DIGITAL EMC CO., LTD.

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CERTIFICATION OF COMPLIANCE

Telian Corporation
5th FL. Namjeun bldg, 53-3 Haan-Dong, Kwangmyung-Si,
Kyunggi-Do, Korea, 423-060

Dates of Tests: January 2 ~ 5, 2006
Test Report S/N: DR50110601B
Test Site : DIGITAL EMC CO., LTD.

FCC ID **NPQRFM2000L**

APPLICANT **Telian Corporation**

FCC Classification	:	**Part 15 Low Power Communication Device Transmitter**
Device name	:	**900MHz Transmitter**
Manufacturer	:	**Telian Corporation**
FCC ID	:	**NPQRFM2000L**
Model name	:	**RFM2000L**
Add Model name	:	**FCS-8900 / FGD-8900 / Avvio 8000 / Avvio 9000**
Test Device Serial number	:	**Identical prototype**
FCC Rule Part(s)	:	**FCC Part2 and Part15 SubpartC(15.249)**
Frequency Range	:	**918 ~ 921MHz**
Data of issue	:	**January 10, 2006**

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

NVLAP LAB CODE 200559-0

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1. General information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".
This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200559-0.

Test operator: engineer

Data	Name	Signature
January 10, 2006	Won-Jung LEE	

Report Reviewed By: manager

Data	Name	Signature
January 10, 2006	Harvey Sung	

Ordering party:

Company name	:	TELIAN CORPORATION
Address	:	5th FL. Namjeun bldg, 53-3 Haan-Dong, Kwangmyung-Si
Zip code	:	423-060
City/town	:	Kyunggi-Do
Country	:	KOREA
Date of order	:	December 27, 2005

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2. Information about test item

NPQRFM2000L

2.1 Equipment information

Equipment model name	RFM2000L
Add Equipment model name	FCS-8900 / FGD-8900 / Avvio 8000 / Avvio 9000
Type of equipment	900MHz Transmitter
Frequency band	918 ~ 921MHz TX
Type of Modulation	FSK
Channel Spacing	200 kHz
Type of antenna	Line Antenna
AC/DC Adaptor	Output: 5Vdc, 500mA

2.2 Tested frequency

Frequency	TX
Low frequency	918 MHz
High frequency	921 MHz

2.3 Tested environment

Temperature	:	15 ~ 35 (^{o}C)
Relative humidity content	:	20 ~ 75 %
Air pressure	:	86 ~ 103 kPa
Details of power supply	:	120 VAC, 60Hz 220 VAC, 50Hz (Adaptor: POD-41050500)

2.4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
1. AC/DC Adaptor	RGD-4105500	N/A	Ron Ger Electric
4. AC/DC Adaptor	3A-031WU05	N/A	ENG
GSM Phone	FCS-8900	N/A	Telian Corp.

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing -> none

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3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
I. Transmit mode(Tx)				
15.249	Field Strength Limits(Fundamental)	Refer to the FCC 15.249(a)	Radiated	C
15.209	Radiated emission limits (Spurious and harmonics)	< FCC 15.209 limits	Radiated	C
15.207	AC Conducted Emissions	< FCC 15.207 limits	Line Conducted	C
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable				

The sample was tested according to the following specification:

FCC Parts 15.249; ANSI C-63.4-2003

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3.2 Transmitter requirements

3.2.1 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- No other emissions were detected at a level greater than 10dB below limit.
- Refer to the next page.

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

Measurement Setup

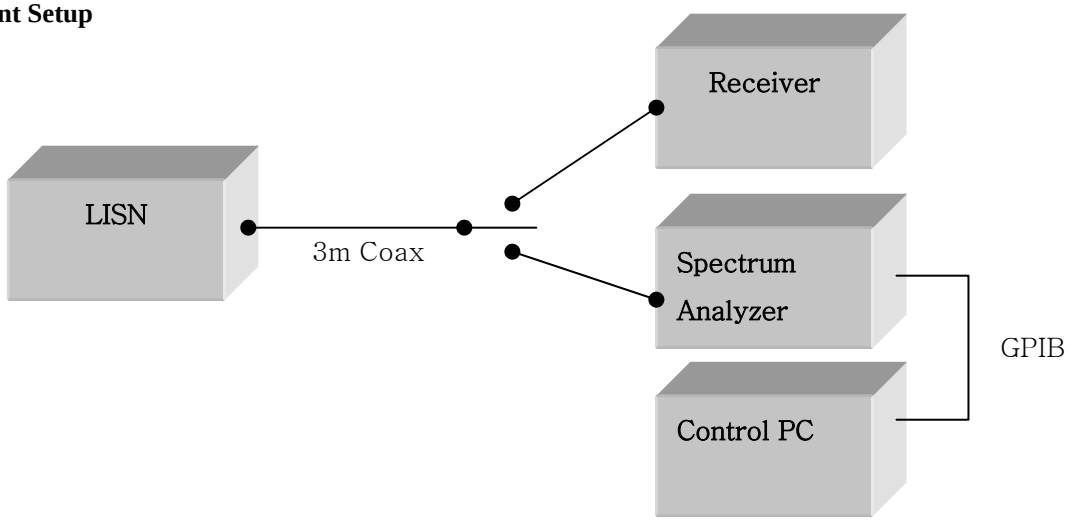

Figure 2: Measurement setup for AC Conducted Emission

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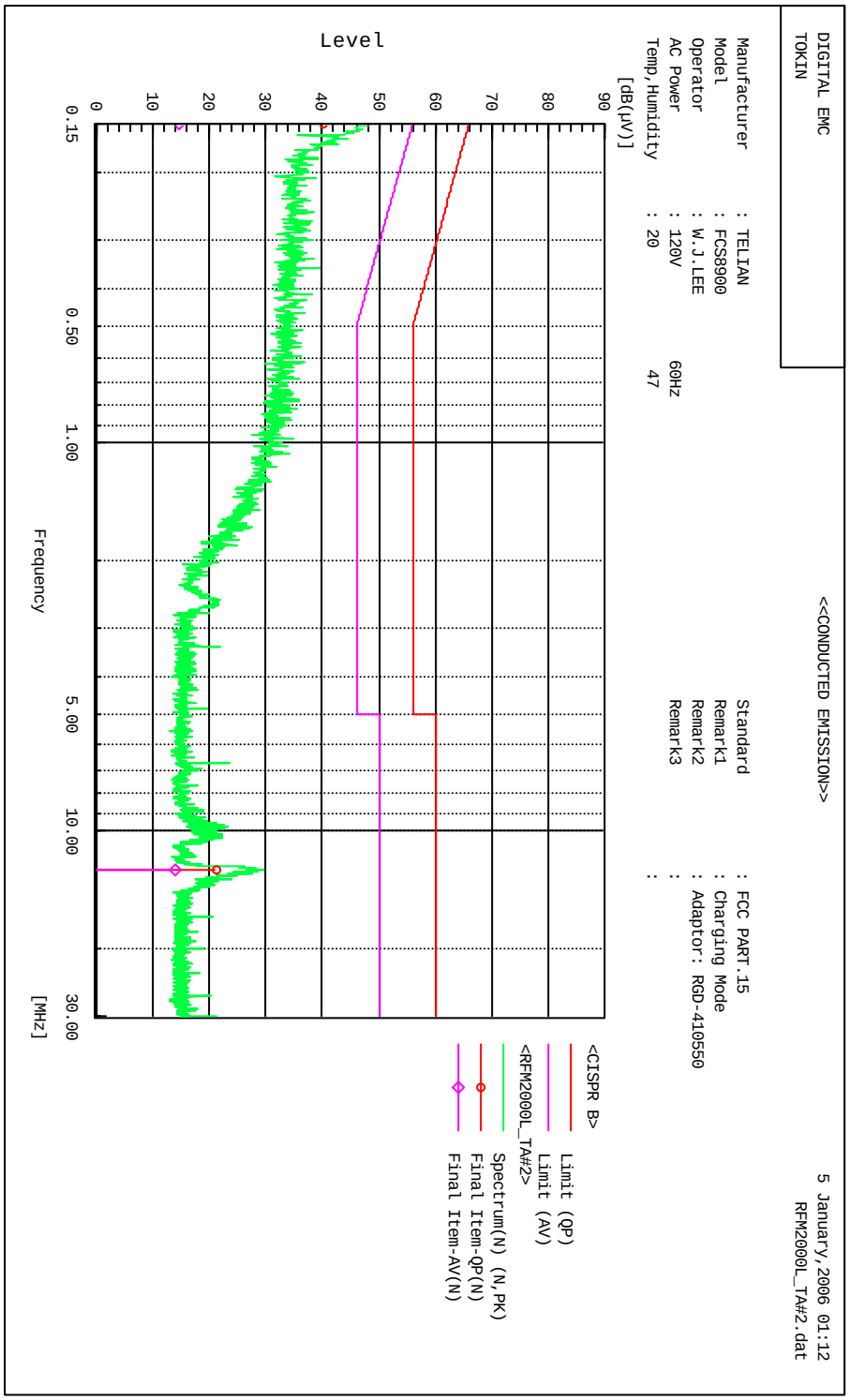
NPQRFM2000 / Adaptor : RGD-4105500 / Line



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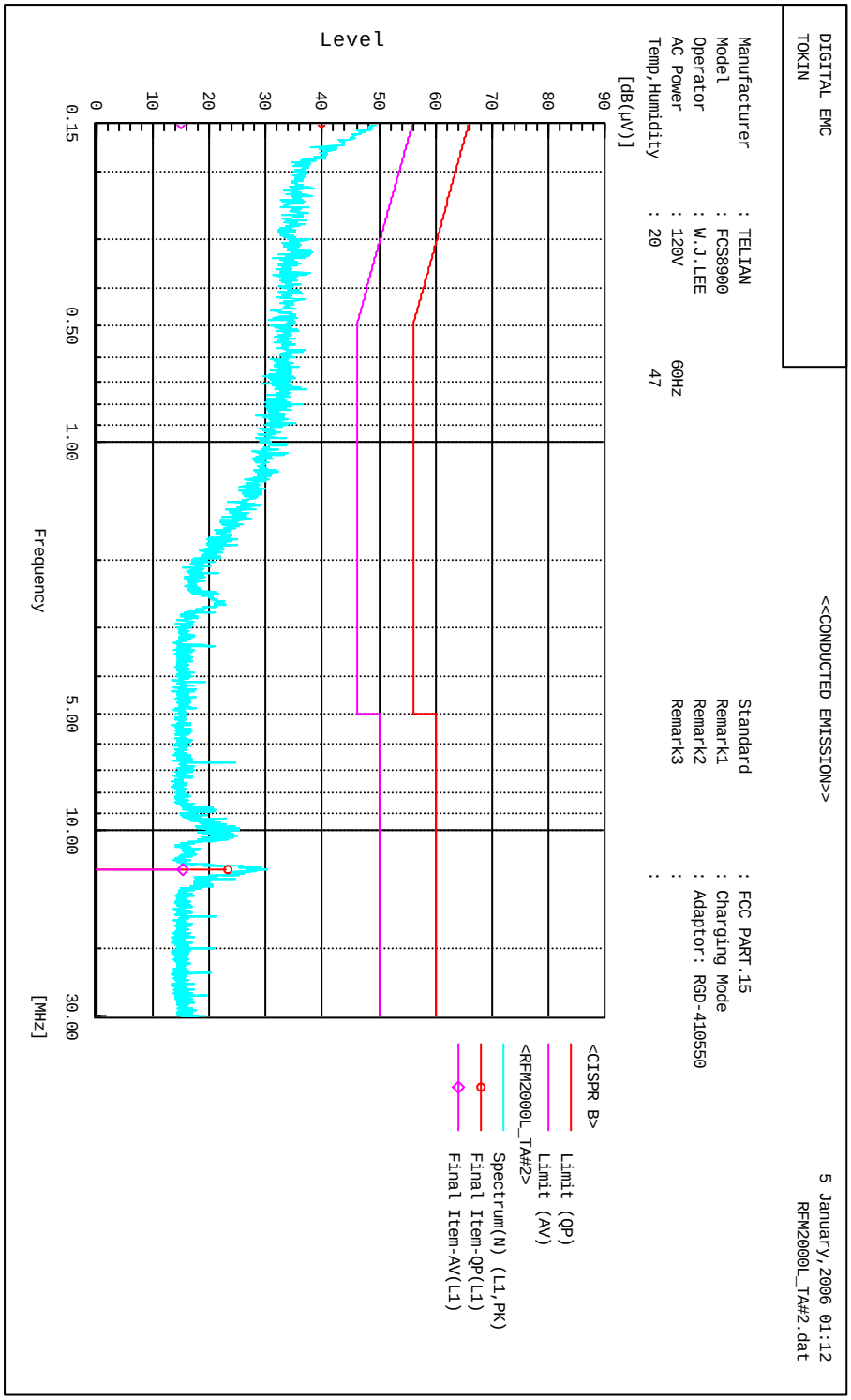
NPQRFM2000 / Adaptor : RGD-4105500 / Neutral



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```
********************************************  DIGITAL EMC  ********************************************
                                        <<CONDUCTED EMISSION>>
                                                                                    5 January,2006 01:12
                                                                                       RFM2000L_TA#2.dat
Standard          : FCC PART.15
Manufacturer      : TELIAN
Model             : FCS8900
Operator          : W.J.LEE
AC Power          : 120V          60Hz
Temp,Humidity     : 20             47
Remark1           : Charging Mode
Remark2           : Adaptor: RGD-410550
Remark3           :
                  :
************************************************************************************************************
Final Result

--- N Phase ---
No.  Frequency   Reading   Reading    c.f     Result    Result     Limit     Limit    Margin   Margin
                   QP        AV                QP        AV        QP        AV        QP       AV
       [MHz]    [dB(µV)]  [dB(µV)]   [dB]   [dB(µV)]  [dB(µV)]  [dB(µV)]  [dB(µV)]   [dB]     [dB]
  1      0.150     38.5      12.7     1.8      40.3      14.5      66.0      56.0     25.7     41.5
  2     12.540     20.6      13.4     0.7      21.3      14.1      60.0      50.0     38.7     35.9

--- L1 Phase ---
No.  Frequency   Reading   Reading    c.f     Result    Result     Limit     Limit    Margin   Margin
                   QP        AV                QP        AV        QP        AV        QP       AV
       [MHz]    [dB(µV)]  [dB(µV)]   [dB]   [dB(µV)]  [dB(µV)]  [dB(µV)]  [dB(µV)]   [dB]     [dB]
  1      0.150     38.2      13.0     1.8      40.0      14.8      66.0      56.0     26.0     41.2
  2     12.642     22.4      14.4     0.8      23.2      15.2      60.0      50.0     36.8     34.8
```

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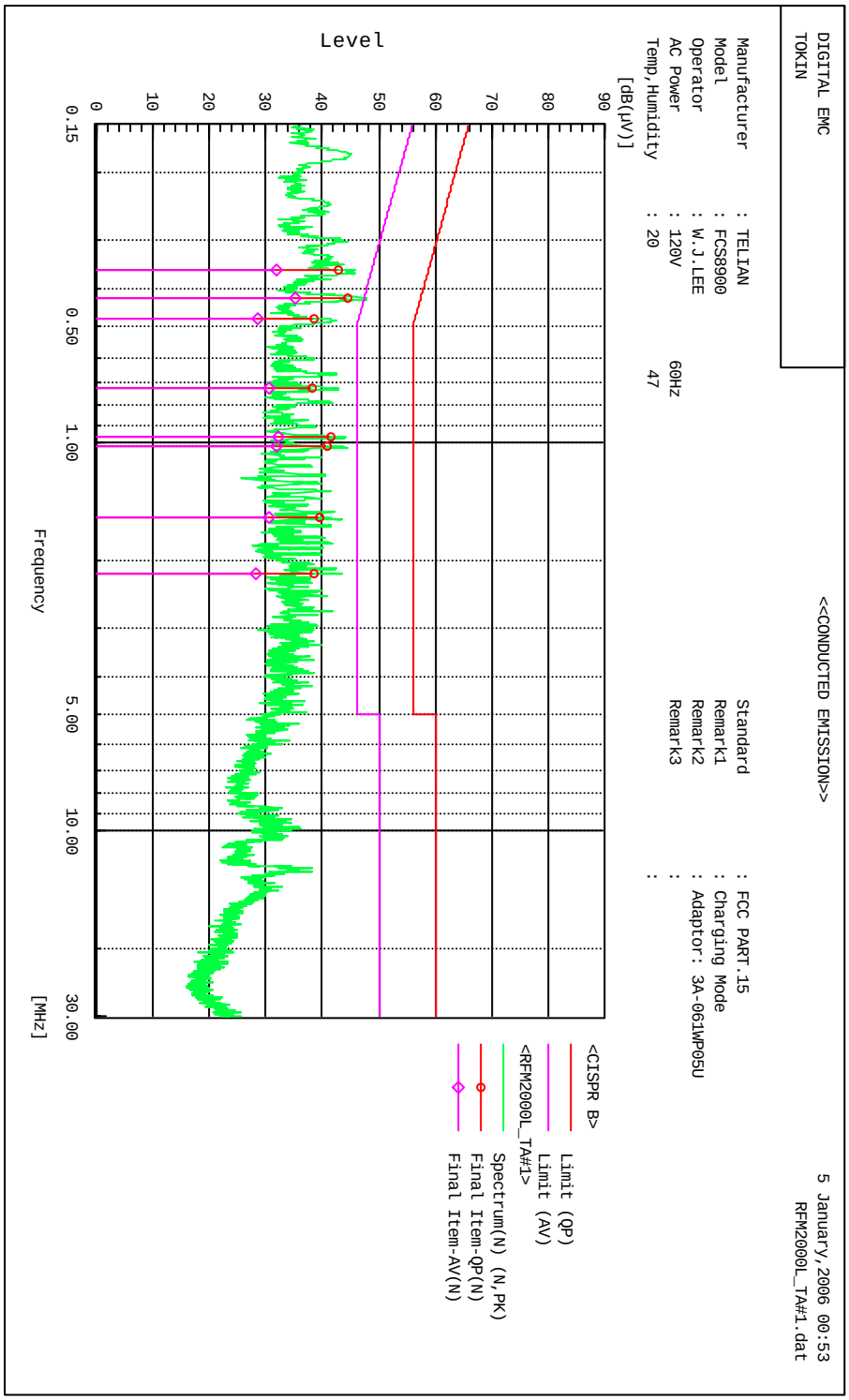
NPQRFM2000 / Adaptor : 3A-031WU05 / Line



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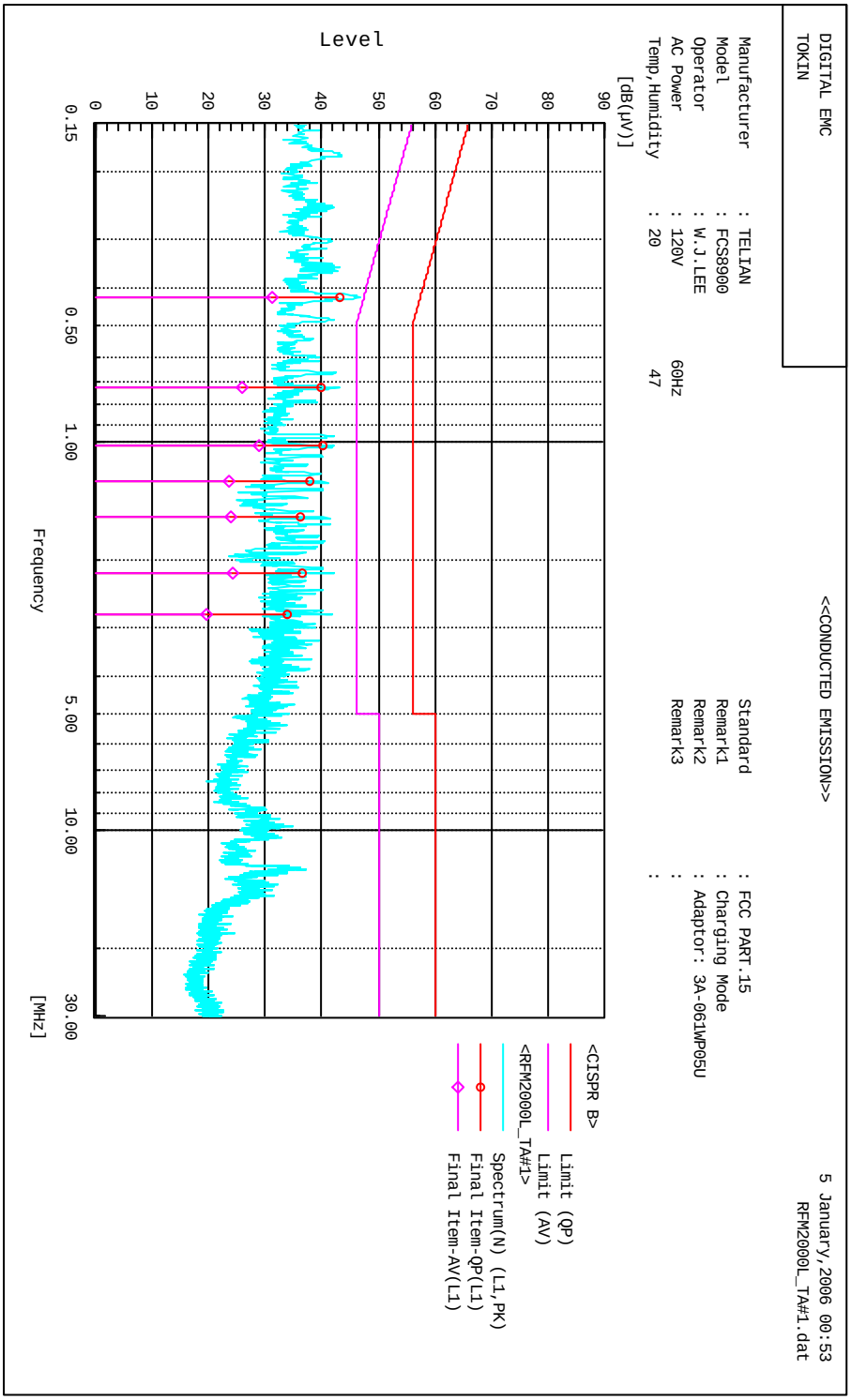
NPQRFM2000 / Adaptor : 3A-031WU05 / Neutral



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********** DIGITAL EMC **********
<<CONDUCTED EMISSION>>

5 January,2006 00:53
RFM2000L_TA#1.dat

Standard : FCC PART.15
Manufacturer : TELIAN
Model : FCS8900
Operator : W.J.LEE
AC Power : 120V 60Hz
Temp,Humidity : 20 47
Remark1 : Charging Mode
Remark2 : Adaptor: 3A-061WP05U
Remark3 :
:

Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.359	42.1	31.4	0.6	42.7	32.0	58.7	48.7	16.0	16.7
2	0.420	43.9	34.6	0.5	44.4	35.1	57.5	47.5	13.1	12.4
3	0.479	38.2	28.2	0.4	38.6	28.6	56.3	46.3	17.7	17.7
4	0.719	37.9	30.3	0.4	38.3	30.7	56.0	46.0	17.7	15.3
5	0.959	41.3	32.1	0.2	41.5	32.3	56.0	46.0	14.5	13.7
6	1.020	40.8	31.8	0.2	41.0	32.0	56.0	46.0	15.0	14.0
7	1.559	39.3	30.2	0.2	39.5	30.4	56.0	46.0	16.5	15.6
8	2.159	38.2	27.9	0.2	38.4	28.1	56.0	46.0	17.6	17.9

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.420	42.6	30.6	0.5	43.1	31.1	57.4	47.4	14.3	16.3
2	0.720	39.5	25.4	0.4	39.9	25.8	56.0	46.0	16.1	20.2
3	1.020	39.8	28.5	0.3	40.1	28.8	56.0	46.0	15.9	17.2
4	1.260	37.5	23.4	0.3	37.8	23.7	56.0	46.0	18.2	22.3
5	1.559	35.9	23.6	0.2	36.1	23.8	56.0	46.0	19.9	22.2
6	2.160	36.4	24.2	0.2	36.6	24.4	56.0	46.0	19.4	21.6
7	2.760	33.6	19.1	0.4	34.0	19.5	56.0	46.0	22.0	26.5

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3.2.2 Radiated Emission

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

- Center frequency = the worst channel
- Frequency Range = 30 MHz ~ 10th harmonic.
- RBW = 120 kHz (30MHz ~ 1 GHz, Quasi-Peak)
- RBW = 1 MHz (1 GHz ~ 10th harmonic, Peak) / VBW = 1MHz, Detector function = peak
- RBW = 1 MHz (1 GHz ~ 10th harmonic, Average) / VBW = 10Hz, Detector function = peak
- Distance = 3m
- Trace = max hold
- Sweep = auto

Measurement Data: **Complies**

- No other emissions were detected at a level greater than 10dB below limit.
- Refer to the next page.

Fundamental / Harmonics emission: FCC Part 15.249(a)

Frequency (MHz)	Limit @ 3m	
	Fundamental (mV/m)	Harmonics (uV/m)
902 - 928	50	500

General Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

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Fundamental Measurement Data(worst case):

Frequency (MHz)	Pol	QP Reading (dBuV)	T.F (dBuV/m)	QP Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
918	H	74.54	-2.83	71.71	94	22.29
918	V	80.37	-2.83	77.54	94	16.46
921	H	79.93	-2.78	77.15	94	16.85
921	V	80.22	-2.78	77.44	94	16.56

Harmonic and other emission Measurement Data(worst case): Fundamental Frequency = 918MHz

Frequency (MHz)	Pol	QP Reading (dBuV)	T.F (dBuV/m)	QP Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
78.50	V	49.3	-15.4	33.9	40	6.1
-	-	-	-	-	-	-

Harmonic and other emission Measurement Data(worst case): Fundamental Frequency = 921MHz

Frequency (MHz)	Pol	QP Reading (dBuV)	T.F (dBuV/m)	QP Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
78.50	V	49.8	-15.4	34.4	40	5.6
-	-	-	-	-	-	-

Note.

1. No other emissions were detected at a level greater than 10dB below limit.
2. Sample Calculation.

   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL - AG

   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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APPENDIX

TEST EQUIPMENT USED FOR TESTS

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	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
01	Spectrum Analyzer	Agilent	E4404B	18/04/06	30601-01-6025569
02	Spectrum Analyzer	H.P	8563E	06/10/06	3551A04634
03	Spectrum Analyzer	Agilent	E4440A	06/10/06	MY45304199
04	Power Meter	H.P	EPM-442A	04/07/06	GB37170413
05	Power Sensor	H.P	8481A	05/07/06	3318A96332
06	Frequency Counter	H.P	5342A	21/10/06	2119A04450
07	Multfunction Synthesizer	H.P	8904A	21/10/06	3633A08404
08	Signal Generator	Rohde Schwarz	SMR20	17/05/06	101251
09	Signal Generator	H.P	E4421A	05/07/06	US37230529
10	Audio Analyzer	H.P	8903B	07/07/06	3011A0944B
11	Modulation Analyzer	H.P	8901B	05/07/06	3028A03029
12	CDMA Mobile Station Test Set	H.P	8924C	21/10/06	US35360688
13	Power Splitter	WEINSCHEL	1593	25/10/06	332
14	BAND Reject Filter	Microwave Circuits	N0308372	21/10/06	3125-01DC0312
15	BAND Reject Filter	Wainwright	WRCG1750	21/10/06	SN2
16	AC Power supply	DAEKWANG	5KVA	18/04/06	N/A
17	DC Power Supply	H.P	6622A	18/04/06	465487
18	Attenuator (30dB)	H.P	8498A	21/10/06	50101
19	Attenuator (10dB)	WEINSCHEL	23-10-34	24/10/06	BP4387
20	HORN ANT	EMCO	3115	06/03/07	6419
21	HORN ANT	EMCO	3115	04/25/07	21097
22	HORN ANT	A.H.Systems	SAS-574	09/11/06	154
23	HORN ANT	A.H.Systems	SAS-574	09/11/06	155
24	Dipole Antenna	Schwarzbeck	VHA9103	18/10/06	2116
25	Dipole Antenna	Schwarzbeck	VHA9103	18/10/06	2117
26	Dipole Antenna	Schwarzbeck	UHA9105	18/10/06	2261

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	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
27	Dipole Antenna	Schwarzbeck	UHA9105	18/10/06	2262
28	RFI/FIELD Iintensity Meter	Kyorits	KNM-504D	07/07/06	SN-161-4
29	Frequency Converter	Kyorits	KCV-604C	07/07/06	4-230-3
30	TEMP & HUMIDITY Chamber	JISCO	J-RHC2	13/09/07	021031
31	Log Periodic Antenna	Schwarzbeck	UHALP9108A1	29/09/06	1098
32	Biconical Antenna	Schwarzbeck	VHA9103	28/11/06	VHA91031946
33	Digital Multimeter	H.P	34401A	18/04/06	3146A13475
34	Universal Radio Communication Tester	Rohde Schwarz	CMU200	28/04/06	107631
35	High-Pass Filter	ANRITSU	MP526	12/05/06	MP27756
36	Attenuator (3dB)	Agilent	8491B	11/08/06	MY39260699
37	Amplifier (25dB)	Agilent	8447D	18/04/06	2944A10144
38	Position Controller	TOKIN	5901T	N/A	14173
39	Driver	TOKIN	5902T2	N/A	14174
40	Spectrum Analyzer	H.P	8591E	18/04/06	3649A05889
41	RFI/FIELD Intensity Meter	Kyorits	KNW-2402	04/07/06	4N-170-3
42	LISN	Kyorits	KNW-407	11/08/06	8-317-8
43	LISN	Kyorits	KNW-242	11/08/06	8-654-15
44	CVCF	NF Electronic	4400	N/A	344536 4420064
45	Software	ToYo EMI	EP5/RE	N/A	Ver 2.0.800
46	Software	ToYo EMI	EP5/CE	N/A	Ver 2.0.801
47	Software	AUDIX	e3	N/A	Ver 3.0
48	Software	Agilent	Benchlink	N/A	A.01.09 021211

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