Test Report

Product Name : Car Alarm Transmitter
Model No. : TC-4100
FCC ID : JKD4100

Applicant : Huge Technology Co., LTD.
Address : 6F-8., No. 20, Lane 609, Chung-Hsin Rd.,
Sec.5, San-Chung City, Taipei, Taiwan.

Date of Receipt : Sep. 09, 2003
Date of Test : Sep. 17, 2003
Report No. : 039L510FI

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Test Date : Sep. 17, 2003
Report No. : 039L510FI

QuieTek Corporation
Accredited by NIST (NVLAP)
NVLAP Lab Code: 200347-0

Product Name	:	Car Alarm Transmitter
Applicant	:	Huge Technology Co., LTD.
Address	:	6F-8., No. 20, Lane 609, Chung-Hsin Rd., Sec.5, San-Chung City, Taipei, Taiwan.
Manufacturer	:	Huge Technology Co., LTD. Ningbo Poly Technology Co., Ltd.
Model No.	:	TC-4100
FCC ID.	:	JKD4100
Rated Voltage	:	DC 12V
Trade Name	:	TOPE
Measurement Standard	:	FCC Part 15 Subpart C Paragraph 15.231
Measurement Procedure	:	ANSI C63.4:1992
Test Result	:	Complied

The Test Results relate only to the samples tested.
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Documented By : Anita Chou
(Anita Chou)

Tested By : Tom Hsieh
(Tom Hsieh)

Approved By : Gene Chang
(Gene Chang)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	: Car Alarm Transmitter
Trade Name	: TOPE
FCC ID.	: JKD4100
Model No.	: TC-4100
Type of Modulation	: GFSK
Antenna type	: Printed
Operating Frequency	: 303.5~330 MHz
Reset Cable	: Non-Shielded, 1.0m
10 Pin Cable	: Non-Shielded, 1.8m
Led Cable	: Non-Shielded, 1.5m
6 Pin Cable	: Non-Shielded, 1.5m
FUSE Cable	: Non-Shielded, 1.5m
Transmitter	: *2
Receiver	: *1
Shock Sensor	: *1
Siren	: *1
Losens	: *1
Fuse	: *1

Note:

1. This device is a Car Alarm Transmitter, a 303.5~330MHz transmitting function.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.231.
3. This device is a composite device in accordance with part 15 regulations. The function for the receiver was measured and made a test report that the report number is 039L510F, certified under Declaration of Conformity.
4. QuieTek had verified the construction and function in typical operation, Then shown in this test report.

1.2. Operation Description

The EUT is a 303.5~330MHz transmitter. The radio remote control signal can be transferred to 308.9~309.3MHz radio frequency in GFSK modulation. The transmission antenna is printed on the EUT.

The radio remote control signal can be control the car alarm system.

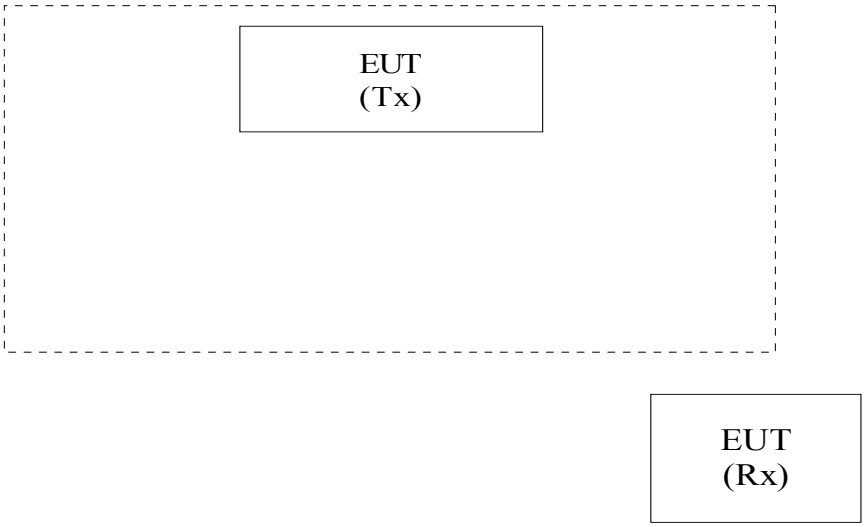
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
(1)	Battery	TRANE	12B50PE	N/A	N/A

Signal Cable Type		Signal cable Description
A.	DC Power Cable	Non-shielded, 1.8m
B.	DC Power Cable	Non-shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1.5.1 Setup the EUT and simulators as shown on 1.4.

1.5.2 Turn on the power of all equipment.

1.5.3 The EUT will transmission the signal form transmitter.

1.5.4 Repeat the above procedure 1.5.2 to 1.5.3

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: June 22, 2001 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

June 30, 2002 Accreditation on NVLAP
NVLAP Lab Code: 200533-0

0914
ILAC MRA

Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,

Lin Kou Shiang, Taipei 244 Taiwan, R.O.C.

TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789

E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0

2. Conducted Emission

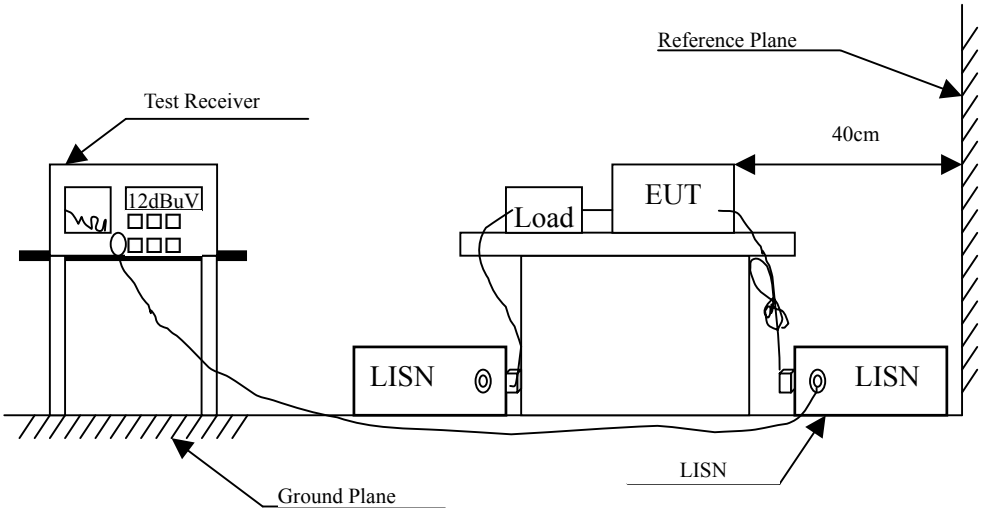
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal..	Remark
1	Test Receiver	R & S	ESCS 30/838251/0001	May, 2003	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2003	EUT
3	L.I.S.N.	R & S	ENV 4200/833209/0023	May, 2003	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2003	
5	No.4 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4:1992 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Result of Conducted Emission

Product : Car Alarm Transmitter
Test Item : Conducted Emission

Owing to the DC operation of EUT, this test item is not performed.

3. Radiated Emission

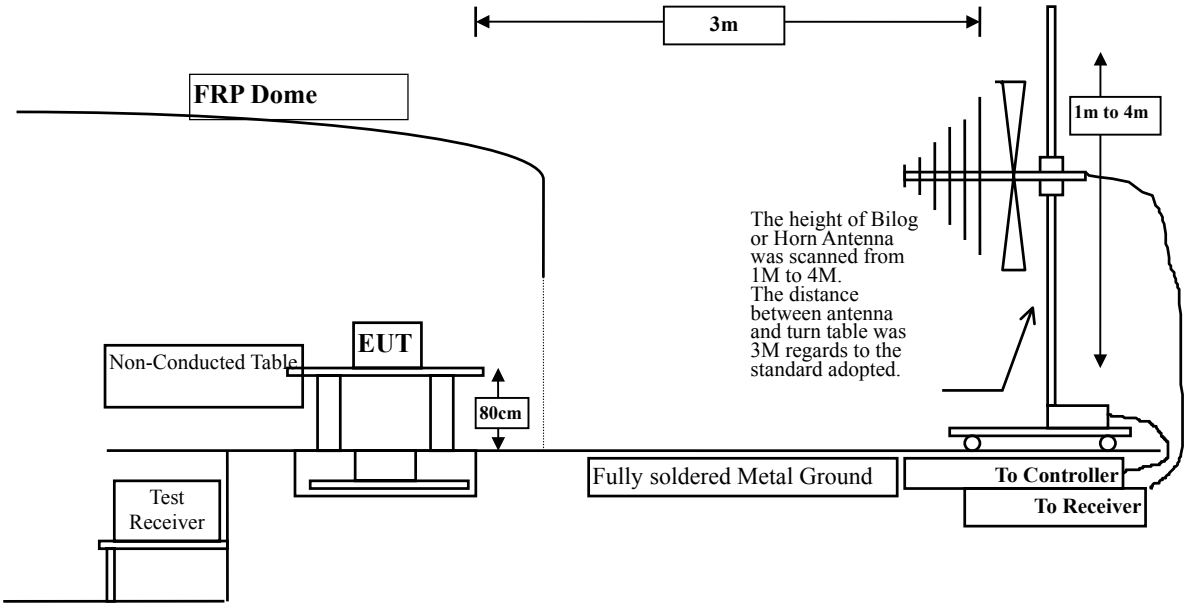
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2003
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2003
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2003
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2002
☐Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2002
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2003
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2003
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2002
	Horn Antenna	ETS	3115 / 0005-6160	July, 2003
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	July, 2003
☒Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2003
	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2003
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2003
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2003
	Horn Antenna	ETS	3115 / 0005-6160	July, 2003
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2003

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup



3.3. Limits

➢ FCC Part 15 Subpart C Paragraph 15.231 Limit

FCC Part 15 Subpart C Paragraph 15.231 Limits				
Fundamental Frequency	Field strength of fundamental		Field Strength of spurious emissions	
MHz	uV/m	dBuV/m	uV/m	dBuV/m
40.66-40.70	2250	67.0	225	47.0
70-130	1250	61.9	125	41.9
130-174	1250-3750[1]	61.9 – 71.5	125-375[1]	41.9 – 51.5
174-260	3750	71.5	375	51.5
260-470	3750-12500[1]	71.5 – 81.9	375-1250[1]	51.5 – 61.9
above 470	12500	82.0	1250	62.0

Remarks : 1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➢ Frequencies in restricted band are complied to limits on Paragraph15.209.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency (MHz)	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks : 1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:1992 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

3.5. Test Result of Radiated Emission

Product : Car Alarm Transmitter
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal							
Peak Detector:							
308.990	2.31	12.15	0.00	51.59	66.05	15.25	75.255
309.050	2.31	12.15	0.00	50.95	65.41	15.89	75.278
309.100	2.31	12.15	0.00	55.55	70.01	11.29	75.263
309.300	2.31	12.15	0.00	54.04	68.50	12.80	75.275

Peak=66.05dBuV/m; Duty Cycle=20Log(0.837)
Average=Peak+Duty Cycle=64.505dBuV/m
Average Limit=41.6667*(308.990MHz)-7083.3333=5791.260uV/m=75.255dBuV/m
Peak Limit=75.255+20dB=95.255dBuV/m

Peak=65.41dBuV/m; Duty Cycle=20Log(0.885)
Average=Peak+Duty Cycle=64.349dBuV/m
Average Limit=41.6667*(309.05MHz)-7083.3333=5806.219uV/m=75.278dBuV/m
Peak Limit=75.278+20dB=95.278dBuV/m

Peak=70.01dBuV/m; Duty Cycle=20Log(0.942)
Average=Peak+Duty Cycle=69.489dBuV/m
Average Limit=41.6667*(309.10MHz)-7083.3333=5795.844uV/m=75.262dBuV/m
Peak Limit=75.262+20dB=95.262dBuV/m

Peak=68.5dBuV/m; Duty Cycle=20Log(0.837)
Average=Peak+Duty Cycle=66.953dBuV/m
Average Limit=41.6667*(309.30MHz)-7083.3333=5804.177uV/m=75.275dBuV/m
Peak Limit=75.275+20dB=95.275dBuV/m

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Car Alarm Transmitter
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Vertical							
Peak Detector:							
308.900	2.31	12.17	0.00	42.92	57.40	23.90	75.250
309.000	2.31	12.17	0.00	43.02	57.50	23.80	75.256
309.050	2.31	12.17	0.00	33.82	48.30	33.00	75.259
309.100	2.31	12.17	0.00	45.69	60.17	21.13	75.262

Peak=57.40dBuV/m; Duty Cycle=20Log(0.837)
Average=Peak+Duty Cycle=55.855dBuV/m
Average Limit=41.6667*(308.900MHz)-7083.3333=5787.510uV/m=75.250dBuV/m
Peak Limit=75.250+20dB=95.250dBuV/m

Peak=57.50dBuV/m; Duty Cycle=20Log(0.885)
Average=Peak+Duty Cycle=56.439dBuV/m
Average Limit=41.6667*(309.000MHz)-7083.3333=5791.677uV/m=75.256dBuV/m
Peak Limit=75.256+20dB=95.256dBuV/m

Peak=48.30dBuV/m; Duty Cycle=20Log(0.942)
Average=Peak+Duty Cycle=47.779dBuV/m
Average Limit=41.6667*(309.050MHz)-7083.3333=5793.760uV/m=75.259dBuV/m
Peak Limit=75.259+20dB=95.259dBuV/m

Peak=60.17dBuV/m; Duty Cycle=20Log(0.837)
Average=Peak+Duty Cycle=58.623dBuV/m
Average Limit=41.6667*(309.100MHz)-7083.3333=5795.844uV/m=75.262dBuV/m
Peak Limit=75.262+20dB=95.262dBuV/m

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botten1)

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal							
Peak Detector:							
1240.480	2.82	24.87	0.00	15.92	43.61	30.39	74.00
1551.390	3.14	25.74	0.00	17.50	46.39	27.61	74.00
1862.300	3.40	27.30	0.00	18.44	49.14	24.86	74.00
2171.210	3.76	28.21	0.00	18.25	50.22	23.78	74.00
2480.120	4.11	28.76	0.00	18.16	51.03	22.97	74.00
2789.030	4.29	29.78	0.00	18.29	52.36	21.64	74.00
3095.940	4.67	30.74	0.00	17.23	52.64	21.36	74.00
Average Detector:							
--							
Vertical							
Peak Detector:							
1242.480	2.82	24.87	0.00	20.93	48.62	25.38	74.00
1551.390	3.14	25.74	0.00	20.98	49.87	24.13	74.00
1860.300	3.40	27.30	0.00	19.75	50.45	23.55	74.00
2169.210	3.76	28.21	0.00	19.88	51.85	22.15	74.00
2478.130	4.11	28.76	0.00	19.09	51.96	22.04	74.00
2787.030	4.29	29.78	0.00	17.88	51.95	22.05	74.00
3095.950	4.67	30.74	0.00	16.87	52.28	21.72	74.00
Average Detector:							
--							

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton2)

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal							
Peak Detector:							
1246.890	2.82	24.87	0.00	14.56	42.25	31.75	74.00
1551.380	3.14	25.74	0.00	14.26	43.15	30.85	74.00
1860.300	3.40	27.30	0.00	14.53	45.23	28.77	74.00
2173.620	3.77	28.21	0.00	14.41	46.39	27.61	74.00
2482.530	4.11	28.76	0.00	15.28	48.15	25.85	74.00
2791.440	4.29	29.78	0.00	15.31	49.38	24.62	74.00
3100.300	4.67	30.79	0.00	15.80	51.26	22.74	74.00
Average Detector:							
--							
Vertical							
Peak Detector:							
1246.880	2.82	24.87	0.00	14.62	42.31	31.69	74.00
1555.800	3.15	25.83	0.00	14.55	43.52	30.48	74.00
1864.710	3.41	27.30	0.00	15.68	46.38	27.62	74.00
2173.620	3.77	28.21	0.00	16.26	48.24	25.76	74.00
2482.540	4.11	28.76	0.00	16.27	49.14	24.86	74.00
2791.450	4.29	29.78	0.00	16.32	50.39	23.61	74.00
3100.340	4.67	30.79	0.00	16.39	51.85	22.15	74.00
Average Detector:							
--							

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton3)

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal							
Peak Detector:							
1238.070	2.81	24.87	0.00	14.68	42.36	31.64	74.00
1551.390	3.14	25.74	0.00	14.73	43.62	30.38	74.00
1860.300	3.40	27.30	0.00	14.44	45.14	28.86	74.00
2169.200	3.76	28.21	0.00	14.41	46.38	27.62	74.00
2478.120	4.11	28.76	0.00	14.82	47.69	26.31	74.00
2787.030	4.29	29.78	0.00	15.51	49.58	24.42	74.00
3095.940	4.67	30.74	0.00	15.87	51.28	22.72	74.00
Average Detector:							
- -							
Vertical							
Peak Detector:							
1242.400	2.82	24.87	0.00	20.87	48.56	25.44	74.00
1551.390	3.14	25.74	0.00	20.25	49.14	24.86	74.00
1860.300	3.40	27.30	0.00	19.60	50.30	23.70	74.00
2169.230	3.76	28.21	0.00	19.27	51.24	22.76	74.00
2478.130	4.11	28.76	0.00	18.88	51.75	22.25	74.00
2787.090	4.29	29.78	0.00	17.94	52.01	21.99	74.00
3095.940	4.67	30.74	0.00	16.95	52.36	21.64	74.00
Average Detector:							
- -							

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton4)

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal							
Peak Detector:							
1238.070	2.81	24.87	0.00	14.83	42.51	31.49	74.00
1546.900	3.14	25.74	0.00	14.80	43.68	30.32	74.00
1855.890	3.40	27.21	0.00	14.04	44.65	29.35	74.00
2164.700	3.76	28.18	0.00	14.43	46.36	27.64	74.00
2473.700	4.10	28.76	0.00	14.76	47.62	26.38	74.00
2782.620	4.28	29.78	0.00	14.24	48.31	25.69	74.00
3091.530	4.65	30.74	0.00	15.30	50.69	23.31	74.00
Average Detector:							
--							
Vertical							
Peak Detector:							
1238.070	2.81	24.87	0.00	18.46	46.14	27.86	74.00
1546.980	3.14	25.74	0.00	19.38	48.26	25.74	74.00
1855.890	3.40	27.21	0.00	18.56	49.17	24.83	74.00
2164.800	3.76	28.18	0.00	18.41	50.34	23.66	74.00
2473.700	4.10	28.76	0.00	18.28	51.14	22.86	74.00
2782.300	4.28	29.78	0.00	17.67	51.74	22.26	74.00
3091.500	4.65	30.74	0.00	16.91	52.30	21.70	74.00
Average Detector:							
--							

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Car Alarm Transmitter
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton1)

	Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal:								
	621.600	3.92	18.68	0.00	7.70	30.30	15.70	46.00
*	930.510	5.51	20.12	0.00	6.51	32.14	13.86	46.00
Vertical:								
	619.700	3.91	19.27	0.00	8.97	32.14	13.86	46.00
*	930.520	5.51	21.32	0.00	9.47	36.30	9.70	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton2)

	Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal								
Peak Detector:								
	621.640	3.92	18.68	0.00	6.03	28.63	17.37	46.00
*	930.550	5.51	20.12	0.00	10.51	36.14	9.86	46.00
Vertical								
Peak Detector:								
	619.770	3.91	19.27	0.00	9.97	33.14	12.86	46.00
*	930.230	5.51	21.32	0.00	8.44	35.27	10.73	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton3)

	Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal								
Peak Detector:								
	619.731	3.91	18.67	0.00	5.84	28.41	17.59	46.00
*	928.641	5.50	20.21	0.00	3.43	29.14	16.86	46.00
Vertical								
Peak Detector:								
	619.732	3.91	19.27	0.00	8.97	32.14	13.86	46.00
*	928.641	5.50	21.41	0.00	8.90	35.81	10.19	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Car Alarm Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton4)

	Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal								
Peak Detector:								
	619.731	3.91	18.67	0.00	3.02	25.59	20.41	46.00
*	928.641	5.50	20.21	0.00	9.44	35.15	10.85	46.00
Vertical								
Peak Detector:								
	619.731	3.91	19.27	0.00	11.08	34.25	11.75	46.00
*	928.641	5.50	21.41	0.00	9.80	36.71	9.29	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

4. Occupied Bandwidth

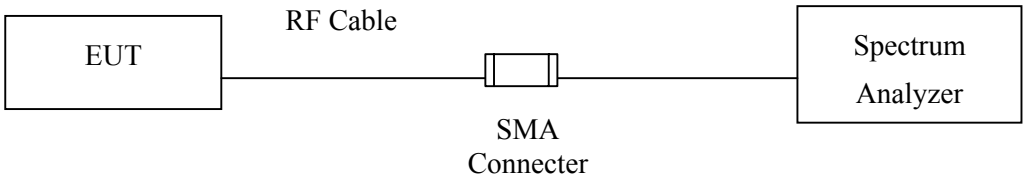
4.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2003

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

4.2. Test Setup



4.3. Limits

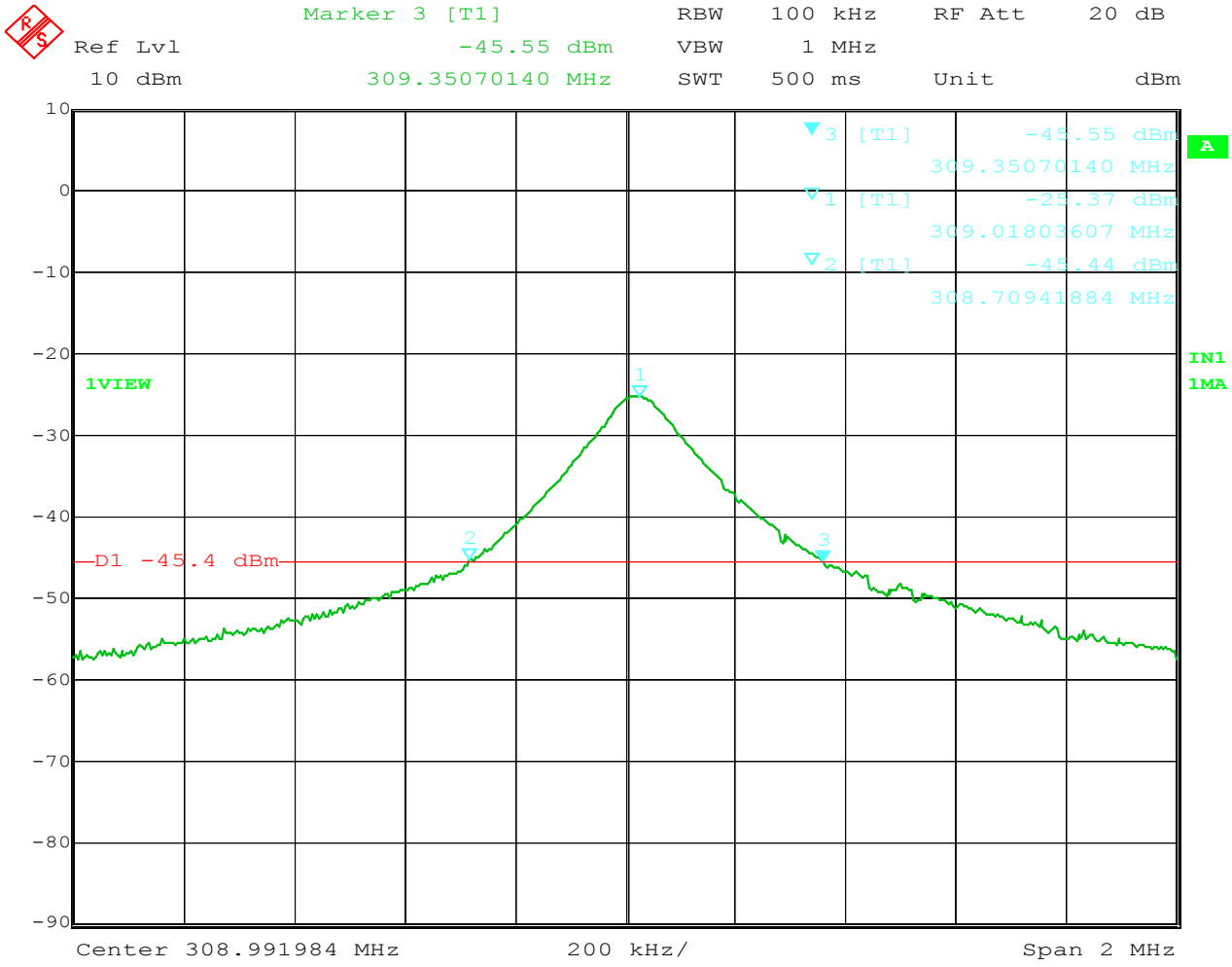
(1) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

(2) The bandwidth of the emission shall be no wider than 0.5% of the center frequency for devices operating above 900MHz.

4.4. Test Result of Occupied Bandwidth

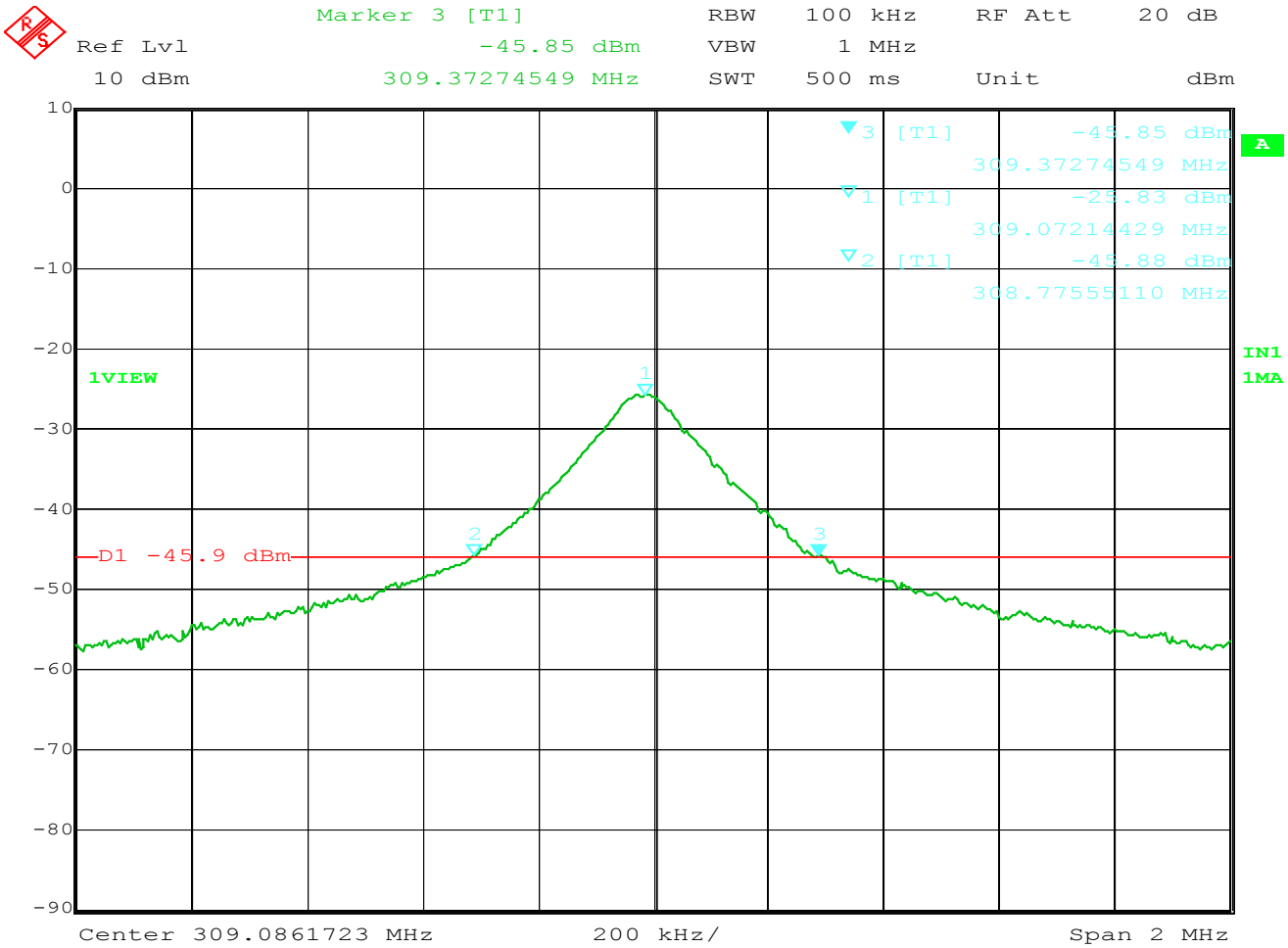
Product : Car Alarm Transmitter
Test Item : Occupied Bandwidth
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton1)

Center Frequency	309.018	MHz
Allowable Bandwidth (70-900 MHz:0.25%, Above 900MHz: 0.5%)	733	kHz
Bandwidth at 20dB down (Max)	641	kHz
Result	Complied with regulation	



Product : Car Alarm Transmitter
Test Item : Occupied Bandwidth
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton2)

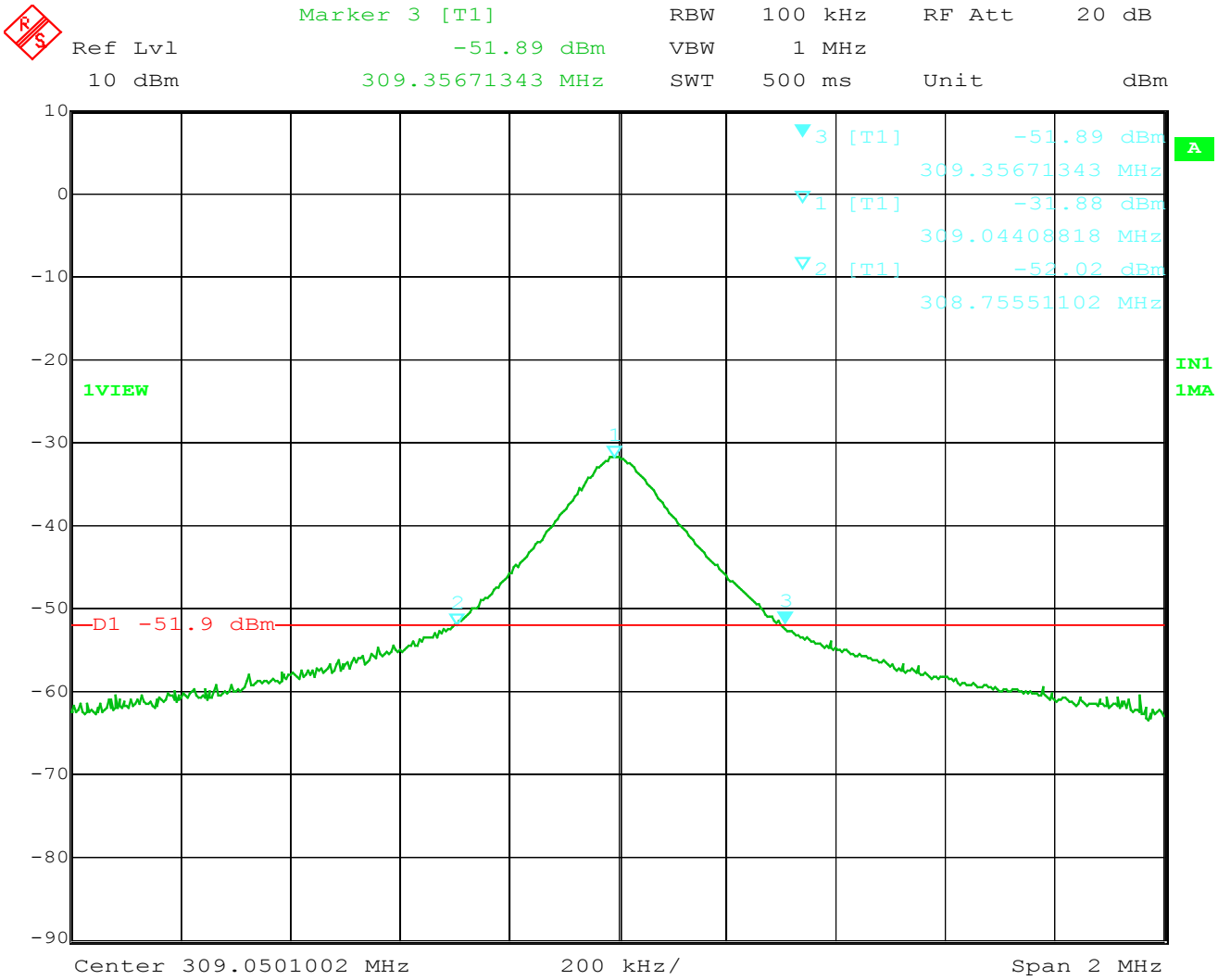
Center Frequency	309.072	MHz
Allowable Bandwidth (70-900 MHz:0.25%, Above 900MHz: 0.5%)	773	kHz
Bandwidth at 20dB down (Max)	597	kHz
Result	Complied with regulation	



Date: 8.OCT.1998 04:33:53

Product : Car Alarm Transmitter
Test Item : Occupied Bandwidth
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton3)

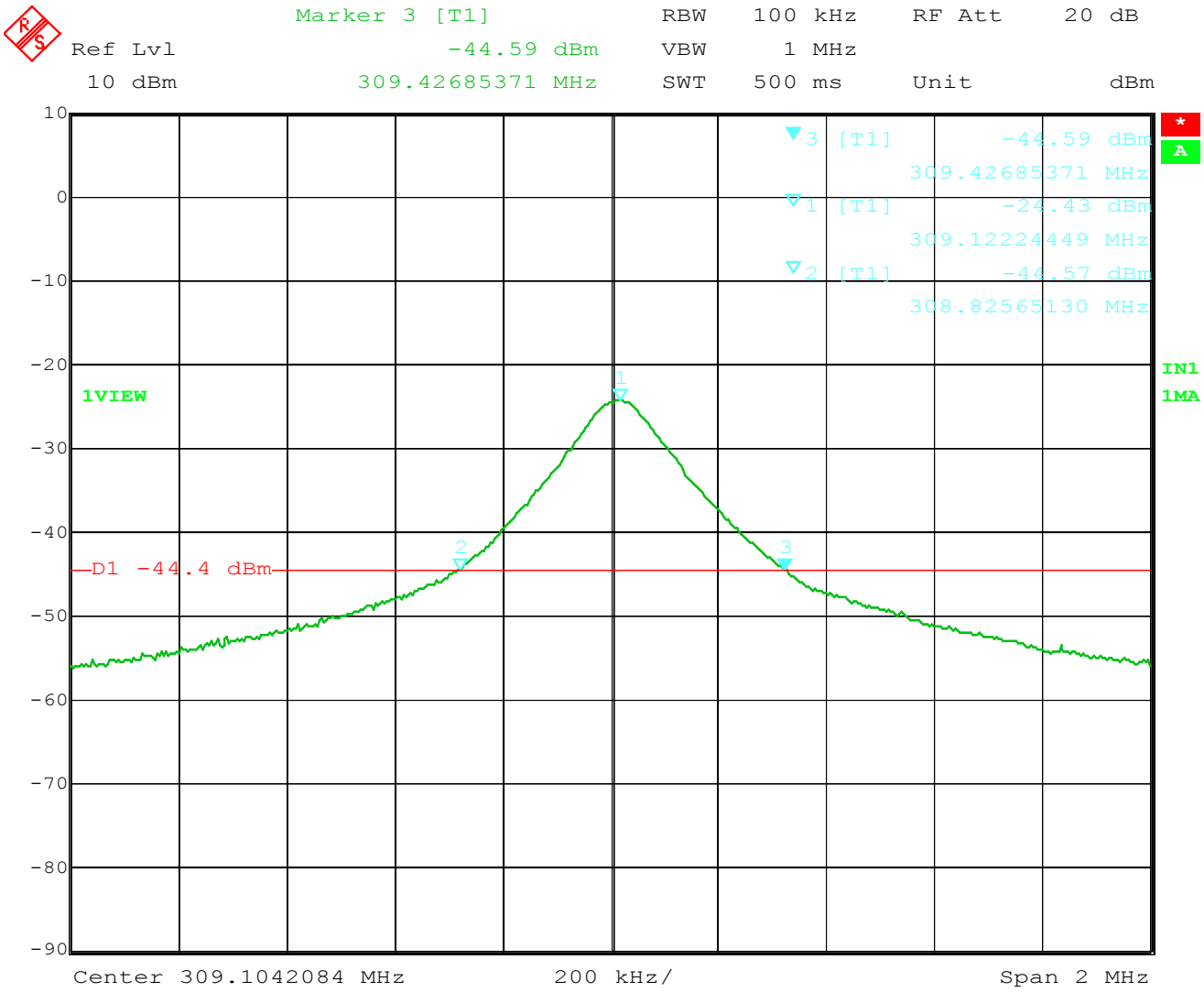
Center Frequency	309.044	MHz
Allowable Bandwidth (70-900 MHz:0.25%, Above 900MHz: 0.5%)	733	kHz
Bandwidth at 20dB down (Max)	602	kHz
Result	Complied with regulation	



Date: 8.OCT.1998 04:30:15

Product : Car Alarm Transmitter
Test Item : Occupied Bandwidth
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton4)

Center Frequency	309.122	MHz
Allowable Bandwidth (70-900 MHz:0.25%, Above 900MHz: 0.5%)	773	kHz
Bandwidth at 20dB down (Max)	603	kHz
Result	Complied with regulation	



Date: 8.OCT.1998 04:36:18

5. Duty Cycle

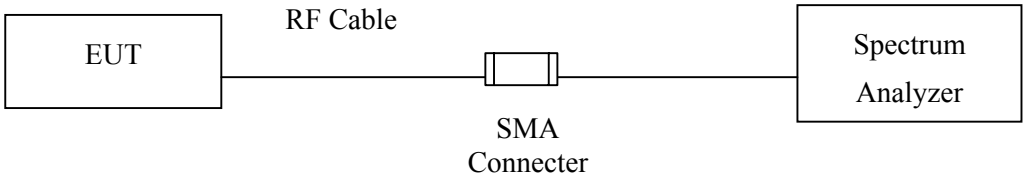
5.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2003

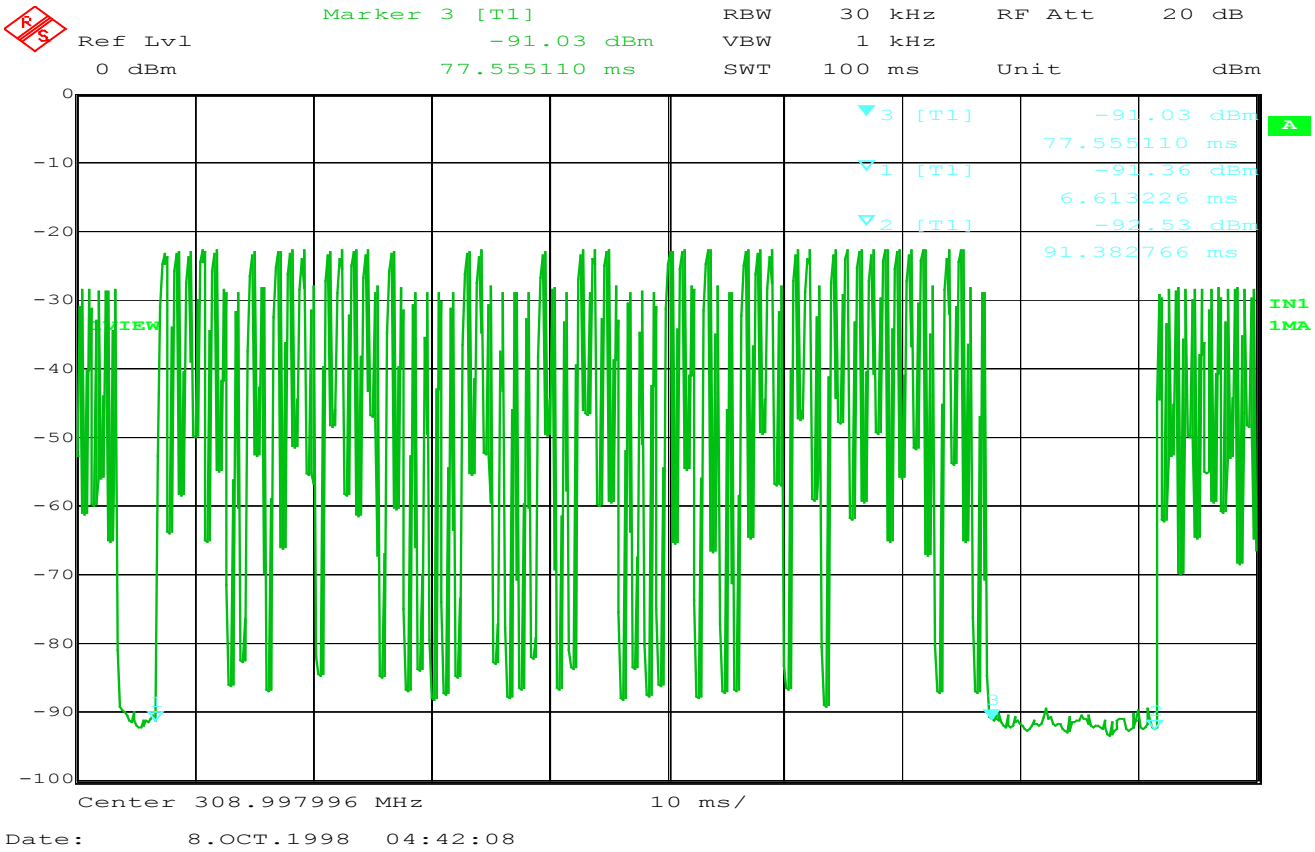
Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

5.2. Test Setup



5.3. Test Result of Duty Cycle

Product : Car Alarm Transmitter
Test Item : Duty Cycle
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton1)



Duty Cycle: 91.383-6.613=84.77ms

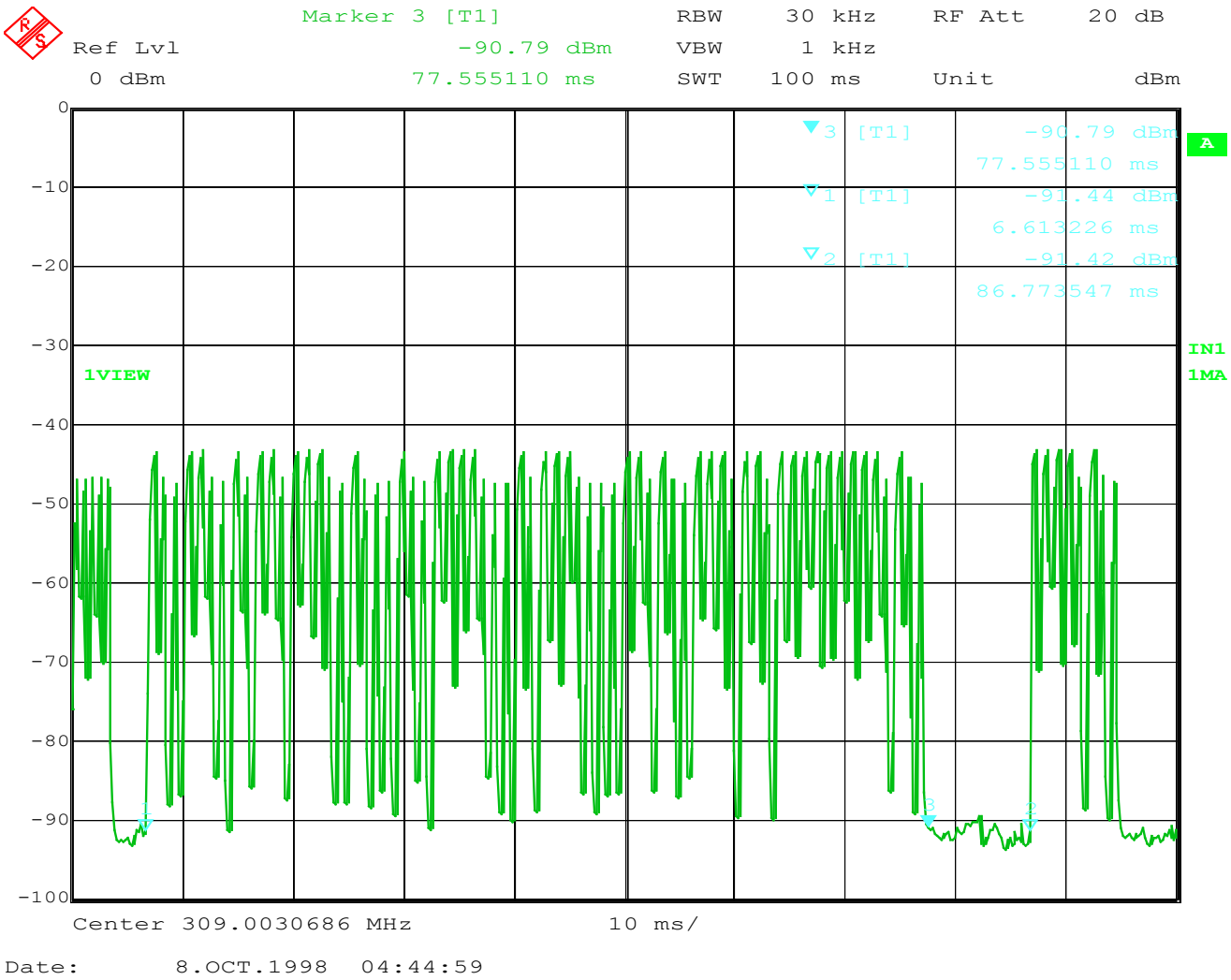
77.555-6.613=70.942ms

70.942 /84.77=0.837

20 log 0.837= -1.545dB

Duty Cycle= -1.545dB

Product : Car Alarm Transmitter
Test Item : Duty Cycle
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton2)



Date: 8.OCT.1998 04:44:59

Duty Cycle: 86.774-6.613=80.161ms

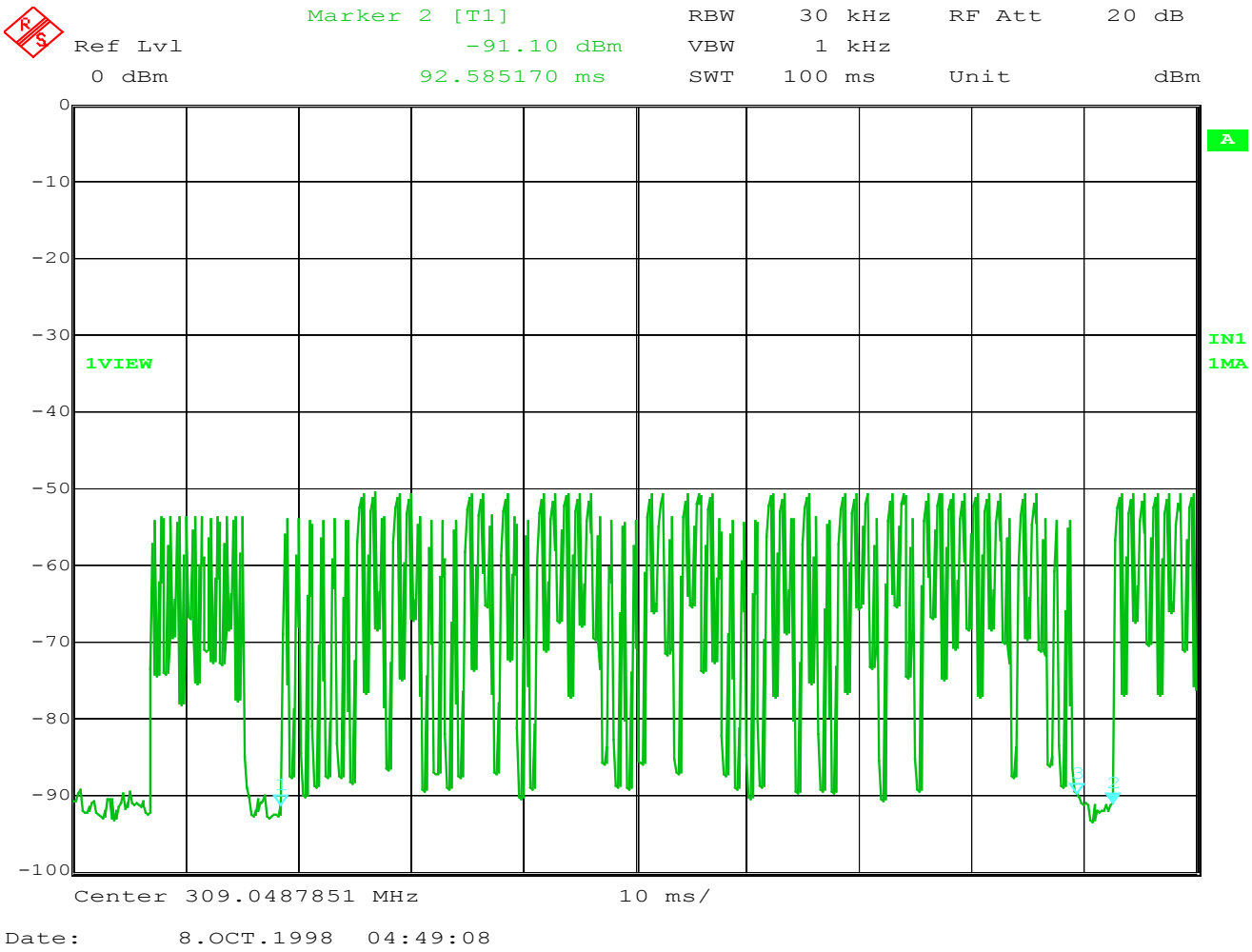
77.555-6.613=70.942ms

70.942/80.161=0.884993

20 log 0.884993=-1.06119dB

Duty Cycle=-1.06119dB

Product : Car Alarm Transmitter
Test Item : Duty Cycle
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton3)



Duty Cycle: 89.178357-13.426854=75.751503ms

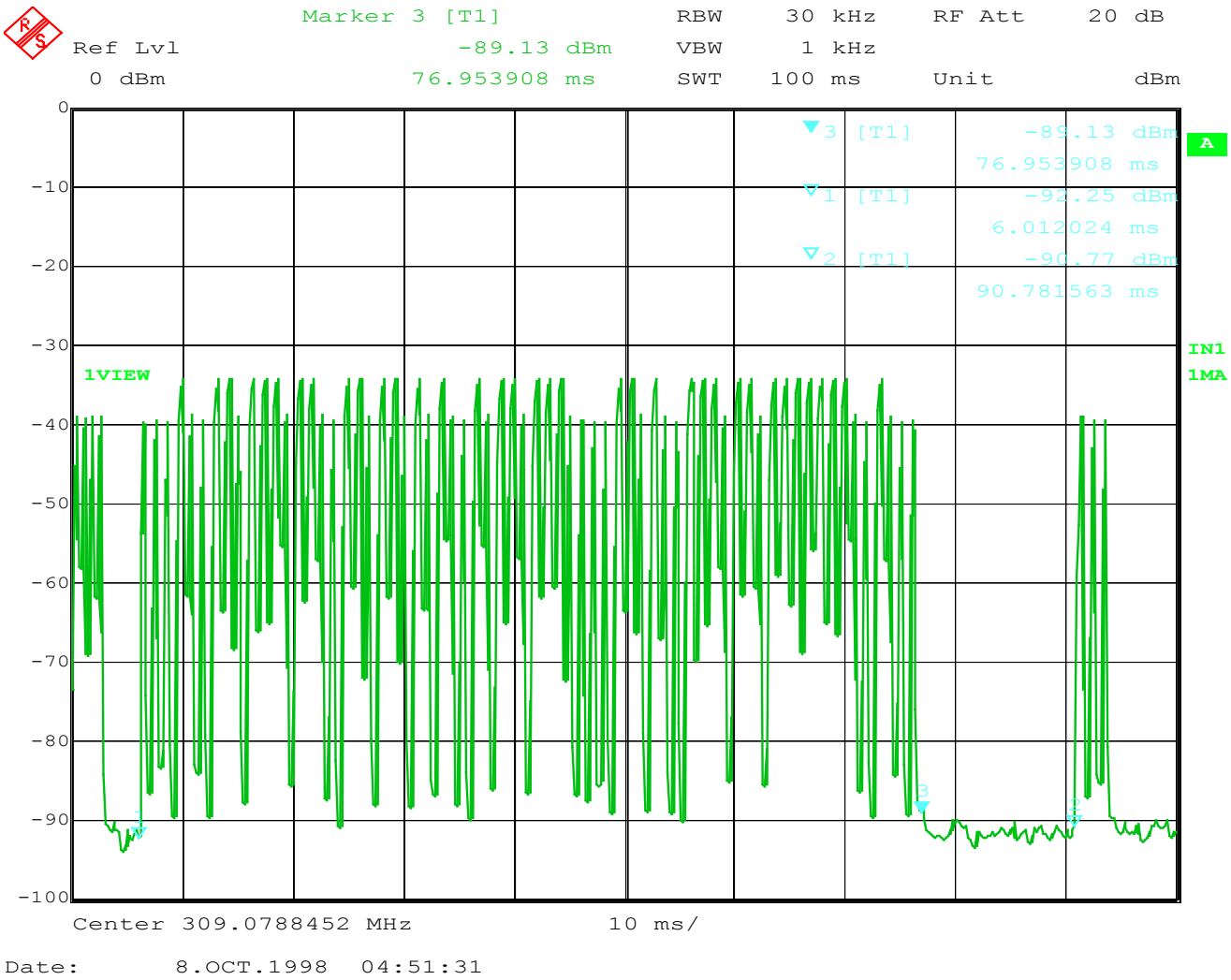
84.769539-13.426854=71.342685ms

71.342685/75.751503=0.941798936

20 log 0.941798936= -0.520836dB

Duty Cycle= -0.520836dB

Product : Car Alarm Transmitter
Test Item : Duty Cycle
Test Site : No.3 OATS
Test Mode : Normal Operation (Botton4)



Date: 8.OCT.1998 04:51:31

Duty Cycle: 90.781563-6.012024=84.769539ms

76.9539-6.012024=70.941876ms

70.941876/84.769539=0.836879

20 log 0.836879= -1.546743dB

Duty Cycle= -1.546743dB

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1 : EUT Test Photographs

Attachment 1: EUT Test Setup Photographs

Front View of Radiated Test

Back View of Radiated Test

Front View of Radiated Test (Horn)

Attachment 2 : EUT Detailed Photographs

Attachment 2 : EUT Detailed Photographs

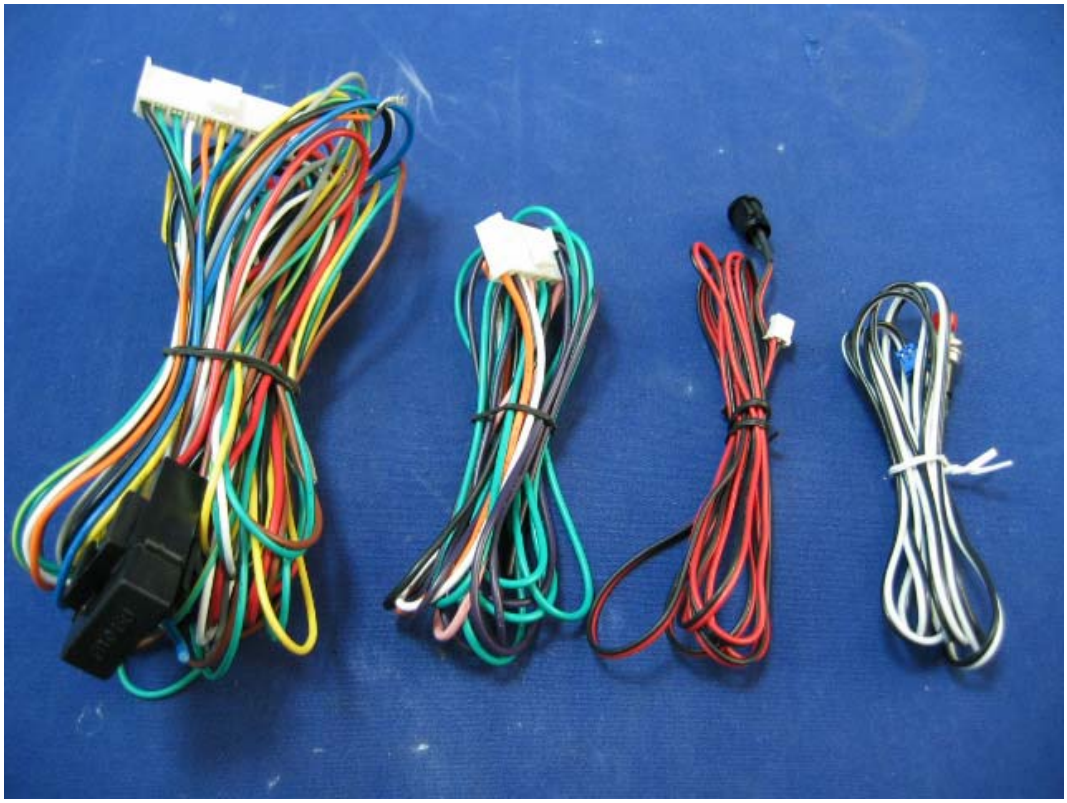
(1) EUT Photo

(2) EUT Photo

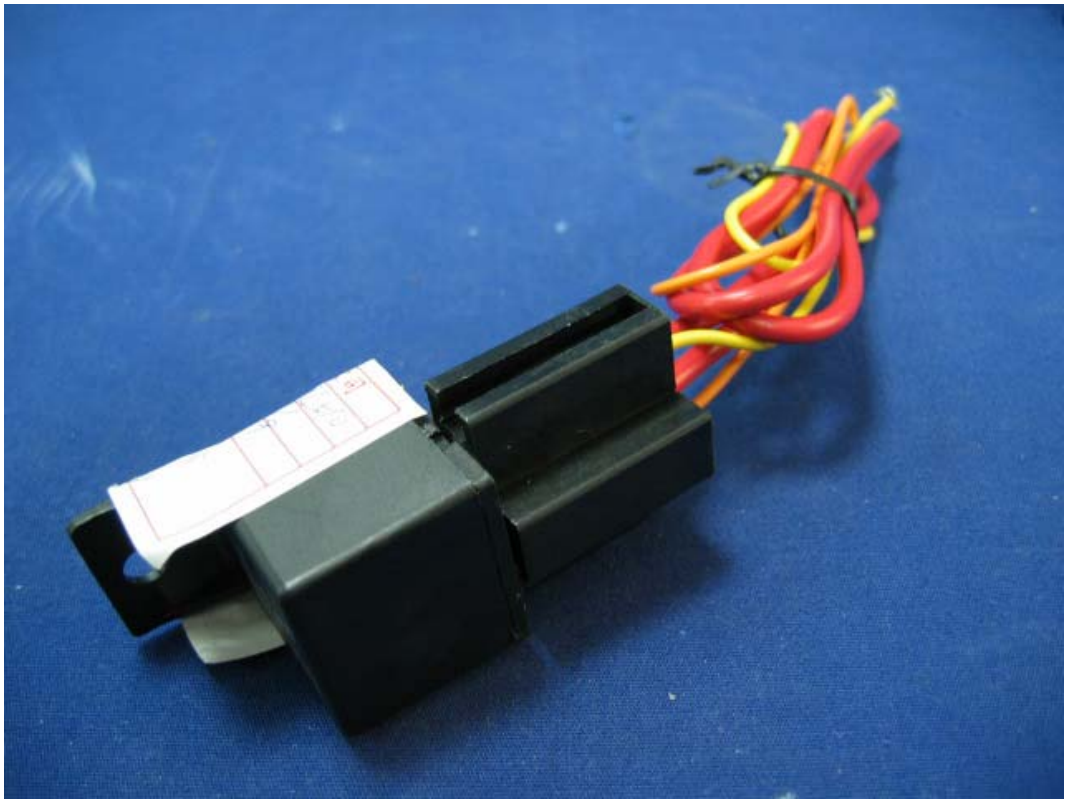
(3) EUT Photo

(4) EUT Photo

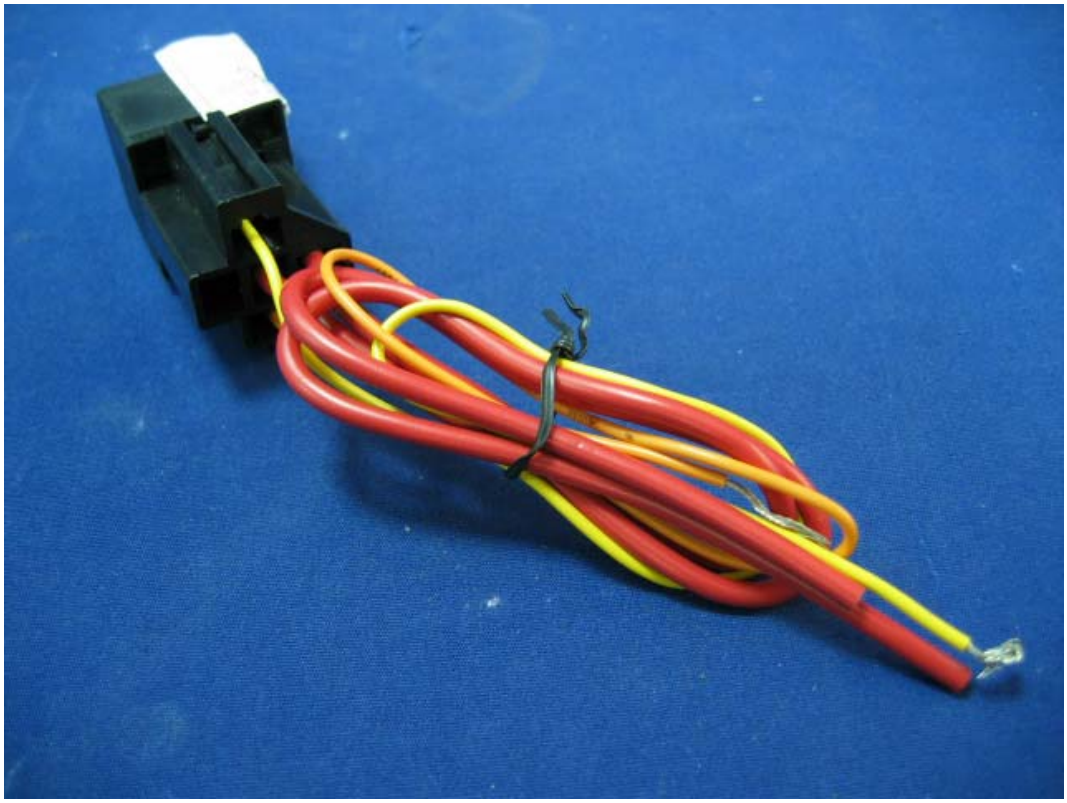
(5) EUT Photo



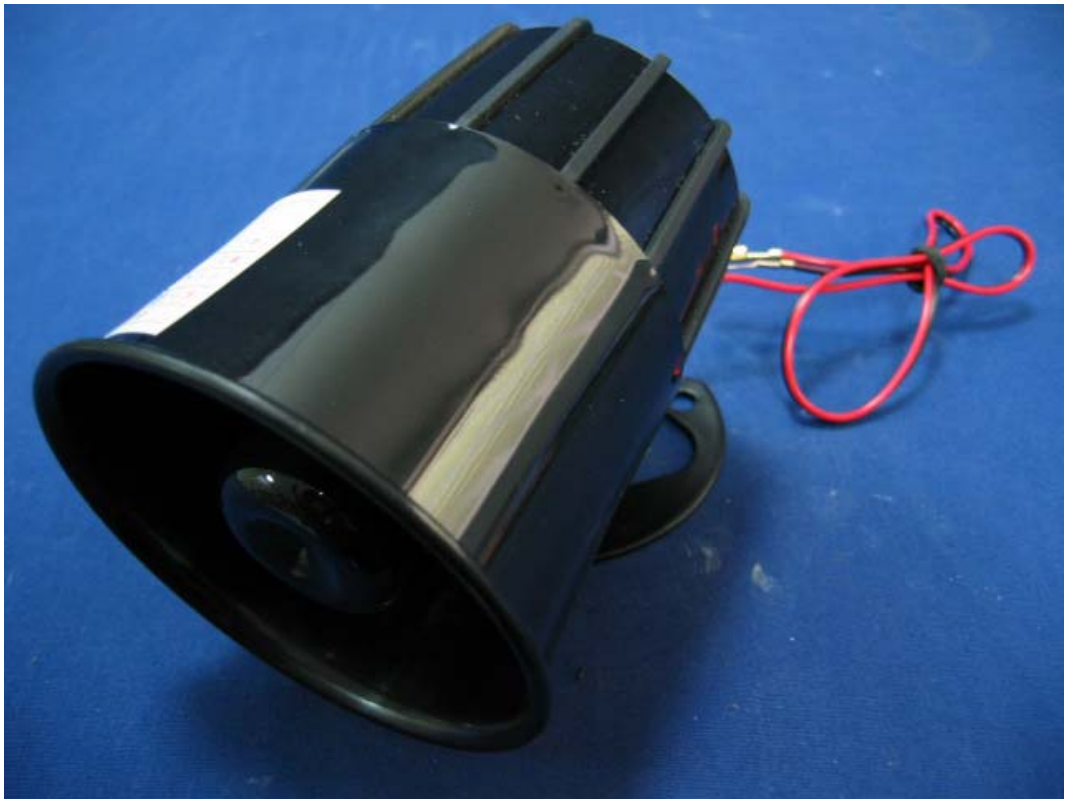
(6) EUT Photo



(7) EUT Photo



(8) EUT Photo



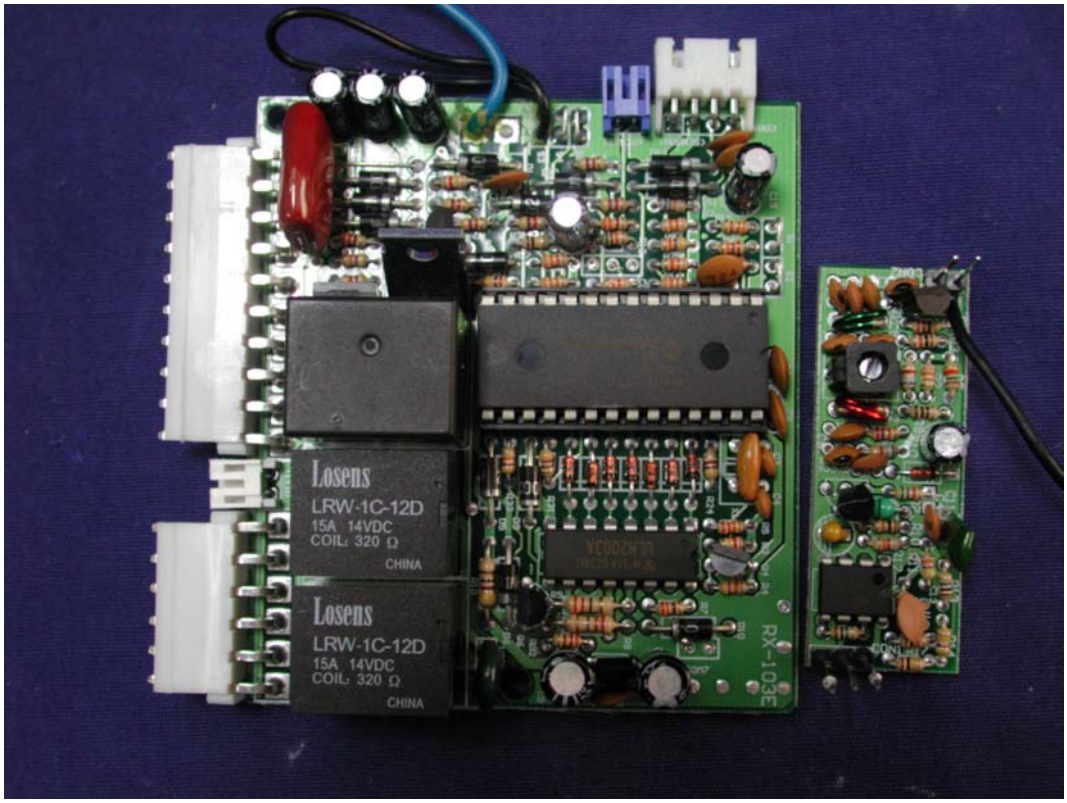
(9) EUT Photo

(10) EUT Photo

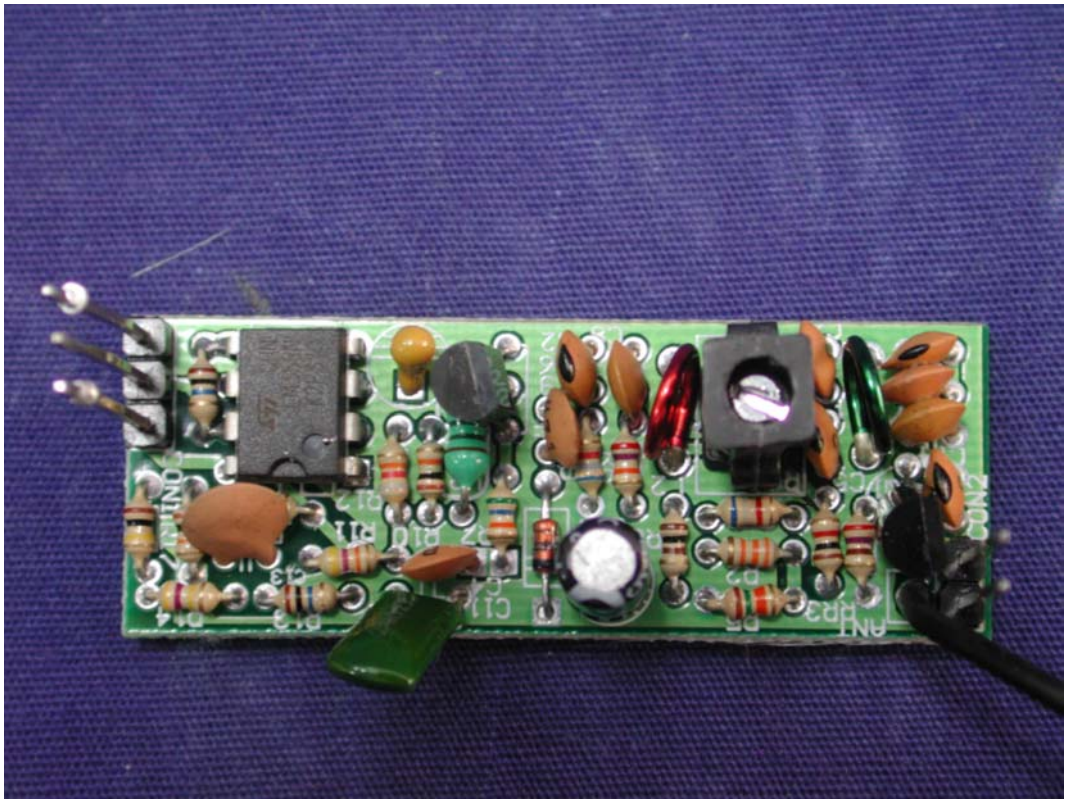
(11) EUT Photo

(12) EUT Photo

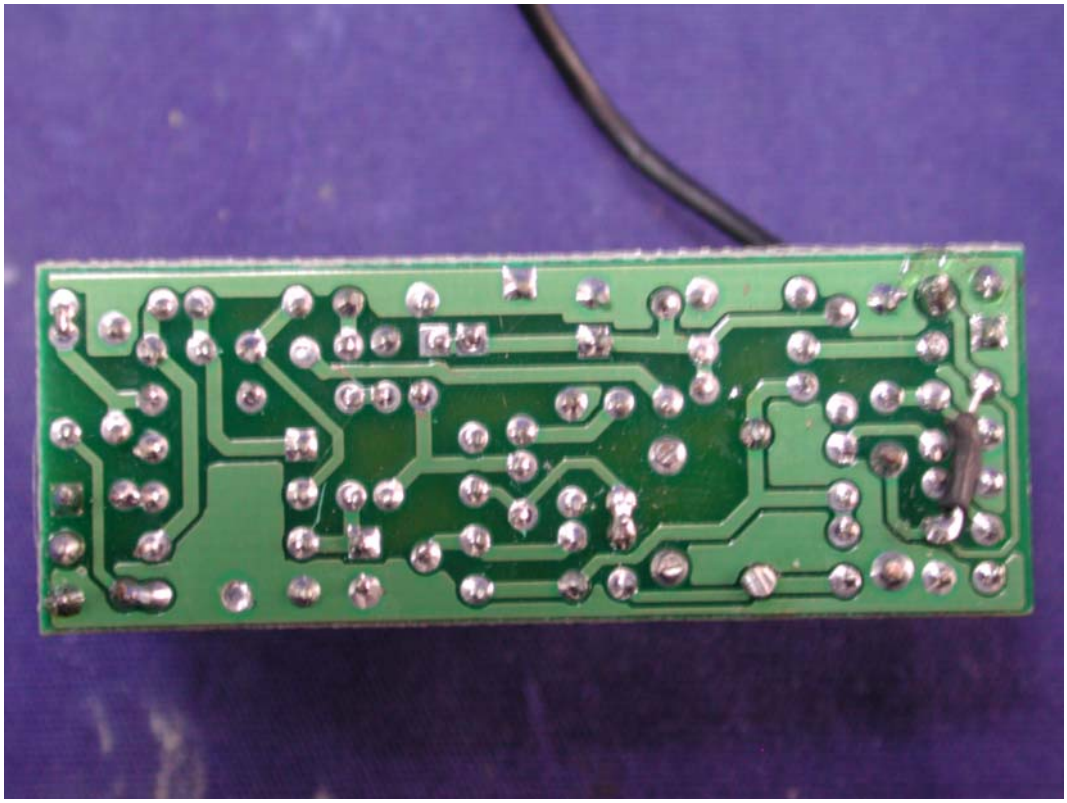
(13) EUT Photo



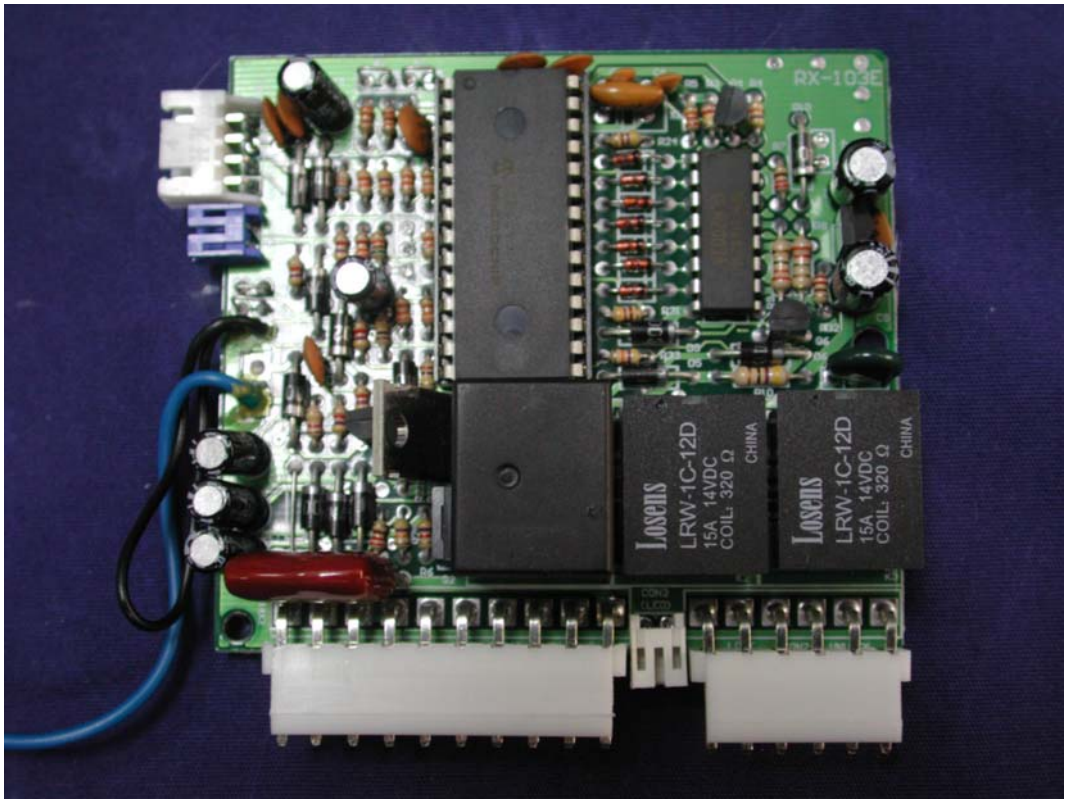
(14) EUT Photo



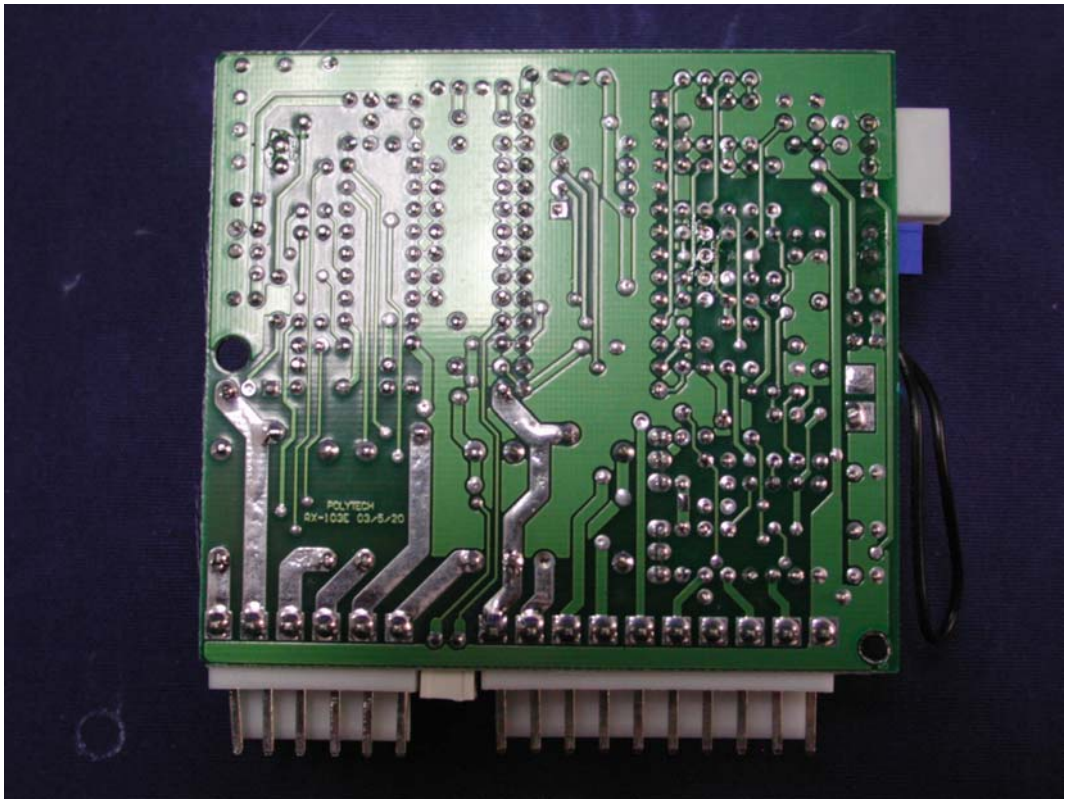
(15) EUT Photo



(16) EUT Photo

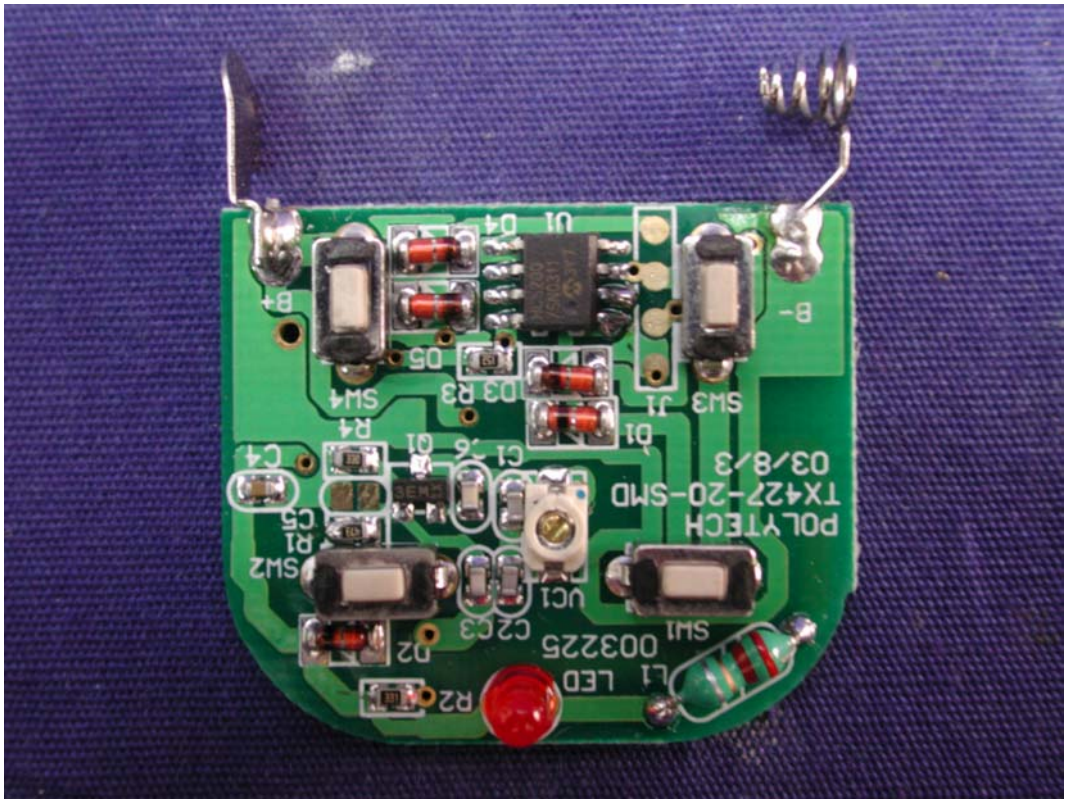


(17) EUT Photo

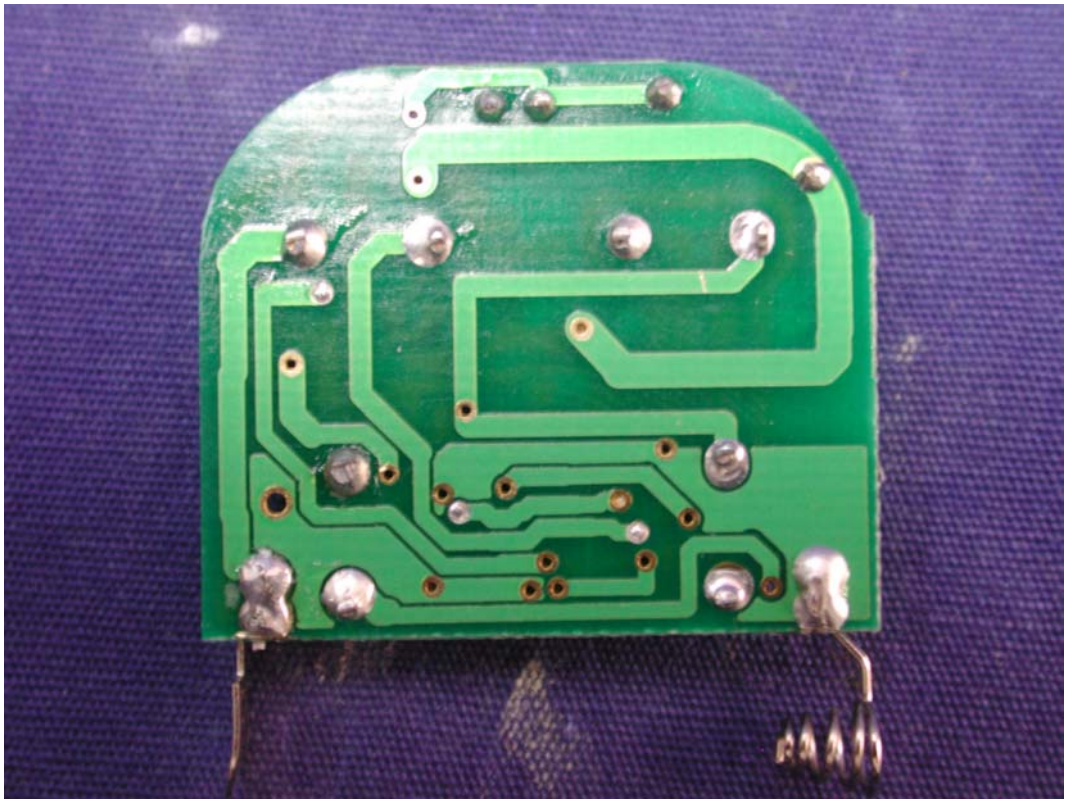


(18) EUT Photo

(19) EUT Photo



(20) EUT Photo



(21) EUT Photo