TEST REPORT

FCC RULES Part 90, Part 2

Equipment Under Test	:	Private Land Mobile Radio for Vehicle(UHF)
Model No.	:	SM5402
Serial No.	:	N/A
Applicant	:	MAXON CIC Corp.
Manufacturer	:	MAXON CIC Corp.
Date of Test(s)	:	2006-04-24 ~ 2006-05-19
Date of Issue	:	2006-05-19

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Testing Korea Co., Ltd. or testing done by SGS Testing Korea Co., Ltd. in connection with distribution or use of the product described in this report must be approved by SGS Testing Korea Co., Ltd. in writing.

VERIFICATION OF COMPLIANCE

Applicant :	MAXON CIC Corp.
Kind of Product :	Private Land Mobile Radio for Vehicle(UHF)
Brand Name :	N/A
Model Name :	SM5402
Model Difference :	N/A
Report File No. :	STROR-06-39
Date of test :	2006-04-24 ~ 2006-05-19
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* 19 May 2006

Feel Jeong

Approved By  *Date* 19 May 2006

Albert Lim

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1. General Description of EUT

Maxon's SM5402 mobile radio are Compatible, Conventional radio system operation.

The SM5402 is capable of up to 208 channels 13 Groups per system in conventional operation.

The operation and functions for the SM5402 Series radios are described in this manual.

SM5402 has a compact size with a various features in range of 440~470 MHz.

SM5402 has a various features shown as below.

- Conventional radio operation, 9 character display with icons
- Wideband frequency separation, Programmable output power
- Programmable 12.5 / 25 kHz channel spacing, Multiple-function five button keypad
- Programmable On / Off hook function, Talk Around
- Scanning, Priority Scanning
- Look Back, Scan list editing
- CTCSS / CDDCS (Conventional operation), Busy channel lockout
- Time-out timer

2. General Information of EUT

Transceiver

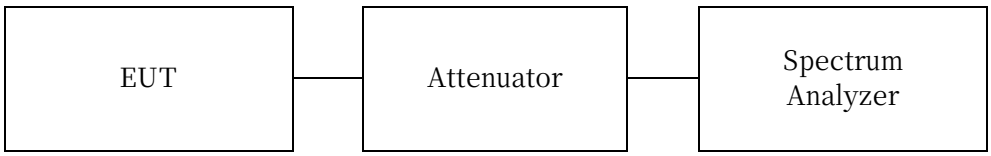
Power Supply	DC 13.8 V
Operating Frequency	440 MHz ~ 470 MHz
Transmit Power	5W(Low), 45 W(High)
Modulation	FM
Channel spacing	12.5 kHz/25 kHz
Emission Type	F3E
Communication method	Simplex
Number of Channels	208
Antenna Type	External

3. Test Procedure

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

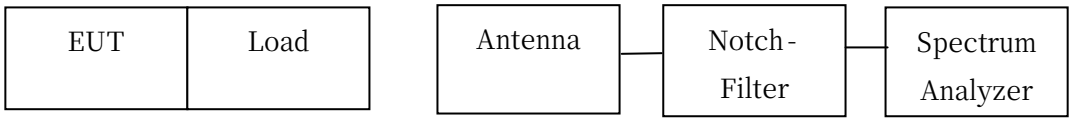
3.1 Output Power Conducted FCC 2.1046(a),FCC 90.205

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.



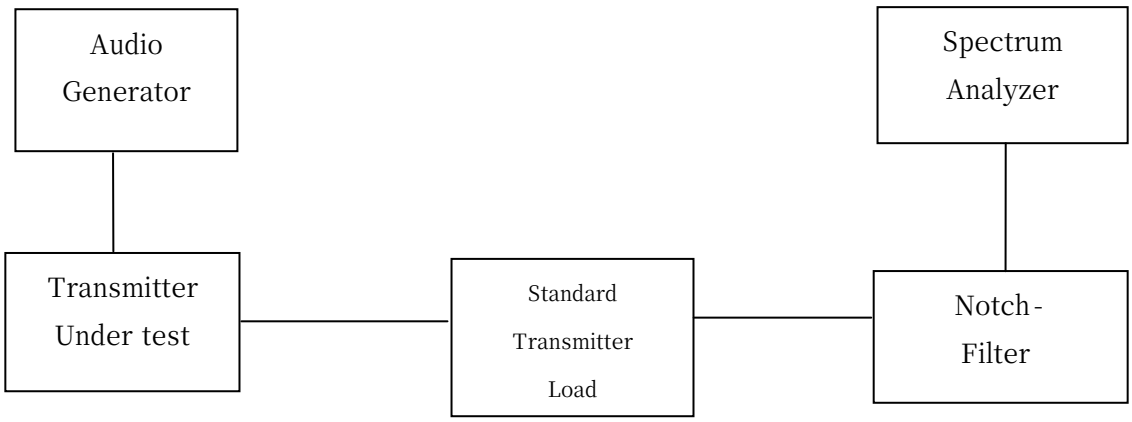
3.2 Radiated Spurious Emissions FCC 2.1053, FCC 90.210

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.

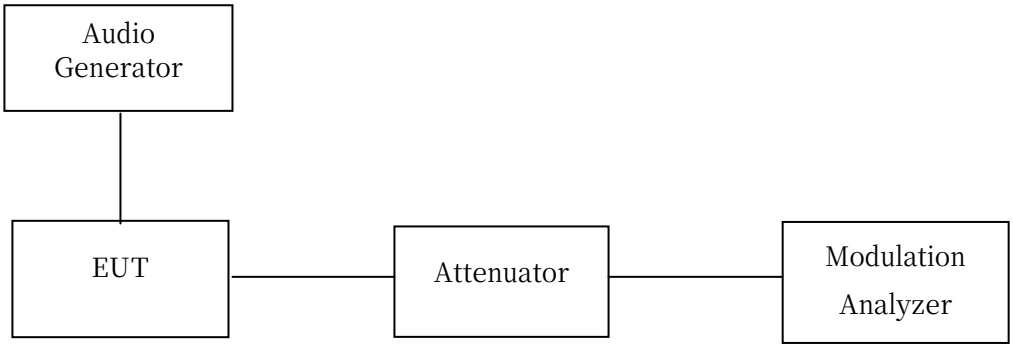
3.4 Audio Frequency Response FCC 2.1047(a)

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:

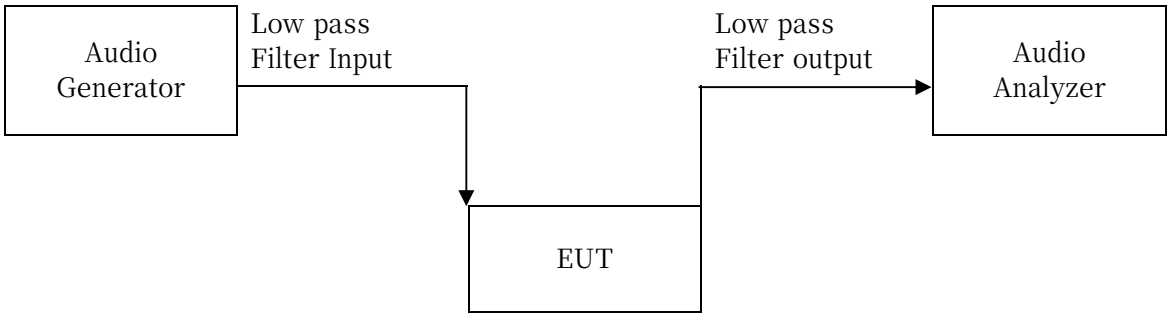
$$\text{Audio Frequency Response} = 20\log[DEV_{Freq} / DEV_{ref}]$$



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 1 kHz(reference point) to 50 kHz with test set-up below.

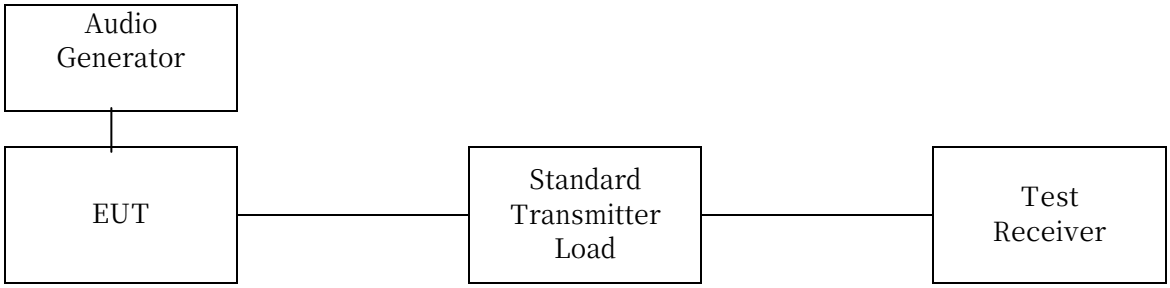


3.6 Modulation Limiting FCC 2.1047(b),22.915(b),90.210

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 –20 dB to 20 dB in nine steps.

Tests are performed 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 2500 Hz tone at an input level 16 dB 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.

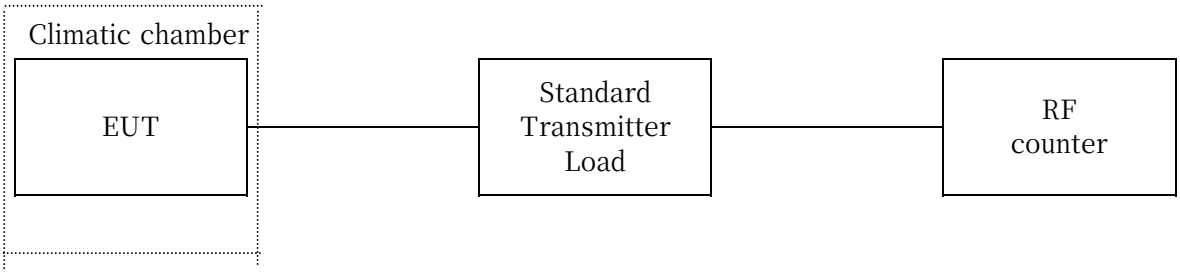
Emission Mask B for transmitters that are equipped with an audio low pass filter.

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 30 dB 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]
5	440.025	12.5	4.58	13.8
	455.025	12.5	4.87	13.8
	469.975	12.5	5.13	13.8
45	440.025	12.5	43.3	13.8
	455.025	12.5	42.7	13.8
	469.975	12.5	42.8	13.8

The supply voltage to the transmitter was set to 13.8 volts DC. The RF output power was measured with the indicated current applied into the final RF amplifying device.

RF Power Output 5 W, Frequency 455.025 MHz

Measured DC Current: 4.74 A

RF Power Output 45 W, Frequency 455.025 MHz

Measured DC Current: 8.53 A

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Signal Generator	Agilent	E4438C	May 2006
Power Meter	Agilent	E4416A	May 2006
Power Sensor	Agilent	E9327A	May 2006
DC Power Supply	Agilent	6674A	May 2006

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

TX FREQ= 440.025 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	H	-33.50	-20	13.5
1320.075	H	-29.27	-20	9.27
1760.100	H	<-40	-20	>20
2200.125	H	<-40	-20	>20
2640.175	H	<-40	-20	>20
3080.175	H	<-40	-20	>20
3520.200	H	<-40	-20	>20
3960.225	H	<-40	-20	>20
4400.025	H	<-40	-20	>20

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Test Receiver	R&S	ESIB 26	Mar. 2007
Signal Generator	R&S	SMR 20	Dec. 2006
Amplifier	H/P	8447F	May 2006
Preamplifer	Agilent	8449B	May 2006
Dipole Antenna	Schwarzbeck Mess	VHAP UHAP	May 2007
Dummy Load	BIRD	8404	Dec. 2006
Horn Antenna	R&S	HF 906	Aug. 2007
Horn Antenna	Electro-Metrics	RGA-60	Apr. 2007
Ultra Broadband Antenna	R&S	HL562	Dec. 2006
Anechoic Chamber	Seo Young EMC	-	-
Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQ = 440.025 MHz High Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	H	-24.36	-20	4.36
1320.075	H	-31.26	-20	11.26
1760.100	H	<-40	-20	>20
2200.125	H	<-40	-20	>20
2640.175	H	<-40	-20	>20
3080.175	H	<-40	-20	>20
3520.200	H	<-40	-20	>20
3960.225	H	<-40	-20	>20
4400.025	H	<-40	-20	>20

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Ultra Broadband Antenna	R&S	HL562	Dec. 2006
Anechoic Chamber	Seo Young EMC	-	-
Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQ = 440.025 MHz Low Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	H	-33.12	-13	20.12
1320.075	H	-29.00	-13	16.00
1760.100	H	<-40	-13	>27
2200.125	H	<-40	-13	>27
2640.175	H	<-40	-13	>27
3080.175	H	<-40	-13	>27
3520.200	H	<-40	-13	>27
3960.225	H	<-40	-13	>27
4400.025	H	<-40	-13	>27

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Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQ = 440.025 MHz High Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	H	-24.01	-13	11.01
1320.075	H	-32.71	-13	19.71
1760.100	H	<-40	-13	>27
2200.125	H	<-40	-13	>27
2640.175	H	<-40	-13	>27
3080.175	H	<-40	-13	>27
3520.200	H	<-40	-13	>27
3960.225	H	<-40	-13	>27
4400.025	H	<-40	-13	>27

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Anechoic Chamber	Seo Young EMC	-	-
Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQE = 455.025 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	H	-35.36	-20	15.36
1365.075	H	-32.18	-20	12.18
1820.100	H	<-40	-20	>20
2275.125	H	<-40	-20	>20
2730.150	H	<-40	-20	>20
3185.175	H	<-40	-20	>20
3640.200	H	<-40	-20	>20
4095.225	H	<-40	-20	>20
4550.025	H	<-40	-20	>20

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TX FREQ = 455.025 MHz High Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	H	-28.55	-20	8.55
1365.075	H	-27.78	-20	7.78
1820.100	H	-35.21	-20	15.21
2275.125	H	<-40	-20	>20
2730.150	H	-39.43	-20	19.43
3185.175	H	<-40	-20	>20
3640.200	H	<-40	-20	>20
4095.225	H	<-40	-20	>20
4550.025	H	<-40	-20	>20

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Horn Antenna	Electro-Metrics	RGA-60	Apr. 2007
Ultra Broadband Antenna	R&S	HL562	Dec. 2006
Anechoic Chamber	Seo Young EMC	-	-
Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQE = 455.025 MHz Low Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	H	-35.12	-13	22.12
1365.075	H	-31.92	-13	>27
1820.100	H	<-40	-13	>27
2275.125	H	<-40	-13	>27
2730.150	H	<-40	-13	>27
3185.175	H	<-40	-13	>27
3640.200	H	<-40	-13	>27
4095.225	H	<-40	-13	>27
4550.025	H	<-40	-13	>27

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TX FREQ = 455.025 MHz High Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	H	-28.71	-13	15.71
1365.075	H	-28.00	-13	15.00
1820.100	H	-34.92	-13	21.92
2275.125	H	<-40	-13	>27
2730.150	H	<-40	-13	>27
3185.175	H	<-40	-13	>27
3640.200	H	<-40	-13	>27
4095.225	H	<-40	-13	>27
4550.025	H	<-40	-13	>27

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Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQ = 469.975 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	H	-28.45	-20	8.45
1409.925	H	<-40	-20	>20
1879.900	H	<-40	-20	>20
2349.875	H	<-40	-20	>20
2819.850	H	<-40	-20	>20
3289.825	H	<-40	-20	>20
3759.800	H	<-40	-20	>20
4229.775	H	<-40	-20	>20
4699.750	H	<-40	-20	>20

Test Equipment Used

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Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

TX FREQ = 469.975 MHz High Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	H	-31.83	-20	11.83
1409.925	H	-31.96	-20	11.96
1879.900	H	<-40	-20	>20
2349.875	H	<-40	-20	>20
2819.850	H	<-40	-20	>20
3289.825	H	<-40	-20	>20
3759.800	H	<-40	-20	>20
4229.775	H	-36.82	-20	16.82
4699.750	H	<-40	-20	>20

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Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	H	-29.01	-13	16.01
1409.925	H	<-40	-13	>27
1879.900	H	<-40	-13	>27
2349.875	H	<-40	-13	>27
2819.850	H	<-40	-13	>27
3289.825	H	<-40	-13	>27
3759.800	H	<-40	-13	>27
4229.775	H	<-40	-13	>27
4699.750	H	<-40	-13	>27

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939.950	H	-32.12	-13	19.12
1409.925	H	-31.54	-13	18.54
1879.900	H	<-40	-13	>27
2349.875	H	<-40	-13	>27
2819.850	H	<-40	-13	>27
3289.825	H	<-40	-13	>27
3759.800	H	<-40	-13	>27
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Dipole Antenna	Schwarzbeck Mess	VHAP UHAP	May 2007
Dummy Load	BIRD	8404	Dec. 2006
Horn Antenna	R&S	HF 906	Aug. 2007
Horn Antenna	Electro-Metrics	RGA-60	Apr. 2007
Ultra Broadband Antenna	R&S	HL562	Dec. 2006
Anechoic Chamber	Seo Young EMC	-	-
Power Supply	Dae Gil Electronic	DGP-300	Jan.2007

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

TX FREQ= 440.025 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	-28.58	-20	8.58
1320.075	-28.16	-20	8.16
1760.100	<-45	-20	>25
2200.125	<-45	-20	>25
2640.175	<-45	-20	>25
3080.175	<-45	-20	>25
3520.200	<-45	-20	>25
3960.225	<-45	-20	>25
4400.025	<-45	-20	>25

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 440.025 MHz High Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	-21.67	-20	1.67
1320.075	-22.92	-20	2.92
1760.100	-32.77	-20	12.77
2200.125	32.49	-20	12.49
2640.175	-40.70	-20	20.70
3080.175	<-45	-20	>25
3520.200	<-45	-20	>25
3960.225	<-45	-20	>25
4400.025	<-45	-20	>25

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 440.025 MHz Low Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	-28.11	-13	15.11
1320.075	-28.00	-13	15.00
1760.100	<-45	-13	>32
2200.125	<-45	-13	>32
2640.175	<-45	-13	>32
3080.175	<-45	-13	>32
3520.200	<-45	-13	>32
3960.225	<-45	-13	>32
4400.025	<-45	-13	>32

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 440.025 MHz High Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
880.050	-26.00	-13	13.00
1320.075	-23.17	-13	10.17
1760.100	-32.07	-13	19.07
2200.125	-31.49	-13	18.49
2640.175	-41.69	-13	28.69
3080.175	<-45	-13	>32
3520.200	<-45	-13	>32
3960.225	<-45	-13	>32
4400.025	<-45	-13	>32

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQE = 455.025 MHz Low Power Setting Channel Spacing 12.5kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	<-45	-20	>25
1365.075	<-45	-20	>25
1820.100	<-45	-20	>25
2275.125	<-45	-20	>25
2730.150	<-45	-20	>25
3185.175	<-45	-20	>25
3640.200	<-45	-20	>25
4095.225	<-45	-20	>25
4550.025	<-45	-20	>25

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 455.025 MHz High Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	-38.65	-20	18.65
1365.075	-40.25	-20	20.25
1820.100	<-45	-20	>25
2275.125	<-45	-20	>25
2730.150	<-45	-20	>25
3185.175	<-45	-20	>25
3640.200	<-45	-20	>25
4095.225	<-45	-20	>25
4550.025	<-45	-20	>25

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQE = 455.025 MHz Low Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	<-45	-13	>32
1365.075	<-45	-13	>32
1820.100	<-45	-13	>32
2275.125	<-45	-13	>32
2730.150	<-45	-13	>32
3185.175	<-45	-13	>32
3640.200	<-45	-13	>32
4095.225	<-45	-13	>32
4550.025	<-45	-13	>32

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 455.025 MHz High Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
910.050	-38.12	-13	25.12
1365.075	41.29	-13	28.29
1820.100	<-45	-13	>32
2275.125	<-45	-13	>32
2730.150	<-45	-13	>32
3185.175	<-45	-13	>32
3640.200	<-45	-13	>32
4095.225	<-45	-13	>32
4550.025	<-45	-13	>32

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 469.975 MHz Low Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	-42.75	-20	22.05
1409.925	<-45	-20	>25
1879.900	<-45	-20	>25
2349.875	<-45	-20	>25
2819.850	<-45	-20	>25
3289.825	<-45	-20	>25
3759.800	<-45	-20	>25
4229.775	<-45	-20	>25
4699.750	<-45	-20	>25

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 469.975 MHz High Power Setting Channel Spacing 12.5 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	-25.46	-20	5.46
1409.925	-34.07	-20	14.07
1879.900	-28.80	-20	8.80
2349.875	-41.67	-20	21.67
2819.850	-27.28	-20	7.28
3289.825	-33.00	-20	13.00
3759.800	<-45	-20	>25
4229.775	<-45	-20	>25
4699.750	<-45	-20	>25

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 469.975 MHz Low Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	-41.92	-13	28.92
1409.925	<-45	-13	>32
1879.900	<-45	-13	>32
2349.875	<-45	-13	>32
2819.850	<-45	-13	>32
3289.825	<-45	-13	>32
3759.800	<-45	-13	>32
4229.775	<-45	-13	>32
4699.750	<-45	-13	>32

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

TX FREQ = 469.975 MHz High Power Setting Channel Spacing 25 kHz

Frequency [MHz]	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
939.950	-25.00	-13	12.00
1409.925	-33.71	-13	20.71
1879.900	-27.49	-13	14.49
2349.875	-41.02	-13	28.02
2819.850	-28.62	-13	15.62
3289.825	-34.97	-13	21.97
3759.800	<-45	-13	>32
4229.775	<-45	-13	>32
4699.750	<-45	-13	>32

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
DC Power Supply	Agilent	6674A	May 2006

7.Audio Frequency Response FCC 2.1.047(a)

Operating Frequency : 455.025 MHz
Channel : Middle
Nominal DC Voltage: 13.8 Vdc

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	0.097	-14.24	0.111	-19.09
200	0.094	-14.52	0.112	-19.02
300	0.175	-9.12	0.295	-10.60
400	0.244	-6.23	0.380	-8.40
500	0.276	-5.16	0.469	-6.58
600	0.331	-3.58	0.631	-3.99
700	0.392	-2.11	0.724	-2.81
800	0.427	-1.37	0.811	-1.82
900	0.488	-0.21	0.908	-0.84
1000	0.500	0	1.000	0
2000	0.826	4.36	1.787	5.04
2500	0.971	5.76	2.130	6.56
3000	0.803	4.11	2.317	7.30
4000	0.097	-14.19	0.100	-20.00
5000	0.087	-15.19	0.104	-19.66

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Modulation Analyzer	H/P	8901B	Dec. 2006
Audio Analyzer	H/P	8903B	Dec. 2006
DC Power Supply	Agilent	6674A	May 2006

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

Operating Frequency : 455.025 MHz
Channel : Middle
Nominal DC Voltage: 13.8 Vdc

Audio frequency [kHz]	Channel spacing 12.5 kHz	Channel spacing 25 kHz
	Response [dB]	Response [dB]
1	0	0
2	2.98	3.13
3	-0.10	-0.30
4	-39.65	-48.76
5	-52.84	<-60
6	-54.16	<-60
7	<-60	<-60
8	<-60	<-60
9	<-60	<-60
10	<-60	<-60
20	<-60	<-60
30	<-60	<-60
50	<-60	<-60

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Modulation Analyzer	H/P	8901B	Dec. 2006
Audio Analyzer	H/P	8903B	Dec. 2006
Spectrum Analyzer	Agilent	E4440A	May 2006
DC Power Supply	Agilent	6674A	May 2006

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

Operating Frequency : 445.025 MHz

Channel : Middle

Nominal DC Voltage: 13.8 Vdc

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	0.10	0.21	0.30	0.10	0.21	0.29
-15	0.12	0.32	0.47	0.12	0.31	0.46
-10	0.17	0.51	0.76	0.16	0.51	0.78
-5	0.26	0.86	1.25	0.26	0.86	1.24
0	0.39	1.52	1.41	0.37	1.51	1.41
5	0.63	1.94	1.38	0.62	1.95	1.39
10	1.09	2.08	1.44	1.07	2.11	1.49
15	1.67	2.11	1.48	1.70	2.20	1.48
20	1.84	2.14	1.48	1.91	2.20	1.41

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	0.14	0.37	0.81	0.13	0.37	0.76
-15	0.20	0.62	1.42	0.18	0.58	1.33
-10	0.30	1.03	2.39	0.26	0.98	2.34
-5	0.47	1.78	2.87	0.42	1.70	2.98
0	0.77	3.00	2.94	0.69	3.06	3.02
5	1.43	3.41	3.13	1.21	3.52	3.12
10	2.23	3.72	3.11	2.10	3.92	3.24
15	2.92	3.76	3.00	3.04	3.98	3.20
20	3.24	3.76	3.06	3.42	3.99	3.24

Limits:

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

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Modulation Analyzer	H/P	8901B	Dec. 2006
Audio Analyzer	H/P	8903B	Dec. 2006
DC Power Supply	Agilent	6674A	May 2006

10.Occupied Bandwidth FCC 2.1049, FCC 90.210

High power mode

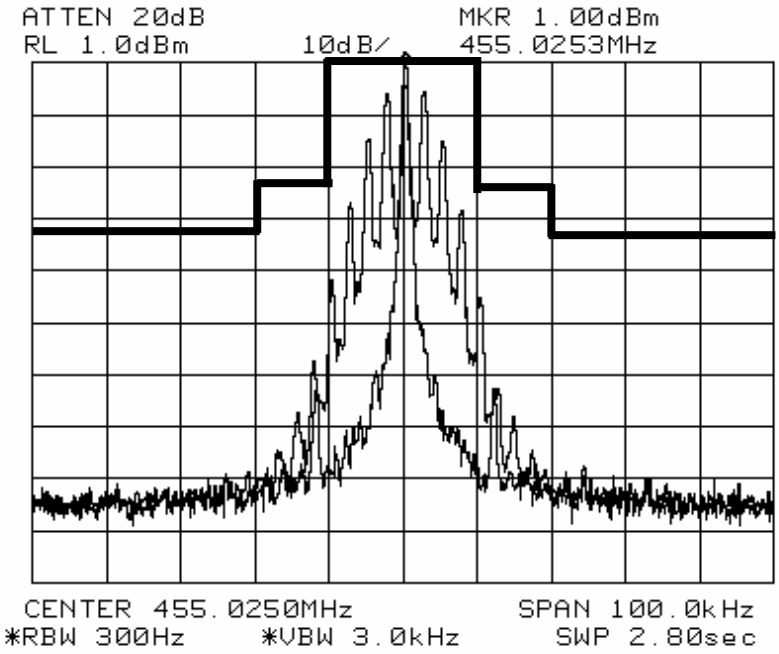
Frequency Channel	Occupied Bandwidth Mask D Channel spacing 12.5 kHz	Occupied Bandwidth Mask B Channel spacing 25 kHz
Middle	Pass	Pass

Operating Frequency : 455.025 MHz

Channel : Middle Nominal DC Voltage: 13.8 Vdc

MAX POWER SETTING

MASK B CHANNEL SPACING = 25 kHz



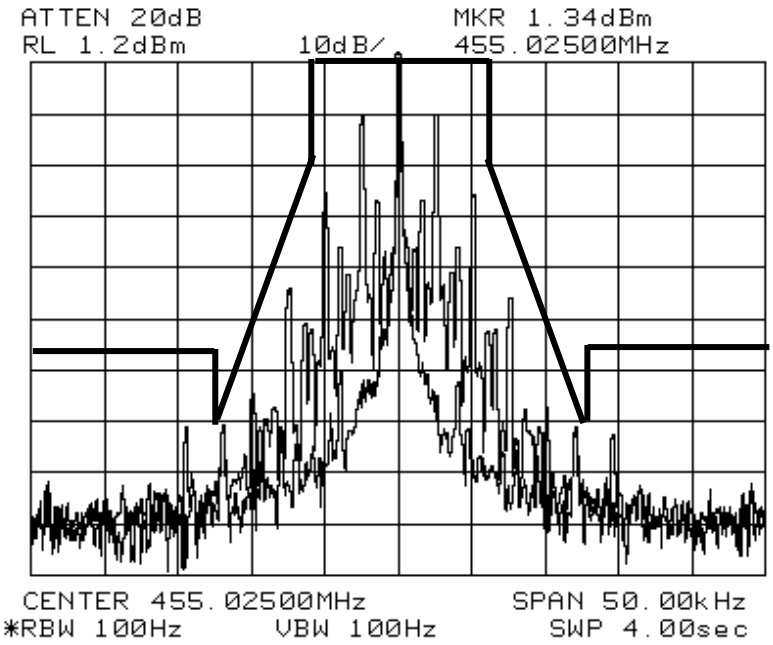
Limits: Are determined by used emission mask.

Operating Frequency : 455.025 MHz

Channel : Middle Nominal DC Voltage: 13.8 Vdc

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.
Modulation Analyzer	H/P	8901B	Dec. 2006
Audio Analyzer	H/P	8903B	Dec. 2006
DC Power Supply	Agilent	6674A	May 2006
Spectrum Analyzer	H/P	8565E	Dec. 2006

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%	13.8	-30	455025112	0.25
100%	13.8	-20	455025104	0.23
100%	13.8	-10	455025097	0.21
100%	13.8	0	455025081	0.18
100%	13.8	+10	455025071	0.16
100%	13.8	+20	455025051	0.11
100%	13.8	+30	455025040	0.09
100%	13.8	+40	455025031	0.07
100%	13.8	+50	455025011	0.02
100%	13.8	+60	455024922	-0.17
90%	11.73	+20	455024951	-0.11
110%	15.87	+20	455024949	-0.11

Limits:

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

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Frequency Counter	Anritsu	MF2414B	Dec. 2006
Temperature Chamber	Han-Gil Technique	HGTP-4050	Oct. 2007
DC Power Supply	Agilent	6674A	May 2006

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 1kHz 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.

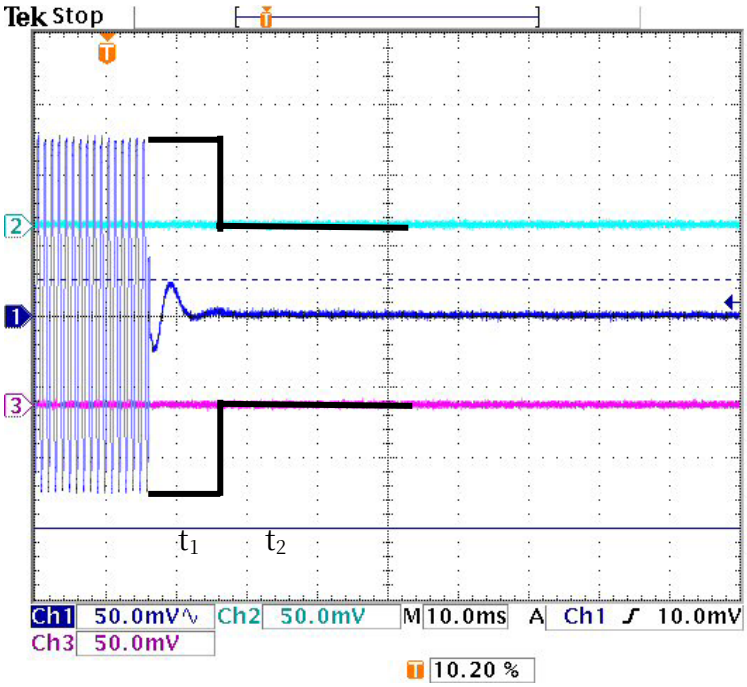
[3] Difference between the actual transmitter frequency and the assigned transmitter frequency .

[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)



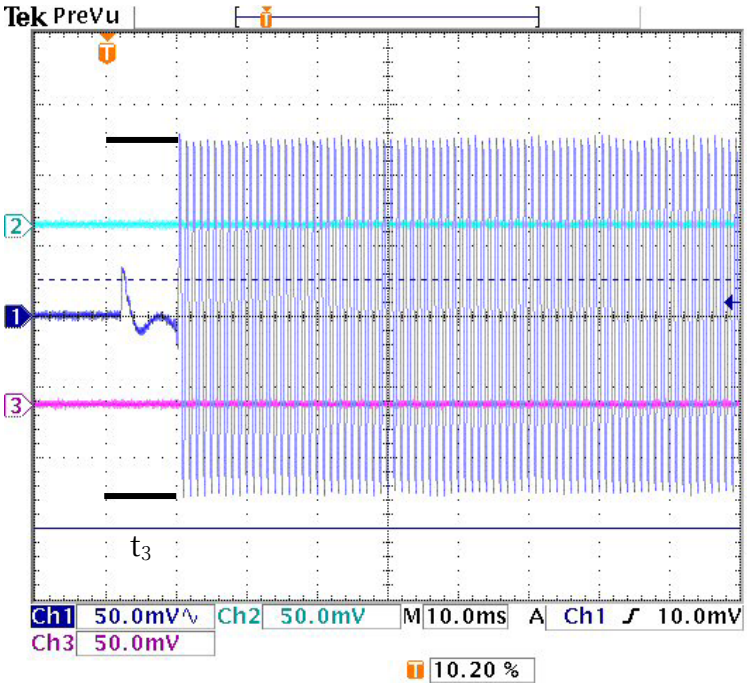
Channel separation

1/2 Channel separation

1/2 Channel separation

Channel separation

Switching from ON to OFF (t_3)



Channel separation

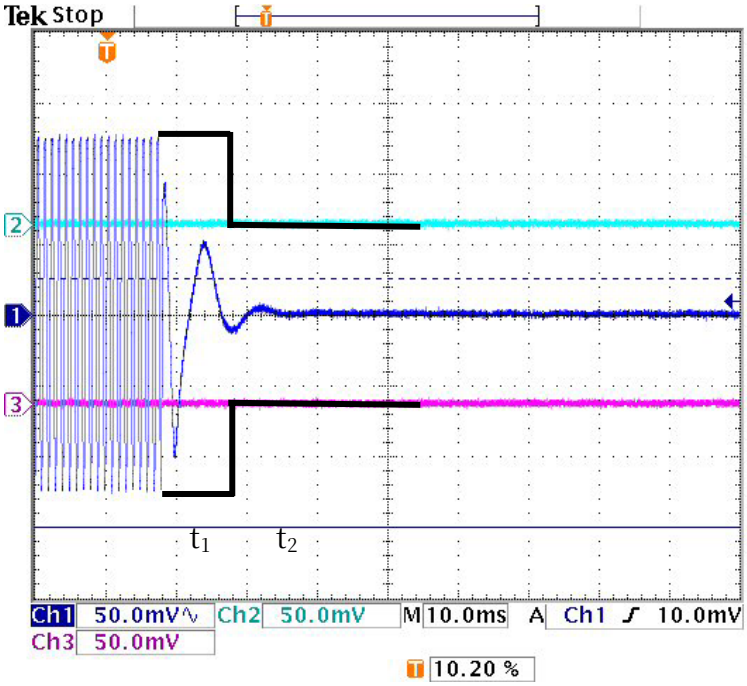
1/2 Channel separation

1/2 Channel separation

Channel separation

Ch 3 Narrow

Switching from OFF to ON (t_1 & t_2)



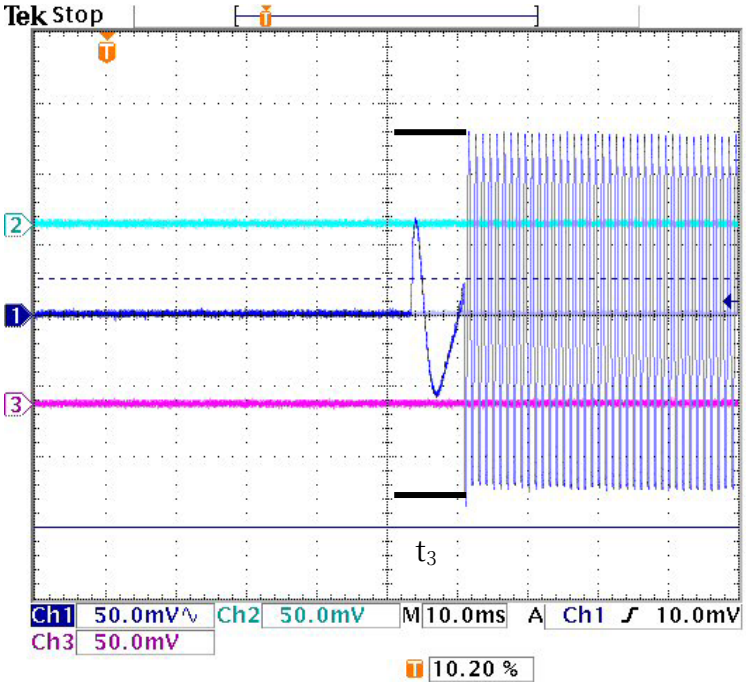
Channel separation

1/2 Channel separation

1/2 Channel separation

Channel separation

Switching from ON to OFF (t_3)



Channel separation

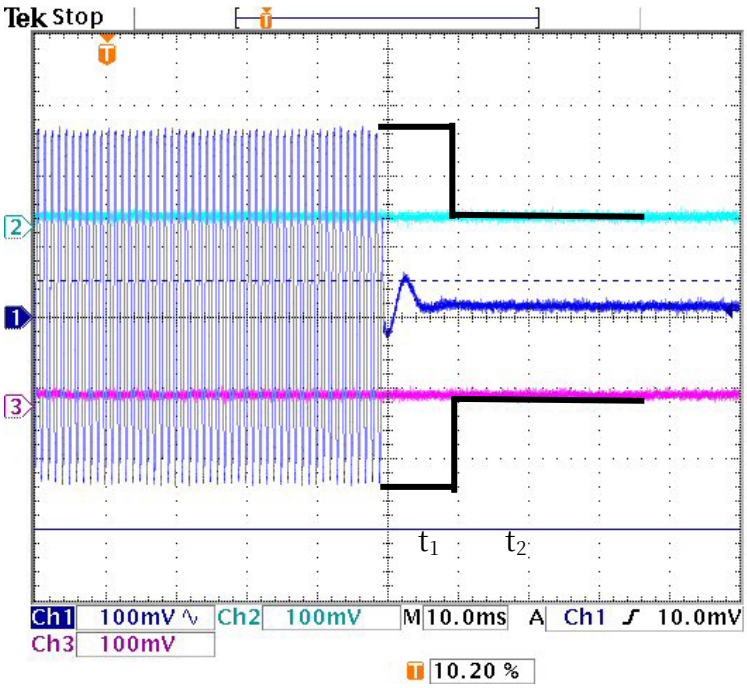
1/2 Channel separation

1/2 Channel separation

Channel separation

Ch 1 Wide

Switching from OFF to ON (t_1 & t_2)



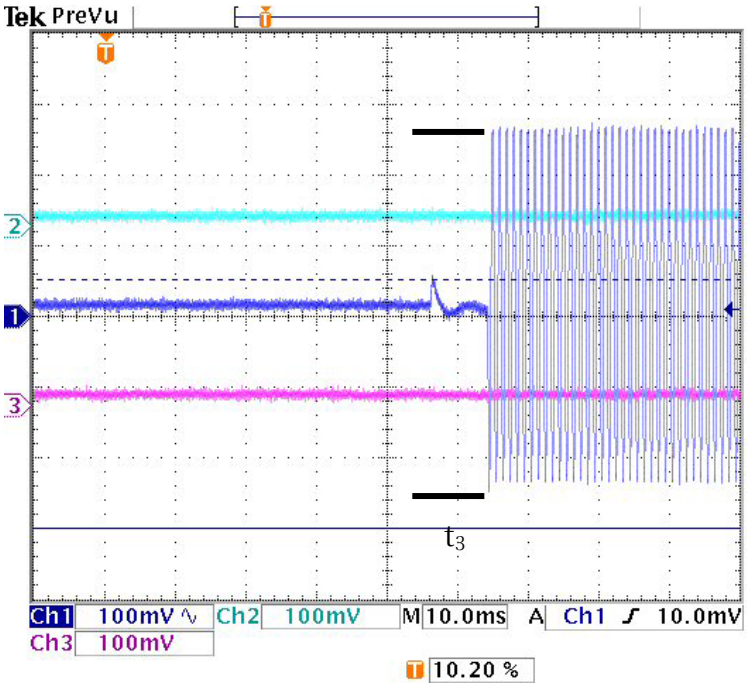
Channel separation

1/2 Channel separation

1/2 Channel separation

Channel separation

Switching from ON to OFF (t_3)



Channel separation

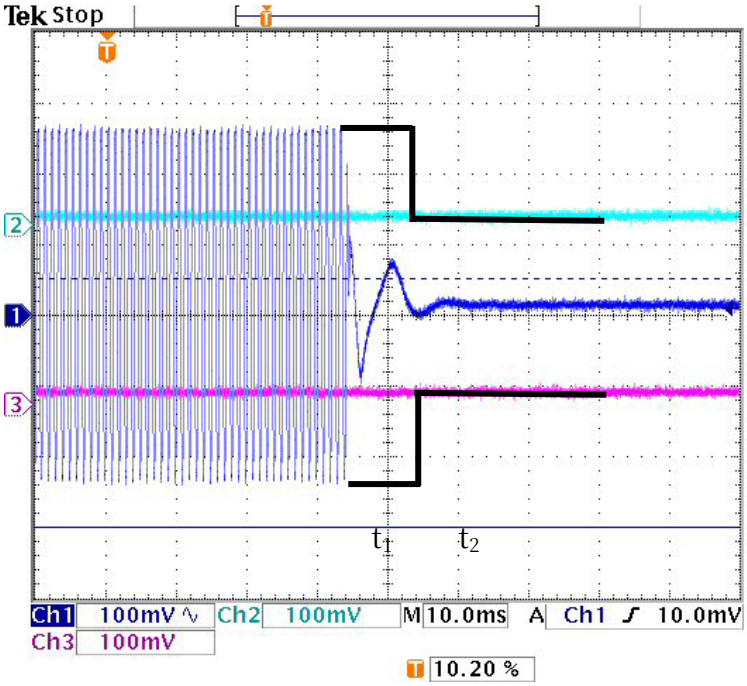
1/2 Channel separation

1/2 Channel separation

Channel separation

Ch 3 Wide

Switching from OFF to ON (t_1 & t_2)



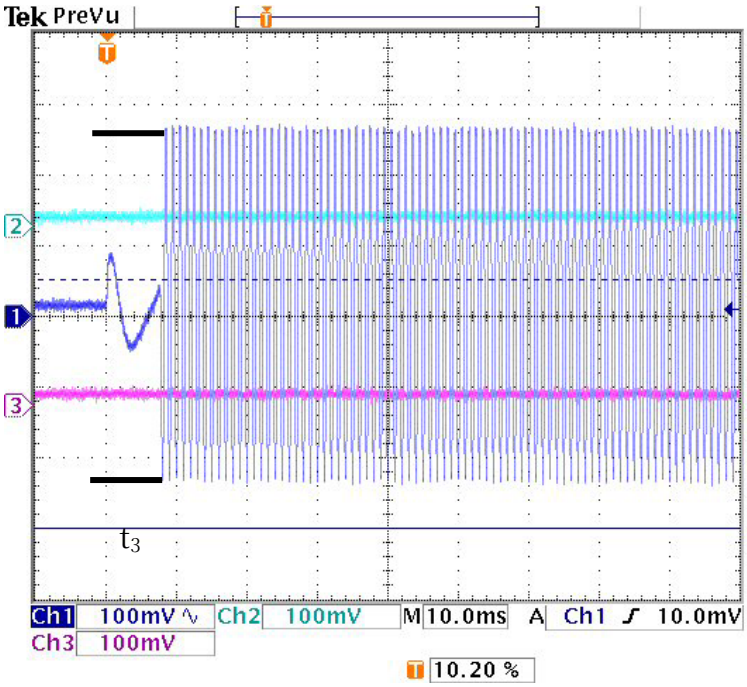
Channel separation

1/2 Channel separation

1/2 Channel separation

Channel separation

Switching from ON to OFF (t_3)



Channel separation

1/2 Channel separation

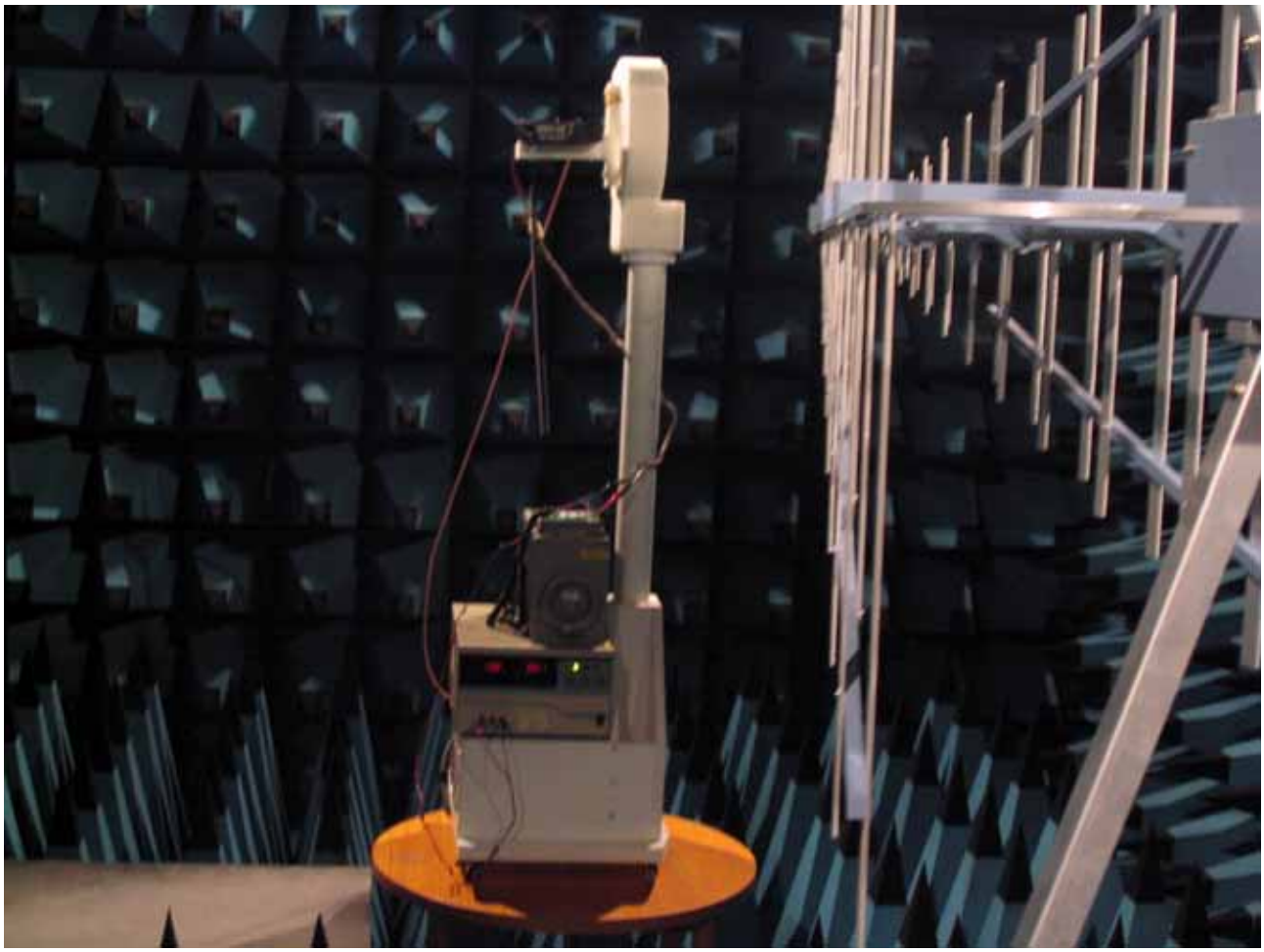
1/2 Channel separation

Channel separation

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Signal Generator	Agilent	E4438C	May 2006
Modulation Analyzer	H/P	8901B	Dec.2006
DC Power Supply	Agilent	6674A	May 2006
Digital Phosphor Oscilloscope	Tektronix	TDS3054B	May 2006

13.Attachment A-Photo of the Test Setup



14.Attachment B-Photo of the EUT

● **Front View of EUT**

● **Rear View of EUT**

● **Left View of EUT**

● **Right View of EUT**

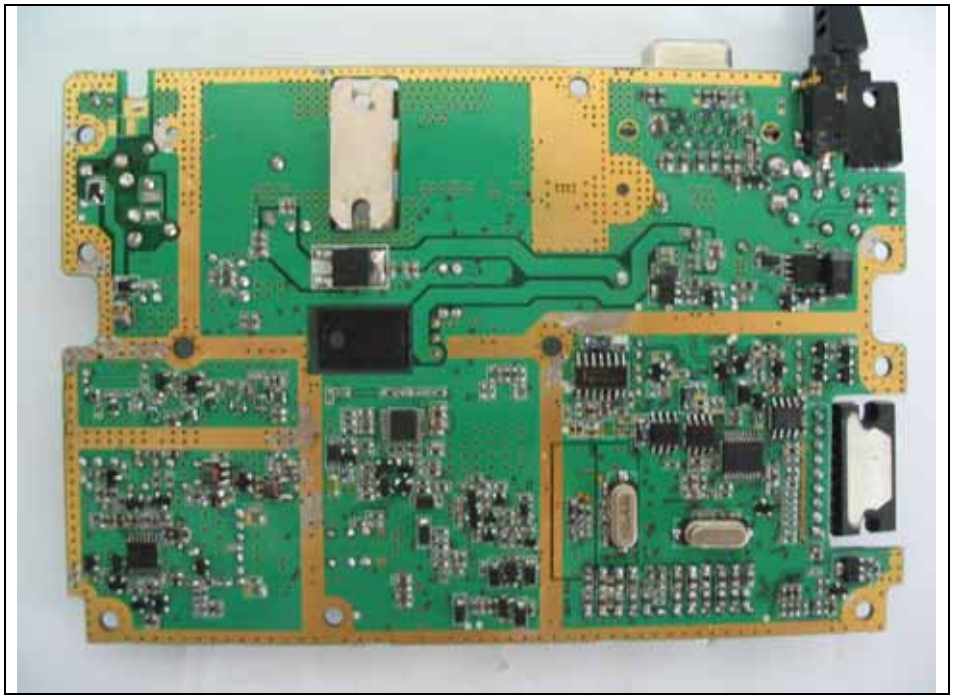
● **Top View of EUT**

● **Bottom View of EUT**

● **Inner View of EUT**

● **Top of Main-board**

● **Bottom of Main-board**



● **Top of Keyboard**

● **Bottom of Keyboard**