

APPLICATION FOR CERTIFICATION
On Behalf of
JowTong Technology Co., Ltd.
Transpod

Model No. : ST-22

FCC ID : QPRST22

Prepared for : JowTong Technology Co., Ltd.
46, Lane 337, Chung Cheng Rd., Yung Kang,
Tainan Hsien 710, Taiwan, R.O.C.

Prepared by : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

Tel : (02) 2609-9301, 2609-2133
Fax: (02) 2609-9303

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Date of Test : Nov. 02, 2002
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TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION	3
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT).....	4
1.2. Tested Supporting System Details.....	5
1.3. Description of Test Facility	5
1.4. Measurement Uncertainty.....	5
2. POWERLINE CONDUCTED TEST	6
3. RADIATED EMISSION TEST	7
3.1. Test Equipment.....	7
3.2. Test Setup	7
3.3. Radiation Limit (§15.239 & §15.209)	8
3.4. EUT's Configuration during Compliance Measurement	8
3.5. Operating Condition of EUT	8
3.6. Test Procedure	9
3.7. Test Results.....	9
3.8. Radiated Emission Noise Measurement Results.....	10
4. BANDWIDTH TEST.....	12
4.1. Test Equipment.....	12
4.2. Block Diagram of Test Setup.....	12
4.3. Specification Limits (§15.239).....	12
4.4. EUT's Configuration during Compliance Measurement	12
4.5. Bandwidth Measurement Results	12
5. DEVIATION TO TEST SPECIFICATIONS.....	16
6. PHOTOGRAPHS.....	17
6.1. Photos of Radiated Measurement at Semi-Anechoic Chamber	17
6.2. Photos of Bandwidth Measurement	18
6.3. Photos of EUT	18
APPENDIX (Radiated Test data At Semi-Anechoic Chamber).....	19

TEST REPORT CERTIFICATION

Applicant : JowTong Technology Co., Ltd.
 Manufacturer : JowTong Technology Co., Ltd.
 EUT Description : Transpod
 FCC ID : QPRST22
 (A) MODEL NO. : ST-22
 (B) SERIAL NO. : N/A
 (C) POWER SUPPLY : DC 12V

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, MAY 2002
 AND ANSI C63.4/1992
 (Intentional Radiators Compliance §15.239)

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and TAIWAN TOKIN EMC ENG. CORP. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : Nov. 02, 2002

Prepared by : Cherry Wang 11/2/02
 (Cherry Wang/Assistant Manager)

Test Engineer : Allen Wang Nov. 08 2002
 (Allen Wang/Deputy Manager)

Approve & Authorized Signer : Leon Liu Nov. 3 2002
 (Leon Liu/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Transpod (It's a transmitting device to hold a MP3 player to transmit music signal that can accept by Car radio FM band)
Model Number	:	ST-22
FCC ID	:	QPRST22
Applicant	:	JowTong Technology Co., Ltd. 46, Lane 337, Chung Cheng Rd., Yung Kang, Tainan Hsien 710, Taiwan, R.O.C.
Manufacturer	:	JowTong Technology Co., Ltd. 46, Lane 337, Chung Cheng Rd., Yung Kang, Tainan Hsien 710, Taiwan, R.O.C.
Fundamental Frequency Range	:	88MHz~108MHz
Power Supply	:	DC 12V (From Car)
Plug #1 (Option)	:	(See Photos 6.3) (It's a fixed holder and socket)
Plug #2 (Option)	:	(See Photos 6.3) (It does belong to cable shape socket)
Date of Receipt of Sample	:	Oct. 16, 2002
Date of Test	:	Nov. 02, 2002

Remark:

Antenna requirement: This EUT's transmitter antenna is a kind of coil ANT and solder on PCB, comply with §15.203 and inform to user that any change and modify is prohibited.

1.2. Tested Supporting System Details

1.2.1. MP3 PLAYER (iPod 10GB)

Model Number : M8541
 Serial Number : U22262V5ML1
 FCC ID : By DoC
 BSMI ID : 3913P001
 Manufacturer : Apple Computer
 Power Supply : DC 8-30V, 0.5A (MAX)

1.2.2. DC POWER SUPPLY (DC 12V)

Model Number : GPQ-3030
 Serial Number : 0032517
 Manufacturer : Goodwill
 Power Wire (to EUT) : Non-Shielded, Detachable, 0.6m *2
 Power Cord : Non-Shielded, Undetachable, 1.5m

1.3. Description of Test Facility

Semi-Anechoic Chamber : May 16, 2000 Re-file on
 Description Federal Communication Commission
 Registration Number: 90993

Name of Firm : Taiwan Tokin EMC Eng. Corp.

Site Location #1 : No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.
 (Semi-Anechoic Chamber)

Site Location #2 : No. 67-4, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab Code : 200077-0

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150KHz~30MHz	±2.66dB
Radiation Test (Distance: 3m)	30MHz~300MHz	+4.26dB / -4.22dB
	300MHz~1000MHz	+5.28dB / -4.0dB

Remark : Uncertainty = $K_{\mu c}(y)$

2. POWERLINE CONDUCTED TEST

【The EUT only employ battery power for operation, no conductive emissions limits are required according to FCC Part 15 Section §15.207】

3. RADIATED EMISSION TEST

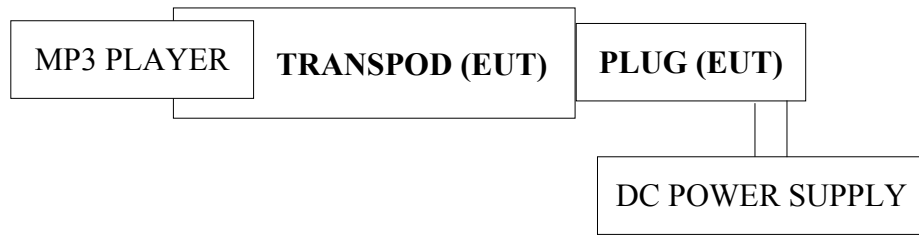
3.1. Test Equipment

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

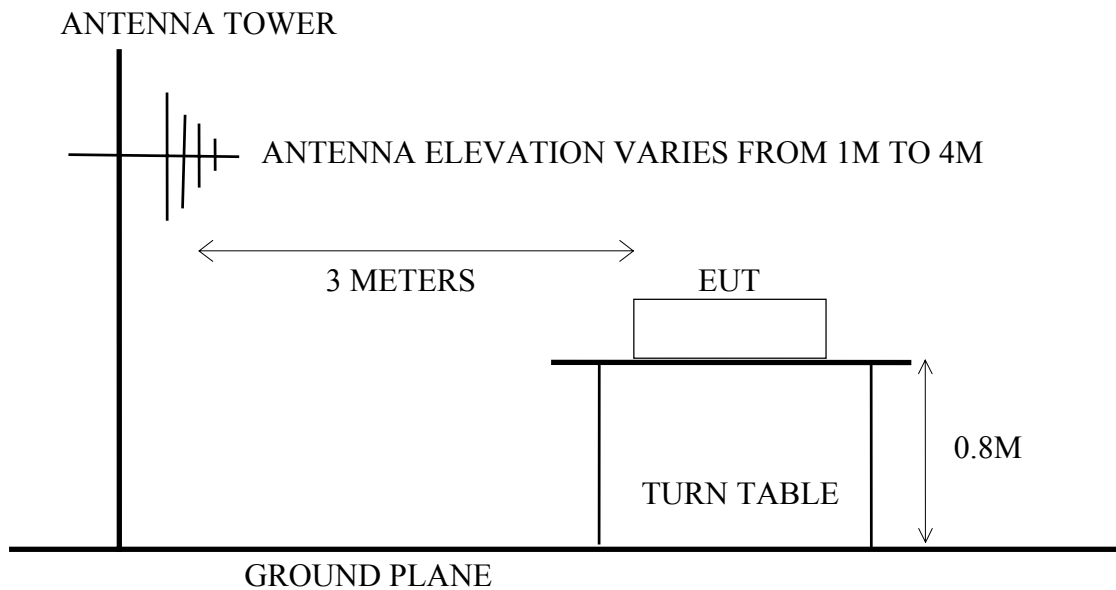
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep.23, 02'	1 Year
2.	Pre-Amplifier	HP	8447D	2944A06305	Mar.05, 02'	1 Year
3.	Test Receiver	Rohde & Schwarz	ESVP	879691/036	Jul. 09, 02'	1 Year
4.	Broadband Antenna	Schwarzbeck	BBA 9106	A3L	Feb. 24, 02'	1 Year
5.	Broadband Antenna	Schwarzbeck	UHALP9108-A	0138	Feb. 24, 02'	1 Year

3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3M) Setup Diagram



3.3. Radiation Limit (§15.239 & §15.209)

3.3.1. §15.239 Radiated Emission Limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
Fundamental Freq.	3	250	48.0 (Average)

Remark: Emission level ($\text{dB}\mu\text{V/M}$) = 20 log Emission level ($\mu\text{V/M}$)

3.3.2. §15.209 Radiated Emission Limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

Remark : (1) Emission level ($\text{dB}\mu\text{V/M}$) = 20 log Emission level ($\mu\text{V/M}$)

- (2) The tighter limit applies at the edge between two frequency bands.
- (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. EUT's Configuration during Compliance Measurement

The following equipment were installed on radiated measurement to meet the commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

3.4.1. Transpod (EUT)

Model Number	:	ST-22
Serial Number	:	N/A
FCC ID	:	QPRST22
Manufacturer	:	JowTong Technology Co., Ltd.
Fundamental Frequency	:	88MHz~108MHz

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown on 3.2.

3.5.2. Turned on the power of all equipment.

3.5.3. The EUT's transmitting frequency tune in to 88.7MHz、98.0MHz、107.0MHz to measure field strength.

3.5.4. The other peripheral devices were drove and operated in turn during all testing.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. For 30MHz to 1000MHz frequency range, EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters for 30MHz to 1000MHz frequency range to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-1992 regulation.

The bandwidth of test receiver was set at 120KHz and resolution bandwidth of spectrum analyzer was set at 1MHz.

The frequency range from 30MHz to 1000MHz was checked.

EUT with three kind of transmitting frequency (88.7MHz、98.0MHz、107.0MHz) and with plug #1 were measured within Semi-Anechoic Chamber and all the scanning waveform were attached within Appendix.

Finally, re-measured the worst test frequency 107.0MHz at Semi-Anechoic Chamber and all the test results are listed in section 3.8.

3.7. Test Results

PASSED. Please refer to the following pages.

3.8. Radiated Emission Noise Measurement Results

The frequency spectrum from 30 MHz to 1000MHz is investigated. All the emissions not reported below are too low against the FCC Part 15 Subpart C official limits.

Date of Test : Nov. 02, 2002 Temperature : 20°C
 EUT : Transpod Humidity : 50%
 Test Mode : Frequency: 107.0MHz (with Plug #1)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Horizontal dBμV	Horizontal dBμV/m	Horizontal dBμV/m	Limits dBμV/m	

Fundamental Freq. (Average Value)							
107.000	17.54	2.20	23.47	43.21	48.00	4.79	
Spurious Freq. (Quasi-Peak Value)							
76.980	12.63	1.80	9.14	23.57	40.00	16.43	
214.000	22.63	3.11	4.00	29.74	43.50	13.76	
239.790	24.64	3.40	5.66	33.70	46.00	12.30	
287.580	26.01	3.80	7.00	36.81	46.00	9.19	
301.400	14.78	3.90	16.42	35.10	46.00	10.90	
360.900	16.60	4.43	2.16	23.19	46.00	22.81	
385.400	16.78	4.70	14.31	35.79	46.00	10.21	
409.900	16.60	4.90	14.46	35.96	46.00	10.04	
428.000	17.14	5.18	3.16	25.48	46.00	20.52	
535.000	18.67	7.00	1.06	26.73	46.00	19.27	
642.000	19.80	6.30	- 0.40	25.70	46.00	20.30	
749.000	22.20	6.70	- 0.40	28.50	46.00	17.50	
856.000	22.80	7.10	- 0.59	29.31	46.00	16.69	
963.000	22.98	7.60	- 0.13	30.45	54.00	23.55	

 Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. The emissions level are too low against the official limit and not report.

Date of Test : Nov. 02, 2002 Temperature : 20°C
 EUT : Transpod Humidity : 50%
 Test Mode : Frequency: 107.0MHz (with Plug #1)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBµV	Emission Level Vertical dBµV/m	Limits dBµV/m	Margin dB

Fundamental Freq. (Average Value)						
107.000	17.40	2.20	22.20	41.80	48.00	6.20
Spurious Freq. (Quasi-Peak Value)						
63.400	14.22	1.66	6.10	21.98	40.00	18.02
214.000	22.90	3.11	- 0.45	25.56	43.50	17.94
240.330	25.04	3.40	2.55	30.99	46.00	15.01
321.000	14.59	4.20	5.22	24.01	46.00	21.99
360.900	15.30	4.43	15.23	34.96	46.00	11.04
385.400	16.10	4.70	13.12	33.92	46.00	12.08
409.900	16.40	4.90	13.89	35.19	46.00	10.81
428.000	16.44	5.18	14.36	35.98	46.00	10.02
535.000	18.50	7.00	- 0.05	25.45	46.00	20.55
642.000	19.70	6.30	0.10	26.10	46.00	19.90
749.000	21.10	6.70	1.11	28.91	46.00	17.09
780.900	22.00	6.80	5.88	34.68	46.00	11.32
963.000	23.26	7.60	1.11	31.97	54.00	22.03

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. The emissions level are too low against the official limit and not report.

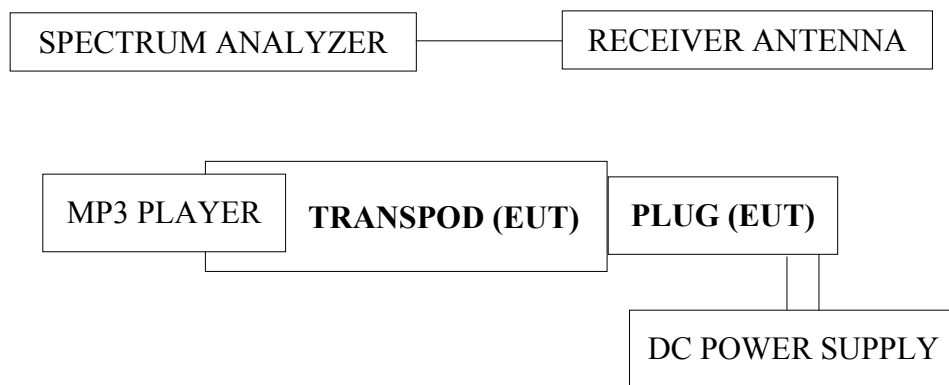
4. BANDWIDTH TEST

4.1. Test Equipment

The following test equipment were used during the Emission Bandwidth Test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	8564EC	3946A00249	Aug. 09, 02'	1 Year

4.2. Block Diagram of Test Setup



4.3. Specification Limits (§15.239)

Emission from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88-108MHz.

4.4. EUT's Configuration during Compliance Measurement

The configuration of EUT were same as section 3.4.

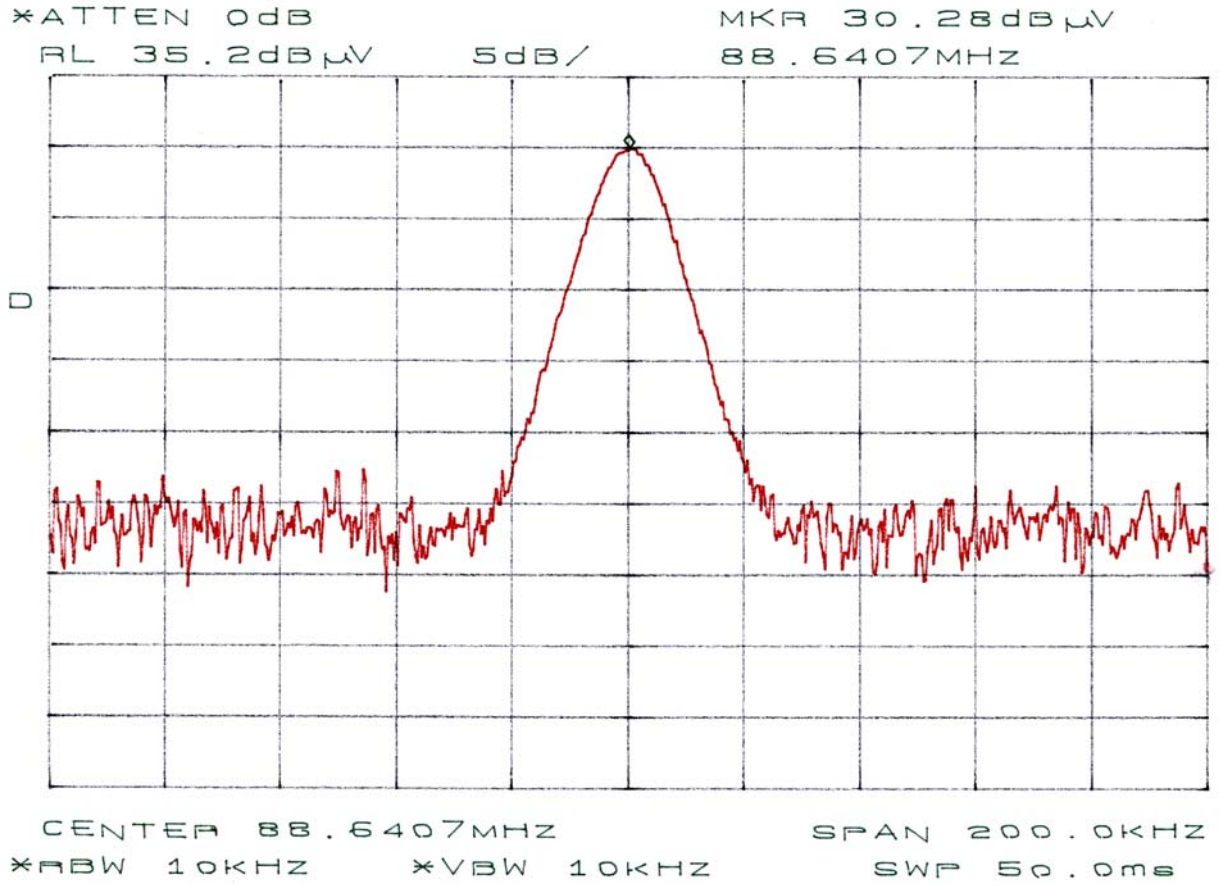
4.5. Bandwidth Measurement Results

Date of Test: Nov. 02, 2002

The graph of bandwidth measured is attached in next pages.
(Remark: -26dB below the peak level to measure)

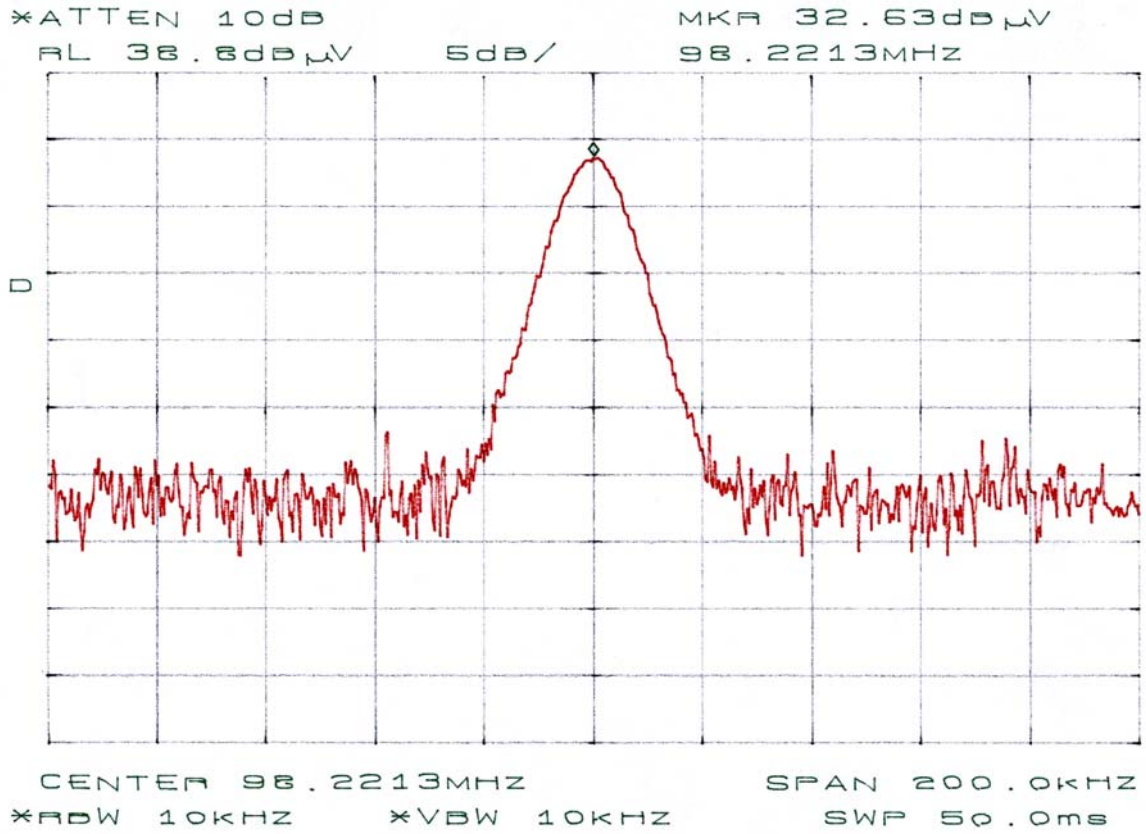
(Graph of Bandwidth Measurement)

Center Frequency 88.6407MHz



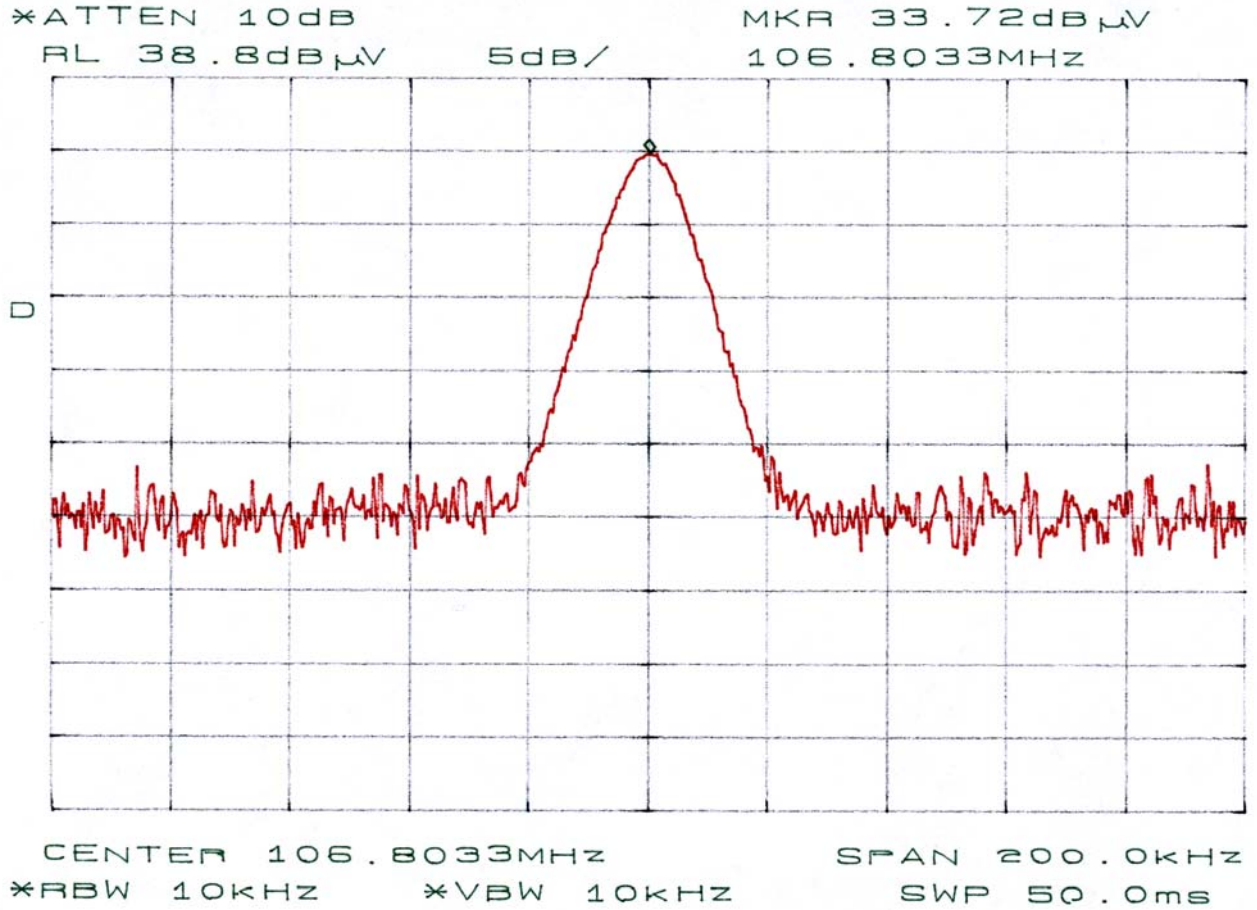
(Graph of Bandwidth Measurement)

Center Frequency 98.2213MHz



(Graph of Bandwidth Measurement)

Center Frequency 106.8033MHz



5. DEVIATION TO TEST SPECIFICATIONS

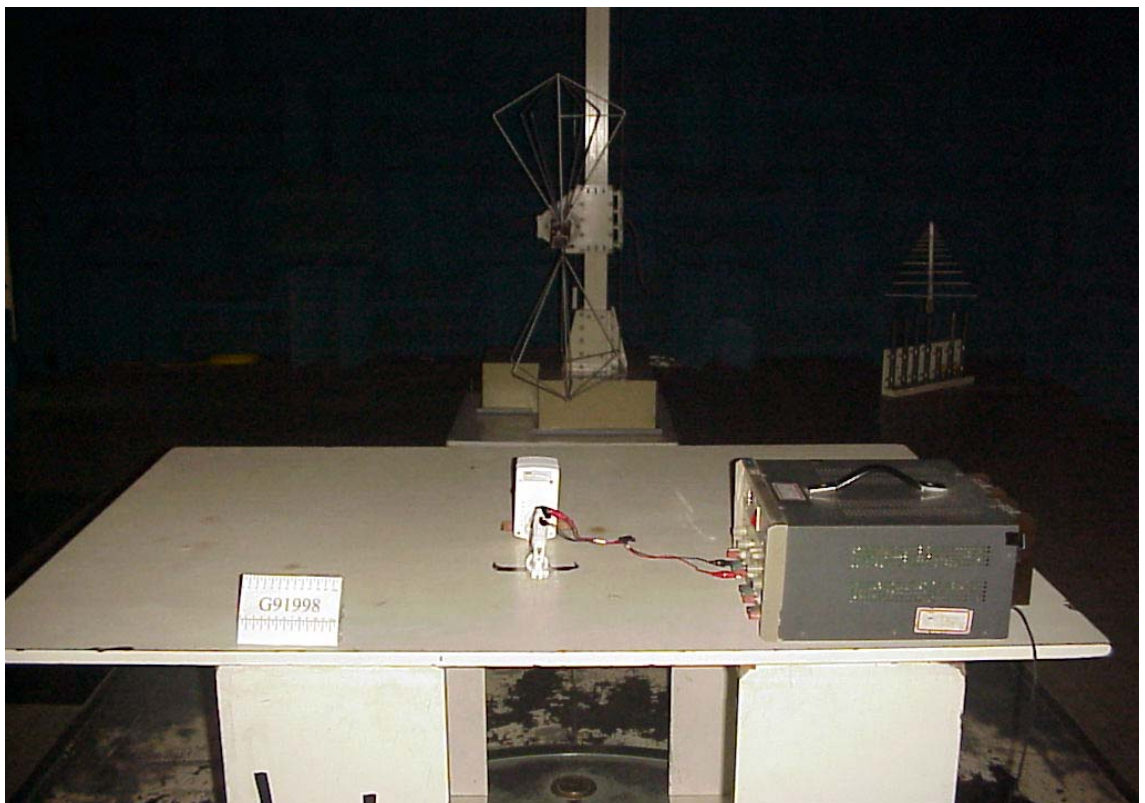
【NONE】

6. PHOTOGRAPHS

6.1. Photos of Radiated Measurement at Semi-Anechoic Chamber



FRONT VIEW OF RADIATED TEST



BACK VIEW OF RADIATED TEST

6.2. Photos of Bandwidth Measurement



6.3. Photos of EUT



APPENDIX

Radiated Test Data At Semi-Anechoic Chamber

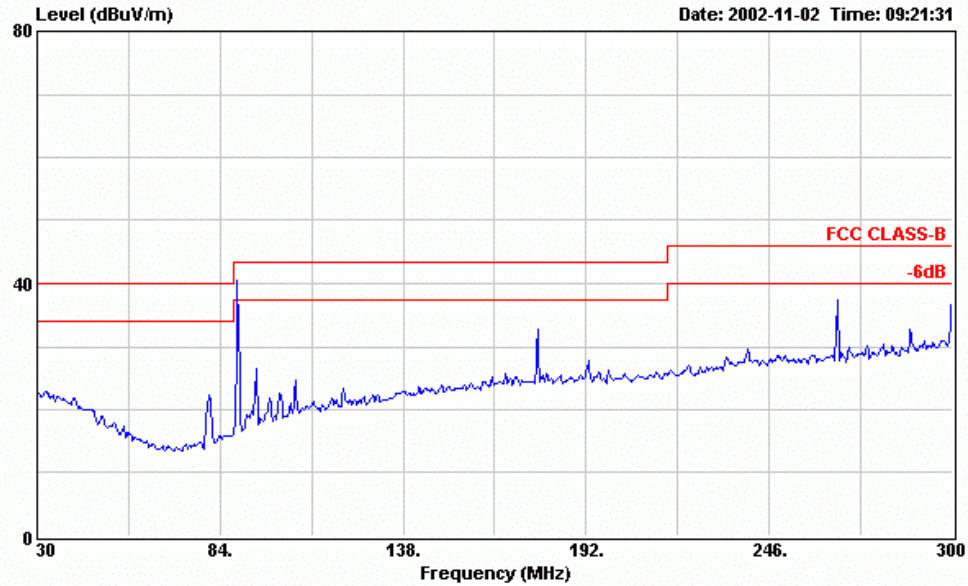
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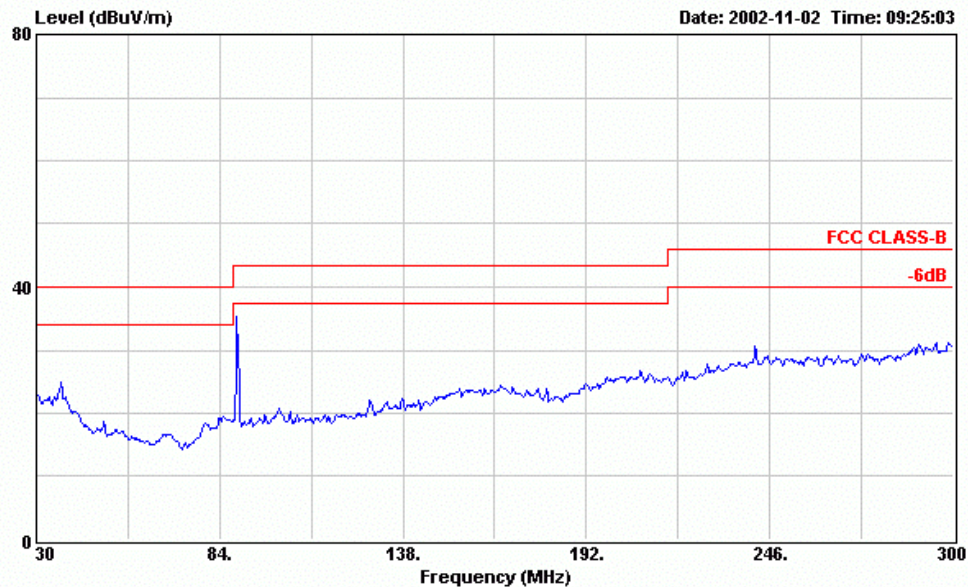
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 Taipei Country, Taiwan, R.O.C.
 Tel:02-26092133 Fax:02-26099303
 Email:ttemc@ttemc.com.tw

Data#: 7 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106(A3L) HORIZONTAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 88.7MHz
 ENVIRONMENT : 20*c/50%

Data#: 8 File#: D:\Jow Tong.EMI



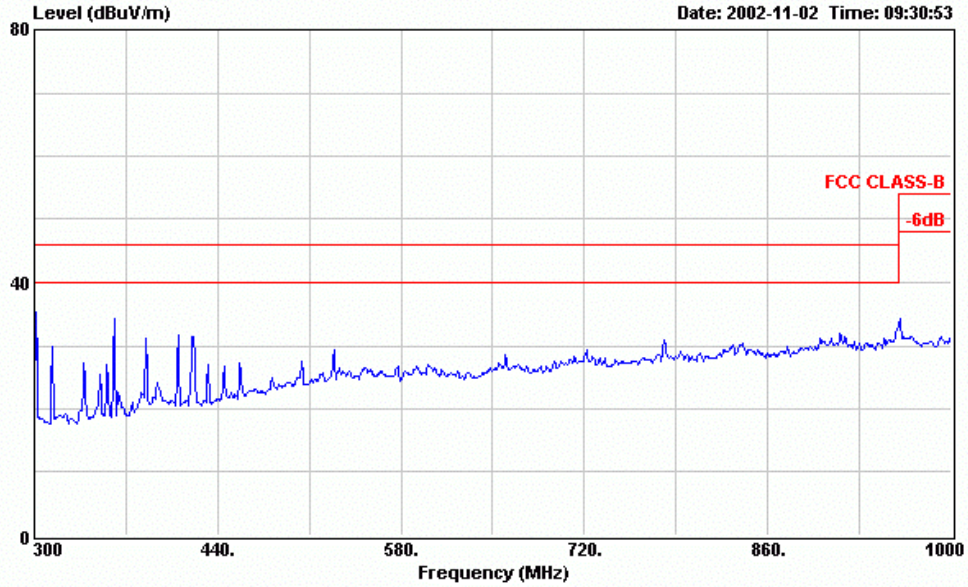
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 POWER : DC 12V
 MEMO : 88.7MHz
 ENVIRONMENT : 20*c/50%



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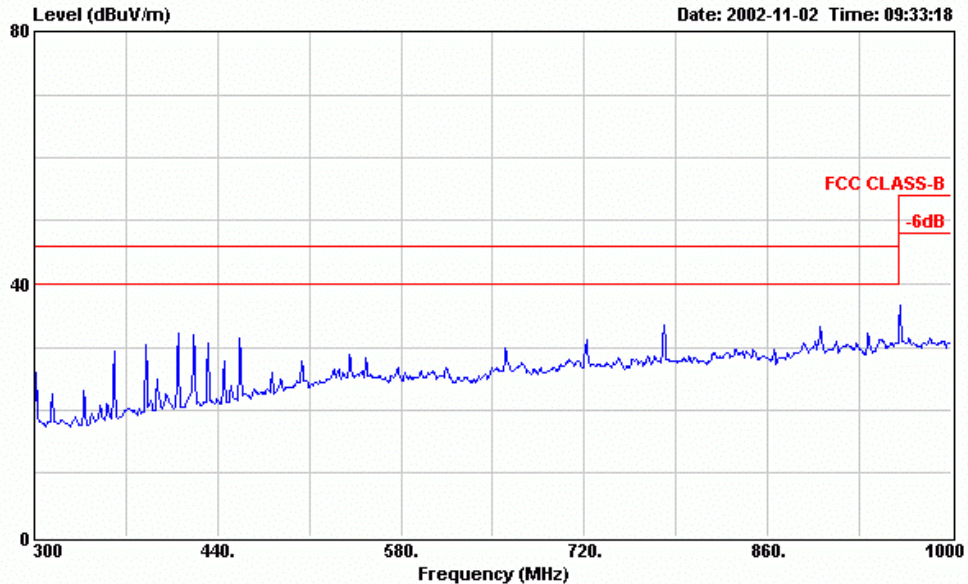
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 Taipei Country, Taiwan, R.O.C.
 Tel:02-26092133 Fax:02-26099303
 Email:ttemc@ttemc.com.tw

Data#: 9 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A HORIZONTAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 88.7MHz
 ENVIRONMENT : 20*c/50%

Data#: 10 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A VERTICAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 88.7MHz
 ENVIRONMENT : 20*c/50%



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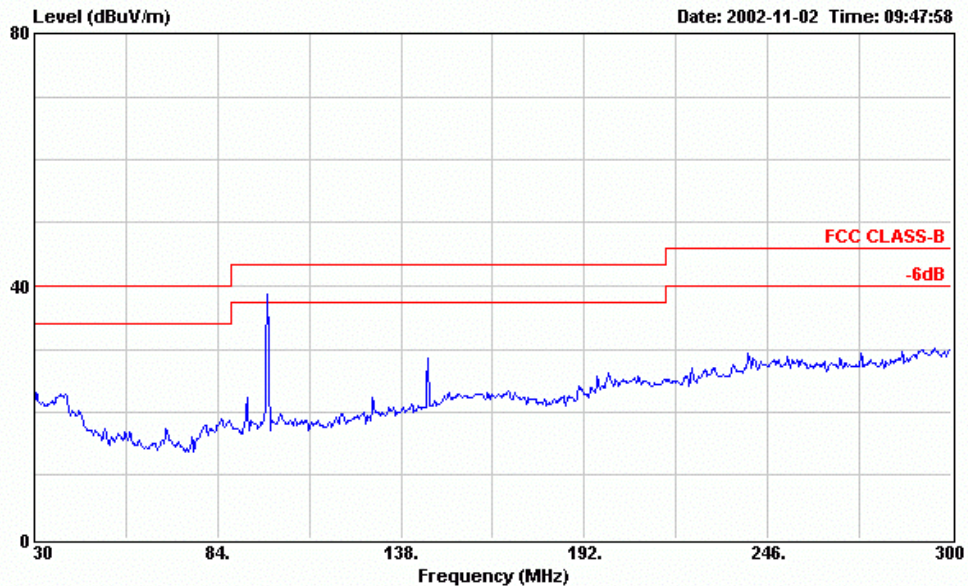
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Data#: 13 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A HORIZONTAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 98.0MHz
 ENVIRONMENT : 20*c/50%

Data#: 14 File#: D:\Jow Tong.EMI



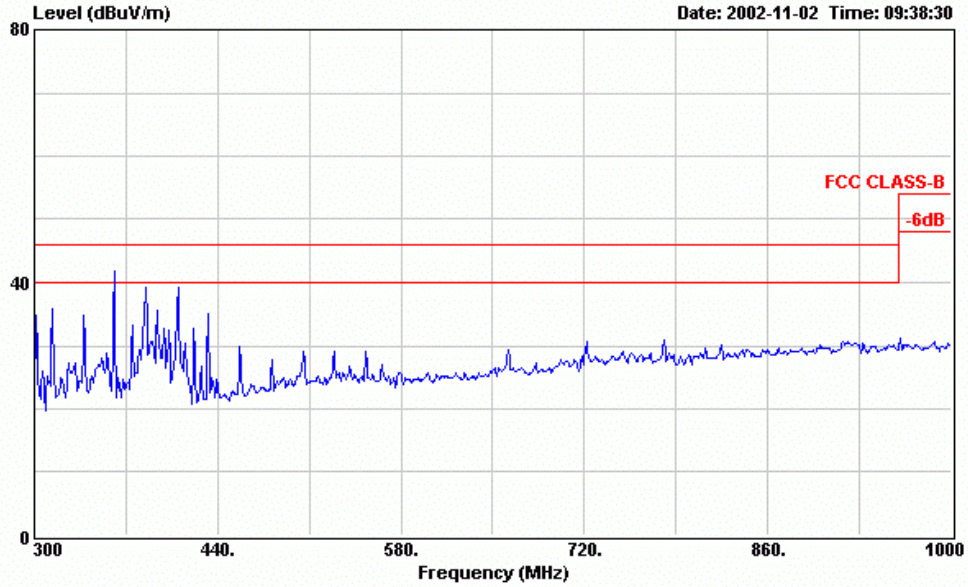
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 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A VERTICAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 98.0MHz
 ENVIRONMENT : 20*c/50%



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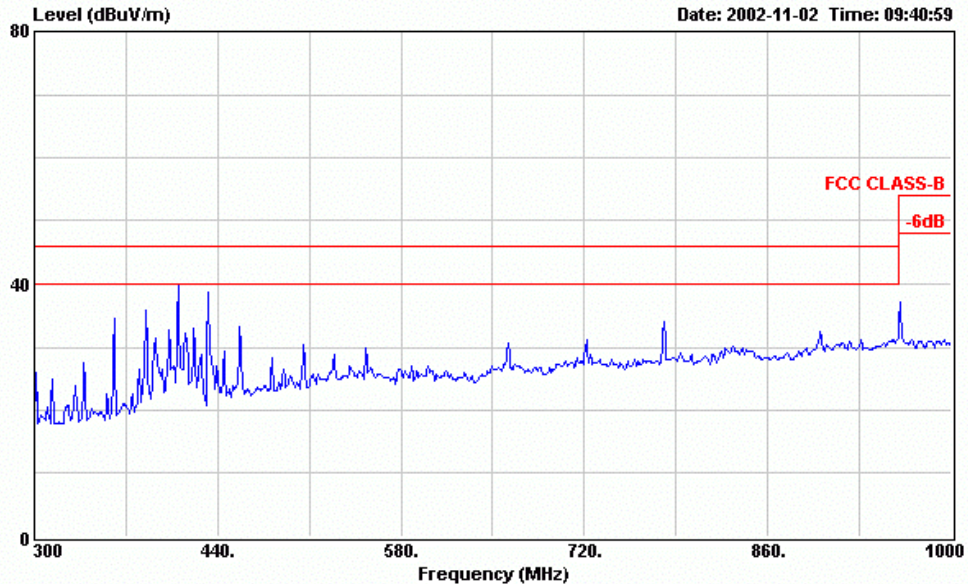
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Data#: 11 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A HORIZONTAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 98.0MHz
 ENVIRONMENT : 20*c/50%

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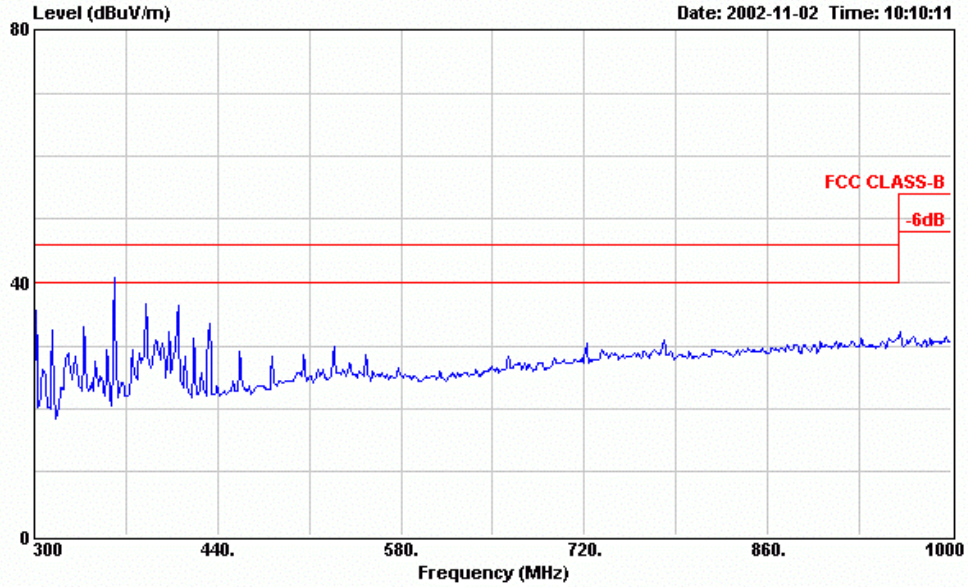
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 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A VERTICAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 98.0MHz
 ENVIRONMENT : 20*c/50%



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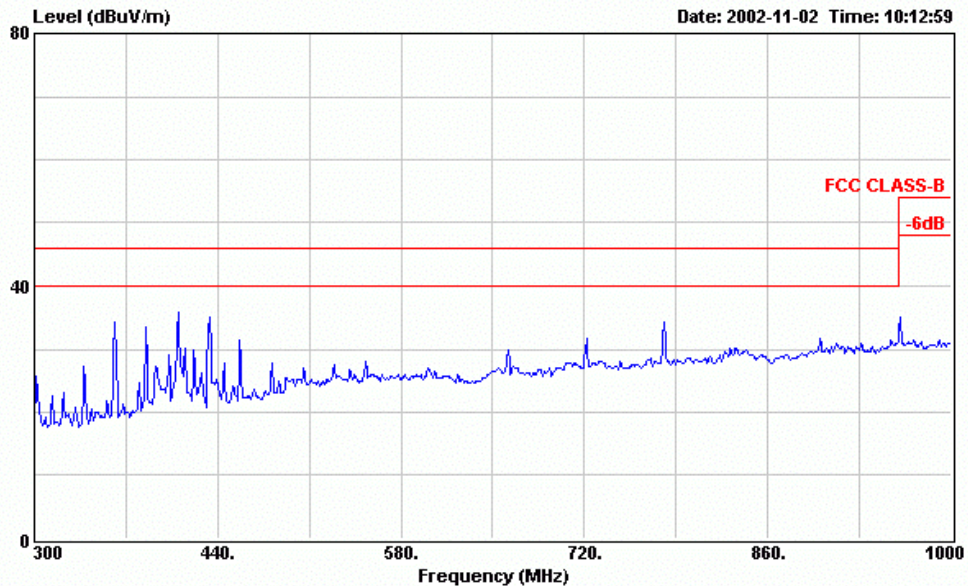
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Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A HORIZONTAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 107.0MHz
 ENVIRONMENT : 20*c/50%

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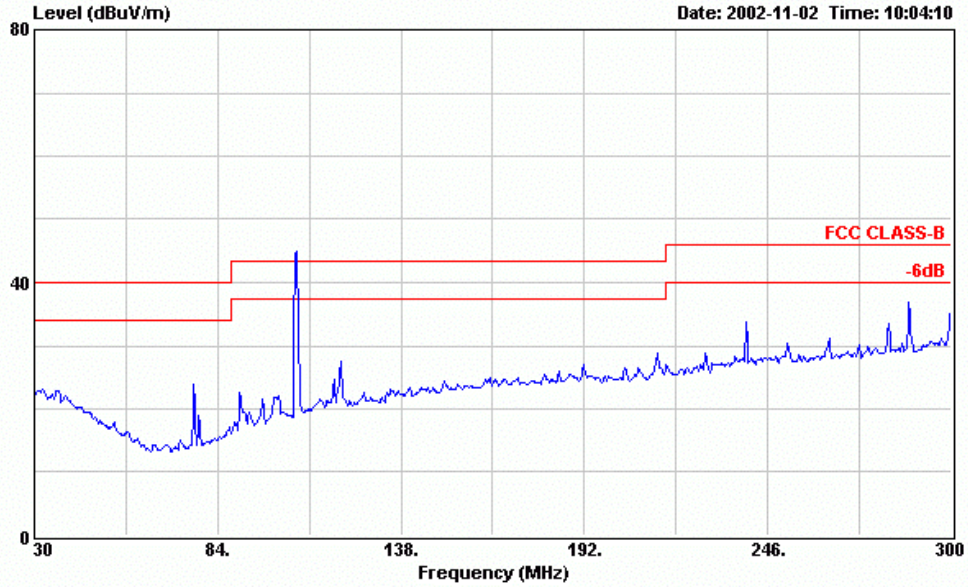
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 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A VERTICAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 107.0MHz
 ENVIRONMENT : 20*c/50%



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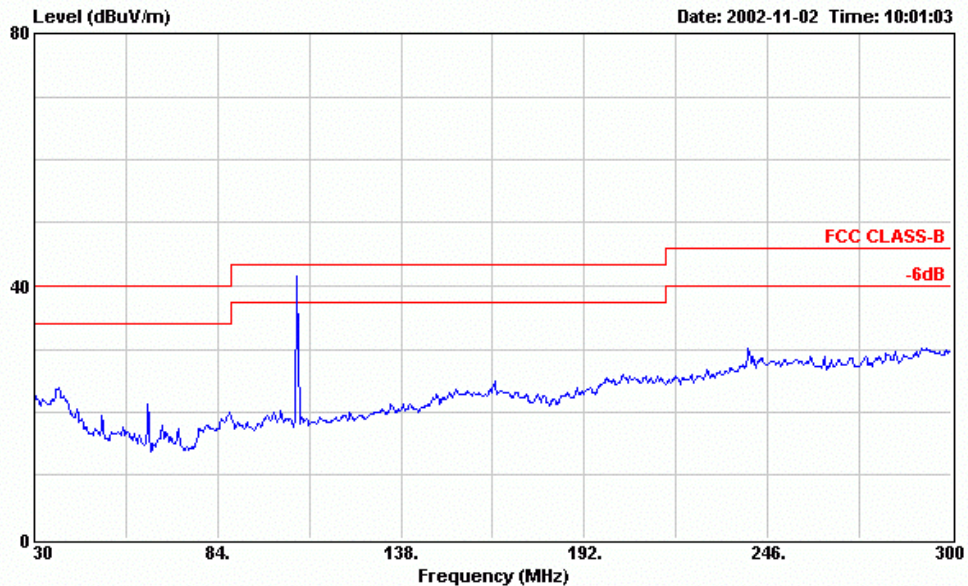
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 Email:ttemc@ttemc.com.tw

Data#: 16 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A HORIZONTAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 107.0MHz
 ENVIRONMENT : 20*c/50%

Data#: 15 File#: D:\Jow Tong.EMI



Site : Anechoic Chamber
 Condition : FCC CLASS-B 3m BBA9106B/UHALP9108A VERTICAL
 EUT : TRANSPAD M/N:ST-22
 POWER : DC 12V
 MEMO : 107.0MHz
 ENVIRONMENT : 20*c/50%