



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

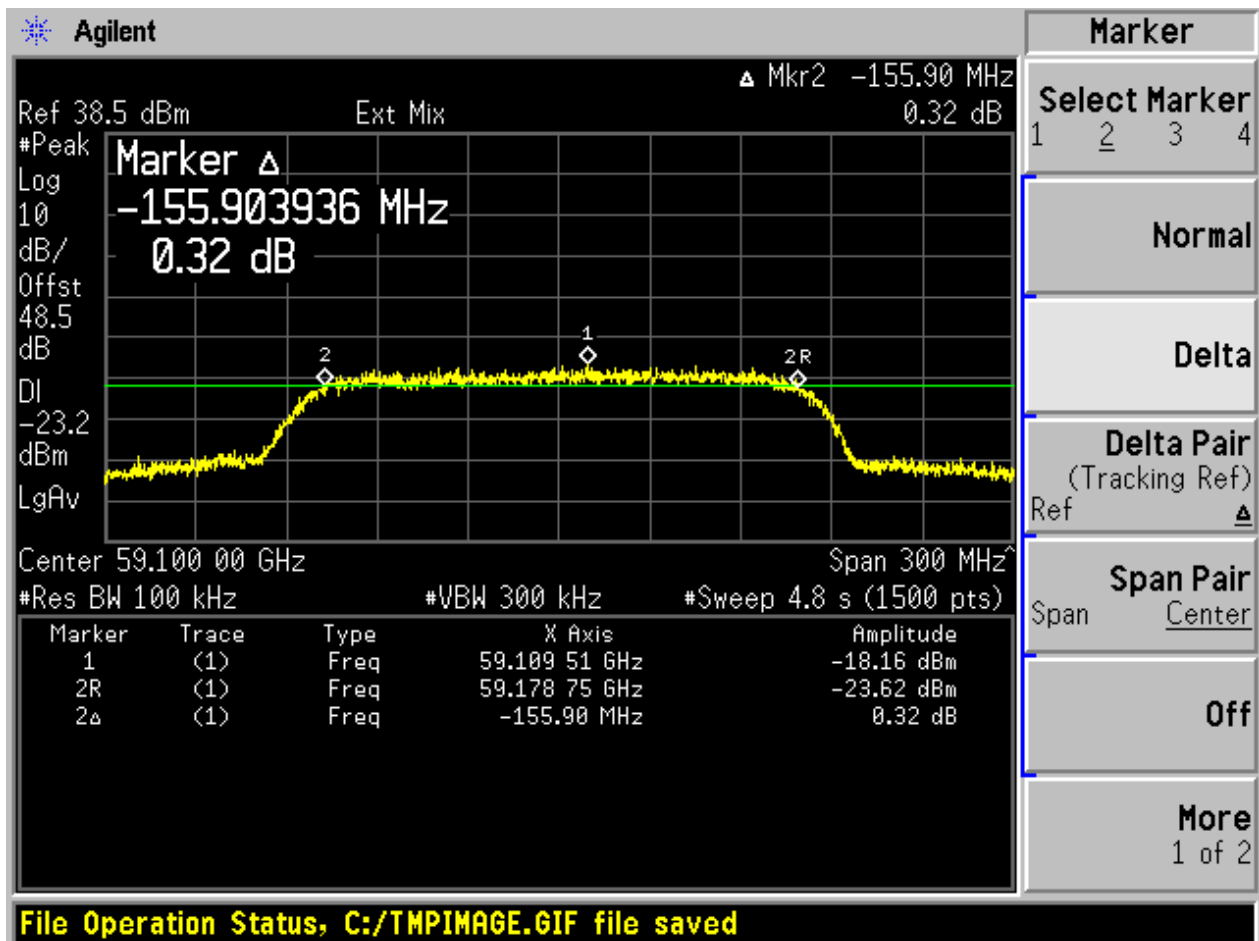
1.2 Occupied Bandwidth (OBW)

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

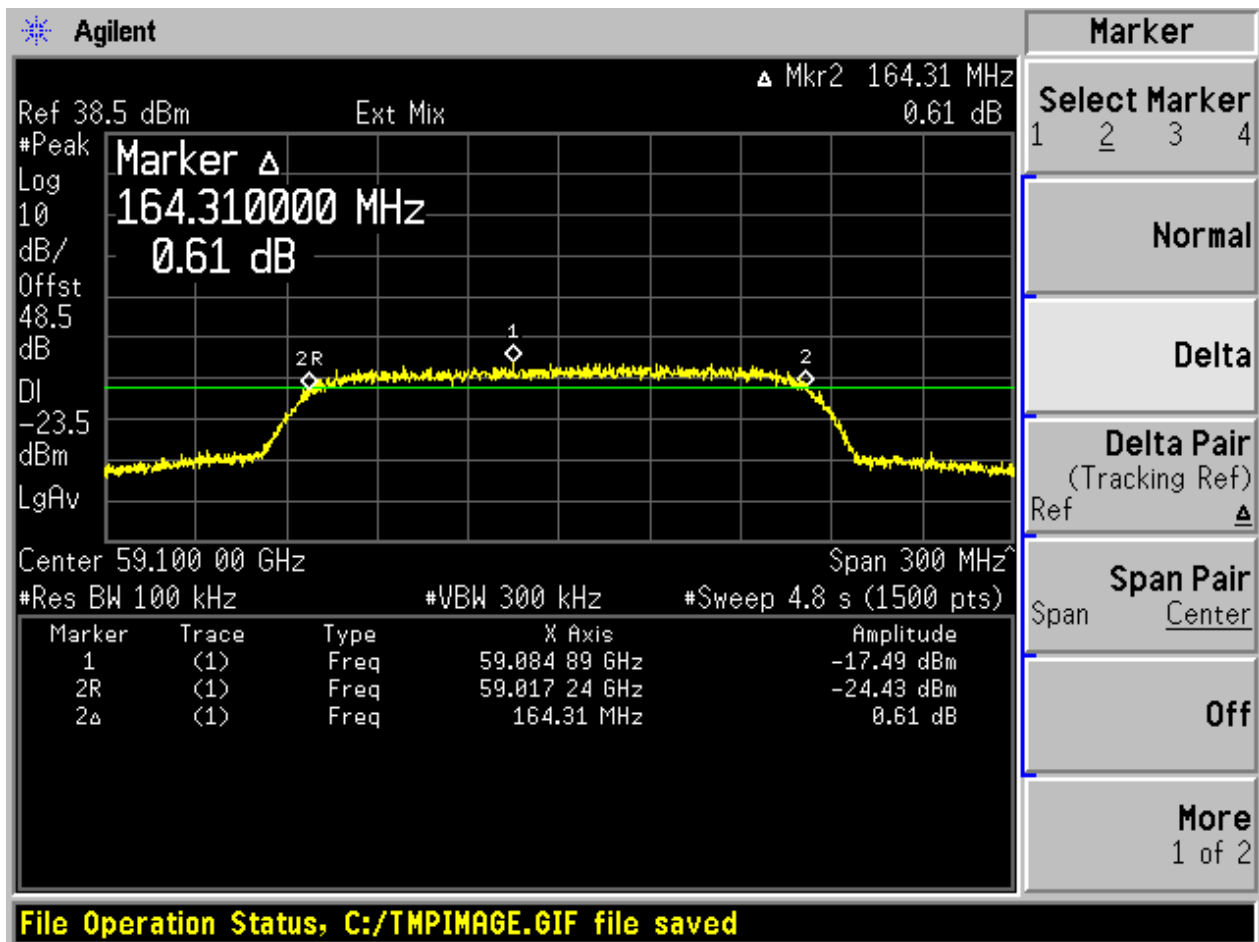
2 Test Plot

2.1 Emission Bandwidth (-6 dBc EBW)

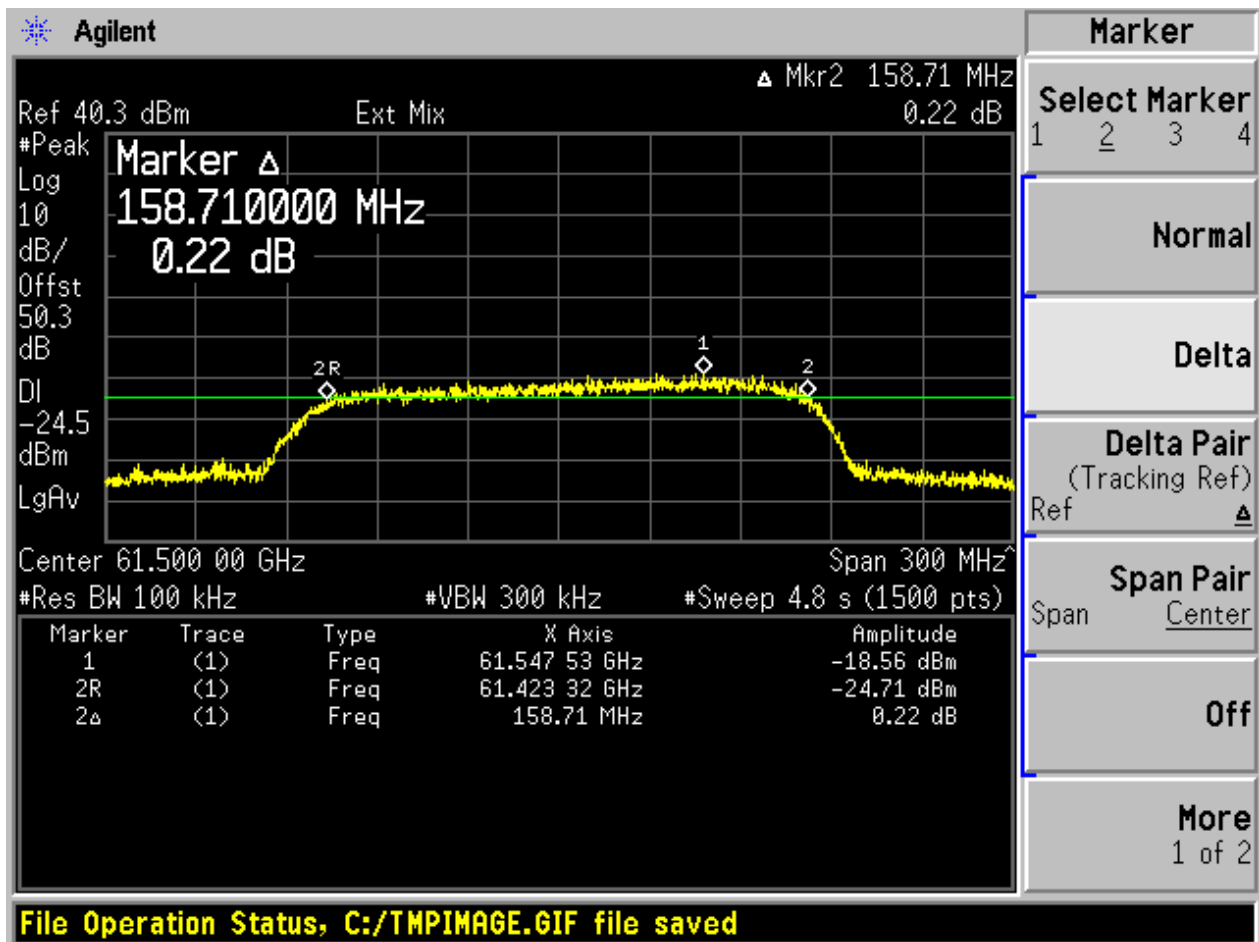
2.1.1 B-TM1



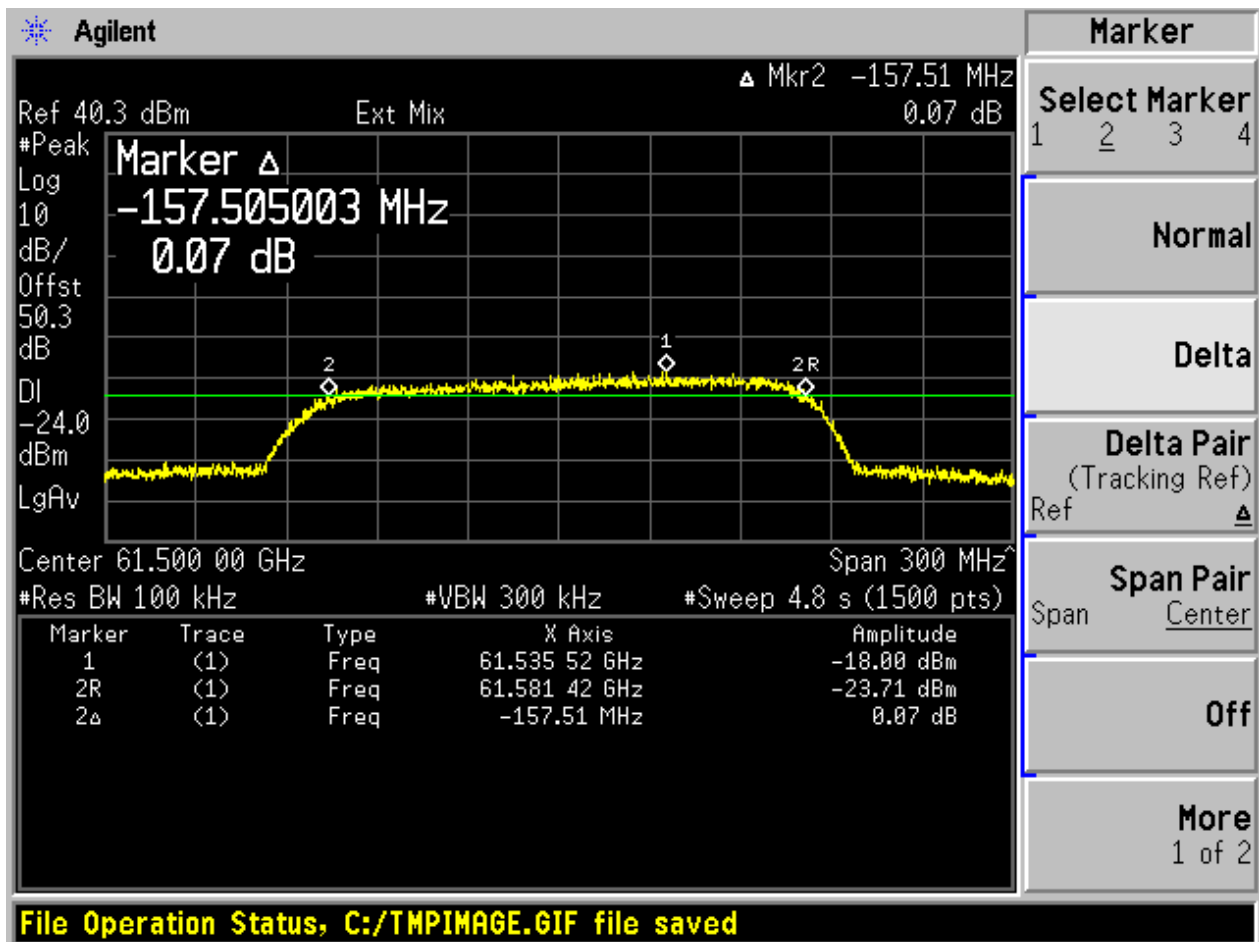
2.1.2 B-TM2



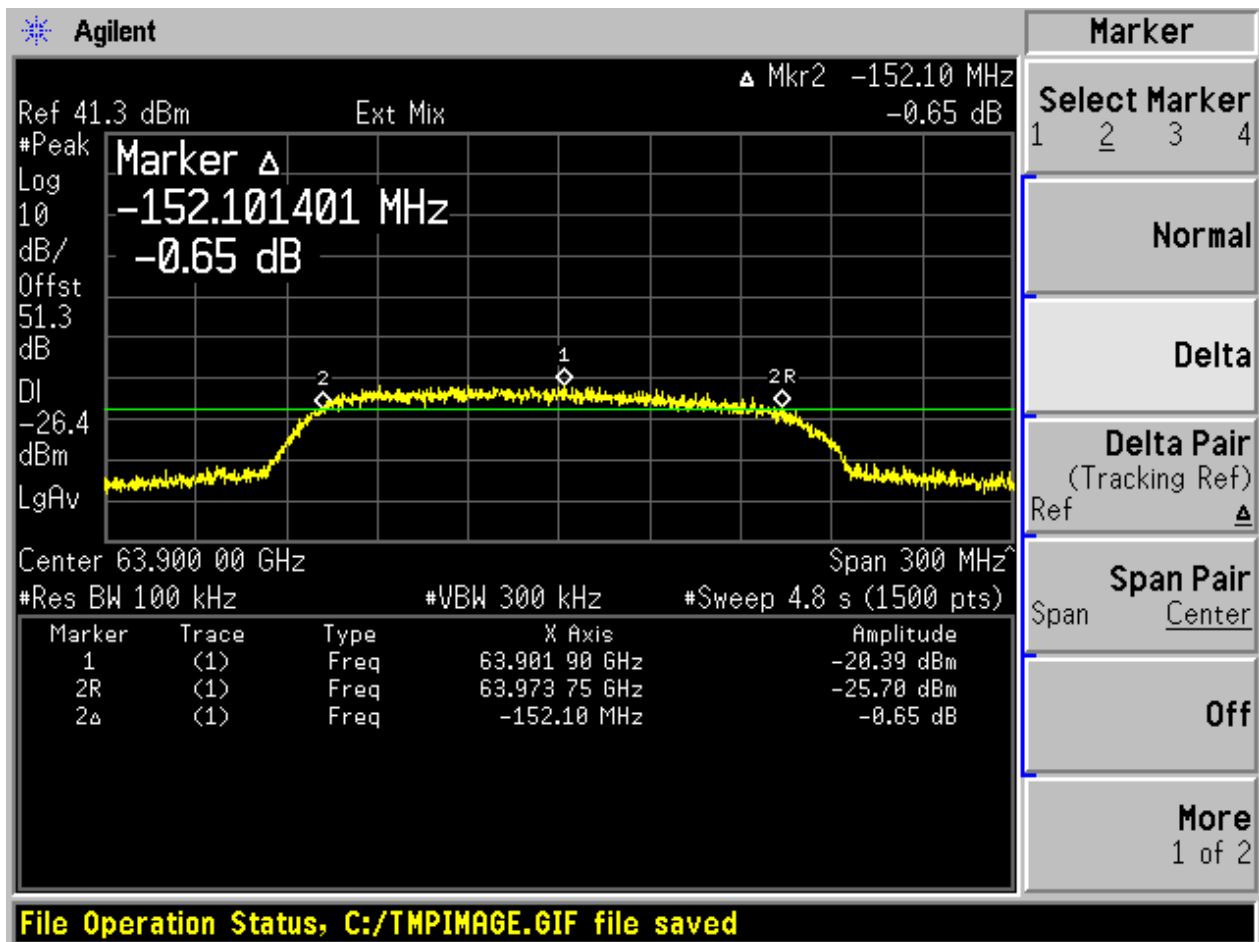
2.1.3 M-TM1



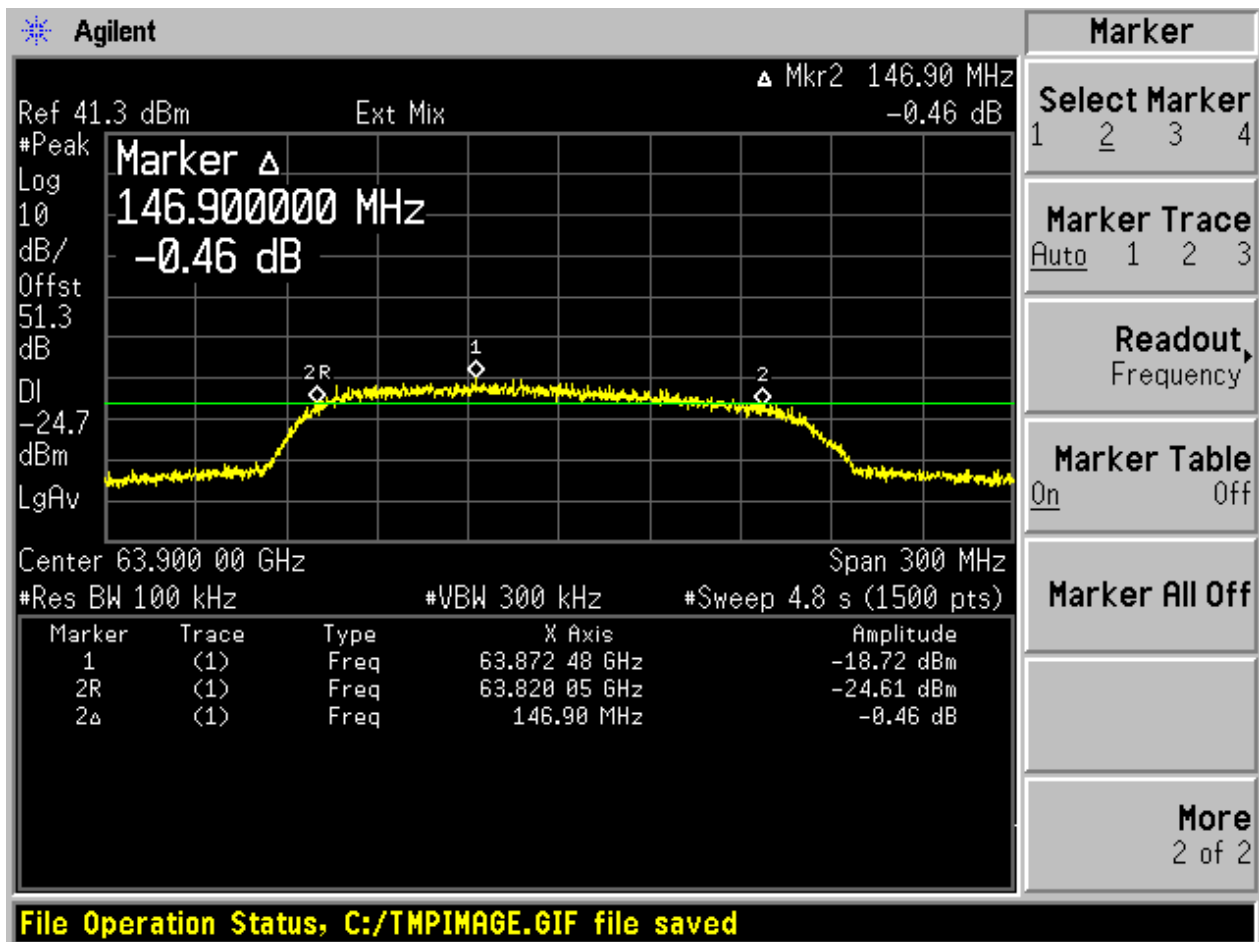
2.1.4 M-TM2



2.1.5 T-TM1

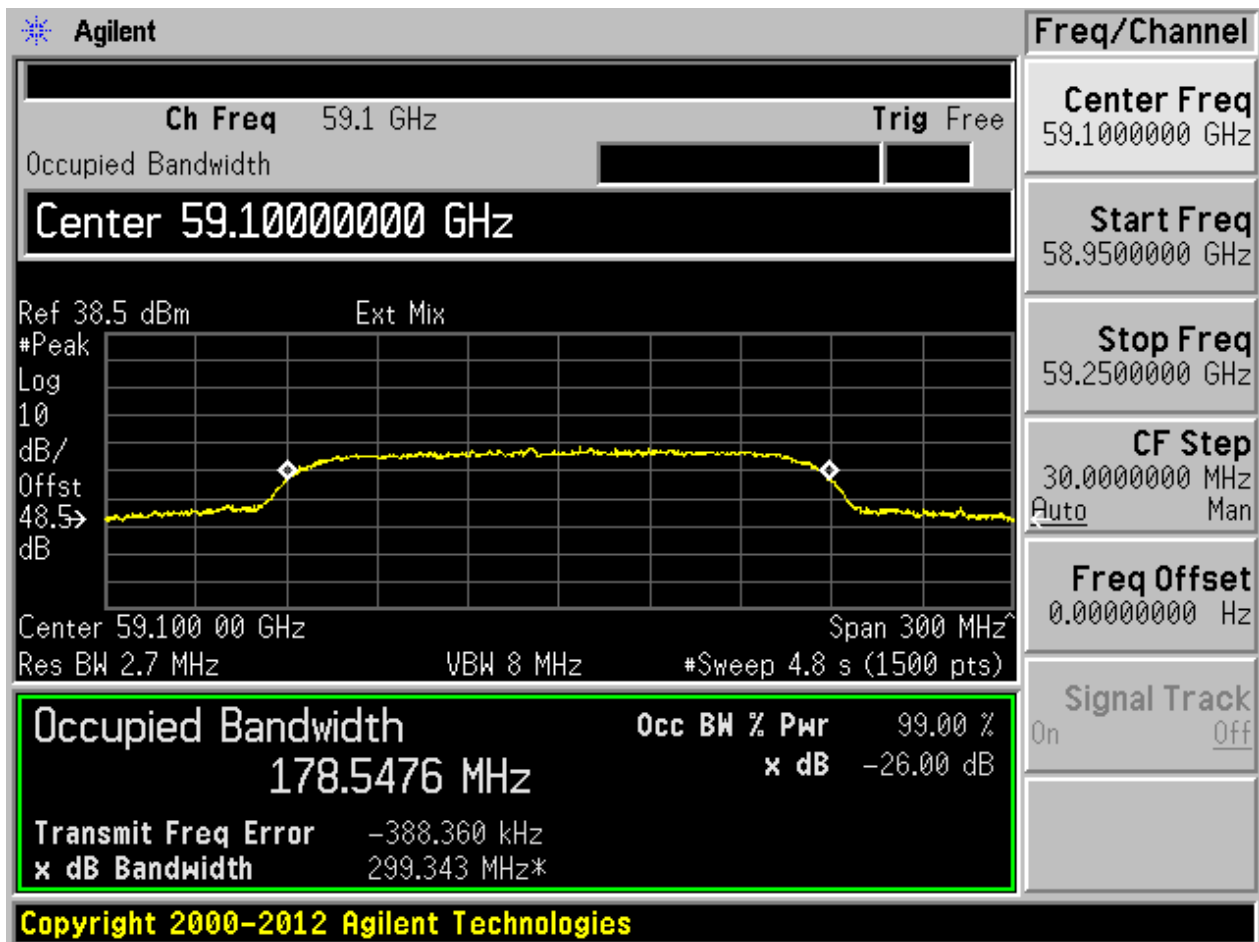


2.1.6 T-TM2

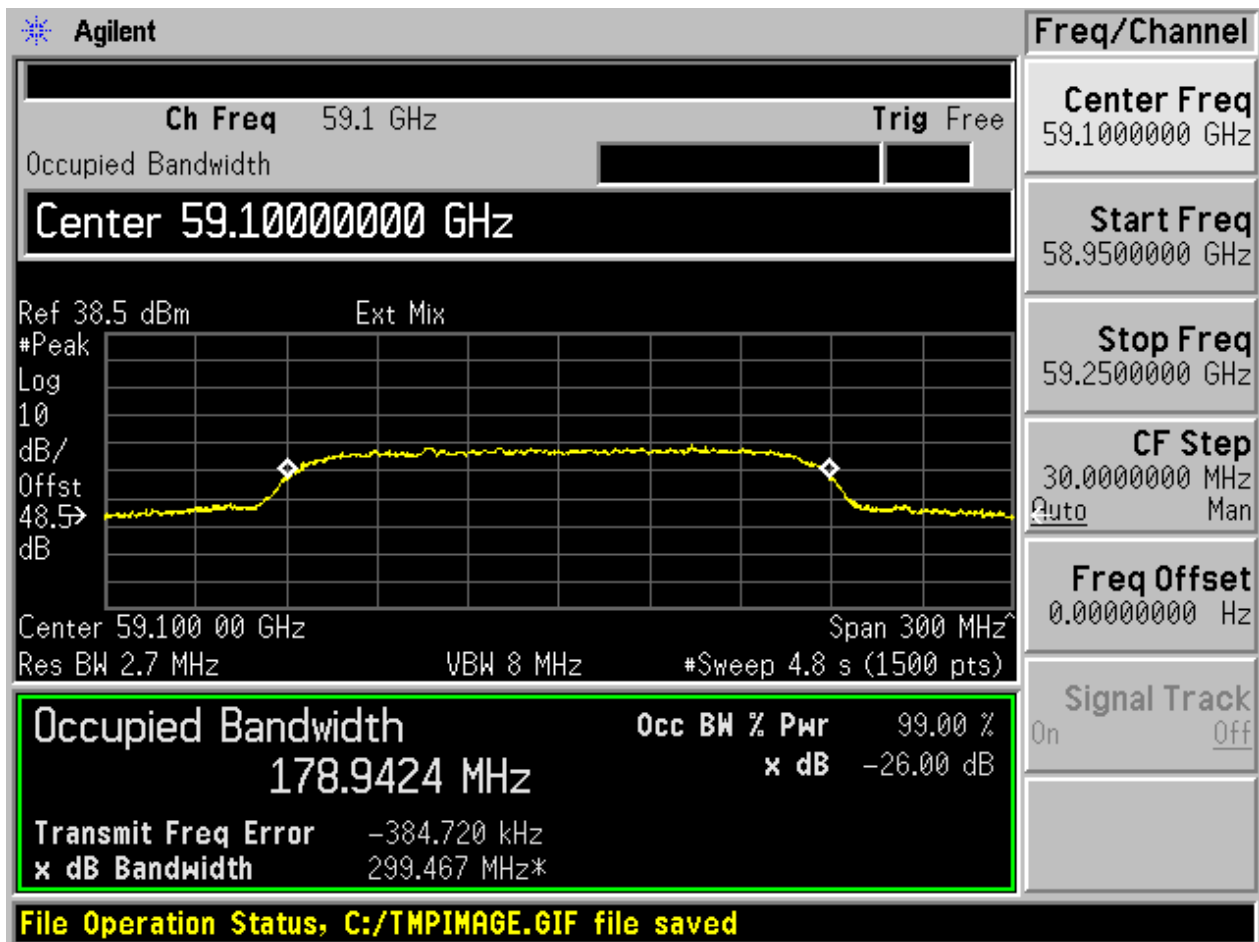


2.2 Occupied Bandwidth (OBW)

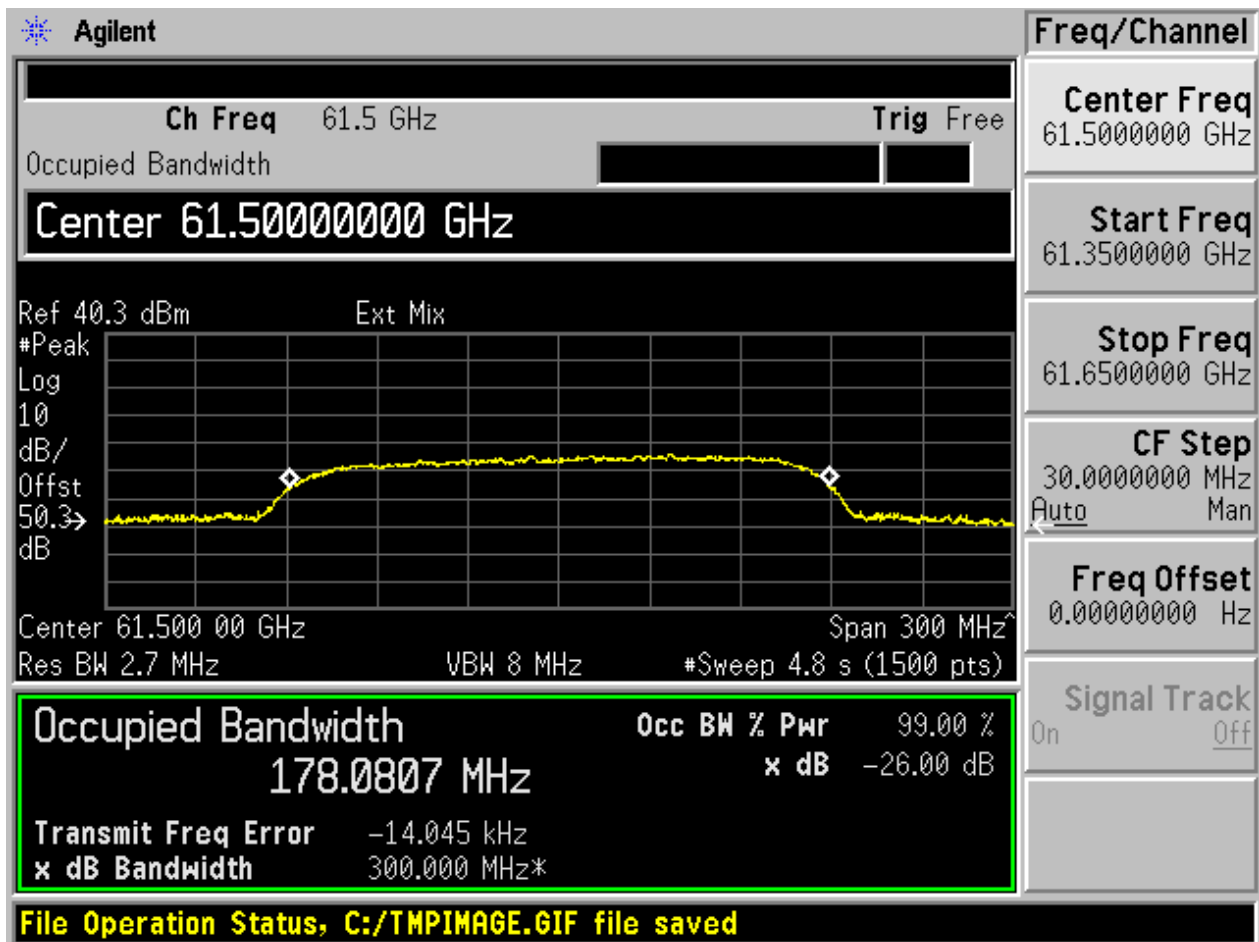
2.2.1 B-TM1



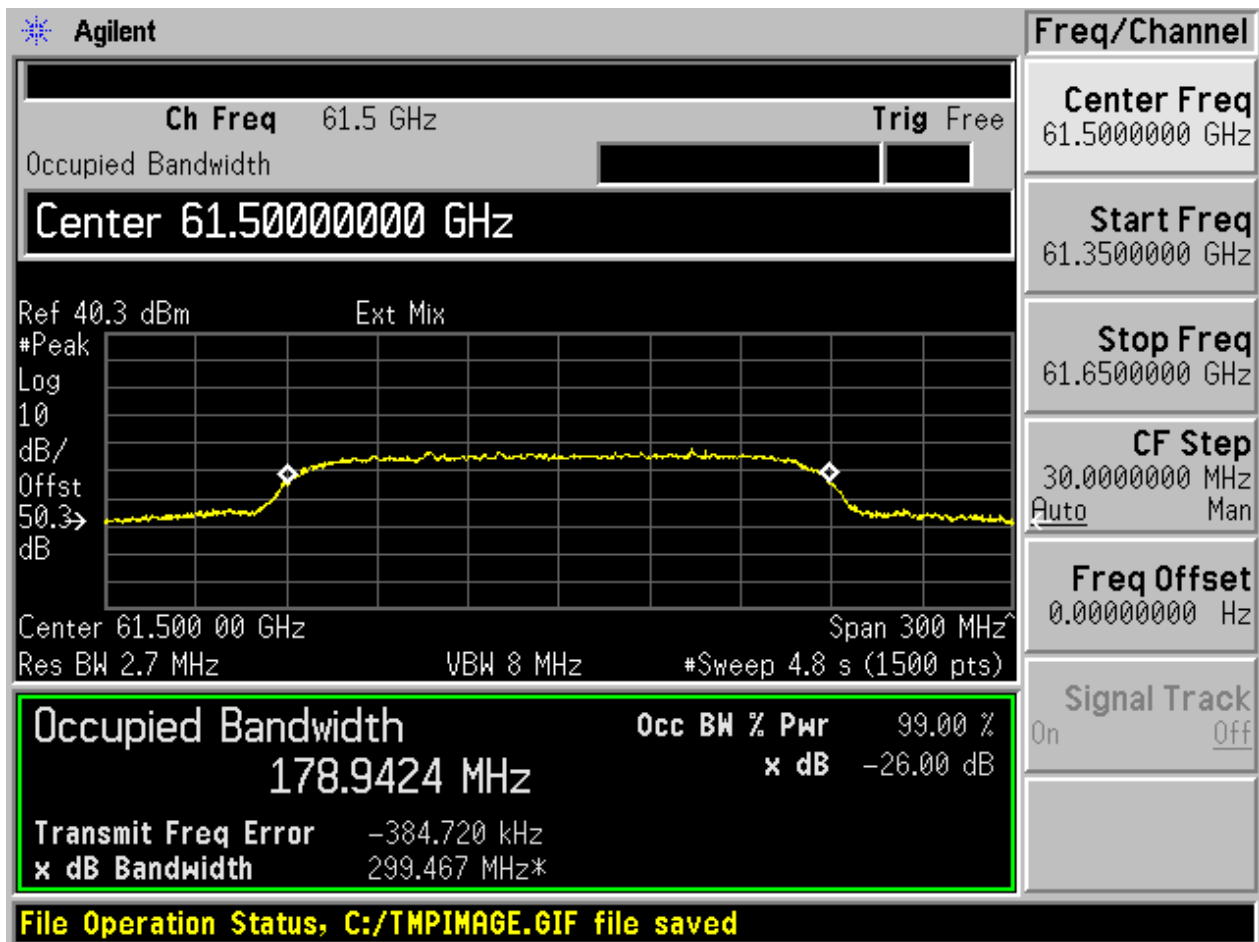
2.2.2 B-TM2



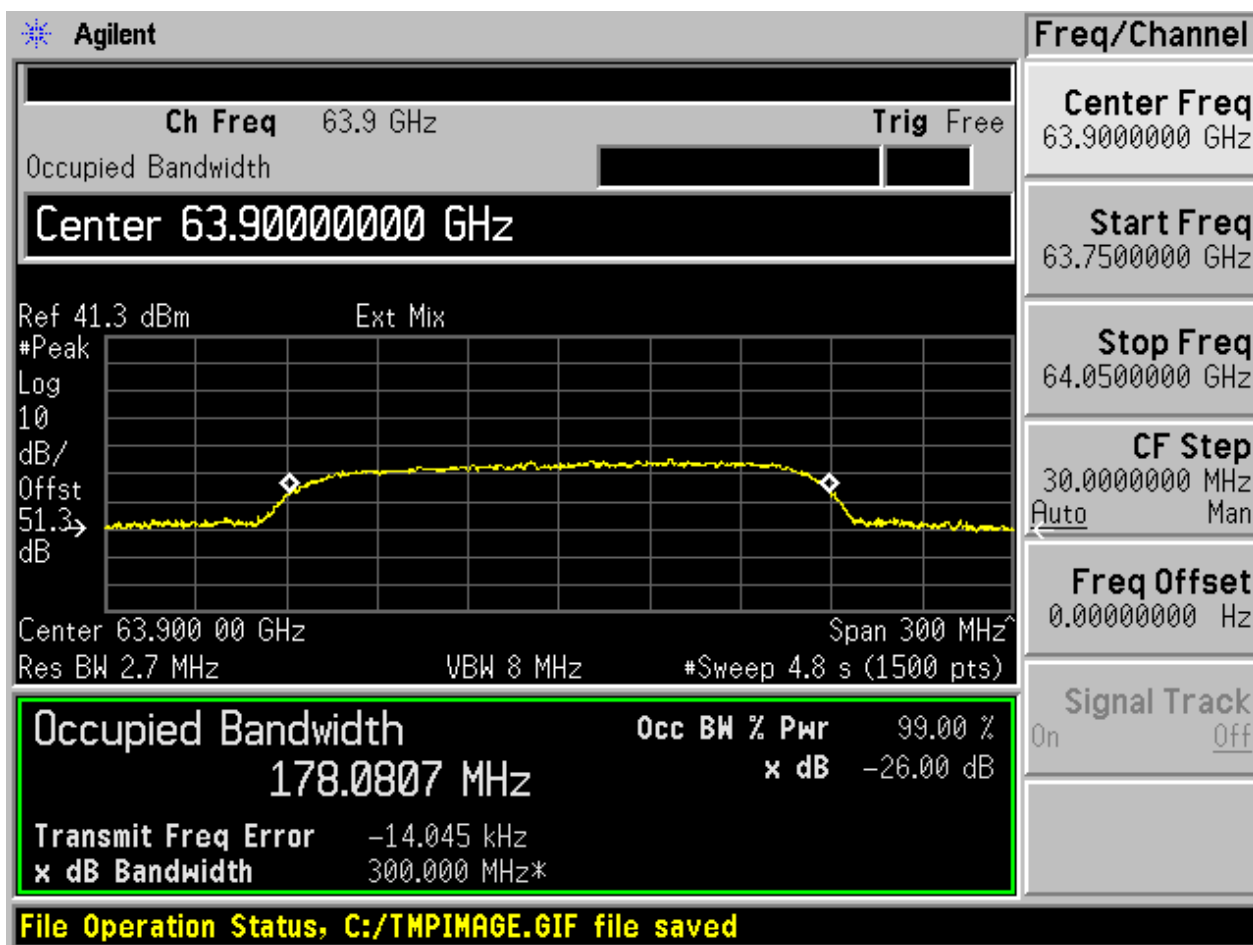
2.2.3 M-TM1



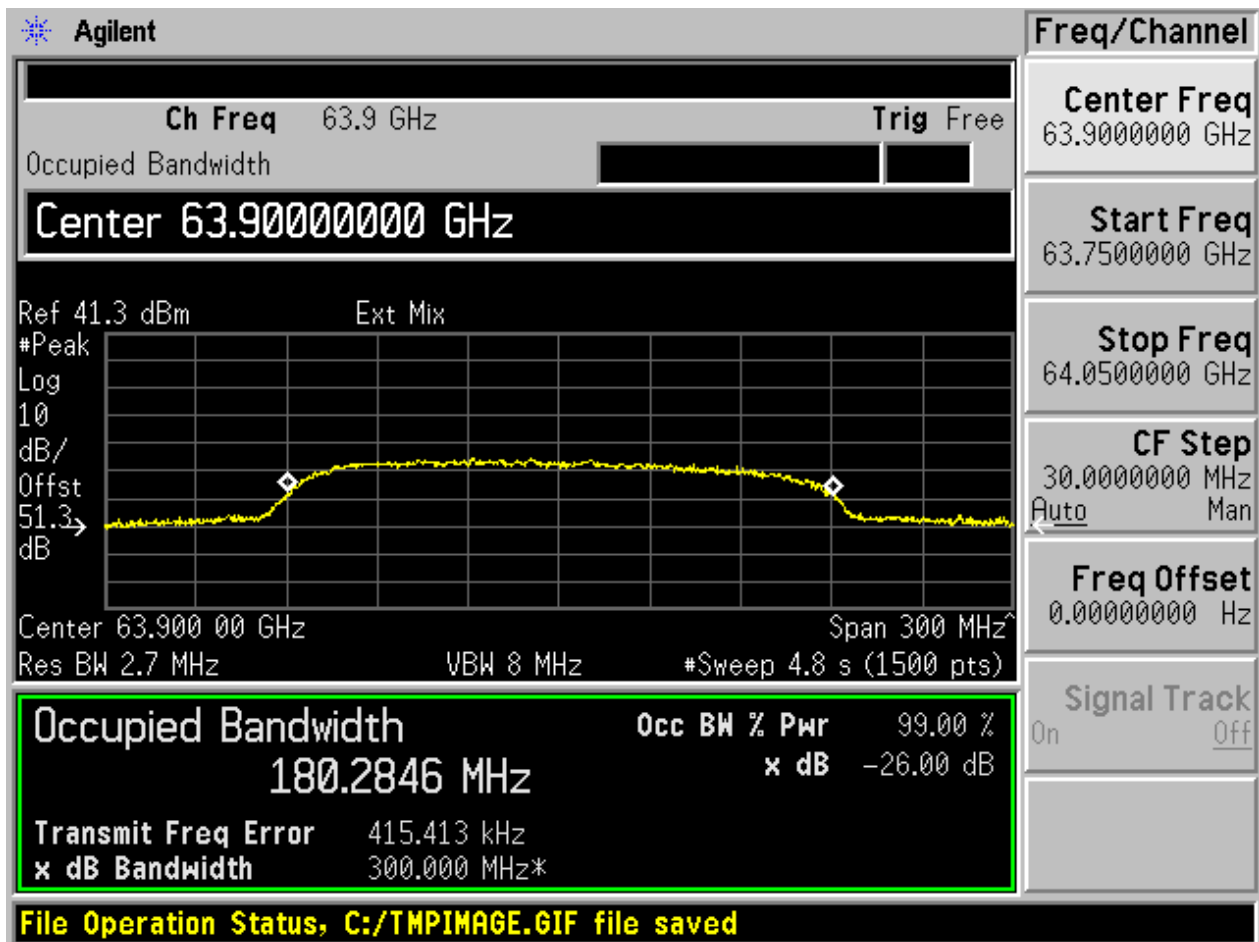
2.2.4 M-TM2



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	≤ 49	≤ 9	Pass
B-TM2	2.03	34.5	36.53	3.98	≤ 49	≤ 9	Pass
M-TM1	1.79	34.5	36.29	3.76	≤ 49	≤ 9	Pass
M-TM2	1.86	34.5	36.36	3.82	≤ 49	≤ 9	Pass
T-TM1	1.90	34.5	36.4	3.86	≤ 49	≤ 9	Pass
T-TM2	1.96	34.5	36.46	3.91	≤ 49	≤ 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 $\text{PAPR (dB)} = P_{\text{Pk}} \text{ (dBm)} - P_{\text{Avg}} \text{ (dBm)}$.
- The maximum PAPR level associated with a probability of 0.1%.
- So, the $P_{\text{Pk}} \text{ (dBm)} = \text{PAPR (dB)} + P_{\text{Avg}} \text{ (dBm)}$.

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	≤ 52	≤ 18	Pass
B-TM2	2.03	5.2	7.23	34.5	41.73	13.17	≤ 52	≤ 18	Pass
M-TM1	1.79	5.2	6.99	34.5	41.49	12.46	≤ 52	≤ 18	Pass
M-TM2	1.86	5.2	7.06	34.5	41.56	12.66	≤ 52	≤ 18	Pass
T-TM1	1.90	5.2	7.1	34.5	41.6	12.78	≤ 52	≤ 18	Pass
T-TM2	1.96	5.2	7.16	34.5	41.66	12.96	≤ 52	≤ 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)

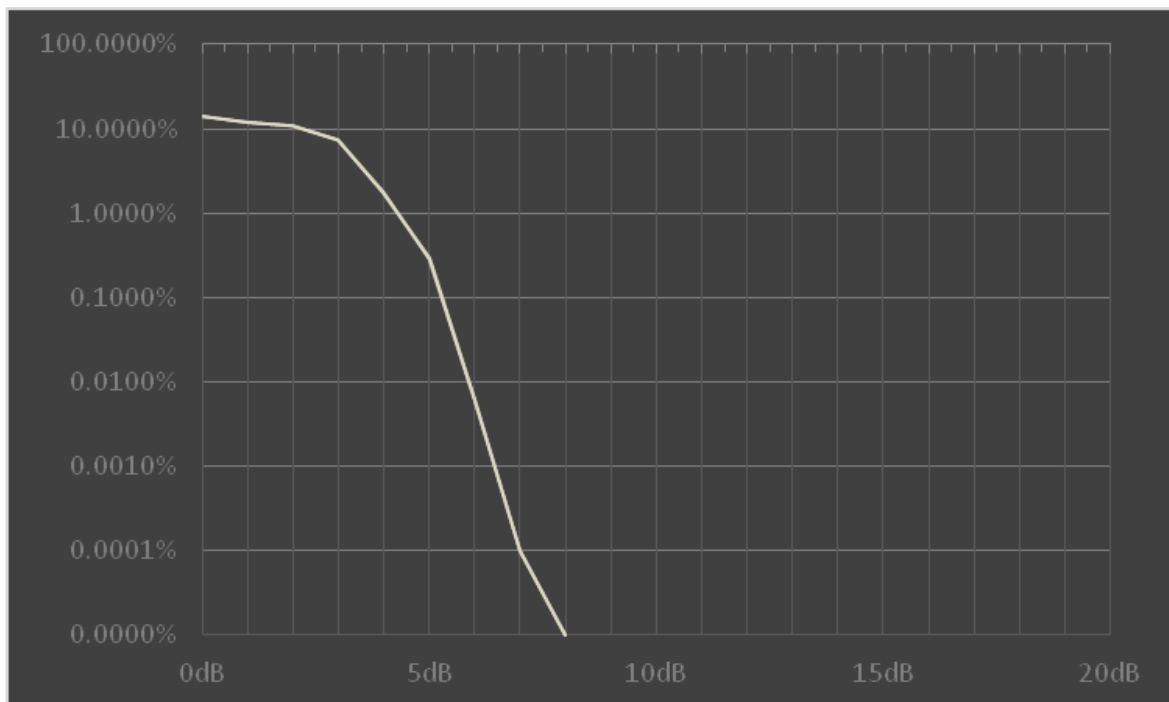
(No plot due to power meter measurement)

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

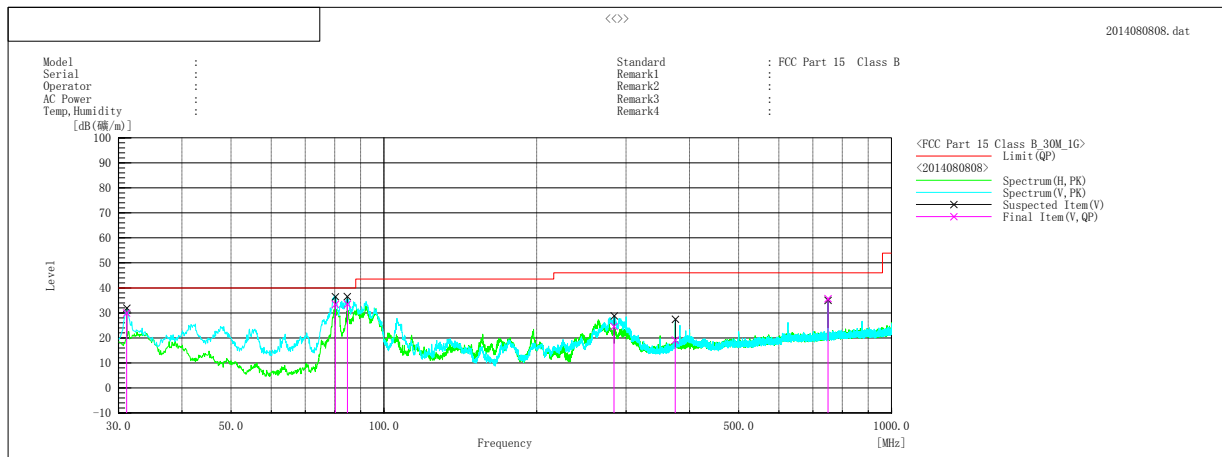
1 Result Table

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	$\leq 90 \text{ pW/cm}^2 @ 3\text{m}$ ($\leq -10 \text{ dBm EIRP}$)	Pass
50 GHz to 75 GHz	Worst Case (B-TM1)	< Limit	(1) 57-64GHz: Level(Fc) > Level(Fspu); (2) Other ranges: $\leq 90 \text{ pW/cm}^2 @ 3\text{m}$ ($\leq -10 \text{ dBm EIRP}$)	Pass
75 GHz to 110 GHz	Worst Case (B-TM1)	< Limit	$\leq 90 \text{ pW/cm}^2 @ 3\text{m}$ ($\leq -10 \text{ dBm EIRP}$)	Pass
110 GHz to 145 GHz	Worst Case (B-TM1)	< Limit	$\leq 90 \text{ pW/cm}^2 @ 3\text{m}$ ($\leq -10 \text{ dBm EIRP}$)	Pass
145 GHz to 220 GHz	Worst Case (B-TM1)	< Limit	$\leq 90 \text{ pW/cm}^2 @ 3\text{m}$ ($\leq -10 \text{ dBm EIRP}$)	Pass

2 Result Plot

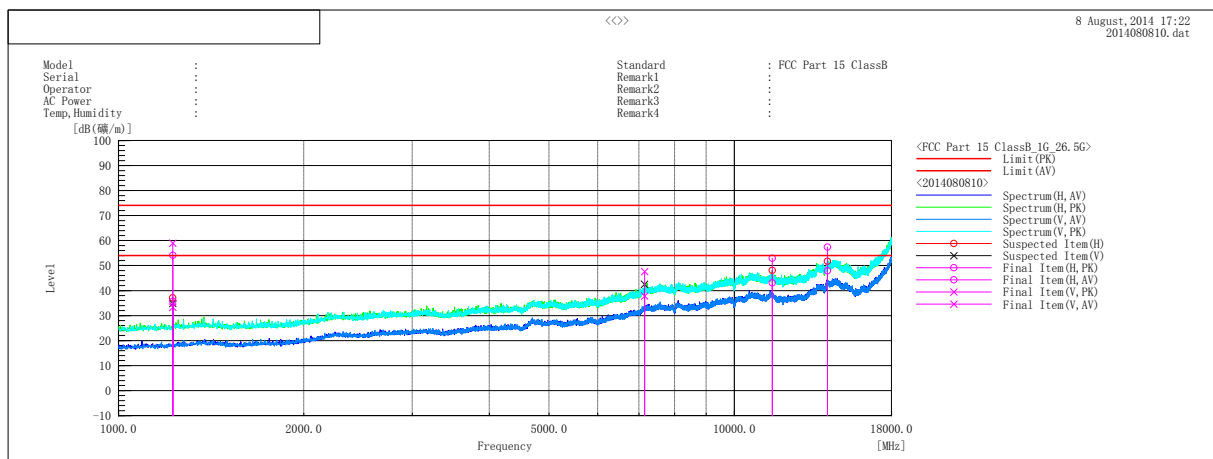
2.1 Test range of “30 MHz to 1 GHz”

2.1.1 Worst Case (B-TM1)



2.2 Test range of “1 GHz to 18 GHz”

2.2.1 Worst Case (B-TM1)

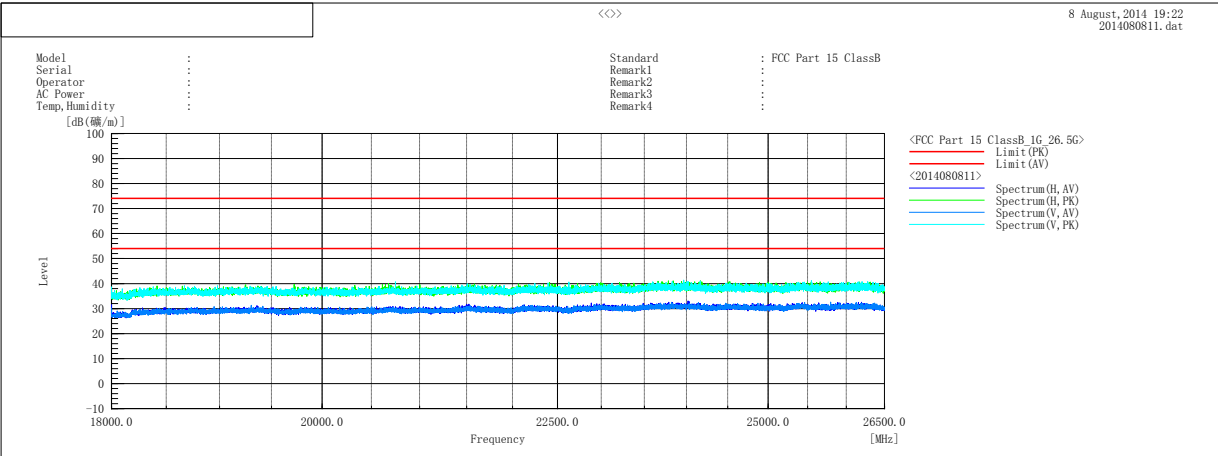


Final Result

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)

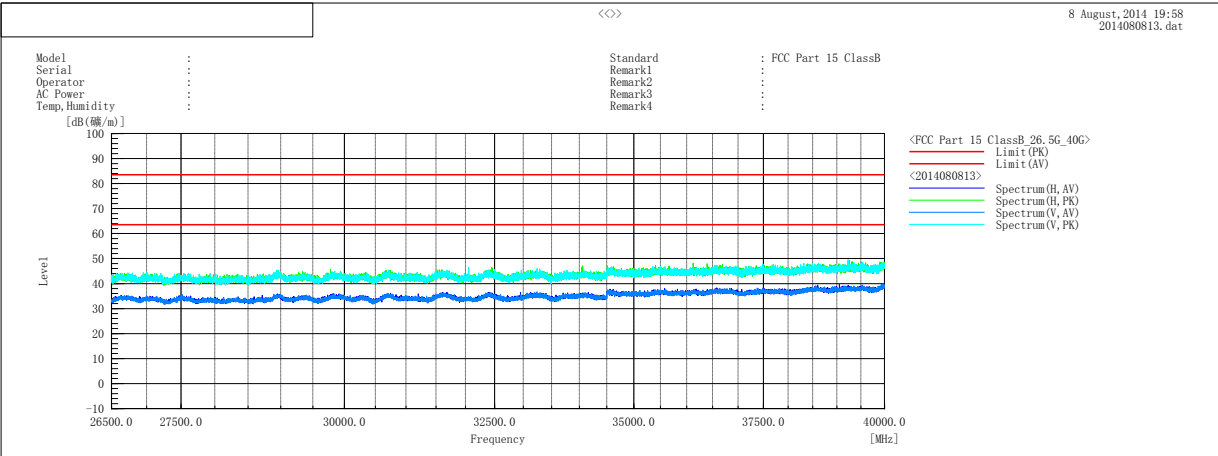


Final Result

No.	Frequency (P)	c.f	Height	Angle	Remark
	[MHz]	[dB(1/m)]	[cm]	[°]	

2.4 Test range of “26.5 GHz to 40 GHz”

2.4.1 Worst Case (B-TM1)

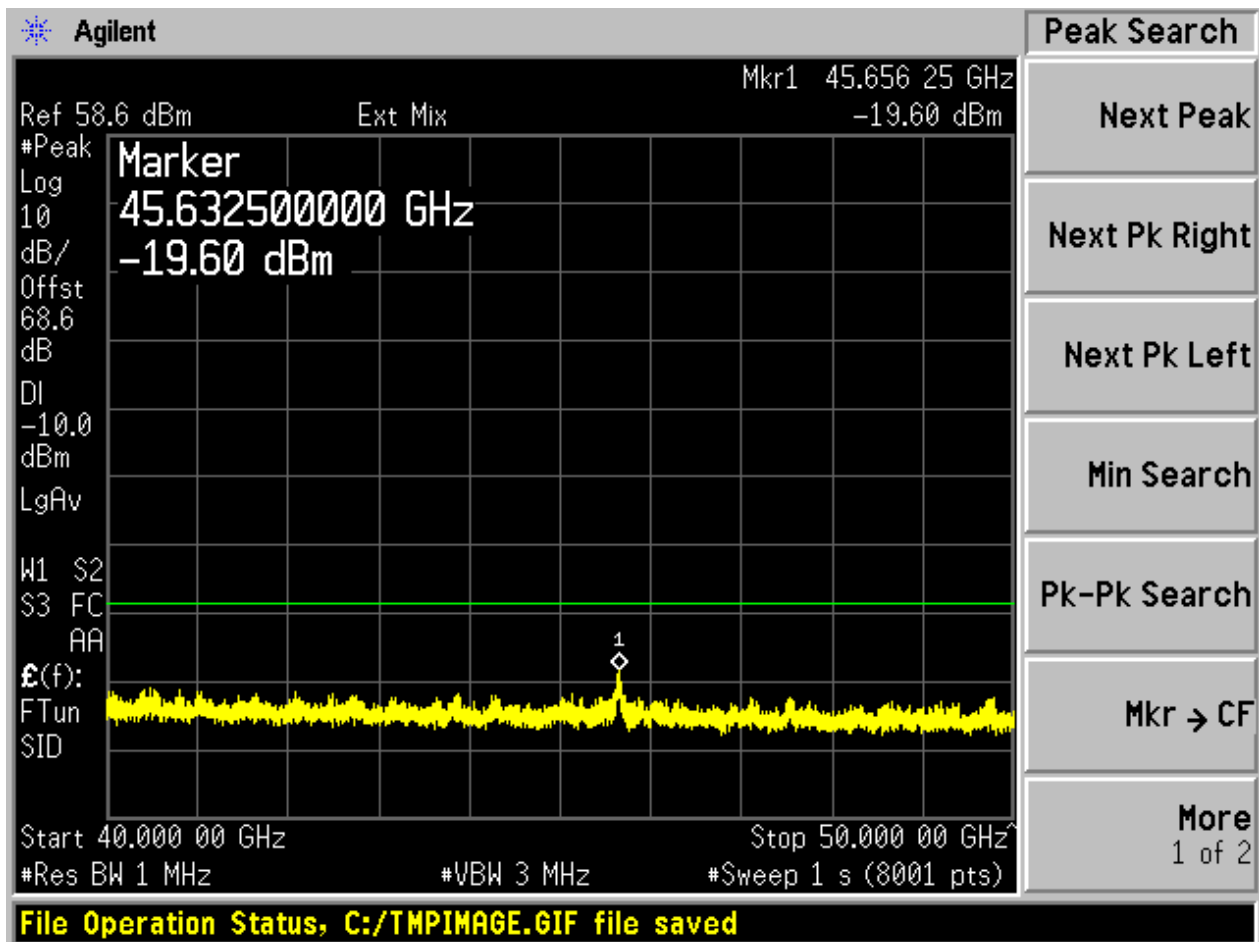


Final Result

No.	Frequency (P)	c. f	Height	Angle	Remark
	[MHz]	[dB(1/m)]	[cm]	[°]	

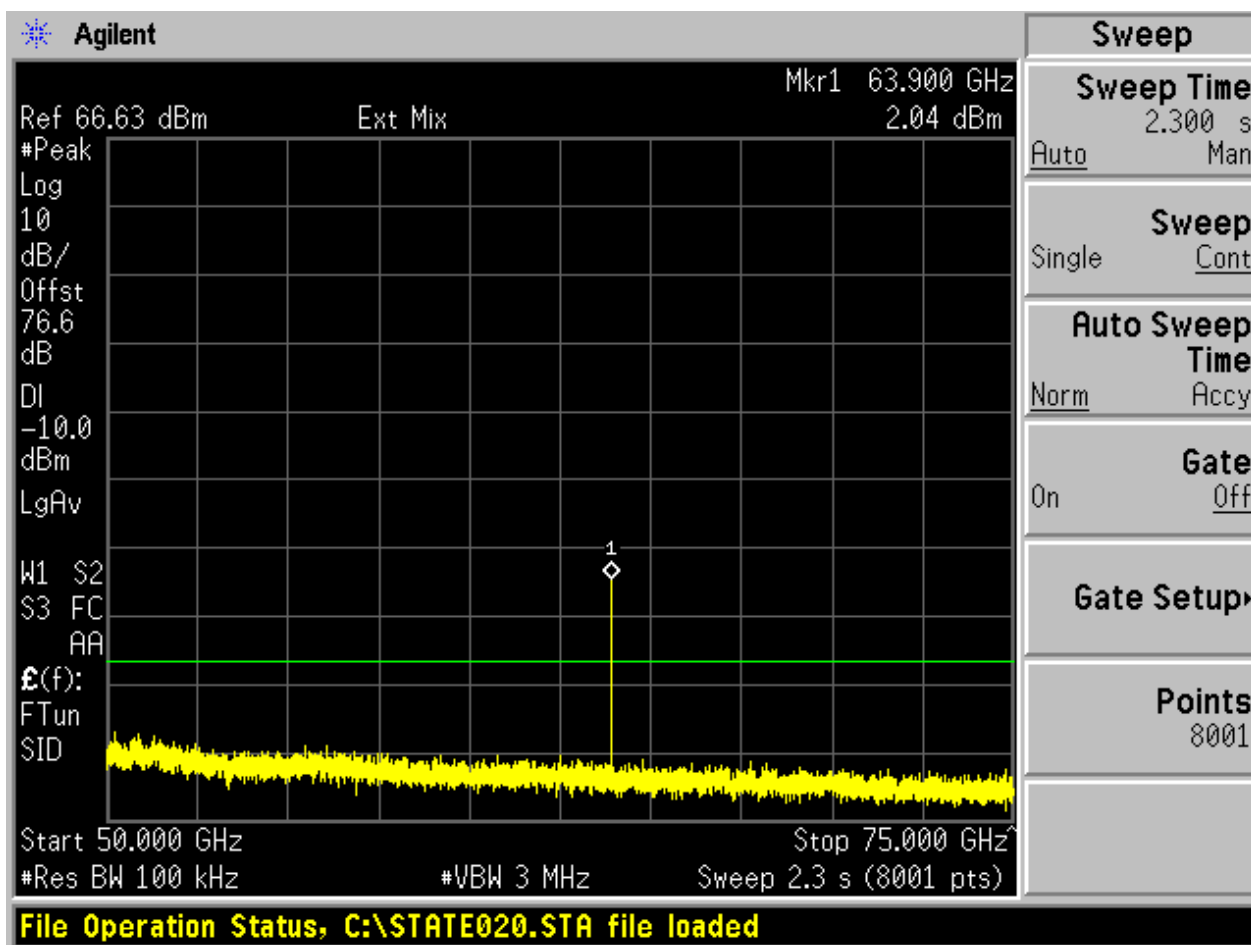
2.5 Test range of “40 GHz to 50 GHz”

2.5.1 Worst Case (B-TM1)



2.6 Test range of “50 GHz to 75 GHz”

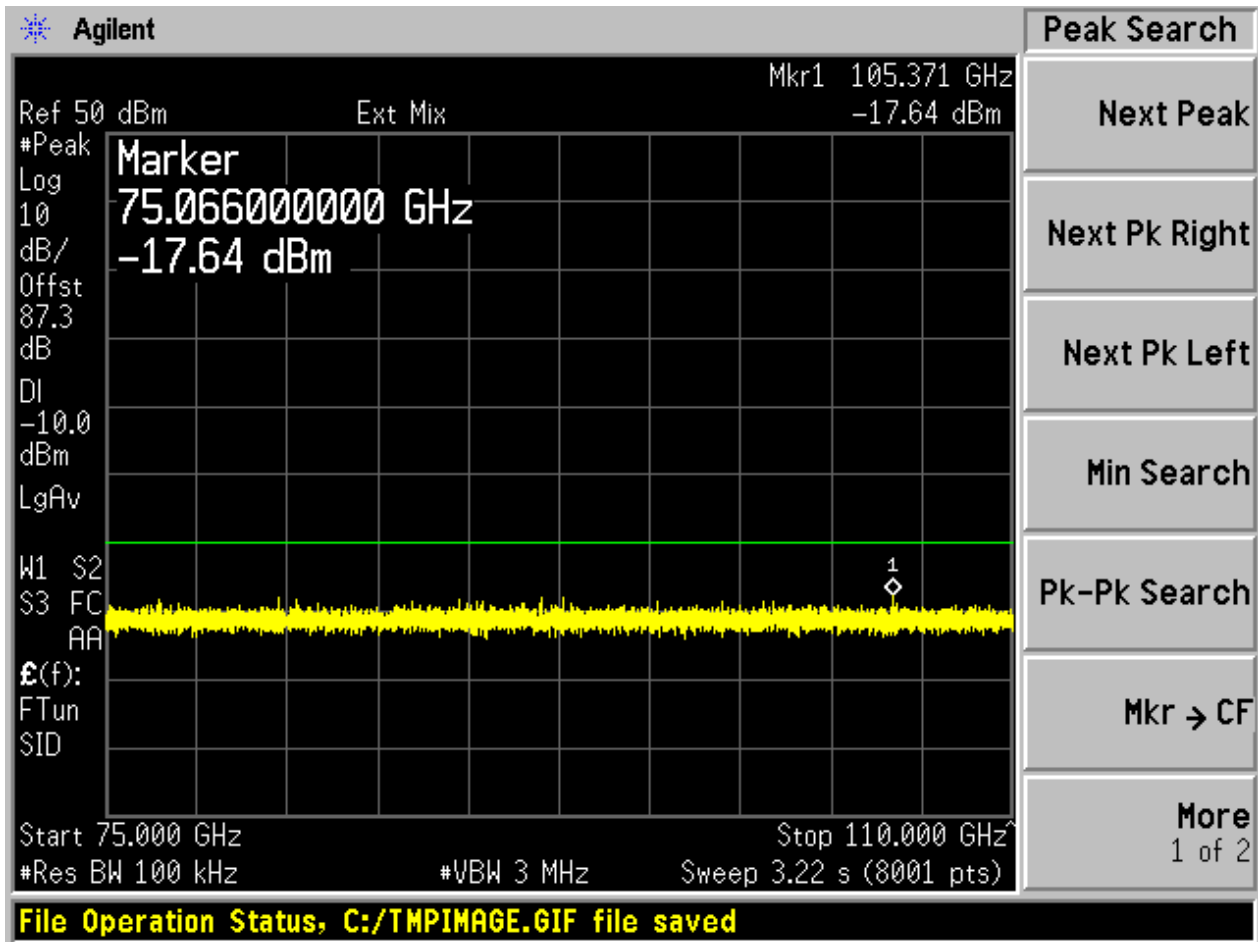
2.6.1 Worst Case (B-TM1)



(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"

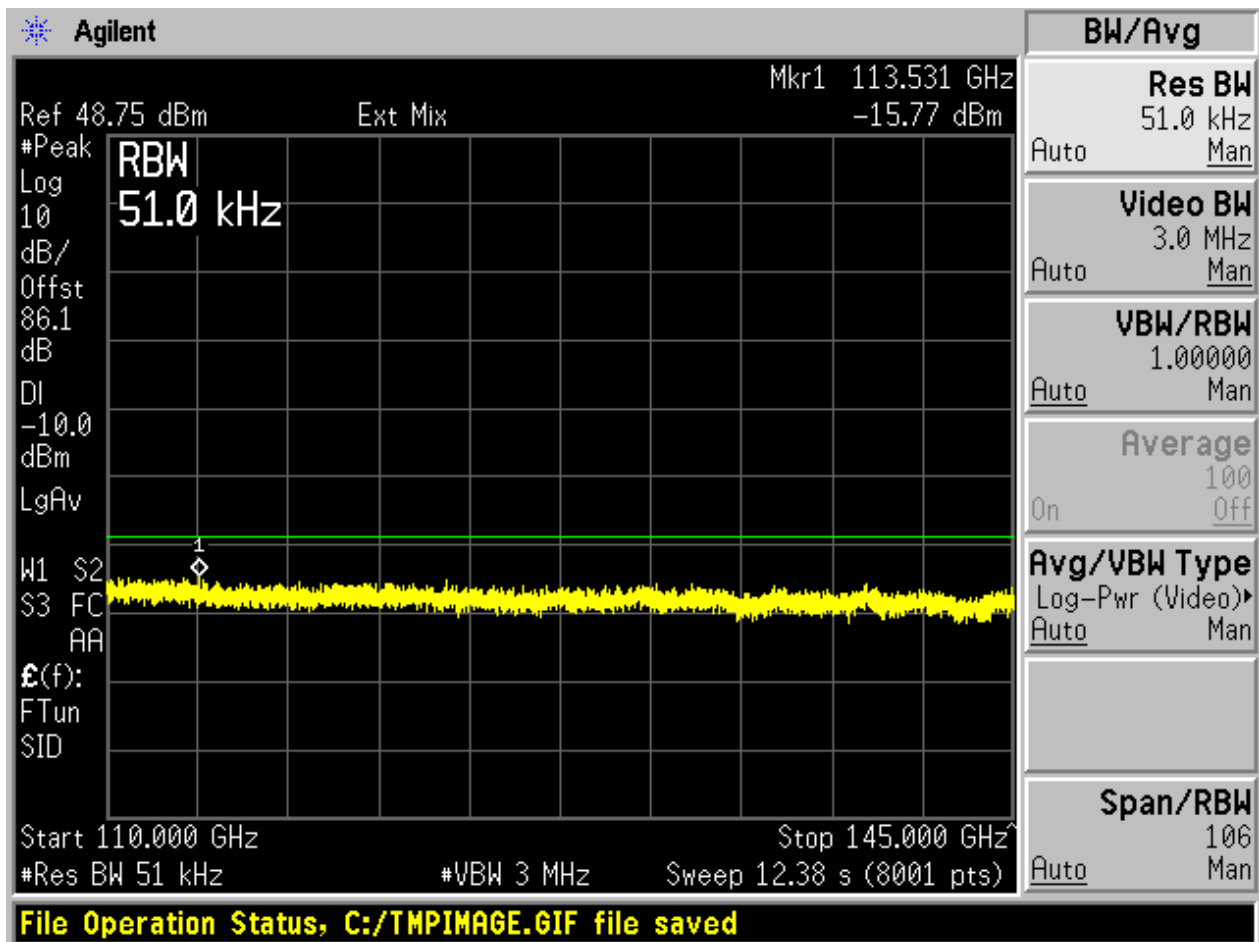
2.7.1 Worst Case (B-TM1)



(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"

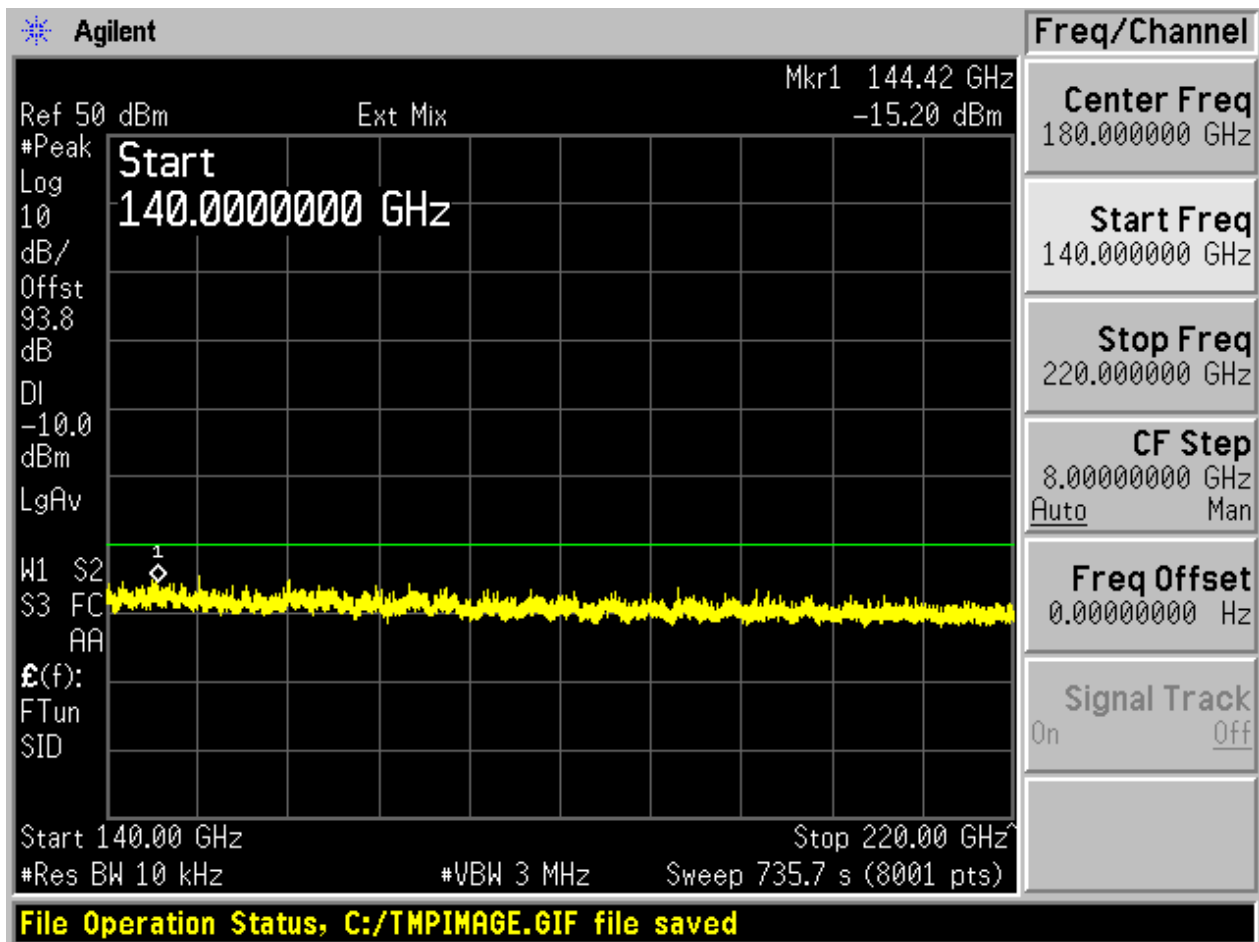
2.8.1 Worst Case (B-TM1)



(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
	100 %	-20 °C	59.006250000	fL > 57, fH < 64	Pass
	100 %	-10 °C	59.006250000	fL > 57, fH < 64	Pass
B-TM2	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
	100 %	-20 °C	63.993750000	fL > 57, fH < 64	Pass
	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
T-TM1	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
	100 %	-20 °C	63.993269231	fL > 57, fH < 64	Pass
	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
T-TM2	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

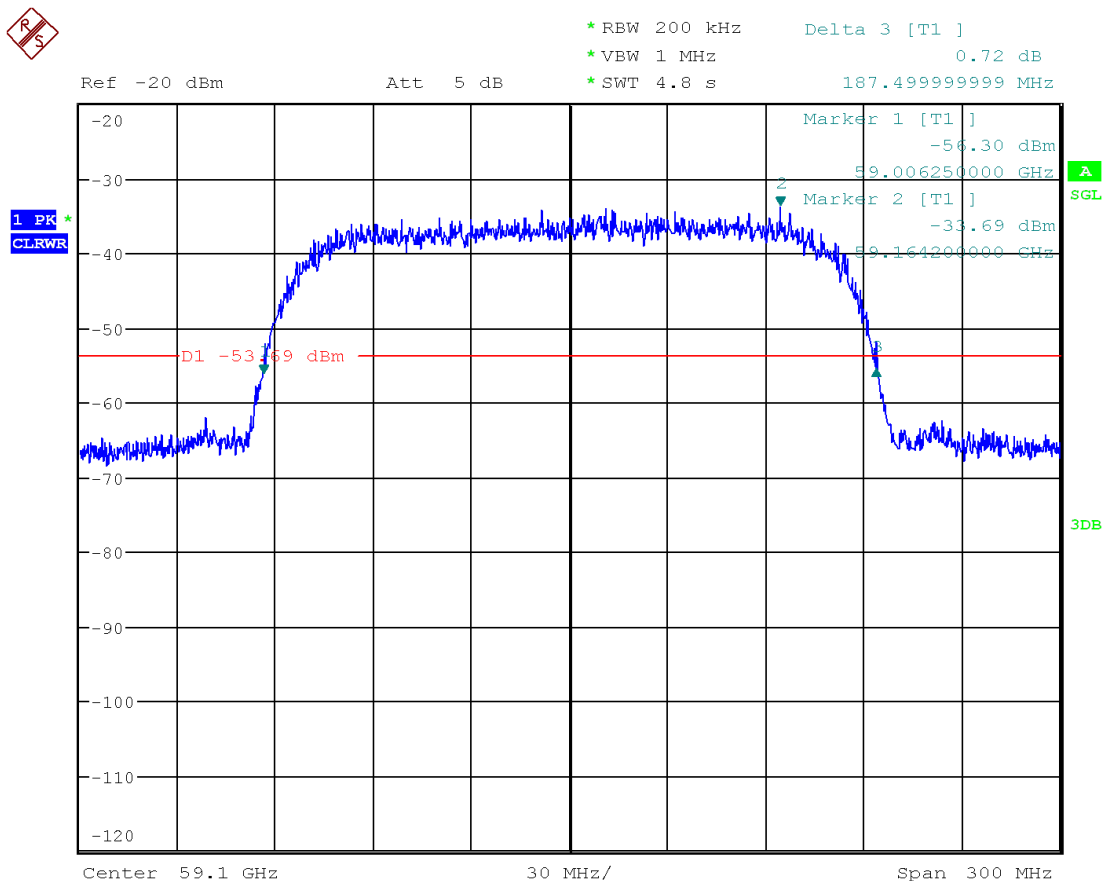


EUT Conf.	Voltage	Temperature	fL/fH [GHz]	Limit [GHz]	Verdict
	100 %	+50 °C	63.993269231	fL > 57, fH < 64	Pass

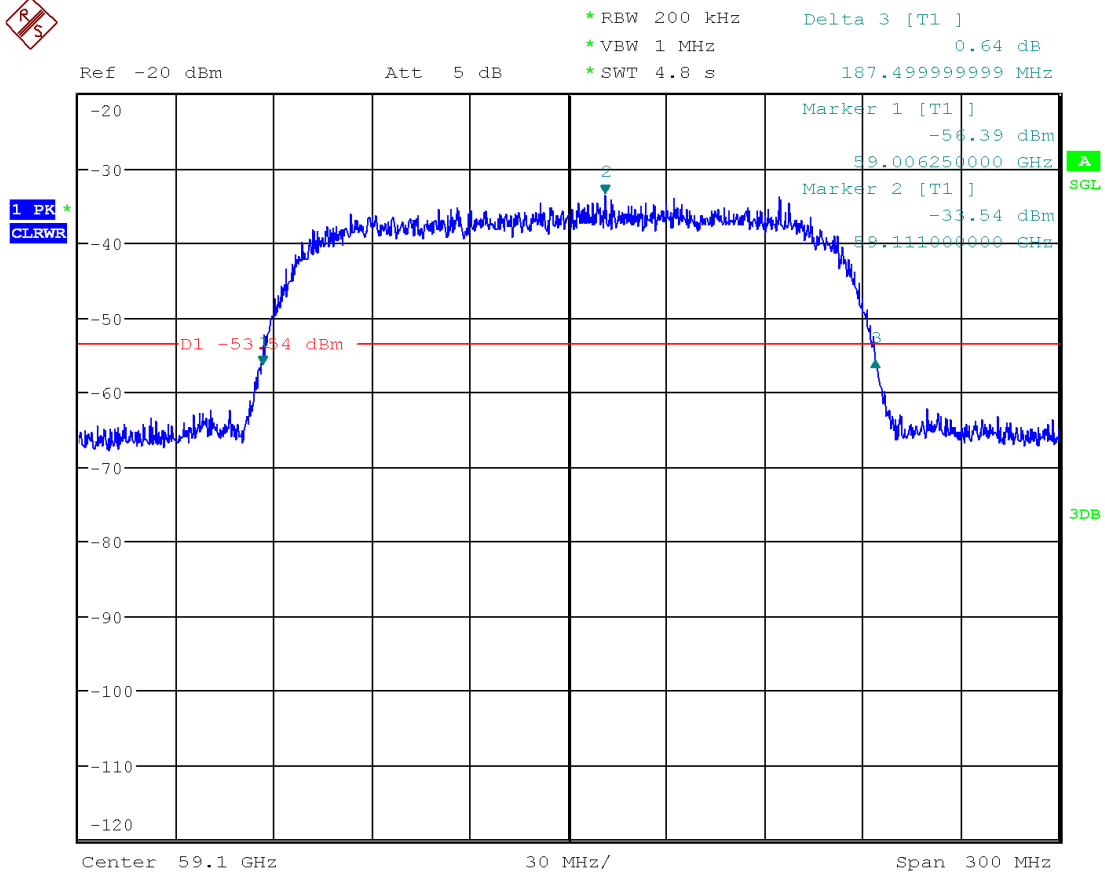
2 Test Plot

2.1 B-TM1

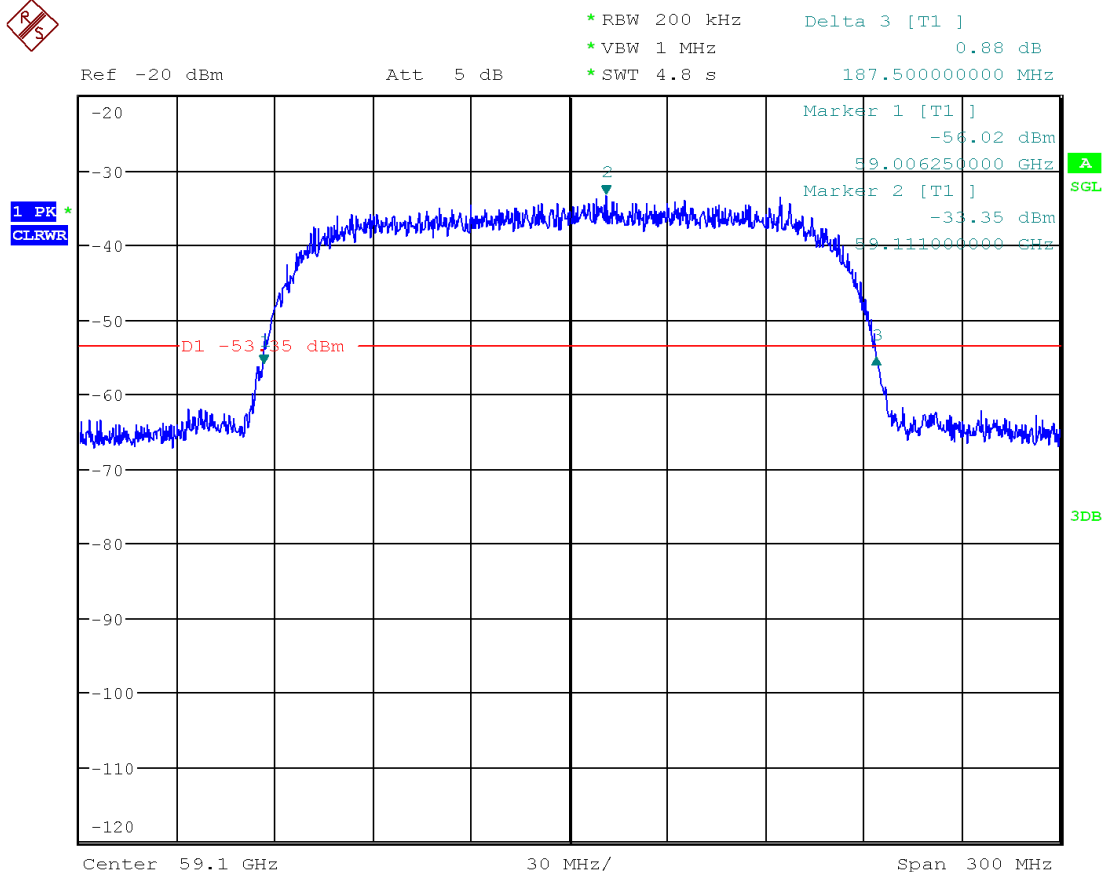
2.1.1 Voltage=100 %, Temperature=-20 °C



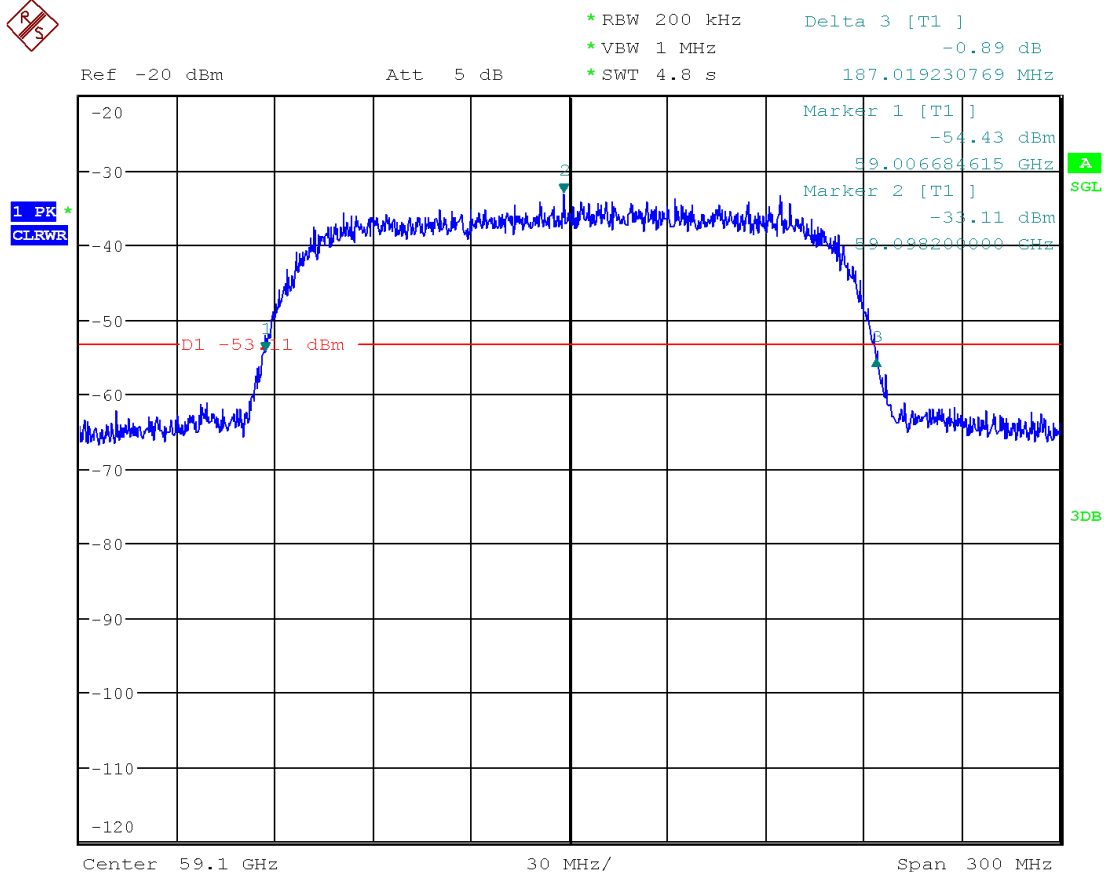
2.1.2 Voltage=100 %, Temperature=-10 °C



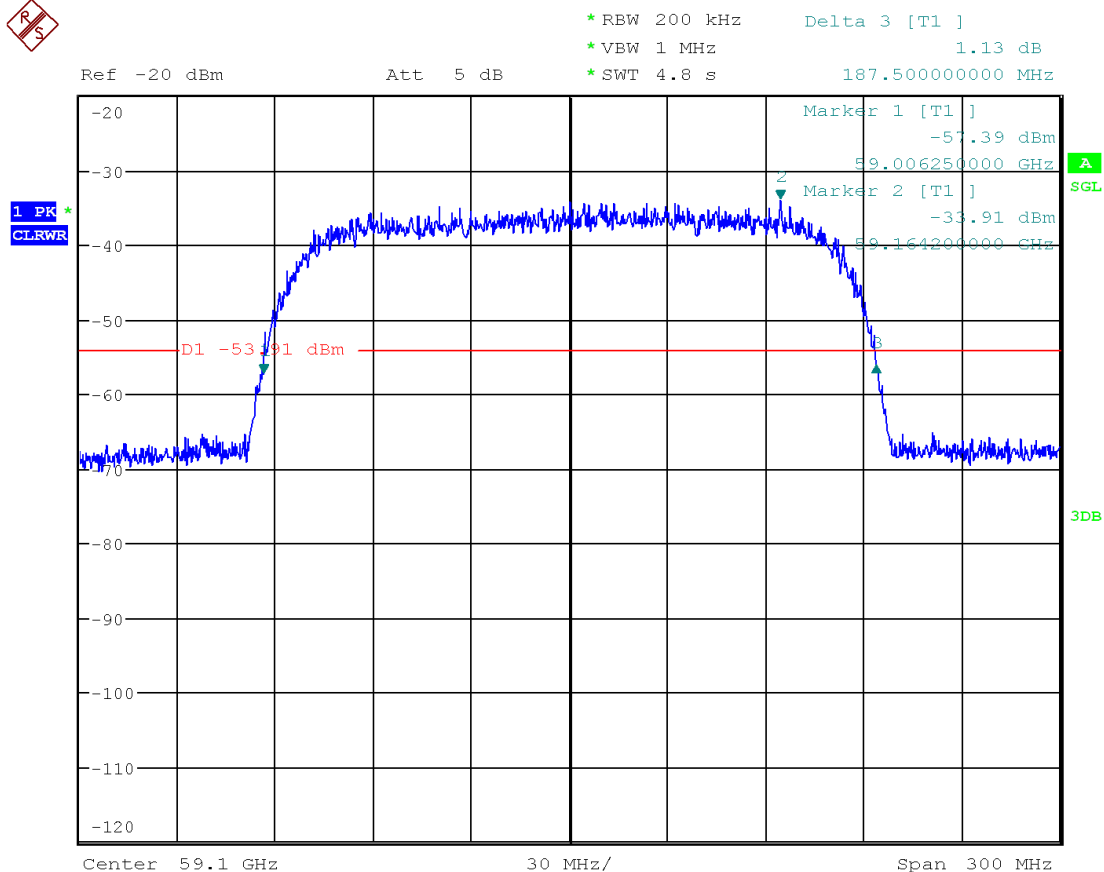
2.1.3 Voltage=100 %, Temperature=0 °C



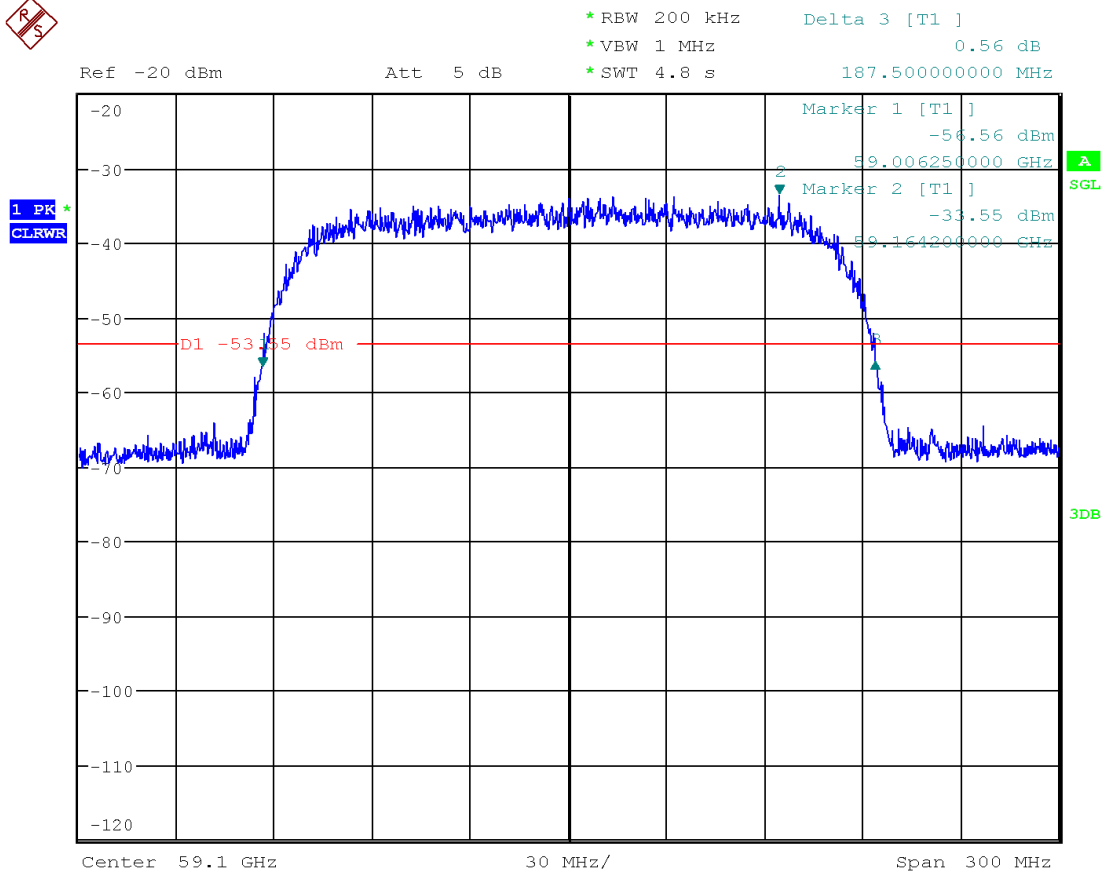
2.1.4 Voltage=100 %, Temperature=+10 °C



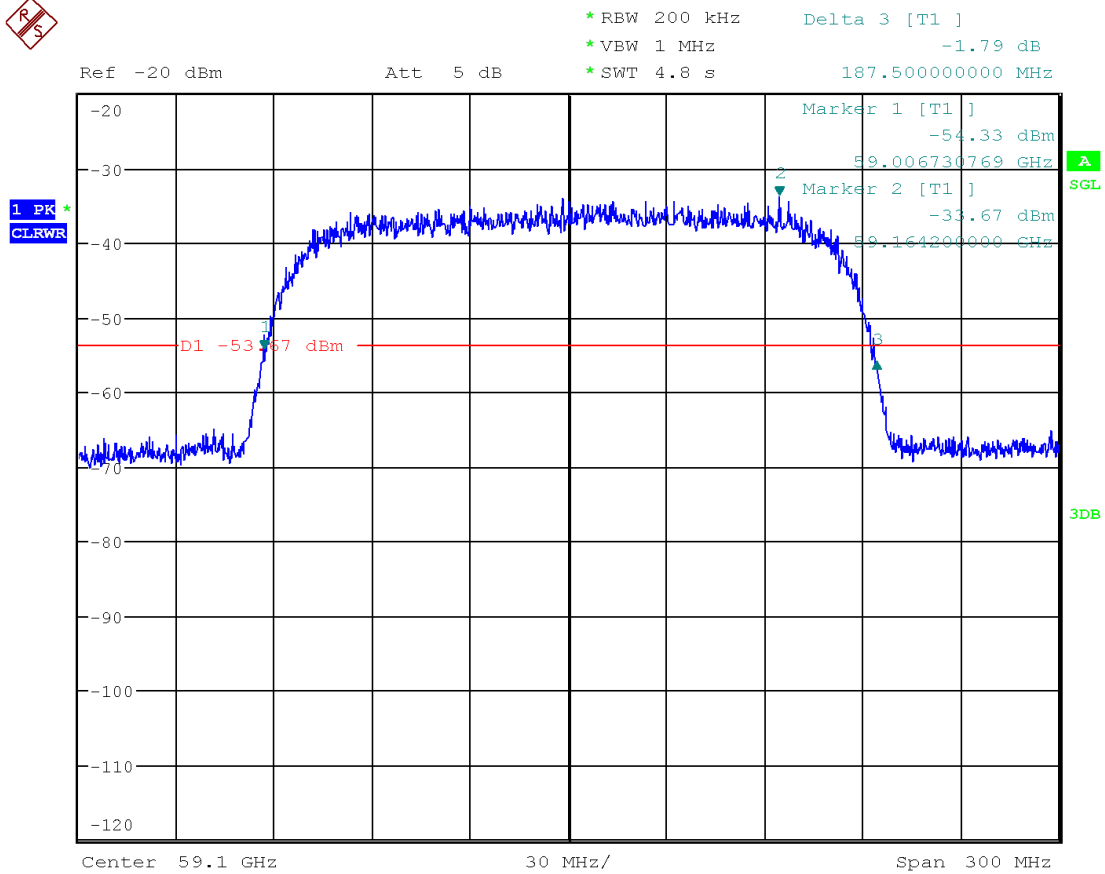
2.1.5 Voltage=85 %, Temperature=+20 °C



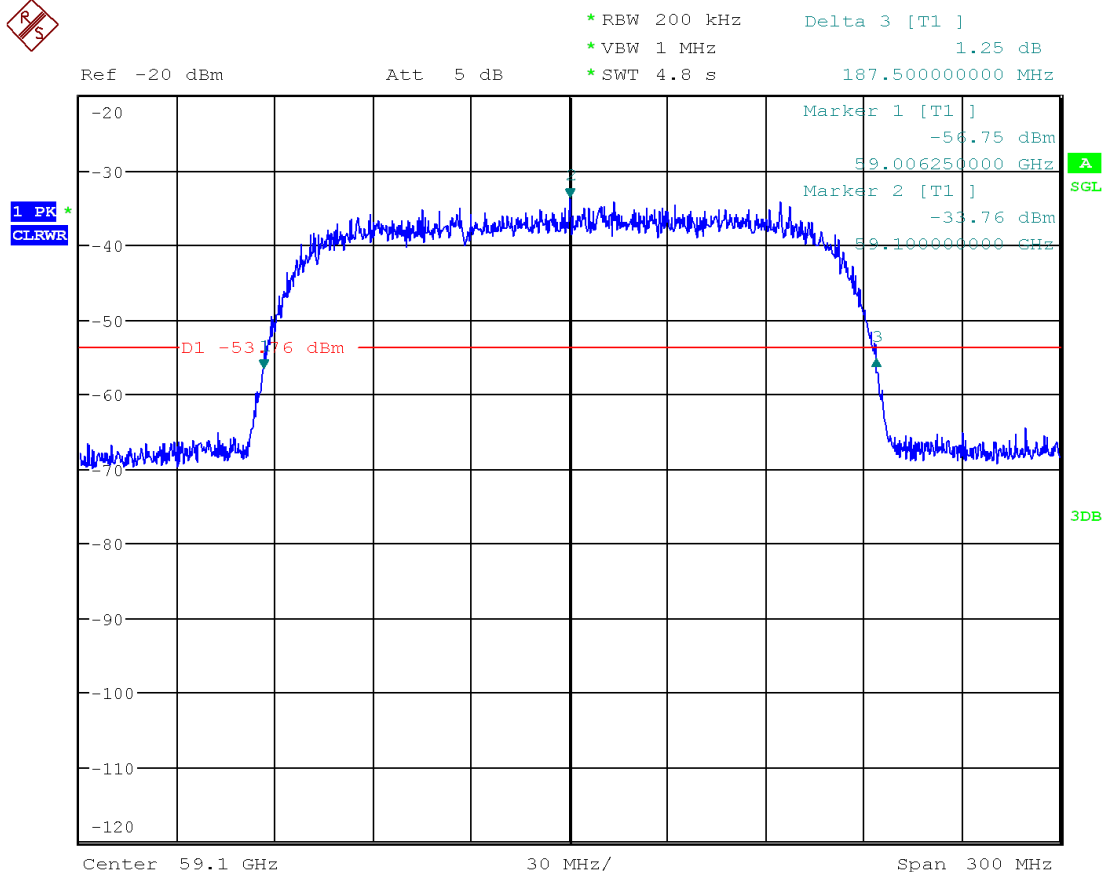
2.1.6 Voltage=100 %, Temperature=+20 °C



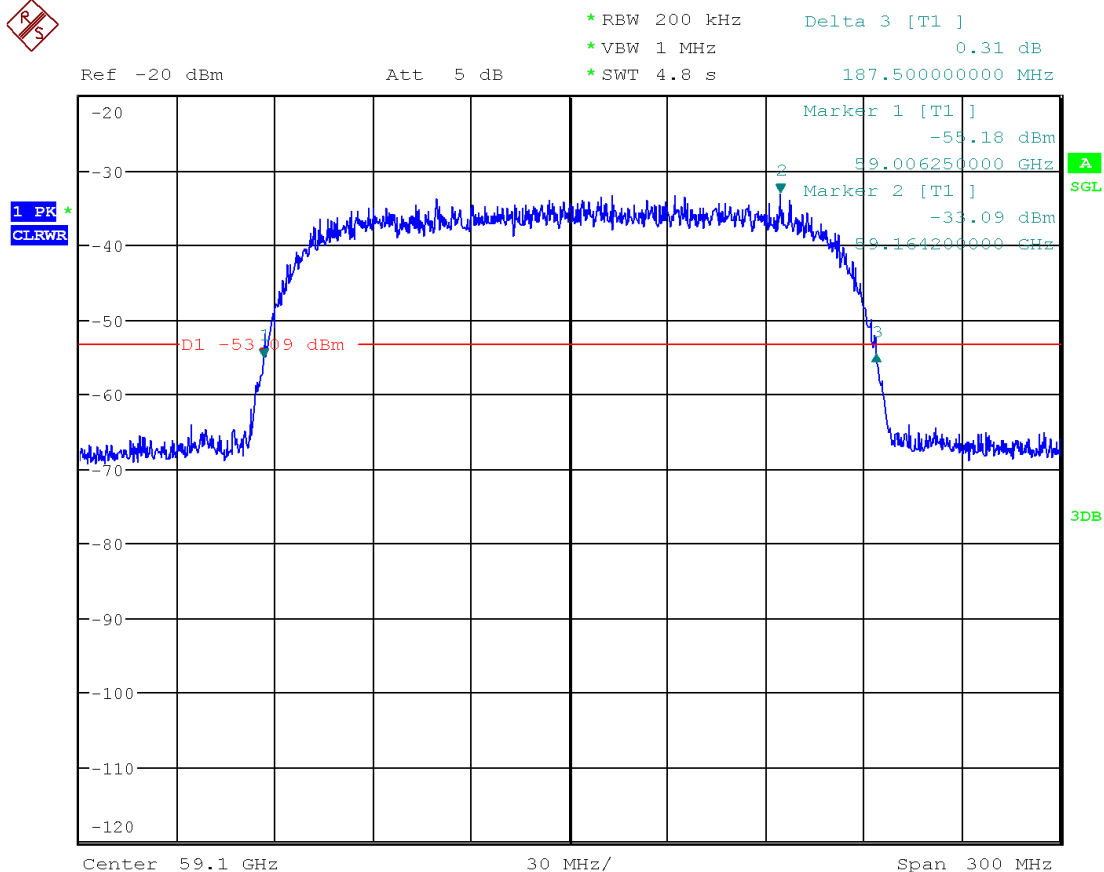
2.1.7 Voltage=115 %, Temperature=+20 °C



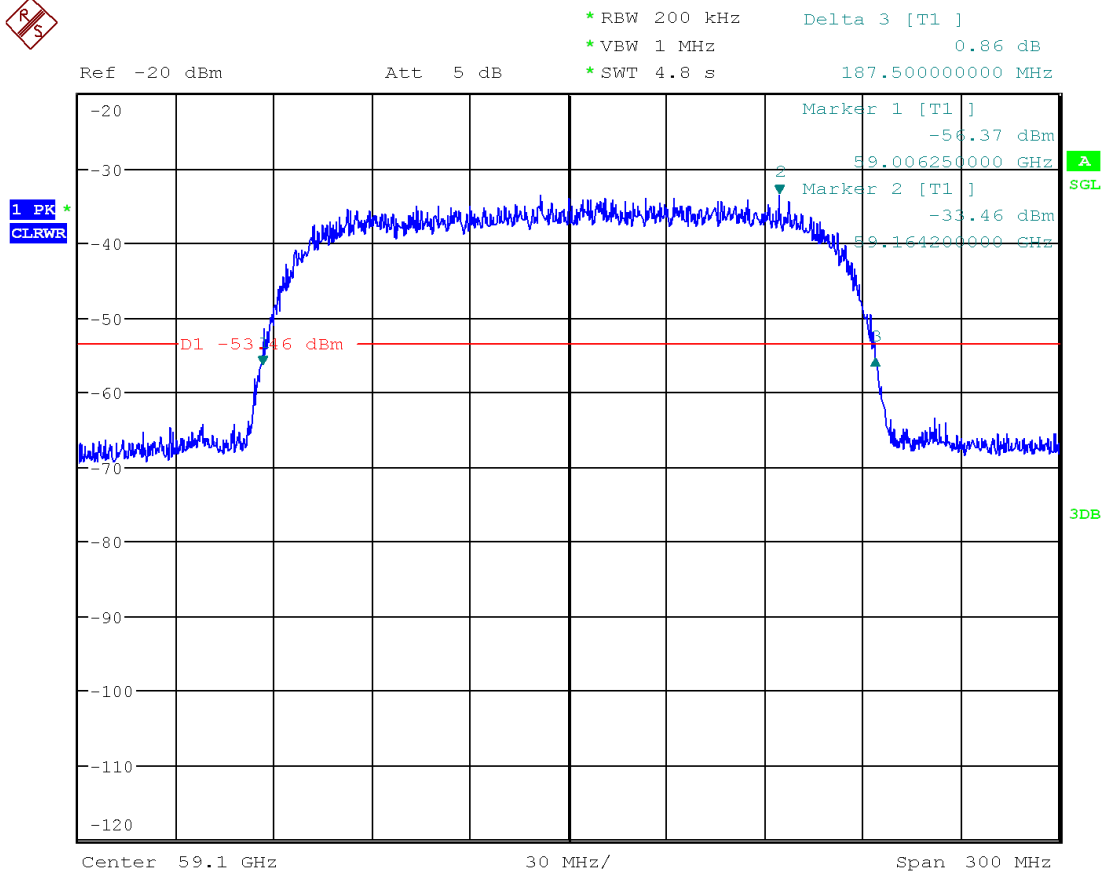
2.1.8 Voltage=100 %, Temperature=+30 °C



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

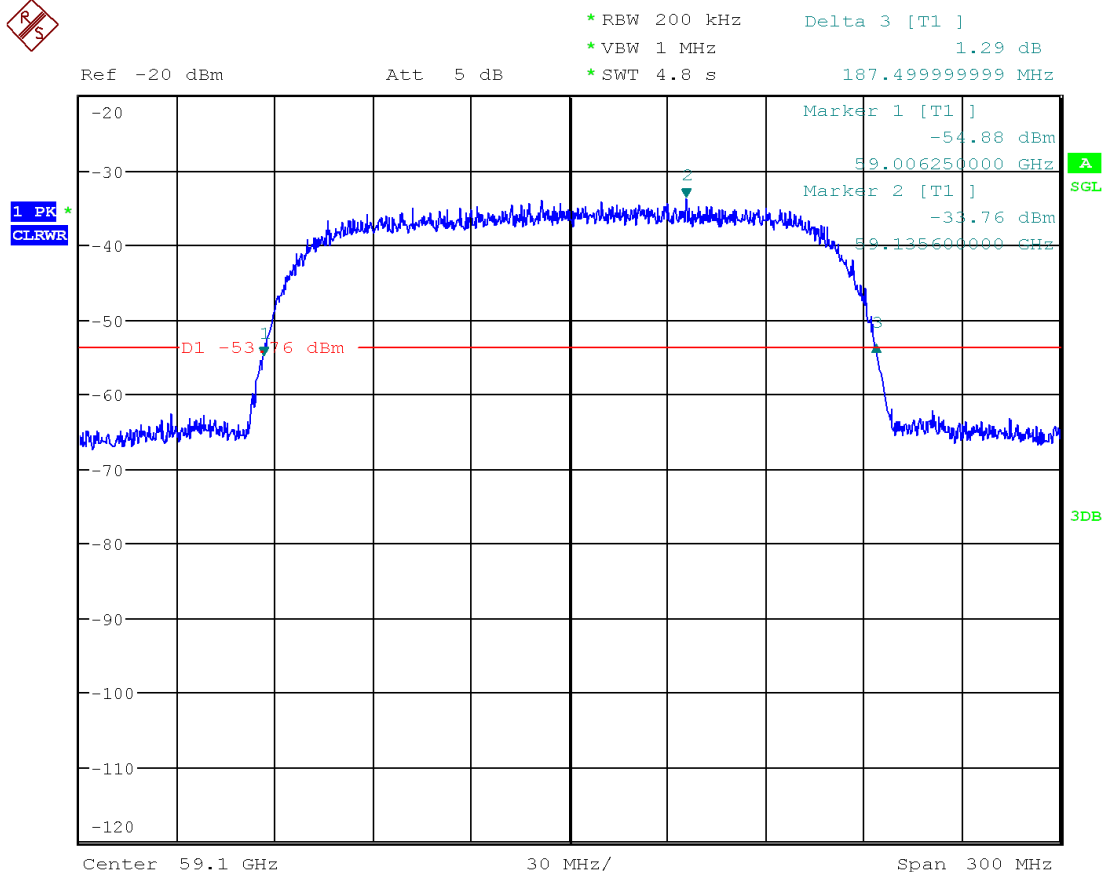


2.1.10 Voltage=100 %, Temperature=+50 °C

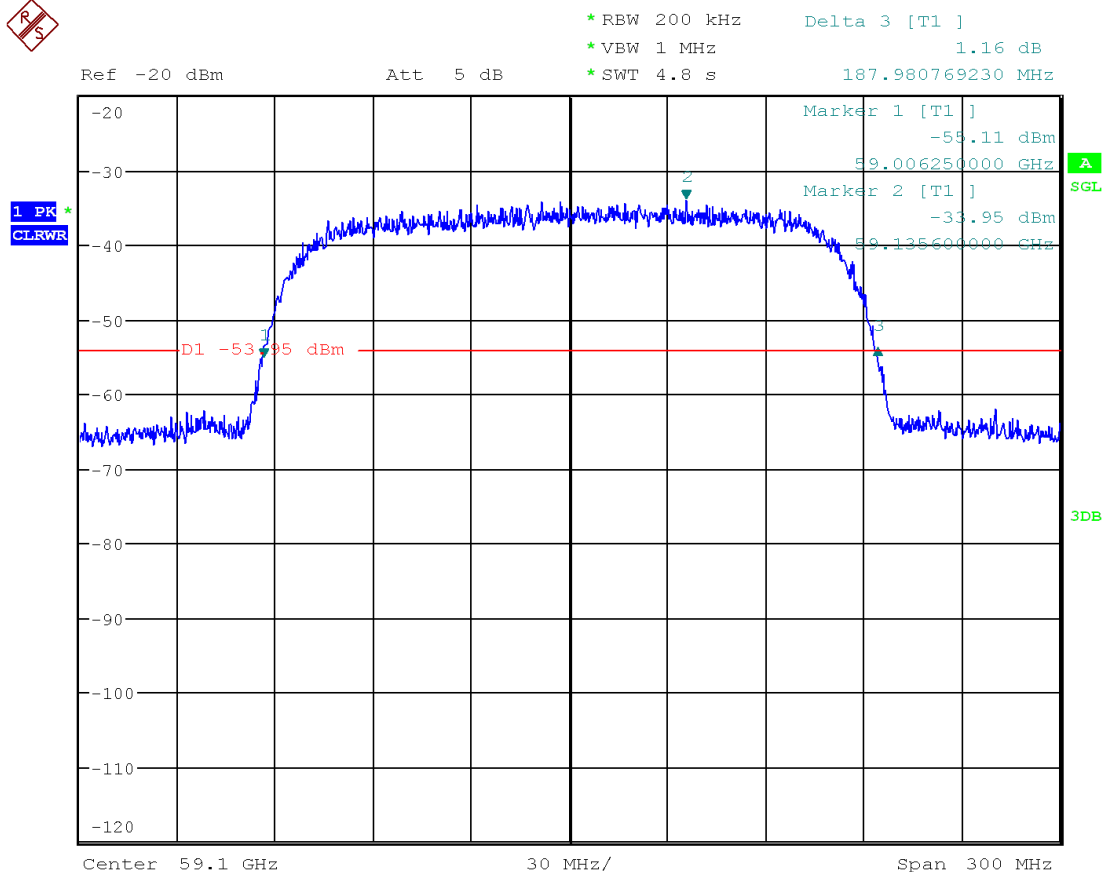


2.2 B-TM2

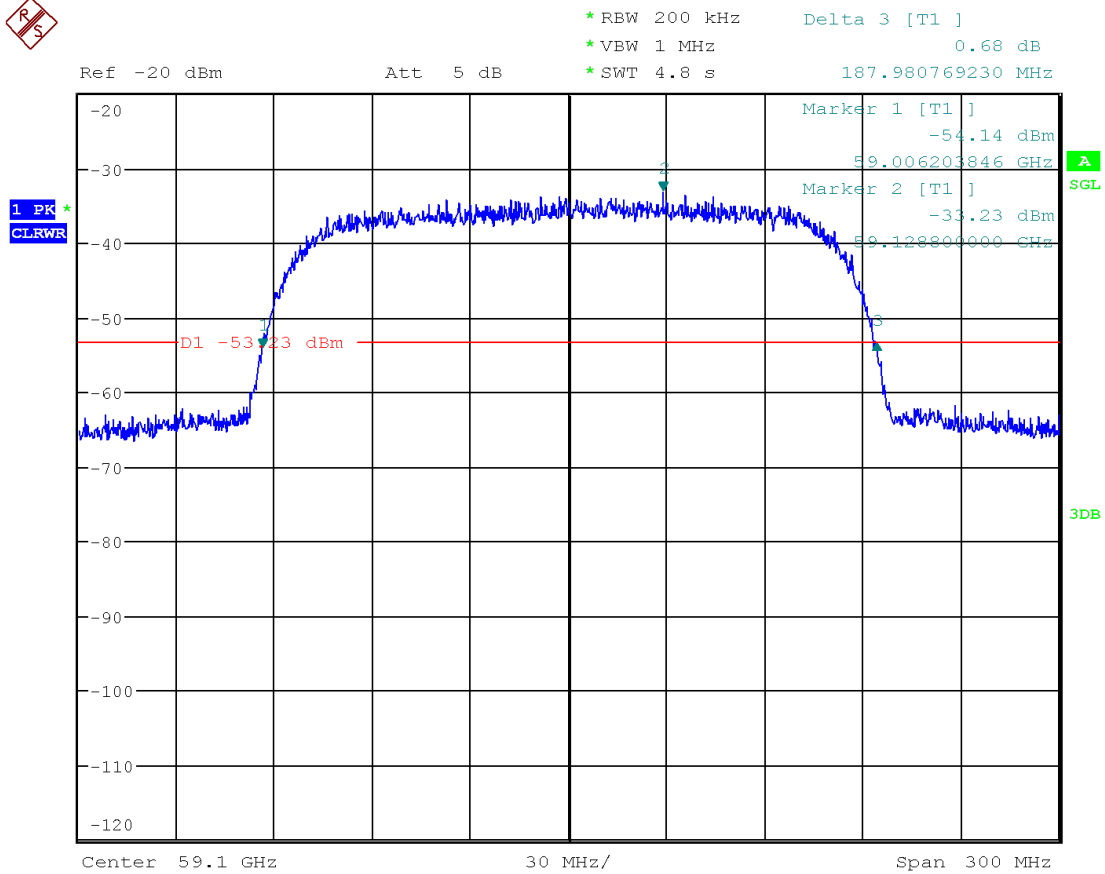
2.2.1 Voltage=100 %, Temperature=-20 °C



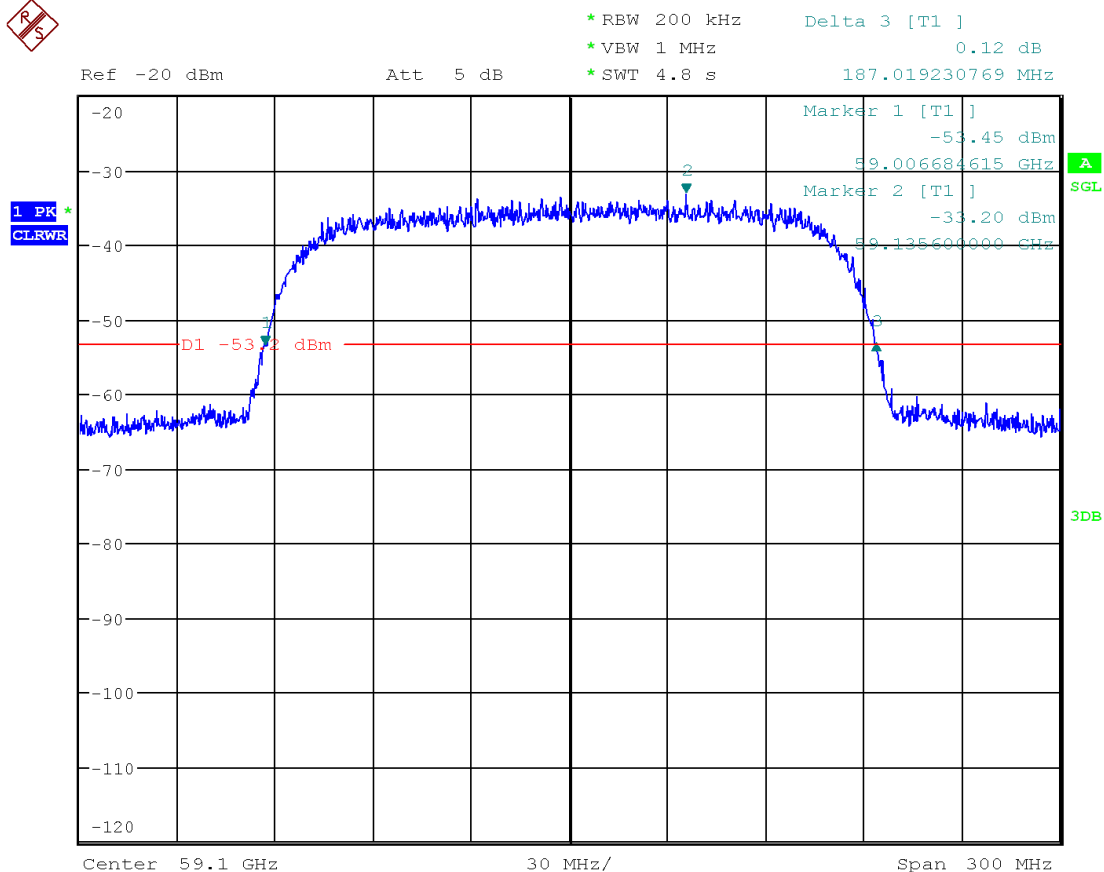
2.2.2 Voltage=100 %, Temperature=-10 °C



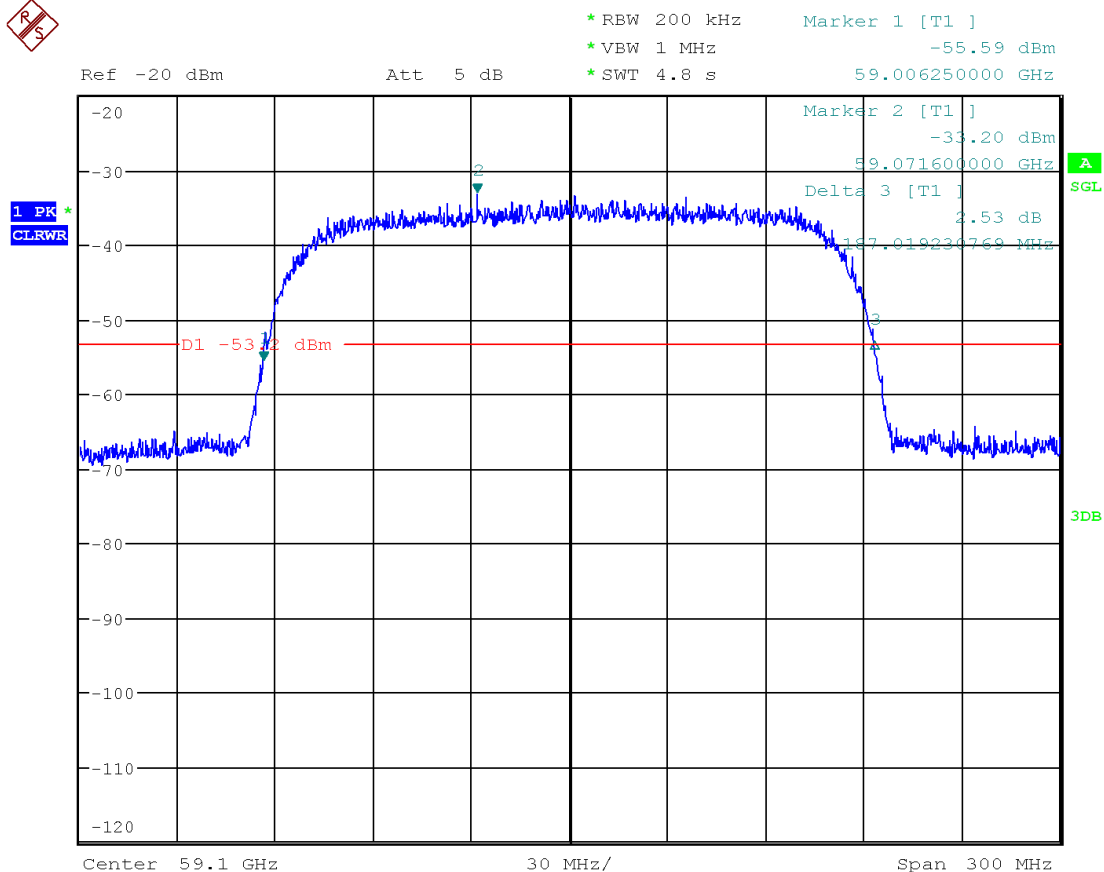
2.2.3 Voltage=100 %, Temperature=0 °C



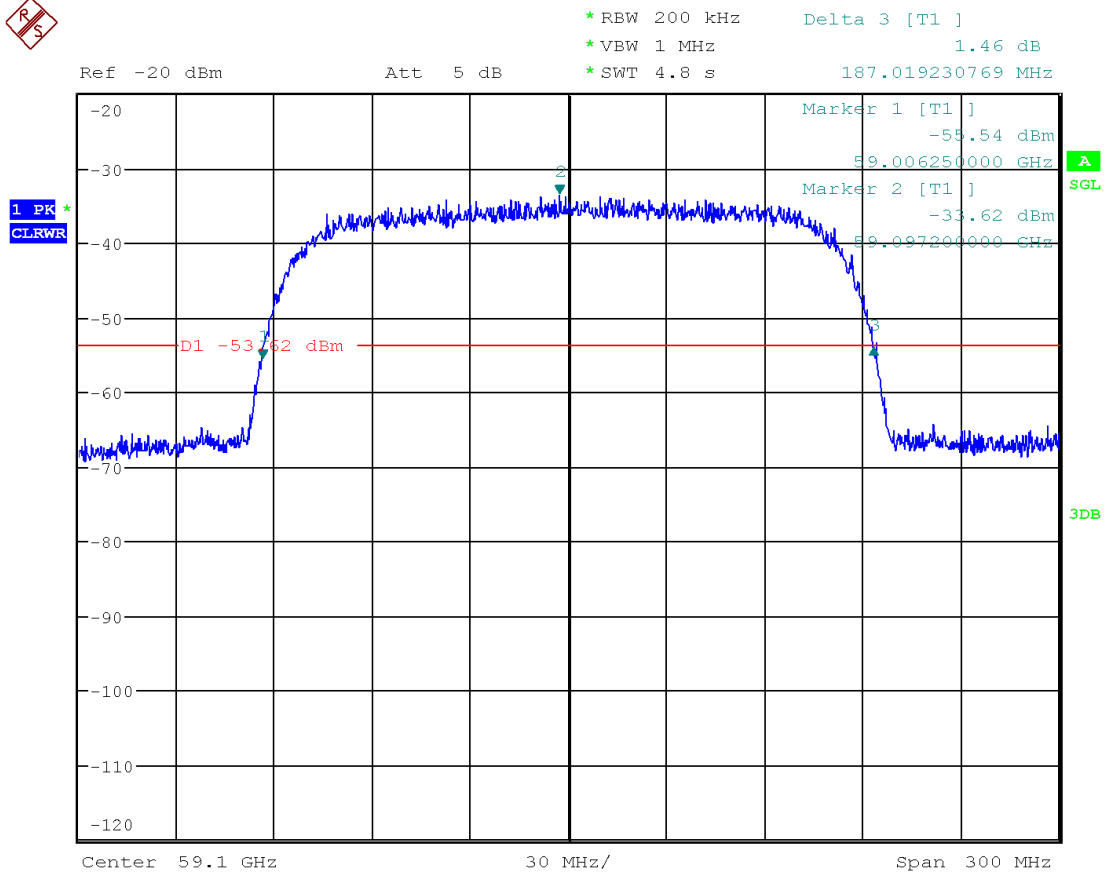
2.2.4 Voltage=100 %, Temperature=+10 °C



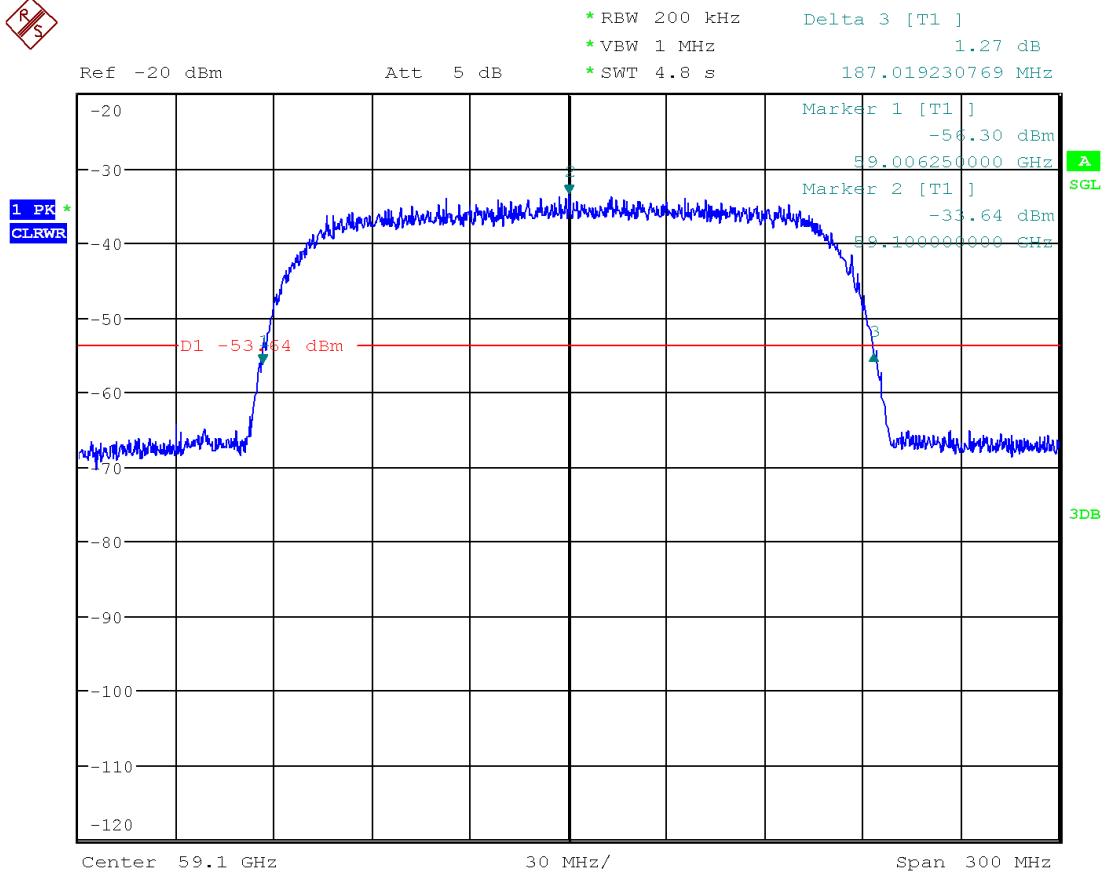
2.2.5 Voltage=85 %, Temperature=+20 °C



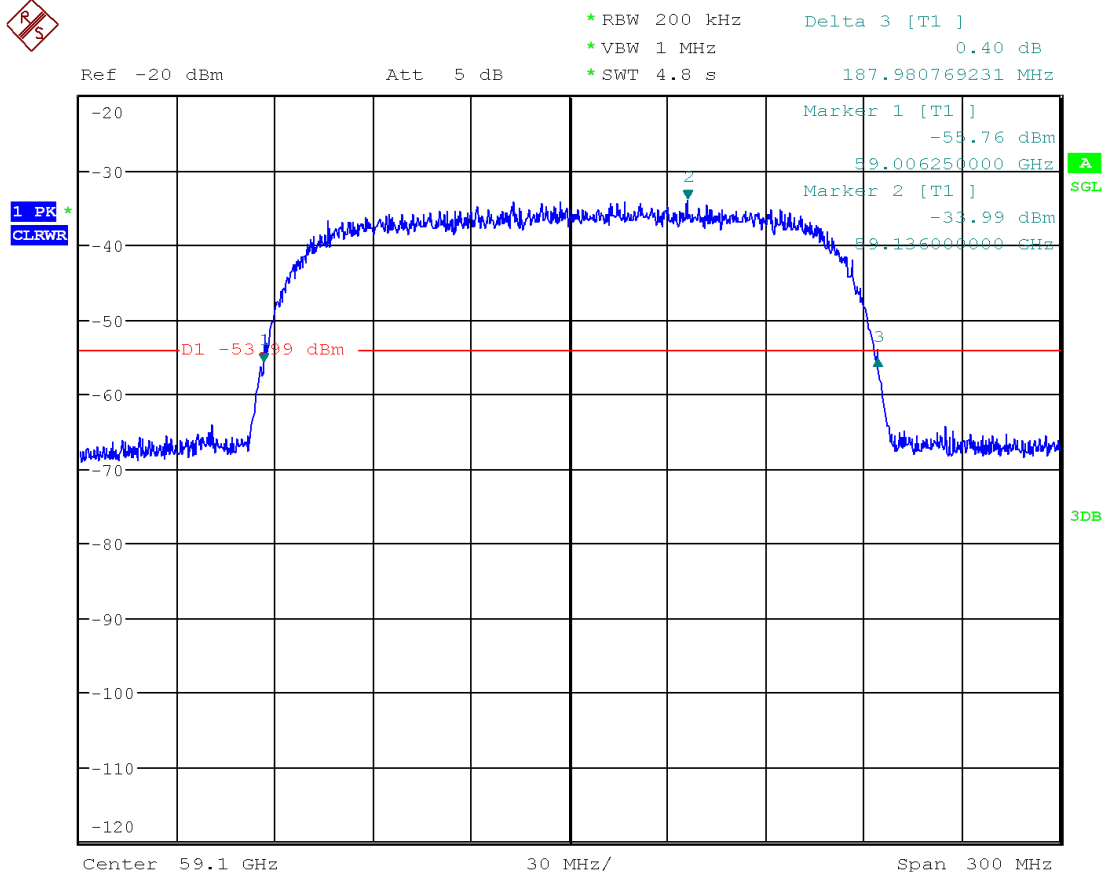
2.2.6 Voltage=100 %, Temperature=+20 °C



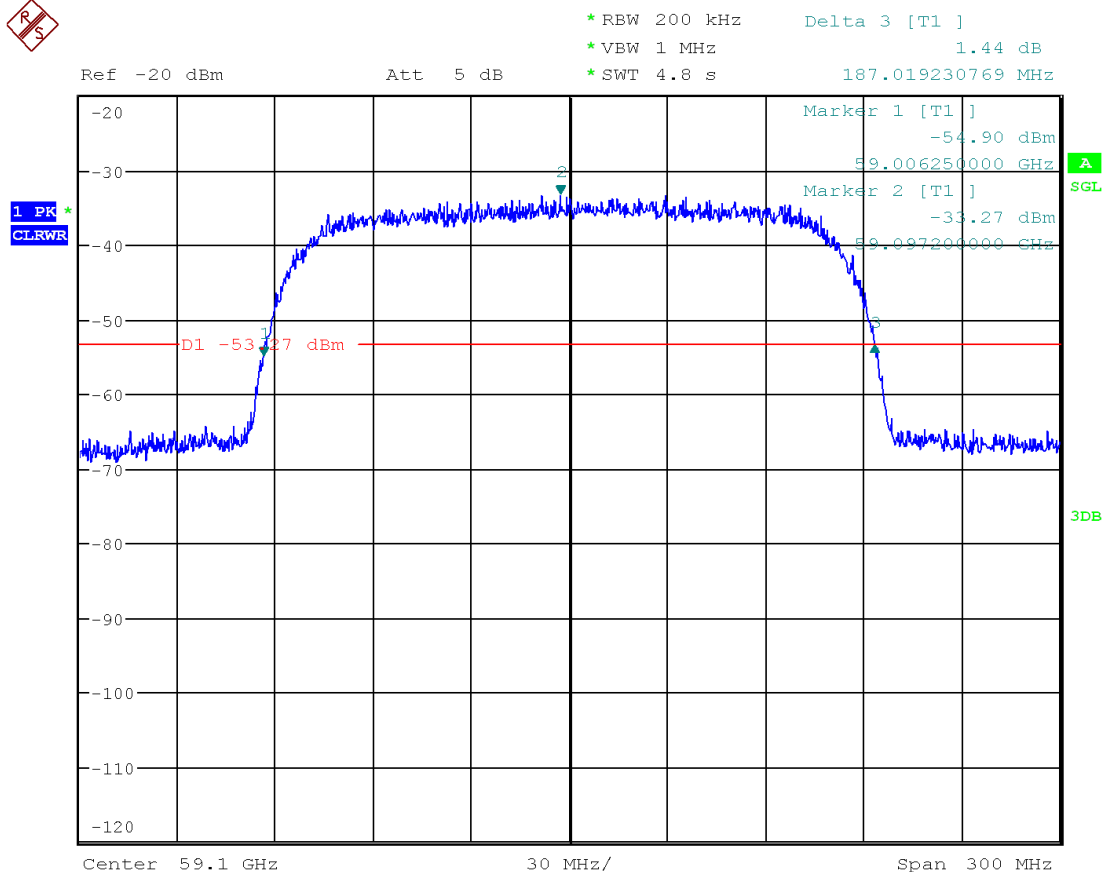
2.2.7 Voltage=115 %, Temperature=+20 °C



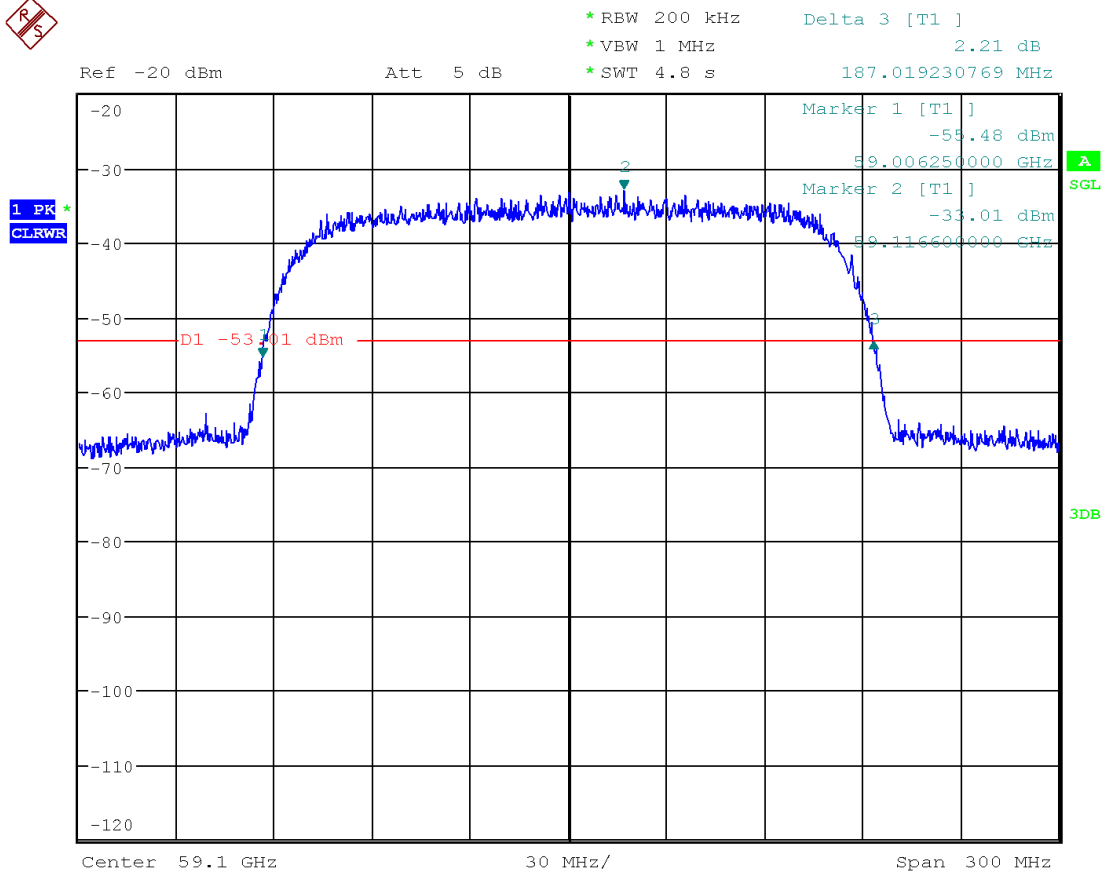
2.2.8 Voltage=100 %, Temperature=+30 °C



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

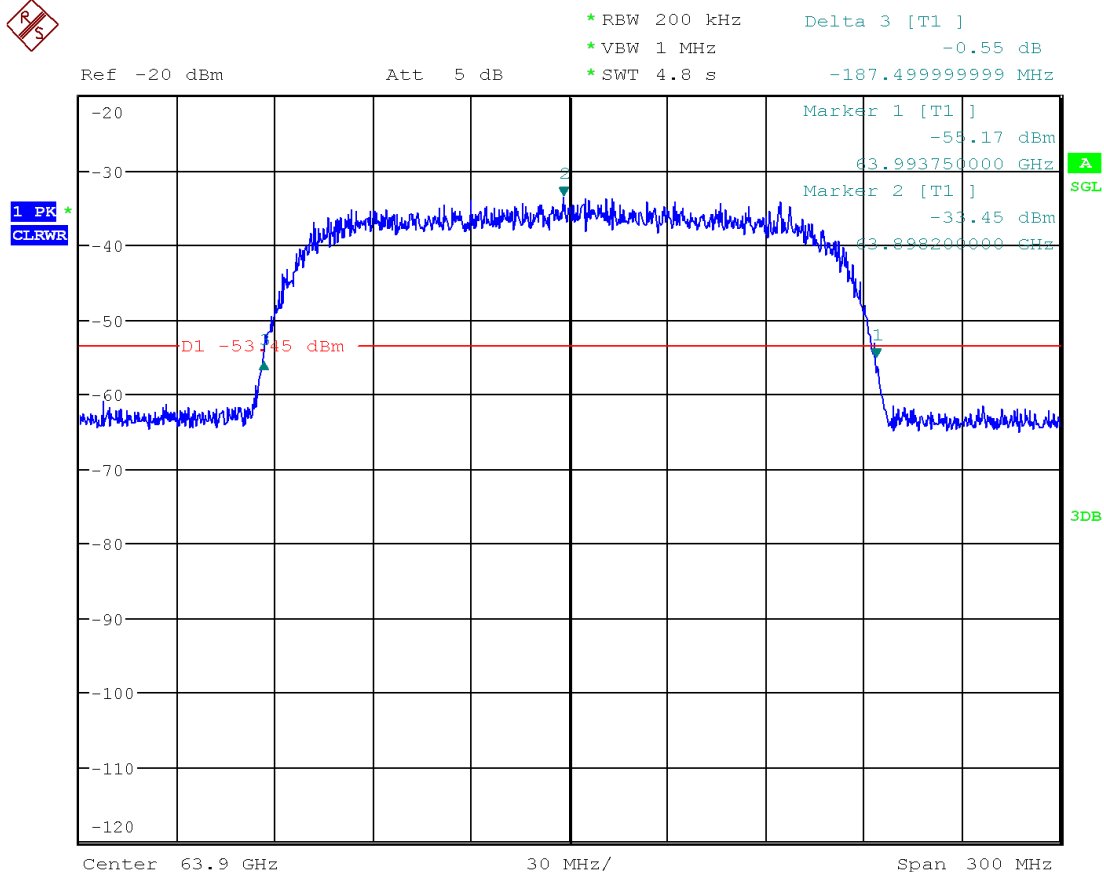


2.2.10 Voltage=100 %, Temperature=+50 °C

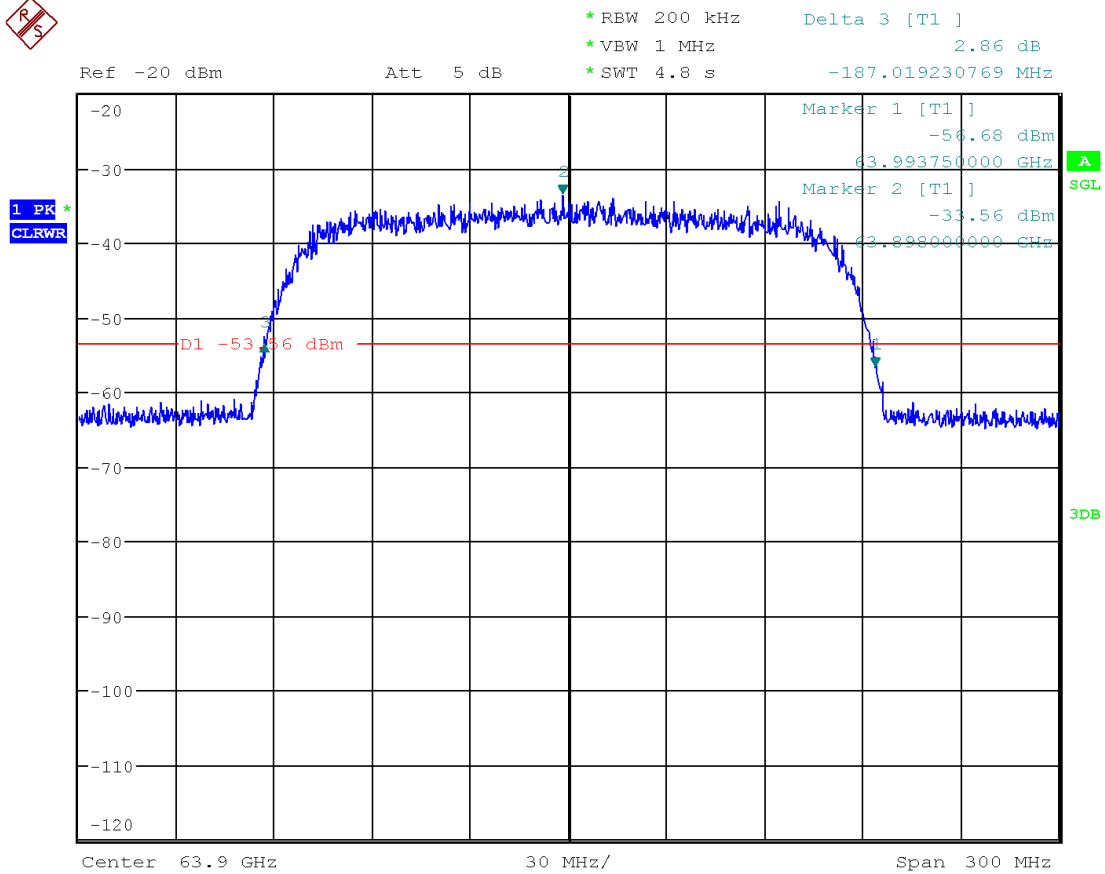


2.3 T-TM1

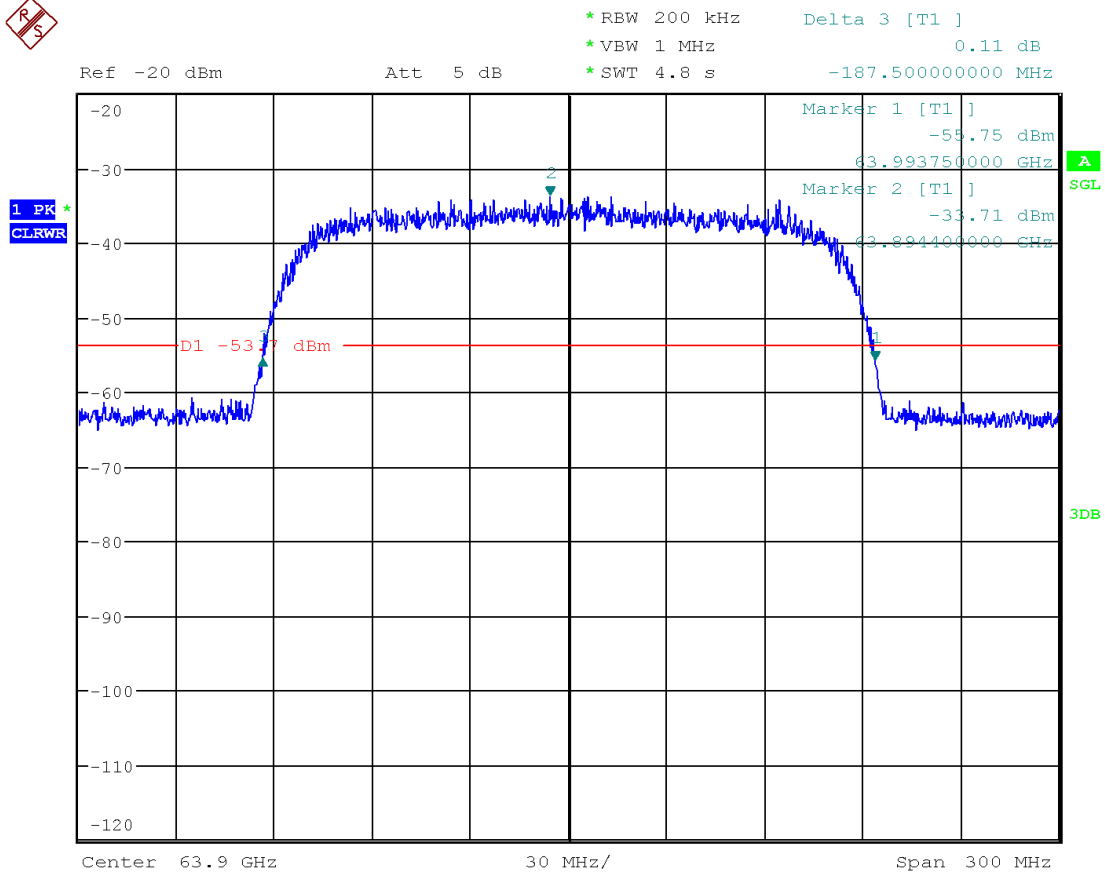
2.3.1 Voltage=100 %, Temperature=-20 °C



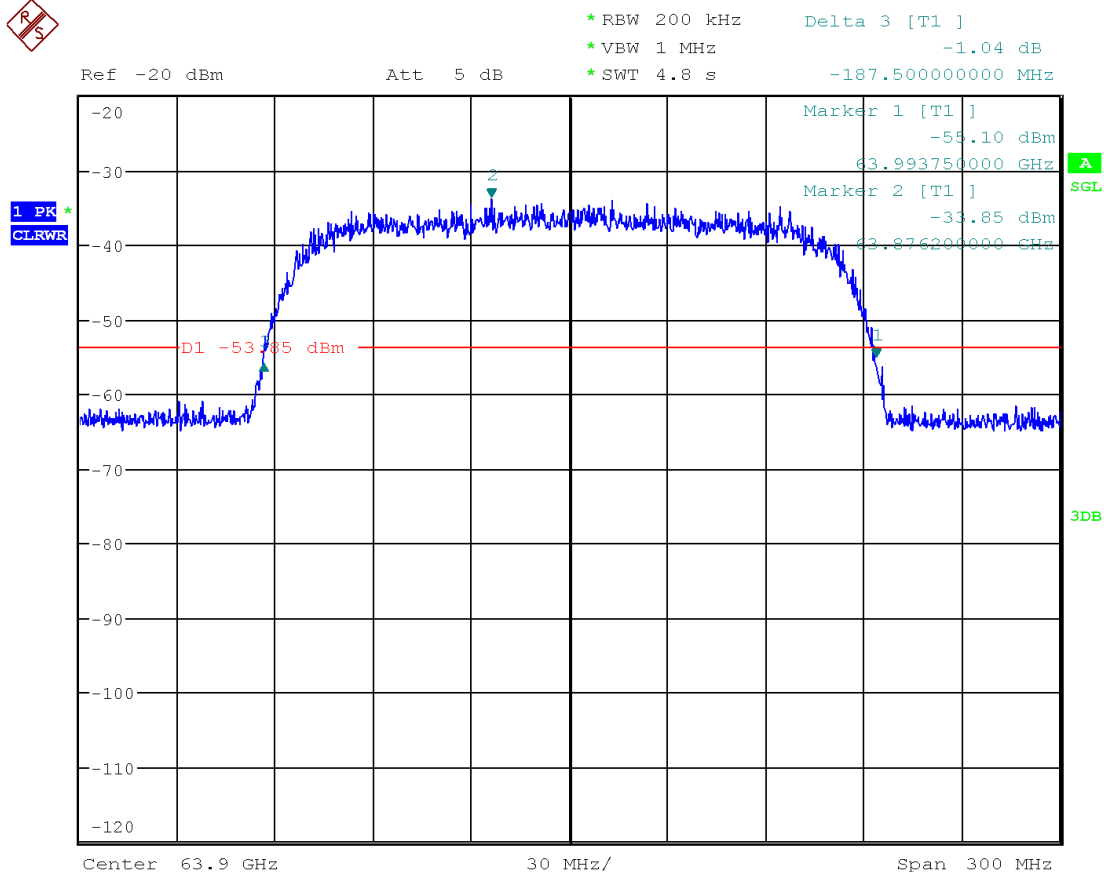
2.3.2 Voltage=100 %, Temperature=-10 °C



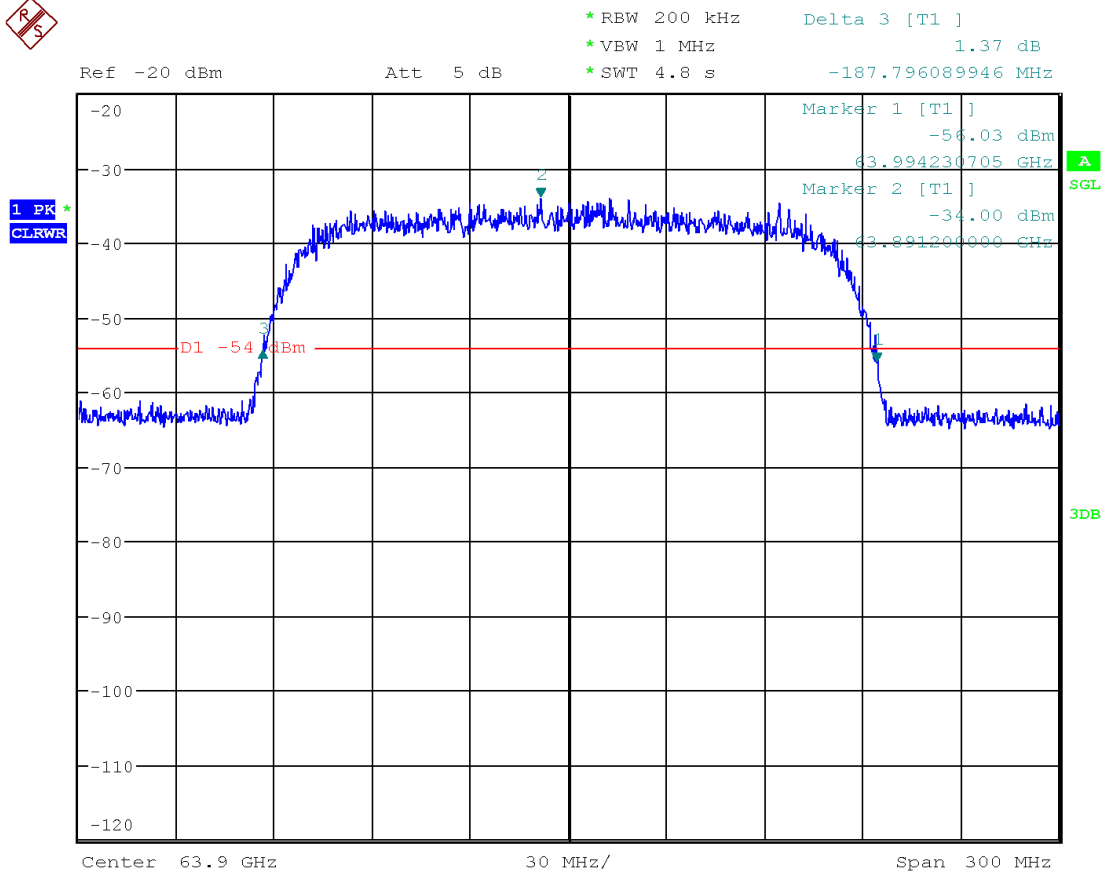
2.3.3 Voltage=100 %, Temperature=0 °C



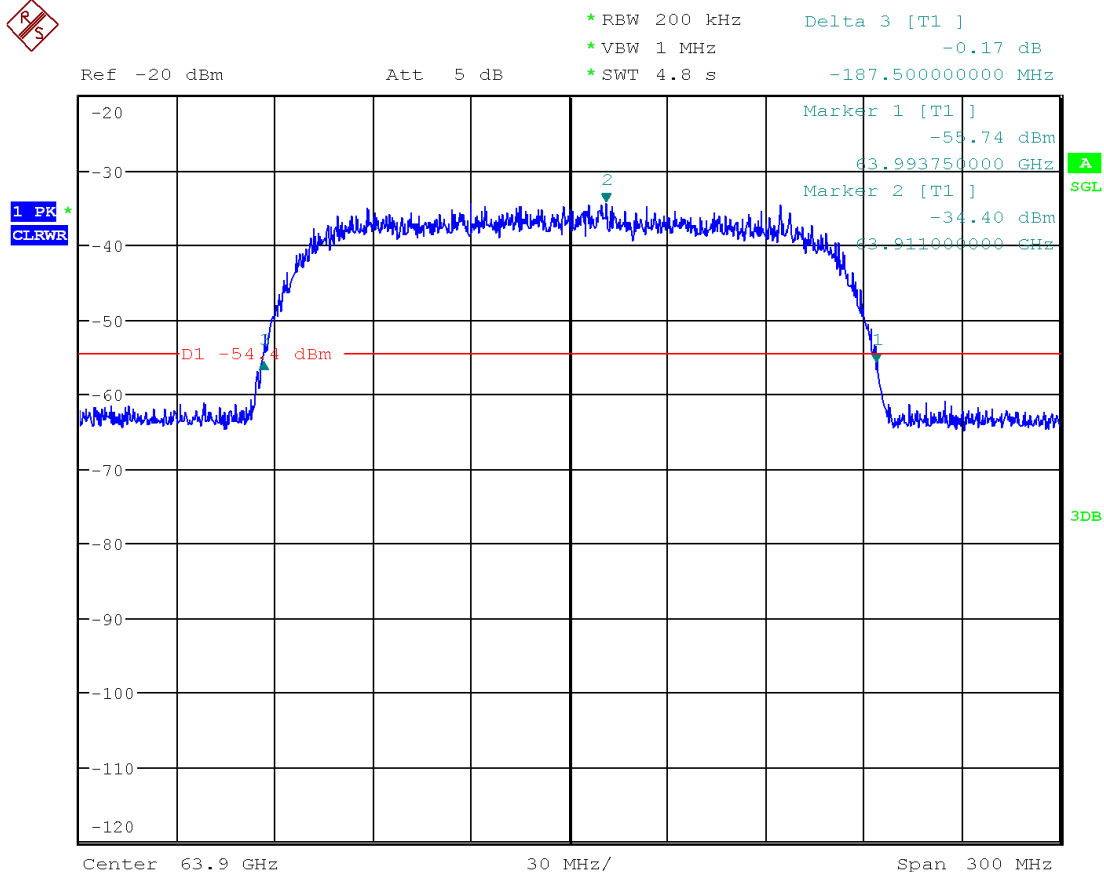
2.3.4 Voltage=100 %, Temperature=+10 °C



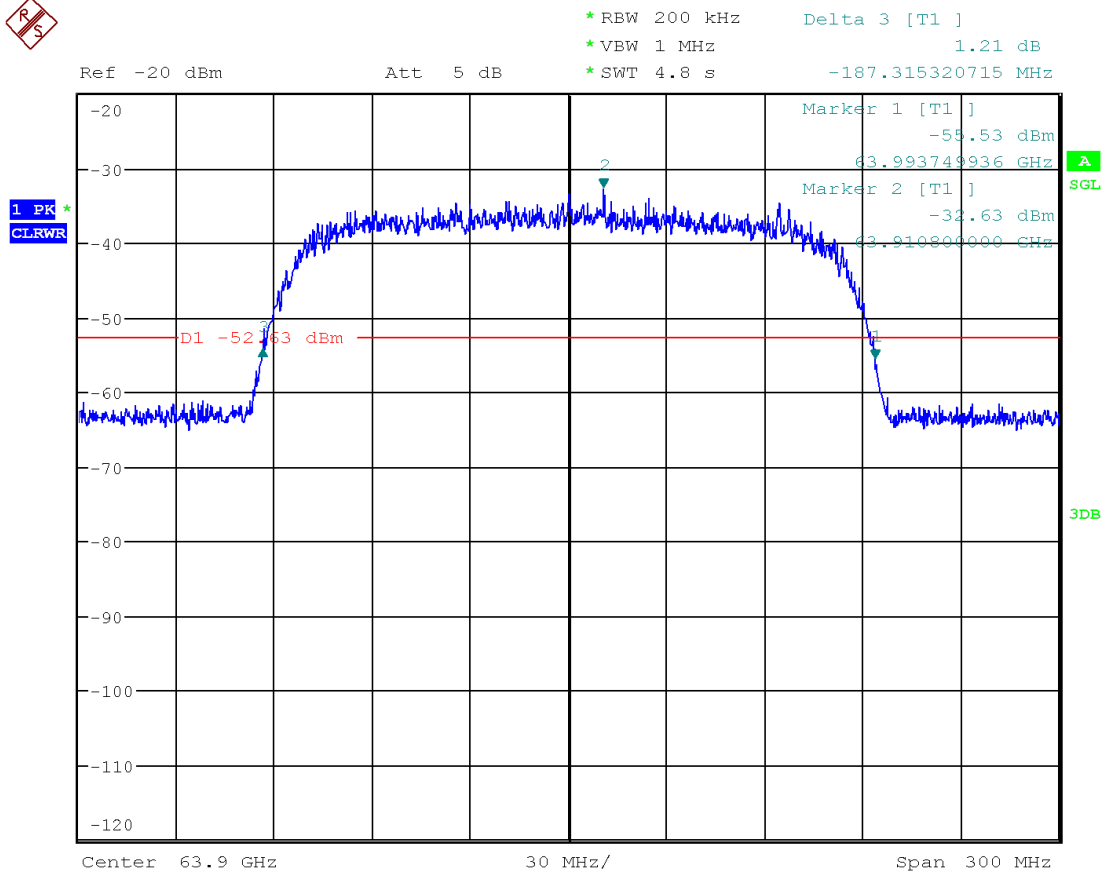
2.3.5 Voltage=85 %, Temperature=+20 °C



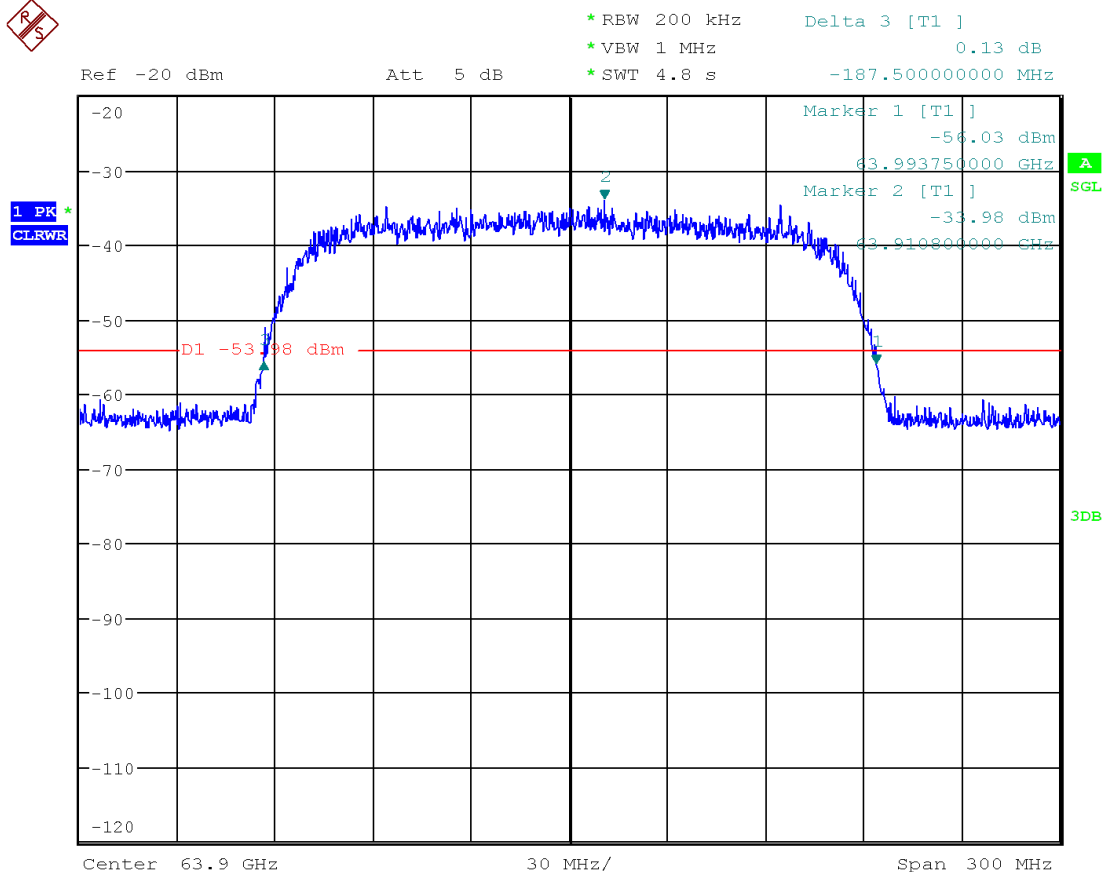
2.3.6 Voltage=100 %, Temperature=+20 °C



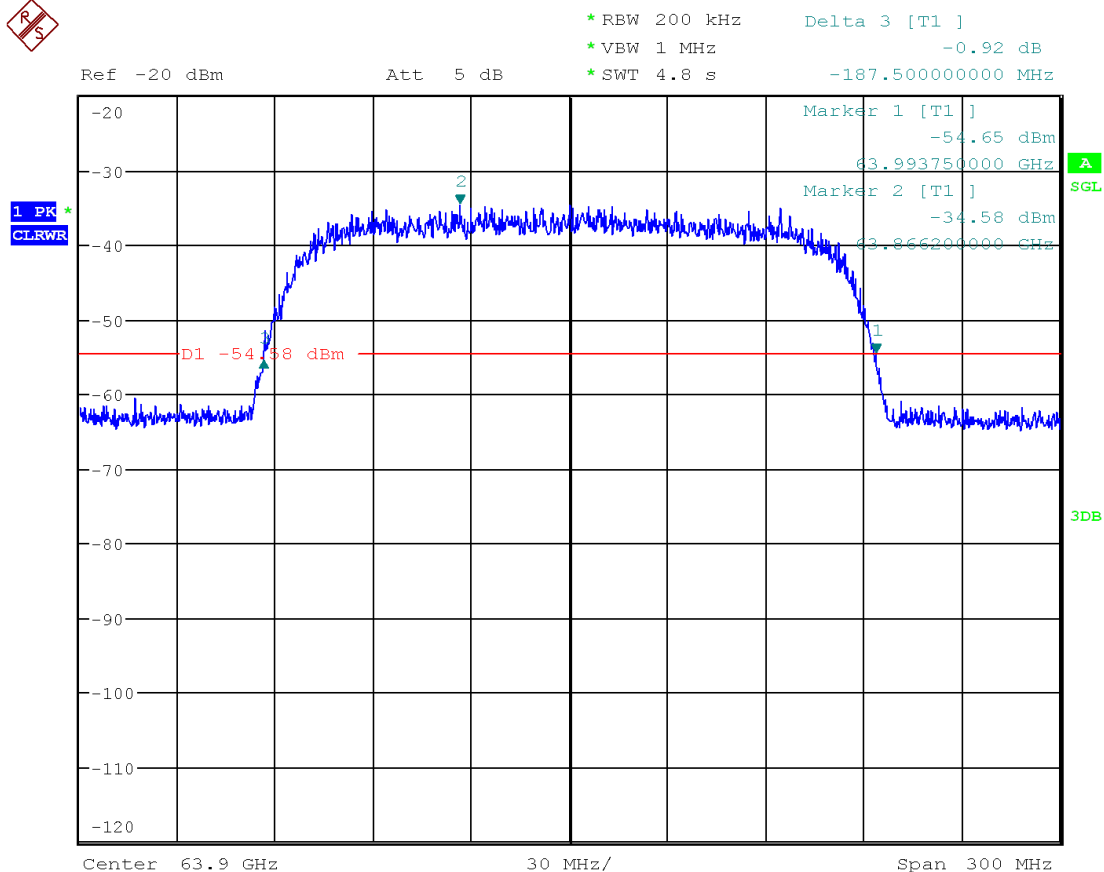
2.3.7 Voltage=115 %, Temperature=+20 °C



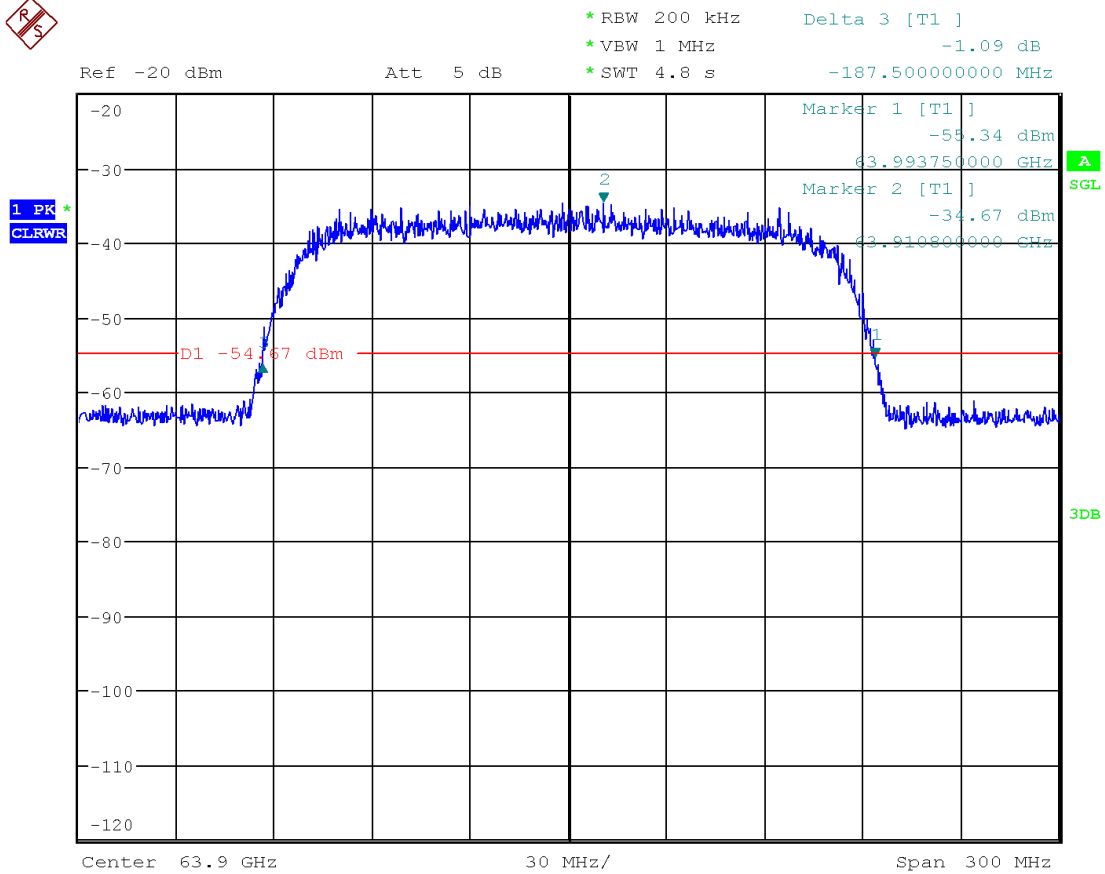
2.3.8 Voltage=100 %, Temperature=+30 °C



2.3.9 Voltage=100 %, Temperature=+40 °C

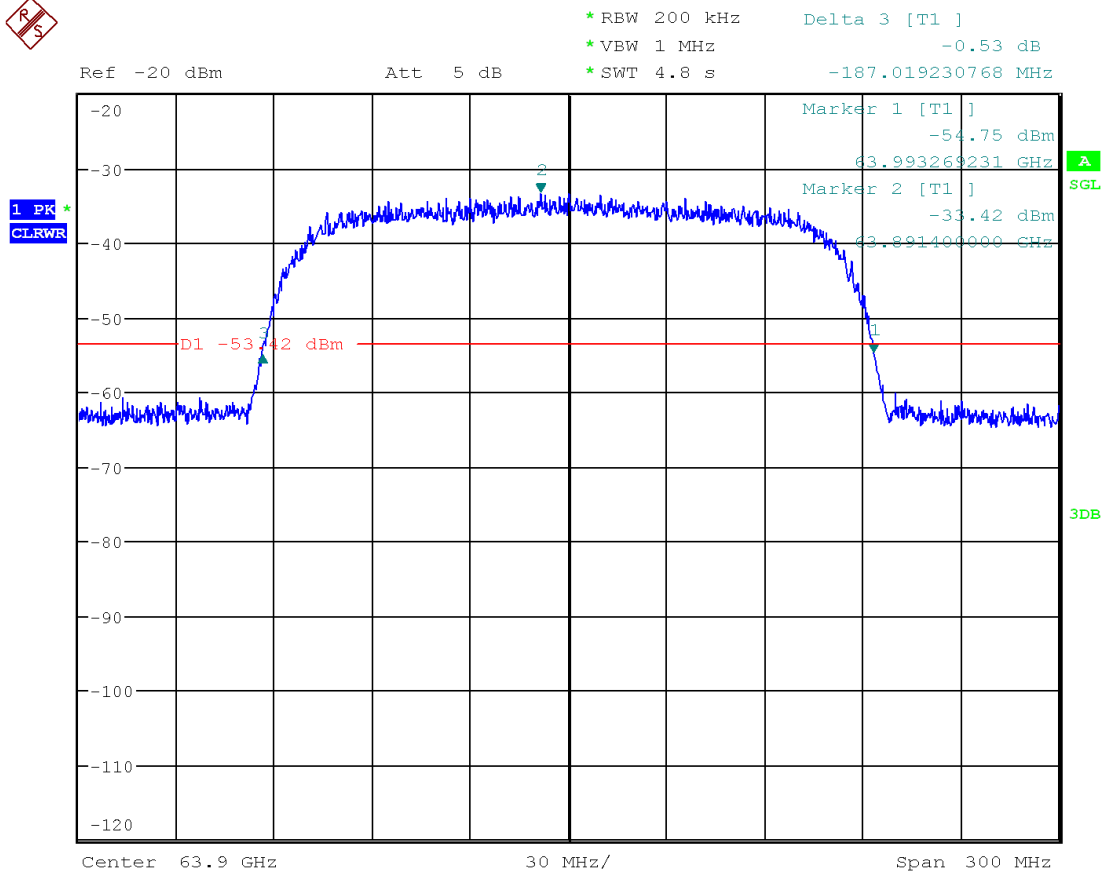


2.3.10 Voltage=100 %, Temperature=+50 °C

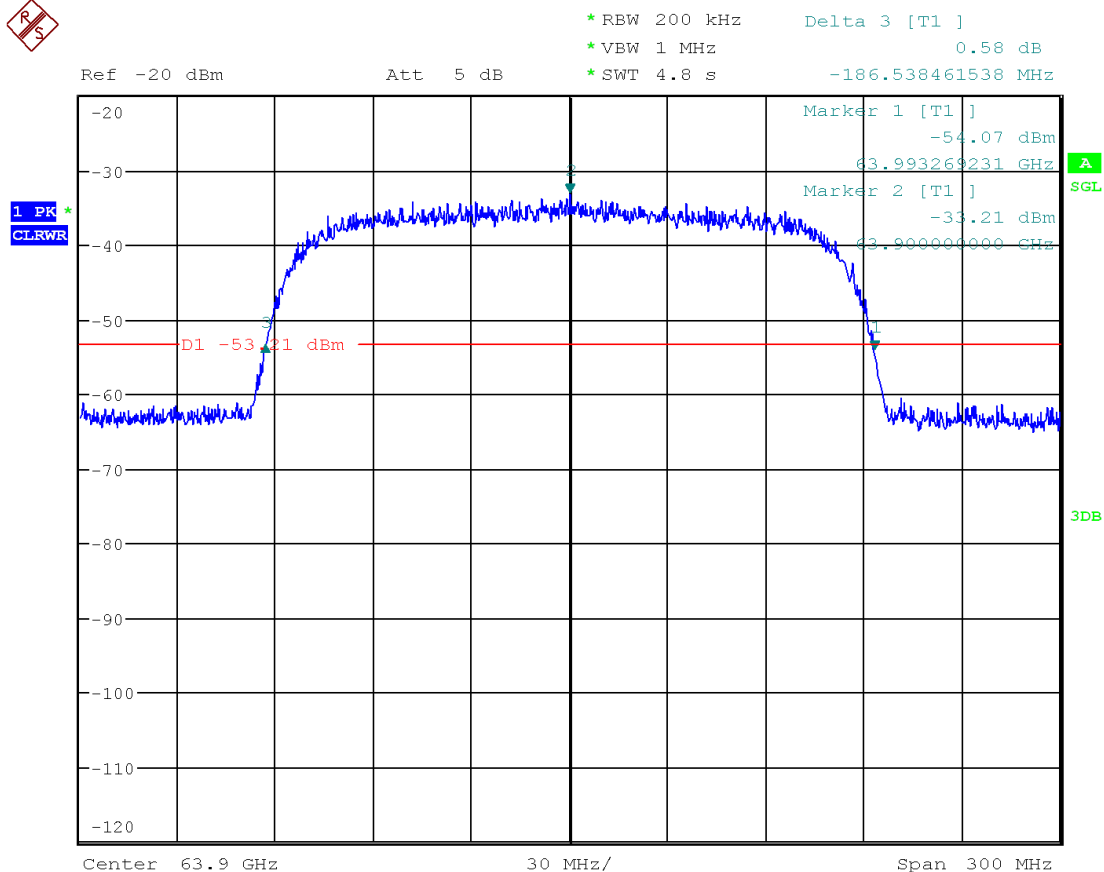


2.4 T-TM2

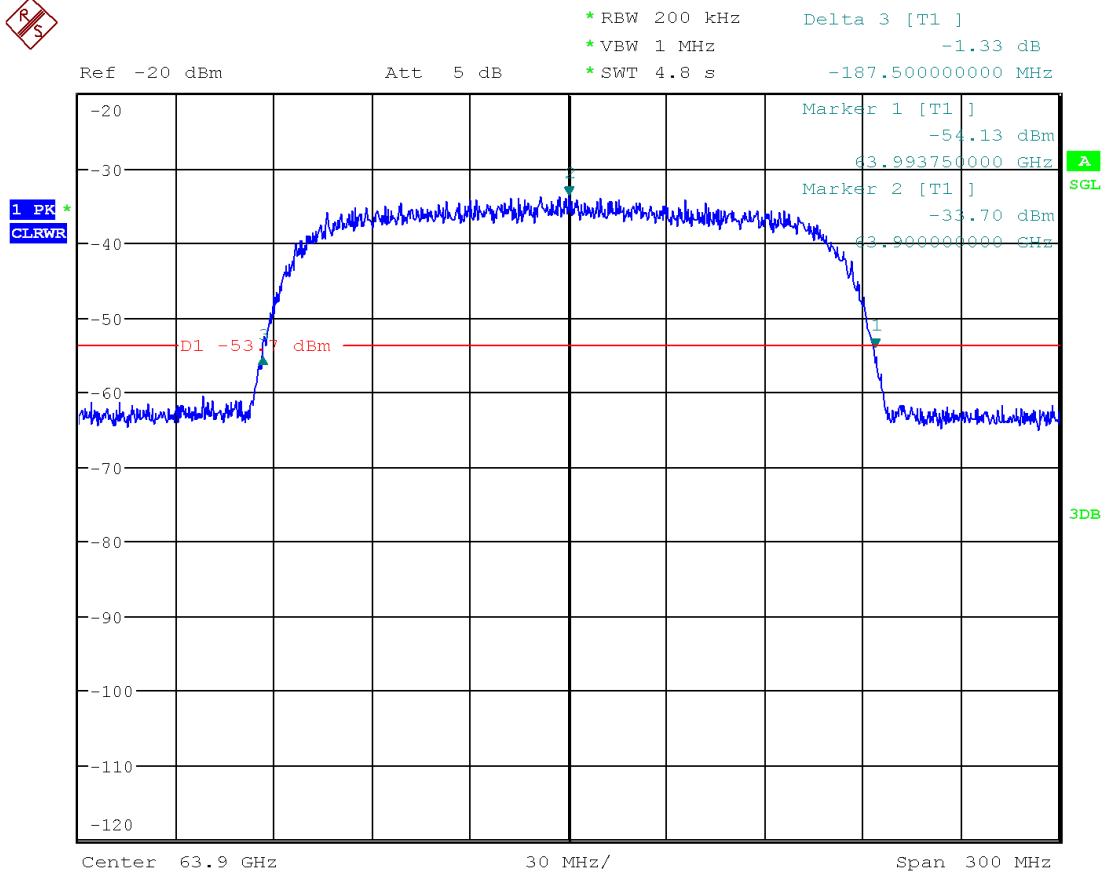
2.4.1 Voltage=100 %, Temperature=-20 °C



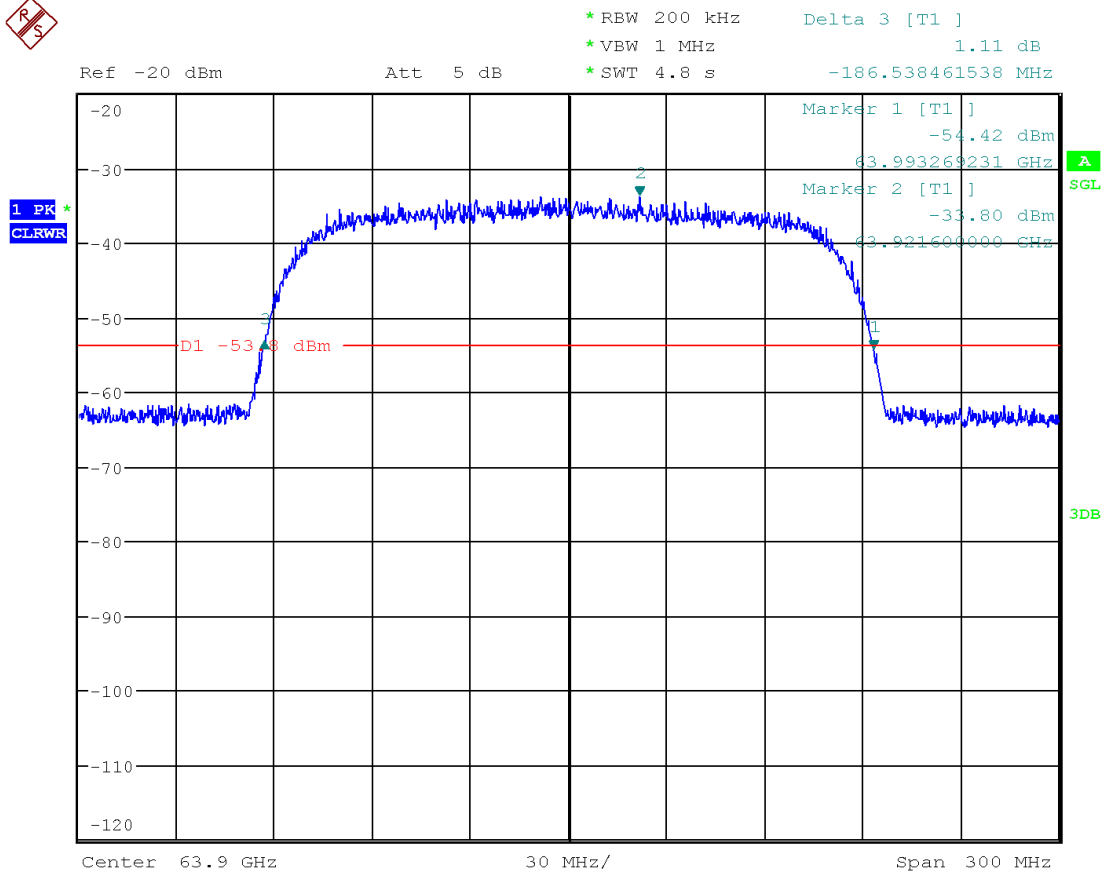
2.4.2 Voltage=100 %, Temperature=-10 °C



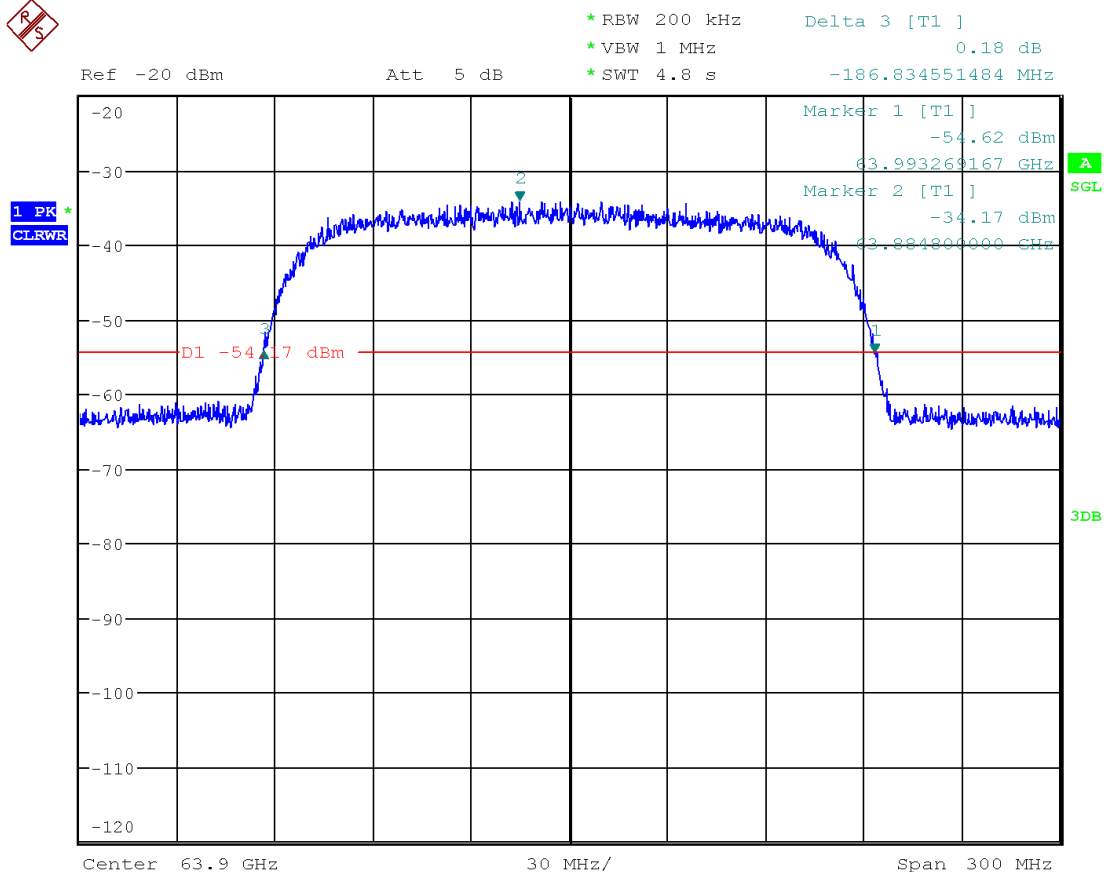
2.4.3 Voltage=100 %, Temperature=0 °C



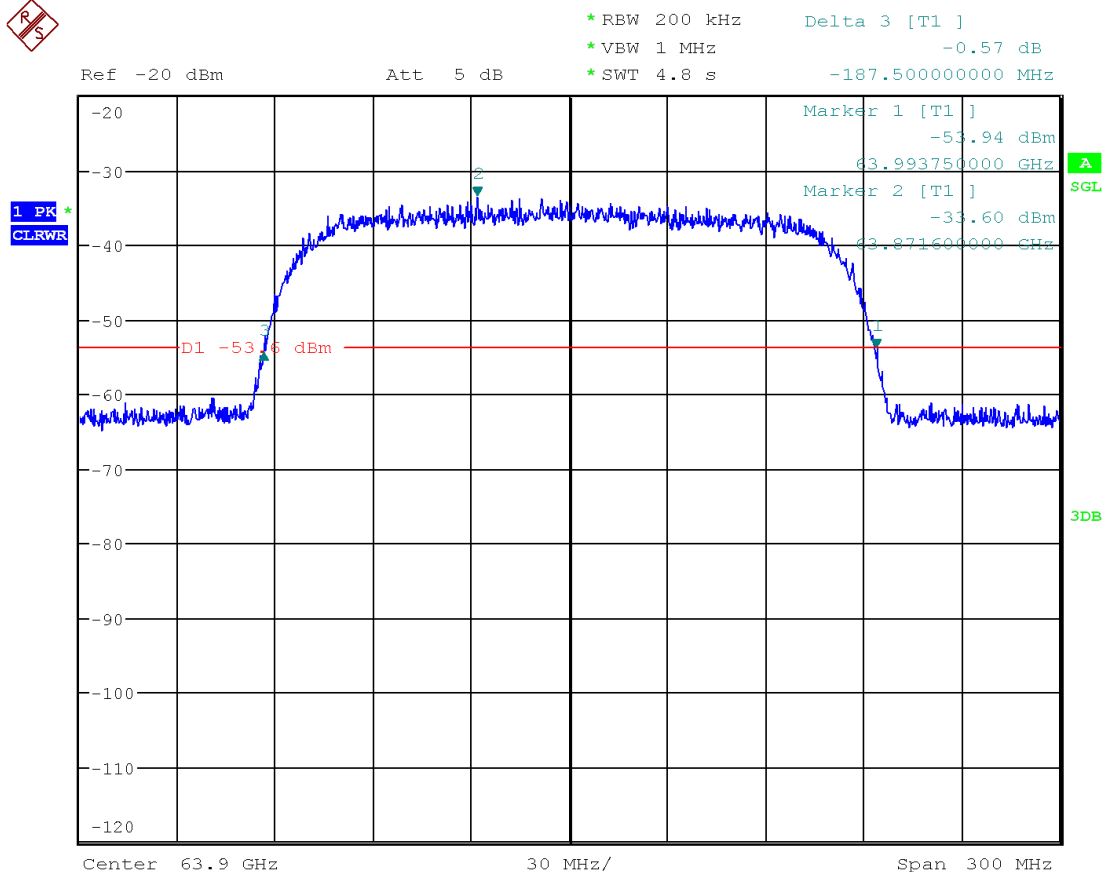
2.4.4 Voltage=100 %, Temperature=+10 °C



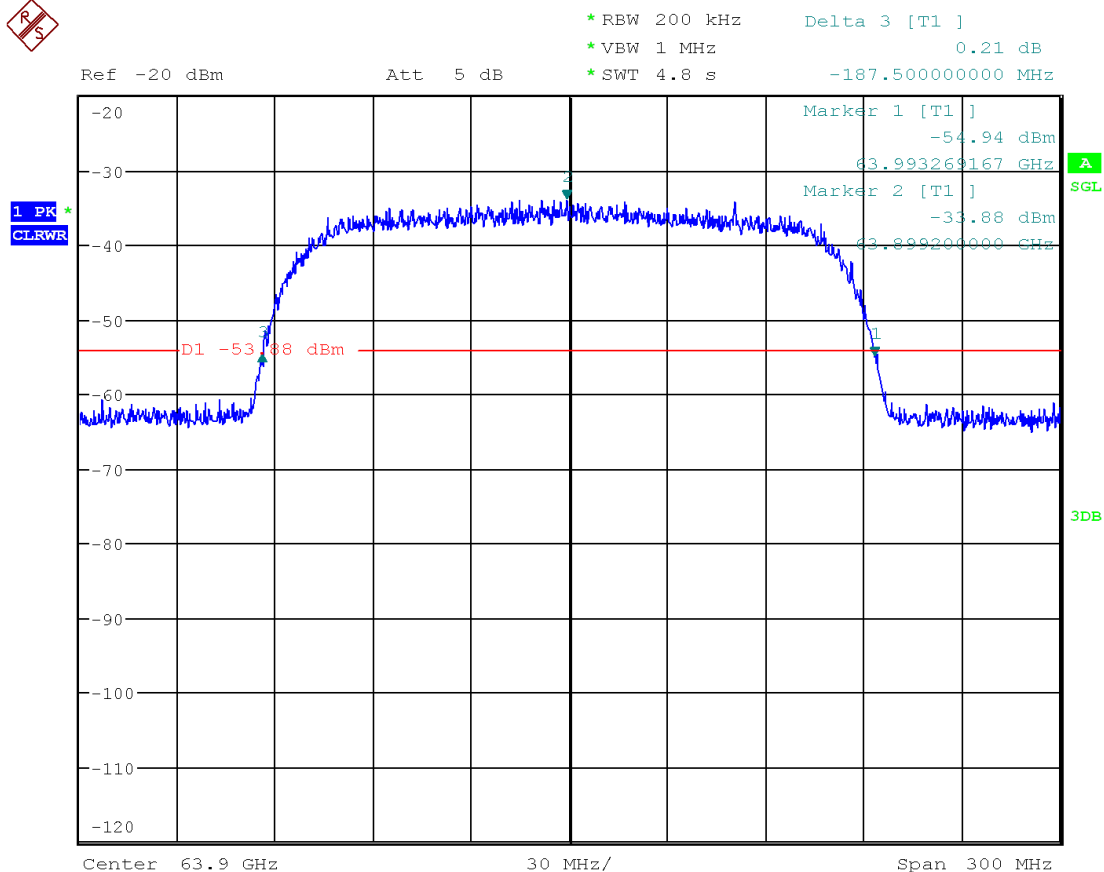
2.4.5 Voltage=85 %, Temperature=+20 °C



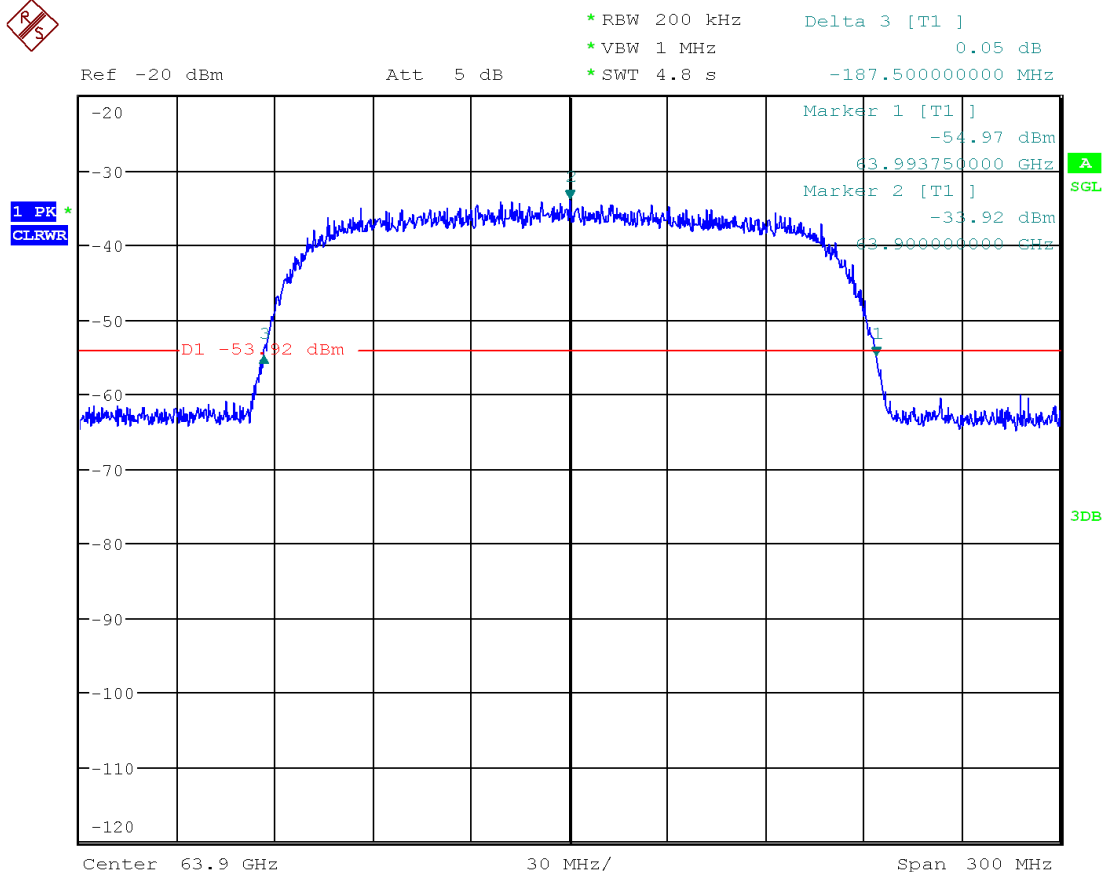
2.4.6 Voltage=100 %, Temperature=+20 °C



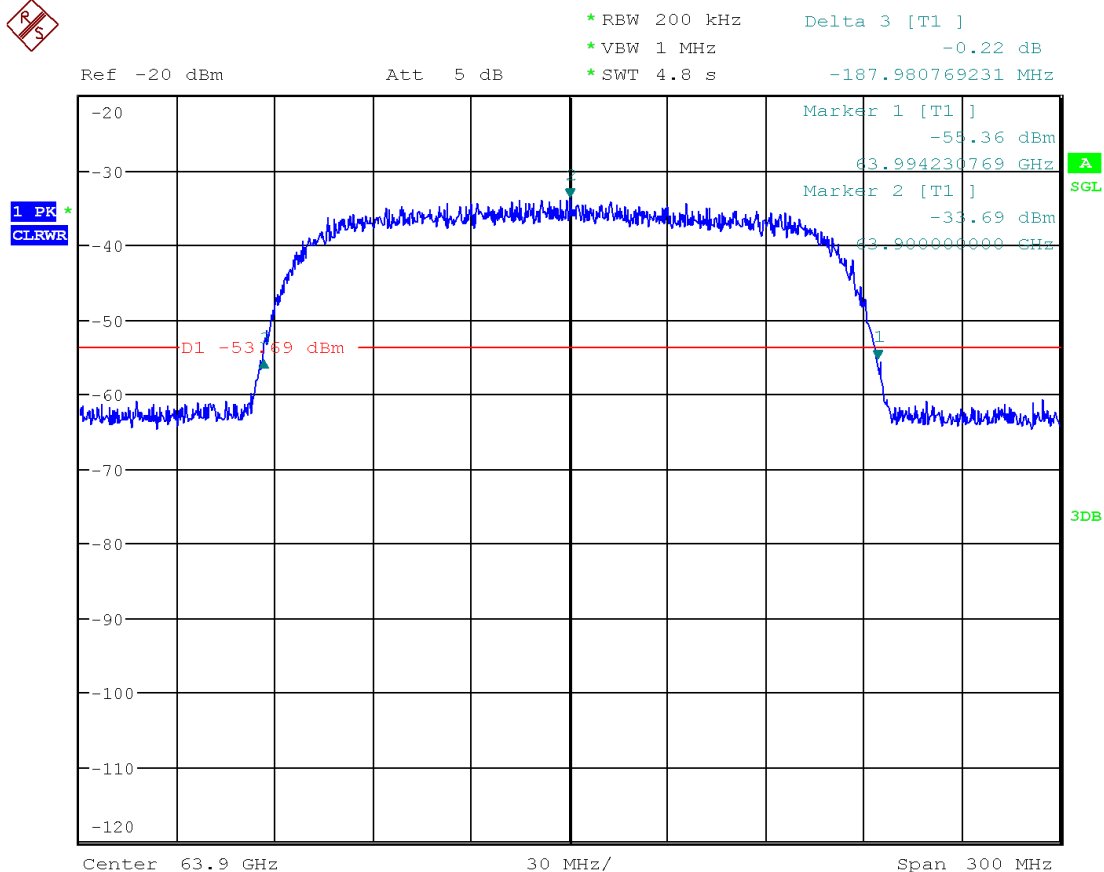
2.4.7 Voltage=115 %, Temperature=+20 °C



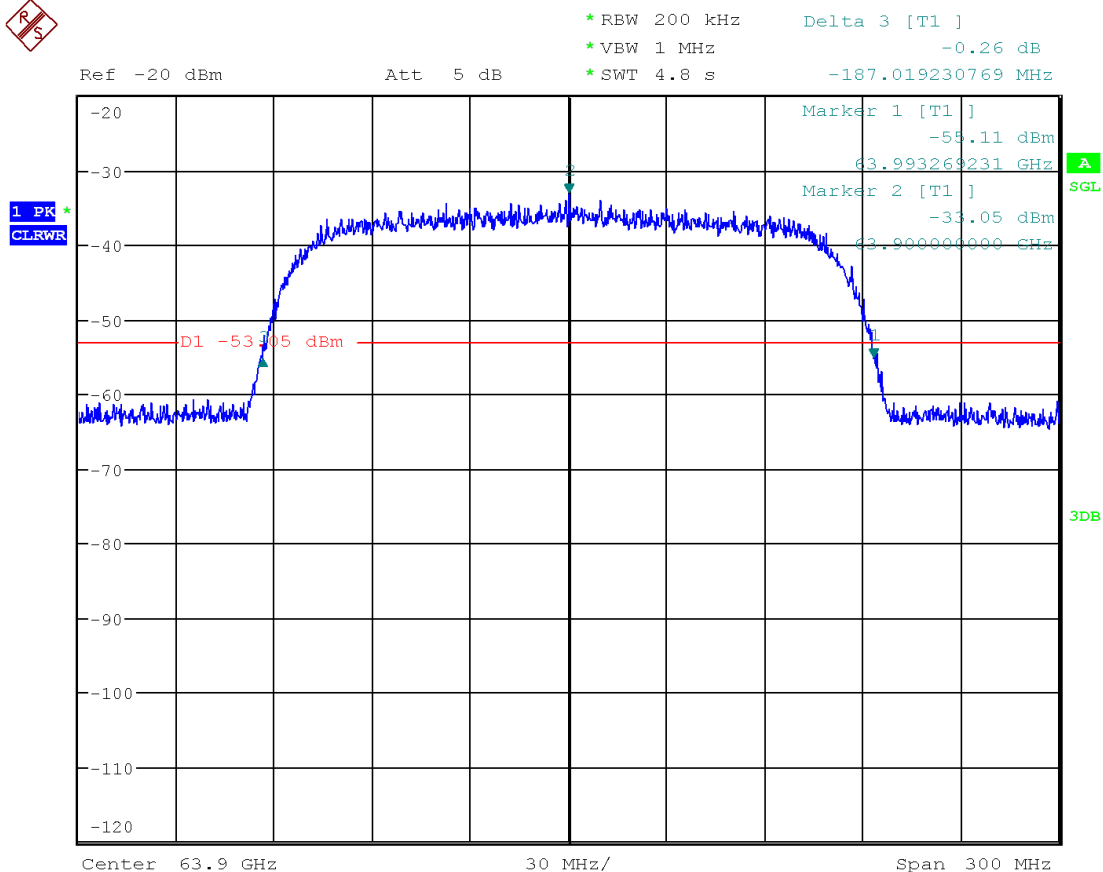
2.4.8 Voltage=100 %, Temperature=+30 °C



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



2.4.10 Voltage=100 %, Temperature=+50 °C





Annex F: AC Power Line Conducted Emissions

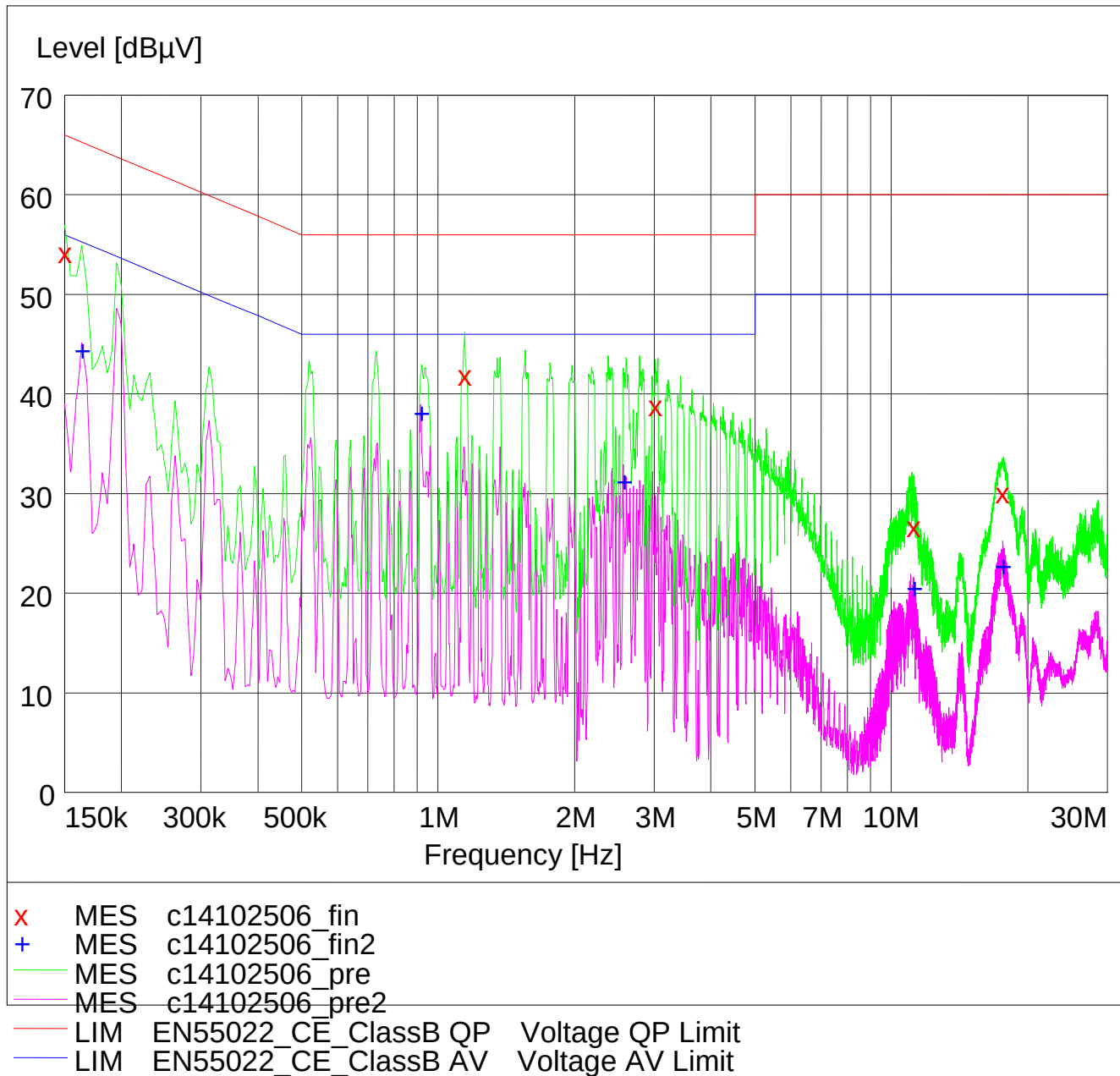


1 Result Table

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			



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

END