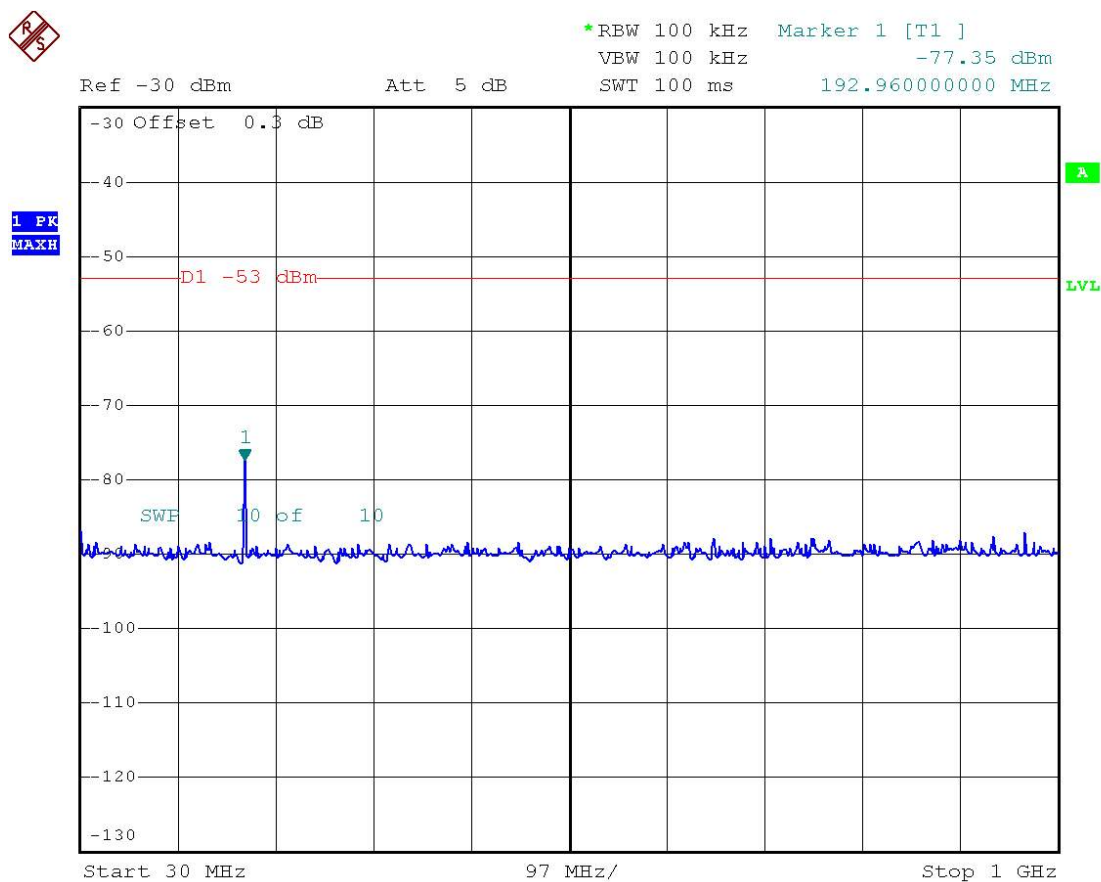


5.7.9.4 1st Channel

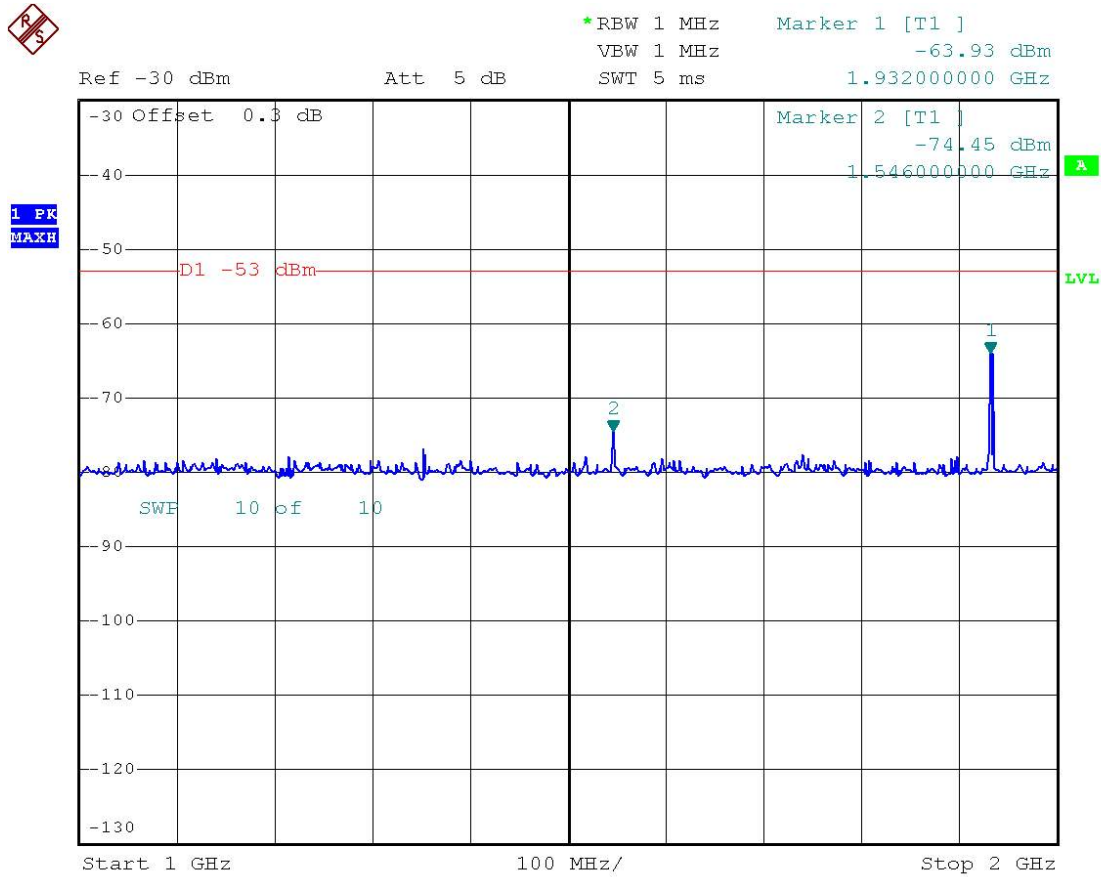
FCC Rules :	Part 2 §2.1051 & §90.210
IC Rules :	RSS-119 Issue 9 Section 5.8
Operating Frequency :	148.025 MHz
Channel :	1st Channel
Power Output :	Stand-By
Channel Spacing :	WideBand
Reference Voltage :	13.8 VDC
Limit :	50 + 10log ₁₀ P (-20dBm)

5.7.9.4.1 10 MHz ~ 1 GHz



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5.7.9.4.2 1 GHz ~ 2 GHz

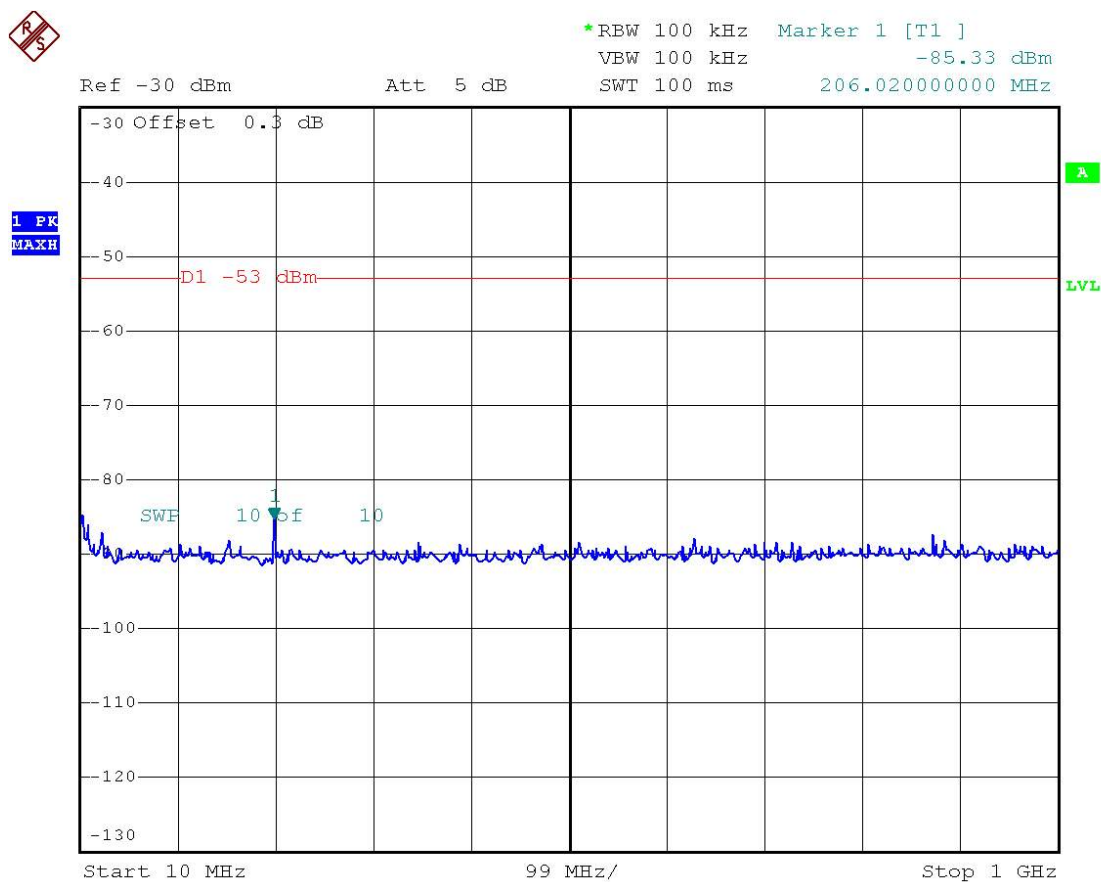


Date: 26.NOV.2008 14:34:18

5.7.9.5 2nd Channel

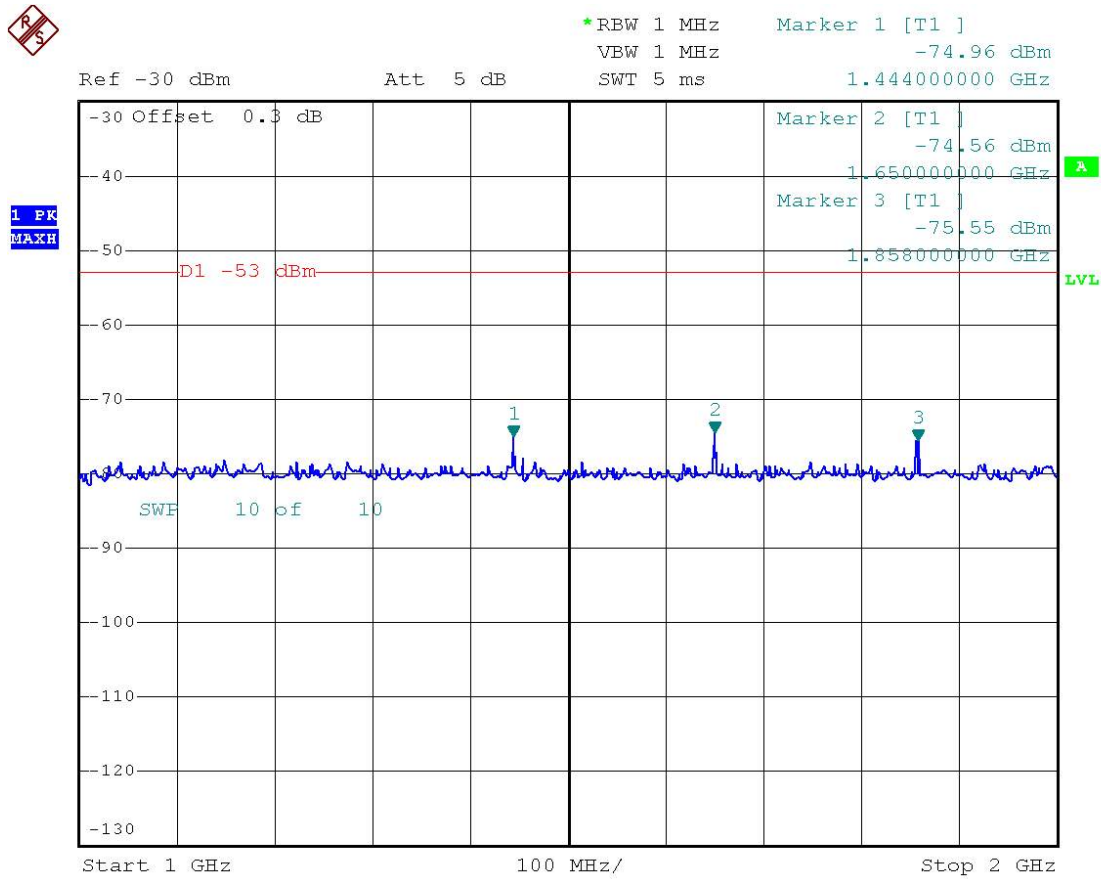
FCC Rules :	Part 2 §2.1051 & §90.210
IC Rules :	RSS-119 Issue 9 Section 5.8
Operating Frequency :	161.025 MHz
Channel :	2nd Channel
Power Output :	Stand-By
Channel Spacing :	WideBand
Reference Voltage :	13.8 VDC
Limit :	50 + 10log ₁₀ P (-20dBm)

5.7.9.5.1 10 MHz ~ 1 GHz



Date: 26.NOV.2008 14:35:10

5.7.9.5.2 1 GHz ~ 2 GHz

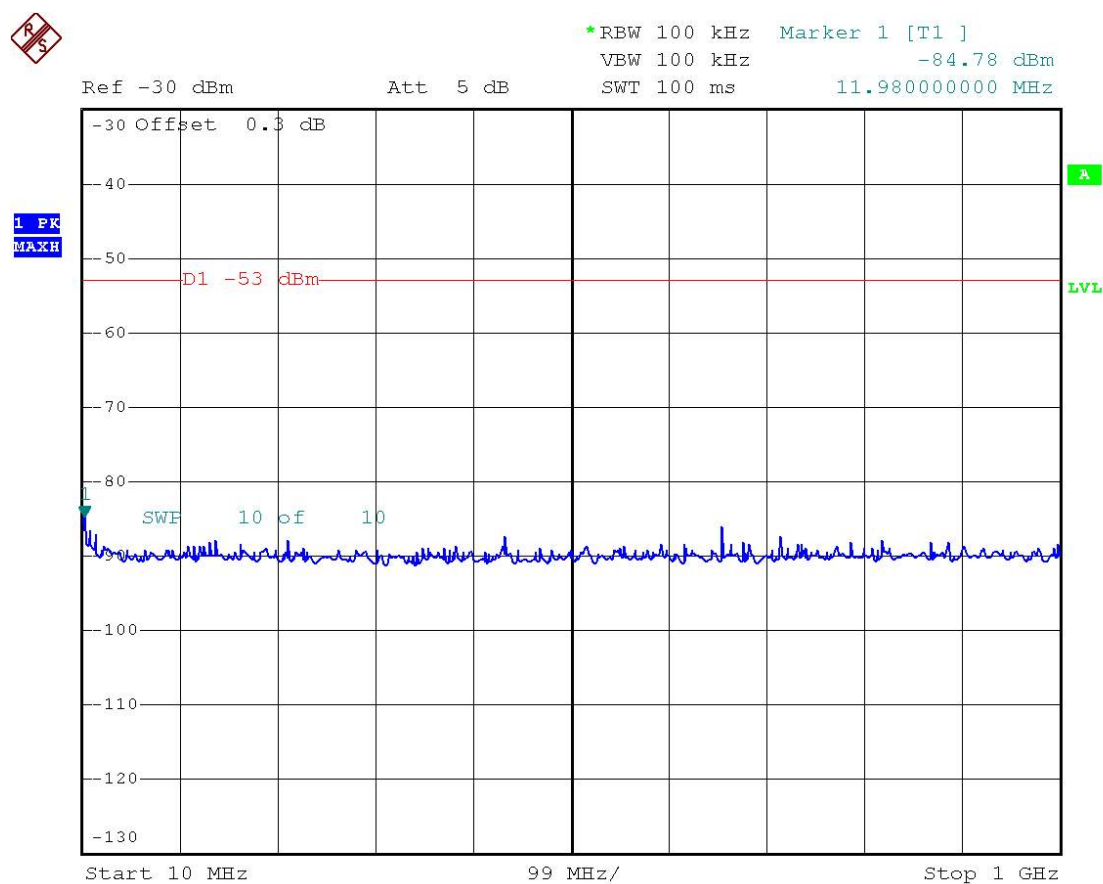


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5.7.9.6 3rd Channel

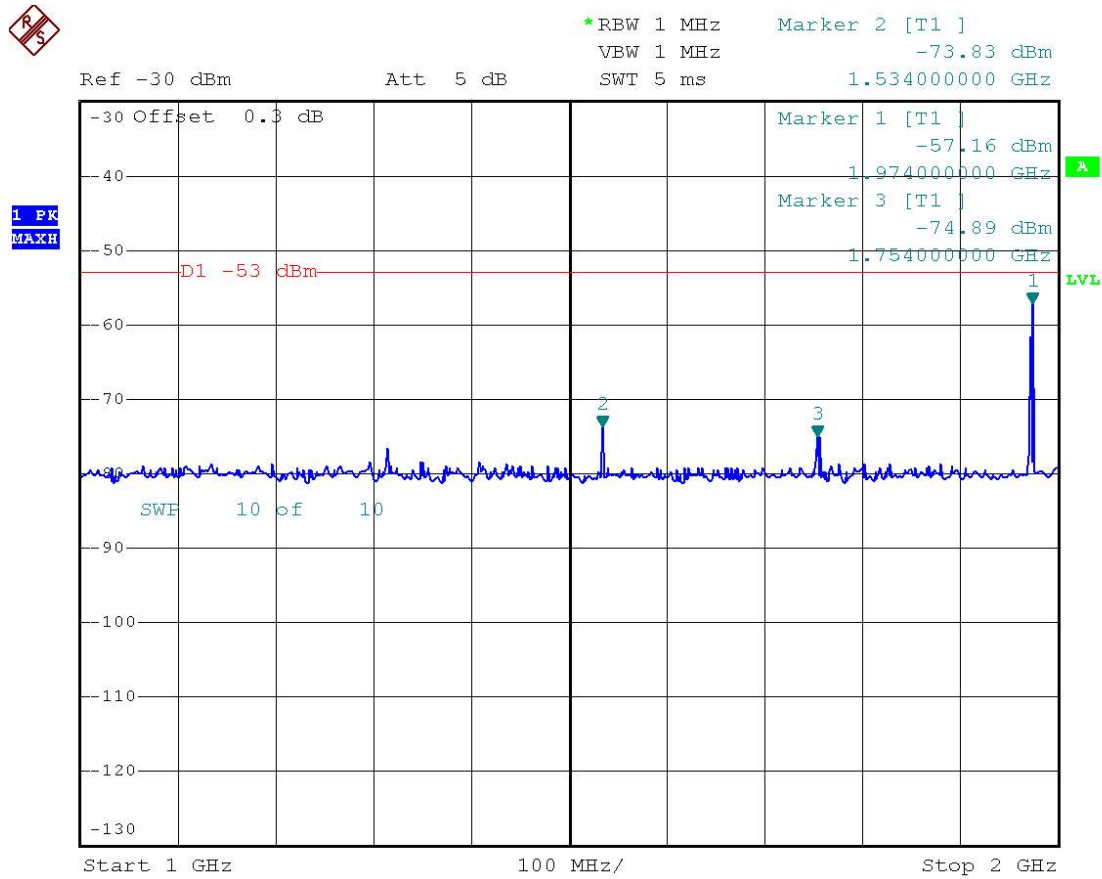
FCC Rules :	Part 2 §2.1051 & §90.210
IC Rules :	RSS-119 Issue 9 Section 5.8
Operating Frequency :	173.975 MHz
Channel :	3rd Channel
Power Output :	Stand-By
Channel Spacing :	WideBand
Reference Voltage :	13.8 VDC
Limit :	50 + 10log ₁₀ P (-20dBm)

5.7.9.6.1 10 MHz ~ 1 GHz



Date: 26.NOV.2008 14:36:29

5.7.9.6.2 1 GHz ~ 2 GHz



Date: 26.NOV.2008 14:36:54

5.8 Field Strength of Spurious Radiation

Radiated spurious emissions are emissions from the equipment when transmitting load on frequency or frequencies which are outside of band sufficient to ensure transmission or information of required quality for the class of communication desired.

5.8.1 Specification

FCC Rules Part 2, Section 2.1053(a)
FCC Rules Part 90, Section 90.210
Industry Canada, RSS-119 Issue 9 Section 5.8

5.8.2 Method of Measurement

ANSI/TIA-603-B-2002 Section 2.2.12

5.8.3 Measurement Set-Up

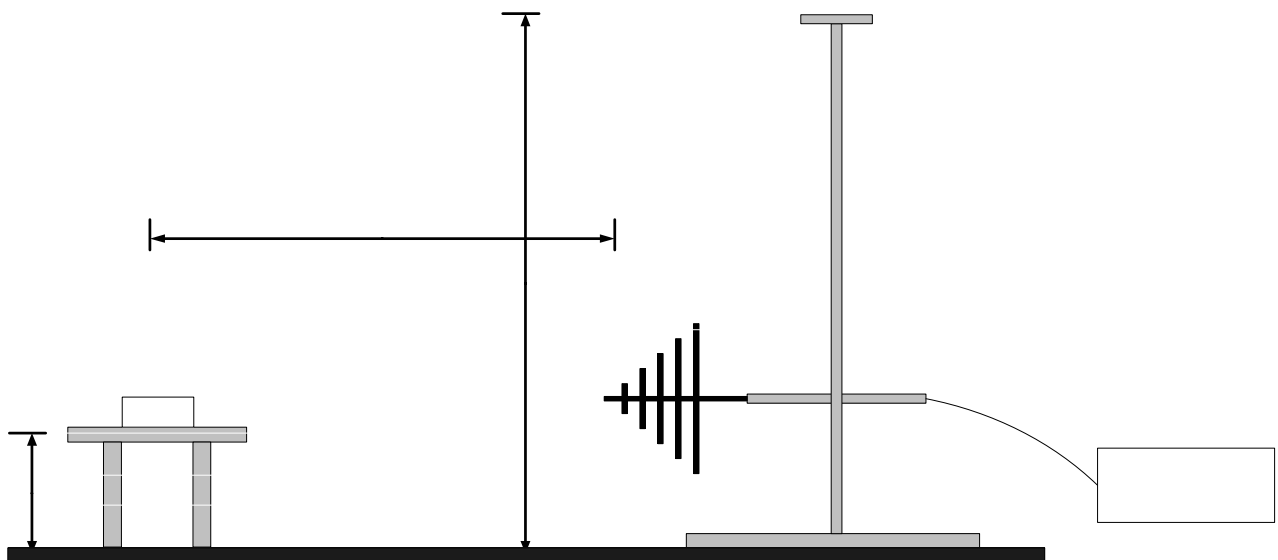


Fig.7

5.8.4 Test Equipment List

Equipment	Model Name	Manufacturer
EUT	SM2102	Maxon CIC Corp.
Power Supply	IPS-30B03DD	INTERACT
Audio Analyzer	8903B	Agilent
Spectrum Analyzer	E7403A	Agilent
Bilog Antenna	VULB9160	SWALZBECK
Horn Antenna	BBHA 9120 D	SWALZBECK

5.8.5 Test Data

FCC Rules :	Part 2 §2.1053(a) & §90.210
IC Rules :	RSS-119 Issue 9 Section 5.8
Power Output :	25 Watts
Reference Voltage :	13.8 VDC
Channel Spacing :	WideBand
Limit :	$50 + 10\log_{10}P$ (-20dBm)

Frequency [MHz]	Spectrum Reading [dBuV/m]	Ant. Pol. [H/V]	S.G Level [dBm]	Ant. Gain [dBi]	Loss [dB]	Emission Level [dBm]	Limit [dBm]	Margin [dB]
1st channel : 148.025 MHz								
295.78	36.1	V	-48.8	6.7	3.8	-38.2	-20	18.2
443.22	37.2	H	-60.5	6.6	4.77	-49.2		29.2
740.04	40.8	H	-67.7	6.4	6.5	-54.8		34.8
1036	30.3	-	-67.2	5.44	7.57	-54.2		34.2
1180	30.8	-	-69.6	5.44	7.84	-56.3		36.3
1480	29.4	-	-74.5	5.44	7.95	-61.1		41.1
2nd channel : 161.025 MHz								
321.00	37.4	V	-51.1	6.9	3.88	-44.2	-20	24.29
1126	31.7	-	-73.5	5.44	7.84	-60.2		40.29
1288	28.9	-	-74.3	5.44	7.95	-60.9		40.98
3rd channel : 173.975 MHz								
697.36	40.4	H	-71.6	6.4	6.15	-59.0	-20	39.0
870.02	50.8	H	-66.1	6.1	6.92	-53.0		33.0
1039	31.2	-	-73.2	5.44	7.57	-60.2		40.2
1042	32.1	-	-71.4	5.44	7.57	-58.4		38.4

Note :

1. The spectrum bandwidth was set to RBW 100 kHz (freq. up to 1GHz) and RBW 1 MHz (freq above 1GHz).
2. Transmitter was set to the high power output (25 Watts) condition.
3. The spectrum was checked from 30 MHz up to the 10th harmonic of the carrier frequency.
4. All emission not reported were found to be more than 20dB below the limit.
5. The EUT was positioned through 3 orthogonal axis and worst-case are reported.
6. Transmitter was set to the high power output (25 Watts) condition because the high power setting is the worst case emission condition.
7. The measurement has been made both narrow and wide band but the attached plots are for narrowband. There is no difference in the test result for the bandwidth setting.
8. ERP measurements were performed using the standard battery with full charged condition.
9. The limit was applied according to the section 90.210(d) $50+10\log P$ or -20dBm or 70dBc whichever is less.

5.8.6 Test Data

FCC Rules :	Part 2 §2.1053(a) & §90.210
IC Rules :	RSS-119 Issue 9 Section 5.8
Power Output :	2 Watts
Reference Voltage :	13.8 VDC
Channel Spacing :	WideBand
Limit :	50 + 10log ₁₀ P (-20dBm)

Frequency [MHz]	Spectrum Reading [dBuV/m]	Ant. Pol. [H/V]	S.G Level [dBm]	Ant. Gain [dBi]	Loss [dB]	Emission Level [dBm]	Limit [dBm]	Margin [dB]
1st channel : 148.025 MHz								
296	45.27	V	-47.8	6.7	3.8	-37.3	-20	17.3
443.2	42.96	V	-51.3	6.6	4.77	-39.9		19.9
592	29.00	V	-64.2	6.5	6.5	-51.2		31.2
740.8	33.36	V	-68.1	6.4	6.5	-55.2		35.2
1036	34.17	-	-66.7	5.44	7.57	-53.7		33.7
1480	26.10	-	-78.2	5.44	7.95	-64.8		44.8
2nd channel : 161.025 MHz								
321.6	50.16	H	-50.5	6.9	3.88	-39.7	-20	19.7
483.2	31.84	V	-66.5	6.6	7.84	-52.1		32.1
644.8	35.84	H	-67.3	6.4	6.15	-54.8		34.8
806.4	32.25	V	-64.8	6.1	6.92	-51.8		31.8
966.4	27.15	V	-67.7	6.1	7.57	-54.0		34.0
1126	25.77	-	-72.5	5.44	7.57	-59.5		39.5
1288	21.88	-	-75.3	5.44	7.57	-62.3		42.3
1450	24.76	-	-74.8	5.44	7.95	-61.4		41.4
3rd channel : 173.975 MHz								
347.2	45.02	H	-49.6	6.4	3.88	-39.3	-20	19.3
521.6	49.04	V	-54.1	6.1	6.12	-41.9		21.9
696	39.92	H	-62.5	6.4	6.15	-50.0		30.0
870.4	32.55	V	-64.6	6.1	6.92	-51.6		31.6
1042	36.38	-	-69.8	5.44	7.57	-56.8		36.8
1392	23.62	-	-73.22	5.44	7.95	-59.8		39.8
1560	25.30	-	-71.47	5.44	7.95	-58.1		38.1

Note :

1. The spectrum bandwidth was set to RBW 100 kHz (freq. up to 1GHz) and RBW 1 MHz (freq above 1GHz).
2. Transmitter was set to the high power output (2 Watts) condition.
3. The spectrum was checked from 30 MHz up to the 10th harmonic of the carrier frequency.
4. All emission not reported were found to be more than 20dB below the limit.
5. The EUT was positioned through 3 orthogonal axis and worst-case are reported.
6. Transmitter was set to the high power output (2 Watts) condition because the high power setting is the worst case emission condition.
7. The measurement has been made both narrow and wide band but the attached plots are for narrowband. There is no difference in the test result for the bandwidth setting.
8. ERP measurements were performed using the standard battery with full charged condition.
9. The limit was applied according to the section 90.210(d) 50+10logP or -20dBm or 70dBc whichever is less.

5.9 Frequency Stability / Temperature Variation

5.9.1 Specification

FCC Rules Part 2, Section 2.1055
FCC Rules Part 90, Section 90.231
Industry Canada, RSS-119 Issue 9 Section 5.3

5.9.2 Method of Measurement

ANSI/TIA-603-B-2002 Section 2.2.2

5.9.3 Measurement Set-Up

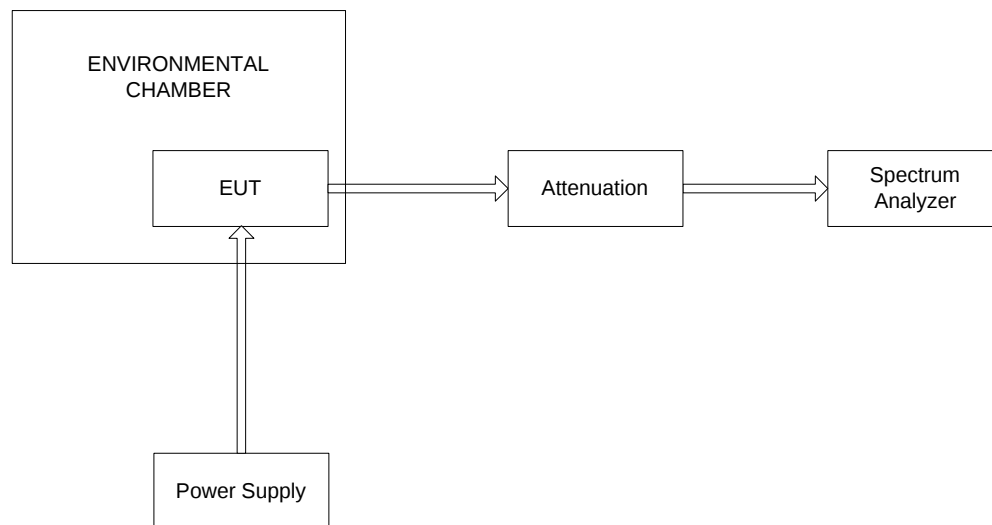


Fig.8

5.9.4 Test Equipment List

Equipment	Model Name	Manufacturer
EUT	SM2102	Maxon CIC Corp.
Power Supply	IPS-30B03DD	INTERACT
Attenuator	33-30-33	WEINSCHEL
Spectrum Analyzer	FSP7	Rohde & Schwarz
Environmental Chamber	EN-GLMP-54	ENEX

5.9.5 Test Procedure

- The unit was turn-up in accordance with the alignment procedure stated in the FIG. 8 , and was loaded into a 50 ohm resistive termination.
- With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
- With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
- The temperature tests were performed for the worst case.
- FCC Limits (according to part 90.213) : $2.5 \times 10^{-6} \times \text{Frequency}$

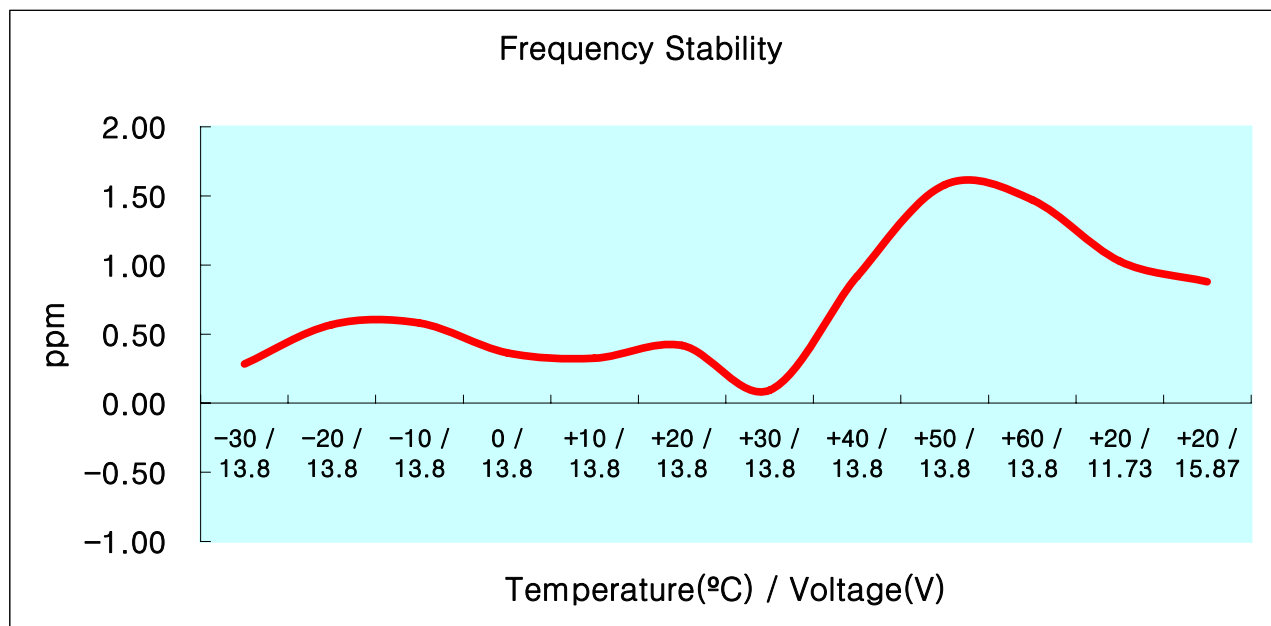
5.9.6 Test Result 1

FCC Rules :	Part 2 §2.1055 & §90.231
IC Rules :	RSS-119 Issue 9 Section 5.3
Operating Frequency :	148.025 MHz
Channel :	1st Channel
Power Output :	25 Watts
Modulation :	Non-Modulation
Reference Voltage :	13.8 VDC

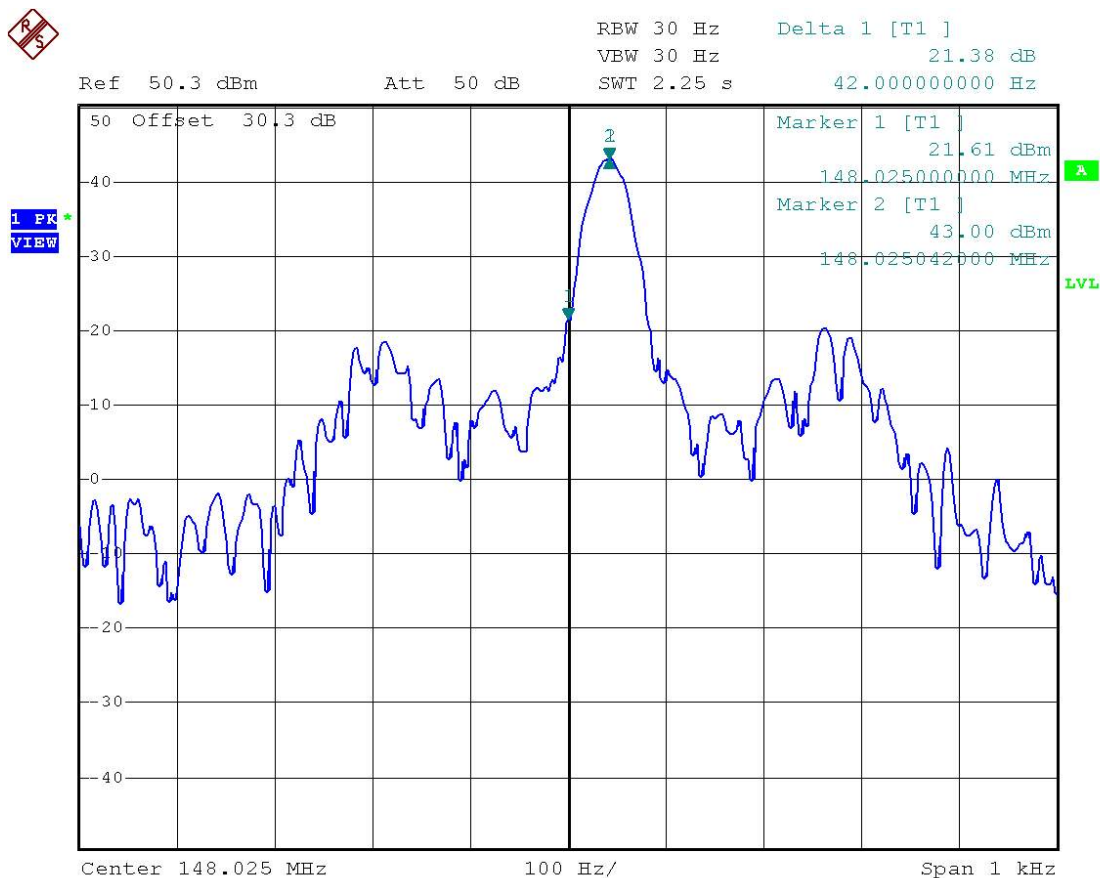
5.9.6.1 Data

Voltage (%)	Power Supply (Vdc)	Temperature (°C)	Frequency (Hz)	Deviation (ppm)	Limit (ppm)
100 %	13.8	-30	148025042	0.28	2.5
100 %	13.8	-20	148025084	0.57	2.5
100 %	13.8	-10	148025086	0.58	2.5
100 %	13.8	0	148025054	0.36	2.5
100 %	13.8	+10	148025048	0.32	2.5
100 %	13.8	+20 (ref)	148025062	0.42	2.5
100 %	13.8	+30	148025014	0.09	2.5
100 %	13.8	+40	148025136	0.92	2.5
100 %	13.8	+50	148025234	1.58	2.5
100 %	13.8	+60	148025218	1.47	2.5
85 %	11.73	+20	148025152	1.03	2.5
115 %	15.87	+20	148025130	0.88	2.5

5.9.6.2 Graph

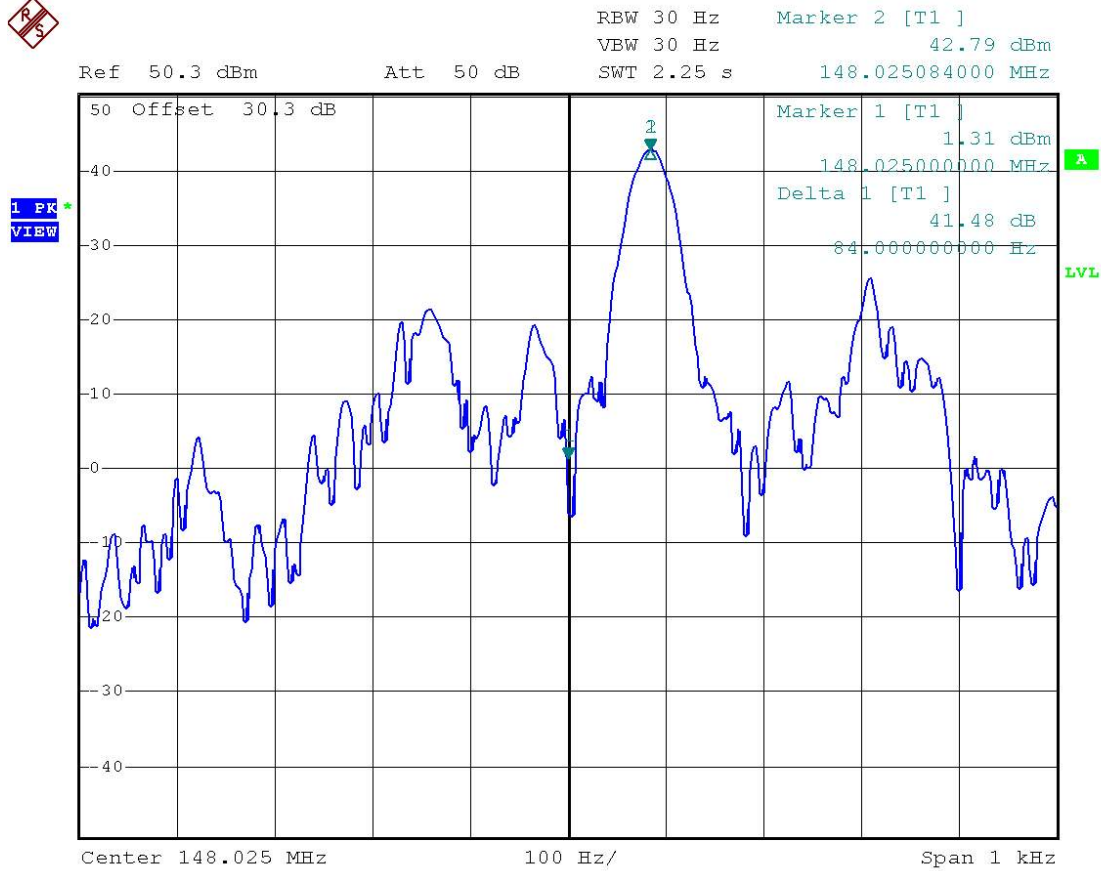


5.9.6.3 Plot 1 (-30°C)



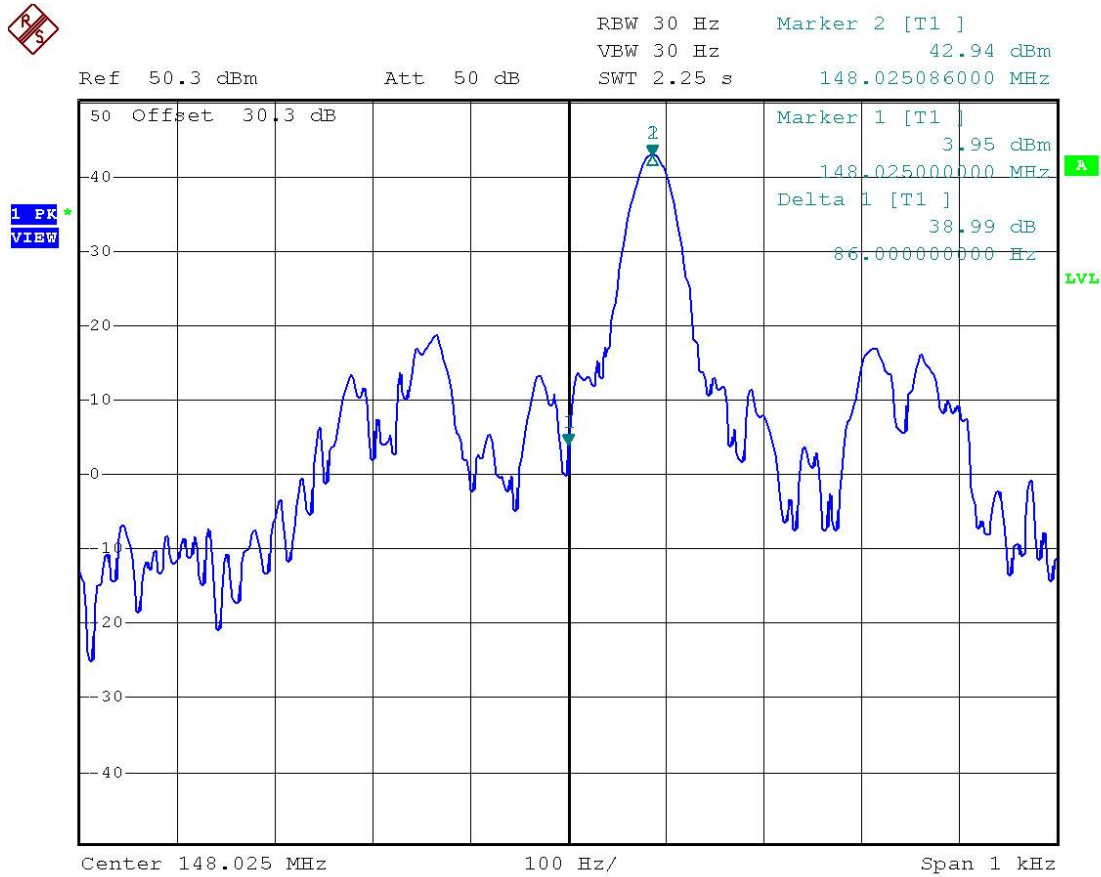
Date: 11.NOV.2008 14:21:25

5.9.6.4 Plot 2 (-20°C)



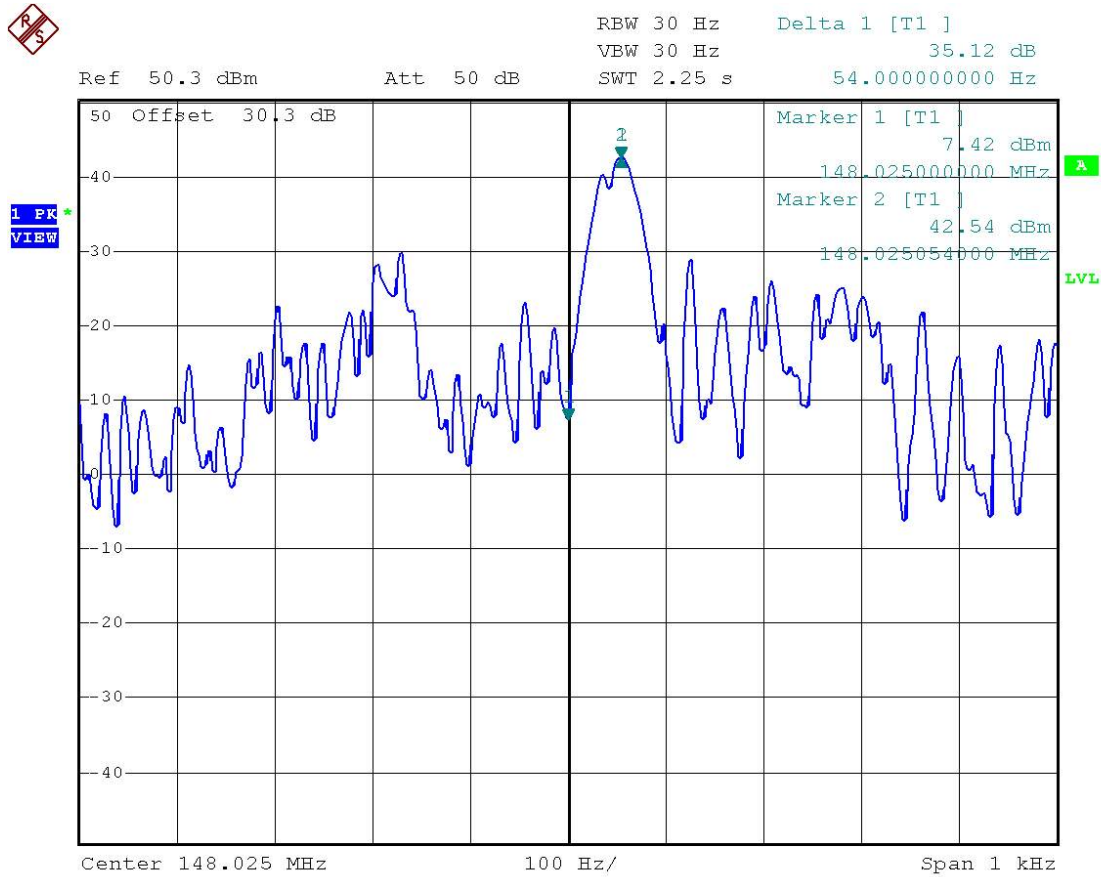
Date: 11.NOV.2008 14:37:31

5.9.6.5 Plot 3 (-10°C)



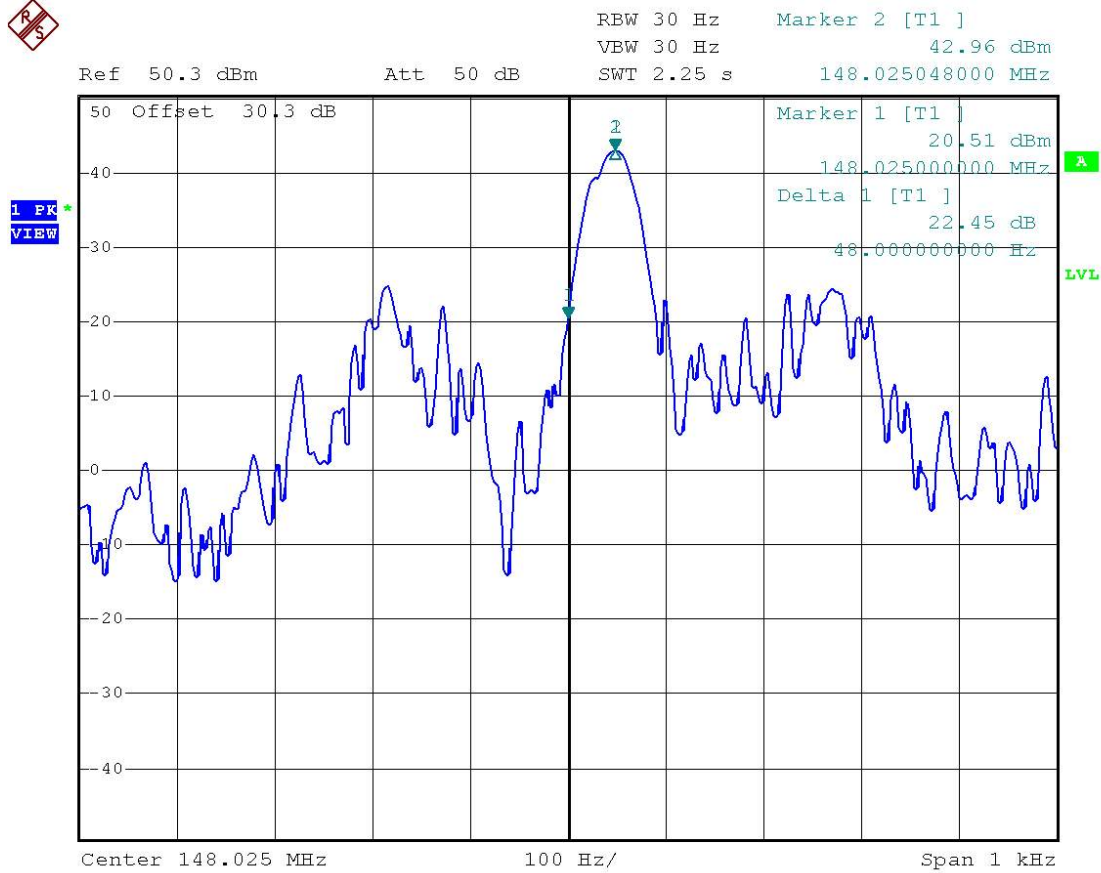
Date: 11.NOV.2008 14:51:49

5.9.6.6 Plot 4 (0°C)



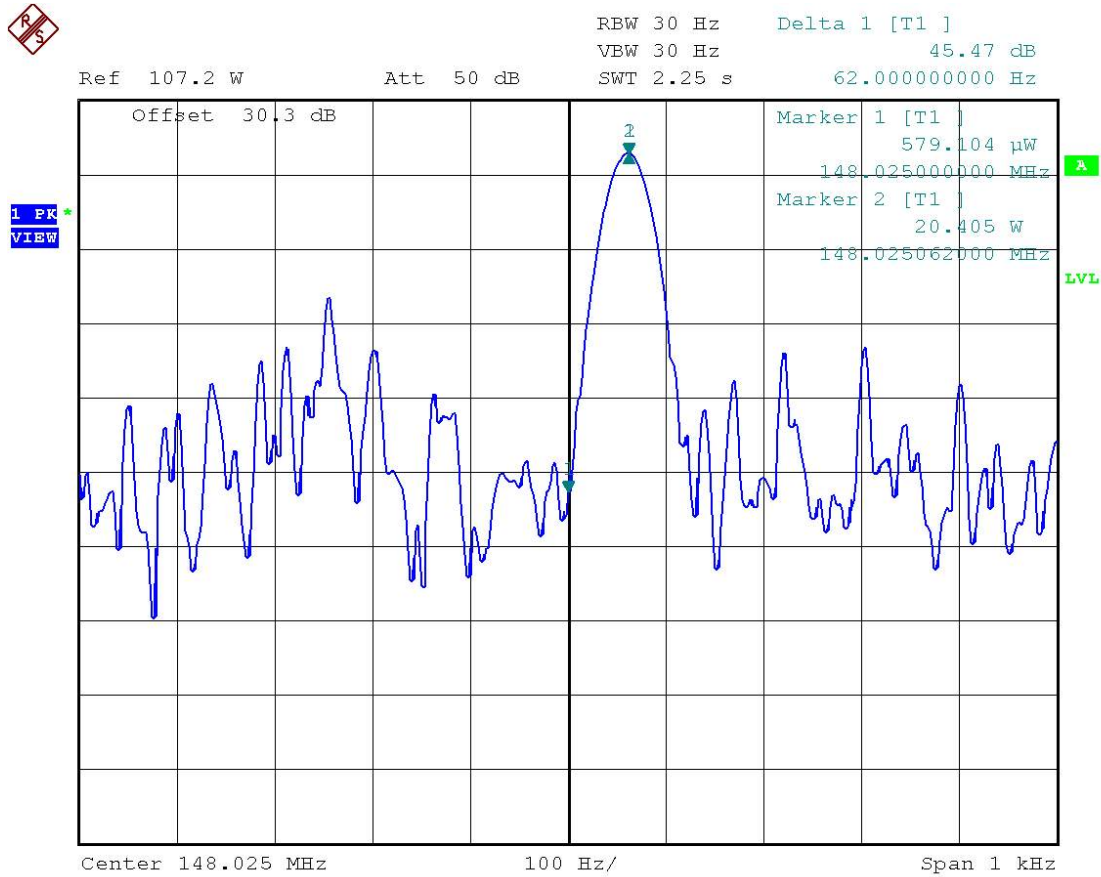
Date: 11.NOV.2008 15:09:29

5.9.6.7 Plot 5 (+10°C)



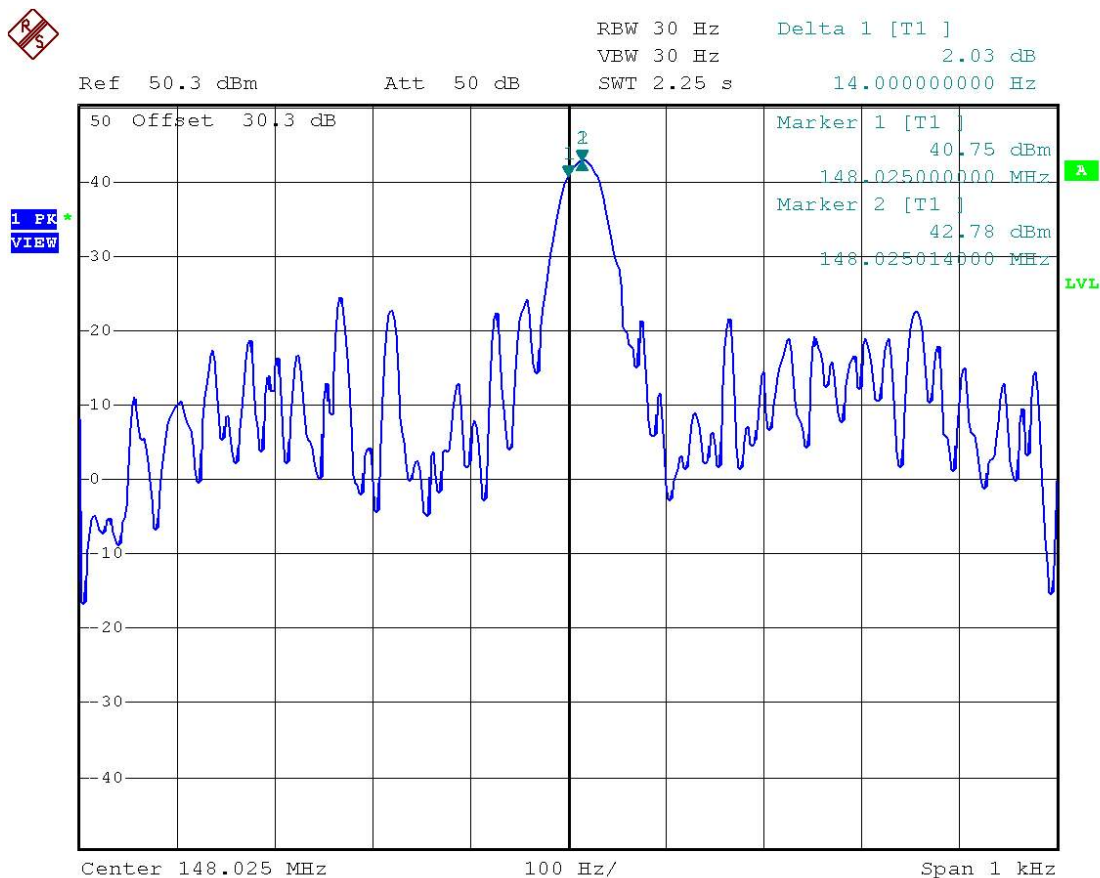
Date: 11.NOV.2008 15:23:09

5.9.6.8 Plot 6 (+20°C)



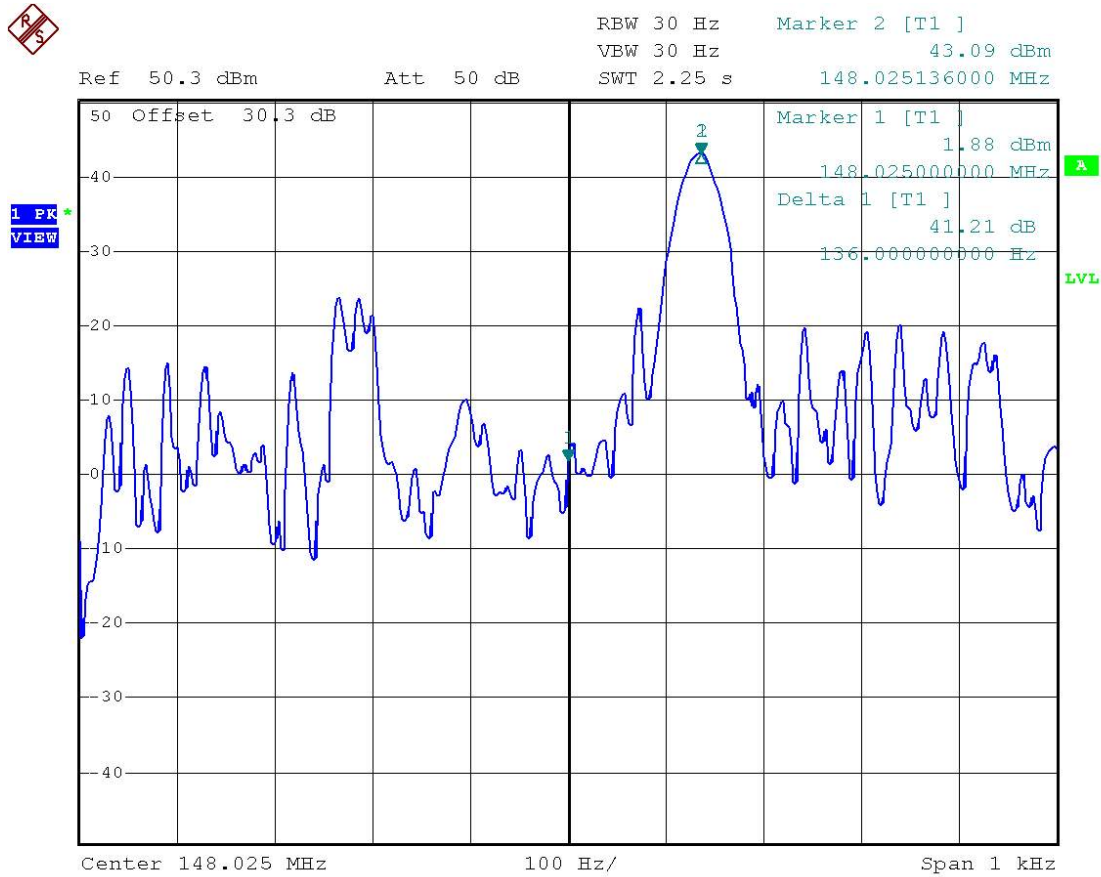
Date: 11.NOV.2008 13:51:23

5.9.6.9 Plot 7 (+30°C)



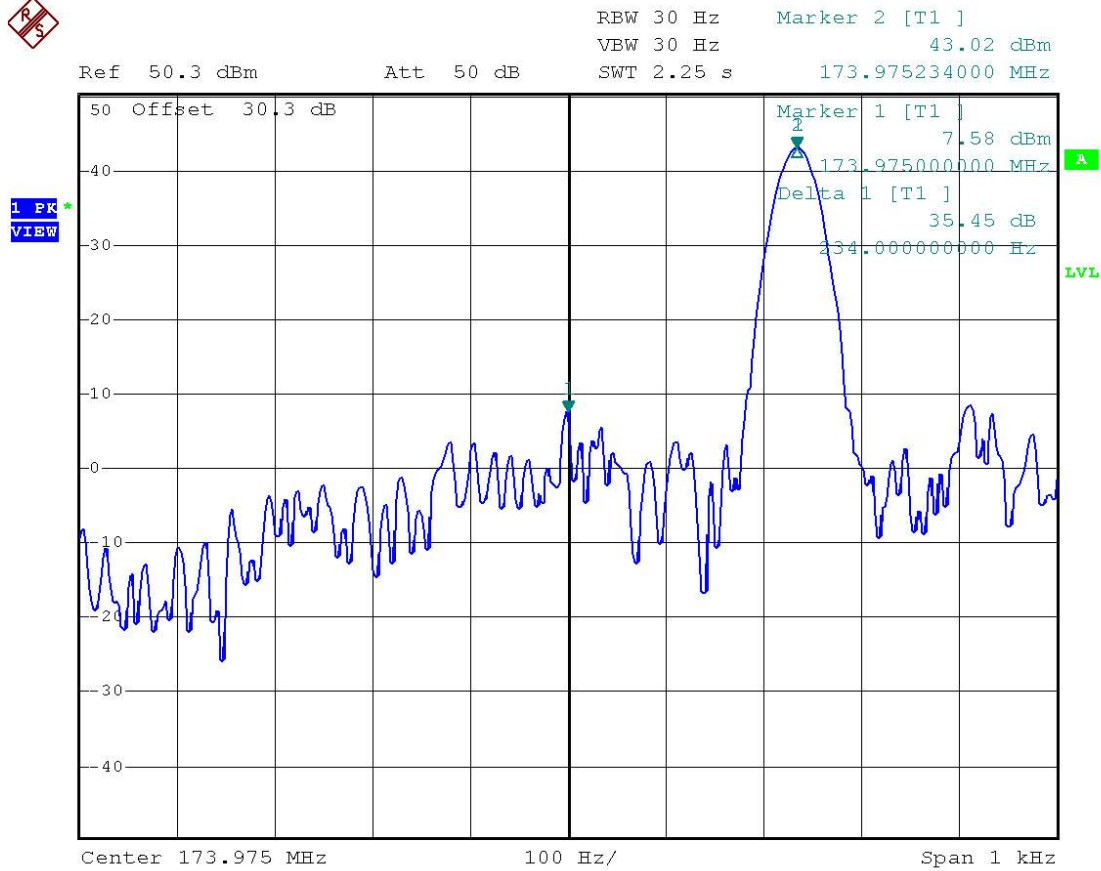
Date: 11.NOV.2008 15:41:54

5.9.6.10 Plot 8 (+40°C)



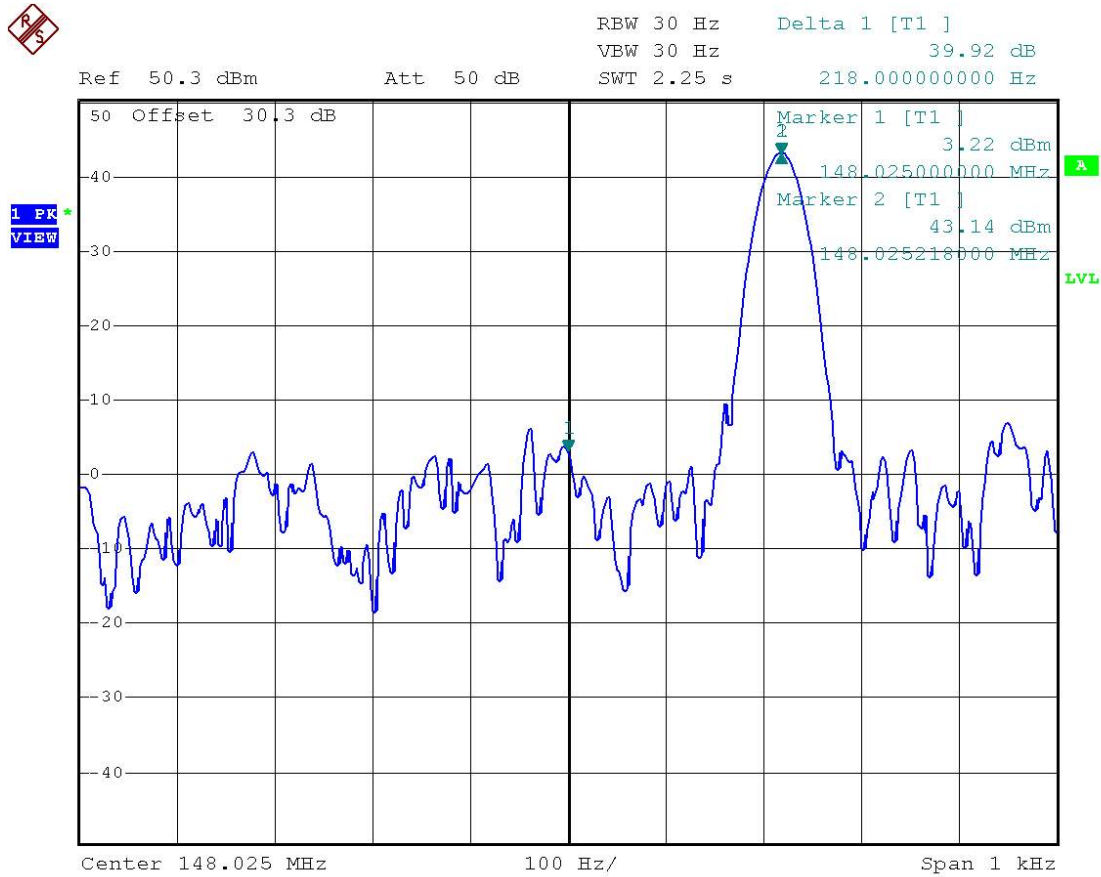
Date: 11.NOV.2008 15:59:29

5.9.6.11 Plot 9 (+50°C)



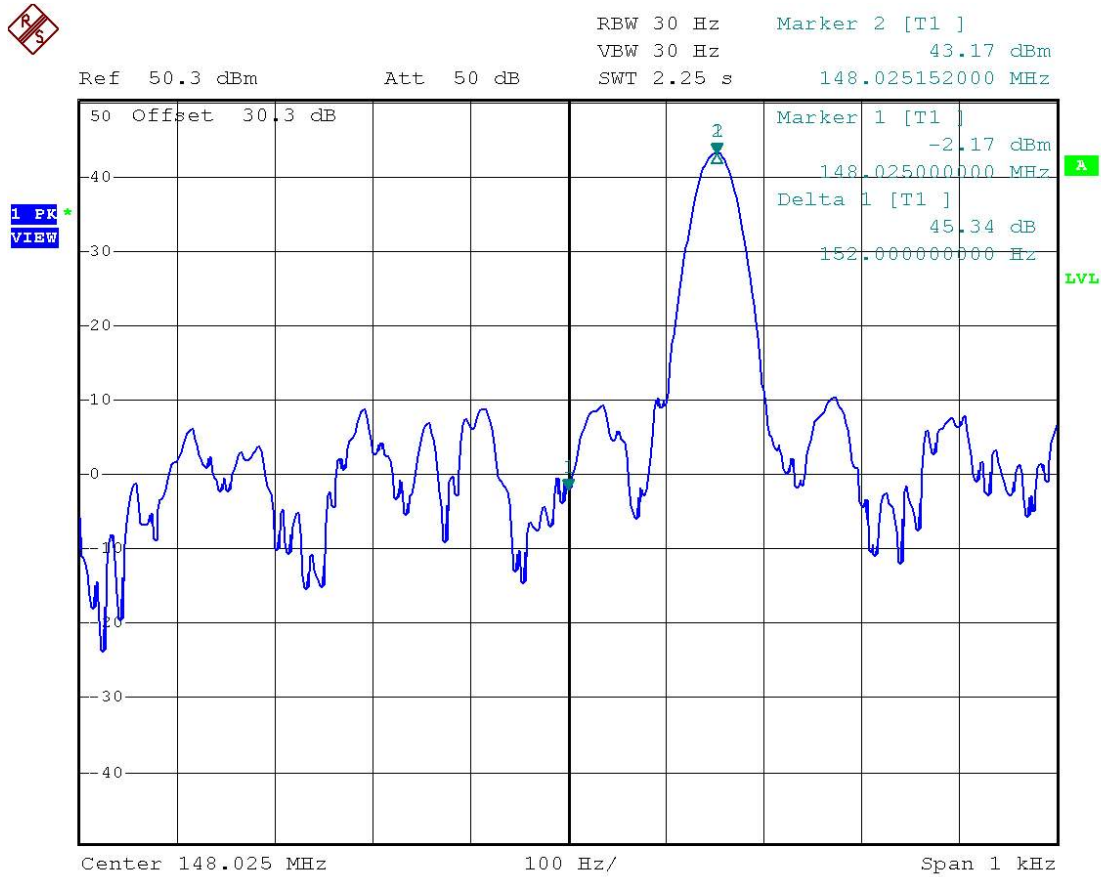
Date: 11.NOV.2008 16:29:20

5.9.6.12 Plot 10 (+60°C)



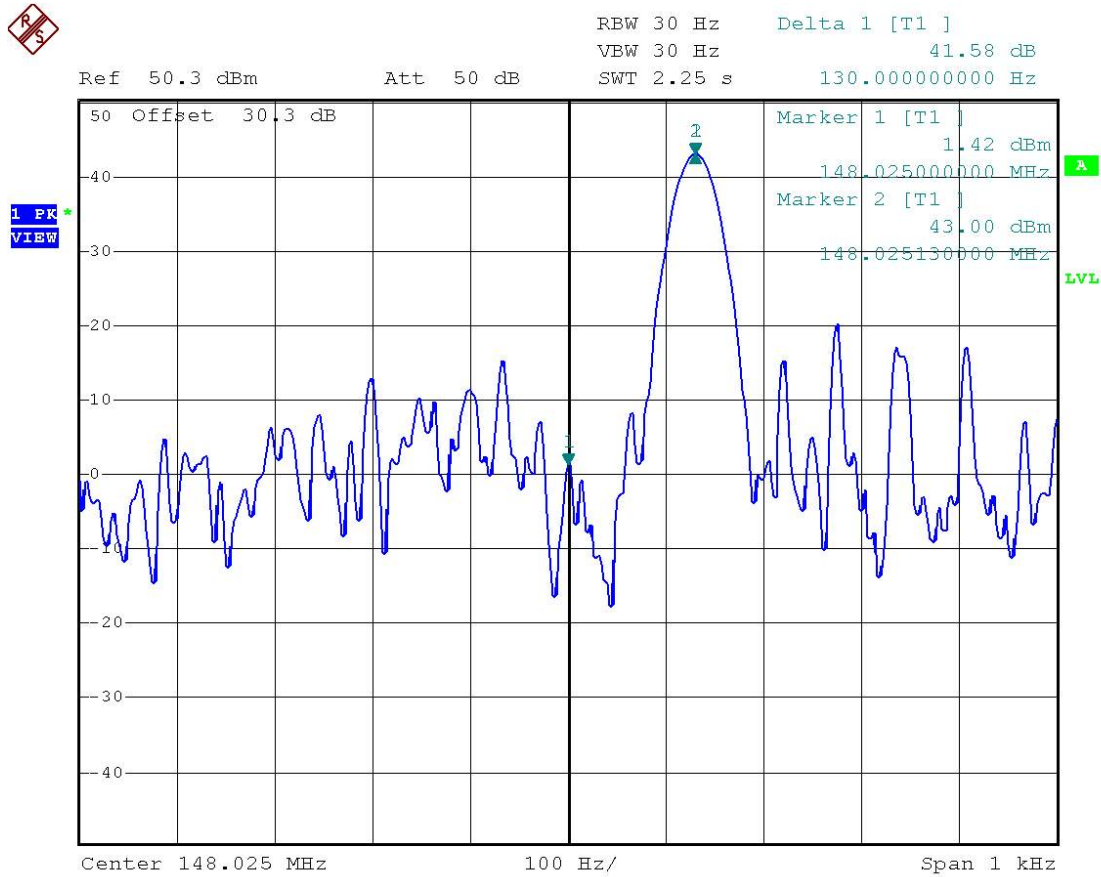
Date: 11.NOV.2008 16:45:50

5.9.6.13 Plot 11 (20°C, 11.73V)



Date: 11.NOV.2008 13:56:05

5.9.6.14 Plot 12 (20°C, 15.87V)



Date: 11.NOV.2008 13:55:16

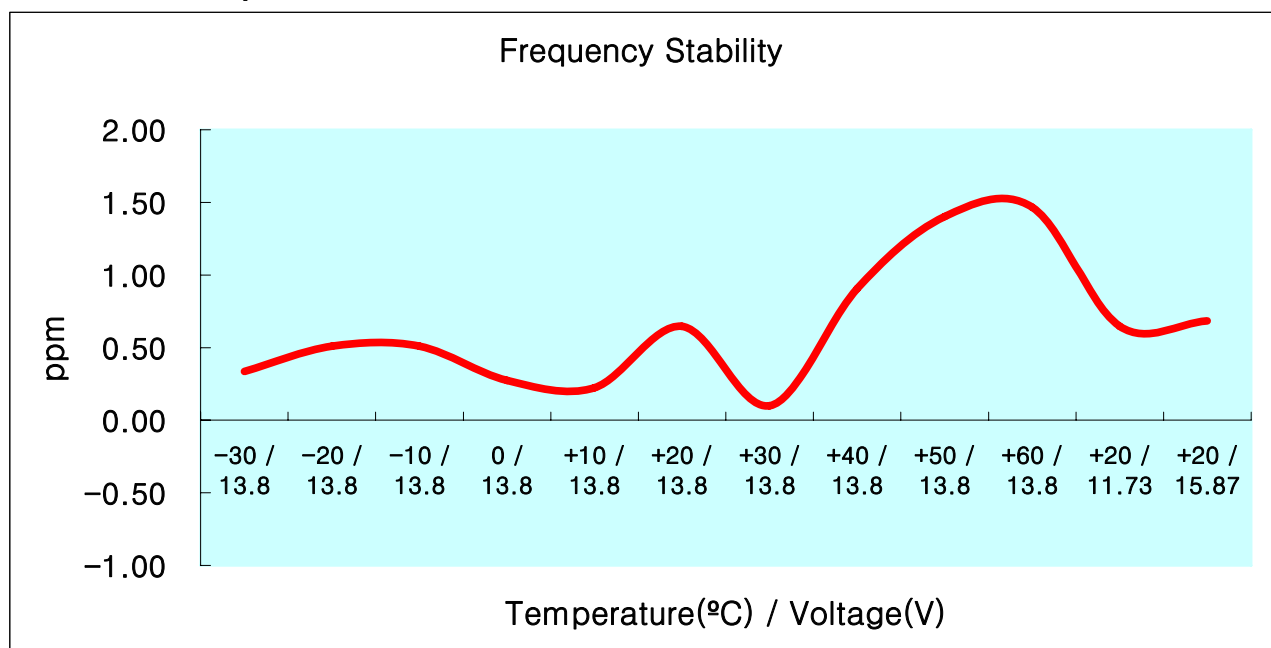
5.9.7 Test Result 2

FCC Rules :	Part 2 §2.1055 & §90.231
IC Rules :	RSS-119 Issue 9 Section 5.3
Operating Frequency :	161.025 MHz
Channel :	2nd Channel
Power Output :	25 Watts
Modulation :	Non-Modulation
Reference Voltage :	13.8 VDC

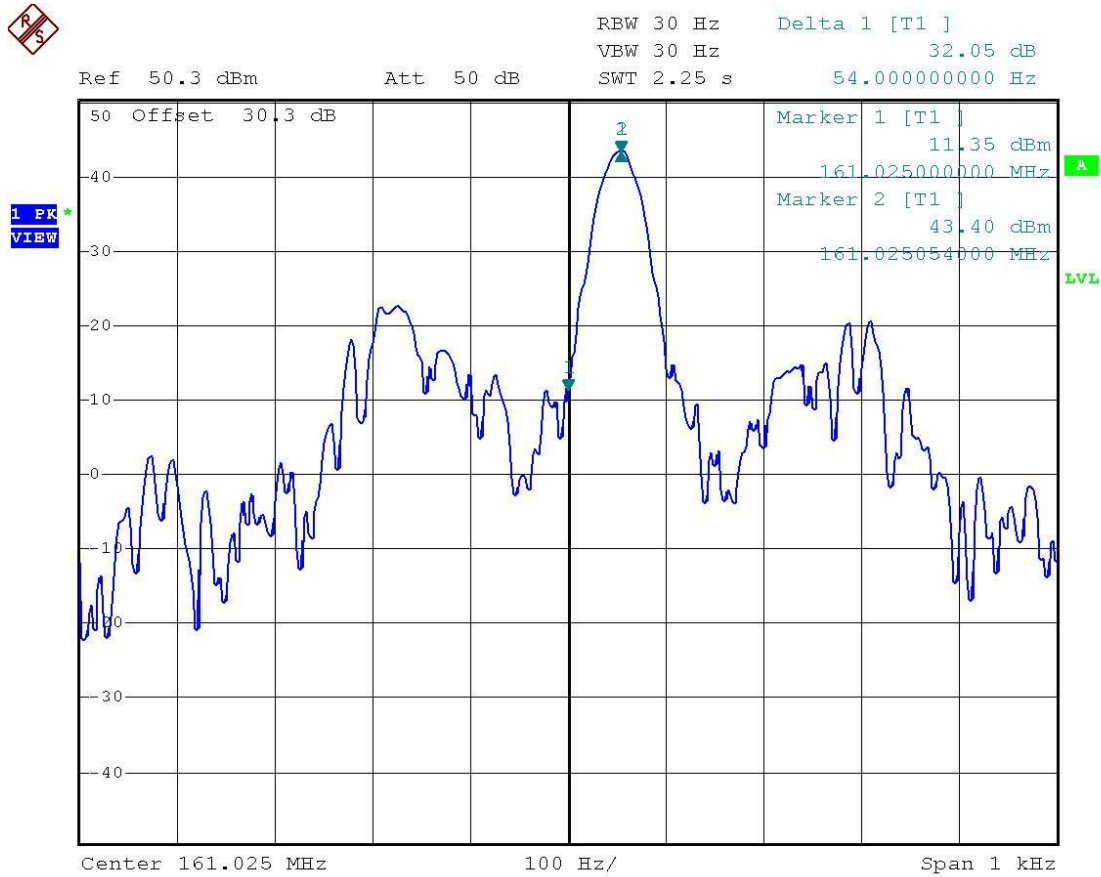
5.9.7.1 Data

Voltage (%)	Power Supply (Vdc)	Temperature (°C)	Frequency (Hz)	Deviation (ppm)	Limit (ppm)
100 %	13.8	-30	161025054	0.34	2.5
100 %	13.8	-20	161025082	0.51	2.5
100 %	13.8	-10	161025082	0.51	2.5
100 %	13.8	0	161025044	0.27	2.5
100 %	13.8	+10	161025036	0.22	2.5
100 %	13.8	+20 (ref)	161025104	0.65	2.5
100 %	13.8	+30	161025016	0.10	2.5
100 %	13.8	+40	161025146	0.91	2.5
100 %	13.8	+50	161025226	1.40	2.5
100 %	13.8	+60	161025236	1.47	2.5
85 %	11.73	+20	161025104	0.65	2.5
115 %	15.87	+20	161025110	0.68	2.5

5.9.7.2 Graph

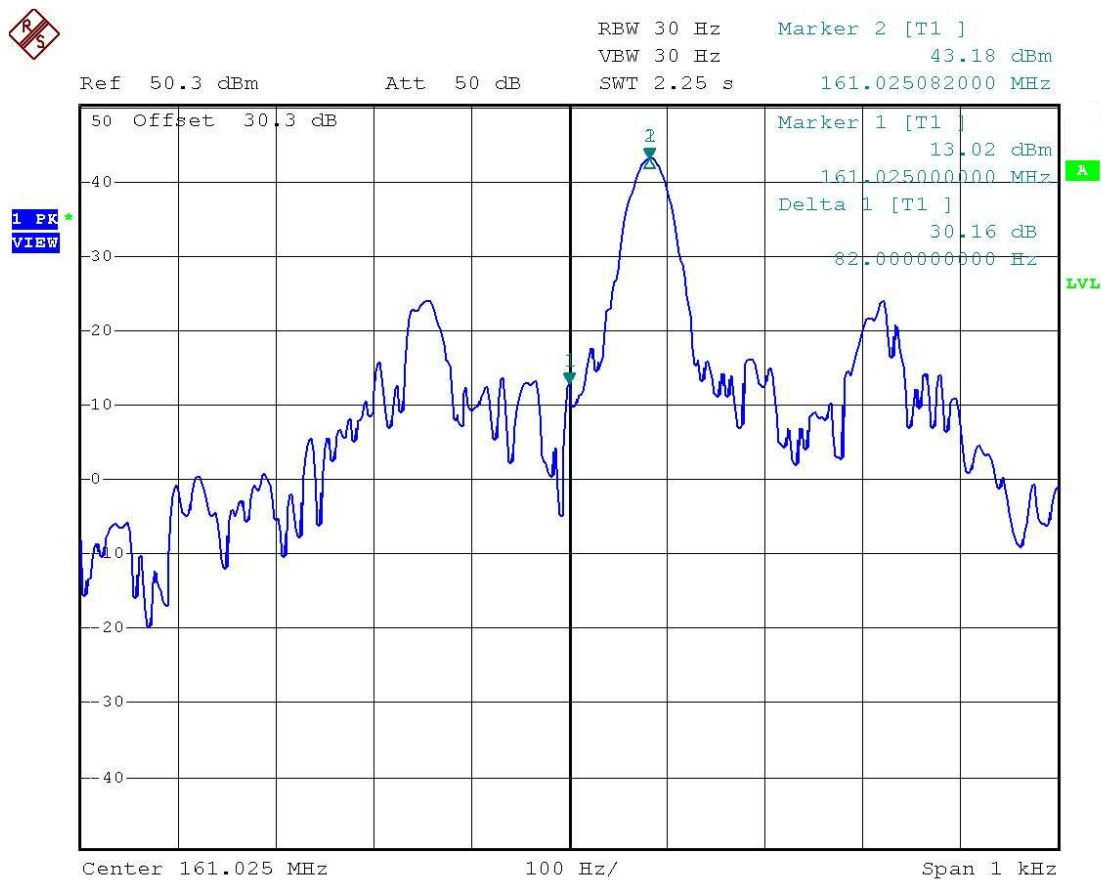


5.9.7.3 Plot 1 (-30°C)



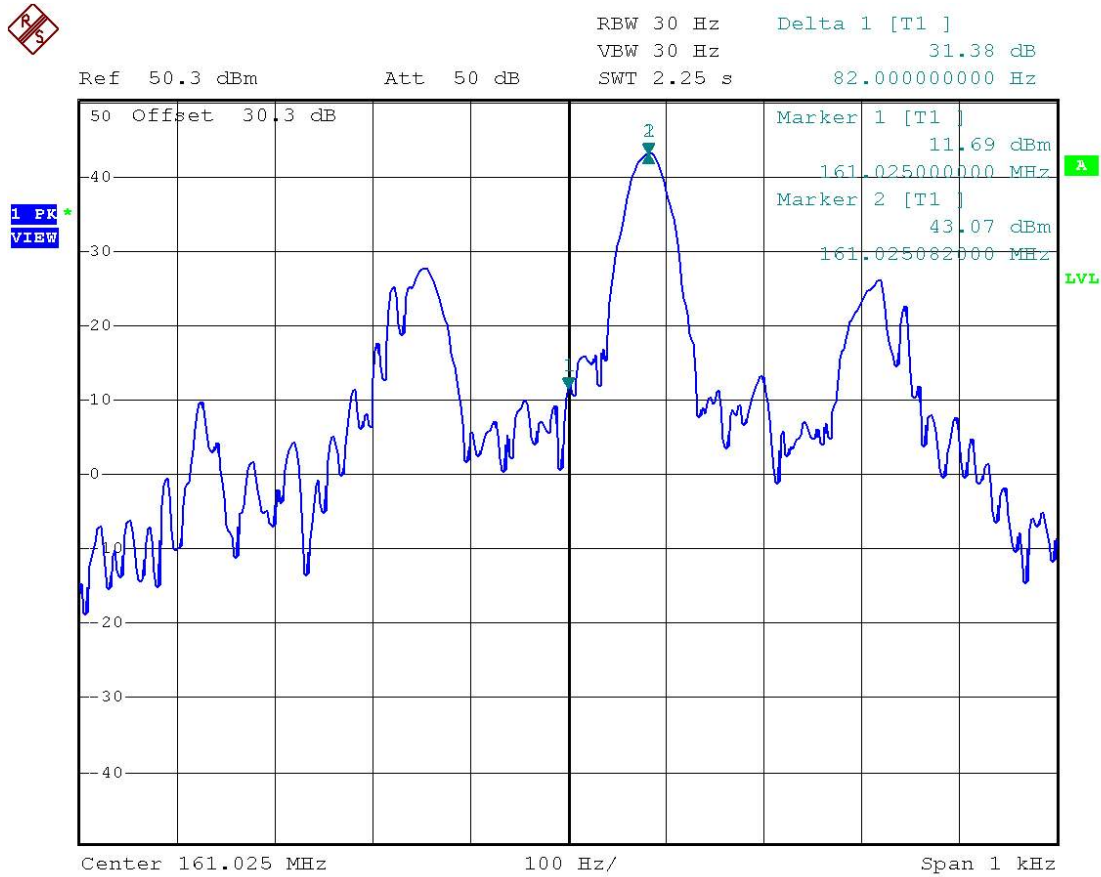
Date: 11.NOV.2008 14:22:34

5.9.7.4 Plot 2 (-20°C)



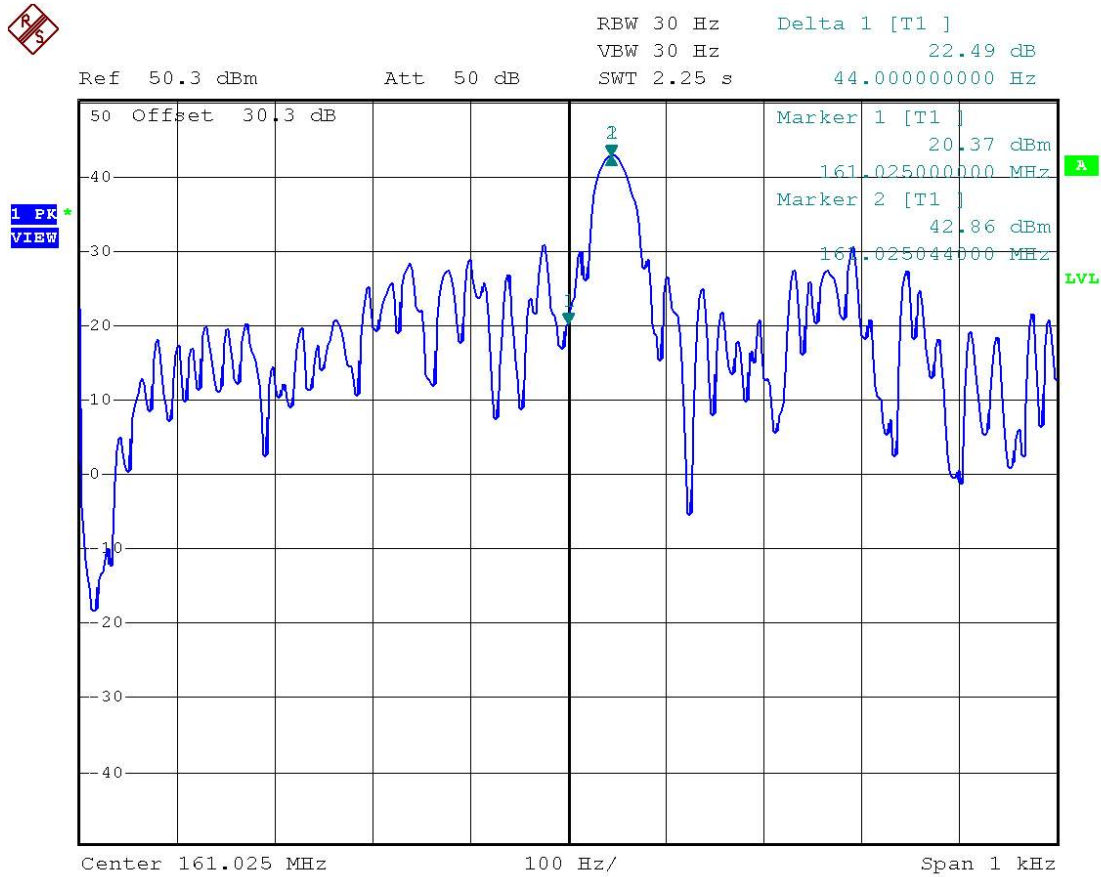
Date: 11.NOV.2008 14:36:29

5.9.7.5 Plot 3 (-10°C)



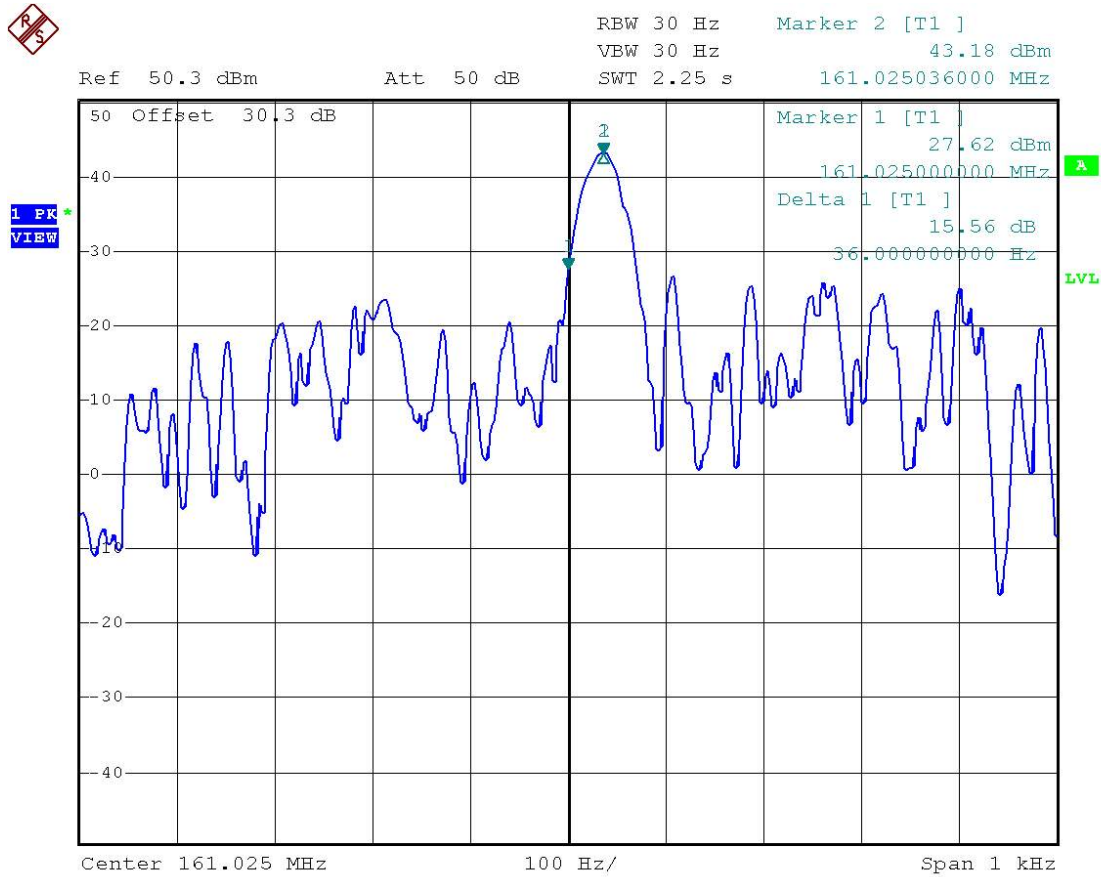
Date: 11.NOV.2008 14:52:49

5.9.7.6 Plot 4 (0°C)



Date: 11.NOV.2008 15:08:18

5.9.7.7 Plot 5 (+10°C)



Date: 11.NOV.2008 15:24:09