

HCT CO., LTD.



PRODUCT COMPLIANCE DIVISION  
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## EMI REPORT (Certification)

CASIO HITACHI Mobile Communications Co., Ltd.

2-229-1, Sakuragaoka, Higashiyamato-shi,  
Tokyo 207-8501, Japan

Date of Issue: April 22, 2008

Test Report No.: HCT-F08-0405-1

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

FCC ID:

**TYKNX9230**

Classification/ Standard(s): FCC PART 15 Subpart B / CISPR 22 CLASS B  
Equipment (EUT) Type: Dual-Band CDMA/EVDO Phone with Bluetooth  
Trade Name/Model(s): CASIO HITACHI Mobile Communication Co., Ltd. / G'zOne Boulder  
Application Type: Certification  
Port/ Connector(s): DC Input Port / Ear Phone Port

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.(See Test Report if any modifications were made for compliance)

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.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988, 21 U.S.C.853(a).

Report prepared by  
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### ATTACHMENT : TEST SETUP PHOTOGRAPHS

## **1. GENERAL INFORMATION**

### **1.1 Product Description**

The CASIO HITACHI Mobile Communication Co., Ltd. G'zOne Boulder Dual-Band CDMA/EVDO Phone with Bluetooth. Its basic purpose is used for communications. It transmits from CDMA 835 (824.7 MHz – 848.31 MHz), PCS1900 (1851.25 MHz – 1908.75 MHz), Bluetooth(2402 MHz – 2480 MHz) and receives from CDMA 835 (869.70 MHz – 893.31 MHz), PCS1900 (1931.25 MHz – 1988.75 MHz) Bluetooth(2402 MHz – 2480 MHz).

MODEL	G'zOne Boulder
FCC ID	TYKNX9230
EUT Type	Dual-Band CDMA/EVDO Phone with Bluetooth
TX Frequency	824.70 MHz – 848.31 MHz (CDMA 835) 1851.25 MHz – 1908.75 MHz (PCS 1900) 2402 MHz – 2480 MHz (Bluetooth)
RX Frequency	869.70 MHz – 893.31 MHz (CDMA 835) 1931.25 MHz – 1988.75 MHz (PCS 1900) 2402 MHz – 2480 MHz (Bluetooth)

### **1.2 Related Submittal(s) / Grant(s)**

ORIGINAL SUBMITTAL ONLY

### 1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER/ PART NUMBER	FCC ID / DoC	CONNECTED TO
Dual-Band CDMA/EVDO Phone with Bluetooth	CASIO HITACHI Mobile Communication Co., Ltd.	G'zOne Boulder	TYKNX9230	PC, TA
Travel Adaptor	-	-	-	EUT
Notebook PC	Toshiba	PSMA2K-01D002	DoC	EUT, TA
Notebook PC Adaptor	Delta	SADP-65KB B		Notebook PC
Mouse	Logitech	M-BT96a	DoC	Notebook PC
Ear phone	-	-	-	EUT
USB Cable	-	-	-	EUT, PC
Desk Top Cradle	-	-	-	EUT

### 1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
Dual-Band CDMA/EVDO Phone with Bluetooth	DC In	N	N/A	(P)1.6
	Ear Jack	N/A	N	(D)1.2
	Ear Jack	N	N	(P,D)0.1
	USB data	N/A	Y	(D)1.0
Notebook PC	USB (Mouse)	N/A	Y	(D)1.8

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

### 1.5 Noise Suppression Parts on Cable. (I/O CABLE)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Dual-Band CDMA/EVDO Phone with Bluetooth	DC-In	N	-	Y	EUT End
	Ear-jack	N	-	Y	EUT End
	USB data	Y	Notebook PC End	Y	Both End
Notebook PC	USB (Mouse)	N	-	Y	Notebook PC End

## **1.6 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

## **1.7 Test Facility**

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

## **1.8 Frequency range of radiated measurements**

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table

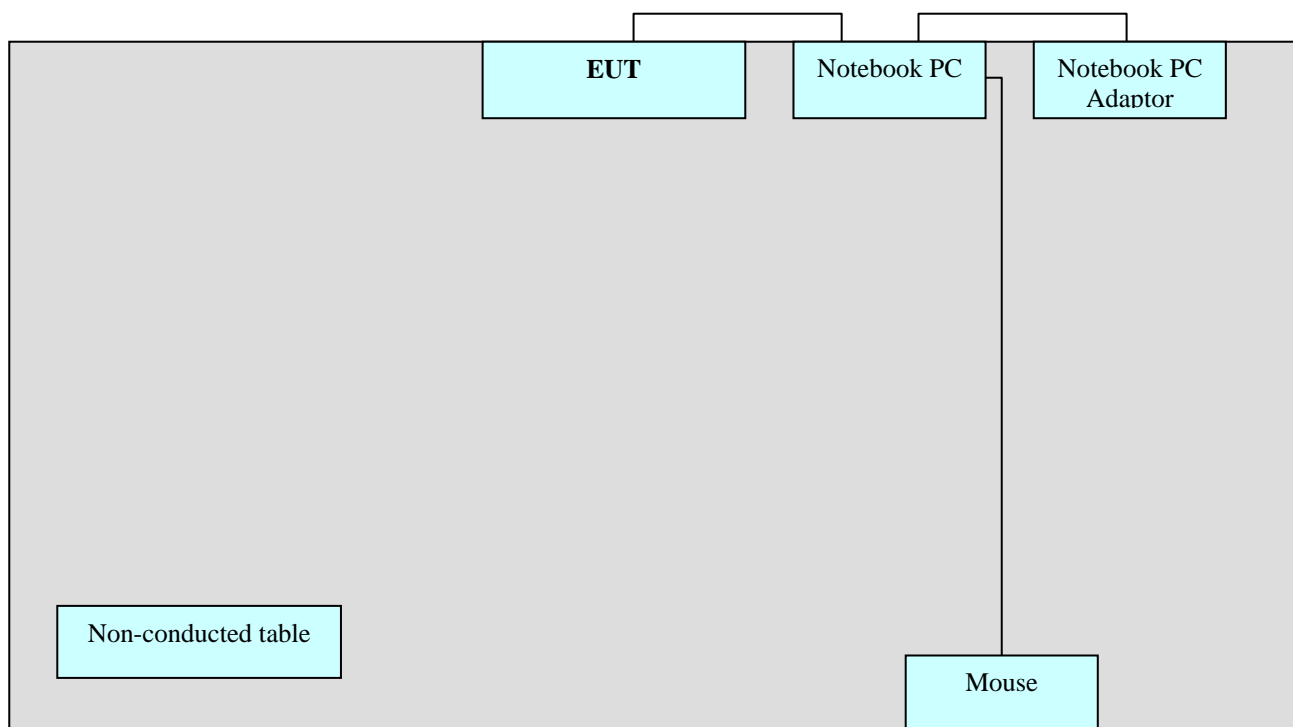
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

## 2.SYSTEM TEST CONFIGURATION

### 2.1 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were Connected to another LISN. Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

Radiated Emission Test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 meter open area test site.



Power Line: 110V AC

[Configuration of Tested System]

### **3. PRELIMINARY TEST**

#### **3.1 Conducted Emission Test**

**During Preliminary Tests, the following operating mode was investigated**

<b>Operation Mode</b>	<b>The worst operating condition</b>
<b>Idle (850, 1900) Mode</b>	
<b>Camera Mode</b>	
<b>Bluetooth Mode</b>	
<b>Data Communication Mode</b>	○

#### **3. 2 Radiated Emission Test**

**During Preliminary Test, the Following operation mode was investigated**

<b>Operation Mode</b>	<b>The worst operating condition</b>
<b>Idle (850, 1900) Mode</b>	
<b>Camera Mode</b>	
<b>Bluetooth Mode</b>	
<b>Data Communication Mode</b>	○



## 4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

### 4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit apply to : CISPR 22 CLASS B  
Result : PASSED BY 4.7 dB  
Operating Condition : Camera mode  
Detector : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)  
Temperature : 20.0 °C  
Humidity Level : 46.0 %  
Test Date : April 08, 2008

Power Line Conducted Emissions			CISPR 22 Class B		
Frequency (MHz)	Amplitude (dBuV)	Conductor	Result	Limit (dBuV)	Margin (dB)
3.396	51.3	HOT	Quasi-Peak	56.0	4.7
3.516	38.3	HOT	Average	46.0	7.7
3.392	47.9	NEUTRAL	Quasi-Peak	56.0	8.1
3.464	35.3	NEUTRAL	Average	46.0	10.7

Limit apply to : CISPR 22 CLASS B  
Result : PASSED BY 12.9 dB  
Operating Condition : Data Communication Mode  
Detector : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)  
Temperature : 24.0 °C  
Humidity Level : 48.0 %  
Test Date : April 14, 2008

Power Line Conducted Emissions			CISPR 22 Class B		
Frequency (MHz)	Amplitude (dBuV)	Conductor	Result	Limit (dBuV)	Margin (dB)
0.152	48.10	HOT	Quasi-Peak	66.0	17.7
15.912	37.10	HOT	Average	50.0	12.9
0.152	48.0	NEUTRAL	Quasi-Peak	66.0	17.8
16.228	36.6	NEUTRAL	Average	50.0	13.4

Line Conducted Emissions Tabulated Data



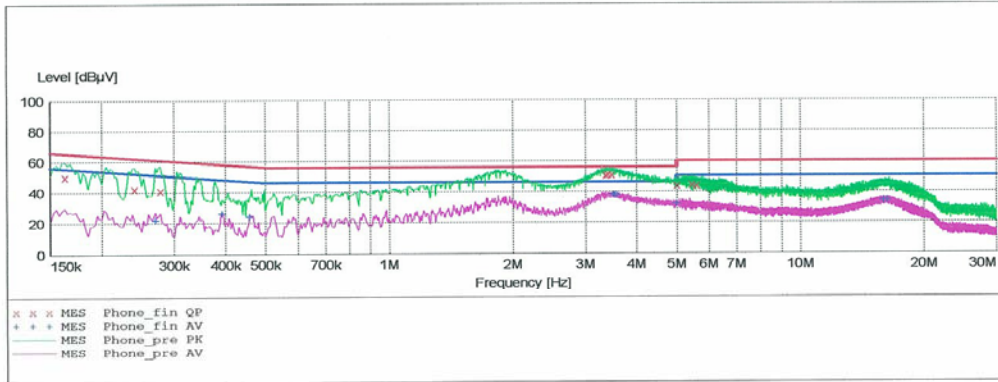
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EMC TEST LAB.

EUT: G'z One Boulder  
Manufacturer: CHMC  
Operating Condition: Camera Mode  
Test Site: SHIELD ROOM  
Operator: YH.LEE  
Test Specification: CISPR 22 CLASS B  
Comment: H

**SCAN TABLE: "CISPR 22 Voltage"**

Short Description:			CISPR 22 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



**MEASUREMENT RESULT: "Phone\_fin QP"**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.162600	50.00	10.0	65	15.4	---	---
0.240100	42.20	10.0	62	19.8	---	---
0.277600	41.20	10.0	61	19.7	---	---
3.360000	50.90	10.4	56	5.1	---	---
3.396000	51.30	10.4	56	4.7	---	---
3.468000	51.00	10.5	56	5.0	---	---
5.000000	43.90	10.6	56	12.1	---	---
5.456000	44.50	10.7	60	15.5	---	---
5.580000	44.10	10.7	60	15.9	---	---

**MEASUREMENT RESULT: "Phone\_fin AV"**

4/8/2008 10:44AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.270100	22.30	10.0	51	28.9	---	---
0.392600	26.10	10.0	48	21.9	---	---
0.457600	24.10	10.1	47	22.7	---	---
3.516000	38.30	10.5	46	7.7	---	---
3.540000	37.80	10.5	46	8.2	---	---
3.576000	38.00	10.5	46	8.0	---	---
5.000000	32.20	10.6	46	13.8	---	---
15.968000	34.20	12.0	50	15.8	---	---
16.272000	34.10	12.0	50	15.9	---	---

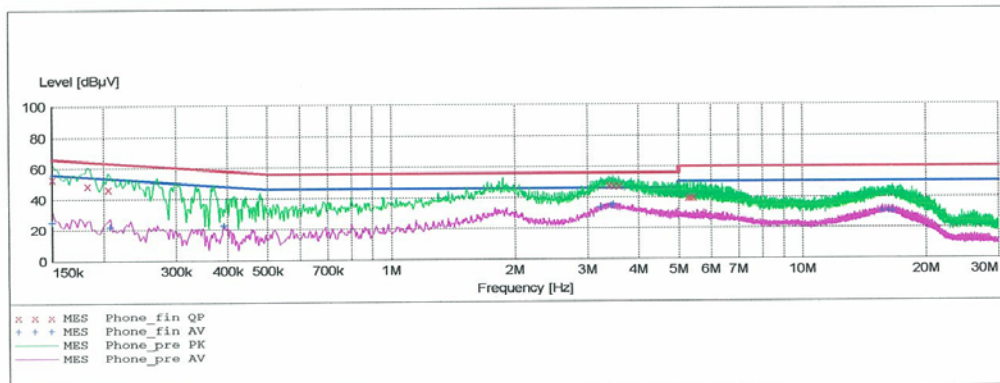
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**EMC TEST LAB.**

EUT: G'z One Boulder  
Manufacturer: CHMC  
Operating Condition: Camera Mode  
Test Site: SHIELD ROOM  
Operator: YH.LEE  
Test Specification: CISPR 22 CLASS B  
Comment: N

**SCAN TABLE: "CISPR 22 Voltage"**

Short Description:			CISPR 22 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



**MEASUREMENT RESULT: "Phone\_fin QP"**

4/8/2008 10:47AM

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.150100	53.20	10.0	66	12.8	---	---
0.182600	48.90	10.0	64	15.4	---	---
0.205100	46.50	10.0	63	16.9	---	---
3.392000	47.90	10.4	56	8.1	---	---
3.464000	47.80	10.5	56	8.2	---	---
3.576000	47.40	10.5	56	8.6	---	---
5.272000	39.90	10.7	60	20.1	---	---
5.352000	39.80	10.7	60	20.2	---	---
5.420000	40.00	10.7	60	20.0	---	---

**MEASUREMENT RESULT: "Phone\_fin AV"**

4/8/2008 10:47AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150100	25.10	10.0	56	30.8	---	---
0.207600	22.30	10.0	53	31.0	---	---
0.392600	22.80	10.0	48	25.2	---	---
3.236000	33.80	10.4	46	12.2	---	---
3.428000	34.70	10.5	46	11.3	---	---
3.464000	35.30	10.5	46	10.7	---	---
15.692000	30.80	12.0	50	19.2	---	---
16.220000	31.10	12.0	50	18.9	---	---
16.600000	30.70	12.1	50	19.3	---	---

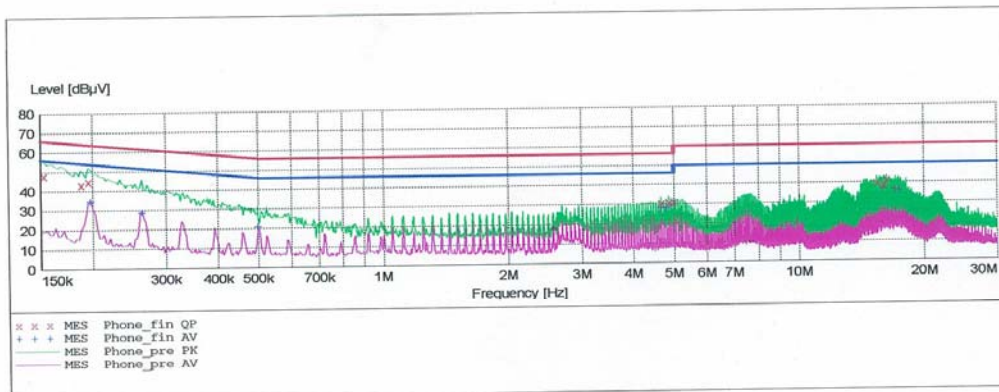
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**EMC TEST LAB.**

EUT: G'z One Boulder  
Manufacturer: CHMC  
Operating Condition: Data Communication Mode  
Test Site: SHIELD ROOM  
Operator: YH.LEE  
Test Specification: CISPR 22 CLASS B  
Comment: H

**SCAN TABLE: "CISPR 22 Voltage"**

Short Description:		CISPR 22 Voltage					
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
Frequency	Frequency	Width					
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



**MEASUREMENT RESULT: "Phone\_fin QP"**

4/14/2008 11:40AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.152600	48.10	10.0	66	17.7	---	---
0.187600	43.20	10.0	64	20.9	---	---
0.195100	44.90	10.0	64	18.9	---	---
4.660000	30.60	10.6	56	25.4	---	---
4.856000	30.80	10.6	56	25.2	---	---
4.988000	30.90	10.6	56	25.1	---	---
15.436000	39.80	12.0	60	20.2	---	---
16.024000	38.80	12.0	60	21.2	---	---
16.284000	41.40	12.0	60	18.6	---	---

**MEASUREMENT RESULT: "Phone\_fin AV"**

4/14/2008 11:40AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.197600	34.90	10.0	54	18.8	---	---
0.262600	29.00	10.0	51	22.4	---	---
0.500000	20.90	10.1	46	25.1	---	---
4.660000	28.00	10.6	46	18.0	---	---
4.792000	28.30	10.6	46	17.7	---	---
4.924000	29.20	10.6	46	16.8	---	---
15.912000	37.10	12.0	50	12.9	---	---
17.024000	36.70	12.1	50	13.3	---	---
17.448000	36.20	12.1	50	13.8	---	---

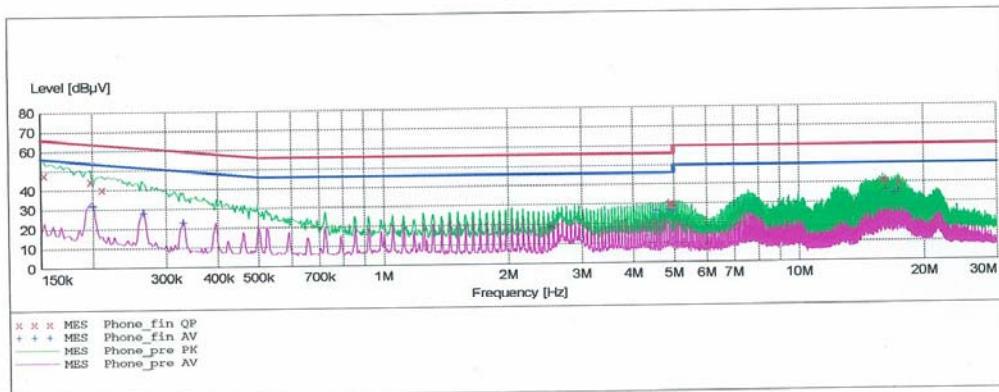
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**EMC TEST LAB.**

EUT: G'z One Boulder  
Manufacturer: CHMC  
Operating Condition: Data Communication Mode  
Test Site: SHIELD ROOM  
Operator: YH.LEE  
Test Specification: CISPR 22 CLASS B  
Comment: N

**SCAN TABLE: "CISPR 22 Voltage"**

Short Description:		CISPR 22 Voltage					
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
Frequency	Frequency	Width					
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



**MEASUREMENT RESULT: "Phone\_fin QP"**

4/14/2008 11:44AM						
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.152600	48.00	10.0	66	17.8	---	---
0.197600	44.60	10.0	64	19.1	---	---
0.210100	40.40	10.0	63	22.8	---	---
4.860000	30.00	10.6	56	26.0	---	---
4.928000	30.10	10.6	56	25.9	---	---
4.992000	29.80	10.6	56	26.2	---	---
15.964000	41.60	12.0	60	18.4	---	---
16.228000	41.00	12.0	60	19.0	---	---
17.392000	40.20	12.1	60	19.8	---	---



**MEASUREMENT RESULT: "Phone\_fin AV"**

4/14/2008 11:44AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.200100	32.00	10.0	54	21.6	---	---
0.265100	28.00	10.0	51	23.3	---	---
0.330100	23.00	10.0	49	26.4	---	---
4.532000	26.80	10.6	46	19.2	---	---
4.860000	27.10	10.6	46	18.9	---	---
4.992000	26.70	10.6	46	19.3	---	---
16.228000	36.60	12.0	50	13.4	---	---
17.024000	34.70	12.1	50	15.3	---	---
17.392000	36.00	12.1	50	14.0	---	---

## **4.2 Radiated Emission Test**

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Limit apply to	: FCC PART 15 Subpart B
Result	: PASSED BY 8.5 dB
Operating Condition	: Data Communication Mode
Detector	: Quasi-Peak (6 dB Bandwidth: 120 kHz)
Temperature	: 20.0 °C
Humidity Level	: 46.0 %
Test Date	: April 08, 2008

Frequency	Reading	Ant. Factor	Cable Loss	ANT POL	Total	Limit	Margin
MHz	dBuV/m	dB/m	dB	(H/V)	dBuV/m	dBuV/m	dB
268.8	17.4	11.7	3.9	H	33.0	46.0	13.0
456.2	12.1	16.3	5.0	H	33.4	46.0	12.6
480.6	15.7	16.6	5.2	H	37.5	46.0	8.5
504.4	12.4	17.0	5.3	H	34.7	46.0	11.3
552.6	13.3	17.9	5.5	H	36.7	46.0	9.3
552.6	12.1	17.9	5.5	V	35.5	46.0	10.5

For measurement over 1 GHz, noise level was more than 10 dB below the limit.

## 5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV/m is obtained. The Antenna Factor of 7.4 dB and a Cable Factor of 1.1 dB is added. The 30 dBuV/m value is mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

### Radiated emission limits

Frequency of emission	Field strength	
	$\mu\text{V} / \text{m}$	$\text{dB } \mu\text{V} / \text{m}$
30 ~ 88	100	40.0
88 ~ 216	150	43.5
216 ~ 960	200	46.0
Above 960	500	54.0

## 6. Test Equipment

<u>Type</u>	<u>Manufacture</u>	<u>Model Number</u>	<u>Next CAL Date</u>
EMI Test Receiver	Rohde & Schwarz	ESI40	2008.11.06
EMI Test Receiver	Rohde & Schwarz	ESCI	2008.06.01
LISN	EMCO	703125	2008.05.04
LISN	Rohde & Schwarz	ESH2-Z5	2009.04.18
LISN	Rohde & Schwarz	ESH3-Z5	2008.06.13
LISN	EMCO	3816/2	2008.06.13
Attenuator	Rohde & Schwarz	ESH3-Z2	2008.10.30
TRILOG Antenna	Schwarzbeck	VULB9160	2009.04.20
Communication Antenna	TDK	LPDA-0802	N/A
Antenna Position Tower	HD	240/520/00	N/A
Base Station	Rohde & Schwarz	CMU 200	2009.02.28
Horn Antenna	Schwarzbeck	BBHA 9120D	2009.03.26
RF-Amplifier	MITEQ	AMF-6D-00101800-35.20P.PS	2008.04.25
Bluetooth Base Station	TESCOM	TC-3000A	2009.01.11

## 7. Conclusion

The data collected shows that the CASIO HITACHI Mobile Communication Co., Ltd. Dual-Band CDMA/EVDO Phone with Bluetooth. FCC ID: TYKNX9230 Complies with §15.107 and §15.109 of the FCC Rules.