TEST REPORT

FCC RULES Part 90, Part2

FCC ID : I7ORL328V

Report File No.	: STROR-05-022
Date of Issue	: Mar. 08, 2005
Kind of Product	: Professional Portable Radio(VHF)
Model Name	: RL328
Manufacturer	: REXON TECHNOLOGY CORP.
Serial No.	: -
Test Result	: Complied

SGS Testing Korea Co., Ltd.
18 - 34, Sanbon - dong, Gunpo - si, Gyeonggi - do, Korea, 435 - 041
Tel. +82 31 428 5700 / Fax. +82 31 427 2371
http://www.sgstesting.co.kr

VERIFICATION OF COMPLIANCE

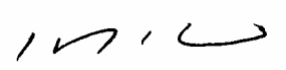
Applicant :	REXON TECHNOLOGY CORP.
Kind of Product :	Professional Portable Radio (VHF)
Brand Name :	-
Model Name :	RL328
Model Difference :	-
Report File No. :	STROR-05-022
Date of test :	Feb. 16, 2005 ~ Mar. 08, 2005
Receiver EUT :	-

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC RULES Part 90, Part2	Complied

The above equipment was tested by SGS Testing Korea Co., Ltd. for compliance with the requirements set forth in the FCC RULES PARTS Part90, Part2. The results of testing in this report apply to the product system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:  *Date* Mar. 08, 2005

Feel Jeong

Approved By  *Date* Mar. 08, 2005

James Kwon

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1. General Description of EUT

RL328 has a general features in range of 150.000-174.000MHz. RL328 has a general features shown as below

1-1. Compact design & size (125(W)*55(H)*34.5(D), 350g with battery)

1-2. Heavy duty durable construction

1-3. Up to 99channels

1-4. 50 CTCSS/104 CDS

1-5. PC Programmable, transferable by cloning

1-6. Timer-out timer(TOT)

1-7. Busy Lockout(BCLO)

1-8. Transmit output power High/Low DC 7.2V Ni-MH battery

2. General Information of EUT

Transceiver

Power Supply	DC 7.2V (Ni-MH battery)
Operating Frequency	150.000 MHz –174.000 MHz
Transmit Power	1 W(low)/5 W(high)
Modulation of Channels	FM
Channel spacing	12.5 kHz and 25 kHz
Emission	8K5F3E/ 16K0F3E
Communication method	Simplex
Number of Channels	99channels
Antenna Type	External

3. Test Procedure

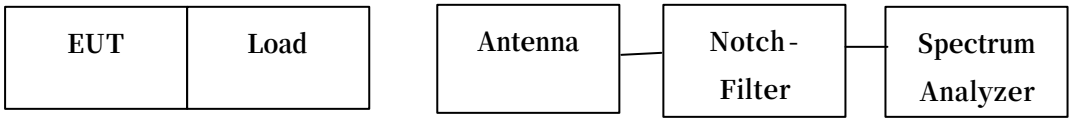
The test procedure are performed following the test stands ANSI/EIA - 603, if applicable.

3.1 Output Power Conducted FCC 2.1046(a),FCC 90.205

The conducted RF output power is the available power at the output terminals of the transmitter when the output terminals are corrected to the standard transmitter load.
The test sample is feeding a 50 ohm coaxial attenuator which is connected to a spectrum analyzer.
The power output at the transmitter antenna port is determined by adding the value of the attenuator to the spectrum analyzer reading.
The test are performed at the frequencies(low, middle, high channels of the EUT operating band) and full rated power levels of the transmitter.

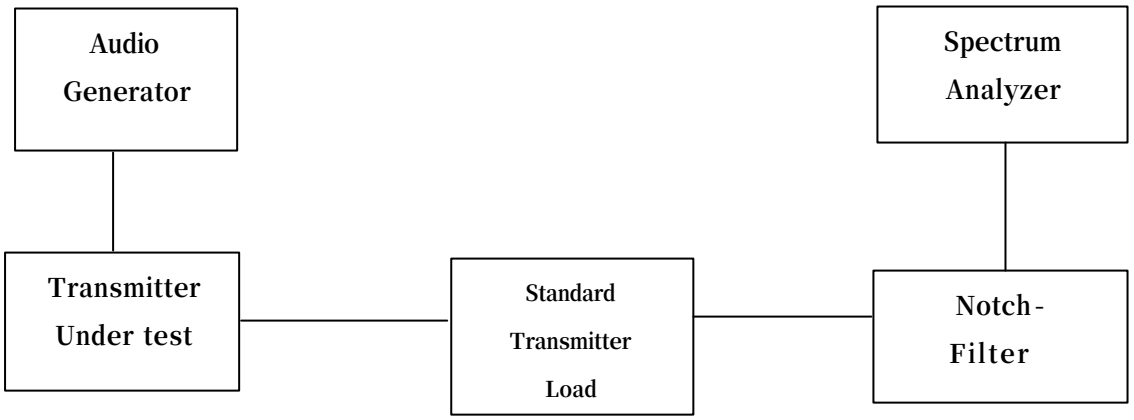
3.2 Radiated Spurious Emissions FCC 2.1053, FCC 90.210

Radiated spurious emissions are emissions from the EUT when transmitting in non - radiating load on frequencies outside the operating band.
ERP measurement of spurious emission the general substitution method as described at 2.4.2.
In order to suppress inter - modulation products in the spectrum analyzer a notch filter is used, if applicable.



3.3 Conducted Spurious Emissions FCC 2.1051

Conducted spurious emissions are emissions at the antenna terminal on frequencies outside the operating band. The test is performed according the principle below using a computer controlled test set-up.



The transmitter is modulated with 2500Hz sine wave at an input level 16dB greater than that necessary to produce 50% of rated system deviation.

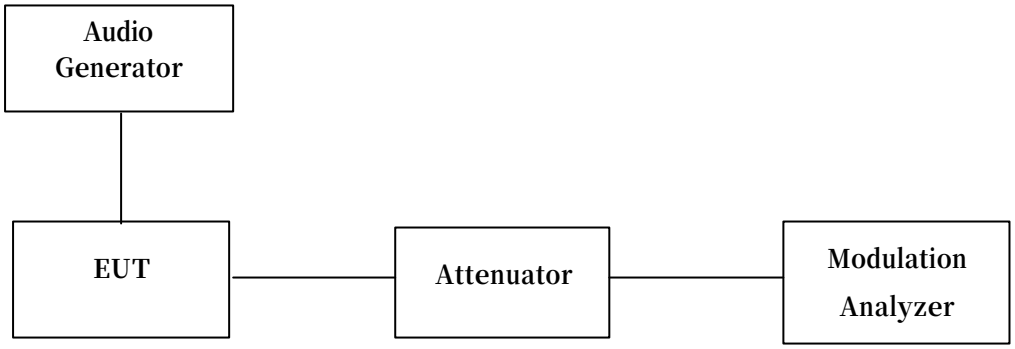
3.4 Audio Frequency Response FCC 2.1047(a)

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.

The frequency response of the audio modulation part is adjusted to get 20% of the rated system deviation.

The deviations obtained over the frequency range from 100Hz to 5000Hz are recorded and compared with the reference deviation as follows:

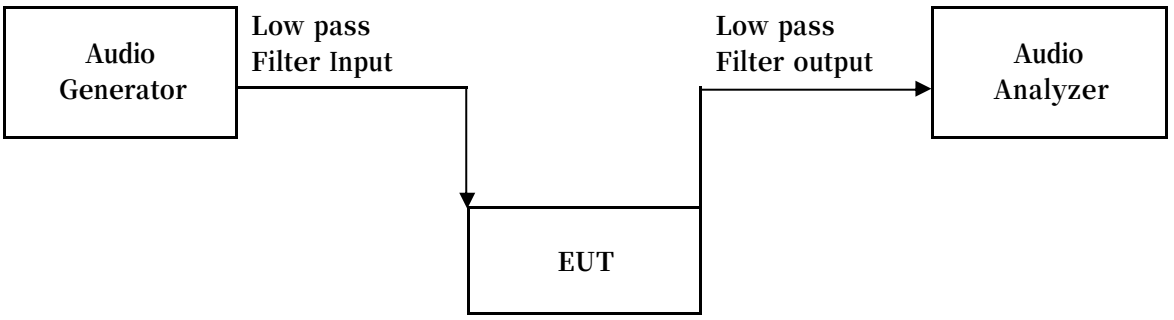
$$\text{Audio Frequency Response} = 20\log[DEV_{Freq} / DEV_{ref}]$$



3.5 Audio Low Pass Filter Frequency Response FCC 2.1047(a), FCC 90.242(b)(8)

The audio low pass filter response is the frequency response of the post limits low pass filter circuit above 3000Hz.

It is measured form 1kHz(reference point) to 50kHz with test set-up below.

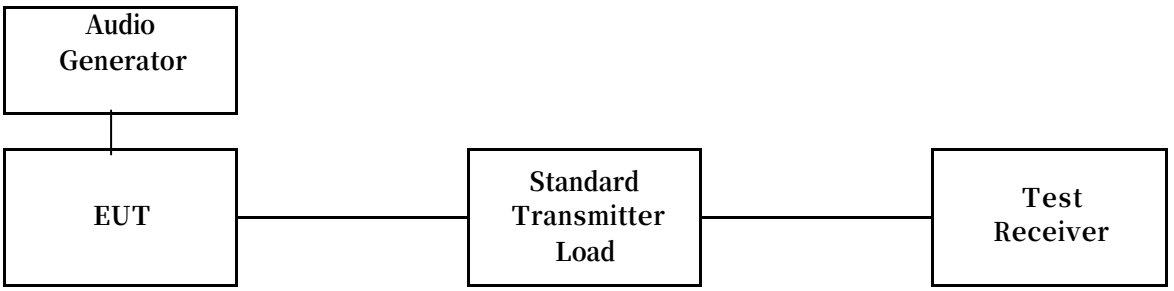


3.6 Modulation Limiting FCC 2.1047(b),22.915(b),90.210

Modulation limiting is the transmitter circuit's ability to limit the transmitter from producing deviations in excess of rated system deviation.

The modulation response is measured at certain modulation frequencies, related to 1000Hz reference signal. The basic setting is 60% of full rated deviation which will be increased the audio generator level from –20dBto 20dB in nine steps.

Tests are perform for positive and negative modulation.



3.7 Occupied Bandwidth FCC 2.1049,90.210

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0,5 percent of the total mean power radiated by a given emission.

The transmitter is modulated by a 2500Hz tone at an input level 16dB greater than that necessary to produce 50 percent modulation.

The input level shall be established at the frequency of maximum response of the audio modulating circuit.

Different emission masks are required.

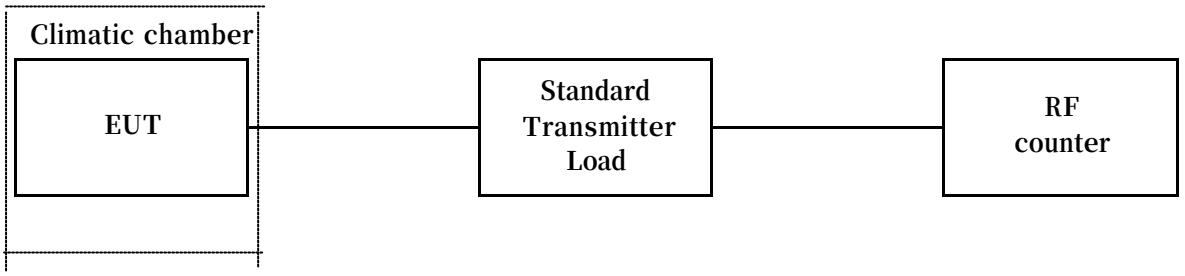
Emission Mask B for transmitters that are equipped with an audio low pass filter.

Emission Mask D for transmitters designed to operate with a 12.5 kHz bandwidth.

3.8 Frequency stability FCC 2.1055,FCC 90.213

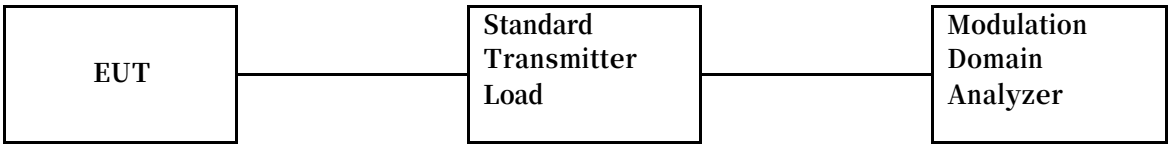
The carrier frequency is the stability of the transmitter to maintain an assigned carrier frequency.

The frequency stability is measured with variation of ambient temperature from -30℃to +60℃.



3.9 Transient frequency behavior FCC 90.214

Transient frequency behavior is a measure of the difference, as a function in time, of the actual transmitter frequency to the assigned transmitter frequency behavior for a 30dB step during the switch on and switch off time.



4. Output Power Conducted FCC 2.1046(a), FCC90.205

Power Level [W]	Frequency [MHz]	Channel Spacing[kHz]	RF Output Power [W]	Nominal DC Voltage[V]
1	150.000	25	1.03	7.2V
	162.000	25	1.05	7.2V
	174.000	25	0.99	7.2V
5	150.000	25	5.91	7.2V
	162.000	25	5.43	7.2V
	174.000	25	4.98	7.2V

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Signal Generator	Agilent	E4438C	May. 2005
Power Meter	Agilent	E4416A	May. 2005
Power Sensor	Agilent	E9327A	May. 2005
DC Power Supply	Agilent	6674A	May. 2005

5.Radiated Spurious Emissions FCC 2.1053(a), FCC90.210

TX FREQ=150.000 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
300.000	H	< -30	-20	>10
450.000	H	< -30	-20	>10
600.000	V	< -30	-20	>10
750.000	H	< -30	-20	>10
900.000	H	< -30	-20	>10
1050.000	V	< -30	-20	>10
1200.000	H	< -30	-20	>10
1350.000	V	< -30	-20	>10
1500.000	V	< -30	-20	>10

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	H/P	8593E	Aug. 2005
Signal Generator	Agilent	8648D	May. 2005
Dipole Antenna	Schwarzbeck Mess	UHAP	May. 2005
Dipole Antenna	Schwarzbeck Mess	UHAP	May. 2005
Dummy Load	BIRD	8404	Dec. 2005
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2006
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2006
Biconical Antenna	Schwarzbeck	VHA9103	Jan. 2006
Biconical Antenna	EMCO	3104C	Feb. 2006
Log-periodic	EMCO	3146	Feb. 2006
Anechoic Chamber	Seo Young EMC	-	-

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TX FREQ =150.000 MHz Low Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
300.000	V	< -30	-13	>17
450.000	V	< -30	-13	>17
600.000	V	< -30	-13	>17
750.000	V	< -30	-13	>17
900.000	V	< -30	-13	>17
1050.000	V	< -30	-13	>17
1200.000	V	< -30	-13	>17
1350.000	V	< -30	-13	>17
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TX FREQ = 162.000 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
324.000	H	< -30	-20	>10
486.000	V	< -30	-20	>10
648.000	V	< -30	-20	>10
810.000	V	< -30	-20	>10
972.000	H	< -30	-20	>10
1134.000	H	< -30	-20	>10
1296.000	H	< -30	-20	>10
1458.000	V	< -30	-20	>10
1620.000	V	< -30	-20	>10

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Anechoic Chamber	Seo Young EMC	-	-

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TX FREQ = 174.000 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
348.000	H	< -30	-20	>10
522.000	V	< -30	-20	>10
696.000	V	< -30	-20	>10
870.000	H	< -30	-20	>10
1044.000	V	< -30	-20	>10
1218.000	H	< -30	-20	>10
1392.000	H	< -30	-20	>10
1566.000	V	< -30	-20	>10
1740.000	V	< -30	-20	>10

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348.000	H	< -30	-20	>10
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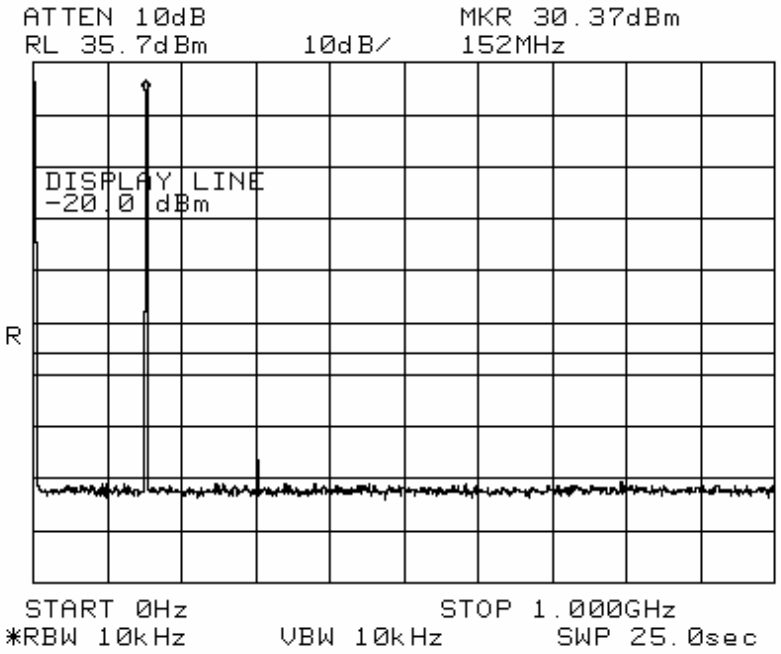
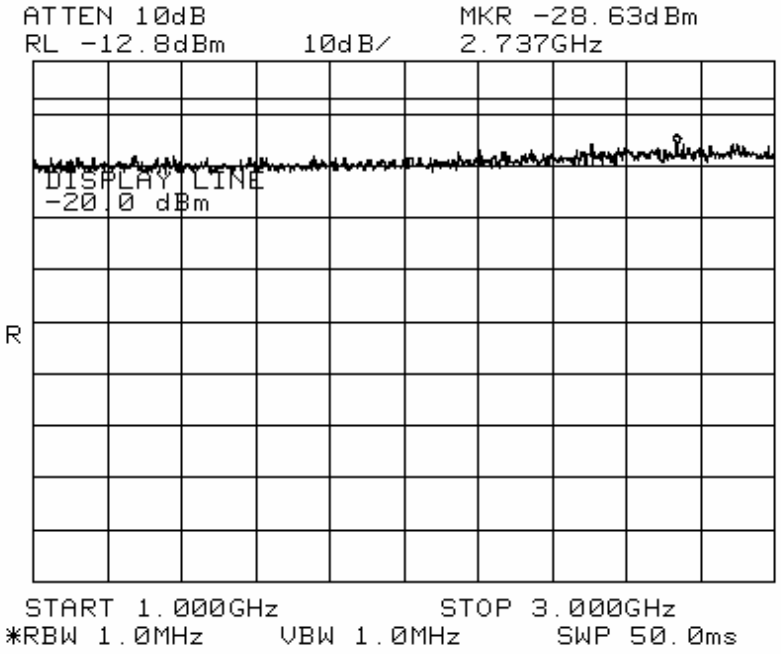
Biconical Antenna	Schwarzbeck	VHA9103	Jan. 2006
Biconical Antenna	EMCO	3104C	Feb. 2006
Log-periodic	EMCO	3146	Feb. 2006
Anechoic Chamber	Seo Young EMC	-	-

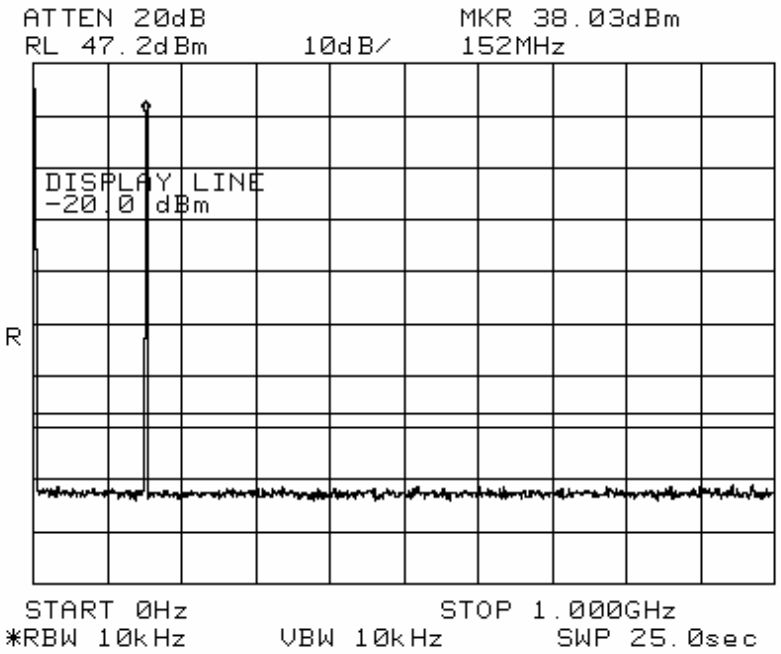
6.Conducted Spurious Emissions FCC 2.1051, FCC90.210(b) (d)

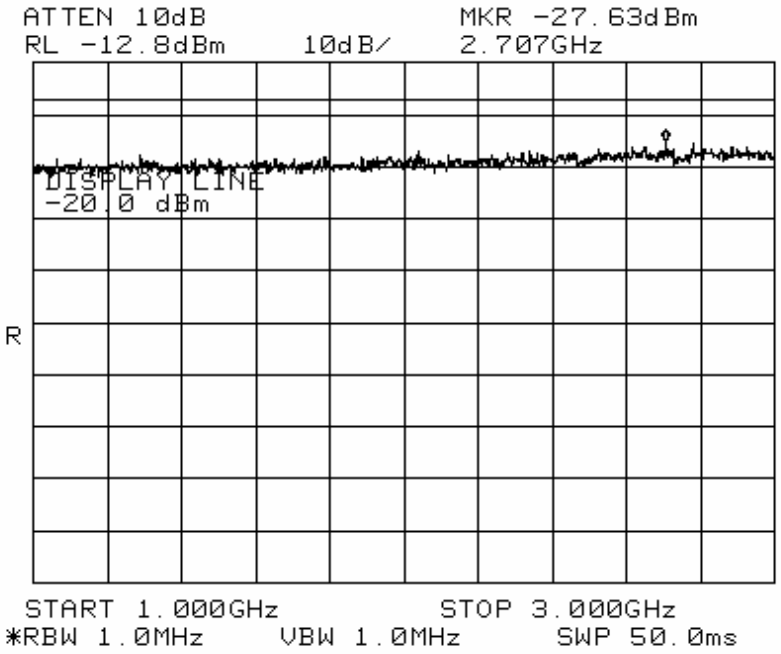
TX FREQ=150.000 MHz Low Power Setting Channel Spacing 12.5 kHz



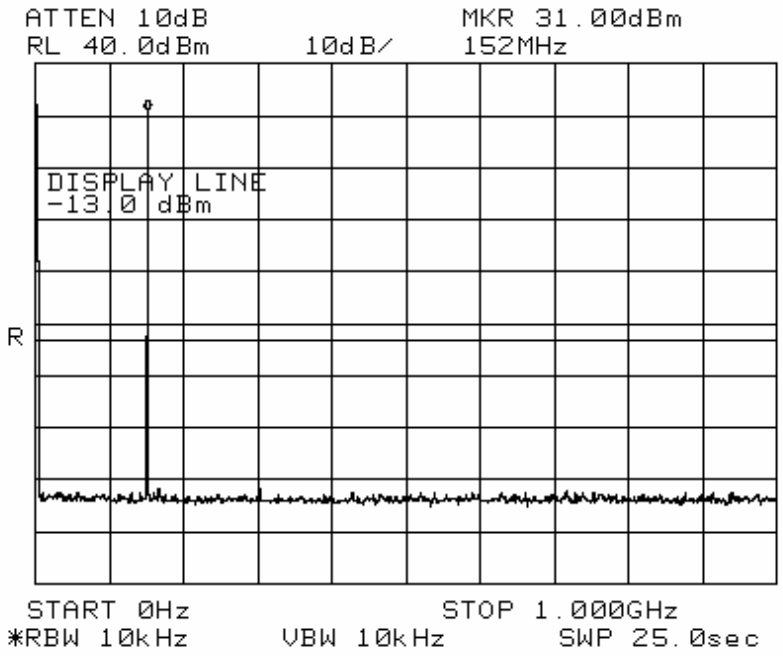


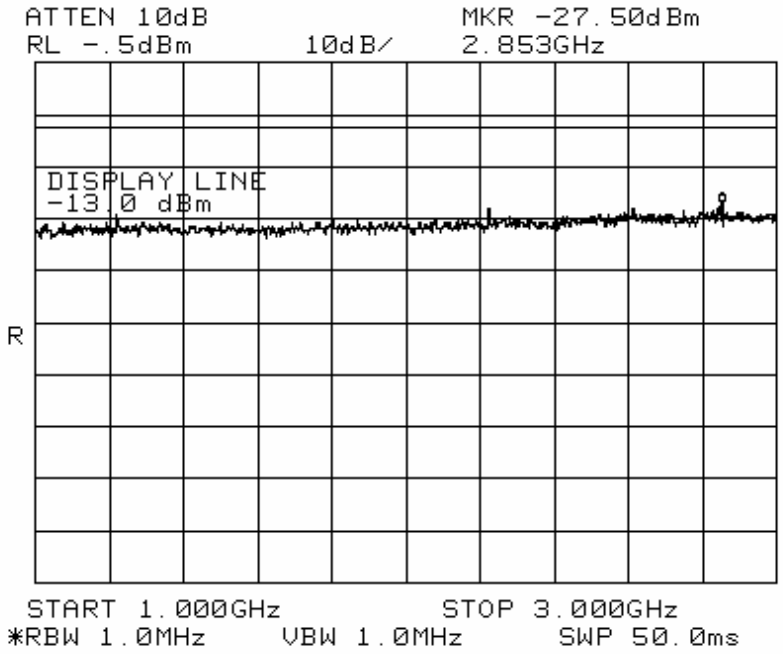
TX FREQ = 150.000 MHz High Power Setting Channel Spacing 12.5 kHz



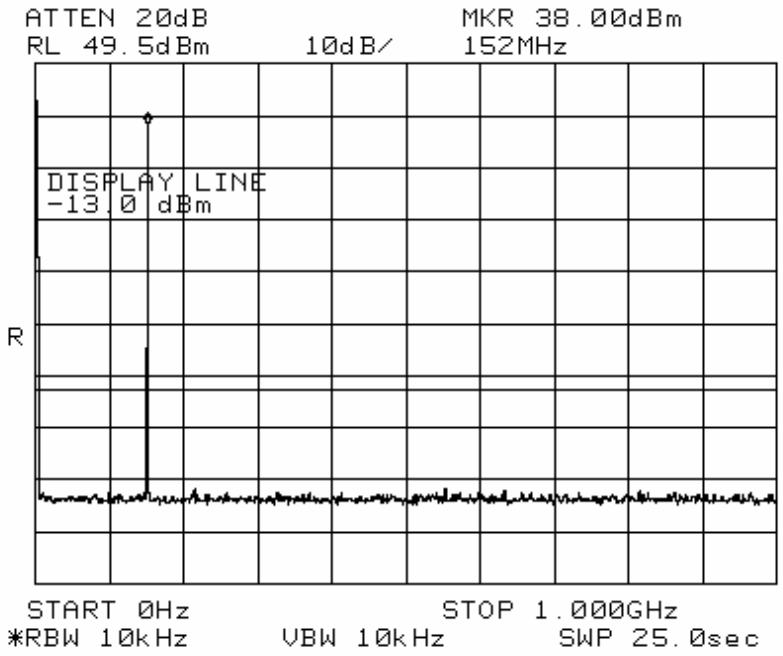


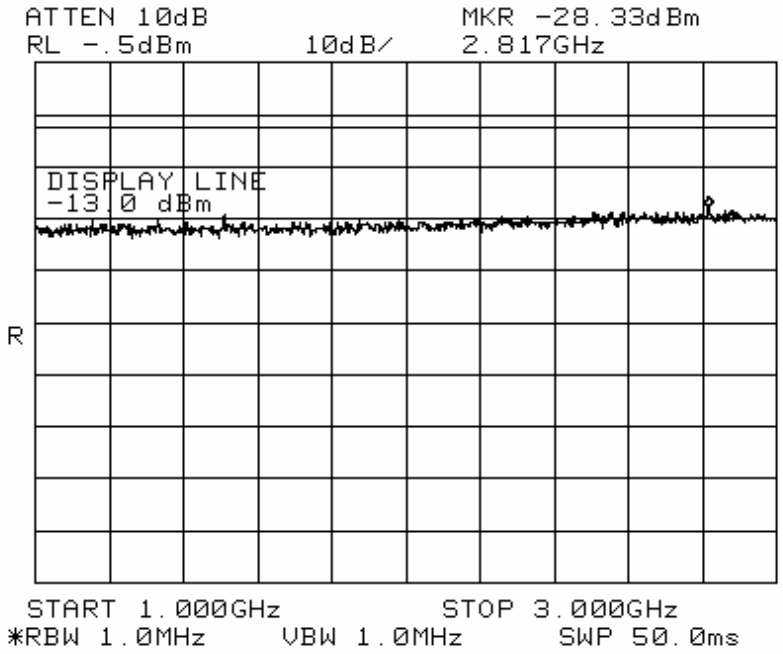
TX FREQ =150.000 MHz Low Power Setting Channel Spacing 25 kHz



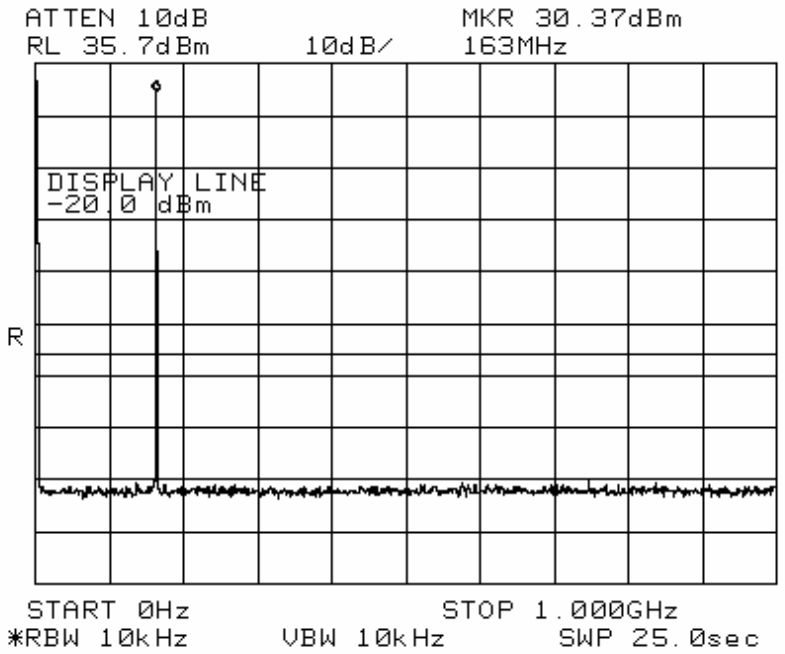


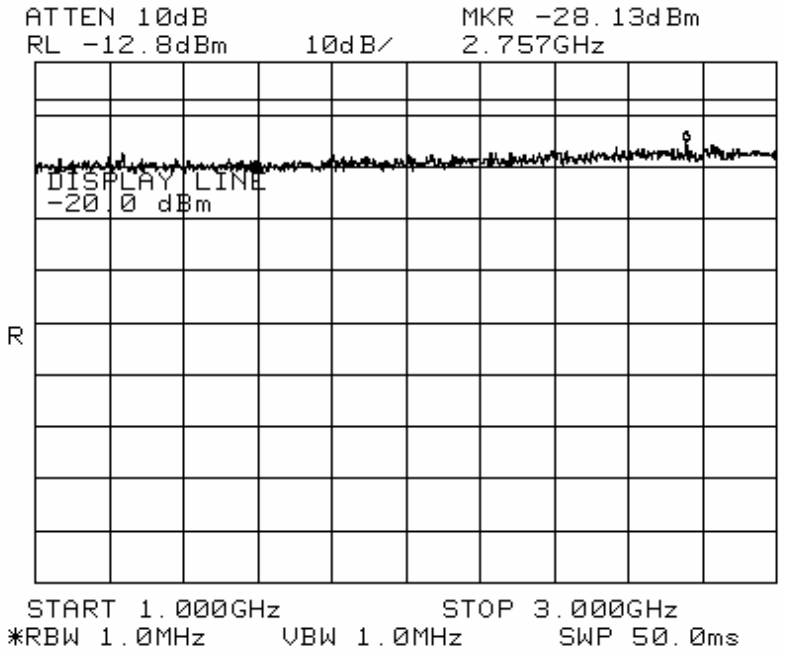
TX FREQ= 150.000 MHz High Power Setting Channel Spacing 25 kHz



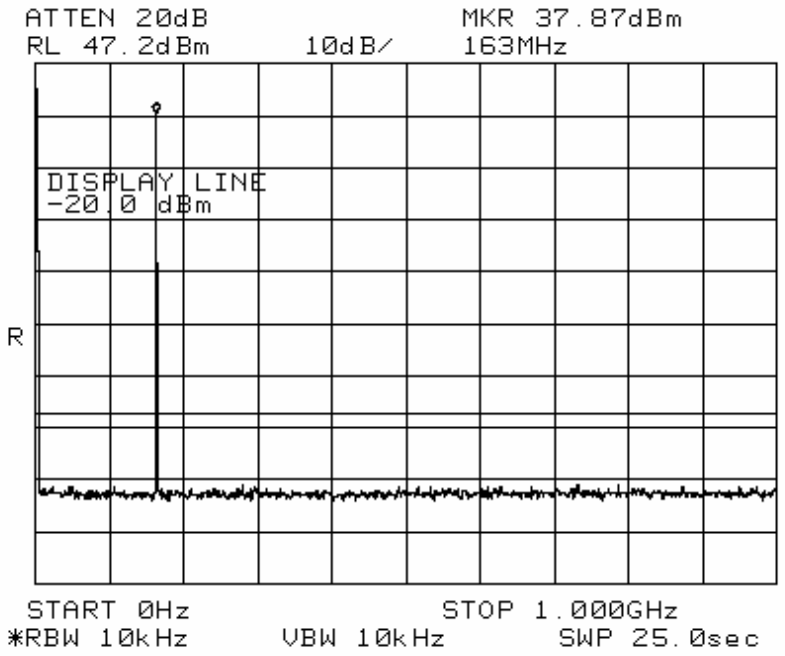


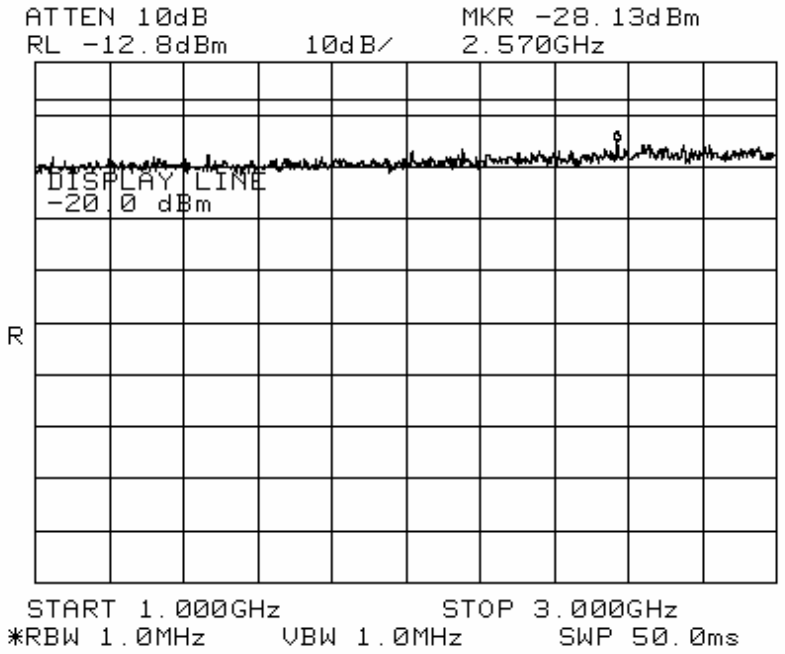
TX FREQ = 162.000 MHz Low Power Setting Channel Spacing 12.5 kHz



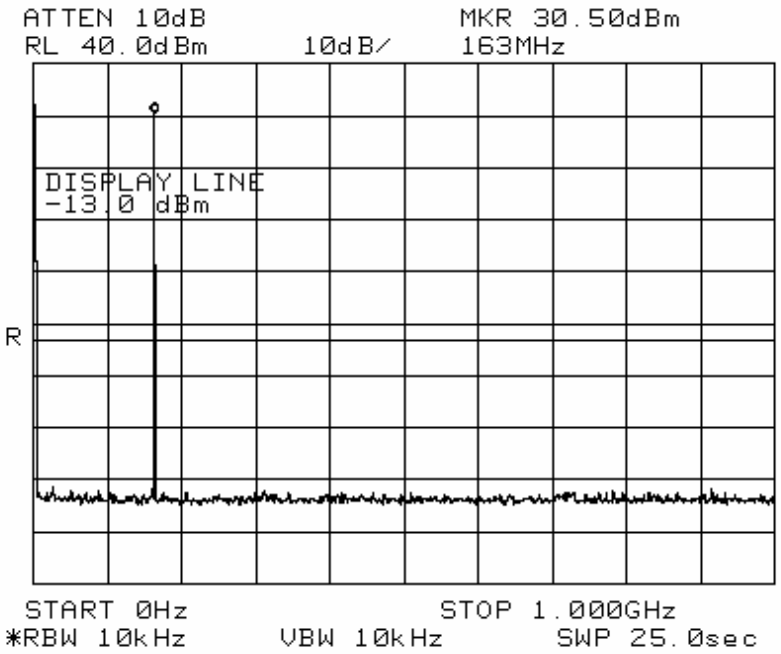


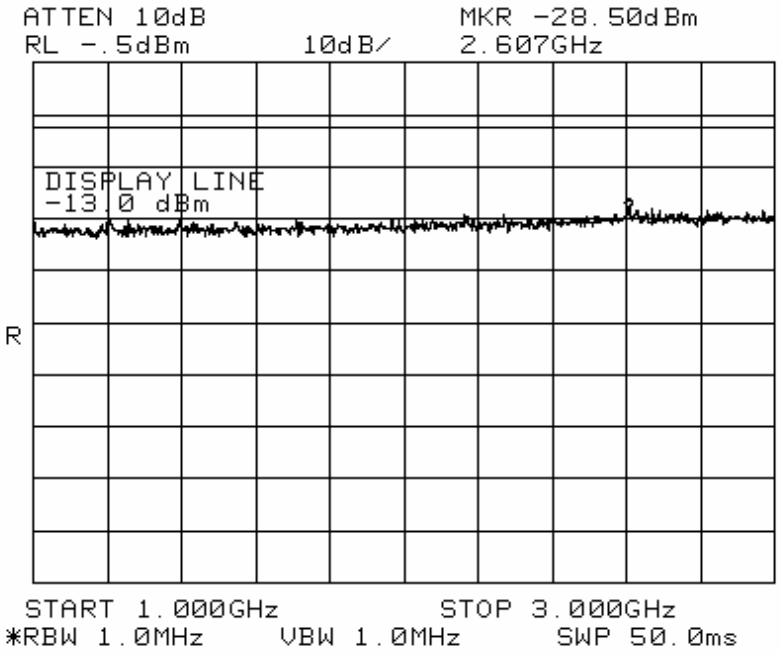
TX FREQ = 162.000 MHz High Power Setting Channel Spacing 12.5 kHz



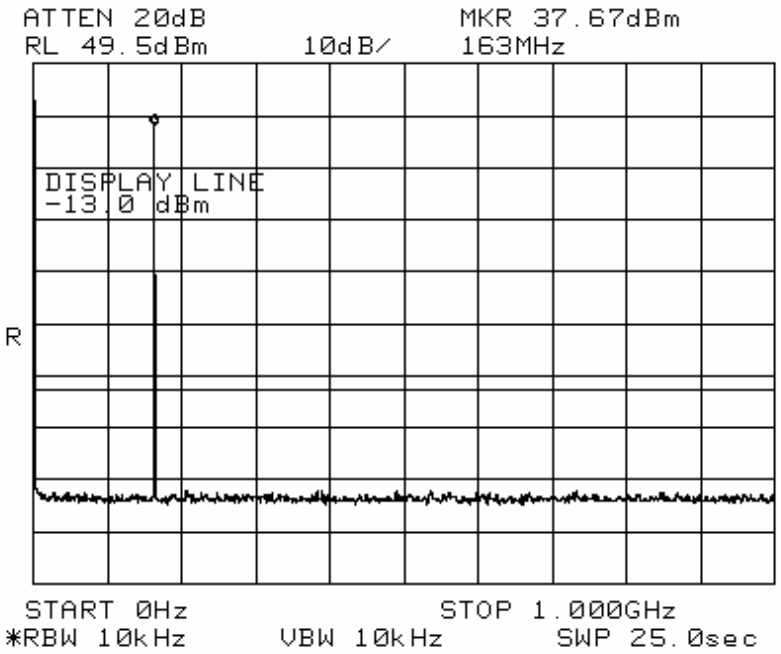


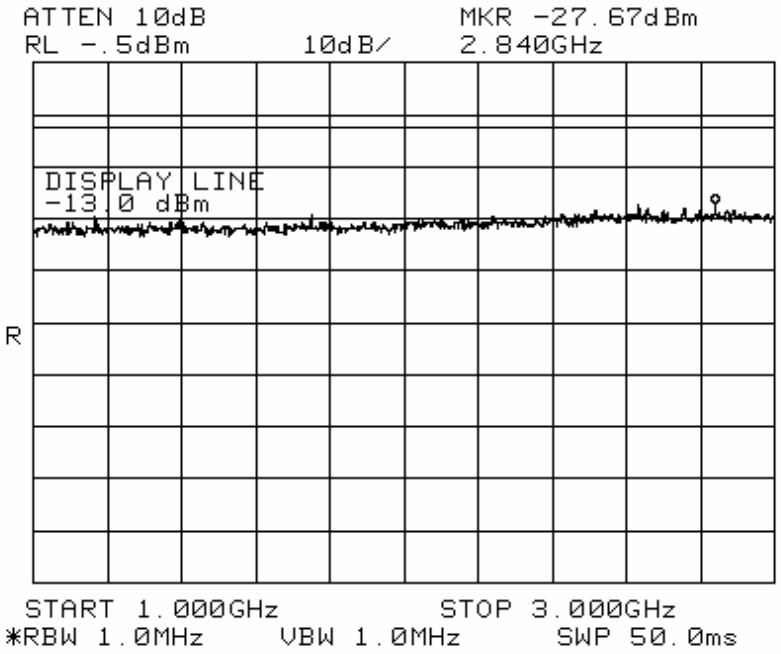
TX FREQ = 162.000 MHz Low Power Setting Channel Spacing 25 kHz



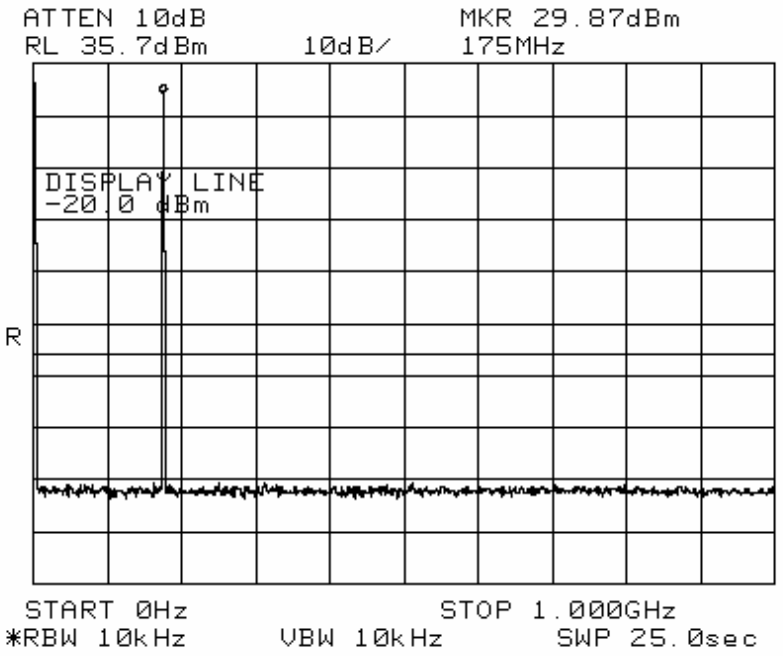


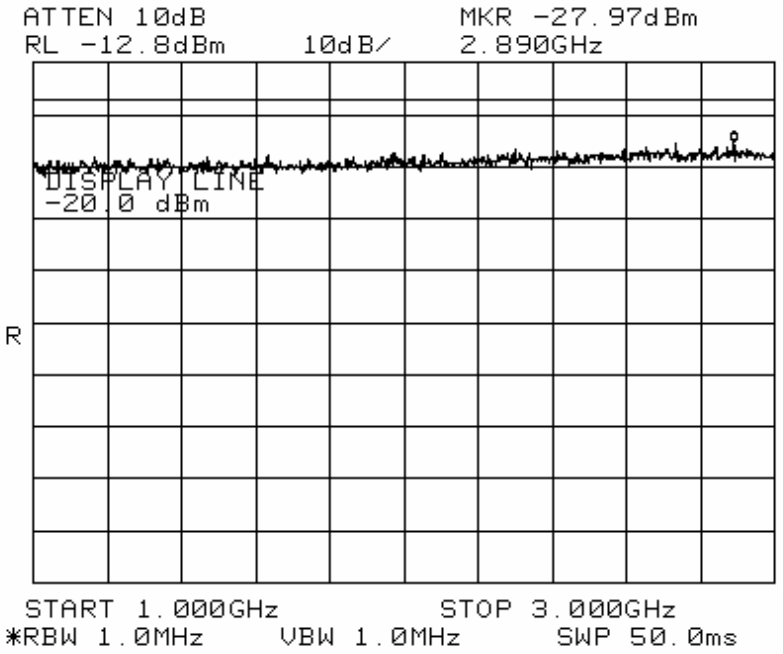
TX FREQ = 162.000 MHz High Power Setting Channel Spacing 25 kHz



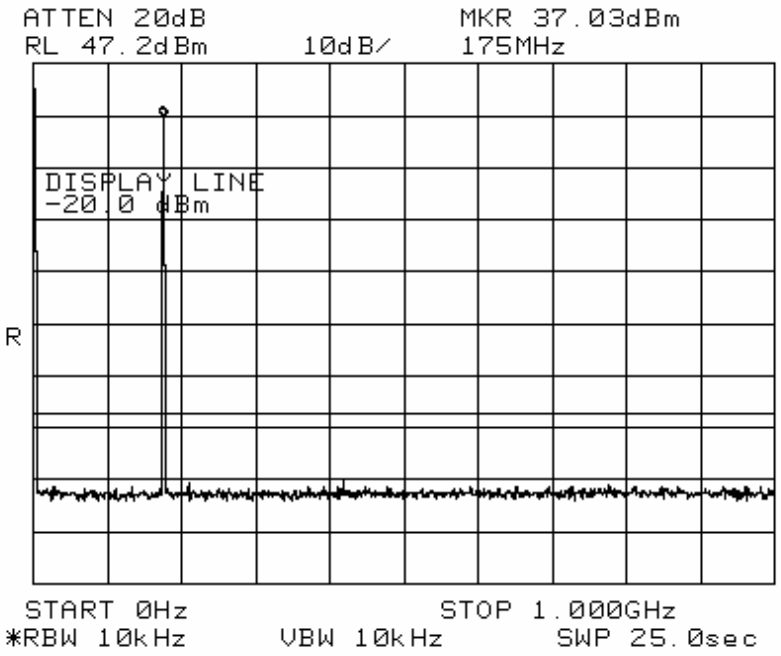


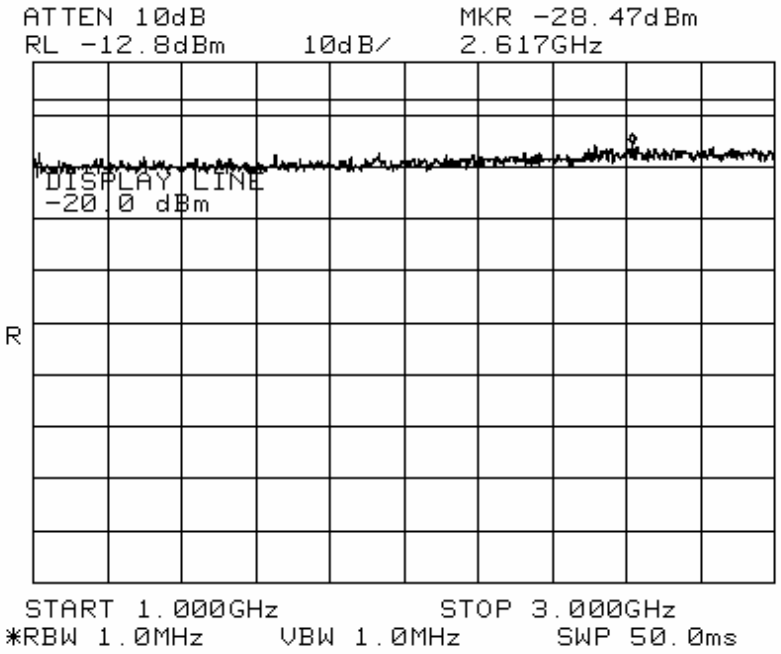
TX FREQ = 174.000 MHz Low Power Setting Channel Spacing 12.5 kHz



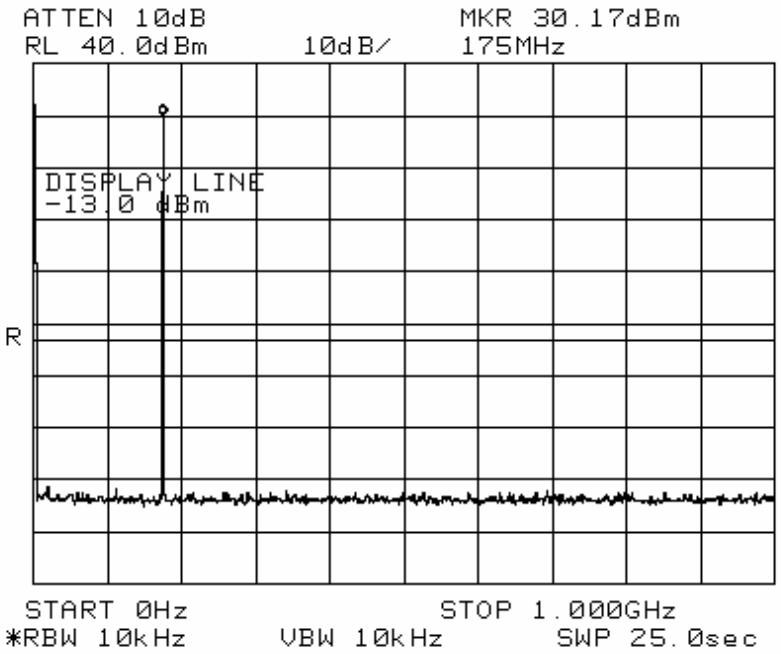


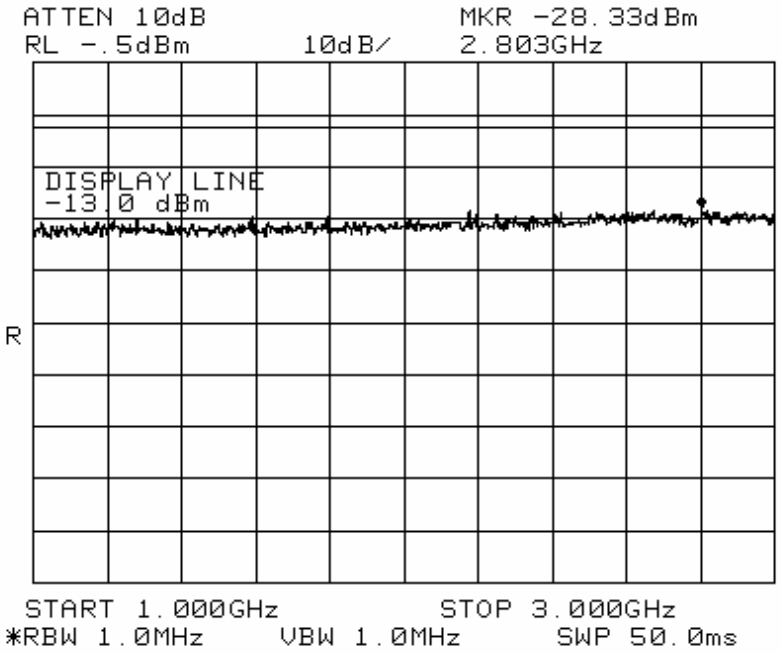
TX FREQ = 174.000 MHz High Power Setting Channel Spacing 12.5 kHz



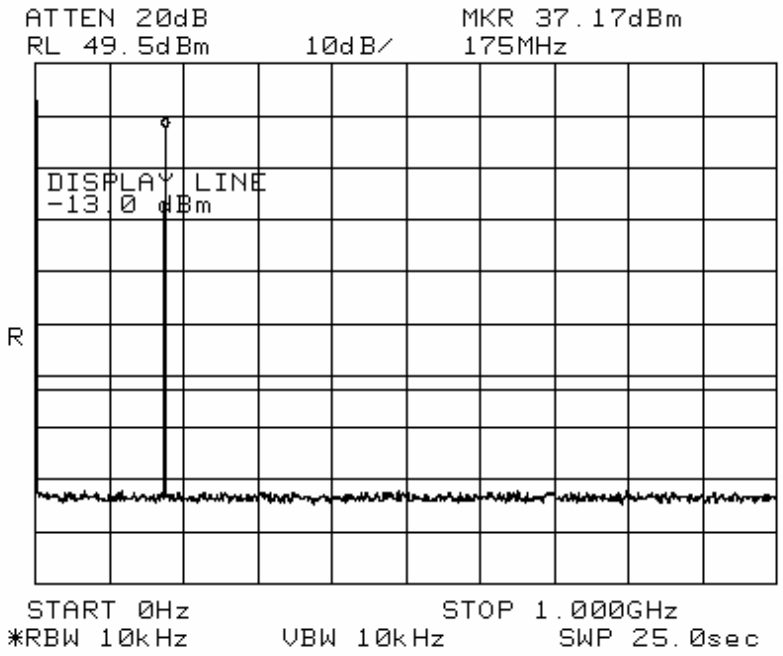


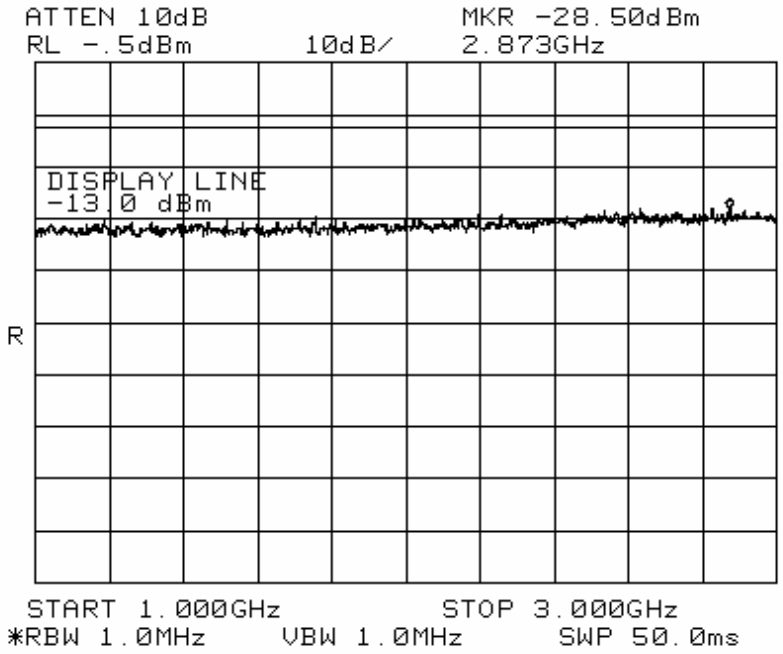
TX FREQ = 174.000 MHz Low Power Setting Channel Spacing 25 kHz





TX FREQ = 174.000 MHz High Power Setting Channel Spacing 25 kHz





Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
Function Generator	Agilent	33220A	May. 2005
DC Power Supply	Agilent	6674A	May. 2005

7.Audio Frequency Response FCC 2.1.047(a)

Operating Frequency : 162.000 MHz

Channel : Middle

Nominal DC Voltage: 7.2Vdc

Audio frequency [Hz]	Channel spacing 12.5 kHz		Channel spacing 25 kHz	
	Measured Deviation [kHz]	Calculated Response [dB]	Measured Deviation [kHz]	Calculated Response [dB]
100	0.037	-22.68	0.054	-25.38
200	0.072	-16.90	0.111	-19.11
300	0.112	-13.06	0.213	-13.46
400	0.165	-9.70	0.325	-9.79
500	0.221	-7.16	0.438	-7.20
600	0.277	-5.20	0.544	-5.31
700	0.324	-3.84	0.660	-3.64
800	0.377	-2.52	0.771	-2.28
900	0.443	-1.12	0.893	-1.01
1000	0.504	0	1.003	0
2000	1.057	6.43	2.173	6.72
2500	1.250	7.89	2.547	8.09
3000	1.290	8.16	2.618	8.33
4000	0.759	3.56	1.524	3.63
5000	0.405	-1.90	0.802	-1.94

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
Function Generator	Agilent	33220A	May. 2005
DC Power Supply	Agilent	6674A	May. 2005

8.Audio Low Pass Filter Frequency Response FCC 2.1047(a), FCC 90.210

Operating Frequency : 162.000 MHz

Channel : Middle

Nominal DC Voltage: 7.2 Vdc

Audio frequency [kHz]	Channel spacing 12.5 kHz	Channel spacing 25 kHz
	Response [dB]	Response [dB]
1	0	0
2	1.86	-18.04
3	-3.39	-3.40
4	-16.05	-15.17
5	-25.70	-24.10
6	-32.00	-30.81
7	-38.01	-37.11
8	-43.82	-42.00
9	-49.31	-48.00
10	-51.81	-50.78
20	< -60	< -60
30	< -60	< -60
50	< -60	< -60

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
Audio Analyzer	H/P	8903B	Dec. 2005
Spectrum Analyzer	Agilent	E4440A	May. 2005
Function Generator	Agilent	33220A	May. 2005
DC Power Supply	Agilent	6674A	May. 2005

9.Modulation Limiting FCC 2.1047(b), FCC 22.915(b), FCC 90.242(b)(8)

Operating Frequency : 162.000 MHz

Channel : Middle

Nominal DC Voltage: 7.2Vdc

12.5 kHz channel spacing

Audio input level Relative[dB]	Positive peak deviation [kHz]			Negative peak deviation [kHz]		
	300 Hz	1000 Hz	3000 Hz	300 Hz	1000 Hz	3000 Hz
-20	0.058	0.181	0.427	0.057	0.175	0.422
-15	0.075	0.297	0.726	0.071	0.287	0.724
-10	0.111	0.493	1.285	0.109	0.491	1.272
-5	0.182	0.861	1.538	0.175	0.851	1.536
0	0.292	1.501	1.543	0.292	1.504	1.546
5	0.499	2.164	1.554	0.498	2.199	1.558
10	0.874	2.170	1.558	0.869	2.212	1.567
15	1.531	2.166	1.561	1.522	2.221	1.564
20	2.429	2.163	1.558	2.421	2.219	1.563

25 kHz channel spacing

Audio input level Relative[dB]	Positive peak deviation [kHz]			Negative peak deviation [kHz]		
	300 Hz	1000 Hz	3000 Hz	300 Hz	1000 Hz	3000 Hz
-20	0.081	0.340	1.438	0.079	0.347	1.440
-15	0.125	0.564	2.522	0.120	0.561	2.510
-10	0.197	0.968	3.159	0.190	0.974	3.162
-5	0.325	1.691	3.177	0.320	1.697	3.181
0	0.569	3.001	3.163	0.563	3.004	3.170
5	0.977	4.510	3.189	0.980	4.521	3.191
10	1.752	4.520	3.194	1.760	4.524	3.197
15	3.097	4.510	3.186	3.100	4.511	3.187
20	4.890	4.500	3.182	4.881	4.500	3.190

Limits:

Channel spacing [kHz]	Rated frequency deviation [kHz]
12,5	2.5
25	5

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
Function Generator	Agilent	33220A	May. 2005
DC Power Supply	Agilent	6674A	May. 2005

10.Occupied Bandwidth FCC 2.1049, FCC 90.210

High power mode

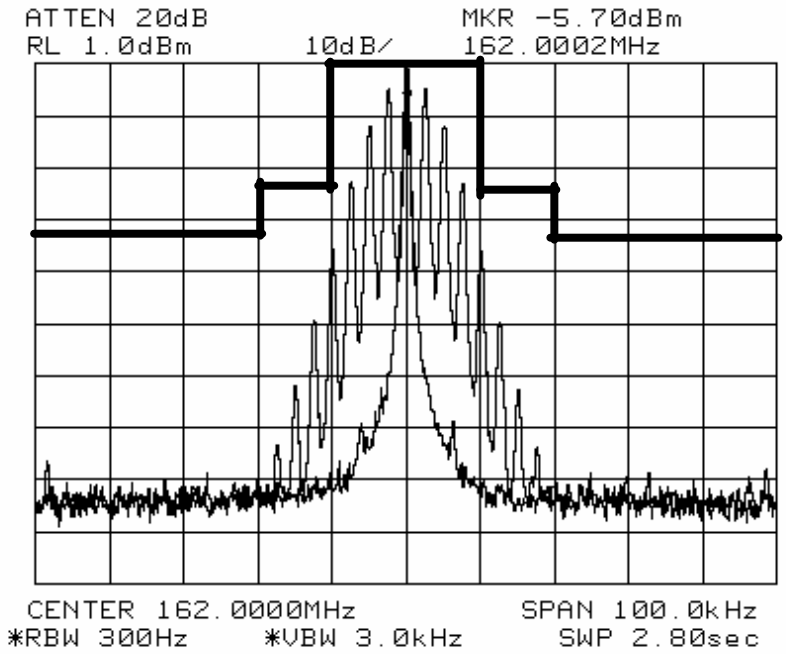
Frequency Channel	Occupied Bandwidth Mask D Channel spacing 12.5 kHz	Occupied Bandwidth Mask B Channel spacing 25 kHz
Middle	Pass	Pass

Operating Frequency : 162.000 MHz

Channel : Middle Nominal DC Voltage: 7.2Vdc

MAX POWER SETTING

MASK B CHANNEL SPACING = 25 kHz



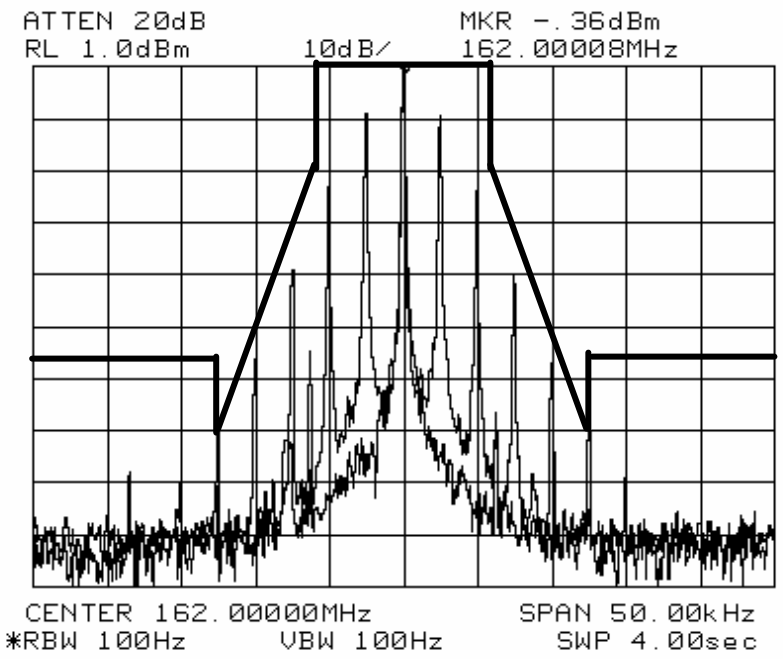
Limits: Are determined by used emission mask.

Operating Frequency : 162.000 MHz

Channel : Middle Nominal DC Voltage: 7.2Vdc

MAX POWER SETTING

MASK D CHANNEL SPACING = 12.5 kHz



Limits: Are determined by used emission mask.

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
Function Generator	Agilent	33220A	May. 2005
DC Power Supply	Agilent	6674A	May. 2005

11. Frequency Stability FCC 90.213, FCC2.1055, FCC 22.915(b)

Voltage [%]	Voltage [V]	Temperature [deg C]	Measured Frequency [MHz]	Frequency Error [ppm]
100%	7.2V	-30	161.999943	-0.35
100%	7.2V	-20	161.999965	-0.22
100%	7.2V	-10	161.999981	-0.12
100%	7.2V	0	161.999962	-0.23
100%	7.2V	+10	161.999941	-0.36
100%	7.2V	+20	161.999910	-0.56
100%	7.2V	+30	162.000032	0.20
100%	7.2V	+40	162.000049	0.30
100%	7.2V	+50	162.000067	0.41
100%	7.2V	+60	162.000089	0.55
90%	6.48V	+20	161.999908	-0.57
110%	7.92V	+20	161.999911	0.56

Limits:

Channel spacing [kHz]	Frequency error [ppm]
12.5	2.5
25	5

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	H/P	8565E	Dec. 2005
Frequency Counter	Anritsu	MF2414B	Dec. 2005
Temperature Chamber	Han-Gil Technique	HGTP-4050	Nov. 2005
DC Power Supply	Agilent	6674A	May. 2005

12. Transient Frequency Behaviour of the Transmitter FCC 90.214

Limits:

Time intervals [1,2]	Maximum Frequency Difference[3]	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behaviour for Equipment Designed to Operate on 25 kHz Channel			
t_1[4] ----------	±25.0 kHz	5.0 ms	10.0 ms
t_2 ----------	±12.5 kHz	20.0 ms	25.0 ms
t_3[4] ----------	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channel			
t_1[4] ----------	±12.5 kHz	5.0 ms	10.0 ms
t_2 ----------	±6.25 kHz	20.0 ms	25.0 ms
t_3[4] ----------	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behaviour for Equipment Designed to Operate on 6.25 kHz Channel			
t_1[4] ----------	±6.25 kHz	5.0 ms	10.0 ms
t_2 ----------	±3.125 kHz	20.0 ms	25.0 ms
t_3[4] ----------	±6.25 kHz	5.0 ms	10.0 ms

[1] t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on}.

t_2 is the time period immediately following t_1.

t_3 is the time period from the instant when the transmitter is turned off until t_{off}.

t_{off} is the instant when the 1 kHz test signal starts to rise.

[2] During the time from the end of t_2 to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.

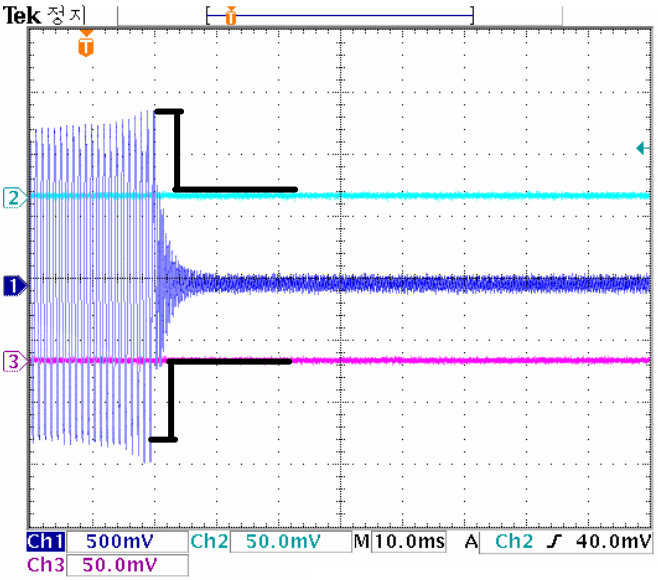
[3] Difference between the actual transmitter frequency and the assigned transmitter frequency .

[4] If the transmitter carrier output power rating is 6watts or less, the frequency difference during this time may exceed the maximum frequency difference for this period.

Plot

Ch 1 Narrow

Switching from OFF to ON (t_1 & t_2)



Channel separation

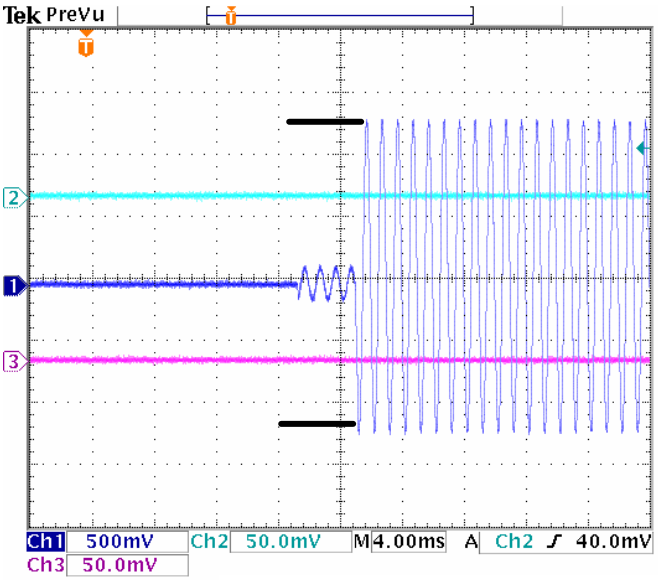
1/2 Channel separation

1/2 Channel separation

Channel separation

t_1 t_2

Switching from ON to OFF (t_3)



Channel separation

1/2 Channel separation

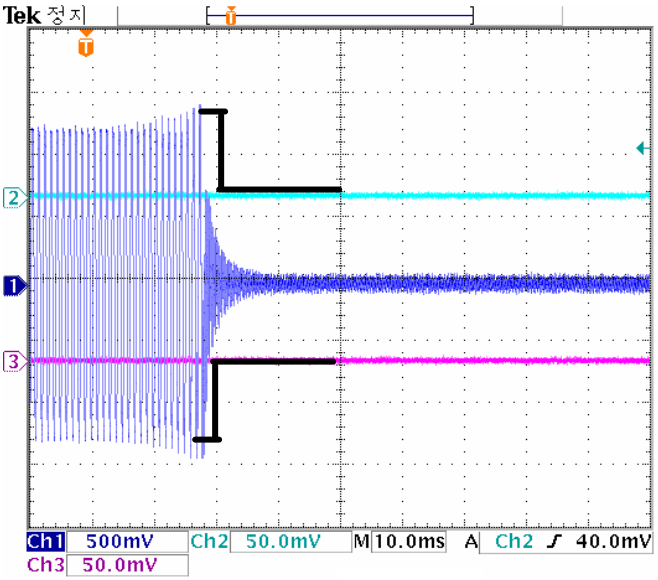
1/2 Channel separation

Channel separation

t_3

Ch 3 Narrow

Switching from OFF to ON (t_1 & t_2)



Channel separation

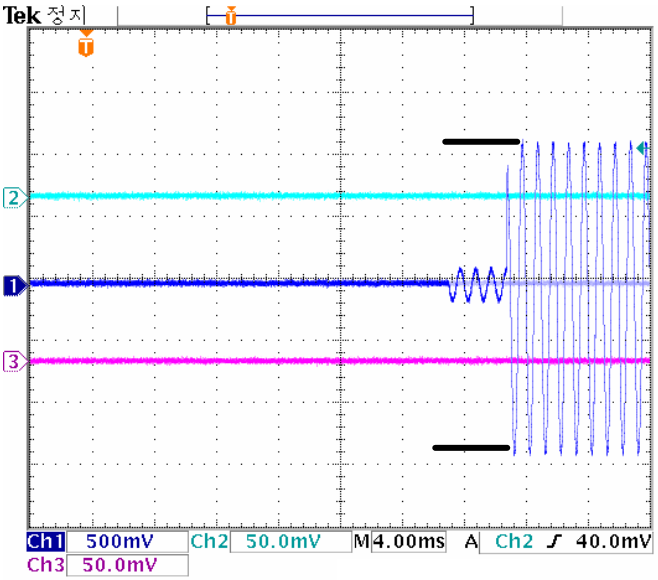
1/2 Channel separation

1/2 Channel separation

Channel separation

t_1 t_2

Switching from ON to OFF (t_3)



Channel separation

1/2 Channel separation

1/2 Channel separation

Channel separation

t_3

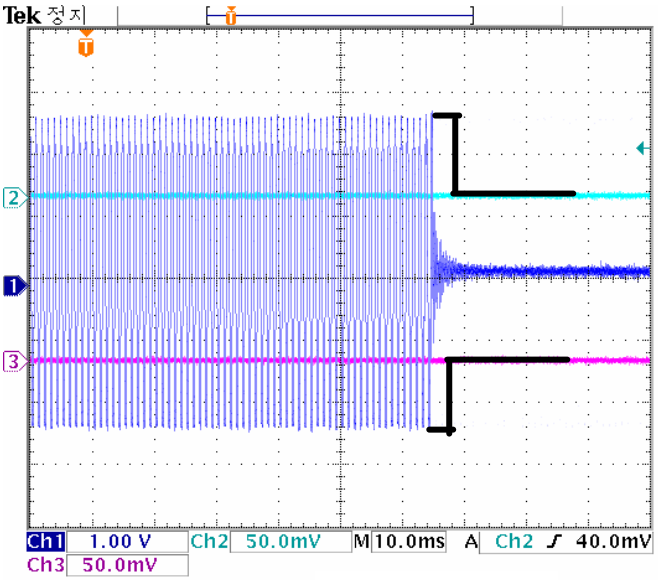
Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Signal Generator	Agilent	E4438C	May. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
DC Power Supply	Agilent	6674A	May. 2005
Digital Phosphor Oscilloscope	Tektronix	TDS3054B	May. 2005

Plot

Ch 1 Wide

Switching from OFF to ON (t_1 & t_2)



Channel separation

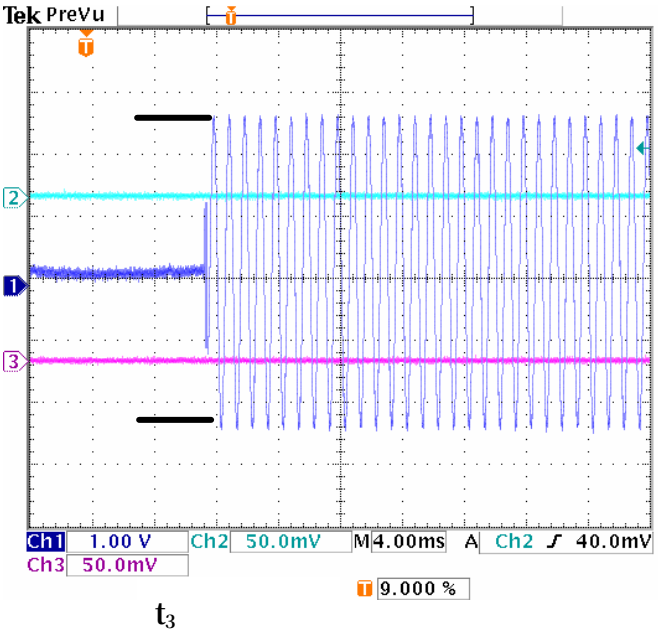
1/2 Channel separation

1/2 Channel separation

Channel separation

t_1 t_2

Switching from ON to OFF (t_3)



Channel separation

1/2 Channel separation

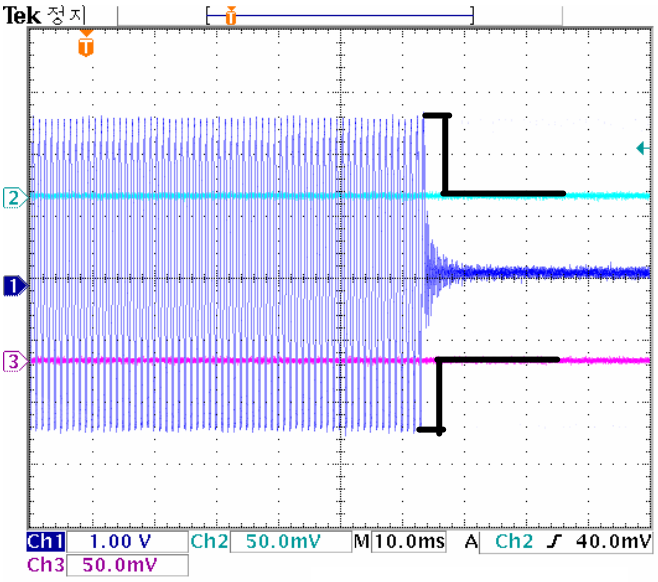
1/2 Channel separation

Channel separation

t_3

Ch 3 Wide

Switching from OFF to ON (t_1 & t_2)



Channel separation

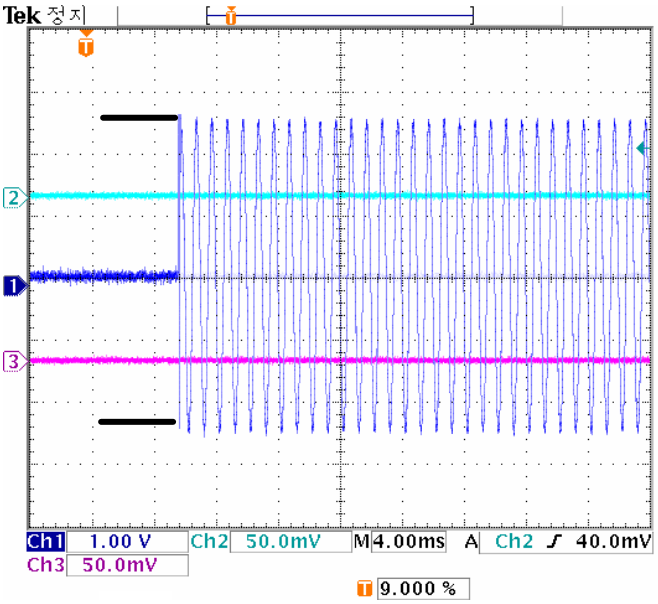
1/2 Channel separation

1/2 Channel separation

Channel separation

t_1 t_2

Switching from ON to OFF (t_3)



Channel separation

1/2 Channel separation

1/2 Channel separation

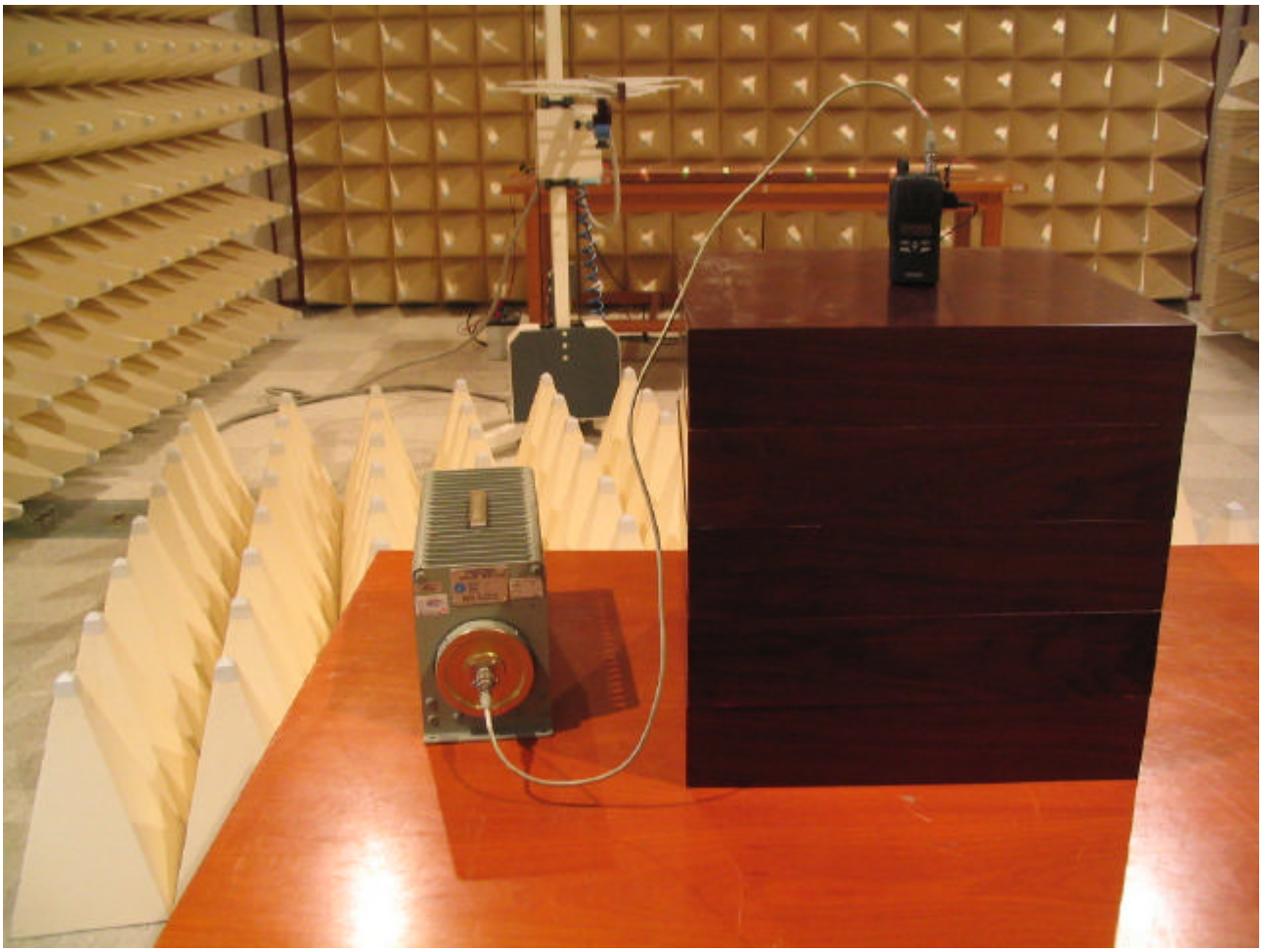
Channel separation

t_3

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Signal Generator	Agilent	E4438C	May. 2005
Modulation Analyzer	H/P	8901B	Dec. 2005
DC Power Supply	Agilent	6674A	May. 2005
Digital Phosphor Oscilloscope	Tektronix	TDS3054B	May. 2005

13. Attachment A – Photos of the test setup



SGS Testing Korea Co., Ltd.
18 - 34, Sanbon - dong, Gunpo - si, Gyeonggi - do, Korea, 435 - 041
Tel. +82 31 428 5700 / Fax. +82 31 427 2371
http://www.sgstesting.co.kr