



**MOTOROLA**

**Date:** August 2, 2004

**Subject:** Request for additional information regarding FCC ID: IHDT6EC1 (Portable PCS GSM Transceiver with Embedded Bluetooth)

**Reference:**

Application Received:	07/16/2004
Correspondence Reference Number:	240730A.IHD
Confirmation Number:	TC4250 and TC4251
Date of Original Email:	07/30/2004

**Prepared by:**

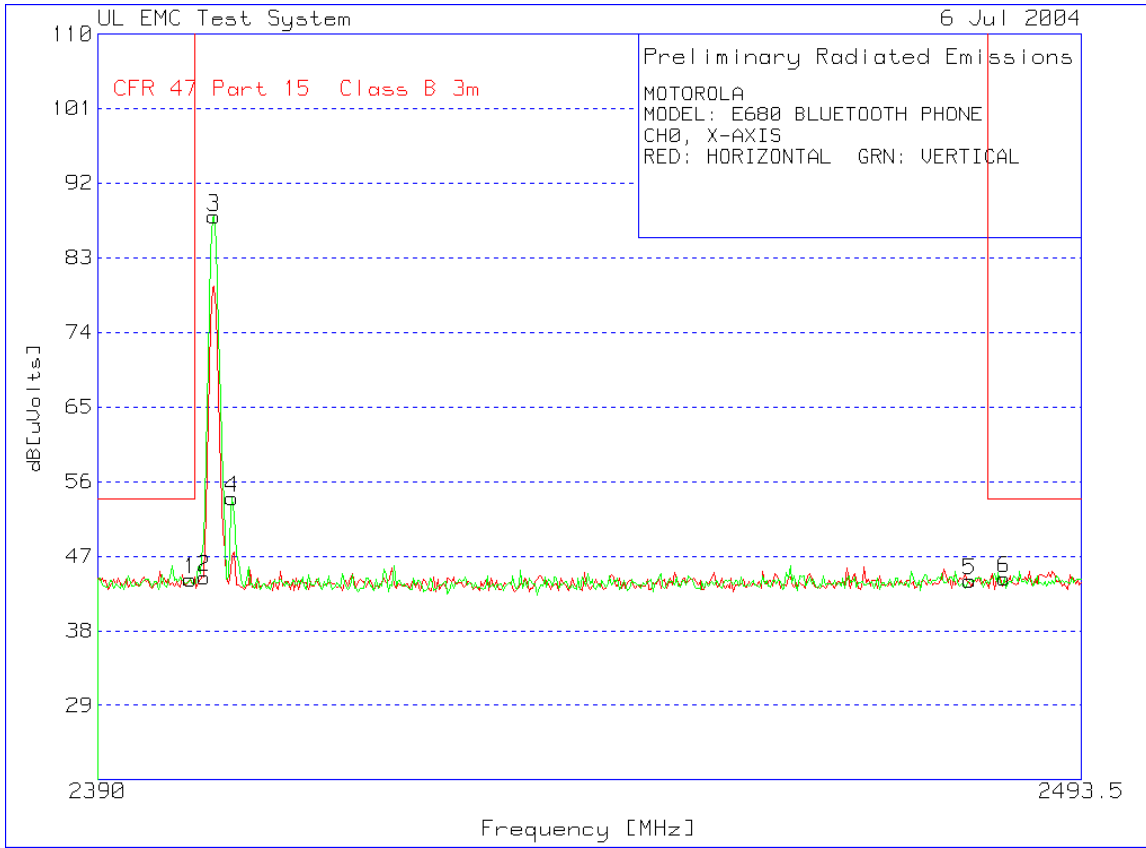
Andrew Bachler, Principal Staff Engineer  
Motorola Personal Communications Sector  
Libertyville, Illinois

**Questions and responses follow:**

Bluetooth application:

1. There is no radiated emission data for emissions in the restricted band at 2483.5 - 2500 MHz, however, the spurious conducted emission plots show a relatively strong strong spur (43.7 dBc) in this band. Please provide radiated emission data for all emissions in the referenced restricted band.

**Response:** Please refer to the following data:



MOTOROLA  
MODEL: E680 BLUETOOTH PHONE  
CH0, X-AXIS  
RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2390 - 2493.5MHz										
1	2399.541	19.1 pk		3.3	21.8	44.2	54	-9.8	100	Horz
2	2400.993	19.36 pk		3.3	21.8	44.46	999	-954.54	100	Horz
2 - 4GHz 2390 - 2493.5MHz										
3	2402.03	62.87 pk		3.3	21.8	87.97	999	-911.03	100	Vert
4	2403.897	28.9 pk		3.3	21.8	54	999	-945	100	Vert
5	2481.47	18.73 pk		3.3	22	44.03	999	-954.97	100	Vert
6	2485.203	18.94 pk		3.3	22.1	44.34	54	-9.66	100	Vert

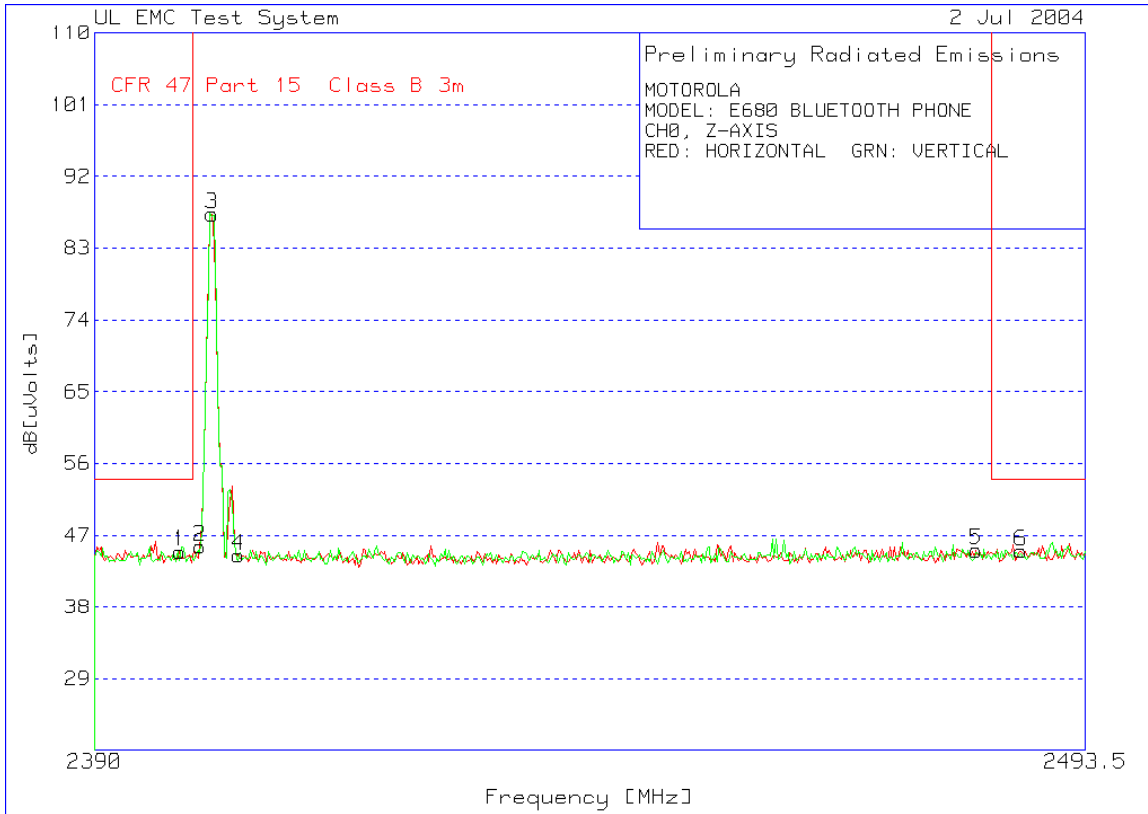
LIMIT 1: CFR 47 Part 15 Class B 3m  
LIMIT 2: NONE



**MOTOROLA**  
**MODEL: E680 BLUETOOTH PHONE**  
**CH0, Y-AXIS**  
**RED: HORIZONTAL GRN: VERTICAL**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
1	2399.334	18.56	pk	3.3	21.8	43.66	54	-10.34	100	Horz
2	2400.993	19.37	pk	3.3	21.8	44.47	999	-954.53	100	Horz
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
3	2402.03	62.21	pk	3.3	21.8	87.31	999	-911.69	100	Vert
4	2404.104	24.67	pk	3.3	21.8	49.77	999	-949.23	100	Vert
5	2481.263	19.33	pk	3.3	22	44.63	999	-954.37	100	Vert
6	2484.374	20.23	pk	3.3	22.1	45.63	54	-8.37	100	Vert

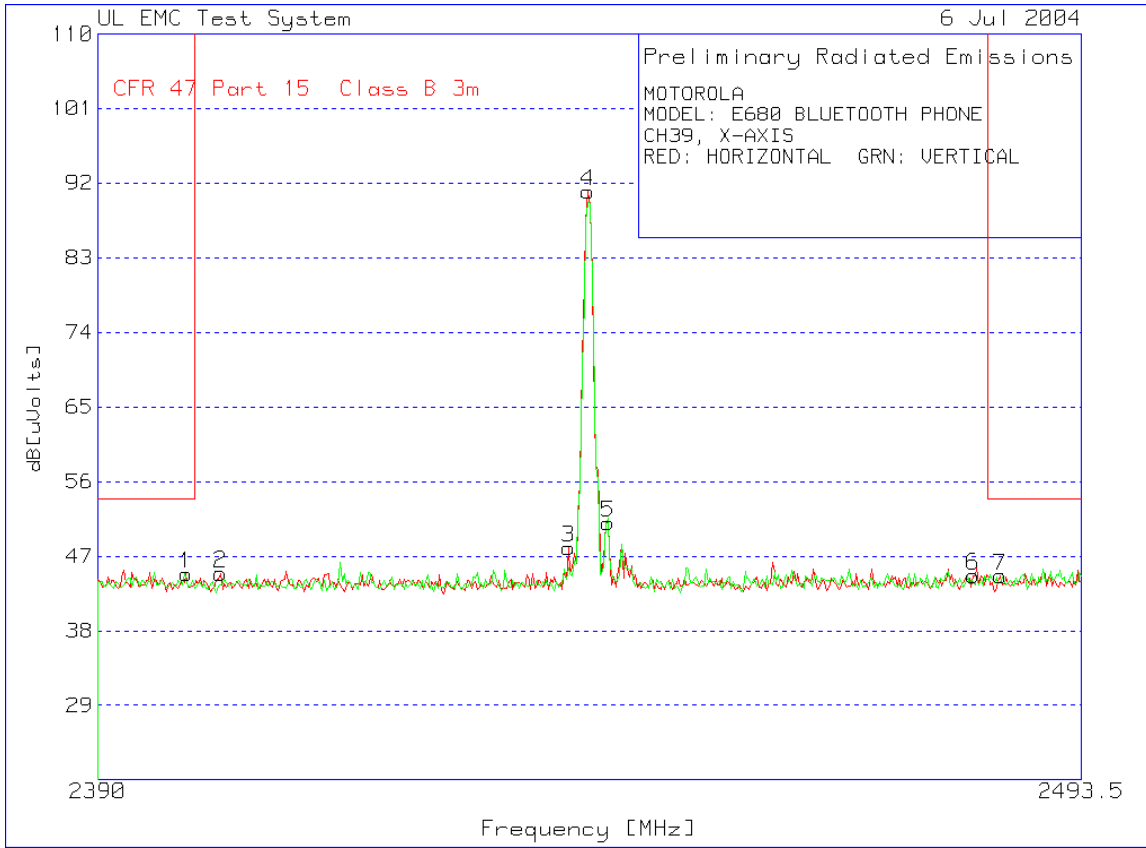
LIMIT 1: CFR 47 Part 15 Class B 3m  
 LIMIT 2: NONE



MOTOROLA  
 MODEL: E680 BLUETOOTH PHONE  
 CH0, Z-AXIS  
 RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2390 - 2493.5MHz										
1	2398.711	19.86	pk	3.3	21.8	44.96	54	-9.04	100	Horz
2	2400.786	20.49	pk	3.3	21.8	45.59	999	-953.41	100	Horz
3	2402.03	62.18	pk	3.3	21.8	87.28	999	-911.72	100	Horz
4	2404.726	19.38	pk	3.3	21.8	44.48	999	-954.52	100	Horz
5	2481.885	19.82	pk	3.3	22	45.12	999	-953.88	100	Horz
6	2486.655	19.61	pk	3.3	22.1	45.01	54	-8.99	100	Horz

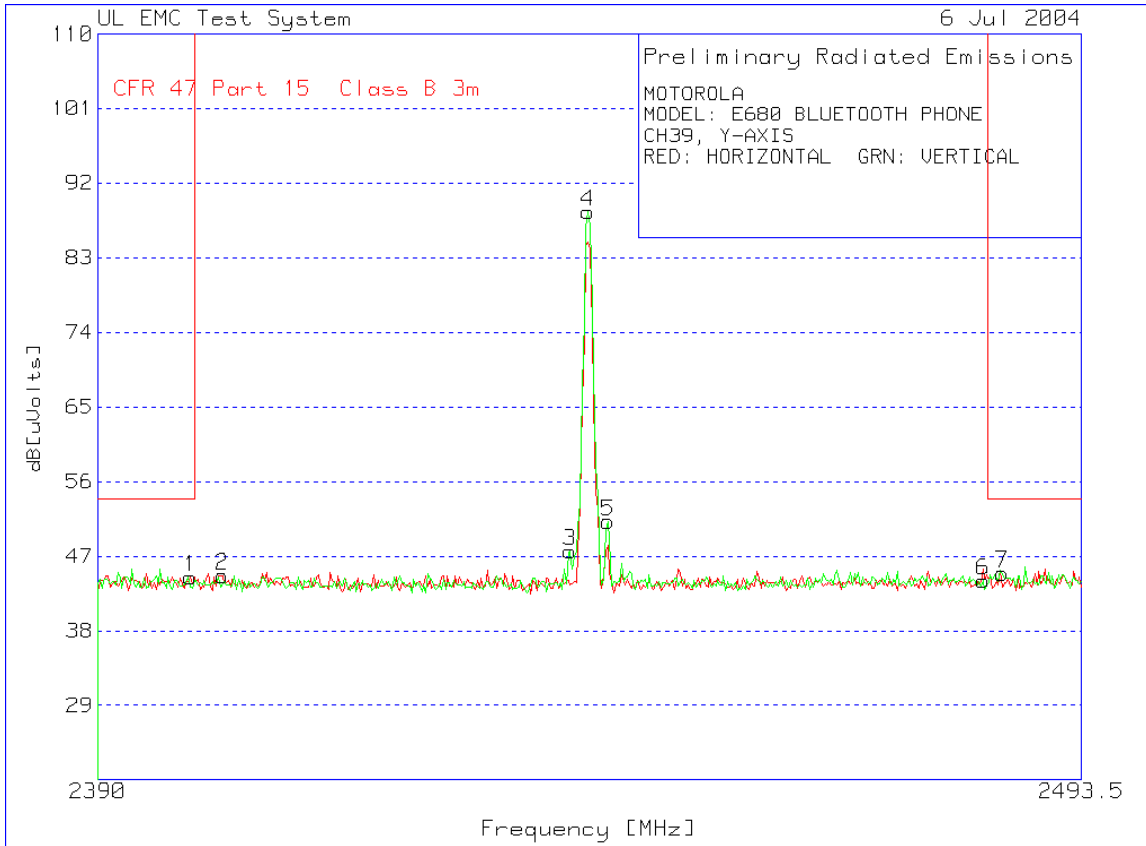
LIMIT 1: CFR 47 Part 15 Class B 3m  
 LIMIT 2: NONE



MOTOROLA  
MODEL: E680 BLUETOOTH PHONE  
CH39, X-AXIS  
RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2390 - 2493.5MHz										
1	2399.126	19.74	pk	3.3	21.8	44.84	54	-9.16	100	Horz
2	2402.652	19.83	pk	3.3	21.8	44.93	999	-954.07	100	Horz
3	2438.95	22.82	pk	3.3	21.9	48.02	999	-950.98	100	Horz
4	2441.024	65.82	pk	3.3	21.9	91.02	999	-907.98	100	Horz
5	2443.098	25.84	pk	3.3	21.9	51.04	999	-947.96	100	Horz
6	2481.885	19.37	pk	3.3	22	44.67	999	-954.33	100	Horz
7	2484.789	19.23	pk	3.3	22.1	44.63	54	-9.37	100	Horz

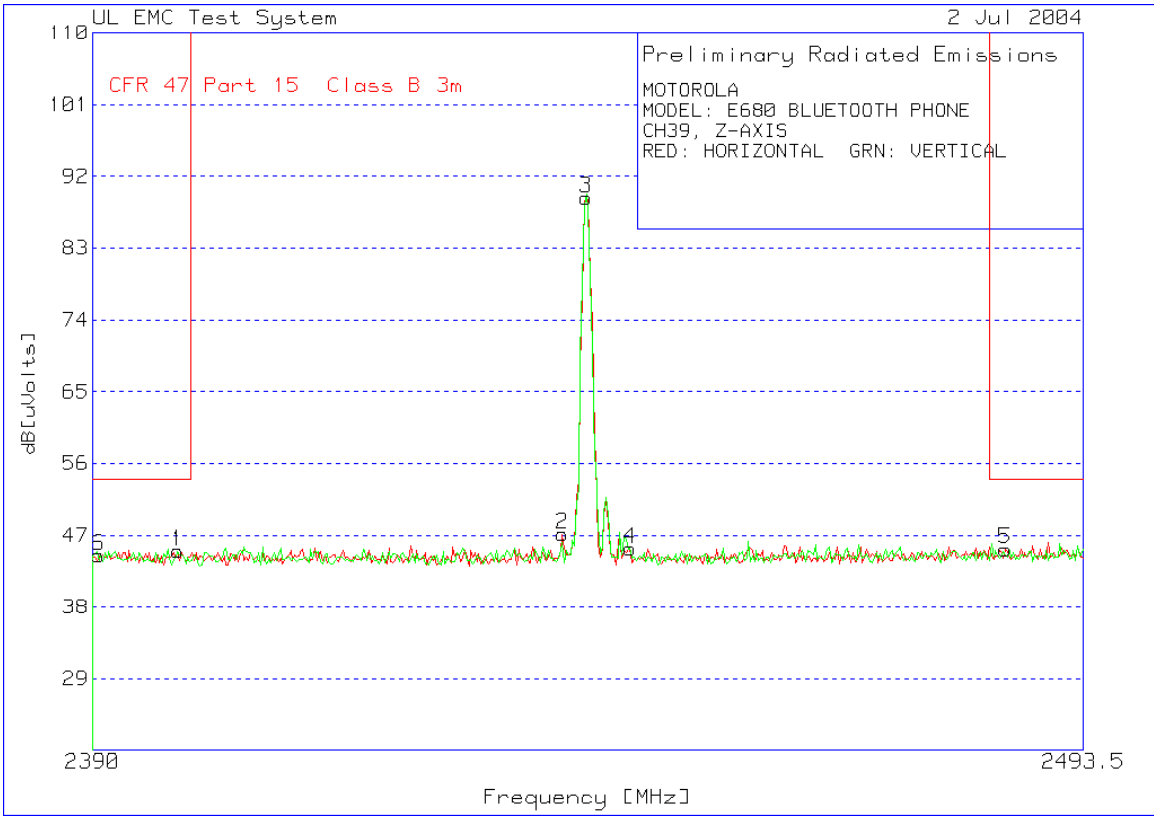
LIMIT 1: CFR 47 Part 15 Class B 3m  
LIMIT 2: NONE  
LIMIT 3: NONE



MOTOROLA  
 MODEL: E680 BLUETOOTH PHONE  
 CH39, Y-AXIS  
 RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
1	2399.541	19.34	pk		3.3	21.8	44.44	54	-9.56	100 Horz
2	2402.86	19.55	pk		3.3	21.8	44.65	999	-954.35	100 Horz
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
3	2439.157	22.41	pk		3.3	21.9	47.61	999	-951.39	100 Vert
4	2441.024	63.36	pk		3.3	21.9	88.56	999	-910.44	100 Vert
5	2443.098	25.98	pk		3.3	21.9	51.18	999	-947.82	100 Vert
6	2482.922	18.75	pk		3.3	22	44.05	999	-954.95	100 Vert
7	2484.996	19.54	pk		3.3	22.1	44.94	54	-9.06	100 Vert

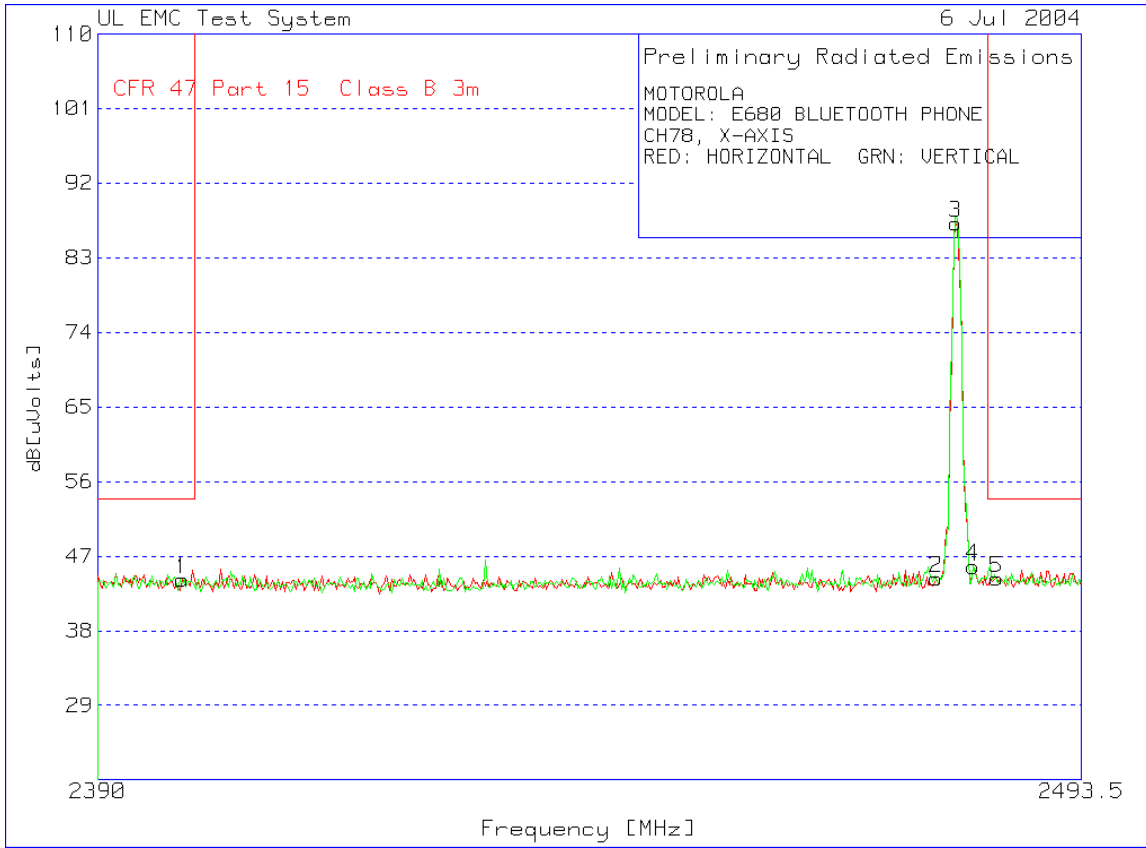
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**MOTOROLA**  
**MODEL: E680 BLUETOOTH PHONE**  
**CH39, Z-AXIS**  
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Marker Number	Test Frequency [MHz]	Meter Reading [dB[uV]]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
1	2398.711	19.9	pk	3.3	21.8	45	54	-9	100	Horz
2	2438.535	21.94	pk	3.3	21.9	47.14	999	-951.86	100	Horz
3	2441.024	64.12	pk	3.3	21.9	89.32	999	-909.68	100	Horz
4	2445.587	20.12	pk	3.3	21.9	45.32	999	-953.68	100	Horz
5	2485.203	19.84	pk	3.3	22.1	45.24	54	-8.76	100	Horz
6	2390.622	19.36	pk	3.3	21.8	44.46	54	-9.54	100	Horz

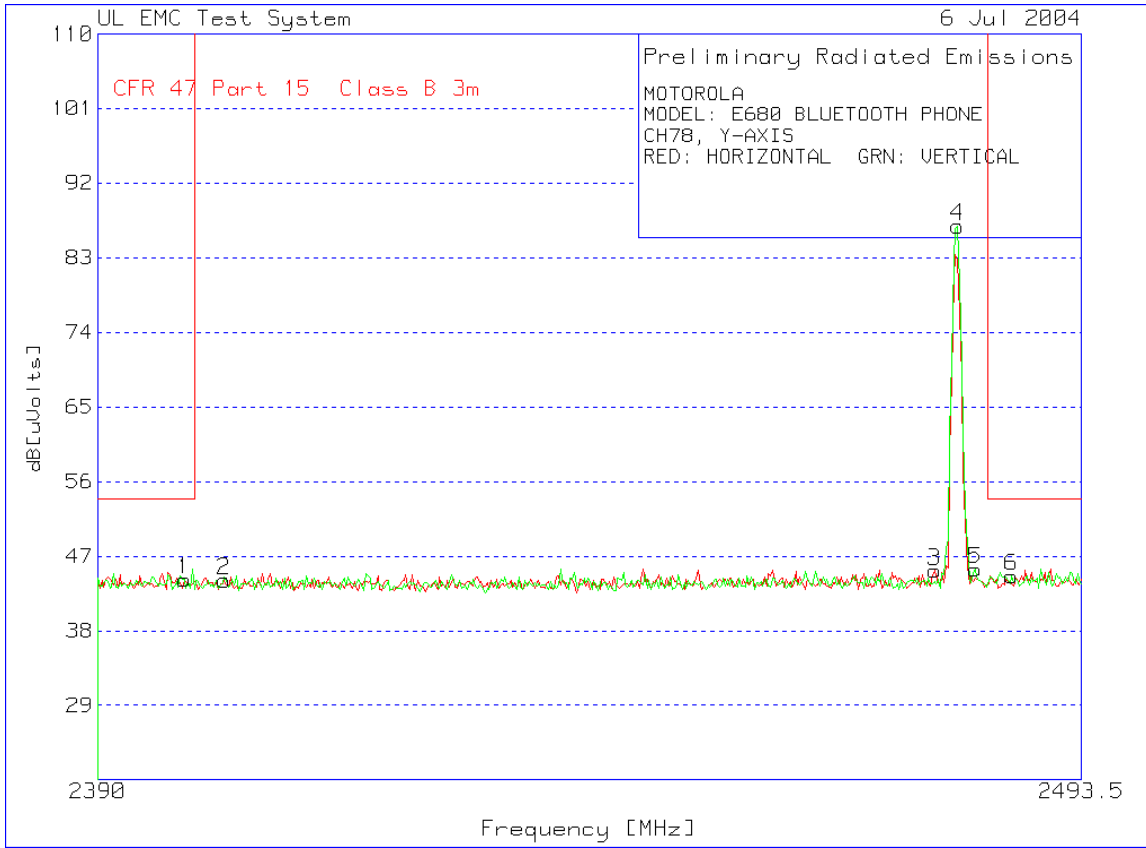
LIMIT 1: CFR 47 Part 15 Class B 3m  
 LIMIT 2: NONE



**MOTOROLA**  
**MODEL: E680 BLUETOOTH PHONE**  
**CH78, X-AXIS**  
**RED: HORIZONTAL GRN: VERTICAL**

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
1	2398.711	19.09 pk		3.3	21.8	44.19	54	-9.81	100	Horz
2	2477.944	19.01 pk		3.3	22	44.31	999	-954.69	100	Horz
3	2480.018	61.89 pk		3.3	22	87.19	999	-911.81	100	Horz
4	2481.885	20.47 pk		3.3	22	45.77	999	-953.23	100	Horz
5	2484.374	18.89 pk		3.3	22.1	44.29	54	-9.71	100	Horz

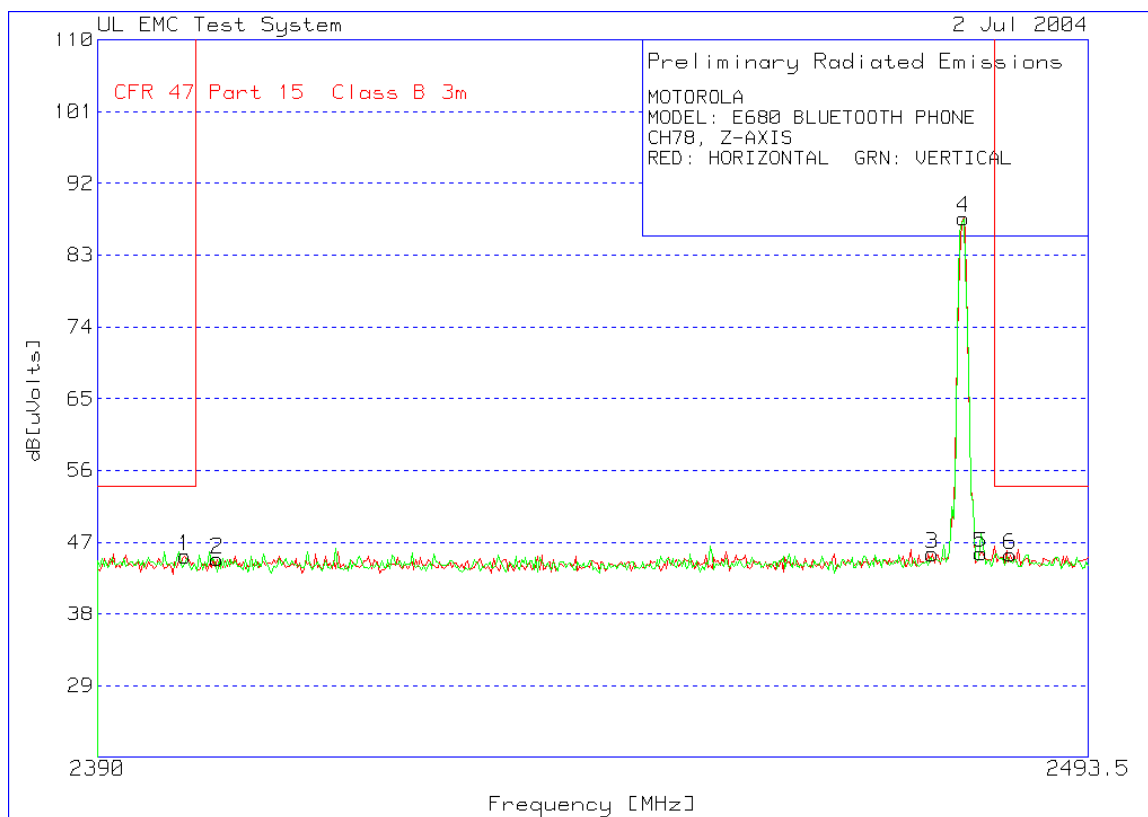
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MOTOROLA  
 MODEL: E680 BLUETOOTH PHONE  
 CH78, Y-AXIS  
 RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type [dB]	Gain/Loss Factor [dB]	Transducer Factor	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
1	2398.919	19.08	pk	3.3	21.8	44.18	54	-9.82	100	Horz
2	2403.067	19.01	pk	3.3	21.8	44.11	999	-954.89	100	Horz
3	2477.737	19.94	pk	3.3	22	45.24	999	-953.76	100	Horz
<b>2 - 4GHz 2390 - 2493.5MHz</b>										
4	2480.226	61.56	pk	3.3	22	86.86	999	-912.14	100	Vert
5	2482.092	20.14	pk	3.3	22	45.44	999	-953.56	100	Vert
6	2486.033	19.21	pk	3.3	22.1	44.61	54	-9.39	100	Vert

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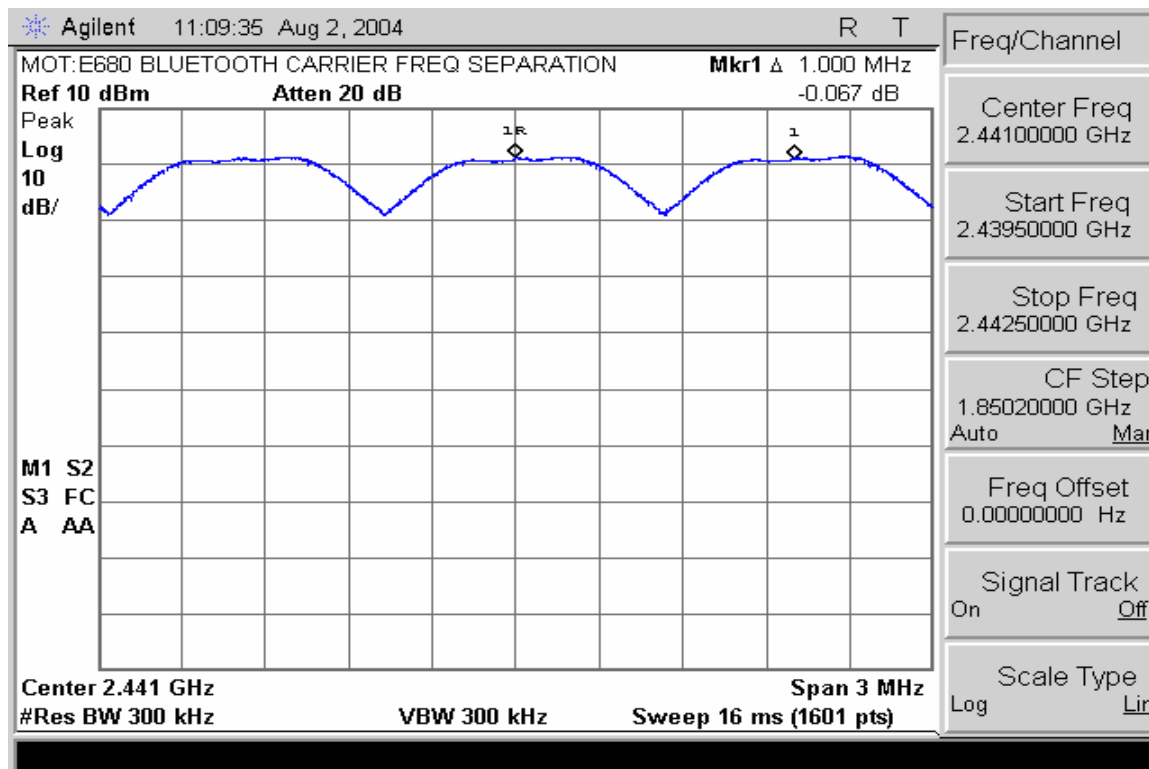
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2 - 4GHz 2390 - 2493.5MHz										
1	2398.919	20.16 pk		3.3	21.8	45.26	54	-8.74	100	Horz
2	2402.237	19.78 pk		3.3	21.8	44.88	999	-954.12	100	Horz
3	2476.907	20.26 pk		3.3	22	45.56	999	-953.44	100	Horz
4	2480.226	62.38 pk		3.3	22	87.68	999	-911.32	100	Horz
5	2482.092	20.34 pk		3.3	22	45.64	999	-953.36	100	Horz
6	2485.203	20.03 pk		3.3	22.1	45.43	54	-8.57	100	Horz

LIMIT 1: CFR 47 Part 15 Class B 3m  
LIMIT 2: NONE

2. The measured channel separation is 999 kHz, but the measured 20 dB BW is 1 MHz. Current Rules (Section 15.247(a)(1)) require that the channel separation be equal to or greater than the 20 dB BW. It appears that merely re-plotting the channel separation would demonstrate compliance with this requirement. Please do so.

**Response:** Please refer to the following plot:

## Carrier Frequency Separation



3. What is the gain of the antenna used with the BT transmitter?

**Response:** The Bluetooth antenna gain is -3dBi.

4. It appears that the pcb still has a shield, on the rear internal photo. Please resubmit with the shield removed.

**Response:** The metal in the photo is part of the memory card slot, and is not a shield. When the bottom shield is installed, it completely covers the lower portion of the PCB (including the memory card slot) up to the receptacle for the SIM.

5. Please submit the user's manual (and ensure that the statements listed in Sections 15.21 and 15.19(a)(3) are included).

**Response:** An updated manual was submitted on August 2, 2004. (Refer to page 4 for the section 15.21 statement, and page 86 for the 15.19 (a)(3) statement.)

### PCS GSM application:

6. Page 3 of the SAR report lists the Bluetooth output power as 0 dBm, however, the BT test report lists the measured level as 3.5 dBm. Please correct the SAR report.

**Response:** Please refer to the following table:

<b>FCC ID Number</b>	<b>IHDT6EC1</b>						
<b>Serial number(s)</b>	00440000613097						
<b>Mode(s) of Operation</b>	GSM 900	GSM 1800	GSM 1900	GPRS 900	GPRS 1800	GPRS 1900	BlueTooth
<b>Modulation Mode(s)</b>	GSM	GSM	GSM	GSM	GSM	GSM	BlueTooth
<b>Maximum Output Power Setting</b>	32.50dBm	29.70dBm	29.70dBm	32.50dBm	29.70dBm	29.70dBm	3.5 dBm
<b>Duty Cycle</b>	1:8	1:8	1:8	2:8	2:8	2:8	1:1
<b>Transmitting Frequency Rang(s)</b>	880.2-914.8 MHz	1710.2-1784.8 MHz	1850.2-1909.8 Mhz	880.2-914.8 MHz	1710.2-1784.8 MHz	1850.2-1909.8 MHz	2400.0-2483.5 MHz
<b>Production Unit or Identical Prototype (47 CFR §2.908)</b>	Identical Prototype						
<b>Device Category</b>	Portable						
<b>RF Exposure Limits</b>	General Population / Uncontrolled						

7. Page 4 of the SAR report shows the Dipole Validation Kit as being past its cal due date. Please address.

**Response:** A corrected table is shown below:

<b>Description</b>	<b>Serial Number</b>	<b>Cal Due Date</b>
DASY3 DAE V1	376	12/22/2004
E-Field Probe ET3DV6	1391	11/24/2004
Dipole Validation Kit, D1800V2	273tr	04/02/2005
S.A.M. Phantom used for 1900MHz	TP-1235	

8. It appears that the pcb still has a shield, on the rear internal photo. Please resubmit with the shield removed.

**Response:** The metal in the photo is part of the memory card slot, and is not a shield. When the bottom shield is installed, it completely covers the lower portion of the PCB (including the memory card slot) up to the receptacle for the SIM.

9. Please submit the user's manual.

**Response:** An updated manual was submitted on August 2, 2004.