



11.5 Number of hopping channels

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Laboratory

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

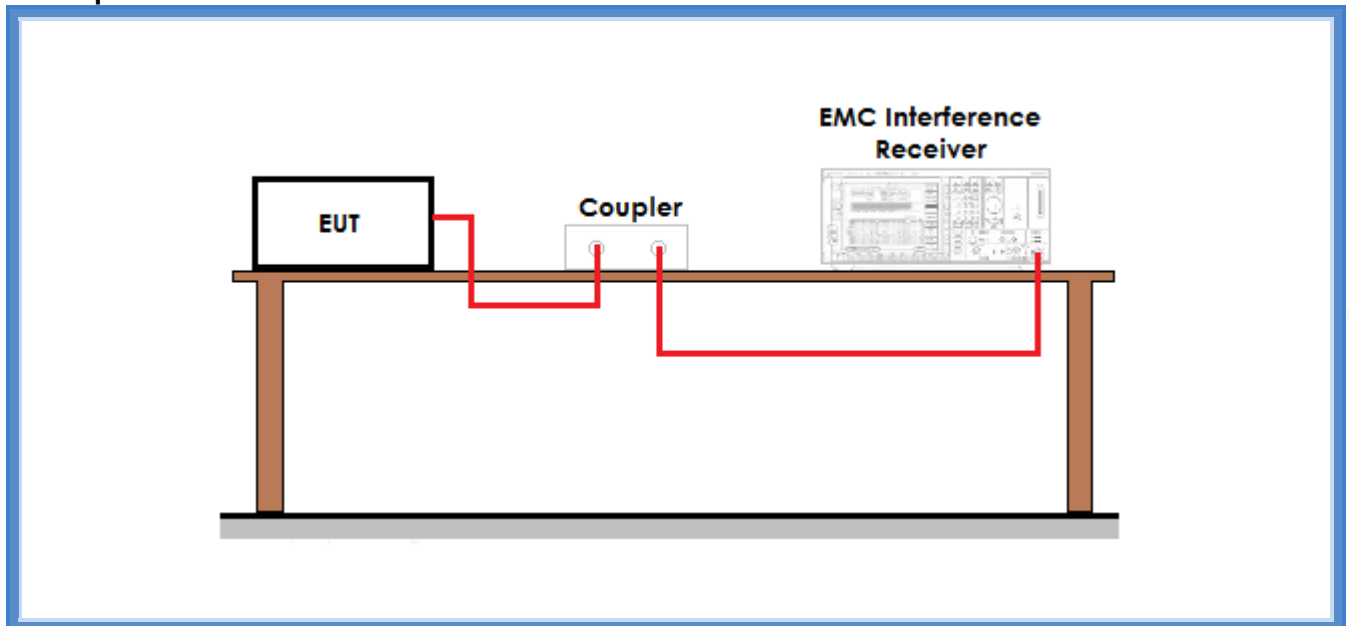
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	98	48

Acceptance limits:

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.



Setup



Result

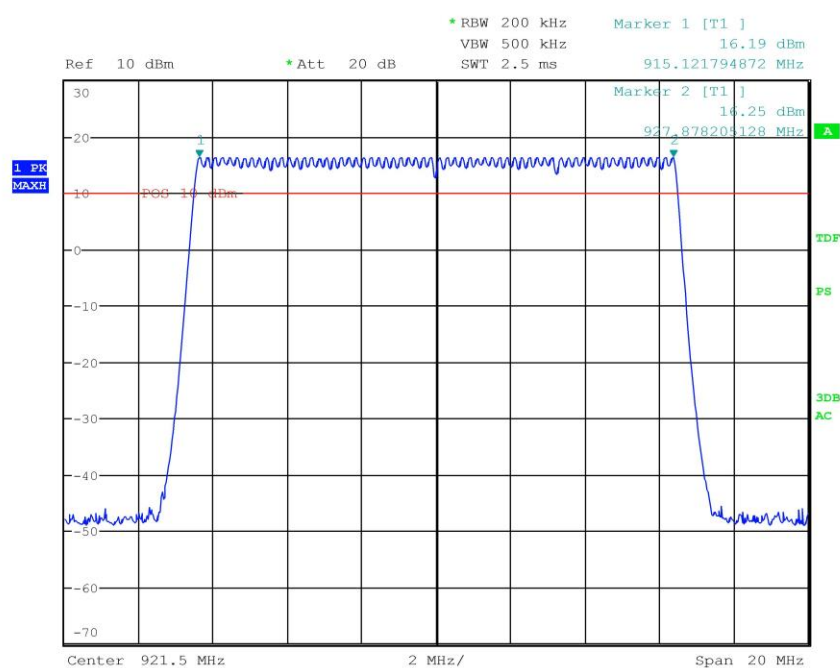
<i>Graphs</i>	<i>Number of hopping channels</i>	<i>Results</i>
G14026701	64	Complies



Graphs

G14026701

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Gandini 14026701
Test Spec



Result: The requirements are met



11.6 Time of occupancy

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Laboratory

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
21	99	48

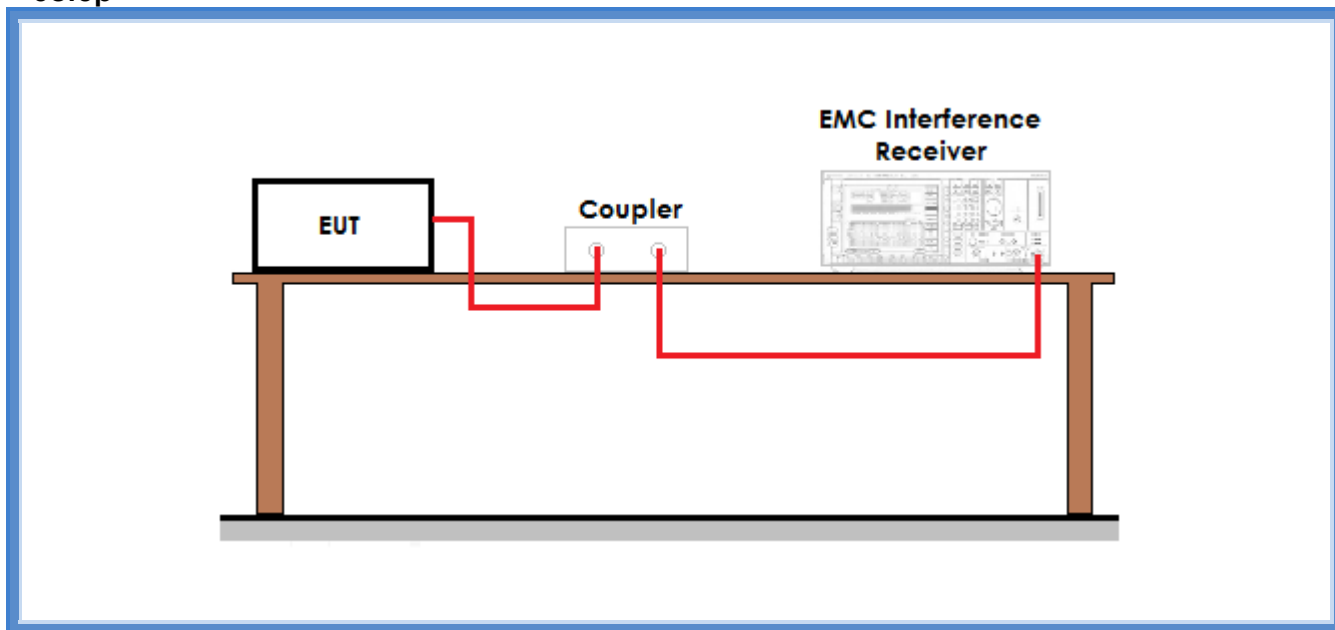
Acceptance limits:

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

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed



Setup



Result

Dwell time of transmission

Frequency (MHz)	Graphs	Dwell time (ms)
915,12	G14026708	21,1

Number of transmissions per period (20s)

Frequency (MHz)	Time between 2 transmission on different channels		Number of transmission
915,32	G14026707	50,0 ms	$20000 / 50 / 64 = 6,25$

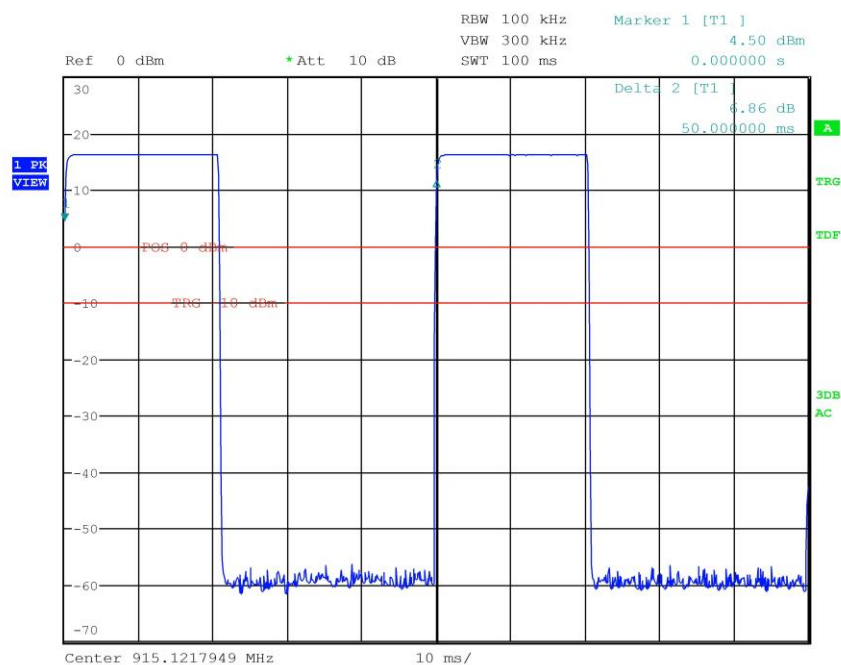
Time of occupancy (Dwell time x Nr. of transmission)	$21,1 \times 6,25 = 131,9 \text{ ms}$
--	---------------------------------------



Graphs

G14026707

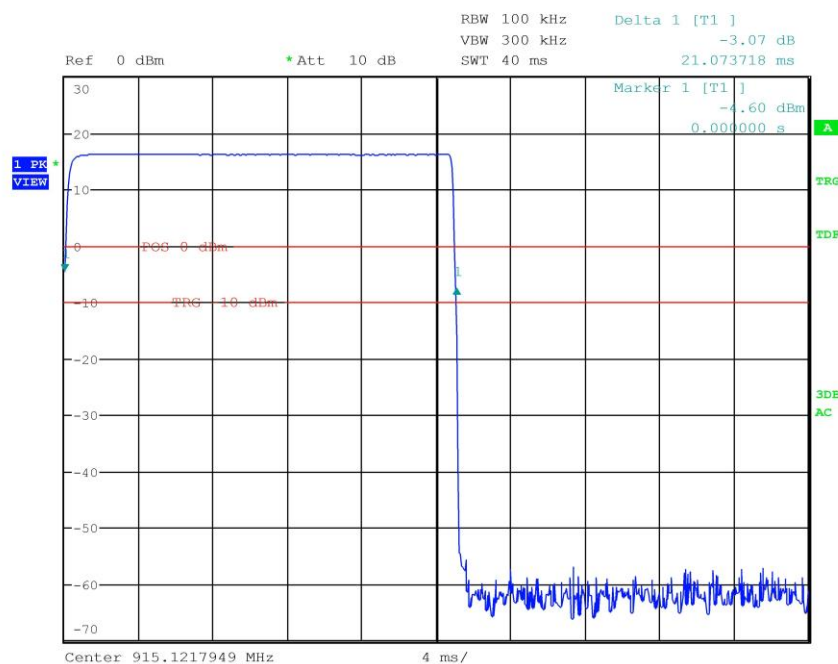
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 14026707
Test Spec





G14026708

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 14026708
Test Spec



Result: The requirements are met



11.7 Band edge

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Laboratory

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

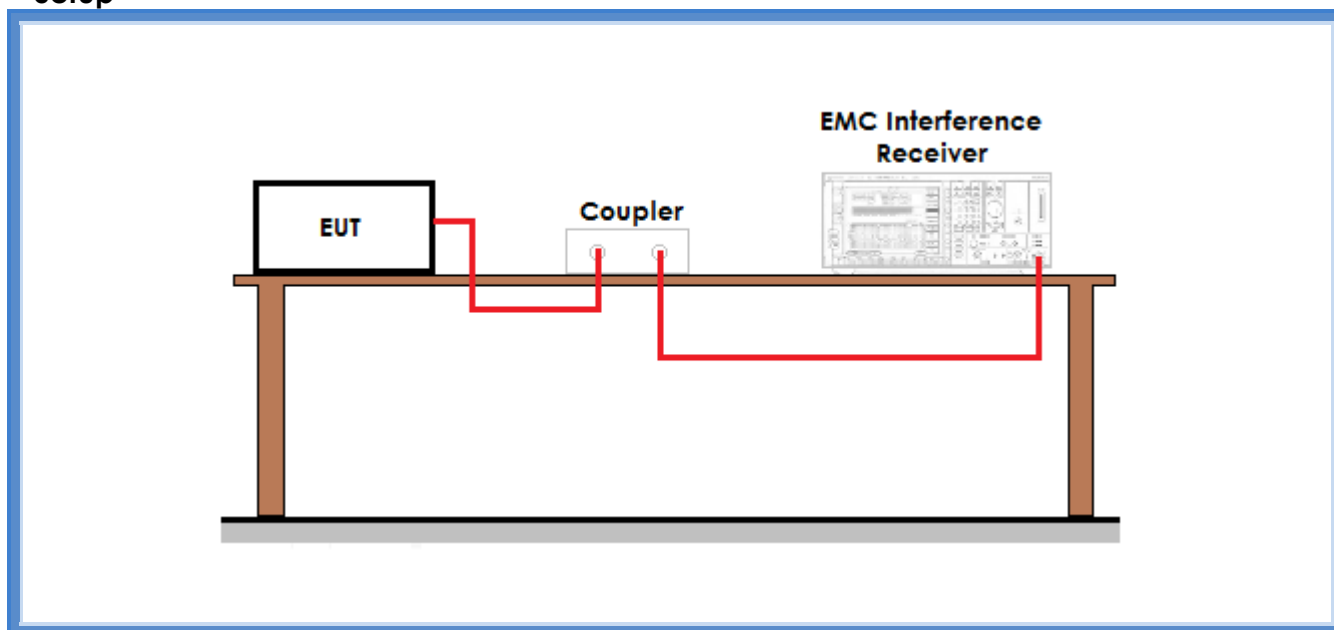
Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	98	50

Acceptance limits: operation within the band 902 – 928 MHz



Setup



Result

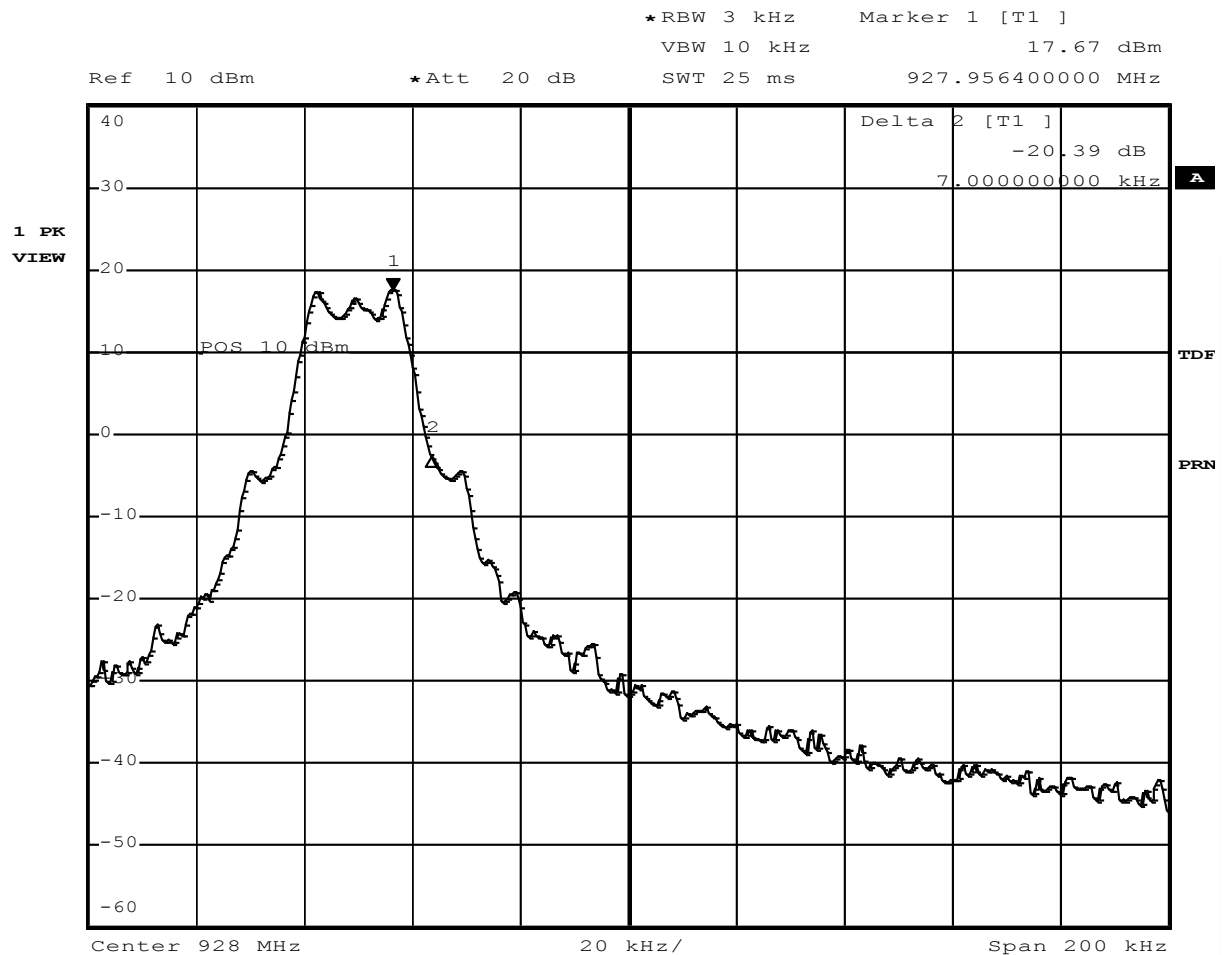
Frequency (MHz)	Graph(s) – Hopping	Results	
915,050	G14026738 G14026759	F _L : 915,0369 MHz	Complies
927,950	G14026737 G14026758	F _H : 927,9490 MHz	Complies

Frequency (MHz)	Graph(s) – No hopping	Results	
915,050	G14026725 G14026756	F _L : 915,0360 MHz	Complies
927,950	G14026722 G14026757	F _H : 927,9490 MHz	Complies



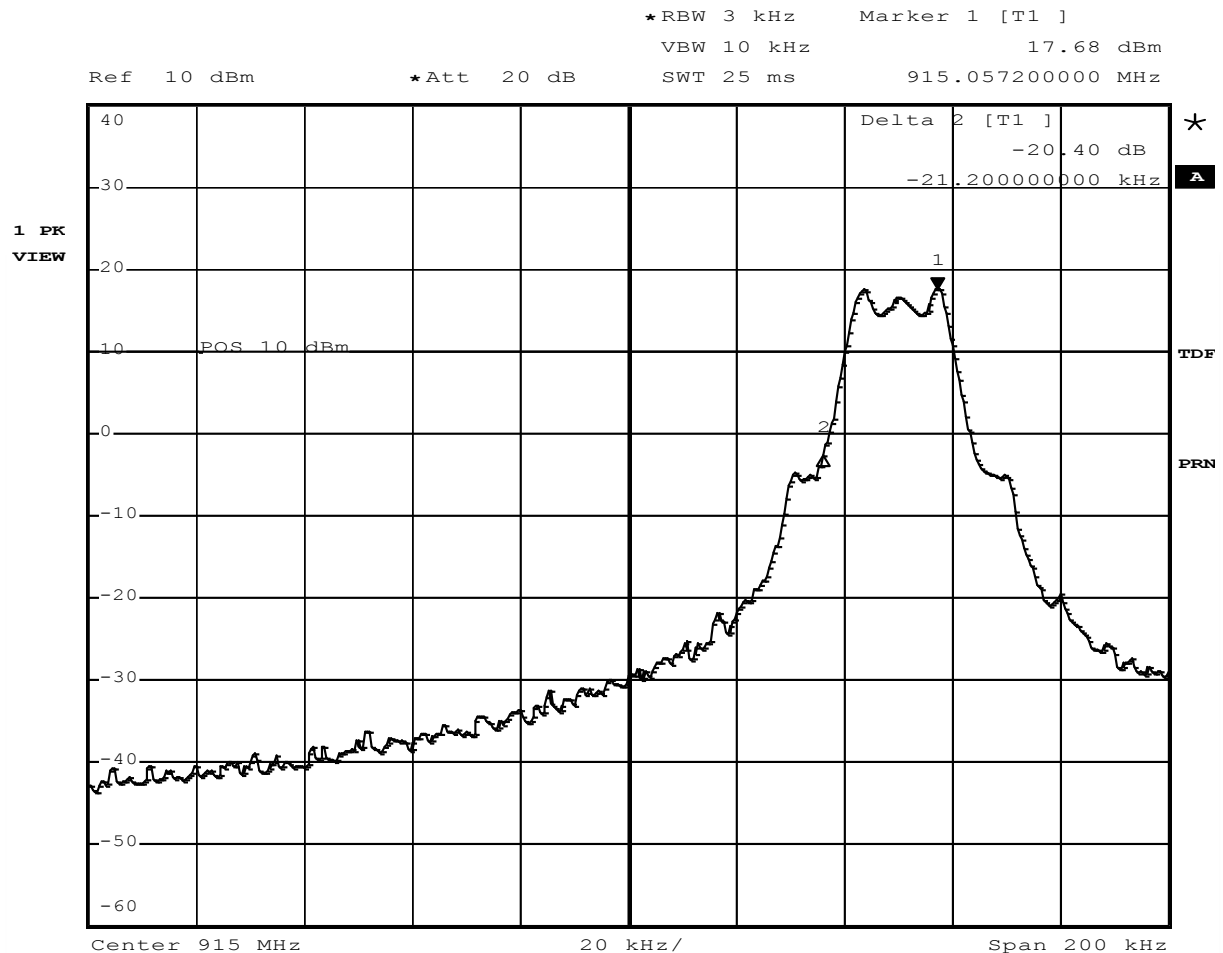
Graphs

G14026722



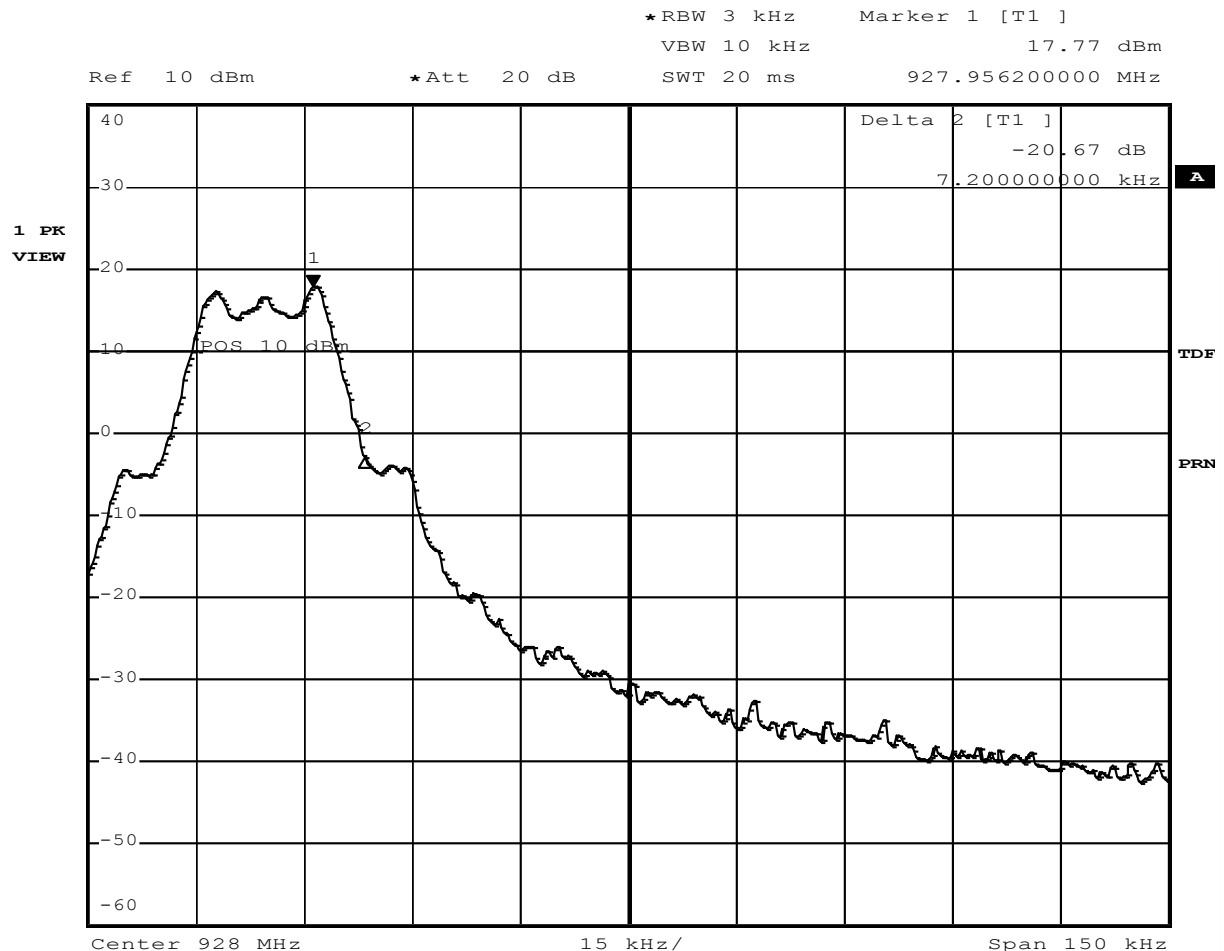


G14026725



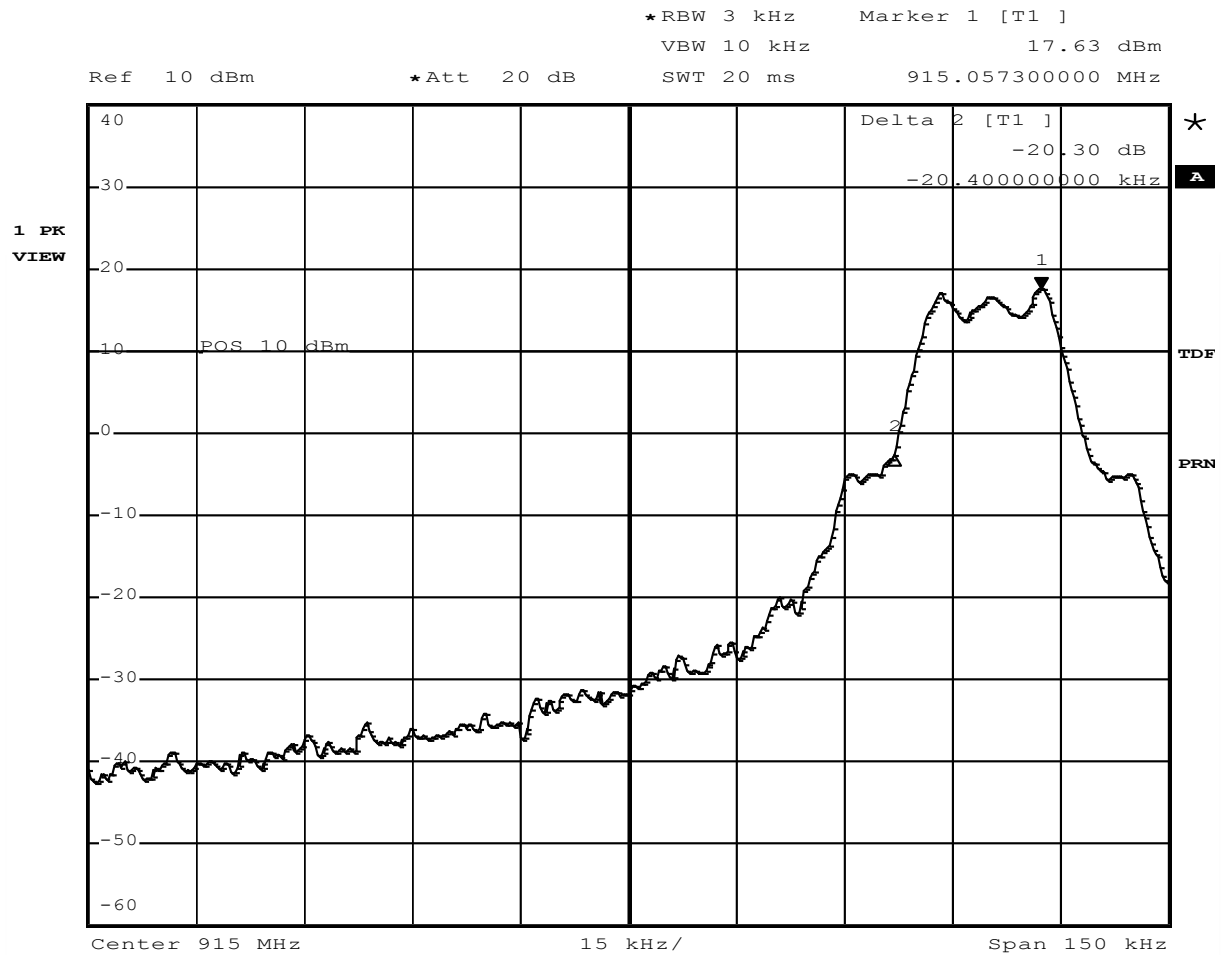


G14026737





G14026738





G14026756



*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz 15.97 dBm
SWT 2.5 ms 915.073800000 MHz

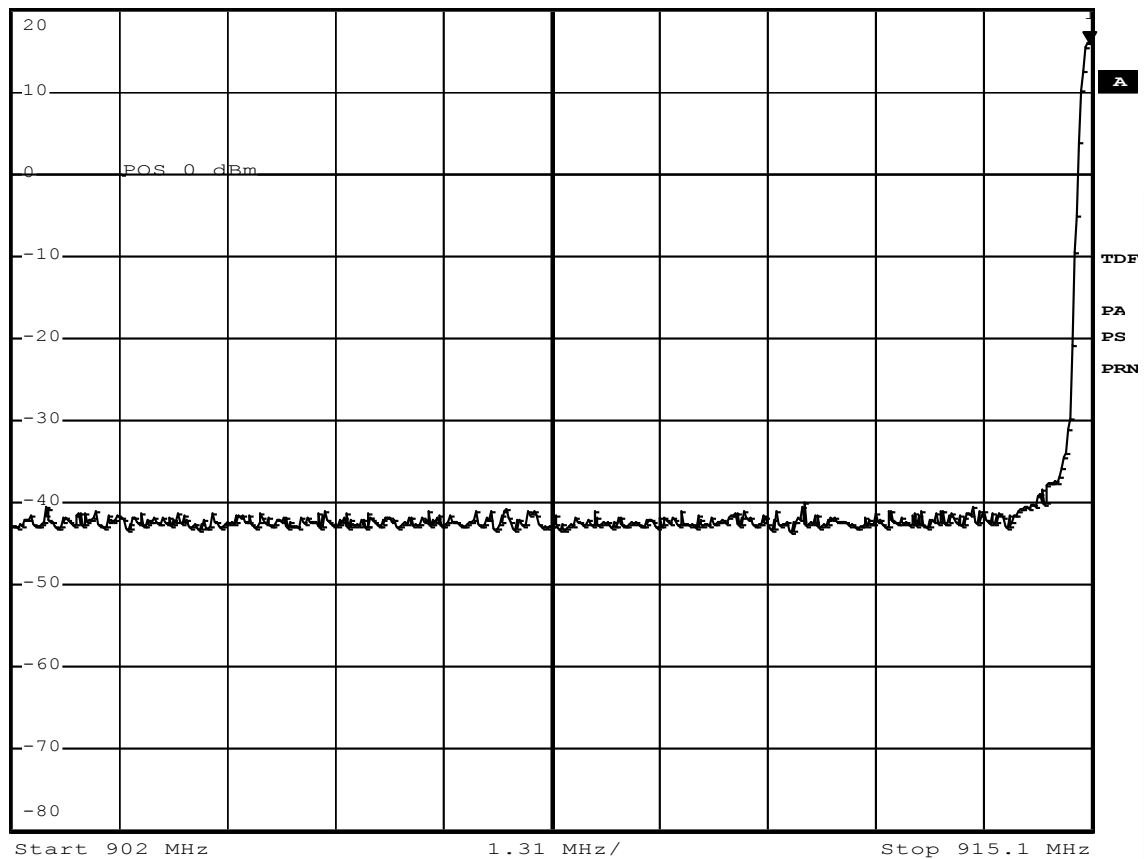
Ref 0 dBm

*Att 40 dB

SWT 2.5 ms

915.073800000 MHz

1 PK
MAXH



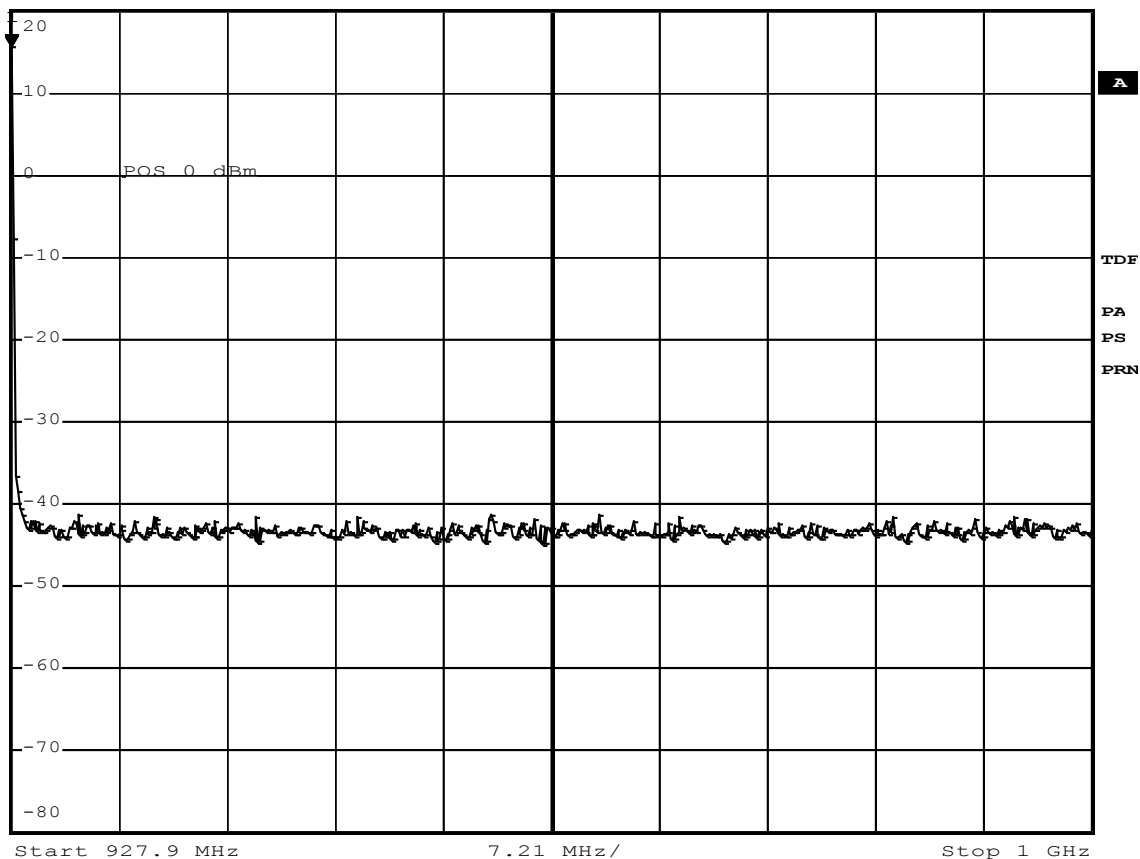


G14026757



*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz 15.80 dBm
Ref 0 dBm *Att 40 dB SWT 10 ms 927.950000000 MHz

1 PK
MAXH



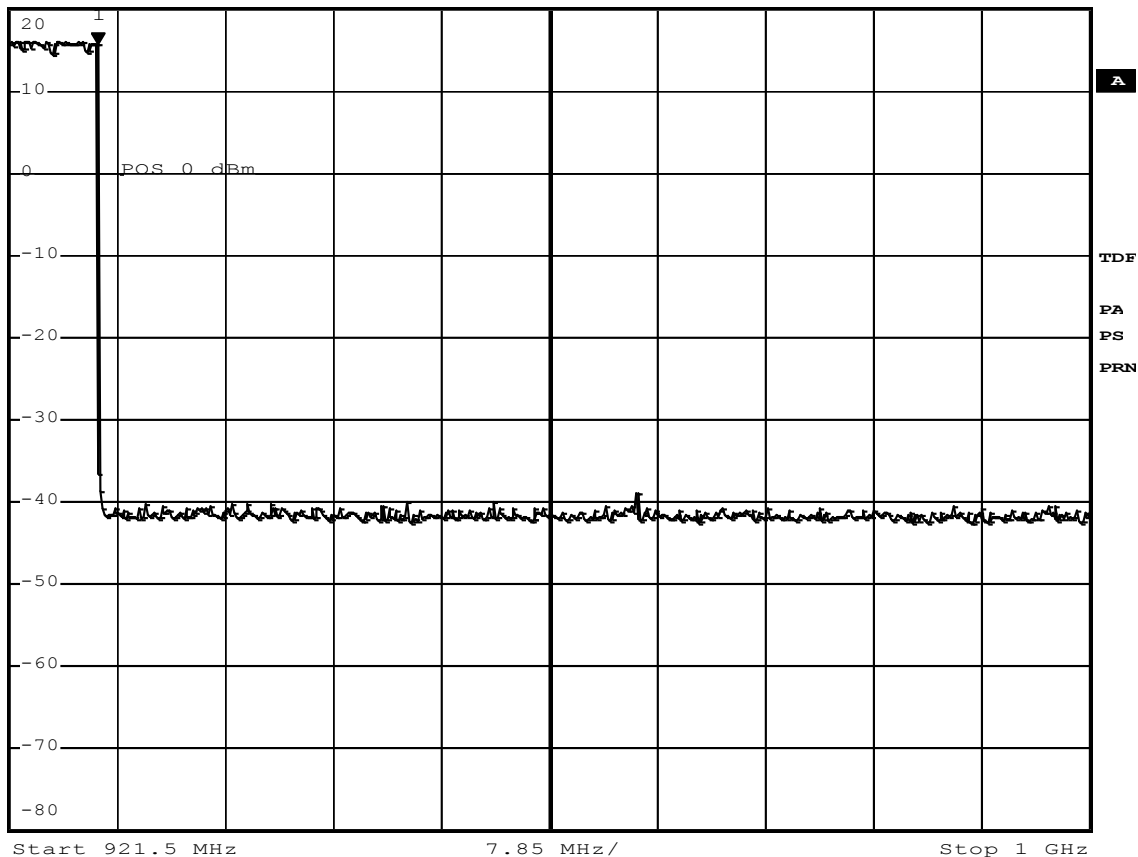


G14026758



*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz 15.78 dBm
Ref 0 dBm *Att 40 dB SWT 10 ms 927.900000000 MHz

1 PK
MAXH





G14026759

*RBW 100 kHz

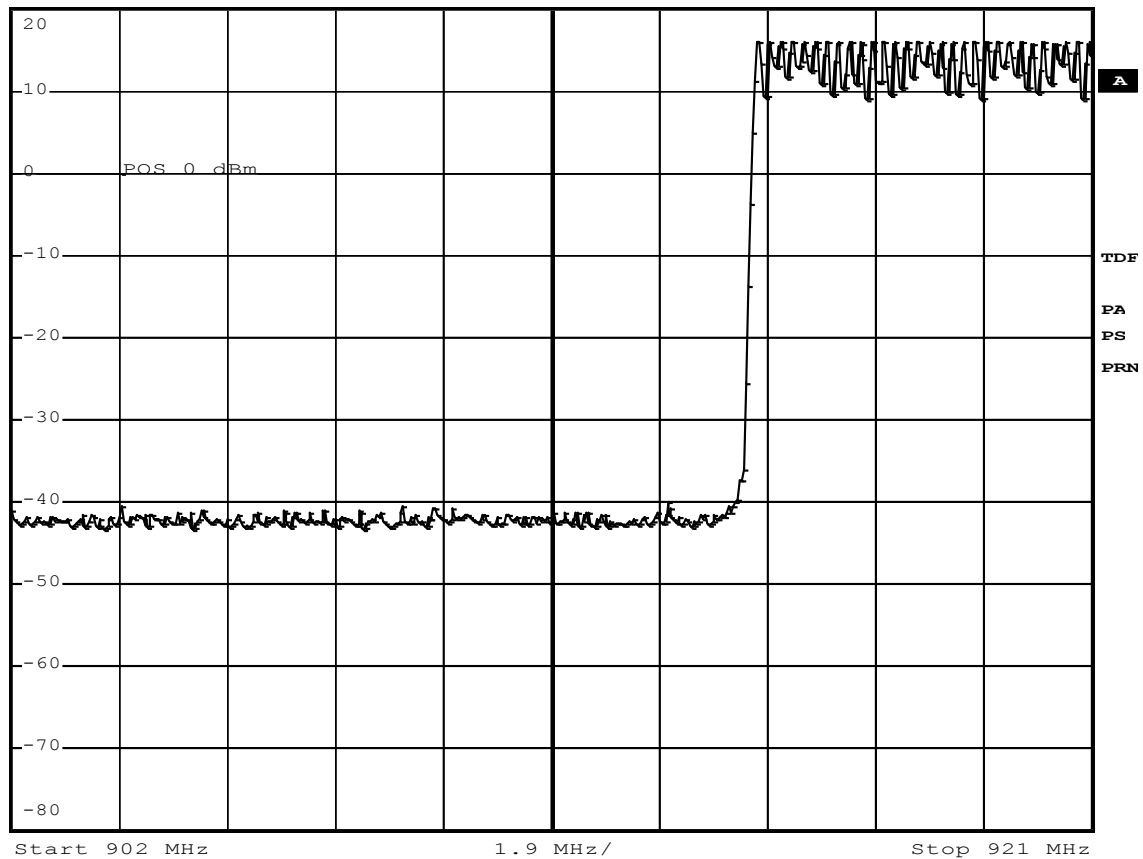
VBW 300 kHz

SWT 2.5 ms

Ref 0 dBm

*Att 40 dB

1 PK
MAXH



Result: The requirements are met



11.8 Peak Output Power – Conducted

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Antenna

Environmental conditions

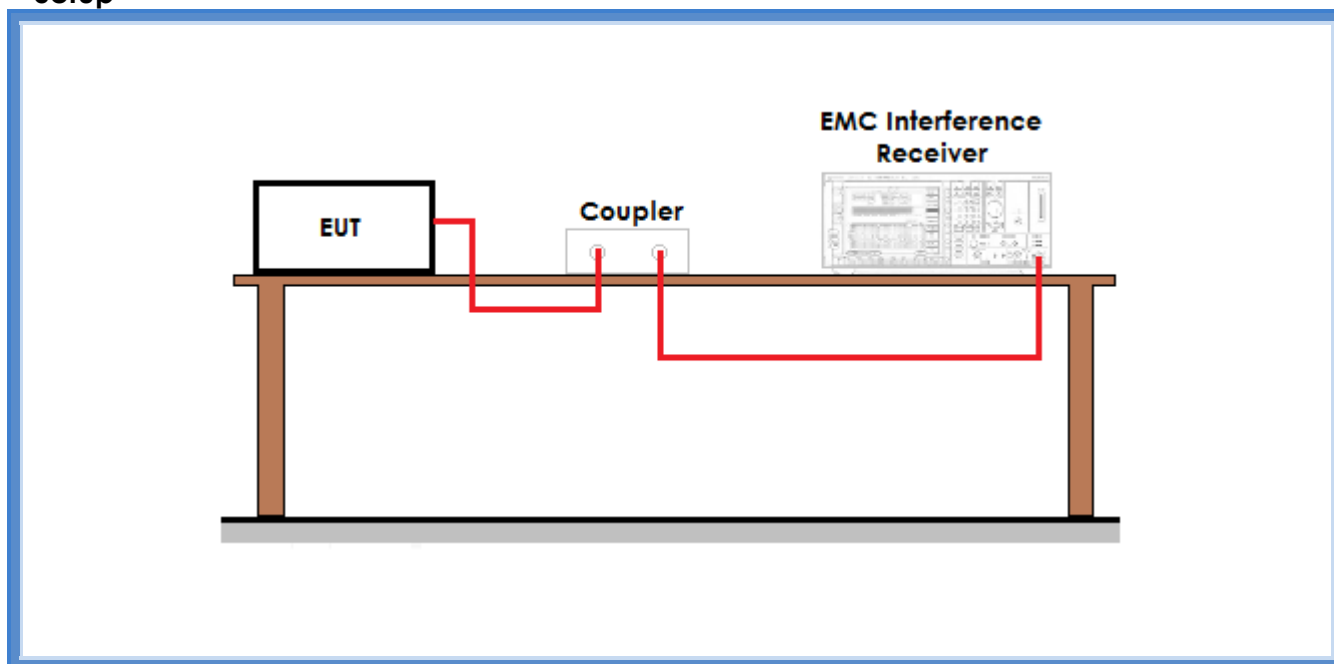
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	99	48

Acceptance limits:

For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0,25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels



Setup



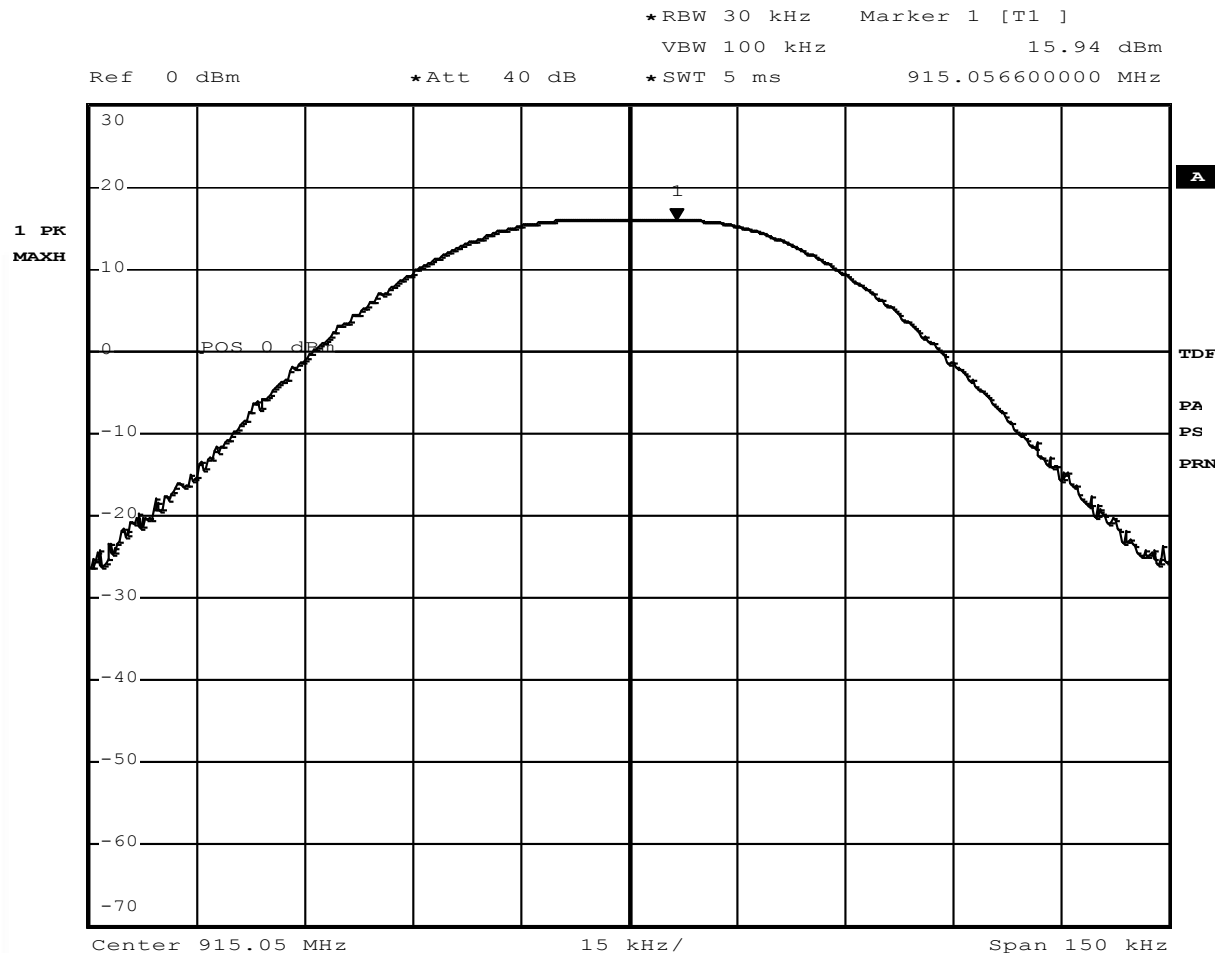
Result

Frequency (MHz)	Graphs	Measured level (dBm)	Peak Output Power (mW)	Remarks
915,050	G14026750	15,94	39,3	--
921,500	G14026752	15,84	38,4	--
927,950	G14026754	15,75	37,6	--
Remarks: --				



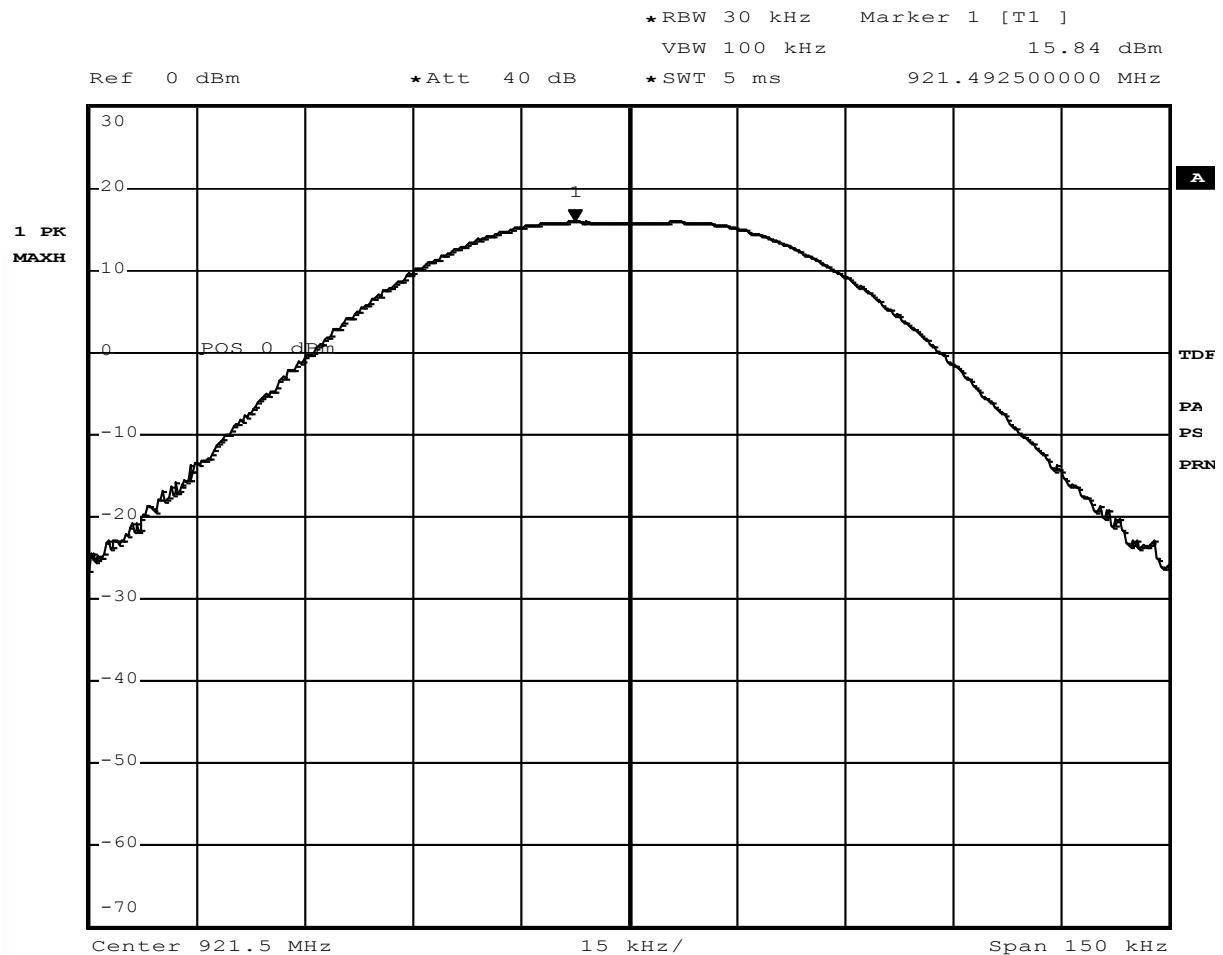
Graphs

G14026750



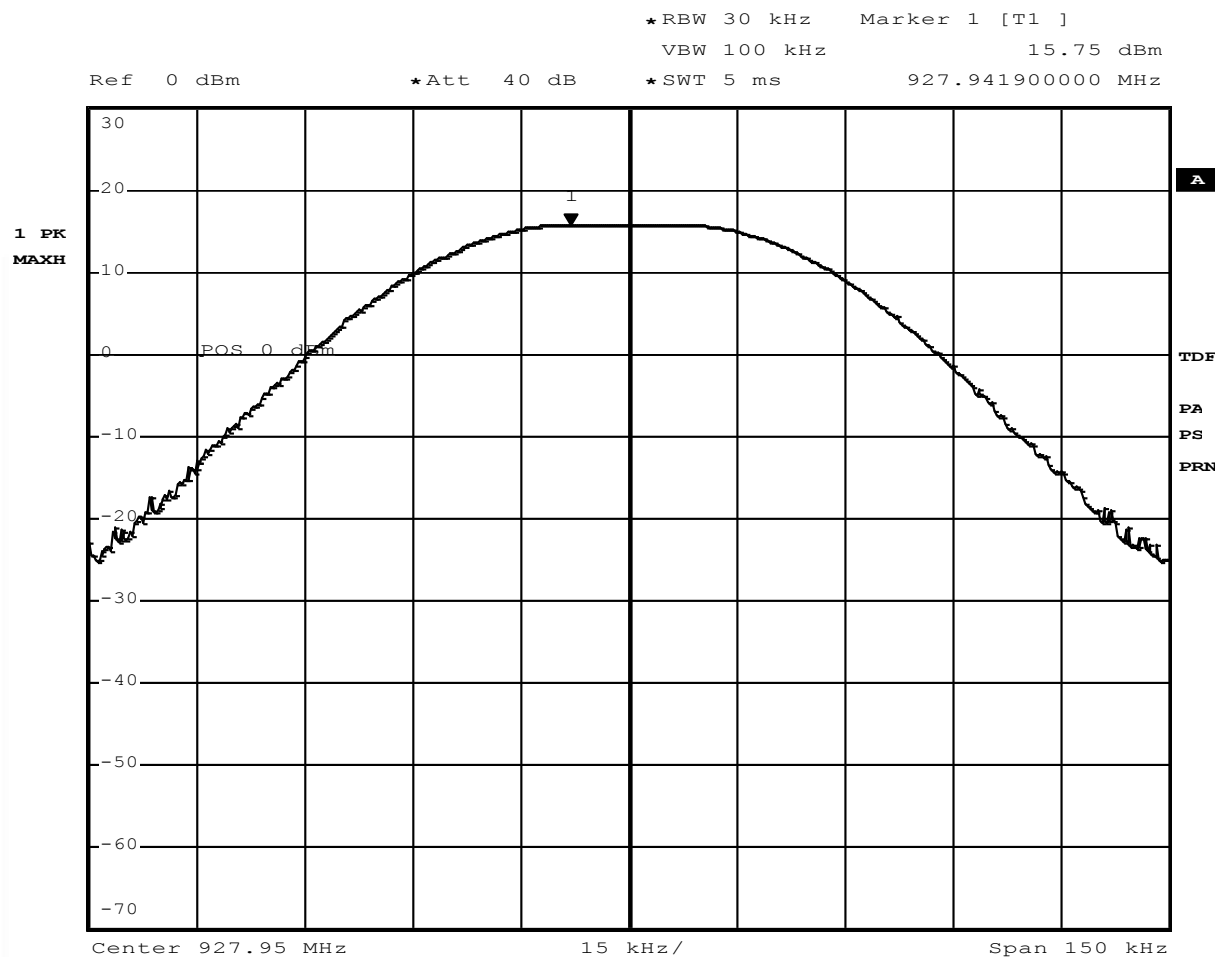


G14026752





G14026754



Result: The requirements are met



11.9 Spurious Emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- DA 00-705
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 3 m
Detector AV + Peak

Environmental conditions

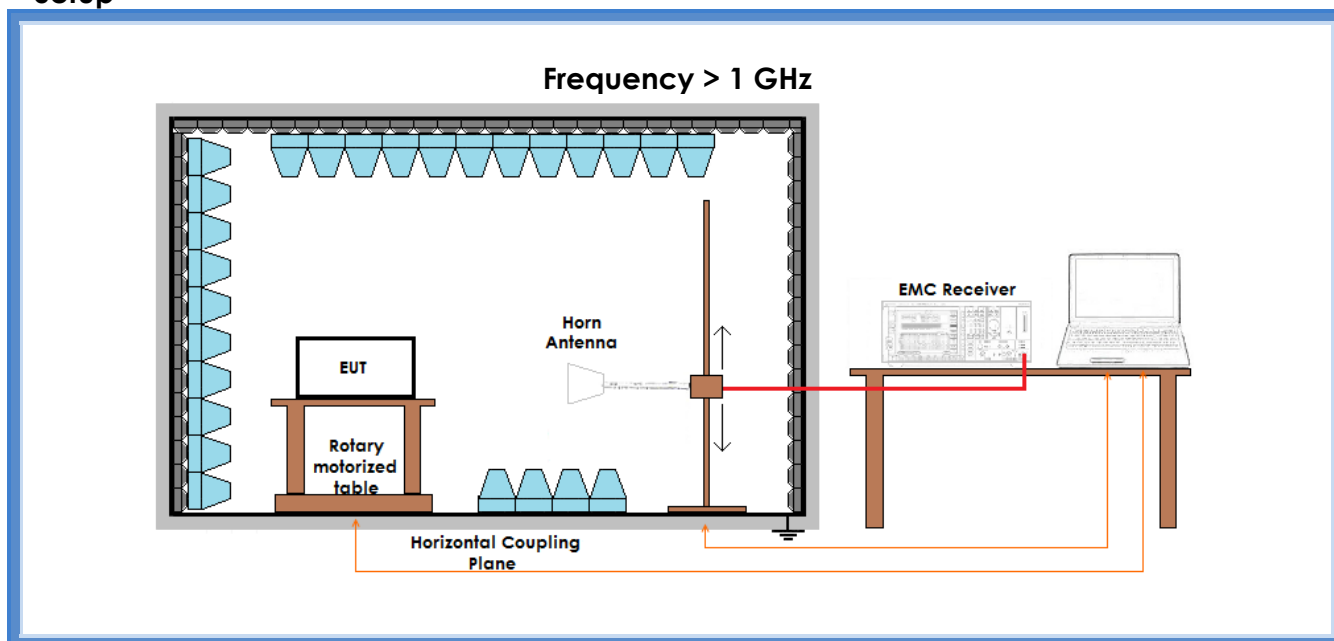
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	99	48

Acceptance limits

Frequency (MHz)	AV limits [dB(μV/m)]	Peak limits [dB(μV/m)]
> 1000	54	74



Setup



Graph:

G14026713



Result – AV detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		915,050 MHz	921,000 MHz	927,950 MHz	
II	54	52,8	52,44	51,4	Complies
III	54	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies
IV	54	52,1	42,1	44,9	Complies
V	54	More than 15dB below limit	44,0	More than 15dB below limit	Complies
VI	54	46,8	42,7	More than 15dB below limit	Complies
VII	54	43,4	37,7	46,5	Complies
VIII	54	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies
IX	54	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies
X	54	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies

Remarks:

EUT was tested in 3 orthogonal planes. The results in this table show the highest values

Result – Peak detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		915,050 MHz	921,000 MHz	927,950 MHz	
II	74	53,4	53,0	52,1	Complies
III	74	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies
IV	74	54,4	48,1	49,3	Complies
V	74	More than 15dB below limit	49,3	More than 15dB below limit	Complies
VI	74	50,7	50,2	More than 15dB below limit	Complies
VII	74	50,9	47,3	51,4	Complies
VIII	74	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies
IX	74	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies
X	74	More than 15dB below limit	More than 15dB below limit	More than 15dB below limit	Complies

Remarks:

EUT was tested in 3 orthogonal planes. The results in this table show the highest values

Result: The requirements are met



11.10 Maximum permissible exposure

Test set-up and execution

- FCC Rules and Regulation;
Titles 47 Part 1.1310
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Laboratory

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Antenna

Acceptance limits	$902/1500 \text{ mW/cm}^2 = 0,60 \text{ mW/cm}^2 \text{ max at 20cm of distance}$
-------------------	---

Result

Power Density Limit (mW/cm ²)	Output Power (mW)	Antenna Gain (G)	Power Density at 20cm (mW/cm ²)	Remarks
0,60	39,3	1,58 (2 dBi)	0,012	Measured
Remarks: Power Density = $(P \times G) / (4\pi R^2)$				

Result: The requirements are met