

Page 1 of 17

FCC PART 15, SUBPART C TEST REPORT

for

TUNEBASE FM

MODEL: F8Z341

Prepared for

BELKIN INTERNATIONAL, INC. 501 W. WALNUT STREET COMPTON, CA 90220-5221

Prepared by:_____

JOSH HANSEN

Approved by:_____

JEFF KLINGER

COMPATIBLE ELECTRONICS INC. 20621 Pascal Way LAKE FOREST, CA 92630 (949) 587-0400

DATE: November 7th 2008

	REPORT		APPENDICES			TOTAL	
	BODY	A	В	С	D	E	
PAGES	17	2	2	2	6	11	40

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TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	4
SUMMARY OF TEST RESULTS	4
1. PURPOSE	5
2. ADMINISTRATIVE DATA	6
2.1 Location of Testing	6
2.2 Traceability Statement2.3 Cognizant Personnel	6 6
2.4 Date Test Sample was Received	6
2.5 Disposition of the Test Sample	6
2.6 Abbreviations and Acronyms	6
3. APPLICABLE DOCUMENTS	7
4. Description of Test Configuration	8
4.1 Description Of Test Configuration - EMI	8
4.1.1 Cable Construction and Termination	9
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	10
5.1 EUT and Accessory List	10
5.2 EMI Test Equipment	11
6. TEST SITE DESCRIPTION	12
6.1 Test Facility Description	12
6.2 EUT Mounting, Bonding and Grounding	12
7. Test Procedures	13
7.1 RF Emissions	13
7.1.1 Conducted Emissions Test	13
 7.1.2 Radiated Emissions (Spurious and Harmonics) Test 7.1.3 Radiated Emissions (Spurious and Harmonics) Test (Continued) 	14 15
7.1.4 Peak radiated EMI	15
7.2 Bandwidth of the Fundamental	16
8. CONCLUSIONS	17

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LIST OF APPENDICES

APPENDIX	TITLE			
А	Laboratory Recognitions			
В	Modifications to the EUT			
С	Additional Models Covered Under This Report			
D	Diagrams, Charts, and Photos			
	Test Setup Diagrams			
	Radiated Emissions Photos			
	Antenna and Effective Gain Factors			
Е	Data Sheets			

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of 3 Meter Radiated Site

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested:	TuneBase FM Model: F8Z341 S/N: N/A
Product Description:	See Expository Statement
Modifications:	The EUT was not modified.
Manufacturer:	Belkin International, inc. 501 W. Walnut Street Compton, CA 90220-5221
Test Date:	October 28 th , 2008
Test Specifications:	CFR Title 47, Part 15 Subpart C, Sections 15.205, 15.209 and 15.239
Test Procedure:	ANSI C63.4: 2003
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 10 kHz – 1080 MHz	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, 15.239 (b), and 15.239 (c).
2	-20 dB Bandwidth of the Fundamental	Complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.239 (a).

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Page 5 of 17

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the TuneBase FM Model: F8Z341. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.239.



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Page 6 of 17

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way, Lake Forest, California 92630.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Belkin International, inc.

Daniel Wesey Compliance Engineer

Compatible Electronics, Inc.

Josh HansenTest EngineerJeff KlingerDirector of Engineering

2.4 Date Test Sample was Received

The test sample was received on October 28th 2008.

2.5 Disposition of the Test Sample

The sample has not yet been returned to Belkin International, inc. as of November 7th 2008.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
CLA	Cigar Lighter Adaptor
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

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The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE			
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)			
ANSI C63.4 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz			

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4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description Of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The TuneBase FM Model: F8Z341 (EUT) was connected to an Apple iPod via its integral 30-Pin Dock Connector. 12v DC was supplied via the EUT's integral CLA (Cigar Lighter Adaptor), which was connected to a CLA socket receptacle, which in turn was connected to a 12v battery. The EUT was receiving audio from the iPod and transmitting the audio in the FM band, the iPod and the music being played was provided by the customer, the song was Kenny G "Forever In Love". The EUT's transmit antenna (the flexible neck of the EUT) was soldered to the Radio PCB of the EUT, which is contained in the back of the CLA.

The low, middle, and high channels were investigated.

The final data was taken in the mode above. Please see Appendix E for the data sheets.

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4.1.1 Cable Construction and Termination

<u>Cable 1</u> The EUT has no cables. The EUT consists of a cradle for holding the iPod/iPhone, connected to a flexible "goose neck" that in turn plugs into your vehicle's cigar lighter or power plug.



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5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIALNUMBER	FCC ID
TUNEBASE FM (EUT)	BELKIN INTERNATIONAL, INC.	F8Z341	N/A	K7SF8Z341
iPod	Apple	A1136	JQ542XTQSZ9	N/A
12v Battery		N/A	N/A	N/A

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5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
	GENERAL TEST I	EQUIPMENT U	SED FOR ALL I	RF EMISSIONS TEST	Ϋ́S
Computer	Compatible Electronics	N/A	N/A	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	April 1, 2008	April 1, 2009
Monitor	ICS Advent	N/A	N/A	N/A	N/A
	RF RA	DIATED EMIS	SIONS TEST EQ	UIPMENT	
CombyLog Antenna	Com-Power	AC-220	001	Sept. 3, 2008	Sept. 3, 2009
Loop Antenna	Com-Power	AL-130	17085	Aug. 1, 2008	Aug. 1, 2010
Antenna Mast	Sunol Sciences Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Sciences Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Sciences Corporation	SC104V	020808-1	N/A	N/A

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6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT, iPod, and Cigar Lighter receptacle were mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was placed in the center, and on the back edge of the table, in accordance with ANSI c63.4:2003. The test site receive antenna distance was measured from the closest periphery of the EUT setup. Each accessory was placed 10cm to either side of the EUT. The battery was placed on the ground, using an 80cm length of wire to connect to a cigar lighter receptacle, which was mounted on the table.

The EUT and accessories were investigated for worst case placement; the above yielded the worst case configuration.

The EUT was not grounded.

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7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

- 7.1 **RF Emissions**
- 7.1.1 Conducted Emissions Test

EUT is DC powered, this test was not performed.

Test Results:

Test not performed.

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7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The receiver was used as a measuring meter along with the quasi-peak adapter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps.

The frequencies above 1 GHz and the fundamental for the low, middle, and high channels were investigated with the built in average detector.

The measurement bandwidths and transducers used for the radiated emissions (Spurious) tests were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER	
9 kHz to 150 kHz	200 Hz	Active Loop Antenna	
150 kHz to 30 MHz	9 kHz	Active Loop Antenna	
30 MHz to 1 GHz	120 kHz	CombiLog Antenna	
1 GHz to 1.08 GHz	1 MHz	CombiLog Antenna	

The Semi-Anechoic test site of Compatible Electronics, Inc, Lab P, was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Final data was collected in the worst case (highest emission) configuration of the EUT (Y Axis – Channel 88.1MHz). At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). When applicable, the gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

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7.1.3 Radiated Emissions (Spurious and Harmonics) Test (Continued)

The emissions from the EUT were investigated with the EUT oriented in each of three axes, X, Y and while operated on each of three channels, 88.1MHz, 97.8MHz and 107.9MHz. The EUT was receiving a 0dB encoded file from the audio source. This file represents maximum audio input level. The EUT was tested at a 3-meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.239.

7.1.4 Peak radiated EMI

The EUT was tested at a 3-meter test distance to obtain the final test data. The EUT was maximized for position, testing in X, Y, and Z axis to determine worst case. The EUT was receiving a 0dB encoded file from the audio source. This file represents maximum audio input level. The resolution bandwidth was 100 KHz and video bandwidth 300 KHz. The final qualification data sheets are located in Appendix E. This data also shows compliance at the band edges.

Test Results:

The EUT complies with Part 15, Subpart C, section15.239.

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7.2 Bandwidth of the Fundamental

The -20 dB bandwidth was checked using the EMI Receiver to see that it was wholly within the 200 kHz band centered on the operating frequency. The RBW was set to 10 kHz and the VBW was set to 30 kHz, but no less than 3kHz RBW and 10kHz VBW. The low, middle, and high channels were investigated. Plots of the -20 dB bandwidth are located in Appendix E.

Test Results:

The EUT complies with the requirements of CFR Title 47, Part 15, Subpart C, section 15.239 (a) for the -20 dB bandwidth of the fundamental. The EUT has a -20 dB bandwidth that is wholly within the 200 kHz band centered on the operating frequency.



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8. CONCLUSIONS

The TuneBase FM Model: F8Z341 meets all of the specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.239 for the transmitter portion.



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APPENDIX A

LABORATORY RECOGNITIONS

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LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200527-0

Voluntary Control Council for Interference - Registration Numbers: R-2848, C-3142, T-1450

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Industry Canada Site Number: 2154C-1

> Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500

Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600 Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700





APPENDIX B

MODIFICATIONS TO THE EUT

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MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.239 or FCC Class B specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT.

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APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

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ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

TuneBase FM Model: F8Z341 S/N: None

Additional Model Numbers: NO ADDITIONAL MODELS

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APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

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FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED TEST SITE

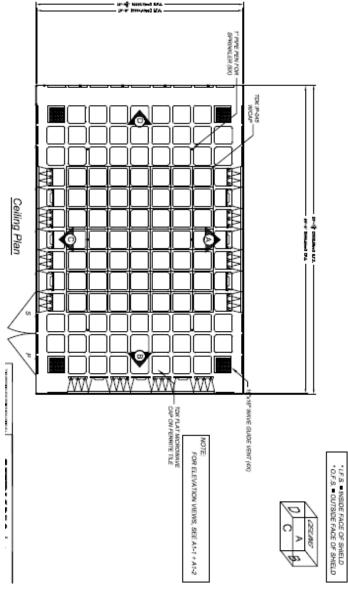


Figure 1TDK FAC-3 test chamber

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COM-POWER AC-220

COMBYLOG ANTENNA

S/N: 001

CALIBRATION DATE: 9/3/08

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(MHz)	(dB)	(MHz)	(dB)
20.0	22.1	300.0	14.9
25.0	21.1	400.0	16.5
30.0	20.6	500.0	18.5
40.0	19.8	700.0	21.1
50.0	19.0	900.0	23.2
60.0	13.8	1000.0	24.6
70.0	9.6	1100.0	24.8
80.0	8.7	1300.0	24.9
100.0	11.6	1500.0	27.2
150.0	9.4	1700.0	27.2
200.0	10.8	2000.0	29.0
250.0	14.9	2100.0	29.0

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COM-POWER AL-130

LOOP ANTENNA

S/N: 17085

CALIBRATION DATE: 8/1/08

FREQUENCY	MAGNETIC	ELECTRIC	FREQUENCY	MAGNETIC	ELECTRIC
(MHz)	(dB / m)	(dB / m)	(MHz)	(dB / m)	(dB / m)
0.009	-43	8.5	0.8	-41.53	9.97
0.01	-41.93	9.57	0.9	-41.46	10.04
0.02	-41.29	10.21	1	-41.29	10.21
0.03	-40.73	10.77	2	-40.97	10.53
0.04	-41.03	10.47	3	-41.1	10.4
0.05	-42.37	9.13	4	-41.36	10.14
0.06	-41.6	9.9	5	-40.93	10.57
0.07	-41.96	9.54	6	-40.67	10.83
0.08	-42.1	9.4	7	-41.07	10.43
0.09	-41.83	9.67	8	-40.9	10.6
0.1	-41.83	9.67	9	-40.1	11.4
0.2	-44.46	7.04	10	-41.16	10.34
0.3	-41.73	9.77	15	-47.97	3.53
0.4	-41.8	9.7	20	-40.77	10.73
0.5	-41.8	9.7	25	-44.37	7.13
0.6	-41.33	10.17	30	-43.1	8.4
0.7	-41.36	10.14			

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Report Number: D81028P1 FCC Part 15 Subpart C Section 15.239 Test Report TuneBase FM - FCC ID: K7SF8Z341 Model: F8Z341



BACK VIEW (Y Axis)

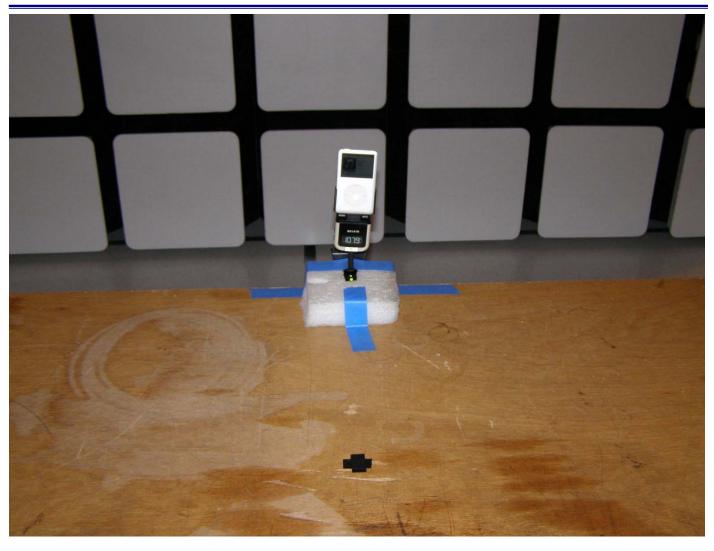
BELKIN INTERNATIONAL, INC. TUNEBASE FM MODEL: F8Z341 FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

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Report Number: D81028P1 FCC Part 15 Subpart C Section 15.239 Test Report TuneBase FM - FCC ID: K7SF8Z341 Model: F8Z341



FRONT VIEW (Close-up Y-Axis)

BELKIN INTERNATIONAL, INC. TUNEBASE FM MODEL: F8Z341 FCC SUBPART B AND C – EUT Close-up

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

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Page D6



APPENDIX E

DATA SHEETS

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RADIATED EMISSIONS

SPURIOUS AND HARMONICS

DATA SHEETS

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Title: FCC 15.239 File: Radiated Final 30-1080Mhz.set Operator: Josh Hansen EUT Type: TuneBase FM 5 (F8Z341) EUT Condition: Y-Axis Channel 88.1MHz (Worst Case) Comments: Playing Kenny G Forever in Love Temp: 64f Hum: 59%

10/28/2008 4:29:28 PM Sequence: Final Measurements

Compatible Electronics, Inc

Freq	(QP) Margin	(QP) EMI	(PEAK) EMI	Limit	Pol	Ttbl Agl	Twr Ht
(MHz)	(dB)	(dB_V/m)	(dB_V/m)	(dB_V/m)		(deg)	(cm)
30.40	-15.27	24.73	29.23	40.00	V	41.25	257.05
31.40	-16.89	23.11	27.82	40.00	Н	36.00	207.11
724.50	-17.18	28.82	34.57	46.00	V	360.00	337.52
786.70	-17.17	28.83	33.67	46.00	Н	355.25	288.64
807.80	-17.43	28.57	33.90	46.00	V	242.75	268.41
965.40	-21.54	32.46	35.59	54.00	V	162.50	159.94
1014.90	-21.15	32.85	37.05	54.00	V	205.00	213.88
1064.30	-21.65	32.35	36.12	54.00	V	185.00	204.64
1073.50	-25.68	28.32	33.66	54.00	Н	84.00	216.64

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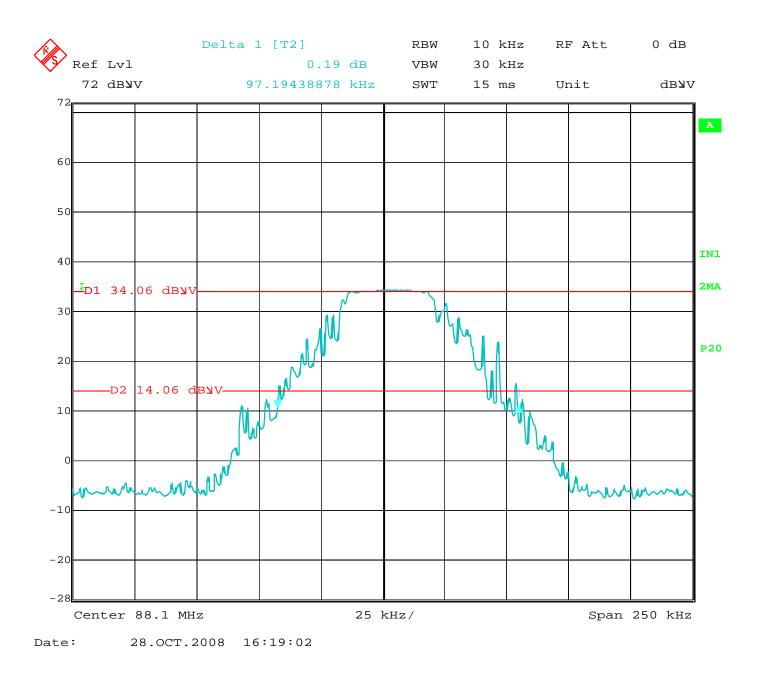


-20 dB BANDWIDTH

DATA SHEETS

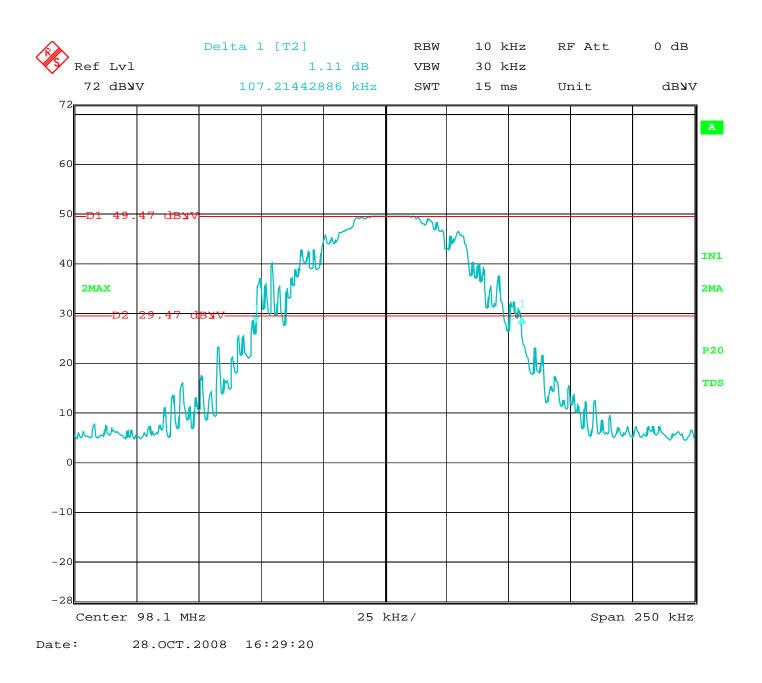
Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500 Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600 Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700





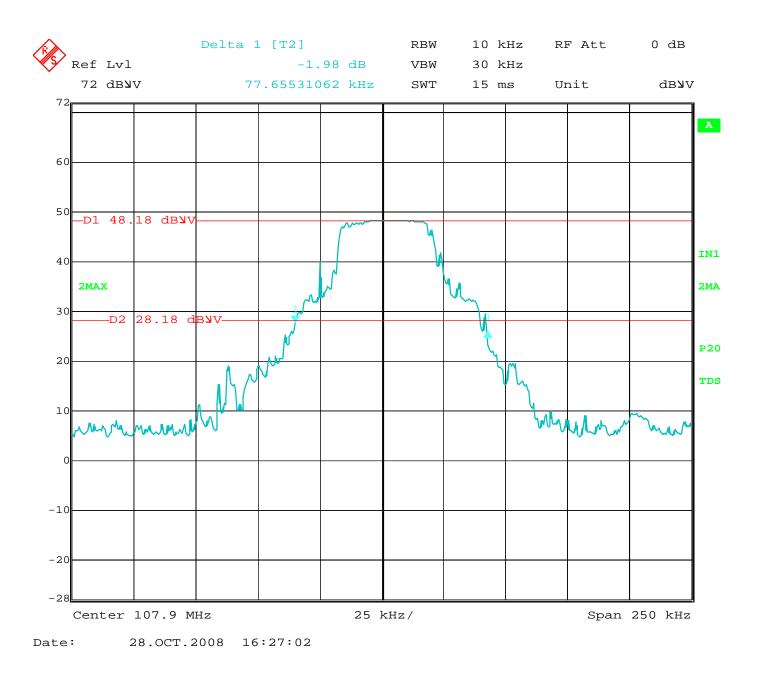
Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600 Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700





Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600 Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700





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PEAK TRANSMIT EMI and BAND EDGE

DATA SHEETS

Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500 Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600 Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700



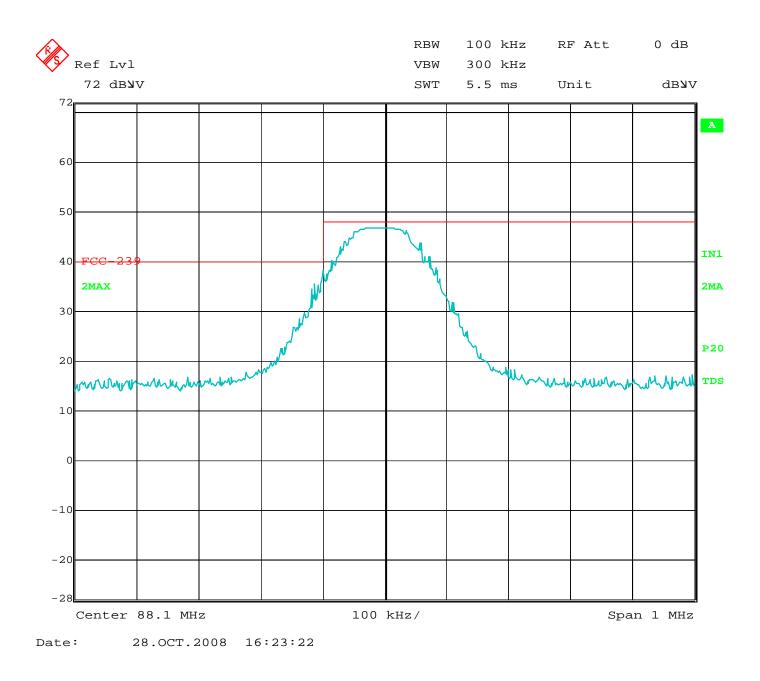
Title: FCC 15.239 File: Final 15.239.set Operator: Josh Hansen EUT Type: TuneBase FM 5 (F8Z341) EUT Condition: Y-Axis (Worst Case) Comments: Temp: 66 Hum: 54% 10/28/2008 12:19:25 PM Sequence: Final Measurements

Compatible Electronics, Inc. FAC-3

Freq (MHz)	(AVG) Margin (dB)	(AVG) EMI (dB_V/m)	(PEAK) EMI (dB_V/m)	Limit (dB_V/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)
(11112)		(db_v/m)				(deg)	(only
88.10	-10.31	37.64	39.22	47.95	Н	272.75	176.29
88.10	-4.86	43.09	46.68	47.95	V	257.75	151.29
98.10	-21.47	26.48	30.50	47.95	Н	360.50	151.29
98.10	-0.03	47.92	51.08	47.95	V	263.50	150.52
107.90	-13.61	34.34	35.86	47.95	Н	125.50	171.88
107.90	-2.30	45.65	47.45	47.95	V	291.00	151.17

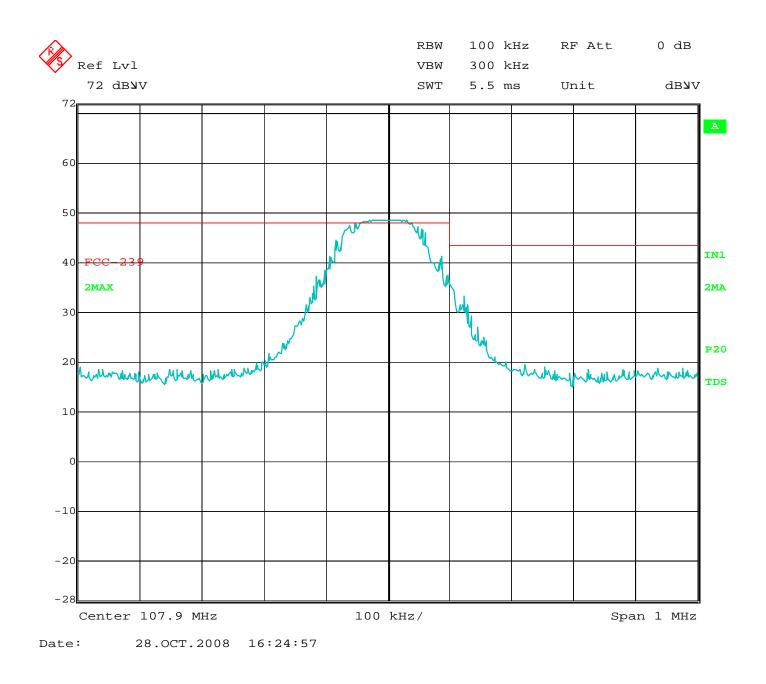
Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500 Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600 Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700





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