GSP-1700 FCC Part 25 Type Acceptance Report

80-C6379-1 Rev A

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QUALCOMM Incorporated
5775 Morehouse Drive
San Diego, CA 92121-1714

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Applicant: Qualcomm Inc. FCC ID: J9CGSK2UT

Exhibit 1 Exhibit Index

The following documents in pdf electronic format will be submitted to FCC for equipment authorization.

Exhibit No.	FCC Exhibit Type	Exhibit Description	File name (.pdf)
1	Cover Letter	Exhibit Index	E_1 index
2	Cover Letter	Request of confidentiality	E_2 letter
3	Attestation statement	Attestation statement	E_3 Attestation
4	Product Overview	Part 2.1033	E_4 general
5	FCC Identifier Label	FCC identifier label	E_5 Label
6	Block Diagram	Block diagram	E_6 Block
7	User Manual	UT user manual	E_7 user manual
8	External Photographs	External Photographs	E_8 external photos
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Exhibit 2 Cover Letters

2.1 Request of Confidentiality

See exhibit 2.1 Request of Confidentiality

2.2 Authority to Act as Agent

See exhibit 2.2 Authority to Act as Agent

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Exhibit 3 Attestation Statement

The equipment, QUALCOMM model Globalstar K2 User Terminal (UT), is a satellite communications user terminal designed to operate under the requirements of FCC CFR47 Part 25. The product is designed to operate at a granted level of 1.0 Watt E.I.R.P. (0.6067 Watts ERP).

The equipment complies with uncontrolled RF exposure environment requirement by the IEEE STD C95.1 and FCC OET Bulletin 65, Edition 97-01 August 1997.

The data, data evaluation and equipment configuration represented herein for equipment certification are a true and accurate representation of the measurements of the sample's radio frequency interference emissions characteristics as of the dates and at the times of the test under the conditions herein specified. This applies to all tests that do not require an Open Area Test Site (OATS) to perform. Nemko USA performed tests that required an OATS site.

Equipment Tested:	GSP-1700 Globalstar K2 User Terminal (UT)
Part 25 References:	25.202 Frequency Stability
	25.202 Emissions Limits
Part Number:	10-C6241-1
Serial Number:	N10CTKWMC
Dates of Test:	June 24, 2006 July 25, 2006

Test Performed by:

Paul Jayne

Senior EMC/Regulatory Engineer

Qualcomm Incorporated

Applicant: Qualcomm Inc. FCC ID: J9CGSK2UT

Exhibit 4 Product Overview (Part 2.1033)

4.1 Technical Description

The GSP-1700 "K2 Globalstar User Terminal" (UT) operates in Globalstar mode only, communicating directly with overhead Globalstar satellites and via those satellites to the nearest Globalstar Gateway and through the Gateway to the rest of the network. The service supports voice and data communications. The User Terminal uses Code Division Multiple Access (CDMA) technology to provide secure, dependable service to the user.

4.2 Address of Manufacturer and Applicant 2.1033 (c) (1)

Manufacturer:
Qualcomm Incorporated
5775 Morehouse Drive
San Diego, CA 92121
Telephone: (858) 587-1121

Applicant:
QUALCOMM, INC.
5775 Morehouse Dr.
San Diego, CA 92121
Telephone: (858) 587-1121

4.3 FCC Identifier 2.1033 (c) (2)

The FCC identifier is: J9CGSK2UT

4.4 User Manual 2.1033 (c) (3)

See Exhibit 7 Globalstar K2 User Terminal User Manual

4.5 Types of Emissions 2.1033 (c) (4)

1M25G1W

4.6 Frequency Range 2.1033 (c) (5)

Each Globalstar UT is capable of transmitting on any one of the frequency channels defined between 1610 and 1626.5 MHz. In the US and other countries where one or more TDMA mobile satellite service (MSS) low earth orbit (LEO) systems are authorized to operate, Globalstar UTs transmit (and are authorized to transmit) in only the lower 9 of the 13 channels, operating in the frequency range from 1610 to 1621.35 MHz. Depending on local Globalstar traffic conditions, a given UT may be assigned to operate on any of the authorized channels for a given call. Multiple access and efficient frequency re-use is provided by means of code division multiple access (CDMA) technology.

4.7 Operating Power Levels 2.1033 (c) (6)

Active power control is employed in the Globalstar system to minimize collateral interference between proximate Globalstar subscribers, since as is true of any multiple access spread spectrum system, other users signals represent noise to a given users signal. Thus all signals are automatically reduced to minimum power levels by the system, transparently to the user. As defined in the Globalstar Air Interface (GAI) Specification (80-25118-1), the effective isotropic radiated power (EIRP) of a mobile UT operating at maximum power output is 1.0 Watt.

4.8 DC Supply and Current Range 2.1033 (c) (8)

The UT is powered by an external DC power supply, which provides a nominal 4.35 VDC nominal (3.35-4.6 VDC range) at 0.3 to 1.5 Amperes current draw, 6.9 Watts maximum load. Power to the transmitter power amplifier (PA) passes through multiple switching and analog power regulator stages, and the PA never “sees” any changes in the supply voltage. It is thus virtually immune to any effects of voltage fluctuation within the defined DC power voltage input range of the UT. Outside that range the UT simply shuts down.

4.9 List of Semiconductor Active Devices 2.1033 (c) (10)

See Exhibit 11 Parts List

4.10 Circuit Diagram 2.1033 (c) (10)

See Exhibit 10 Schematics

4.11 Tune-up Procedure 2.1033 (c) (9)

All frequency adjustments are set at the factory and there are no frequency field adjustments for this product. The transmit frequency is locked to the base station and controlled by VCTCXO adjustments to offset any possible errors.

4.12 Frequency Stability Device 2.1033 (c) (10)

All RF oscillators are phase-lock loop locked to the output signal of a voltage controlled temperature compensated crystal oscillator (TCXO), the master oscillator of the system. It is specified to provide frequency accuracy to better than 5 parts per million over the UT’s 5

year design life. Exhibit 13 details the temperature variation frequency stability test results which have been obtained. Due to the relatively large Doppler error inherent to an LEO communications system, transmit frequencies are locked to the TCXO signal and are not adjusted based on frequency differences with respect to Gateway transmitted signals.

4.13 Spurious Radiation Suppression Devices 2.1033 (c) (10)

See Exhibit 6 and Exhibit 10

4.14 Drawing of Equipment Identification Plate or Label 2.1033 (c) (11)

See Exhibit 5 : Identifier Label

4.15 Photographs 2.1033 (c) (12)

See Exhibit 8 and Exhibit 9

4.16 Modulation Technique 2.1033 (c) (13)

The Globalstar Air Interface uses a modified form of IS-95 to support Code Division Multiple Access. CDMA was selected for Globalstar because it represents a proven technology that can provide efficient modulation scheme for satellite communications. It is relatively interference tolerant, both from a standpoint of generation of interference to other services and tolerating outside interference. As a bonus, there is a level of security inherent in the modulation scheme. It is difficult to listen into conversations or to pirate services from the system. CDMA is able to provide good voice quality while operating at relatively low RF power levels. The Globalstar CDMA is based on the existing QUALCOMM CDMA product line used for terrestrial cellular communications.

4.17 Test Data 2.1033 (3) (14)

See Exhibit 14 , Exhibit 15 , and Exhibit 16

4.18 RF Block Diagram

See Exhibit 6: Block Diagram

4.19 AC Adapter

Except for the conducted data from exhibit 15 and the frequency stability data from exhibit 13, all other tests were performed using an AC adapter model number GWC-1700 part number CV90-C6024-1

4.20 Maximum RF output power

Maximum RF output power was measured spatially in three axes in a fully anechoic antenna chamber. The following values were measured for peak EIRP power levels:

RF Channel	1	7	9
Peak EIRP (dBm)	29.75	29.99	29.95

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Exhibit 5 FCC Identifier Label

See exhibit 5 FCC Identifier Label

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Exhibit 6 RF Block Diagram

See exhibit6 RF Block Diagram

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Exhibit 7 Globalstar K2 User Terminal User Manual

See Exhibit 7 User Manual

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Exhibit 8 External Photos

See Exhibit 8 External Photos

Applicant: Qualcomm Inc. FCC ID: J9CGSK2UT

Exhibit 9 Internal Photos

See exhibit 9 Internal Photos

Exhibit 10 Schematics

See exhibit 10 Schematics

Applicant: Qualcomm Inc. FCC ID: J9CGSK2UT

Exhibit 11 Parts List

See Exhibit 11 Parts List

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Exhibit 12 RF Exposure

See Exhibit 12 SAR

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Exhibit 13 Frequency Stability

Applicant: Qualcomm Inc. FCC ID: J9CGSK2UT

See Exhibit 13 Frequency Stability

Exhibit 14 Radiated Test Report

The radiated test results reflect worst-case emissions maximized while the EUT was configured on three axes: EUT standing, EUT lying flat, and EUT on it's side. While in transmit mode, the EUT was set to maximum power transmit mode by sending power control bits 0 (increase power) continuously to the EUT via the Globalstar User Terminal Tester (Anritsu MG8803).

The spectrum was searched from the lowest frequency internally generated (30 MHz was used as the default starting frequency) to 10 times the frequency of the fundamental frequency of the transmitter (16,205.7 MHz at the highest channel).

Test Data: See exhibit 14 Radiated

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Exhibit 15 Conducted Test Data

15.1 Compliance Lab Test Equipment

The following table is a list of equipment used in the compliance lab during the testing of the GSP-1700.

Model Number	Manufacturer	Serial Number	Description	Calibration Date	Calibration Due Date
TDS 460A	Tektronics	K60721	Oscilloscope	2/7/2006	2/7/2007
MT8803G	Anritsu	X07179	Globalstar User Terminal Tester	10/17/2005	10/17/2006
FSEM20	Rhode & Shwarz	X06071	Spectrum Analyzer	11/2/2005	11/2/2006
8542C	Power Meter	K64822	Power Meter	2/1/2006	2/1/2007
83712B	Hewlett Packard	K81226	Synthesized CW Generator	8/24/2005	8/24/2006
6632B	Hewlett Packard	K82372	Power Supply	5/5/2006	5/5/2007
6674A	Hewlett Packard	K60687	Power Supply	4/4/2006	4/4/2007
2031	Marconi	K64729	Signal Generator	4/3/2006	4/3/2007
MC-710	Mini-SubZero	X11704	Temperature Chamber	3/7/2006	3/7/2007

15.2 Compliance Lab Conducted Data

The Globalstar transmit channel carrier frequency is found by the formula:

Fc(MHz)= 1610.64 + 0.03(N-1)

Where Fc is the carrier frequency and N is a fractional channel multiplier in the range of $4 \leq N \leq 509$

The compliance lab test data is listed by the channel number N value which correspond to the following Globalstar channels and frequencies:

Globalstar Channel Number	**N=**	**Frequency (MHz)**
1	4	1610.73
6	250	1616.88
9	332	1620.57

Test Data: See exhibit 15 Conducted

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Exhibit 16 Conducted Measurement Test Procedure

See exhibit 16 Conducted