

Sub-part 2.903 (f):

**Equipment Identification**

FCC ID: J9CKAG4

**Nameplate Drawing**

See Attachment, Exhibit 1

**Location**

As per Label Drawing(s)

**Date of Report**

March 16, 1999

Supervised By:  
RD:kg

Richard Dean

The applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27 (a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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**List of General Information Required for Type Acceptance**

In Accordance with FCC Rules and Regulations,  
Volume II, Part 2 and to  
Part 24 sub-part E

Sub-part2.983 (a) Name and Address of Applicant:

Qualcomm Incorporated  
6455 Lusk Blvd.  
San Diego, CA 92121-1617

Vendor:

Applicant

2.983 (b): FCC ID: J9CKAG4Model No: Qcell519e2.983 (c): Quantity Production Planned.2.983 (d): Technical Description: See Appendix A(1) : Type of Emission: 1M25F9W(2) : Frequency Range, MHz: 1930 MHz  
(2) 1990 MHz(3) : Power Rating, Watts: 1, 15  
Switchable  Adjustable  N/A (4) : Maximum Power Rating, Watts: 15

2.983 (d)

(5) : Voltages & Currents in all Elements in Final R.F. Stage, Including Final Transistor or Solid State Device:

Collector Current, A = per manual  
Collector Voltage, Vdc = per manual  
Supply Voltage, Vac = N/A

(6) : Function of Active Circuit Devices:  
Please see Attached Appendix C

(7) : Circuit Diagram:  
Please see Attached Appendix C

(8) : Manual:  
Please see Attached Appendix D

(9) : Tune-Up Procedure:  
Please see Attached Appendix E

(10) : Description of Circuitry & Devices Provided for Determining and Stabilizing Frequency:  
Please see Attached Appendix F

(11) : Description of Circuits or Devices Employed For  
(a) Suppression of Spurious Radiation,  
(b) Limiting Modulation,  
(c) Limiting Power:  
  
Please see Attached Appendix G

(12) : Digital Modulation Description:  
Please see Attached Appendix H

2.983 (e) : Test and Measurement Data:  
Follows

2.983 (f) : Label Information:  
Please see Attached Exhibit 1

2.983 (g) : Photographs:  
Please see Attached Exhibits 2-16

Sub-part  
2.983 (e) : Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.981, 2.983, 2.985, 2.987, 2.989, 2.991, 2.993, 2.995, 2.997, 2.999 and the following individual Parts:

<u>21</u>	Domestic Public Radio Services	___
<u>24</u>	Personal Communications Services	<u>X</u>
<u>22E</u>	Broadband PCS	<u>X</u>
22.901 (d)	Special Provisions for Alternative Cellular Technologies and and Auxiliary Services	___
<u>23</u>	International Fixed Public Radio Communications Service	___
<u>74</u>	Experimental, Auxiliary & Special Broadcast and Other Program Distribution Services	___
<u>74H</u>	Low Power Auxiliary Stations	___
<u>80</u>	Stations in the Maritime Service	___
<u>80.209 (5)(l)</u>	Transmitter Frequency Tolerances, 156–162 MHz, Coast Stations	___
<u>80K</u>	Private Coast Stations & Marine Utility Stations	___
<u>80S</u>	Compulsory R/T Installations for Small Passenger Boats	___
<u>80T</u>	Radio Telegraph Installation Required for Vessels on the Great Lakes	___
<u>80U</u>	Radio Telegraph Installation Required by the Bridge-to-Bridge Act	___
<u>87</u>	Aviation Services	___
<u>90</u>	Private Land Mobile Radio Services	___
<u>94</u>	Private Operational–Fixed microwave Services	___
<u>95</u>	General Mobile Radio Service	___

General Information

1. Spurious radiation was measured at ten (3) meters.
  
2. The normal modes of modulation are:
  - (a) Voice \_\_\_\_\_
  - (b) Wideband Data \_\_\_\_\_
  - (c) SAT \_\_\_\_\_
  - (d) ST \_\_\_\_\_
  - (e) SAT + Voice \_\_\_\_\_
  - (f) SAT + DTMF \_\_\_\_\_
  - (g) 64-Ary Orthogonal CDMA  X
  - (h) Pi/4 DQPSK \_\_\_\_\_
  - (i) NAMPS Voice \_\_\_\_\_
  - (j) NAMPS DSAT \_\_\_\_\_
  - (k) NAMPS ST \_\_\_\_\_

Standard Test Conditions  
and  
Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

Room Temperature	=	25 ± 5° C
Room Humidity	=	20–50%
D.C. Supply Voltage, Vdc	=	N/A
A.C. Supply Voltage, Vac	=	120 Vac
A.C. Supply Frequency, Hz	=	60Hz

Prior to testing, the E.U.T. was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurements.



Name of Test: R.F. Power Output

Paragraph: 47 CFR 2.985 (a)

Guide: EIA Standard RS 152B, Paragraph 3.3

Test Condition: Standard Temperature & Humidity

Test Equipment: As per Attached Appendix J

Measurement Procedures

1. The E.U.T. was connected to a directional coupler and a resistive coaxial attenuator of normal load impedance, and the modulated output power was measured by means of an R.F. power meter.
1. Measurement accuracy is  $\pm 3\%$ .

Measurement Results

Nominal, MHz	Channel	Band	R.F. Power Output, Watts	
			Low Power	High Power
1931.250	25	A	1.0	15.0
1937.500	150	A	1.0	15.0
1944.950	299	A	1.0	15.0
1945.000	300	D	1.0	15.0
1947.500	350	D	1.0	15.0
1949.950	399	D	1.0	15.0
1950.000	400	B	1.0	15.0
1957.500	550	B	1.0	15.0
1964.950	699	B	1.0	15.0
1965.000	700	E	1.0	15.0
1967.500	750	E	1.0	15.0
1969.950	799	E	1.0	15.0
1970.000	800	F	1.0	15.0
1972.500	850	F	1.0	15.0
1974.950	899	F	1.0	15.0
1975.000	900	C	1.0	15.0
1982.500	1050	C	1.0	15.0
1988.750	1175	C	1.0	15.0

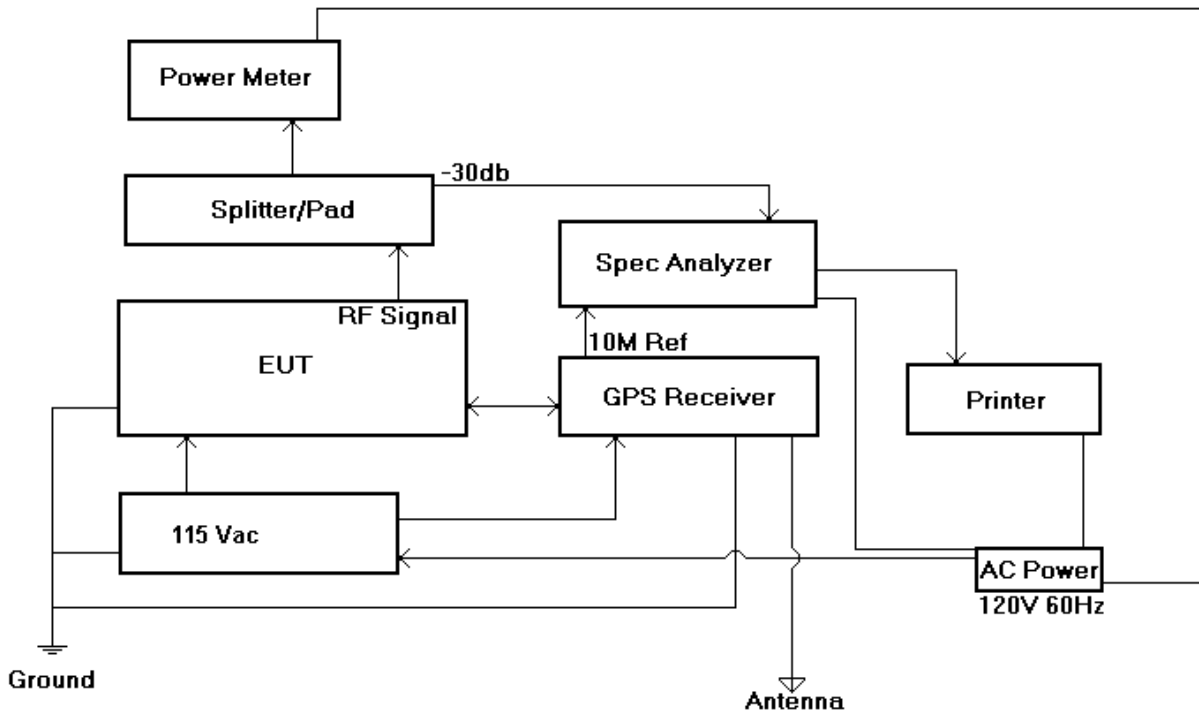
Supervised By:

Richard Dean

R.F. Power Output (A.M. or F.M.)

Test 1: R.F. Power Output

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Name of Test: Modulation Characteristics - Frequency Response of Audio Modulating Circuit

Paragraph: 47 CFR 2.987 (a)

Guide:

Test Condition:

Test Equipment:

**Not Applicable**

Name of Test: Modulation Characteristics - Frequency Response of Audio Low Pass Filter

Paragraph: 47 CFR 2.987 (a)

Guide:

Test Condition:

Test Equipment:

**Not Applicable**

Name of Test: Modulation Characteristics - Modulation Limiting

Paragraph: 47 CFR 2.987 (b)

Guide:

Test Condition:

Test Equipment:

**Not Applicable**

Name of Test: Occupied Bandwidth  
Paragraph: 47 CFR 2.989 (c) (1)  
Guide:  
Test Condition: Standard Temperature & Humidity  
Test Equipment: As per Attached Appendix J

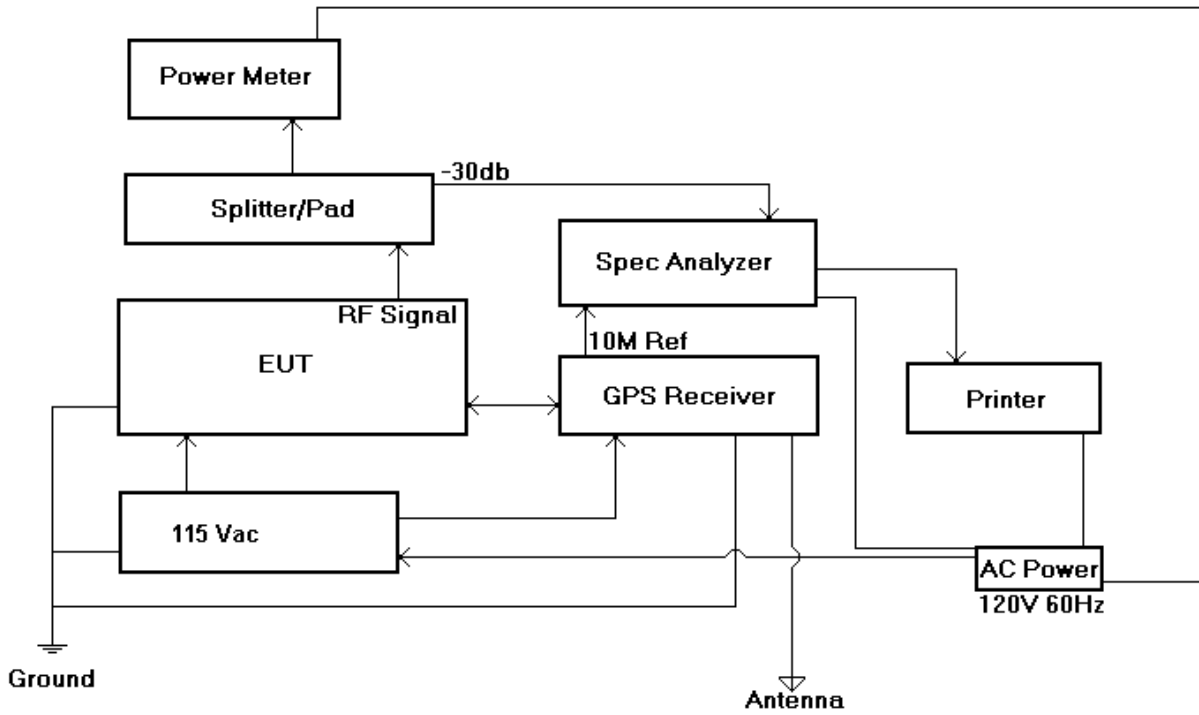
Measurement Procedures

1. The E.U.T. was connected, through a directional coupler, a 30 dB coaxial attenuator and then to a Rohde & Schwarz Spectrum Analyzer.
1. Measurements were made for the worst case modulation at both the highest and lowest R.F. power settings.
1. Spectrum analyzer bandwidth was set to section 22.917 (h)(1) & (2) as applicable.
1. Measurement Results: Attached Pages 49 - 84

Occupied Bandwidth

Test 1: Occupied Bandwidth

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Name of Test: Emission Requirements - Worst Case Modulation & Wideband Data

Paragraph: 47 CFR 22.917

Guide:

Test Condition:

Test Equipment:

**Not Applicable**



Name of Test: Spurious Emissions at Antenna Terminals  
Paragraph: 47 CFR 2.991, 22.917  
Guide: EIA Standard RS 152B, Paragraph 17  
Test Condition: Standard Temperature & Humidity  
Test Equipment: As per Attached Appendix J

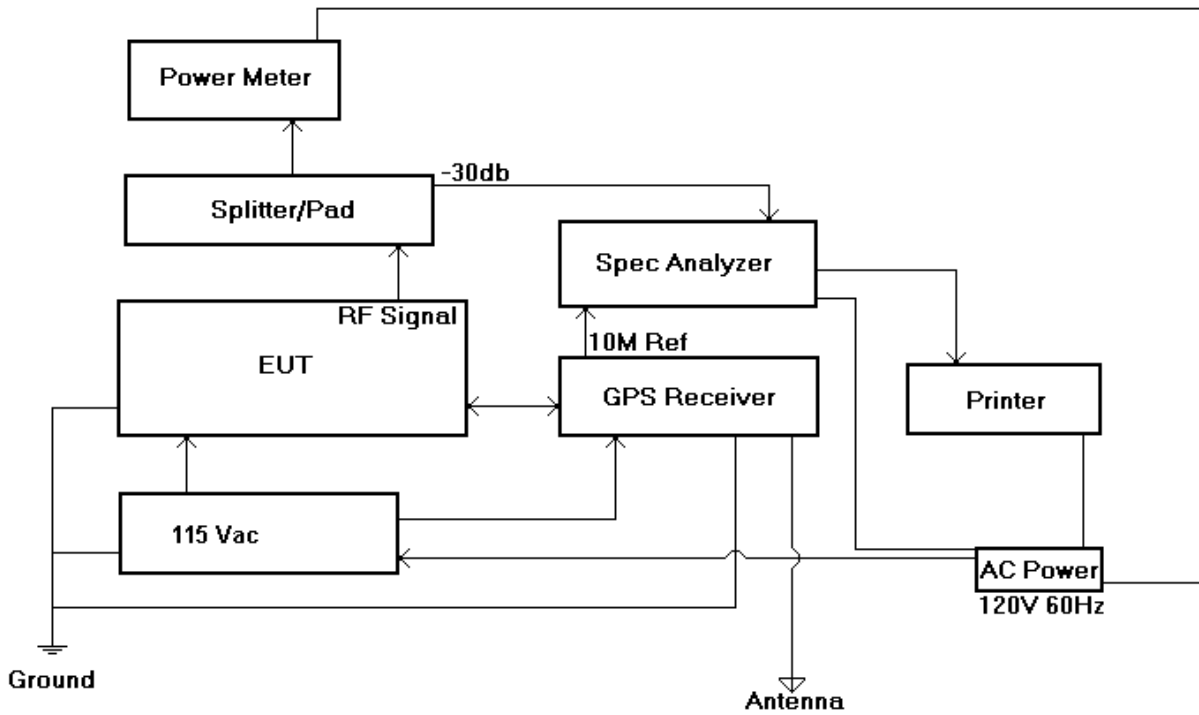
#### Measurement Procedures

1. The E.U.T. was connected, through a directional coupler, a 30 dB coaxial attenuator then to a Rohde & Schwarz Spectrum Analyzer.
1. Measurements were made over the range from 1Ghz to 12 Ghz for the worst case modulation at the highest R.F. power settings.
1. All other emissions were 20 dB or more below the limit.
1. Spectrum analyzer bandwidth was set to section 22.917 (h)(1) & (2) as applicable.
1. Measurement Results: Attached Pages 88 - 178

Spurious Emissions at Antenna Terminals

Test 1: Spurious Emissions at Antenna Terminals

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<u>Name of Test:</u>	Field Strength of Spurious Radiation
<u>Paragraph:</u>	47 CFR 2.993 (a)
<u>Guide:</u>	See Measurement Procedure Below
<u>Test Condition:</u>	Standard Temperature & Humidity
<u>Test Equipment:</u>	As per Attached Appendix J

#### Measurement Procedures

1. A description of the measurement facilities was filed with the F.C.C. and was found to be in compliance with the requirements of Section 15.38, by letter from the F.C.C.
1. In the field, the test sample was placed on a turntable at ten and three meters away from the search antenna. The test sample was connected to an R.F. wattmeter and a 50 ohm dummy load, and adjusted to its rated output.

In order to obtain the maximum response at each spurious frequency, the turntable was rotated. Also, the Search Antennas were raised and lowered vertically, and all cables were oriented. Excess power lead was coiled above the system.

1. The worst case for all channels is shown.
4. Measurement Results: Attached Page 179

Measurement Results: Field Strength of Spurious Radiation

Measurement Distance, meters = 10

Spectrum Searched, GHz = 0.03 to 20

Tuned, MHz	Distance Meters	Azimuth	Level, dB $\mu$ V/m	
			Polarization	High
30.12	10	0°	Vertical	17.0
42.48	10	0°	Horizontal	17.7
51.73	10	0°	Vertical	16.4
54.05	10	0°	Horizontal	16.2
131.24	10	0°	Vertical	15.7
163.65	10	0°	Vertical	16.6
298.42	10	0°	Vertical	17.4
707.80	10	0°	Vertical	24.3
1713.7	10	30°	Horizontal	34.3
1793.7	10	30°	Horizontal	36.2
1022.3	10	30°	Horizontal	32.6
5141.2	10	322°	Vertical	35.5

## Notes:

1. The field strength of spurious radiation over the above noted range measured 20 dB or more below the limit, except where noted.
2. Spurious emission bandwidth settings per 22.907 (j)(1) & (2) as applicable.

Name of Test: Frequency Stability – Temperature and Voltage Variation

Paragraph: 47 CFR 2.995 (a) (1) , (d) (1)

Guide: EIA Standard RS 152B, Paragraph 10

Test Condition:

Test Equipment:

1. Measurement Results:

Attached Page 181

Name of Test: Necessary Bandwidth and Emission Bandwidth

Paragraph: 47 CFR 2.202 (g)

Modulation = CDMA (F9W)

Emission Bandwidth Calculation:

Necessary Bandwidth, kHz = 1250.00

***Justification for CDMA bandwidth of 1.25 Mhz***

Reference: TIA/EIA/IS-95

Chip rate is 1.228 Mhz (see page 6-10 of IS-95 {attached}). When we look 3 dB down from the signal we find 1.25 Mhz. Channel spacing is normally set at this 1.25 Mhz. Also, one can reference baseband filtering requirements (page 6-27 TIA/EIA/IS-95 {attached}) for filtering frequency response limits.

## § 15.205 Restricted Bands of Operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505 <sup>1</sup>	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 Mhz.

<sup>2</sup> Above 38.6

Testimonial and Statement of Certification
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This is to certify:

1. That the application was prepared either by, or under the direct supervision of, the undersigned.
2. That the technical data supplies with the application was taken under my direction and supervision.
3. That the data was obtained on representative units, randomly selected.
4. That, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer:



Radio Frequency Radiation Exposure Limits

The device is installed in a permanent location. It is not operator accessible, and is contained in a secured environment that is accessible by field service engineers or installation engineers only. The ERP of the device is less than 1000 Watts.