PCTEST Engineering Laboratory, Inc.

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CERTIFICATE OF COMPLIANCE
FCC Part 22 Certification

Benq Corporation
157 Shan-Ying Road Kweishan
Taoyuan 333, TAIWAN, R.O.C.
Atn: Mr. George Chiou
Technical Manager

Dates of Tests: Jan. 9-10, 2002
Test Report S/N: 22.220110007.JVP
Test Site: PCTEST Lab, Columbia, MD USA

FCC ID	**JVPH0622**
APPLICANT	**BENQ Corporation**

Classification:	**Non-Broadcast Transmitter held to ear (TNE)**
FCC Rule Part(s):	**§22(H), §22.901(d), §2**
EUT Type:	**Dual-Mode Cellular Phone (AMPS/CDMA)**
Trade Name/Model(s):	***BENQ ACTON***
Tx Frequency Range:	**824.04 ~ 848.97MHz (AMPS) / 824.70 ~ 848.31 MHz (CDMA)**
Rx Frequency Range:	**869.04 ~ 893.31MHz (AMPS) / 869.70 ~ 893.31 MHz (CDMA)**
Max. RF Output Power:	**0.424W ERP AMPS (26.273 dBm) / 0.345W ERP CDMA (25.373 dBm)**
Max. SAR Measurement:	**1.4395 mW/g AMPS Brain SAR; 1.1917 mW/g CDMA Brain SAR 0.8122 mW/g AMPS Body SAR; 0.7064 mW/g CDMA Body SAR**
Frequency Tolerance:	**0.00025% (2.5 ppm)**
Emission Designators:	**40K0F8W,40K0F1D**

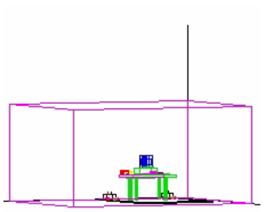
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.

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.

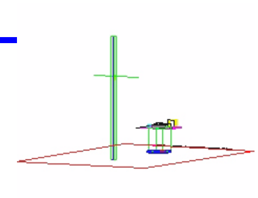
PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

TABLE OF CONTENTS



MEASUREMENT REPORT



1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

§2.1033 General Information

Applicant:	**Benq Corporation**
Address:	**157 Shan-Ying Road Kweishan**
	Taoyuan 33, TAIWAN, R.O.C.
Attention	**Mr. George Chiou**
	Technical Manager

- FCC ID: **JVPH0622**
- Trade Name(s): ***BENQ***
- Model(s): ***ACTON***
- Quantity: Quantity production is planned
- Emission Designator: 40K0F8W, 40K0F1D
- Tx Freq. Range: 824.04 – 848.97 MHz (AMPS) / 824.70 ~ 848.31 (CDMA)
  Rx Freq. Range: 869.04 – 893.31 MHz (AMPS) / 869.70 ~ 893.31 (CDMA)
- Equipment Class: Non-Broadcast Transmitter Held to Ear (TNE)
- Equipment Type: Dual-Mode Cellular Phone
- Modulation(s): AMPS / CDMA
- Frequency Tolerance: ± 0.00025% (2.5 ppm)
- Max. RF Output Power: 0.424W ERP AMPS (26.273 dBm) / 0.345W ERP CDMA (25.373dBm)
- Max. SAR Measurement: 1.4395 mW/g AMPS Brain SAR; 1.1917 mW/g CDMA Brain SAR; 0.8122 mW/g AMPS Body SAR; 0.7064 mW/g CDMA Body SAR
- FCC Rule Part(s): §22(H), §22.901(d), §2
- Battery Pack: 3.7 VDC
- Dates of Tests: January 9-10, 2002
- Place of Tests: PCTEST Lab, Columbia, MD U.S.A.
- Report Serial No.: 22.220110007.JVP

2.1 INTRODUCTION

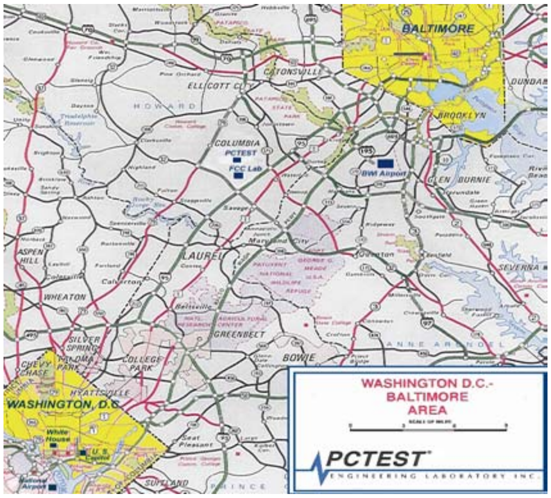


Figure. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

These measurement tests were conducted at ***PCTEST Engineering Laboratory, Inc.*** facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on October 19, 1992.

Measurement Procedure

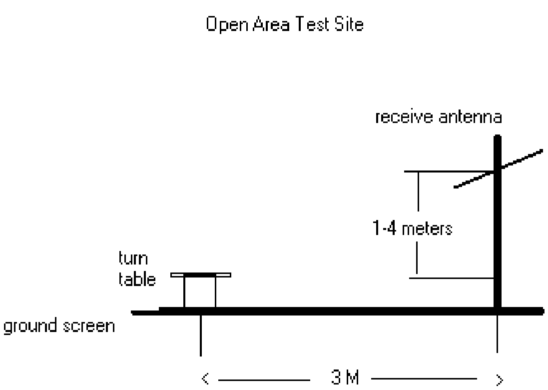


Figure 2. 3-meter Outdoor Test Site

The radiated and spurious measurements were made outdoors at a 3-meter test range (see Figure2). The equipment under testing was placed on a wooden turntable, 3-meters from the receive antenna. The receive antenna height and turntable rotations was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level was recorded.

For readings above 1 GHZ, the above procedure would be repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

3.1 INSERTS

Function of Active Devices (Confidential)

The Function of active devices are shown in Attachment L.

Block/Circuit Diagrams & Description (Confidential)

The circuit diagram & description are shown in Attachment J, and the block diagrams are shown in Attachment I

Operating Instructions

The instruction manual is shown in Attachment M.

Parts List & Tune-Up Procedure (Confidential)

The parts list & tune-up procedure are shown in Attachment K.

Description of Freq. Stabilization Circuit (Confidential)

The description of frequency stabilization circuit is shown in Attachment L.

Description for Suppression of Spurious Radiation, for Limiting Modulation, and Harmonic Suppresion Circuits (Confidential)

The description of suppression stabilization circuits are shown in Attachment L.

4.1 DESCRIPTION OF TESTS

4.2 Transmitter Audio Frequency Response

The frequency response of the audio modulating circuit over the frequency range 100 – 5000 Hz is measured. The audio signal generator is connected to the audio input circuit/microphone of the EUT. The audio signal input is adjusted to obtain 50% modulation at 1kHz and this point is taken as the 0dB reference. With the input held constant and below the limit at all frequencies, the audio signal generator is varied from 100 to 50 kHz.

4.3 Audio Low Pass Filter Frequency Response

The response in dB relative to 1kHz is measured using the HP8901 a Modulation Analyzer. For the frequency response of the audio low-pass filter, the audio input is connected at the input to the modulation limiter and the modulated stage. The audio output is connected at the output of the modulated stage. The corresponding plots are shown herein.

4.4 Modulation Limiting

The audio signal generator is connected to the audio input circuit/microphone of the EUT. The modulation response is measured for each of the three modulating frequencies (300Hz, 1000 Hz, and 3000Hz), and the input voltage is varied from 30% modulation (±3.6kHz deviation) to at least 20dB higher than the saturation point. Measurements of modulation and the plots are attached herein. Measurements were performed for ST, SAT, and wide-band data modulations. The corresponding results are shown herein.

Note: ST, SAT, & Wide-Band data were internally generated by the EUT.

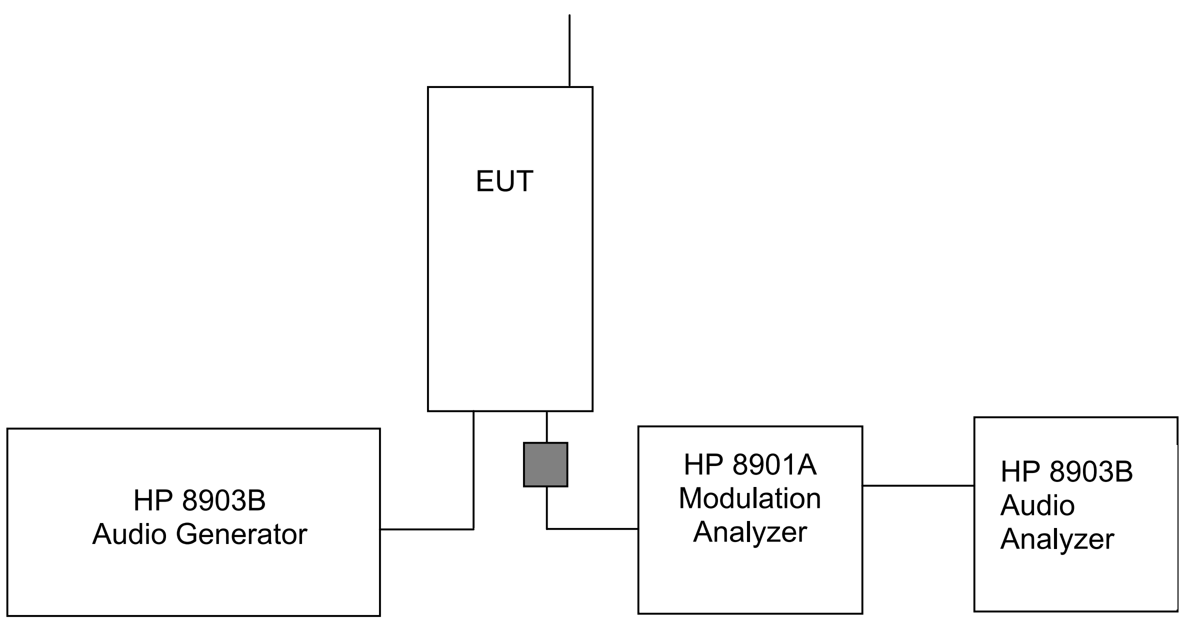


Fig. 3. Transmitter Audio Frequency & Tone Modulation Test Setup.

4.1 DESCRIPTION OF TESTS (CONTINUED)

4.4 Occupied Bandwidth

The audio signal generator is adjusted to 1kHz. The output level is set to +/- 6kHz deviation. With the level constant, the freq. Is set to 2,500Hz. Then the audio signal level is increased by 16dB. The occupied bandwidth data is obtained for the SAT (Supervisory Audio Tone), ST (Signaling Tone), WBD (Wideband Data), and DTMF (Dual Tone Multi Frequencies). The results are shown on the attached graphs.

Specified Limits:

(a) On any frequency removed from the assigned carrier frequency by more than 20kHz, up to and including 45kHz, the sideband is at least 26dB below the carrier.

(b) On any frequency removed from the assigned carrier frequency by more than 45kHz, up to and including 90kHz, the sideband is at least 45dB below the carrier.

(c) On any frequency removed from the assigned carrier frequency by more than 90kHz, up to the first multiple of the carrier frequency, the sideband is at least 60dB below the carrier of 40 + $\log_{10}$ (mean power output in Watts) dB, whichever is the smaller attenuation.

4.5 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10 GHz. The transmitter is modulated with a 2500Hz tone at a level of 16dB greater than that required to provided 50% modulation.

At the input terminals of the spectrum analyzer, an isolator (RF circulator with on port terminated with 50 ohms) and an 870 MHz to 890 MHz bandpass filter is connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The rejection of the bandpass filter to signals in the 825 – 845 MHz range is adequate to limit the transmit energy from the test transceiver which appears to a level which will allow the analyzer to measure signals less than –90dBm. Calibration of the test receiver is performed in the 870 – 890 MHz range to insure accuracy to allow variation in the passband filter insertion loss to be calibrated.

4.6 Radiation Spurious and Harmonic Emissions

Radiation and harmonic emissions above 1 GHz is measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

4.1 DESCRIPTION OF TESTS (CONTINUED)

4.7 Frequency Stability/Temperature Variation

The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +60°C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification **–** *The minimum frequency stability shall be +/- 0.00025% at any time during normal operation*.

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at 30°C (usually 14-16 hours), the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements is made at 10°C interval up to room temperature. At least a period of one and one half hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency were made at 10 intervals starting at 30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

NOTE: The EUT is tested down to the battery endpoint.

5.1 Test Data

5.2 Effective Radiated Power Output

A. POWER: **Low (Analog Mode)**

Freq. Tuned (MHz)	LEVEL (dBm)	POL (H/V)	ERP (W)	ERP (dBm)
824.04	-15.300	H	0.397	25.973
836.49	-15.520	H	0.391	25.909
848.97	-15.310	H	0.425	26.275

B. POWER: **High (Analog Mode)**

Freq. Tuned (MHz)	LEVEL (dBm)	POL (H/V)	ERP (W)	ERP (dBm)	BATTERY
824.04	-15.300	V	0.39566	25.973	Standard
836.49	-15.520	V	0.38917	25.901	Standard
848.97	-15.310	V	0.42412	26.275	Standard

NOTES:

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603 (rev.1998):

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

5.1 Test Data (Cont'd)

5.3 Effective Radiated Power Output

A. POWER: **High (CDMA Mode)**

Freq. Tuned (MHz)	LEVEL (dBm)	POL (H/V)	ERP (W)	ERP (dBm)	BATTERY
824.70	-15.920	H	0.34368	25.362	Standard
835.89	-16.300	V	0.32604	25.133	Standard
848.31	-16.200	V	0.34488	25.377	Standard

NOTES:

ERP Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This ERP level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

6.1 Test Data

6.2 AMPS Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 824.04 MHz
CHANNEL: 0991 (Low)
MEASURED OUTPUT POWER: 26.273 dBm = 0.424 W
MODULATION SIGNAL: FM (Internal)
DISTANCE: 3 meters
LIMIT: $43 + 10 \log_{10}(W) =$ 39.27 dBc

FREQ. (MHz)	LEVEL (dBm)	POL (H/ V)	(dBc)
1648.08	-88.00	H	70.2
2472.12	-98.40	H	76.3
3296.16	-103.20	H	77.4
4120.20	-105.67	H	76.2
4944.24	< -130		

NOTES:

Radiated Spurious Emission Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

6.1 Test Data (Continued)

6.3A MPS Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.49			MHz
CHANNEL:	0383 (Mid)			
MEASURED OUTPUT POWER:	26.273	dBm =	0.424	W
MODULATION SIGNAL:	FM (Internal)			
DISTANCE:	3			meters
LIMIT:	$43 + 10 \log_{10} (W) =$	39.27		dBc

FREQ. (MHz)	LEVEL (dBm)	POL (H/ V)	(dBc)
1672.98	-88.90	V	71.1
2509.47	-99.00	V	76.7
3345.96	-102.56	V	76.5
4182.45	-105.00	V	75.5
5018.94	< -130		

NOTES:

Radiated Spurious Emission Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

6.1 Test Data (Continued)

6.4 AMPS Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 848.97 MHz
CHANNEL: 0799 (High)
MEASURED OUTPUT POWER: 26.273 dBm = 0.424 W
MODULATION SIGNAL: FM (Internal)
DISTANCE: 3 meters
LIMIT: $43 + 10 \log_{10}$ (W) = 39.27 dBc

FREQ. (MHz)	LEVEL (dBm)	POL (H/ V)	(dBc)
1697.94	-87.00	V	68.8
2546.91	-97.00	V	74.5
3395.88	-103.00	V	76.8
4244.85	-105.00	V	75.6
5093.82	< -130		

NOTES:

Radiated Spurious Emission Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

6.1 Test Data (Continued)

6.5 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 824.70 MHz
CHANNEL: 1013 (Low)
MEASURED OUTPUT POWER: 25.373 dBm = 0.345 W
MODULATION SIGNAL: CDMA (Internal)
DISTANCE: 3 meters
LIMIT: $43 + 10 \log_{10}$ (W) = 38.37 dBc

FREQ. (MHz)	LEVEL (dBm)	POL (H/V)	(dBc)
1649.40	-87.10	V	68.3
2474.10	-95.00	V	71.9
3298.80	-101.00	V	74.2
4123.50	-109.00	V	78.6
4948.20	< -130		

NOTES:

Radiated Spurious Emission Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

6.1 Test Data (Continued)

6.6 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	835.89	MHz	
CHANNEL:	0363 (Mid)		
MEASURED OUTPUT POWER:	25.373 dBm	=	0.345 W
MODULATION SIGNAL:	CDMA (Internal)		
DISTANCE:	3	meters	
LIMIT:	$43 + 10\log_{10}(W) =$	38.37	dBc

FREQ. (MHz)	LEVEL (dBm)	POL (H/V)	(dBc)
1671.78	-92.00	V	73.2
2507.67	-99.80	V	76.5
3343.56	-103.00	V	76.0
4179.45	-120.00	V	89.5
5015.34	< -130		

NOTES:

Radiated Spurious Emission Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

6.1 Test Data (Continued)

6.7 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	848.31	MHz	
CHANNEL:	0777 (High)		
MEASURED OUTPUT POWER:	25.373 dBm	=	0.345 W
MODULATION SIGNAL:	CDMA (Internal)		
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10}$ (W) =	38.37	dBc

FREQ. (MHz)	**LEVEL** (dBm)	**POL** (H/V)	(dBc)
1696.62	-87.00	V	67.8
2544.93	-97.00	V	73.5
3393.24	-109.00	V	81.8
4241.55	-126.60	V	96.0
5089.86	< -130		

NOTES:

Radiated Spurious Emission Measurements by Substitution Method:
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7.1 Test Data (Continued)

7.2 FREQUENCY STABILITY (AMPS)

OPERATING FREQUENCY: 836,490,002 Hz

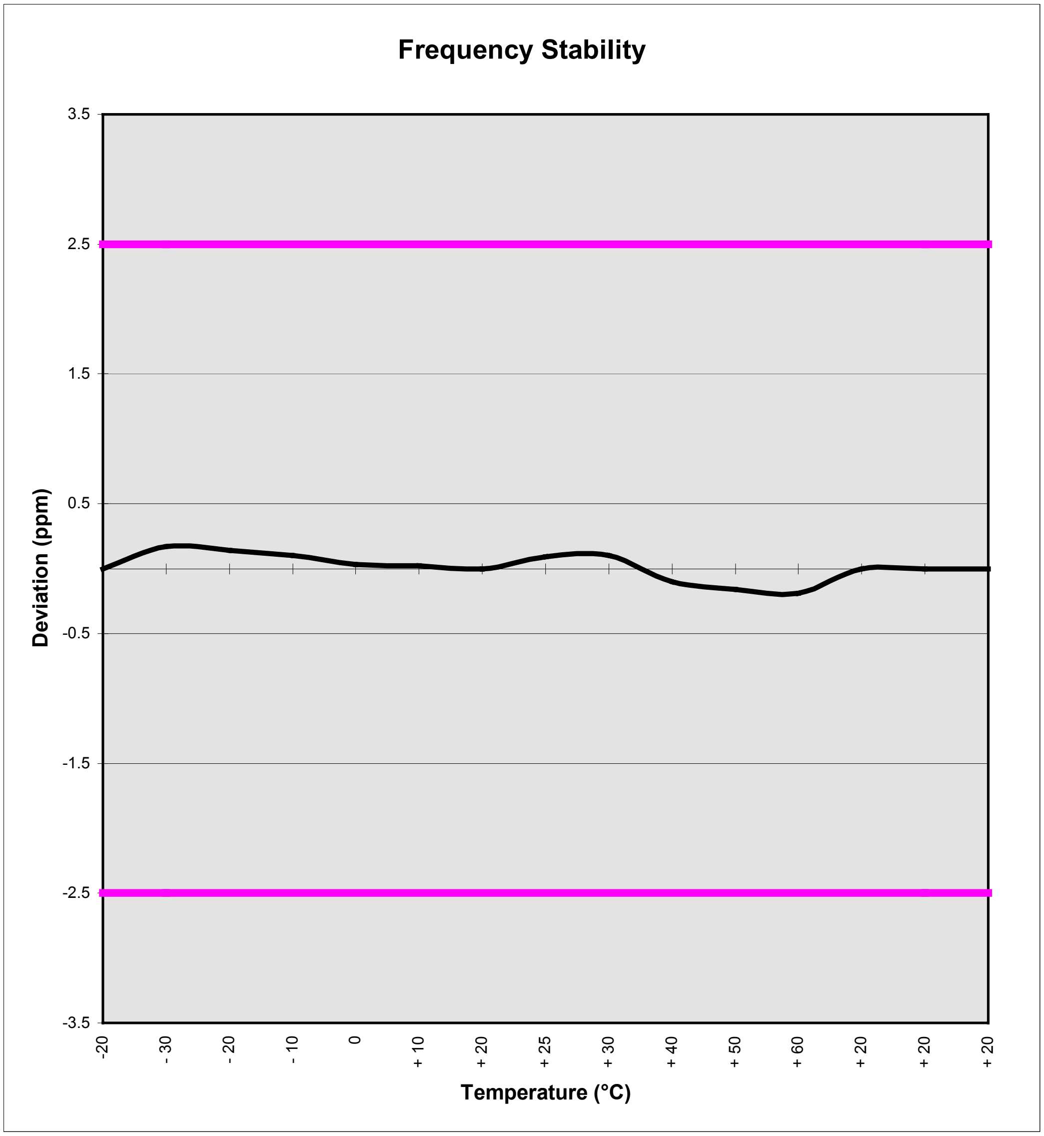
CHANNEL: 383

REFERENCE VOLTAGE: 3.6 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Deviation (%)
100 %	3.60	+ 20 (Ref)	836,490,002	0.000000
100 %		- 30	836,489,860	0.000017
100 %		- 20	836,489,885	0.000014
100 %		- 10	836,489,918	0.000010
100 %		0	836,489,977	0.000003
100 %		+ 10	836,489,985	0.000002
100 %		+ 20	836,490,002	0.000000
100 %		+ 25	836,489,927	0.000009
100 %		+ 30	836,489,918	0.000010
100 %		+ 40	836,490,086	-0.000010
100 %		+ 50	836,490,136	-0.000016
100 %		+ 60	836,490,161	-0.000019
85 %	3.06	+ 20	836,490,002	0.000000
115 %	4.14	+ 20	836,490,002	0.000000
BATT. ENDPOINT	2.89	+ 20	836,490,002	0.000000

7.3 FREQUENCY STABILITY (AMPS)



8.1 PLOT(S) OF EMISSIONS

SEE ATTACHMENT D

9.1 TEST EQUIPMENT

Type	Model	Cal. Due Date	S/N
Microwave Spectrum Analyzer	*HP 8566B (100Hz-22GHz)*	*08/15/02*	*3638A08713*
Microwave Spectrum Analyzer	*HP 8566B (100Hz-22GHz)*	*04/17/03*	*2542A11898*
Spectrum Analyzer/Tracking Gen.	*HP 8591A (100Hz-1.8GHz)*	*08/10/02*	*3144A02458*
*Signal Generator**	*HP 8640B (500Hz-1GHz)*	*06/03/02*	*2232A19558*
*Signal Generator**	*HP 8640B (500Hz-1GHz)*	*06/03/02*	*1851A09816*
*Signal Generator**	*Rohde & Schwarz (0.1-1000MHz)*	*09/11/02*	*894215/012*
Ailtech/Eaton Receiver	*NM 37/57A-SL (30-1000MHz)*	*04/12/03*	*0792-03271*
Ailtech/Eaton Receiver	*NM 37/57A (30-1000MHz)*	*03/11/03*	*0805-03334*
Ailtech/Eaton Receiver	*NM 17/27A (0.1-32MHz)*	*09/17/02*	*0608-03241*
Quasi-Peak Adapter	*HP 85650A*	*08/15/02*	*2043A00301*
Ailtech/Eaton Adapter	*CCA-7 CISPR/ANSI QP Adapter*	*03/11/03*	*0194-04082*
Gigatronics Universal Power Meter	*8657A*		*1835256*
Gigatronics Power Sensor	*80701A (0.05-18GHz)*		*1833460*
Signal Generator	*HP 8648D (9kHz-4GHz)*		*3613A00315*
Amplifier Research	*5S1G4 (5W, 800MHz-4.2GHz)*		*22322*
Network Analyzer	*HP 8753E (30kHz-3GHz)*		*JP38020182*
Audio Analyzer	*HP 8903B*		*3011A09025*
Modulation Analyzer	*HP 8901A*		*2432A03467*
Power Meter	*HP 437B*		*3125U24437*
Power Sensor	*HP 8482H (30μW-3W)*		*2237A02084*
Harmonic/Flicker Test System	*HP 6841A (IEC 555-2/3)*		*3531A00115*
Broadband Amplifier (2)	*HP 8447D*		*1145A00470, 1937A03348*
Broadband Amplifier	*HP 8447F*		*2443A03784*
Horn Antenna	*EMCO Model 3115 (1-18GHz)*		*9704-5182*
Horn Antenna	*EMCO Model 3115 (1-18GHz)*		*9205-3874*
Horn Antenna	*EMCO Model 3116 (18-40GHz)*		*9203-2178*
Biconical Antenna (4)	*Eaton 94455/Eaton 94455-1/Singer 94455-1/Compliance Design*		*1295, 1332, 0355*
Log-Spiral Antenna (3)	*Ailtech/Eaton 93490-1*		*0608, 1103, 1104*
Roberts Dipoles	*Compliance Design (1 set)*		
Ailtech Dipoles	*DM-105A (1 set)*		*33448-111*
EMCO LISN (6)	*3816/2*		*1079*
Microwave Preamplifier 40dB Gain	*HP 83017A (0.5-26.5GHz)*		*3123A00181*
Microwave Cables	*MicroCoax (1.0-26.5GHz)*		
Ailtech/Eaton Receiver	*NM37/57A-SL*		*0792-03271*
Spectrum Analyzer	*HP 8594A*		*3051A00187*
Spectrum Analyzer (2)	*HP 8591A*		*3034A01395, 3108A02053*
Microwave Survey Meter	*Holaday Model 1501 (2.450GHz)*		*80931*
Digital Thermometer	*Extech Instruments 421305*		*426966*
Attenuator	*HP 8495A (0-70dB) DC-4GHz*		
Bi-Directional Coax Coupler	*Narda 3020A (50-1000MHz)*		
Shielded Screen Room	*RF Lindgren Model 26-2/2-0*		*6710 (PCT270)*
Shielded Semi-Anechoic Chamber	*Ray Proof Model S81*		*R2437 (PCT278)*
Enviromental Chamber	*Associated Systems Model 1025 (Temperature/Humidity)*		*PCT285*

* *Calibration traceable to the National Institute of Standards and Technology (NIST).*

10.1 SAMPLE CALCULATIONS

A. Emission Designator

CDMA Sample

2M + 2DK

CDMA BW = 1.25 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

Emission Designator = 1M25F9W

B. Radidated Spurious

Example: Channel 0991 AMPS mode 2nd harmonic (1648.08MHz).

The receive analyzer reading at 3 meters with the EUT on the turntable was measured at –85.8dBm. The gain of the substituted antenna is 6.1 dBd. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –85.8 dBm on the receive analyzer. The cable loss of the cable between the signal generator and the terminals of the substituted antenna is 1.0dB at 1648.08 MHz. So 5.1 dB is added to the signal generator reading of –46.77 dBm yielding –41.67 dBm. The fundamental ERP was 25.273 dBm so the harmonic equals 25.273 dBm – (-44.17dBm) = 66.9dBc

11.1 CONCLUSION

The data collected shows that the **BENQ Dual-Mode Cellular Phone FCC ID: JVPH0622** complies with all the requirements of Parts 2 and 22 of the FCC rules.