



# RADIO TEST REPORT

REP068642

Date of issue: December 23, 2024

Applicant:

Andrew Wireless Systems Industriering 10, Buchdorf 86675  
Germany

Product:

RPM-A61L1-7E

Model:

7847588-00

Model variant:

None

FCC ID:

XS5-RPML2-B121314 NA

IC Registration number:

Specifications:

◆ FCC 47 CFR Part 27

Miscellaneous Wireless Communications Services

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**Lab and test locations**

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Tested by	O. Frau
Signature	
Reviewed by	D. Guarnone
Review date	December 23, 2024
Signature	

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**Limits of responsibility**

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Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report. This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Spa ISO/IEC 17025 accreditation.

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## Section 1. Report summary

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### 1.1 Applicant and manufacturer

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Company name	Andrew Wireless Systems
Address	Industriering 10,
City	Buchdorf
Province/State	--
Postal/Zip code	86675
Country	Germany

### 1.2 Test specifications

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FCC 47 CFR Part 27

Miscellaneous Wireless Communications Services

### 1.3 Statement of compliance

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In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

### 1.4 Exclusions

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None

### 1.5 Test report revision history

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Revision #	Details of changes made to test report
REP068642	Original report issued

## Section 2. Summary of test results

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### 2.1 FCC Part 27 test results

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Part	Test description	Verdict
§2.1033(c)(4)	Modulation type	Pass
§2.1049(h)	99% Occupied bandwidth	Pass
§27.53(h)(3)	Frequency ranges	Pass
§27.50(b)(4)	Output power at RF antenna connector	Pass
§27.50(d)(5)	Peak to average power ratio	Pass
§27.53(m)	Conducted spurious emissions	Pass
§27.53(m)	Radiated spurious emissions	Pass
§27.53(h)(3)	26 dB Occupied bandwidth	Pass
§27.54	Frequency stability	Pass

Note: None.

## Section 3. Equipment under test (EUT) details

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### 3.1 Sample information

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Receipt date	November 7, 2024
Nemko sample ID number	PRJ00630770006

### 3.2 EUT information

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Product name	RPM-A61L1-7E
Model	7847588-00
Part Number	7847588-00
Serial number	SZRMBG24230045

### 3.3 Technical information

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Frequency band	B13: 746 - 756 MHz
RF power Max (W), Conducted	max Port 1 = 23.5 dBm (0.22 W) – max Port 2 = 23.0 dBm (0.20 W); max comb. Port 1 + Port 2 = 26.5 dBm (0.44 W) @ 748.5 MHz (with 5 MHz bandwidth)
Supported bandwidths:	5, 10 MHz
Type of modulation	TM1.1, TM3p1, TM3p1a, TM3p3 (QPSK, 16QAM, 64QAM, 256QAM)
Power requirements	48 Vdc
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.
Antenna gain	3.7 dBi

### 3.4 Product description and theory of operation

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The radio unit (RU) is one of the components to configure the 4G RAN mobile communication system.

### 3.5 EUT exercise details

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A laptop computer was used to send test commands to EUT to force it to transmit the appropriate signal. Unit transmit the selected signal at full power. The unit was tested using a conducted port. The antenna installation shall be done by professionals, and they are not within the scope of the tests evaluated on this document.

## 3.6 EUT setup diagram

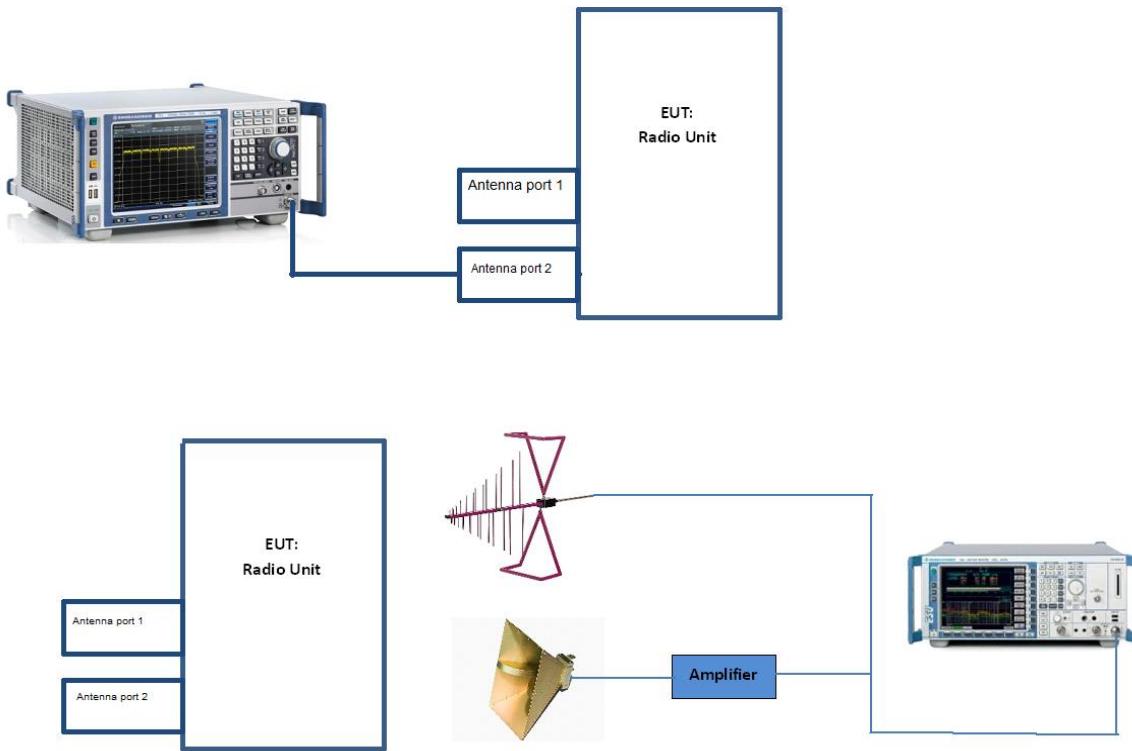


Figure 3.6-1: Setup diagram

## Section 4. Engineering considerations

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### 4.1 Modifications incorporated in the EUT

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There were no modifications performed to the EUT during this assessment.

### 4.2 Technical judgment

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None

### 4.3 Deviations from laboratory tests procedures

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No deviations were made from laboratory procedures.

## Section 5. Test conditions

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### 5.1 Atmospheric conditions

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Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (1060 mbar)

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

The following instruments are used to monitor the environmental conditions:

Equipment	Manufacturer	Model no.	Asset no.	Cal date	Next cal.
Thermo-hygrometer data loggers	Testo	175-H2	20012380/305	2022-12	2024-12
Thermo-hygrometer data loggers	Testo	175-H2	38203337/703	2022-12	2024-12
Barometer	Castle	GPB 3300	072015	2024-04	2025-04

### 5.2 Power supply range

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The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.

## Section 6. Measurement uncertainty

### 6.1 Uncertainty of measurement

The measurement uncertainty was calculated for each test and quantity listed in this test report, according to CISPR 16-4-2, ETSI TR 100 028-1, ETSI TR 100 028-2 and other specific test standards and is documented in Nemko Spa working manuals WML1002 and WML0078.

The assessment of conformity for each test performed on the equipment is performed not taking into account the measurement uncertainty. The two following possible verdicts are stated in the report:

P (Pass) - The measured values of the equipment respect the specification limit at the points tested. The specific risk of false accept is up to 50% when the measured result is close to the limit.

F (Fail) - One or more measured values of the equipment do not respect the specification limit at the points tested. The specific risk of false reject is up to 50% when the measured result is close to the limit.

Hereafter Nemko's measurement uncertainties are reported:

EUT	Type	Test	Range	Measurement Uncertainty	Notes
Transmitter	Conducted	Frequency error	0.001 MHz ÷ 40 GHz	0.08 ppm	(1)
			0.009 MHz ÷ 30 MHz	1.1 dB	(1)
	RF Output Power	30 MHz ÷ 18 GHz		1.5 dB	(1)
		18 MHz ÷ 40 GHz		3.0 dB	(1)
		5 MHz ÷ 140 GHz		5.0 dB	(1)
	Adjacent channel power	1 MHz ÷ 18 GHz		1.4 dB	(1)
		0.009 MHz ÷ 18 GHz		3.0 dB	(1)
		18 GHz ÷ 40 GHz		4.2 dB	(1)
		40 GHz ÷ 220 GHz		6.0 dB	(1)
	Intermodulation attenuation	1 MHz ÷ 18 GHz		2.2 dB	(1)
		1 MHz ÷ 18 GHz		2.0 ms	(1)
		1 MHz ÷ 18 GHz		2.5 ms	(1)
	Attack time – frequency behaviour	1 MHz ÷ 18 GHz		2.0 ms	(1)
		1 MHz ÷ 18 GHz		2.5 ms	(1)
		1 MHz ÷ 18 GHz		2.0 ms	(1)
	Attack time – power behaviour	1 MHz ÷ 18 GHz		2.5 ms	(1)
		1 MHz ÷ 18 GHz		2.0 ms	(1)
		1 MHz ÷ 18 GHz		2.5 ms	(1)
	Release time – frequency behaviour	1 MHz ÷ 18 GHz		0.2 kHz	(1)
		1 MHz ÷ 18 GHz		9%	(1)
		1 MHz ÷ 18 GHz		1.3%	(1)
	Transient behaviour of the transmitter – Transient frequency behaviour	0.001 MHz ÷ 18 GHz		0.5 dB	(1)
		0.001 MHz ÷ 18 GHz		0.009 MHz ÷ 26.5 GHz	(1)
		0.001 MHz ÷ 18 GHz		26.5 GHz ÷ 66 GHz	(1)
	Radiated	Transient behaviour of the transmitter – Power level slope	0.001 MHz ÷ 18 GHz	66 GHz ÷ 220 GHz	(1)
		Frequency deviation - Maximum permissible frequency deviation	0.001 MHz ÷ 18 GHz	10 kHz ÷ 26.5 GHz	(1)
		Frequency deviation - Response of the transmitter to modulation frequencies above 3 kHz	0.001 MHz ÷ 18 GHz	26.5 GHz ÷ 66 GHz	(1)
		Dwell time	-	66 GHz ÷ 220 GHz	(1)
		Hopping Frequency Separation	0.01 MHz ÷ 18 GHz	6.0 dB	(1)
	Effective radiated power transmitter	Occupied Channel Bandwidth	0.01 MHz ÷ 18 GHz	8.0 dB	(1)
		Modulation Bandwidth	0.01 MHz ÷ 18 GHz	10 dB	(1)
		Radiated spurious emissions	0.009 MHz ÷ 26.5 GHz	6.0 dB	(1)
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)
			66 GHz ÷ 220 GHz	10 dB	(1)

NOTES:

(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 %

## Section 7. Test equipment

### 7.1 Test equipment list

**Table 7.1-1: Equipment list**

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767	2024-01	2025-01
EMI Receiver	Rohde & Schwarz	ESU8	100202	2024-09	2025-09
EMI Receiver	Rohde & Schwarz	ESW44	101620	2024-08	2025-08
RF Vector Signal Generator	Rohde & Schwarz	SMBV100A	263254	2024-05	2025-05
RF Vector Signal Generator	Rohde & Schwarz	SMBV100A	263397	2024-09	2025-09
Climatic Chamber	MSL	EC500DA	15022	2024-01	2025-01
Antenna Trilog 25MHz - 8GHz	Schwarzbeck Mess-Elektronik	VULB9162	9162-025	2024-07	2027-07
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STLP 9148-152	2024-09	2027-09
Double Ridge Horn Antenna	RFSpin	DRH40	061106A40	2023-04	2026-04
Broadband Amplifier	Schwarzbeck Mess-Elektronik	BBV9718C	00121	2024-01	2025-01
Broadband Bench Top Amplifier	Sage	STB-1834034030-KFKF-L1	18490-01	2024-04	2025-04
Semi-anechoic chamber	Nemko S.p.a.	10m semi-anechoic chamber	530	2023-09	2025-09
Controller	Maturo	FCU3.0	10041	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR	NCR
Semi-anechoic chamber	Comtest	3m SAC	1711-150	2024-09	2026-09
Controller	Maturo	FCU3.0	10237	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	3466.01	NCR	NCR
Turntable	Maturo	TT4.0	-	NCR	NCR
Pyramidal Horn Antenna 40-60 GHz	Sage	SAR-2507-19VF-R2	15715-01	2024-06	2027-06
Harmonic Mixer	Radiometer Physics	FS-Z60	100988	2024-01	2027-01
Cable set	Rosenberger	ST.ALO-02	1.650	2024-10	2025-10
Cable set	Rosenberger and Huber + Suhner	RE01+RE02	1.654+1.655	2024-09	2025-09
Cable set	Rosenberger+Huber-Suhner	RE03+RE04	1.510+1.511	2024-09	2025-09

## Section 8. Testing data

### 8.1 FCC §2.1033(c)(4) Modulation type

#### 8.1.1 Definitions and limits

(c) Applications for equipment other than that operating under parts 15, 11 and 18 of this chapter shall be accompanied by a technical report containing the following information:

(4) Type or types of emission

#### 8.1.2 Test summary

Test date	November 26, 2024	Temperature	22 °C
Test engineer	O. Frau	Air pressure	1001 mbar
Verdict	Pass	Relative humidity	62 %

#### 8.1.3 Observations, settings and special notes

None

#### 8.1.4 Test data

##### Band B13:

Bandwidth (MHz)	Emission type
5	TM1.1
5	TM3p1
5	TM3p1a
5	TM3p3
10	TM1.1
10	TM3p1
10	TM3p1a
10	TM3p3

**Table** Errore. Per applicare Heading 2 al testo da visualizzare in questo punto, utilizzare la scheda Home.-1: Types of emission

## 8.2 FCC §2.1049(h) 99% Occupied Bandwidth and frequency ranges

### 8.2.1 Definitions and limits

§2.1049 (h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the use.

### 8.2.2 Test summary

Test start date	November 26, 2024	Temperature	22 °C
Test end date	December 13, 2024	Air pressure	1001 mbar
Test engineer	O. Frau	Relative humidity	62%
Verdict	Pass		

### 8.2.3 Observations, settings and special notes

Test method: ANSI C63.26 Section 5.4.4

Spectrum analyzer settings:

Resolution bandwidth	1% - 5% OBW
Video bandwidth	3*RBW
Frequency span	2*OBW
Detector mode	Peak
Trace mode	Max Hold

### 8.2.4 Test equipment used

Equipment	Manufacturer	Model no.	Asset no.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767

## 8.2.5 Test data

**Band B13: Antenna port 1**

Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM1.1	748.5	4.49
B13	5 MHz	TM1.1	751.0	4.50
B13	5 MHz	TM1.1	753.5	4.50
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM3p1	748.5	4.52
B13	5 MHz	TM3p1	751.0	4.49
B13	5 MHz	TM3p1	753.5	4.52
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM3p1a	748.5	4.48
B13	5 MHz	TM3p1a	751.0	4.48
B13	5 MHz	TM3p1a	753.5	4.49
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM3p3	748.5	4.50
B13	5 MHz	TM3p3	751.0	4.49
B13	5 MHz	TM3p3	753.5	4.50
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM1.1	n/a	-
B13	10 MHz	TM1.1	751.0	8.97
B13	10 MHz	TM1.1	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM3p1	n/a	-
B13	10 MHz	TM3p1	751.0	8.97
B13	10 MHz	TM3p1	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM3p1a	n/a	-
B13	10 MHz	TM3p1a	751.0	8.98
B13	10 MHz	TM3p1a	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM3p3	n/a	-
B13	10 MHz	TM3p3	751.0	8.97
B13	10 MHz	TM3p3	n/a	-

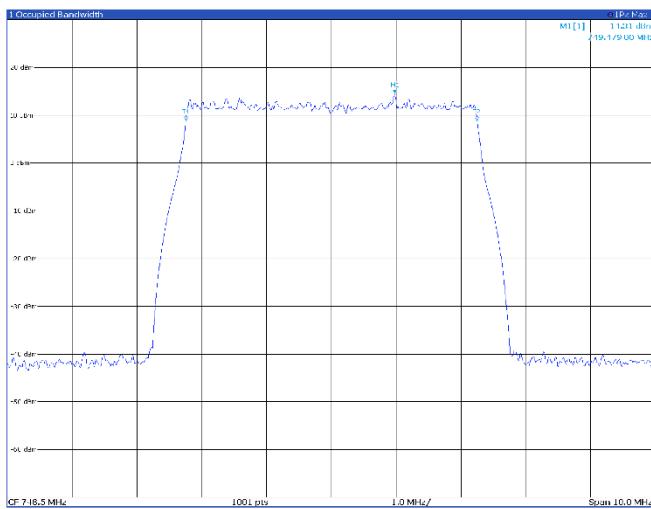
**Band B13: Antenna port 2**

Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM1.1	748.5	4.50
B13	5 MHz	TM1.1	751.0	4.50
B13	5 MHz	TM1.1	753.5	4.50
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM3p1	748.5	4.49
B13	5 MHz	TM3p1	751.0	4.52
B13	5 MHz	TM3p1	753.5	4.51
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM3p1a	748.5	4.49
B13	5 MHz	TM3p1a	751.0	4.49
B13	5 MHz	TM3p1a	753.5	4.48
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	5 MHz	TM3p3	748.5	4.50
B13	5 MHz	TM3p3	751.0	4.49
B13	5 MHz	TM3p3	753.5	4.48
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM1.1	n/a	-
B13	10 MHz	TM1.1	751.0	8.97
B13	10 MHz	TM1.1	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM3p1	n/a	-
B13	10 MHz	TM3p1	751.0	8.97
B13	10 MHz	TM3p1	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM3p1a	n/a	-
B13	10 MHz	TM3p1a	751.0	8.98
B13	10 MHz	TM3p1a	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	99% OBW (MHz)
B13	10 MHz	TM3p3	n/a	-
B13	10 MHz	TM3p3	751.0	8.97
B13	10 MHz	TM3p3	n/a	-

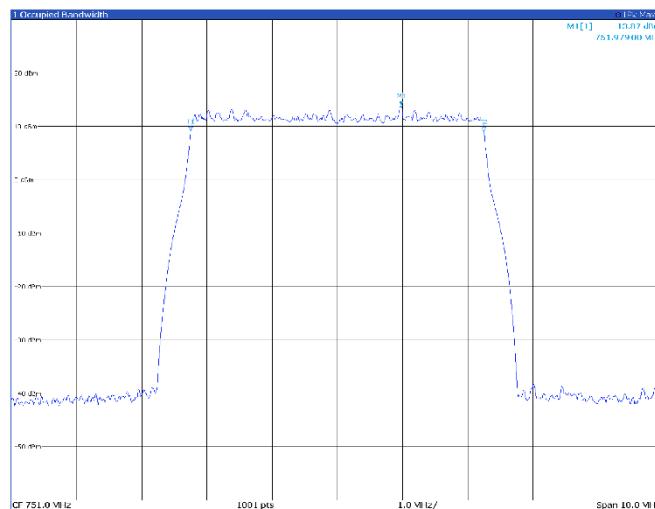
## Antenna port 1

## Band B13

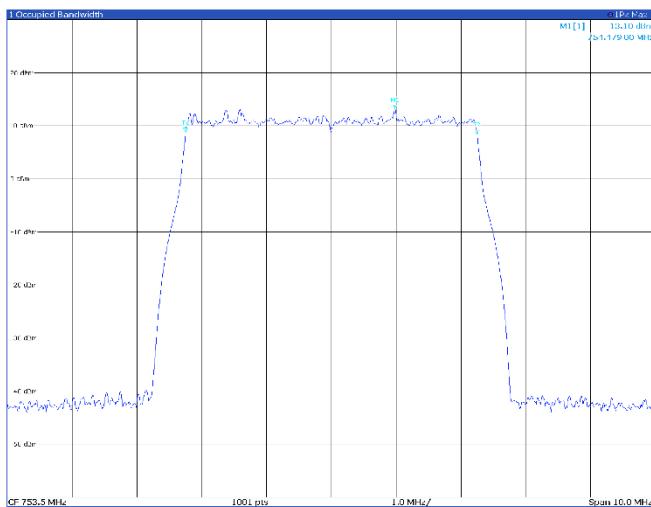
5 MHz

**TM1.1, 5 MHz, low channel**


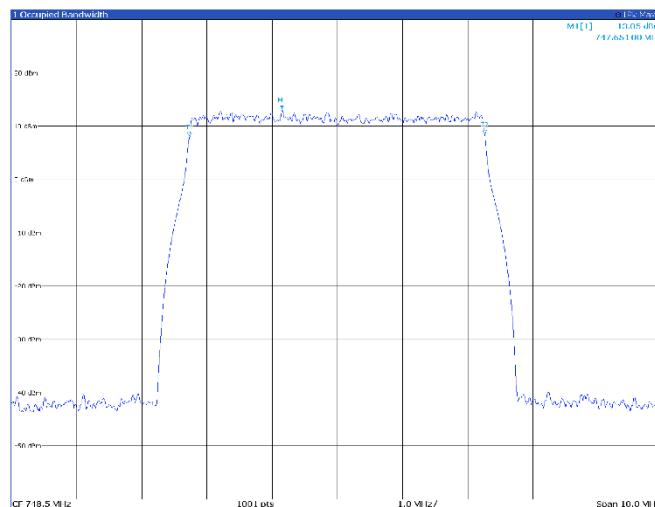
Type	Ref	Trc	X Value	Y Value	Function	Function Result
M1	1		<b>749.479 MHz</b>	<b>14.31 dBm</b>	Occ. Sx. Centered	<b>4.487 633 961 MHz</b>
T1	1		749.479 MHz	8.70 dBm	Occ. Sx. Centered	753.460 515 721 MHz
T2	1		749.479 MHz	8.70 dBm	Occ. Sx. Centered	-1.426 774 001 kHz

**TM1.1, 5 MHz, mid channel**


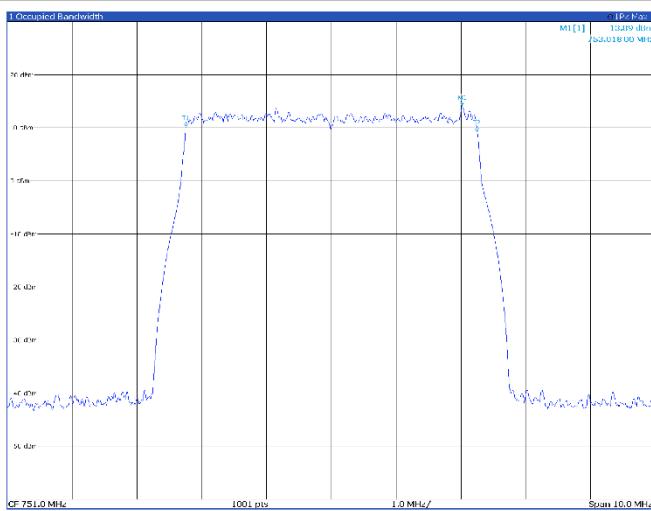
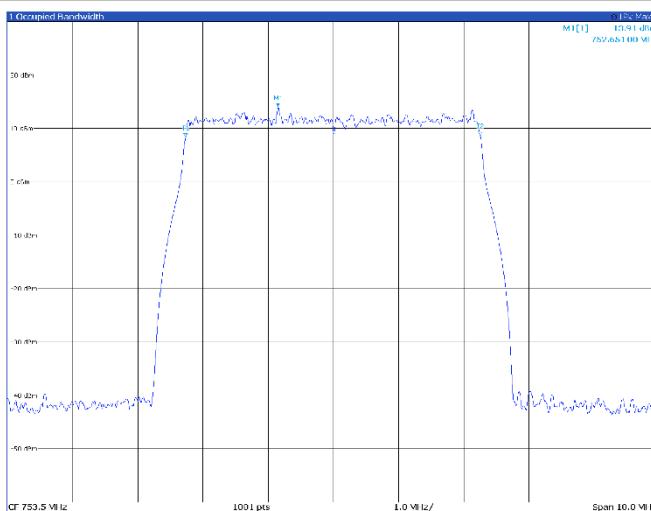
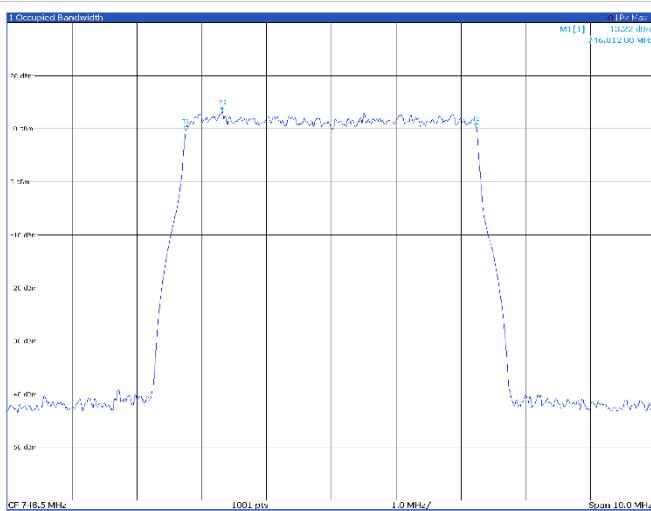
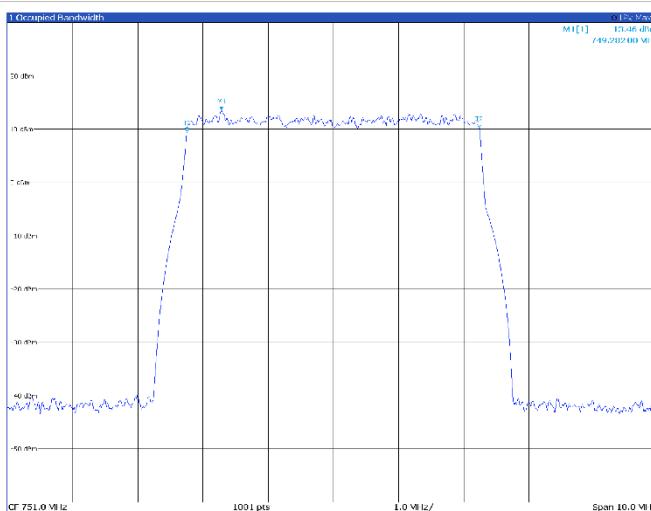
Type	Ref	Trc	X Value	Y Value	Function	Function Result
M1	1		<b>751.979 MHz</b>	<b>13.87 dBm</b>	Occ. Sx. Centered	<b>4.495 754 862 MHz</b>
T1	1		751.979 MHz	9.12 dBm	Occ. Sx. Centered	759.992 256 777 kHz
T2	1		751.979 MHz	9.12 dBm	Occ. Sx. Centered	-4.127 1-1.119 kHz

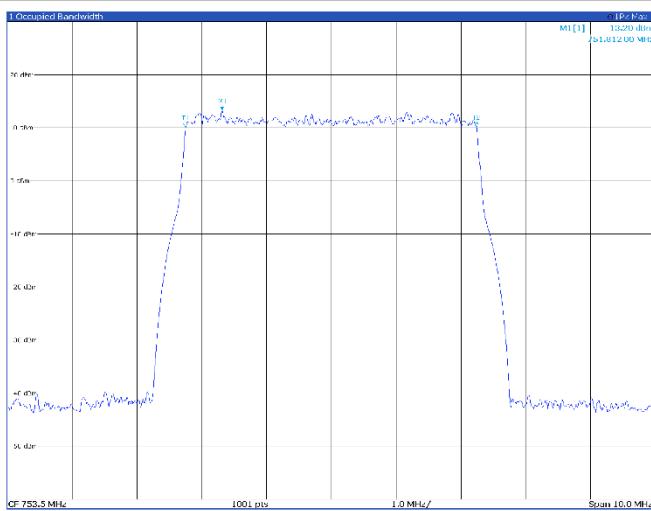
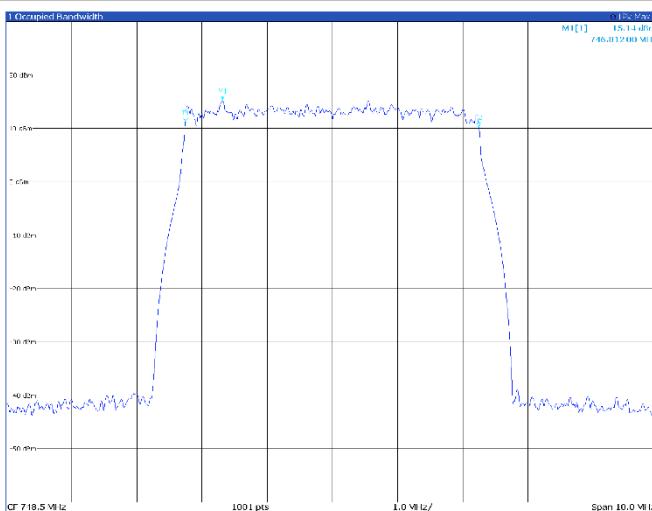
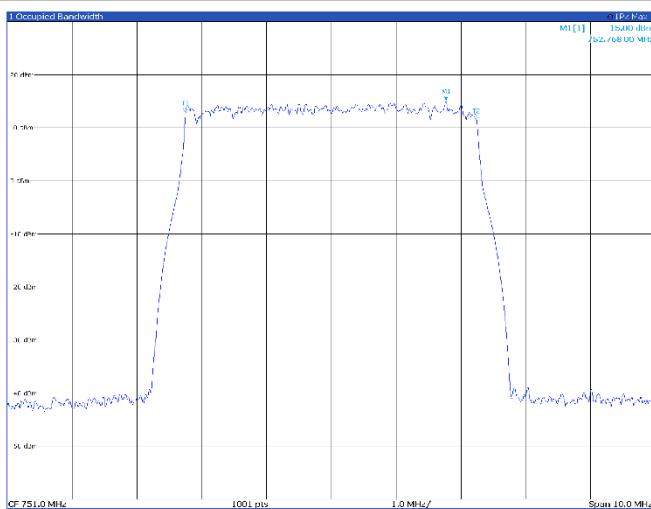
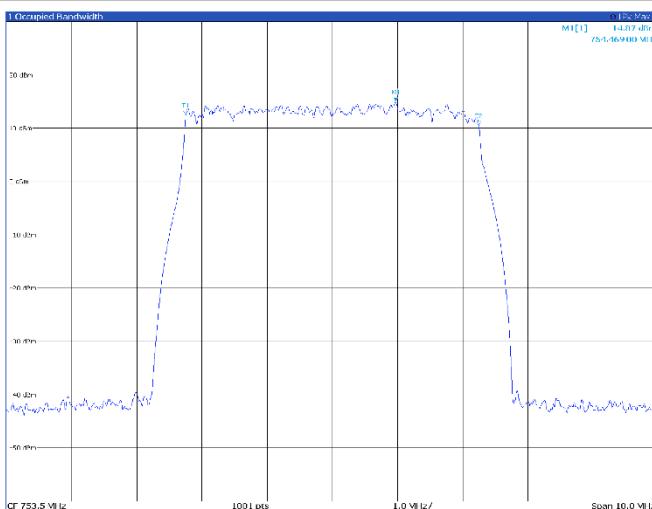
**TM1.1, 5 MHz, high channel**


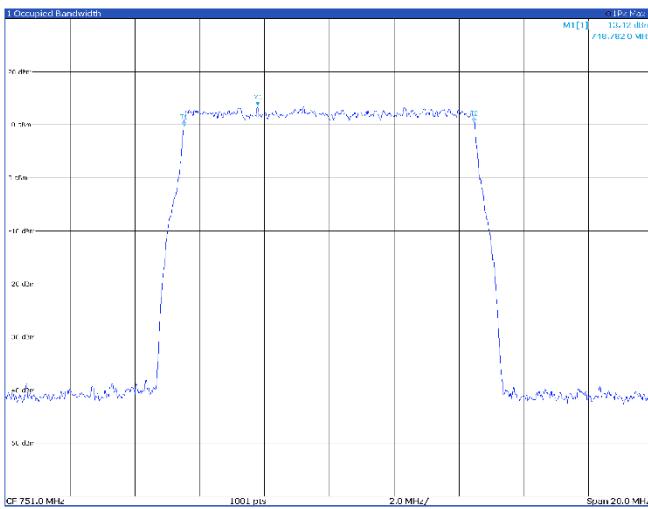
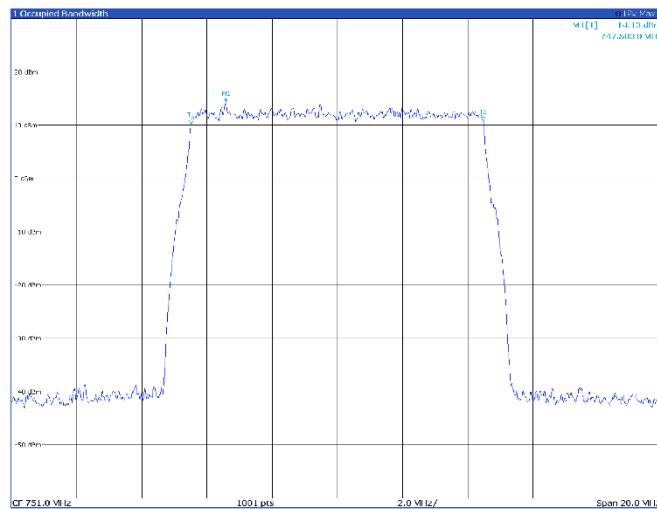
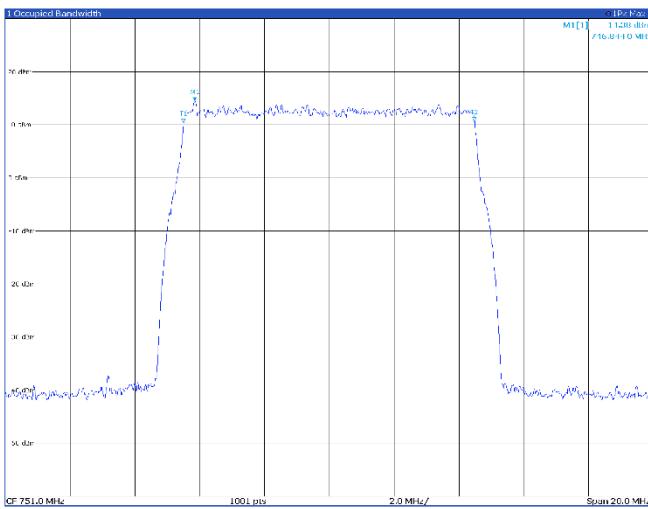
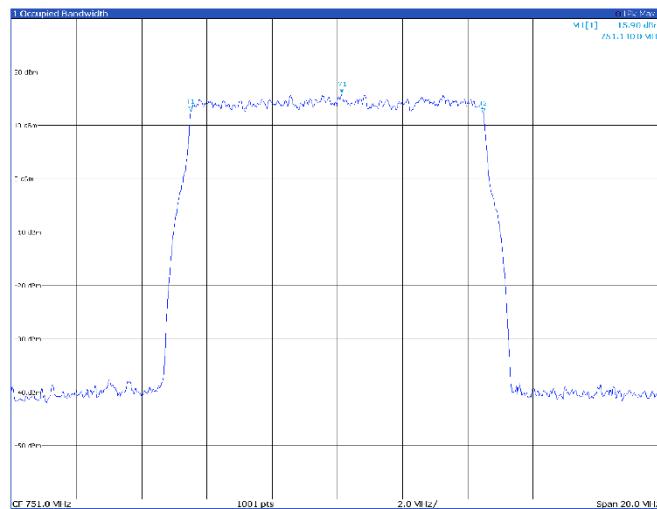
Type	Ref	Trc	X Value	Y Value	Function	Function Result
M1	1		<b>754.479 MHz</b>	<b>13.10 dBm</b>	Occ. Sx. Centered	<b>4.496 141 595 MHz</b>
T1	1		754.479 MHz	8.70 dBm	Occ. Sx. Centered	758.460 515 721 MHz
T2	1		754.479 MHz	8.70 dBm	Occ. Sx. Centered	-1.426 774 001 kHz

**TM3p1, 5 MHz, low channel**


Type	Ref	Trc	X Value	Y Value	Function	Function Result
M1	1		<b>747.651 MHz</b>	<b>13.05 dBm</b>	Occ. Sx. Centered	<b>4.520 632 696 MHz</b>
T1	1		747.651 MHz	7.59 dBm	Occ. Sx. Centered	746.992 256 777 kHz
T2	1		747.651 MHz	8.48 dBm	Occ. Sx. Centered	-4.116 774 001 kHz

**TM3p1, 5 MHz, mid channel**

**TM3p1, 5 MHz, high channel**

**TM3p1a, 5 MHz, low channel**

**TM3p1a, 5 MHz, mid channel**


**TM3p1a, 5 MHz, high channel**

**TM3p3, 5 MHz, low channel**

**TM3p3, 5 MHz, mid channel**

**TM3p3, 5 MHz, high channel**


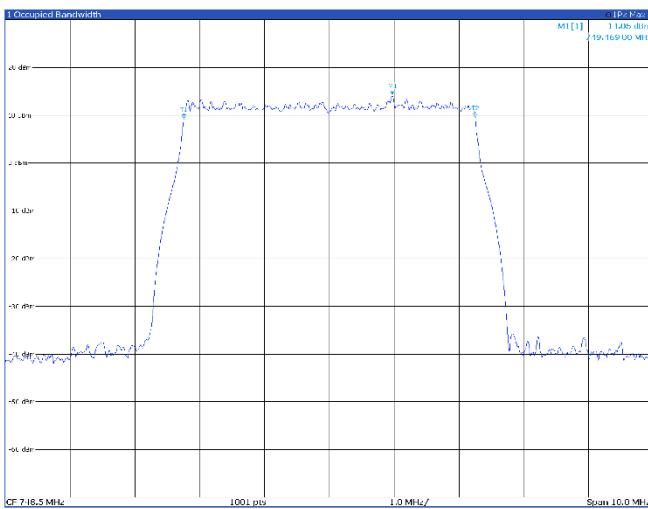
**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**

**TM3p1, 10 MHz, mid channel**

**TM3p1a, 10 MHz, mid channel**

**TM3p3, 10 MHz, mid channel**


## Antenna port 2

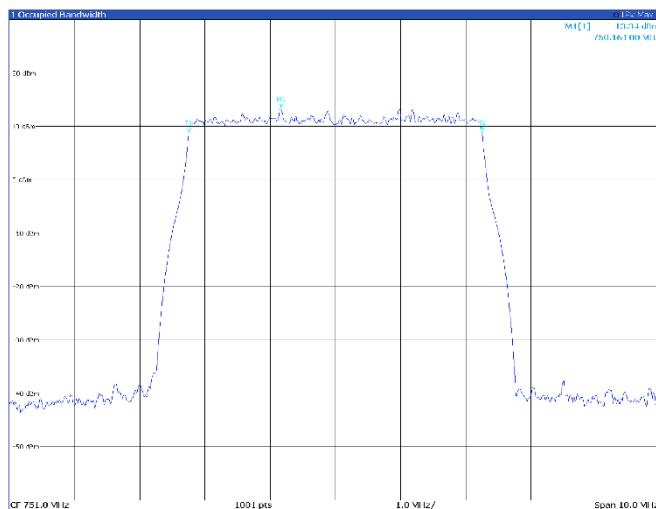
## Band B13

5 MHz

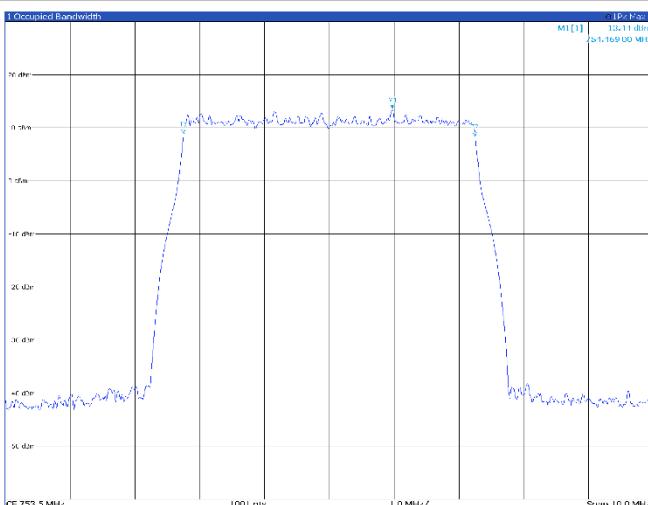
## TM1.1, 5 MHz, low channel



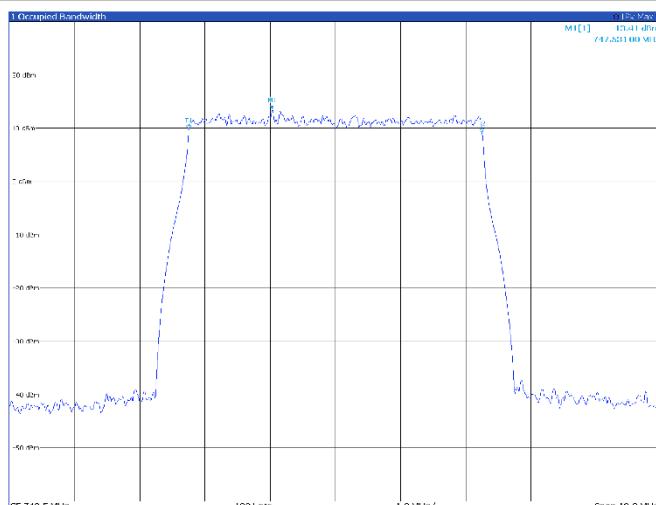
## TM1.1, 5 MHz, mid channel

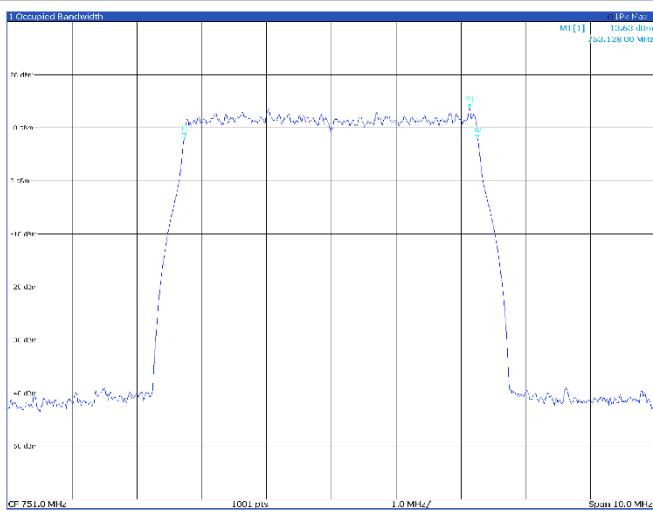
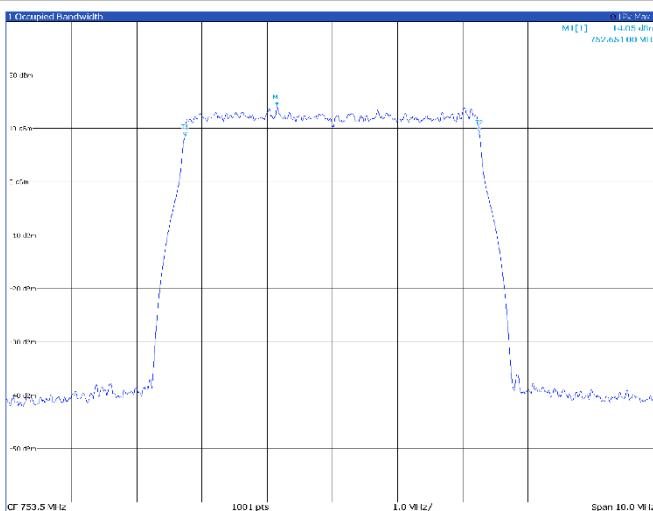
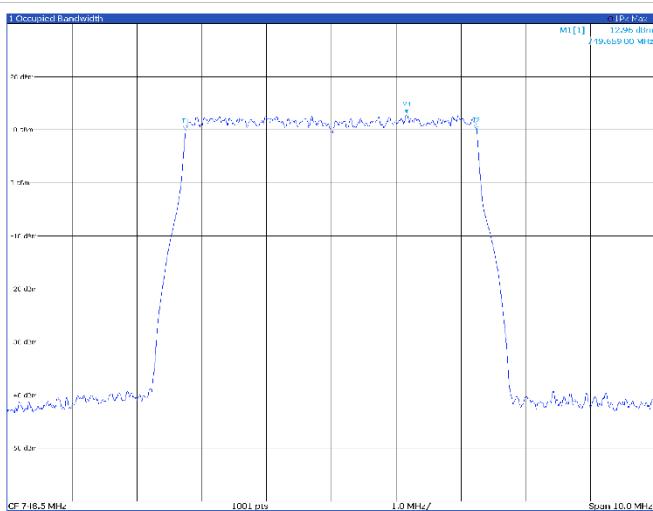
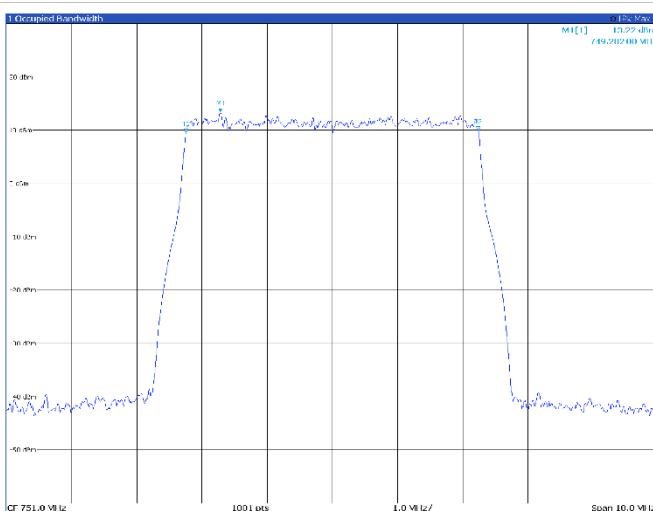


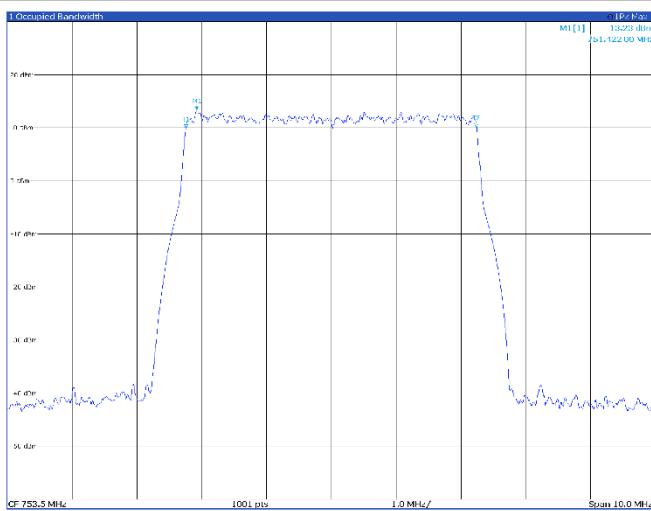
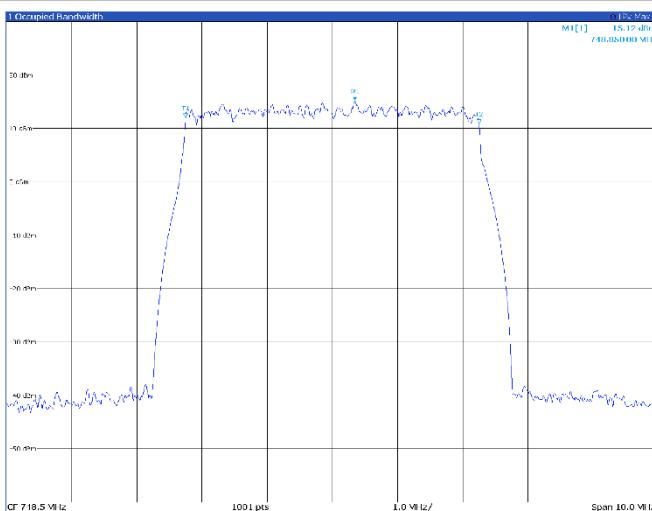
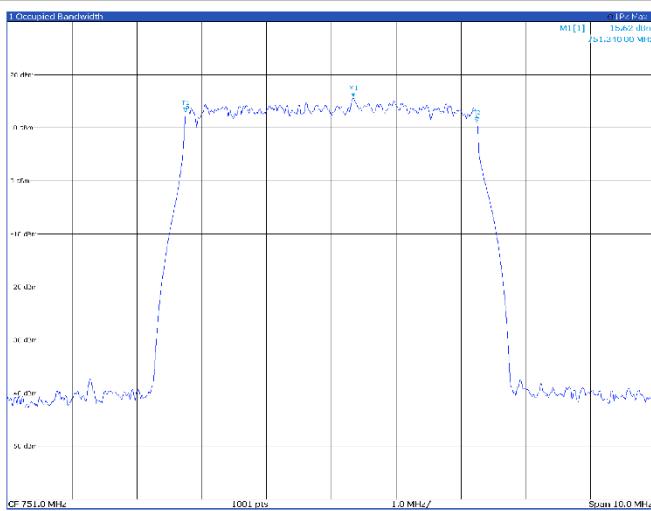
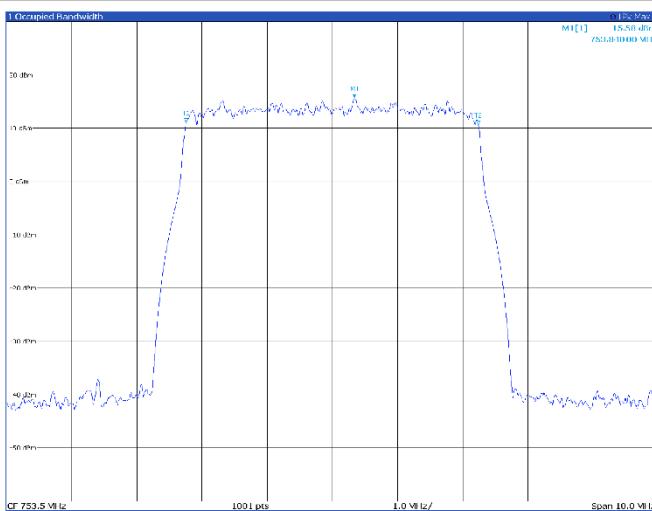
## TM1.1, 5 MHz, high channel

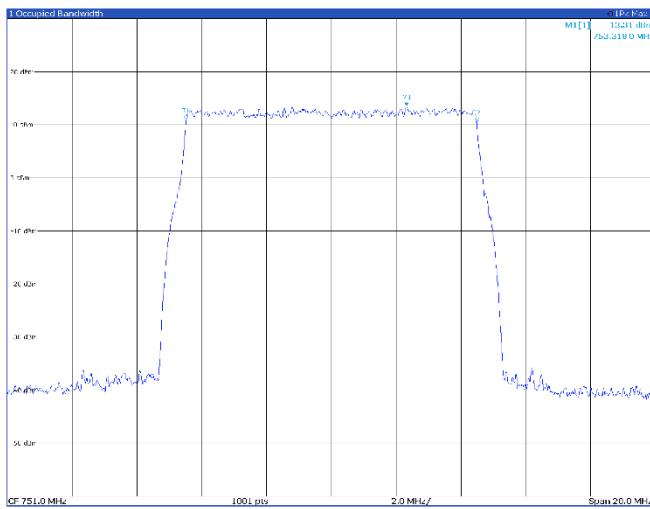
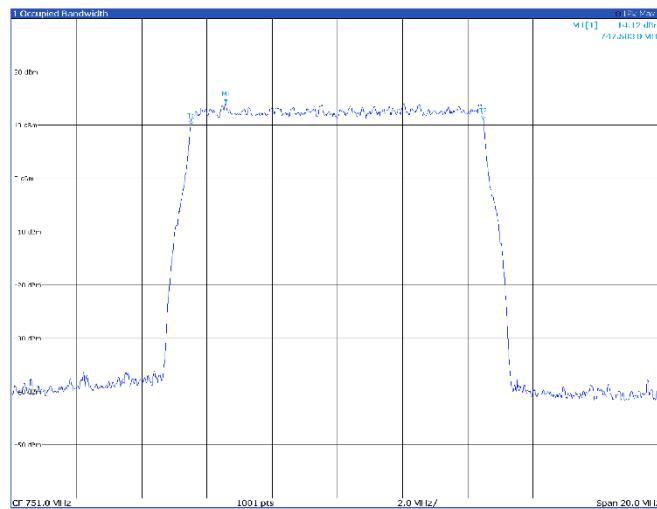
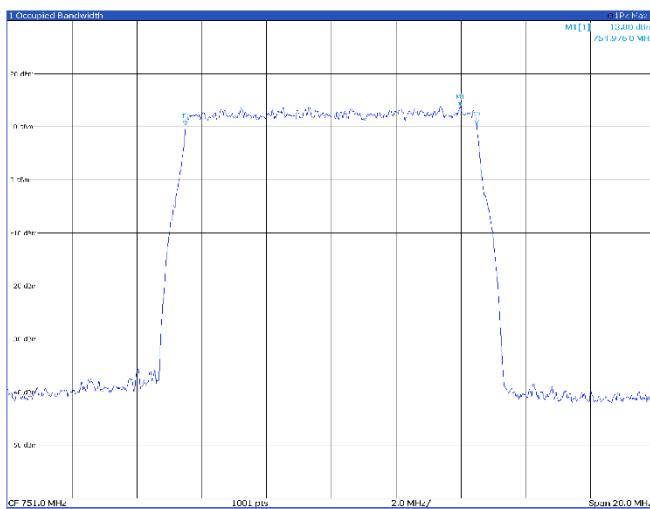
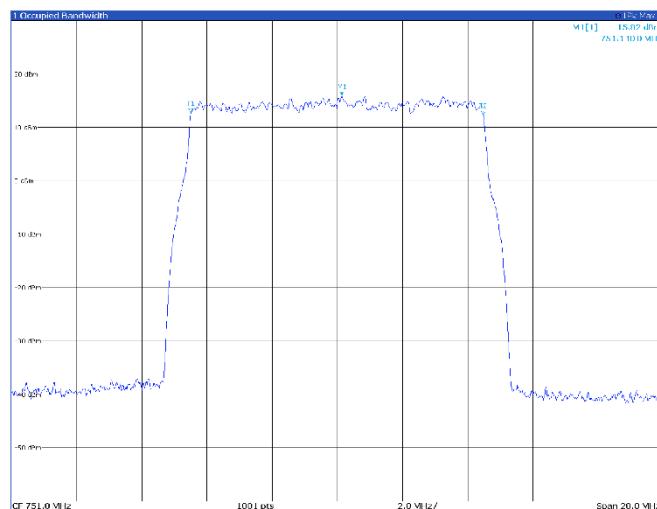


## TM3p1, 5 MHz, low channel



**TM3p1, 5 MHz, mid channel**

**TM3p1, 5 MHz, high channel**

**TM3p1a, 5 MHz, low channel**

**TM3p1a, 5 MHz, mid channel**


**TM3p1a, 5 MHz, high channel**

**TM3p3, 5 MHz, low channel**

**TM3p3, 5 MHz, mid channel**

**TM3p3, 5 MHz, high channel**


**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**

**TM3p1, 10 MHz, mid channel**

**TM3p1a, 10 MHz, mid channel**

**TM3p3, 10 MHz, mid channel**


## 8.3 FCC §27.53(h)(3) 26 dB Occupied Bandwidth

### 8.3.1 Definitions and limits

(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

### 8.3.2 Test summary

Test start date	November 26, 2024	Temperature	22 °C
Test end date	December 13, 2024	Air pressure	1001 mbar
Test engineer	O. Frau	Relative humidity	62%
Verdict	Pass		

### 8.3.3 Observations, settings and special notes

Test method: ANSI C63.26 Section 5.4.4

Spectrum analyzer settings:

Resolution bandwidth	1% - 5% OBW
Video bandwidth	3*RBW
Frequency span	2*OBW
Detector mode	Peak
Trace mode	Max Hold

### 8.3.3 Test equipment used

Equipment	Manufacturer	Model no.	Asset no.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767

## 8.3.4 Test data

**Band B13: Antenna port 1**

Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM1.1	748.5	5.05
B13	5 MHz	TM1.1	751.0	5.08
B13	5 MHz	TM1.1	753.5	5.08
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM3p1	748.5	5.13
B13	5 MHz	TM3p1	751.0	5.04
B13	5 MHz	TM3p1	753.5	5.11
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM3p1a	748.5	5.00
B13	5 MHz	TM3p1a	751.0	5.03
B13	5 MHz	TM3p1a	753.5	5.01
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM3p3	748.5	5.08
B13	5 MHz	TM3p3	751.0	5.04
B13	5 MHz	TM3p3	753.5	5.08
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM1.1	n/a	-
B13	10 MHz	TM1.1	751.0	10.03
B13	10 MHz	TM1.1	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM3p1	n/a	-
B13	10 MHz	TM3p1	751.0	9.99
B13	10 MHz	TM3p1	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM3p1a	n/a	-
B13	10 MHz	TM3p1a	751.0	10.03
B13	10 MHz	TM3p1a	n/a	-
<hr/>				
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM3p3	n/a	-
B13	10 MHz	TM3p3	751.0	10.01
B13	10 MHz	TM3p3	n/a	-

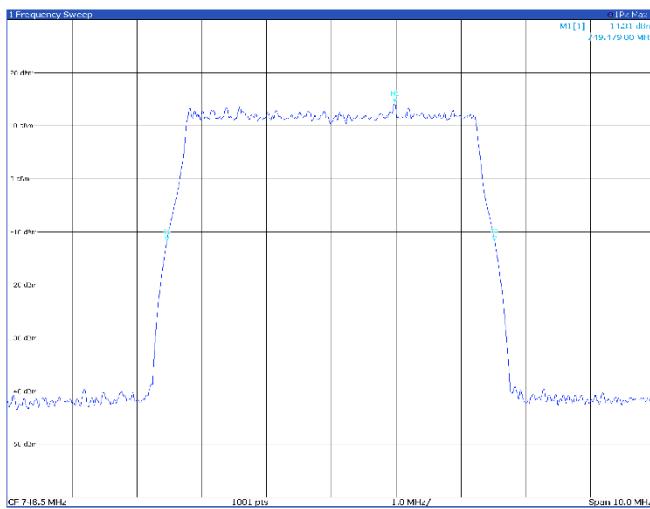
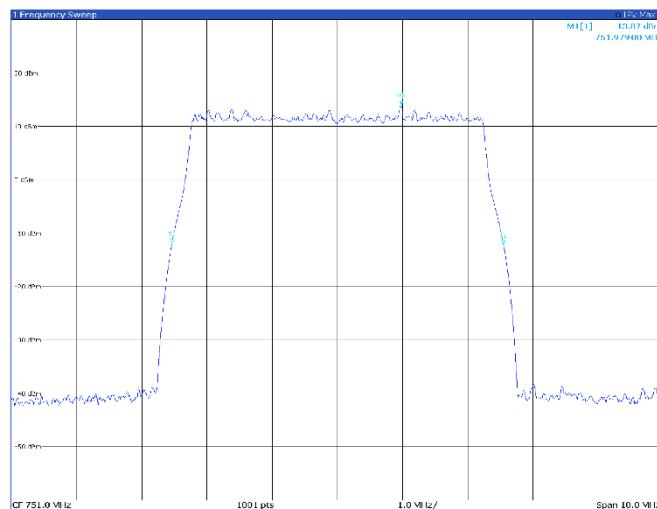
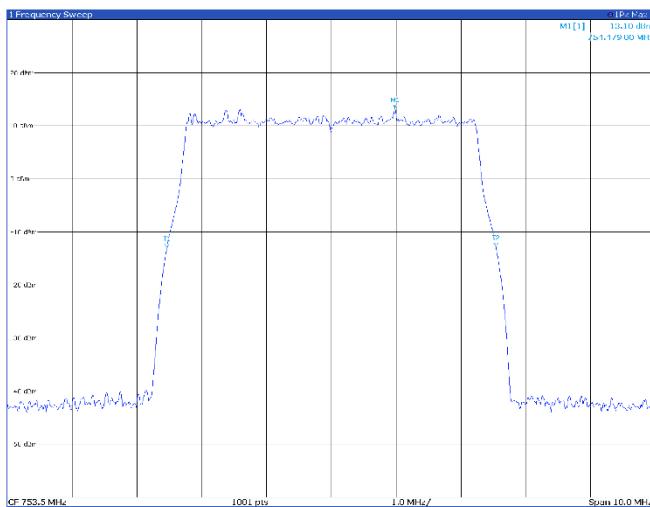
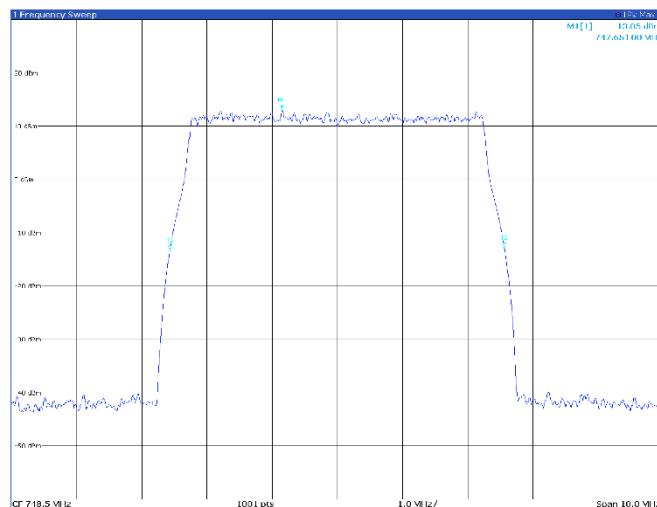
**Band B13: Antenna port 2**

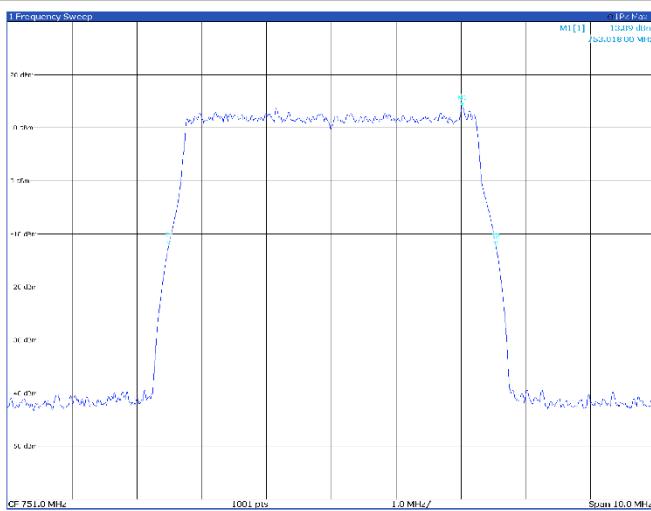
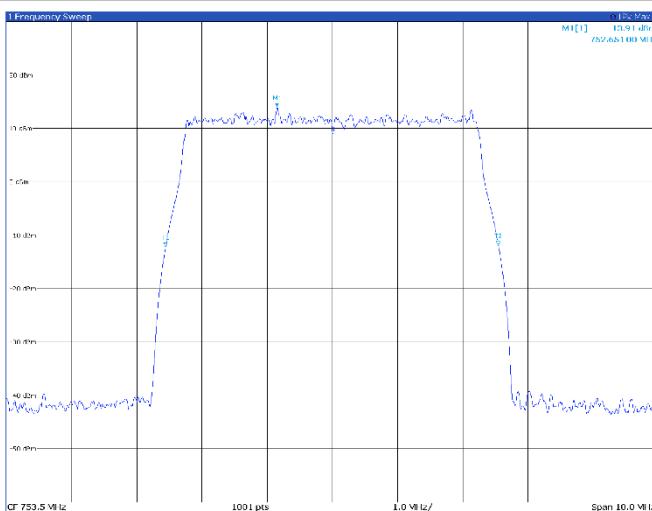
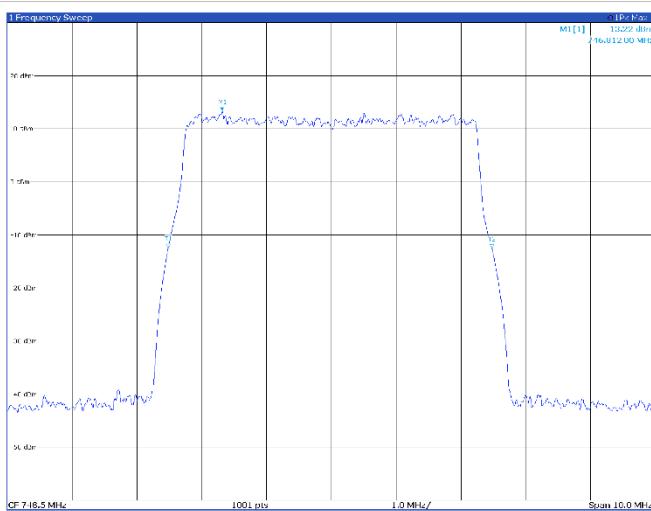
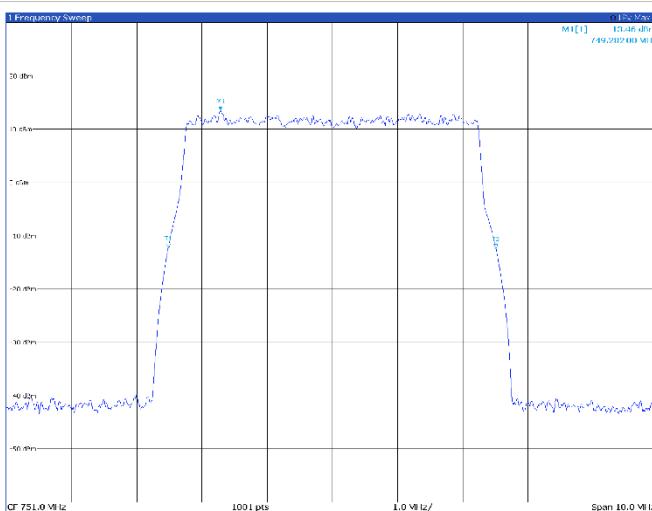
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM1.1	748.5	5.09
B13	5 MHz	TM1.1	751.0	5.09
B13	5 MHz	TM1.1	753.5	5.09
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM3p1	748.5	5.05
B13	5 MHz	TM3p1	751.0	5.12
B13	5 MHz	TM3p1	753.5	5.11
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM3p1a	748.5	5.03
B13	5 MHz	TM3p1a	751.0	4.99
B13	5 MHz	TM3p1a	753.5	5.03
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	5 MHz	TM3p3	748.5	5.09
B13	5 MHz	TM3p3	751.0	5.05
B13	5 MHz	TM3p3	753.5	5.00
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM1.1	n/a	-
B13	10 MHz	TM1.1	751.0	10.07
B13	10 MHz	TM1.1	n/a	-
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM3p1	n/a	-
B13	10 MHz	TM3p1	751.0	9.99
B13	10 MHz	TM3p1	n/a	-
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM3p1a	n/a	-
B13	10 MHz	TM3p1a	751.0	10.05
B13	10 MHz	TM3p1a	n/a	-
Band	OBW Declared	Modulation	Channel (MHz)	26 dB (MHz)
B13	10 MHz	TM3p3	n/a	-
B13	10 MHz	TM3p3	751.0	9.99
B13	10 MHz	TM3p3	n/a	-

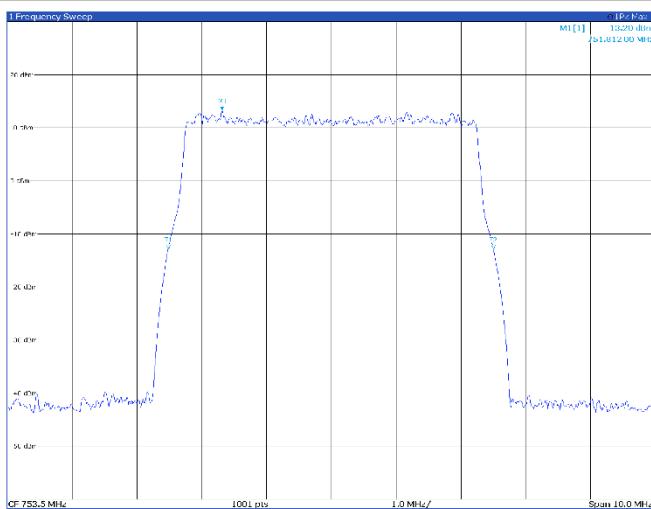
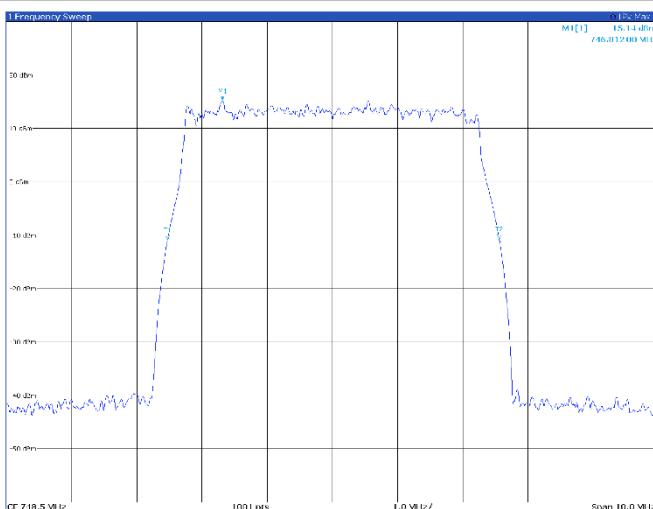
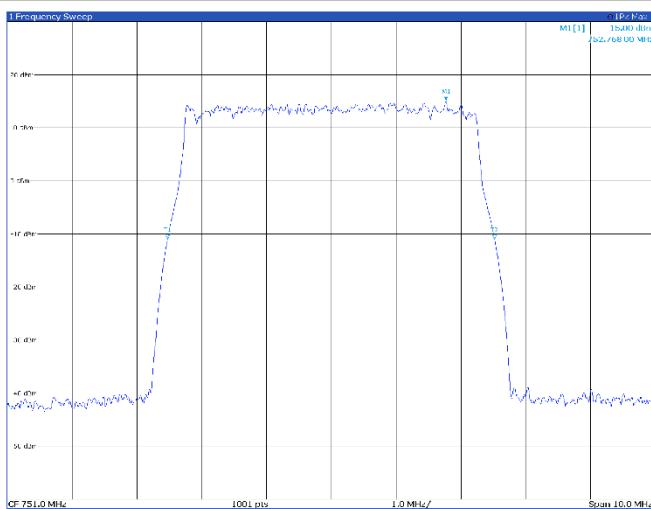
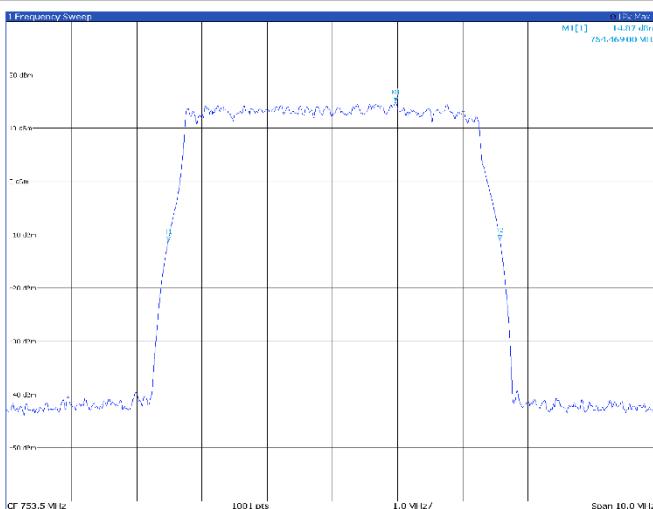
## Antenna port 1

## Band B13

## 5 MHz

**TM1.1, 5 MHz, low channel**

**TM1.1, 5 MHz, mid channel**

**TM1.1, 5 MHz, high channel**

**TM3p1, 5 MHz, low channel**


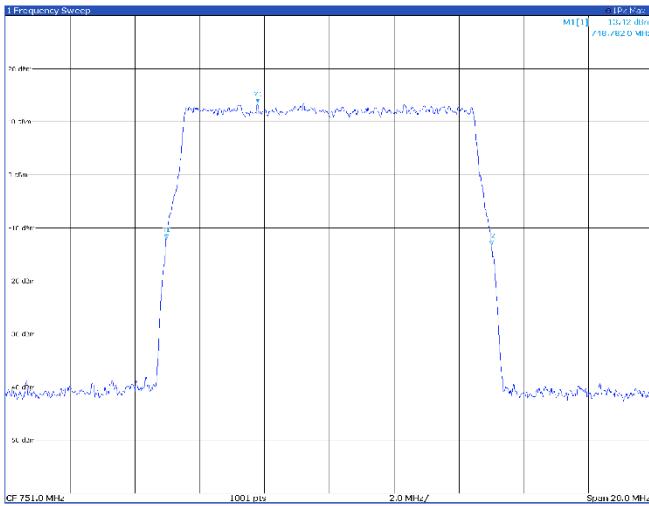
**TM3p1, 5 MHz, mid channel**

**TM3p1, 5 MHz, high channel**

**TM3p1a, 5 MHz, low channel**

**TM3p1a, 5 MHz, mid channel**


**TM3p1a, 5 MHz, high channel**

**TM3p3, 5 MHz, low channel**

**TM3p3, 5 MHz, mid channel**

**TM3p3, 5 MHz, high channel**


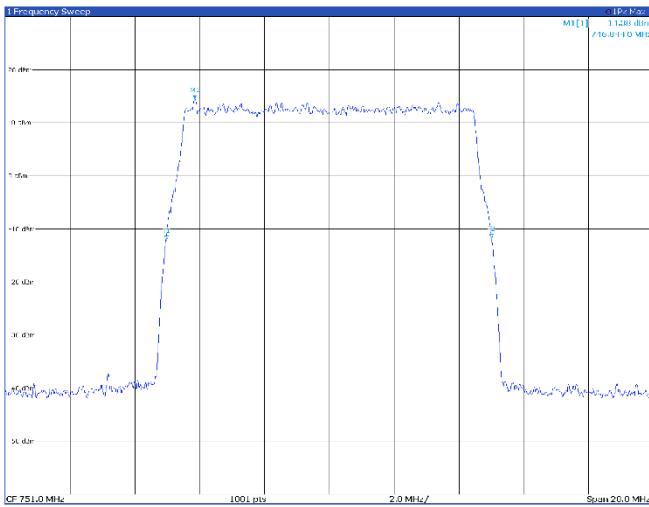
### Band B13

10 MHz

### TM1.1, 10 MHz, mid channel

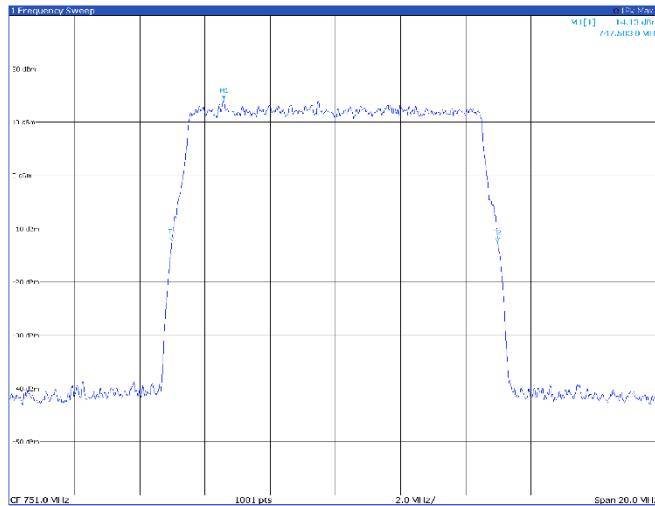


TM3p1a, 10 MHz, mid channel



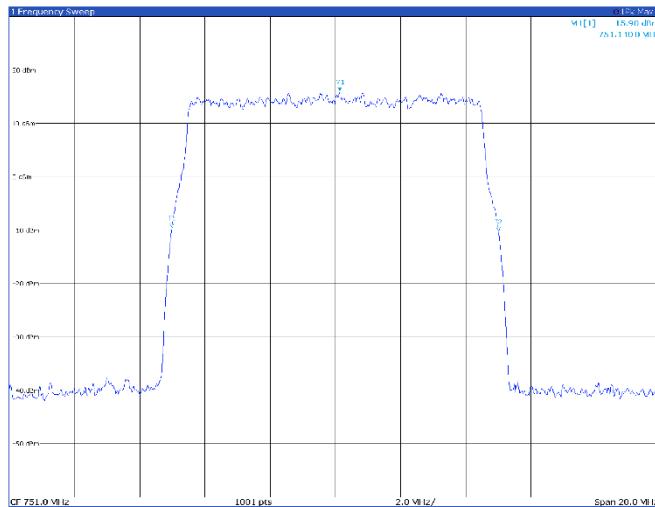
2 Marker Table		Marker	Value	Value	Function	Function Result
Type	Rel	Trc	Marker	Value	Function	Function Result
Marker	1		<b>746.844 MHz</b>	<b>14.38 dBm</b>	dBm	<b>10.03 MHz</b>
Marker	1		45.956 MHz	16.16 dBm	dBm	44.00 MHz
Marker	1		84.956 MHz	1.99 dBm	dBm	84.00 MHz

TM3p1, 10 MHz, mid channel



Marker Table			Function			Function Result	
Type	Ref	Trc	X Value	V Value	Function	Value	Unit
M1	-	-	<b>747.583 MHz</b>	<b>14.13 dBm</b>	ncB	96.1 dB	
"1	-	-	748.583 MHz	-12.25 dBm	ncB open BW	<b>9.99 Hz</b>	Hz
"2	-	-	749.583 MHz	-12.25 dBm	ncB open BW	<b>9.99 Hz</b>	Hz

TM3p3, 10 MHz, mid channel

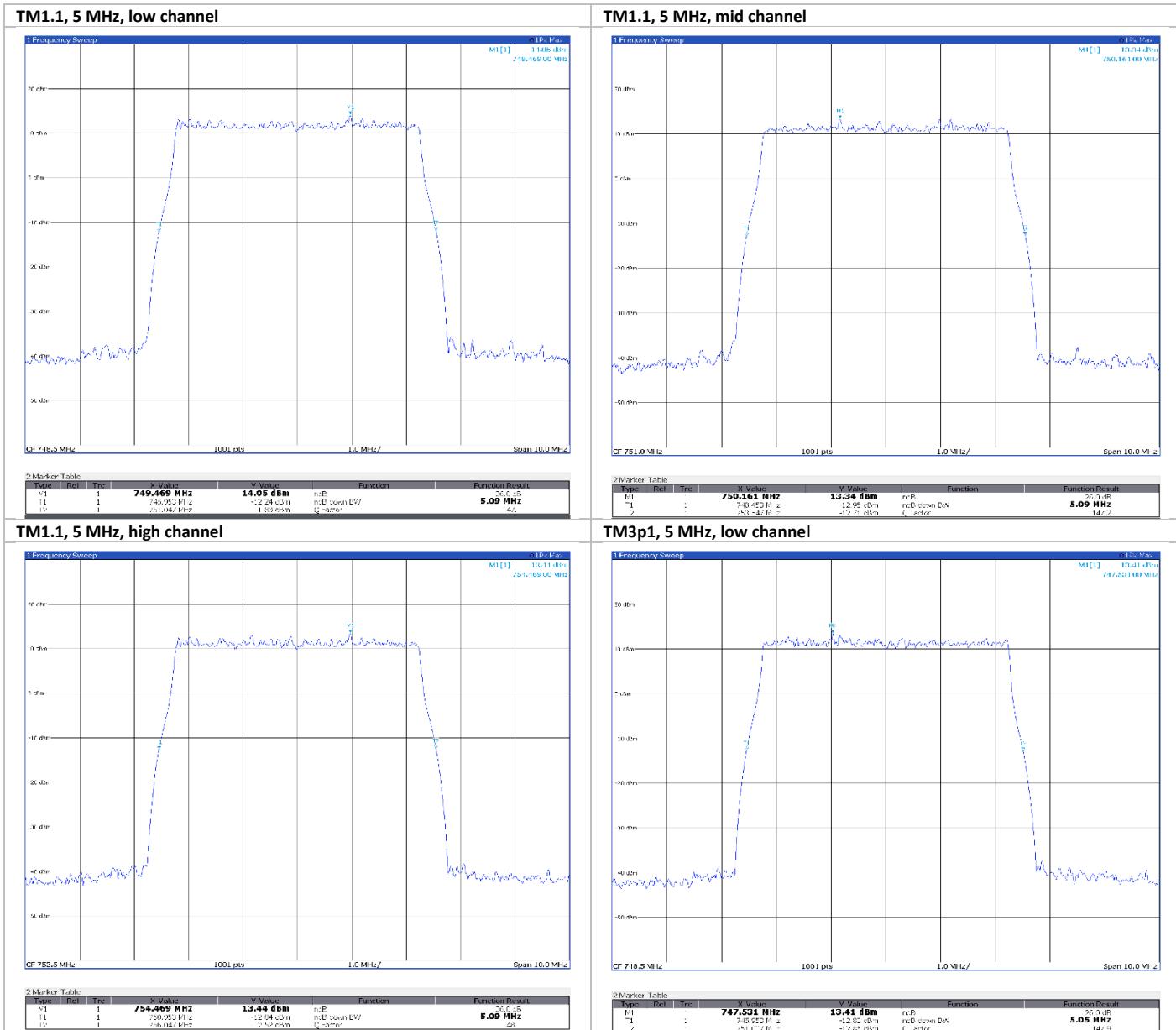


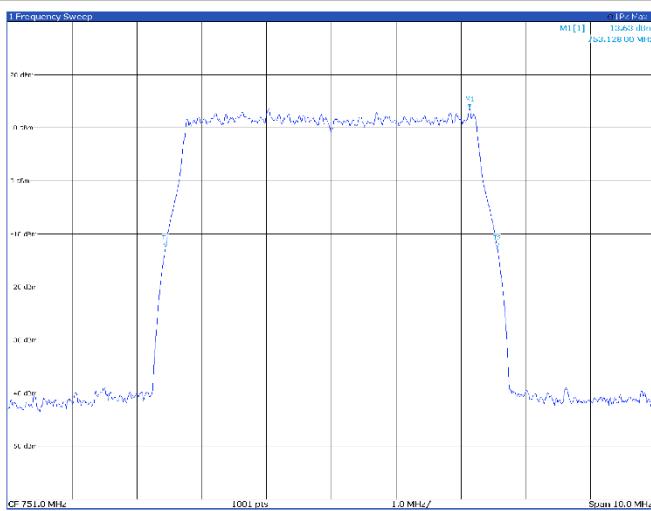
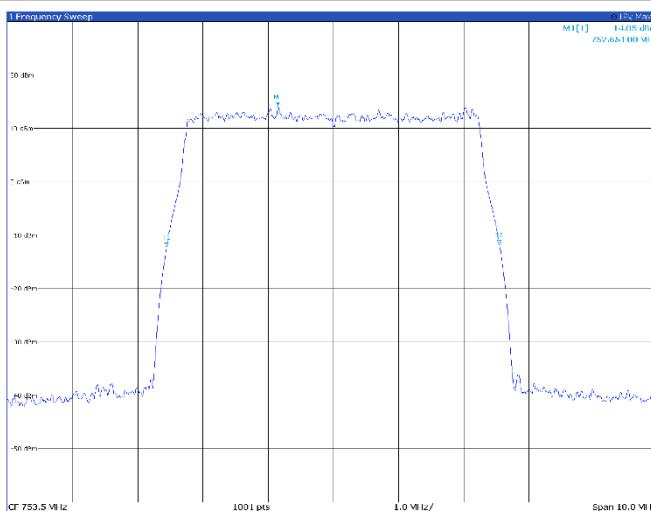
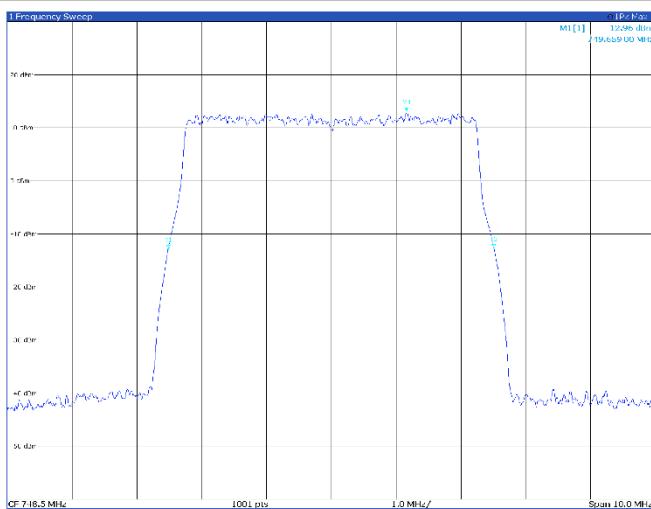
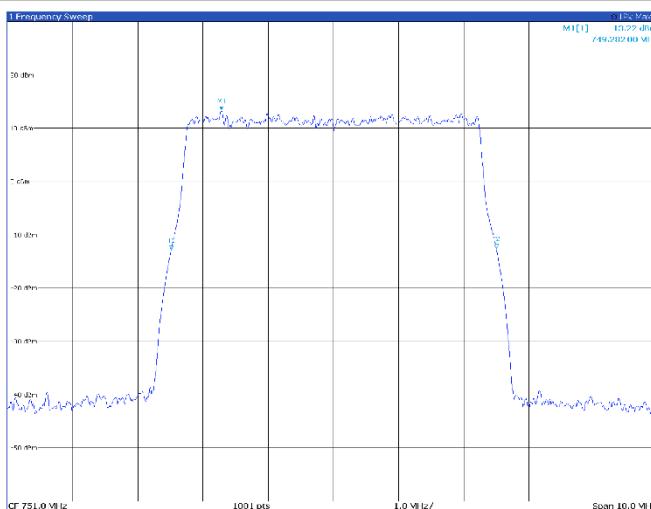
Marker Table			X Value		Y Value		Function	Function Result
Type	Ref	Trc	751.14 MHz	15.90 dBm	dB	dB	Open BW	10.01 MHz
M			751.14 MHz	15.90 dBm	dB	dB	Open BW	26.0 dB
1			751.14 MHz	15.90 dBm	dB	dB	Open BW	10.01 MHz

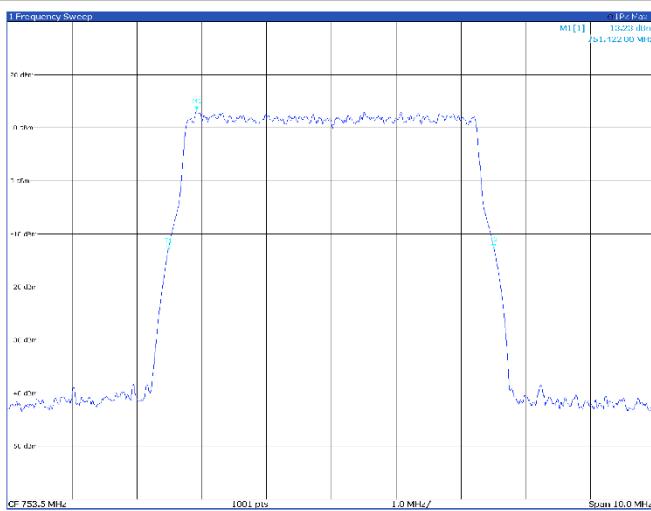
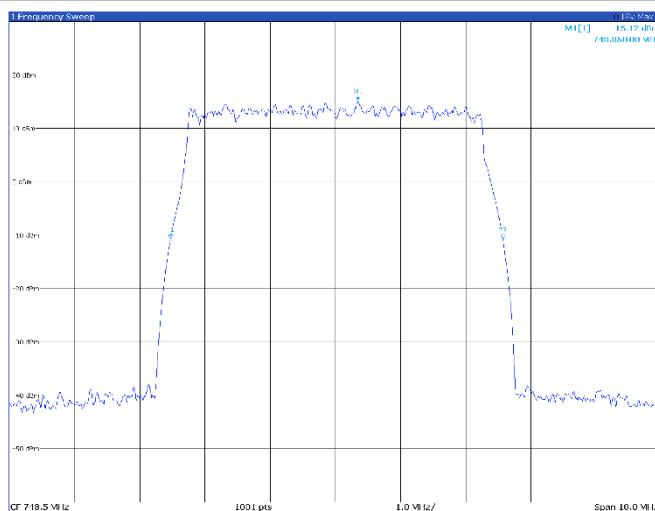
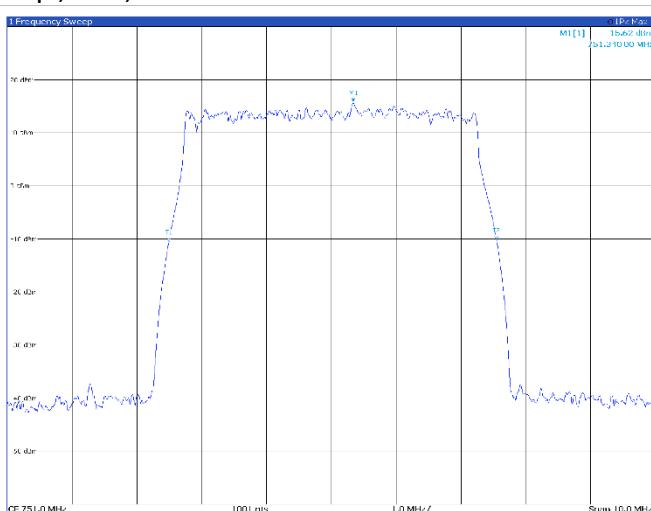
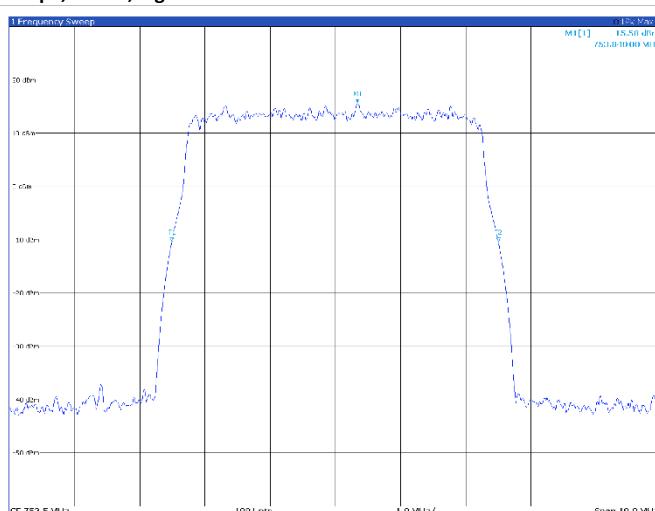
## Antenna port 2

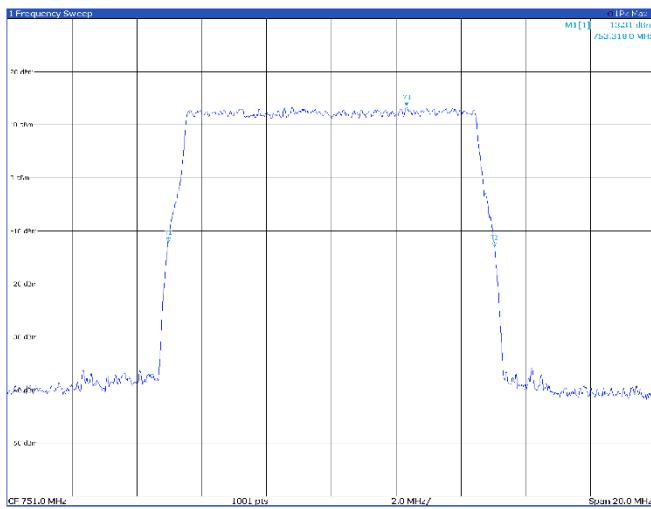
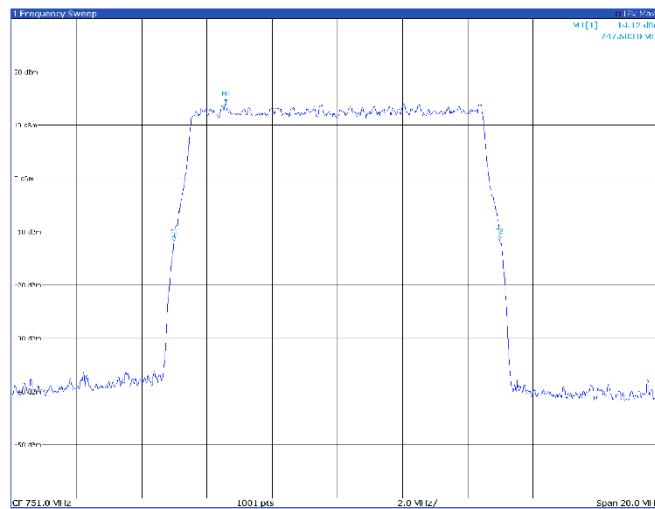
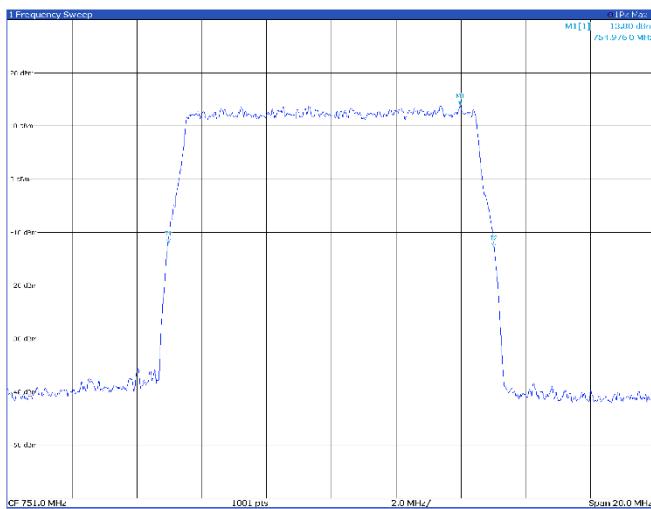
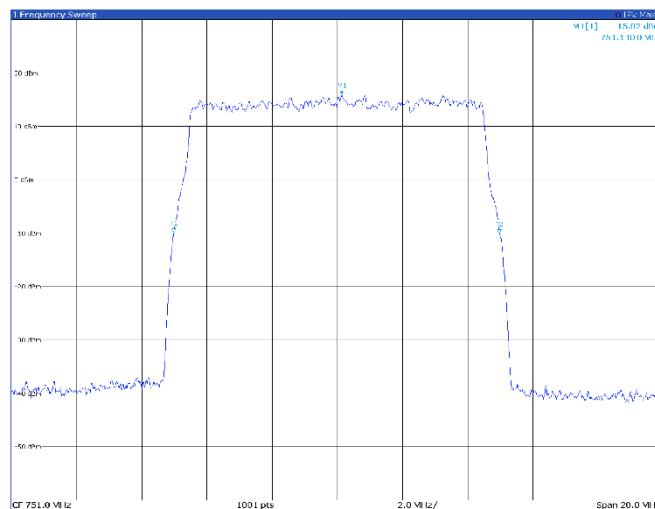
## Band B13

## 5 MHz



**TM3p1, 5 MHz, mid channel**

**TM3p1, 5 MHz, high channel**

**TM3p1a, 5 MHz, low channel**

**TM3p1a, 5 MHz, mid channel**


**TM3p1a, 5 MHz, high channel**

**TM3p3, 5 MHz, low channel**

**TM3p3, 5 MHz, mid channel**

**TM3p3, 5 MHz, high channel**


**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**

**TM3p1, 10 MHz, mid channel**

**TM3p1a, 10 MHz, mid channel**

**TM3p3, 10 MHz, mid channel**


## 8.4 FCC §27.50(b)(4) Output power

### 8.4.1 Definitions and limits

(b) The following power and antenna height limits apply to transmitters operating in the **746-758 MHz**, 775-788 MHz and 805-806 MHz bands:

(4) Fixed and base stations transmitting a signal in the 746-757 MHz and 776-787 MHz bands with an emission bandwidth greater than 1 MHz must not exceed an ERP of **1000 watts/MHz (60 dBm/MHz)** and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP in accordance with Table 3 of this section.

(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

### 8.4.2 Test summary

Test start date	November 26, 2024	Temperature	22 °C
Test end date	December 13, 2024	Air pressure	1001 mbar
Test engineer	O. Frau	Relative humidity	62%
Verdict	Pass		

### 8.4.3 Observations, settings and special notes

Test method: ANSI C63.26 Section 5.2.4.5

Spectrum analyzer settings:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Frequency span	>= 1.5* OBW
Detector mode	Peak
Trace mode	Max Hold

This test was made across the conducted port and using a sensor power. An offset of 30 dB was added to the measurement to compensate the loss of the external 30 dB attenuator. Interconnecting cable losses were included as a transducer factor in the spectrum analyzer.

### 8.4.4 Test equipment used

Equipment	Manufacturer	Model no.	Asset no.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767

## 8.4.5 Test data

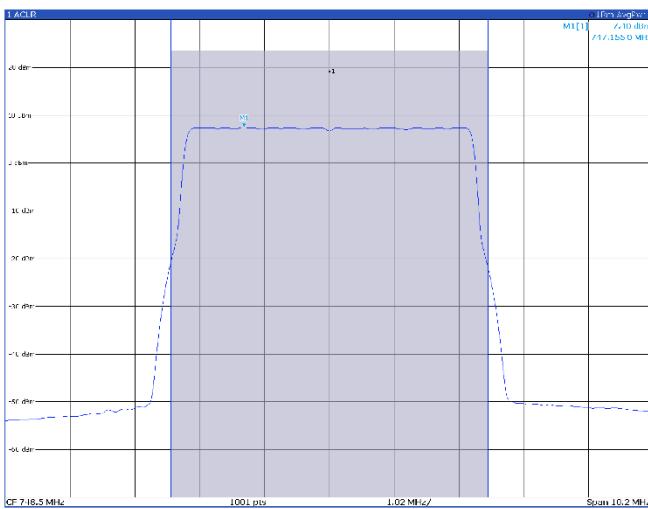
## Band B13:

Modulation	OBW	Frequency	Measured Power Density (dBm/MHz) port 1	Measured Power Density (dBm/MHz) port 2	Antenna Gain Max (dBi)	Total EIRP Power Density (dBm/MHz)	Measured Power (dBm) port 1	Measured Power (dBm) port 2	Limits Power (dBm)	Margin (dB)
	(MHz)	(MHz)								
TM1.1	5	748.5	7.40	7.16	3.7	13.99	23.53	23.39	60.0	-46.01
TM3p1	5	748.5	6.71	6.58	3.7	13.36	22.89	22.70	60.0	-46.64
TM3p1a	5	748.5	6.74	6.69	3.7	13.43	22.91	22.78	60.0	-46.57
TM3p3	5	748.5	8.16	8.08	3.7	14.83	22.83	22.72	60.0	-45.17
TM1.1	5	751.0	6.95	6.87	3.7	13.62	23.45	23.00	60.0	-46.38
TM3p1	5	751.0	6.84	6.73	3.7	13.50	22.93	22.84	60.0	-46.50
TM3p1a	5	751.0	6.88	6.86	3.7	13.58	23.00	22.99	60.0	-46.42
TM3p3	5	751.0	8.21	8.22	3.7	14.93	22.96	22.84	60.0	-45.07
TM1.1	5	753.5	6.82	6.81	3.7	13.53	23.00	22.95	60.0	-46.47
TM3p1	5	753.5	6.86	6.92	3.7	13.60	22.90	22.96	60.0	-46.40
TM3p1a	5	753.5	6.84	6.93	3.7	13.60	22.87	22.97	60.0	-46.40
TM3p3	5	753.5	8.22	8.28	3.7	14.96	22.88	22.96	60.0	-45.04
TM1.1	10	n/a	-	-	-	-	-	-	-	-
TM3p1	10	n/a	-	-	-	-	-	-	-	-
TM3p1a	10	n/a	-	-	-	-	-	-	-	-
TM3p3	10	n/a	-	-	-	-	-	-	-	-
TM1.1	10	751.0	3.70	3.80	3.7	10.46	22.91	22.88	60.0	-49.54
TM3p1	10	751.0	3.73	3.96	3.7	10.56	22.85	22.95	60.0	-49.44
TM3p1a	10	751.0	3.82	3.89	3.7	10.57	22.88	22.81	60.0	-49.43
TM3p3	10	751.0	5.40	5.40	3.7	12.11	22.88	22.86	60.0	-47.89
TM1.1	10	n/a	-	-	-	-	-	-	-	-
TM3p1	10	n/a	-	-	-	-	-	-	-	-
TM3p1a	10	n/a	-	-	-	-	-	-	-	-
TM3p3	10	n/a	-	-	-	-	-	-	-	-

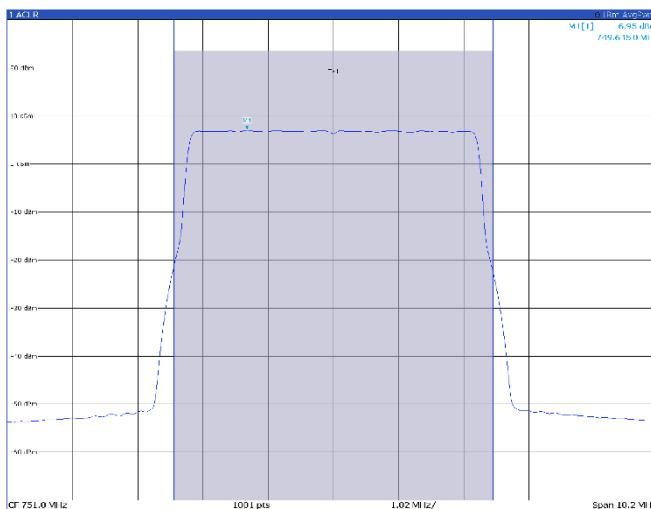
## Antenna port 1

## Band B13

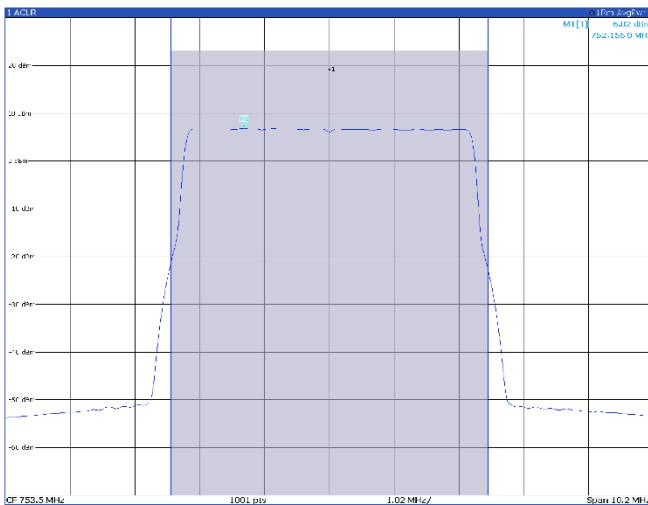
5 MHz

**TM1.1, 5 MHz, low channel**


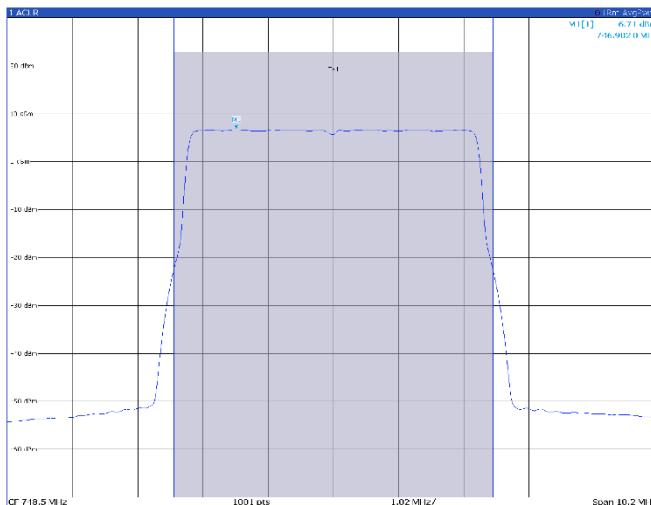
2 Result Summary		EUTRA/LTE Square/RRC	Power	Power Max Hold
Channel	Bandwidth	Offset		
I21 (90%)	5 000.14Hz		<b>23.83 dBm</b>	
Tx Total			<b>23.83 dBm</b>	

**TM1.1, 5 MHz, mid channel**


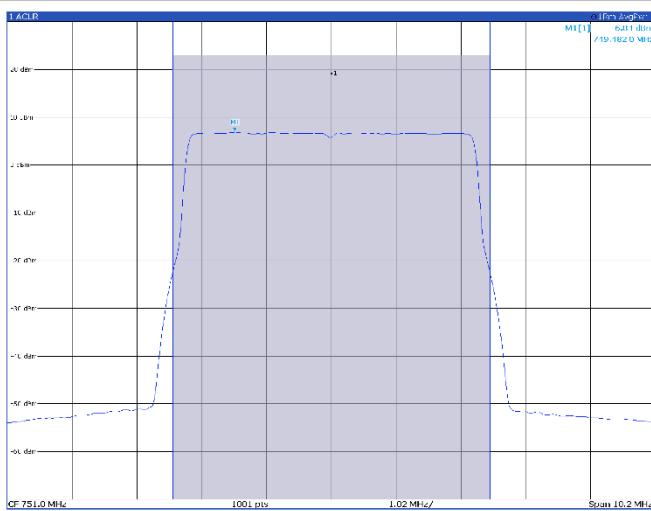
2 Result Summary		EUTRA/LTE Square/RRC	Power	Power Max Hold
Channel	Bandwidth	Offset		
I21 (90%)	5 000.14Hz		<b>23.45 dBm</b>	
Tx Total			<b>23.45 dBm</b>	

**TM1.1, 5 MHz, high channel**


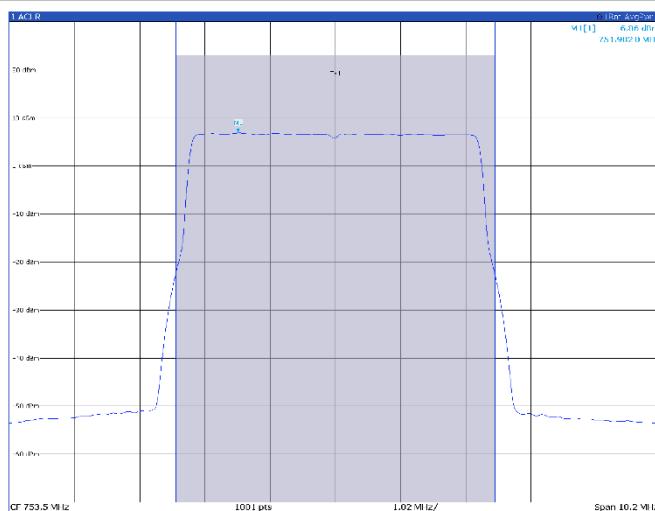
2 Result Summary		EUTRA/LTE Square/RRC	Power	Power Max Hold
Channel	Bandwidth	Offset		
I21 (90%)	5 000.14Hz		<b>23.00 dBm</b>	
Tx Total			<b>23.00 dBm</b>	

**TM3p1, 5 MHz, low channel**


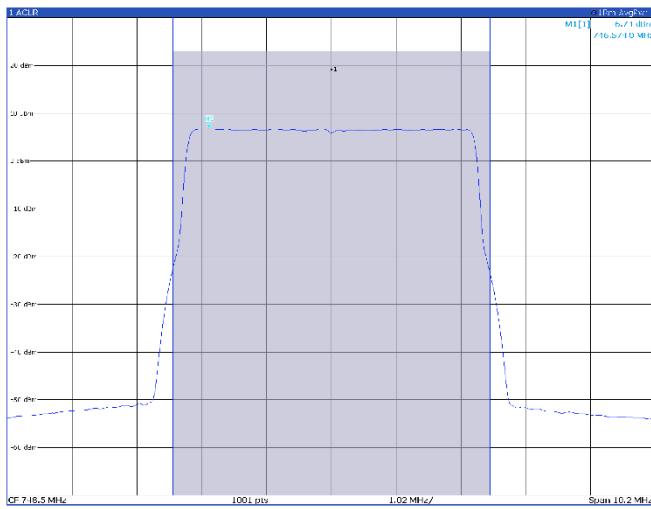
2 Result Summary		EUTRA/LTE Square/RRC	Power	Power Max Hold
Channel	Bandwidth	Offset		
I21 (90%)	5 000.14Hz		<b>23.89 dBm</b>	
Tx Total			<b>23.89 dBm</b>	

**TM3p1, 5 MHz, mid channel**


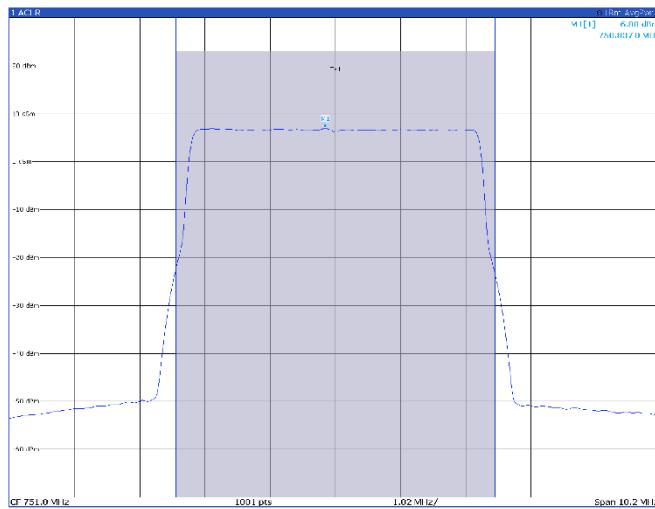
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1x (Tx Total)	5 000.0 Hz	Offset	Power
			<b>22.93 dBm</b>
			<b>22.93 dBm</b>

**TM3p1, 5 MHz, high channel**


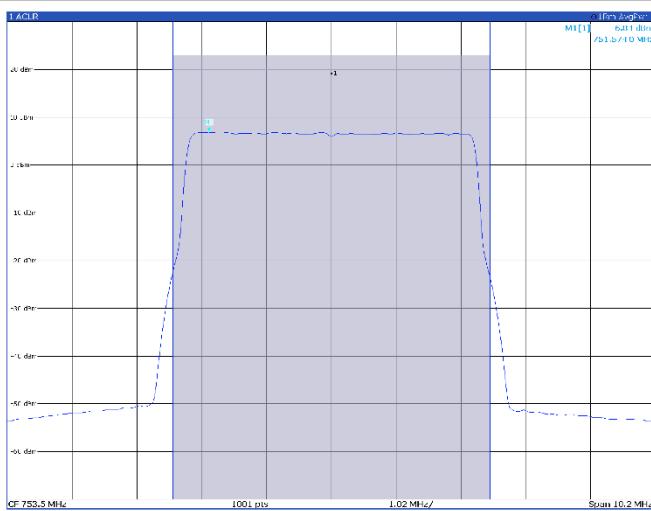
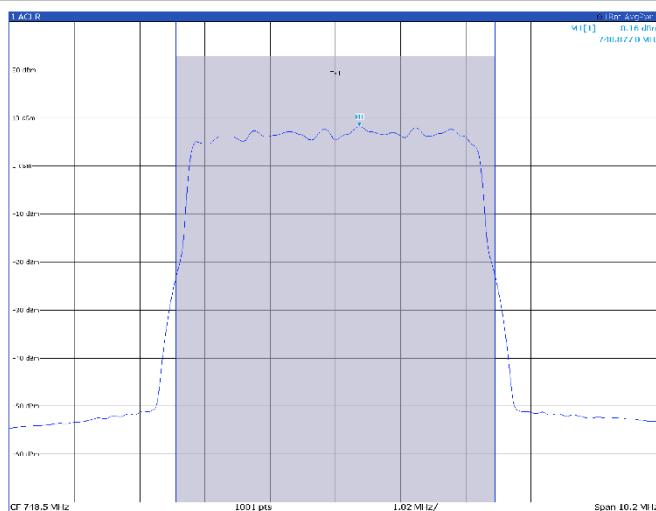
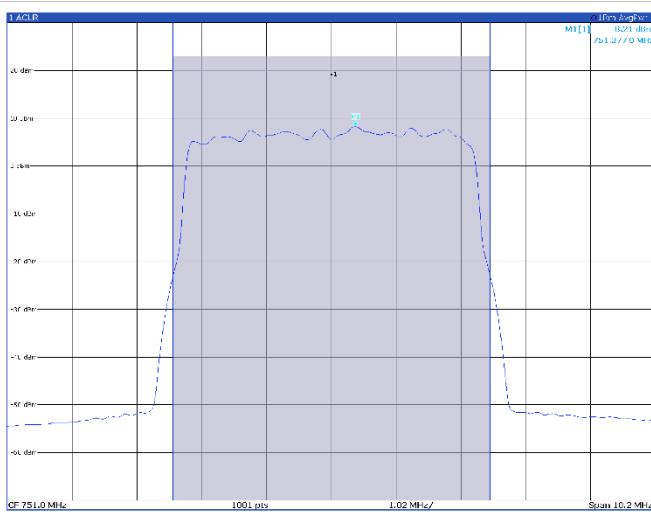
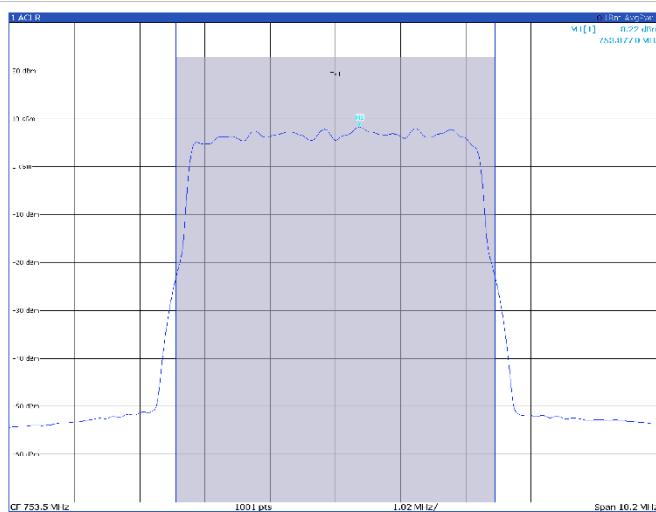
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1x (Tx Total)	5 000.0 Hz	Offset	Power
			<b>22.90 dBm</b>
			<b>22.90 dBm</b>

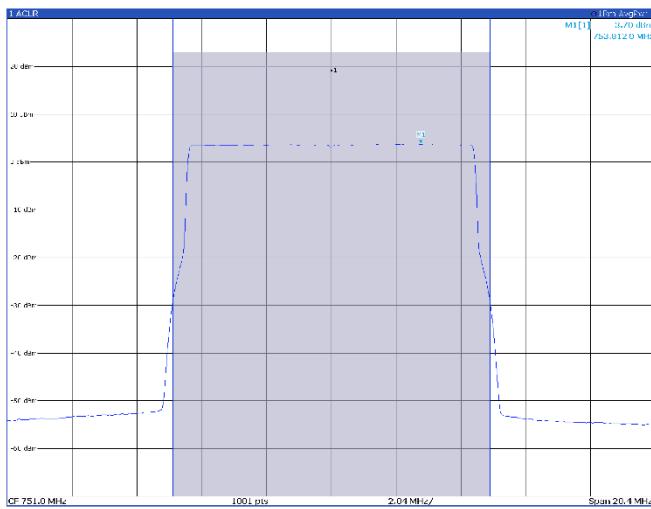
**TM3p1a, 5 MHz, low channel**


2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1x (Tx Total)	5 000.0 Hz	Offset	Power
			<b>22.91 dBm</b>
			<b>22.91 dBm</b>

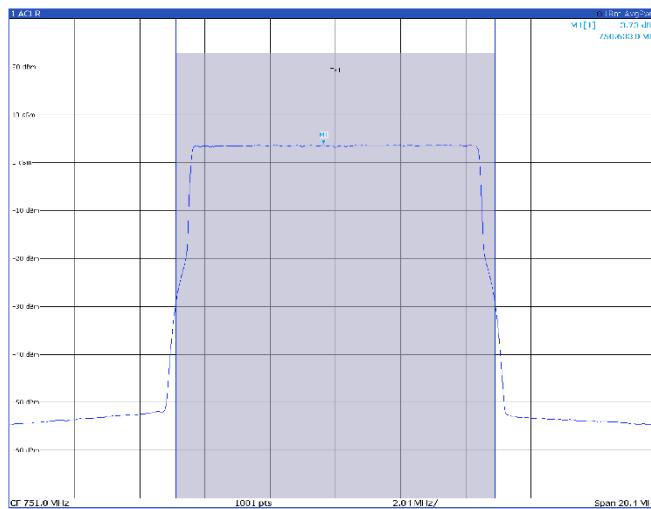
**TM3p1a, 5 MHz, mid channel**


2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1x (Tx Total)	5 000.0 Hz	Offset	Power
			<b>23.00 dBm</b>
			<b>23.00 dBm</b>

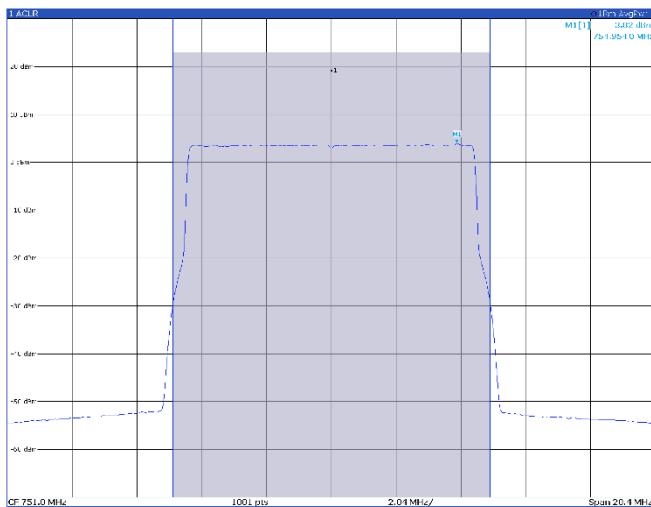
**TM3p1a, 5 MHz, high channel**

**TM3p3, 5 MHz, low channel**

**TM3p3, 5 MHz, mid channel**

**TM3p3, 5 MHz, high channel**


**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**


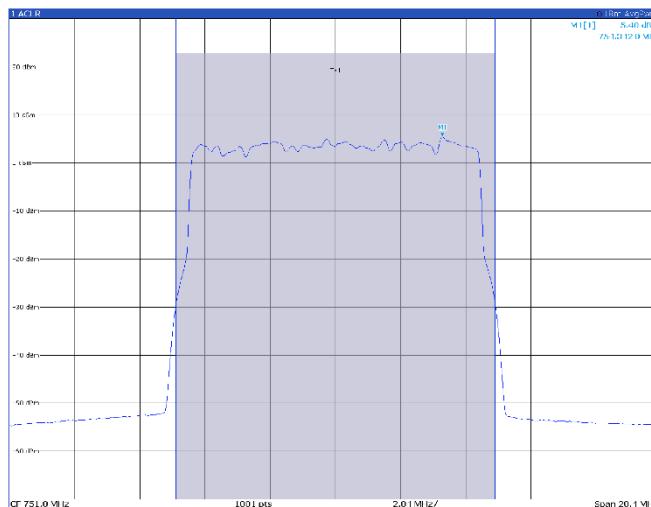
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
121 (K0P)	10.000 MHz	Offset	22.91 dBm
Tx Total			22.91 dBm

**TM3p1, 10 MHz, mid channel**


2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
121 (K0P)	10.000 MHz	Offset	22.85 dBm
Tx Total			22.85 dBm

**TM3p1a, 10 MHz, mid channel**


2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
121 (K0P)	10.000 MHz	Offset	22.88 dBm
Tx Total			22.88 dBm

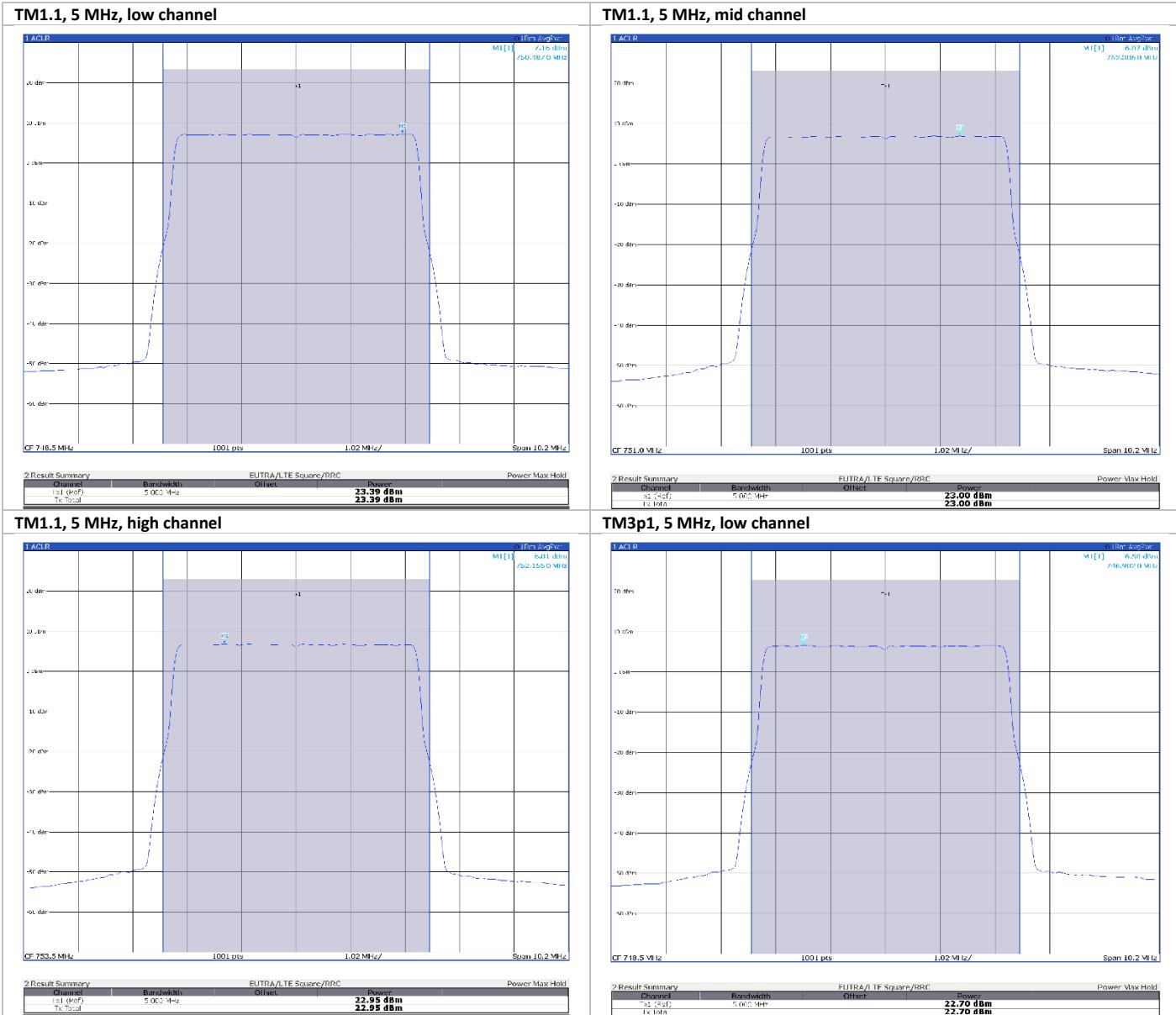
**TM3p3, 10 MHz, mid channel**


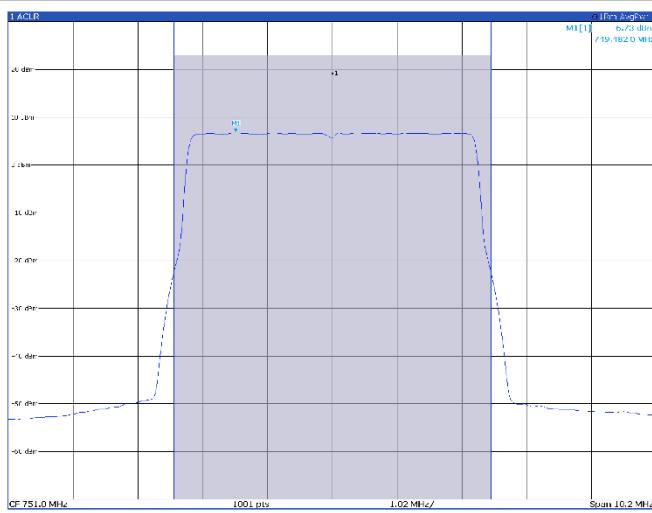
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
121 (K0P)	10.000 MHz	Offset	22.88 dBm
Tx Total			22.88 dBm

## Antenna port 2

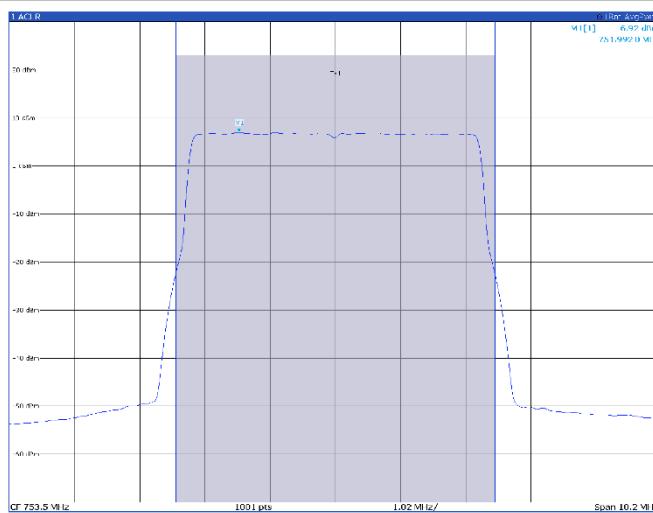
## Band B13

5 MHz

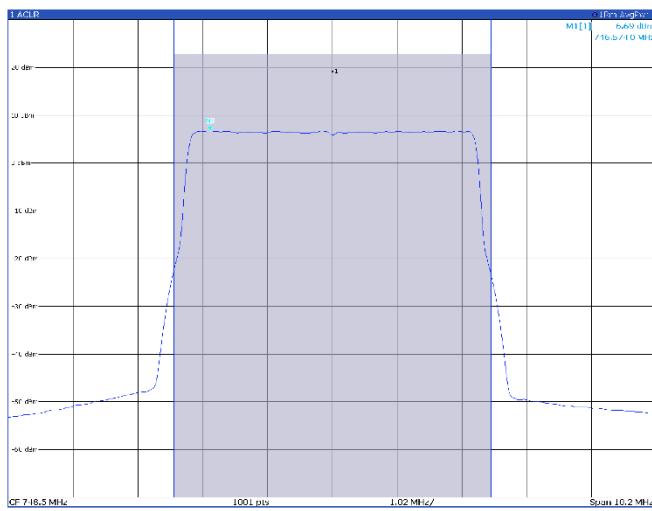


**TM3p1, 5 MHz, mid channel**


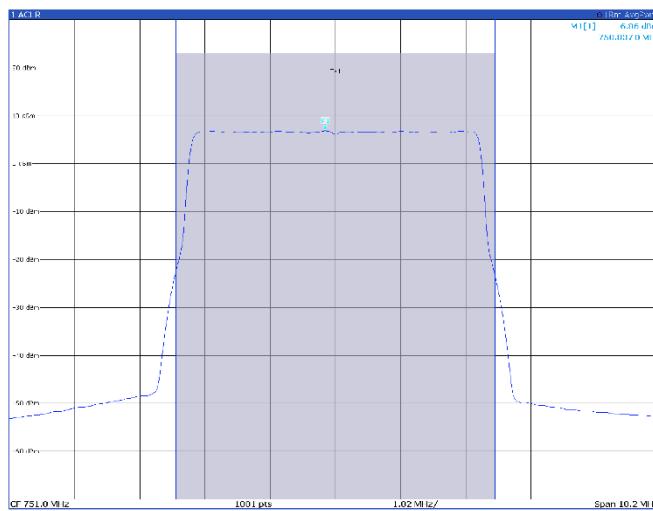
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
1:1 (Tx Total)	5 000.0 Hz	Offset	<b>22.84 dBm</b>
Tx Total			<b>22.84 dBm</b>

**TM3p1, 5 MHz, high channel**


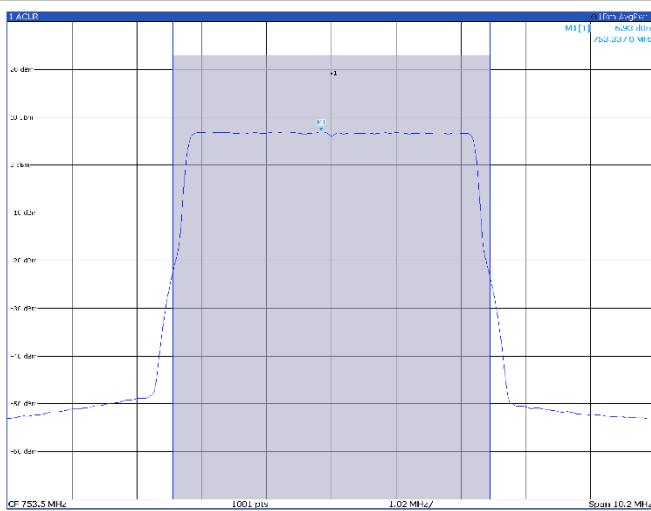
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
1:1 (Tx Total)	5 000.0 Hz	Offset	<b>22.96 dBm</b>
Tx Total			<b>22.96 dBm</b>

**TM3p1a, 5 MHz, low channel**


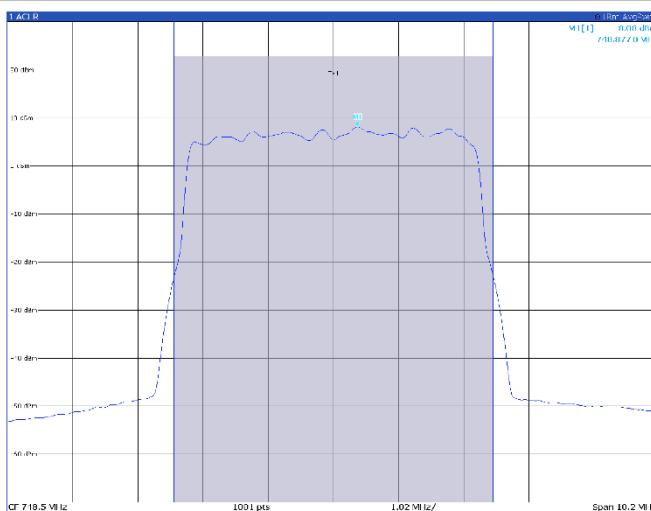
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
1:1 (Tx Total)	5 000.0 Hz	Offset	<b>22.78 dBm</b>
Tx Total			<b>22.78 dBm</b>

**TM3p1a, 5 MHz, mid channel**


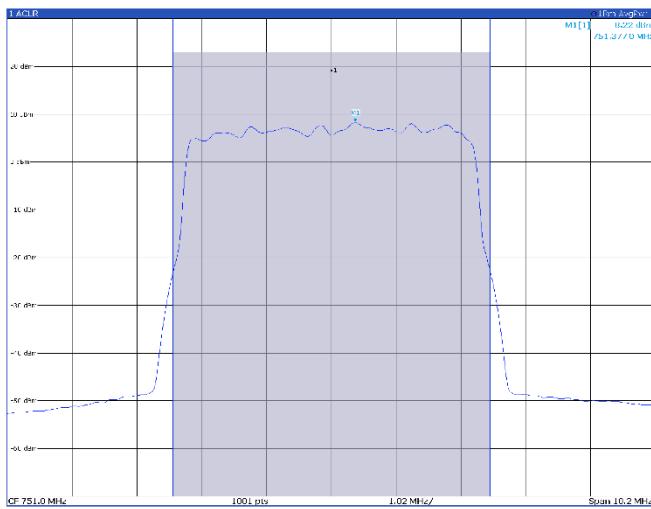
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power
1:1 (Tx Total)	5 000.0 Hz	Offset	<b>22.99 dBm</b>
Tx Total			<b>22.99 dBm</b>

**TM3p1a, 5 MHz, high channel**


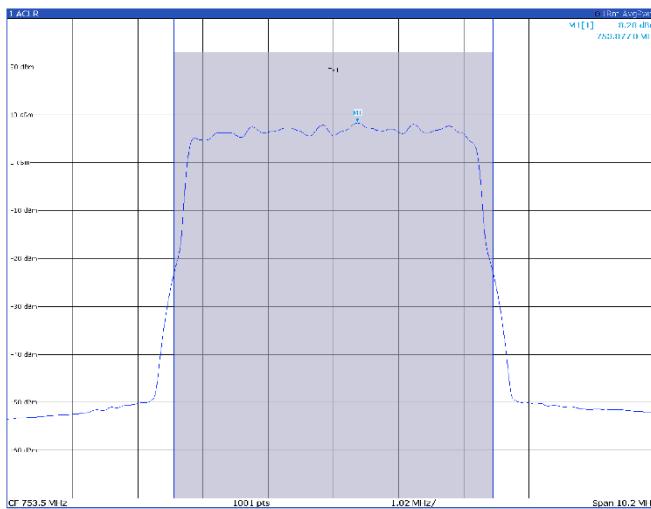
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1:1 (Tx-F) Tx:Tx	5 000.14Hz	Offset: 22.97 dBm	Power: 22.97 dBm

**TM3p3, 5 MHz, low channel**


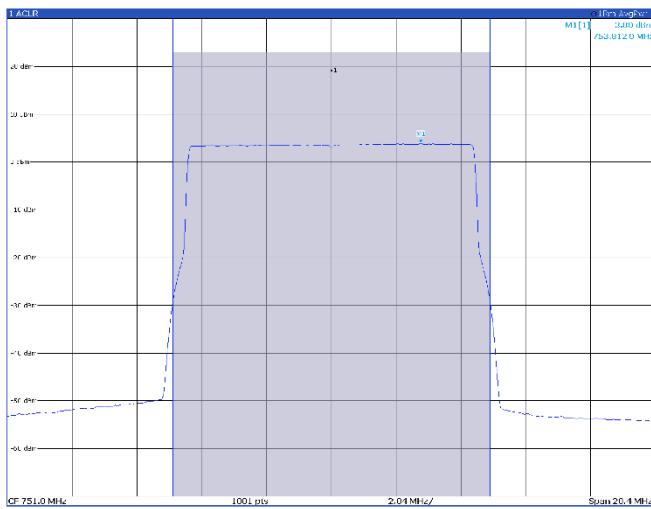
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1:1 (Tx-F) Tx:Tx	5 000.14Hz	Offset: 22.72 dBm	Power: 22.72 dBm

**TM3p3, 5 MHz, mid channel**


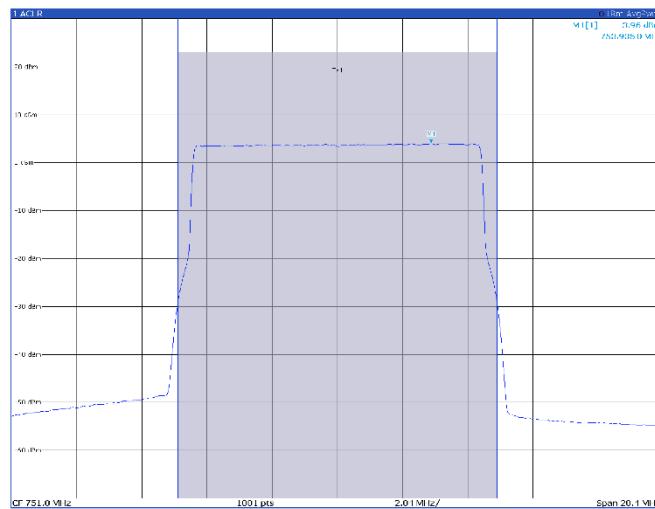
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1:1 (Tx-F) Tx:Tx	5 000.14Hz	Offset: 22.84 dBm	Power: 22.84 dBm

**TM3p3, 5 MHz, high channel**


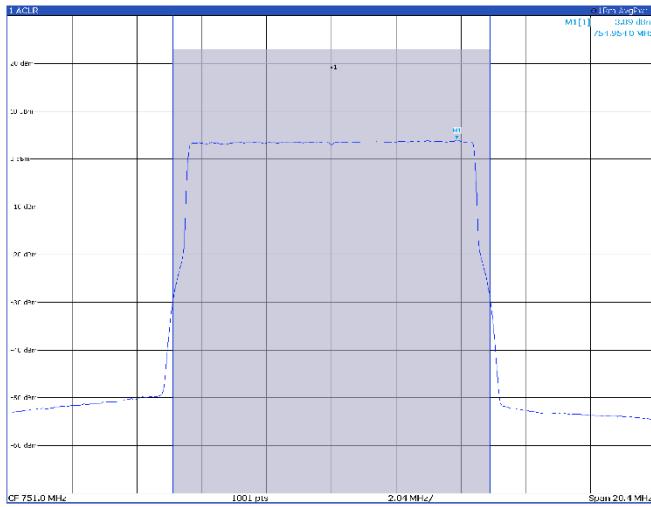
2 Result Summary			
Channel	Bandwidth	EUTRA/LTE Square/RRC	Power Max Hold
1:1 (Tx-F) Tx:Tx	5 000.14Hz	Offset: 22.96 dBm	Power: 22.96 dBm

**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**


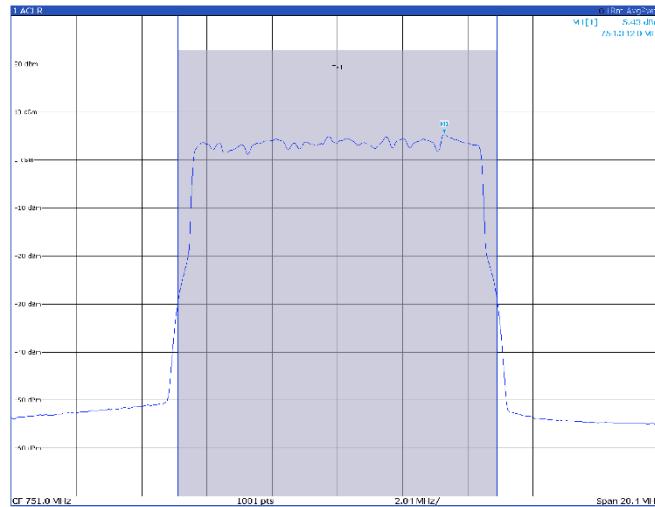
2 Result Summary			
Channel	Bandwidth	Offset	Power
1:1 (Ref)	10.000 MHz		<b>22.88 dBm</b>
Tx Total			<b>22.88 dBm</b>

**TM3p1, 10 MHz, mid channel**


2 Result Summary			
Channel	Bandwidth	Offset	Power
1:1 (Ref)	10.000 MHz		<b>22.95 dBm</b>
Tx Total			<b>22.95 dBm</b>

**TM3p1a, 10 MHz, mid channel**


2 Result Summary			
Channel	Bandwidth	Offset	Power
1:1 (Ref)	10.000 MHz		<b>22.81 dBm</b>
Tx Total			<b>22.81 dBm</b>

**TM3p3, 10 MHz, mid channel**


2 Result Summary			
Channel	Bandwidth	Offset	Power
1:1 (Ref)	10.000 MHz		<b>22.86 dBm</b>
Tx Total			<b>22.86 dBm</b>

## 8.5 FCC §27.50(d)(5) Peak to Average Power Ratio

### 8.5.1 Definitions and limits

d) (5) Equipment employed must be authorized in accordance with the provisions of § 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

(6) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, and any other relevant factors, so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

### 8.5.2 Test summary

Test start date	November 26, 2024	Temperature	22 °C
Test end date	December 13, 2024	Air pressure	1001 mbar
Test engineer	O. Frau	Relative humidity	62%
Verdict	Pass		

### 8.5.3 Observations, settings and special notes

Test method: ANSI C63.26 Section 5.2.3.4.

Spectrum analyzer settings:

Resolution bandwidth	≥ OBW
Number of counts	The necessary number up to stabilizes the measured
Trace mode	Clear/Write

### 8.5.4 Test equipment used

Equipment	Manufacturer	Model no.	Asset no.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767

## 8.5.5 Test data

## Antenna 1

## Band B13:

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	1	748.5	8.46	13	-4.54
B13	5 MHz	1	751.0	8.56	13	-4.44
B13	5 MHz	1	753.5	8.56	13	-4.44

Peak to average power ratio, TM1.1

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	1	748.5	8.48	13	-4.52
B13	5 MHz	1	751.0	8.44	13	-4.56
B13	5 MHz	1	753.5	8.46	13	-4.54

Peak to average power ratio, TM3p1

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	1	748.5	8.28	13	-4.72
B13	5 MHz	1	751.0	8.32	13	-4.68
B13	5 MHz	1	753.5	8.26	13	-4.74

Peak to average power ratio, TM3p1a

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	1	748.5	8.36	13	-4.64
B13	5 MHz	1	751.0	8.38	13	-4.62
B13	5 MHz	1	753.5	8.34	13	-4.66

Peak to average power ratio, TM3p3

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	1	n/a	-	-	-
B13	10 MHz	1	751.0	8.38	13	-4.62
B13	10 MHz	1	n/a	-	-	-

Peak to average power ratio, TM1.1

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	1	n/a	-	-	-
B13	10 MHz	1	751.0	8.32	13	-4.68
B13	10 MHz	1	n/a	-	-	-

Peak to average power ratio, TM3p1

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	1	n/a	-	-	-
B13	10 MHz	1	751.0	8.40	13	-4.60
B13	10 MHz	1	n/a	-	-	-

Peak to average power ratio, TM3p1a

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	1	n/a	-	-	-
B13	10 MHz	1	751.0	8.48	13	-4.52
B13	10 MHz	1	n/a	-	-	-

Peak to average power ratio, TM3p3

**Antenna 2**
**Band B13:**

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	2	748.5	8.48	13	-4.52
B13	5 MHz	2	751.0	8.54	13	-4.46
B13	5 MHz	2	753.5	8.56	13	-4.44

*Peak to average power ratio, TM1.1*

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	2	748.5	8.44	13	-4.56
B13	5 MHz	2	751.0	8.48	13	-4.52
B13	5 MHz	2	753.5	8.42	13	-4.58

*Peak to average power ratio, TM3p1*

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	2	748.5	8.26	13	-4.74
B13	5 MHz	2	751.0	8.32	13	-4.68
B13	5 MHz	2	753.5	8.28	13	-4.72

*Peak to average power ratio, TM3p1a*

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	5 MHz	2	748.5	8.38	13	-4.62
B13	5 MHz	2	751.0	8.38	13	-4.62
B13	5 MHz	2	753.5	8.40	13	-4.52

*Peak to average power ratio, TM3p3*

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	2	n/a	-	-	-
B13	10 MHz	2	751.0	8.58	13	-4.42
B13	10 MHz	2	n/a	-	-	-

*Peak to average power ratio, TM1.1*

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	2	n/a	-	-	-
B13	10 MHz	2	751.0	8.52	13	-4.48
B13	10 MHz	2	n/a	-	-	-

*Peak to average power ratio, TM3p1*

Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	2	n/a	-	-	-
B13	10 MHz	2	751.0	8.38	13	-4.62
B13	10 MHz	2	n/a	-	-	-

*Peak to average power ratio, TM3p1a*

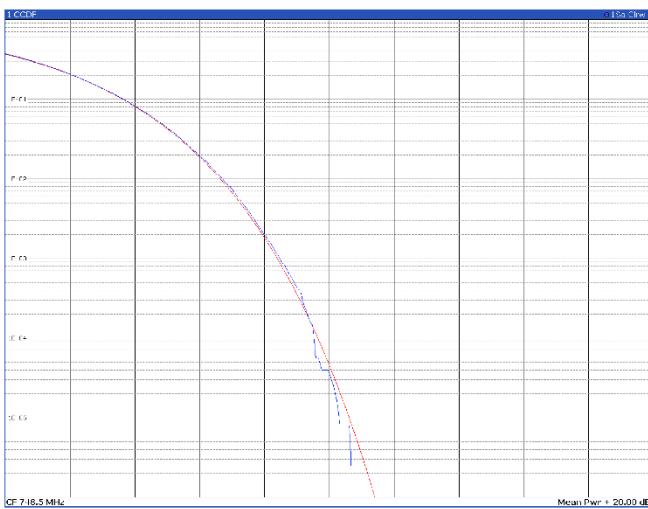
Band	OBW Declared	Port	Channel (MHz)	0.1% (dB)	0.1% Limit (dB)	Margin (dB)
B13	10 MHz	2	n/a	-	-	-
B13	10 MHz	2	751.0	8.46	13	-4.54
B13	10 MHz	2	n/a	-	-	-

*Peak to average power ratio, TM3p3*

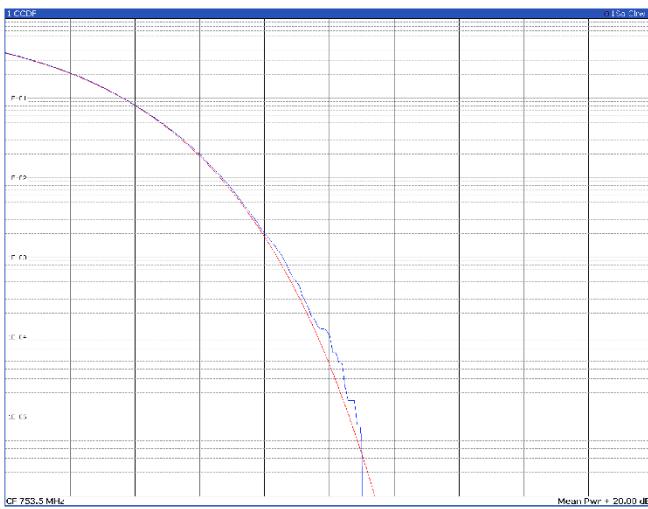
## Antenna port 1

## Band B13

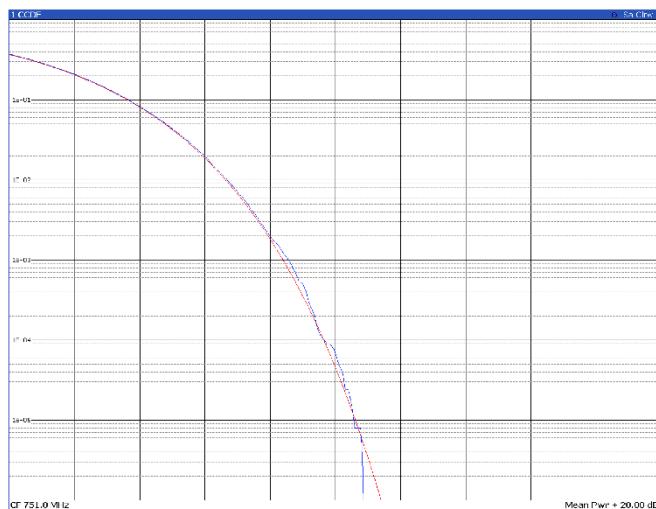
## 5 MHz

**TM1.1, 5 MHz, low channel**


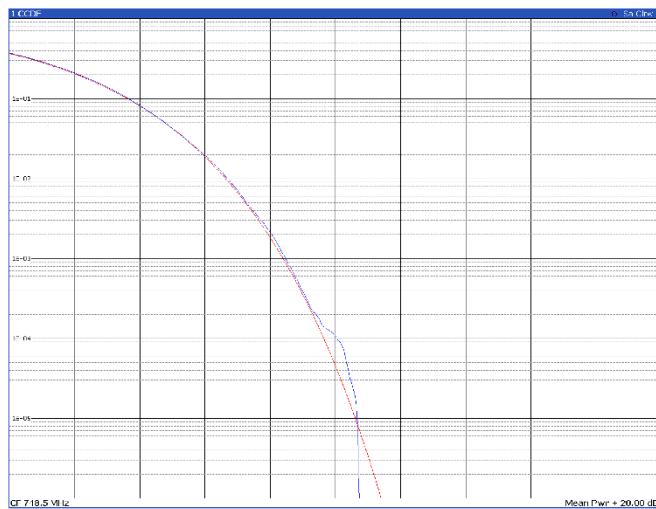
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	22.08 dBm	32.65 dBm	10.57 dB	3.51 ± 5	6.71 dB	± 46 dB	9.52 ± 5

**TM1.1, 5 MHz, mid channel**


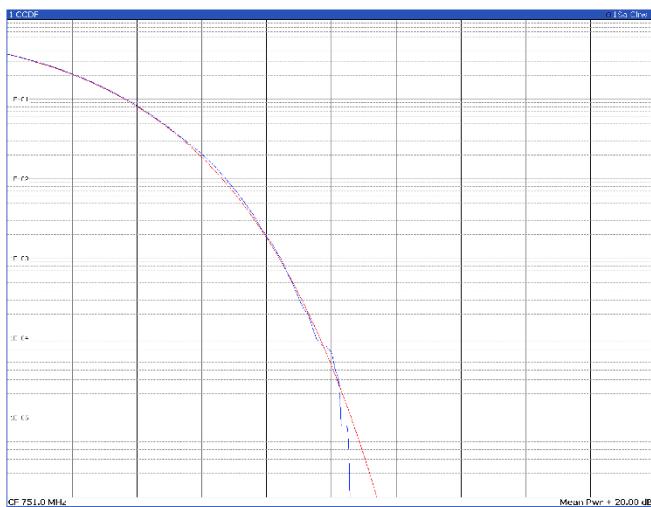
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.82 dBm	32.56 dBm	10.74 dB	3.64 ± 5	6.68 dB	± 33 dB	9.65 ± 5

**TM1.1, 5 MHz, high channel**


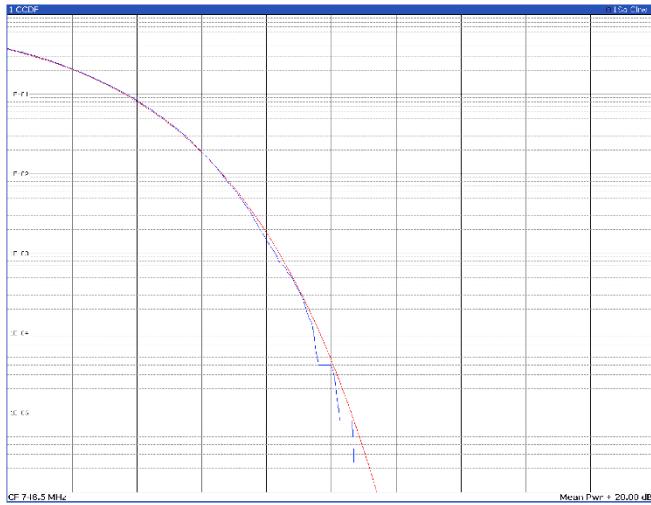
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.64 dBm	32.56 dBm	10.92 dB	3.51 ± 5	6.71 dB	± 56 dB	10.02 ± 5

**TM3p1, 5 MHz, low channel**


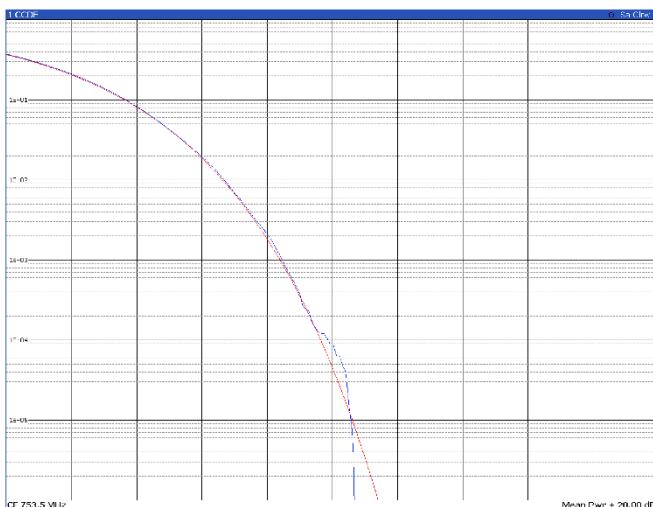
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.59 dBm	32.19 dBm	10.60 dB	3.64 ± 5	6.65 dB	± 43 dB	10.00 ± 5

**TM3p1, 5 MHz, mid channel**


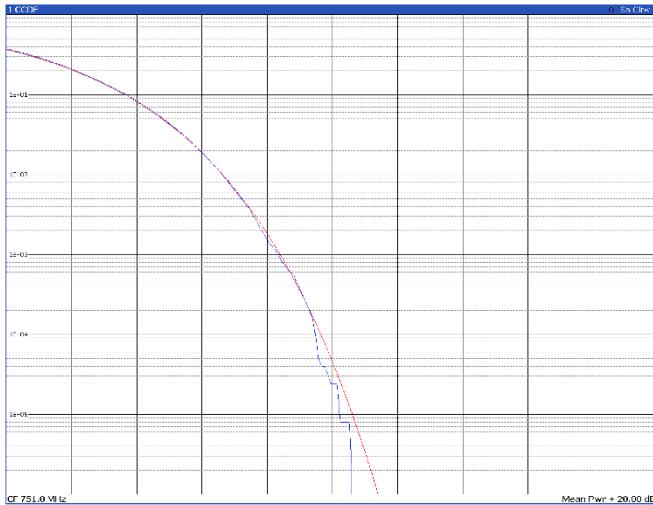
2 Result Summary							Samples: 100000				
Trace 1	Mean	Peak	Crest	10%	10%	0.1%	0.1%	0.01%	0.01%	0.001%	
		<b>21.64 dBm</b>	<b>32.12 dBm</b>	<b>10.48 dB</b>	3.55 dB	6.71 dB	8.41 dB	9.51 dB	9.51 dB	9.51 dB	

**TM3p1a, 5 MHz, low channel**


2 Result Summary							Samples: 100000				
Trace 1	Mean	Peak	Crest	10%	10%	0.1%	0.1%	0.01%	0.01%	0.001%	
		<b>21.58 dBm</b>	<b>32.24 dBm</b>	<b>10.66 dB</b>	3.58 dB	6.62 dB	8.28 dB	9.36 dB	9.36 dB	9.36 dB	

**TM3p1, 5 MHz, high channel**


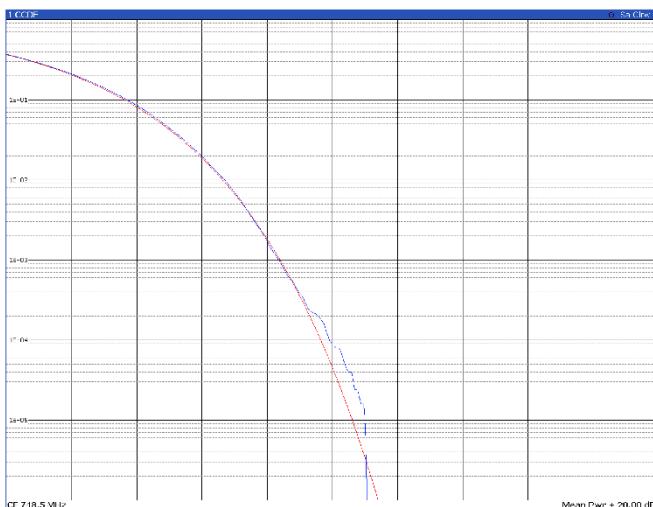
2 Result Summary							Samples: 100000				
Trace 1	Mean	Peak	Crest	10%	10%	0.1%	0.1%	0.01%	0.01%	0.001%	
		<b>21.62 dBm</b>	<b>32.19 dBm</b>	<b>10.57 dB</b>	3.61 dB	6.63 dB	8.41 dB	9.57 dB	9.57 dB	9.57 dB	

**TM3p1a, 5 MHz, mid channel**


2 Result Summary							Samples: 100000				
Trace 1	Mean	Peak	Crest	10%	10%	0.1%	0.1%	0.01%	0.01%	0.001%	
		<b>21.70 dBm</b>	<b>32.21 dBm</b>	<b>10.50 dB</b>	3.63 dB	6.65 dB	8.37 dB	9.45 dB	9.45 dB	9.45 dB	

**TM3p1a, 5 MHz, high channel**

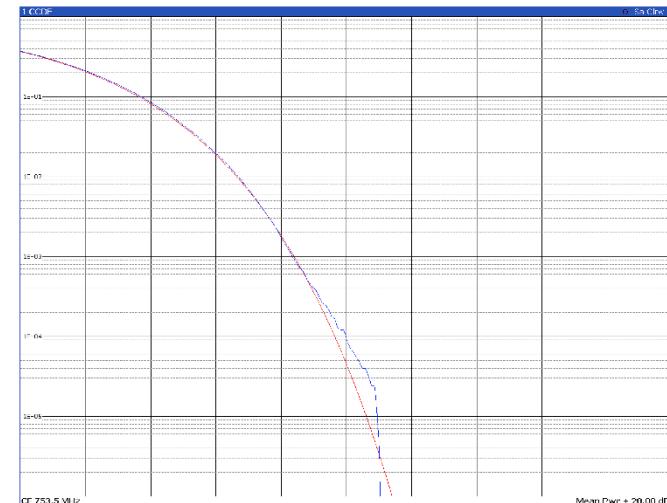

2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.61 dBm	31.86 dBm	10.25 dB	3.58 dB	6.42 dB	2.76 dB	0.41 dB

**TM3p3, 5 MHz, low channel**
**TM3p3, 5 MHz, low channel**


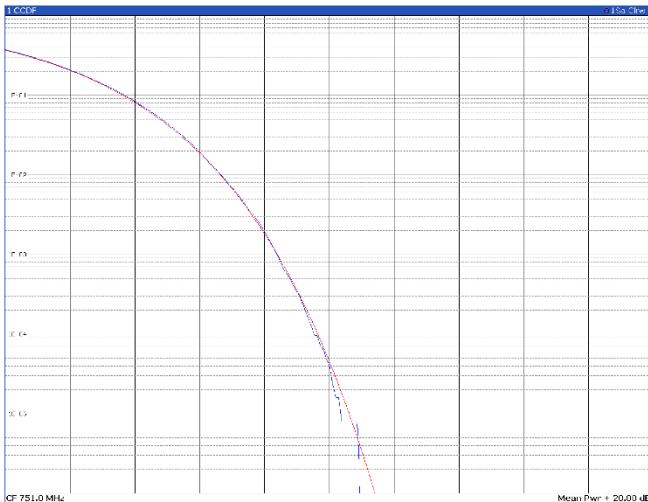
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.82 dBm	32.61 dBm	10.99 dB	3.71 dB	6.22 dB	0.32 dB	0.95 dB

**TM3p3, 5 MHz, mid channel**

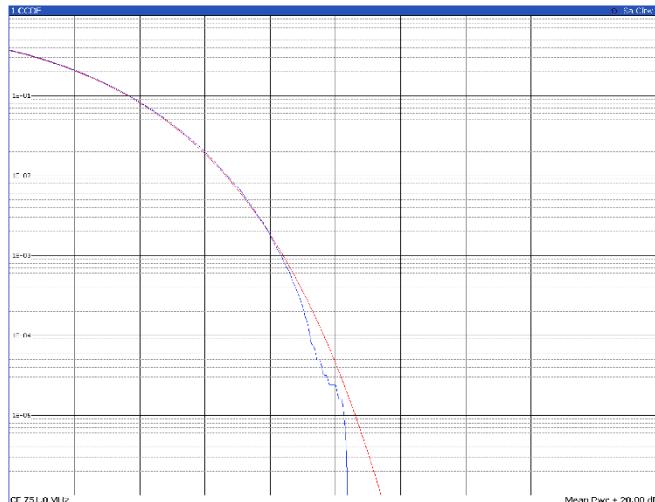

2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.88 dBm	32.65 dBm	10.77 dB	3.59 dB	6.72 dB	0.38 dB	10.00 dB



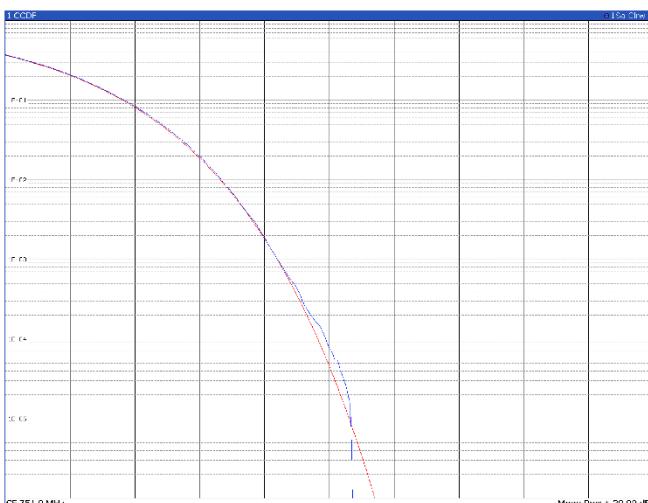
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.73 dBm	32.71 dBm	10.98 dB	3.71 dB	6.62 dB	0.34 dB	0.46 dB

**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**


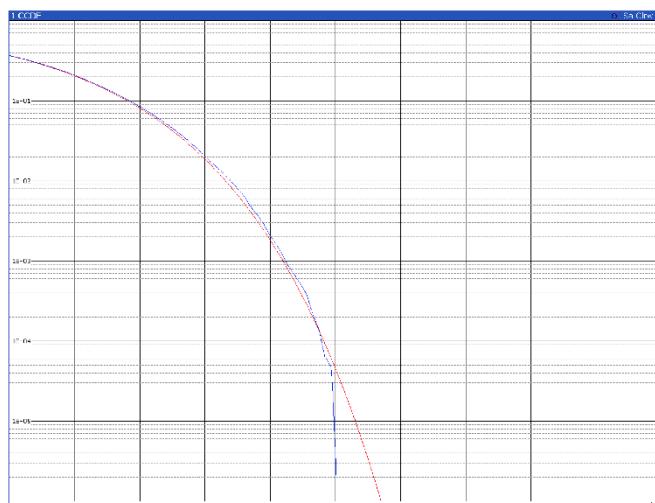
2 Result Summary								Samples: 100000					
Trace 1	Mean	Peak	Crest	10%	1%	0.1%	0.01%	10%	1%	0.1%	0.01%		
	<b>18.64 dBm</b>	<b>29.45 dBm</b>	<b>10.81 dB</b>	3.58 dB	6.42 dB	2.38 dB	0.27 dB	3.58 dB	6.42 dB	2.38 dB	0.27 dB		

**TM3p1, 10 MHz, mid channel**


2 Result Summary								Samples: 100000					
Trace 1	Mean	Peak	Crest	10%	1%	0.1%	0.01%	10%	1%	0.1%	0.01%	100000	100000
	<b>18.54 dBm</b>	<b>28.01 dBm</b>	<b>10.26 dB</b>	3.65 dB	6.65 dB	2.40 dB	0.32 dB	3.65 dB	6.65 dB	2.40 dB	0.32 dB	100000	100000

**TM3p1a, 10 MHz, mid channel**


2 Result Summary								Samples: 100000					
Trace 1	Mean	Peak	Crest	10%	1%	0.1%	0.01%	10%	1%	0.1%	0.01%	100000	100000
	<b>18.58 dBm</b>	<b>29.24 dBm</b>	<b>10.66 dB</b>	3.58 dB	6.65 dB	2.40 dB	0.32 dB	3.58 dB	6.65 dB	2.40 dB	0.32 dB	100000	100000

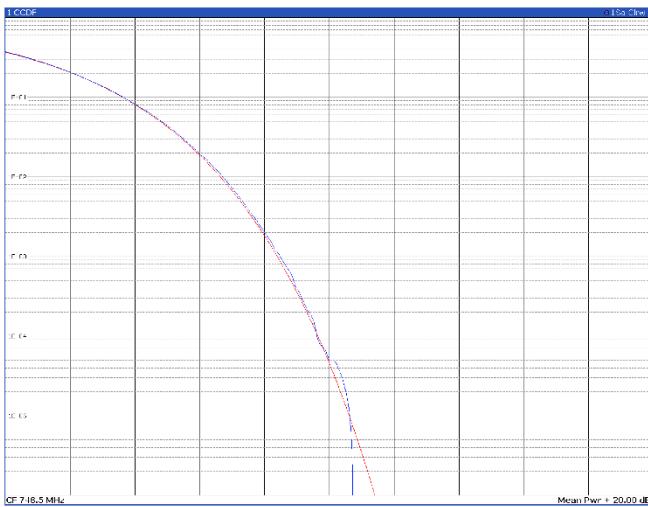
**TM3p3, 10 MHz, mid channel**


2 Result Summary								Samples: 100000					
Trace 1	Mean	Peak	Crest	10%	1%	0.1%	0.01%	10%	1%	0.1%	0.01%	100000	100000
	<b>18.69 dBm</b>	<b>28.67 dBm</b>	<b>9.98 dB</b>	3.63 dB	6.72 dB	2.45 dB	0.33 dB	3.63 dB	6.72 dB	2.45 dB	0.33 dB	100000	100000

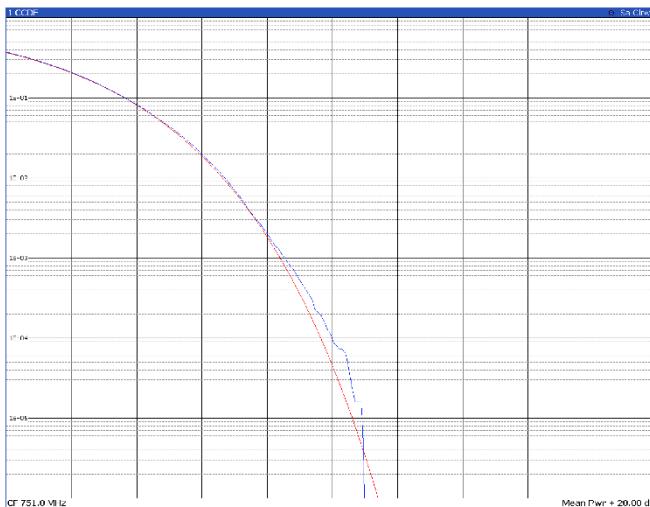
## Antenna port 2

## Band B13

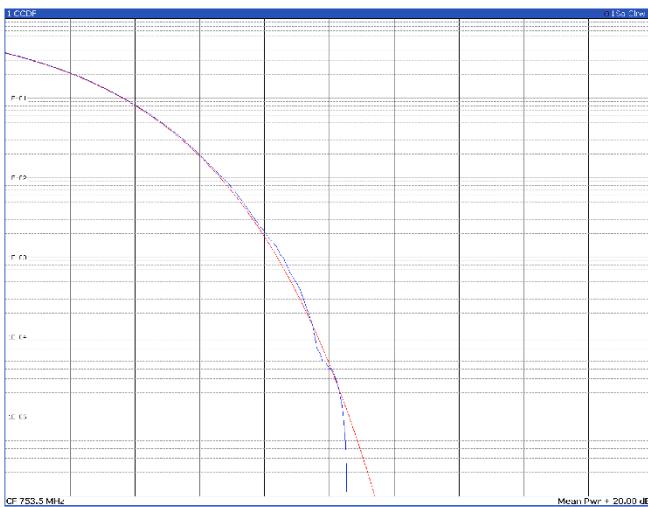
## 5 MHz

**TM1.1, 5 MHz, low channel**


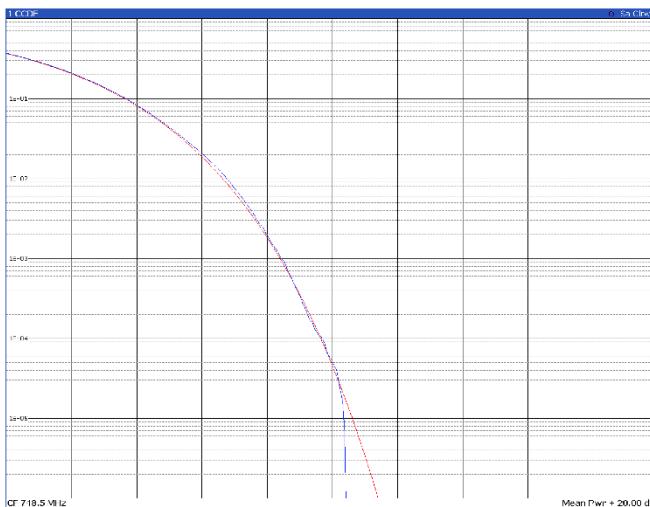
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.94 dBm	32.56 dBm	10.61 dB	3.74 dB	6.77 dB	2.48 dB	0.67 dB

**TM1.1, 5 MHz, mid channel**


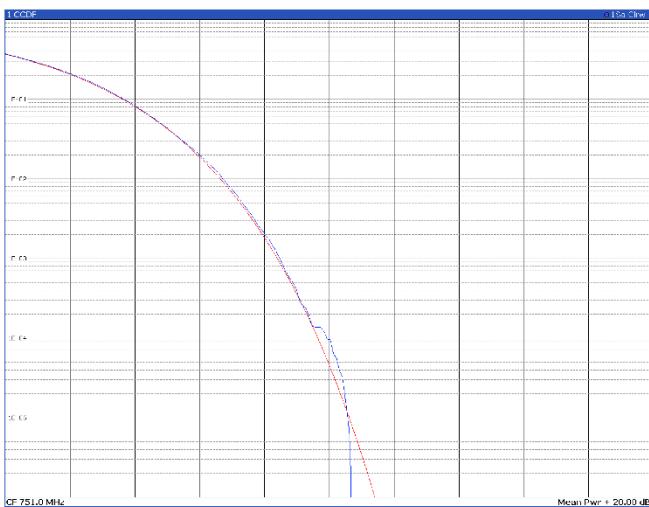
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.81 dBm	32.72 dBm	10.91 dB	3.64 dB	6.27 dB	2.34 dB	0.69 dB

**TM1.1, 5 MHz, high channel**


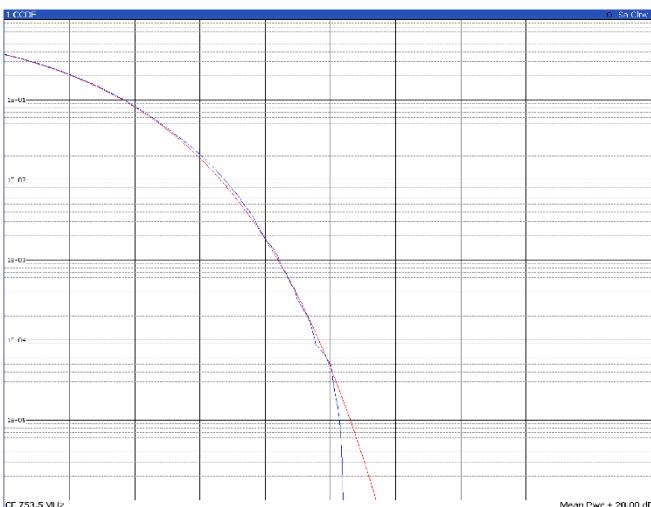
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.76 dBm	32.23 dBm	10.47 dB	3.56 dB	6.70 dB	2.50 dB	0.70 dB

**TM3p1, 5 MHz, low channel**


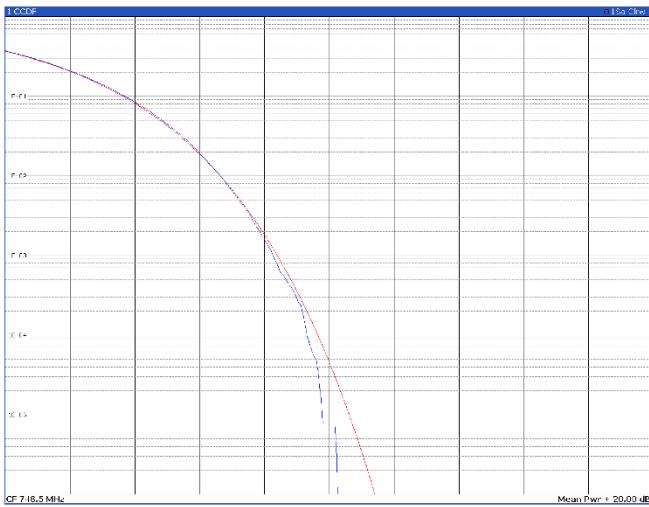
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.52 dBm	31.86 dBm	10.34 dB	3.65 dB	6.27 dB	2.44 dB	0.68 dB

**TM3p1, 5 MHz, mid channel**


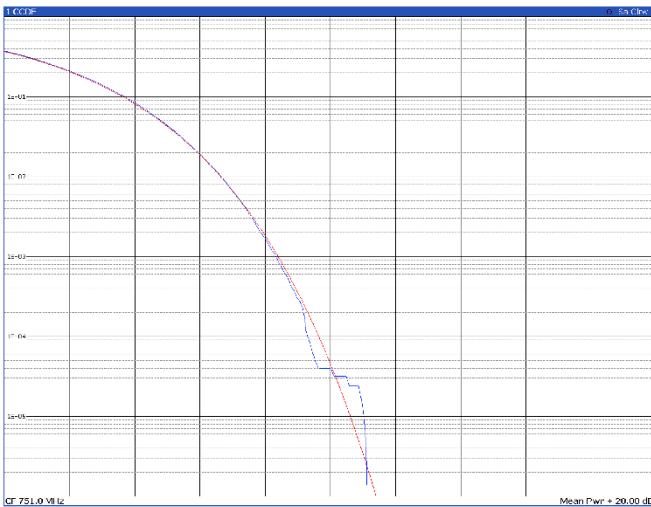
2 Result Summary							
	Mean	Peak	Crest	10%	10%	0.1%	0.01%
Trace 1	21.63 dBm	32.21 dBm	10.58 dB	3.53 dB	6.77 dB	0.85 dB	0.42 dB

**TM3p1, 5 MHz, high channel**


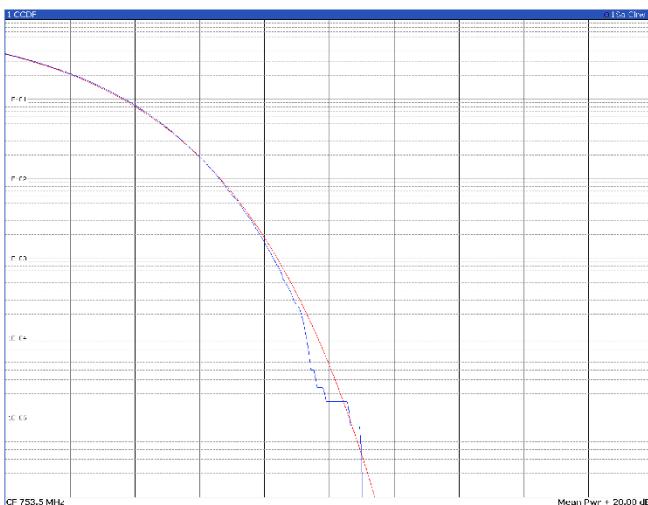
2 Result Summary							
	Mean	Peak	Crest	10%	10%	0.1%	0.01%
Trace 1	21.73 dBm	31.98 dBm	10.25 dB	3.61 dB	6.71 dB	0.84 dB	0.47 dB

**TM3p1a, 5 MHz, low channel**


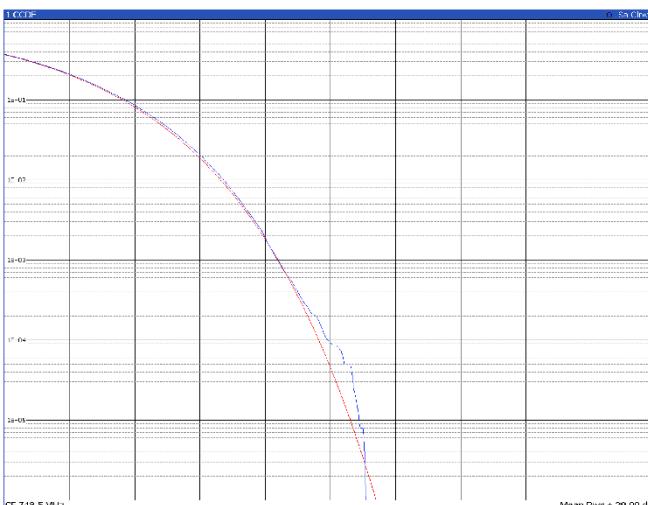
2 Result Summary							
	Mean	Peak	Crest	10%	10%	0.1%	0.01%
Trace 1	21.49 dBm	31.67 dBm	10.18 dB	3.59 dB	6.64 dB	0.76 dB	0.32 dB

**TM3p1a, 5 MHz, mid channel**


2 Result Summary							
	Mean	Peak	Crest	10%	10%	0.1%	0.01%
Trace 1	21.64 dBm	32.67 dBm	11.03 dB	3.63 dB	6.65 dB	0.83 dB	0.33 dB

**TM3p1a, 5 MHz, high channel**


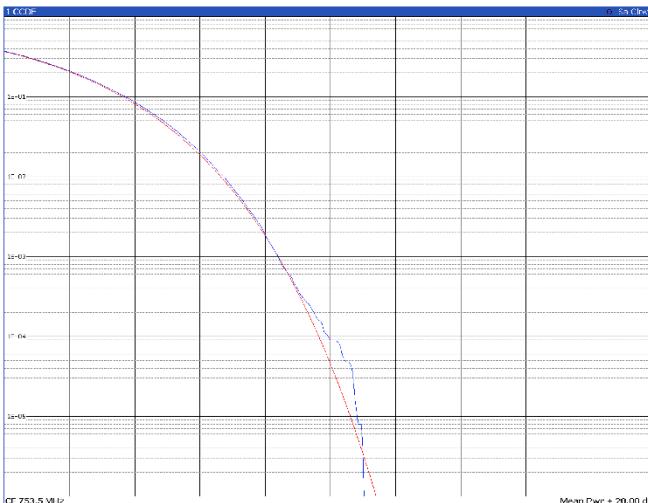
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.75 dBm	32.72 dBm	10.96 dB	3.58 dB	6.42 dB	2.78 dB	0.30 dB

**TM3p3, 5 MHz, low channel**


2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.69 dBm	32.71 dBm	11.02 dB	3.71 dB	6.72 dB	2.85 dB	0.32 dB

**TM3p3, 5 MHz, mid channel**

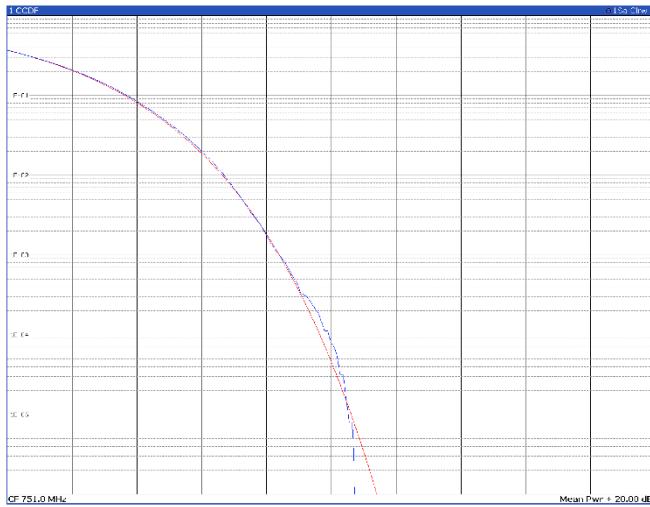

2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.88 dBm	32.86 dBm	10.98 dB	3.70 dB	6.77 dB	2.88 dB	0.33 dB

**TM3p3, 5 MHz, high channel**


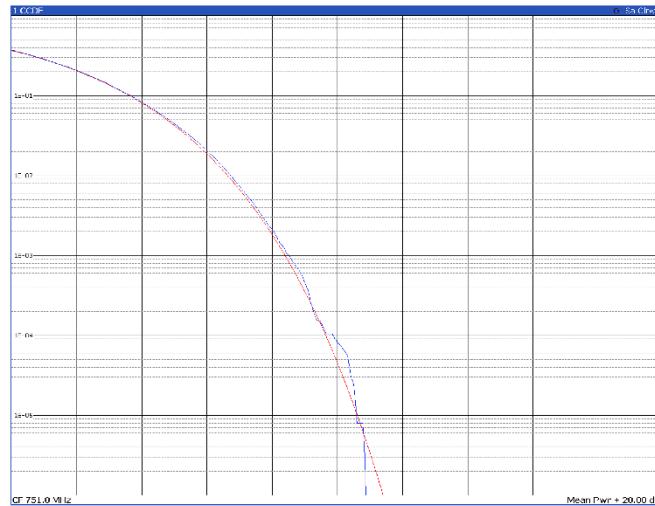
2 Result Summary							
	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.93 dBm	32.90 dBm	10.97 dB	3.71 dB	6.77 dB	2.85 dB	0.34 dB

**Band B13**
**10 MHz**
**TM1.1, 10 MHz, mid channel**

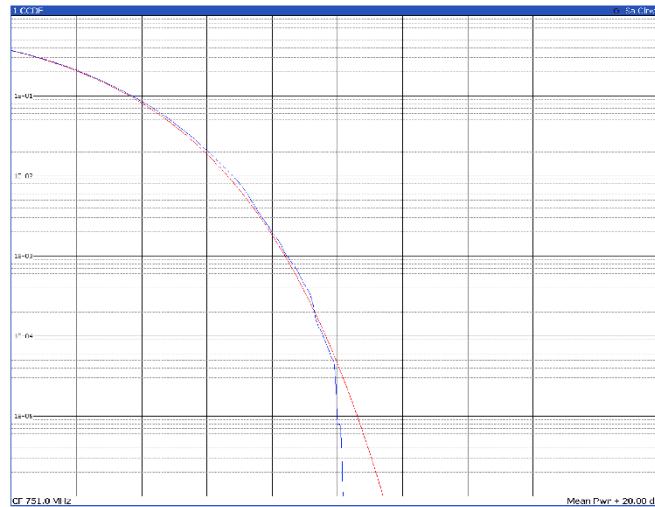

	Mean	Peak	Crest	10%	1%	0.1%	0.01%	Samples: 100000
Trace 1	<b>18.55 dBm</b>	<b>29.61 dBm</b>	<b>11.06 dB</b>	3.58 dB	6.74 dB	12.34 dB	20.00 dB	

**TM3p1a, 10 MHz, mid channel**


	Mean	Peak	Crest	10%	1%	0.1%	0.01%	Samples: 100000
Trace 1	<b>18.57 dBm</b>	<b>29.16 dBm</b>	<b>10.59 dB</b>	3.70 dB	6.63 dB	12.38 dB	20.00 dB	

**TM3p1, 10 MHz, mid channel**


	Mean	Peak	Crest	10%	1%	0.1%	0.01%	Samples: 100000
Trace 1	<b>18.71 dBm</b>	<b>29.45 dBm</b>	<b>10.74 dB</b>	3.54 dB	6.75 dB	12.52 dB	20.00 dB	

**TM3p3, 10 MHz, mid channel**


	Mean	Peak	Crest	10%	1%	0.1%	0.01%	Samples: 100000
Trace 1	<b>18.65 dBm</b>	<b>28.70 dBm</b>	<b>10.04 dB</b>	3.71 dB	6.78 dB	12.42 dB	20.00 dB	

## 8.6 FCC §27.53(m) Emission Limits

### 8.6.1 Definitions and limits

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(2) For digital base stations, the attenuation shall be not less than  $43 + 10 \log (P)$  dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:

(v) For all fixed digital user stations, the attenuation factor shall be not less than  $43 + 10 \log (P)$  dB at the channel edge.

(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

### 8.6.2 Test summary

Test start date	November 26, 2024	Temperature	21 °C
Test end date	December 13, 2024	Air pressure	1005 mbar
Test engineer	O. Frau	Relative humidity	64%
Verdict	Pass		

### 8.6.3 Observations, settings and special notes

EUT setup configuration	Table top
Test facility	3 m Semi anechoic chamber
Measuring distance	3m
Antenna height variation	1–4 m
Turn table position	0–360°
Measurement details	A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	<ul style="list-style-type: none"> <li>– Peak (Preview measurement)</li> <li>– Quasi-peak (Final measurement)</li> </ul>
Trace mode	Max Hold
Measurement time	<ul style="list-style-type: none"> <li>– 100 ms (Peak preview measurement)</li> <li>– 5000 ms (Quasi-peak final measurement)</li> </ul>

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (Preview measurement) Peak and Coverage (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Peak and Coverage final measurement)

Spectrum analyzer settings (conducted test):

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Frequency span	Sufficient for making an accurate measurement
Detector mode	RMS
Trace mode	Max Hold

This test was realized in two parts: one with a conducted setup and another one with a radiated setup.

The conducted test was made on one port at time, transmitting at max power and with the other one loaded with  $50\ \Omega$  loads. For capturing the signal with the equipment, it was divided in two ranges, using a transducer factor to compensate the losses caused by a cable and attenuator used to protect the test equipment. The first range was measured from 30 MHz to 1 GHz where the fundamental signal is visible; the second range was selected from 1 GHz to 8 GHz. The evaluation was made using the three channels and all the modulations (TM1.1, TM3p1, TM3p1a, and TM3p3).

A 30 dB attenuator was placed between the EUT and spectrum analyzer and compensated for as a reference level offset. Additionally, to correct for MIMO consideration, an additional offset of  $10\log(2) = -3.01$  dB was included to compensate for 2 correlated antennas output.

For band edge tests, in the 1 MHz region immediately outside of the authorized band, a resolution bandwidth of approximately 1 – 5 % of the 26 dB bandwidth measured was used.

The radiated test was made transmitting to max power too with the two ports terminated with  $50\ \Omega$  loads. The scans were made from 30 MHz to 8 GHz considering all the channels but only the bandwidth and modulation with the highest power was showed.

Based on equation  $43 + 10 \log_{10}(P)$  dB, the general emission limit is -13 dBm (conducted and radiated test) or the equivalent at 3m is 82.23 dB $\mu$ V/m above 1 GHz and 84.38 dB $\mu$ V/m below 1 GHz.

#### 8.6.4 Test equipment used

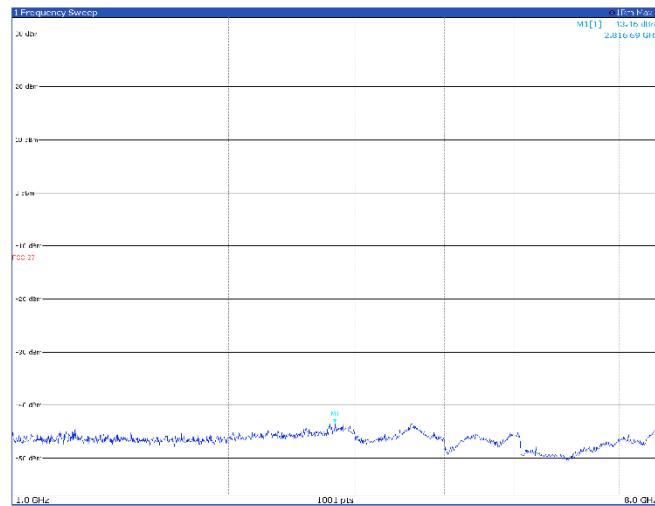
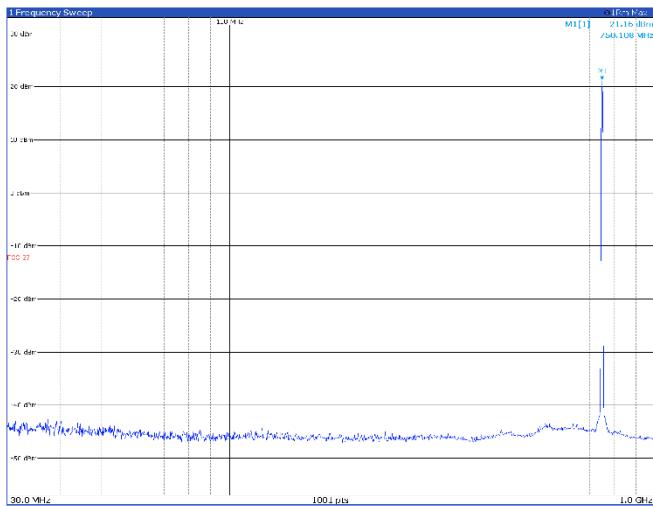
Equipment	Manufacturer	Model no.	Asset no.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767
EMI Receiver	Rohde & Schwarz	ESW44	101620
RF Vector Signal Generator	Rohde & Schwarz	SMBV100A	263254
RF Vector Signal Generator	Rohde & Schwarz	SMBV100A	263397
Antenna Trilog 25MHz – 8GHz	Schwarzbeck Mess-Elektronik	VULB9162	9162-025
Antenna 1 – 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STLP 9148-152
Double Ridge Horn Antenna	RFSpin	DRH40	061106A40
Broadband Amplifier	Schwarzbeck Mess-Elektronik	BBV9718C	00121
Broadband Bench Top Amplifier	Sage	STB-1834034030-KFKF-L1	18490-01
Controller	Maturo	FCU3.0	10041
Tilt antenna mast	Maturo	TAM4.0-E	10042
Turntable	Maturo	TT4.0-5T	2.527

## 8.6.5 Test data

## Band B13 – conducted emissions Antenna port 1

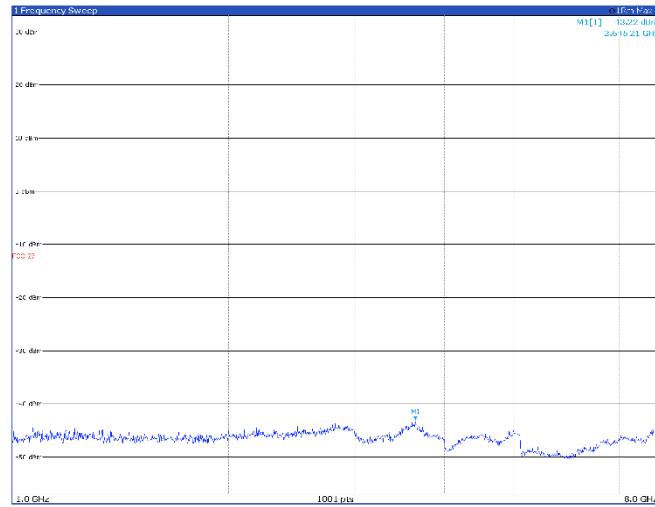
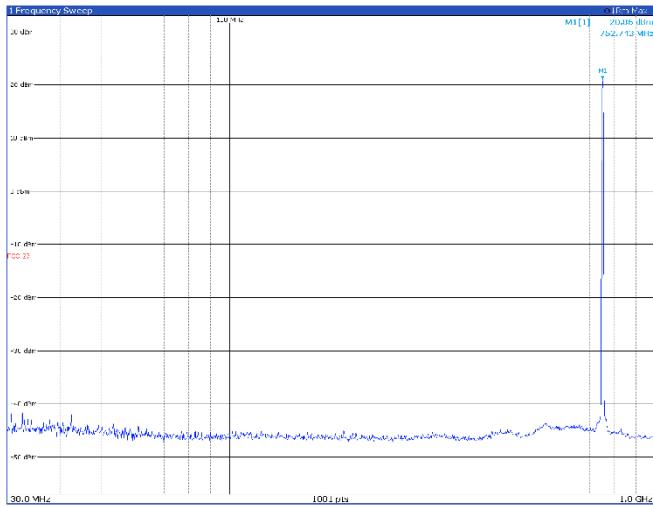
5 MHz

## TM1.1, 5 MHz, low channel

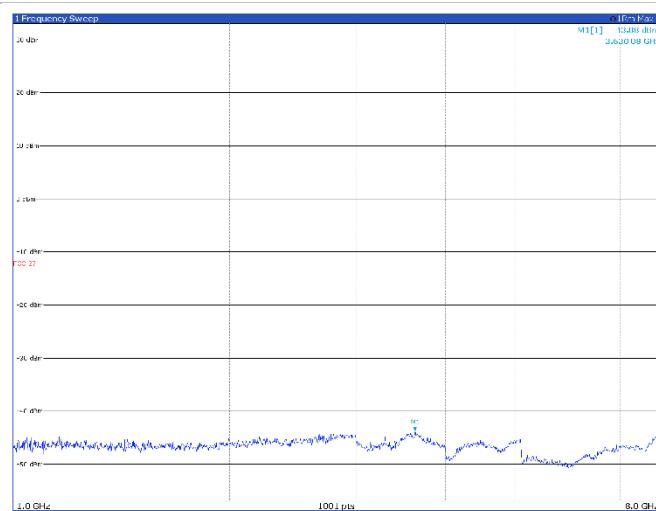
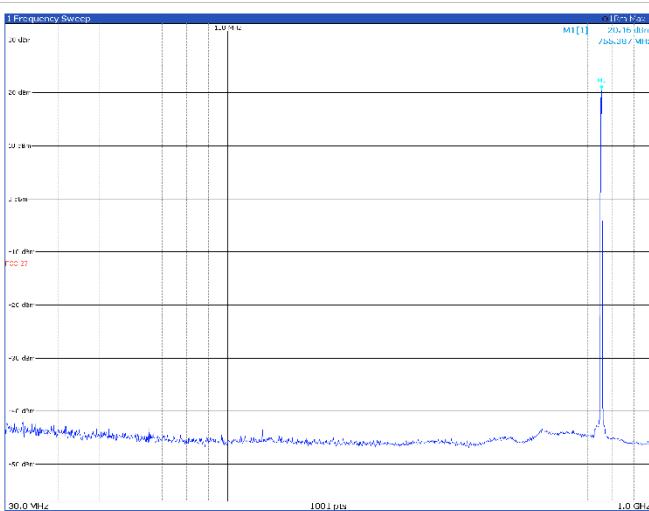


Limit exceeded by the carrier

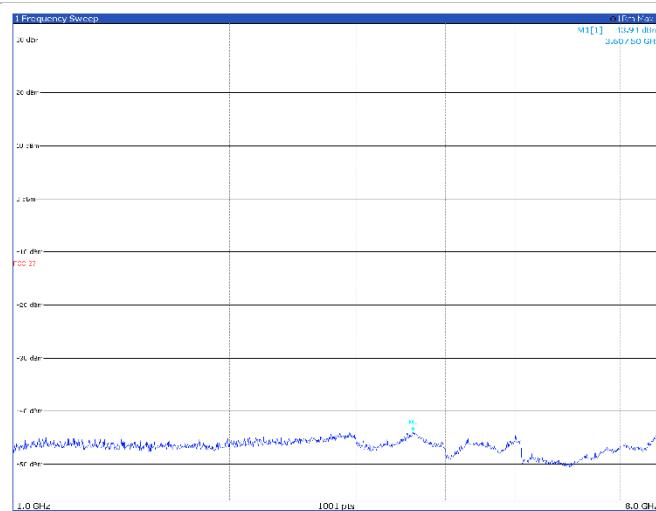
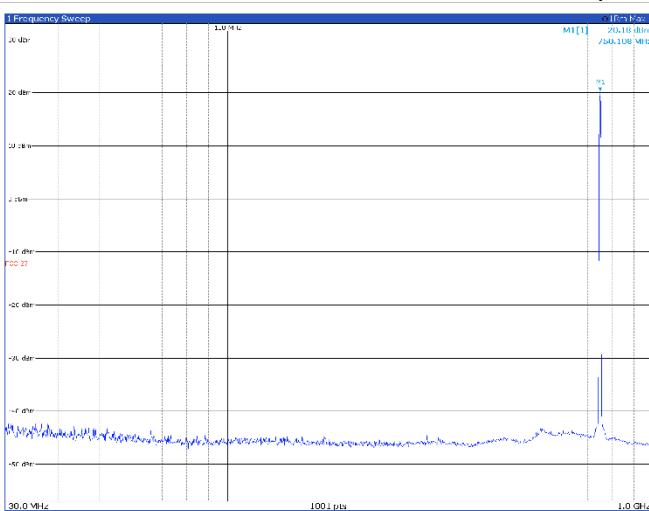
## TM1.1, 5 MHz, mid channel



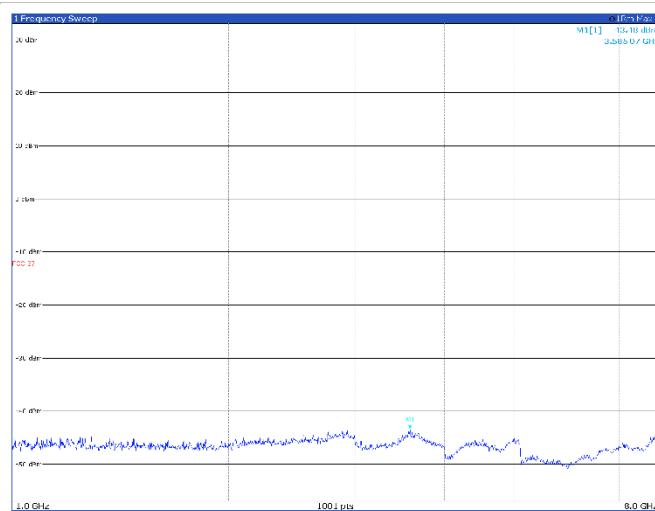
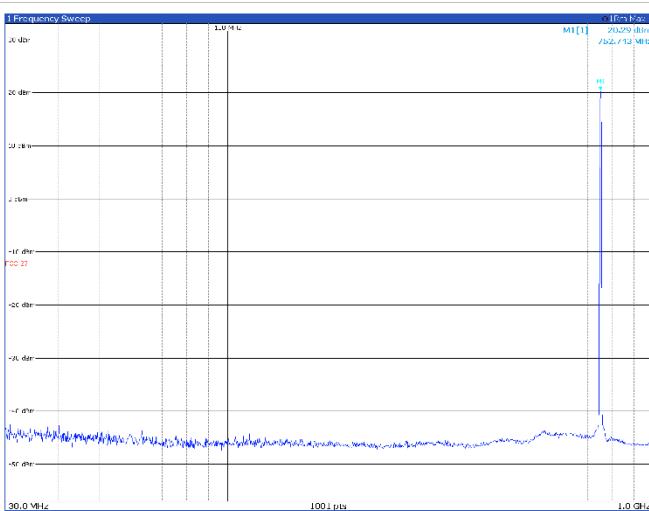
Limit exceeded by the carrier

**TM1.1, 5 MHz, high channel**


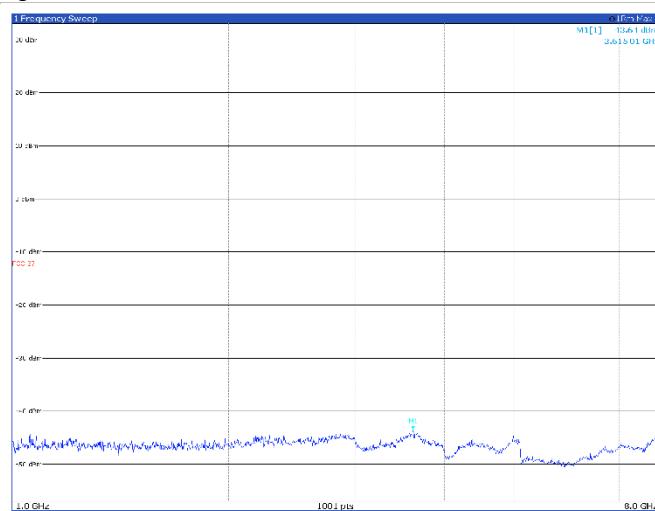
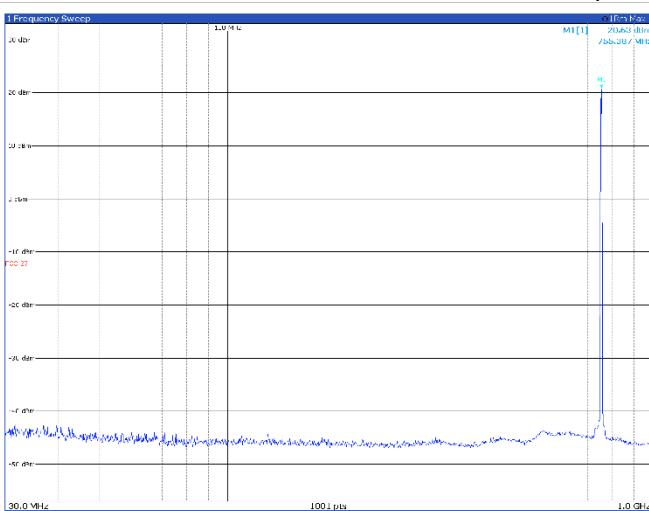
Limit exceeded by the carrier

**TM3p1, 5 MHz, low channel**


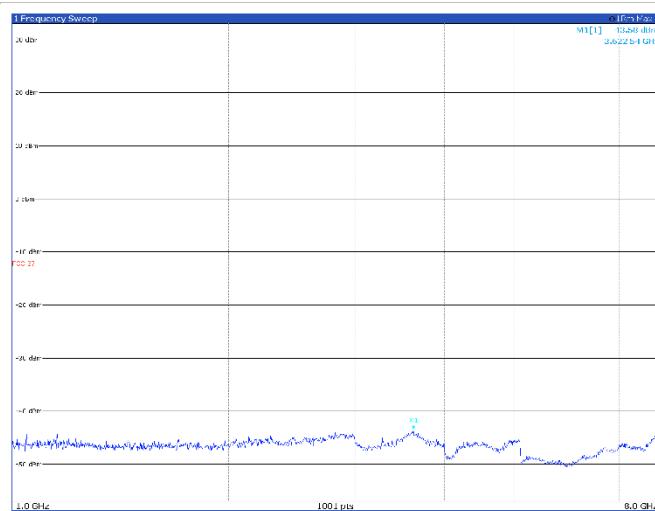
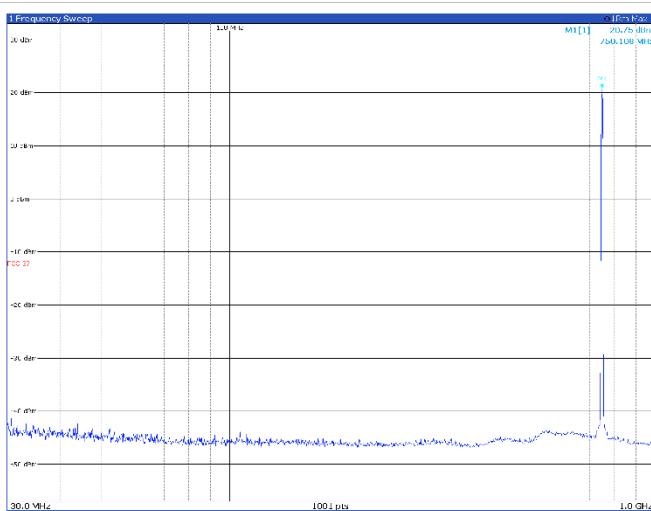
Limit exceeded by the carrier

**TM3p1, 5 MHz, mid channel**


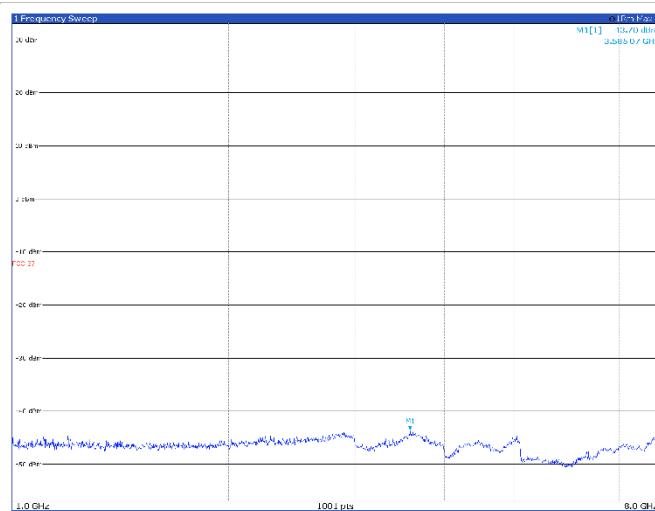
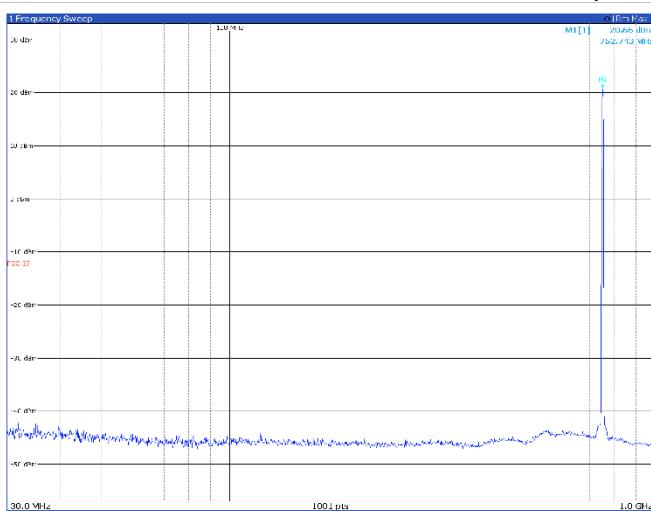
Limit exceeded by the carrier

**TM3p1, 5 MHz, high channel**


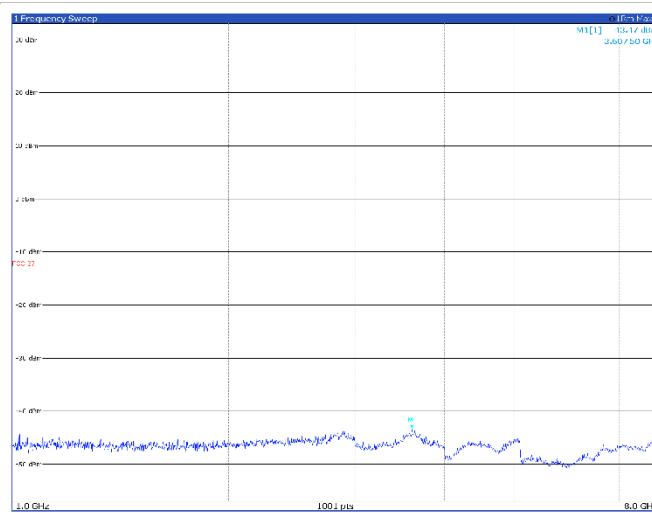
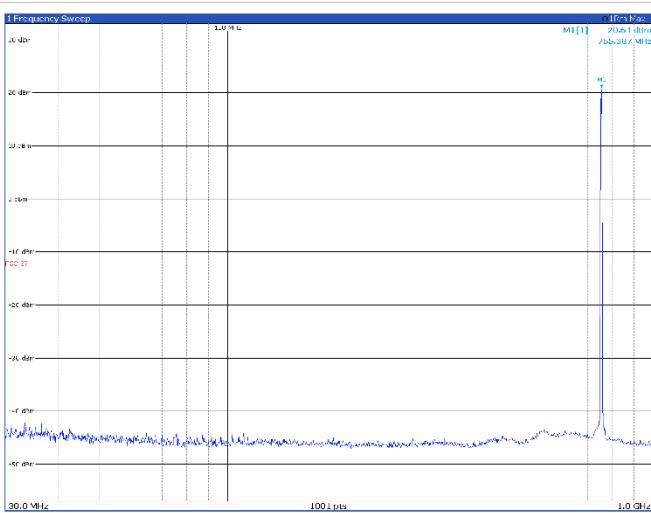
Limit exceeded by the carrier

**TM3p1a, 5 MHz, low channel**


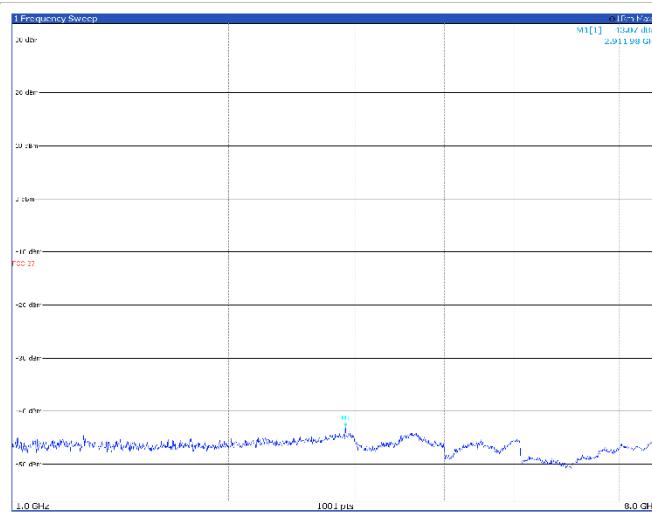
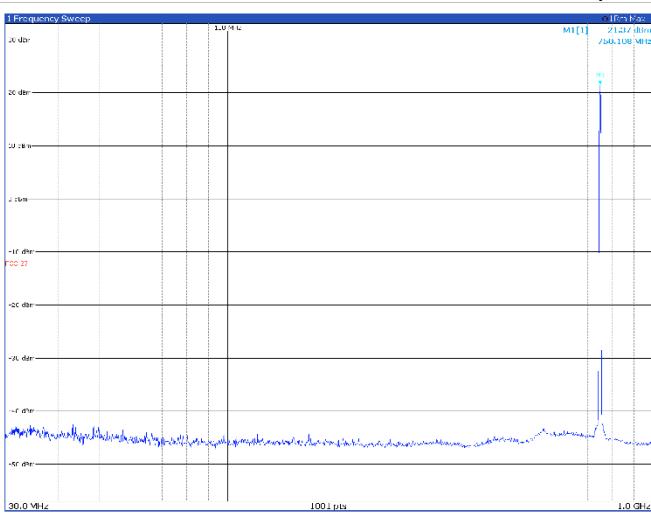
Limit exceeded by the carrier

**TM3p1a, 5 MHz, mid channel**


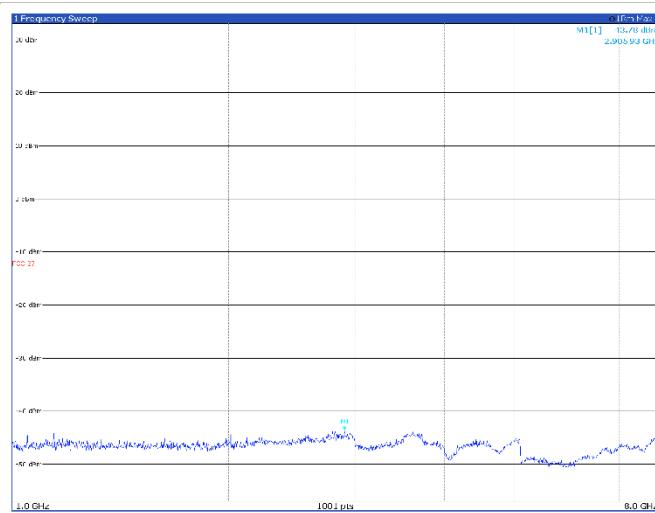
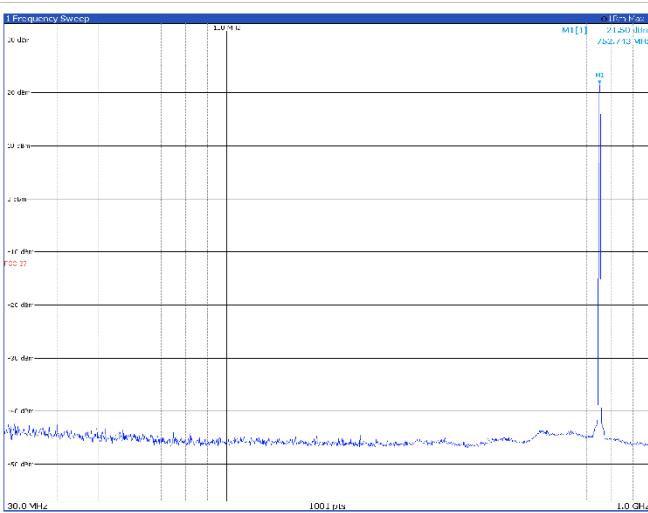
Limit exceeded by the carrier

**TM3p1a, 5 MHz, high channel**


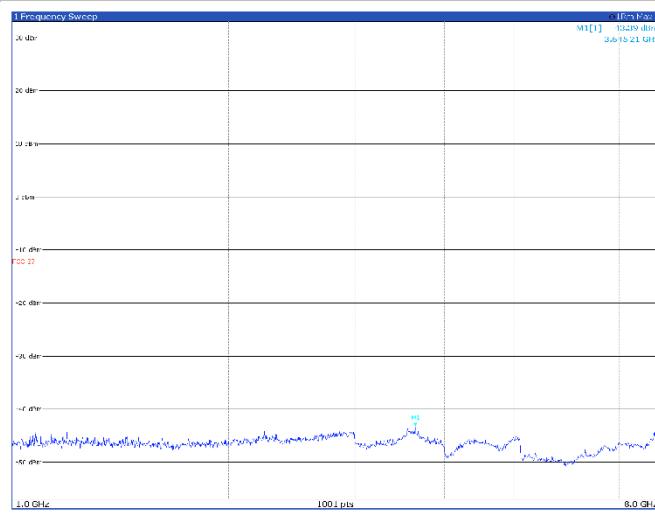
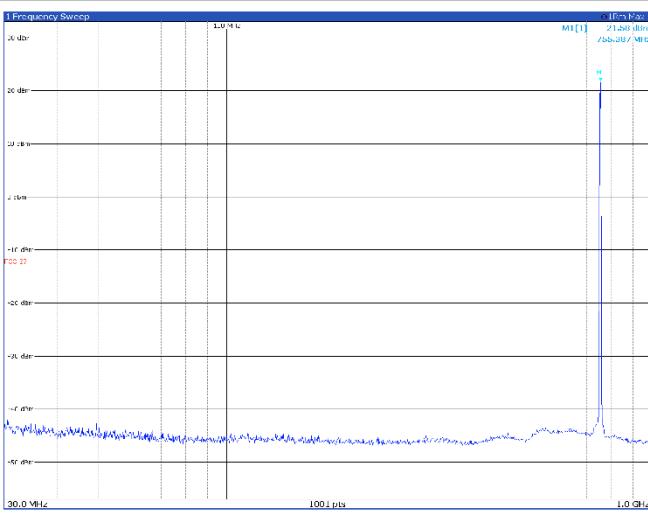
Limit exceeded by the carrier

**TM3p3, 5 MHz, low channel**


Limit exceeded by the carrier

**TM3p3, 5 MHz, mid channel**


Limit exceeded by the carrier

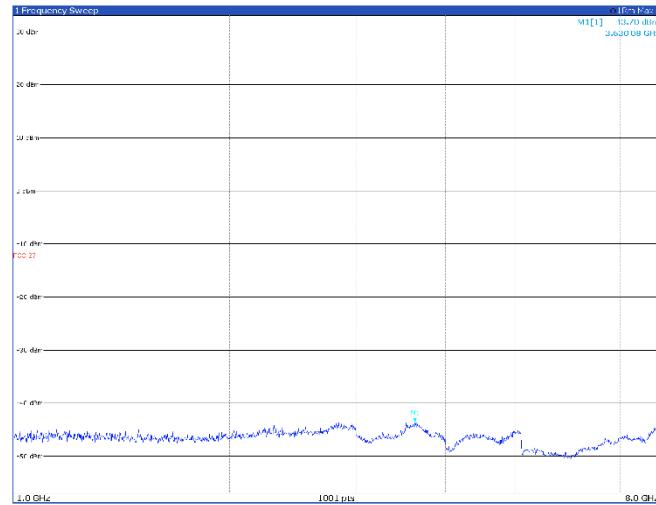
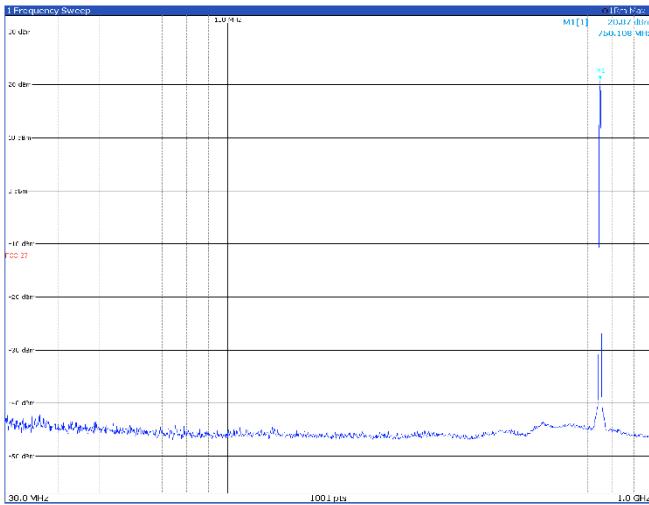
**TM3p3, 5 MHz, high channel**


Limit exceeded by the carrier

## Band B13 – conducted emissions Antenna port 2

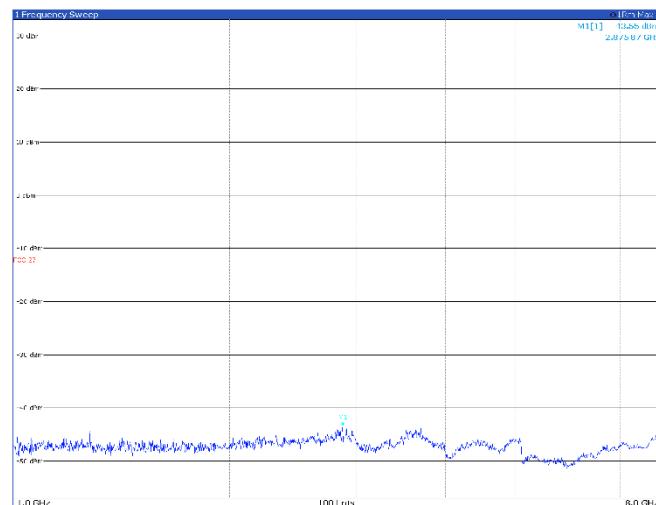
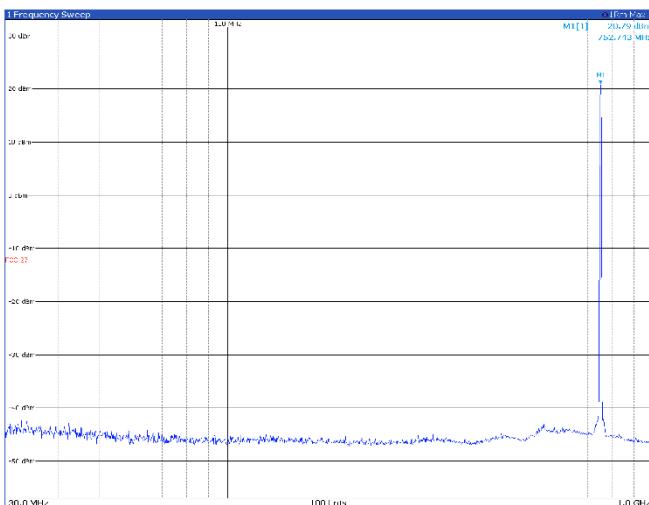
5 MHz

## TM1.1, 5 MHz, low channel

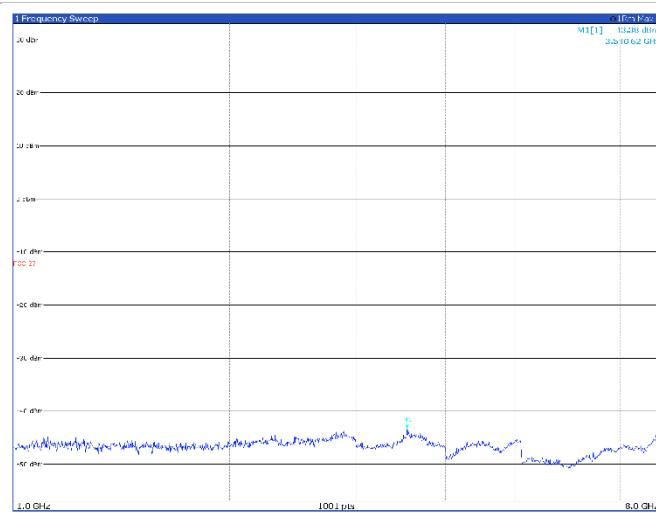
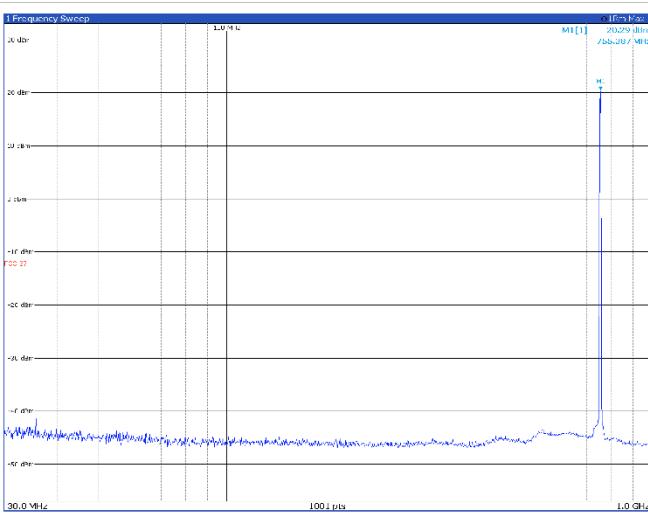


Limit exceeded by the carrier

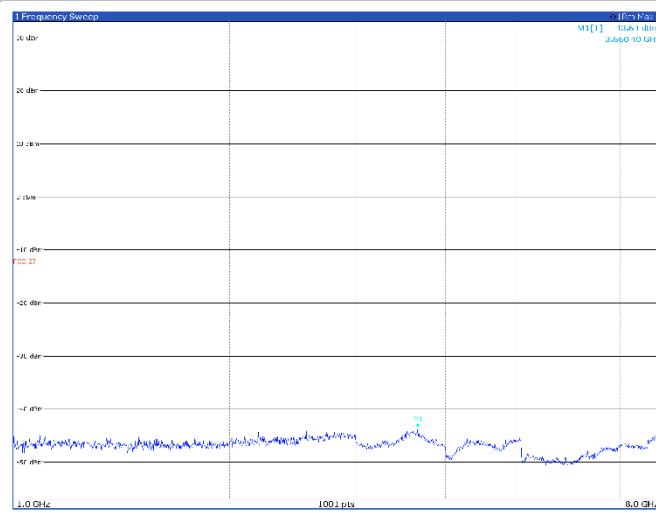
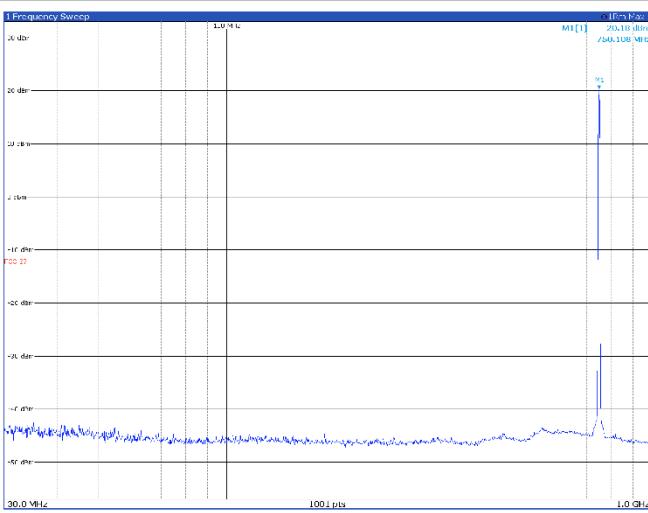
## TM1.1, 5 MHz, mid channel



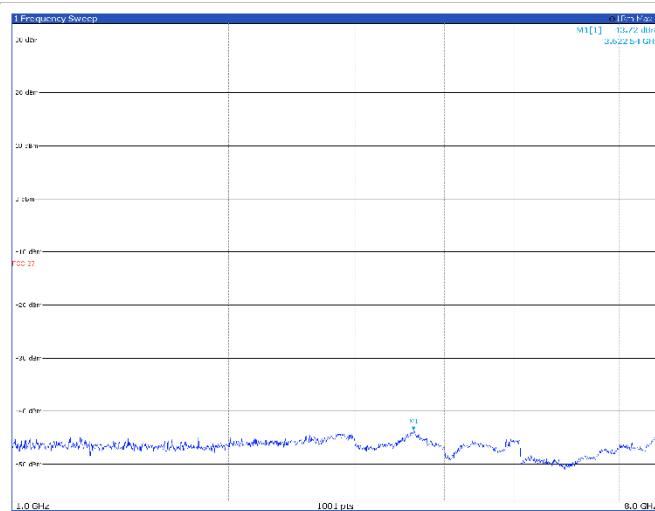
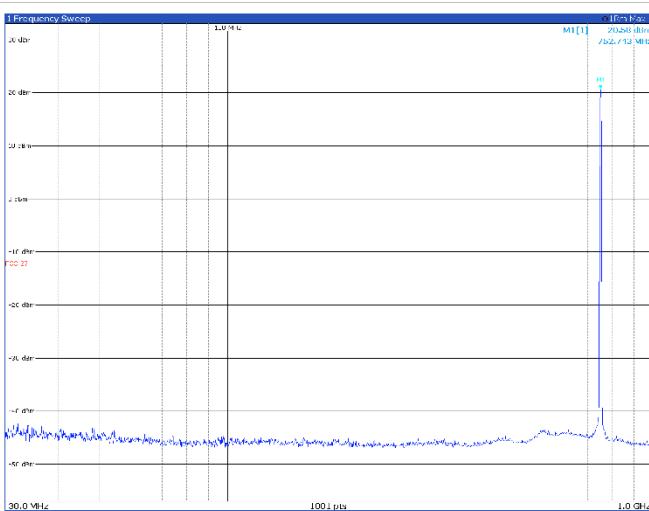
Limit exceeded by the carrier

**TM1.1, 5 MHz, high channel**


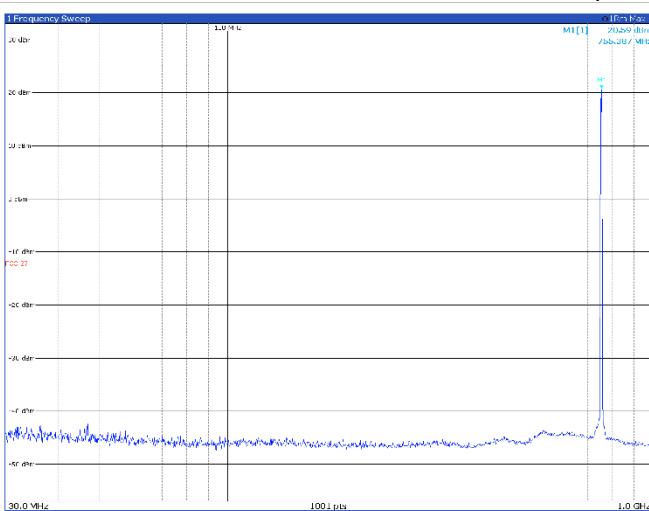
Limit exceeded by the carrier

**TM3p1, 5 MHz, low channel**


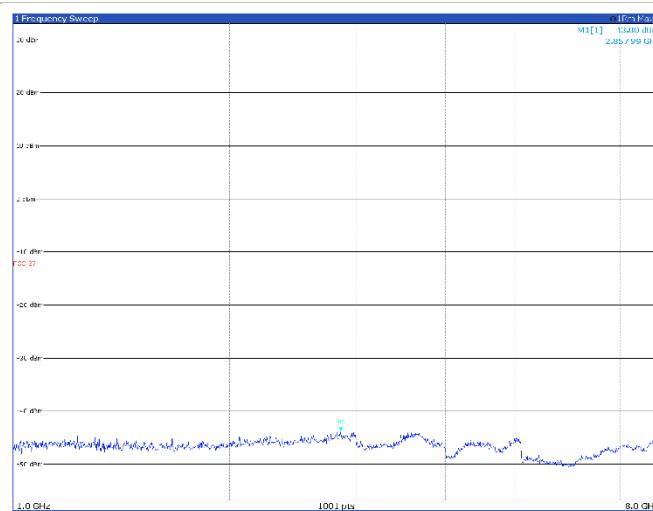
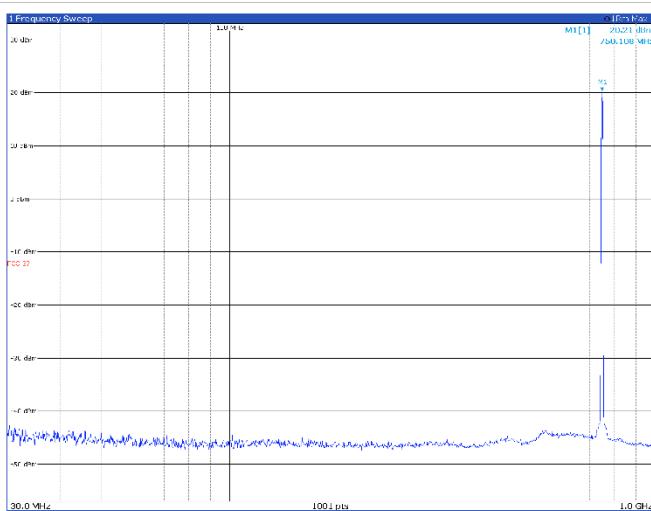
Limit exceeded by the carrier

**TM3p1, 5 MHz, mid channel**


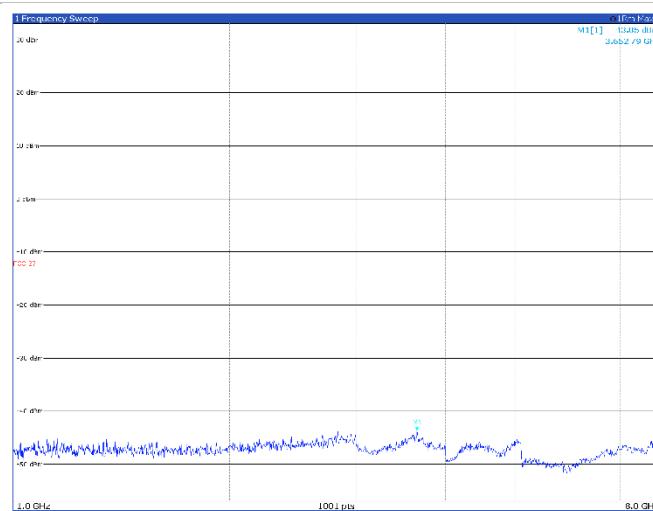
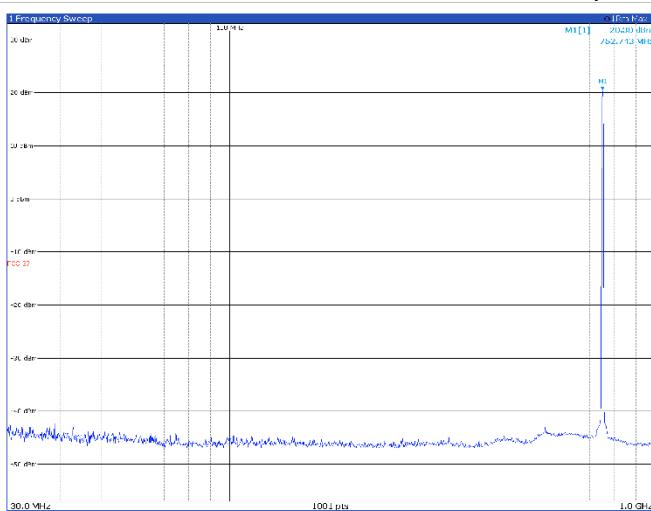
Limit exceeded by the carrier

**TM3p1, 5 MHz, high channel**


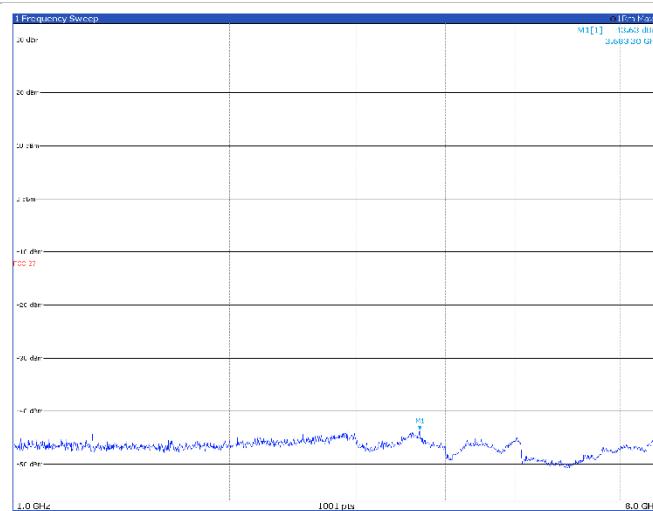
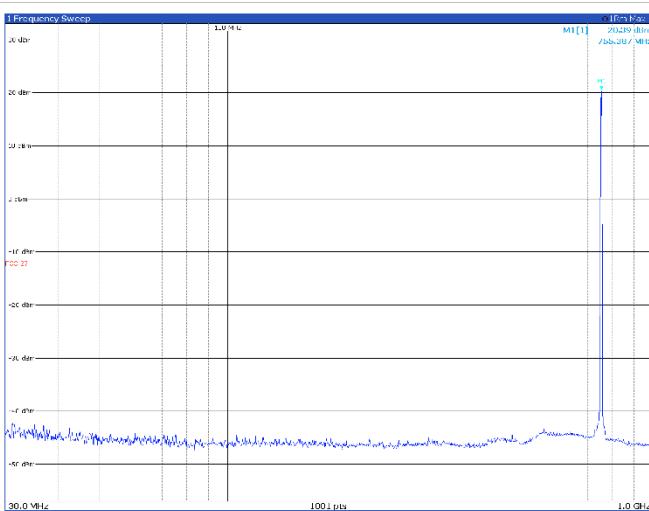
Limit exceeded by the carrier

**TM3p1a, 5 MHz, low channel**


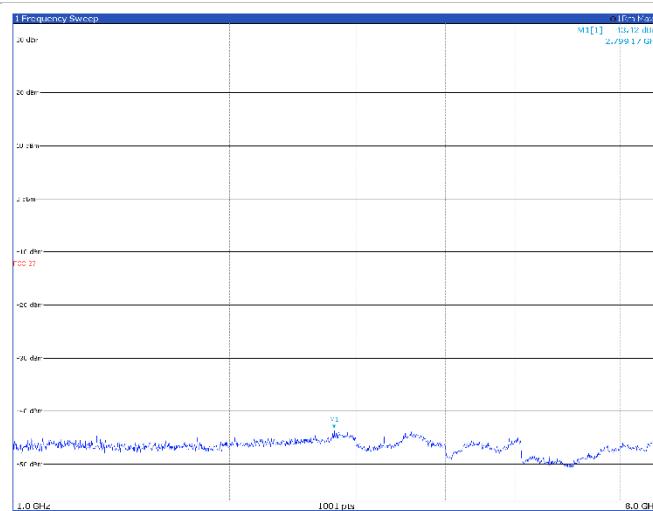
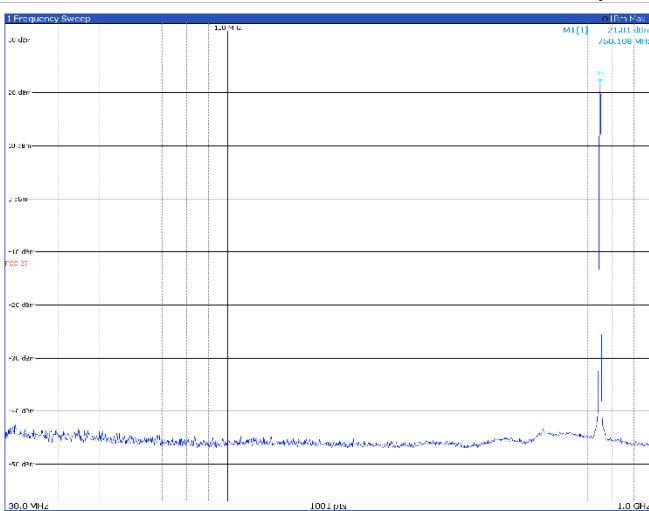
Limit exceeded by the carrier

**TM3p1a, 5 MHz, mid channel**


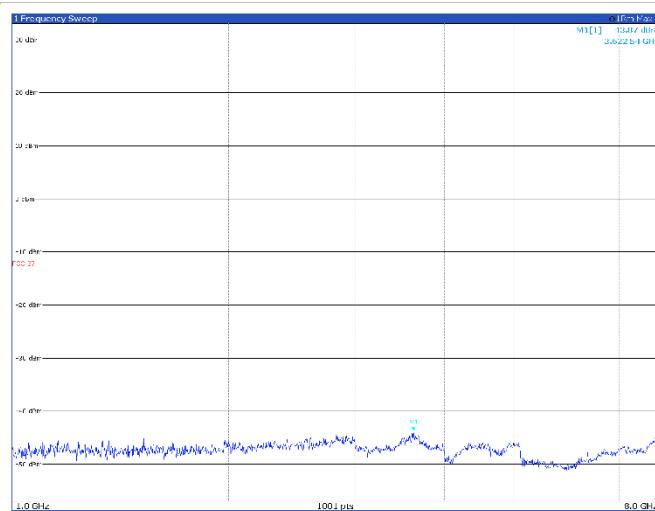
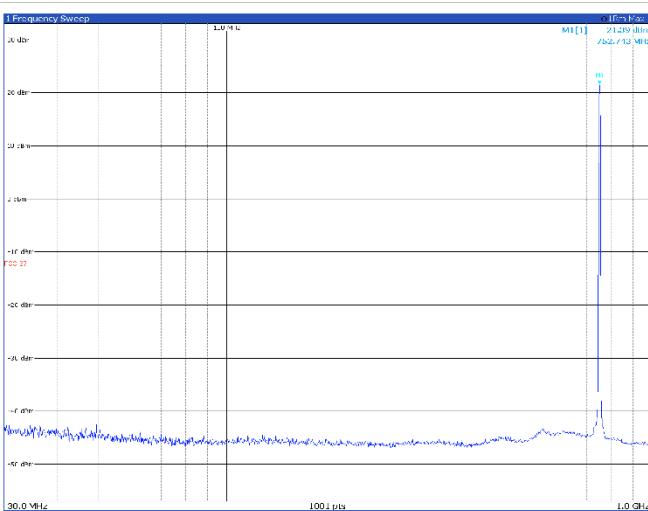
Limit exceeded by the carrier

**TM3p1a, 5 MHz, high channel**


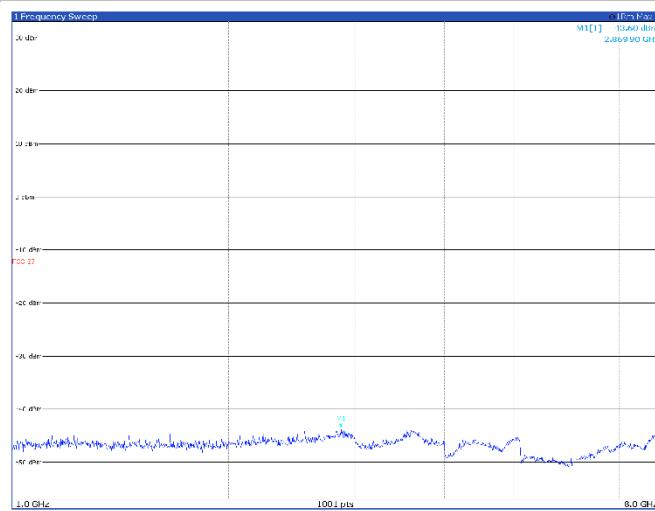
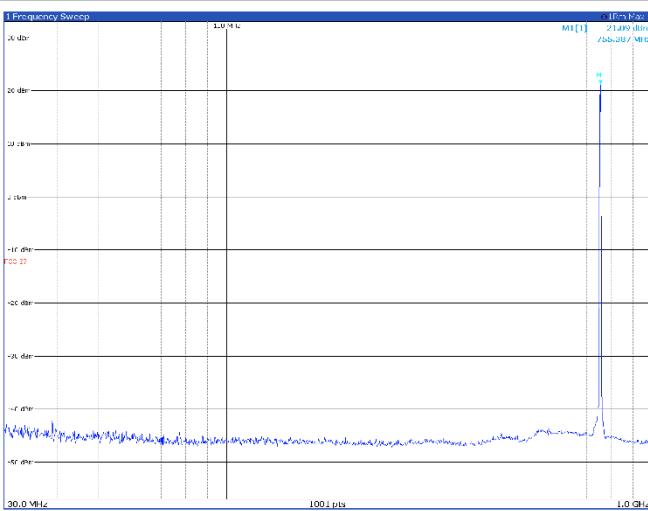
Limit exceeded by the carrier

**TM3p3, 5 MHz, low channel**


Limit exceeded by the carrier

**TM3p3, 5 MHz, mid channel**


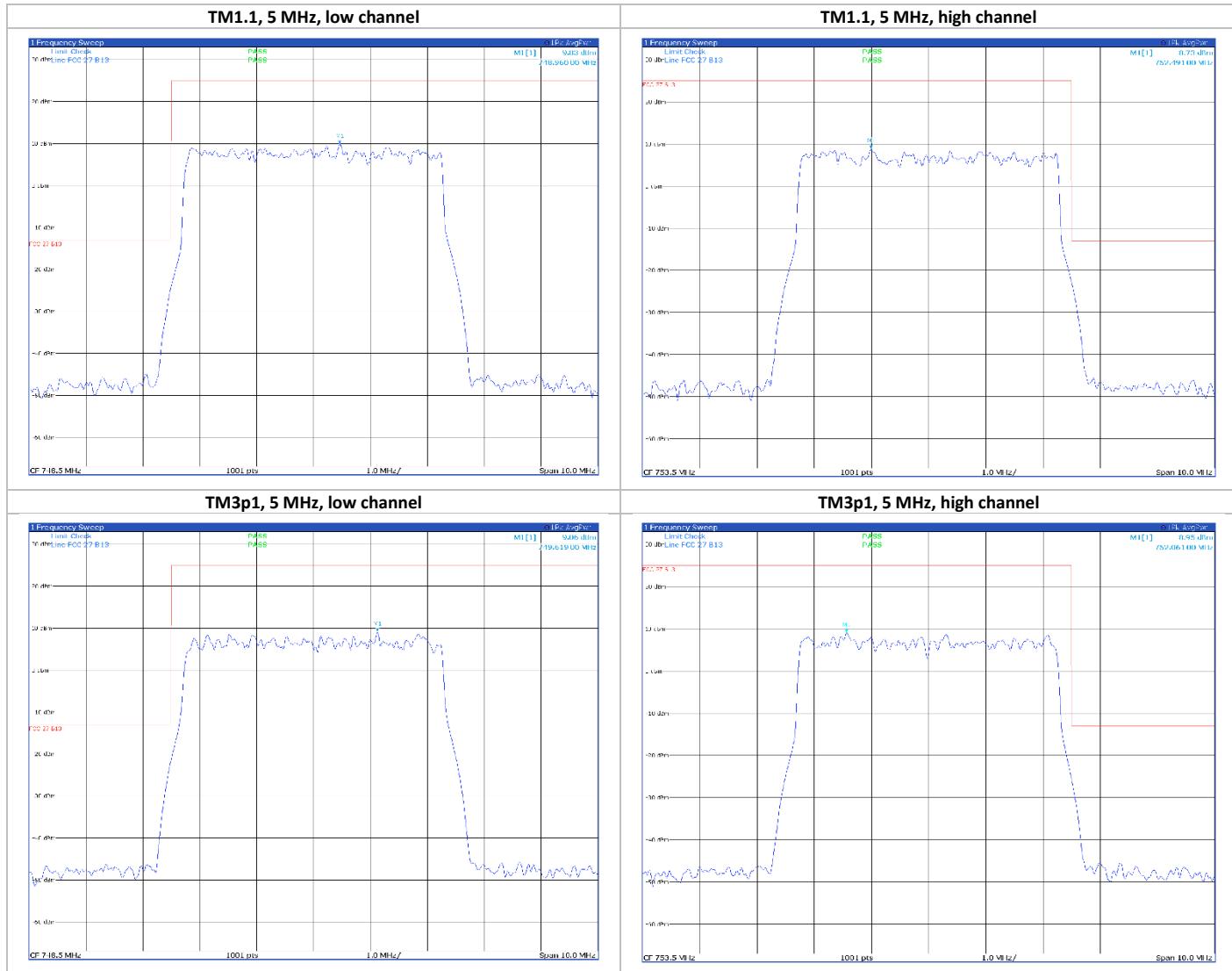
Limit exceeded by the carrier

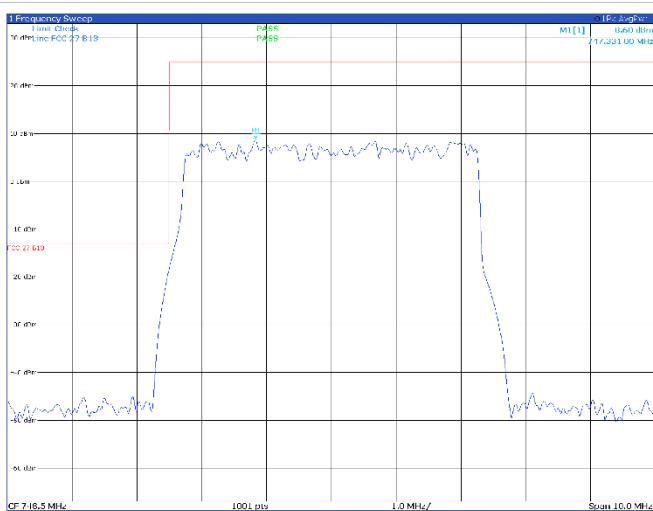
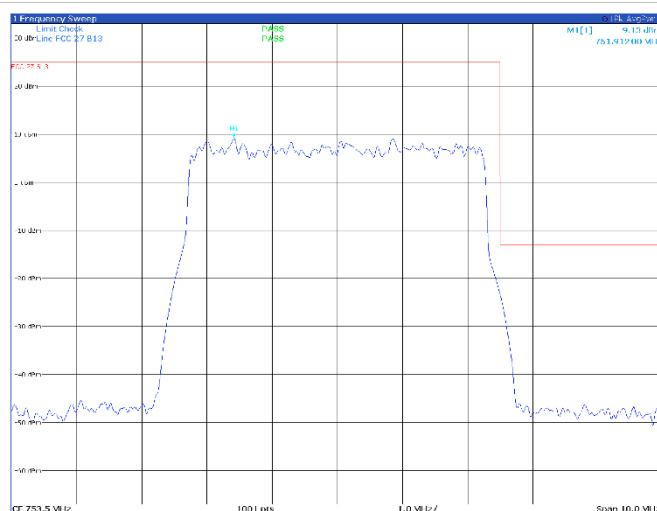
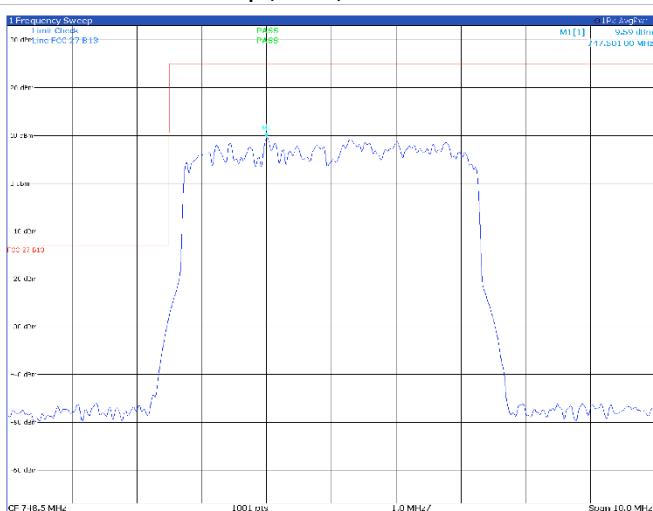
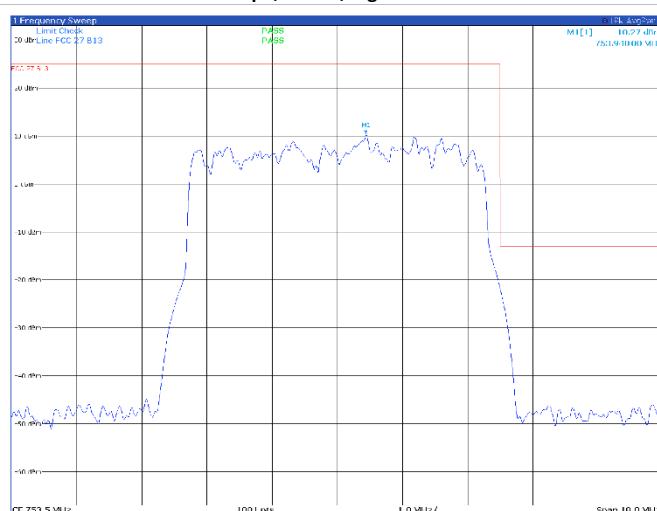
**TM3p3, 5 MHz, high channel**


Limit exceeded by the carrier

## Band B13 – band edge Antenna port 1

5 MHz



**TM3p1a, 5 MHz, low channel**

**TM3p1a, 5 MHz, high channel**

**TM3p3, 5 MHz, low channel**

**TM3p3, 5 MHz, high channel**


**Band B13 – band edge Antenna port 2**
**5 MHz**
