



## **Giant Electronics Limited**

Application  
For  
Certification  
**(FCC ID: K7GT9100)**

November 8, 2004

GMRS and FRS Two Ray Radio with Computer Peripheral (MP3 Player)

0418832  
TL/ Ann Choy  
November 8, 2004

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**Intertek Testing Services Hong Kong Ltd.**

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# INTERTEK TESTING SERVICES

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## INTERTEK TESTING SERVICES

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List of attached file

Exhibit type	File Description	Filename
Operation Description	Technical Description	descri.pdf
Test Report	Bandwidth Plot	bw.pdf
Test Report	Modulation Frequency Response	mfr.pdf
Test Report	Modulation Limit Characteristic	mlc.pdf
Test Report	Spurious Emission	spurious.pdf
Test Report	Conducted Emission Test Result	conducted.pdf
Test Report	Test Report	report.pdf
Test Report	Tune Up Procedure	tuneup.pdf
Test Report	Part List	partlist.pdf
Test Report	Audio Low Pass Filter Response	lpf.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Test Setup Photo	Radiated Emission - Computer Peripheral	radiated photos_cp.doc
Test Setup Photo	Conducted Emission - Computer Peripheral	conducted photos.doc
Test Setup Photo	Radiated Emission - Radio	radiated photos_r.doc
Internal Photo	Internal Photo	internal photos.doc
External Photo	External Photo	external photos.doc
Cover Letter	Confidentiality Request	request.pdf

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**EXHIBIT 1**

**GENERAL DESCRIPTION**

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### 1.0 General Description

#### 1.1 Product Description

The Equipment Under Test (EUT) is a Two Way Radio with MP3 Player, FRS and GMRS operating between 462.5500MHz and 467.7125MHz. The EUT is powered by 3.6Vd.c. (1 x 3.6V rechargeable NiMH battery) or 4.5Vd.c. (3 x 1.5V "AAA" size alkaline batteries). The EUT can play songs in digital format from its internal memory or external SD Disk. Digital data can be transferred to or from the computer through the USB port as removable disk.

##### Transmitter Portion

- (i) Type of Emission : 10K25F3E
- (ii) Frequency Range : FRS 7 Channels from 467.5625MHz to 467.7125MHz  
GMRS 15 Channels from 462.5500MHz to 462.7250MHz
- (iii) Maximum Power Rating : FRS - 0.11W ERP, GMRS - 0.12W ERP
- (iv) Antenna Type : Integral

The Model: Giant / T9100 and Motorola / T5MP3 are the same as the Model: Giant / T9110 in PCB layout and wiring. The difference in trade name and model number serves as marketing strategy and for the cosmetic changes only.

The brief circuit description is saved with filename: descri.pdf

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### 1.2 Related Submittal(s) Grants

This is an Application for Part 95 Certification of the transmitter portion of a GMRS + FRS Transceiver and Part 15 Certification of the computer peripheral (MP3 player). The receiver and digital section of this Transceiver is subject to verification process.

### 1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001) and ANSI/TIA/EIA-603-A-2001. All measurement were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure of maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna the EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application.

### 1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. The test facility and site measurement data have been fully placed on file with the FCC.



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**EXHIBIT 2**

**SYSTEM TEST CONFIGURATION**

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## 2.0 System Test Configuration

### 2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2001). For transmitter testing the device was placed on a turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes. When the radiated emissions are measured.

The device was powered by 3 new 1.5V "AAA" size alkaline batteries.

For computer peripheral testing, the recording download from PC to SD RAM 64MB mode is applied during test.

The frequency range from 30 MHz to 4.69 GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

### 2.2 EUT Exercising Software

For transmitter testing, there was no special software to exercise the device. Once the unit is powered on, a signal is transmitted.

For computer peripheral testing, the EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

### 2.3 Special Accessories

Shielded USB cable was used for compliance of this device.

### 2.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

### 2.5 Equipment Modification

Any modification installed previous to testing by Giant Electronics Limited will be incorporated in each production model sold/leased in the United States.

No modification were installed by Intertek Testing Services.

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### 2.6 Support Equipment List and Description

This device was tested with computer systems. (Supplied by Intertek)

Refer List:	For Radiated Emission Test	For Conducted Emission Test
	1. HP Computer Model: Vectra VL420 S/N: SG20409996 DOC Product	1. HP Computer Model: D530S S/N: CNG4110DX DOC Product
	2. HP Monitor Model: D2813 S/N: TW63600424 FCCID: A3KM043	2. Philips LCD Monitor Model: 150B4CG S/N: CX000409301774 DOC Product
	3. HP Keyboard Model: SK-2502 S/N: C0205303122 FCCID: GYUR41SK	3. HP Keyboard Model: KB-0133 S/N: 323686-B31 DOC Product
	4. HP Mouse Model: M-S48A FCCID: JNZ201213	4. HP Mouse Model: M-S69 FCCID: JNZ211443
	5. HP Printer Model: C2642A S/N: SG67B131RY FCCID: B94C2642X	5. SD RAM 64MB
	6. Hayes Modem Model: 6800CN FCCID: BFJ9D907-00038	
	7. 1 x serial cable with 1 meter long	
	8. 1 x parallel cable with 1 meter long	
	9. Headset with 1.2m Unshield Cable (Supplied by Intertek)	
	10. SD RAM 64MB	

*Confirmed by:*

*Tommy Leung  
Supervisor  
Intertek Testing Services  
Agent for Giant Electronics Limited*



\_\_\_\_\_  
Signature

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November 8, 2004 Date

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**EXHIBIT 3**

**RF POWER OUTPUT**

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### 3.0 **RF Power Output (Section 2.1046(a))**

#### A. Equipment Used

<b>Equipment</b>	<b>Brand Name</b>	<b>Model No.</b>
Log Periodic Antenna	EMCO	3148
Test receiver	Rohde & Schwarz	ESVS30
Tuned Dipole Antenna	CDI	A100
Signal Generator	RFI	2023B

#### B. Testing Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarisation located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.
4. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

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6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a tuned dipole (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarisation and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarisation.
17. The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

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**Table 1**

**Giant Electronics Limited  
Giant / T9110**

**Transmission Power**

Channel	Frequency (MHz)	Effective Radiated Power		Limit (W)	Margin (W)
		(dBm)	(W)		
1	462.5625	20.6	0.12	2.0	-1.88
2	462.5875	20.6	0.12	2.0	-1.88
3	462.6125	20.6	0.12	2.0	-1.88
4	462.6375	20.6	0.12	2.0	-1.88
5	462.6625	20.6	0.12	2.0	-1.88
6	462.6875	20.6	0.12	2.0	-1.88
7	462.7125	20.6	0.12	2.0	-1.88
8	467.5625	20.2	0.11	0.5	-0.39
9	467.5875	20.2	0.11	0.5	-0.39
10	467.6125	20.2	0.11	0.5	-0.39
11	467.6375	20.2	0.11	0.5	-0.39
12	467.6625	20.2	0.11	0.5	-0.39
13	467.6875	20.2	0.11	0.5	-0.39
14	467.7125	20.2	0.11	0.5	-0.39
15	462.5500	20.6	0.12	2.0	-1.88
16	462.5750	20.6	0.12	2.0	-1.88
17	462.6000	20.6	0.12	2.0	-1.88
18	462.6250	20.6	0.12	2.0	-1.88
19	462.6500	20.6	0.12	2.0	-1.88
20	462.6750	20.6	0.12	2.0	-1.88
21	462.7000	20.6	0.12	2.0	-1.88
22	462.7250	20.6	0.12	2.0	-1.88

Notes: Negative sign in the margin column shows the value below limits.

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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**EXHIBIT 4**

**MODULATION CHARACTERISTICS**



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### 4.0 **Modulation Characteristics**

In order to satisfy the 95.637(a) requirement, Modulation Frequency Response and Modulation Limit Characteristics are attached in Exhibit 4.1 & 4.2.

Plots for each tests are saved with filename: mfr.pdf and mlc.pdf

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## INTERTEK TESTING SERVICES

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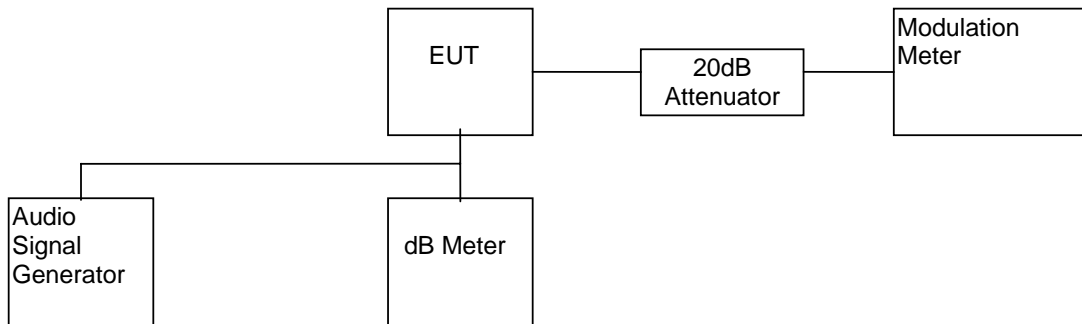
### 4.1 Modulation Frequency Response

#### A. Test Equipment

Equipment	Brand Name	Model No.
Audio Signal Generator	HP	HP8904A
AC Millivoltmeter	Leader	LMV-182A
20 dB RF Attenuator	Bird	8304-200-N
Communication Service Monitor	Marconi	2945

#### B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the audio signal generator frequency to the sound pressure level 113dB SPL at the microphone of the EUT.
- 3) The frequency of the audio signal generator is changed from 300Hz to 5kHz.
- 4) Record the frequency deviation.

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**C. Test Result**

**Table 2**

**Giant Electronics Limited  
Giant / T9110**

**Modulation Frequency Response**

Test Channel : 4  
Input level = 113dB SPL

Modulation Frequency (Hz)	Modulation index (%)
300	1.86
400	1.86
500	1.92
600	2.38
700	2.55
800	2.63
900	2.24
1000	2.12
1250	1.62
1500	1.46
1750	1.23
2000	0.90
2250	0.48
2500	0.50
2750	0.70
3000	0.61
3125	0.57
3250	0.53
3500	0.42
4000	0.04
5000	0.03

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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## INTERTEK TESTING SERVICES

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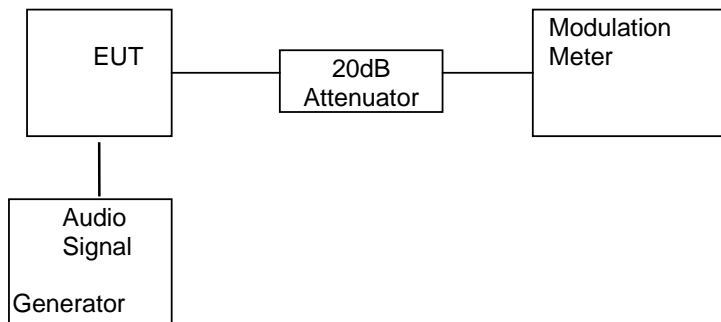
### 4.2 Modulation Limiting Characteristics (Section 2.1047(b))

#### A. Test Equipment

Equipment	Brand Name	Model No.
Audio Signal Generator	HP	HP8904A
20 dB RF Attenuator	Bird	8304-200-N
Communication Service Monitor	Marconi	2945

#### B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the frequency of the audio signal generator to 500Hz and adjust the level from 47dBSPL to 137dBSPL.
- 3) Record the maximum value of plus or minus peak frequency deviation.
- 4) Repeat the above procedure with frequency 1000Hz, 2500Hz & 3125Hz.

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**INTERTEK TESTING SERVICES**

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**C. Test Result**

**Table 3**

**Giant Electronics Limited  
Giant / T9110**

**Modulation Limiting Characteristics**

Test Channel : 4

<b>Modulation Input (dB SPL)</b>	<b>Peak Frequency Deviation (kHz) at 500Hz</b>	<b>Peak Frequency Deviation (kHz) at 1000Hz</b>	<b>Peak Frequency Deviation (kHz) at 2500Hz</b>	<b>Peak Frequency Deviation (kHz) at 3125Hz</b>
47	0.06	0.06	0.06	0.06
57	0.06	0.06	0.06	0.06
67	0.06	0.06	0.06	0.06
77	0.06	0.07	0.07	0.08
87	0.07	0.15	0.07	0.55
97	0.14	0.87	0.14	1.24
107	0.71	1.85	0.70	1.67
117	2.08	2.31	1.60	1.79
127	2.36	2.25	1.90	1.84
137	2.40	2.15	1.92	1.93

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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## INTERTEK TESTING SERVICES

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### 4.3 Audio Low Pass Filter Response (Section 95.637(b))

#### A. Test Equipment

Equipment	Brand Name	Model No.
Audio Signal Generator	HP	HP8904A
AC Millivoltmeter	Leader	LMV-182A

#### B. Testing Procedure

- 1) Connect the audio signal generator to the input of the post limiter low pass filter and the dB meter to the output of the post limiter low pass filter.
- 2) Apply a 1000 Hz tone from the audio signal generator and adjust the level per manufacturer's specifications. Record the dB level of the 1000 Hz tone as  $LEV_{REF}$ .
- 3) Set the audio signal generator to the desired test frequency between 3000 Hz and the upper low pass filter limit. Record the dB level at the test frequency as  $LEV_{FREQ}$ .
- 4) Calculate the audio frequency response at the test frequency as:

$$\text{low pass filter response} = LEV_{FREQ} - LEV_{REF}$$

- 1) Repeat the above procedure for all the desired test frequencies.

#### C. Test Result

For electronic filing, the audio low pass frequency response is saved with filename: lpf.pdf.

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**EXHIBIT 5**

**OCCUPIED BANDWIDTH**

## INTERTEK TESTING SERVICES

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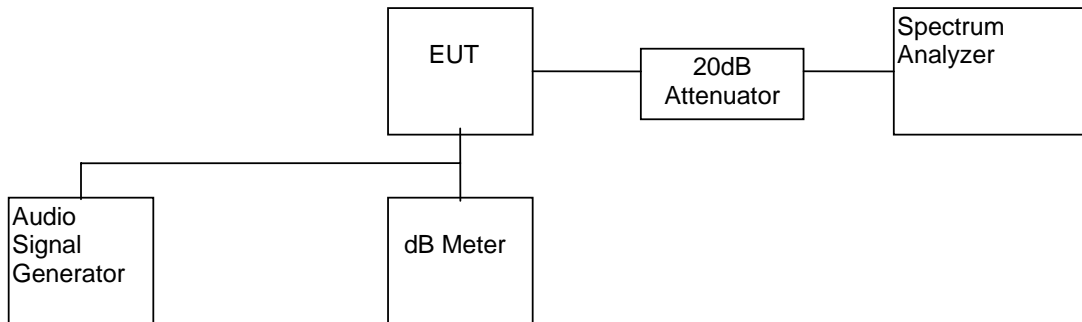
### 5.0 Occupied Bandwidth (Section 95.633(c))

#### A. Test Equipment

Equipment	Brand Name	Model No.
Audio Signal Generator	HP	HP8904A
AC Millivoltmeter	Leader	LMV-182A
20 dB RF Attenuator	Bird	8304-200-N
Spectrum Analyzer	HP	8951EM

#### B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the level of audio signal generator to obtain 16 dB greater than required for 50% modulation.
- 3) The occupied bandwidth is measured with the spectrum analyzer set at 2kHz/div scan and 10dB/div.

#### C. Test Result

The occupied Bandwidth is measured to be 8.05 kHz for GMRS and 10.25 kHz for FRS.

For the electronic filing, the bandwidth plot is saved with filename: bw.pdf

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004



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**EXHIBIT 6**

**EMISSION RESULTS**

## INTERTEK TESTING SERVICES

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### 6.0 **Emission Results**

In order to satisfy the 95.635(b) requirement, the spurious emission from the EUT - Transmitter are measured and shown in the Exhibit 6.1.

In order to satisfy the 15.109 requirement, the emission from the EUT - computer peripheral are measured and shown in the Exhibit 6.2.

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## INTERTEK TESTING SERVICES

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### 6.1 Field Strength of Spurious Radiation (Section 95.635) - Transmitter

#### A. Test Equipment

<b>Equipment</b>	<b>Brand Name</b>	<b>Model No.</b>
Antenna	EMCO	A100, 3148, 3104C, 3115
Spectrum Analyzer	ADVANTEST	R3271
Test receiver	Rohde & Schwarz	ESVS30
RF Filter	Trilithic	3VF500/1000-5-50-CC

#### B. Testing Procedure

Radiated emission measurements were performed according to the procedures in ANSI C63.4(2001). All measurements were performed in Open Area Test Sites located at Roof Top of Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.

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### C. Radiated Emission Configuration Photograph - Transmitter

Worst Case Radiated Emission Mode: TX without headset

For electronic filing, the radiated emission configurations photograph is saved with filename: radiated\_photos\_r.doc

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### C. Test Result

**Giant Electronics Limited  
Giant / T9110**

**Table 4(a)**

1) Unwanted emission from CARRIER  $\pm 6.25\text{kHz}$  to CARRIER  $\pm 31.25\text{kHz}$

(Refer to the plots which is saved with filename: spurious.pdf)

<b>Region</b>	<b>Unwanted emission</b>	
	<b>Channel 4</b>	<b>Channel 11</b>
CARRIER $\pm 6.25\text{kHz}$ to $\pm 12.5\text{kHz}$	<25dB	<25dB
CARRIER $\pm 12.5\text{kHz}$ to $\pm 31.25\text{kHz}$	<35dB	<35dB

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**Table 4(b): Channel 4**

<b>Frequency (MHz)</b>	<b>Effective Radiated Power (dBm)</b>	<b>Transmission Power (dBm)</b>	<b>Attenuation (dB)</b>	<b>Limit (dB)</b>	<b>Margin (dB)</b>
231.318	-54.9	20.0	74.9	33.0	-41.9
693.956	-54.3	20.0	74.3	33.0	-41.3
925.275	-38.2	20.0	58.2	33.0	-25.2
1387.910	-28.7	20.0	48.7	33.0	-15.7
1850.550	-27.0	20.0	47.0	33.0	-14.0
2313.188	-25.2	20.0	45.2	33.0	-12.2
2775.825	-26.8	20.0	46.8	33.0	-13.8
3238.463	-25.2	20.0	45.2	33.0	-12.2
3701.101	-27.6	20.0	47.6	33.0	-14.6
4163.738	-31.9	20.0	51.9	33.0	-18.9

- Remark: 1. Transmission power is 20 dBm or -10 dB(W).
2. According to Section 95.635(b7), the unwanted emission should be attenuated below TP by at least  $43 + 10 \log_{10} (TP)$  dB or 33 dB.
3. The test is performed according to ANSI/TIA/EIA-603-A-2001.

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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**Table 4(b): Channel 11**

<b>Frequency (MHz)</b>	<b>Effective Radiated Power (dBm)</b>	<b>Transmission Power (dBm)</b>	<b>Attenuation (dB)</b>	<b>Limit (dB)</b>	<b>Margin (dB)</b>
233.819	-55.2	19.6	74.8	32.6	-42.2
701.456	-55.8	19.6	75.4	32.6	-42.8
935.275	-33.9	19.6	53.5	32.6	-20.9
1402.913	-30.7	19.6	50.3	32.6	-17.7
1870.551	-22.1	19.6	41.7	32.6	-9.1
2338.188	-26.1	19.6	45.7	32.6	-13.1
2805.826	-30.8	19.6	50.4	32.6	-17.8
3273.464	-18.4	19.6	38.0	32.6	-5.4
3741.101	-27.4	19.6	47.0	32.6	-14.4
4208.739	-28.4	19.6	48.0	32.6	-15.4

- Remark: 1. Transmission power is 19.6 dBm or -10.4 dB(W).
2. According to Section 95.635(b7), the unwanted emission should be attenuated below TP by at least  $43 + 10 \log_{10} (TP)$  dB or 32.6 dB.
3. The test is performed according to ANSI/TIA/EIA-603-A-2001.

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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### 6.2 **Field Strength of Radiation Emission (Section 15.109) - Computer Peripheral**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.



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## INTERTEK TESTING SERVICES

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### A. Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB
- PD = Pulse Desensitization in dB
- AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

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## INTERTEK TESTING SERVICES

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### A. Field Strength Calculation (cont'd)

#### Example

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

## INTERTEK TESTING SERVICES

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### **B. Radiated Emission Configuration Photograph - Computer Peripheral**

Worst Case Radiated Emission  
at  
160.030 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated\_photos\_cp.doc.

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## INTERTEK TESTING SERVICES

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### C. Radiated Emission Data - Computer Peripheral

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 1.5 dB

#### **TEST PERSONNEL:**



\_\_\_\_\_  
*Signature*

Ken Sit, Lead Engineer  
\_\_\_\_\_  
*Typed/Printed Name*

November 8, 2004  
\_\_\_\_\_  
*Date*

## INTERTEK TESTING SERVICES

Company: Giant Electronics Limited  
Model: Giant T9110  
Mode: PC Download

Date of Test: August 28-October 27, 2004

Table 4(c)

### Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	80.016	43.8	16	6.7	34.5	40.0	-5.5
H	128.016	40.0	16	12.6	36.6	43.5	-6.9
H	136.020	37.1	16	11.9	33.0	43.5	-10.5
H	144.035	40.1	16	11.7	35.8	43.5	-7.7
H	160.030	44.9	16	13.1	42.0	43.5	-1.5
H	168.030	43.3	16	13.8	41.1	43.5	-2.4
H	176.030	39.5	16	15.5	39.0	43.5	-4.5
H	192.030	35.7	16	17.1	36.8	43.5	-6.7
H	208.044	37.2	16	11.8	33.0	43.5	-10.5
H	248.052	39.3	16	11.4	34.7	46.0	-11.3
H	288.055	36.7	16	13.3	34.0	46.0	-12.0
H	344.060	34.0	16	14.6	32.6	46.0	-13.4
H	376.070	35.4	16	15.4	34.8	46.0	-11.2
H	384.070	30.6	16	15.4	30.0	46.0	-16.0
H	448.080	31.4	16	16.3	31.7	46.0	-14.3
H	464.102	30.2	16	16.8	31.0	46.0	-15.0

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

Test Engineer: Ken Sit

## INTERTEK TESTING SERVICES

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### D. Conducted Emission Configuration Photograph - Computer Peripheral

Worst Case Line-Conducted Configuration  
at  
0.480 MHz

For electronic filing, the worst case line-conducted configuration photograph are saved with filename: conducted photos.doc.

## INTERTEK TESTING SERVICES

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### E. Conducted Emission Data - Computer Peripheral

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgement: Passed by 7.2 dB

#### **TEST PERSONNEL:**



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*Signature*

Ken Sit, Lead Engineer  

---

*Typed/Printed Name*

November 8, 2004  

---

*Date*

**INTERTEK TESTING SERVICES**

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**EXHIBIT 7**

**FREQUENCY STABILITY**



## INTERTEK TESTING SERVICES

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### 7.0 **Frequency Stability**

The frequency tolerance was tested in normal condition & over extreme ambient conditions with respect to voltage and temperature variation.

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## INTERTEK TESTING SERVICES

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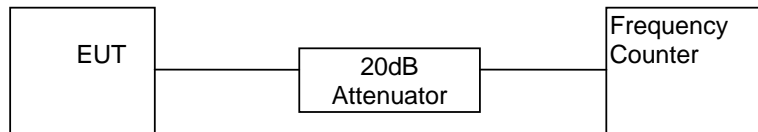
### 7.1 Frequency Tolerance (Section 95.627)

#### A. Test Equipment

Equipment	Brand Name	Model No.
20 dB RF Attenuator	Bird	8304-200-N
Frequency Counter	Phillips	PM6668

#### B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Measure all transmit channel frequencies in MHz.

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**INTERTEK TESTING SERVICES**

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**C. Test Result**

**Table 5**

**Giant Electronics Limited  
Giant / T9110**

**Frequency Tolerance**

Channel	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)
1	462.5625	462.56260	0.000022
2	462.5875	462.58748	-0.000004
3	462.6125	462.61248	-0.000004
4	462.6375	462.63723	-0.000058
5	462.6625	462.66225	-0.000054
6	462.6875	462.68755	0.000011
7	462.7125	462.71250	0.000000
8	467.5625	467.56225	-0.000053
9	467.5875	467.58750	0.000000
10	467.6125	467.61250	0.000000
11	467.6375	467.63730	-0.000043
12	467.6625	467.66265	0.000032
13	467.6875	467.68765	0.000032
14	467.7125	467.71255	0.000011
15	462.5500	462.54980	-0.000043
16	462.5750	462.57505	0.000011
17	462.6000	462.59995	-0.000011
18	462.6250	462.62495	-0.000011
19	462.6500	462.64975	-0.000054
20	462.6750	462.67490	-0.000022
21	462.7000	462.70000	0.000000
22	462.7250	462.72485	-0.000032

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## INTERTEK TESTING SERVICES

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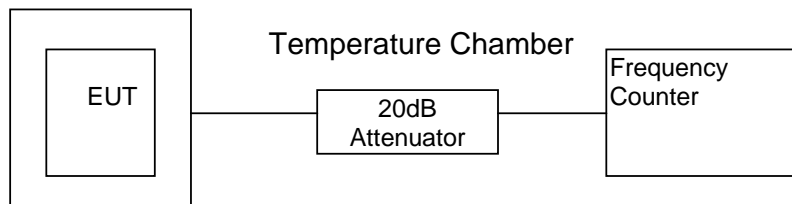
### 7.2 Frequency Stability - Temperature (Section 2.1055)

#### A. Test Equipment

Equipment	Brand Name	Model No.
20 dB RF Attenuator	Bird	8304-200-N
Frequency Counter	Phillips	PM6668

#### B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Set the Temperature Chamber to 20°C and stabilize the EUT temperature for one hour. Set transmitter ON for two minutes.
- 3) Measure the channel frequency of channel 4, 11 in MHz.
- 4) Turn the EUT OFF.
- 5) Repeat the above procedure from -20°C to 50°C with 10°C increment.

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**INTERTEK TESTING SERVICES**

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**C. Test Result**

**Table 6(a)**

**Giant Electronics Limited  
Giant / T9110**

**Frequency Deviation with Temperature Variation**

Channel : 4

Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (%)	Frequency Tolerance with reference to its value at +20°C (ppm)
-20	462.6375	462.63643	-0.000231	-1.7
-10	462.6375	462.63710	-0.000086	-0.3
0	462.6375	462.63775	0.000054	1.1
10	462.6375	462.63798	0.000104	1.6
20	462.6375	462.63723	-0.000058	0.0
30	462.6375	462.63730	-0.000043	0.2
40	462.6375	462.63685	-0.000140	-0.8
50	462.6375	462.63660	-0.000195	-1.4

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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**INTERTEK TESTING SERVICES**

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**C. Test Result**

**Table 6(b)**

**Giant Electronics Limited  
Giant / T9110**

**Frequency Deviation with Temperature Variation**

Channel : 11

Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (%)	Frequency Tolerance with reference to its value at +20°C (ppm)
-20	467.6375	467.63670	-0.000171	-1.3
-10	467.6375	467.63738	-0.000026	0.2
0	467.6375	467.63785	0.000075	1.2
10	467.6375	467.63790	0.000086	1.3
20	467.6375	467.63730	-0.000043	0.0
30	467.6375	467.63713	-0.000079	-0.4
40	467.6375	467.63678	-0.000154	-1.1
50	467.6375	467.63710	-0.000086	-0.4

Test Engineer: Ken Sit

Date of Test: September 24-October 25, 2004

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## INTERTEK TESTING SERVICES

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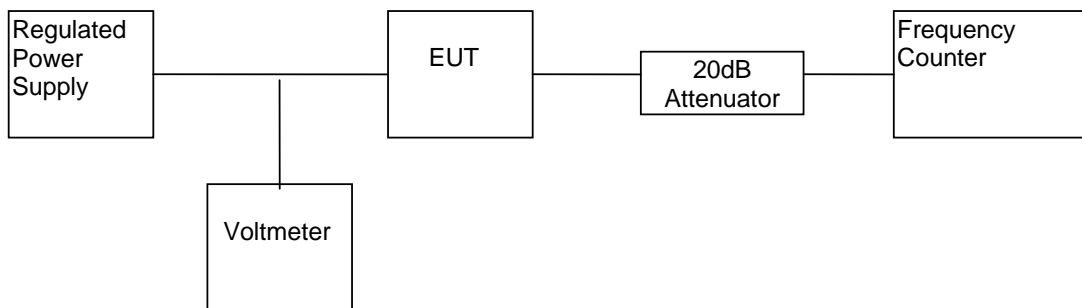
### 7.3 Frequency Stability - Voltage (Section 2.995)

#### A. Test Equipment

Equipment	Brand Name	Model No.
Regulated Power Supply	PAD	30-35L
20 dB RF Attenuator	Bird	8304-200-N
Voltage meter	Fluke	87
Frequency Counter	Phillips	PM6668

#### B. Testing Procedure

- 1) Set-up the test equipment in the following configuration:



- 2) Vary the level of regulated power supply to the manufacturer specified battery end point of the EUT.
- 3) Measure the channel frequency of channel 4 and 11 in MHz.

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**INTERTEK TESTING SERVICES**

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**C. Test Result**

**Table 7**

**Giant Electronics Limited  
Giant / T9110**

**Frequency Deviation with Voltage Variation**

The manufacturer specified battery end point 3.5V

Channel	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)
4	462.6375	462.63725	-0.000054
11	467.6375	467.63730	-0.000043



**INTERTEK TESTING SERVICES**

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**EXHIBIT 8**

**TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

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### 8.0 Technical Specifications

## INTERTEK TESTING SERVICES

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### 8.1 Block Diagram

For electronic filing, the block diagram of the transceiver is saved with filename: block.pdf

Figure 8.1 Block Diagram

## INTERTEK TESTING SERVICES

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### 8.2 Schematic Diagram

For electronic filing, the schematic diagram of the transceiver is saved with filename: circuit.pdf

Figure 8.2 Schematic Diagram

**INTERTEK TESTING SERVICES**

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**EXHIBIT 9**

**PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

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### 9.0 Product Labelling

## INTERTEK TESTING SERVICES

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### 9.1 Label Artwork & Location

#### Figure 9.1 Label Artwork & Location

An engineering drawing of the label which will be permanently affixed to the unit.  
For electronic filing, the label artwork & location are saved with filename: label.pdf

**INTERTEK TESTING SERVICES**

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**EXHIBIT 10**

**PHOTOGRAPHS**



## INTERTEK TESTING SERVICES

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### 10.0 Equipment Photographs

For electronic filing, photographs of the tested EUT are saved with filename: external photos.doc and internal photos.doc

**INTERTEK TESTING SERVICES**

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**EXHIBIT 11**

**INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

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### 11.0 Instruction Manual

This manual will be provided to the end-user with each unit sold/leased in the United States.

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

**INTERTEK TESTING SERVICES**

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**EXHIBIT 12**

**TUNE UP PROCEDURE**

## INTERTEK TESTING SERVICES

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### 12.0 Tune Up Procedure

For electronic filing, a preliminary copy of the Tune Up Procedure is saved with filename: tuneup.pdf

**INTERTEK TESTING SERVICES**

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**EXHIBIT 13**

**PART LIST**

## INTERTEK TESTING SERVICES

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### 13.0 **Part List**

For electronic filing, a preliminary copy of the Part List is saved with filename:  
partlist.pdf

**INTERTEK TESTING SERVICES**

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**EXHIBIT 14**

**INPUT CURRENT**



14.0 **Input Current**

The input current to final r.f. stage at 4.5V is 0.47A.

**INTERTEK TESTING SERVICES**

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**EXHIBIT 15**

**RF EXPOSURE INFO**

## INTERTEK TESTING SERVICES

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### 15.0 RF Exposure Info

The RF Safety Information is shown on P.2-10 of User Manual.

**INTERTEK TESTING SERVICES**

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**EXHIBIT 16**

**CONFIDENTIALITY REQUEST**

## INTERTEK TESTING SERVICES

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### 16.0 Confidentiality Request

For electronic filing, a confidentiality request is saved with filename: request.pdf