FCC COMPLIANCE REPORT

Order No. : **STE-05-0858**
Reference No. : **F690501/LF-EMC001086**
Applicant : **Fine Digital Inc.**
Address of Applicant : **7F, FineVenture Bldg. 345-1, YaTap-Dong, BunDang-Gu, SeongNam-Si, KyongGi-Do, Korea**
Manufacturer : **Fine Digital Inc.**
Address of Manufacturer : **7F, FineVenture Bldg. 345-1, YaTap-Dong, BunDang-Gu, SeongNam-Si, KyongGi-Do, Korea**

Equipment Under Test (EUT) :

Name : Card Navigation
Model No. : FINEDRIVE 400
Serial No. : None

Standards : FCC Part 15, Subpart B, Subpart C.
ANSI C63.4:2003

Date of Receipt : **19 Aug 2005**
Date of Test : **23 Aug 2005**
Date of Issue : **24 Aug 2005**

Test Result :	**PASS**

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 shall not be reproduced except in full, without the written approval of the laboratory. 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.

Carl Lee
EMC DIV. Manager
SGS Testing Korea Co., Ltd.

Contents

1. General Information

1.1 Applicant & Manufacturer Information

Applicant : Fine Digital Inc.
Address of Applicant : 7F, FineVenture Bldg. 345-1, YaTap-Dong, BunDang-Gu, SeongNam-Si, KyongGi-Do, Korea
Manufacturer : Fine Digital Inc.
Address of Manufacturer : 7F, FineVenture Bldg. 345-1, YaTap-Dong, BunDang-Gu, SeongNam-Si, KyongGi-Do, Korea

1.2 General Description of EUT

Product Name : Card Navigation
Model No. : FINEDRIVE 400
Serial No : None

1.3 Details of EUT

Tested Power Supply : AC 120V, 60Hz
Port : DC IN, USB, Memory, I/O
Description of Operating : Connect to the PC, then load the data from PC.

1.4 Description of Support Units

Product	Model No.	Serial No.	Manufacturer
NOTE PC	Tecra M4	N/A	Toshiba Corporation
DC Power Supply	6237B	N/A	H.P

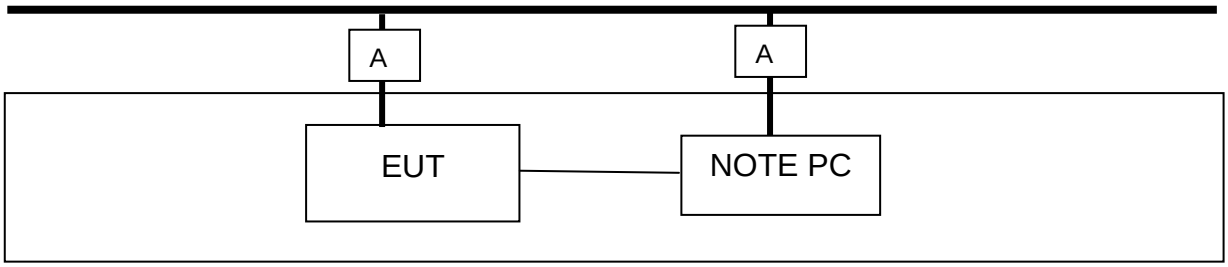
1.5 Cable List

Start		END		Cable Spec	
Name	I/O Port	Name	I/O Port	Length	Shield
PC	USB	NOTE PC	USB	1.5	Shielded
	DC IN	DC Power Supply	COM/20V	1.0	Unshielded
NOTE PC	USB	EUT	USB	1.5	Shielded
	DC IN	ADAPTER	DC OUT	1.2	Unshielded
Adapter	DC OUT	NOTE PC	DC IN	1.2	Unshielded
	AC IN	LISN	-	1.2	Unshielded

1.6 System Configuration

Description	Model	Serial No.	Manufacturer
Main Board	N/A	4105071-02204	N/A
GPS MODUL	N/A	N/A	N/A
LCD PANEL	LB040Q02	04056D1206206 B11	LG. PHILIPS LCD
GPS ANT	N/A	N/A	N/A
FM TRANSMITTER	WDFD-F400	N/A	N/A

1.7 Test Set-Up Configuration



1.8 Measurment Procedure

Conducted Emission Testing was performed according ANSI C63.4:2003 in a shielded room with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded room wall.

Radiated Emission Testing was performed according to ANSI C63.4:2003 at the open field test site. The EUT was placed in a 0.8m high table along with the peripherals. The turn table was separated from the antenna distance 10meters. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for maximum.
The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Reported are maximized emission levels.

1.9 Standards Applicable for Testing

Table of tests to be carried out under FCC Part 15

Test Standards	Status
FCC Part 15	Applicable
Deviation from Standard	No Deviation

1.10 Summary of Results

The data collected shows that Model **FINEDRIVE 400** complies with of the FCC Part 15.

The highest emission level observed was at 0.28MHz for Q/P mode conducted emission with a margin of 17.0dB and at 0.28MHz for AV mode conducted emission with a margin of 13.3dB and at 148.67MHz radiated emission with a margin of 11.69dB.

Radio Disturbance

2.1 Test Results

	Results
Conducted Emission	**PASS**
Radiated Emission	**PASS**

2.2 Frequency Range

Conducted Emission : 150 kHz - 30 MHz

Radiated Emission : 30 MHz - 1000 MHz

2.3 Limits Of Conducted And Radiated Emission

2.3.1 Limit Of Conducted Emission Of FCC Part 15

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi - peak	Average	Quasi - peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note : (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected there to, shall not exceed the level of field strengths specified above.

2.3.2 Limit Of Radiated Emissions Of FCC Part 15

FREQUENCY (MHz)	Class A (at 10m)*	Class B (at 10m)*
	dBuV/m	dBuV/m
30-230	40	30
230-1000	47	37

* Detector Function : Quasi - Peak

2.3.3 Limit Of Disturbance Radiation Antenna Of FCC Part 15

FREQUENCY (MHz)	Limits Db(μV)	
	Source	Quasi-Peak
30 to 88	FUNDAMENTAL /HARMONICS	39.0
88 to 216	FUNDAMENTAL /HARMONICS	43.5
216 to 960	FUNDAMENTAL /HARMONICS	46.5
Above 960	FUNDAMENTAL /HARMONICS	54

2.4.Test of Conducted Emission

2.4.1 Test Equipments

Equipment	Manufacturer	Model No.	Date of Calibration
Test Receiver	ESPC	R/S	Dec. 2004
LISN	3825/2	EMCO	Dec. 2004
Pulse Limiter	ESH3-Z2	R/S	Jul. 2004
Shielded Room	N/A	-	-

2.4.2 Test Site

Name and address : SGS Testing Korea Co., Ltd.
18-34, Sanbon-dong, Gunpo, Gyeonggi-do, Korea, 435-041

2.4.3 Operating Environment

Temperature : 25.6 degree C Humidity : 38.0 %RH
Atmospheric Pressure : 99.6 mBar

2.4.4 Measurement Data

Measurment Bandwidth : 9kHz

Date of Test : 23 Aug 2005

FREQ.	LEVEL(dBμV)		LIMIT(dBμV)		MARGIN(dBμV)	
(MHz)	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.15	44.9	39.4	66.0	56.0	21.1	16.6
0.17	42.2	37.4	65.0	55.0	22.8	17.6
0.20	40.8	35.9	63.6	53.6	22.8	17.7
0.23	39.4	34.5	62.5	52.4	23.1	17.9
0.26	38.1	33.2	61.4	51.4	23.3	18.2
0.28	43.8	37.5	60.8	50.8	17.0	13.3

See Appendix A (Test Data of Hot Line)
See Appendix B (Test Data of Neutral Line)

* *Measurements using CISPR quasi-peak mode*

See - Ho, Lee / Test Engineer

2.5 Test of Radiated Emission

2.5.1 Test Instruments

Description	Manufacturer	Model No.	Date of Calibration
Test Receiver	ESVS30	R & S	Jan. 2005
Bilog Antenna	CBL6111C	Schaffner	Apr. 2005
RF Select s/w	CX-210N	DIAMOND ANTENNA	-
Open Site	N/A	N/A	Feb. 2005

2.5.2 Test Site

Name and address : SGS Testing Korea Co., Ltd.
18-34, Sanbon-dong, Gunpo, Gyeonggi-do, Korea, 435-041

2.5.3 Operating Environment

Temperature : 28.9 degree C Humidity : 35.5 %RH
Atmospheric Pressure : 99.8 mBar

2.5.4 Measurement Data

Measurment Bandwidth : 120kHz

Date of Test : 23 Aug 2005

SYNC MODE

FREQ. (MHz)	LEVEL (dBμV)	POL (H/V)	AF (dB)	CL (dB)	F/S (dBμV/m)	LIMIT (dBμV/m)	MARGIN (dBμV)
52.34	8.4	V	7.85	1.45	17.70	30.0	12.30
85.60	6.3	V	8.49	1.46	16.24	30.0	13.76
148.67	5.3	H	11.21	1.80	18.31	30.0	11.69
154.24	5.7	H	10.88	1.72	18.30	30.0	11.70
185.74	6.2	H	8.72	2.00	16.92	30.0	13.08
202.38	5.8	H	8.80	2.01	16.62	30.0	13.38

** AF = Antenna Factor. ** CL = Cable Loss. *** Margin=Each Frequency Limit Level(dBuV)-(Level+AF+CL)*

NAVI MODE

FREQ. (MHz)	LEVEL (dBμV)	POL (H/V)	AF (dB)	CL (dB)	F/S (dBμV/m)	LIMIT (dBμV/m)	MARGIN (dBμV)
200.00	15.2	H	8.63	2.00	25.83	30.0	4.17
283.34	14.0	H	12.82	2.63	29.45	37.0	7.55
300.01	13.7	H	13.10	2.80	29.60	37.0	7.40
316.67	16.2	H	13.57	2.77	32.54	37.0	4.46
333.34	13.5	H	14.05	2.73	30.28	37.0	6.72
366.67	13.8	H	14.92	2.67	31.38	37.0	5.62

** AF = Antenna Factor. ** CL = Cable Loss. *** Margin=Each Frequency Limit Level(dBuV)-(Level+AF+CL)*

FM MODE

FREQ. (MHz)	LEVEL (dBμV)	POL (H/V)	AF (dB)	CL (dB)	F/S (dBμV/m)	LIMIT (dBμV/m)	MARGIN (dBμV)
88.50	18.2	V	8.85	1.49	28.54	48.0	19.46
98.00	20.4	V	9.82	1.34	31.56	48.0	16.44
196.00	19.6	V	8.65	2.00	30.25	43.5	13.25
294.03	13.1	V	13.00	2.74	28.84	46.5	17.66
107.50	25.4	V	10.59	1.34	37.33	48.0	10.67
215.01	11.9	V	9.72	2.09	23.71	43.5	19.79
322.49	17.7	V	13.74	2.76	34.19	46.5	12.31

** AF = Antenna Factor. ** CL = Cable Loss. *** Margin=Each Frequency Limit Level(dBuV)-(Level+AF+CL)*

See Appendix C (200kHz Bandwidth of Lowest Operating Frequency)
See Appendix D (200kHz Bandwidth of Highest Operating Frequency)

See – Ho, Lee / Test Engineer

3. Photographs of Test

- **Front View of Conducted Emission**

- **Rear View of Conducted Emission**

- **Front View of Radiated Emission(SYNC MODE)**

- **Rear View of Radiated Emission(SYNC MODE)**

- **Front View of Radiated Emission(NAVI MODE)**

- **Rear View of Radiated Emission(NAVI MODE)**

- **Front View of Radiated Emission(FM MODE)**

- **Rear View of Radiated Emission(FM MODE)**

4. Photographs of Product

- **Front View**

- **Rear View**

- **Inside View**

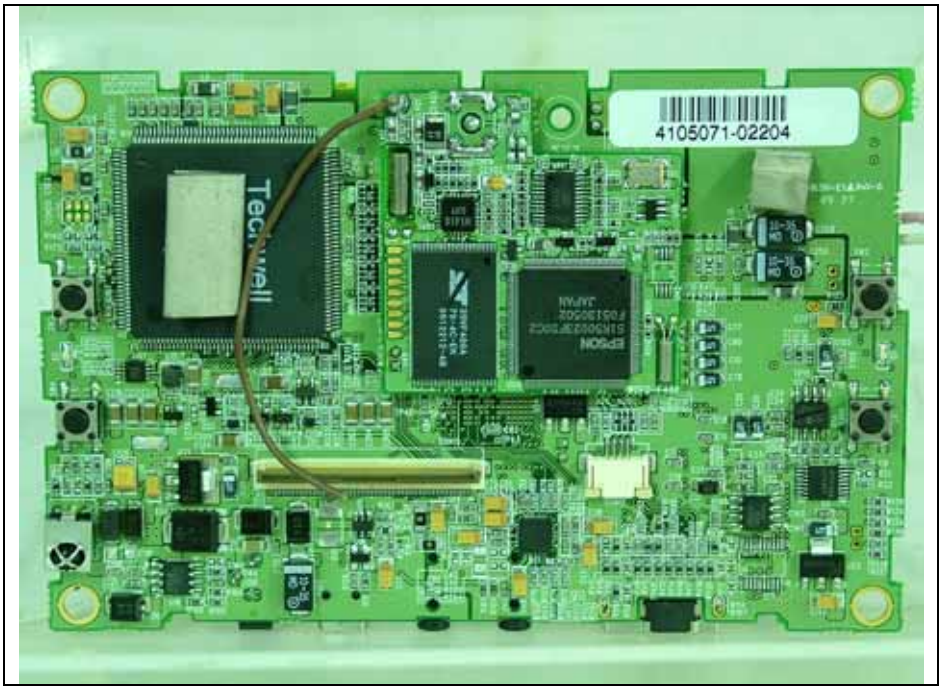
- **Front View of GPS Antenna**

- **Rear View of GPS Antenna**

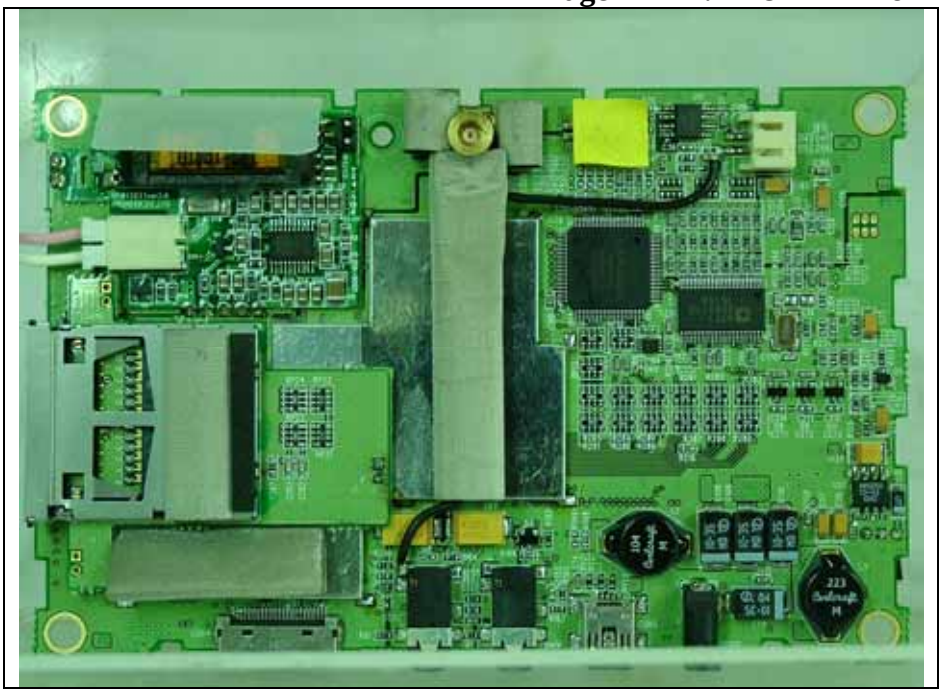
- **Front View of LCD Panel**

- **Rear View of LCD Panel**

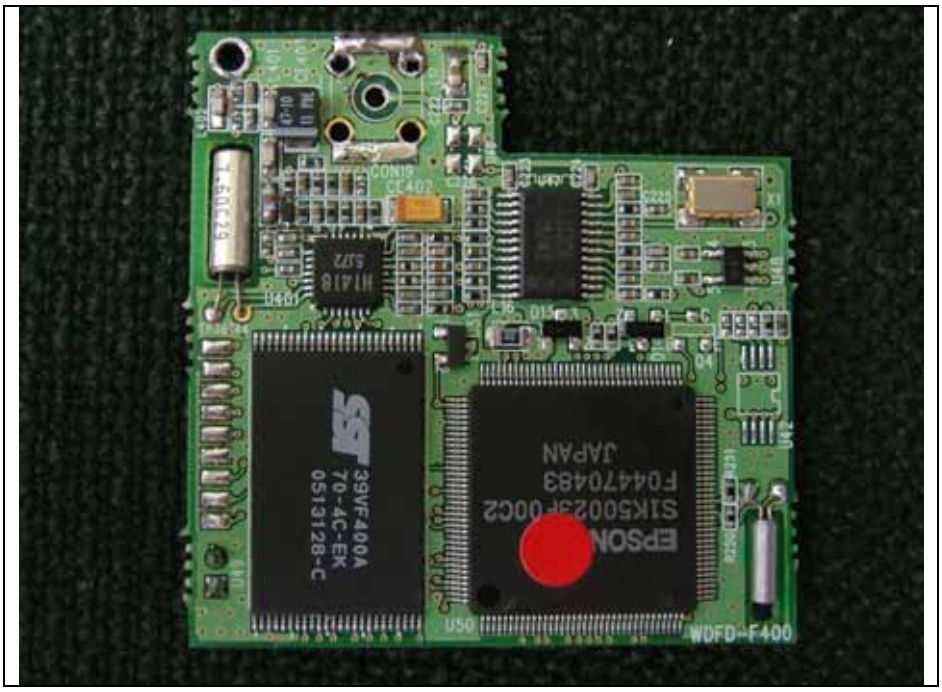
- **Front View of Mine Board**



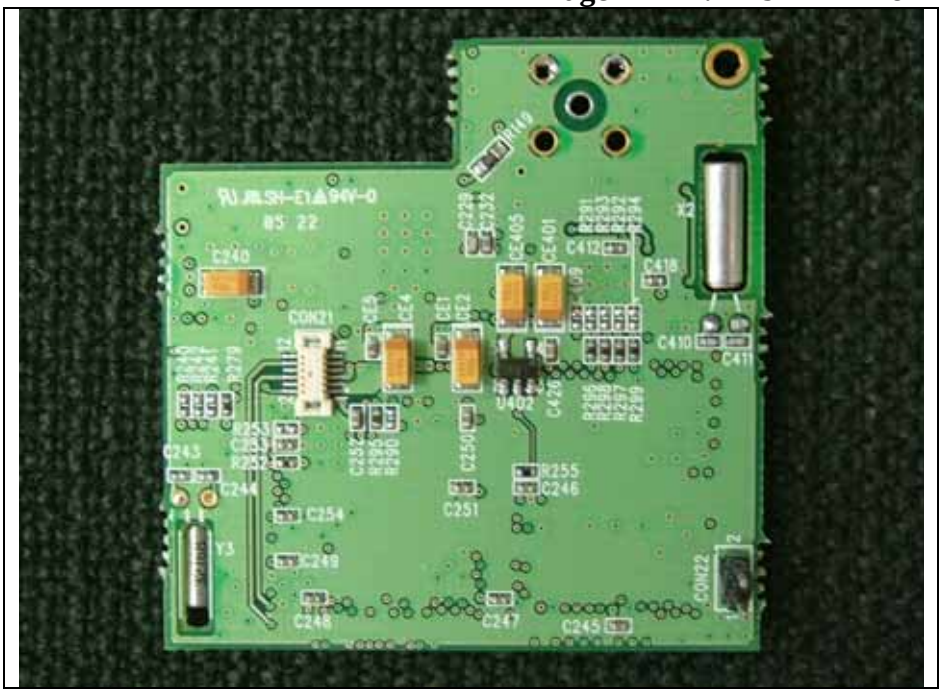
- **Rear View of Mine Board**



- **Front View of FM TRANSMITTER**



- **Rear View of FM TRANSMITTER**



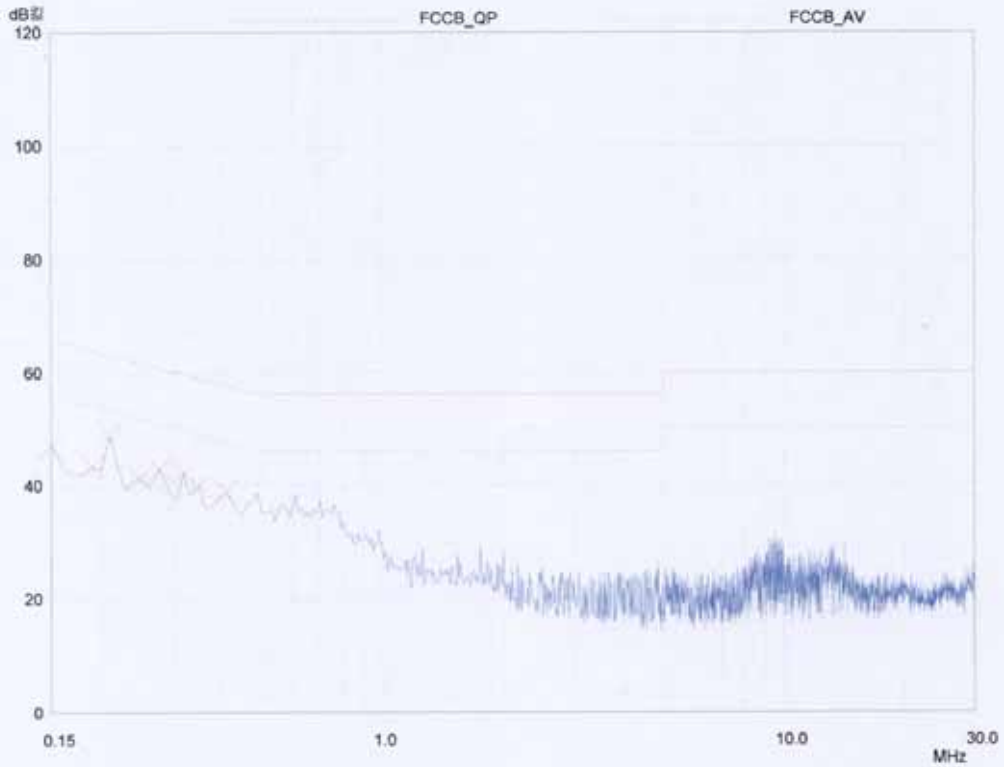
Appendix A : Mains Terminal Continuous Disturbance Voltage Test Data

Fine Digital Inc.
FINEDRIVE 400

EUT:	Car Navigation
Manuf:	Fine Digital Inc.
Op Cond:	HOT
Operator:	E.J.CHOI
Test Spec:	FCC Part 15
Comment:	

File: e0858h.dat : New Measurement

Prescan Measurement: X PK
Meas Time: see scan settings
Peaks: 8
Acc Margin: 25 dB



Appendix B : Mains Terminal Continuous Disturbance Voltage Test Data

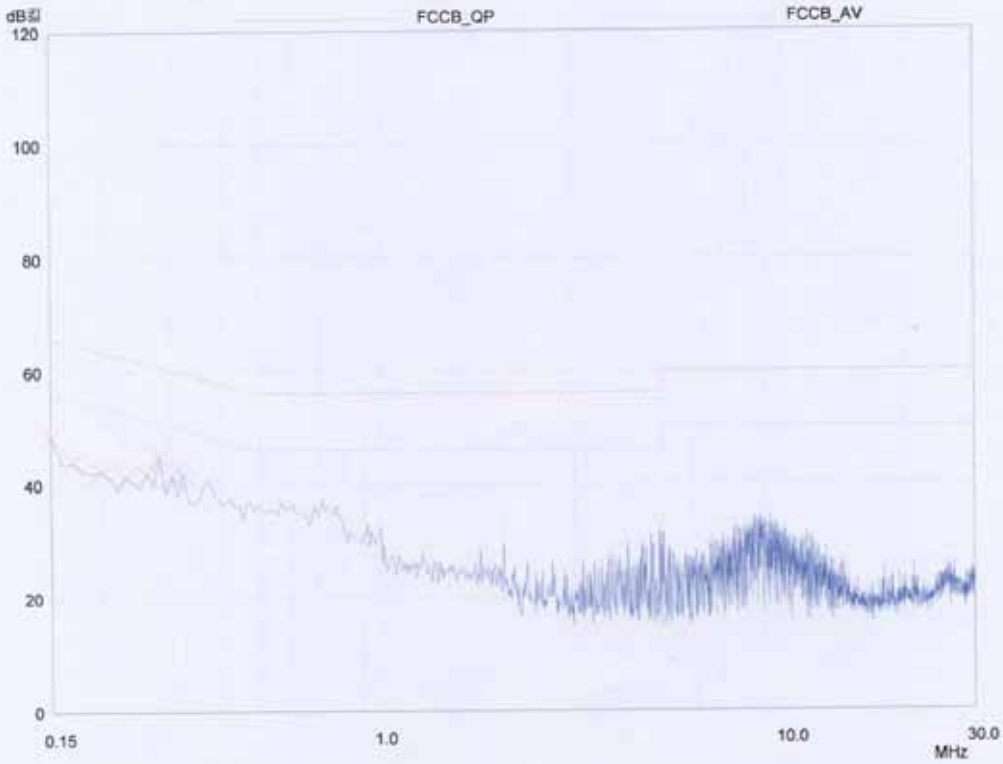
Fine Digital Inc.
FINEDRIVE 400

EUT:	Car Navigation
Manuf:	Fine Digital Inc.
Op Cond:	NEUTRAL
Operator:	E.J.CHOI
Test Spec:	FCC Part 15
Comment:	

File: E0858N.dat : New Measurement

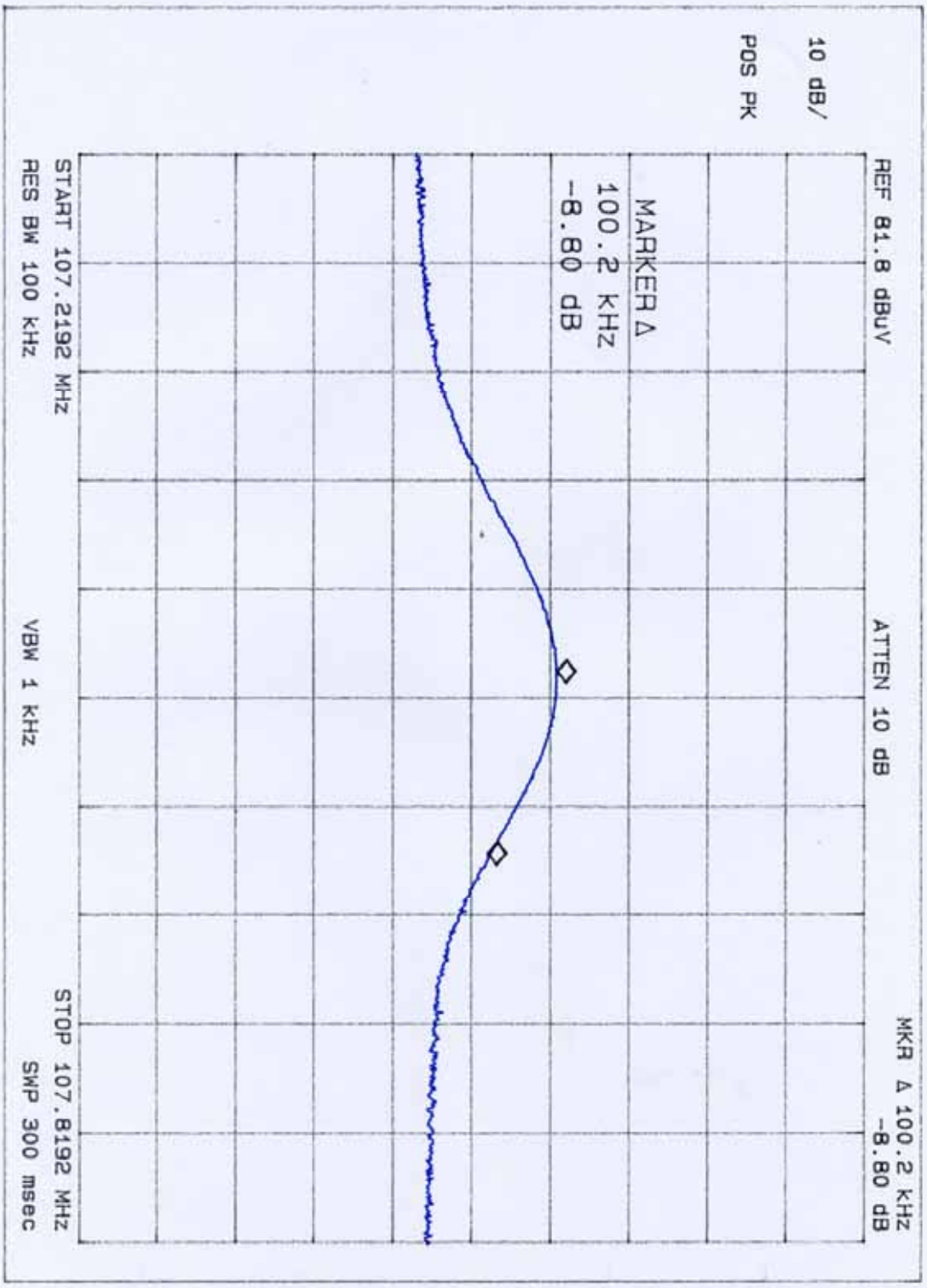
Prescan Measurement: X PK

Meas Time:	see scan settings
Peaks:	8
Acc Margin:	25 dB



Appendix C : 200kHz Bandwidth of Lowest Operating Frequency

Appendix D : 200kHz Bandwidth of Highest Operating Frequency


REF 81.8 dBuV
ATTEN 10 dB
MKR Δ 100.2 kHz
-8.80 dB
10 dB/
POS PK
MARKER Δ
100.2 kHz
-8.80 dB
START 107.2192 MHz
RES BW 100 kHz
VBW 1 kHz
STOP 107.8192 MHz
SWP 300 msec