TEST REPORT

Report number	:	**KR21190531A**
Issue date	:	**2019/06/13**

Applicant	:	Spacosa Corporation 11-41, Simin-daero 327beon-gil, Anyang-si, Gyeonggi-do, Republic of Korea Tel. 82-31-360-3655 Fax. -
Model name	:	Gper-G100
Serial number	:	N/A
Test procedure	:	Radio equipment according to Certification Ordinance Article 2 Section 1 No. 19
Date of test	:	2019/06/01 ~ 2019/06/12
Name of facility	:	KRL Co., Ltd.

The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of KRL Co.,Ltd.

Tested by : Moo-Hong, Kim

Approved by : Kyu-Hyun, LEE

Antenna Information

Antenna Type	*Chip Antenna*
Antenna Gain	*5.19 dBi*
Frequency Range	*(2 400 ~ 2 500) MHz*
Model no.	*LA31H2450-A35*
Manufacturer	*JIA XING GLEAD ELECTRONICS CO., LTD*

Summary of Test Results

Test report No.	Description	Result
1	Frequency Tolerance	Pass
2	Occupied Bandwidth	Pass
3	Spurious emission intensity	Pass
4	Antenna Power	Pass
5	Spread-spectrum Bandwidth	NA
6	Secondary radiated emission	Pass
7	Dwell Time	NA
8	Interference Prevention Function	Pass

Measurement equipment list

USE	Equipment	Company	Model No.	Serial No.	Calibrated by	Cal. Method	Cal. Due	Cal. Date
X	FREQUENCY COUNTER	EIP	28B	9205-00369	KTICC	ハ(c)	Oct. 2019	Oct. 18, 2018
	SPECTRUM ANALYZER	ROHDE&SCHWARZ	FSP	100665	KTICC	ハ(c)	Nov. 2019	Nov. 13, 2018
X	Auto Range DC Power Supply	ITECH	IT6721	600104011 726910097	BCS	ハ(c)	Nov. 2019	Nov. 26, 2018
	AC POWER SUPPLY	DAELIM	D-45	KRL-002	KTICC	ハ(c)	Aug. 2019	Aug. 9, 2018
	TEMP & HUMI. CHAMBER	HITACHI	EC-25MHHPS	U5539026	KTICC	ハ(c)	Oct. 2019	Oct. 12, 2018
X	SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ26	100044	KTICC	ハ(c)	Jan. 2020	Jan. 10, 2019
X	USB Average Power Sensor	KEYSIGHT	U2004A	MY53340013	BCS	ハ(c)	Oct. 2019	Oct. 18, 2018
	POWER DIVIDER	HP	11636A	03871	BCS	ハ(c)	Jan. 2020	Jan. 11, 2019
	STEP ATTENUATOR	AEROFLEX	AF9010-60-31	12987	BCS	ハ(c)	Jan. 2020	Jan. 11, 2019
	WIDEBAND RADIO COMMUNICATION TEST	ROHDE&SCHWARZ	CMW500	104194	BCS	ハ(c)	Jul. 2019	Jul. 26, 2018
	FIXED ATTENUATOR	XMA CORP	4882-6140-10	KRL-010	KTICC	ハ(c)	Oct. 2019	Oct. 18, 2018

Note1: The calibration of measurement equipment is valid for one year period.

Note2: "X" used equipment.

Note3: Cal.Method …

a) : Calibration conducted by the National Institute of Information and Communications Technology(NICT)(hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)

c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)

d) : Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

Specified Radio Equipment Test Report

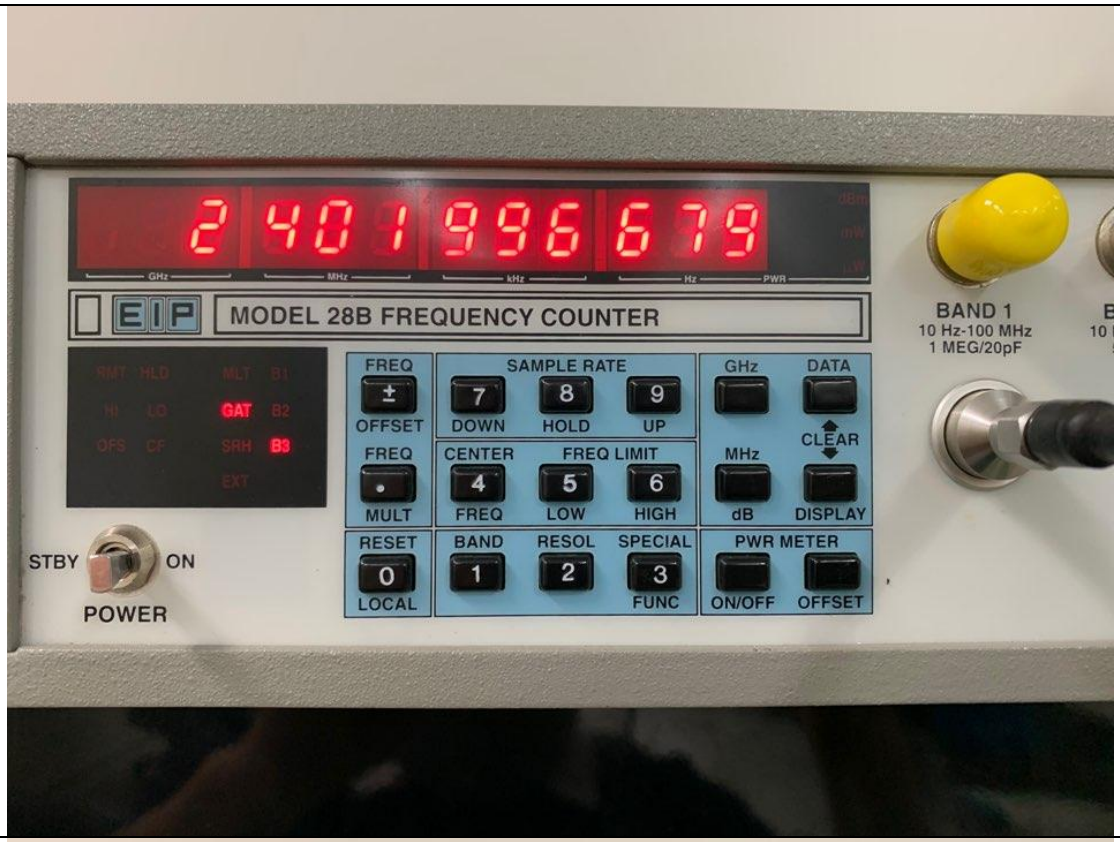
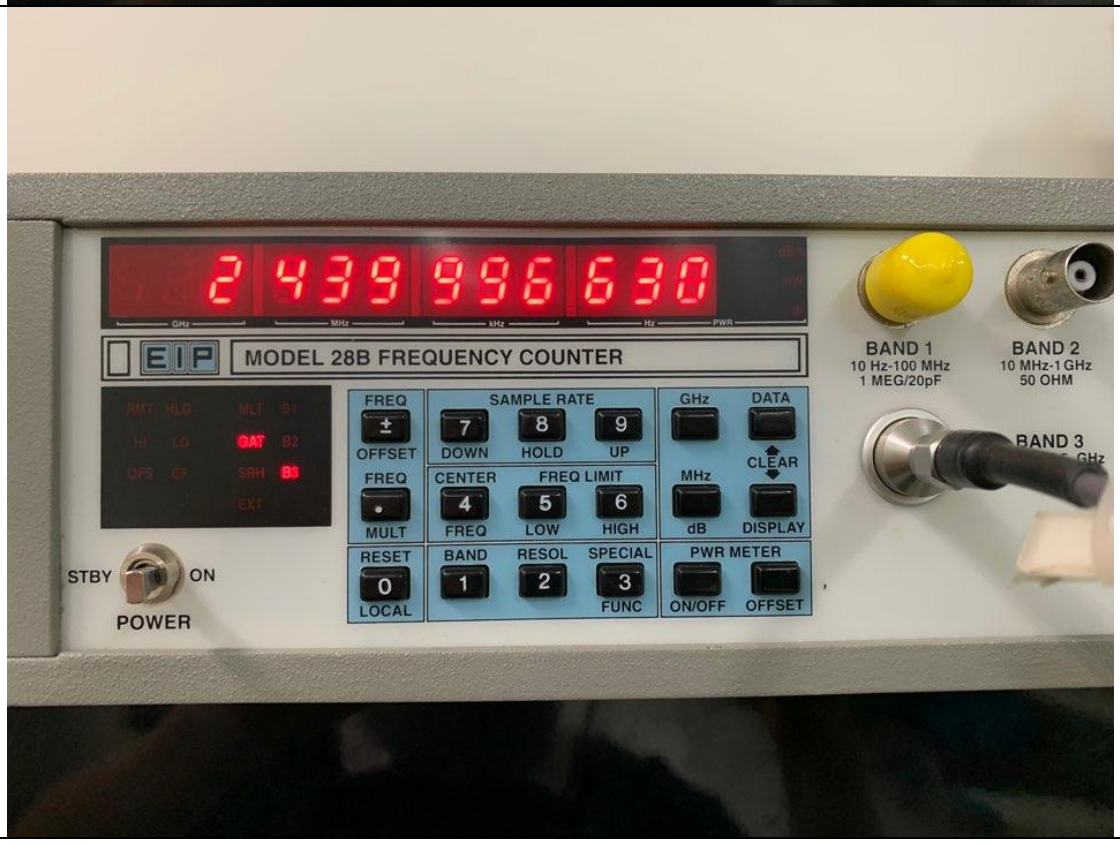
Test Date : 2019-06-01 ~ 2019-06-12

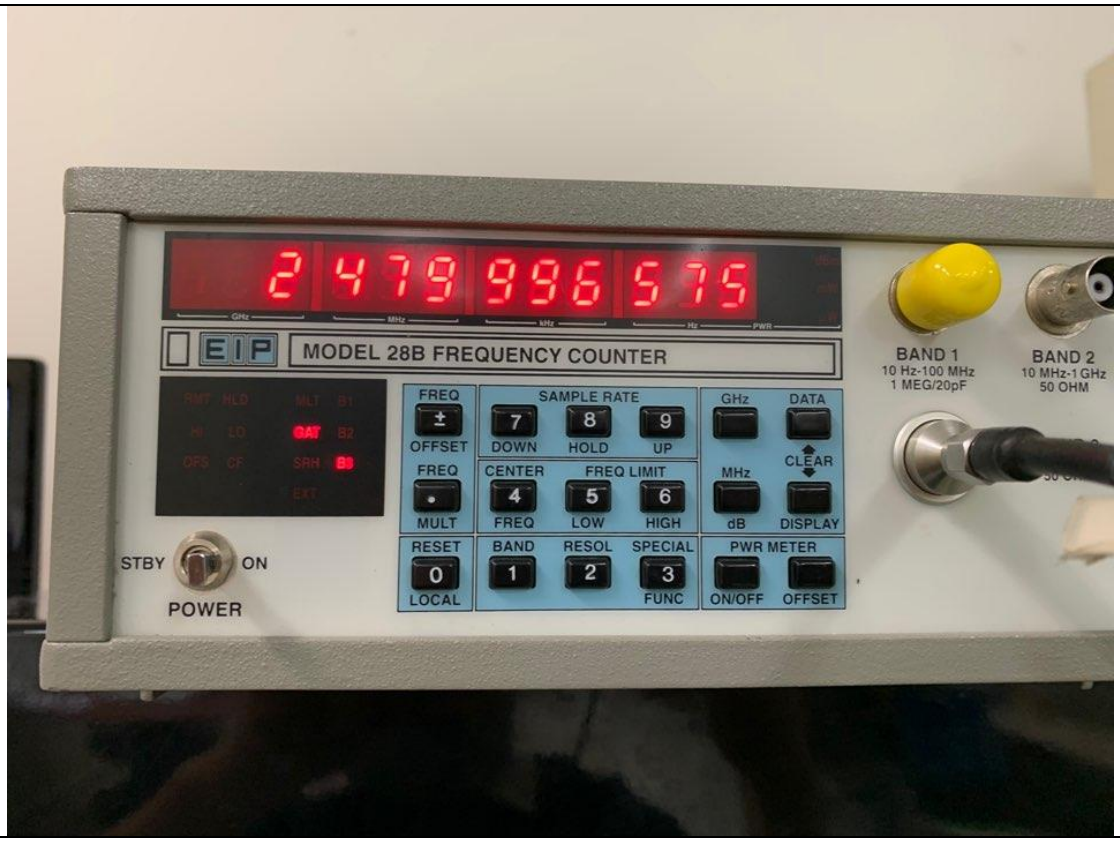
Class: Article 2 Paragraph 1 Item 19			Frequency :	(2 402 ~ 2 480) MHz	
Rated Power (mW) :	1	mW	Antenna Gain :	5.19	dBi
Rated Power (dBm) :	0.00	dBm	E.I.R.P :	5.19	dBm
Emission Designator : F1D					
Model Name : Gper-G100			Test Location :	RF TEST ROOM	
Serial No. : N/A			Temp / Humid.	26℃ / 43%	
Type of Emission : BLE			Tested By :	MooHong Kim	

No.	Test Items	Test ch	Test Frequency MHz	Test Result			Unit	Technical Regulations
				Voltage				
				DC 3.7 V				
1	Frequency Tolerance	0	2402.0	2401.996679			MHz	50 PPM or less
				-1.383			PPM	
		19	2440.0	2439.996630			MHz	
				-1.381			PPM	
		39	2480.0	2479.996575			MHz	
				-1.381			PPM	
2	Occupied Bandwidth	0	2402.0	1.394			MHz	26MHz or less
		19	2440.0	1.939			MHz	
		39	2480.0	2.228			MHz	
3	Spurious Emission Intensity	0	2402__(1)	-35.36			dBm	(1) Below 2387 MHz : -26dBm (2) 2387 to 2400 MHz : -16dBm (3) 2483.5 to 2496.5 MHz : -16dBm (4) Over 2496.5 MHz : -26dBm
			2402__(2)	-23.79			dBm	
			2402__(3)	-62.00			dBm	
			2402__(4)	-46.11			dBm	
		19	2440__(1)	-57.38			dBm	
			2440__(2)	-56.97			dBm	
			2440__(3)	-61.17			dBm	
			2440__(4)	-44.13			dBm	
		39	2480__(1)	-57.27			dBm	
			2480__(2)	-56.71			dBm	
			2480__(3)	-35.91			dBm	
			2480__(4)	-44.55			dBm	
4	Antenna Power	0	2402.0	0.000630			W	0.01W or less Error＋20%-80%
				-37.00			%	
		19	2440.0	0.000706			W	
				-29.40			%	
		39	2480.0	0.000650			W	
				-35.00			%	
5	Spread-spectrum Bandwidth	0	2402.0				kHz	500kHz or more
		19	2440.0				kHz	
		39	2480.0				kHz	
6	Secondary Radiated Emissions	0	2402__(1)	-71.41			dBm	(1) Below 1 GHz : -54dBm (2) 1 GHz or higher : -47dBm
			2402__(2)	-55.38			dBm	
		19	2440__(1)	-67.76			dBm	
			2440__(2)	-56.29			dBm	
		39	2480__(1)	-79.23			dBm	
			2480__(2)	-57.74			dBm	
7	Dwell Time	0	2402.0				Sec	less than 0.4sec
		19	2440.0				Sec	
		39	2480.0				Sec	
8	Interference Prevention Function	0	ID Code	**MAC Address : CA-7B-98-F5-B9-CC**			-	Carrier Sense is not required
		19					-	
		39					-	

The input voltage to receiver RF circuit varies below ± 1% as the input voltage from the external power supply to the receiver varies ± 10%(excluding power supply). The voltage regulator IC model is LN1134A332MR.

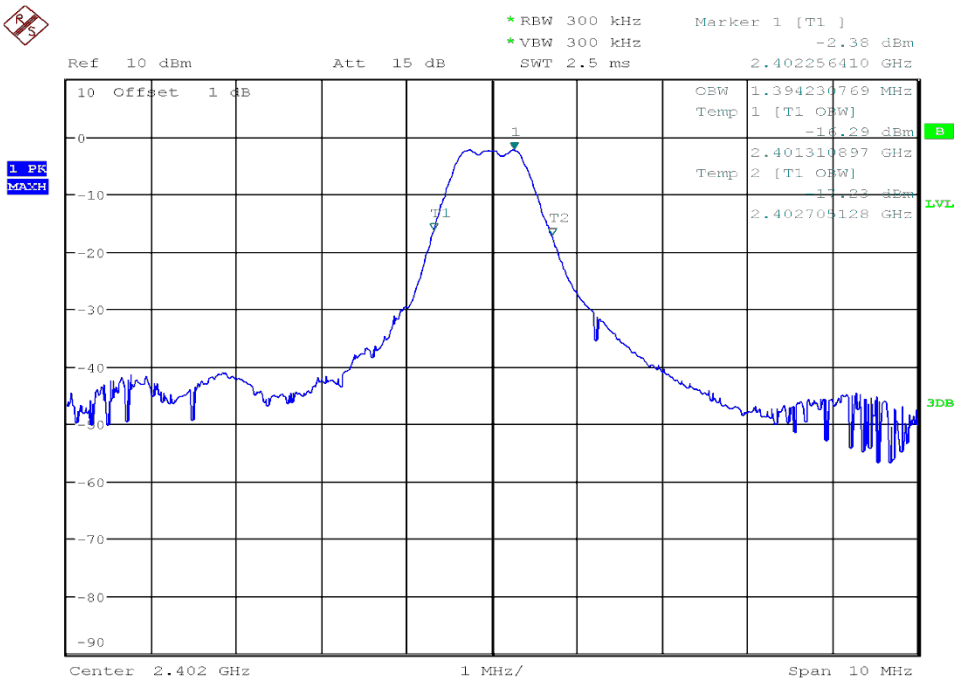
BLE Test Result

Frequency error	
LOW	
MID	

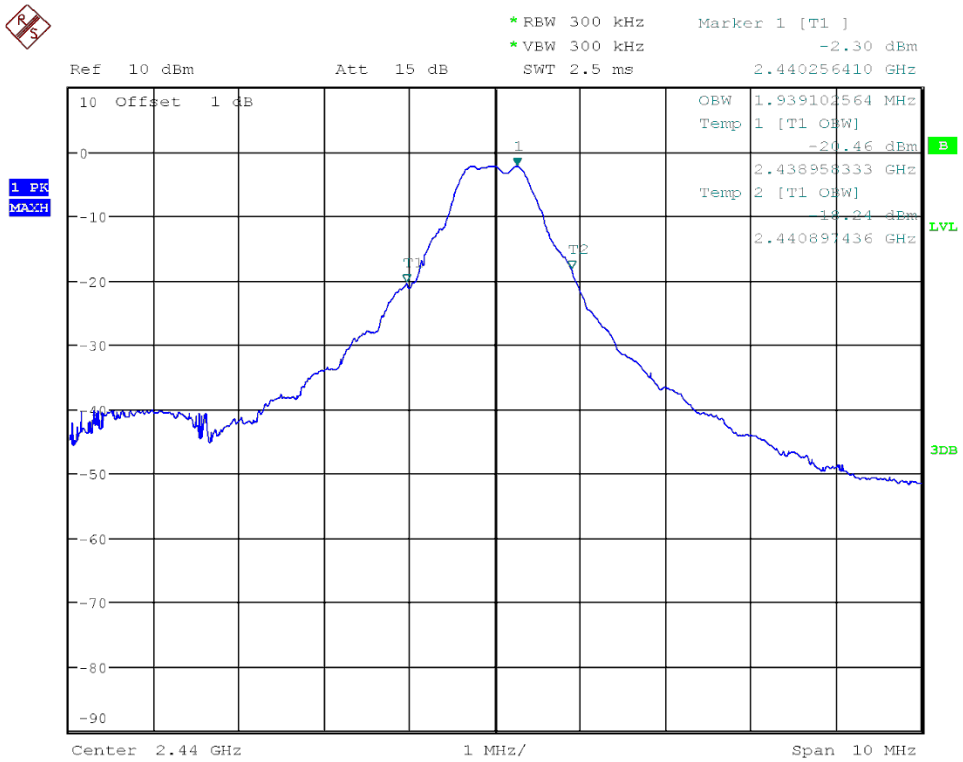
HIGH	 2 479 996 575 EIP MODEL 28B FREQUENCY COUNTER BAND 1 10 Hz-100 MHz 1 MEG/20pF BAND 2 10 MHz-1 GHz 50 OHM FREQ OFFSET SAMPLE RATE 7 DOWN 8 HOLD 9 UP GHz DATA CLEAR FREQ MULT CENTER FREQ 4 FREQ LIMIT 5 LOW 6 HIGH MHz dB DISPLAY STBY ON POWER RESET 0 LOCAL BAND 1 RESOL 2 SPECIAL 3 FUNC PWR METER ON/OFF OFFSET

Occupied Bandwidth

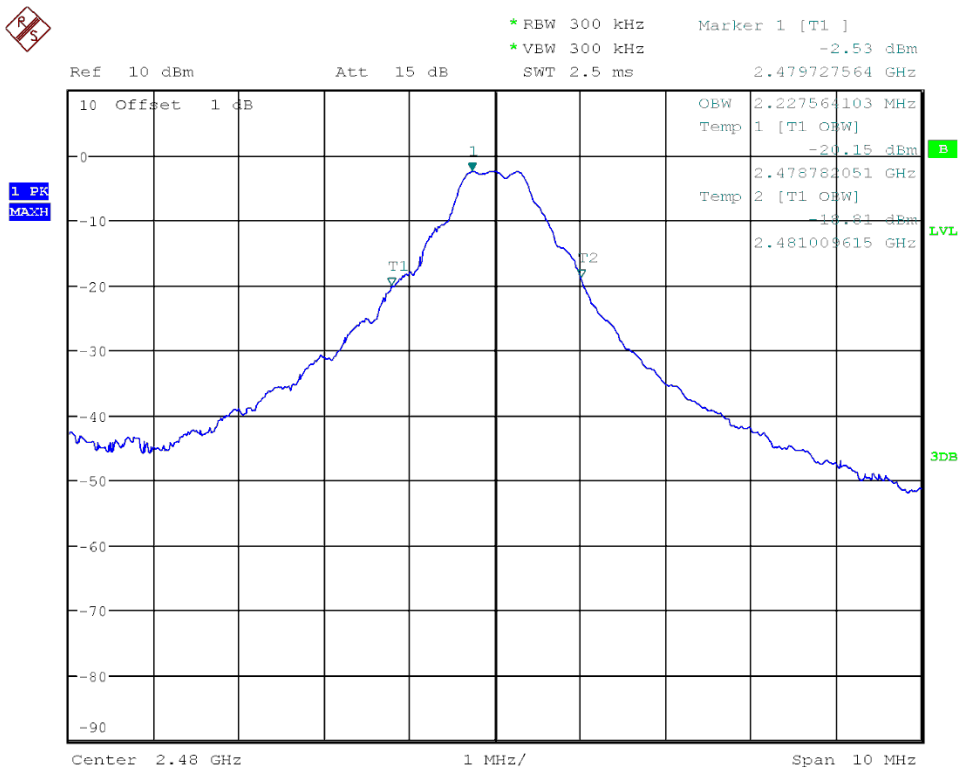
LOW



MID

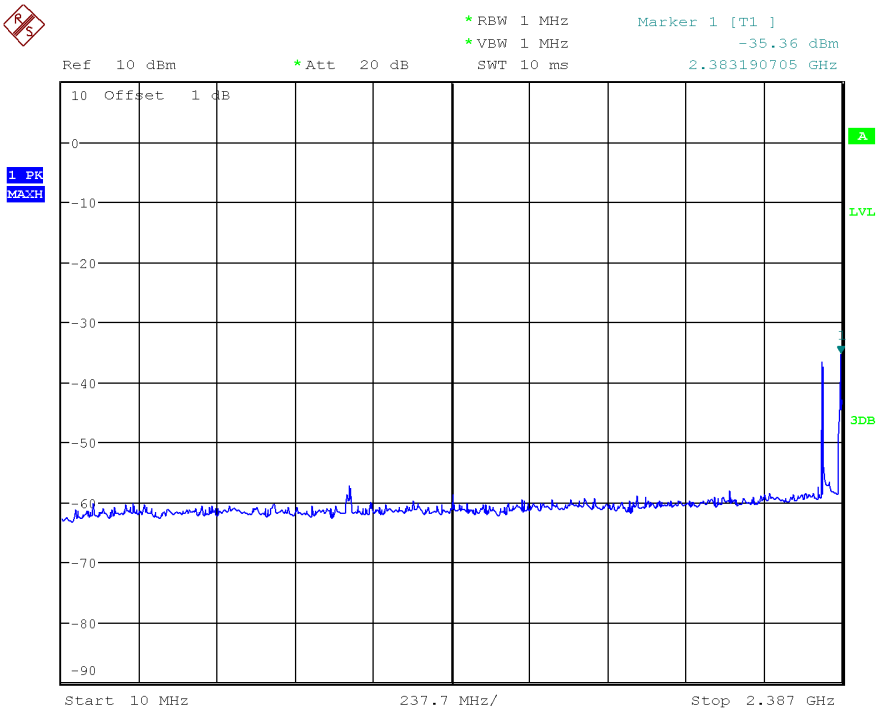


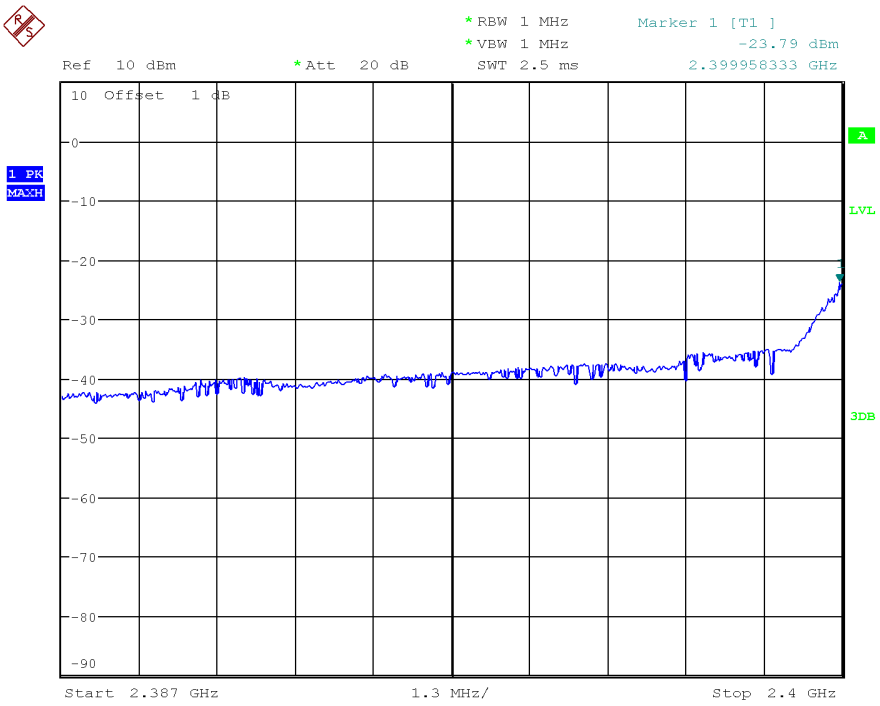
HIGH

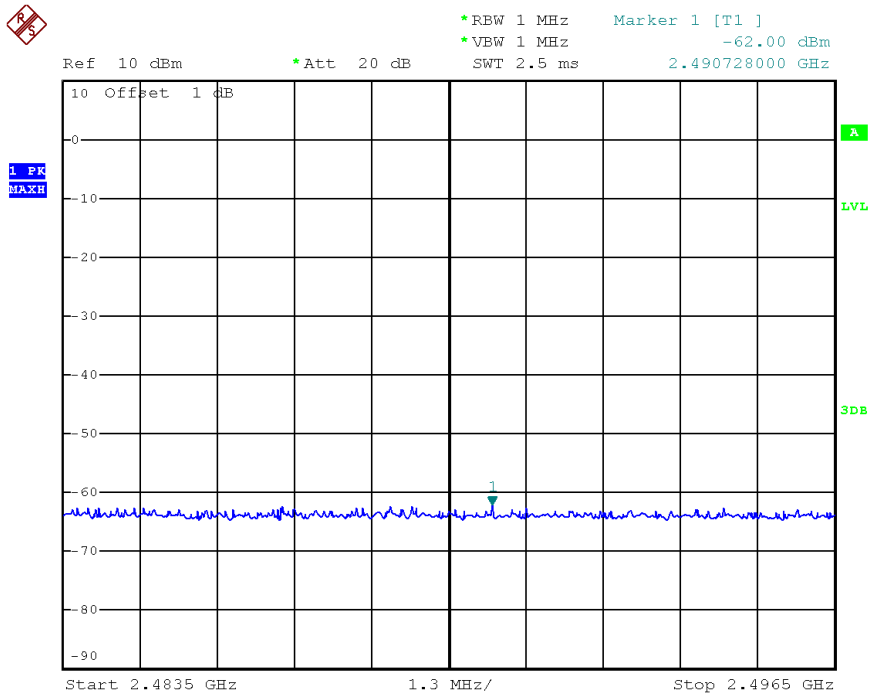

* RBW 300 kHz
* VBW 300 kHz
Ref 10 dBm
Att 15 dB
SWT 2.5 ms
Marker 1 [T1]
-2.53 dBm
2.479727564 GHz
10 Offset 1 dB
OBW 2.227564103 MHz
Temp 1 [T1 OBW]
-20.15 dBm
2.478782051 GHz
Temp 2 [T1 OBW]
-18.81 dBm
2.481009615 GHz
1 PK
MAXH
B
LVL
3DB
T1
T2
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
1 MHz/
Span 10 MHz

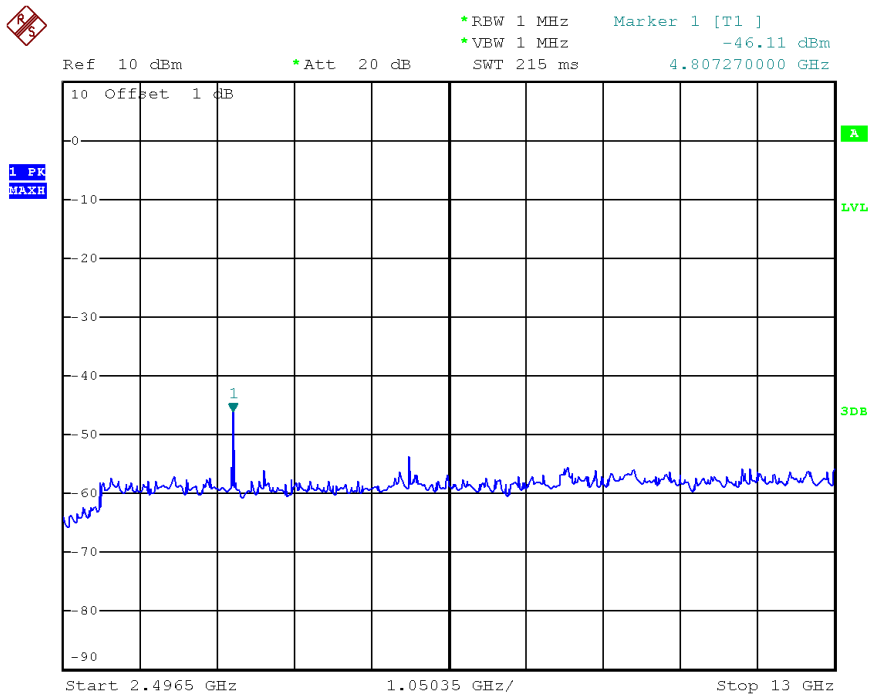
Spurious Emission Intensity

LOW



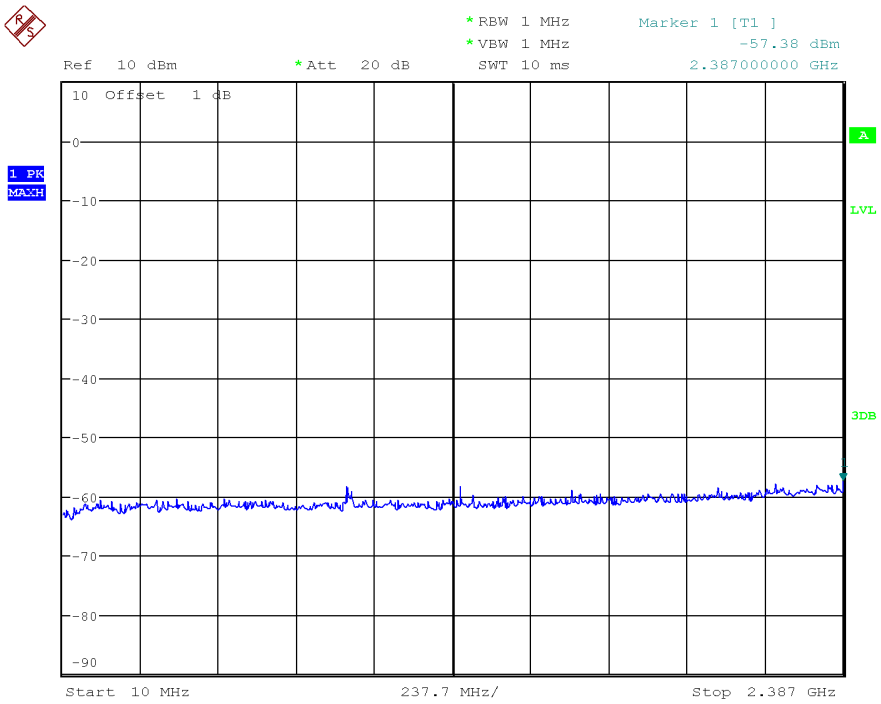


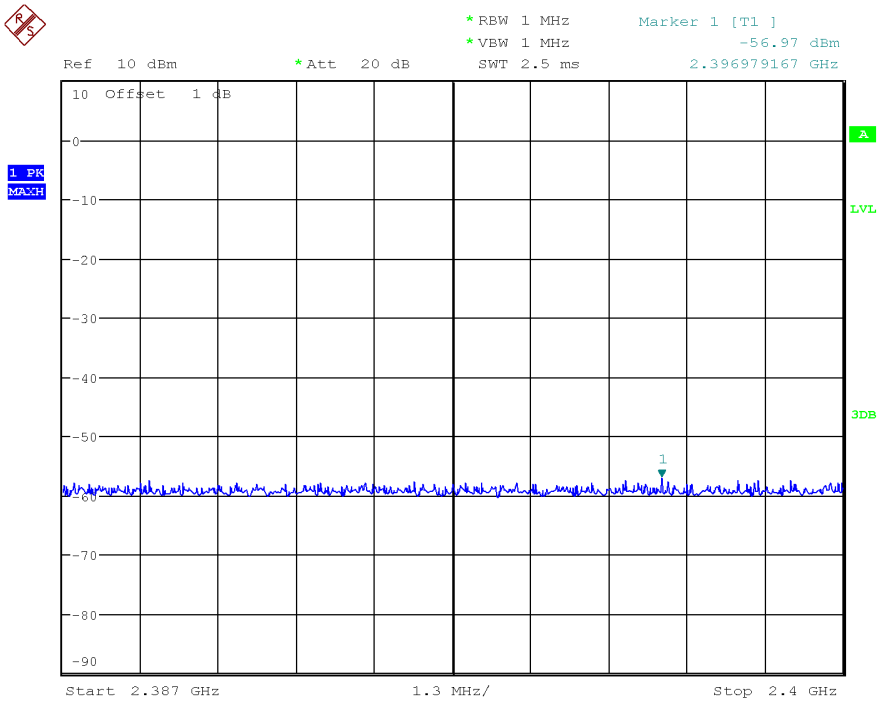

*RBW 1 MHz
Marker 1 [T1]
*VBW 1 MHz
-62.00 dBm
Ref 10 dBm
*Att 20 dB
SWT 2.5 ms
2.490728000 GHz
10 Offset 1 dB
1 PK
MAXH
A
LVL
3DB
Start 2.4835 GHz
1.3 MHz/
Stop 2.4965 GHz

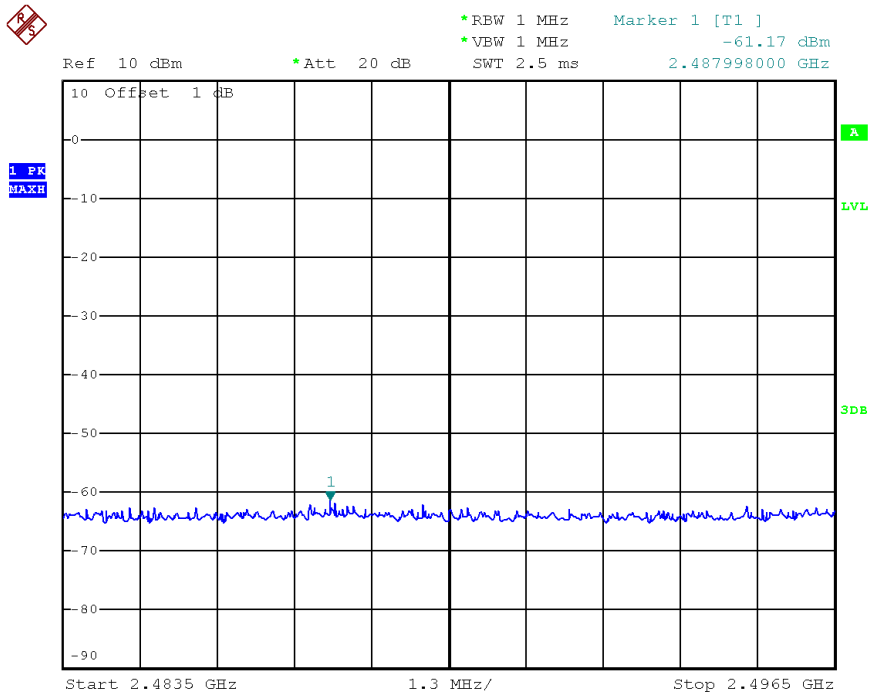

*RBW 1 MHz
Marker 1 [T1]
*VBW 1 MHz
-46.11 dBm
Ref 10 dBm
*Att 20 dB
SWT 215 ms
4.807270000 GHz
10 Offset 1 dB
1 PK
MAXH
A
LVL
3DB
Start 2.4965 GHz
1.05035 GHz/
Stop 13 GHz

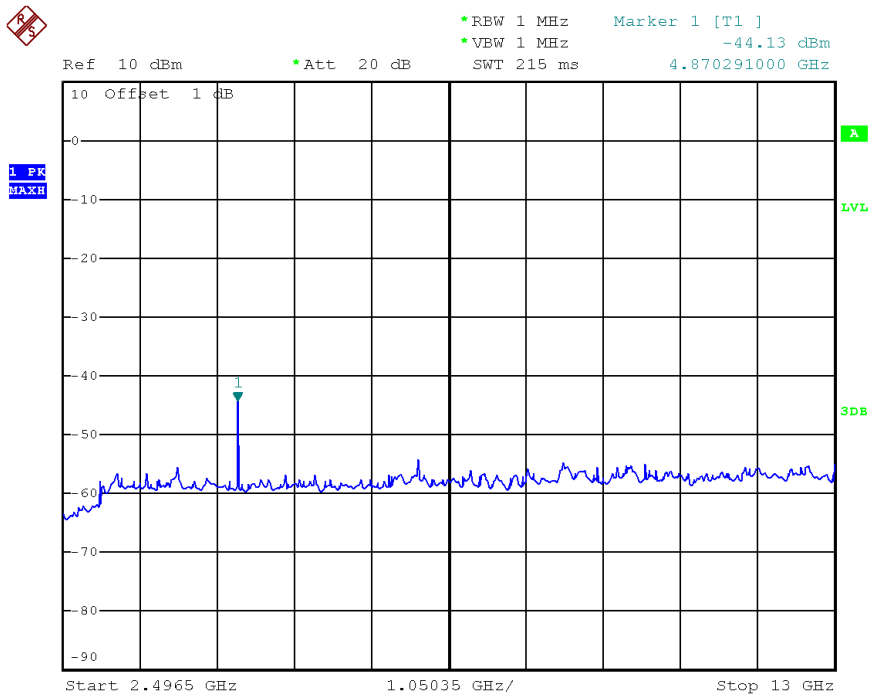
Spurious Emission Intensity

MID



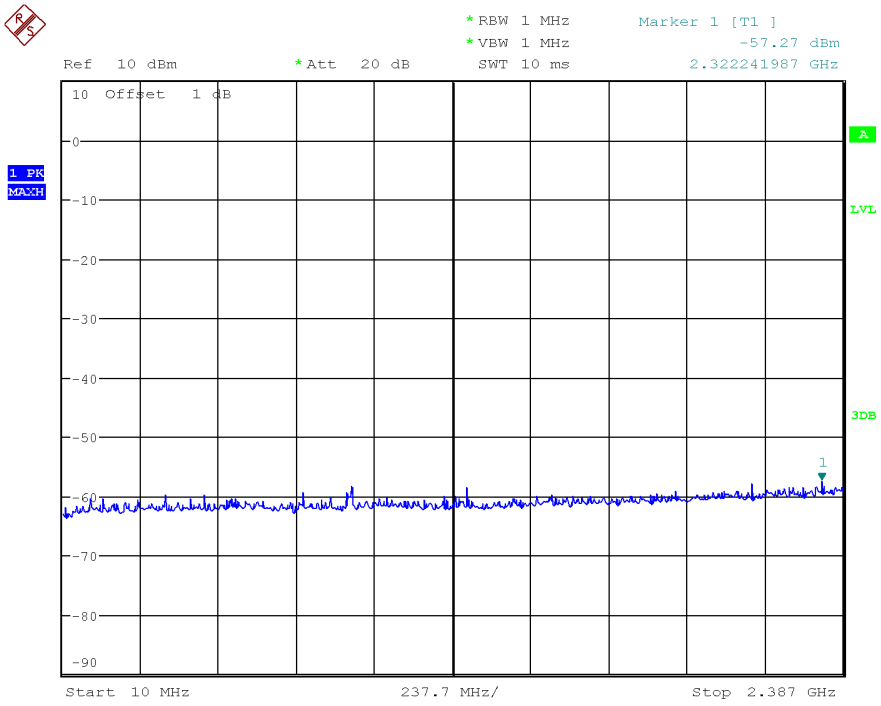


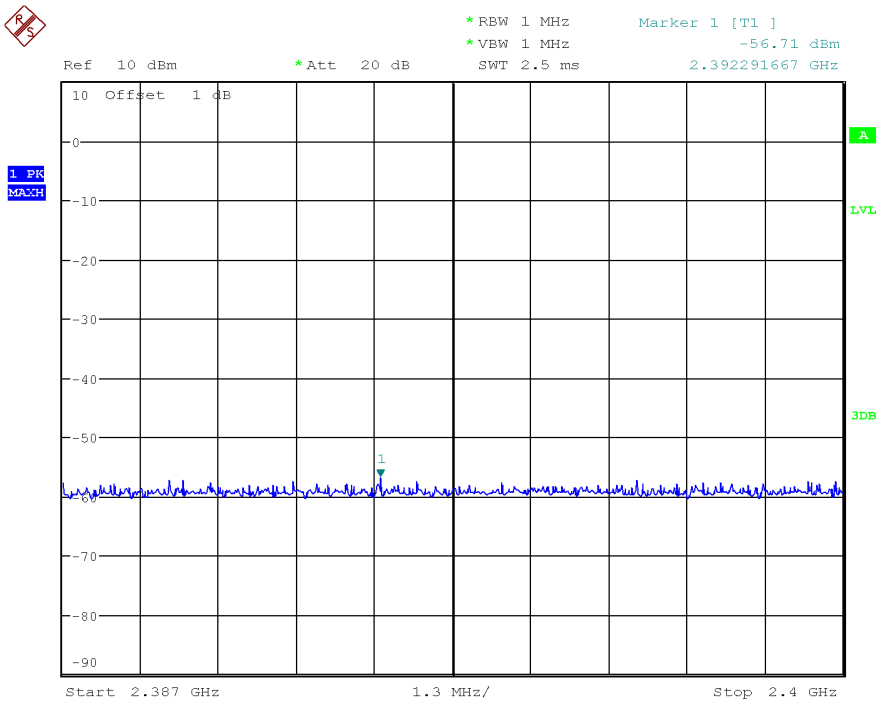

*RBW 1 MHz
Marker 1 [T1]
*VBW 1 MHz
-61.17 dBm
Ref 10 dBm
*Att 20 dB
SWT 2.5 ms
2.487998000 GHz
10 Offset 1 dB
1 PK
MAXH
A
LVL
3DB
Start 2.4835 GHz
1.3 MHz/
Stop 2.4965 GHz

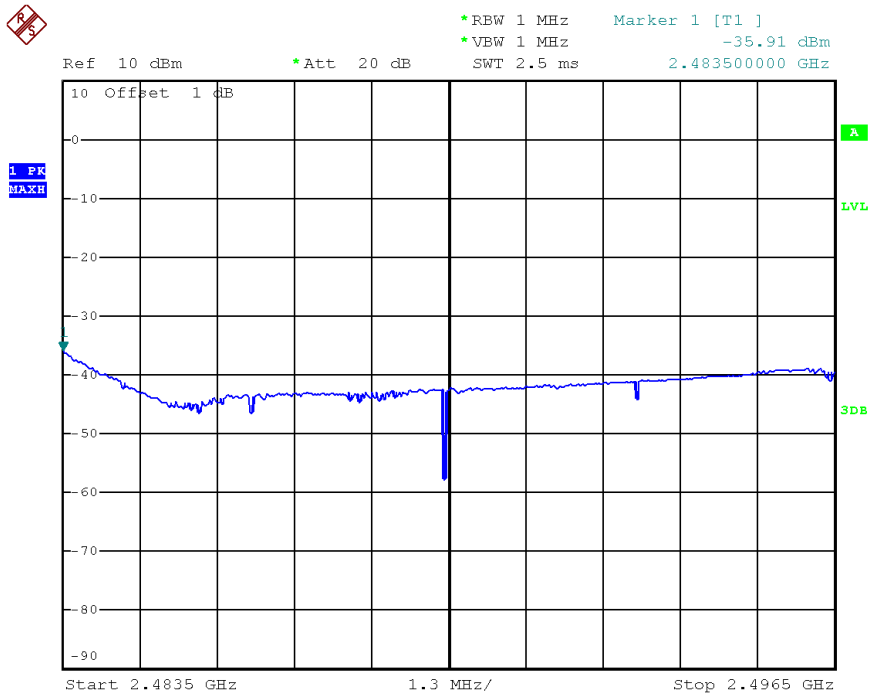

*RBW 1 MHz
Marker 1 [T1]
*VBW 1 MHz
-44.13 dBm
Ref 10 dBm
*Att 20 dB
SWT 215 ms
4.870291000 GHz
10 Offset 1 dB
1 PK
MAXH
A
LVL
3DB
Start 2.4965 GHz
1.05035 GHz/
Stop 13 GHz

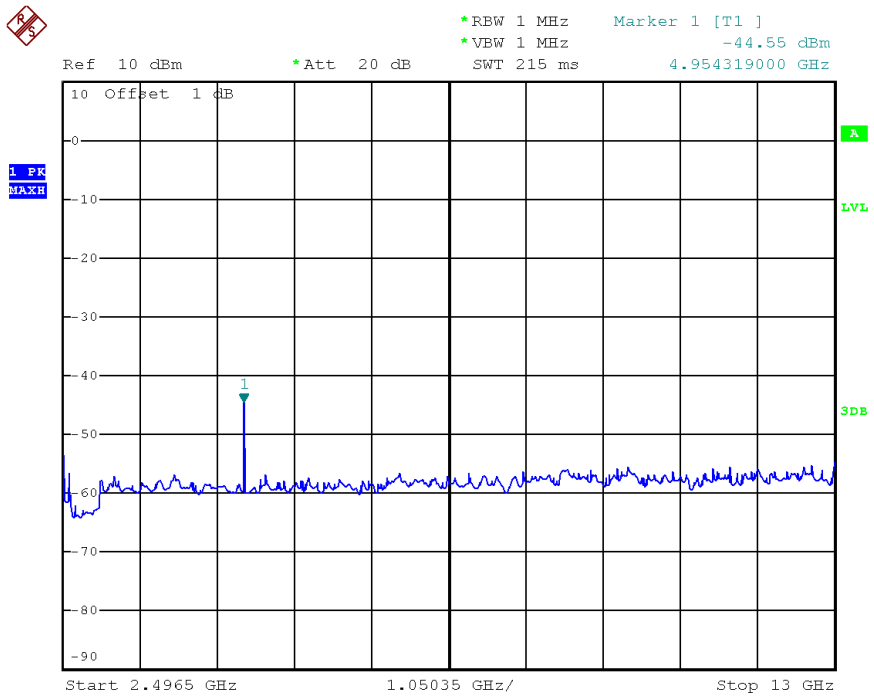
Spurious Emission Intensity

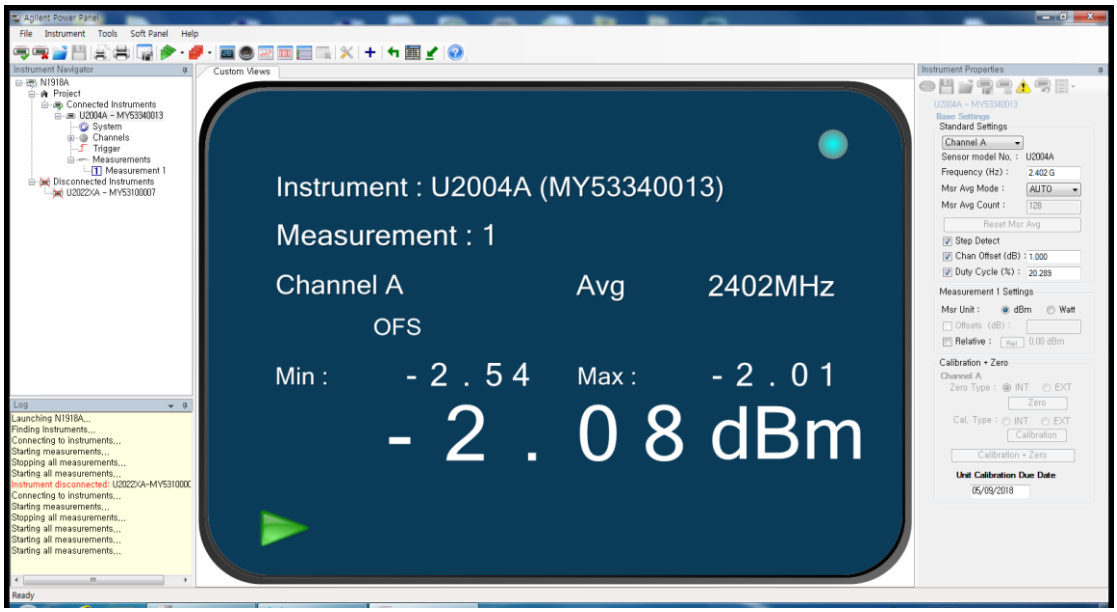
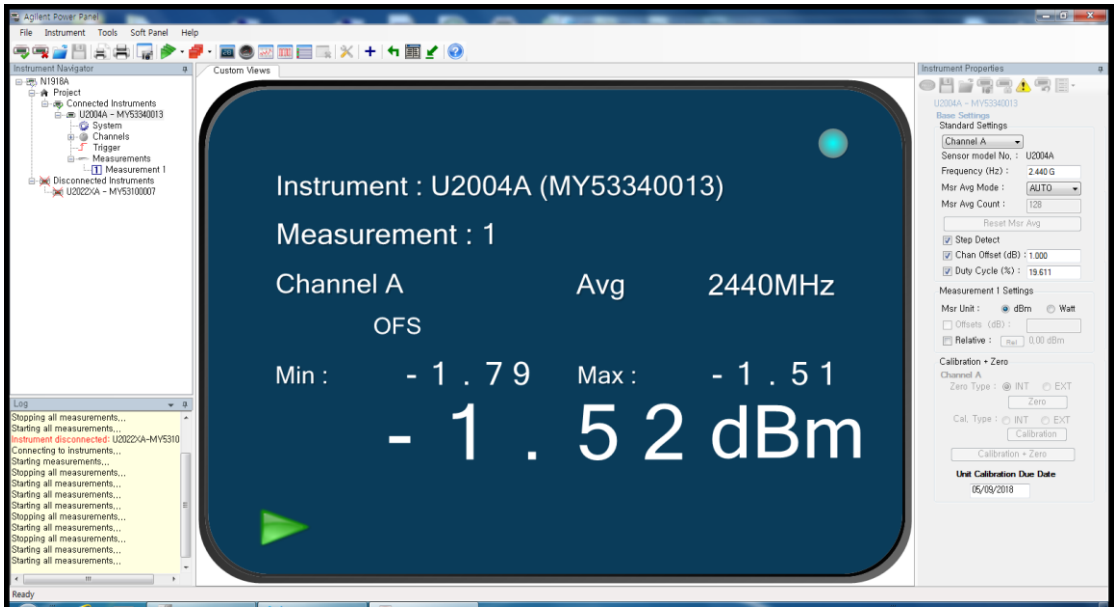
HIGH

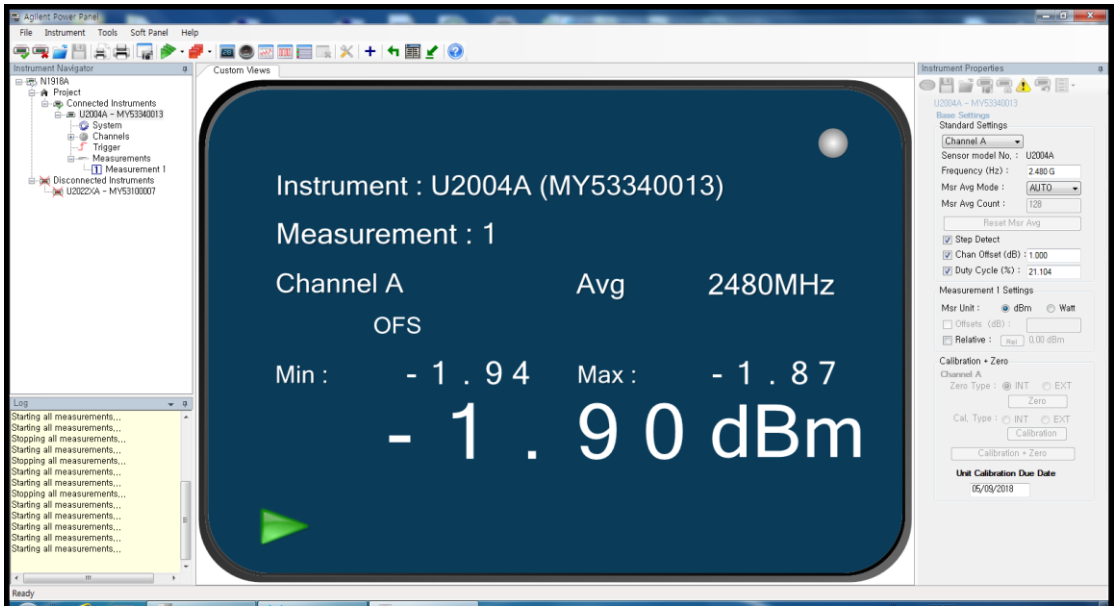





*RBW 1 MHz
Marker 1 [T1]
*VBW 1 MHz
-35.91 dBm
Ref 10 dBm
*Att 20 dB
SWT 2.5 ms
2.483500000 GHz
10 Offset 1 dB
1 PK
MAXH
A
LVL
3DB
Start 2.4835 GHz
1.3 MHz/
Stop 2.4965 GHz

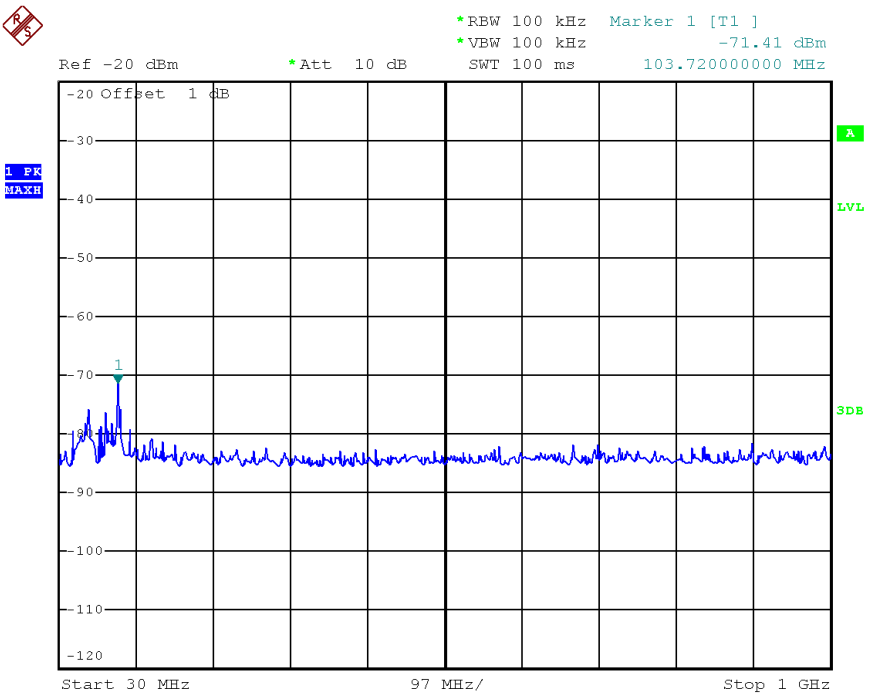

*RBW 1 MHz
Marker 1 [T1]
*VBW 1 MHz
-44.55 dBm
Ref 10 dBm
*Att 20 dB
SWT 215 ms
4.954319000 GHz
10 Offset 1 dB
1 PK
MAXH
A
LVL
3DB
Start 2.4965 GHz
1.05035 GHz/
Stop 13 GHz

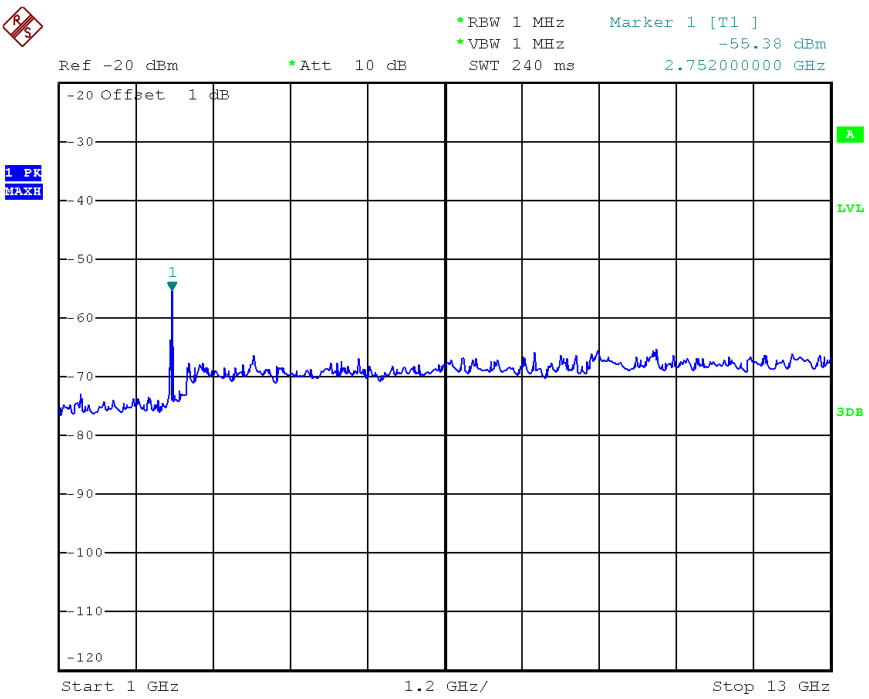
Antenna Power	
LOW	
MID	

HIGH	 Agilent Power Panel File Instrument Tools Soft Panel Help Instrument Navigator N1918A Project Connected Instruments U2004A - MY53340013 System Channels Trigger Measurements Measurement 1 Disconnected Instruments U2022XA - MY53100007 Custom Views Instrument : U2004A (MY53340013) Measurement : 1 Channel A Avg 2480MHz OFS Min : - 1 . 9 4 Max : - 1 . 8 7 - 1 . 9 0 dBm Instrument Properties Standard Settings Channel A Sensor model No. : U2004A Frequency (Hz) : 2.480 G Msr Avg Mode : AUTO Msr Avg Count : 128 Reset Msr Avg Step Detect Chan Offset (dB) : 1.000 Duty Cycle (%) : 21.104 Measurement 1 Settings Msr Unit : dBm Watt Offsets (dB) : Relative : Rel 0.00 dBm Calibration + Zero Channel A Zero Type : INT EXT Zero Cal. Type : INT EXT Calibration Calibration + Zero Unit Calibration Due Date 05/09/2018 Log Starting all measurements... Stopping all measurements... Ready

Secondary Radiated Emissions

LOW

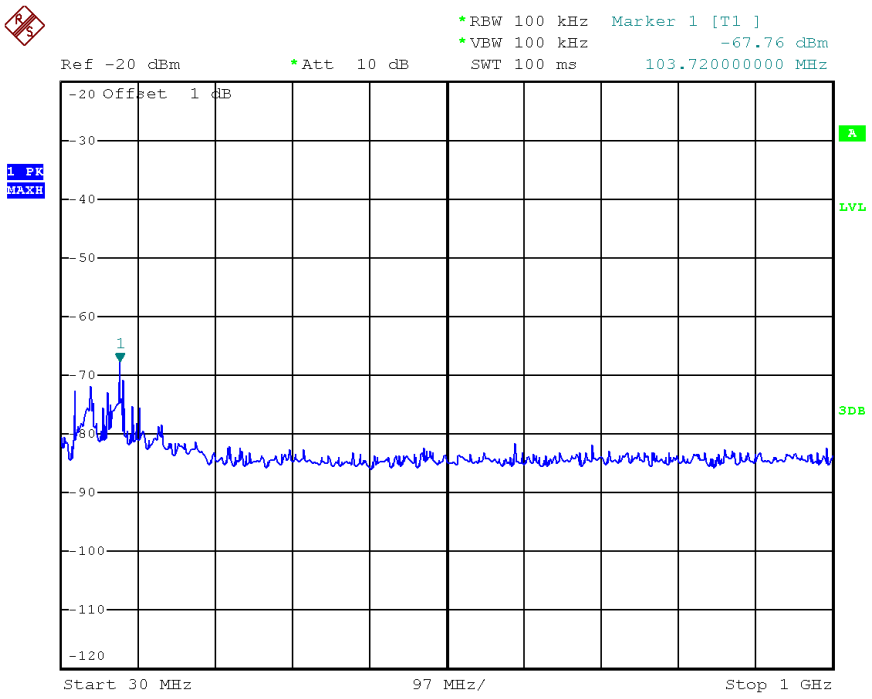




Date: 10.JUN.2019 18:19:15

Secondary Radiated Emissions

MID



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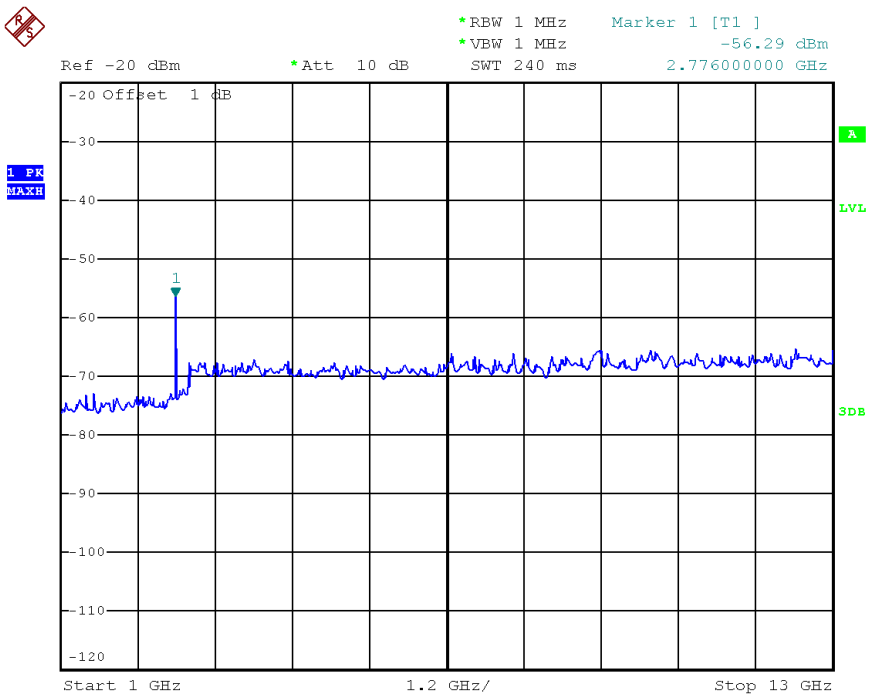

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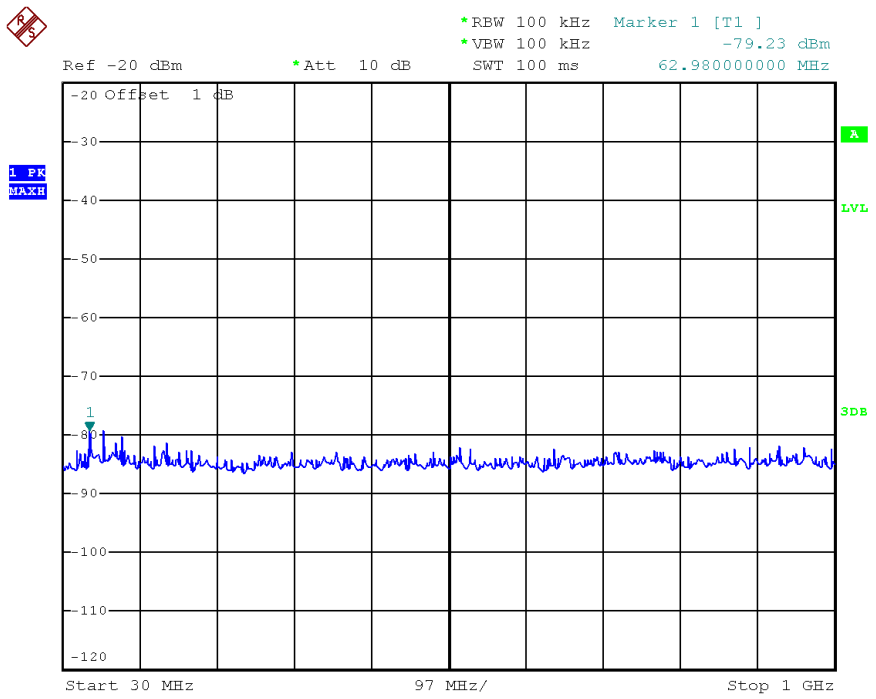
Secondary Radiated Emissions

HIGH



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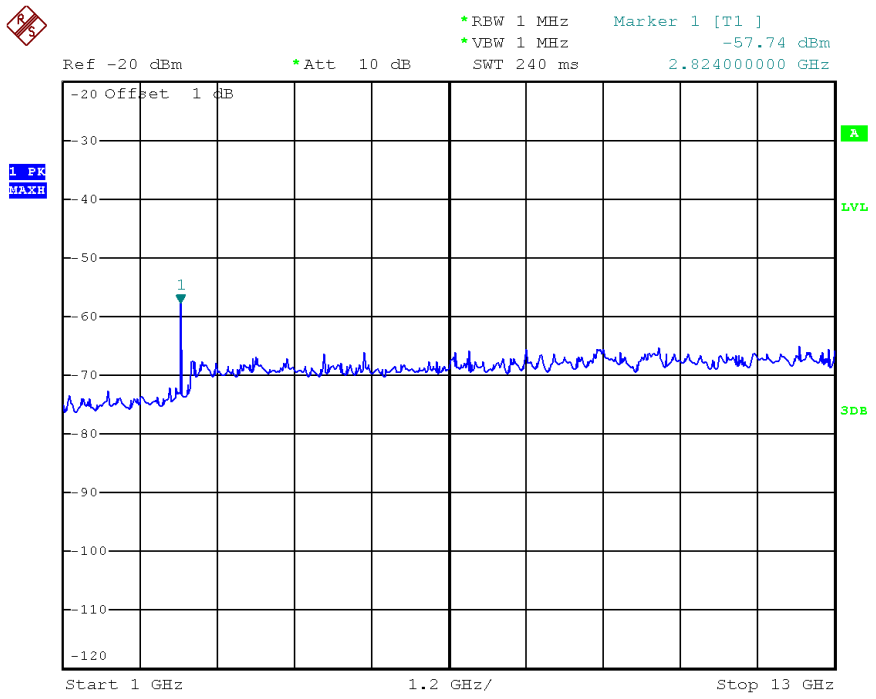

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