TÜV PRODUCT SERVICE

EMC EMISSION - TEST REPORT
UNITED STATES STANDARD 47 CFR PART 2, SUBPART J[1]

Test Report File No.	:	**9553-06**	Date of Issue:	22 November 1999

Model / Serial No.	:	**10-52675-10 / 19999128**
Product Type	:	TUTT[2]
Applicant	:	QUALCOMM, INC.
Manufacturer	:	QUALCOMM, INC.
License holder	:	QUALCOMM, INC.
Address	:	5775 Morehouse Drive, L-300D
	:	San Diego, CA 92064
Test Result	:	■ **Positive** ☐ **Negative**
Test Project Number Reference(s)	:	**9553-06**
Total pages - Test Report	:	8

[1] Paragraph 2.1053
[2] With AMPS modem made by Standard Communication.

NOTE: All test equipment used during testing is calibrated and traceable to NIST.

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

TÜV PRODUCT SERVICE

DIRECTORY - EMISSIONS
Test Report

Technical Documentation

Appendices

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to the following regulations:

☐ - EN 50081-1 / 1991

☐ - EN 55011 / 1991	☐ - Group 1	☐ - Group 2
	☐ - Class A	☐ - Class B
☐ - EN 55014 / 1993	☐ - Household appliances and similar	
	☐ - Portable tools	
	☐ - Semiconductor devices	
☐ - EN 55022 / 1987	☐ - Class A	☐ - Class B
☐ - EN 55022 / 1998	☐ - Class A	☐ - Class B
☐ - VCCI	☐ - Class A ITE	☐ - Class B ITE

■ - 47 CFR Part 2, Subpart J

■ - 2.1053

☐ - AS/NZS 3548: 1995	☐ - Class A	☐ - Class B
☐ - CISPR 11 (1990)	☐ - Group 1	☐ - Group 2
	☐ - Class A	☐ - Class B
☐ - CISPR 22 (1998)	☐ - Class A	☐ - Class B

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Environmental Conditions In The Laboratory:

	Actual
Temperature:	: 23 °C
Relative Humidity:	: 50 %
Atmospheric Pressure:	: 100.0 kPa

Power Supply Utilized:

Power supply system : 12 Vdc

Symbol Definitions:

■ - Applicable
☐ - Not Applicable

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Emissions Test Conditions: Field Strength of Spurious Radiation, Part 2, Paragraph 2.1053

The measurements were tested at the following test location :

☐ - Test not applicable

■ - Roof (Small Open Area Test Site) (Calibration Due Date: 28 May 2000)
☐ - Canyon #1 (10- and 30-Meter Open Area Test Site), Carroll Canyon, San Diego (Calibration Due Date: 03 September 2000)
☐ - Canyon #2 (3- and 10-Meter Open Area Test Site), Carroll Canyon, San Diego (Calibration Due Date: 20 May 2000)

Testing was performed at a test distance of :

■ - 3 meters
☐ - 10 meters
☐ - 30 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
AMF-3D-010180-35-10P	752	Preamplifier	Miteq	614344	05/99*
FF6549-1	777	Cellular Band Filter	Sage	004	N/A
AA-190-06.00.0	728	Cables	United Microwave	--	10/99**
AA-190-30.00.0	732	Cables	United Microwave	--	10/99**
3115	453	Double Ridge Guide Antenna	EMCO	9412-4364	10/01
8566B	720/721	Spectrum Analyzer & Display	Hewlett Packard	2115F00842	03/00

Remarks: One year calibration cycle for all test equipment.

(*) Preamplifier verification date. (**) Cable verification date.

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Equipment Under Test (EUT) Test Operation Mode - Emissions Tests :

The equipment under test was operated under the following conditions during emissions testing:

☐ - Standby

☐ - Test Program (H - Pattern)

☐ - Test Program (Color Bar)

☐ - Test Program (Customer Specified)

☐ - Practice Operation

☐ - Normal Operating Mode

■ - SAT+ST mode, transmit power 1.2W

Configuration of the equipment under test:

☐ - See Constructional Data Form in Appendix B - Page B2

■ - See Product Information Form(s) in Appendix B - Page B2

The following peripheral devices and interface cables were connected during the testing:

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - unshielded power cable

☐ - unshielded cables

☐ - shielded cables MPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Emissions Test Results:

Spurious Radiation, Part 2, Paragraph 2.1053

■ - PASS ☐ - FAIL ☐ - NOT APPLICABLE

Minimum limit margin	0.2 dB	at	1648.08	MHz
Maximum limit exceeding	_____ dB	at	_____	MHz

Remarks: _____

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

GENERAL REMARKS:

NOTE: All photographs are representative of setup for maximum emissions.

SUMMARY:

All tests according to the regulations cited on page 3 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements cited on page 3.

☐ - **Does not** fulfill the general approval requirements cited on page 3.

Statement of Measurement Uncertainty

The data and results referenced in this document are true and accurate. The measurement uncertainty is calculated to be ±2 dB for conducted emissions and ±4 dB for radiated emissions.

Equipment Received Date: 18 November 1999

Testing Start Date: 18 November 1999

Testing End Date: 18 November 1999

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:

Mary Washington
(EMC Engineer)

Responsible Engineer:

Jim Owen
(EMC Engineer)

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

TÜV PRODUCT SERVICE

Technical Documentation

Test Data Sheets

and

See photograph(s) for test setup.

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

TÜV PRODUCT SERVICE

REPORT No: S9553 TESTED BY: Jim Owen SPEC: FCC Part 2, Section 2.1053

CUSTOMER: Qualcomm, Inc. TEST DIST: 3 Meters

E U T: TUTT with AMPS modem made by Standard Communication TEST SITE: 3
MODEL 10-52675-10

EUT MODE: SAT+ST mode, transmit power 1.2W BICONICAL: N/A

DATE: 18-Nov-99 LOG: 244

NOTES: RBW and VBW = 100 kHz below 1 GHz. OTHER: 453
RBW and VBW = 1 MHz above 1 GHz.

v.beta

FREQ (MHz)	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CORRECTION FACTOR (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotation	Antenna Height
824.04	102.3		94.7		25.2	**127.5**		-	-	-	-	90	2
1648.08	53.9		44.1		30.3	**84.2**		84.4		-0.2		76	1.5
2472.12	28.9		24.6		33.6	**62.5**		84.4		-21.9		139	1.5
3296.16	29.1		30.1		37.4	**67.5**		84.4		-16.9		164	2.5
4120.2	12.3		13.8		40.8	**54.6**		84.4		-29.8		21	1.5
4944.24	12.1		9.6		40.1	**52.2**		84.4		-32.2			
5768.28	11.9		13.6		43.5	**57.1**		84.4		-27.3		305	2.5
6592.32	14.7		12.9		44.1	**58.8**		84.4		-25.6		74	1.5
7416.36	16.7		10.2		44.8	**61.5**		84.4		-22.9		76	2
8240.4	13.8		10.7		45.5	**59.3**		84.4		-25.1		122	1.5
836.4	103.2		92.6		25.2	**128.4**				128.4		90	2
1672.8	52.3		44.4		30.3	**82.6**		84.4		-1.8		126	1
2509.2	32.1		30.5		35.4	**67.5**		84.4		-16.9		83	1.5
3345.6	29.5		28.6		37.6	**67.1**		84.4		-17.3		141	1.5
4182	12.7		14.2		40.7	**54.9**		84.4		-29.5		13	1.5
5018.4	11.5		11.6		41.8	**53.4**		84.4		-31		161	1.5
5854.8	12.8		17		43.5	**60.5**		84.4		-23.9		193	1.5
6691.2	13		15.7		44.7	**60.4**		84.4		-24		150	1.5
7527.6	14.9		11.4		47.1	**62.0**		84.4		-22.4			
8364	13.1		11.4		45.6	**58.7**		84.4		-25.7			
848.97	100		89.4		25.4	**125.4**				125.4		90	2
1697.94	53.4		45.7		30.2	**83.6**		84.4		-0.8		45	1.5
2546.91	34.1		29.1		35.2	**69.3**		84.4		-15.1			
3395.88	30.6		29.9		40.4	**71.0**		84.4		-13.4			
4244.85	13.9		14.3		39.9	**54.2**		84.4		-30.2		0	3
5093.82	14.4		9.5		42.3	**56.7**		84.4		-27.7		300	2.5
5942.79	15.7		12.5		44.3	**60.0**		84.4		-24.4		300	2.5
6791.76	16.1		13		44.4	**60.5**		84.4		-23.9		81	2.2
7640.73	13.8		9.9		47.2	**61.0**		84.4		-23.4		129	2
8489.7	12.1		10.9		46.3	**58.4**		84.4		-26		132	1.8

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Appendix A

Test Setups
(Photographs)

NOTE: All photographs are representative of setup for maximum emissions.

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Photograph of Test Setup:
Spurious Radiation, Part 2, Paragraph 2.1053

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Photograph of Test Setup:
Spurious Radiation, Part 2, Paragraph 2.1053

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Appendix B

Product Information Form(s)

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

TÜV PRODUCT SERVICE

PRODUCT DESCRIPTION	
NAME, MODEL, SERIAL # OF EUT:	TUTT with AMPS modem made by Standard Communication, Model 10-52675-10, S/N 19999128
DESCRIPTION OF EUT:	The Terrestrial Untethered Trailer TRACS (TUTT) is part of a trialer tracking and monitoring system. It is designed to communicate over the TUTT cellular network for data transmission at very low duty cycle.

Components of EUT			
Description	Model Number	Serial Number	FCC ID Number
AMPS modem	CMM 8600	214-00140946	APV0896
OPERATING MODE(S):	--		

I/O CABLES				
CONNECTION	AMPS Analog Cellular Antenn	GPS reveiving antenna	Power and digital control	
SHIELD	Coaxial	Coaxial	None	
CONNECTORS	TNC	TNC	12-pin Deutsch connector	
TERMINATION TYPE	Female	Female	--	
LENGTH	6’	6’	6’	
REMOVABLE	Yes	Yes	Yes	

POWER CORDS			
UNIT:	--		
MANUFACTURER:			
SHIELDED:			
LENGTH:			

POWER INTERFACE	
FREQUENCY/AC/DC VOLTAGE:	12 Vdc
PHASES/CURRENT:	2 amps

OSCILLATOR FREQUENCIES		
FREQUENCY	EUT LOCATION	DESCRIPTION OF USE
--		

POWER SUPPLY				
DESCRIPTION	MANUFACTURER	MODEL #	SERIAL #	SWITCHING/LINEAR FREQ.
--				

POWER LINE FILTERS			
MANUFACTURER	MODEL NO.	QTY.	LOCATION ON EUT
--			

CRITICAL EMI COMPONENTS				
DESCRIPTION	MANUFACTURER	PART # OR VALUE	QTY.	LOCATION ON EUT
--				
DESCRIPTION OF ENCLOSURE:	--			

INTERFACING AND/OR SIMULATORS PERIPHERAL EQUIPMENT:				
DESCRIPTION	MANUFACTURER	MODEL #	SERIAL #	FCC ID
--				

BLOCK DIAGRAM:	--

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Appendix C

Change History

Not Applicable

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

Appendix D

Supplemental Information

Not Applicable

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364