GE Security, Inc. 2-Way Talking Touch Pad B4Z-839-TWTP Certification

09/09/2004 FCC ID: B4Z-839-TWTP Page 1 of 23

E:\Engineer\eng_DEG\ACTIVE\55-839 Simon 3 2-way talking touchpad\Approvals-Listings-Technical File\FCC\Part 15 Submittle\55-839 TUV Data\pieces\FCC_REPT.DOC

Two-Way Talking Touchpad B4Z-839-TWTP

09/09/2004

GE Security, Inc. 1275 Red Fox Road Arden Hills, MN 55112 (651) 777-2690

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 2 of 23
09/09/04 12:35 PM		

1. INTRODUCTION	4
2. STATEMENT OF COMPLIANCE	4
3. LAB MEASUREMENTS DISCUSSION / TEST NOTES	7
3.1 Test Notes	7
3.1.1 Transmissions shall cease within 5 seconds of activation [§15.231(a)(2)]	7
3.1.2 Supervisory Calculations	9
3.1.3 Duty Cycle Correction Factor [§15.231(b)(2) and §15.35(c)]	9
3.1.4 Bandwidth Measurement [§15.231(c)]	12
3.1.5 Emissions Measurements	16
3.1.5.1 Radiated Emissions Summary	16
3.1.5.2 FCC Emissions Calculation	16
3.1.5.2.1 Terms	16
3.1.5.2.2 Example Calculation	17
3.1.5.3 Radiated Emissions	18
3.1.5.4 Forbidden Bands	18

1. Introduction

This device is a wireless Two Way Touch Pad transmitter for use in a wireless security system. The unit is self-contained and powered by three 1.5 Volt Alkaline batteries. The transmitter's frequency is crystal controlled and is not adjustable by the user. The device measures approximately 3.5" in width, 5.5" in length, and 1" in height. The unit weighs approximately 7.6 ounces with the batteries.

We are requesting Certification under FCC Rules, Part 15, Subpart C, Paragraph 15.231.

Please send comments/suggestions on the report format to: Rick.Conner@GE.com

2. Statement of Compliance

§2.907 <u>Certification</u>

This is an application for certification

§2.911 Application

- a) This is an application and has been filed electronically with form 731.
- b) All information required has been supplied.
- c) The applicant has signed the application (electronically).
- d) The technical data has been signed. (See Radiated Emissions)
- e) Applicant signature block on electronic form 731 completed by officer of the company or authorized company personnel.
- f) The appropriate fee has been paid electronically with VISA on 09/09/2004.

§2.915 <u>Grant</u>

This application demonstrates that all applicable technical standards have been met and a grant of this application will serve the public interest.

§2.925 <u>Label</u>

Each piece of equipment for which authorization will be granted will be uniquely identified with "FCC ID: B4Z-839-TWTP" The required statement will appear with the FCC ID on the product and, although not required, in the installation instructions. See Exhibit A, PDF file *id label.pdf*

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 4 of 23
09/09/04 12:35 PM		

§2.947 <u>Measurement Procedure</u>

- a) The measurement procedure follows ANSI C63.4 procedure. Procedural notes are contained in the laboratory report.
- d) A list of test equipment used is contained in the laboratory report.

§2.948 Description of Measurement Facilities

Measurements were performed at TUV Testing Services Open Test Site. The FCC keeps a full description of the measurement facilities on file. TUV's acceptance and approval is dated as December 5, 1993 in a letter received from the FCC.

The address of the test facility is: TUV Product Service 19035 Wild Mountain Road Taylors Falls, MN 55084-1758

Phone: 651-638-0297 Contact: Joel Schneider

Test Engineer in Charge

See Exhibit F, PDF file test pho.pdf for sketch of measurement setup

§2.1033 Application for Certification

- Form 731 has been electronically filed on 09/09/2004. Items that did not apply were left blank.
- b) This technical report contains the following information where applicable.
 - 1) Full name and mailing address of manufacturer and applicant for certification:

GE Security, Inc. 1275 Red Fox Road Arden Hills, MN 55112

2) FCC Identifier:

B4Z-839-TWTP

3) Copy of installation instructions:

See Exhibit G, PDF file: user man.pdf

Brief Description of circuit functions and device operation:

See Exhibit I, PDF file *op_desc.pdf*See Exhibit D, PDF file *schemat.pdf* for schematics (page 1) and parts placement (page 2) diagrams.

5) Block Diagram

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 5 of 23
09/09/04 12:35 PM		

See Exhibit C, PDF file block.pdf.

6) Report of the measurements of radiation and conducted emissions:

This document.

7) Photographs

External:

See Exhibit B, PDF file extern.pdf

Internal:

See Exhibit H, PDF file *intern.pdf*

8) Peripheral or Accessory devices:

This is not applicable since this device is stand-alone product.

9) Transition Rules

This application is not pursuant to the transition rules of §15.37

10) Emergency Broadcast decoding:

This is not applicable to device in this application.

11) Application for direct sequence spread spectrum devices...

This is not applicable to device in this application.

12) Application for scanning receivers...

This is not applicable to device in this application.

c) Composite Systems

This is not applicable to device in this application.

3. Lab Measurements Discussion / Test Notes

3.1 Test Notes

3.1.1 Transmissions shall cease within 5 seconds of activation [§15.231(a)(2)] In the event of an transmit condition, 2 packets are sent in the transmission. The packet duration is, at most, 30 mS, see Supervisory Calculation [§15.231(a)(3)] The 2 Way Touch Pad does not perform any supervisory transmissions, so 15.231(a)(3) does not apply.

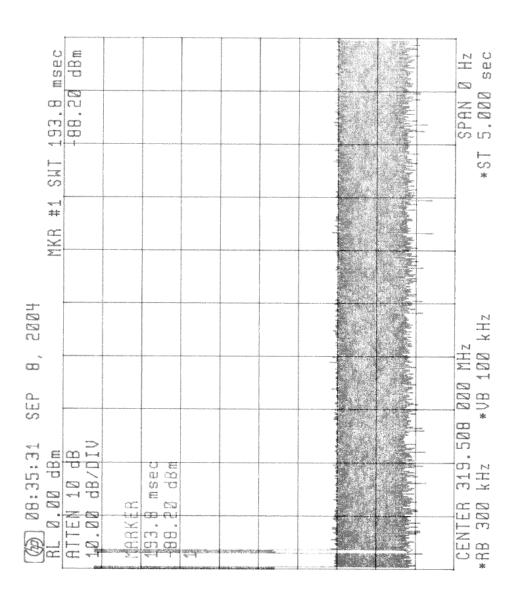
Duty Cycle Correction Factor [§15.231(b)(2) and §15.35(c)]. The time between packets random between 100 mS and 450 mS so the length of the longest transmission is:

$$2*30mS + 450mS = .51$$
 seconds.

A transmit condition occurs when a button is pressed on the 2 Way Touch Pad, 2 packets are sent to the control panel. The 2 Way Touch Pad transmits 80 bits per packet. Each bit consist of either a one or a zero, the Control Panel interprets the packets and carries out the command, such as arming, disarming, and status.

The following plot shows a 2-packet transmission that concludes in less than 5 seconds.

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 7 of 23
09/09/04 12:35 PM		



FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 8 of 23
09/09/04 12:35 PM		

3.1.2 Supervisory Calculation [§15.231(a)(3)]

The 2 Way Touch Pad does not perform any supervisory transmissions, so 15.231(a)(3) does not apply.

3.1.3 Duty Cycle Correction Factor [§15.231(b)(2) and §15.35(c)]

The transmitter employs amplitude modulation and transmits 80 bits. Each bit, except for one, has an "ON" time of 122 μ S. One bit has an on time of 366 μ S. The total on time of a single packet is:

$$79 * 122 \mu S + 366 \mu S = 10.00 \text{ mS}.$$

Only one packet is sent in any given 100 mS window for a duty cycle correction factor of:

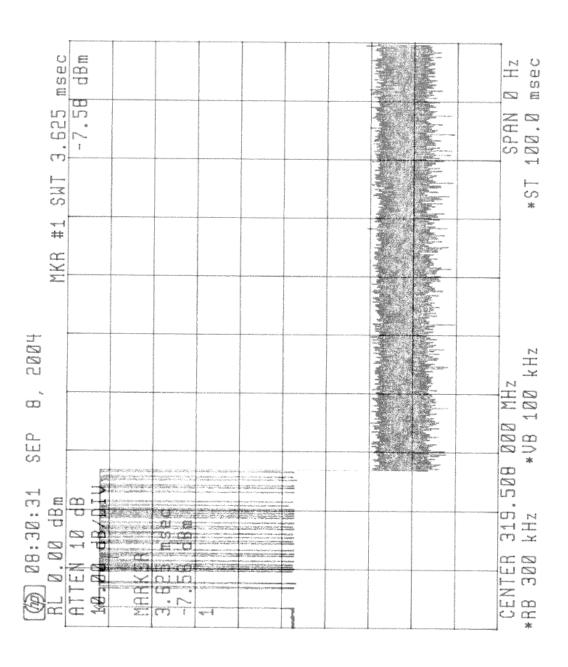
$$20*LOG(10.00/100) = -20.00 \text{ dB}$$

The maximum allowed correction factor is 20 dB.

The following plots show:

- 1. Single packet in 100 mS window.
- 2. Expanded view of a packet with a duration of 24.02 mS

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 9 of 23
09/09/04 12:35 PM		



FCC	_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 10 of 23
09/09	9/04 12:35 PM		

C	鲁		2					and the second s	-	To der	F	7
(C)	-		OF THE LOCAL PROPERTY OF THE PARTY OF THE PA							-		line.
	co		400000000000000000000000000000000000000			protonene - w.a.						
Beerla			restation.				Talle in a tilenta.		I	1	C	52
	-		en monte		en transmission of the con-	The second british of a						
\Box			Carrie Contract		STOCKTONE STOCK	100 - 1757 Names 60 - 1	TOTAL THE TOTAL PROPERTY.	-			2	
-	(53)		Section 1 to 1		The tall services of	10000017777785417	27750 N 11 Publish		1		D	
*	1		Prince of the second		Personal and the second			1				
CLI			4800000 JUNE	20.221.0000			A CONTRACTOR OF THE PARTY OF TH				Ω	i
			gen								U	0
CLI			-		THE RESIDENCE OF	-	The State of Contract of Contr	-				
			groups, no company and glasses, included and an artist and an artist and an artist and artist artist artist and artist arti	THE PERSON NAMED IN COLUMN	A START LINES	Committee and the committee of the commi	CONTRACTOR CONTRACTOR					
ļ			Maria Control of the			TO THE TIES OF WELL	SOCIOCIONES				į.	
~~~			Section of the sectio	PARCEL LANGUAGE SERVICE		dillion Value on to	COLOTORIOMEN					
\ \ \ \ \			Ger Talancia			The second second second second second						
ď			Carrier and		The spinish of the	test men auren i vo	Transfer course			1		
-	-	***************************************	Mark - S. C. Committee			100	an acatoma					
~i			- Parisin	Miscrisian or server		EXTLANDAMENTO NO.	Security Section			ĺ		
##			(CO) - CO - CO	N. 2477 (Marie 2011)	And the second of the second o		The state of the s					
			Secretary Contract				er og en er en er			1		
~			Appropriate the second		Company of the compan	100000000000000000000000000000000000000	The Manager and Ma			-	-	
			Ex.	THE PERSON NAMED IN COLUMN		TO KNACH SILVERSON SILVERS	CONTROL SERVICE			ļ	1	
¥			photos or description				AND LALLES AND					
2			Water to the same	A		programme in the second	LACT TYPE					
			Section 1977								İ	
			emman	To the transport of the			Salah Colonia and					
			American Control									
			gament or con-	Mary Company of the Control of the C							İ	
			ALC: CONTRACTOR OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF			1					į	
			Service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the servic				COLUMN COMMO					
			Comment	The Control of the Control			State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State of the State					
			ginano con con	a control of control								
- 1			Commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of the commence of th		0.0000000000000000000000000000000000000	COURT SENSONS SERVICES	PROTECTION OF THE PARTY.		1	1		
			Francis III		5-26 (Free Co. 2) - 484	SGSGCMASTER SHAP	THE RESERVE OF THE PERSON					
			description of the		Car expenses to entry	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon						7
- 1			######################################	and the same of the same of		W. College						
į			E. C.	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s		and a complete of the complete of					Σ	
-			Contract to the								1	
			#BOSSTON	and the second contract of	Manufacture and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec					1	CS	Ξ.
			Service of the line		mar or common		STORE HOUSE			- Annual Control	ACT	~
			September 1	en regent a portion of the con-			EFEN OUR PROPERTY			1	2	200
- 1	-		-		South Property of	Michigan Statement	COST CONSIDERATION					ليد
			C				AT GOVERNMENT			-	1	
			Personal Control	CONTRACTOR		MR DOWNLAND CONTRACT				-	C	
			Consideration of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of the last of t		Carry March	EAST AND TRANSPORTED AND A STREET	COST 4 CORNE			A SALES	CS	J
		$\Rightarrow$	games	A SACRATA TO SECURE		CONTRACTOR STATE	CASTON AND AND AND AND AND AND AND AND AND AN			Ē	L	7
prote	$\Omega\Omega$	j	Francisco Con-	N,0000 - 1010 - 1010 - 1010	THE VENTERAL	Continuent free	minuscomown.			į		ï
00			April 1000	and the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of th							,	
		L-mark	promote of a comment			TOTAL STATE STATE OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY	ENCHOLOGIC HARD					7
			Establishment of the second	- W			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				-	-4
1	$\Box$	$\alpha$	E C	ഗ ന			Stockwent com-			Ē	(7	7
2			formation and	6 0		The second second	Entropisycheels Cutofoliopisycheels			a de		
2			Contract of the second				Control automorphy				~	,
	-		and the same of	നഗ	And the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s		C. ZOSETIA FORTESE					
-	1 . 1	2	general vibration	7 4		CONTRACTOR OF THE	C-Constitution				1.1	3
الحب	todod t	العتسا	CONTRACTOR .	and a second			8				1	
	<u> -</u>				The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s		- 2			ŀ	12	general contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contra
	-	0	a c	വയ	1		Agrin, north p				Z	J
r	T)	4	agreement of the same	CL I	4	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	3				1	۲
ı							1			1	1	

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 11 of 23
09/09/04 12:35 PM		

#### 3.1.4 Bandwidth Measurement [ §15.231(c) ]

Bandwidth Measurements were made in peak mode, using a Hewlett Packard Spectrum Analyzer, model number 70000.

The spectrum analyzer 20 dB skirt bandwidth is 3.4 KHz.

The allowed 20 dB bandwidth is 0.25% of center frequency.

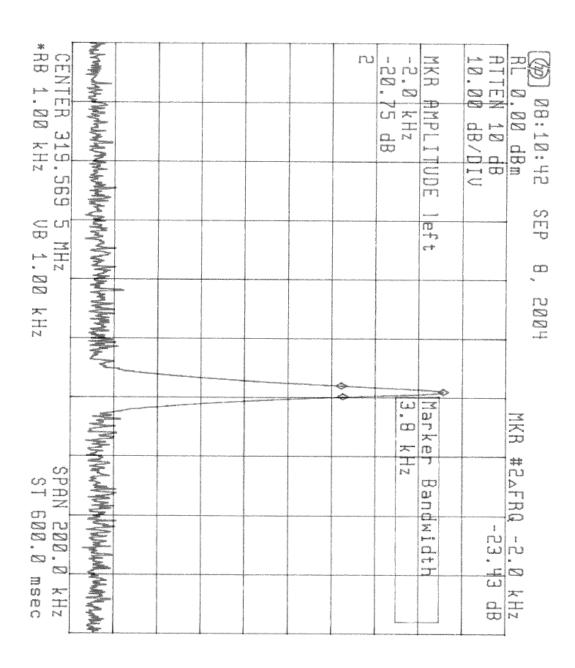
Estimated signal bandwidth = Measured signal bandwidth - analyzer bandwidth.

Center Frequency	Measured 20 dB	Estimated 20 dB	FCC allowed 20 dB
MHz	Bandwidth in	signal Bandwidth in	Bandwidth in
	KHz	KHz	KHz
319.5	43.5	40.1	799

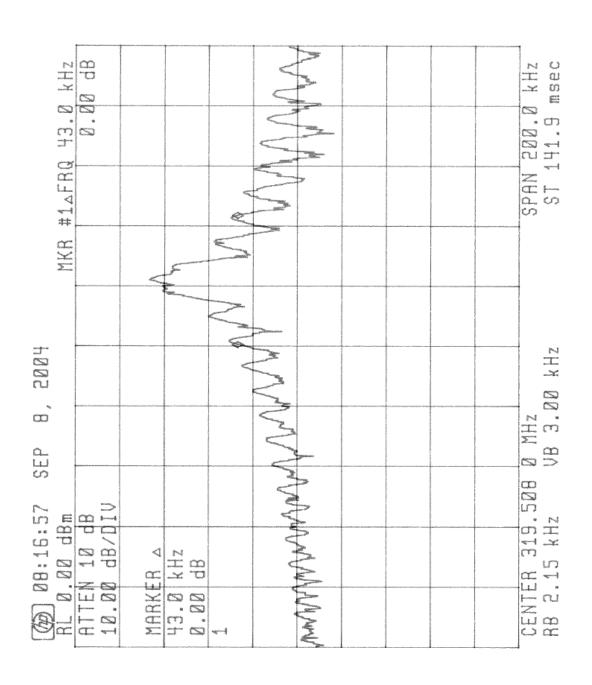
The following three plots show:

- 1. Bandwidth of carrier without modulation
- 2. Bandwidth of signal with modulation, 200 KHz span
- 3. Bandwidth of signal with modulation, 200 MHz span

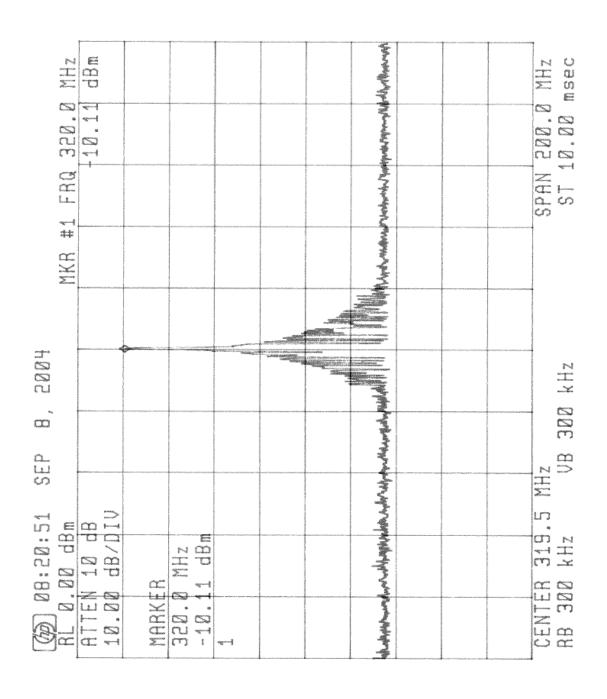
FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 12 of 23
09/09/04 12:35 PM		



FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 13 of 23
09/09/04 12:35 PM		



FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 14 of 23
09/09/04 12:35 PM		



FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 15 of 23
09/09/04 12:35 PM		

#### **Emissions Measurements**

#### 3.1.4.1 Radiated Emissions Summary

The Two Way Touch Pad passes FCC Rules Part 15, Subpart C, Paragraph 15.231. The highest fundamental radiated emission was .23 dB below the FCC limit at 319.5 MHz. The highest spurious emission measurement was 16.6 dB below the FCC limit at 639.00 MHz. The highest forbidden band emission was 32.1 dB below the FCC limit at 2662.59 MHz.

#### 3.1.4.2 FCC Emissions Calculation

#### 3.1.4.2.1 Terms

Term	Abbreviation	Units	Description
Analyzer	AR	dBμV	The power reading read directly from the
Reading			analyzer without any correction for
			cabling or receive antenna.
Duty	DC	dB	Correction for averaging measurement,
Cycle			see Supervisory Calculation [ §15.231(a)(3) ]
Correction			The 2 Way Touch Pad does not perform
			any supervisory transmissions, so
			15.231(a)(3) does not apply.
			Duty Cycle Correction Factor [§15.231(b)(2) and §15.35(c)]
Antenna	AF	dB	Calibration factor for measurement
Factor			antenna which converts from dBµV
			measured with antenna to the field
			strength received by the antenna in
			dBμV/M.
Cable	CL	dB	Amount of power lost in cable (and
Loss			connectors, if any) between antenna and
			analyzer
Pre-Amp	PA	dB	Gain in pre-amp

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 16 of 23
09/09/04 12:35 PM		

#### 3.1.4.2.2 Example Calculation

 $AR = 99.3 \text{ dB}\mu\text{V}$ 

AF = 13.9 dB

CL = 3.8 dB

DC = 20 dB

PA=26.2 dB

The field strength for comparison to FCC limits is found to be:

$$AR + AF + CL - DC - PA = 99.3 + 13.9 + 3.8 - 20 - 26.2 = 70.8 dB\mu V/M$$

Alternatively, the AR + AF +CL -PA is compared to the FCC limit + DC. This number is often written to the right of measurement data on the test results. For example, the FCC limit for ITI transmitters at 319.5 MHz is approximately 95.8 dB $\mu$ V/M. The limit from §15.231(b) with linear interpolation yields a limit, without consideration for duty cycle, of approximately 75.8 dB $\mu$ V/M.

To convert to  $\mu V/M$  the following equation is used:

$$\mu V/M = INVLOG(dB\mu V/M / 20)$$

For the above example,  $70.8 \text{ dB}\mu\text{V/M}$  is  $3,467.369\mu\text{V/M}$ 

The average ON time field strength of each packet, as shown on page 11, has an upper level of 94.2dBuV/M and a lower level, which is 35db down, is 59.2dBuV/M. Calculate the average Field Strength of each packet follows:

94.2 dBuV/M = 51286.1384uV/M

52.2 dBuV/M = 912.0108394uV/M

20 * LOG (51286.1384uV/M + 912.0108394uV/M)

20 * LOG (52198.14924uV/M) = 94.35310209dBuV/M

Average Field Strength = 94.4dBuV/M

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 17 of 23
09/09/04 12:35 PM		

#### 3.1.4.3 Radiated Emissions

The highest fundamental emission along with the three highest spurious and restricted band emissions are listed below as per ANSI C63.4 paragraph 10.1.8.2. Emissions from 0.009 MHz to the tenth harmonic were measured as per FCC Rules Part 15, Subpart C, Paragraph 15.33(a). Emission limits were derived from §15.231(b).

Frequency MHz	Analyzer Reading dBuV		Cable Loss dB	Antenna Factor dB	Pre-Amp	Field Strength dBuV/M	Field Strength uV/M	FCC Limit
319.5	103.60	20	2.6	13.8	24.4	75.57	6,005	6,229
639	63.55	20	3.9	19.3	24.4	42.36	131	623
1278	51.80	20	5.4	24.7	27.7	34.22	51	623
1917	45.20	20	6.85	28.3	27.8	32.55	42	623

#### 3.1.4.4 Forbidden Bands

Noise floor of spectrum analyzer with antenna factors and duty cycle correction converted to  $\mu V/M$  at approximately one meter.

All measurements were taken with an HP 8566B Spectrum Analyzer. The bandwidth was 100 KHz for measurements below 1000 MHz. The bandwidth was 1 MHz for measurements above 1000 MHz. The video filter was off.

The noise floor measurements are summarized in the table below. See also the test data included in this report.

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 18 of 23
09/09/04 12:35 PM		

	_							
Frequen	cy Range							
Low Limit	High Limit	Noise Floor Reading	Duty Cycle Corr	Field Strength	Field Strength	FCC Limit @ 3M	FCC Limit @	
MHz	MHz	dBuV	dB	dBuV/M	uV/M	uV/M	uV/M	Ì
0.09000	0.11000	N/A	20	N/A	N/A	2400/F		
0.49500		N/A	20	N/A	N/A	2400/F		
2.13750		N/A	20	N/A	N/A	30	90	
4.12500		N/A	20	N/A	N/A	30	90	
4.17725	4.17775	N/A	20	N/A	N/A	30	90	
4.20725	4.20775	N/A	20	N/A	N/A	30	90	
6.21500	6.21800	N/A	20	N/A	N/A	30	90	
6.26775		N/A	20	N/A	N/A	30 30	90	
6.31175		N/A	20	N/A	N/A		90	
8.29100 8.36200		N/A N/A	20 20	N/A N/A	N/A N/A	30 30	90 90	<u> </u>
8.36200		N/A N/A	20	N/A N/A	N/A N/A	30	90	
8.41425		N/A N/A	20	N/A N/A	N/A N/A	30	90	
12.29000	12.29300	N/A	20	N/A	N/A	30	90	
12.51975	12.52025	N/A	20	N/A	N/A	30	90	
12.57675		N/A	20	N/A	N/A	30	90	
13.36000	13.41000	N/A	20	N/A	N/A	30	90	
16.42000		N/A	20	N/A	N/A	30	90	
16.69475		N/A	20	N/A	N/A	30	90	
16.80425	16.80475	N/A	20	N/A	N/A	30	90	
25.50000	25.67000	N/A	20	N/A	N/A	30	90	
37.50000	38.25000	23.00	20	3.0	1.4	100	300	, <u> </u>
73.00000	74.60000	17.20	20	-2.8	0.7	100	300	
74.80000	75.20000	19.00	20	-1.0	0.9	100	300	
108.00000	121.94000	14.50	20	-5.5	0.5	150	450	
123.00000	138.00000	14.50	20	-5.5	0.5	150	450	
149.90000	150.05000	14.50	20	-5.5	0.5	150	450	
156.52475	156.52525	14.50	20	-5.5	0.5	150	450	
156.70000	156.90000	14.50	20	-5.5	0.5	150	450	
162.01250	167.17000	14.50	20	-5.5	0.5	150	450	
167.72000	173.20000	14.50	20	-5.5	0.5	150	450	
240.0	285.0	21.80	20	1.8	1.2	200	600	
322.0	335.4	21.80	20	1.8	1.2	200	600	
399.9		21.80	20	1.8	1.2	200	600	
608.0	614.0	21.80	20	1.8	1.2	200	600	
960.0		21.80	20	1.8	1.2	500	1500	
1300.0	1427.0	36.80	20	16.8	6.9	500	1500	
1435.0	1626.5	38.00	20	18.0	7.9	500	1500	
1645.5	1646.5	40.90	20	20.9	11.1	500	1500	
1660.0		40.90	20	20.9	11.1	500	1500	
1718.8		43.70	20	23.7	15.3	500	1500	
2200.0 2310.0		41.60 41.60	20 20	21.6	12.0 12.0	500 500	1500 1500	<u> </u>
2483.5		41.60	20	21.6 21.6	12.0	500	1500	
2483.5 2655.0		41.60	20	21.6	12.0	500	1500	i
3260.0		41.60	20	21.6	12.0	500	1500	
3332.0		41.60	20	21.6	12.0	500	1500	
3345.8		41.60	20	21.6	12.0	500	1500	
3600.0		41.60	20	21.6	12.0	500	1500	i
3000.0	4400.0	41.00	20	21.0	12.0	500	1500	

The test data follows on the next 4 pages:

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 19 of 23
09/09/04 12:35 PM		

#### RADIATED EMISSIONS



Test Report	#: NC30267	1 Run 2	Test Area:	STS		
EUT Model	#: 52-839		Date:	6/13/03		
EUT Serial	#:	EUT Power: 4.5VDC BATTERY			Temperatu	ıre: 19.0 °C
Test Metho	d: FCC - 15	.231			Air Pressu	ire: 99.0 kPa
Custome	er: GE INTE	RLOGIX			Rel. Humid	ity: 35.0 %
EUT Description	n: SIMON II	I 2-WAY TALKING TP				
Note	s:					
Data File Nam	e: <u>2671RE-</u>	2.dat				Page: 1 of 2
List of mea	asureme	nts for run #: 2				
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMF ATTEN (dB)	P / FINAL (dBuV /		DELTA1	DELTA2
MAXIMIZED.			•	•	•	•
2.876 GHz	37.45 Pk	8.6 / 31.13 / 28.47 / 0.0	48.71	V / 1.00 / 0	n/a	n/a
2.556 GHz	37.3 Pk	8.09 / 30.68 / 28.39 / 0.0	47.68	V / 1.00 / 0	n/a	n/a
2.237 GHz	36.65 Pk	7.61 / 29.97 / 27.82 / 0.0		V / 1.00 / 0	n/a	n/a
1.917 GHz	45.2 Pk	6.85 / 28.3 / 27.8 / 0.0	52.55		n/a	n/a
1.278 GHz	51.8 Pk	5.4 / 24.72 / 27.7 / 0.0	54.22		n/a	n/a
958.52 MHz	77.4 Pk	4.68 / 22.79 / 27.52 / 0.0	77.36		n/a	n/a
638.924 MHz	63.55 Pk	3.79 / 19.91 / 28.1 / 0.0	59.16	V / 1.00 / 0	n/a	n/a
319.424 MHz	79.0 Pk	2.6 / 13.97 / 0.0 / 0.0	95.57	V / 1.00 / 0	n/a	n/a
1.597 GHz	35.15 Pk	6.12 / 26.5 / 27.72 / 0.0		V / 1.00 / 0	n/a	n/a
3.195 GHz	39.95 Pk	9.16 / 31.81 / 28.26 / 0.0	52.65	V / 1.00 / 0	n/a	n/a

Tested by:	RMJ	
-	Printed	Signature
Reviewed by:		
	Printed	Signature

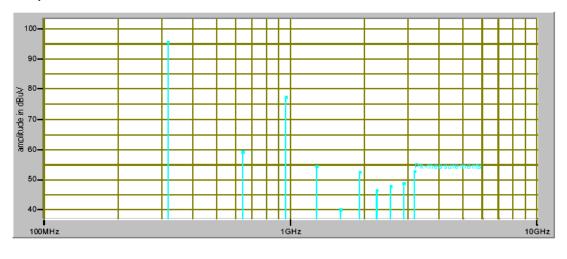
FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 20 of 23
09/09/04 12:35 PM		

#### RADIATED EMISSIONS



Test Report #:	NC302671 Run 2	Test Area:	STS	_			
EUT Model #:	52-839	Date:	6/13/03	_			
EUT Serial #:		EUT Power:	4.5VDC BATTERY	Temperatu	ure:1	9.0	°C
Test Method:	FCC - 15.231			Air Pressu	ıre: 9	9.0	kPa
Customer:	GE INTERLOGIX			Rel. Humio	lity: 3	5.0	%
EUT Description:	SIMON III 2-WAY TALKING TP						
Notes:							
Data File Name:	2671RE-2.dat				Page:	2.0	f 2

#### Graph:



Tested by:	RMJ	
	Printed	Signature
Reviewed by:		
-	Printed	Signature

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 21 of 23
09/09/04 12:35 PM		

#### **RADIATED EMISSIONS**



Test Report #:	NC302671 Run 3	Test Area:	STS			
EUT Model #:	52-839-A	Date:	6/13/03	_		
EUT Serial #:		EUT Power:	4.5VDC BATTERY	Temperatu	re:1	9.0 °C
Test Method:	FCC B			Air Pressu	re:9	9.0 kPa
Customer:	GE INTERLOGIX			Rel. Humidi	ty: 3	35.0 %
EUT Description:	SIMON III 2-WAY TALKING TP					
Notes:	RECEIVER SCAN					
Data File Name:	2671RE-3.dat				Page:	1 of 2
List of meas	surements for run #: 3					
FREQ	LEVEL CABLE / ANT / PREAM (dBuV) ATTEN	P / FINAL (dBuV / i		DELTA1 FCC-B <1GHz		DELTA2 C B >1GHz
NO EMISSIONS FO	(dB) OUND WITH V OR H POLARIZATIONS	I S AT ALL AZIMU	I ITHS.	3m		3m
END OF SCAN 30 -	3.19GHz.					
Tested by:	RMJ Printed		Signature			

FCC_REPT.DOC 09/09/04 12:35 PM	FCC ID: B4Z-839-TWTP	Page 22 of 23
09/09/04 12.33 FWI		

Signature

by:__

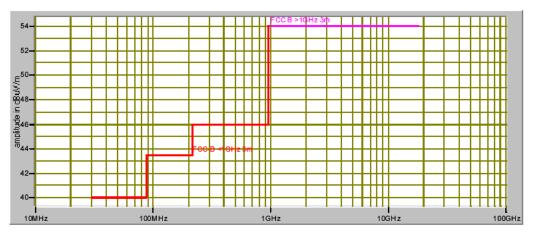
Printed

#### RADIATED EMISSIONS



Test Report #:	NC302671 Run 3	Test Area:	STS	_			
EUT Model #:	52-839-A	Date:	6/13/03	_			
EUT Serial #:		EUT Power:	4.5VDC BATTERY	Temperatu	ıre: <u>1</u>	9.0	°C
Test Method:	FCC B			Air Pressu	ıre: 9	9.0	kPa
Customer:	GE INTERLOGIX			Rel. Humid	lity: 3	35.0	%
UT Description:	SIMON III 2-WAY TALKING TP						
Notes:	RECEIVER SCAN						
Data File Name:	2671RE-3.dat				Page:	20	f 2

#### Graph:



Tested by:	RMJ	
	Printed	Signature
Reviewed by:		
	Printed	Signature

FCC_REPT.DOC	FCC ID: B4Z-839-TWTP	Page 23 of 23
09/09/04 12:35 PM		