

FCC Test Report FCC Part 22,24 / RSS 132,133

FOR:

For the Hewlett Packard Company

Model Number: HSTNN-W26C

FCC ID: N7NMC8775-H

TEST REPORT #: EMC_HEWL4_019_07002_FCC22_24 DATE: 2007-7-24





Bluetooth Qualification Test Facility (BQTF)



LAB CODE 20020328-00

FCC listed: A2LA accredited

IC recognized # 3925

CETECOM Inc.

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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS132 and RSS133.

Company	Description	Model #
Hewlett Packard Company	Convertable Tablet Notebook PC	HSTNN-W26C

Technical responsibility for area of testing:

Lothar	Schmidt	

(Director Regulatory and

2007-7-24	EMC & Radio	Antenna Services)	
Date	Section	Name	Signature
This report	t is prepared by:		
		Peter Mu	
2007-7-24	EMC & Radio	(EMC Project Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID.





2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Lothar Schmidt
Responsible Project Leader:	Peter Mu
Date of test:	2007-3-21 to 2007-3-23

2.2 Identification of the Client

Applicant's Name:	Hewlett Packard Company
Address Line 1:	20555 SH 249
Address Line 2:	MS 1208-10
City/ Zip Code	Houston, TX 77070
Country:	U.S.A
Contact Person:	Glenn Meyer
Phone No.:	281-514-9391
Fax:	281-518-0979
e-mail:	Glenn.meyer@hp.com

2.3 Identification of the Manufacturer

Same as above client.



3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name of EUT (if not same as Model No.)	HP Compaq 2701p notebook PC	
Description	Convertable Tablet Notebook PC	
Model No.	HSTNN-W26C	
FCC-ID	N7NMC8775-H	
IC-ID (Industry Canada)		
	824.2MHz – 848.8MHz for GSM 850	
	1850.2MHz – 1909.8MHz for PCS 1900	
Frequency Range:	826.4MHz – 846.6MHz for UMTS FDD5	
	1852.4MHz – 1907.6MHz for UMTS FDD2	
Type(s) of Modulation:	GMSK, 8PSK, QPSK	
Number of Channels:	124 for GSM-850, 299 for PCS-1900	
Antenna Type:	PCB, FPCB	
	Conducted : Tests Conducted not by Cetecom.	
	Radiated : see section 5.1.5 and 5.1.6.	
Max. Output Power:	27.75dBm (0.596W) @ GSM 824.2MHz ERP values	
	27.34dBm (0.542W) @ PCS 1880MHz EIRP values	

3.2 Identification of the Equipment Under Test (EUT)

EUT #	ТҮРЕ	MANF.	MODEL	SERIAL #
1	EUT	HP	HSTNN-W26C	2CE71707R5

3.3 Identification of Accessory equipment

AE #	ТҮРЕ	MANF.	MODEL	SERIAL #
1	AC/DC ADAPTER	HP	384019-003	CT:5978C0AU4TTDBV



4 Subject of Investigation

All testing was performed on the EUT listed in Section 3. The EUT was maximized in the X,Y, Z positions, all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz. The dual band antenna used has 2dBi only and is provided with a 3m cable.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS132 and RSS133.

This EUT contains an FCC approved module with the FCC ID **N7NMC8775-H** This report refers only to the radiated measurements in both GSM and UMTS FDD technology.



5 Measurements

5.1 <u>RF Power Output</u>

5.1.1 FCC 2.1046 Measurements required: RF power output.

Power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on circuit elements as specified. The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

5.1.2 <u>Limits:</u>

5.1.2.1 FCC 22.913 (a) Effective radiated power limits.

The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

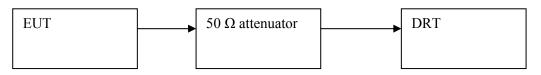
5.1.2.2 FCC 24.232 (b)(c) Power limits.

(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).(c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.

5.1.3 <u>Conducted Output Power Measurement procedure:</u>

Based on TIA-603C 2004

2.2.1 Conducted Carrier Output Power Rating



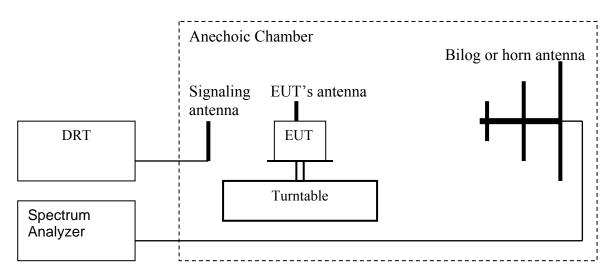
- 1. Connect the equipment as shown in the above diagram. A Digital Radiocommunication Tester (DRT) is used to enable the EUT to transmit and to measure the output power.
- 2. Adjust the settings of the DRT to set the EUT to its maximum power at the required channel.
- 3. Record the output power level measured by the DRT.
- 4. Correct the measured level for all losses in the RF path.
- 5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.



5.1.4 <u>Radiated Output Power Measurement procedure:</u>

Based on TIA-603C 2004

2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



- 1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
- 2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
- 4. Rotate the EUT 360°. Record the peak level in dBm (LVL).
- 5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
- 6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) Analyzer reading (dBm).
- 7. Determine the ERP using the following equation: ERP (dBm) = LVL (dBm) + LOSS (dB)
- 8. Determine the EIRP using the following equation: EIRP (dBm) = ERP (dBm) + 2.14 (dB)
- 9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band. **Spectrum analyzer settings = rbw=vbw=3MHz**

(note: Steps 5 and 6 above are performed prior to testing and LOSS is recorded by test software. Steps 3, 4, 7 and 8 above are performed with test software.)



5.1.5 ERP Results 850 MHz band:

Power Control Level	Burst Peak ERP
5	≤38.45dBm (7W)

Frequency (MHz)	Effective Radiated Power (dBm)	
	GPRS	EGPRS
824.2	27.75 (29.89)	25.85 (27.99)
836.6	27.6 (29.74)	25.7 (27.84)
848.8	27.38 (29.52)	25.67 (27.81)

Eroquonov (MHz)	Effective Radiated Power (dBm)		
Frequency (MHz)	UMTS FDD5		
826.4	21.72 (23.86)		
836.6	21.95 (24.09)		
846.6	23.12 (25.26)		

*Values reported are ERP and (EIRP) in parentheses.

5.1.6 EIRP Results 1900 MHz band:

Power Control Level	Burst Peak EIRP
0	≤33dBm (2W)

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)		
	GSM	EGPRS	
1850.2	26.62	26.52	
1880.0	27.34	27.3	
1909.8	25.61	25.6	

Frequency (MHz)	Effective Radiated Power (dBm)		
	UMTS FDD5		
1852.4	22.62		
1880	23.11		
1907.6	22.86		

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CETECOM

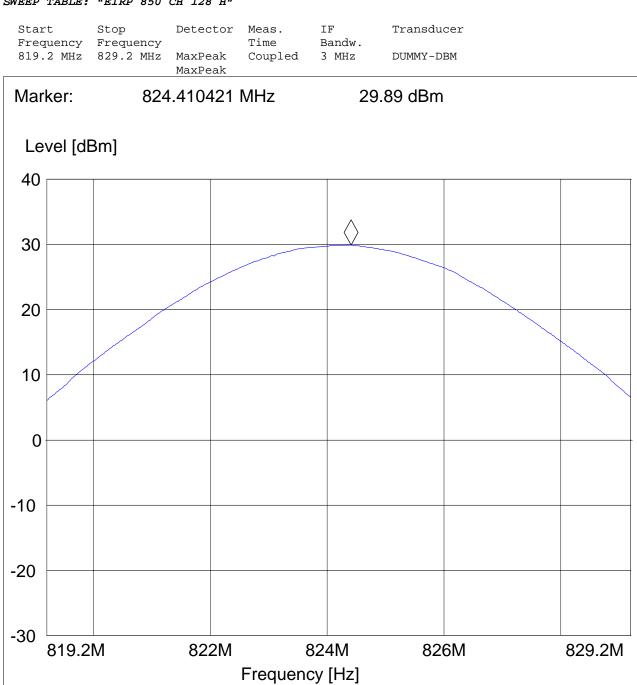
EIRP (GSM 850) CHANNEL 128 GPRS §22.913(a)

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	GPRS 850 TCH 128
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "EIRP 850 CH 128 H"

Test Report #:

Date of Report:



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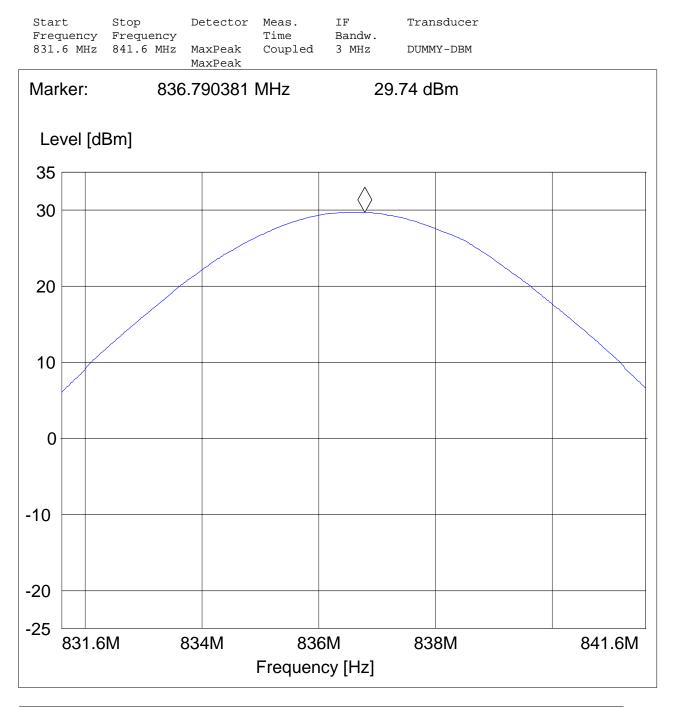
EIRP (GSM 850) CHANNEL 190 GPRS §22.913(a)

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	GPRS 850 TCH 190
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "EIRP 850 CH 190 H"

Test Report #:

Date of Report:



Test Report #:	EMC_HEWL4_019	9_07002_FCC22_24
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EIRP (GSM 850) CHANNEL 251 GPRS §22.913(a) EUT: HP Compaq 2710p HOYAS Hewlett Packard Customer: Test Mode: GPRS 850 TCH 251 ANT Orientation: H EUT Orientation: H Test Engineer: Power Supply: Satya Radhakrishna AC Adapter Comments: SWEEP TABLE: "EIRP 850 CH 251 H" Transducer Start Stop Detector Meas. IF Bandw. Frequency Frequency Time 843.8 MHz 853.8 MHz MaxPeak Coupled 3 MHz DUMMY-DBM Marker: 29.52 dBm 848.950301 MHz Level [dBm] 40 30 20 10 0 -10 -20 848M 843.8M 846M 850M 852M 853.8M Frequency [Hz]

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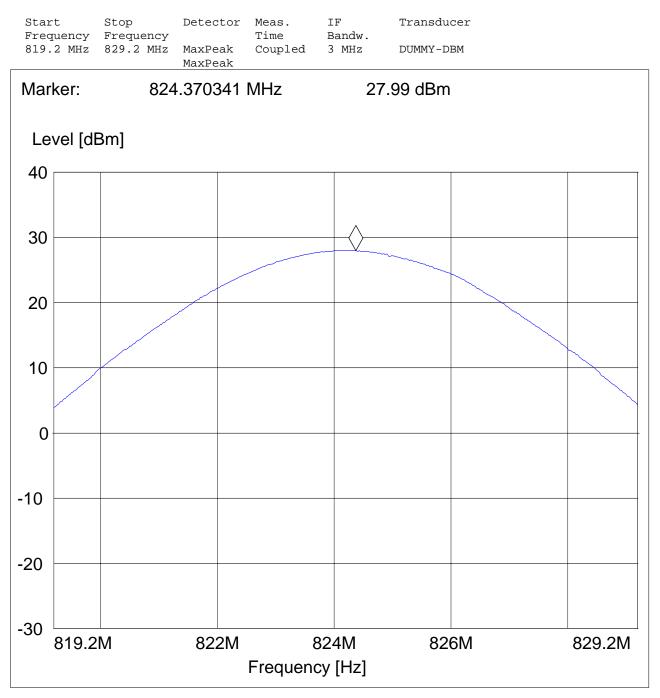


EIRP (GSM 850) CHANNEL 128 EGPRS §22.913(a)

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	EGPRS 850 TCH 128
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "EIRP 850 CH 128 H"

Test Report #: Date of Report:



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EIRP (GSM 850) CHANNEL 190 EGPRS §22.913(a)

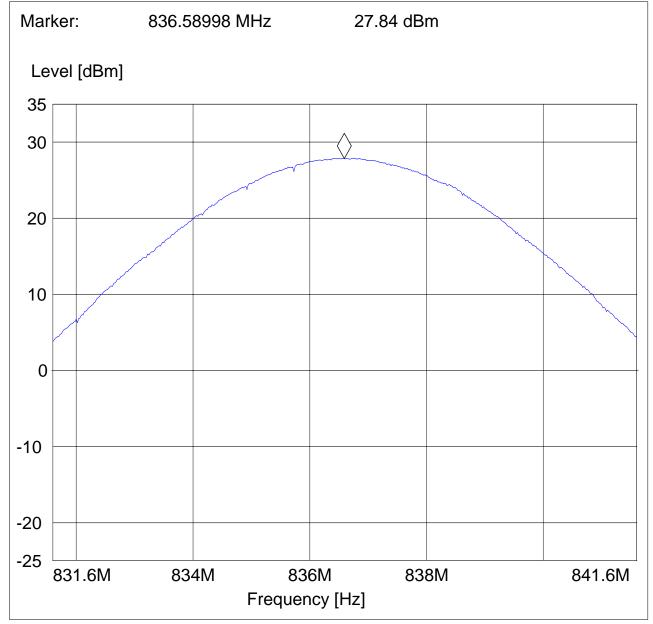
EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	EGPRS 850 TCH 190
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "EIRP 850 CH 190 H"

Test Report #:

Date of Report:

Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
831.6 MHz	841.6 MHz	MaxPeak	Coupled	3 MHz	DUMMY-DBM
		MaxPeak			



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EIRP (GSM 850) CHANNEL 251 EGPRS §22.913(a)

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	EGPRS 850 TCH 251
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "EIRP 850 CH 251 H"

Test Report #:



Test Report #:	EMC_HEWL4_019_07002_FC0	C 22_24
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EIRP (UMTS FDD5) CHANNEL 4132 §22.913(a)

EUT: Customer Test Mod ANT Orie	r: de: entation: entation: gineer: upply:	Optimator HP Texas FDD5 V	L 4132 §22.9	13(a)			
Start Freque	ABLE: "EIR Stop ency Freq MHz 836.	uency 4 MHz Maxi	ector Meas Time	Bandw			
Marke	er:		1483 MHz		23.86 dBm)	
Leve	el [dBm]						
60							
50							
40 -							
30 -					$\sum_{i=1}^{n}$		
20 -			and the second s			han han had been had	
10 -		www.r					
0-							1
	uMM~~~						M.
-10 –	M						- Marken
-20 8	16.4M	820M		825M uency [Hz]		OM	836.4M

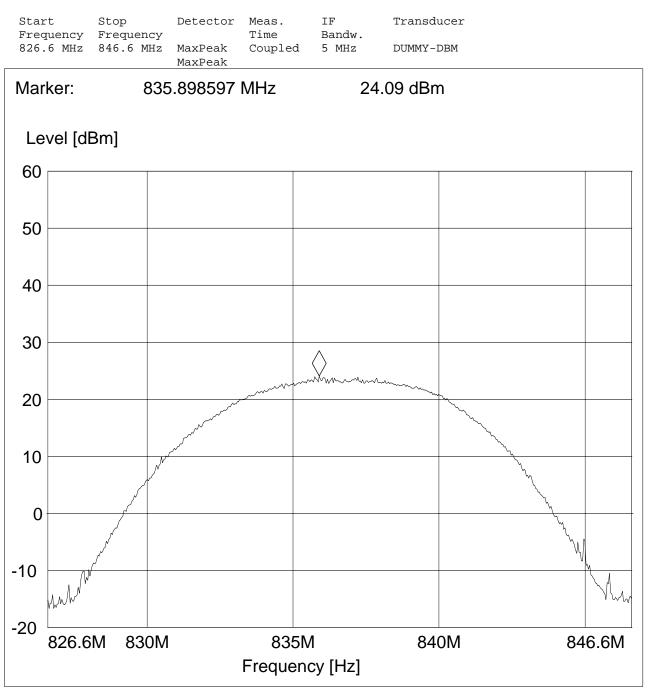
Test Report #:	EMC_HEWL4_019_07002_FC0	C 22_24
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EIRP (UMTS FDD5) CHANNEL 4183 §22.913(a)

EUT:	Optimator	
Customer:	HP Texas	
Test Mode:	FDD5	
ANT Orientation:	V	
EUT Orientation:	Н	
Test Engineer:	Ed	
Power Supply:	AC Adapter	
Comments:		

SWEEP TABLE: "EIRP 850 CH 4183 V"



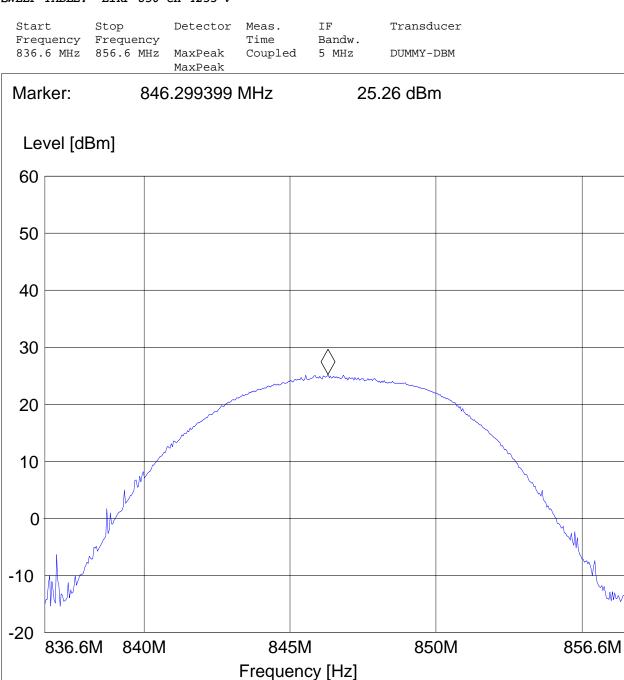
Test Report #:	EMC_HEWL4_019_07002_FC	C22_24
Date of Report:	2007-7-24	Page 19 of 84



EIRP (UMTS FDD5) CHANNEL 4233 §22.913(a)

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "EIRP 850 CH 4233 V"



Test Report #:	EMC_HEWL4_019_07002_	FCC22_24
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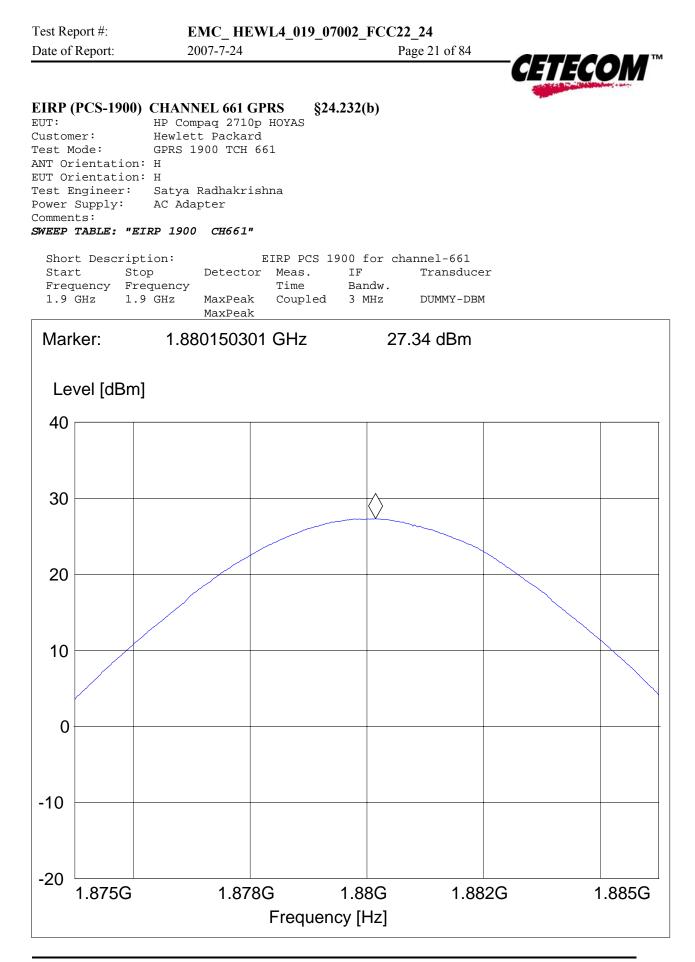


EIRP (PCS-1900) CHANNEL 512 GPRS §24.232(b)

EUT: HP Compaq 2710p HOYAS Customer: Hewlett Packard Test Mode: GPRS 1900 TCH 512 ANT Orientation: H EUT Orientation: H Test Engineer: Satya Radhakrishna Power Supply: AC Adapter Comments:

SWEEP TABLE: "EIRP 1900 CH512"

Shor Star		ription: Stop	Detec		RP PCS 19 Meas.	00 for cl IF	nannel-512 Transdu	cer	
	uency		MaxPe	5	Time Coupled	Bandw. 3 MHz	DUMMY-D		
Mar			502100				62 dBm		
Le	vel [dl	3m]							
40									
30						\Diamond			
				_				~	
20									
10	/								
0									
-10									
-20									
	1.8452G 1.848G 1.85G 1.852G 1.8552G								
	Frequency [Hz]								

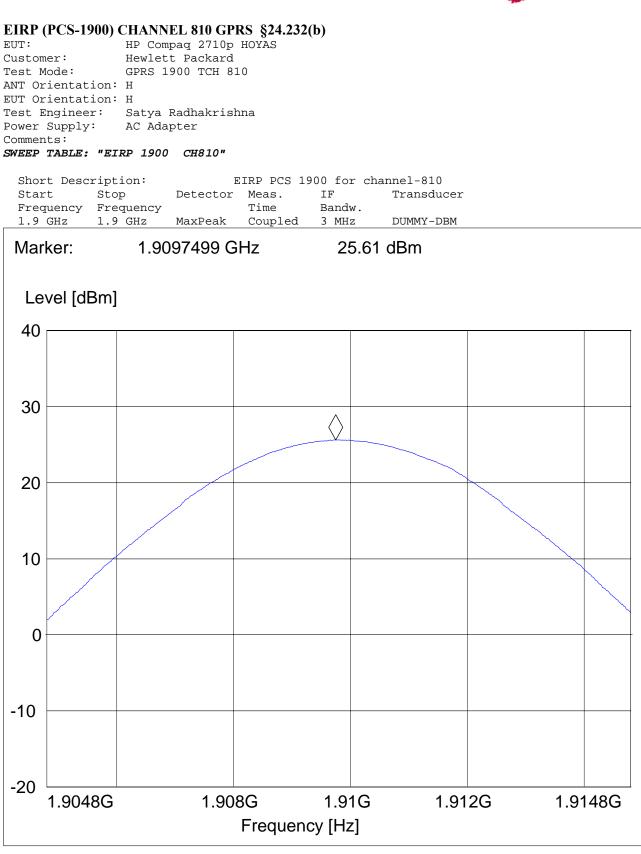


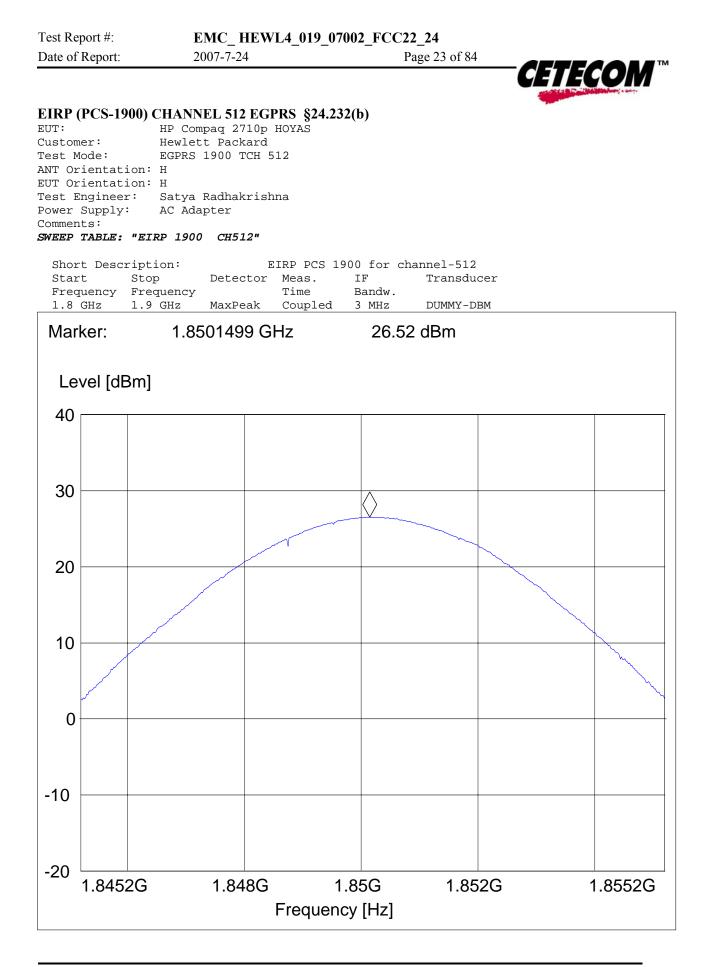
EMC_	HEWL4	_019_	_07002_	_FCC22_24
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Test Report #: Date of Report:

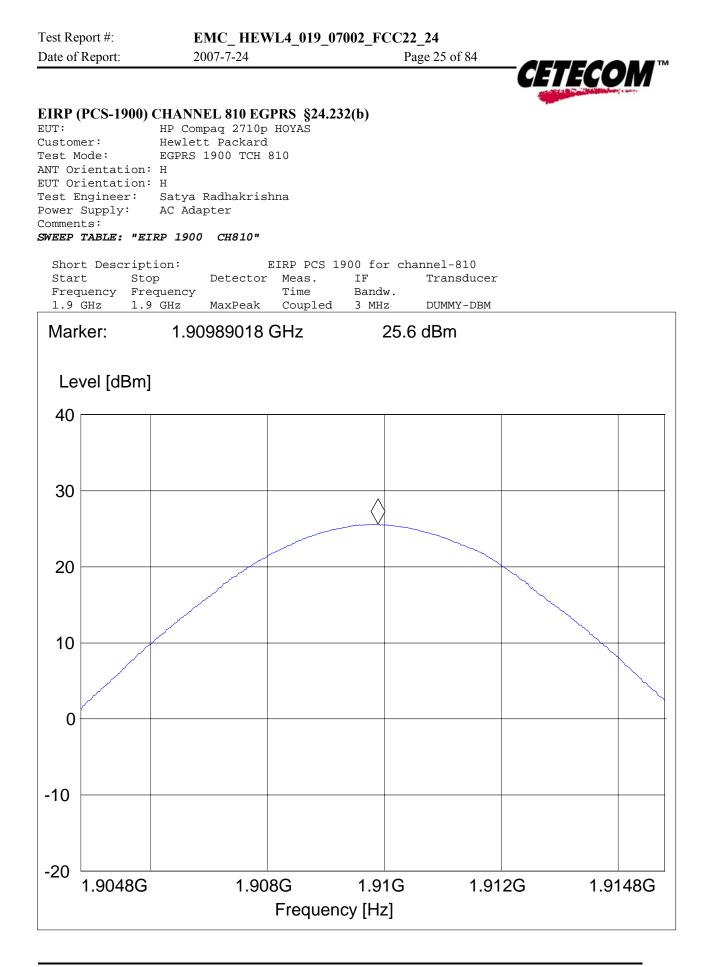
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Test Re	port #:	EMC_HI	EWL4_019_07002_	_FCC22_24		
Date of	Report:	2007-7-24		Page 24 of 84		
EUT:)) CHANNEL 661 H HP Compag 271	Op HOYAS		CETEC	OM
EUT Or	ode: ientatio ientatio	n: H	H 661			
Power Commen		Satya Radhakr AC Adapter EIRP 1900 CH661				
Star	uency F	top Detect	or Meas. IF Time Ba k Coupled 3	for channel-661 Transduce ndw. MHz DUMMY-DBM		
Mar	ker:	1.8800100	2 GHz	27.3 dBm		
	vel [dBn	n]				
40						
30			(
20						
		, M				
10						
0						
-10						
-20						
	1.875G	1.87		8G 1.88	32G -	1.885G
Frequency [Hz]						



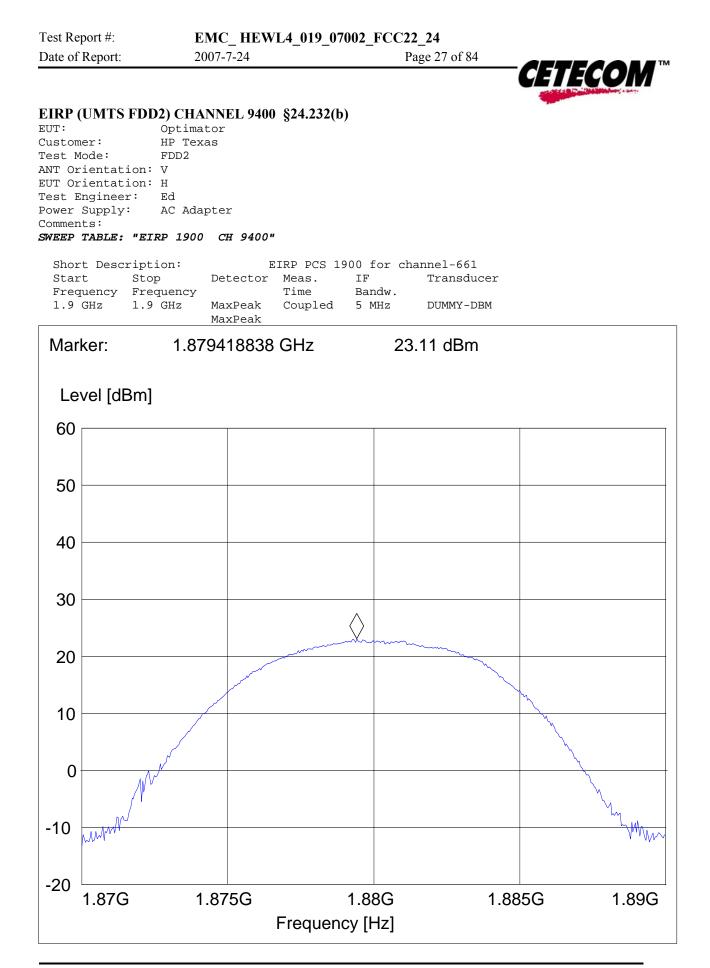
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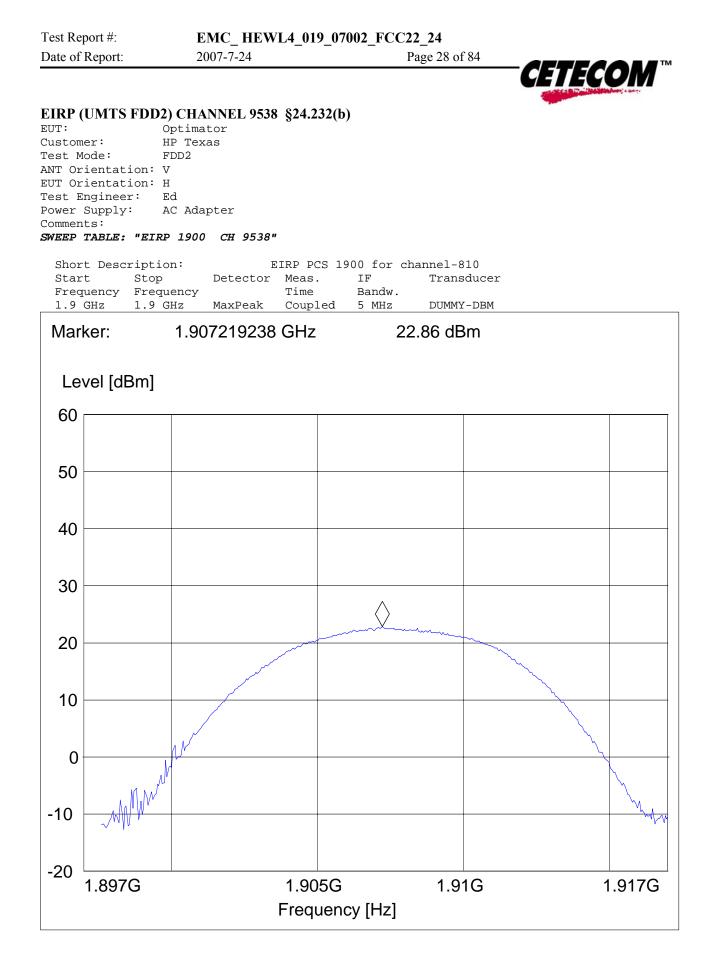
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EIRP (UMTS FDD2) CHANNEL 9262 §24.232(b) EUT: Optimator

EUT:		Optimator											
Customer: HP Texas Test Mode: FDD2													
		FDD2											
ANT Orientation: V EUT Orientation: H													
	Ingineer:	Ed											
	Supply:	AC Adapter											
Commen	nts:												
	SWEEP TABLE: "EIRP 1900 CH 9262" Short Description: EIRP PCS 1900 for channel-512												
Shor Star		tion: I top Detector	EIRP PCS 19 Meas.	00 for cha IF	nnel-512 Transducer								
	quency Fr		Time	Bandw.									
1.8	GHz 1.	9 GHz MaxPeak	Coupled	5 MHz	DUMMY-DBM								
Mar	ker:	1.852820842	GHz	22.	.62 dBm								
Level [dBm]													
60	[
50													
40													
40													
20													
30													
				\wedge									
			m	mm									
20		~	~~~~		my								
					×	\sim							
10													
						\sim							
						\sim							
0		. / [*]											
	N	M				le la							
	لر					\ \	\. I						
-10													
	MM.						Mm						
-20													
20	1.84240	3	1.85G		1.855G	1.8	8624G						
	Frequency [Hz]												
L													







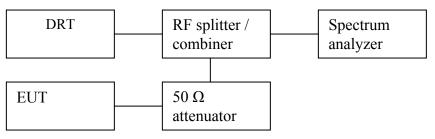
5.2 Occupied Bandwidth/Emission Bandwidth

5.2.1 FCC 2.1049 Measurements required: Occupied bandwidth

The occupied bandwidth, that is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

(h) Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

5.2.2 <u>Occupied / emission bandwidth measurement procedure:</u>



- 1. Connect the equipment as shown in the above diagram.
- 2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 3. Set the spectrum analyzer to measure the 99% (-20 dB) occupied bandwidth. Record the value.
- 4. Set the spectrum analyzer to measure the 99.5% (-26 dB) emission bandwidth. Record the value.
- 5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.2.3 Occupied / Emission bandwidth results 850 MHz band:

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID. For results of the conducted measurement please refer to the conducted test report.



5.3 Frequency Stability

5.3.1 <u>Limit</u>

For Hand carried battery powered equipment:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.2VDC and 4.5VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -2.7% and +21.62%. For the purposes of measuring frequency stability these voltage limits are to be used.

Method of Measurement:

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU 200 UNIVERSAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.

2. Subject the EUT to overnight soak at -30 C.

With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for FDD5 & 661 for PCS-1900&9400 for FDD2), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
 Repeat the above measurements at 10 C increments from -30 C to +50 C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6. Subject the EUT to overnight soak at +50 C.

7. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for FDD5 & 661 for PCS-1900&9400 for FDD2), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming. 8. Repeat the above measurements at 10 C increments from +50 C to -30 C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9. At all temperature levels hold the temperature to +/- 0.5 C during the measurement procedure.

For equipment powered by primary supply voltage:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

For this EUT section 2.1055(d)(1) applies. This requires to vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

5.3.2 FREQUENCY STABILITY (GSM-850)

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID. For results of the conducted measurement please refer to the conducted test report.



5.3.3 FREQUENCY STABILITY (PCS-1900)

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID. For results of the conducted measurement please refer to the conducted test report.

5.4 Spurious Emissions Conducted

5.4.1 FCC 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

5.4.2 <u>Limits:</u>

5.4.2.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

(b) *Measurement procedure*. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.4.2.2 FCC 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

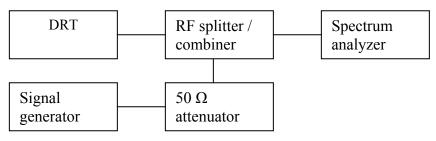


(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

(b) *Measurement procedure*. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.4.3 <u>Conducted out of band emissions measurement procedure:</u>

Based on TIA-603C 2004 2.2.13 Unwanted Emissions: Conducted Spurious



- 1. Connect the equipment as shown in the above diagram.
- 2. Set the spectrum analyzer to measure peak hold with the required settings.
- 3. Set the signal generator to a known output power and record the path loss in dB (LOSS) for frequencies up to the tenth harmonic of the EUT's carrier frequency. LOSS = Generator Output Power (dBm) Analyzer reading (dBm).
- 4. Replace the signal generator with the EUT.
- 5. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
- 7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
- 8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
- 9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.

(**note:** Step 3 above is performed prior to testing and **LOSS** is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)



5.4.4 <u>Test Results: Conducted Emission:</u>

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID. For results of the conducted measurement please refer to the conducted test report.

5.5 Spurious Emissions Radiated

5.5.1 FCC 2.1053 Measurements required: Field strength of spurious radiation.

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

5.5.2 Limits:

5.5.2.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

(b) *Measurement procedure*. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.5.2.2 FCC 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

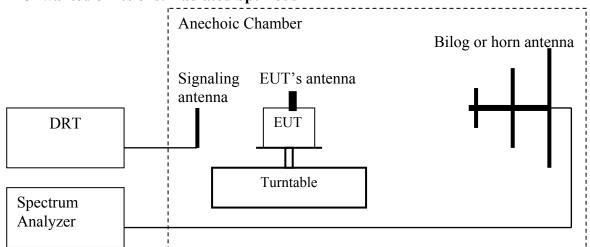
Test Report #: Date of Report:



(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.5.3 <u>Radiated out of band measurement procedure:</u> Based on TIA-603C 2004





- 1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
- 2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
- 3. Set the spectrum analyzer to measure peak hold with the required settings.
- 4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (LVL) up to the tenth harmonic of the carrier frequency.
- 5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
- 6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) Analyzer reading (dBm).



- Determine the level of spurious emissions using the following equation: Spurious (dBm) = LVL (dBm) + LOSS (dB):
- 8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
- Determine the level of spurious emissions using the following equation: Spurious (dBm) = LVL (dBm) + LOSS (dB):
- 10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(**note:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

Spectrum analyzer settings:

Res B/W: 1 MHz Vid B/W: 1 MHz

Measurement Survey:

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850 & PCS-1900 bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 & PCS-1900 band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Radiated emission measurements were made only with GPRS mode GMSK modulation because this mode represents the worse case emission for all the modulations for GSM. See section 5.5.4.1 and 5.5.4.3

Radiated emissions measurements were made also with UMTS FDD mode. See section 5.5.4.2 and 5.5.4.4



5.5.4 <u>Radiated out of band emissions results on EUT:</u>

5.5.4.1 RESULTS OF RADIATED SPURIOUS EMISSIONS TESTS GSM-850:

Harmonics	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)			
2	1648.4	NF	1673.2	NF	1697.6	NF			
3	2472.6	NF	2509.8	NF	2546.4	NF			
4	3296.8	NF	3346.4	NF	3395.2	NF			
5	4121	NF	4183	NF	4244	NF			
6	4945.2	NF	5019.6	NF	5092.8	NF			
7	5769.4	NF	5856.2	NF	5941.6	NF			
8	6593.6	NF	6692.8	NF	6790.4	NF			
9	7417.8	NF	7529.4	NF	7639.2	NF			
10	8242	NF	8366	NF	8488	NF			
NF = NOISE FLOOR									



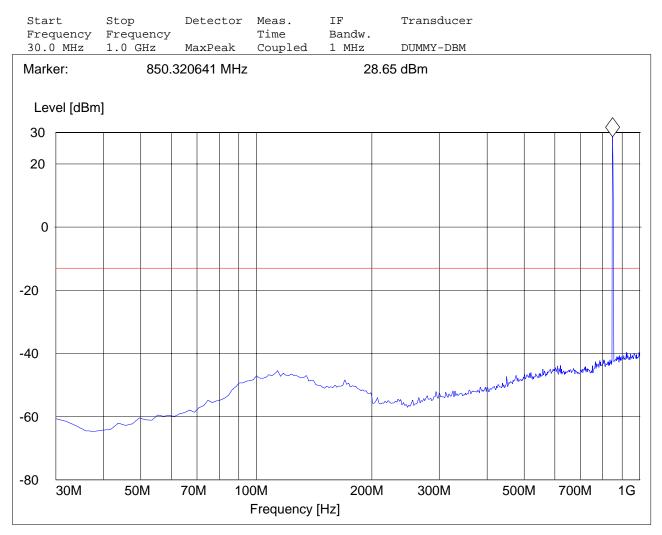
RADIATED SPURIOUS EMISSIONS (GSM-850) TX: 30MHz - 1GHz Spurious emission limit –13dBm Antenna: vertical

Note:

The peak above the limit line is the carrier freq. This plot is valid for low, mid & high channels (worst-case plot)

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	GPRS 850 CH251
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	Peak marked is uplink

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"





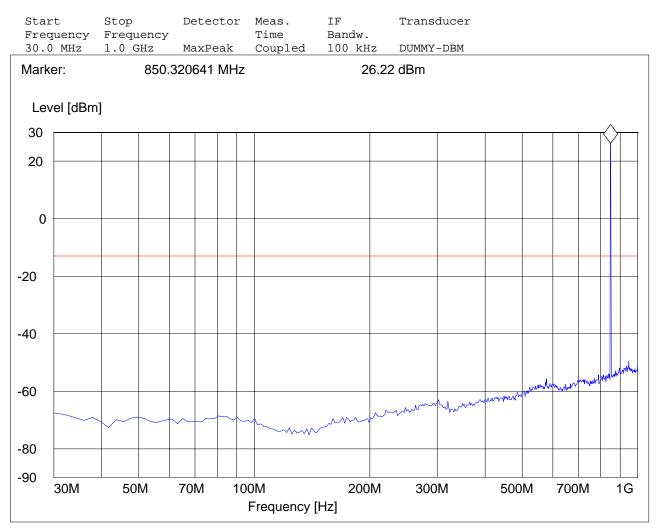
RADIATED SPURIOUS EMISSIONS (GSM-850)TX: 30MHz - 1GHz Spurious emission limit –13dBm Antenna: horizontal

Note:

The peak above the limit line is the carrier freq. This plot is valid for low, mid & high channels (worst-case plot)

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	GPRS 850 CH251
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	Peak marked is uplink

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"



Test Repo	ort #:	EMC_HEWL4	4_019_07002_FC	CC22_24		
Date of R	Report:	2007-7-24		Page 39 of 84		
RADIA'	TED SPURIOI	JS EMISSIONS (CSM-850) Ty @) 874 2MHz+ 1 C	and the second	<u>COM</u> ™
EUT: Custome Test Mo ANT Ori	HP r: Hew de: GPF entation: H entation: H gineer: Sat upply: AC	Compaq 2710p HC clett Packard S 850 CH128 ya Radhakrishna Adapter	DYAS	/ 624.2 MINZ: 1G	nz – 1.30Gnz	
Start Frequ	Stop ency Frequer	ісу Л	leas. IF Cime Bandw			
1.0 G		.54745491 Gł	Coupled 1 MHz	2 DUMMY-DB1 50.14 dBm	v <u>1</u>	
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Lev	vel [dBm]					
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-20						
-40						
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-60						
-80						
-100	1G 1	.1G 1.2	2G 1.3	G 1.4	G	1.58G
			requency [Hz			1.000

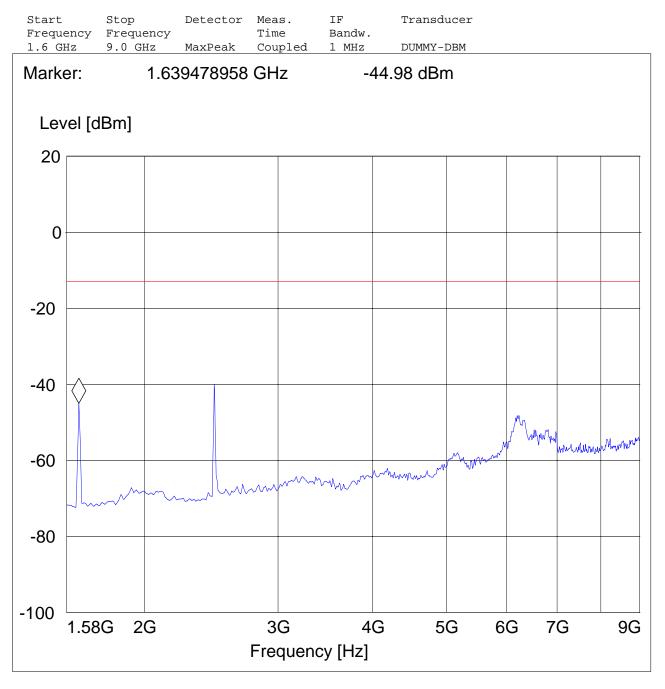
Test Report #:	EMC_HEWL4_019_07002_FCC	222_24
Date of Report:	2007-7-24	Page 40 of 84

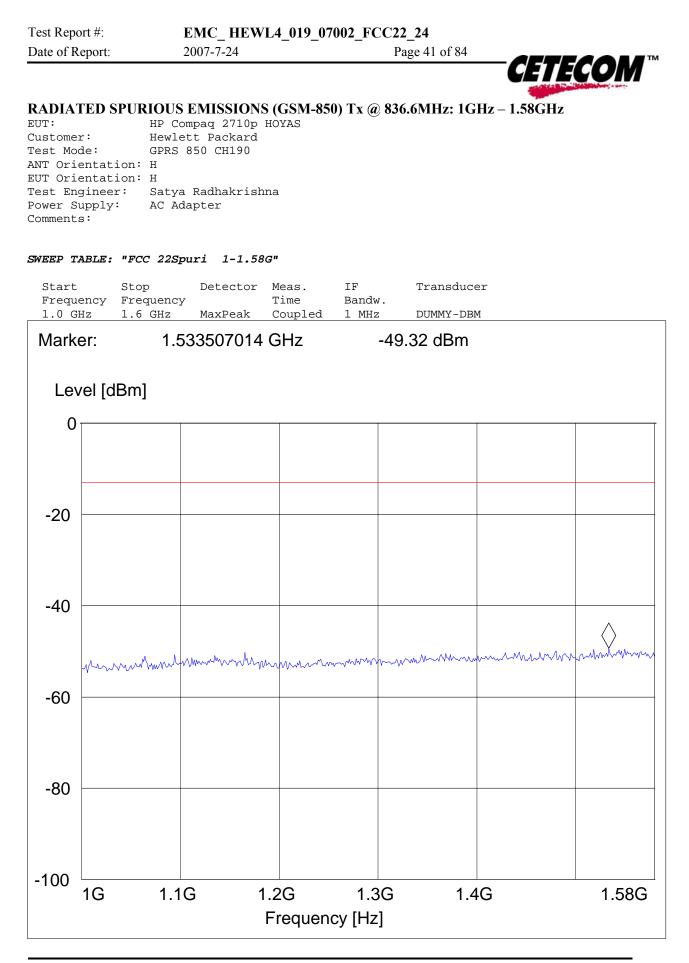


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx @ 824.2MHz: 1.58GHz - 9GHz

EUT:	HP Compaq 2710p HOYAS
Customer:	Hewlett Packard
Test Mode:	GPRS 850 CH128
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	Peak marked is first harmonic

SWEEP TABLE: "FCC 22Spuri 1.58-9G"





Test Report #:	EMC_HEWL4_019_	07002_FCC22_24	
Date of Report:	2007-7-24	Page 42 of 84	
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RADIATED SPURIOUS EMISSIONS (GSM-850) Tx @ 836.6MHz: 1.58GHz - 9GHz EUT: HP Compag 2710p HOYAS

EOL	HP Compad 2/10p HOYAS
Customer:	Hewlett Packard
Test Mode:	GPRS 850 CH190
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	Peak marked is first harmonic

	•	SWEEP TABLE: "FCC 22Spuri 1-1.58G"						
Start		Stop	Detector	Meas.	IF	Transducer		
Freque 1.0 GH		Frequency 1.6 GHz	MaxPeak	Time Coupled	Bandw. 1 MHz	DUMMY-DBM		
Marker: 1.533507014 GHz -49.32 dBm								
Lev	el [d	Bm]						
0 T								
-20								
10								
-40							\land	
~	pm	mmm	mmmmh	mmmmm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mm mm mm mm	montan	
-60								
-80								
-100								
-100 -	1G	1.10		.2G	1.3G	1.4G	1.58G	
				Frequend	cy [Hz]			

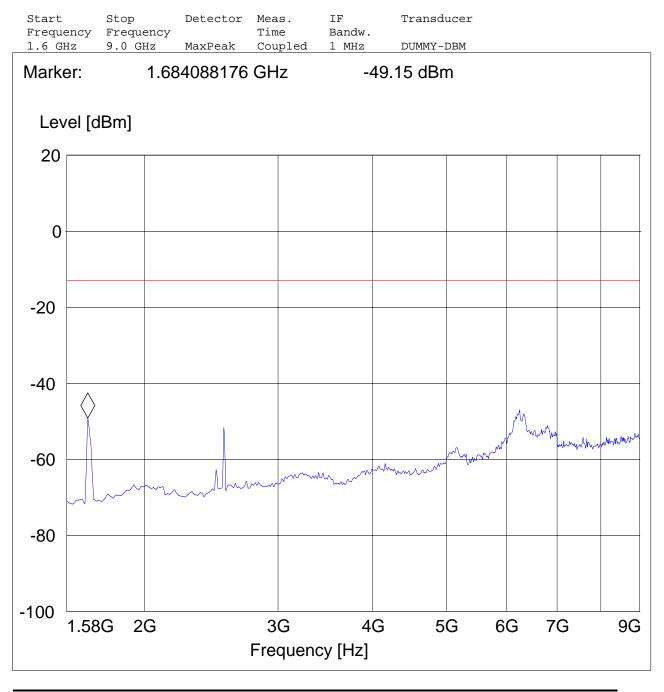
Test Repo	ort #: EMC_HEWL4_019_07002_FCC22_24					
Date of R	eport:	2007-7-24		Page	43 of 84	
EUT: Custome: Test Mod ANT Ori EUT Ori Test En Power S Comment:	H r: H de: G entation: H entation: H gineer: S upply: A s:	P Compaq 271 ewlett Packa PRS 850 CH25	0p HOYAS rd 1 ishna	50) Tx @ 848.8M	G MHz: 1GHz – 1.5	8GHz
Start Freque		-	Time	Bandw.	ransducer UMMY-DBM	
Mark	er: /el [dBm]	1.5497795	59 GHz	-50.08	3 dBm	
0						
-20						
-40						
	and on many mark	and	manuhun		WWWWWWWW	www.www.m.
-60			,			
-80						
-100	1G	1.1G	1.2G Frequen	1.3G icy [Hz]	1.4G	1.58G

Test Report #:	EMC_HEWL4_019	_07002_FCC22_24	
Date of Report:	2007-7-24	Page 44 of 84	-CETECO

RADIATED SPURIOUS EMISSIONS (GSM-850) Tx @ 848.8MHz: 1.58GHz – 9GHz EUT: HP Compag 2710p HOYAS

EUT:	HP Compaq 2710p HOYA
Customer:	Hewlett Packard
Test Mode:	GPRS 850 CH251
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Satya Radhakrishna
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 22Spuri 1.58-9G"





5.5.4.2 RESULTS OF RADIATED SPURIOUS EMISSIONS TESTS(UMTS FDD5)

Harmonics	Tx ch-4132 Freq. (MHz)	Level(dBm)	Tx ch-4183 Freq. (MHz)	Level(dBm)	Tx ch-4233 Freq. (MHz)	Level(dBm)
2	1652.8	NF	1673.2	NF	1693.2	NF
3	2479.2	NF	2509.8	NF	2539.8	NF
4	3305.6	NF	3346.4	NF	3386.4	NF
5	4132	NF	4183	NF	4233	NF
6	4958.4	NF	5019.6	NF	5079.6	NF
7	5784.8	NF	5856.2	NF	5926.2	NF
8	6611.2	NF	6692.8	NF	6772.8	NF
9	7437.6	NF	7529.4	NF	7619.4	NF
10	8264	NF	8366	NF	8466	NF

Test Report #:	EMC_HEWL4_019_07002_FCC	222_24
Date of Report:	2007-7-24	Page 46 of 84



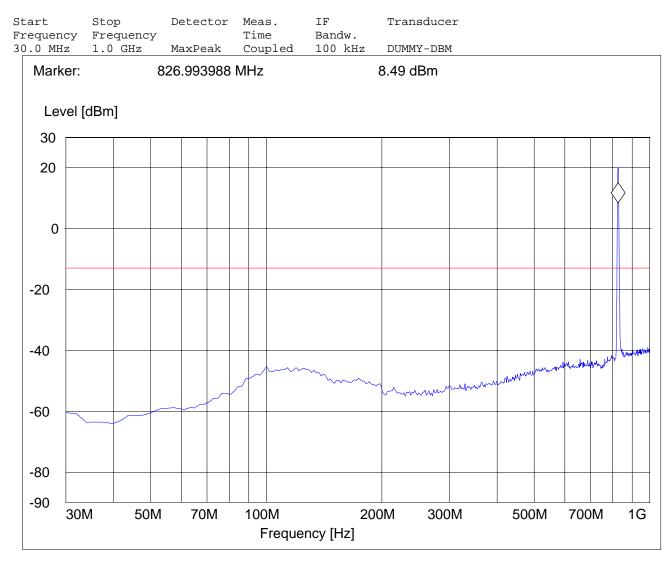
RADIATED SPURIOUS EMISSIONS (UMTS FDD5) TX: 30MHz - 1GHz Spurious emission limit –13dBm Antenna: vertical

Note:

The peak above the limit line is the carrier freq.
 This plot is valid for low, mid & high channels (worst-case plot)

EUT: Optimator Customer: HP Texas Test Mode: FDD5 ANT Orientation: V EUT Orientation: H Test Engineer: Ed Power Supply: AC Adapter Comments:

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"





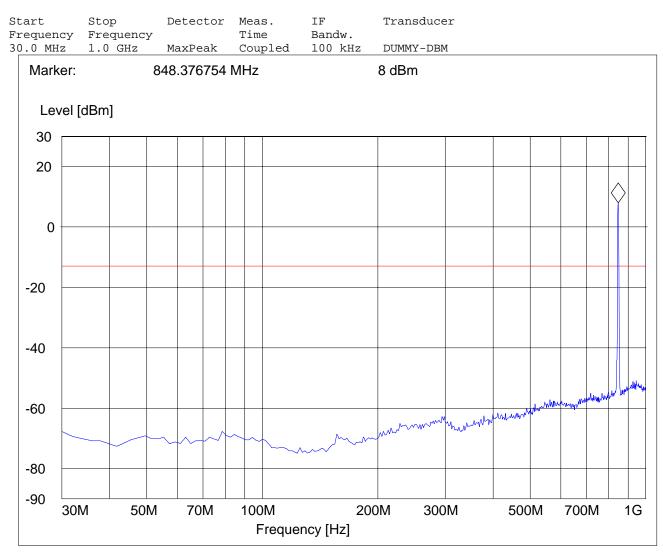
RADIATED SPURIOUS EMISSIONS (UMTS FDD5) TX: 30MHz - 1GHz Spurious emission limit –13dBm Antenna: Horizontal

Note:

The peak above the limit line is the carrier freq. This plot is valid for low, mid & high channels (worst-case plot)

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	Н
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"

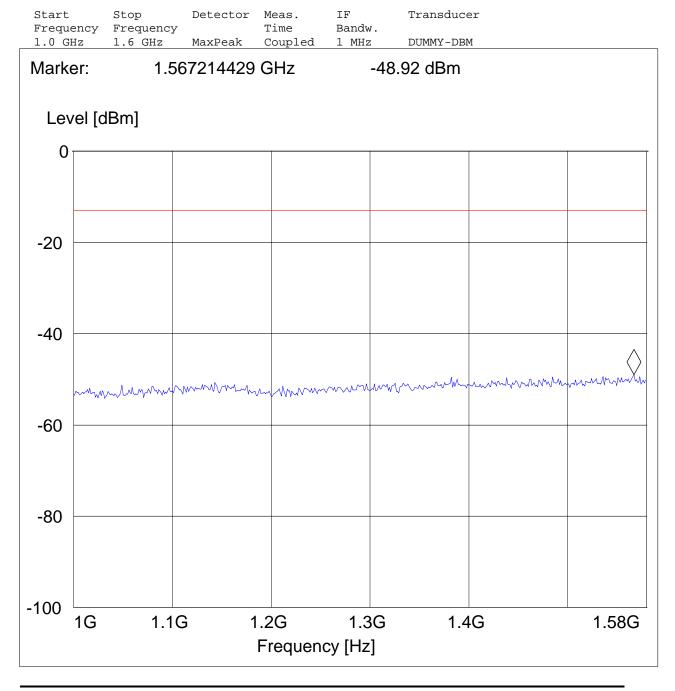


Test Report #:	EMC_HEWL4_019_	_07002_FCC22_24	
Date of Report:	2007-7-24	Page 48 of 84	
			-CETECO

RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 826.4MHz: 1GHz - 1.58GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 22Spuri 1-1.58G"



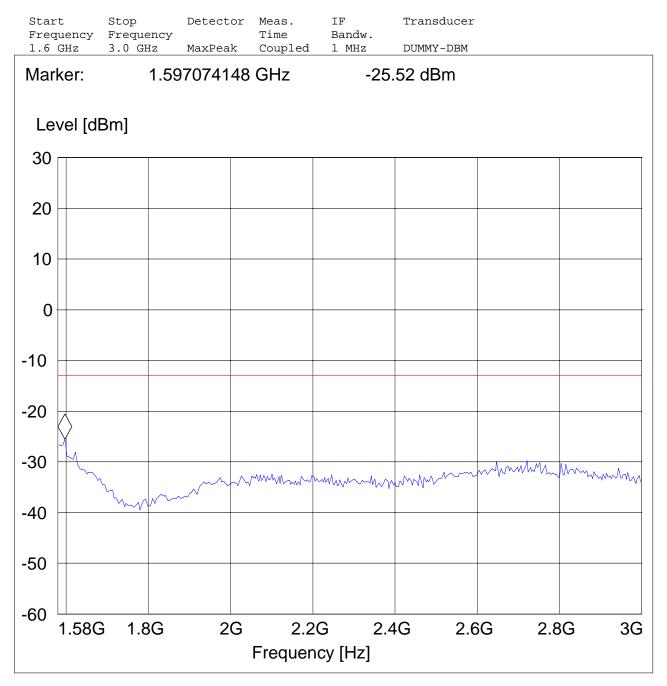
Test Report #:	EMC_HEWL4_019_07002_FC	C 22_24
Date of Report:	2007-7-24	Page 49 of 84



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 826.4MHz: 1.58GHz - 3GHz

EUT:	Optimator	
Customer:	HP Texas	
Test Mode:	FDD5	
ANT Orientation:	V	
EUT Orientation:	Н	
Test Engineer:	Ed	
Power Supply:	AC Adapter	
Comments:		

SWEEP TABLE: "FCC 22Spuri 1.58-3G"



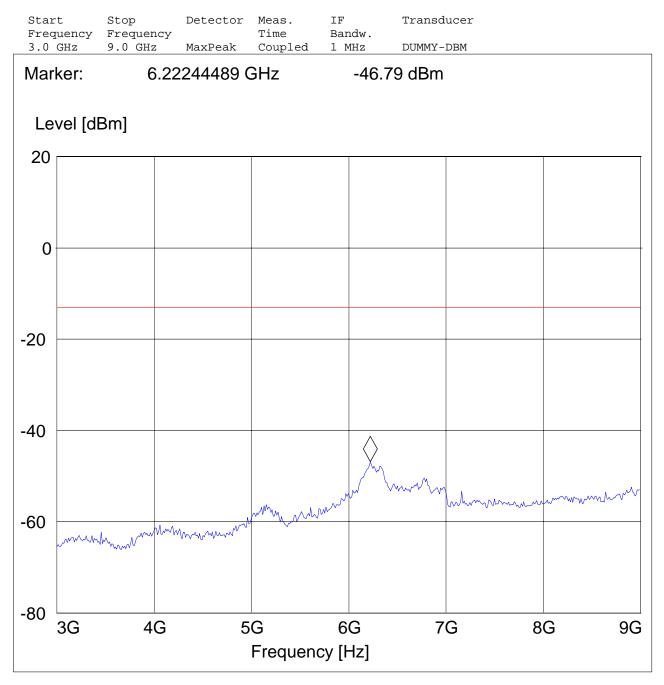
Test Report #:	EMC_HEWL4_019_07002_FC	C 22_24
Date of Report:	2007-7-24	Page 50 of 84



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 826.4MHz: 3GHz - 9GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 22Spuri 3-9G"



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2007-7-24	Page 51 of 84	
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		EMC_HEWL4_019_07002_FCC22_24 2007-7-24 Page 51 of 84

RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 836.6MHz: 1GHz - 1.58GHz

EUT:	Optimato	r
Customer:	HP Texas	i
Test Mode:	FDD5	
ANT Orientation:	V	
EUT Orientation:	Н	
Test Engineer:	Ed	
Power Supply:	AC Adapt	er
Comments:		

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Freque 1.0 GH:		Detector MaxPeak	Meas. Time Coupled	IF Bandw. 1 MHz	Transducer DUMMY-DBM	
Marke	r: 1.5	70701403	GHz	-48.9	98 dBm	
Leve	el [dBm]					
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-20						
20						
-40						\land
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-60						
-80						
-100						
100	IG 1.1		.2G	1.3G	1.4G	1.58G
			Frequenc	у [П2]		

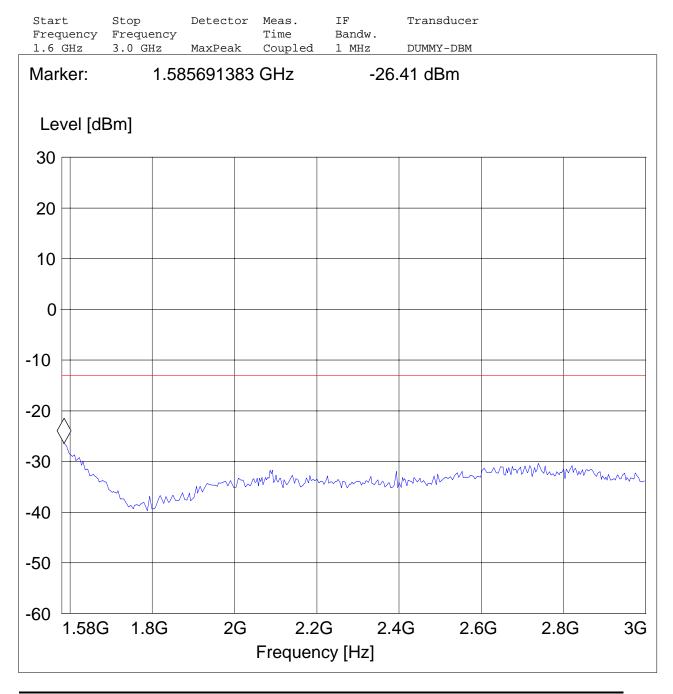
Test Report #:	EMC_HEWL4_019_07002_I	FCC22_24
Date of Report:	2007-7-24	Page 52 of 84



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 836.6MHz: 1.58GHz - 3GHz

Optimator
HP Texas
FDD5
V
Н
Ed
AC Adapter

SWEEP TABLE: "FCC 22Spuri 1.58-3G"



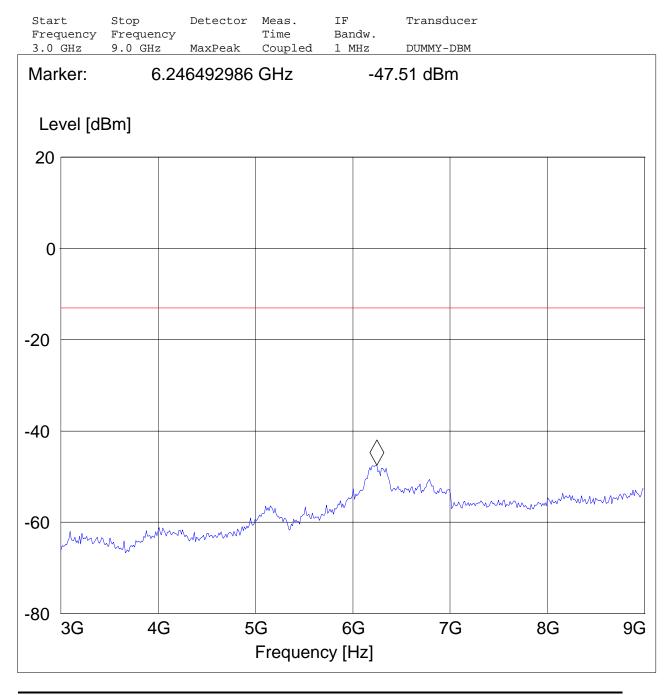
Test Report #:	EMC_HEWL4_019_07002_FC	C22_24
Date of Report:	2007-7-24	Page 53 of 84



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 836.6MHz: 3GHz - 9GHz

Optimator
HP Texas
FDD5
V
Н
Ed
AC Adapter

SWEEP TABLE: "FCC 22Spuri 3-9G"



Test Report #:	EMC_HEWL4_019_07002_FC	C22_24	
Date of Report:	2007-7-24	Page 54 of 84	AFTEA

CETECOM

RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 846.6MHz: 1GHz - 1.58GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequ 1.0 G	lency	Stop Frequency 1.6 GHz	Detector MaxPeak	Meas. Time Coupled	IF Bandw. 1 MHz	Transducer DUMMY-DBM		
Mark	er:	1.54	46292585	GHz	-49	.7 dBm		
Le	vel [d	Bm]						
0		_						
-20								
-40								
-60	Mm	www.wh	MMMMMM	MMMM-M-	1 MMmm		MMMM	www.
00								
-80								
-100	1G	1.10	G ~	1.2G	1.3G	1.4G		1.58G
				Frequen	cy [Hz]			

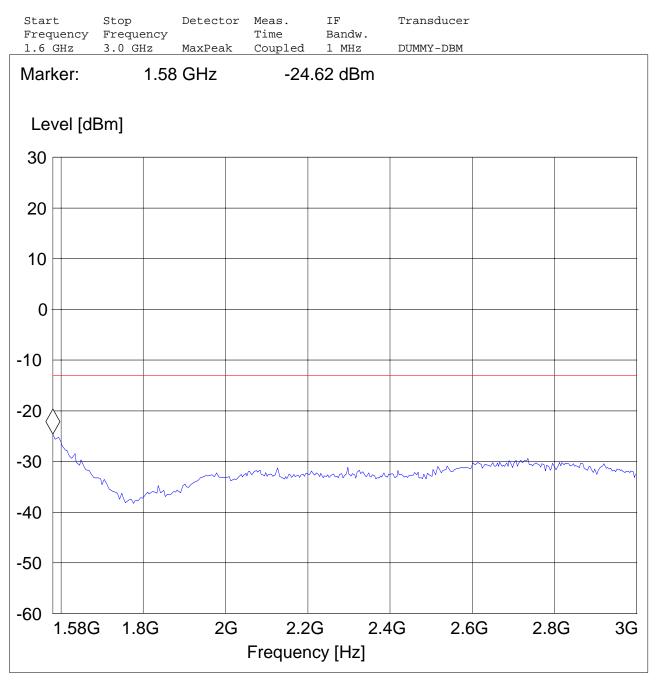
Test Report #:	EMC_HEWL4_019_07002_FC0	C 22_24
Date of Report:	2007-7-24	Page 55 of 84



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 846.6MHz: 1.58GHz - 3GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 22Spuri 1.58-3G"



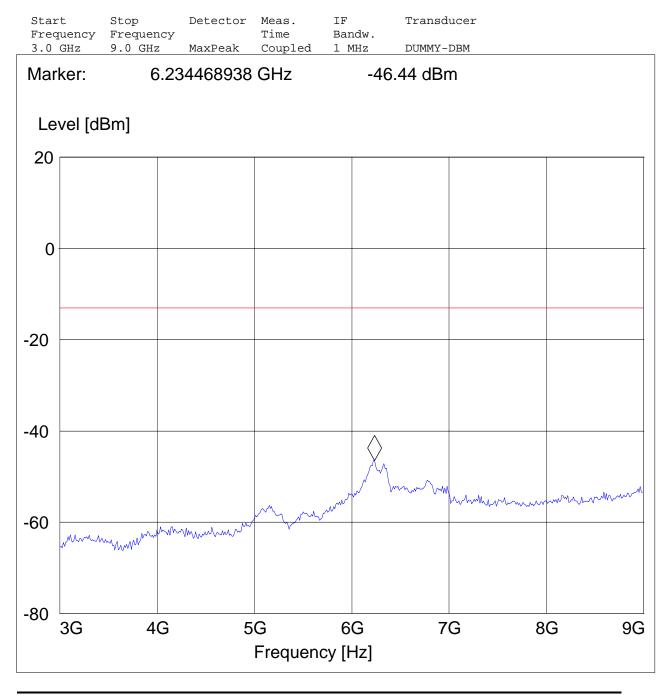
Test Report #:	EMC_HEWL4_019_07002_FC	CC22_24
Date of Report:	2007-7-24	Page 56 of 84



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx @ 846.6MHz: 3GHz - 9GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD5
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 22Spuri 3-9G"

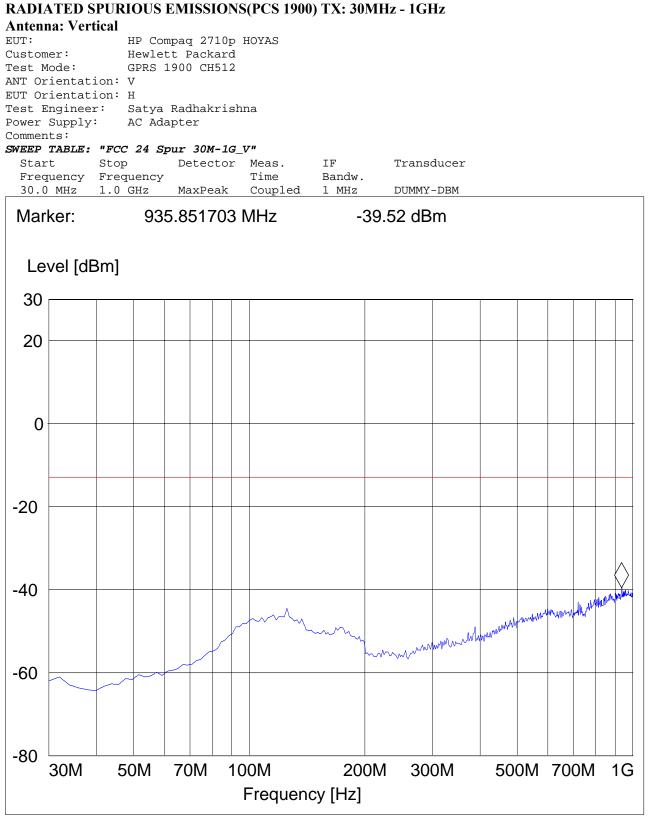




5.5.4.3 RESULTS OF RADIATED SPURIOUS EMISSIONS TESTS (PCS-1900):

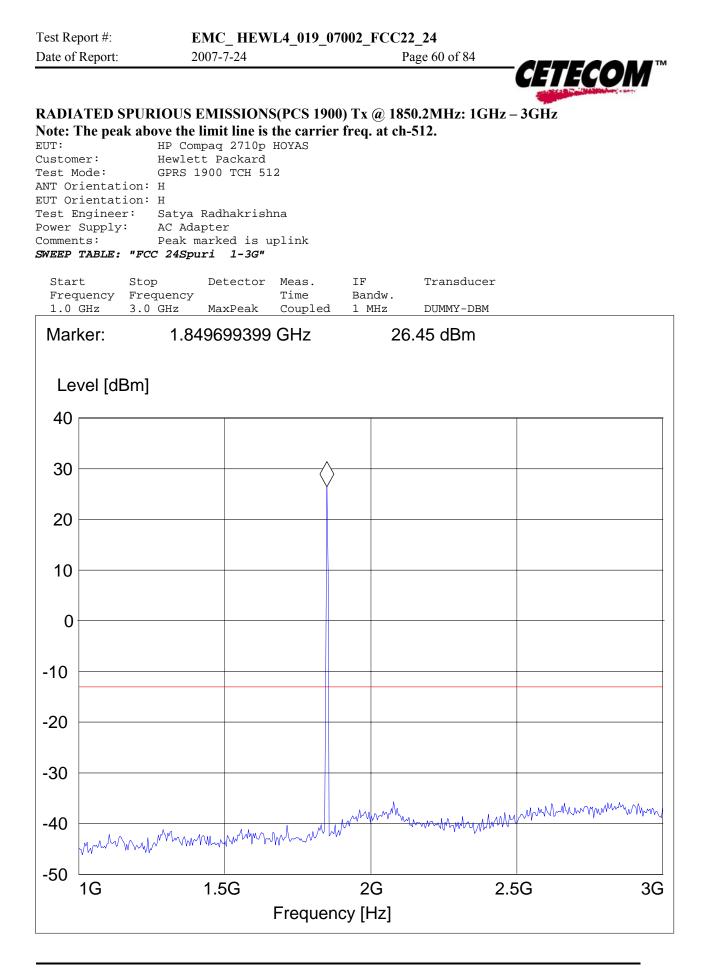
Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)	
2	3700.4	NF	3760	NF	3819.6	NF	
3	3 5550.6		5640	NF	5729.4	NF	
4	4 7400.8		7520	NF	7639.2	NF	
5	9251	NF	9400	NF	9549	NF	
6	11101.2	NF	11280	NF	11458.8	NF	
7	12951.4	NF	13160	NF	13368.6	NF	
8	14801.6	NF	15040	NF	15278.4	NF	
9	16651.8	NF	16920	NF	17188.2	NF	
10	18502	NF	18800	NF	19098	NF	
NF = NOISE FLOOR							







RADIATED SPURIOUS EMISSIONS(PCS 1900) TX: 30MHz - 1GHz **Antenna: Horizontal** EUT: HP Compaq 2710p HOYAS Customer: Hewlett Packard Test Mode: GPRS 1900 CH661 ANT Orientation: H EUT Orientation: H Test Engineer: Satya Radhakrishna Power Supply: AC Adapter Comments: SWEEP TABLE: "FCC 24 Spur 30M-1G_H" Stop Detector Meas. IF Transducer Start Frequency Frequency Time Bandw. 30.0 MHz 1.0 GHz MaxPeak Coupled 100 kHz DUMMY-DBM Marker: 30 MHz -65.52 dBm Level [dBm] 30 20 0 -20 -40 -60 Martin . MV -80 -90 30M 50M 70M 100M 200M 300M 500M 700M 1G Frequency [Hz]



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Test Repo	ort #:	EMC_HEWL4_019_07002_FCC22_24							
Date of R	Date of Report: 2007-7-24 Page 61 of 84			ge 61 of 84					
ΡΑΠΙΑΊ	FFD S	PUDIOUS P	MISSIONS	(PCS 1000)	Tv @ 1850).2MHz: 3GHz	and the second	<u>COM</u> ™	
EUT: Custome: Test Moo ANT Orie EUT Orie Test Eng Power St Comments	r: de: entat: entat: ginee: upply	HP Com Hewlet GPRS 1 ion: H ion: H r: Satya	paq 2710p : t Packard 900 TCH 51 Radhakrish:	HOYAS 2	1 X (2) 1030	.2.19112: 3G17	2 – 10GHZ		
SWEEP TZ	ABLE:	"FCC 24Spu	ri 3-18G"						
Start Freque 3.0 GI		Stop Frequency 18.0 GHz	Detector Average		IF Bandw. 1 MHz	Transducer DUMMY-DBM			
Marke	er:	17.90	09819639	GHz	-51.	84 dBm			
Lev	vel [d	Bm]							
40									
20									
0									
-20									
40									
-40									
-60			M				· ····································		
	~ 1	for the second	hulyman						
-80									
4.00									
-100	20	~	\sim		0	400 4	10 10		

Frequency [Hz]

8G

10G

12G

14G

16G

18G

3G

6G

Test Report #: EMC_HEWL4_019_07002_FCC22_24							
Date of Report:		2007-7	7-24		Page 62	of 84	
	ATED SPUR		SSIONS(PCS 19	00) Tx (/) 1880.0MI	Hz: 1GHz -	-3GHz
EUT Or Test E	ode: ientation: ientation: ngineer: Supply:	Hewlett Pa GPRS 1900 H H Satya Radh AC Adapter	TCH 661 hakrishna				
SWEEP :	TABLE: "FCC	24Spuri	1-3G"				
Star Freq 1.0 (uency Freq	quency	tector Meas. Time xPeak Coupled	IF Band 1 MH	lw.	nsducer MY-DBM	
Mark			63527 GHz		27.23 d		
Lev	vel [dBm]						
40							
30							
				Y			
20							
10							
0				_			
-10							
-20							
-30				_			
					λ.,		manum
-40	u. MMaran	Munhuh	mmmmmm	h	NWW MANNA	WMWWW M	WANN INDAMARAN CAME AND ADDR

Frequency [Hz]

1.5G

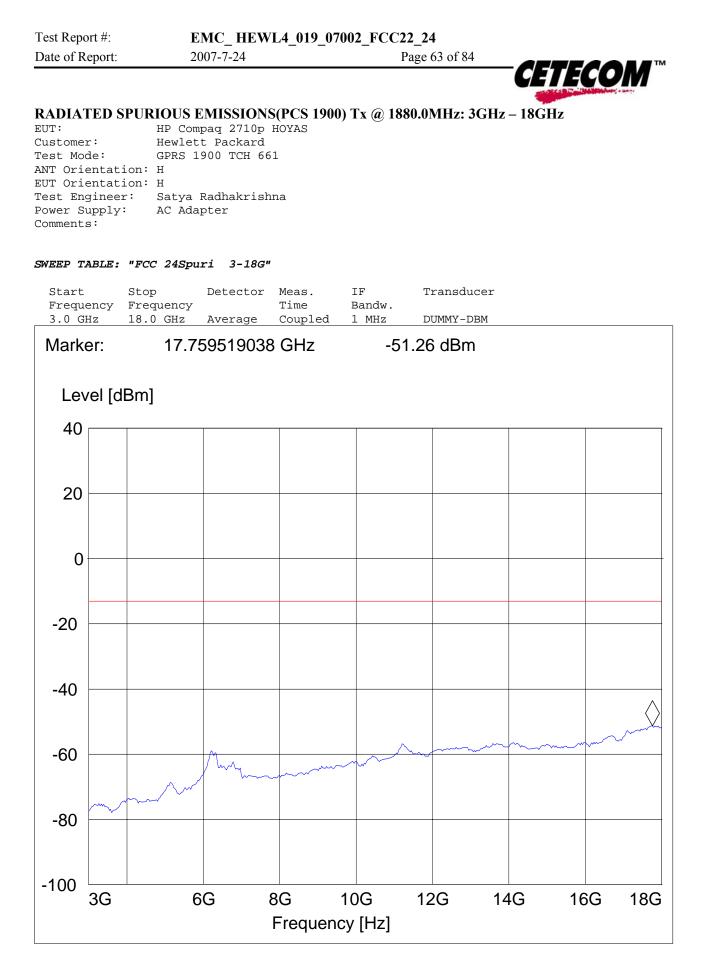
2G

2.5G

3G

-50

1G

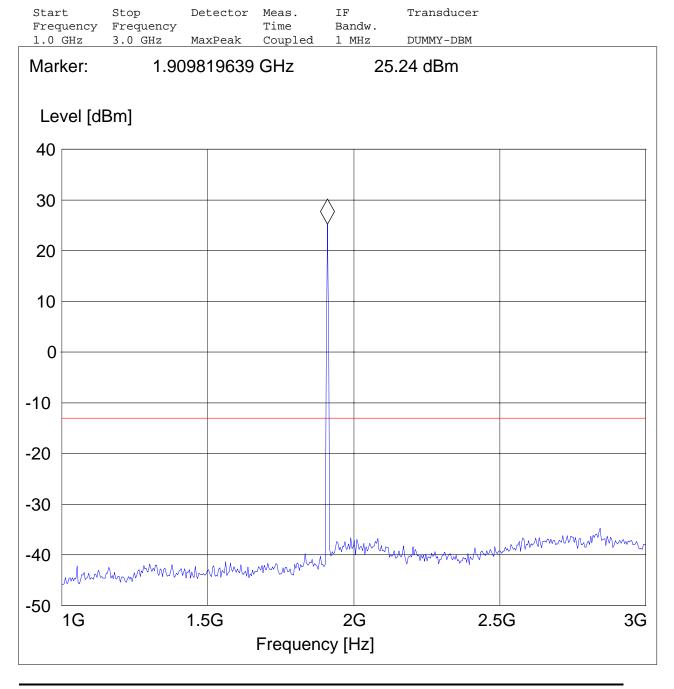


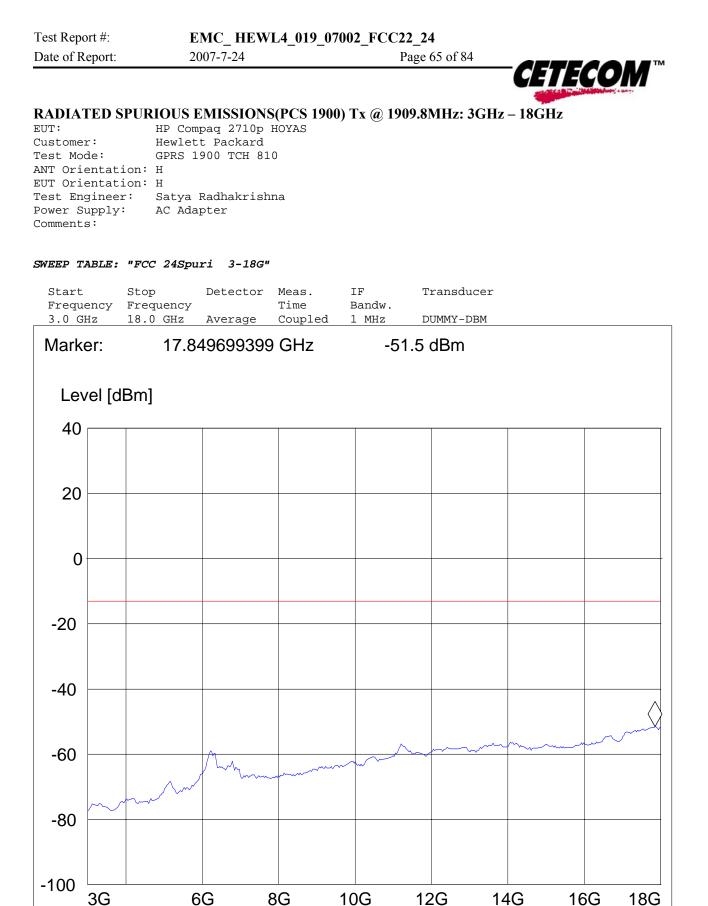
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Test Report #:	EMC_HEWL4_019_07002		
Date of Report:	2007-7-24	Page 64 of 84	
			CETECOM
RADIATED SPUR	LIOUS EMISSIONS(PCS 1900) T	Tx @ 1909.8MHz: 1GH	z – 3GHz
EUT:	HP Compaq 2710p HOYAS	0	
Customer:	Hewlett Packard		
Test Mode:	GPRS 1900 TCH 810		
ANT Orientation:	Н		

ANT Orientation:	Н					
EUT Orientation:	Н					
Test Engineer:	Satya Radhakrishna					
Power Supply:	AC Adapter					
Comments:	Peak marked is uplink					

SWEEP TABLE: "FCC 24Spuri 1-3G"





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Frequency [Hz]

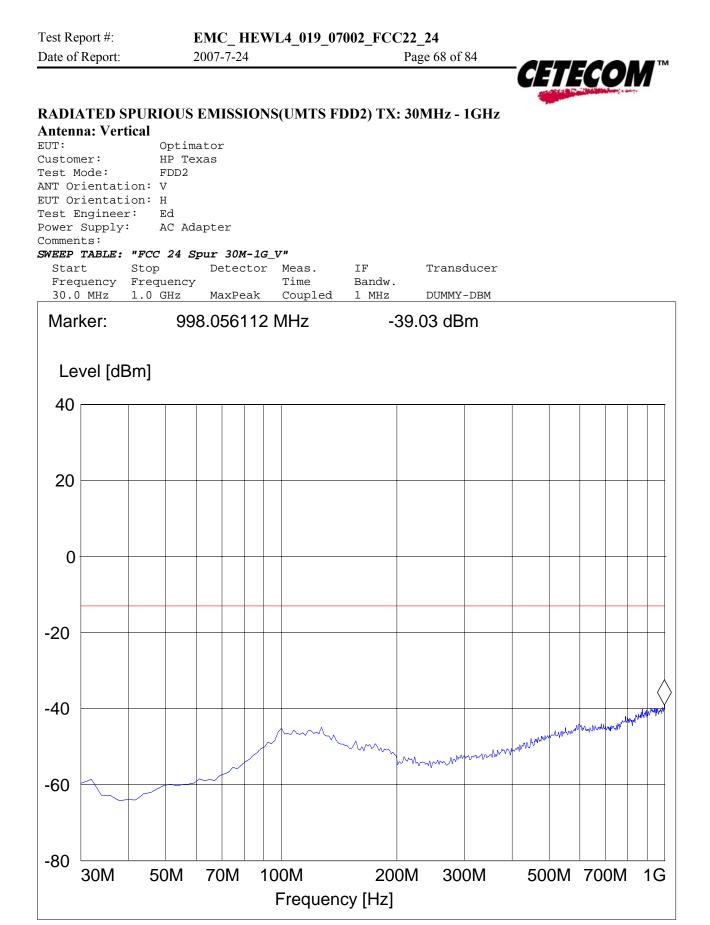


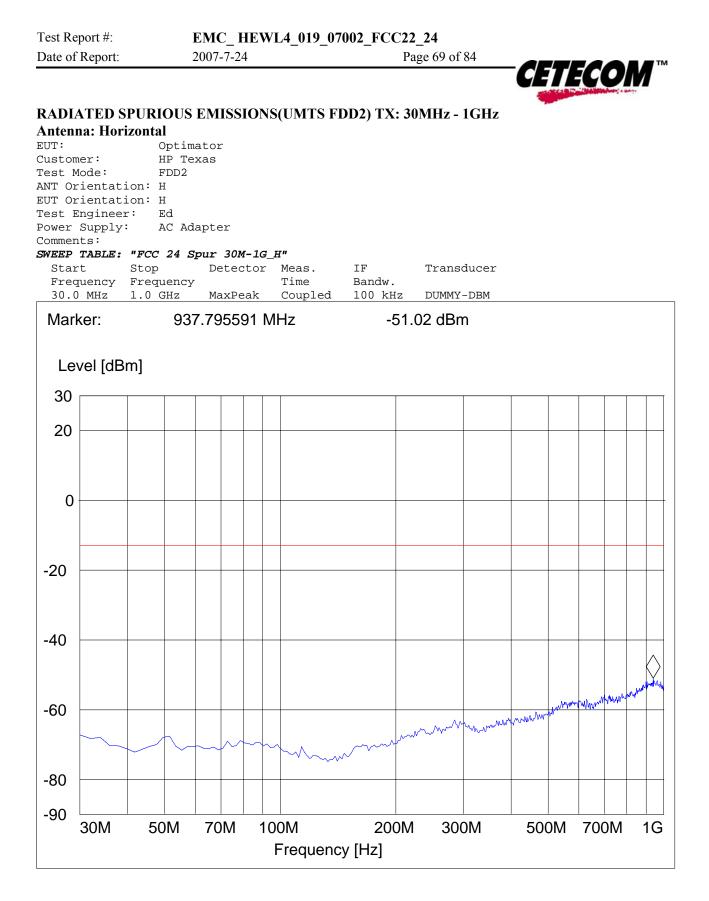
RADIATED SPURIOUS EMISSIONS(PCS 1900) 18GHz - 19.1GHz Note: This plot is valid for low, mid & high channels (worst-case plot) EUT: HP Compaq 2710p HOYAS Customer: Hewlett Packard Test Mode: GPRS 1900 CH661 ANT Orientation: H EUT Orientation: H Test Engineer: Satya Radhakrishna Power Supply: AC Adapter Comments: SWEEP TABLE: "FCC 24spuri 18-19.1G" Start Stop Detector Meas. IFTransducer Frequency Frequency Time Bandw. 18.0 GHz 19.1 GHz Coupled 1 MHz DUMMY-DBM Average Marker: 18.89498998 GHz -57.83 dBm Level [dBm] 0 -10 -20 -30 -40 -50 -60 www WA 1..... have when when the -70 18.2G 18.4G 18.6G 18G 18.8G 19.1G Frequency [Hz]

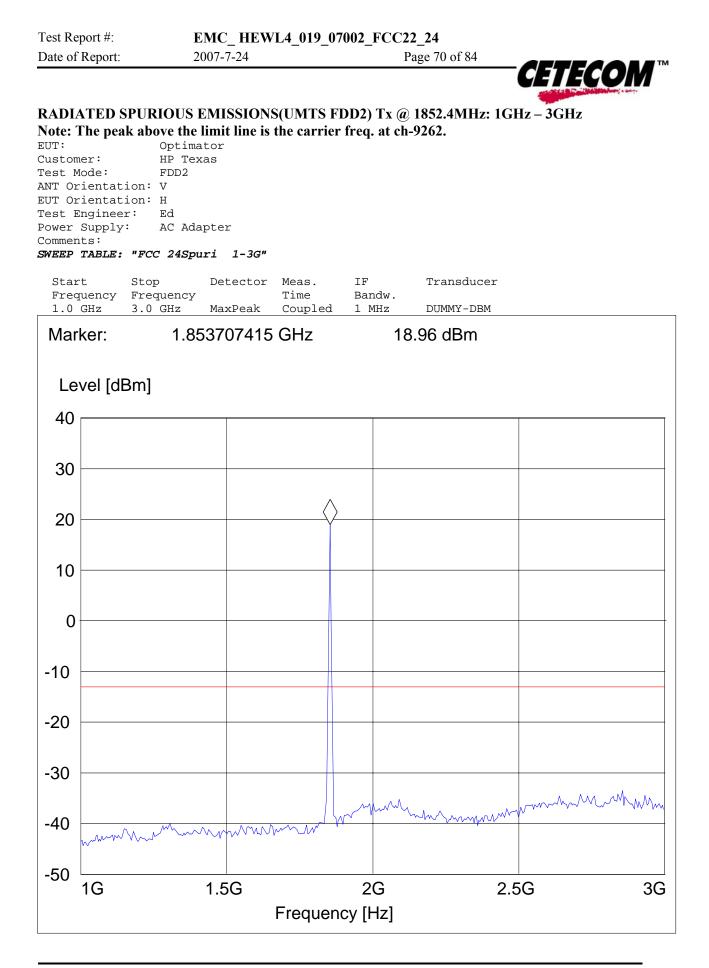
Test Report #:

RESULTS OF RADIATED SPURIPUS EMISSIONS TESTS (UMTS FDD2): 5.5.4.4

Harmonics	Tx ch-9262 Freq. (MHz)	Level (dBm)	Tx ch-9400 Freq. (MHz)	Level (dBm)	Tx ch-9538 Freq. (MHz)	Level (dBm)
2	3704.8	NF	3760	NF	3815.2	NF
3	5557.2	NF	5640	NF	5722.8	NF
4	7409.6	NF	7520	NF	7630.4	NF
5	9262	NF	9400	NF	9538	NF
6	11114.4	NF	11280	NF	11445.6	NF
7	12966.8	NF	13160	NF	13353.2	NF
8	14819.2	NF	15040	NF	15260.8	NF
9	16671.6	NF	16920	NF	17168.4	NF
10	18524	NF	18800	NF	19076	NF







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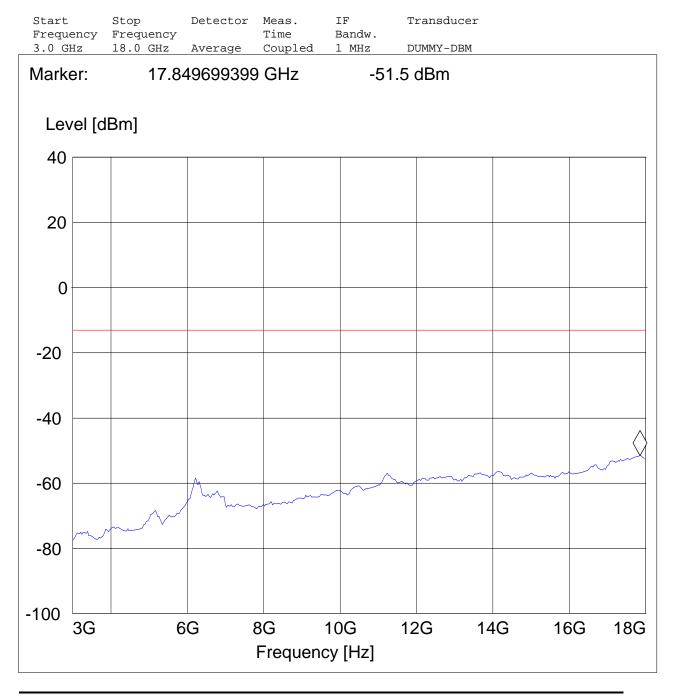
Test Report #:	EMC_HEWL4_019_07002_	FCC22_24
Date of Report:	2007-7-24	Page 71 of 84



RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx @ 1852.4MHz: 3GHz - 18GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD2
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 24Spuri 3-18G"



Test Report #:			_	_019_07002_F		—			
Date of	Report:	2007	7-7-24		Page 72 o	of 84	CETECON	тм	
EUT: Custom Test M ANT Or EUT Or Test E	er: ode: ientatio ientatio ngineer: Supply:	Optimato HP Texas FDD2 n: V	r	MTS FDD2) ⁷	Гх @ 1880.0		A COLOR OF THE ADDRESS OF THE PARTY		
		FCC 24Spuri							
Star Freq 1.0	uency F	requency	Ti	eas. IF ime Band oupled 1 MI	dw.	lsducer IY-DBM			
Marl			755511 G		19.17 d				
	vel [dBr	n]							
40									
30									
20									
10									
0									
-10									
-20									
-30				I AMM	Mm m.		mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	\sim	
-40	MANN	mon	hunn	N_N~~	· · · · · · · · · · · · · · · · · · ·	WV~W~/~/~/~			

Frequency [Hz]

2G

2.5G

3G

1.5G

-50

1G

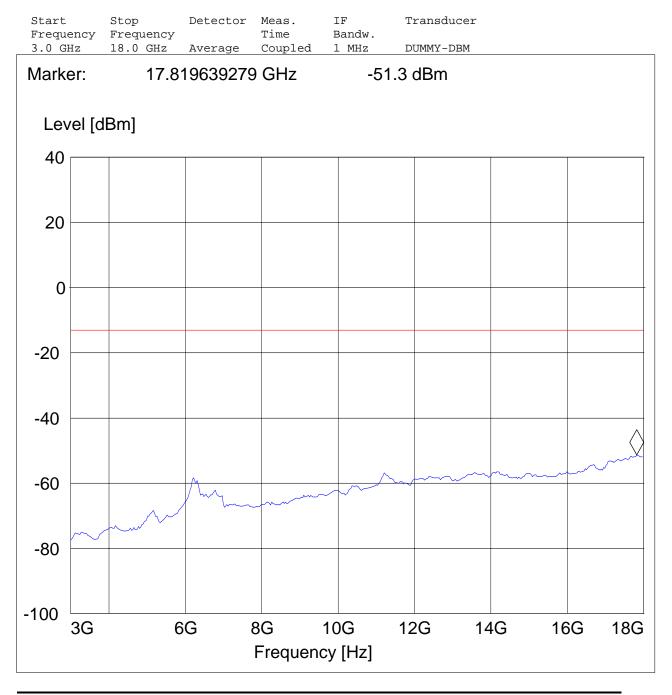
Test Report #:	EMC_HEWL4_019_07002_FCC	22_24
Date of Report:	2007-7-24	Page 73 of 84



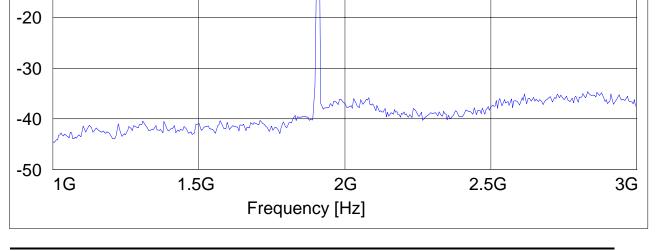
RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx @ 1880.0MHz: 3GHz - 18GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD2
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 24Spuri 3-18G"



Test Report #	E	MC_HEW	L4_019_070	002_FCC22	2_24		
Date of Repo		007-7-24		—	_ age 74 of 84		
						CETEC	OM
EUT: Customer: Test Mode: ANT Orient EUT Orient Test Engin Power Supp Comments:	Optima HP Tex FDD2 ation: V ation: H eer: Ed ly: AC Ada	tor as pter	GUMTS FD	D2) Tx @	1907.6MHz: 10	GHz – 3GHz	
SWEEP TABL Start Frequenc	E: "FCC 24Spu Stop y Frequency	ri 1-3G" Detector	Meas. Time	IF Bandw.	Transducer		
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM]
Marker: Level [)5811623	GHZ	18	.78 dBm		
40							
30							
20							
10							
0							
-10							



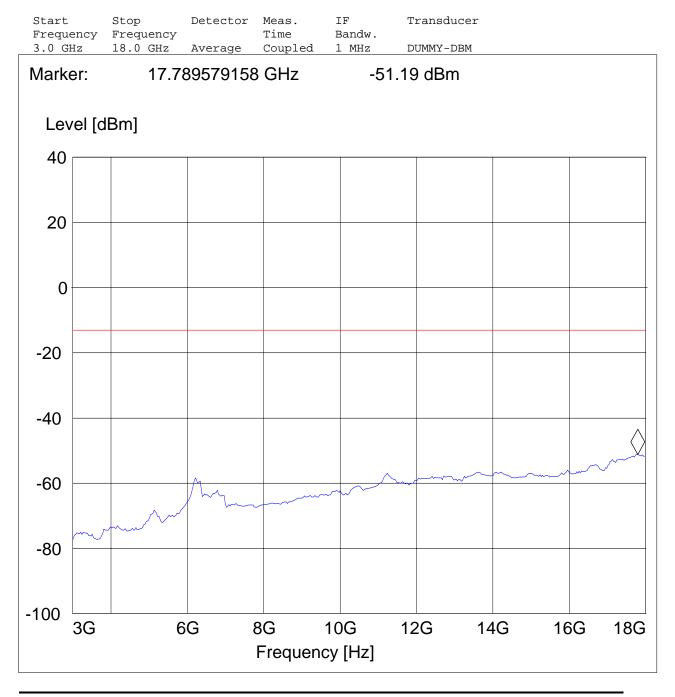
Test Report #:	EMC_HEWL4_019_07002_FC0	222_24
Date of Report:	2007-7-24	Page 75 of 84

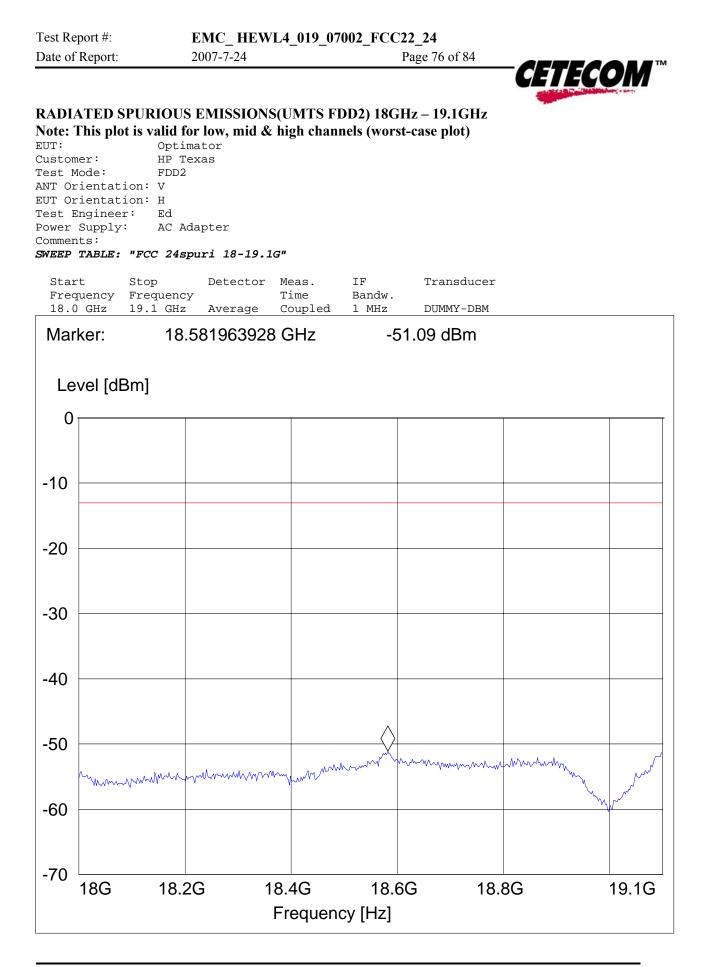


RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx @ 1907.6MHz: 3GHz - 18GHz

EUT:	Optimator
Customer:	HP Texas
Test Mode:	FDD2
ANT Orientation:	V
EUT Orientation:	Н
Test Engineer:	Ed
Power Supply:	AC Adapter
Comments:	

SWEEP TABLE: "FCC 24Spuri 3-18G"





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5.5.5 <u>RECEIVER RADIATED EMISSIONS</u>

<u>§ 2.1053 / RSS-132 & 133</u>

NOTE:

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3GHz and 26.5GHz very short cable connections to the antenna was used to minimize the noise level.

Limits		SUBCLAUSE § RSS-133
Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

5.5.5.1 Test Results

Test not conduted.



5.6 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.6.1 <u>Limits</u> Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Limit

Conducted Limit (dBµV)		
Quasi-Peak	Average	
66 to 56*	56 to 46*	
56	46	
60	50	
-	Quasi-Peak 66 to 56* 56	

* Decreases with logarithm of the frequency

ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

Test Report #: Date of Report:

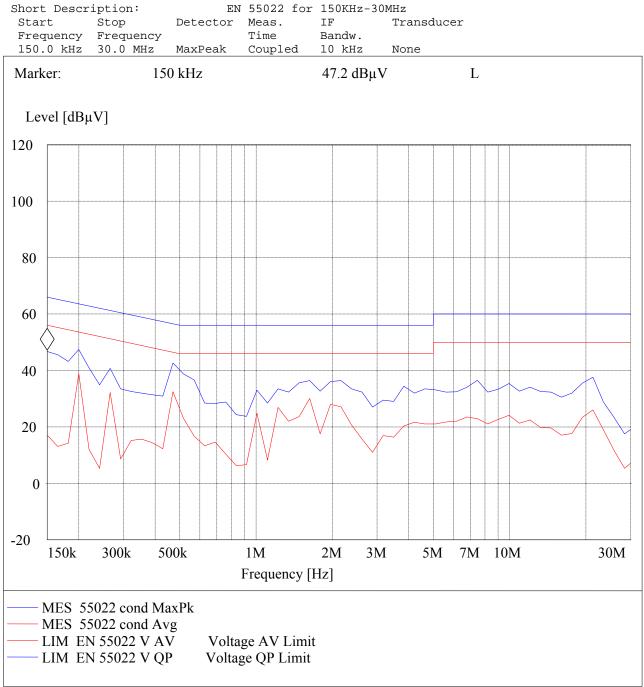
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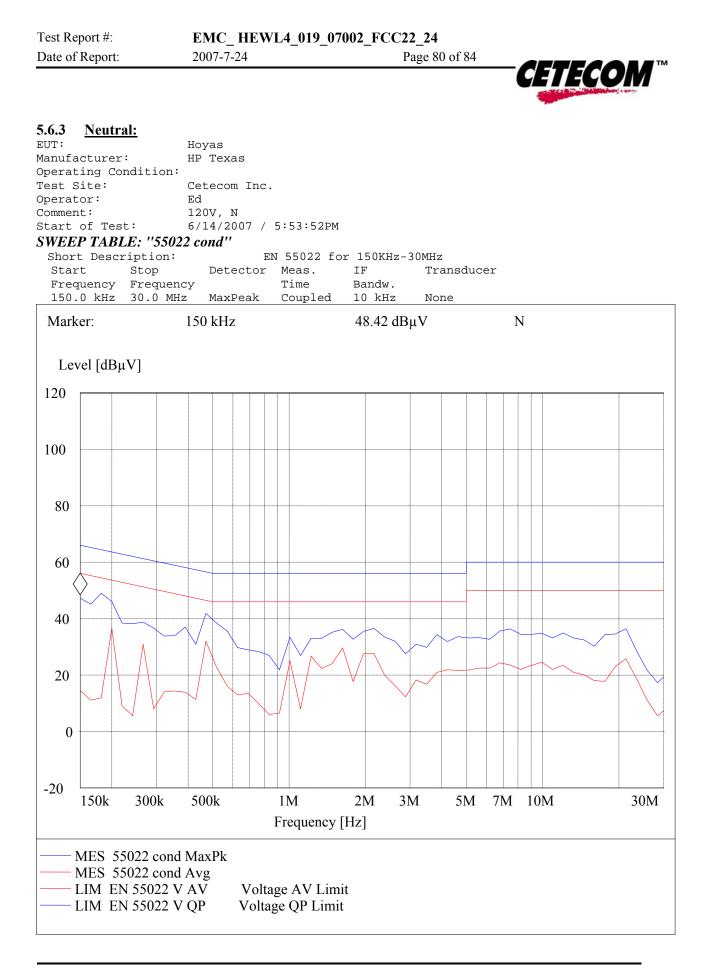


5.6.2 **Results**, Line:

EUT:	Hoyas	
Manufacturer:	HP Teaxas	
Operating Condition:		
Test Site:	Cetecom Inc.	
Operator:	Ed	
Comment:	120V, L	
Start of Test:	6/14/2007 / 5:58:10PM	

SWEEP TABLE: "55022 cond"







6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Туре	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2008	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	August 2008	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2008	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2008	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2008	1 year
06	Horn Antenna (1- 18GHz)	SAS- 200/571	AH Systems	325	June 2008	1 year
07	Horn Antenna (18- 26.5GHz)	3160-09	ЕМСО	1240	June 2008	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2008	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4- 00102600	Miteq	00616	May 2008	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2008	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2008	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2008	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2008	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2008	2 years



7 <u>References</u>

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 2--FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS October 1, 2001.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 22 PUBLIC MOBILE SERVICES October 1, 1998.

FCC Report and order 02-229 September 24, 2002.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 24 PERSONAL COMMUNICATIONS SERVICES October 1, 1998.

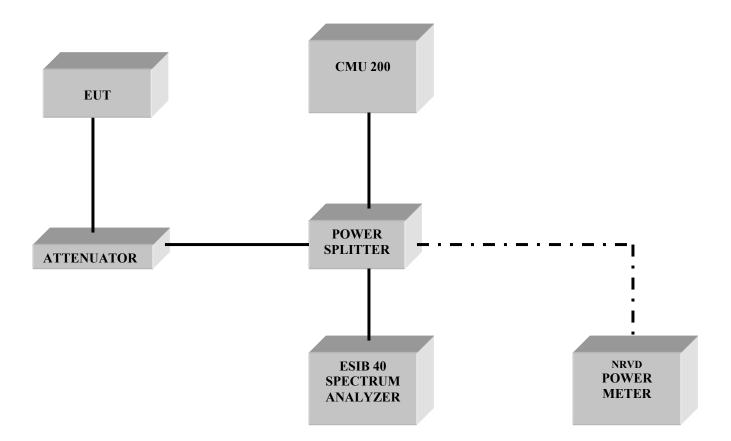
ANSI / TIA-603-C-2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard November 7, 2002.

Test Report #: Date of Report:



8 BLOCK DIAGRAMS

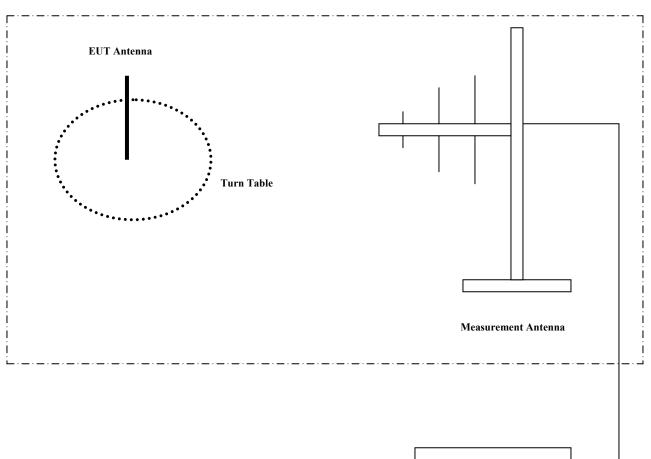
Conducted Testing



Test Report #:	
Date of Report:	



Radiated Testing



ANECHOIC CHAMBER

Spectrum Analyzer