



# Annex A: Bandwidth



## 1 Result Table

### 1.1 Emission Bandwidth (-6 dBc EBW)

EUT Conf.	-6 dBc EBW [MHz]	Limit	Verdict
B-TM1	155.90	(No limit)	Pass
B-TM2	164.31	(No limit)	Pass
M-TM1	158.71	(No limit)	Pass
M-TM2	157.51	(No limit)	Pass
T-TM1	152.10	(No limit)	Pass
T-TM2	146.90	(No limit)	Pass

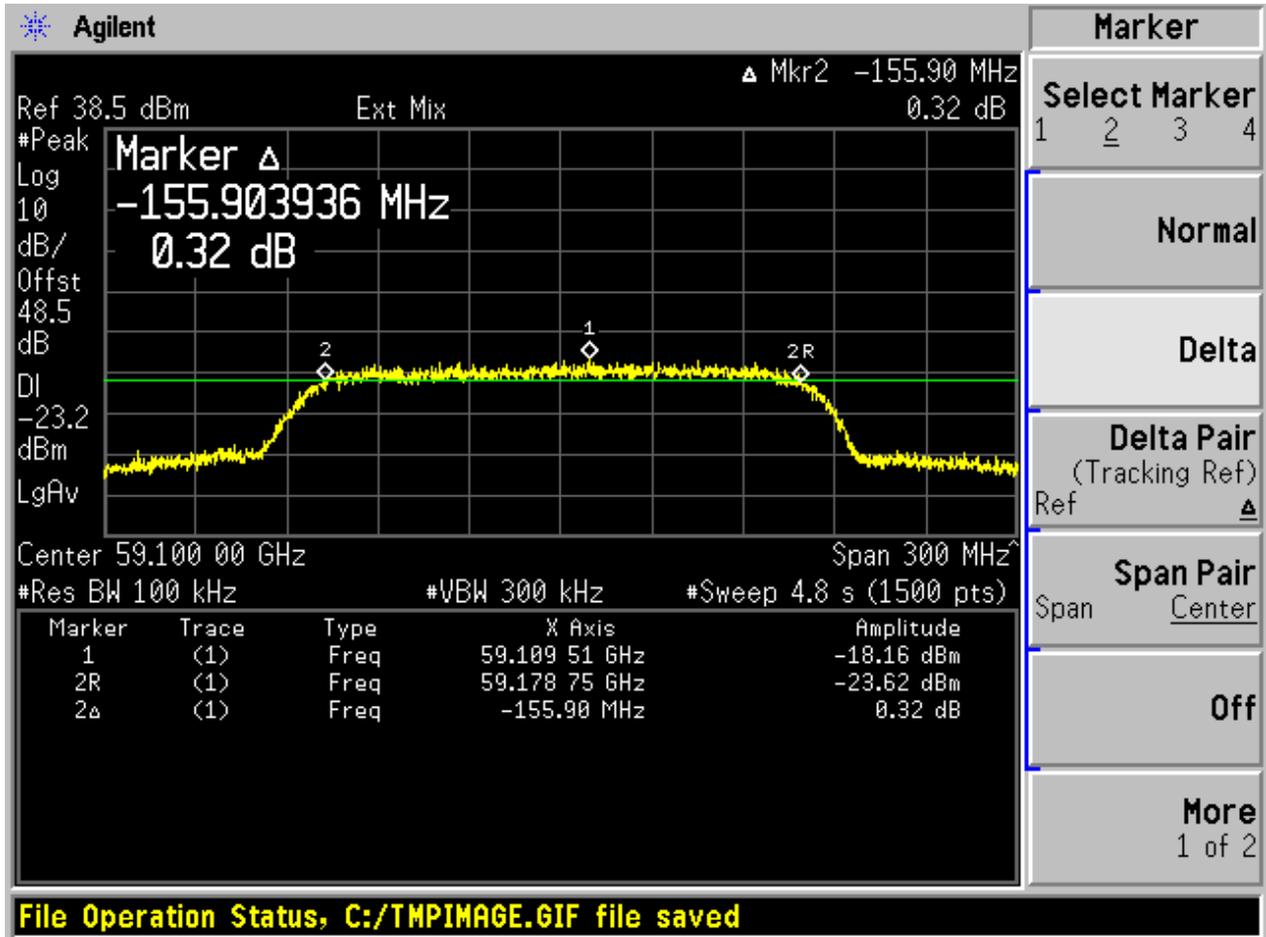
### 1.2 Occupied Bandwidth (OBW)

EUT Conf.	OBW [MHz]	Limit	Verdict
B-TM1	178.5476	(No limit)	Pass
B-TM2	178.9424	(No limit)	Pass
M-TM1	178.0807	(No limit)	Pass
M-TM2	178.9424	(No limit)	Pass
T-TM1	178.0807	(No limit)	Pass
T-TM2	180.2846	(No limit)	Pass

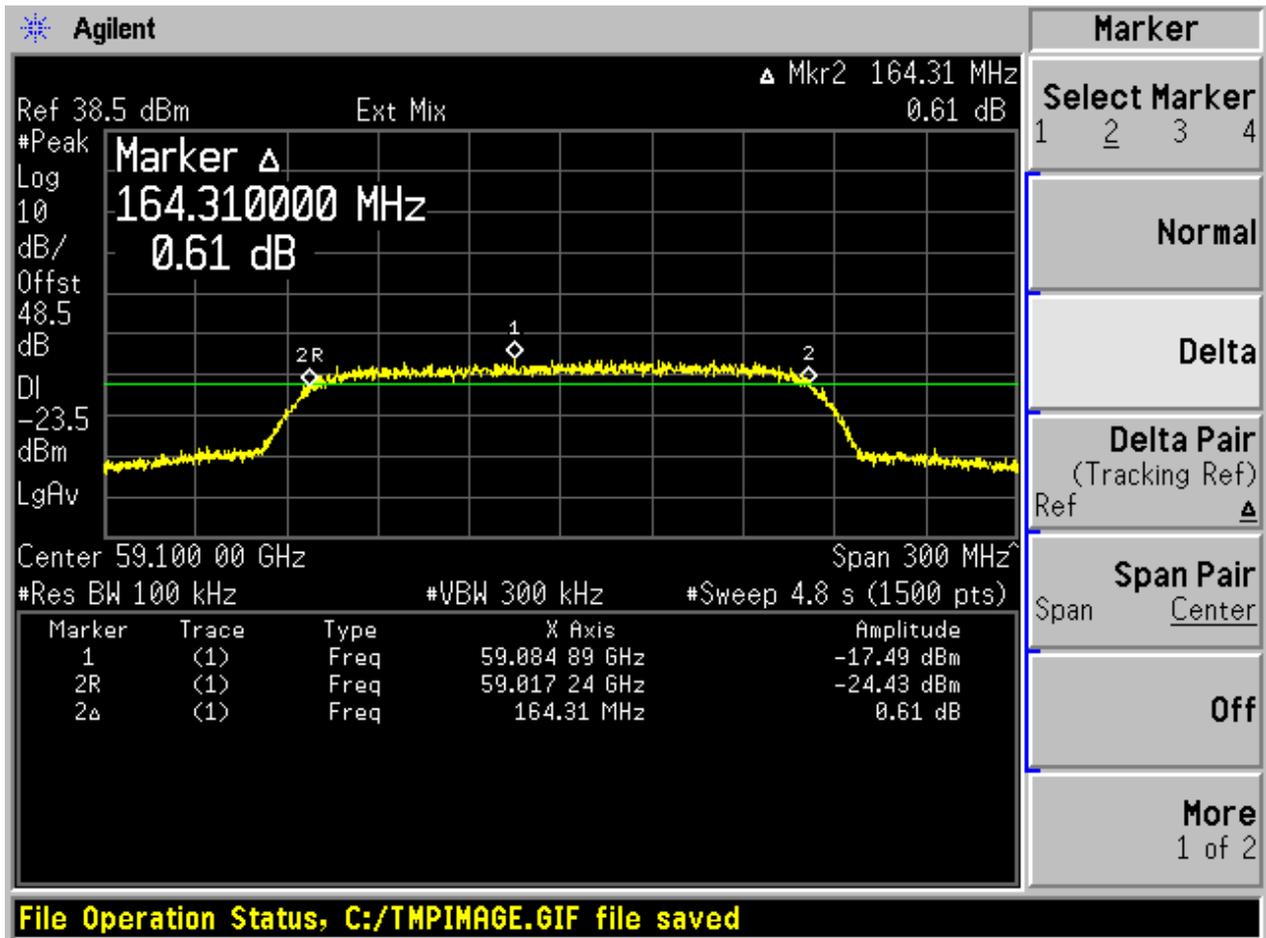
## 2 Test Plot

### 2.1 Emission Bandwidth (-6 dBc EBW)

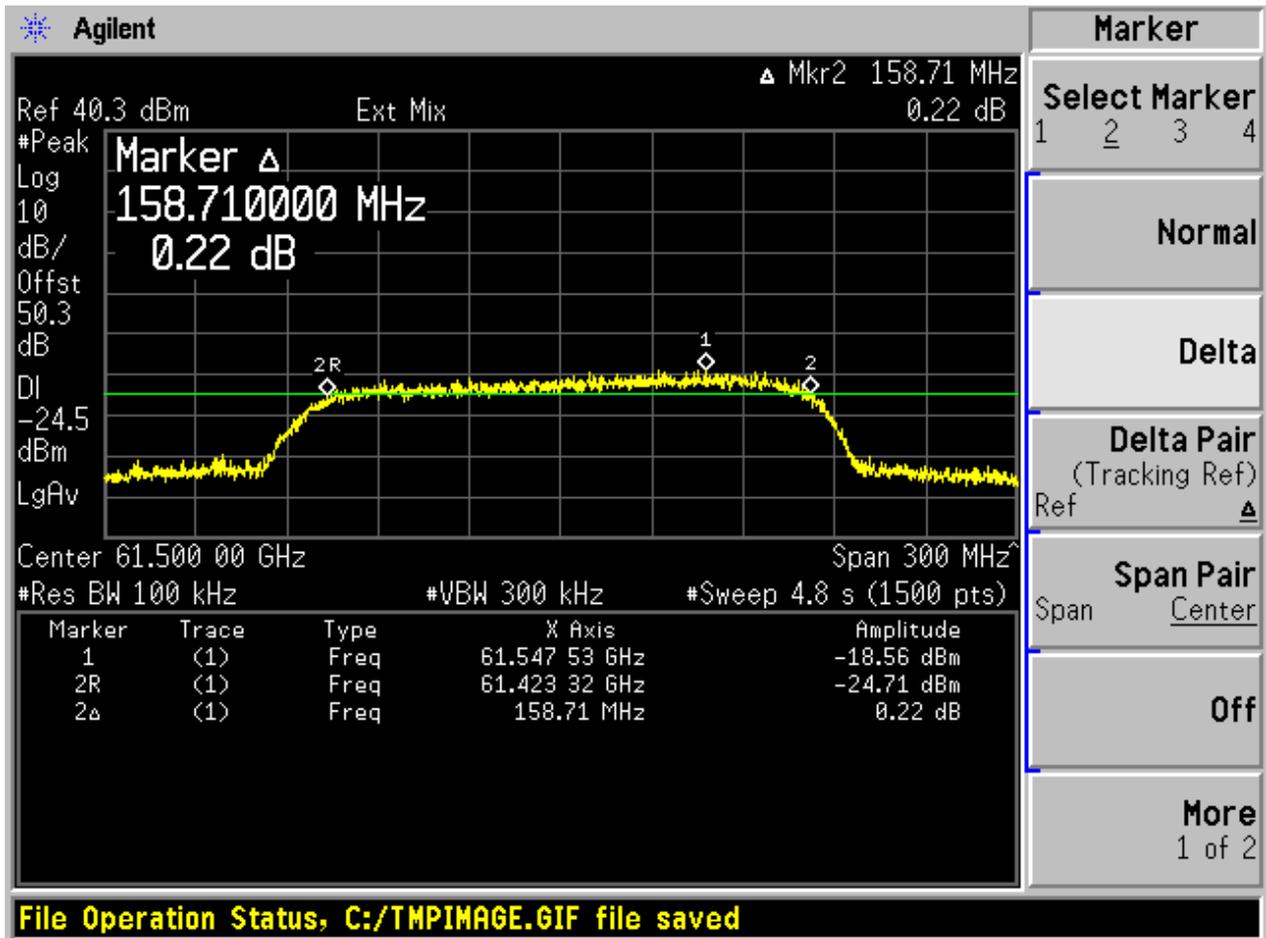
#### 2.1.1 B-TM1



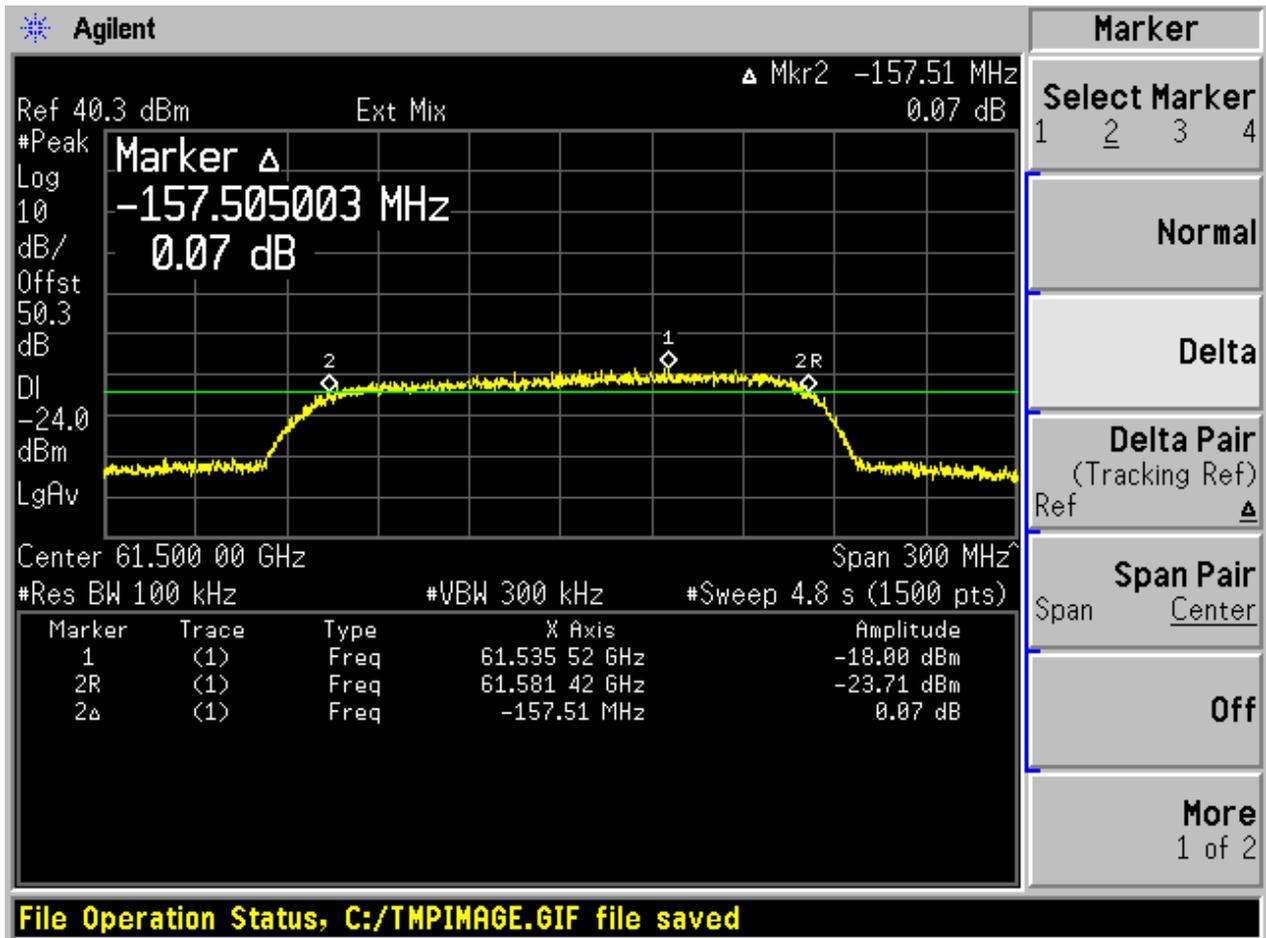
#### 2.1.2 B-TM2



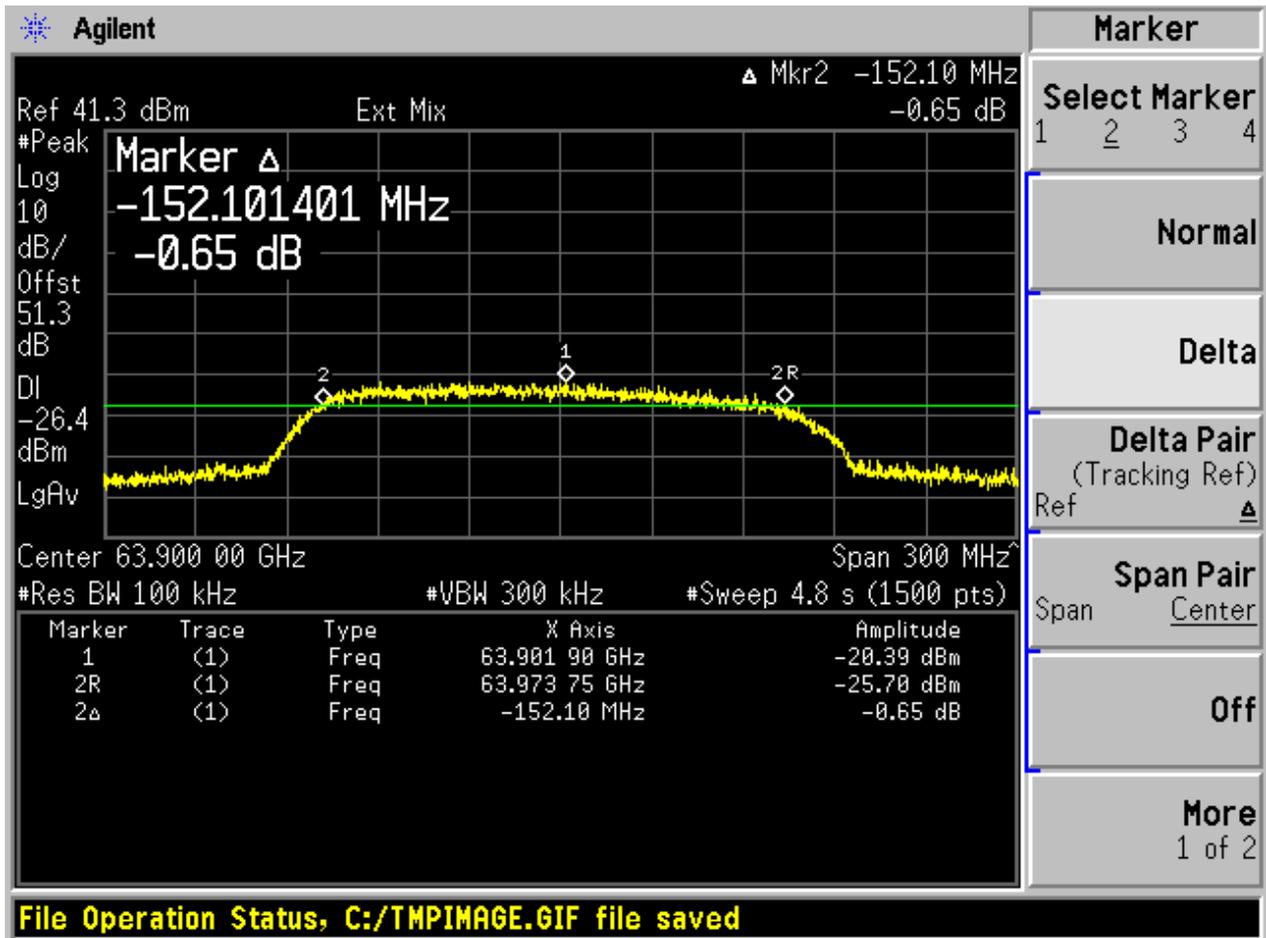
### 2.1.3 M-TM1



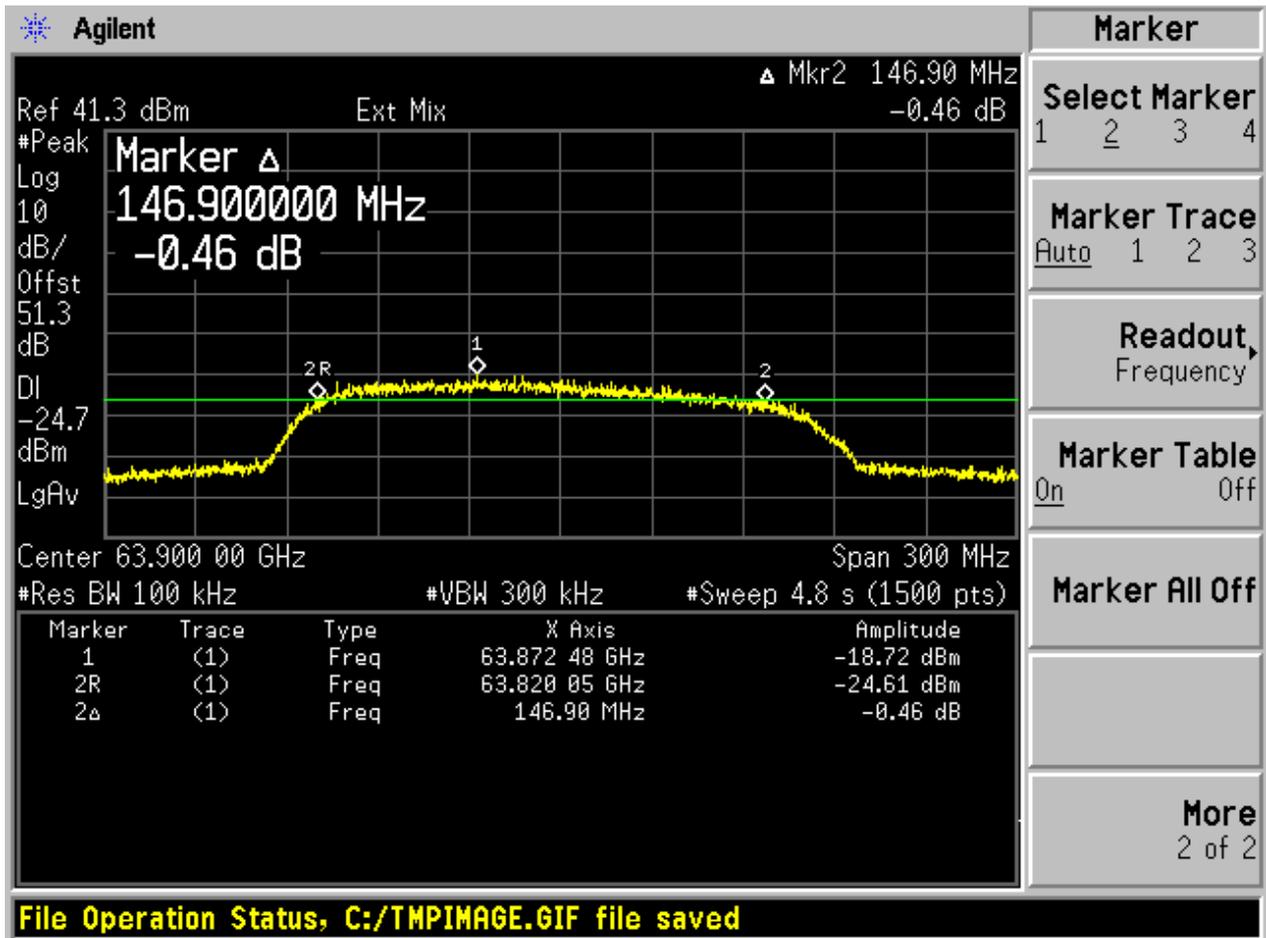
#### 2.1.4 M-TM2



### 2.1.5 T-TM1

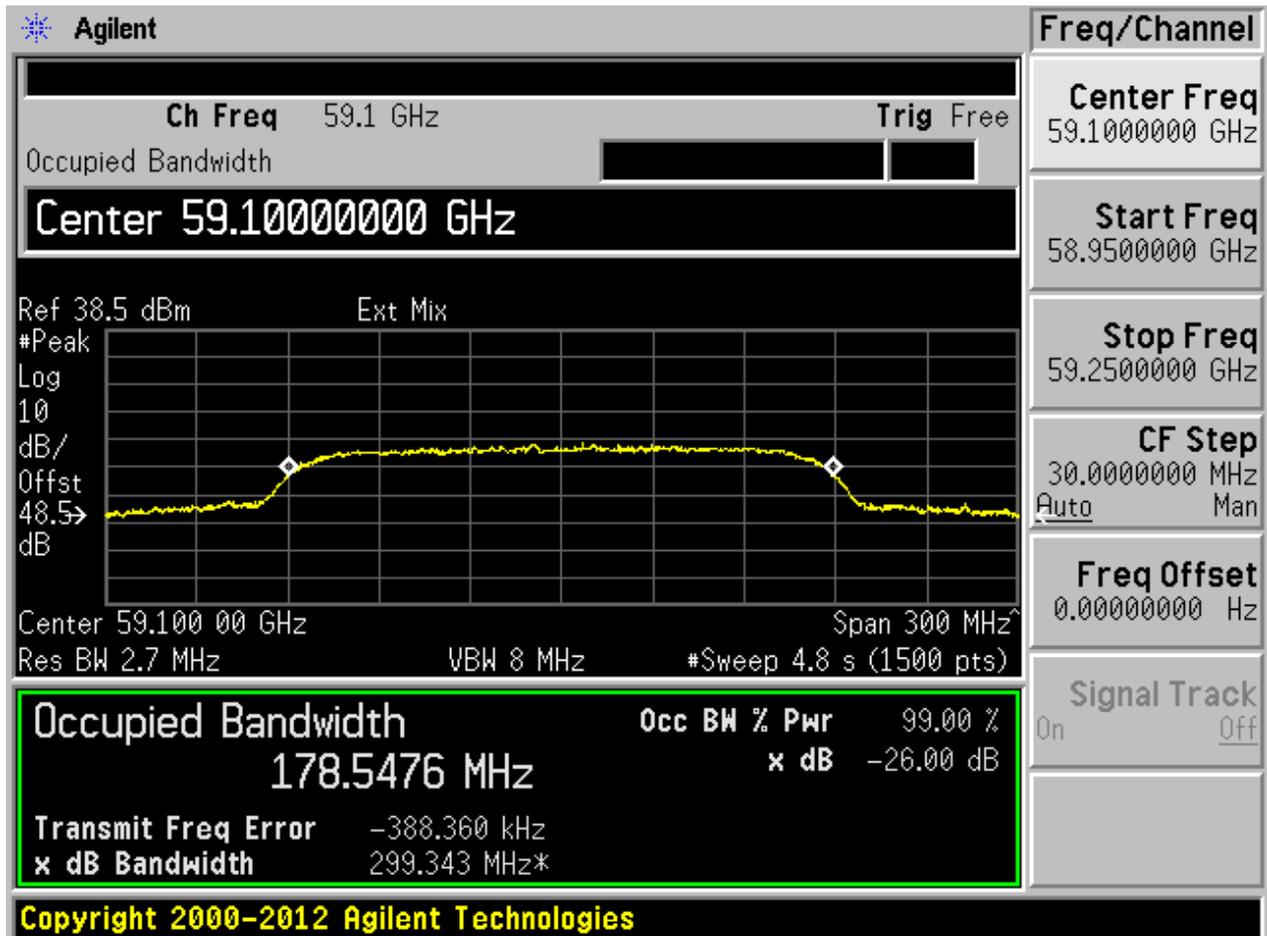


### 2.1.6 T-TM2

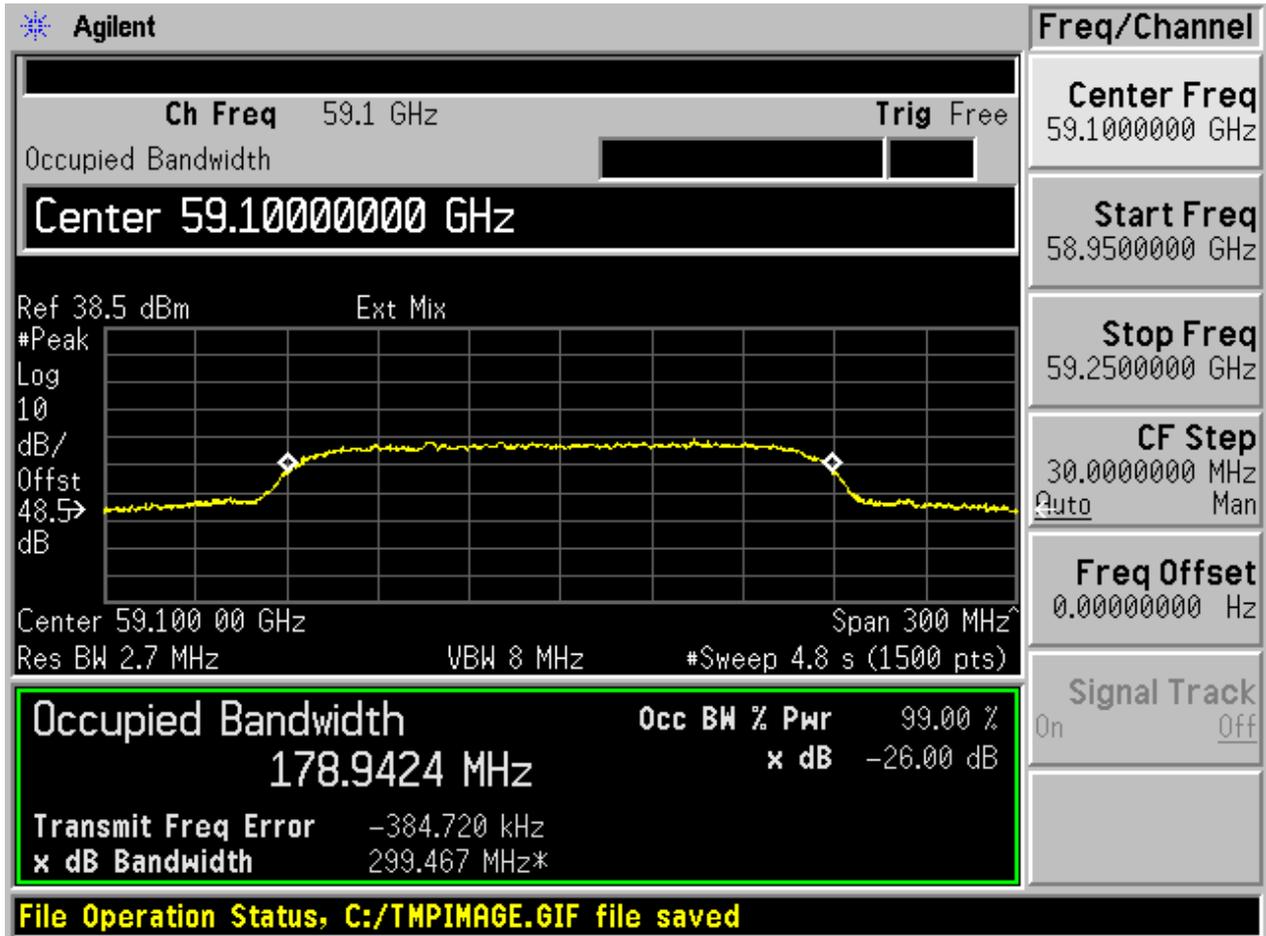


## 2.2 Occupied Bandwidth (OBW)

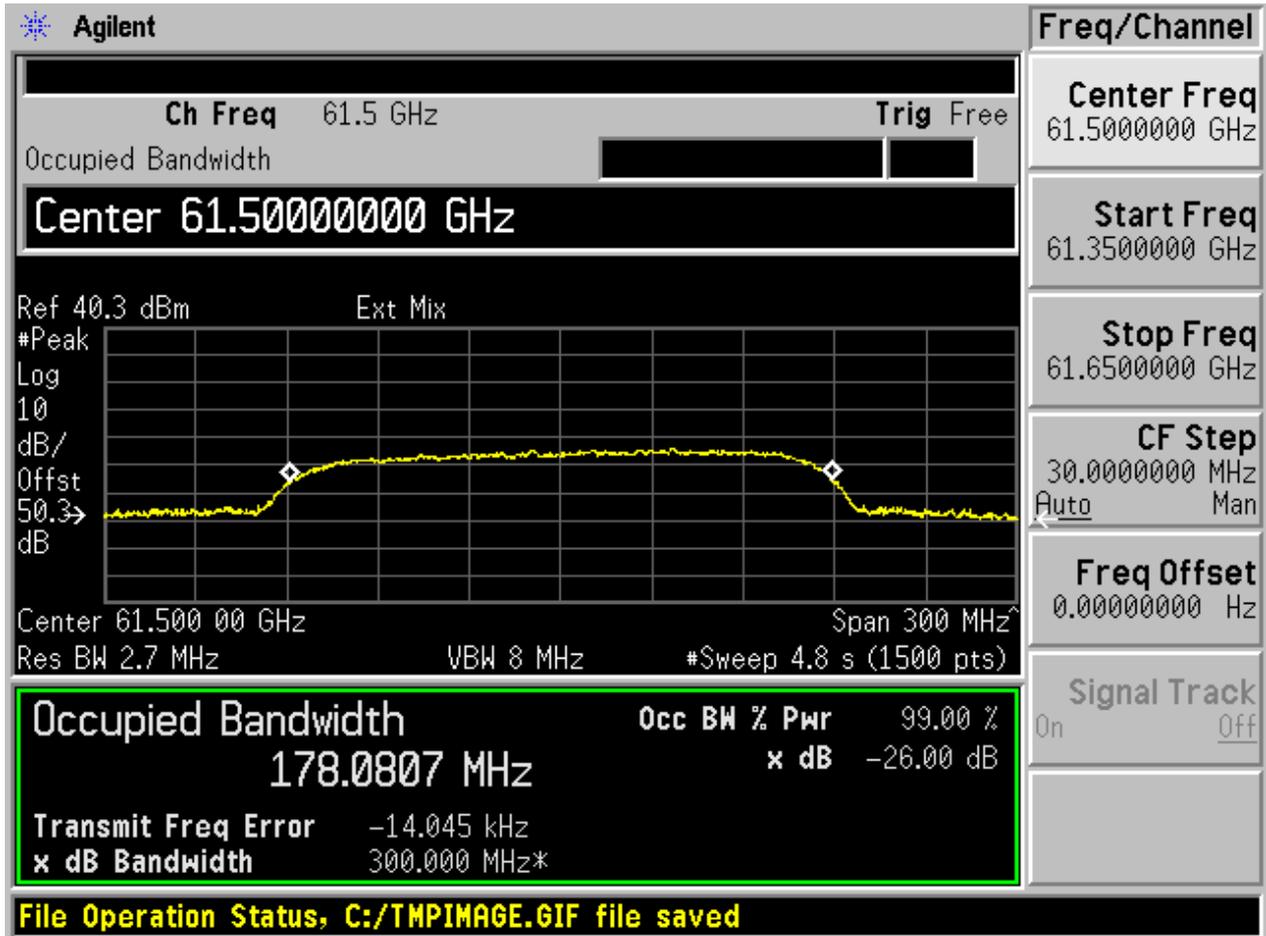
### 2.2.1 B-TM1



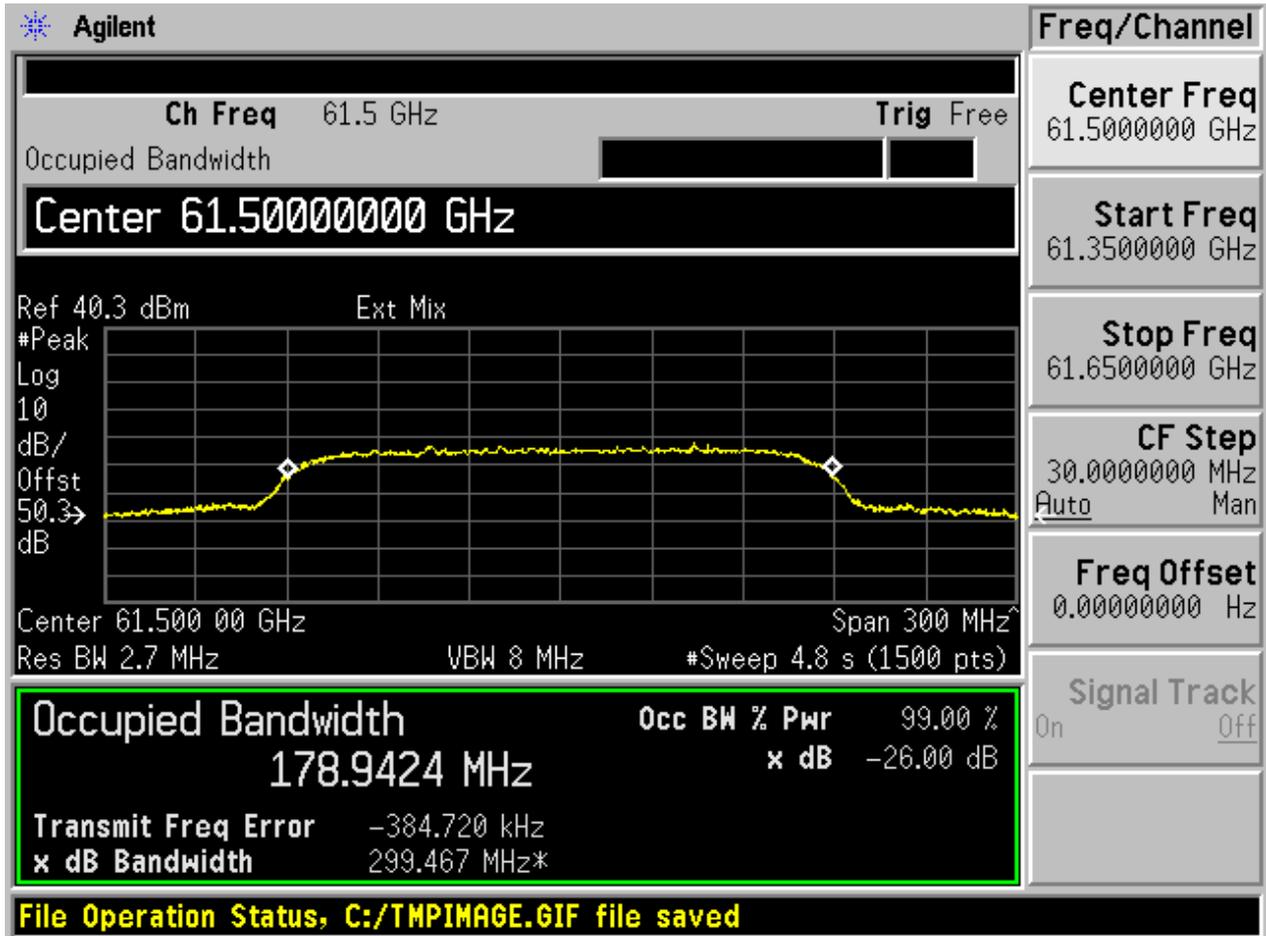
2.2.2 B-TM2



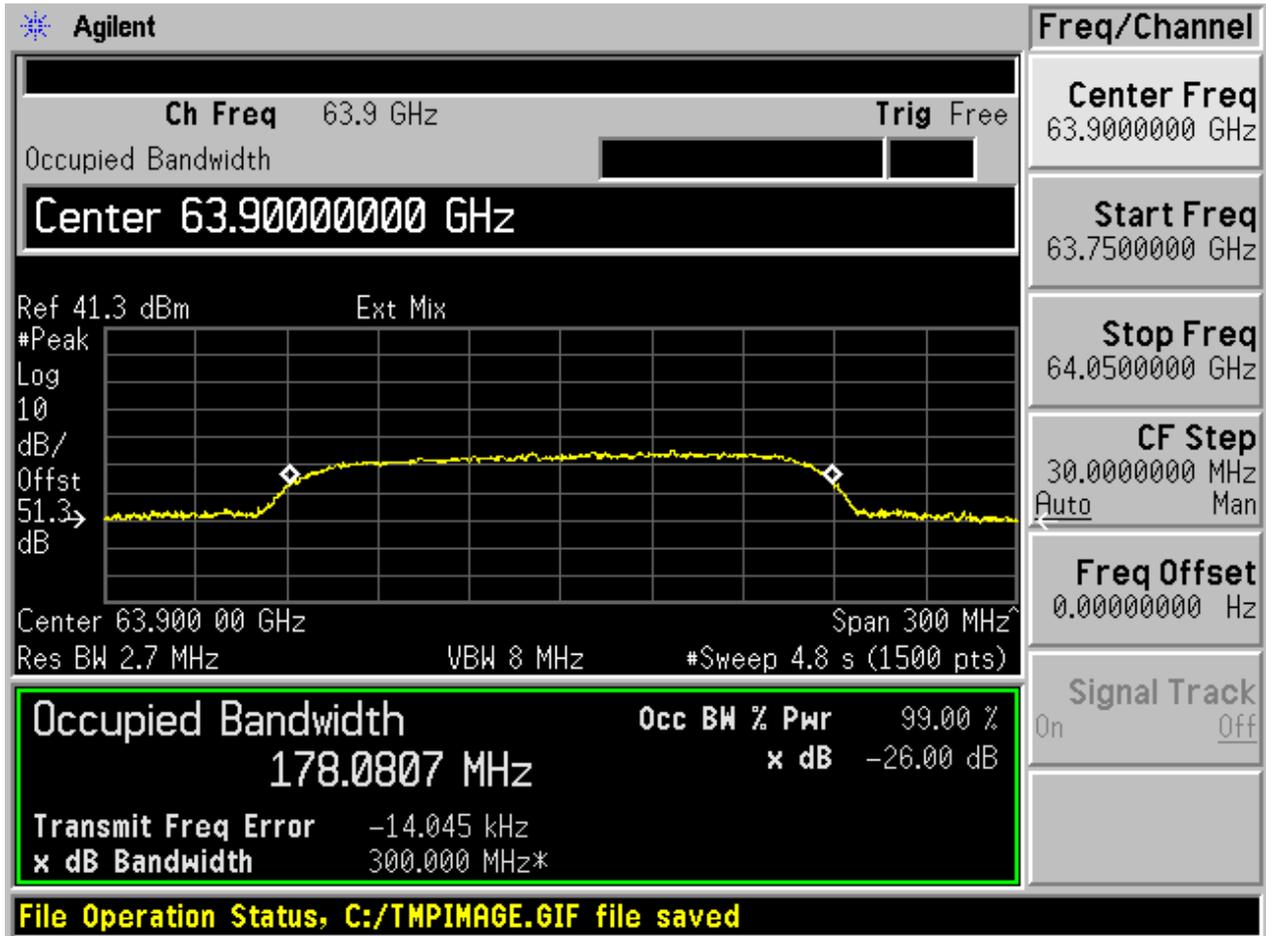
2.2.3 M-TM1



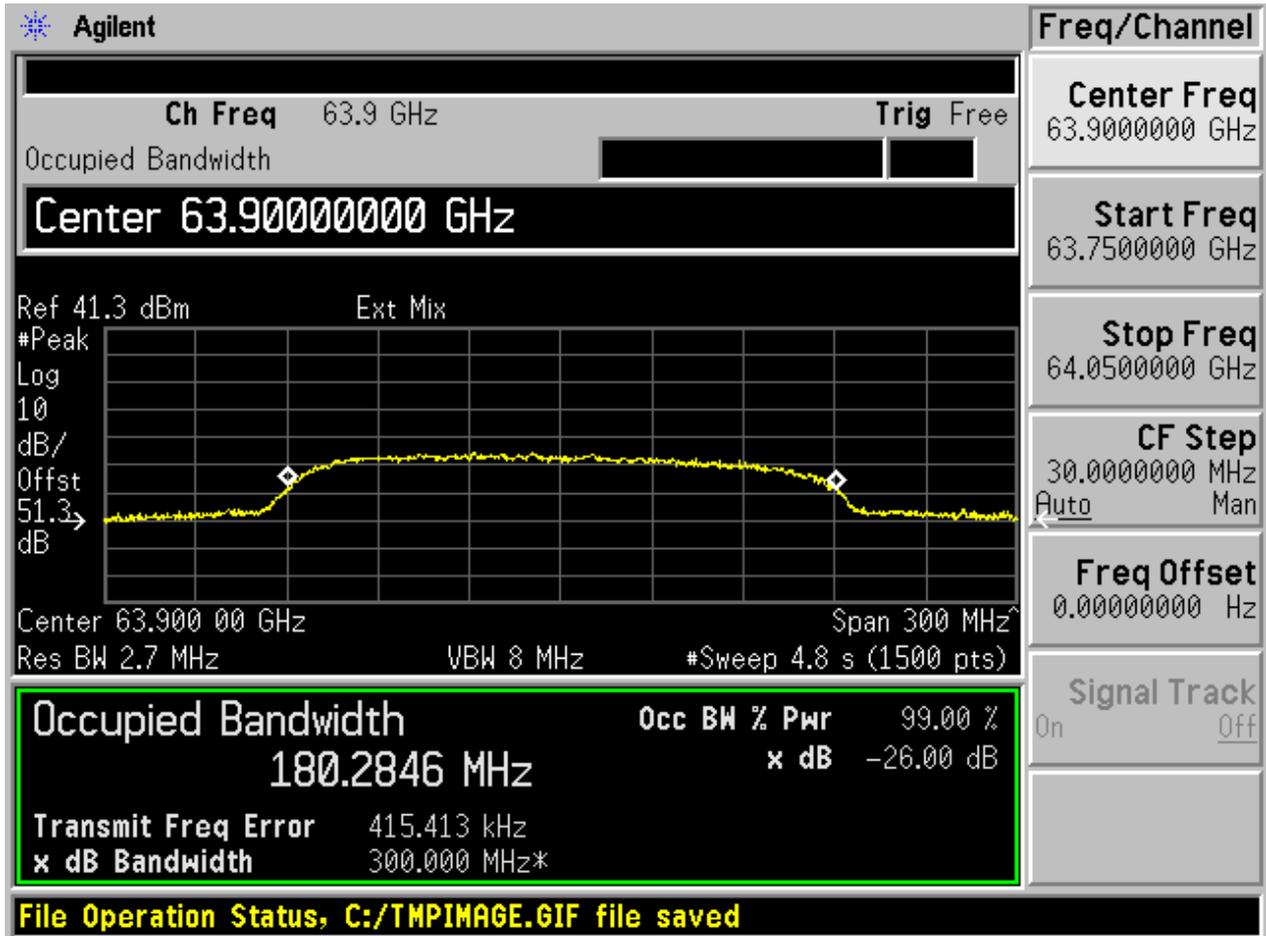
2.2.4 M-TM2



2.2.5 T-TM1



2.2.6 T-TM2





# Annex B: EIRP / In-Band Emissions

## 1 Result Table

### 1.1 Avg EIRP (Tx on)

EUT Conf.	Avg Condt. Pwr (Tx on), measured [dBm]	Ant. Gain [dBi]	Avg EIRP (Tx on), calculated [dBm]	Avg PD (Tx on) @ 3m, calculated [ $\mu\text{W}/\text{cm}^2$ ]	Limit [dBm]	Limit [ $\mu\text{W}/\text{cm}^2$ ]	Verdict
B-TM1	2.07	34.5	36.57	4.01	$\leq 49$	$\leq 9$	Pass
B-TM2	2.03	34.5	36.53	3.98	$\leq 49$	$\leq 9$	Pass
M-TM1	1.79	34.5	36.29	3.76	$\leq 49$	$\leq 9$	Pass
M-TM2	1.86	34.5	36.36	3.82	$\leq 49$	$\leq 9$	Pass
T-TM1	1.90	34.5	36.4	3.86	$\leq 49$	$\leq 9$	Pass
T-TM2	1.96	34.5	36.46	3.91	$\leq 49$	$\leq 9$	Pass

### 1.2 Pk EIRP

According to FCC KDB 971168 D01 v02r01:

- The peak-to-average power ratio (PAPR) can be get from the CCDF curve, and the PAPR (dB) =  $P_{Pk}$  (dBm) -  $P_{Avg}$  (dBm).
- The maximum PAPR level associated with a probability of 0.1%.
- So, the  $P_{Pk}$  (dBm) = PAPR (dB) +  $P_{Avg}$  (dBm).

EUT Conf.	Avg Condt. Pwr (Tx on), measured [dBm]	PAPR [dB]	Pk Condt. Pwr, measured [dBm]	Ant. Gain [dBi]	Pk EIRP, calculated [dBm]	Pk PD @ 3m, calculated [ $\mu\text{W}/\text{cm}^2$ ]	Limit [dBm]	Limit [ $\mu\text{W}/\text{cm}^2$ ]	Verdict
B-TM1	2.07	5.2	7.27	34.5	41.77	13.29	$\leq 52$	$\leq 18$	Pass
B-TM2	2.03	5.2	7.23	34.5	41.73	13.17	$\leq 52$	$\leq 18$	Pass
M-TM1	1.79	5.2	6.99	34.5	41.49	12.46	$\leq 52$	$\leq 18$	Pass
M-TM2	1.86	5.2	7.06	34.5	41.56	12.66	$\leq 52$	$\leq 18$	Pass
T-TM1	1.90	5.2	7.1	34.5	41.6	12.78	$\leq 52$	$\leq 18$	Pass
T-TM2	1.96	5.2	7.16	34.5	41.66	12.96	$\leq 52$	$\leq 18$	Pass

### 1.3 Pk Condt. Pwr (only for other fixed field disturbance sensors)

(Not applicable)

## 2 Test Plot

### 2.1 Avg EIRP (Tx on)

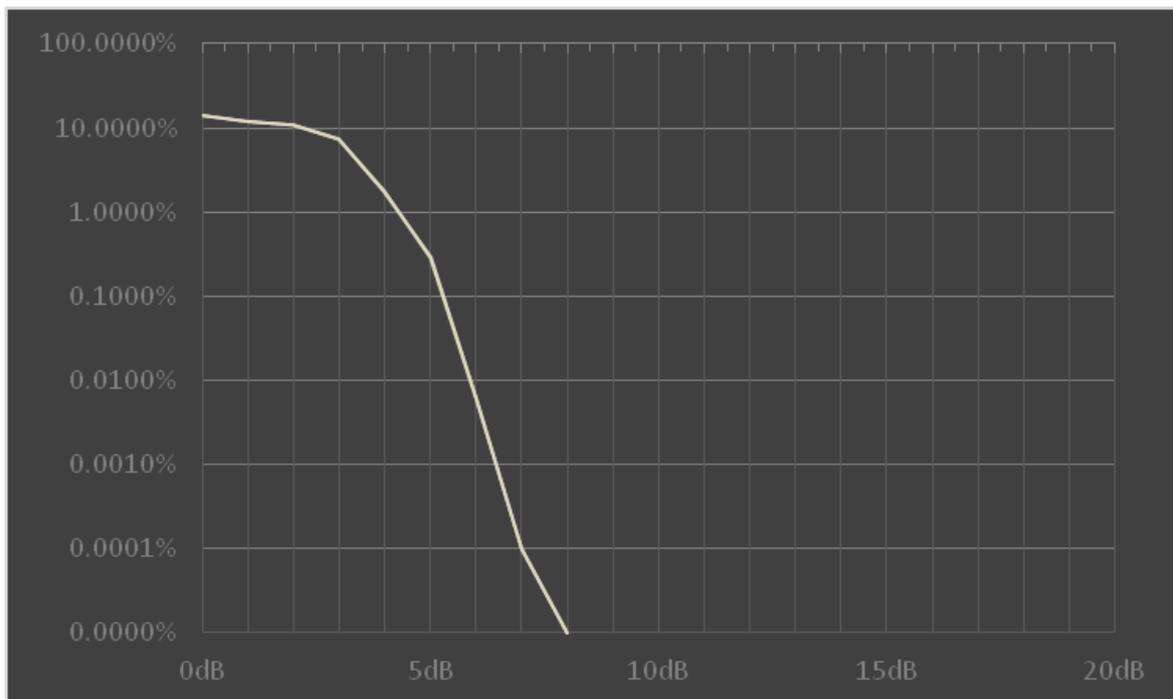
(No plot due to power meter measurement)

### 2.2 Pk EIRP

According to FCC KDB 971168 D01 v02r01:

- The peak-to-average power ratio (PAPR) can be get from the CCDF curve, and the PAPR (dB) =  $P_{Pk}$  (dBm) -  $P_{Avg}$  (dBm).
- The maximum PAPR level associated with a probability of 0.1%.
- So, the  $P_{Pk}$  (dBm) = PAPR (dB) +  $P_{Avg}$  (dBm).

For the EUT, the PAPR level associated with a probability of 0.1% is 5.2 dB (See the following plot). The CCDF curve is statistically from sampled baseband data of the EUT.



### 2.3 Pk Cond. Pwr (only for other fixed field disturbance sensors)

(Not applicable)



# Annex C: Peak Transmitter Output Power



## 1 Result Table

NOTE: The measured values of Pk Condt. Pwr are directly derived from the Annex B, and the test plots are not listed repeatedly.

EUT Conf.	Avg Condt. Pwr, measured [dBm]	PAPR [dB]	Pk Condt. Pwr, calculated [dBm]	Pk Condt. Pwr, calculated [mW]	Limit [mW]	Verdict
B-TM1	2.07	5.2	7.27	5.33	≤ 500	Pass
B-TM2	2.03	5.2	7.23	5.28	≤ 500	Pass
M-TM1	1.79	5.2	6.99	5	≤ 500	Pass
M-TM2	1.86	5.2	7.06	5.08	≤ 500	Pass
T-TM1	1.90	5.2	7.1	5.13	≤ 500	Pass
T-TM2	1.96	5.2	7.16	5.2	≤ 500	Pass



## 2 Test Plot

(The measured values of Avg Condt. Pwr are directly derived from the Annex B, so the test plots are not listed repeatedly.)



# Annex D: Spurious Emissions



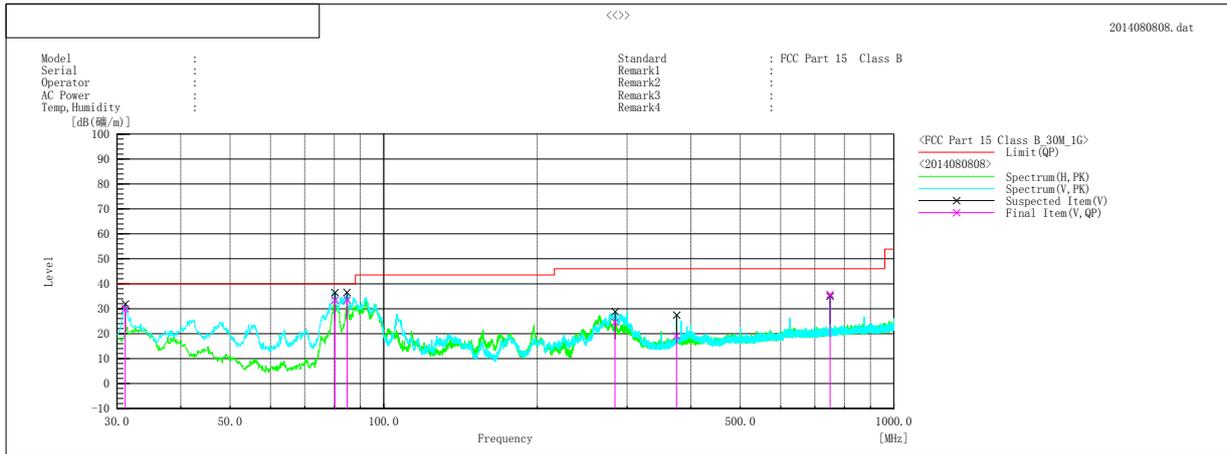
## 1 Result Table

Test Range	EUT Conf.	Emissions	Limit	Verdict
30 MHz to 1 GHz	Worst Case (B-TM1)	< Limit	§15.209 / RSS-Gen general limit	Pass
1 GHz to 18 GHz	Worst Case (B-TM1)	< Limit	§15.209 / RSS-Gen general limit	Pass
18 GHz to 26.5 GHz	Worst Case (B-TM1)	< Limit	§15.209 / RSS-Gen general limit	Pass
26.5 GHz to 40 GHz	Worst Case (B-TM1)	< Limit	§15.209 / RSS-Gen general limit	Pass
40 GHz to 50 GHz	Worst Case (B-TM1)	< Limit	≤ 90 pW/cm <sup>2</sup> @ 3m (≤ -10 dBm EIRP)	Pass
50 GHz to 75 GHz	Worst Case (B-TM1)	< Limit	(1) 57-64GHz: Level(Fc) > Level(Fspu); (2) Other ranges: ≤ 90 pW/cm <sup>2</sup> @ 3m (≤ -10 dBm EIRP)	Pass
75 GHz to 110 GHz	Worst Case (B-TM1)	< Limit	≤ 90 pW/cm <sup>2</sup> @ 3m (≤ -10 dBm EIRP)	Pass
110 GHz to 145 GHz	Worst Case (B-TM1)	< Limit	≤ 90 pW/cm <sup>2</sup> @ 3m (≤ -10 dBm EIRP)	Pass
145 GHz to 220 GHz	Worst Case (B-TM1)	< Limit	≤ 90 pW/cm <sup>2</sup> @ 3m (≤ -10 dBm EIRP)	Pass

## 2 Result Plot

### 2.1 Test range of “30 MHz to 1 GHz”

#### 2.1.1 Worst Case (B-TM1)

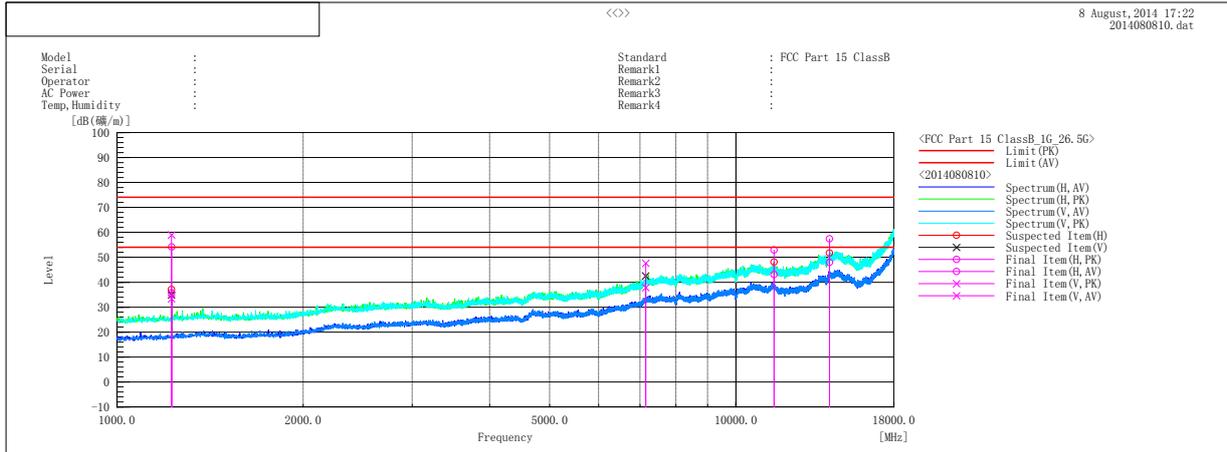


Final Result

No.	Frequency [MHz]	(P)	Reading [dB(μV/m)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	31.116	V	50.3	-20.3	30.0	40.0	10.0	100.0	4.0	
2	80.260	V	64.1	-30.7	33.4	40.0	6.6	194.0	216.0	
3	84.723	V	63.3	-29.8	33.5	40.0	6.5	145.0	231.0	
4	284.078	V	48.3	-23.7	24.6	46.0	21.4	100.0	20.0	
5	375.004	V	39.9	-20.7	19.2	46.0	26.8	100.0	85.0	
6	750.005	V	51.1	-15.4	35.7	46.0	10.3	114.0	22.0	

### 2.2 Test range of “1 GHz to 18 GHz”

#### 2.2.1 Worst Case (B-TM1)

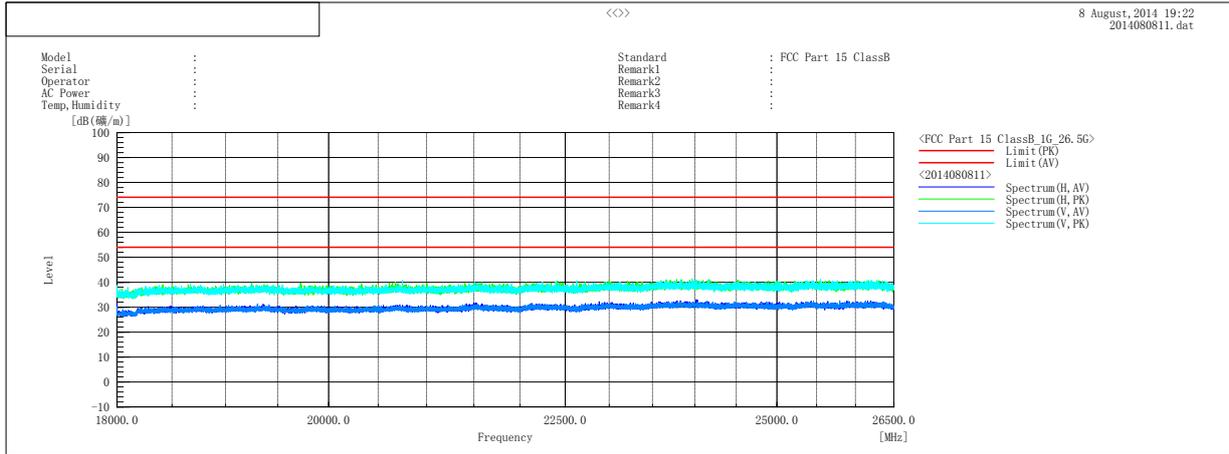


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV/m)]	Reading AV [dB(μV/m)]	c. f [dB(1/m)]	Result PK [dB(μV/m)]	Result AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [°]	Remark
1	1224.666	V	71.2	45.7	-12.3	58.9	33.4	74.0	54.0	15.1	20.6	101.0	101.0	
2	1225.358	H	66.4	48.0	-12.3	54.1	35.7	74.0	54.0	19.9	18.3	180.0	355.0	
3	7149.770	V	44.7	34.9	2.9	47.6	37.8	74.0	54.0	26.4	16.2	204.0	99.0	
4	11526.295	H	44.1	34.3	8.8	52.9	43.1	74.0	54.0	21.1	10.9	100.0	341.0	
5	14162.812	H	44.7	35.4	12.6	57.3	47.9	74.0	54.0	16.7	6.1	109.0	348.0	

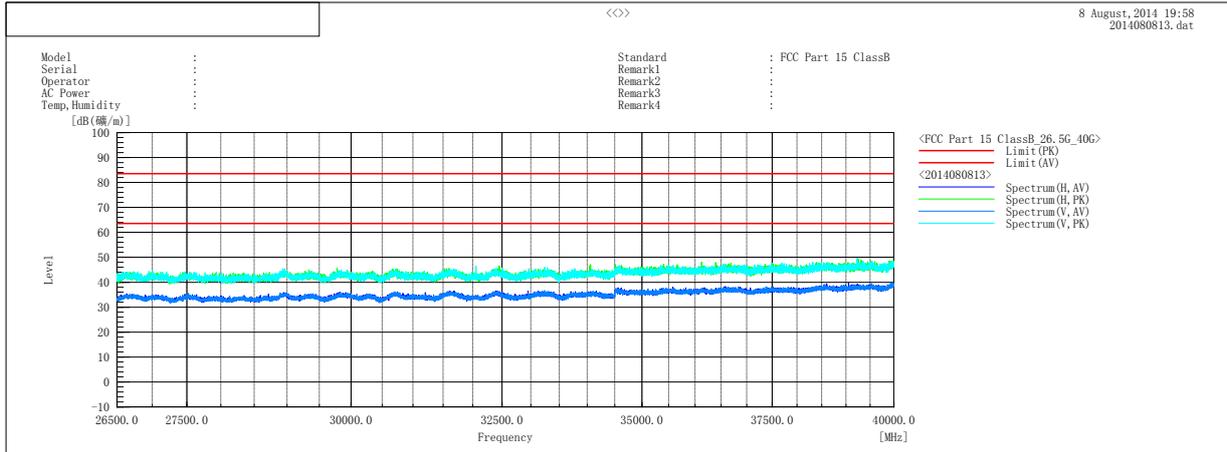
### 2.3 Test range of "18 GHz to 26.5 GHz"

#### 2.3.1 Worst Case (B-TM1)



## 2.4 Test range of “26.5 GHz to 40 GHz”

### 2.4.1 Worst Case (B-TM1)

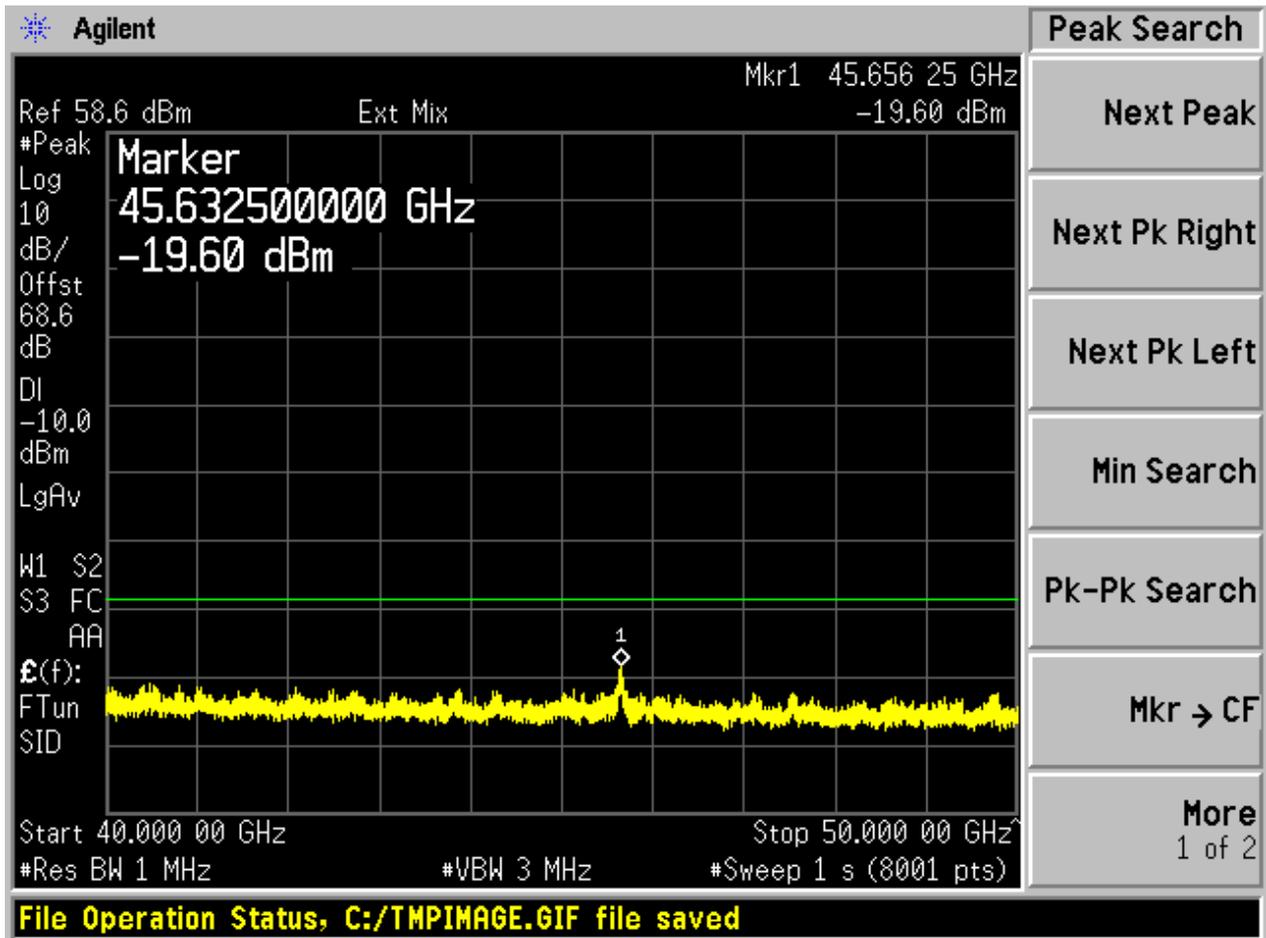


Final Result

No.	Frequency (P) [MHz]	c. f [dB(1/m)]	Height [cm]	Angle [°]	Remark
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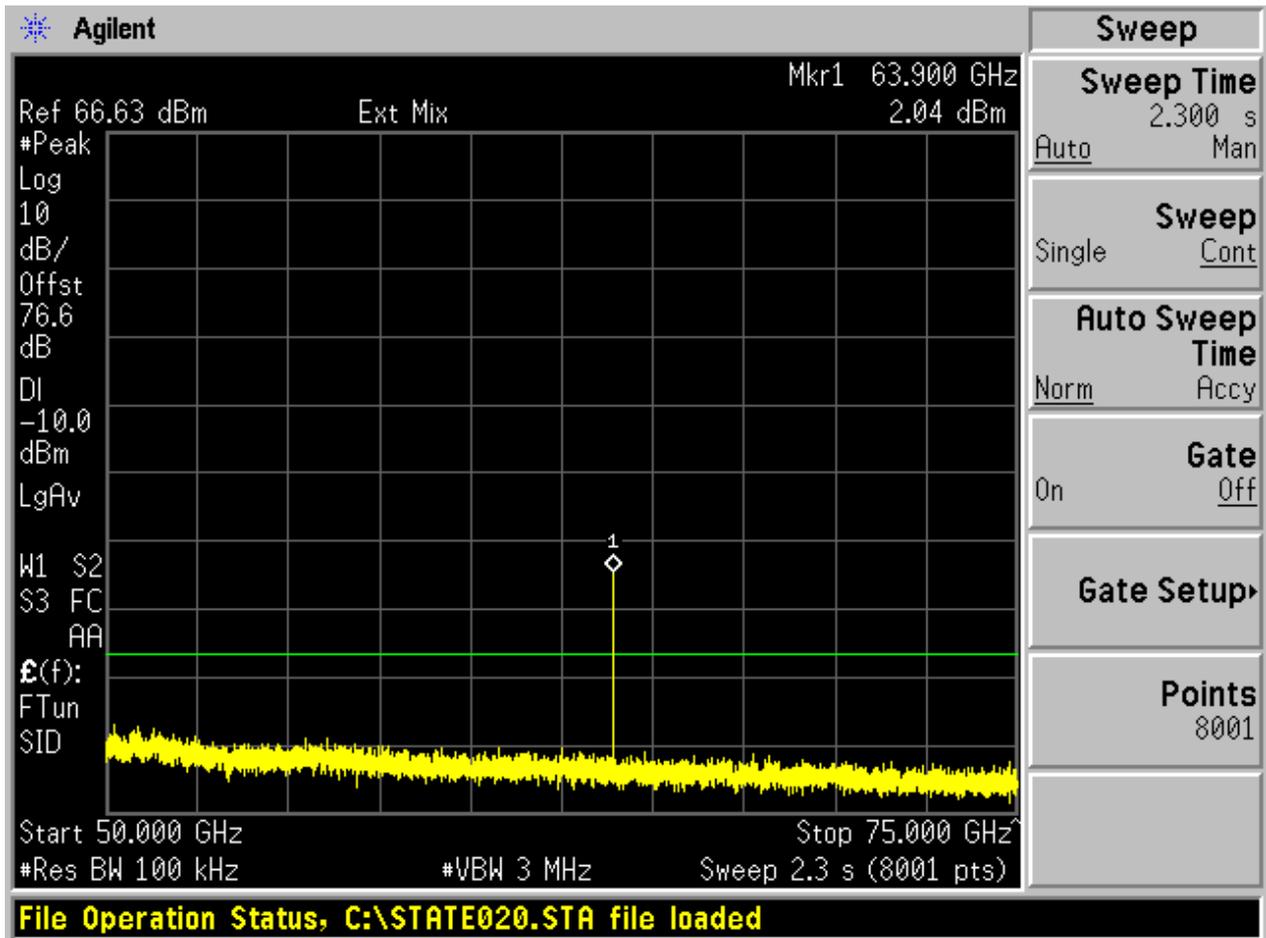
## 2.5 Test range of “40 GHz to 50 GHz”

### 2.5.1 Worst Case (B-TM1)



## 2.6 Test range of "50 GHz to 75 GHz"

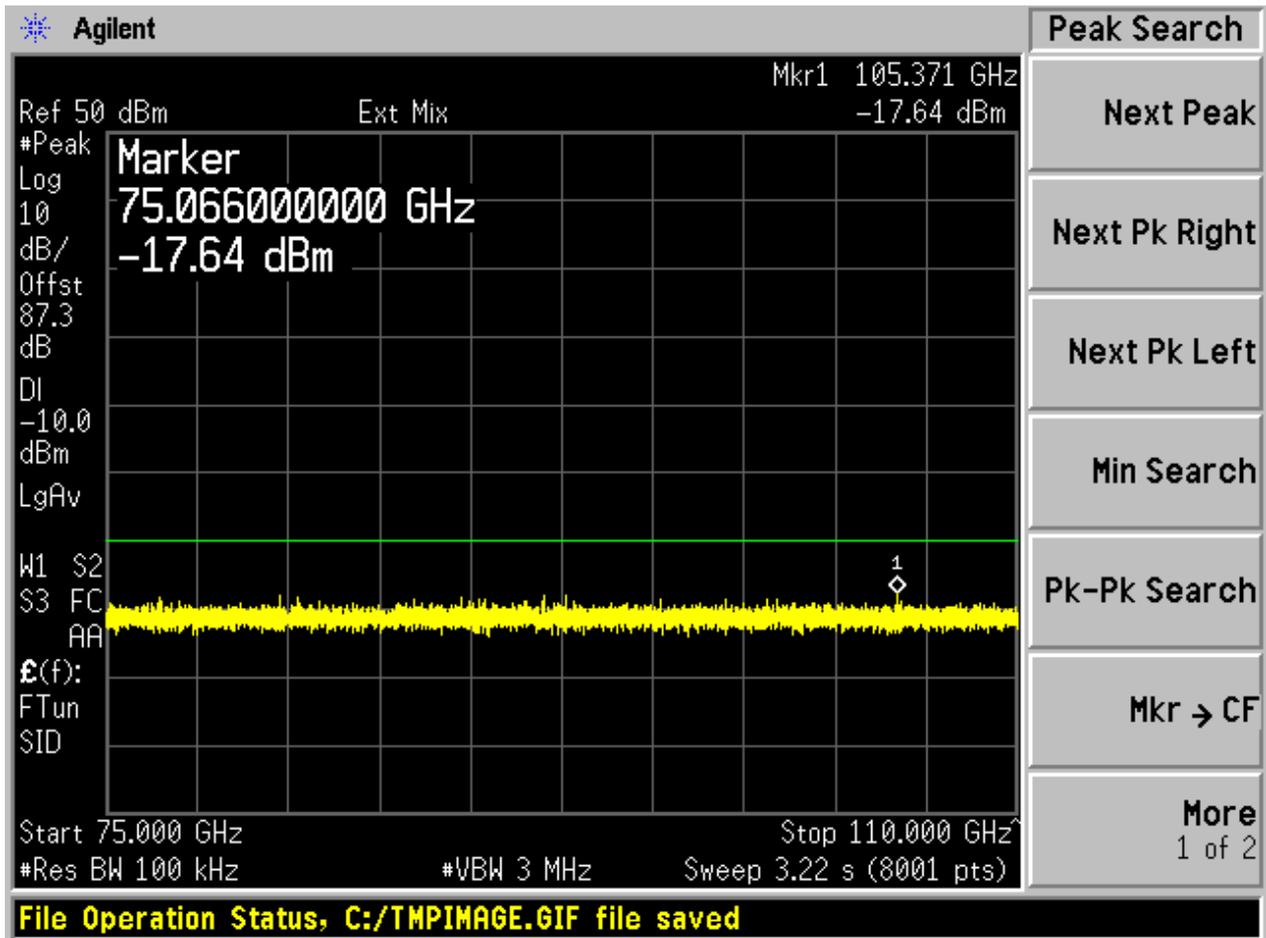
### 2.6.1 Worst Case (B-TM1)



(According to FCC "MILLIMETER WAVE TEST PROCEDURES", the reduced RBW is used to increase system sensitivity. No obvious emissions are found in spurious test ranges.)

## 2.7 Test range of "75 GHz to 110 GHz"

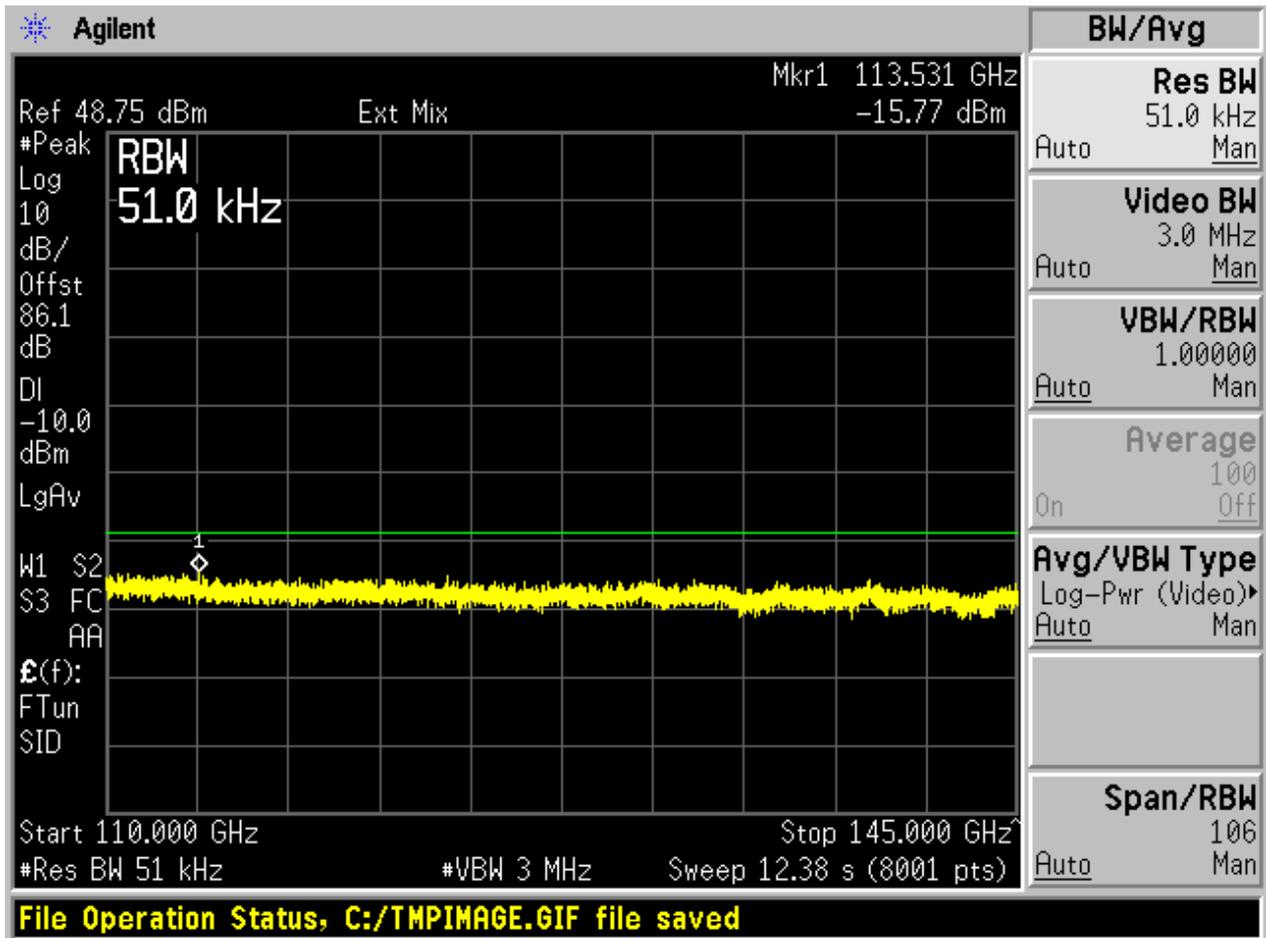
### 2.7.1 Worst Case (B-TM1)



(According to FCC "MILLIMETER WAVE TEST PROCEDURES", the reduced RBW is used to increase system sensitivity. No obvious emissions are found in spurious test ranges.)

## 2.8 Test range of "110 GHz to 145 GHz"

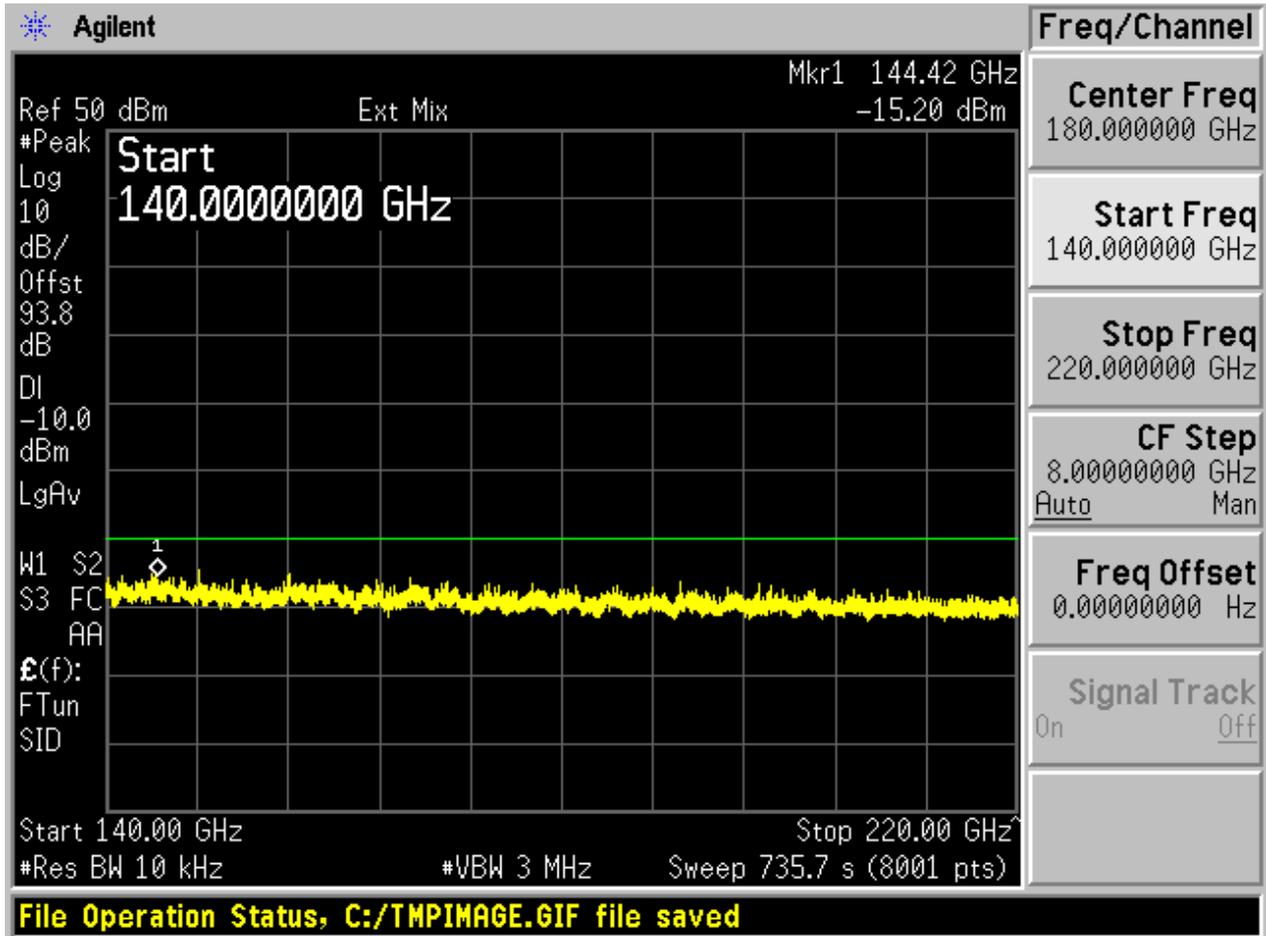
### 2.8.1 Worst Case (B-TM1)



(According to FCC "MILLIMETER WAVE TEST PROCEDURES", the reduced RBW is used to increase system sensitivity. No obvious emissions are found in spurious test ranges.)

## 2.9 Test range of "145 GHz to 220 GHz"

### 2.9.1 Worst Case (B-TM1)



(According to FCC "MILLIMETER WAVE TEST PROCEDURES", the reduced RBW is used to increase system sensitivity. No obvious emissions are found in spurious test ranges.)



# Annex E: Frequency Stability



## 1 Result Table

EUT Conf.	Voltage	Temperature	fL/fH [GHz]	Limit [GHz]	Verdict
B-TM1	100 %	-20 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	-10 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	0 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	+10 °C	59.006684615	fL > 57, fH < 64	Pass
	85 %	+20 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	+20 °C	59.006250000	fL > 57, fH < 64	Pass
	115 %	+20 °C	59.006730769	fL > 57, fH < 64	Pass
	100 %	+30 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	+40 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	+50 °C	59.006250000	fL > 57, fH < 64	Pass
	B-TM2	100 %	-20 °C	59.006250000	fL > 57, fH < 64
100 %		-10 °C	59.006250000	fL > 57, fH < 64	Pass
100 %		0 °C	59.006203846	fL > 57, fH < 64	Pass
100 %		+10 °C	59.006684615	fL > 57, fH < 64	Pass
85 %		+20 °C	59.071600000	fL > 57, fH < 64	Pass
100 %		+20 °C	59.006250000	fL > 57, fH < 64	Pass
115 %		+20 °C	59.006250000	fL > 57, fH < 64	Pass
100 %		+30 °C	59.006250000	fL > 57, fH < 64	Pass
100 %		+40 °C	59.006250000	fL > 57, fH < 64	Pass
100 %		+50 °C	59.006250000	fL > 57, fH < 64	Pass
T-TM1		100 %	-20 °C	63.993750000	fL > 57, fH < 64
	100 %	-10 °C	63.993750000	fL > 57, fH < 64	Pass
	100 %	0 °C	63.993750000	fL > 57, fH < 64	Pass
	100 %	+10 °C	63.993750000	fL > 57, fH < 64	Pass
	85 %	+20 °C	63.994230705	fL > 57, fH < 64	Pass
	100 %	+20 °C	63.993750000	fL > 57, fH < 64	Pass
	115 %	+20 °C	63.993749936	fL > 57, fH < 64	Pass
	100 %	+30 °C	63.993750000	fL > 57, fH < 64	Pass
	100 %	+40 °C	63.993750000	fL > 57, fH < 64	Pass
	100 %	+50 °C	63.993750000	fL > 57, fH < 64	Pass
	T-TM2	100 %	-20 °C	63.993269231	fL > 57, fH < 64
100 %		-10 °C	63.993269231	fL > 57, fH < 64	Pass
100 %		0 °C	63.993750000	fL > 57, fH < 64	Pass
100 %		+10 °C	63.993269231	fL > 57, fH < 64	Pass
85 %		+20 °C	63.993269167	fL > 57, fH < 64	Pass
100 %		+20 °C	63.993750000	fL > 57, fH < 64	Pass
115 %		+20 °C	63.993269167	fL > 57, fH < 64	Pass
100 %		+30 °C	63.993750000	fL > 57, fH < 64	Pass
100 %		+40 °C	63.994230769	fL > 57, fH < 64	Pass



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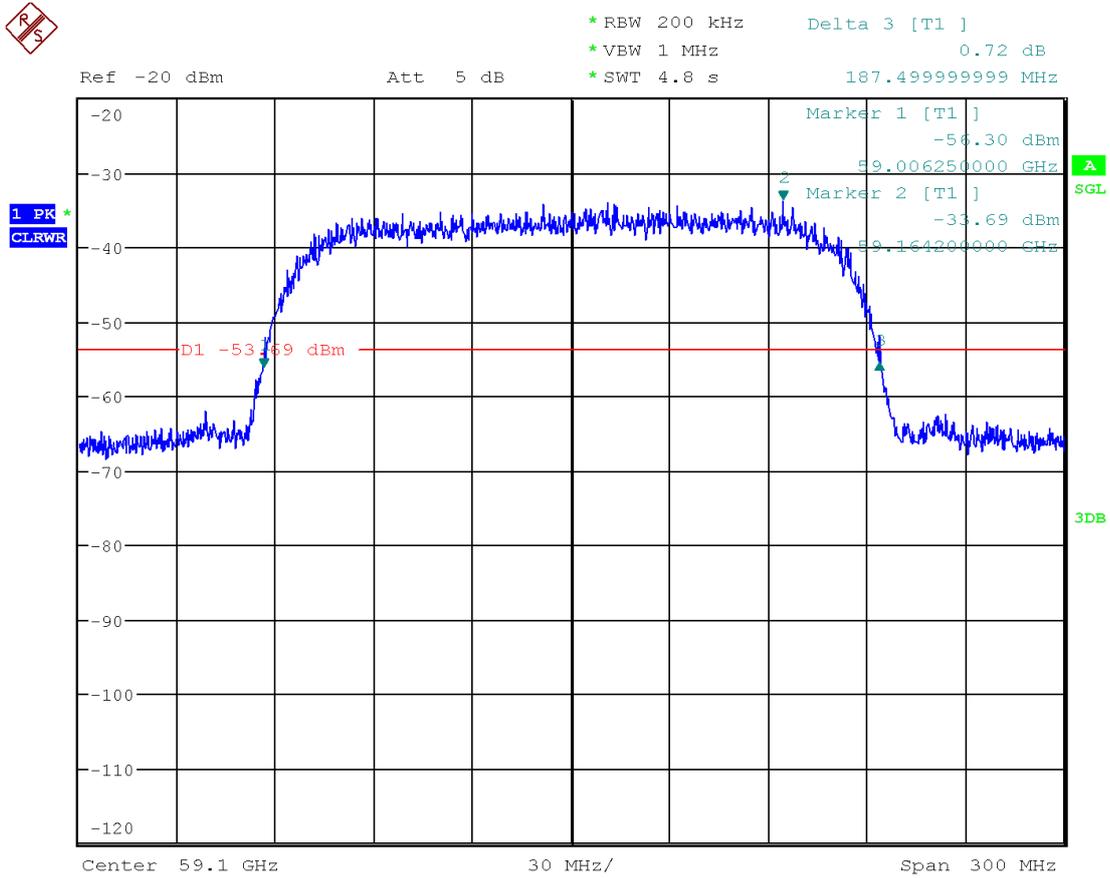
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EUT Conf.	Voltage	Temperature	fL/fH [GHz]	Limit [GHz]	Verdict
	100 %	+50 °C	63.993269231	fL > 57, fH < 64	Pass

## 2 Test Plot

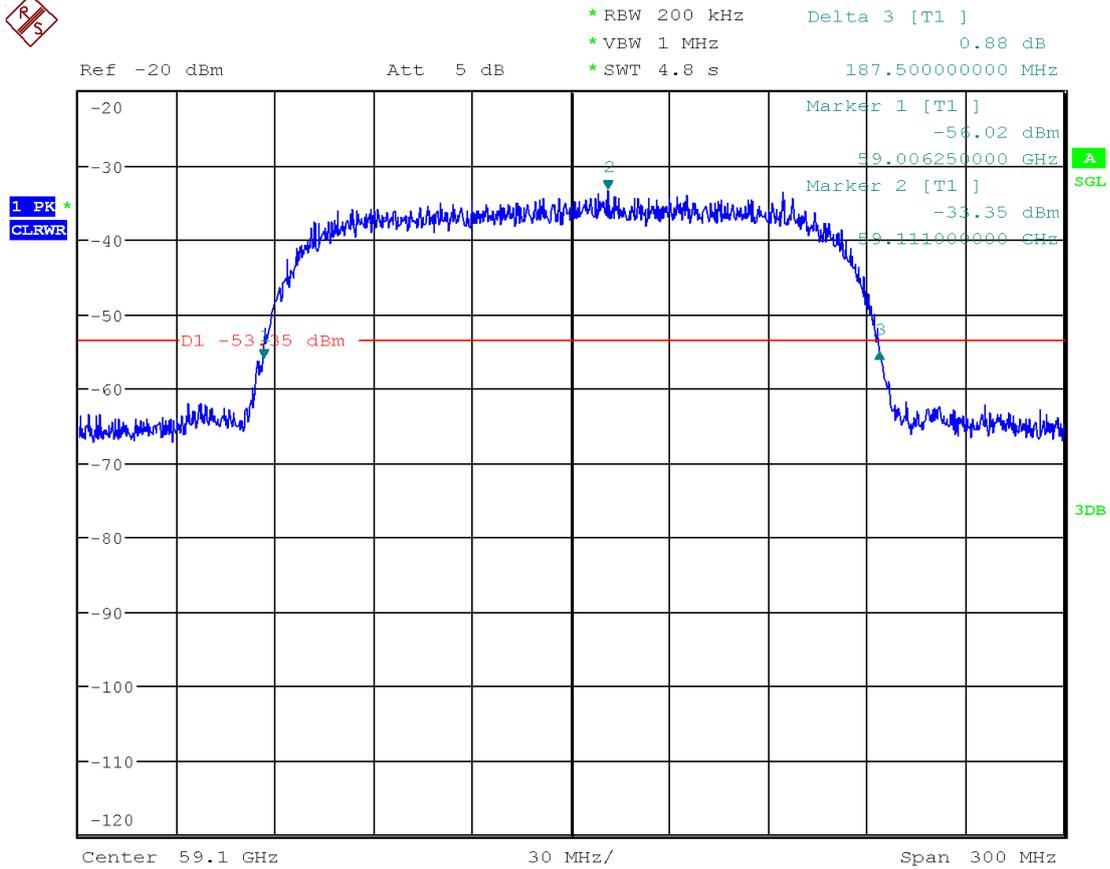
### 2.1 B-TM1

#### 2.1.1 Voltage=100 %, Temperature=-20 °C



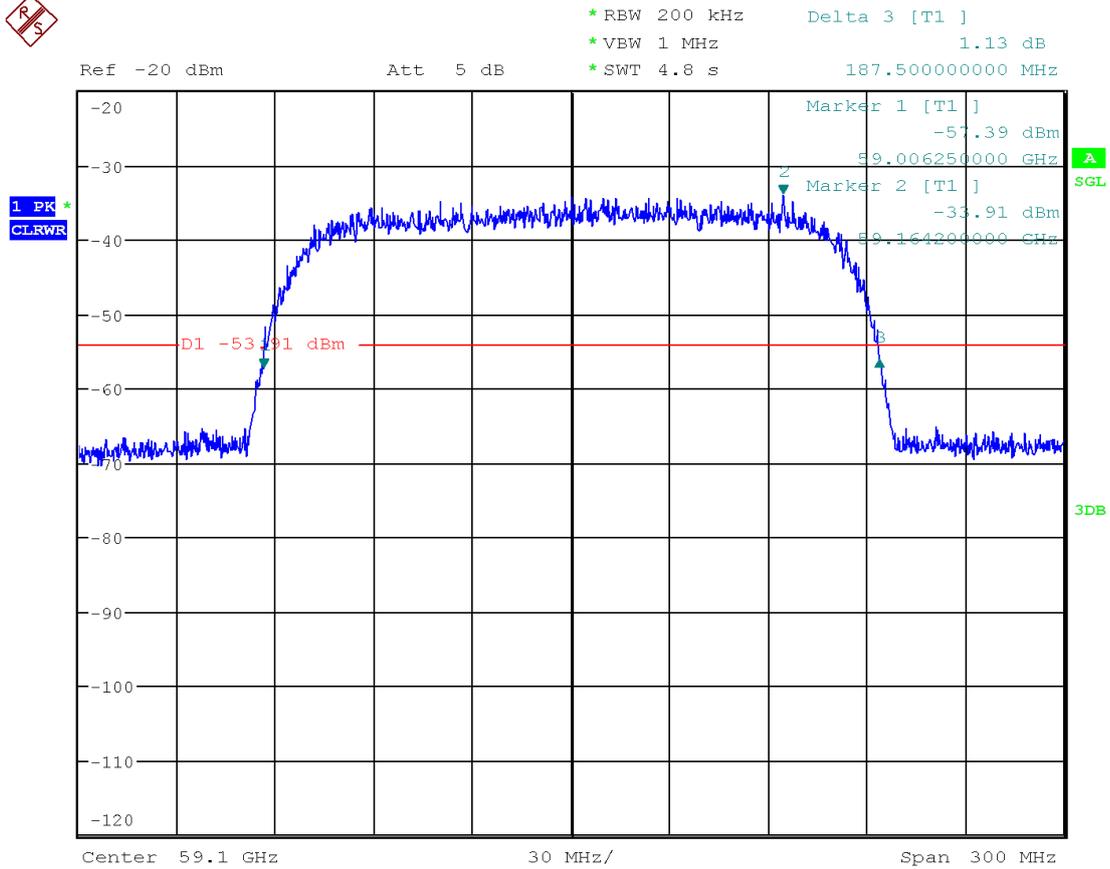
#### 2.1.2 Voltage=100 %, Temperature=-10 °C





**2.1.4 Voltage=100 %, Temperature=+10 °C**

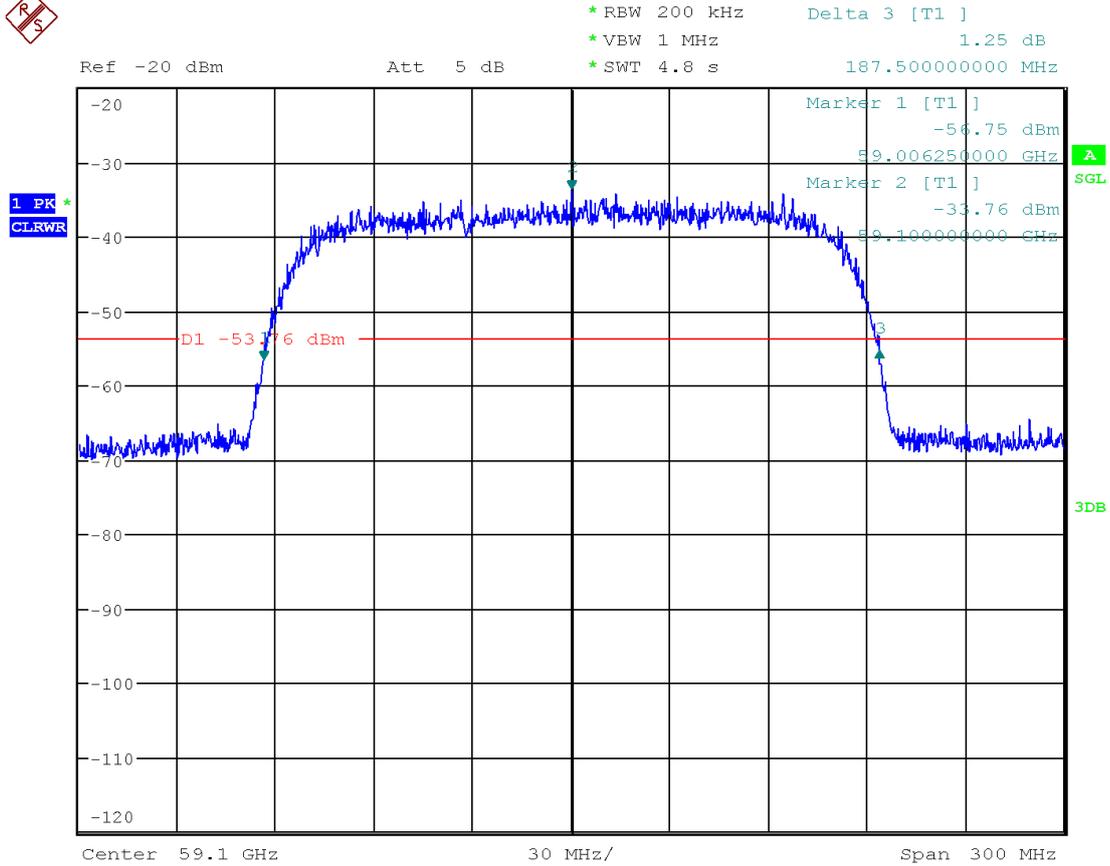




### 2.1.6 Voltage=100 %, Temperature=+20 °C

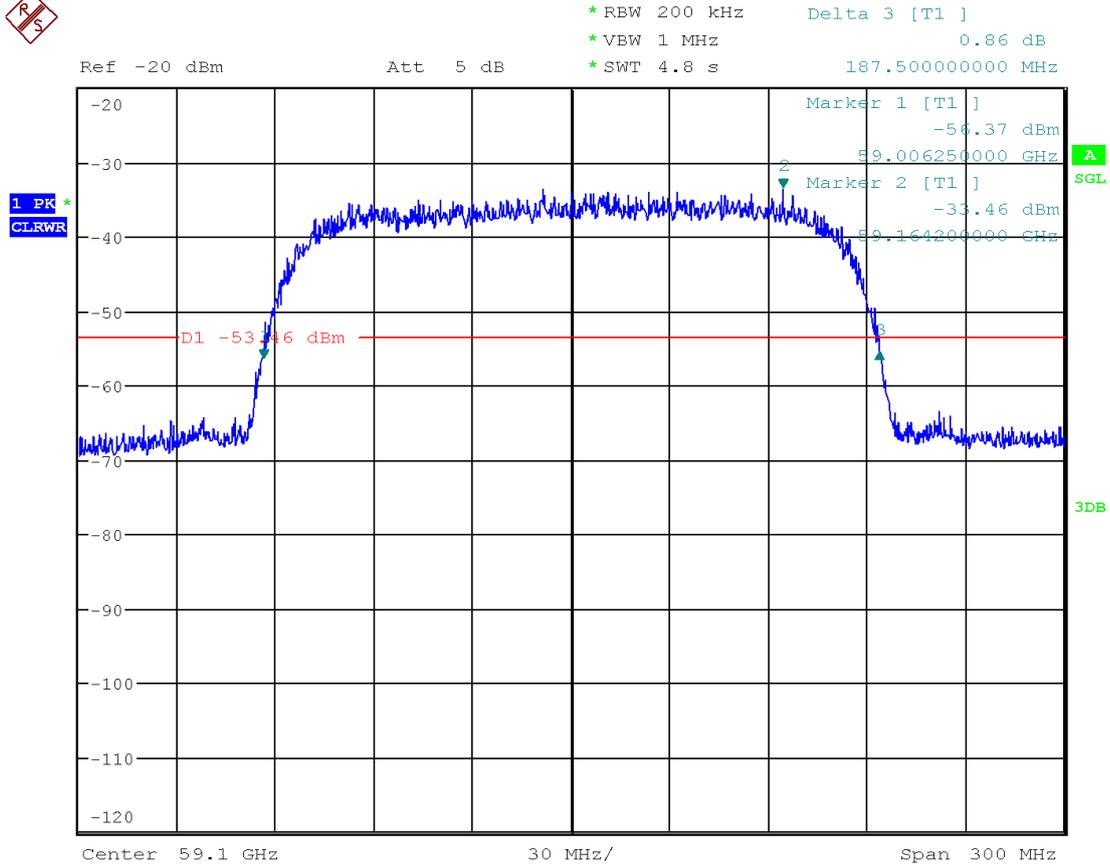






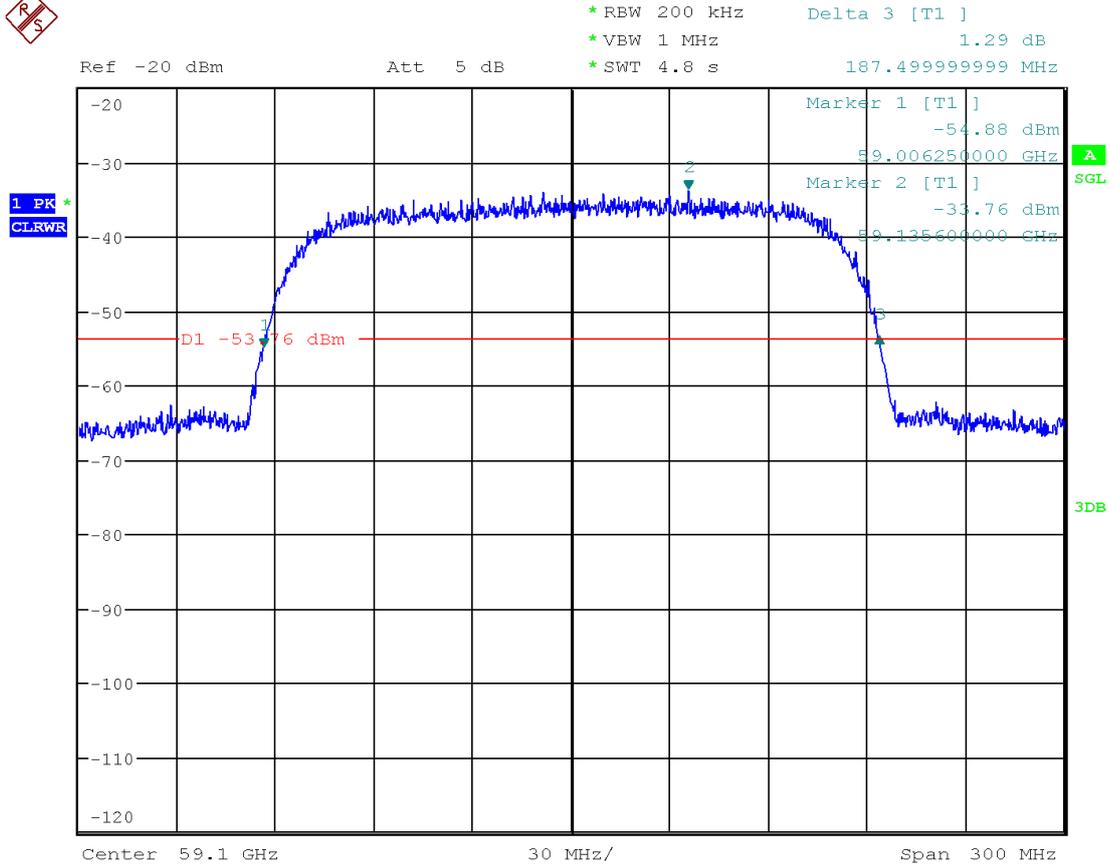
### 2.1.9 Voltage=100 %, Temperature=+40 °C



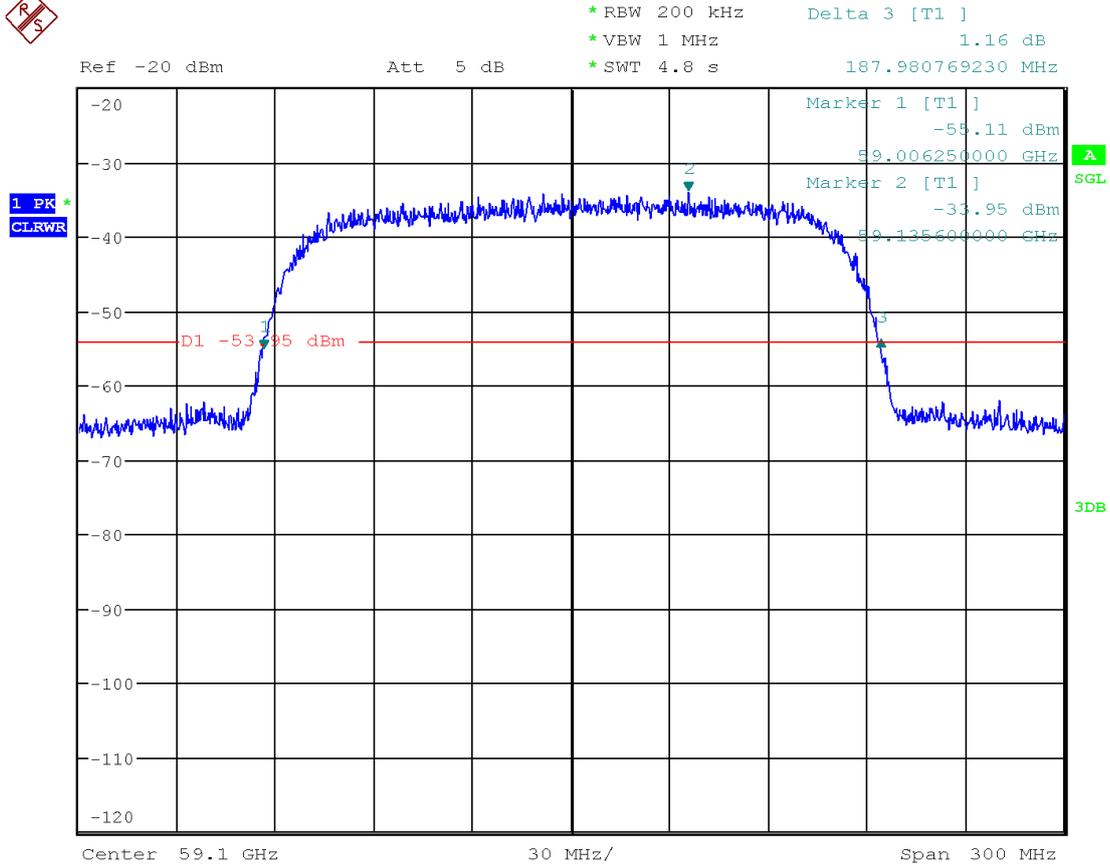


## 2.2 B-TM2

### 2.2.1 Voltage=100 %, Temperature=-20 °C

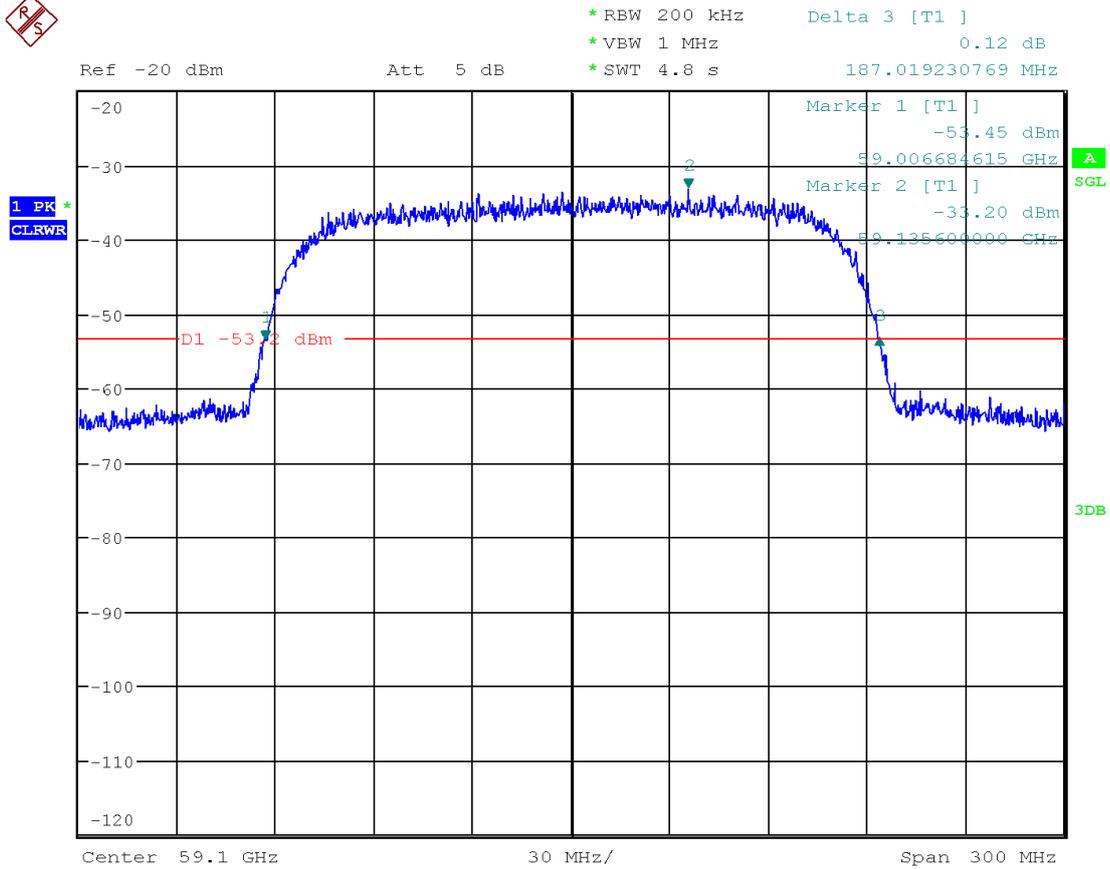


### 2.2.2 Voltage=100 %, Temperature=-10 °C

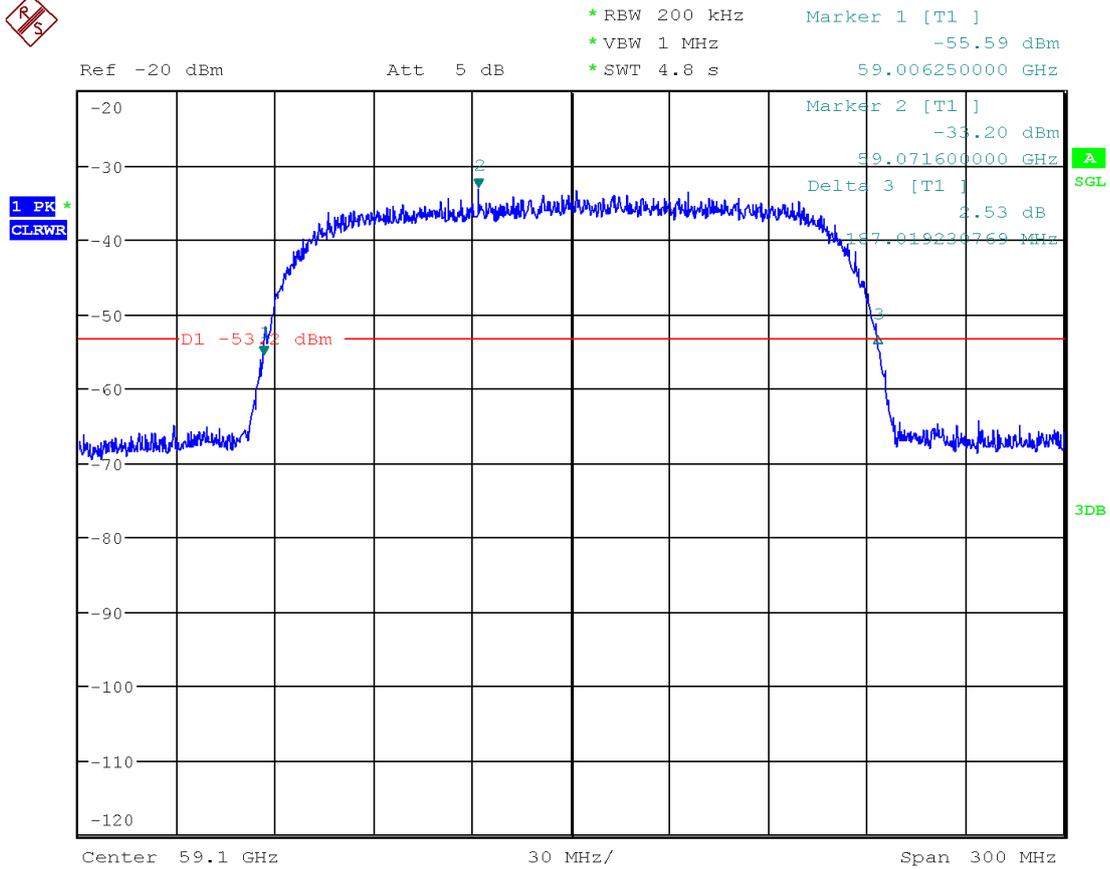


### 2.2.3 Voltage=100 %, Temperature=0 °C

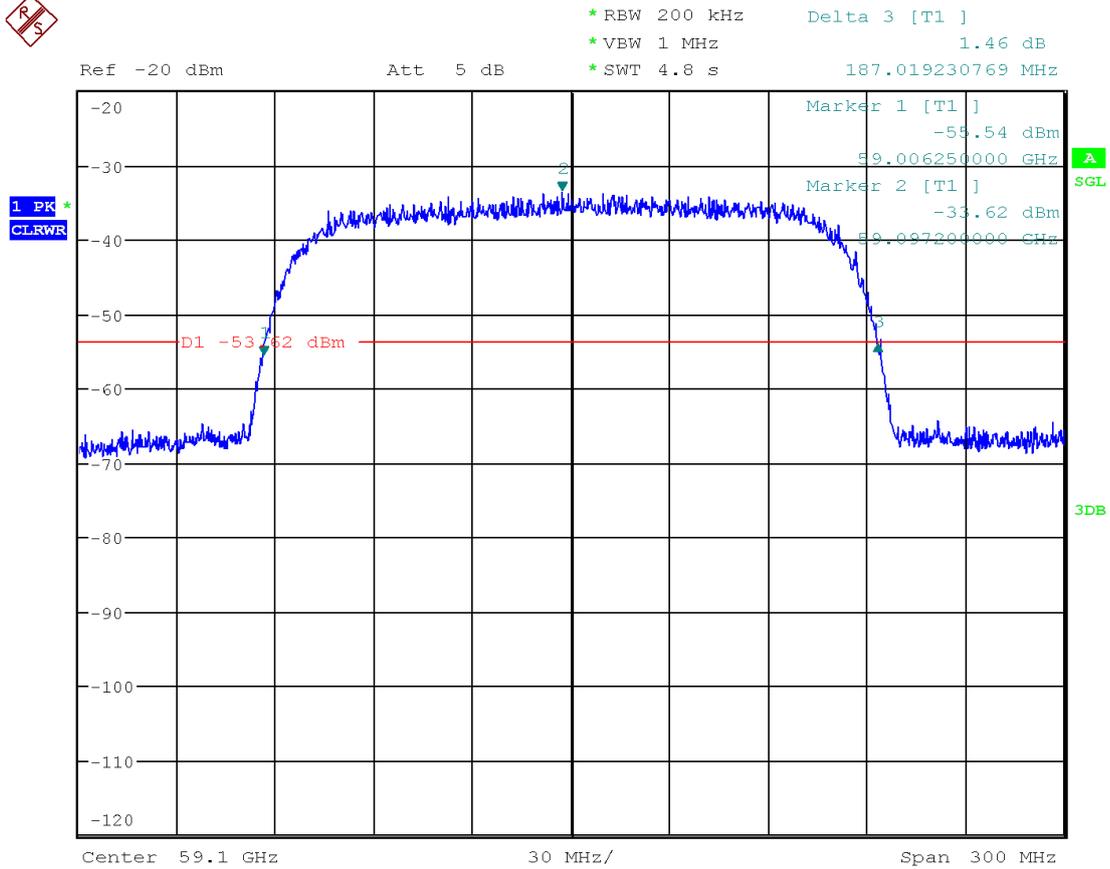




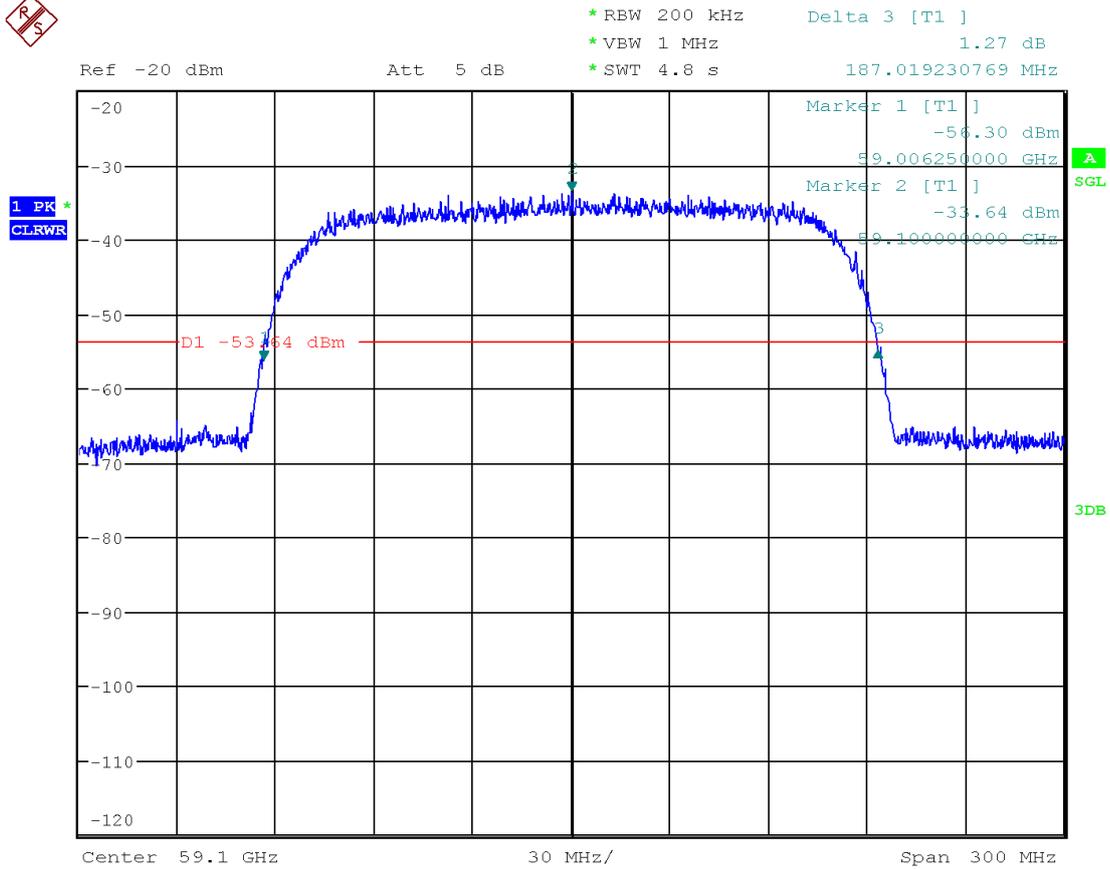
### 2.2.5 Voltage=85 %, Temperature=+20 °C



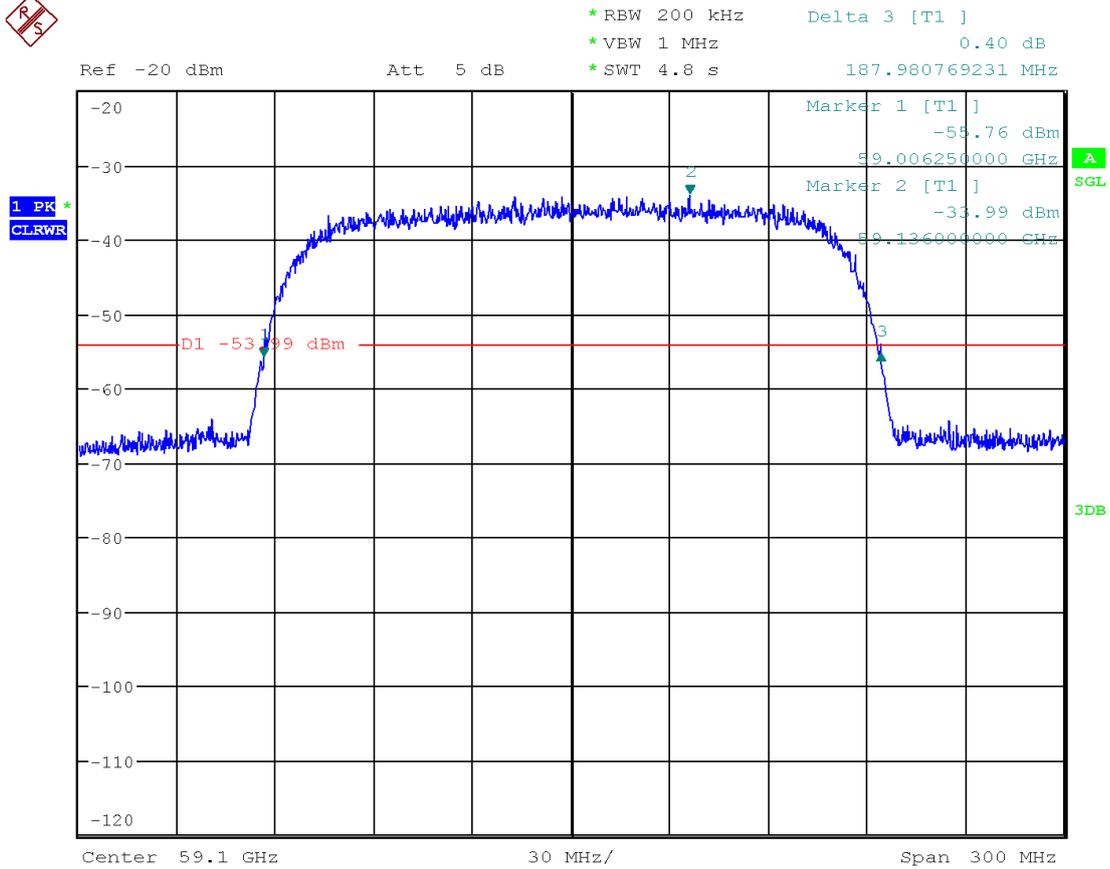
## 2.2.6 Voltage=100 %, Temperature=+20 °C



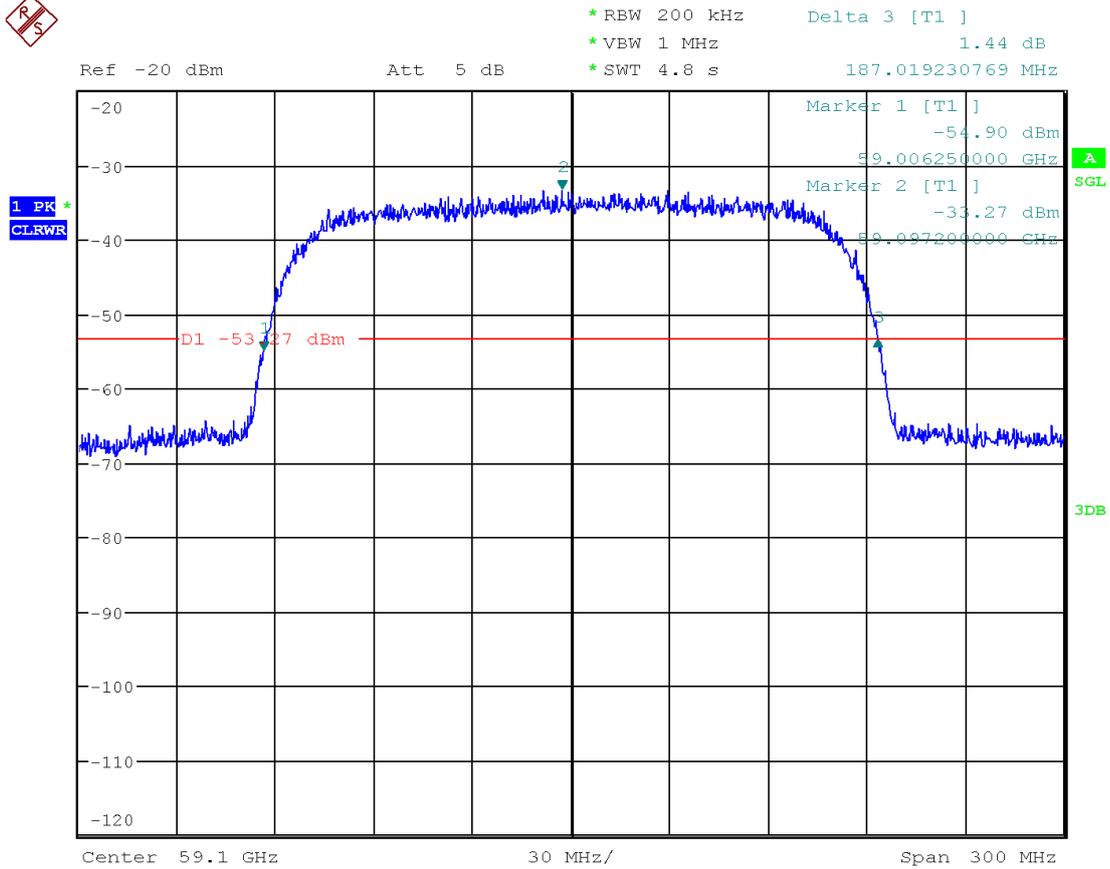
### 2.2.7 Voltage=115 %, Temperature=+20 °C



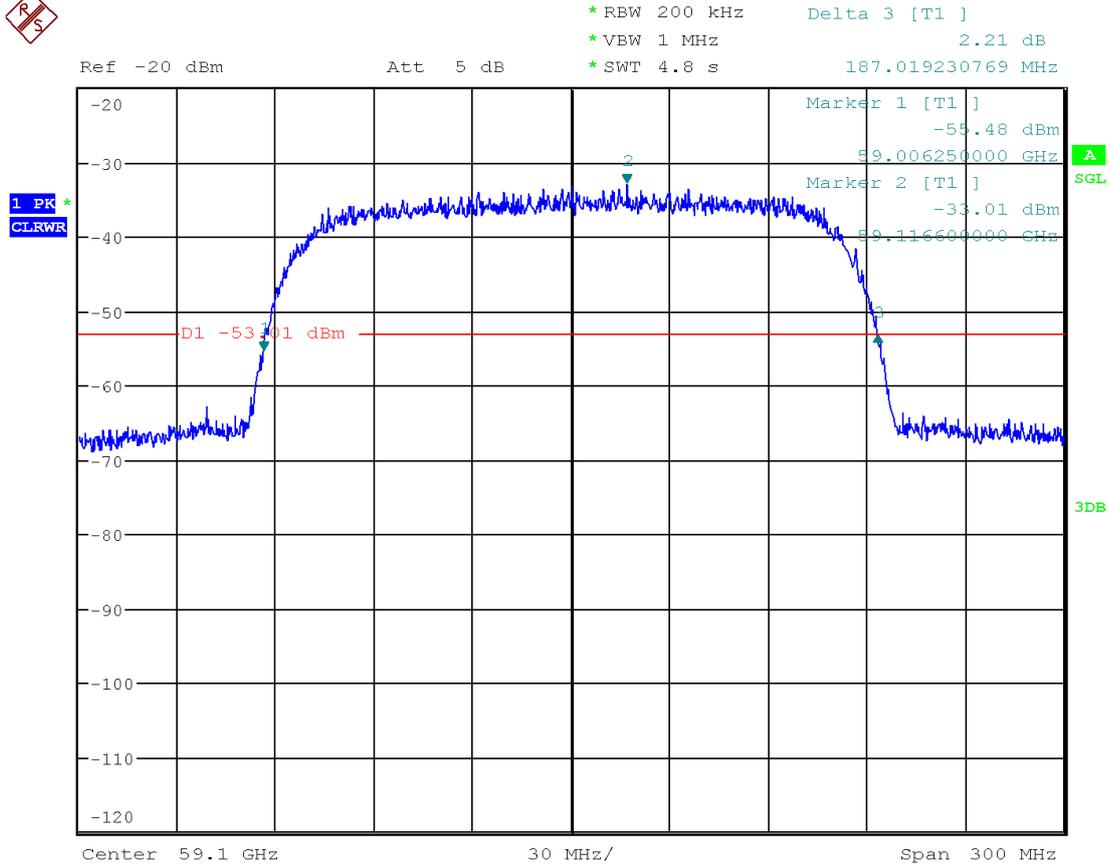
**2.2.8 Voltage=100 %, Temperature=+30 °C**



### 2.2.9 Voltage=100 %, Temperature=+40 °C



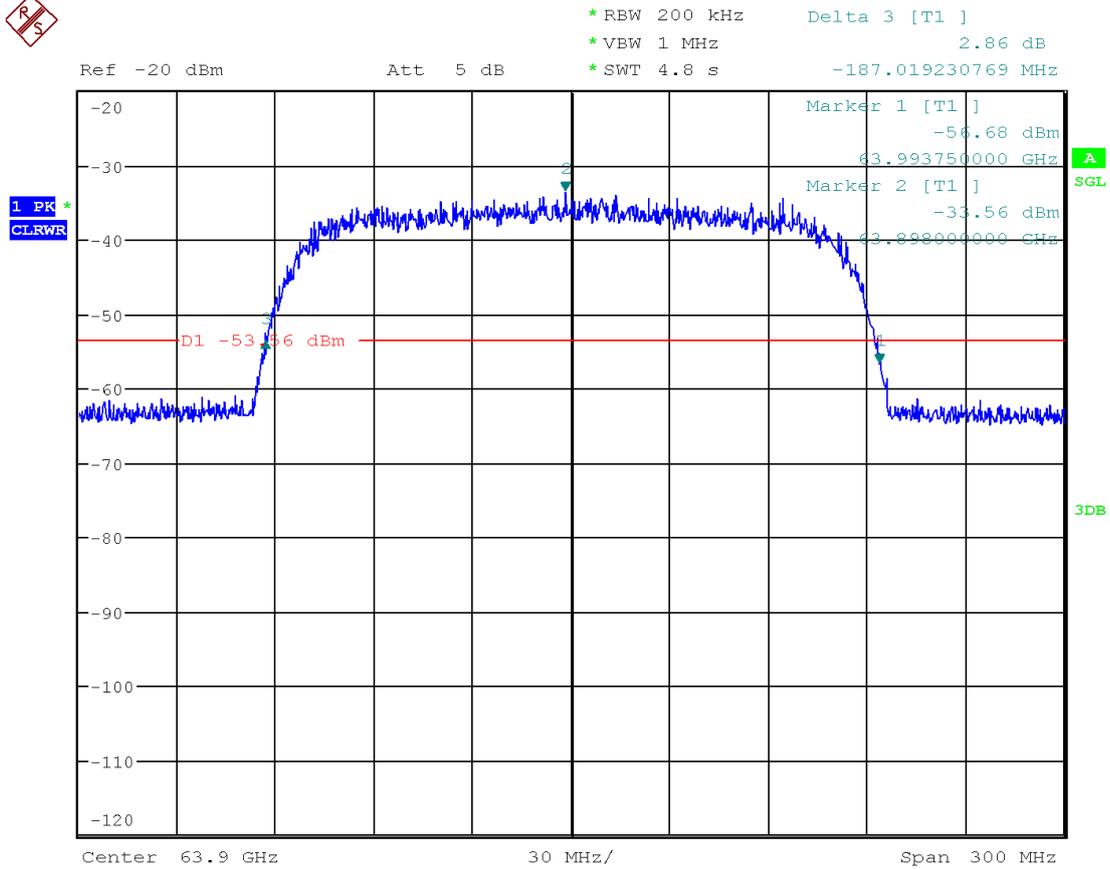
### 2.2.10 Voltage=100 %, Temperature=+50 °C



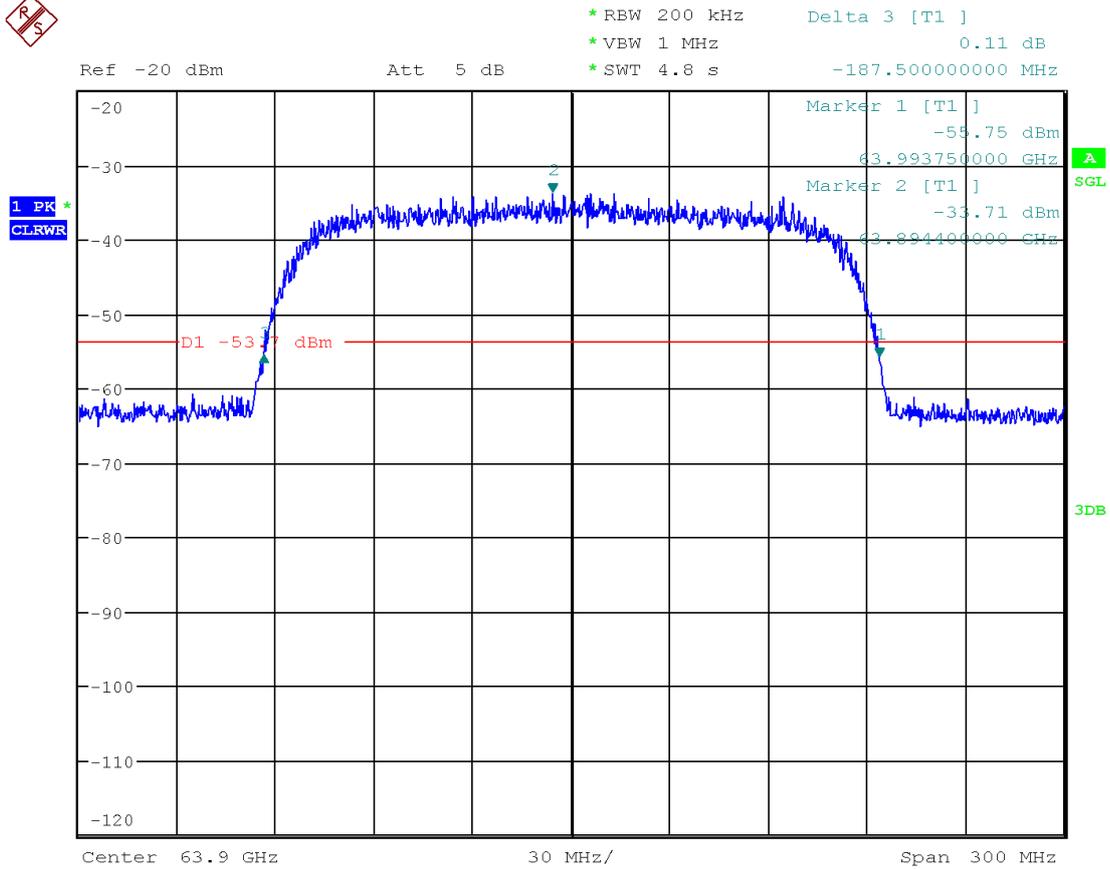
## 2.3 T-TM1

### 2.3.1 Voltage=100 %, Temperature=-20 °C



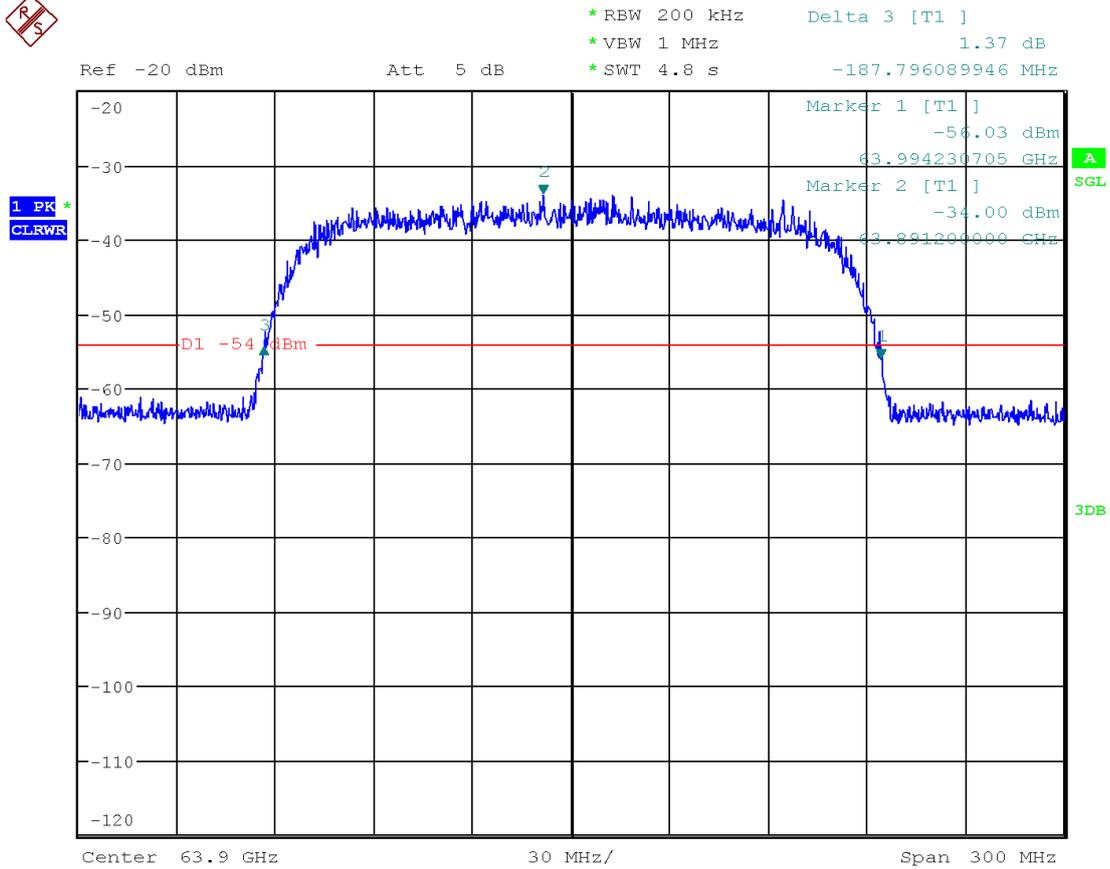


### 2.3.3 Voltage=100 %, Temperature=0 °C



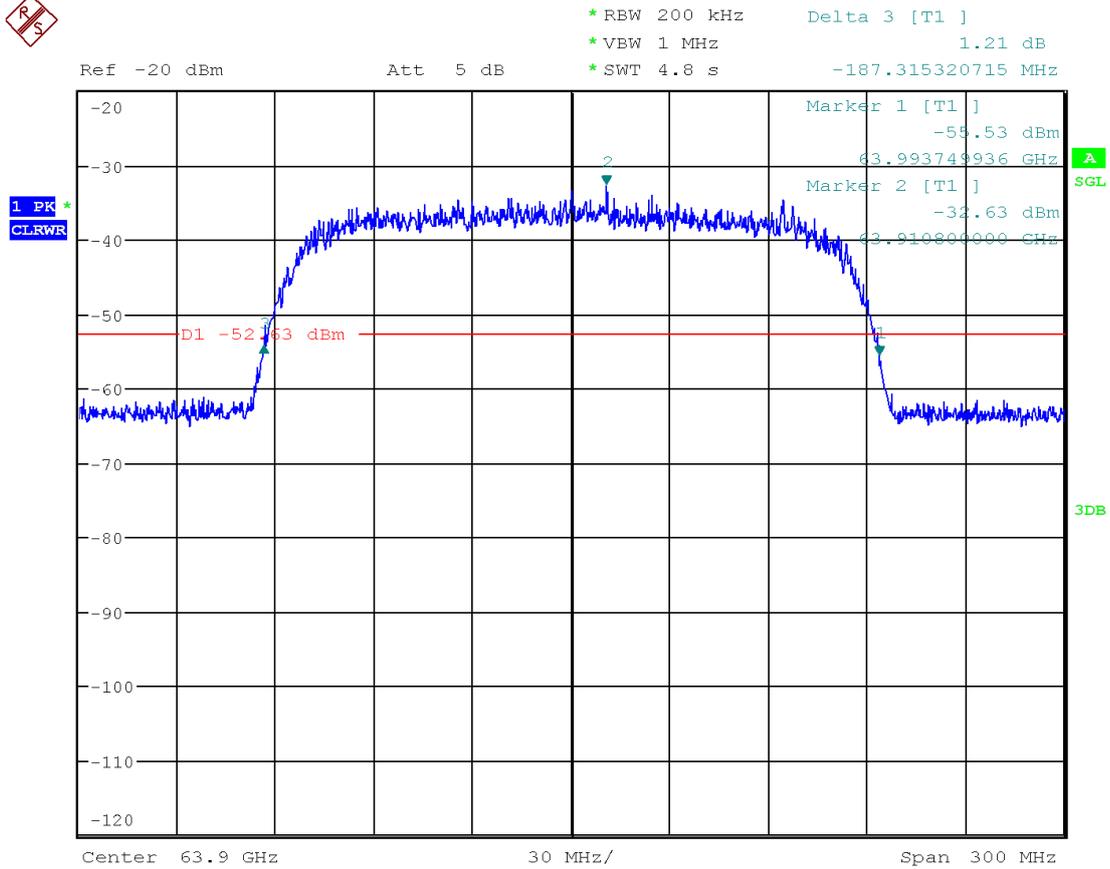
### 2.3.4 Voltage=100 %, Temperature=+10 °C





### 2.3.6 Voltage=100 %, Temperature=+20 °C





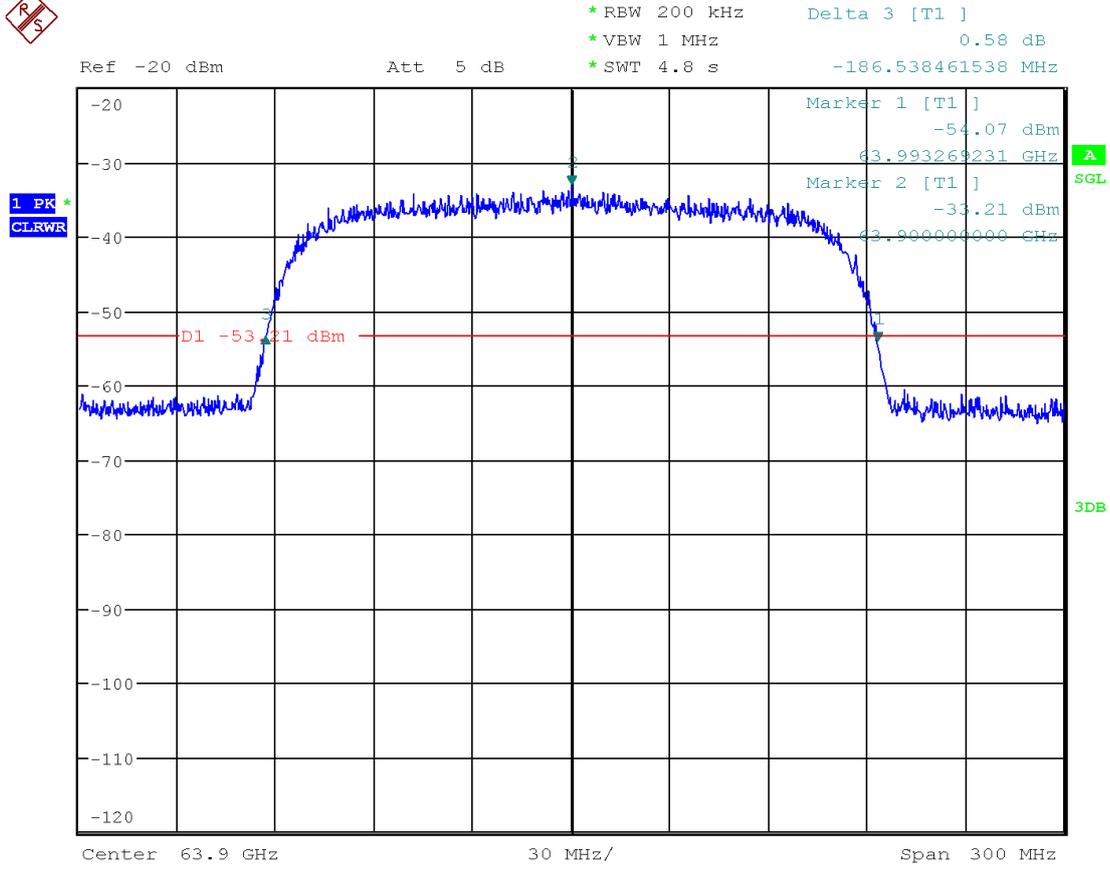
### 2.3.8 Voltage=100 %, Temperature=+30 °C





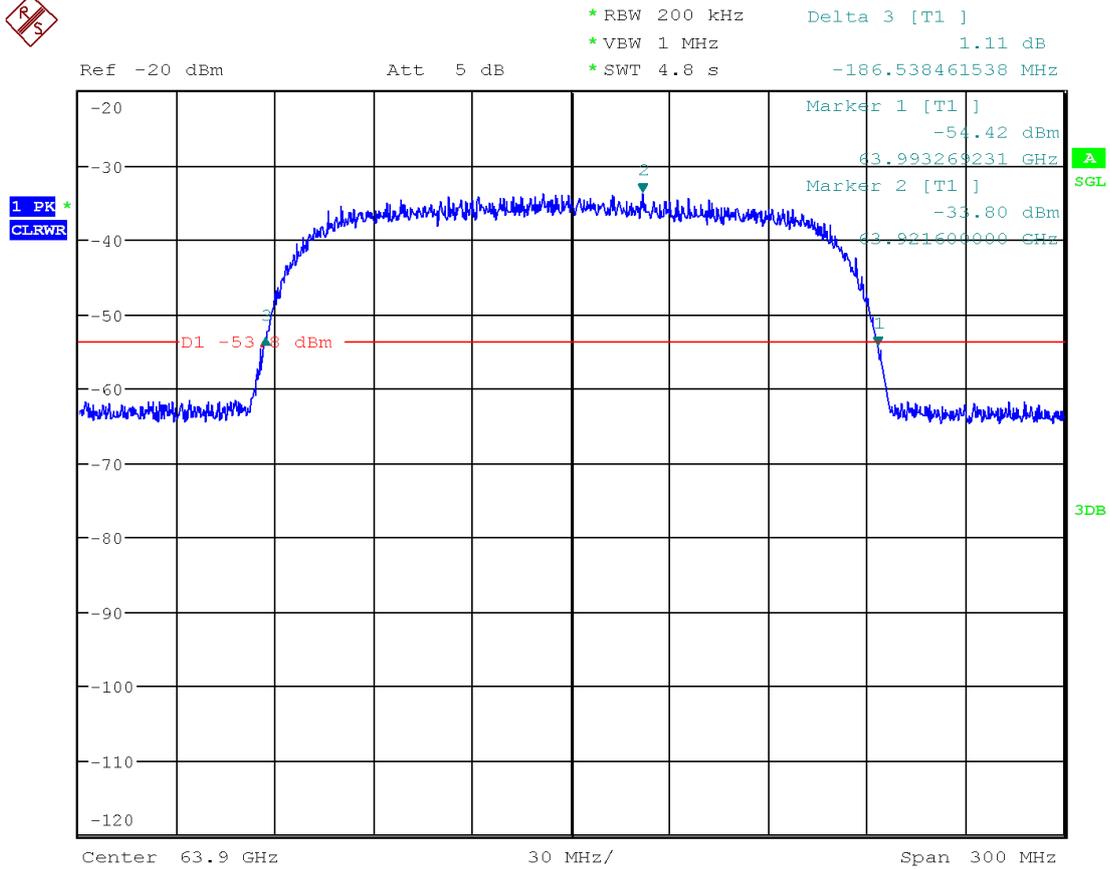






**2.4.3 Voltage=100 %, Temperature=0 °C**

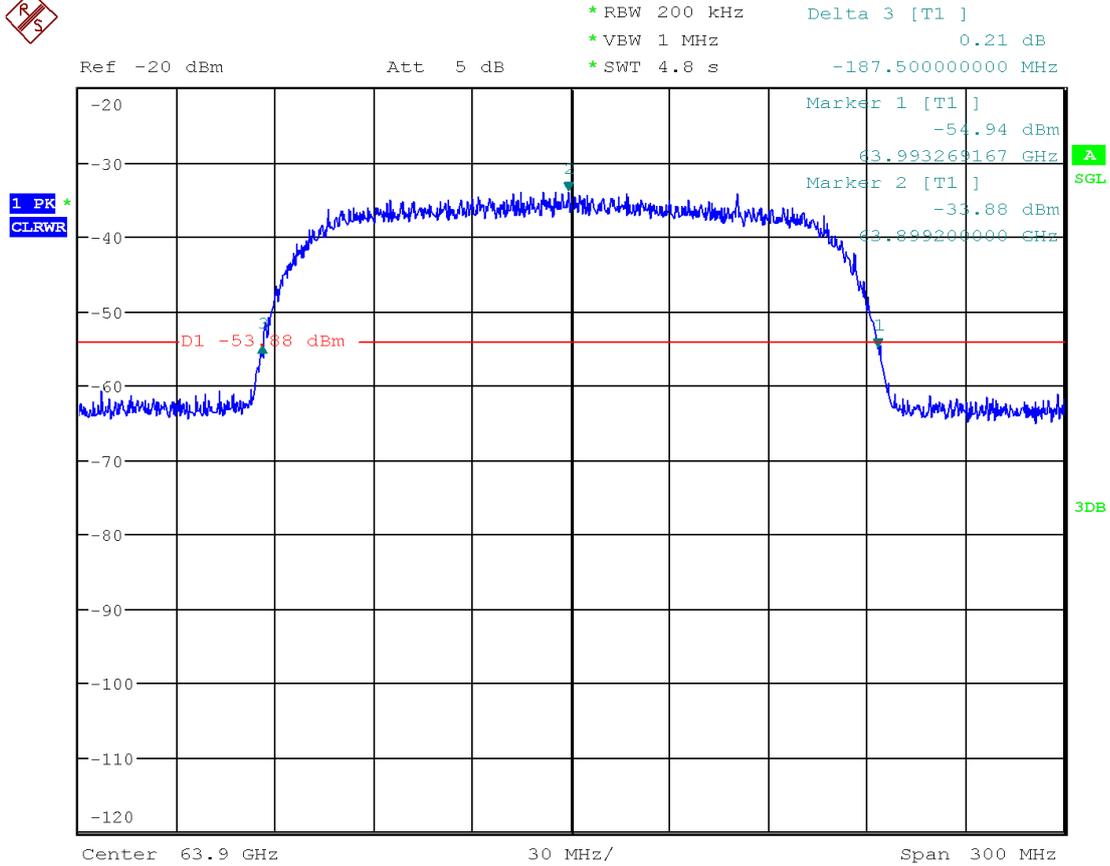




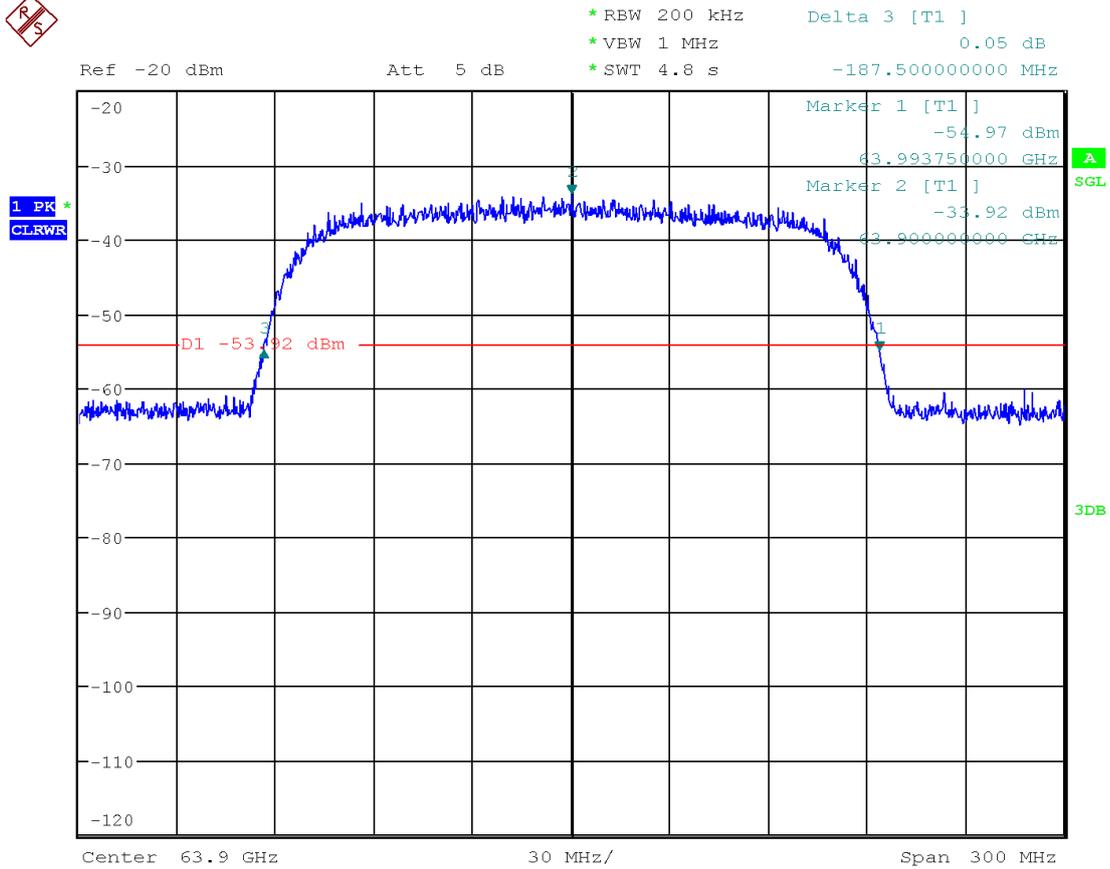
### 2.4.5 Voltage=85 %, Temperature=+20 °C







**2.4.8 Voltage=100 %, Temperature=+30 °C**



#### 2.4.9 Voltage=100 %, Temperature=+40 °C







# Annex F: AC Power Line Conducted Emissions

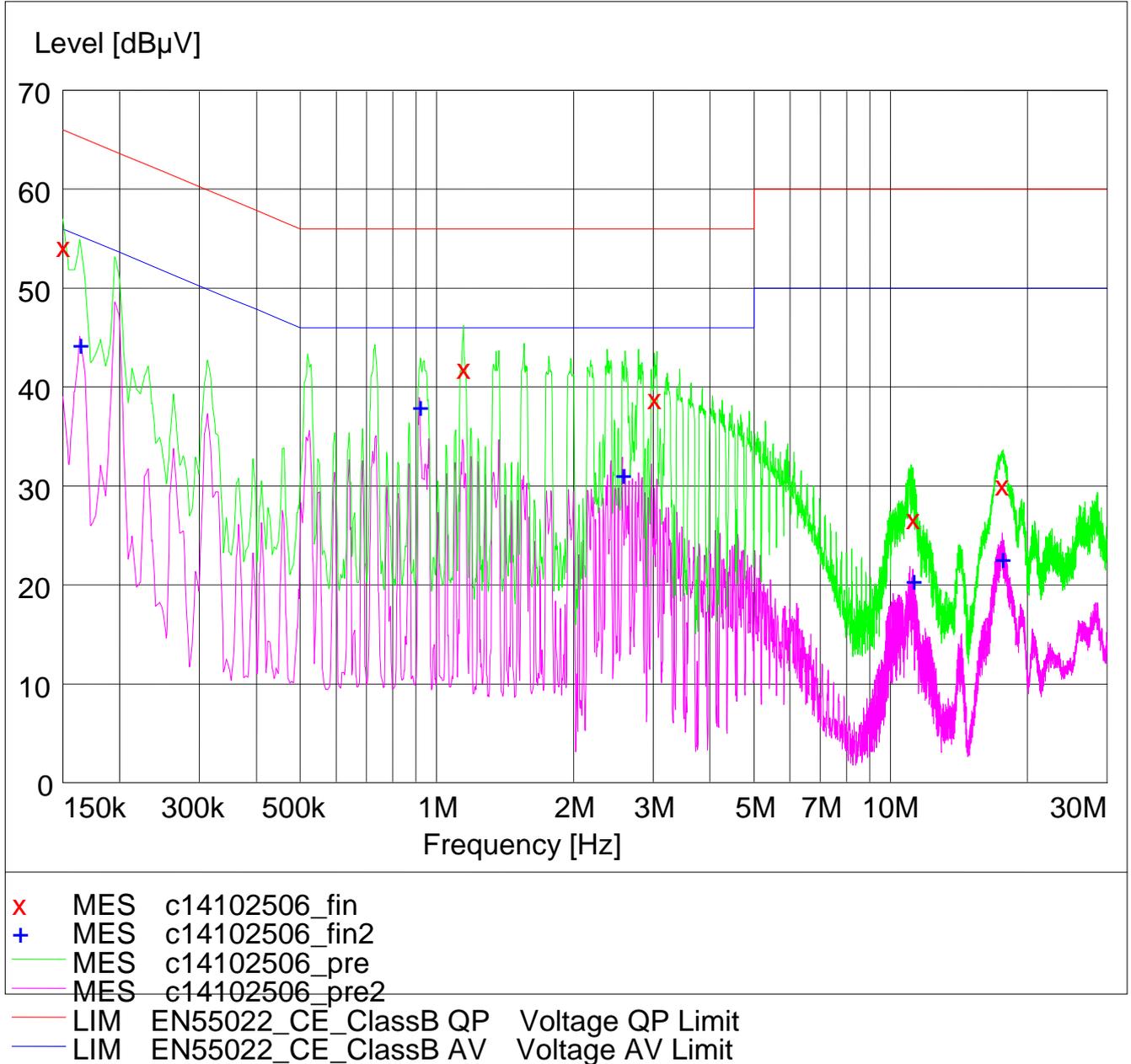


## 1 Result Table

EUT Conf.	Maximum Emissions	Limit	Verdict
Worst Case (B-TM1)	Not found obvious spikes or see marked spikes on plots and listed emissions records.	§15.207 / RSS-Gen 7.2.4 limit.	Pass

## 2 Result Plot

### 2.1 Worst Case (B-TM1)



#### MEASUREMENT RESULT: "c14102506\_fin"

2014-10-25 15:25

Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
MHz	dBμV	dB	dBμV	dB			



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0.150000	54.50	10.7	66	11.5	QP	L3	GND
1.144500	42.20	11.0	56	13.8	QP	L3	GND
3.016500	39.10	10.8	56	16.9	QP	L3	GND
11.193000	27.00	11.0	60	33.0	QP	N	GND
17.556000	30.40	11.1	60	29.6	QP	L3	GND

**MEASUREMENT RESULT: "c14102506\_fin2"**

2014-10-25 15:25

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB	Margin dB $\mu$ V	Detector dB	Line	PE
0.163500	44.60	10.7	55	10.7	AV	N	GND
0.915000	38.40	11.0	46	7.6	AV	N	GND
2.562000	31.50	10.8	46	14.5	AV	N	GND
11.193000	20.80	11.0	50	29.2	AV	N	GND
17.578500	23.00	11.1	50	27.0	AV	L3	GND



# Appendix G: Receiver Spurious Emissions



(Not applicable)

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END