – 24.45 and 24.75 – 25.25 GHz
No of supported beams:	Config mode 0: 4 beams in 2 orthogonal polarizations each, 8 beams in total. Config mode 1: 2 beams in 2 orthogonal polarizations each, 4 beams in total. Config mode 2: 1 beam in 2 orthogonal polarizations each, 2 beams in total.
Operating bandwidth:	Config mode 0: 4 segments of 200 MHz (700 MHz in total) Config mode 1: 2 segments of 400 MHz (600 MHz in total) Config mode 2: 1 segment of 400 MHz
Nominal Output power (EIRP):	Config mode 0: 47 dBm/ beam and polarization Config mode 1: 53 dBm/ beam and polarization Config mode 2: 59 dBm/ beam and polarization
RF configurations:	TX Diversity, SU and MU MIMO up to 2 layers 1x(2x2), Contiguous Spectrum (CS) and Non-Contiguous spectrum (NCS), Carrier Aggregation (CA) intra-band supported
Antenna beam steering:	Azimuth $\pm 60 \text{ deg}$ , elevation $\pm 15 \text{ deg}$
Channel bandwidth(s)/ Sub Carrier Spacing:	50, 100 and 200 MHz/ 120 kHz
Modulations:	QPSK, 16QAM and 64QAM
Emission designators:	45M9W7D, 94M8W7D and 189MW7D
Emission designators Carrier Aggregation:	Intra-band Maximum 492MW7D (5x100 MHz) Inter-band Maximum 680MW7D (200 + 500 MHz)
RF power Tolerance:	+2.4/ -2.0 dB
CPRI Speed	10.1 and 24.3 Gbps

The information above is supplied by the manufacturer.

#### Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in applicable items of FCC CFR 47 Part 30.

#### **Operation modes during measurements**

The measurements were performed with the test object transmitting test models as defined in 3GPP TS 38.141-2. Test model NR-FR2 TM 1.1 is used to represent QPSK, test model NR-FR2 TM 3.2 to represent 16QAM, test model NR-FR2 TM 3.1 to represent 64QAM modulation

The settings below were deemed representative for worst case settings, for all traffic scenarios when settings with different modulations and RF configurations was found to represent worst case settings.

MIMO mode, NR-FR2 TM1.1, QPSK with the beams locked in boresight. All measurements were performed with the test object configured for maximum transmit power.

The measurement shall be done during active part of transmission, or if the measurement is performed with constant duty cycle <98%, the result shall be adjusted for the duty cycle according to ANSI C63.26 5.2.4.3.4. The duty cycle was measured to 74% and to compensate for this 1.30 dB was added to the test results.

#### Measurements

The test object was powered with -48 VDC by an external power supply. Additional connections are documented in the setup drawings for radiated measurements.

Evaluation of spurious emissions have been done in several beam directions, including extreme settings both in azimuth and elevation planes. Results have shown that Beam index 0/Boresight can represent worst case.

Far field distance for power, OBW and Band edge measurements is 4.66 m, based on the EUT antenna dimensions and the highest transmitter frequency (25.25 GHz).

Far field distances for OOB emissions is based on the measurement antenna dimension and highest frequency in the measurement range :

Frequency range [GHz]	Far field distance R [m]	Measurement distance [m]
18 - 26.5	0.73	5
26.5 - 40	0.48	5
40 - 60	0.34	3
60 - 90	0.22	1
90 - 100	0.17	1

Formula for far field distance calculation, with R being far field distance and D meaning antenna aperture size:

 $R = 2x D^2 / \lambda$ 

#### References

Measurements were done according to relevant parts of the following standards:

CFR 47 part 30, June 2021 ANSI C63.26-2015 KDB 842590 D01 Upper Microwave Flexible Use Service v01r02 KDB 971168 D01 Power Meas License Digital Systems v03r01 KDB 971168 D03 IM Emission Repeater Amp v01 3GPP TR 38.141-2 V15.9.0 3GPP TR 37.842 V13.3.0 (2020-01) RI. SE

#### Measurement equipment

	Calibration Due	RISE number
Anechoic chamber, Hertz	2021-09	BX50194
R&S FSW 43	2021-07	902 073
R&S ESU 40	2021-07	901 385
R&S ZNB 40	2021-07	BX50051
RF Cable VNA-calibration	2022-01	BX50189
RF Cable VNA-calibration	2022-01	BX50190
RF Cable	2021-09	BX50192
RF Cable	2022-05	BX81423
RF Cable	2022-04	KWP04236
RF Cable	2021-09	503 681
RF Cable FSW-B21	2021-09	BX62069
RF Cable FSW-B21	2021-09	BX62073
Attenuator 20 dB	2022-01	BX90205
Bilog antenna Schaffner 6143A	2021-08	504079
EMCO Horn Antenna 3115	2021-07	502 175
EMCO Horn Antenna 3115	2021-12	902 212
EMCO Horn Antenna 3116	2021-07	503 279
Flann STD Gain Horn Antenna 20240-20	-	KWP02600
Flann STD Gain Horn Antenna 22240-20	-	KWP02601
Flann STD Gain Horn Antenna 24240-20	-	BX92414
Flann STD Gain Horn Antenna 26240-20	-	BX92416
Flann STD Gain Horn Antenna 27240-20	-	BX92417
Mixer FS-Z60	2023-09	BX90566
Mixer FS-Z90	2022-01	BX90567
Mixer FS-Z110	2024-01	BX81425
μComp Nordic, Low Noise Amplifier	2022-01	901 544
Miteq, Low Noise Amplifier	2022-01	503 278
Temperature and humidity meter, Testo 615	2021-06	503 498

#### EAB Measurement equipment

Calibrated at RISE before testing.

	Calibration Due	S/N
Eravant SCF-21306340-SFSF-B3 Bandpass filter	2022-05	04881-01
Eravant SCF-34312340-KFKF-B3 Bandpass filter	2022-05	04876-01

## Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation "SP-QD 10885". The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).

Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

#### Reservation

The test results in this report apply only to the particular test object as declared in the report.

### Delivery of test object

The test object was delivered: 2021-04-14.

#### Manufacturer's representative

Mikael Jansson, Ericsson AB.

#### **Test engineers**

Tomas Lennhager and Björn Skönvall, RISE

### Test participant(-s)

None



### Test frequencies used for radiated measurements

Frequency Hor/ Ver [MHz]	Symbolic name	Config mode	Comment
24275.04	$BL_{50}$	2	50 MHz BW, TX bottom frequency configuration lower band
24425.04	TL <sub>50</sub>	2	50 MHz BW, TX top frequency configuration lower band
24775.08	BH <sub>50</sub>	2	50 MHz BW, TX bottom frequency configuration higher band
25225.08	$TH_{50}$	2	50 MHz BW, TX top frequency configuration higher band
24300.00	BL100	2	100 MHz BW, TX bottom frequency configuration lower band
24800.04	$BH_{100}$	2	100 MHz BW, TX bottom frequency configuration higher band
25200.00	TH <sub>100</sub>	2	100 MHz BW, TX top frequency configuration higher band
24350.04	BL200	2	200 MHz BW, TX bottom frequency configuration lower band
24850.08	BH200	2	200 MHz BW, TX bottom frequency configuration higher band
25150.08	TH200	2	200 MHz BW, TX top frequency configuration higher band
24800.04 24900.00 25000.08 25100.04	BH4100	2	100 MHz BW, 4 carrier, TX Bottom frequencies configuration lower band
24275.04 24325.08 24425.04	BimL <sub>50</sub>	2	50 MHz BW, 3 carrier, TX bottom frequencies configuration lower band
24275.04 24375.00 24425.04	TimL <sub>50</sub>	2	50 MHz BW, 3 carrier, TX top frequencies configuration lower band
24775.08 24825.00 25125.00	BimH <sub>50</sub>	2	50 MHz BW, 3 carrier, TX bottom frequencies configuration higher band
24875.04 25175.04 25225.08	TimH <sub>50</sub>	2	50 MHz BW, 3 carrier, TX top frequencies configuration higher band

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Frequency Hor/ Ver [MHz]	Symbolic name	Config mode	Comment
24275.04 24325.08 24375.00 24425.04 25075.08 25125.00 25175.04 25225.08	BT8 <sub>50</sub>	1	50 MHz BW, 8 carrier, bottom and top frequencies configuration
24275.04 24325.08 24775.08 24825.00 24975.00 25025.04 25175.04 25225.08	BMT8 <sub>50</sub>	0	50 MHz BW, 8 carrier, bottom near mid and top frequencies configuration
24800.04 24900.00 25000.08 25100.04 25200.00	CA5 <sub>100</sub>	1	100MHz BW, 5 carrier higher band



#### Test setup: radiated measurements



#### Test object:

1.	Air 5322 B258A, KRD 901 200/2, rev. R1A, s/n: E23C835113,
	Radio Software: CXP 203 0045/1, rev. R9A779
	containing KRX 101 03/1 Rev. R1A with FCC ID: TA8AKRX10103

#### Associated equipment:

2. Testing Equipment: CT11, LPC102494/1, rev. R2A, s/n: T01G487940, BAMS - 1001967409

#### **Functional test equipment:**

2. Computer, Mac Mini, BAMS - 1001997578

#### Interfaces:

Power input configuration DC (KRD 901 200/2): -48 VDC	Power	
EXT Alarm, shielded multi-wire	Signal	
1, Optical Interface Link, single mode opto fibre	Signal	
2, Optical Interface Link, single mode opto fibre	Signal	
3, Optical Interface Link, single mode opto fibre	Signal	
4, Optical Interface Link, single mode opto fibre	Signal	
Ground wire		

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#### RF power output measurements according to CFR 47 §30.202

Date	Temperature	Humidity
2021-05-21	$23 \text{ °C} \pm 3 \text{ °C}$	20 % ± 5 %
2021-06-04	$24 \ ^{\circ}C \pm 3 \ ^{\circ}C$	26 % ± 5 %

#### Test set-up and procedure

The test object was located in a anechoic chamber. The measuring antenna was aligned to the centre of the PAAM. A turn table was used to find the highest output power. A signal analyzer with the channel power function activated was used to measure the output power with the RMS detector activated. The bandwidth setting of the channel power function was set to 100 MHz.

A substitution measurement defined in 3GPP TR 37.842 chapter 10.3.1.1.2 was used to get the actual correction factor (Transducer factor A-D in the figure 1 below) with a Network analyzer (ZNB 40).



Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP



#### Stage 1 - Calibration:

- 1) Connect the reference antenna and the receiving antenna to the measurement RF out port and RF in port of the network analyzer, respectively, as shown in figure 1.
- 2) Install the reference antenna with its *beam peak direction* and the height of its phase centre aligned with the receiving antenna.
- 3) Set the centre frequency of the network analyzer to the carrier centre frequency of the tested signal for EIRP measurement of the EUT and measure LF<sub>EIRP, E→D</sub>, which is equivalent to 20log|S21| (dB) obtained by the network analyzer: LF<sub>EIRP, E→D</sub>: Pathloss between E and D in figure 1.
- 4) Measure the cable loss,  $LF_{EIRP, E \rightarrow F}$  between the reference antenna connector and the network analyzer connector:

 $LF_{EIRP, E \rightarrow F}$ : Cable loss between E and F in figure 1.

5) Calculate the calibration value between A and D with the following formula:  $L_{EIRP\_cal, A \rightarrow D} = LF_{EIRP, E \rightarrow D} + G_{REF\_ANT\_EIRP, A \rightarrow F} - LF_{EIRP, E \rightarrow F}.$   $L_{EIRP\_cal, A \rightarrow D}$ : Calibration value between A and D in figure 1. Was implemented in the spectrum analyzer as a transducer.  $G_{REF\_ANT\_EIRP, A \rightarrow F}$ : Antenna gain of the reference antenna.

#### Stage 2 - Measurement:

- 6) Uninstall the reference antenna and install the EUT with the manufacturer declared coordinate system reference point in the same place as the phase centre of the reference antenna. The manufacturer declared coordinate system orientation of the EUT is set to be aligned with the testing system.
- 7) Measure the mean power,  $P_{R\_EUT\_EIRP, D}$ , D in figure 1.
- 8) Calculate the EIRP with the following formula:

 $EIRP = P_{R\_EUT\_EIRP, D} + L_{EIRP\_cal, A \rightarrow D}$ 

Test Setup, measuring distance 5m:

Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
FLANN Std gain 20240-20	KWP02600
RF Cable	BX81423
RF Cable VNA-calibration	BX50189
RF Cable VNA-calibration	BX50190
RF Cable	KWP04236
RF Cable	BX50192
Testo 615, temperature and humidity meter	503 498

Measurement uncertainty: 3.3 dB

#### Results

Single carrier Config mode 2

Beam index 0 Bore site, Bandwidth 50MHz, QPSK

Nominal rated output power (EIRP) per Beam: 59 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal					
Symbolic name	Carrier 1					
BL <sub>50</sub>	59.17/ 59.79					
BH <sub>50</sub>	57.95/ 59.29					
TH50	58.52/ 59.51					

Beam index 0 Bore site, Bandwidth 100MHz, QPSK Nominal rated output power (EIRP) per Beam: 59 dBm/ Polarization.

Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal						
Symbolic name	Carrier 1					
BL100	59.32/ 59.55					
BH100	57.75/ 58.95					
TH <sub>100</sub>	58.55/ 59.35					

Beam index 0 Bore site, Bandwidth 200MHz, QPSK

Nominal rated output power (EIRP) per Beam: 59 dBm/ Polarization.

	Output power per 100 MHz, Horize		
Symbolic name	Carrier 1 Part A	Carrier 1 Part B	Total (per 200 MHz)
BL <sub>200</sub>	56.53/ 57.22	56.57/ 56.68	59.56/ 59.97
BH200	55.35/ 56.65	55.80/ 56.75	58.59/ 59.71
TH <sub>200</sub>	55.58/ 56.69	56.10/ 56.86	58.86/ 59.79

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Multi carrier

4-Carrier Config mode 2

Beam index 0 Bore site, Bandwidth 100MHz, QPSK Nominal rated output power (EIRP) per Beam: 59 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal						
Symbolic name	Carrier 1	Carrier 2	Carrier 3	Carrier 4	Total (per 400 MHz)		
BH4100	52.69/ 53.61	52.49/ 53.51	52.94/ 53.65	52.76/ 54.01	58.74/ 59.72		

8-Carrier Config mode 1

#### Beam index 0 Boresight, Carrier Bandwidth 50 MHz, QPSK Nominal rated output power (EIRP) per Beam: 53 dBm/ Polarization.

		Output power per 50 MHz, EIRP [RMS dBm] Vertical/ Horizontal								
	Beam 1 Beam 2									
Symbolic name	А	В	С	D	Total Power Beam 1 (per 200 MHz)	Е	F	G	Н	Total power Beam 2 (per 400 MHz)
BT850	47.21/ 47.89	48.05/ 48.88	48.31/ 48.66	48.56/ 48.53	54.08/ 54.52	46.18/ 47.11	46.82/ 48.08	46.91/ 47.99	47.02/ 48.05	52.77/ 53.84

5-Carrier Config mode 1

#### Beam index 0 Boresight, Carrier Bandwidth 100 MHz, QPSK Nominal rated output power (EIRP) per Beam: 53 dBm/ Polarization.

	Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal						
		]	Beam 1			Bea	m 2
Symbolic name	А	В	С	Total Power Beam 1 (per 200 MHz)	Е	F	Total power Beam 2 (per 400 MHz)
CAH5100	48.83/ 49.17	48.09/ 48.90	48.38/ 48.71	53.22/ 53.70	49.80/ 50.11	50.20/ 50.41	53.01/ 53.27

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#### 8-Carrier Config mode 0

#### Beam index 0 Boresight, Carrier Bandwidth 50 MHz, QPSK Nominal rated output power (EIRP) per Beam: 47 dBm/ Polarization.

	Output power per 50 MHz, EIRP [RMS dBm] Vertical/ Horizontal								
		Beam 1			Beam 2				
Symbolic name	A B Total Power Beam 1 (per 100 MHz			С	D	Total power Beam 2 (per 100 MHz)			
BMT850	45.01/44.73	45.35/45.56	48.19/48.18	42.96/43.64	43.1/44.49	46.04/ 47.10			
		Beam 3			Beam 4				
Symbolic name	Е	F	Total Power Beam 3 (per 100 MHz)	G	Н	Total power Beam 4 (per 100 MHz)			
BMT850	44.40/ 44.62	43.43/ 45.30	46.95/ 47.98	43.89/ 43.64	43.89/ 44.34	46.90/ 47.01			

#### Limits

CFR47 §30.202 Power limits.

(a) For fixed and base stations operating in connection with mobile systems, the average power of the sum of all antenna elements is limited to an equivalent isotopically radiated power (EIRP) density of +75dBm/100 MHz. For channel bandwidths less than 100 MHz the EIRP must be reduced proportionally and linearly based on the bandwidth relative to 100 MHz.

Complies?	Yes
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Date	Temperature	Humidity
2021-05-20	$23 \text{ °C} \pm 3 \text{ °C}$	25 % ± 5 %
2021-05-21	$23 \ ^{\circ}C \pm 3 \ ^{\circ}C$	20 % ± 5 %

#### Test set-up and procedure

The test object was located in a anechoic chamber. The measuring antenna was aligned to the centre of the of the PAAM. A turn table was used to find the highest output power. A signal analyzer with Peak detector and max hold was used to measure the OBW.

Test Setup, measuring distance 5m:

Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
FLANN Std gain 20240-20	KWP02600
RF Cable	BX81423
RF Cable VNA-calibration	BX50189
RF Cable VNA-calibration	BX50190
RF Cable	KWP04236
RF Cable	BX50192
Testo 615, temperature and humidity meter	503 498

Measurement uncertainty: 3.3 dB

#### Results

Single carrier, Config mode 2, Bandwidth: 50MHz Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.1	$BH_{50}$	Hor	45.755
1.2	$BH_{50}$	Ver	45.921

#### Single carrier, Config mode 2, Bandwidth: 100MHz Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.3	$BH_{100}$	Hor	94.419
1.4	$BH_{100}$	Ver	94.829

#### Single carrier, Config mode 2, Bandwidth: 200MHz Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.5	$BH_{200}$	Hor	188.558
1.6	$BH_{200}$	Ver	188.567

#### Carrier Aggregation, Config mode 2, Bandwidth: 4x 100MHz, Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.7	BH4100	Hor	392.187
1.8	BH4100	Ver	391.555

Carrier Aggregation contiguous spectrum

Config mode 1, Bandwidth: 5x 100MHz, Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1.9	CAH5100	Hor	490.875
1.10	CAH5100	Ver	491.577

Carrier Aggregation Non-contiguous spectrum

Config mode 0, Bandwidth: 7x 100MHz (2x 100MHz + 5x 100MHz) Calculated maximum aggregated bandwith: = 188.567 + 491.577 = 680.144 MHz

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#### Diagram 1.2, Symbolic name: BH<sub>50</sub>, QPSK, Vertical:

DF 1SM(5322 PL 24-260 Occupied Bandwidth	HZ SM <sup>®</sup>	a sere mode sere	n and a second			315			Cours :	e IPL May
									М	1[1] 44,70 dB 24,770 141 0 D
o den			man	montilion	many	formation				
U Det-										
o dein-						1				
to dibivi										
0 din	Approximation	annun ar verschilte	And and				has	manna	a share	
Bran whether a string the store									and the second second	and a second pression
1D offere										
20 din										
30 dên							-			
F 24,775 GHz			5001 pts			15.0 MHz/				Span 150.0 MH
the second se										

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Diagram 1.4, Symbolic name: BH100, QPSK, Vertical:

22 Bh	
-12 (b)	
10 Bit	maphiesesset
1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
-10 dm	
07 24.8 GHz 5001 pts 30.0 MHz/	Span 300.0 MH

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#### Diagram 1.6, Symbolic name: BH<sub>200</sub>, QPSK, Vertical:

Ref Level 60.00 dB	m = RBW d5 = SWT 100 ms = VBW	Anno and Auto Sweep	X INVIN	×					SGL Count :	100/300
1 Occupied Bandwis	260HZ SM*				9.0			0	8-1	- IFk Max
										M1[1] 48,42 dBn
50 dBm	-		11			- H1	-			24.040 140 100
40 d0+										
			1				1			
30, 0910-										
10 d8w-							1			
10 dBer	and and the second second	an selen and an and the selen					-		and make the second second	
-	and the second data is a s									- was a stand a share a stand
1.00										
-1D dBrs										
-20 dire-										
-30 dim	-					-				
CF 24.85 GHz			5001 pts			60.0 MHz/				Span 600.0 MH
2 Marker Table	d Tec	V-Value		V.V.d.m		Exection			Function Re	0.#
Mi TI T2	1 1	24.939 14 GHz 24.755 86 GHz 24.956 87 GHz		48.42 dBm 44.69 dBm 45.26 dBm	Doc Bw Occ Bw Centrol Occ Bw Fren Of	d Toot			188.567 095 7 24.85014 143.8551	41 MHz 1065 GHz 40.45 HHz
11						2010			Roady III	

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#### Diagram 1.7, Symbolic name: BH4100, QPSK, Horizontal:

I Occupied Bandwid	th			1			112			- LPK Max M1[1] 49,74 dBn
50 dBm				mon	1 anoneman	monthermany to	arrowt			25.138120 04
40 mm				- X - 33	V	V V				
30 dem						-				
10 d8v-								hanna		
	1 mm N	human	m						manner	mante
and the second second	1 million of									- Andrewski
D dbre			-							
-1D dbra										
-20 dint-										
-30 dim			-							
CF 24.95 GHz			-	5001 pts			120.0 MHz/			Span 1.2 GHz
2 Marker Table	and a sector	100000								and the second second
Mi TL	1 1 1	25.138 12 GHz 24.754075 GHz			49.74 dBm 46.17 dBm	Doc Bw Occ Bw Centrol	Eunchon.		392.186 756 2 24.95016	5 MHz 030 GHz

#### Diagram 1.8, Symbolic name: BH4100, QPSK, Vertical:

Ref Level 60.00 dBr Att 10 d TDF '5M(5322 PL 24-2	x +==== X = RB = SWT 100 ms = VB = G0+Z SM*	W 5MHz Mode Auto Sw	x mana	X Passe in F	×				SGL Count	300/300
1 Occupied Bandwid	th				10					M1[1] 49.24 dBn 24.988 150 GH
10 dBm			mon	my reasoning	, dentaming 1	many	_			
40 d0m				V	y v		-			
30 dam-							-		-	
10 day						2				
		noursen	-				-	manna		
Di Ben	and a state of the								and have a start of the section	
20 000										
-20 dim									-	
-10 dim						-				
CF 24.95 GHz			5001 pts			120.0 MHz/				Span 1.2 GR
2 Marker Table	1000	10000	0.00/04010-000	to the second		Provide State			Constant on Di-	
M1 T1 T2	1 1 1	24.988 15 GHz 24.754 59 GHz 25.146145 GHz		49.24 dBm 45.00 dBm 45.13 dBm	Doc Bw Doc Bw Centrol Doc Bw Freq D	d Tout			391.555 303 8 24,950 36 367,2940	68 MHz 7 294 GHz 28 961 HHz
10									Roady	

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#### Diagram 1.9, Symbolic name: CAH5100, QPSK, Horizontal:



#### Diagram 1.10, Symbolic name: CAH5100, QPSK, Vertical::

MultiView 00 Ref Level 65.00 dB Att 10 d TDF '5M(5322 PL 24-2	BW 200 S S m = RE 5 = SWT 100 ms = VB 560HZ SM*	P I IW 5 MHz IW 10 MHz Mode Auto S	nitt 🗙					s	- Gu. Jount 300/300
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T2	1	24.754.444 GHz 25.246.021 GHz		44.38 dBm 44.43 dBm	Dicc Bw Centrolo Dicc Bw Freg Off	a fseit		25.0	00 232 793 GH2 792 940 228 kHz
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# Field strength of spurious radiation measurements according to CFR 47 §30.203

Date	Temperature	Humidity
2021-05-25	$23 \ ^{\circ}C \pm 3 \ ^{\circ}C$	26 % ± 5 %
2021-05-26	$22 \degree C \pm 3 \degree C$	28 % ± 5 %
2021-05-27	$23 \ ^{\circ}C \pm 3 \ ^{\circ}C$	25 % ± 5 %
2021-05-28	$23 \ ^{\circ}C \pm 3 \ ^{\circ}C$	27 % ± 5 %
2021-05-31	$25 \ ^{\circ}C \pm 3 \ ^{\circ}C$	28 % ± 5 %
2021-06-01	$23 \text{ °C} \pm 3 \text{ °C}$	25 % ± 5 %
2021-06-02	$24 \ ^{\circ}C \pm 3 \ ^{\circ}C$	25 % ± 5 %
2021-06-03	$24 ^{\circ}\text{C} \pm 3 ^{\circ}\text{C}$	25 % ± 5 %
2021-06-04	$24 \text{ °C} \pm 3 \text{ °C}$	26 % ± 5 %
2021-06-10	$23 \ ^{\circ}C \pm 3 \ ^{\circ}C$	25 % ± 5 %

The measurements were performed with both horizontal and vertical polarization of the antenna. The measurement was performed with a RBW of 1 MHz. The antenna distance and test object height in the different frequency ranges is descried below.

In the test range from 40 - 100 GHz

A propagation loss in free space was calculated. The used formula was

 $\gamma = 20 \log \left(\frac{4\pi D}{\lambda}\right), \ \gamma$  is the propagation loss and *D* is the antenna distance. For 40 – 60 GHz *D* was 3.0m and for 60 – 100 GHz *D* was 1.0m.

In the test range from 30MHz - 40 GHz a substitution measurement defined in 3GPP TR 37.842 chapter 10.3.1.1.2 was used to get the actual correction factor (Transducer factor A-D in the figure 1 below) with a Network analyzer (ZNB 40).



Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

#### Stage 1 - Calibration:

- 1) Connect the reference antenna and the receiving antenna to the measurement RF out port and RF in port of the network analyzer, respectively, as shown in figure 1.
- 2) Install the reference antenna with its *beam peak direction* and the height of its phase centre aligned with the receiving antenna.
- Set the centre frequency of the network analyzer to the carrier centre frequency of the tested signal for EIRP measurement of the EUT and measure LF<sub>EIRP, E→D</sub>, which is equivalent to 20log|S21| (dB) obtained by the network analyzer:
   LF<sub>EIRP, E→D</sub>: Pathloss between E and D in figure 1.
- 4) Measure the cable loss,  $LF_{EIRP, E \rightarrow F}$  between the reference antenna connector and the network analyzer connector:

 $LF_{EIRP, E \rightarrow F}$ : Cable loss between E and F in figure 1.

 5) Calculate the calibration value between A and D with the following formula: L<sub>EIRP\_cal, A→D</sub> = LF<sub>EIRP, E→D</sub> + G<sub>REF\_ANT\_EIRP, A→F</sub> -LF<sub>EIRP, E→F</sub>. L<sub>EIRP\_cal, A→D</sub>: Calibration value between A and D in figure 1. Was implemented in the spectrum analyzer as a transducer. G<sub>REF\_ANT\_EIRP, A→F</sub>: Antenna gain of the reference antenna.

#### Stage 2 - Measurement:

- 6) Uninstall the reference antenna and install the EUT with the manufacturer declared coordinate system reference point in the same place as the phase centre of the reference antenna. The manufacturer declared coordinate system orientation of the EUT is set to be aligned with the testing system.
- 7) Measure the mean power,  $P_{R\_EUT\_EIRP, D}$ , D in figure 1.
- 8) Calculate the EIRP with the following formula:

 $EIRP = P_{R\_EUT\_EIRP, D} + L_{EIRP\_cal, A \rightarrow D}$ 

#### The measurement procedure was as the following:

- 1) An EIRP pre-scan with the measurement antenna in horizontal and vertical polarization is performed with RMS detector and Max Hold on the spectrum analyzer. The turn table was slowly rotating form 0-360 degrees.
- 2) EIRP spurious radiation on frequencies closer than 10 dB to the TRP limit in the pre-scan a manual search for maximum response was done.
- 3) If the recorded EIRP value was above the TRP limit, a TRP measurement was done according to KDB 842590 D01 chapter 4.4. Overview of the methods.
  - a) Two Cut method according to KDB 842590 D01 chapter 4.4.2.2
    - i. EUT set in vertical orientation
    - ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT
    - iii. EUT set in horizontal orientation
    - iv. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT.
    - v. TRP = EIRP measurement samples averaged+ $\Delta$ TRP. ( $\Delta$ TRP = Margin factor based on grid selection).

- b) Two Cut method when pattern multiplication is applicable and used according to KDB 842590 D01 chapter 4.4.2.3
  - i. EUT set in vertical orientation
  - ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT
  - iii. EUT set in horizontal orientation
  - iv. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT.
  - v. TRP is calculated using the formula in Appendix E of KDB 842590 D01
- c) EIRP to Conducted Power Conversion in Band Edge Using Antenna Gain according to KDB 842590 D01 chapter 4.4.2.5
  - i. Convert each radiated measurement to conducted power/BW using the equations:

Conducted Power level (dBm) at any frequency/BW = Measured EIRP level (dBm)/BW – EUT antenna Gain (dBi)

- ii. Sum the radiated power Horizontal and Vertical polarisations for total conducted power level/BW.
- iii. Evaluate the pass/fail decision by comparing total conducted power level/BW against the applicable TRP limit.
- d) Spherical Grid Method, according to KDB 842590 D01 chapter 4.4.2.4
  - i. EUT set in horizontal orientation bottom of the EUT to the right.
  - ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size of the turn table was 15 degrees from 0 165 degrees and 195 360 degrees. In cone of radiation 165 195 degrees the step size of the turn table was 1 degree.
  - iii. EUT was changed in 15 degrees step from horizontal bottom right to horizontal bottom to the left (twelve steps). Step ii. was repeated for all twelve steps.
  - iv. TRP was calculated according to Appendix B in KDB 842590 D01.

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#### Measurement equipment

	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ESU 40	901 385
R&S ZNB 40	BX50051
RF Cable VNA-calibration	BX50189
RF Cable VNA-calibration	BX50190
RF Cable	BX50192
RF Cable	BX81423
RF Cable	KWP04236
RF Cable	503 681
RF Cable FSW-B21	BX62069
RF Cable FSW-B21	BX62073
Attenuator 20 dB	BX90205
Bilog antenna Schaffner 6143A	504079
EMCO Horn Antenna 3115	502 175
EMCO Horn Antenna 3115	902 212
EMCO Horn Antenna 3116	503 279
Flann STD Gain Horn Antenna 20240-20	KWP02600
Flann STD Gain Horn Antenna 22240-20	KWP02601
Flann STD Gain Horn Antenna 24240-20	BX92414
Flann STD Gain Horn Antenna 26240-20	BX92416
Flann STD Gain Horn Antenna 27240-20	BX92417
Mixer FS-Z60	BX90566
Mixer FS-Z90	BX90567
Mixer FS-Z110	BX81425
µComp Nordic, Low Noise Amplifier	901 544
Miteq, Low Noise Amplifier	503 278
Temperature and humidity meter, Testo 615	503 498

#### EAB Measurement equipment

Calibrated at RISE before testing.

	S/N
Eravant SCF-21306340-SFSF-B3 Bandpass filter	04881-01
Eravant SCF-34312340-KFKF-B3 Bandpass filter	04876-01

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## Results

Evaluation of spurious emissions have been done in several beam directions, including extreme settings both in azimuth and elevation planes. Results have shown that Beam index 0/Boresight can represent worst case.

The diagrams represents worst case configurations (Beam index 0 /Boresight) for each frequency range.

Diagram	Symbolic name	Config mode	Pol	Frequency range	Measurement method	"Early exit?"
2.1a	BH <sub>50</sub>	2	Hor	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.1b	BH <sub>50</sub>	2	Ver	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.2a	BT850	1	Hor	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.2b	BT850	1	Ver	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.3a	BMT850	0	Hor	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.3b	BMT850	0	Ver	30-1000 MHz	Pre scan Max hold EIRP	Yes
2.4a	BH <sub>50</sub>	2	Hor	1-18 GHz	Pre scan Max hold EIRP	Yes
2.4b	BH <sub>50</sub>	2	Ver	1-18 GHz	Pre scan Max hold EIRP	Yes
2.5a	BT850	1	Hor	1-18 GHz	Pre scan Max hold EIRP	Yes
2.5b	BT850	1	Ver	1-18 GHz	Pre scan Max hold EIRP	Yes
2.6a	BMT850	0	Hor	1-18 GHz	Pre scan Max hold EIRP	Yes
2.6b	BMT850	0	Ver	1-18 GHz	Pre scan Max hold EIRP	Yes
				18-23 GHz		No
2.7a	TimL <sub>50</sub>	2	Hor	23-23.5 GHz	Pre scan Max hold EIRP	Yes <sup>2</sup>
				23.5-24 GHz		Yes <sup>3</sup>
				18-23 GHz		No
2.7b	TimL <sub>50</sub>	2	Ver	23-23.5 GHz	Pre scan Max hold EIRP	Yes <sup>2</sup>
				23.5-24 GHz		Yes <sup>3</sup>
2.7c	TimL <sub>50</sub>	2	Hor/ Ver	22.8-22.9 GHz	Two cut TRP	Compliant to TRP limit
2.8a	BH <sub>50</sub>	2	Hor	18-23.3 GHz 23 3-24 GHz	Pre scan Max hold EIRP	Yes <sup>1</sup> No
				18-23.3 GHz		Yes <sup>1</sup>
2.8b	$BH_{50}$	2	Ver	23.3-24 GHz	Pre scan Max hold EIRP	No
2.8c	BH <sub>50</sub>	2	Hor/ Ver	23.86-23.96 GHz	Two cut TRP	Compliant to TRP limit
2.9a	BimL <sub>50</sub>	2	Hor	18-23.4GHz 23.4-24 GHz	Pre scan Max hold EIRP	Yes <sup>1</sup> No
2.9b	BimL <sub>50</sub>	2	Ver	18-23.4GHz 23.4-24 GHz	Pre scan Max hold EIRP	Yes <sup>1</sup> No
2.9c	BimL <sub>50</sub>	2	Hor/ Ver	23.4-24 GHz	Two cut TRP	Compliant to TRP limit
2.9d	BimL <sub>50</sub>	2	Hor	23.6-24 GHz	Pre scan Max hold EIRP	No
2.9e	BimL <sub>50</sub>	2	Ver	23.6-24 GHz	Pre scan Max hold EIRP	No
2.9f	BimL <sub>50</sub>	2	Hor/ Ver	23.6-24GHz	Spherical grid Method TRP	Compliant to TRP limit <sup>*</sup>

<sup>1)</sup>Compliant (5x LO) to TRP limit based on Lower EIRP compared to TimL<sub>50</sub> (Diagram 2.7)

<sup>2)</sup>Compliant to TRP limit based on Lower EIRP compared to BH<sub>50</sub> (Diagram 2.8)

<sup>3)</sup>Compliant to TRP limit based on Lower EIRP compared to BimL<sub>50</sub> (Diagram 2.9)

<sup>\*)</sup> Compliant to proposed rule change in FR Document Number: 2021-10536, Table 1—WRC-19 Resolution 750 Unwanted Emissions Permitted Within Any 200 Megahertz in the 23.6-24 GHz Passive Band "Current TRP limit IMT Base Stations: -33dBW"

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Diagram	Symbolic name	Config mode	Pol	Frequency range	Measurement method	"Early exit?"
2.10a	BT850	1	Hor	18-24 GHz	Pre scan Max hold EIRP	Yes <sup>1,2</sup>
2.10b	BT850	1	Ver	18-24 GHz	Pre scan Max hold EIRP	Yes <sup>1,2</sup>
2.11a	BMT850	0	Hor	18-24 GHz	Pre scan Max hold EIRP	Yes <sup>1</sup>
2.11b	BMT850	0	Ver	18-24 GHz	Pre scan Max hold EIRP	Yes
2.12a	BL <sub>50</sub>	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.12b	BL <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.12c	BL <sub>50</sub>	2	Hor	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.12d	BL <sub>50</sub>	2	Ver	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.13a	BimL <sub>50</sub>	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.13b	BimL <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.13c	BimL <sub>50</sub>	2	Hor	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.13d	BimL <sub>50</sub>	2	Ver	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.13e	BimL <sub>50</sub>	2	Hor/ Ver	24-24.25 GHz	Pattern multiplication TRP	Compliant to TRP limit
2.14a	TL <sub>50</sub>	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.14b	TL <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.14c	TL <sub>50</sub>	2	Hor	24.45-25.4 GHz	Pre scan Max average EIRP	Yes <sup>4</sup>
2.14d	TL <sub>50</sub>	2	Ver	24.45-25.4 GHz	Pre scan Max average EIRP	Yes <sup>4</sup>
2.15a	TimL <sub>50</sub>	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.15b	TimL <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.15c	TimL <sub>50</sub>	2	Hor	24.45-25.4 GHz	Pre scan Max average EIRP	Yes <sup>4</sup>
2.15d	TimL <sub>50</sub>	2	Ver	24.45-25.4 GHz	Pre scan Max average EIRP	Yes <sup>4</sup>
2.16a	BH <sub>50</sub>	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.16b	BH <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.16c	BH <sub>50</sub>	2	Hor	24-24.75 GHz	Pre scan Max average EIRP	Yes <sup>4</sup>
2.16d	BH <sub>50</sub>	2	Ver	24-24.75 GHz	Pre scan Max average EIRP	Yes <sup>4</sup>
2.17a	BimH <sub>50</sub>	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.17b	BimH <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.17c	BimH <sub>50</sub>	2	Hor	24-24.75 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>
2.17d	BimH <sub>50</sub>	2	Ver	24-24.75 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>

<sup>1)</sup>Compliant (5x LO) to TRP limit based on Lower EIRP compared to TimL<sub>50</sub> (Diagram 2.7)

<sup>2)</sup> Compliant to TRP limit based on Lower EIRP compared to BH<sub>50</sub> (Diagram 2.8)

<sup>4)</sup> Calculated conducted power based on antenna gain below limit

<sup>5)</sup> Compliant to TRP limit based on Lower EIRP compared to BimL<sub>50</sub> (Diagram 2.13)

<sup>6)</sup> Compliant to TRP limit based on Lower EIRP compared to TimH<sub>50</sub> (Diagram 2.19)

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Diagram	Symbolic name	Config mode	Pol	Frequency range	Measurement method	"Early exit?"
2.18a	TH50	2	Hor	24-26.5 GHz	Pre scan Max hold EIRP	No
2.18b	TH <sub>50</sub>	2	Ver	24-26.5 GHz	Pre scan Max hold EIRP	No
2.18c	TH50	2	Hor	25.25-26.5 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>
2.18d	TH <sub>50</sub>	2	Ver	25.25-26.5 GHz Pre scan Max average EIRP		Yes <sup>4,6</sup>
2.19a	TimH <sub>50</sub>	2	Hor	24-26.5 GHz Pre scan Max hold EIRP		No
2.19b	TimH <sub>50</sub>	2	Ver	24-26.5 GHz Pre scan Max hold EIRP		No
2.19c	TimH <sub>50</sub>	2	Hor	25.25-26.5 GHz	Pre scan Max average EIRP	No
2.19d	TimH <sub>50</sub>	2	Ver	25.25-26.5 GHz	Pre scan Max average EIRP	No
2.19e	TimH <sub>50</sub>	2	Hor/ Ver	25.25-26.2 GHz	Pattern multiplication TRP	Compliant to TRP limit
2.20a	BT850	1	Hor	24-26.5 GHz	Pre scan Max average EIRP	No
2.20b	BT850	1	Ver	24-26.5 GHz	Pre scan Max average EIRP	No
2.20c	BT850	1	Hor	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.20d	BT850	1	Ver	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.20e	BT850	1	Hor	25.25-26.5 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>
2.20f	BT850	1	Ver	25.25-26.5 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>
2.21a	BMT850	0	Hor	24-26.5 GHz	Pre scan Max average EIRP	No
2.21b	BMT850	0	Ver	24-26.5 GHz	Pre scan Max average EIRP	No
2.21c	BMT850	0	Hor	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.21d	BMT850	0	Ver	24-24.25 GHz	Pre scan Max average EIRP	Yes <sup>4,5</sup>
2.21e	BMT850	0	Hor	25.25-26.5 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>
2.21f	BMT850	0	Ver	25.25-26.5 GHz	Pre scan Max average EIRP	Yes <sup>4,6</sup>

 4) Calculated conducted power based on antenna gain below limit

 5) Compliant to TRP limit based on Lower EIRP compared to BimL<sub>50</sub> (Diagram 2.13)

 6) Compliant to TRP limit based on Lower EIRP compared to TimH<sub>50</sub> (Diagram 2.19)

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Diagram	Symbolic name	Config mode	Pol	Frequency range Measurement method		"Early exit?"
2.22a	BL <sub>50</sub>	2	Hor	26.5-28 GHz	Pre scan Max hold EIRP	Yes
2.22b	BL <sub>50</sub>	2	Ver	26.5-28 GHz	Pre scan Max hold EIRP	Yes
2.23a	BT850	1	Hor	26.5-28 GHz	Pre scan Max hold EIRP	Yes
2.23b	BT850	1	Ver	26.5-28 GHz	Pre scan Max hold EIRP	Yes
2.24a	BMT850	0	Hor	26.5-28 GHz	Pre scan Max hold EIRP	Yes
2.24b	BMT850	0	Ver	26.5-28 GHz	Pre scan Max hold EIRP	Yes
2.25a	TH <sub>50</sub>	2	Hor	28-40 GHz	Pre scan Max hold EIRP	Yes
2.25b	TH <sub>50</sub>	2	Ver	28-40 GHz	Pre scan Max hold EIRP	Yes
2.26a	BT850	1	Hor	28-40 GHz	Pre scan Max hold EIRP	Yes
2.26b	BT850	1	Ver	28-40 GHz	Pre scan Max hold EIRP	Yes
2.27a	BMT850	0	Hor	28-40 GHz	Pre scan Max hold EIRP	Yes
2.27b	BMT850	0	Ver	28-40 GHz	Pre scan Max hold EIRP	Yes
2.28a	BH50	2	Hor	40-60 GHz	Pre scan Max hold EIRP	Yes
2.28b	BH <sub>50</sub>	2	Ver	40-60 GHz	Pre scan Max hold EIRP	Yes
2.29a	BT850	1	Hor	40-60 GHz	Pre scan Max hold EIRP	Yes
2.29b	BT850	1	Ver	40-60 GHz	Pre scan Max hold EIRP	Yes
2.30a	BMT850	0	Hor	40-60 GHz	Pre scan Max hold EIRP	Yes
2.30b	BMT850	0	Ver	40-60 GHz	Pre scan Max hold EIRP	Yes
2.31a	BH <sub>50</sub>	2	Hor	60-75 GHz	Pre scan Max hold EIRP	Yes
2.31b	BH <sub>50</sub>	2	Ver	60-75 GHz	Pre scan Max hold EIRP	Yes
2.32a	BT850	1	Hor	60-75 GHz	Pre scan Max hold EIRP	Yes
2.32b	BT850	1	Ver	60-75 GHz	Pre scan Max hold EIRP	Yes
2.33a	BMT850	0	Hor	60-75 GHz	Pre scan Max hold EIRP	Yes
2.33b	BMT850	0	Ver	60-75 GHz	Pre scan Max hold EIRP	Yes
2.34a	BH <sub>50</sub>	2	Hor	75-90 GHz	Pre scan Max hold EIRP	Yes
2.34b	BH <sub>50</sub>	2	Ver	75-90 GHz	Pre scan Max hold EIRP	Yes
2.35a	BT850	1	Hor	75-90 GHz	Pre scan Max hold EIRP	Yes
2.35b	BT850	1	Ver	75-90 GHz	Pre scan Max hold EIRP	Yes
2.36a	BMT850	0	Hor	75-90 GHz	Pre scan Max hold EIRP	Yes
2.36b	BMT850	0	Ver	75-90 GHz	Pre scan Max hold EIRP	Yes
2.37a	BH <sub>50</sub>	2	Hor	90-100 GHz	Pre scan Max hold EIRP	Yes
2.37b	BH <sub>50</sub>	2	Ver	90-100 GHz	Pre scan Max hold EIRP	Yes
2.38a	BT850	1	Hor	90-100 GHz	Pre scan Max hold EIRP	Yes
2.38b	BT850	1	Ver	90-100 GHz	Pre scan Max hold EIRP	Yes
2.39a	BMT850	0	Hor	90-100 GHz	Pre scan Max hold EIRP	Yes
2.39b	BMT850	0	Ver	90-100 GHz	Pre scan Max hold EIRP	Yes



Limits

CFR 47 §30.203 Emission limits.

(a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be -13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be -5 dBm/MHz or lower.

(b)(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges as the design permits.

(3) The measurements of emission power can be expressed in peak or average values.

Complies: Tes
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Diagram 2.1b: Pre scan 30 - 1000 MHz, BH<sub>50</sub>, EIRP Vertical polarization

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Diagram 2.2b: Pre scan 30 - 1000 MHz, BT850, EIRP Vertical polarization

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Diagram 2.3a: Pre scan 30 - 1000 MHz, BMT850, EIRP Horizontal polarization

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Diagram 2.3b: Pre scan 30 - 1000 MHz, BMT850, EIRP Vertical polarization

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#### Diagram 2.4a: Pre scan 1 – 18 GHz, BH<sub>50</sub>, EIRP Horizontal polarization

									8
MultiView *	Spectrum 🛛 🗙 1	-18GHz ×							
Ref Level 30,001 Att 31	dDre Offset 20.00 db = 1 0 db = SWT 1 1 = 1	NDW 19912 Mode Auto St	Head (						
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A40									
-60 dBm-									
-70 dBm-									
1.0 GHz		4	80001 pts		1	1.7 GHz/			18.0 GHz
2 Marker Table	Val. Van	M Makes		V Mahar		Frankline .		Constitute Days	
MI	1	17.919 36 GHz		-22.78 dBm		FUNCTION		Function Res	unc
10								Measuring	1115.001

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#### Diagram 2.4b: Pre scan 1 – 18 GHz, BH<sub>50</sub>, EIRP Vertical polarization

									89
MultiView - Sp	ectrum	18GHz X							
Ref Level 20.00 dbm	Offeet 20.00 (D =)	ADW 199ts							
• Att 10-8	• 5WT 1 1 * 1	VBW 2017th: Mode Aut	in Derivati						
I Prequency Sweep	342.94					1.1			IRim Max B2Rint City
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A. Harden									
•									
-60 d8m-									
-70 dBm									
- ro dom									
1.0 GHz			80001 ote			176H2/			18.0 CH2
2 Marker Table			60001 pts			1.7 68.127			10.0 GHz
Type Ref	Trc	X-Value		Y-Value	1	Function	1	Function Res	ult
MI		17.91978 GHZ		-22.77 0.000					11 15 2021

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## Diagram 2.5a: Pre scan 1 – 18 GHz, BT850, EIRP Horizontal polarization

U			<i>,</i>			1			\$
MultiView Sp Ref Level 20:00 dbr Att 20:4 TOP 194522 PL 1-18	ectrum <b>X</b> 1 Offset 20.00 dB = 5 = SWT 1 1 = 0+2 SWT	-18GHz X ADW 19Hz VBW 30FHz Mede Az	n Swaag						
L Prequency Sweep	2	1				12	P. 11		Rm Max 22Rm Oter
20 dbm									
E des		-							
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-11 (81)									in the second
-30 dBm	-	and water attended			and the state of t	and a large state and the state of the state	and the second	and the state of the	A second sala manufacture at the second
	and a second second second	deriften anteren anteren anteren a	heinen	5.86 - 5.5					
-60 d8m									
-70 d8m									
1.0 GHz 2 Marker Table			80001 pts			1.7 GHz/			18.0 GHz
Type Rel	Trc	X-Value 17.847 11 GHz		-23.08 dBm		Function		Function Res	ült
E.								Measuring	11.15.2021 15.0027

13:00:27 31.05.2021

# Diagram 2.5b: Pre scan 1 – 18 GHz, BT8<sub>10</sub>, EIRP Vertical polarization

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Multiviant - So	actrum 🔽 1	ARGHA							
Bel Level 20.00 dfr	v Offeet 20.00 (5 *)	REW LIVEL							
• Att 10 d	5 = 5WT 1 1 = 1	VBW SOTHER Mode Au	to Swimp						
E Prequency Sweep	OHT ON.				1	10	200 D		IRm Max B2Rm City
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-40 dBm	And the second division of the second divisio	and the sector of the sector o	and and international distantioners	C. C. M. C. Millionic Coloris, and all a	alithest Holes, stels its of .	And a statistic second		a di Mari dal ad	ur the s
	a hits should be a start to be a	derror birthing and tools							
Sold and the second second	1								
-60 d8m	-				-	-	-		
-70 dBm-									
				2					
2 Marker Table			80001 pts			1.7 GH2/			18.0 GHz
Type Rel	Trc	X-Value		Y-Value	1	Function		Function Res	ult
MI	1	17.91617 GHZ		-22.32 dBm					1145,2921

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# Diagram 2.6a: Pre scan 1 - 18 GHz, BMT<sub>50</sub>, EIRP Horizontal polarization

Offeet 20.00 db = 1 SWT 1 1 = 1	ADW 19942 MDW 201942 Mode Auto	Sweep						
1		l				<u> </u>		IRm Max #2Rm Ohr.
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		80001 pts			1.7 GHz/			18.0 GHz
Trc	X-Value		Y-Value		Function		Function Res	ult
1	17.970 14 GHz		-23.14 dBm					
	ин 2018 + 1 Нее 2010 10 + 1 WF 1 = 1 = 1 er - 1 = 1 - 1 - 1 - 1	Imm         Immune         Immune           WHENE 2000         Hard In Petra           WF         11 * VEW 2019         Medic Aussister           Print 12.00         Hard In Petra         Medic Aussister	Image: 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	Imm         Imm <td>Image: Second Second</td> <td>Image: 1.1001/fc         1.1001/fc           WF         1.1001/fc         Medic Autom Senser           WF<td>Image: 1 - Line infer:           Mile: 2000 00 FPtz:         Marke Auto Select           Mile: 2000 1 FPtz:         Mile: 2000 00 FPtz           Mile: 2000 1 FPtz         Mile: 2000 00 FPtz</td><td>Im 1 1990 Here 2000 apr 1 1990 Here 2000 Here 2000</td></td>	Image: Second	Image: 1.1001/fc         1.1001/fc           WF         1.1001/fc         Medic Autom Senser           WF <td>Image: 1 - Line infer:           Mile: 2000 00 FPtz:         Marke Auto Select           Mile: 2000 1 FPtz:         Mile: 2000 00 FPtz           Mile: 2000 1 FPtz         Mile: 2000 00 FPtz</td> <td>Im 1 1990 Here 2000 apr 1 1990 Here 2000 Here 2000</td>	Image: 1 - Line infer:           Mile: 2000 00 FPtz:         Marke Auto Select           Mile: 2000 1 FPtz:         Mile: 2000 00 FPtz           Mile: 2000 1 FPtz         Mile: 2000 00 FPtz	Im 1 1990 Here 2000 apr 1 1990 Here 2000 Here 2000

13:13:30 31.05.2021

# Diagram 2.6b: Pre scan 1 – 18 GHz, BMT850, EIRP Vertical polarization

MultiView - Sp	ectrum	18GHz X							
Ref Level 20.00 thr	. Offeet 20.00 (D = )	ADW 199ts							
• Att 10 d	5 = 5WT 1 = 1	VBW SOTHE Mede As	to Sweet						
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-11.00		-							
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-30 dBm	1	-		and the second second second second	an an an de la sub stat a la bria		and a standing all and the	That and the second second second	and a state of the
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A dam	A CONTRACTOR OF A CONTRACTOR OF	al Alama Styles and a structure	free in the part of the second						
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ALC: Parts									
-60 d8m									
-70 dam									
1.4 5451									
1.0 GHz			80001 pts			1.7 GHz/	-		18.0 GHz
2 Marker Table		000010		00000					
M1 Ref	Trc	17.872 18 GHz		-23.09 dBm		Function		Function Res	ult
12									

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## Diagram 2.7a: Pre scan 18 – 24 GHz, TimL<sub>50</sub>, EIRP Horizontal polarization See diagram 2.7c for TRP result MultiView 24-26.5GHz 18-24GHz 23.6-24GHz Ref Level 1000 dm = NBW 1191z 23.6-24GHz 23.6-24GHz # Att 1000 dm = NBW 1191z Mode Auto Sereep 30 dB - SWT 11 VBW 10191z Mode Auto Sereep # TW 2000 dm = 0.2300 dM VBW 10191z Mode Auto Sereep 30 dB - SWT 11 VBW 10191z Mode Auto Sereep × + See diagram 2.8 See diagram 2.9 11-11 18.0 GHz 27001 pts 600.0 MHz/ 24.0 GHz 22.850 6 GHz 23.488 57 GHz 23.989 22 GHz -7.61 dBm -8.07 dBm -9.04 dBm M1 M2

12:51:53 26.05.2021

# Diagram 2.7b: Pre scan 18 - 24 GHz, TimL<sub>50</sub>, EIRP Vertical polarization See diagram 2.7c for TRP result

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ult/View * left.evel 10.00 10 1	24-26.5GHz = 26W 1 0.0 = 6WF 1 + V6W 10	18-24GHz 23.6-1 19-2 19-2 Mode Auto Sweep	24GHz X			See diagram	12.8 See	diagram 2.9
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dBm								
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.0 GHz			27001 pts	6	00.0 MHz/	3		24.0 G
Aarker Table								6
M1	tel Inc	22.850 6 GHz	-1.27 dBm		Function		Function Re	sult
M2 M3	1	23.488 57 GHz 23.989 22 GHz	-13.41 dBm -10.66 dBm					
		and the					Measuring	100 State

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# Diagram 2.8a: Pre scan 18 – 24 GHz, BH $_{50},$ EIRP Horizontal polarization See diagram 2.8c for TRP result

Diagram 2.8b: Pre scan 18 – 24 GHz, BH  $_{50},$  EIRP Vertical polarization See diagram 2.8c for TRP result

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Diagram 2.8c: Two cut TRP 23.86 - 23.96 GHz, BH<sub>50</sub>

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# Diagram 2.9a: Pre scan 18 – 24 GHz, BimL<sub>50</sub>, EIRP Horizontal polarization See diagram 2.9c for TRP result MultiView 24-26.5GHz 18-240Hz 23.6-24GHz RefLevel 5000 dm = Rew 1 He Att 10.88 ± SWF 11 VBW 10 He Mode Auto Sweets Tor "Sw52267.01.10-26802 bWL VBW 10 He Mode Auto Sweets × + See diagram 2.7 11-1 18.0 GHz 27001 pts 600.0 MHz/ 24.0 GHz 22.850 6 GHz 23.488 57 GHz 23.999 89 GHz -8.23 dBm -7.86 dBm -7.87 dBm MI

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### Diagram 2.9b: Pre scan 18 - 24 GHz, BimL<sub>50</sub>, EIRP Vertical polarization See diagram 2 9c for TRP result

IbiView * 24-26.56	Hz 18-24GHz	X 23.5-24GHz X		See diagram 2	.7	
tt 10.43 = 8WT "94/5322 R, 19-24042 54 requercy Sweet	1.1 VBW 10.19-2 Mode Aut	s Sweep		() ()		Inn Max 2000
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lm lm	s anatomore en entre an					
m						
Bm						
GHz tker Table		27001 pts		600.0 MHz/		24.0
M1 M2 M3	rc X-Value 22.850 6 23.488 57 23.999 89	GHz -1. GHz -12. GHz -9.	Value 41 dBm 88 dBm 80 dBm	Function	1.	Function Result
110					100	Measuring

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Diagram 2.9c: Two cut TRP 23.4 – 24 GHz, BimL<sub>50</sub>

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Diagram 2.9d: Pre scan Channel power 200MHz 23.6 – 24 GHz,  $Bim L_{50},\,EIRP$  Horizontal polarization



Diagram 2.9e: Pre scan Channel power 200MHz 23.6 – 24 GHz, BimL<sub>50</sub>, EIRP Vertical polarization See diagram 2.9f for TRP result



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Diagram 2.9f: Spherical grid Method TRP Channel power 200MHz 23.6 – 24 GHz, BimL<sub>50</sub>

Proposed rule change in FR Document Number: 2021-10536, Table 1—WRC-19 Resolution 750 Unwanted Emissions Permitted Within Any 200 Megahertz in the 23.6-24 GHz Passive Band

Freq [GHz]	Power TRP [dBW] Channel power 200MHz	Current TRP limit IMT Base Stations [dBW]
23.7	-38.197	-33
23.8	-37.193	-33
23.9	-36.305	-33

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### x4-20.5GHz X 18-240Hz X Ref Level 1000 dm = RBW 1 Hz X MultiView 24-25.5GHz X 18-24GHz X 23.5-24GHz X + See diagram 2.8 See diagram 2.7 11-10 -+++++23.7010 1001 ..... NAMES OF TAXABLE PARTY OF 18.0 GH 27001 pts 600.0 MHz/ 24.0 GHz X-Value 22.850 6 GHz 23.488 57 GHz 23.516 13 GHz V-Value -13.58 dBm -13.27 dBm -12.94 dBm M1 M2 M3

# Diagram 2.10a: Pre scan 18 - 24 GHz, BT850, EIRP Horizontal polarization

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### Diagram 2.11a: Pre scan 18 – 24 GHz, BMT850, EIRP Horizontal polarization



12:22:56 26.05.2021

# Diagram 2.11b: Pre scan 18 - 24 GHz, BMT850, EIRP Vertical polarization

ultiView 24-26.5GHz 24-26.5GHz 24-26.5GHz	18-24GHz X 23.6-24G	tz · X		
T 10 45 = 5WT 1 1 VBW *94/5122 R, 19-24047 5M *0104042 Sweep	10 PP-2 Mode Auto Sweep		VP	Jam Max # 3km d
A CONTRACTOR OF A				
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łm				
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n GHz	2	2001 pts	600.0 MHz/	24.0
arker Table	10000000	001 00	00010 10112/	2.10
M1 1	22.809 71 GHz	-13.72 dBm	Punction	Function Result
M2 1 M3 1	23.393 02 GHz	-18.17 dBm		
M5 1	23.937 22 GHz	-17.35 dBm		

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# MultiView 24-26.5GHz X 18-24GHz X 23.5-24GHz X + Ref Level 60:00 dth = REW 19% • Att 10:45 = SWT 1; VOW 10.9% Mode Auto Sweep Ther should be character be Hereinstein, Sweep Hereinstein, Sweep 15001 pts 250.0 MHz/ 26.5 GHz 4.0 GH X-Value 24.7657 GHz V-Value -7.71 dBm 09:09:00 26.05.2021

### Diagram 2.12a: Pre scan 24 – 26.5 GHz, BL<sub>50</sub>, EIRP Horizontal polarization



09:12:10 26.05.2021

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# Diagram 2.12c: 24 – 24.25 GHz, QPSK, BL<sub>50</sub>, EIRP Horizontal polarization

500 250.0 M
Carlor Carlor
12
1Rm Av
Count 100/100

15:14:03 24.05.2021

# Diagram 2.12d: 24 – 24.25 GHz, QPSK, BL<sub>50</sub>, EIRP Vertical polarization

Att 10 F *5M\5322 PL 24	(dB ● SWT 100 ms VI -26GHZ 5M*	BW 10 MHz Mode Auto Swe	ep				Count	100/100
requency Swee	p							- 1Rm A
dBm								
dBm-								
dBm						·		
dBm		·						
d8m								
tino							~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
	HT -13.000 dbm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~		
d8m								
dBm								
) dBm								
1.0 GHz		3 S	1001 pts	6	25.0 MHz/	б		24.25
Type R M1	ef Tric	X-Value 24.25 GHz	V-Value 14.77 dBm 9.45 dBm	I	Function		Function Res	alt

Power EIRP for 24.25 GHz Hor/ Ver [dBm]	Power EIRP for 24.245 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.25 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.245 GHz (Limit -13 dBm) [dBm]/ Verdict
16.48/ 14.77	8.67/ 9.45	30.88/ 30.69	-12.08/ Pass	-18.08/ Pass

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# Diagram 2.13a: Pre scan 24 – 26.5 GHz, BimL<sub>50</sub>, EIRP Horizontal polarization See diagram 2.13e for TRP result MultiView 24-26.5GHz X 18-24GHz X 23.8-24GHz Ref Level 50:00 dm = RW 19% A 00 59-594529 4 - 5945 6 WT 11 VBW 10 PR Mode Auto Sector × + 15001 pts 250.0 MHz/ 26.5 GHz 4.0 GHz -5.33 dBm 9.78 dBm -7.52 dBm 24.057 75 GHz 24.556 34 GHz 24.747 89 GHz MI

08:50:02 26.05.2021

# Diagram 2.13b: Pre scan 24 – 26.5 GHz, BimL<sub>50</sub>, EIRP Vertical polarization



Total conducted Power Antenna Gain power/BW (Limit Freq Hor/ Ver Hor/ Ver [GHz] -13 dBm) [dBm] [dBi] [dBm]/ Verdict 24.556 9.78/ 11.05 30.88/ 30.77 -17.35/ Pass

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# Diagram 2.13c: 24 – 24.25 GHz, QPSK, BimL<sub>50</sub>, EIRP Horizontal polarization See diagram 2.13e for TRP result NUMERAL SOLUCION WINNER AND BEENER INTER Reflected 5500 dbm 00fbet 1.00 dbm RM Mode Ando Seree The Market Solucion Winner Ando Seree The Market Solucion Control of the Second S

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# Diagram 2.13d: 24 – 24.25 GHz, QPSK, BimL<sub>50</sub>, EIRP Vertical polarization

Type F M1 M2	ef Trc	X-Vakue 24.25 GHz 24.245 GHz		Y-Value 12.26 dBm 8.06 dBm		Function	1	Function Res	ulti
24.0 GHz Marker Table		6 S	5001 pts		18. 	25.0 MHz/			24.25 GF
40 dBm									
30 dBm									
1000									
20 d8m									
10-96W	H1 -13.000 dBm								
dim-			- And						
			-	······································	· ·····				
0 d8m									M2
0 dBm-					7 <u>.</u>				
ID dBm-						-			
iu dami-									
i0 dBm-									
DF *5M\5322 PL 24	-26GHZ 5M*	ISW TO MILE Mode Mato SI	weep					Count	1007100
Ref Level 55.00	Bm Offset 1.30 dB = R	BW 1 MHz						SGL	100/100
	A 1998	· · · · · · · · · · · · · · · · · · ·	Let De Los	×	<u>^</u>				

17:06:56 24.05.2021

Power EIRP for 24.25 GHz Hor/ Ver [dBm]	Power EIRP for 24.245 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.25 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.245 GHz (Limit -13 dBm) [dBm]/ Verdict
11.66/ 12.26	6.34/ 8.06	30.88/ 30.69	-15.80/ Pass	-20.47/ Pass

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Diagram 2.13e: Pattern multiplication TRP 24 - 24.25 GHz, BimL<sub>50</sub>

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# Diagram 2.14a: Pre scan 24 - 26.5 GHz, TL<sub>50</sub>, EIRP Horizontal polarization MultiView 24-26.5GHz X 18-24GHz X 23.5-24GHz X Ref Level 60:00 dth = REW 19% • Att 10:45 = SWT 1; VOW 10.9% Mode Auto Switch \* Det Switch 0; Auto-Switch 0; Press Mode Auto Switch \* Press Auto-Switch 0; Press Press Press LIDENCIA UNITAL 24.0 GHz 15001 pts 250.0 MHz/ 26.5 GHz V-Value -7.54 dBm 24.915 36 GHz 10:41:37 26.05.2021



10:44:34 26.05.2021

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### Diagram 2.14c: 24.45 – 25.4 GHz, QPSK, TL<sub>50</sub>, EIRP Horizontal polarization + Offset 1.30 dB # RBW 1 MHz SWT 100 ms VBW 10 MHz Mode Auto Sweep RefLe 1 55.00 dB SGL Count 100/100 Att 10 dB = SWT 40 dE 95.0 MHz/ 5001 pts 25.4 GHz 24.45 GH Y-Value 14.81 dBm 9.67 dBm -8.59 dBm 24.45 GHz 24.455 GHz 24.916 45 GHz M1 M2 M3 24.85.292

15:09:59 24.05.2021

## Diagram 2.14d: 24.45 – 25.4 GHz, QPSK, TL<sub>50</sub>, EIRP Vertical polarization

tt 10 *5M\5322 PL 24	dB = SWT 100 ms VI 26GHZ 5M*	BW 10 MHz Mode Auto Sweep			Count 100/100
equency Swee	p				-1Rm
Bro					
m					
IC.					
Y		· · · · · · · · · · · · · · · · · · ·			
n					
1					
1	19				
im-m	hannen				
	HI -12.000 dBm			the second se	and the second sec
m					
Jm					
541					
IS GHz			5001 pts	95.0 MHz/	25.4
Type R	ef Trc	X-Value	Y-Value	Function	Function Result
M1	1	24.45 GHz	12.97 dBm 8.19 dBm		

Power EIRP for 24.45 GHz Hor/ Ver [dBm]	Power EIRP for 24.455 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.45 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.455 GHz (Limit -13 dBm) [dBm]/ Verdict
14.81/ 12.97	9.67/ 8.19	30.88/ 30.77	-13.84/ Pass	-18.83/ Pass

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### Diagram 2.15a: Pre scan 24 – 26.5 GHz, TimL<sub>50</sub>, EIRP Horizontal polarization

08:52:16 26.05.2021



Total conducted Power Antenna Gain power/BW (Limit Freq Hor/ Ver Hor/ Ver [GHz] -13 dBm) [dBm] [dBi] [dBm]/ Verdict 24.556 10.09/ 10.10 30.88/ 30.77 -18.83/ Pass

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ew 2428.500 dBm Offs t 10 dB = SWT	et 1.30 dB = RBW 10 100 ms VBW 10	MHz Mode Auto Sweep	201 Do. 100 X 79 Do. 100	×			SGL Count 100/100
EM/6322 PL 24-26GHZ EM Equency Sweep							1Rm
m				1			
m							
m							
m							
0							
and a second	m						
	-						
	and and a	manne		M3			
m +0	-13.000 dBm			man	Minute and an		
			-				
m							
m							
m							
5 GHz			5001 pts		95.0 MHz/		25
ker Table			1 · · · · · · · · · · · · · · · · · · ·				S
Vpc Ref 1	nc	24.45 GHz	Y-Value 11.59 dBm		Function	Func	tion Result
M2	24	24.455 GHz	5.97 dBm				
13	24.	502 99 ONZ	-9.32 dbm				

### Diagram 2 15c. 24 45 25.4 GHz OPSK TimI **FIRP** Horizontal polarization





Total conducted Total conducted Power EIRP for Power EIRP for Antenna Gain power/BW for power/BW for 24.45 GHz 24.445 GHz Hor/ Ver 24.45 GHz 24.455 GHz Hor/ Ver Hor/ Ver [dBi] (Limit -5 dBm) (Limit -13 dBm) [dBm] [dBm] [dBm]/ Verdict [dBm]/ Verdict 11.59/ 11.52 5.97/7.40 30.88/ 30.77 -16.26/ Pass -21.06/ Pass

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# MultiView 24-26.5GHz X 18-24GHz X 23.6-24GHz X + Ref Level 50,00 dfm # 80W 1 Met Att 10 dfi # 6WF 11 VBW 10 Met Mode Auto Sweep The "Privinger, balance be" Lifestration of the second be" Lifestration of the second be" 4.0 GH 15001 pts 250.0 MHz/ 26.5 GHz -9.85 dBm 25.270 67 GHz 09:55:55 26.05.2021

# Diagram 2.16a: Pre scan 24 – 26.5 GHz, BH<sub>50</sub>, EIRP Horizontal polarization

Diagram 2.16b: Pre scan 24 – 26.5 GHz, BH<sub>50</sub>, EIRP Vertical polarization



09:52:33 26.05.2021

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## Diagram 2.16c: 24 – 24.75 GHz, QPSK, BH<sub>50</sub>, EIRP Horizontal polarization . 0 dBm Offset 1.30 dB # RBW 1 MHz 10 dB # SWT 100 ms VBW 10 MHz Mode Auto Sweep 24-246447 5M\* RefLev el 55.00 dBr SGL Count 100/100 Att an da 20 di 24.0 GHz 5001 pts 75.0 MHz/ 24.75 GHz 24.75 GHz 24.745 GHz 15.66 dBm 10.35 dBm MI MJ

15:06:13 24.05.2021



			manne
1m			
	5001 ptr	25.0 MHz/	2
	0001 000	TOTO MILLY	
100000000000000000000000000000000000000	SZ SZOLOW	Exection	Function Desult
		2001 pts	Image: Source of the second

Power EIRP for 24.75 GHz Hor/ Ver [dBm]	Power EIRP for 24.745 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.75 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.745 GHz (Limit -13 dBm) [dBm]/ Verdict
15.66/ 12.68	10.35/ 8.80	31.05/ 31.00	-13.60/ Pass	-18.38/ Pass

# See diagram 2.13e for TRP result MultiView 24-26.5GHz 18-24GHz 23.6-24GHz 1 Ref Level 35.21 dm \* HBW 1194z \* BW 1194z 23.6-24GHz 1 \* AT 15.48 = 6WT 11 \* HBW 10194z Mode Auto Sereep 1 # TM TOPOLOGUE ALCONDUCTURE \* ALCONDUCTURE \* ALCONDUCTURE \* ALCONDUCTURE \* ALCONDUCTURE × + See diagram 2.19 250.0 MHz/ 26.5 GHz 24.0 GH 15001 pts Y-Value 10.34 dBm 13.70 dBm 24.484 51 GHz 25.453 52 GHz MI

Reference

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# Diagram 2.17b: Pre scan 24 – 26.5 GHz, BimH<sub>50</sub>, EIRP Vertical polarization



08:37:10 26.05.2021

Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
24.484	10.34/ 4.94	30.88/ 30.77	-19.41/ Pass

# Diagram 2.17a: Pre scan 24 – 26.5 GHz, BimH<sub>50</sub>, EIRP Horizontal polarization

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Diagram 2	.17c: 24	– 24.75 GHz	z, QPSK,	BimH <sub>50</sub> ,	EIRP Hor	zontal pol	arization		
See diagram	m 2.13e	for TRP resu	ılt			_			
Ref Level 55.00 dBm • Att 10 dB + TDF *5M\5322 PL 24-260 1 Frequency Sweep	Offset 1.30 dB SWT 100 ms HZ 5M <sup>4</sup>	RBW 1 MHz Mode Auto 5	weep	X 39.8e.100	×		1	SGL Count	• 100/100 1Rm Avg
40 dBm-									
20 dBm									M
0 dBm	H3						and the second		mont
-20 dBm	H1 -13.000 dBm								
-40 d8m			5001 pts			75.0 MHz/			24.75 GHz
2 Marker Table Type Ref M1 M2 M3	1 1 1	X-Volue 24.75 GHz 24.745 GHz 24.090 51 GHz		Y-Value 10.10 dBm 4.91 dBm -5.41 dBm		Function		Function Rest	alt.

16:06:32 24.05.2021

Diagram 2.17d: 24 – 24.75 GHz, QPSK, BimH<sub>50</sub>, EIRP Vertical polarization See diagram 2.13e for TPP result

see ulag	, and 2.150							
ultiliew 👛 2426.503	n X Failt 2	X 81.84100 X 11.84200 X	80.0x100 × 10.0x100	×				
Ref Level 55.00	dBm Offset 1.30 dB 🖷 🛛	RBW 1 MHz					SGL	
Att 1	0 dB . SWT 100 ms	VBW 10 MHz Mode Auto Sweep					Count	100/100
Frequency Swe	ep							1Rm Av
dim	- C							
Guin								
dim								
dBm								
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d8m				-	-			
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dBm		-		man	- marine marine	were man		and the second s
	MB			www		m	ma	
lu dem	H1 -13.000 dBm		warman				~~~~	
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to dem								
30 dBm								
40 dBm								
4.0 GHz			5001 pts		75.0 MHz/	8		24.75 G
Marker Table								
Туре	Ref Trc	X-Value	Y-Value	3	Function	li li	Function Res	ulto
M1 M2	1	24.75 GHz 24.745 GHz	4.39 dBm					
M3	1	24.090 51 GHz	-11.49 dBm					

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Power EIRP for 24.75 GHz Hor/ Ver [dBm]	Power EIRP for 24.745 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.75 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.745 GHz (Limit -13 dBm) [dBm]/ Verdict
10.10/ 8.45	4.91/ 4.39	31.05/ 31.00	-18.67/ Pass	-23.36/ Pass

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# Diagram 2.18a: Pre scan 24 – 26.5 GHz, TH<sub>50</sub>, EIRP Horizontal polarization





Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
24.367	-5.80/ -9.89	30.88/ 30.77	-35.22/ Pass

Reference 2021-06-18 P110210-F30



# Diagram 2.18c: 25.25 – 26.5 GHz, QPSK, TH<sub>50</sub>, EIRP Horizontal polarization . SGL Count 100/100 a) de H1 -13.000 dBm 6001 pts 125.0 MHz/ 26.5 GHz 5.25 GH V-Value 13.98 dBm 6.94 dBm -11.24 dBm 25.25 GHz 25.25 GHz 25.255 GHz 25.841 67 GHz M1 M2 M3 24.05,2021

### 15:00:10 24.05.2021

## Diagram 2.18d: 25.25 – 26.5 GHz, OPSK, TH<sub>50</sub>, EIRP Vertical polarization

ef Level 55.00 dBm Offset 1.30	dB = RBW 1 MHz	× 100 Do 100	×		SGL
tt 10 dB = SWT 100 - * 5M\5322 PL 24-26GHZ 5M*	ms VBW 10 MHz Mode Auto Sweep				Count 100/100
requency Sweep					= 1Rm A
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18m					
1Bm-					
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18m					
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und					
Lanna	· · · · · · · · · · · · · · · · · · ·	2.5			
dBm H1 -12.000	dim				
-					
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dem				2	
di m					
.25 GHz		6001 pts	125.0 MHz/		26.5 0
Type Ref Trc	X-Value	Y-Value	Function	n' (	Function Result
M1 1	25.25 GHz	12.13 dBm			
M2 1	25.255 GHZ	6.63 dBm			
					Ready 2445

Power EIRP for 25.25 GHz Hor/ Ver [dBm]	Power EIRP for 25.255 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 25.25 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 25.255 GHz (Limit -13 dBm) [dBm]/ Verdict
13.98/ 12.13	6.94/ 6.63	31.23/ 31.27	-15.08/ Pass	-21.45/ Pass

Date



Reference

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# Diagram 2.19b: Pre scan 24 – 26.5 GHz, TimH<sub>50</sub>, EIRP Vertical polarization



00:50:36 26.05.2021

Freq [GHz]	Power Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW (Limit -13 dBm) [dBm]/ Verdict
24.588	4.86/-0.04	30.88/ 30.77	-24.78/ Pass

# Diagram 2.19a: Pre scan 24 - 26.5 GHz, TimH<sub>50</sub>, EIRP Horizontal polarization

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# 

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Diagram 2.19d: 25.25 - 26.5 GHz, QPSK, TimH<sub>50</sub>, EIRP Vertical polarization



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Power EIRP for 25.25 GHz Hor/ Ver [dBm]	Power EIRP for 25.255 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 25.25 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 25.255 GHz (Limit -13 dBm) [dBm]/ Verdict
11.18/ 8.07	5.21/ 2.69	31.23/ 31.27	-18.34/ Pass	-24.10/ Pass

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Diagram 2.19e: Pattern multiplication TRP 25.25 – 26.2 GHz, TimH<sub>50</sub>

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### Diagram 2.20c: 24 – 24.25 GHz, QPSK, BT8<sub>50</sub>, EIRP Horizontal polarization . Ref Level 55.00 dBr 0 dBm Offset 1.30 dB = RBW 1 MHz 10 dB = SWT 100 ms VBW 10 MHz Mode Auto Sweep SGL Count 100/100 Att an da 10 dBr an d 24.0 GHz 5001 pts 25.0 MHz/ 24.25 GHz 24.25 GHz 24.245 GHz 6.22 dBm 3.80 dBm MI MJ 25.05.2021

09:46:30 25.05.2021



*5M\5322 PL 24-2	6GHZ 5M*		New York 200					0000403	1.0
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0 GHz			5001 pts			25.0 MHz/			24.2
arker Table	THE	V Value		V. Value	_	Exaction	_	Equation Doc	a de
Type Re	Inc	24.25 GHz		6 71 dBm		Function		Function Res	aute

Power EIRP for 24.25 GHz Hor/ Ver [dBm]	Power EIRP for 24.245 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.25 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.245 GHz (Limit -13 dBm) [dBm]/ Verdict
6.22/ 6.71	3.80/ 3.54	28.01/28.03	-18.54/ Pass	-21.34/ Pass

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## Diagram 2.20e: 25.25 – 26.5 GHz, QPSK, BT850, EIRP Horizontal polarization X Fuelt X BLBalle X BLBalle X BH Balle X Manuel X . Offset 1.30 dB = RBW 1 MHz SWT 100 ms VBW 10 MHz Mode Auto Swee RefLe SGL Count 100/100 dB = SWT to de 125.0 MHz/ 26.5 GHz 6001 pts 5.25 GH X Value 25.25 GHz 25.255 GHz 25.545 77 GHz V-Value 4.31 dBm 1.50 dBm 14.31 dBm M1 M2 M3

09:47:43 25.05.2021

09:40:57 25.05.2021





Total conducted Total conducted Power EIRP for Power EIRP for Antenna Gain power/BW for power/BW for 25.25 GHz 25.255 GHz Hor/ Ver 25.25 GHz 25.255 GHz Hor/ Ver Hor/ Ver (Limit -5 dBm) (Limit -13 dBm) [dBi] [dBm] [dBm] [dBm]/ Verdict [dBm]/ Verdict 4.31/4.76 1.5/2.04 28.29/28.20 -20.69/ Pass -23.45/ Pass

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# Diagram 2.21b: Pre scan 24 – 26.5 GHz, BMT8<sub>50</sub>, EIRP Vertical polarization



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# Diagram 2.21c: 24 – 24.25 GHz, QPSK, BMT850, EIRP Horizontal polarization

-40 d8m			5001.pts	25.0 MHz/	24.25 GH
-30 dBm					
-20 d8m					
-10 dBm	HI -13.000 dBm			and the second s	
0 dBm					M2
10 dBm					
20 dBm		·			
30 dBm	-				
40 dBm					
50 dBm					
1 Frequency Swee	p				+1Rm Av

10:26:47 25.05.2021

### Diagram 2.21d: 24 – 24.25 GHz, QPSK, BMT850, EIRP Vertical polarization

*5M\5322 PL 24	-26GHZ 5M*				
requency Swee	p				-1Rm
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Bm	-				
Bm					
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dillem	and the second s			70.5	
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) dBm					
dBm					
.0 GHz			5001 pts	25.0 MHz/	24.2
larker Table	of Tak	V Vishin	V Value	Exection	Execution Docalt
TANG 10		24 25 GHz	2.71 dBm	Editada	CURARIO (CESUIC

Power EIRP for 24.25 GHz Hor/ Ver [dBm]	Power EIRP for 24.245 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 24.25 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 24.245 GHz (Limit -13 dBm) [dBm]/ Verdict
2.61/2.71	-1.67/ -0.02	25.25/25.03	-19.47/ Pass	-22.87/ Pass

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## Diagram 2.21e: 25.25 – 26.5 GHz, QPSK, BMT850, EIRP Horizontal polarization X 81. 8x100 X 31. 8x200 X 800 8x 300 8x 300 8x × Paitt . Offset 1.30 dB # RBW 1 MHz SWT 100 ms VBW 10 MHz Mode Auto Sweet RefLe 55-00 JB SGL Count 100/100 dB = SWT 125.0 MHz/ 26.5 GHz 6001 pts 25 GH X-Value 25.25 GHz 25.255 GHz 25.333 1 GHz -0.29 dBm -5.70 dBm -13.95 dBm M1 M2 M3

10:36:43 25.05.2021

10:43:13 25.05.2021



Total conducted Total conducted Power EIRP for Power EIRP for Antenna Gain power/BW for power/BW for 25.25 GHz 25.255 GHz Hor/ Ver 25.25 GHz 25.255 GHz Hor/ Ver Hor/ Ver (Limit -5 dBm) (Limit -13 dBm) [dBi] [dBm] [dBm] [dBm]/ Verdict [dBm]/ Verdict -0.29/ -0.27 -5.70/ -4.64 24.95/25.06 -22.27/ Pass -27.14/ Pass
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## Diagram 2.22a: 26.5 - 28 GHz, QPSK, BL<sub>50</sub>, EIRP Horizontal polarization

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Nuttiview Spect Ref Level 30.00 db Att 0 d	nam RBW n FRBW 5 = SWT 1 5 VBW 1	e X 19-24942 1975 1975 Mode Auto Severa	× 26.5/280	te X					
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-70 dBm-									
26.5 GHz 2 Marker Table			8001 pts			150.0 MHz/			28.0 GHz
Type Re Mt	f Trc	X-Value 27.347 113 GHz		Y-Value		Function	¥!	Function Re	sult
12								Measuring	11111

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## Diagram 2.22b: 26.5 - 28 GHz, QPSK, BL<sub>50</sub>, EIRP Vertical polarization

Programmy Sec	26-280H2 5M2 26-280H2 5M2	PPE Mode Auto Ire	ф. уч	 ,	¥4	(d)		IRm Max 22Rm C
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## Diagram 2.23a: 26.5 – 28 GHz, QPSK, BT850, EIRP Horizontal polarization

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Multiview * Sp Ref Level 20.00 • Att	ectourn	e • • • • • • • • • • • • • • • • • • •	× 26.5 280	* X					
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-30 d8m		1							
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100071									
-50 dBm						-			
-60 d8m									
-70 d8m						_			
26.5 GHz			8001 pts			150.0 MHz/			28.0 GHz
2 Marker Table									100
M1	1	27.420 791 GHz		-18.85 dBm		Function	1-	Function Res	suit
								Measuring	11111 - · · · · · · · · · · · · · · · ·

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## Diagram 2.23b: 26.5 - 28 GHz, QPSK, BT850, EIRP Vertical polarization

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## Diagram 2.24a: 26.5 - 28 GHz, QPSK, BMT850, EIRP Horizontal polarization

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MultiView Spec Ref Level 20:00 df • Att 0 The Technologies, cel	man i-bilite	x 19-2464t · X 2	6.3-28694z X			
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26.5 GHz		8	001 pts	150.0 MHz/		28.0 GHz
2 Marker Table Type Re	ef Trc 27.6	X-Value 31 177 GHz	Y-Value -20.02 dBm	Function	Function Re	sult
					Measuring	11111 10 + 11.16.2021 12.03.05

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## Diagram 2.24b: 26.5 - 28 GHz, QPSK, BMT850, EIRP Vertical polarization

uttiview * Spectra Ref Level 20,00 dfm Att 0 df	m i-tara = park i = SWT 1 + VBW 11	er 🔹 🔀 18-2464 1992 1992 Mode Autolom	26.5-280 4	He 🗙			I
nequency Sweep	17.2010/0		940 (M)				IPm Max 22Pm Ch
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	10 122.000 days						
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.5 GHz			8001 pts		150.0 MHz/		28.0 0
Type Ref	Trc	X-Value		Y-Value	Function	 Function Res	sult

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## Diagram 2.25a: 28 – 40 GHz, QPSK, TH<sub>50</sub>, EIRP Horizontal polarization

* 1autos X 11	n	· · X ···· X		
vel 10,00 dbre	= REW 119%			
0 d5 = SWT 1 07322 PL 28-400H2 SM*	s VBW 10 MHz Mode Auto Sensp			
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42		55001 ote	1.2 (Hz/	
r Table		55001 pts	112 01 127	
e Ref Tro	X-Value	Y-Value	Function	Function Result
1	28.299 231 GHz	-22.51 dBm		
				Manual Manua Manual Manual

Diagram 2.25b: 28 - 40 GHz, QPSK, TH<sub>50</sub>, EIRP Vertical polarization

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8.0 GHz Marker Table			55001 pts			1.2 GHz/			40.0 GF
Type R	tef Trc	X-Value 28.299 231 GHz		-24.02 dBm		Function		Function Res	ult
1.18									116.2

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# Diagram 2.26a: 28 – 40 GHz, QPSK, BT850, EIRP Horizontal polarization

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-12.080								
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-70 d8m								
TO GOM								
-80 dBm								
28.0 GH2 2 Marker Table		and the	55001 pts		1.2 GH2/		11. A. 10.	40.0 GHz
Type R	ef Trc	X-Value 28.219 378 GHz	-34.08 dBm		Function	1.	Function Res	ault
1.11			01100 000				Measuring	1105,2021
								S2745328

12:43:26 01.06.2021

## Diagram 2.26b: 28-40 GHz, QPSK, BT850, EIRP Vertical polarization

Ref Level 30.00 d	tro = RBW 10 d5 = SWI 15 VBW 103	nom 🔹 🔀 nom 12 12 Mode Autotomp	- <mark>-</mark> X	×					
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ro den									
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28.0 GHz Marker Table			55001 pts			1.2 GHz/			40.0 GH
Time D	of Tre	X-Mahun		V-Value	1	Function		Eurotion Res	ult

12:39:48 01.06.2021

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## Diagram 2.27a: 28 - 40 GHz, QPSK, BMT850, EIRP Horizontal polarization

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Ref Level 10.00 d		none <b>X</b> none	× ****						
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-80 dBm-									
28.0 CH2			55001 ote			1.2 (Hz/	4		40.0 CH2
2 Marker Table			55001 pts			112 (#127			40.0 GH2
Type Re M1	ef Trc	X-Value 28.071 89 GHz		-29.84 dBm		Function		Function Res	sult
1								Measuring	11111

12:31:23 01.06.2021

## Diagram 2.27b: 28-40 GHz, QPSK, BMT850, EIRP Vertical polarization

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Ref Level 10:00 dbm = R	IW 1 HF2			-
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28.0 GHz	550	01 pts	1.2 GHz/	40.0 GH
Type Ref Trc	X-Value	Y-Value	Function	Function Result
M1 1	28.071 89 GHz	-27.90 dBm	1775 FOR \$725	

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## Diagram 2.28a: 40 - 60 GHz, QPSK, BH<sub>50</sub>, EIRP Horizontal polarization

Parl Lawel - 10,00 db	SWT 1 = REW SWT 1 = YOW 0 Other, TRL 3 MT No: Ex	3 MHz - 0 MHz - Mode Auto Sino MHz U	=						IRm Che - 2Rm Mae
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-80 dBm									
-90 d8m		-				-			-
-100 GBM									
40.0 GHz			90001 pts			2.0 GHz/			60.0 GH
Marker Table Type Re	f Trc	X-Value		Y-Value		Function		Function Res	ult

15:30:51 01.06.2021

## Diagram 2.28b: 40 - 60 GHz, QPSK, BH<sub>50</sub>, EIRP Vertical polarization

MultiView = 9	-1G • 🗙 43-60	GHz X							
Ref Level +10,00 d	<ul> <li>SWT 1 = VSW ()</li> <li>SWT 1 = VSW ()</li> </ul>	3 Minte - Mode Auto Simong Minte - Mode Auto Simong							
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10.000									
50 d8m									
70 dBm									
80 d8m									
90 d8m						-	-		
100 dBm									
10.0 GHz		1	90001 pts			2.0 GHz/			60.0 GH
Type R	ef Tre	X-Value		Y-Value		Function		Function Re	sult
101	6	40.791 125 GHZ		-22.25 0.00				Measuring	11.16.202

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## Diagram 2.29a: 40 - 60 GHz, QPSK, BT850, EIRP Horizontal polarization

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100 dBm									
IO.0 GHz		2	90001 pts			2.0 GHz/			60.0 GH
Marker Table	an an an an							14 640 65	

15:35:07 01.06.2021

## Diagram 2.29b: 40 - 60 GHz, QPSK, BT850, EIRP Vertical polarization

									8
MultiView - 9-1	G 43-60	GHz X							
Raf Level +10.00 (Er	= PEW	1 Mills							-
	= SWT 1 = = VSW ()	O Mitte - Mode Auto Sino	92						
EProquency Sweep	CONTRACTOR FORES	10.0	(1) (1)	5			(a) (a)		IRm Chiel 28rd Max
	10 - 12 AM								
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-10.000							Constraint State		
-10 1819									
-60 d8m									
-70 d8m									
-80 dBm									
-90 d8m							-		
100 -00-									
-100 GBH									
40.0 GHz	-		90001 pts			2.0 GHz/			60.0 GHz
2 Marker Table									
M1 Ref	2	48.872 235 GHz		-21.46 dBm		Function		Function Res	ult
									-

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#### Diagram 2.30a: 40 - 60 GHz, QPSK, BMT850, EIRP Horizontal polarization

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-							
ou dem							
70 d8m							
30 dBm-							
30 dBm							
100 dBm							
10.0 GHz			90001 pts		2.0 GHz/		60.0 GF
Type Re	ef Tro	X-Value		V-Value	Function	Function Res	ult

15:43:46 01.06.2021

## Diagram 2.30b: 40 - 60 GHz, QPSK, BMT850, EIRP Vertical polarization

									0
MultiView = 9-1	G × 43-60	GHz X							
Raf Level -10.00 (Err	= PEW	INTE .							
		O Minte - Mode Auto Sim	10						
Prequency Sweep		and the second se	- <u>1</u> -1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	·	9	44			IRim Che - 2Rei Mai
	10 - 12 Mill offer-								
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60 dBm	[		1				-		
70 dBm					-				
80 dBm									
90 d8m-									
100 dBm-									
40.0 GHz			90001 pts			2.0 GHz/			60.0 GH
Marker Table	No.	V Value		W.Webee		Firm officer		Counting Day	4
M1 Ker	2	48.602 016 GH	z	-21.23 dBm		Punction	12	Function Res	uic.

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## Diagram 2.31a: 60 - 75 GHz, QPSK, BH<sub>50</sub>, EIRP Horizontal polarization

MultiView 40-60GHz 106073 1075-90GHz 175-90GHz	\$
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45 dm	_
-50 dm	
-53 dm	_
60.0 GHz 66001.pts 1.5 GHz/ 75.0	GHz
2 Marker Table	-
Type         Ref         Trc         X-Value         Y-Value         Function         Function Result           M1         2         74.011.26 GHz         -16.97 dBm         Function         Function         Function	
Messuring Messuring 🕯	16,2021

08:31:46 02.06.2021

# Diagram 2.31b: 60 - 75 GHz, QPSK, BH<sub>50</sub>, EIRP Vertical polarization

									~
MultiView - 40	-60GHz X 6	0-75GHz X	75-90GHz ×						
Raf Level +10.00 (Er	. # REW 1	Hrz	an a						
THE PERS AND TRACKING	· SWT Is · VSW 3	19th Mode Auto Sve	4p						
EProquency Sweep	and the second second second						1	1	IRim Cine @2Ref Max
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200							Section 24	No. of Concession, Name	
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		distantiation in the	A COLUMN TO A COLUMN	and the second sec	and the second states of the	The second s			
-35 dem	and the state of t	and the supplication of th		and Disalerout of	10 10 States	1			
	and the second second	and some the second second	a second second						
-40 d8m									
-45 d8m									
-50 d8m									
-55 dBm		-							
60.0 GHz		1	66001 pts			1.5 GHz/		1	75.0 GHz
2 Marker Table Type Ref	E Trc	X-Value		Y-Value	12	Function	10	Function Re	sult
M1	2	73.981 49 GH	z	-17.06 dBm					

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#### Diagram 2.32a: 60 – 75 GHz, QPSK, BT850, EIRP Horizontal polarization

C		1	
MultiView * 40-60GHz 8 60-75GHz Ref Level -10.00 (Em * REW 1 Mt	75-90GHz ×		
TOP THE INT 28240-2016-020 CBF Tree Entroits L Programmy Second		10 U.	IRm Die CORT Mar
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132 cguine in the state of the	Philadeline and the second s		
-40 dBm			
-45 dBm-			
-50 d8m-			
-55 dBm			
60.0 GHz	66001 pts	1.5 GHz/	75.0 GH:
Z Marker Table Type Ref Trc X-Value With 2 73 929 09	V-Value	Function	Function Result
	-17:05 000		Meesuring

09:10:15 02.06.2021

## Diagram 2.32b: 60 - 75 GHz, QPSK, BT850, EIRP Vertical polarization

60GHz 🕅 6	0-75GHz	75-90GHz						
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. SWT 1.5 . VSW 31	Hele Auto Swe							
040-320 CRI* Ing. ExtP	As £							Day Place British Mar
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and the second se	hardinglad and places.	division in the day of the	the training of the second sec					
								-
				1				
		66001 pts			1.5 GH2/			75.0 GHz
Trc	X-Value		Y-Value		Function		Function Res	ault
2	73.880 13 GHz		-16.70 dBm					
		SOGHZ         CO-75GHZ         X           *         RRW 1992         X         Mode Auto See           *         RRW 1992         Mode Auto See         X           *         RRW 1992         X         Mode Auto See           *         RRW 1992         X         X           *         X         X         X           *         X         X         X           *         X         X         X	60GHz         X         60-75GHz         75-80GHz         X           *	SOGHZ         SO-73GHZ         75-B0GHZ         S           *         * RRW 1992         * Hard 1992         * * RRW 1992         * * RRW 1992           *         * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992           *         * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992           *         * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992           *         * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992           *         * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992         * * RRW 1992           *         * * RRW 1992           *         * * RRW 1992           *         * * RRW 1992           *         * * RRW 1992           *         * RRW 1992         * * RRW 1992	SOGHZ         SO-75GHZ         75-80GHZ         S           *         * RRW 11912         *	SOGHZ         Note of the second	SOGHZ         NUM 1982         75-90GHZ         X           *	SOGHZ         NUM 1 Hor           *         <

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#### Diagram 2.33a: 60 – 75 GHz, QPSK, BMT850, EIRP Horizontal polarization

U		, , ,		1		3
MultiView 🍨 40-6	60GHz 🗙 6	90-75GHz 🗙 75	-90GHz			
HAP LEVEL +10,00 (EPH)	= 5WT 1s = VSW 3	1915 Mode Auto Sweep				
Proquency Sweep						IRim Cline @28ct Max
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Li des						in the second se
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-11.000					and the second se	and the state of t
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40 dtm	and a second sec	and all the tax is the tax				
-45 dBm						
-50 d8m						
2004005						
-55 dBm-						
60.0 GHz			66001 pts	1.5 GHz/		75.0 GH
2 Marker Table	Tre	X-Value	V-Value	Function	Function Re	sult
M1	2	73.993 77 GHz	-16.91 dBm	Punction	Purction Re	Pull

09:18:18 02.06.2021

## Diagram 2.33b: 60 - 75 GHz, QPSK, BMT850, EIRP Vertical polarization

									~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
MultiView -	10-60GHz X 6	0-75GHz	75-90GHz X						
Raf Level -10.00 s	Ern + REW 1	HPE NO							
	= SWT Is = VSW 3	19th Mode Auto Swee	÷						
E Prequency Sweet	P.		<b>V</b> 21			<u>19</u>	pa - 1		IPm Cine GCPm Max
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1111								200	A DESCRIPTION OF THE OWNER OWNER OF THE OWNER
-28 slites								Sector States	- Index Sector
-25.080	-	-				the support of the state	And a state of the state of the		A DESCRIPTION OF THE PARTY OF T
in a la constantino					A DESCRIPTION OF THE OWNER	and the second s		tenter (Dillion	
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and the second second	inda material a real dimension	an half as from by such as	and allow the set						
-40 d8m									
-45 08m									
-50 d8m					-				
-55 dBm-									
2 Marker Table		10 March 10 March 10	66001 pts			1.5 GHZ/			75.0 GH2
Type R	ef Trc	X-Value 74.020.12.CHz		Y-Value		Function	1	Function Res	alt
1911	. 6	74.030 13 012		-10.74 0011					82.06.2021

09:28:08 02.06.2021

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## Diagram 2.34a: 75 - 90 GHz, QPSK, BH<sub>50</sub>, EIRP Horizontal polarization

U		,				1			\$
MultiView 40 Paf Level -10.00 (E)	-60GHz = REW 1	0-75GHz X 7	5-90GHz ×						
TOP THE INT TORONO	= SWT 1s = VSW 3 20:60-320 CRI" Ing. ExP	HPIE Mode Auto Sweep No S				191			IBm Dhe BORt Max
15 dire			-		or service and	and designed as a	the second second second		00000 000000
-		and an interest of the second	and a state of the		A second second second				
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-10 2819									
-35 dBm							-		
-40 d8m									
-45 dBm									
-50 d8m									
-55 dBm									
75.0 GHz			66001 pts			1.5 GHz/			90.0 GHz
Type Rel M1	Trc 2	X-Value 79.926 403 GHz		V-Value -16.81 dBm		Function		Function Res	ult
1								Measuring	82.46.2021 85.53.00

08:33:11 02.06.2021

# Diagram 2.34b: 75 - 90 GHz, QPSK, BH<sub>50</sub>, EIRP Vertical polarization

MultiView 40-60GHz X 60-75GHz X 75-60GHz X Part Level - 10.00 dbm 9 BPW 199± FF THE Level - 10.00 dbm 9 BPW 199± FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Seven FF THE Level - 10 WK 399± Mode Auto Se	- 99										
								75-90GHz 🔀	0-75GHz 🗙 3	-60GHz 🛛 60	MultiView - 40
									1912 1912 - Moder Auto Sweep 1918	= FUEW 11 = SWT 1s = VEW 31	Part Level +10.00 cm
	m Max	IRm Che G25			(1) (1)			a		Contract with a second	EProquency Sworp
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	_							-			LS dire
		120200	at a statistic leader to	and the second second second second	Tella Industria	in a strength of the	States in the second	State of the local division in street	the states		
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-35 dbn											-10 18/1
-35 dBm-											
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-40 dbm											-40 d8m
-45 dm											-45 dBm-
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-55 dbm											-55 dBm
75.0 GHz 66001 pts 1.5 GHz/	).0 GHz	9			1.5 GHz/			66001 pts		1	75.0 GHz
2 Marker Table		ault	Function Res		Function		Y-Value	-	X-Value	Irc	2 Marker Table Type Re
Mi 2 79.566 181 GHz -17.45 dBm					- and done		-17.45 dBm		79.566 181 GHz	2	M1

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# Diagram 2.35a: 75 - 90 GHz, QPSK, BT850, EIRP Horizontal polarization

U		,				1			\$
MultiView • 40 Ref Level -10.00 db	-60GHz S	0-75GHz X 7	5-90GHz ×						
TOP 7111, 107/7282404	20:40-320 CRF Ing. Erm	Node Auto Sweet	£						
I Prequency Sweep	P					1			IRm Christel Rate Mas
11. 4									
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No. of Contraction of	Contraction of the local division of the loc	in a second distant	angitte free law	Similar and show	water in the initial	- de incert stilder ab a finites	and the house in the local state		
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-10 1819-									
-35 dBm									
-40 d8m									
-45 dBm									
-50 d8m									n
-55 d8m-									
75.0 GHz	-		66001 pts			1.5 GHz/			90.0 GHz
Type Rel	F Trc	X-Value		Y-Value		Function	1	Function Res	ult
MI.	.4	60.040 846 GHZ		-17.12 dbm				Measuring	*** **********************************

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# Diagram 2.35b: 75 - 90 GHz, QPSK, BT850, EIRP Vertical polarization

									2
MultiView - 40-60GH	tr 🗙 60-7	SGHr X 7	5-90GHz ×						
Paf Level -10.00 (Em	= PEW 110-2	Made 1. in Succession							_
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LS dans	11-12.202.200		WC.						
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ld stars									
35 dBm									
40 dBm									
45 dBm									
50 d8m									
55 dBm									
75.0 GHz			66001 pts		1	1.5 GHz/		1	90.0 GH
Type Ref	Trc	X-Value		Y-Value		Function		Function Res	ult
MI	2 8	0.002765 GHz		-17.28 dBm					

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#### Diagram 2.36a: 75 – 90 GHz, QPSK, BMT850, EIRP Horizontal polarization

Date

U		,				1			\$
MultiView • 40 Part Level - 10.00 dbr	-60GHz × 64 = 88W 1 = 98W 1 1 = 98W 2	0-75GHz X 3	75-90GHz 🗙						
E Prequency Sweep	0.60-320 CHI" (Hg. E+P	As 1							IRm Che CORth Max
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. Manufacture date	- HISTORY CONTRACTOR	and the second second		and the set	and the second second	ter in state to be			and the second se
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-35 dBm									
-40 d8m									
-45 dBm									
-50 d8m									
-55 dBm									
75.0 GHz	-		66001 pts			1.5 GH2/			90.0 GHz
2 Marker Table	1	M Door Jan	00001 pts	1010.000		1.5 GHZ/		11. 0.20	50.0 Cirtz
Type Ref	2	X-Value 79.547 545 GHz		-17.27 dBm		Function	14-	Function Res	ult
1 9								Measuring	1111 AZ.16.2021 95:20:10

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## Diagram 2.36b: 75 - 90 GHz, QPSK, BMT850, EIRP Vertical polarization

									8
MultiView - 4	0-60GHz 🛛 🗙 6	0-75GHz	75-90GHz ×						
TOP THE MY T26240	= 5WT 1s = VSW 3 2040-320 CHP Ins. Ere	HPE Mode Auto Sweet We E	e						
E Prequency Sweet	and the second second second		94) (A)			112			IRm Cine CORM Max
	HI - ST. BIR (BU)								
LS dire			¥.						
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-as dem									
-40 dBm					-				
-45 dBm-		-				-			
-50 dam									
-55 dBm-									
75.0 GHz		1	66001 pts		E	1.5 GH2/	L	1	90.0 GHz
2 Marker Table	f Irc	X-Value		Y-Value		Function		Function Res	allt
M1	2	79.780 268 GHz	1	-17.26 dBm		- differentia		+ STADAOT POD	
									- 87.66.2021

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Date Reference 2021-06-18 P110210-F30



#### Diagram 2.37a: 90 - 100 GHz, QPSK, BH<sub>50</sub>, EIRP Horizontal polarization



#### Diagram 2.37b: 90 - 100 GHz, QPSK, BH<sub>50</sub>, EIRP Vertical polarization



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A) "False signals" originating from unwanted mixer products between LO signal generated by the spectrum analyser and the high field strength from the EUT are marked with red circle.

**RI.** Se

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#### Diagram 2.38a: 90 - 100 GHz, QPSK, BT850, EIRP Horizontal polarization

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MultiView 40-60 Part Level -10.00 dbr	6842 60-750 n PRW 1 = 5WT 1 = 98W 3	Bitz · · · · · · · · · · · · · · · · · · ·	Hz • 🗙 90-100	Gitz 🗙					
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+0.000									
-11 (81)									
-00 dBm									
-70 d8m									
-60 d8m									
1000									
-90 d8m-									
-100 dBm						-			
00.0.011-			07001			1.0.011-1			100.0.00
2 Marker Table			87001 pts	20		1.0 GH2/			100.0 GH2
Type Ref	Trc 2	X-Value 99.901 553 GHz		-21.03 dBm		Function		Function Res	ilt
1								Measuring	10.0001

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## Diagram 2.38b: 90 - 100 GHz, QPSK, BT850, EIRP Vertical polarization

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Muttiview = 40-6	06847 <b>- 32</b> 60-7518	Hz · × 75-906	Ha 90-100	GHz 🗙					
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11.00									611
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10.000	a second second second		and the set of				1.1		
-10 1814									
-60 d8m-									
-70 d8m									
-80 d8m-									
-90 d8m									
-100 dBm									
90.0 GHz			87001 pts			1.0 GHz/		1	100.0 GHz
2 Marker Table	f Trc	X-Value		Y-Value		Function		Function Res	ault
M1	2	99.861 438 GHz		-21.24 dBm					
								Measuring	82.06.2021

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#### Diagram 2.39a: 90 - 100 GHz, QPSK, BMT8<sub>50</sub>, EIRP Horizontal polarization

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	10 - 12 All day						
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dBm							
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00 d8m		-					
0.0 GHz			87001 pts		1.0 GHz/		100.0 GH

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## Diagram 2.39b: 90 - 100 GHz, QPSK, BMT850, EIRP Vertical polarization

Mutriview * 40-6064e * X 60-75584e * X 75-0064e * X 90-10004e X Ref Level -10.00 dbm * RBW 1.955 * BWT 1.8 * WW 3.955; Mode Auto Seven DP Th. INF. 7200402 05:1100 DBC For terms w Infernational Seven	Han the same Mar
Parf Level - 10.00 dBm # RBW 1.19tz # BWT 11 # WWW 319tz Myde Auto-Streep DF TR: Let Carbon 0.15:1100 DBC to 15Mb W From antroy Estimate	I Em Cine ØGP#1Mas
HWT II is # VMW 3 Mt Mode Auto Seven TP UM (2020-2015-1100 DP) for LMMe W FMULAUXYSENERD	IRm Chie Gotter Mar
Proteganica) Senterp	IRm Dhe @2Rm Mai
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90.88m	
100 dbm	
0.0 GHz 87001 pts 1.0 GHz/	100.0 GH
Marker Lable Type Ref Trc X-Value Y-Value Function Funct	on Result
M1 2 99.974 196 GHz -21.08 dBm	

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# End of report.