

Prüfbericht - Nr.: Test Report No.	14007582 001		Seite 1 von 12 Page 1 of 12		
Auftraggeber: Applicant	Nokia Corporation, Multimedia Joensuunkatu 7E 24100 Salo Finland				
Gegenstand der Prüfung: Test item	Nokia Wireless Keyboard				
Bezeichnung: Identification	SU-8W	Serien-Nr.: Serial No.	Engineering sample		
Wareneingangs-Nr.: Receipt No.	041013029	Eingangsdatum: Date of receipt	13.10.2004		
Prüfart: Testing location	TÜV Rheinland Hong Kong Ltd. Room 8, 25th Floor, Skyline Tower, 39 Wang Kwong Road, Kowloon Bay Kowloon, Hong Kong Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong				
Prüfgrundlage: Test specification	FCC Part 15 Subpart C ANSI C63.4-2001 CISPR 22:1997				
Prüfresultat: Test Result	Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage. The above mentioned product was tested and passed .				
geprüft / tested by:		kontrolliert / reviewed by:			
26.10.2004	Hugo Wan		26.10.2004	Thomas Berns	
Datum Date	Name Name	Unterschrift Signature	Datum Date	Name Name	
					
				Unterschrift Signature	
Sonstiges: Other Aspects	FCCID: PYASU-8W				
Abkürzungen:	OK, Pass, P	= entspricht Prüfgrundlage	Abbreviations:	OK, Pass, P	= passed
	Fail, F	= entspricht nicht Prüfgrundlage		Fail, F	= failed
	N/A	= nicht anwendbar		N/A	= not applicable
	NT	= nicht getestet		NT	= not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicate in extracts. This test report does not entitle to carry any safety mark on this or similar products.					

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Product information

Manufacturers declarations

	Transmitter	Receiver
Operating frequency range	2402 - 2480 MHz	2402 - 2480 MHz
Type of modulation	FHSS modulation	FHSS modulation
Number of channels	79	79
Channel separation	1 MHz	1 MHz
Type of antenna	inverted F type	inverted F type
Antenna gain (dBi)	-4	
Power level	fix	
Type of equipment	stand alone, plug-in radio device	stand alone, plug-in radio device
Connection to public utility power line	No	
Nominal voltage	V _{nom} : 3.0 V	V _{nom} : 3.0 V
Independent Operation Modes	Page scan Inquiry scan Connection state - ACL Link	

Product function and intended use

The test item is a Wireless Keyboard based on the Bluetooth technology.

Bluetooth is a short-range radio link intended to be a cable replacement between portable and/or fixed electronic devices.

Bluetooth operates in the unlicensed ISM Band at 2.4 GHz. In the US a band of 83.5 MHz width is available. In this band, 79 RF channels spaced 1 MHz apart are defined.

The channel is represented by a pseudo-random hopping sequence through the 79 channels. The channel is divided into time slots, with a nominal slot length of 625 µs, where each slot corresponds to different RF hop frequencies. The nominal hop rate is 1600 hops/s. The symbol rate on the channel is 1 Ms/s.

Submitted documents

Circuit Diagram
PCB Layout
Block Diagram
Bill of material
User manual

Special accessories and auxiliary equipment

None

List of Test and Measurement Instruments

	Kind of Equipment	Manufacturer	Type	S/N
☐	Test Receiver	Rohde & Schwarz	ESH-3	890173/033
☐	L/I/S/N	Rohde & Schwarz	ESH 3-Z5	849876/026
☐	Oscilloscope	HP	54713B	US34510455
☐	Test Receiver	Rohde & Schwarz	ESVP	882402/033
☐	Absorbing Clamp	Rohde & Schwarz	MDS-21	979 3/4
☒	Test Receiver	Rohde & Schwarz	ESVS30	842807/009
☒	Biconical Antenna	Rohde & Schwarz	HK116	841489/015
☒	Log.-Periodic Antenna	Rohde & Schwarz	HL223	841516/017
☐	Universal Power Analyzer	Voltech	PM3000A	9915
☐	Reference Impedance Network	Voltech	IEC 555 Standard	9946
☐	AC Power Source	California Instr.	4500L	HK51895
☐	Trip-Loop Antenna	Chase	LLA6142	1019
☒	Double Ridge Horn Antenna	EMCO	3115	9002-3351
☒	Double Ridge Horn Antenna	EMCO	3115	9002-3347
☐	RF Comms Test Set	HP	8920B	US36492628
☐	Spectrum Analyser + Tracking G.	HP	8596E	3639A00758
☐	Signal Generator	Rohde & Schwarz	SMY 01	844146/024
☐	Signal Generator	Rohde & Schwarz	SMY 01	844146/023
☐	BiLog Antenna	EMCO	3143	9607-1287
☐	Isotropic Field Probe	Holladay	HI-4422	90956
☐	Power Amplifier	Kalmus	757-LC	7620-1
☐	Power Amplifier	Kalmus	122-FC	7620-2
☐	Coupling Clamp	Schaffner	CDN 126	312
☐	Couple Device Network	Fischer	CDN-M2	9604
☒	Spectrum Analyzer	Rohde & Schwarz	FSP30	1093.4495K30
☐	Temperature Chamber	Binder	MK 240	9020-0028
☐	EFT,ESD,SURGE, DIPS tester	Schaffner	Best 96	IN3796-011
☐	Surge Generator	Schaffner	NSG650	280

Result FCC Part 15 – Subpart C

Subclause 15.203 – Antenna Information		Pass
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device	
Result:	Permanent attached antenna	
Verdict:	Pass	

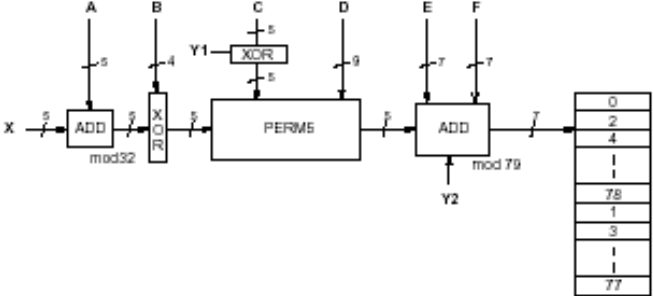
Subclause 15.204 – Antenna Information		Pass
Requirement:	Provide information for every antenna proposed for the use with the EUT	
Result:	a) Antenna type: Inverted F type antenna soldered to the circuit board b) Manufacturer and model no: N.A. c) Gain with reference to an isotropic radiator: -4 dBi	
Verdict:	Pass	

Subclause 15.207 – Disturbance Voltage on AC Mains		N.A.
Test Port: Nil		
Applicable only to equipment designed to be connected to the public utility power line.		

Subclause 15.247 (a) – Carrier Frequency Separation		Pass
Requirement:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.	
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (hopping on), DH1 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 100 kHz / 300 kHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23°C Humidity : 50%		
Result:	The centre frequencies of the hopping channels are separated by more than the 20dB bandwidth. For test results plots refer to Appendix 1, page 2.	
Verdict:	Pass	

Subclause 15.247 (a) – Time of Occupancy (Dwell Time)	Pass
Requirement: Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.	
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (hopping on), DH5 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 1 MHz / 3 MHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23°C Humidity : 50%	
Result: The screenshot in Appendix 1 page 4 shows the occurrence of a channel in a 12.8 s time period. In inquiry and page scan mode Bluetooth is using 32 hopping channels only. The frequency was used 26 times. The dwell time for the longest supported packet type is about 3 ms. As a result the average time of occupancy will not be greater than 400 ms. i.e. Time period calculation: $0.4 \times 32 = 12.8\text{s}$ Limit calculation: $26 \times 2.944 \times 10^{-3} = 76.54 \times 10^{-3}\text{s}$ $\leq 400 \times 10^{-3}\text{s}$ For test protocols please refer to Appendix 1, page 3-4. Verdict: Pass	

Subclause 15.247 (a) – 20 dB Bandwidth			
Requirement: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.			
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), DH5 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 30 kHz / 100 kHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23°C Humidity : 50%			
Results			
For test protocols refer to Appendix 1, page 5-6.			
Frequency (MHz)	20 dB left (MHz)	20 dB right (MHz)	20dB bandwidth (MHz)
2402	0.468	0.464	0.932
2441	0.452	0.472	0.924
2480	0.452	0.476	0.928

Subclause 15.247 (a) – Hopping Sequence	Pass
Requirement: The hopping sequence is generated and provided with an example.	
Hopping sequence The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master. The X input determines the phase in the 32-hop segment, whereas Y1 and Y2 selects between master-to-slave and slave-to-master transmission. The inputs A to D determine the ordering within the segment, the inputs E and F determine the mapping onto the hop frequencies.	
	

Example data:

Hop sequence {k} for CONNECTION STATE:

CLK start: 0x0000010

ULAP: 0x00000000

#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |

```

0x0000010: 08 66 | 10 70 | 12 19 | 14 23 | 16 01 | 18 05 | 20 33 | 22 37 |
0x0000030: 24 03 | 26 07 | 28 35 | 30 39 | 32 72 | 34 76 | 36 25 | 38 29 |
0x0000050: 40 74 | 42 78 | 44 27 | 46 31 | 48 09 | 50 13 | 52 41 | 54 45 |
0x0000070: 56 11 | 58 15 | 60 43 | 62 47 | 32 17 | 36 19 | 34 49 | 38 51 |
0x0000090: 40 21 | 44 23 | 42 53 | 46 55 | 48 33 | 52 35 | 50 65 | 54 67 |
0x00000b0: 56 37 | 60 39 | 58 69 | 62 71 | 64 25 | 68 27 | 66 57 | 70 59 |
0x00000d0: 72 29 | 76 31 | 74 61 | 78 63 | 01 41 | 05 43 | 03 73 | 07 75 |
0x00000f0: 09 45 | 13 47 | 11 77 | 15 00 | 64 49 | 66 53 | 68 02 | 70 06 |
0x0000110: 01 51 | 03 55 | 05 04 | 07 08 | 72 57 | 74 61 | 76 10 | 78 14 |
0x0000130: 09 59 | 11 63 | 13 12 | 15 16 | 17 65 | 19 69 | 21 18 | 23 22 |
0x0000150: 33 67 | 35 71 | 37 20 | 39 24 | 25 73 | 27 77 | 29 26 | 31 30 |
0x0000170: 41 75 | 43 00 | 45 28 | 47 32 | 17 02 | 21 04 | 19 34 | 23 36 |
0x0000190: 33 06 | 37 08 | 35 38 | 39 40 | 25 10 | 29 12 | 27 42 | 31 44 |
0x00001b0: 41 14 | 45 16 | 43 46 | 47 48 | 49 18 | 53 20 | 51 50 | 55 52 |
0x00001d0: 65 22 | 69 24 | 67 54 | 71 56 | 57 26 | 61 28 | 59 58 | 63 60 |
0x00001f0: 73 30 | 77 32 | 75 62 | 00 64 | 49 34 | 51 42 | 57 66 | 59 74 |
0x0000210: 53 36 | 55 44 | 61 68 | 63 76 | 65 50 | 67 58 | 73 03 | 75 11 |
0x0000230: 69 52 | 71 60 | 77 05 | 00 13 | 02 38 | 04 46 | 10 70 | 12 78 |
0x0000250: 06 40 | 08 48 | 14 72 | 16 01 | 18 54 | 20 62 | 26 07 | 28 15 |
0x0000270: 22 56 | 24 64 | 30 09 | 32 17 | 02 66 | 06 74 | 10 19 | 14 27 |
0x0000290: 04 70 | 08 78 | 12 23 | 16 31 | 18 03 | 22 11 | 26 35 | 30 43 |
0x00002b0: 20 07 | 24 15 | 28 39 | 32 47 | 34 68 | 38 76 | 42 21 | 46 29 |
0x00002d0: 36 72 | 40 01 | 44 25 | 48 33 | 50 05 | 54 13 | 58 37 | 62 45 |
0x00002f0: 52 09 | 56 17 | 60 41 | 64 49 | 34 19 | 36 35 | 50 51 | 52 67 |
0x0000310: 38 21 | 40 37 | 54 53 | 56 69 | 42 27 | 44 43 | 58 59 | 60 75 |
0x0000330: 46 29 | 48 45 | 62 61 | 64 77 | 66 23 | 68 39 | 03 55 | 05 71 |
0x0000350: 70 25 | 72 41 | 07 57 | 09 73 | 74 31 | 76 47 | 11 63 | 13 00 |
0x0000370: 78 33 | 01 49 | 15 65 | 17 02 | 66 51 | 70 67 | 03 04 | 07 20 |
0x0000390: 68 55 | 72 71 | 05 08 | 09 24 | 74 59 | 78 75 | 11 12 | 15 28 |
0x00003b0: 76 63 | 01 00 | 13 16 | 17 32 | 19 53 | 23 69 | 35 06 | 39 22 |
0x00003d0: 21 57 | 25 73 | 37 10 | 41 26 | 27 61 | 31 77 | 43 14 | 47 30 |
0x00003f0: 29 65 | 33 02 | 45 18 | 49 34 | 19 04 | 21 08 | 23 20 | 25 24 |

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Subclause 15.247 (a) – Equal Hopping Frequency Use**Pass**

Requirement: Each of the transmitter's hopping channels is used equally on average.

Equal hopping frequency use

The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.

Subclause 15.247 (a) – Receiver Input Bandwidth		Pass
Requirement:	The associated receiver(s) complies with the requirement that its input bandwidth matches the bandwidth of the transmitted signal.	
Receiver input bandwidth		
The receiver bandwidth is equal to the receiver bandwidth in the 79 hopping channel mode, which is 1 MHz. The receiver bandwidth was verified during Bluetooth RF conformance testing.		

Subclause 15.247 (a) – Receiver Hopping Capability		Pass
Requirement:	The associated receiver has the ability to shift frequencies in synchronisation with the transmitted signals.	
Receiver hopping Capability		
The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.		

Subclause 15.247 (b) – Peak Output Power		Pass			
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), DH1 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 1 MHz / 3 MHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23°C Humidity : 50%					
Requirement:	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 Watt. For all other frequency hopping systems in the 2400 – 2483.5 MHz band: 0.125 Watts.				
Result					
All three transmit frequency modes comply with the maximum peak output power limit.					
For test protocols please refer to Appendix 1, page 7-8.					
Frequency (MHz)	Maximum peak output power (dBm)	Cable attenuation (dB)	Output power (dBm)	Limit (W/dBm)	Verdict
2402	0	3.52	3.52	1 / 30.0	Pass
2441	-0.28	3.65	3.37	1 / 30.0	Pass
2480	-0.06	3.60	3.54	1 / 30.0	Pass

Subclause 15.247 (b) – Band edge compliance		Pass
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), DH1 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 300 kHz / 1 MHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23°C Humidity : 50%		
Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.		
Result There is no peak found outside any 100 kHz bandwidth of the operating frequency band in the three transmit frequency. All three transmit frequency modes comply with the limit stated in subclause 15.247(c). For test protocols refer to Appendix 1, page 9-10.		

Subclause 15.247 (c) – Spurious Conducted Emissions					Pass
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), DH1 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 100 kHz / 300 kHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23 °C Humidity : 50 %					
Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.					
Result There is no peak found outside any 100kHz bandwidth of the operating frequency band in the three transmit frequency. All three transmit frequency modes comply with the limit stated in subclause 15.247(c). For test protocols refer to Appendix 1, page 11-17.					
Operating frequency (MHz)	Spurious frequency (MHz)	Spurious Level (dBm)	Reference value (dBm)	Delta (dB)	Verdict
2402	No peak found	-	-	-	Pass
2441	No peak found	-	-	-	Pass
2480	No peak found	-	-	-	Pass

Subclause 15.247 (c) – Spurious Radiated Emissions							Pass
Test Specification : ANSI C63.4 - 1992 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), DH1 packet Port of testing : Enclosure Detector : Peak RBW/VBW : 100 kHz / 300 kHz for $f < 1$ GHz 1 MHz / 3 MHz for $f > 1$ GHz Supply voltage : 3.0V, 2xAAA batteries Temperature : 23°C Humidity : 50%							
Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.							
Result All three transmit frequency modes comply with the field strength within the restricted bands. For test protocols refer to Appendix 1, page 18-48.							
Tx frequency 2402MHz				Vertical Polarization			
Freq MHz	Reading dBuV	AF dB(1/m)	Cable att. dB	Pre-amp dB	Filter att. dB	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	-	-	-	-	-	-	-
Tx frequency 2402MHz				Horizontal Polarization			
Freq MHz	Reading dBuV	AF dB(1/m)	Cable att. dB	Pre-amp dB	Filter att. dB	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	-	-	-	-	-	-	-
Tx frequency 2441MHz				Vertical Polarization			
Freq MHz	Reading dBuV	AF dB(1/m)	Cable att. dB	Pre-amp dB	Filter att. dB	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	-	-	-	-	-	-	-
Tx frequency 2441MHz				Horizontal Polarization			
Freq MHz	Reading dBuV	AF dB(1/m)	Cable att. dB	Pre-amp dB	Filter att. dB	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	-	-	-	-	-	-	-

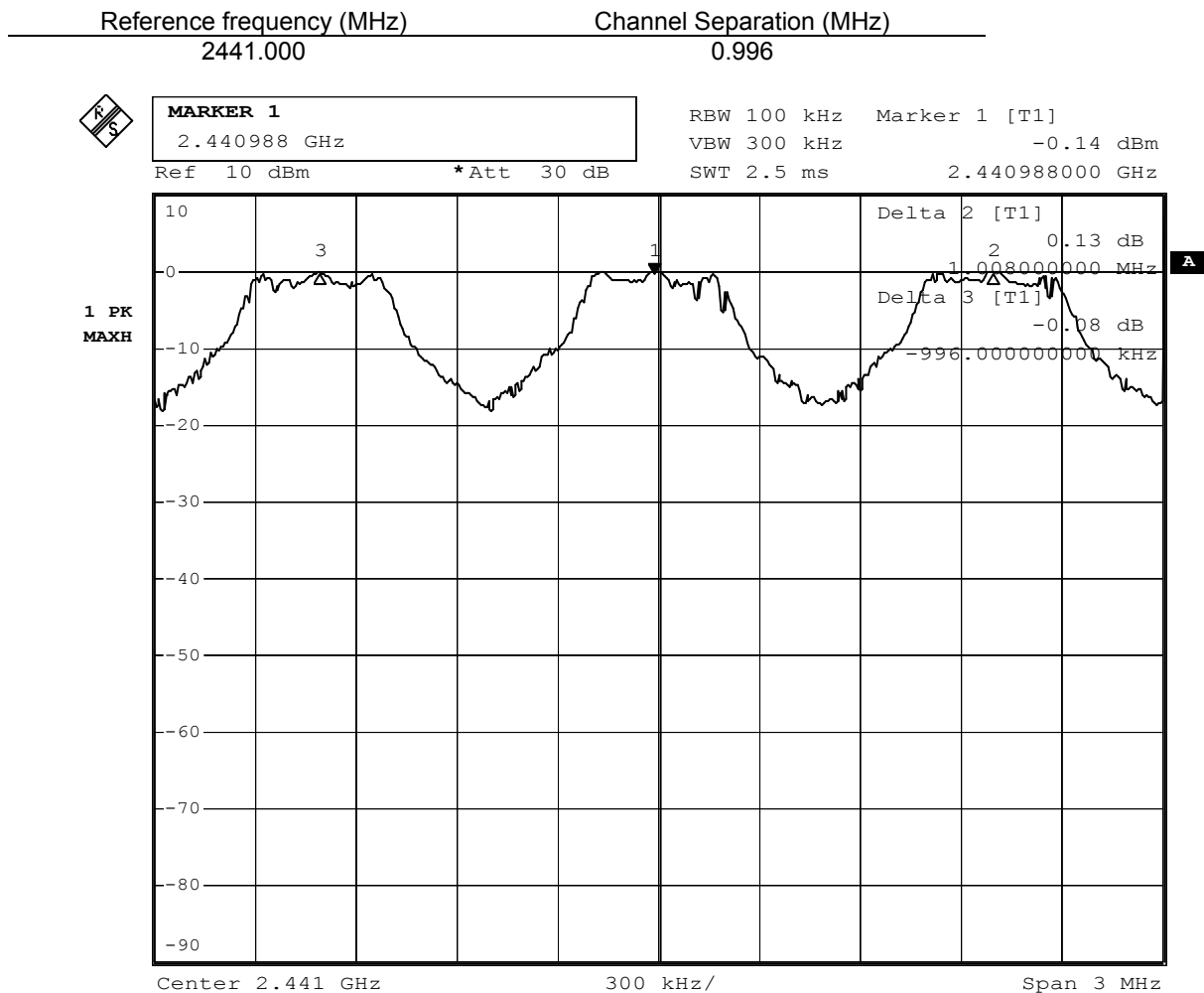
Tx frequency 2480MHz				Vertical Polarization			
Freq MHz	Reading dBuV	AF dB(1/m)	Cable att. dB	Pre-amp dB	Filter att. dB	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	-	-	-	-	-	-	-
Tx frequency 2480MHz				Horizontal Polarization			
Freq MHz	Reading dBuV	AF dB(1/m)	Cable att. dB	Pre-amp dB	Filter att. dB	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	-	-	-	-	-	-	-

Appendix 1

Test results

Carrier Frequency Separation

Date: 21 Oct 2004
 EUT: SU-8W
 Company: Nokia Corporation, Multimedia
 Humidity: 50%
 Temperature: 23°C
 Voltage supply: 3.0V, 2xAAA batteries
 Test by: Hugo Wan
 Op. mode: Hopping on



Date: 21.OCT.2004 11:33:29

Dwell Time

Date: 21 Oct 2004
 EUT: SU-8W
 Company: Nokia Corporation, Multimedia
 Humidity: 50%
 Temperature: 23°C
 Voltage supply: 3.0V, 2xAAA batteries
 Test by: Hugo Wan
 Op. mode: Hopping on

Burst Duration (ms)	Number of hopping	Time of occupancy (s)	Results
2.944	26	$0.002944 \times 26 = 0.07654$	Pass


DELTA MARKER 2

2.944 ms

Ref 10 dBm

*Att 30 dB

RBW 1 MHz

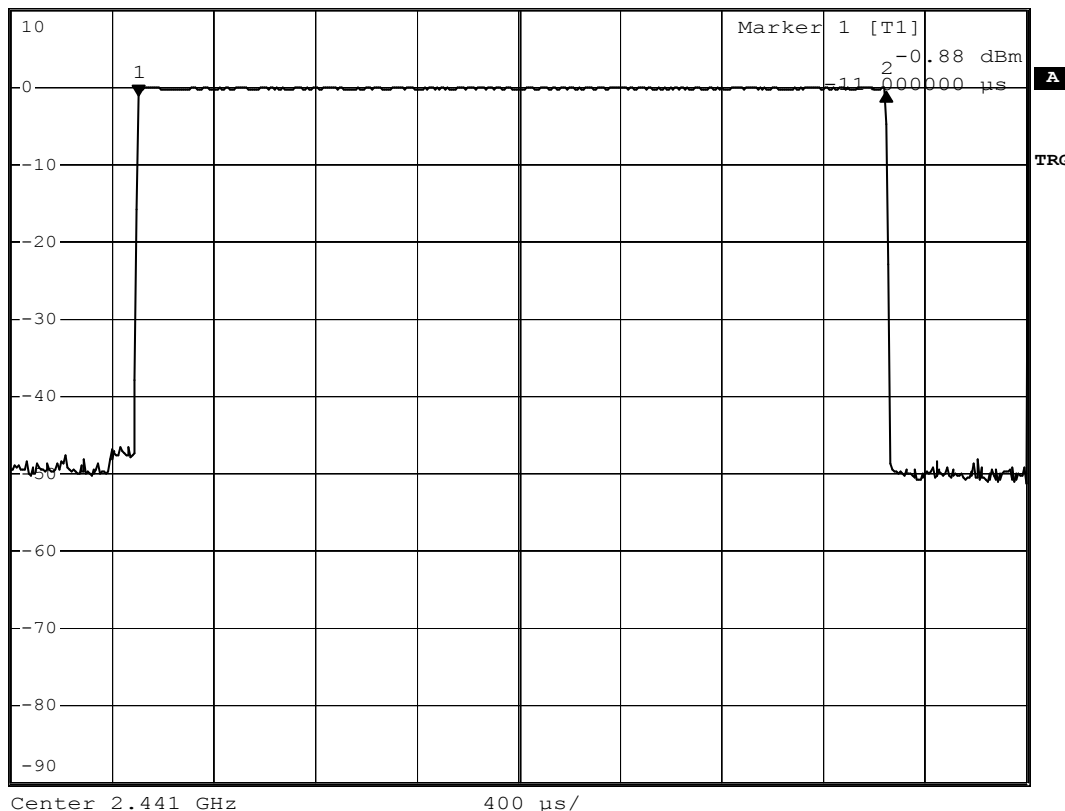
Delta 2 [T1]

VBW 3 MHz

0.62 dB

SWT 4 ms

2.944000 ms

 1 PK
 MAXH


Date: 21.OCT.2004 11:38:13



SWEEP TIME

12.8 s

RBW 1 MHz

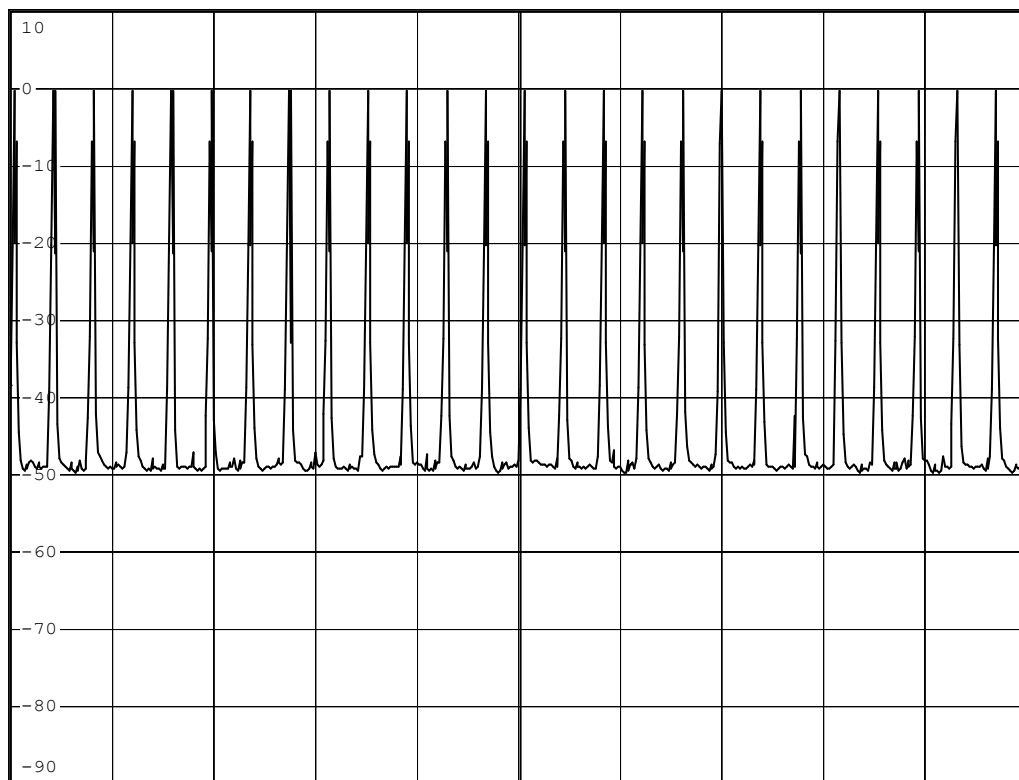
VBW 3 MHz

SWT 12.8 s

Ref 10 dBm

*Att 30 dB

1 PK
MAXH



A
SGL

Center 2.441 GHz

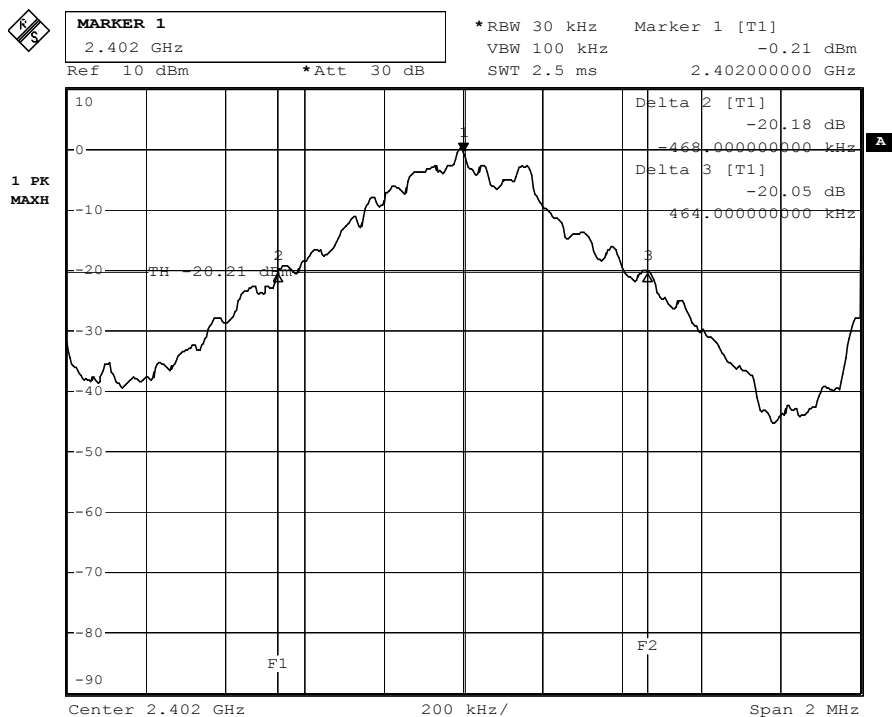
1.28 s/

Date: 21.OCT.2004 11:39:59

20dB Bandwidth

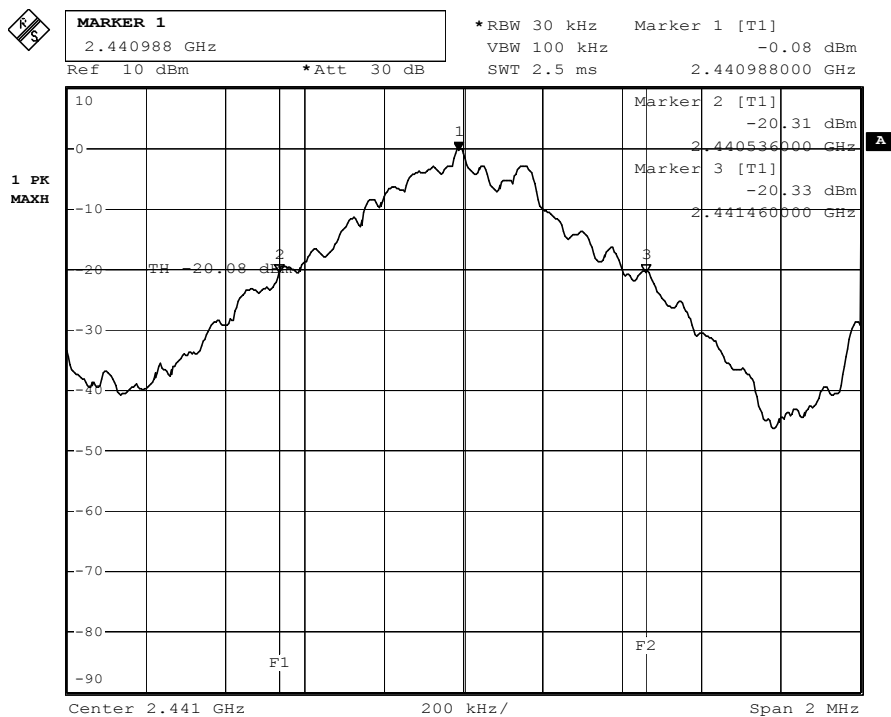
Date: 21 Oct 2004
 EUT: SU-8W
 Company: Nokia Corporation, Multimedia
 Humidity: 50%
 Temperature: 23°C
 Voltage supply: 3.0V, 2xAAA batteries
 Test by: Hugo Wan
 Op. mode: TX mode, DH5 with PRBS9 payload

Tx frequency (MHz)	Δf_L (MHz)	Δf_H (MHz)	$ \Delta f_H + \Delta f_L $ (MHz)	Results
2402	0.468	0.464	0.932	Pass
2441	0.452	0.472	0.924	Pass
2480	0.452	0.476	0.928	Pass



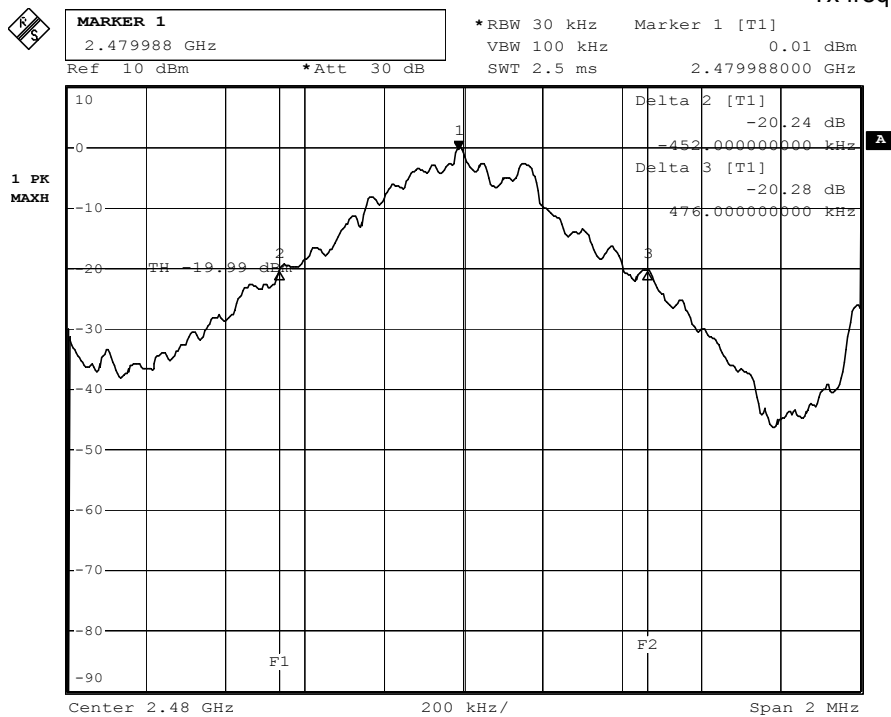
Date: 21.OCT.2004 11:42:58

Tx frequency: 2402MHz



Date: 21.OCT.2004 11:48:59

Tx frequency: 2441MHz



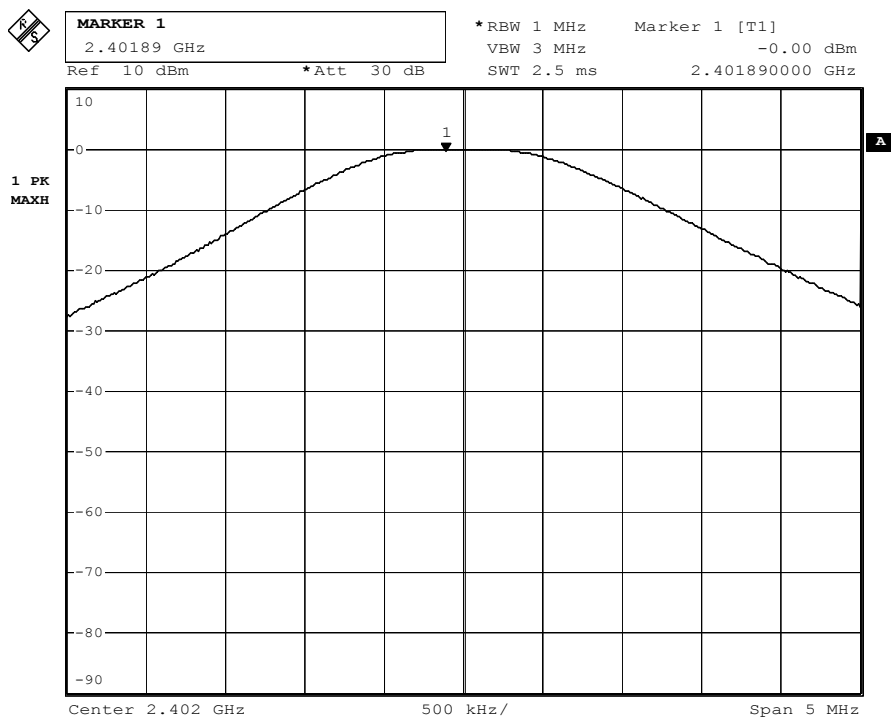
Date: 21.OCT.2004 11:45:08

Tx frequency: 2480MHz

Peak Output Power

Date: 21 Oct 2004
 EUT: SU-8W
 Company: Nokia Corporation, Multimedia
 Humidity: 50%
 Temperature: 23°C
 Voltage supply: 3.0V, 2xAAA batteries
 Test by: Hugo Wan
 Op. mode: TX mode, DH1 with PRBS9 payload

Tx Frequency (MHz)	Power P _{PK} (dBm)	Cable Attenuation (dB)	Actual Peak Power (dBm)	Results
2402	0	3.52	3.52	Pass
2441	-0.28	3.65	3.37	Pass
2480	-0.06	3.60	3.54	Pass



Date: 21.OCT.2004 11:51:15

Tx frequency: 2402MHz

**MARKER 1**

2.44082 GHz

Ref 10 dBm

*Att 30 dB

*RBW 1 MHz

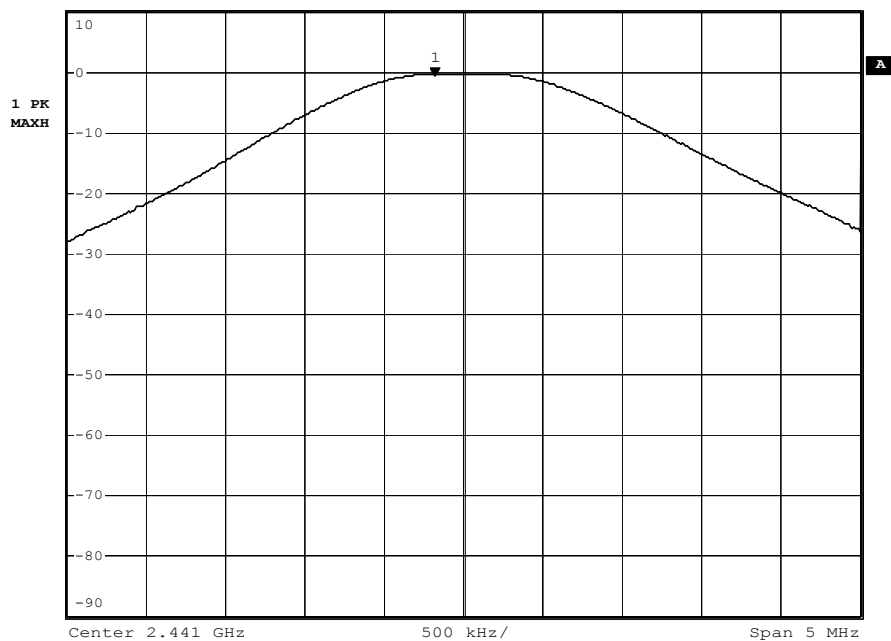
VBW 3 MHz

SWT 2.5 ms

Marker 1 [T1]

-0.28 dBm

2.440820000 GHz



Date: 21.OCT.2004 11:52:52

Tx frequency: 2441MHz

**MARKER 1**

2.48011 GHz

Ref 10 dBm

*Att 30 dB

*RBW 1 MHz

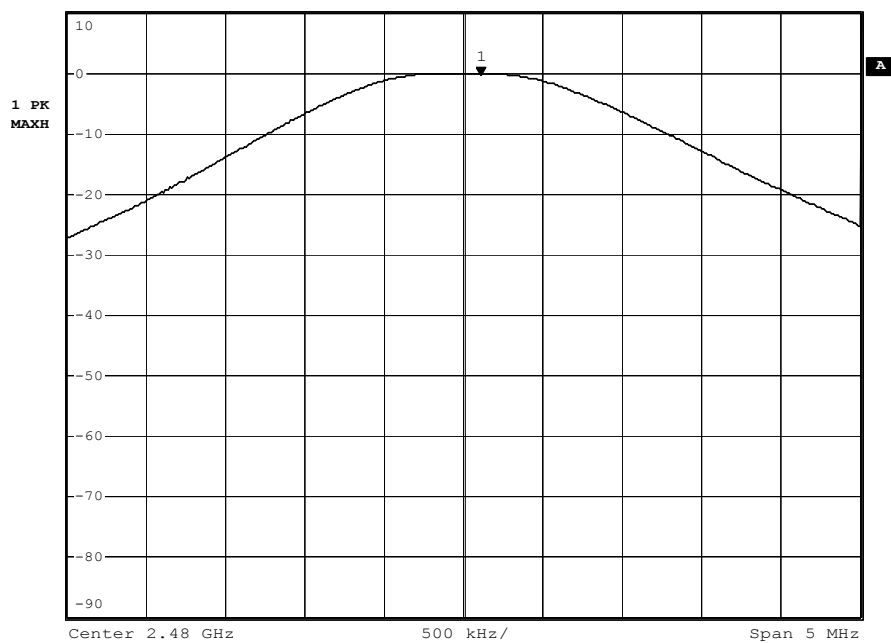
VBW 3 MHz

SWT 2.5 ms

Marker 1 [T1]

-0.06 dBm

2.480110000 GHz



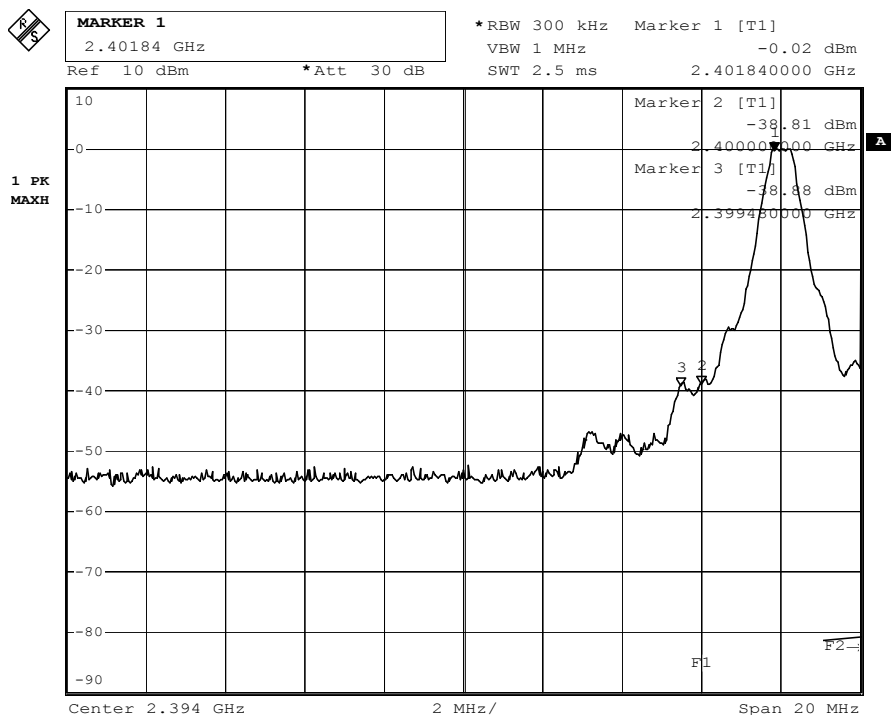
Date: 21.OCT.2004 11:52:17

Tx frequency: 2480MHz

Band Edge Compliance

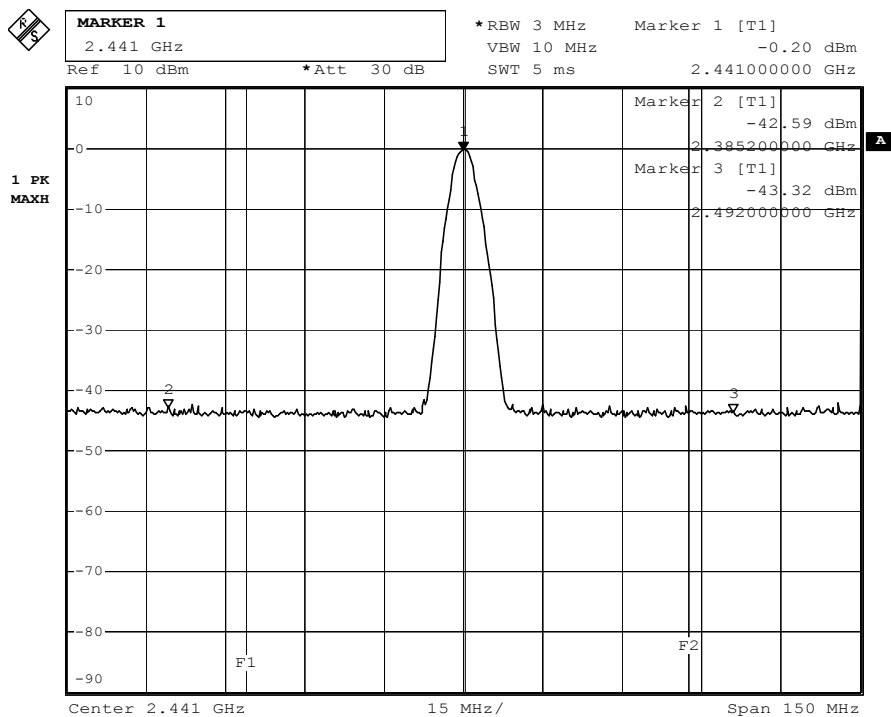
Date: 21 Oct 2004
 EUT: SU-8W
 Company: Nokia Corporation, Multimedia
 Humidity: 50%
 Temperature: 23°C
 Voltage supply: 3.0V, 2xAAA batteries
 Test by: Hugo Wan
 Op. mode: TX mode, DH1 with PRBS9 payload

Tx Frequency (MHz)	Peak in band Power level (dBm)	RF power outside 100kHz BW (MHz)	RF power difference outside 100kHz BW (dB)	Results
2402	-0.02	No Peak	-	Pass
2480	-0.09	No Peak	-	Pass



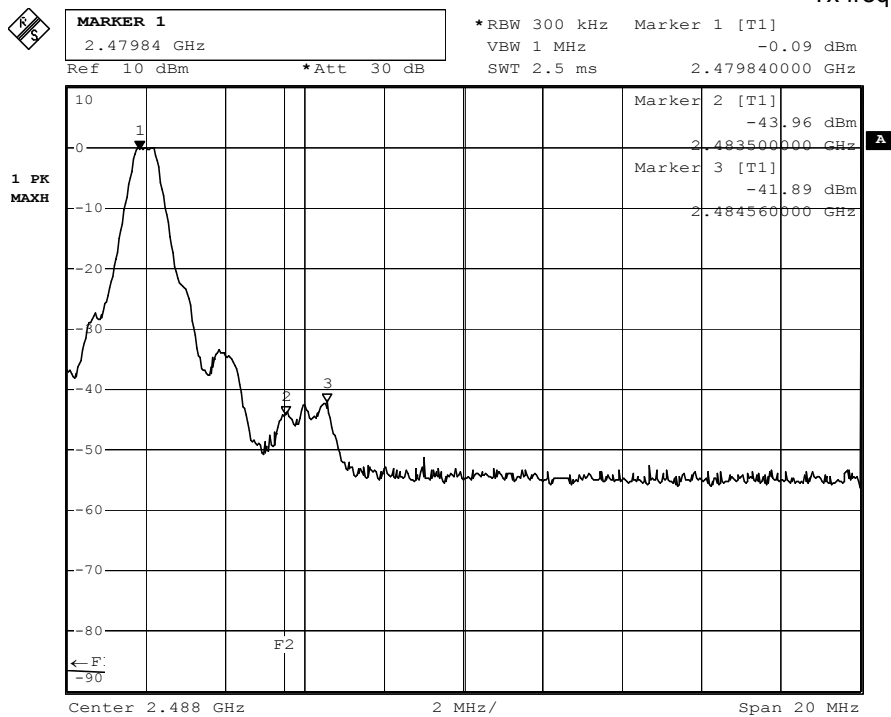
Date: 21.OCT.2004 12:00:47

Tx frequency: 2402MHz



Date: 21.OCT.2004 11:59:11

Tx frequency: 2441MHz



Date: 21.OCT.2004 12:01:53

Tx frequency: 2480MHz

Spurious Emissions - Conducted

Date: 21 Oct 2004
EUT: SU-8W
Company: Nokia Corporation, Multimedia
Humidity: 50%
Temperature: 23°C
Voltage supply: 3.0V, 2xAAA batteries
Test by: Hugo Wan
Op. mode: TX mode, DH1 with PRBS9 payload

Tx frequency : 2402MHz

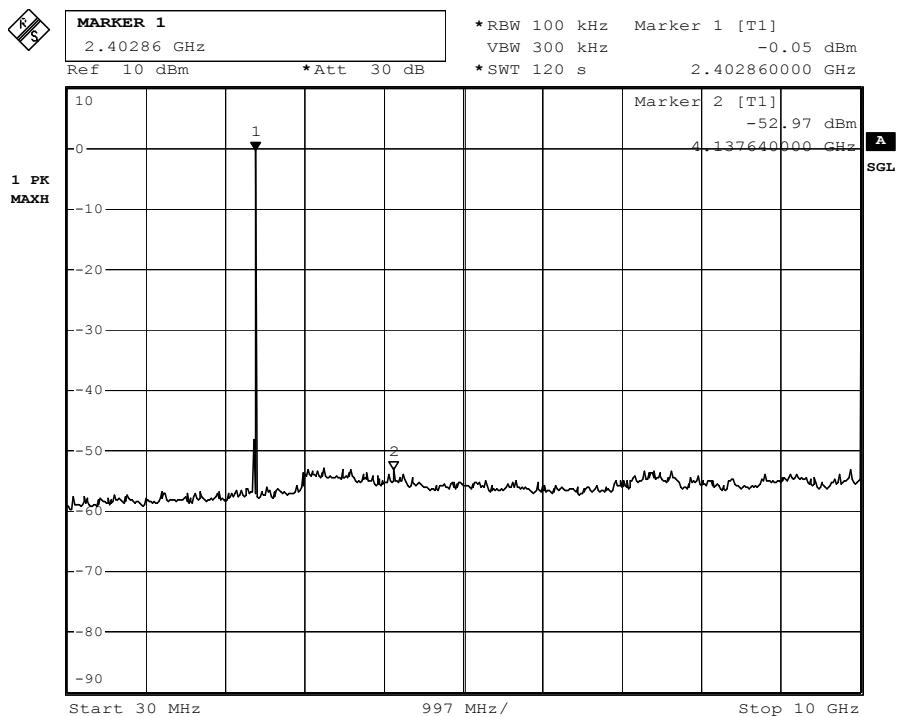
Spurious Frequency (MHz)	Power level (dBm)	Reference value (dBm)	Delta to reference level (dB)	Results
No peak found	-	-	-	Pass

Tx frequency : 2441MHz

Spurious Frequency (MHz)	Power level (dBm)	Reference value (dBm)	Delta to reference level (dB)	Results
No peak found	-	-	-	Pass

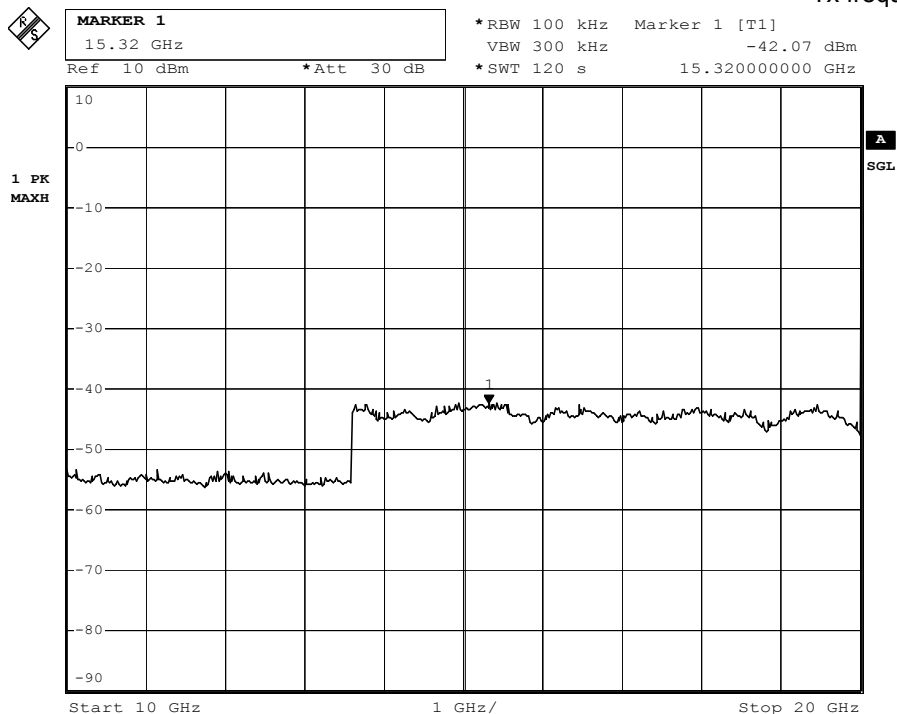
Tx frequency : 2480MHz

Spurious Frequency (MHz)	Power level (dBm)	Reference value (dBm)	Delta to reference level (dB)	Results
No peak found	-	-	-	Pass



Date: 21.OCT.2004 12:36:55

Tx frequency: 2402MHz



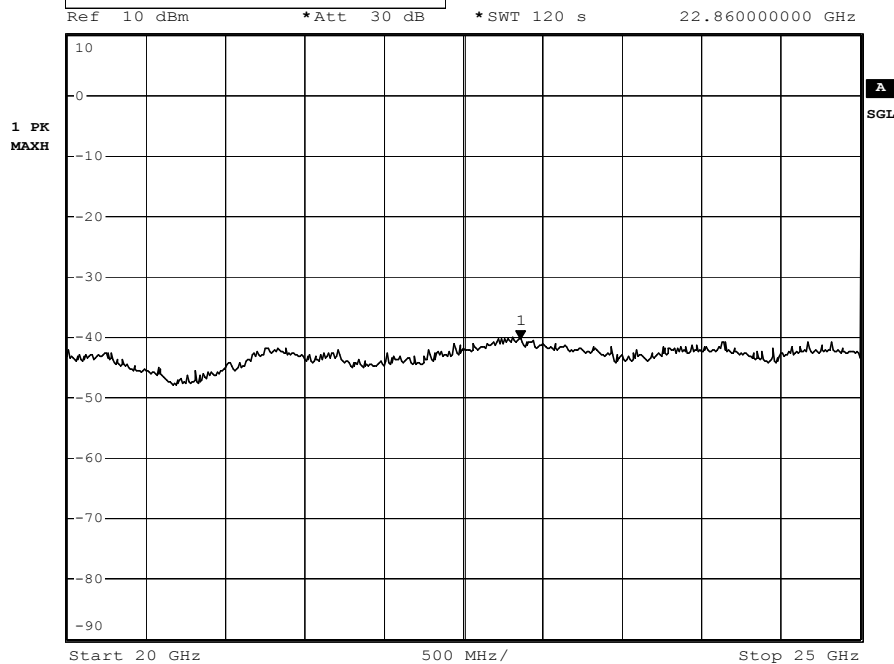
Date: 21.OCT.2004 12:30:47

Tx frequency: 2402MHz



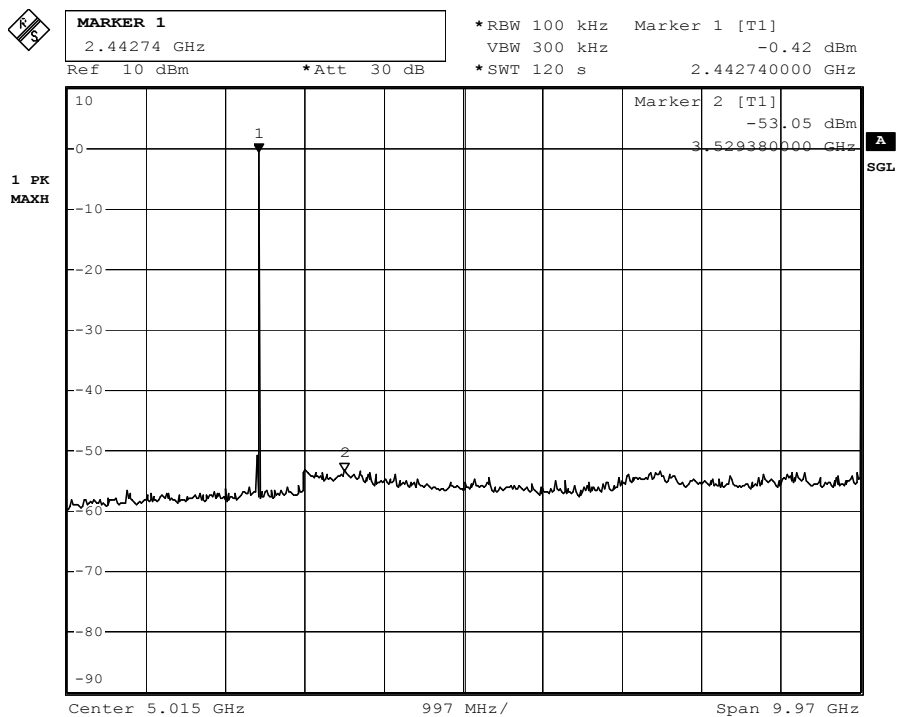
MARKER 1
22.86 GHz

*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz -39.87 dBm
*SWT 120 s 22.86000000 GHz



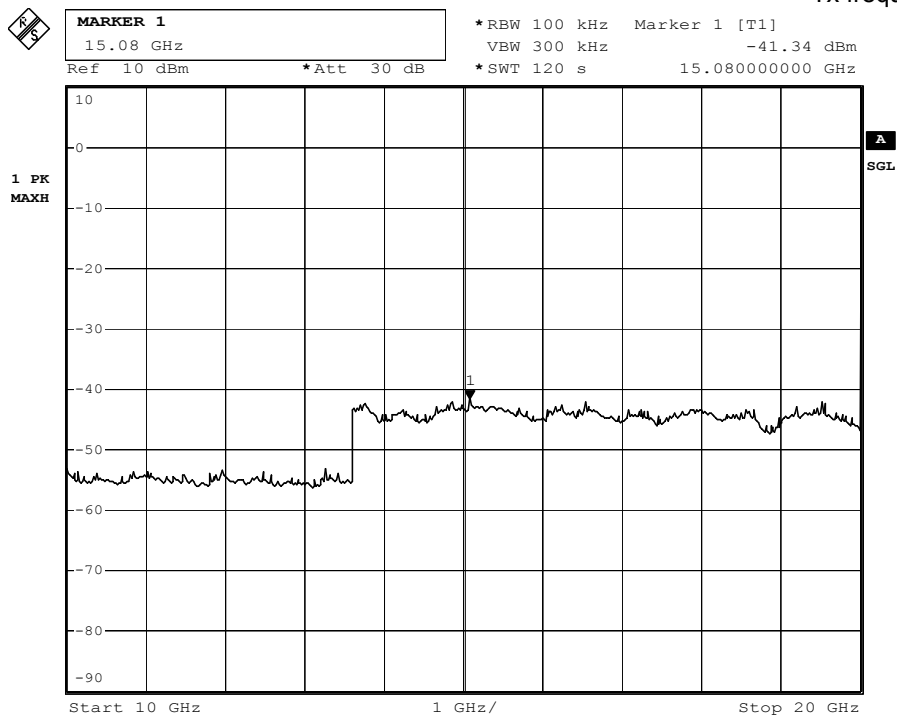
Date: 21.OCT.2004 12:26:31

Tx frequency: 2402MHz



Date: 21.OCT.2004 12:53:33

Tx frequency: 2441MHz



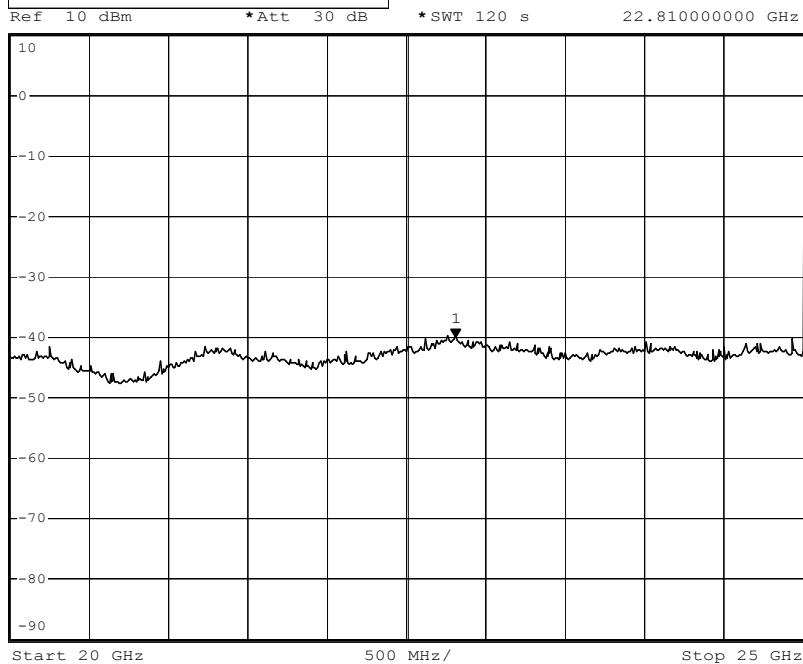
Date: 21.OCT.2004 13:08:30

Tx frequency: 2441MHz



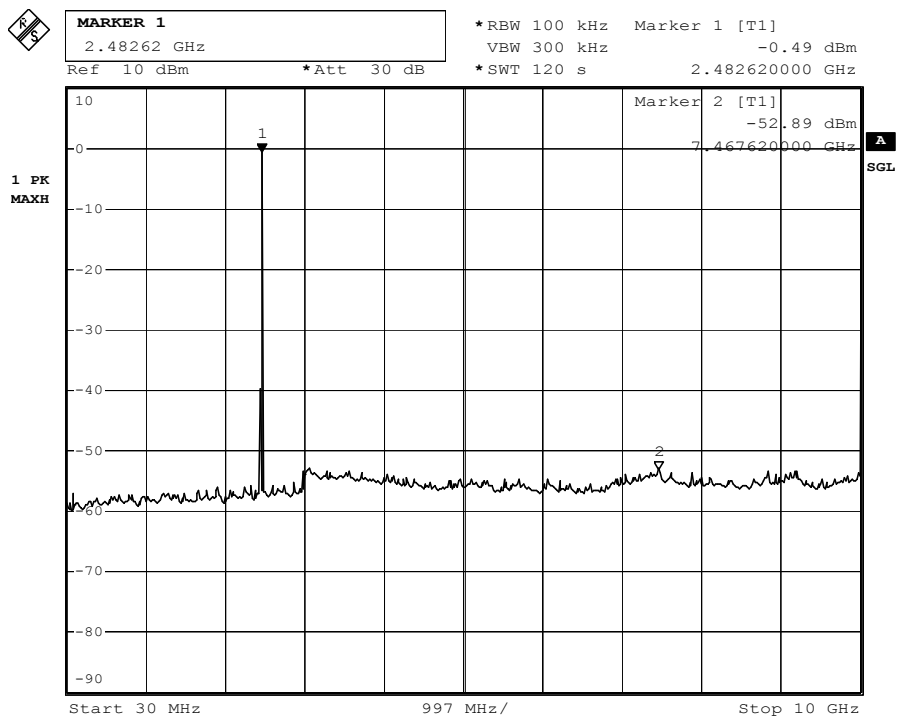
MARKER 1
22.81 GHz

*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz -39.72 dBm
*SWT 120 s 22.81000000 GHz



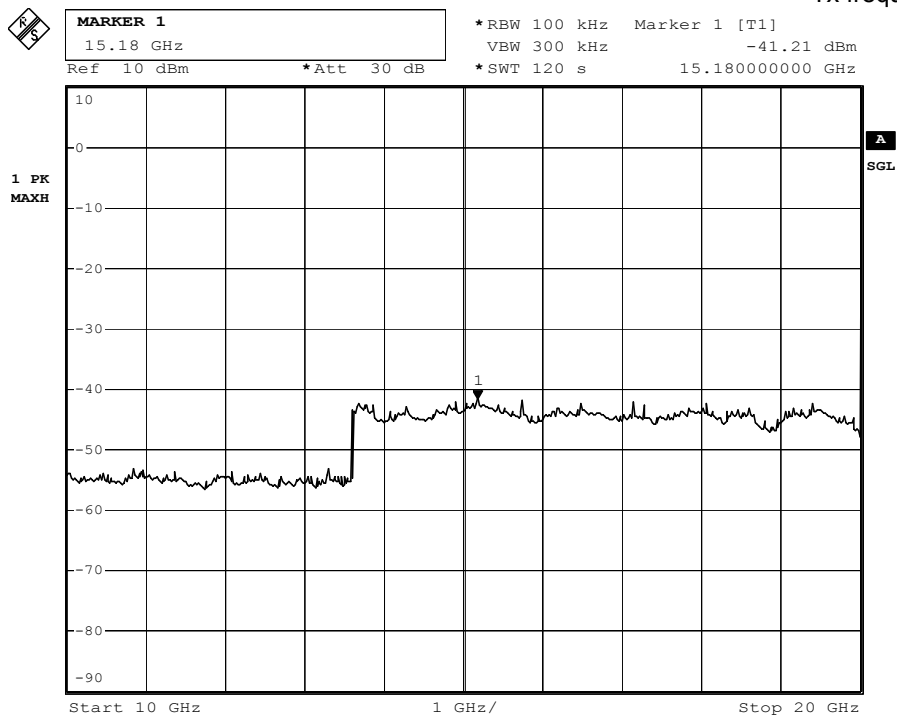
Date: 21.OCT.2004 13:15:01

Tx frequency: 2441MHz



Date: 21.OCT.2004 12:10:24

Tx frequency: 2480MHz



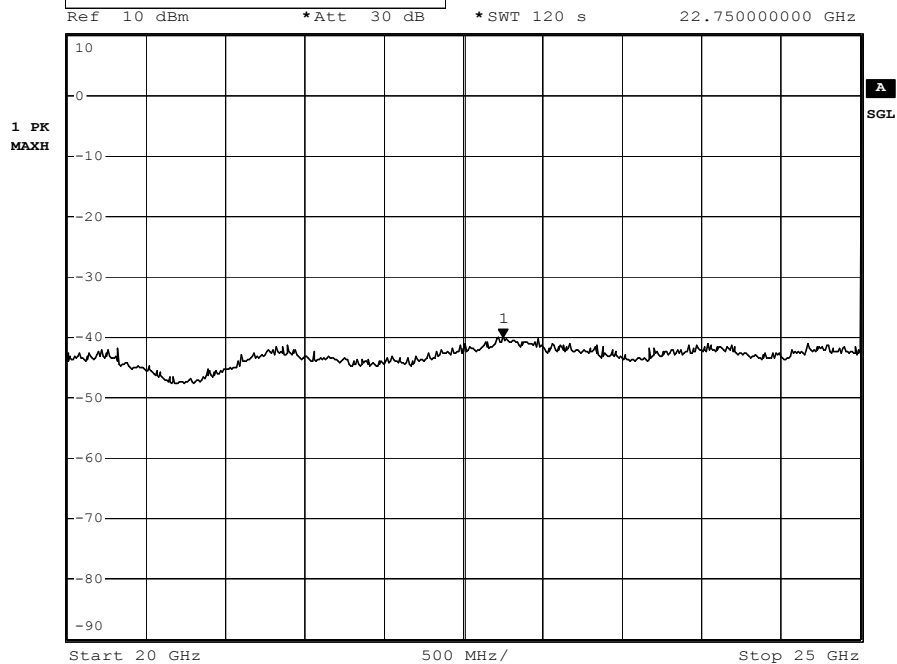
Date: 21.OCT.2004 12:16:28

Tx frequency: 2480MHz



MARKER 1
22.75 GHz

*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz -39.77 dBm
*SWT 120 s 22.75000000 GHz



Date: 21.OCT.2004 12:21:57

Tx frequency: 2480MHz

Spurious Emissions - Radiated

Date: 21 Oct 2004

EUT: SU-8W

Company: Nokia Corporation, Multimedia

Voltage supply: 3.0V, 2xAAA batteries

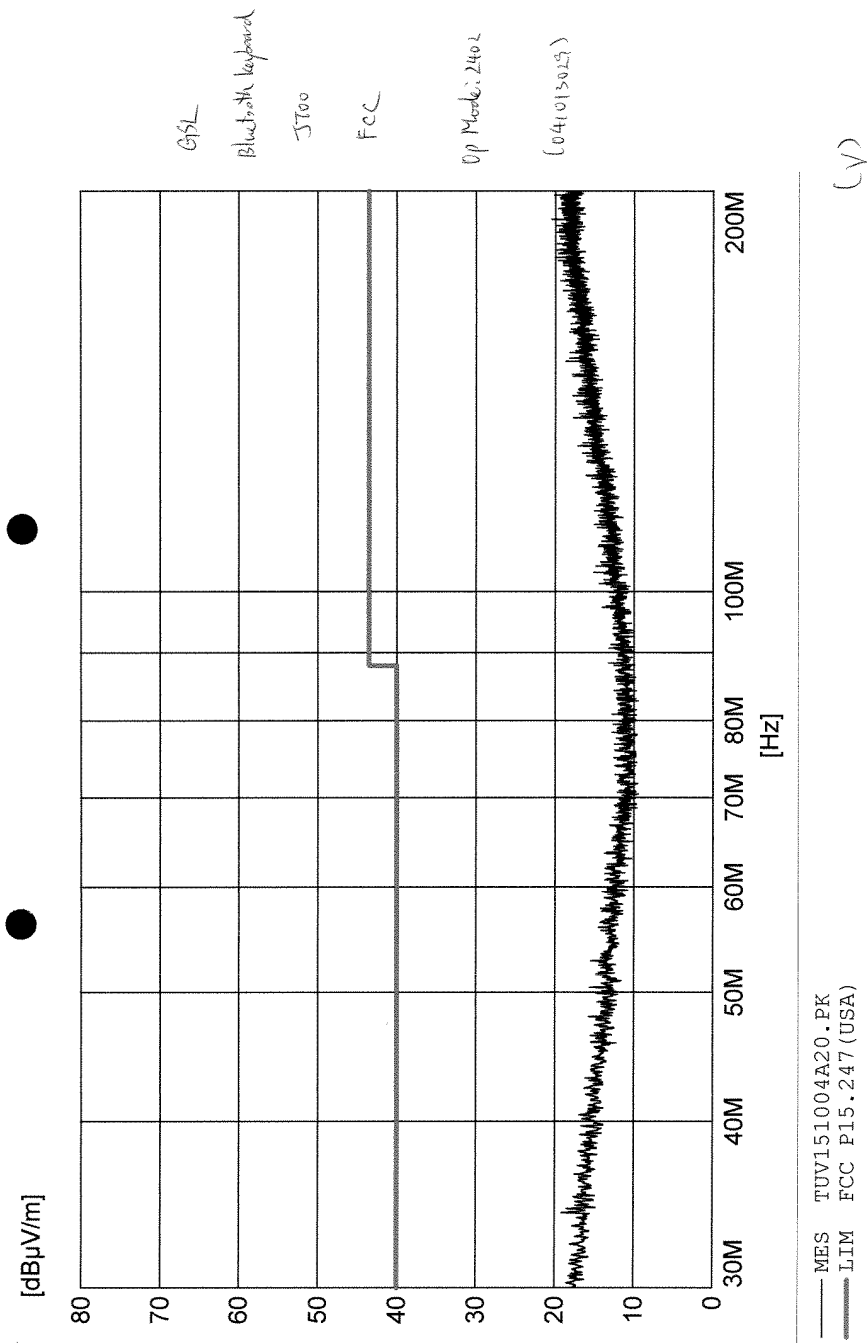
Test by: Hugo Wan

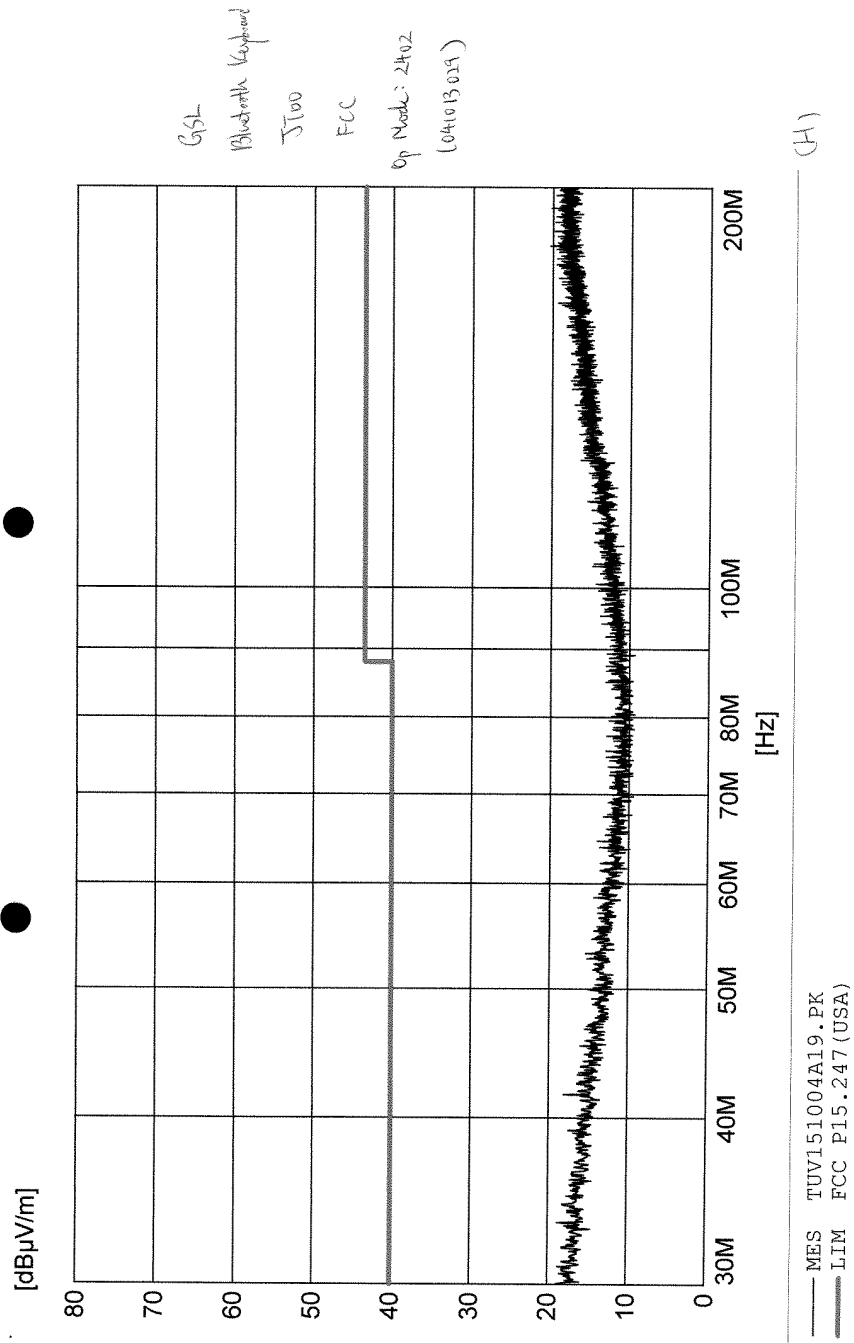
Op. mode: TX mode, DH1 with PRBS9 payload

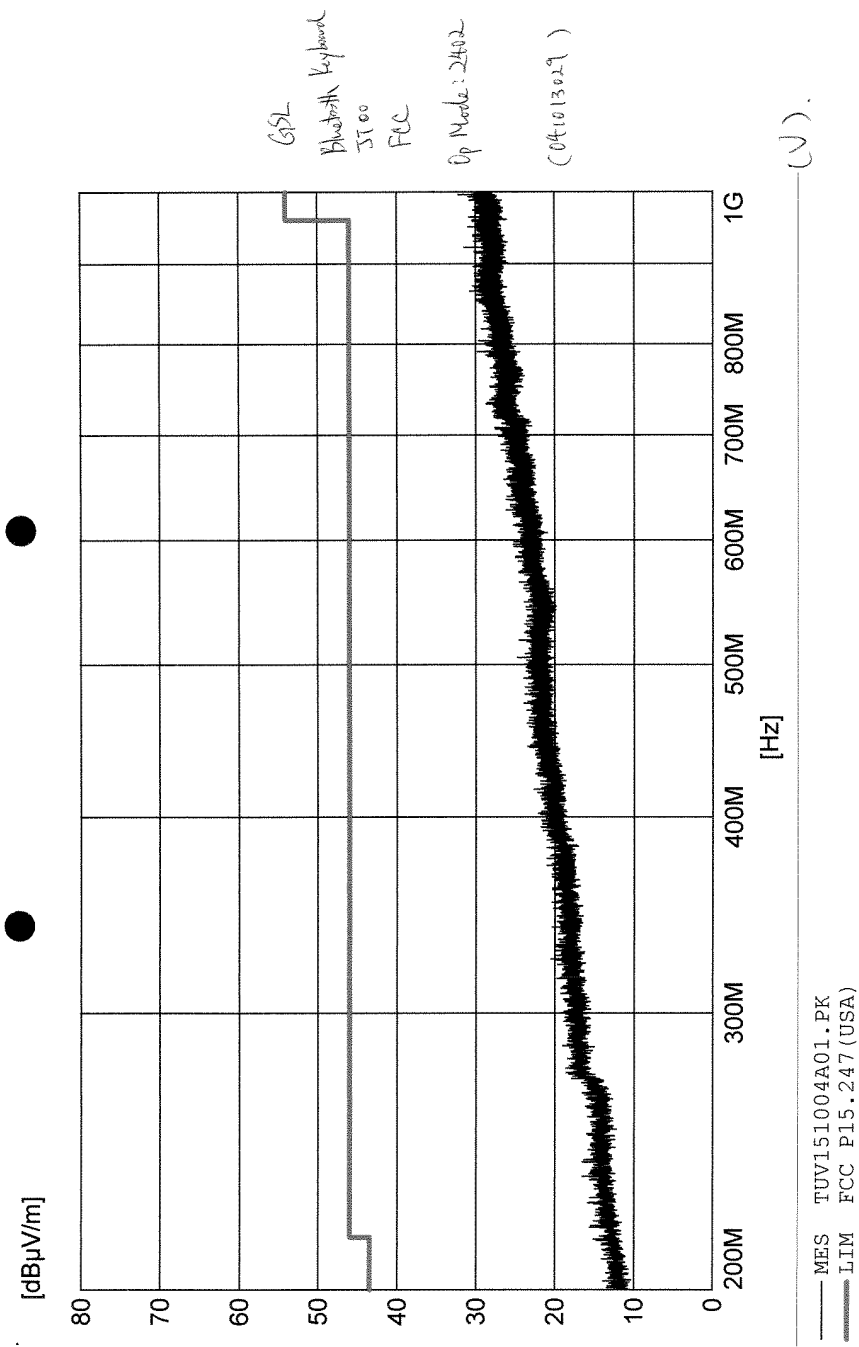
Tx frequency (MHz)	Polarization	Spurious Frequency (MHz)	Power Level (dBuV/m)	Detector (P/QP/A)
2402	-	No peak found	-	-

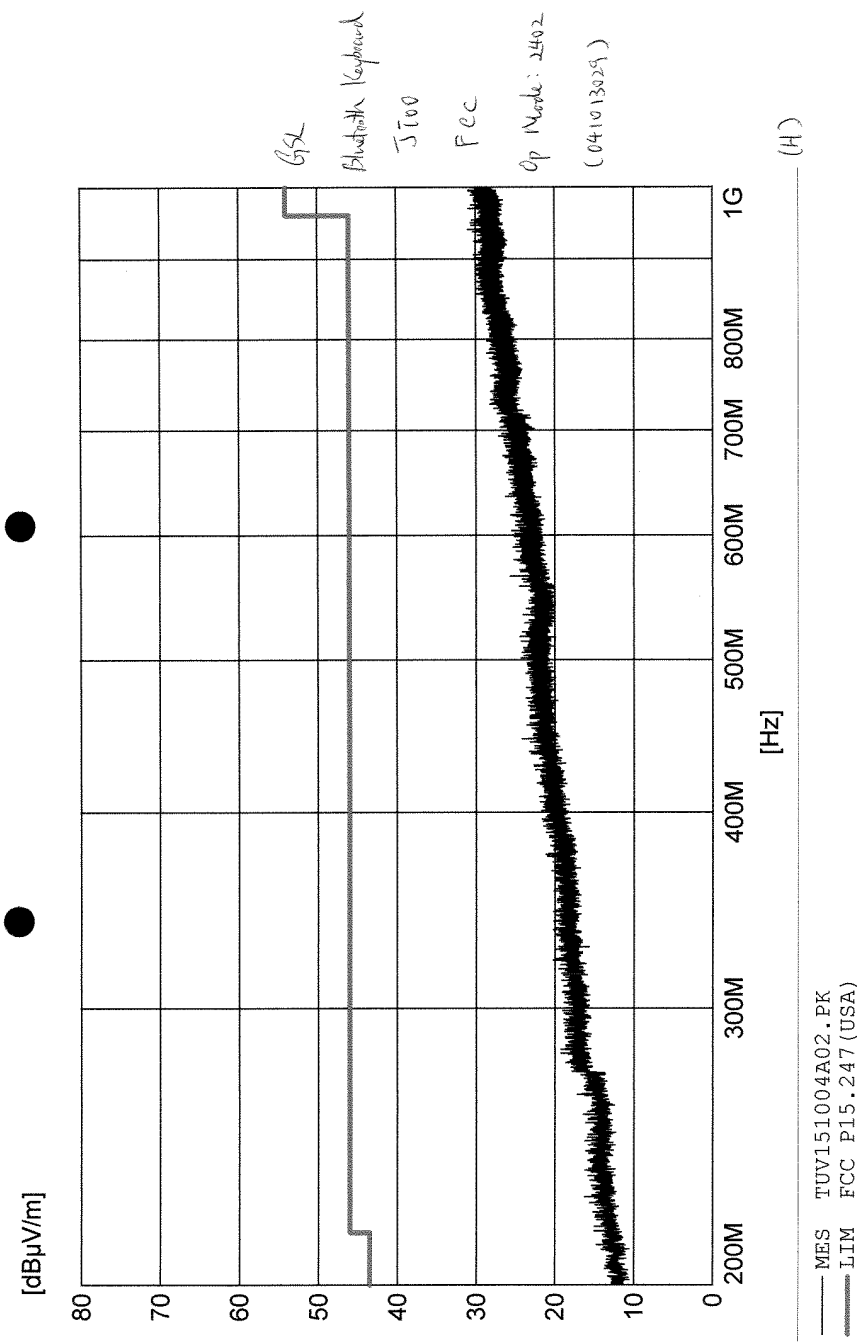
Tx frequency (MHz)	Polarization	Spurious Frequency (MHz)	Power Level (dBuV/m)	Detector (P/QP/A)
2441	-	No peak found	-	-

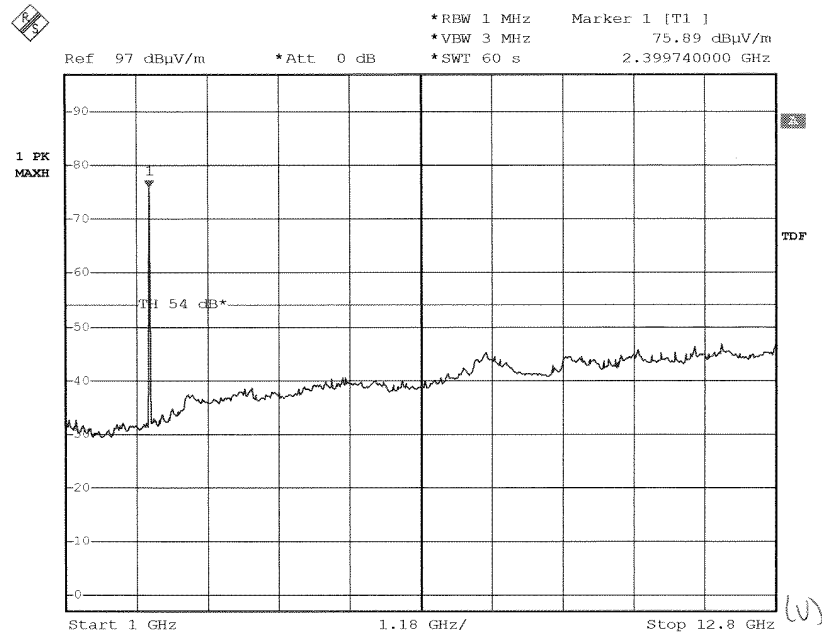
Tx frequency (MHz)	Polarization	Spurious Frequency (MHz)	Power Level (dBuV/m)	Detector (P/QP/A)
2480	-	No peak found	-	-











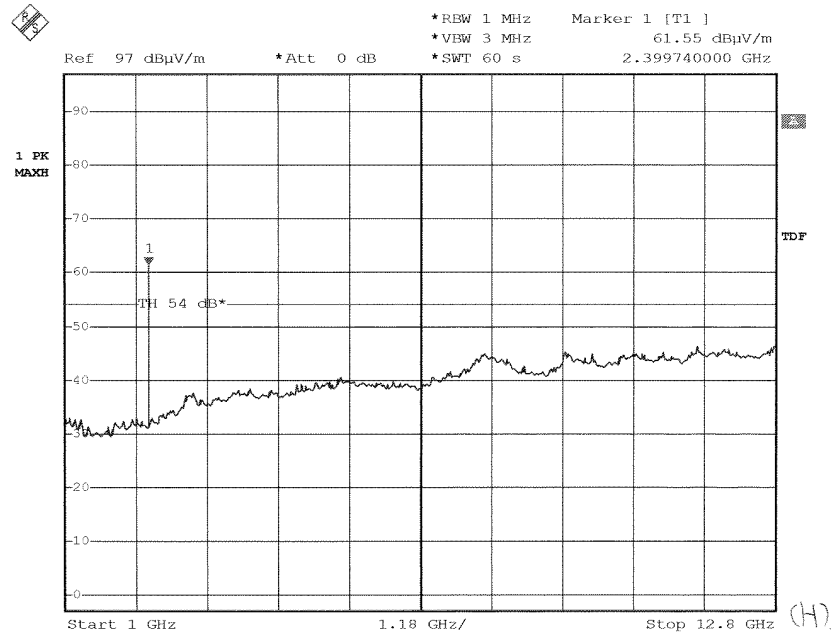
Date: 15.OCT.2004 20:05:38

GSL

Bluetooth Keyboard J100 (041013029)

FCC

Op Mode: 2402



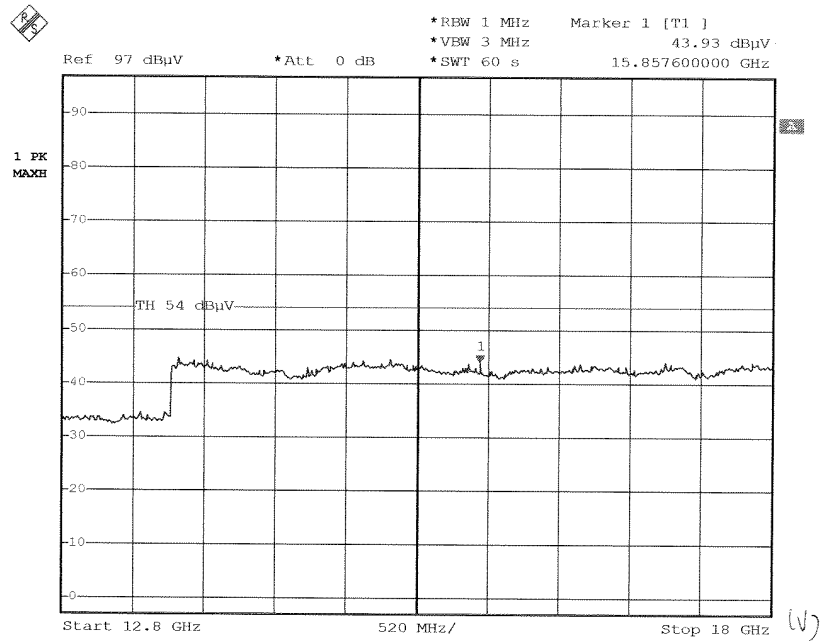
Date: 15.OCT.2004 20:03:04

GSL

Bluetooth Keyboard J100 (041013029)

FCC

Op Mode: 2402



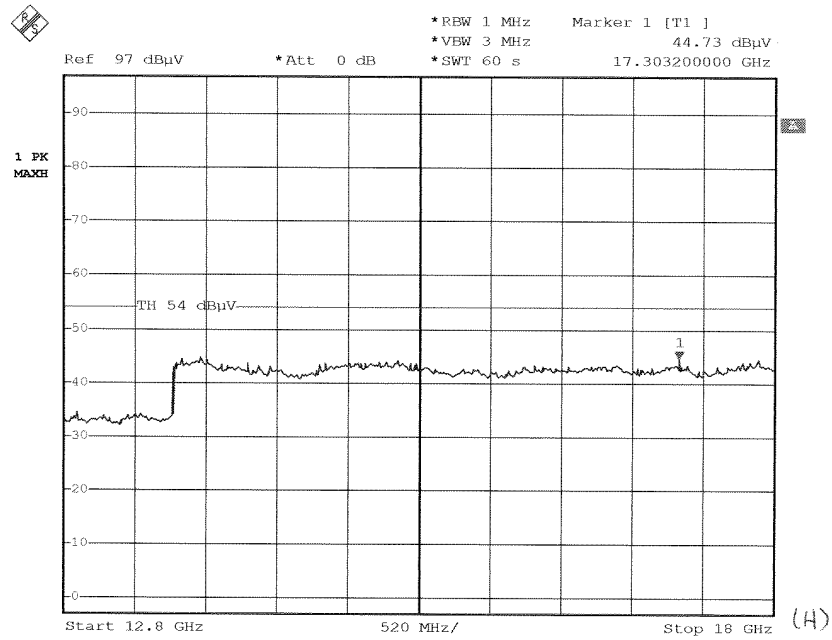
Date: 15.OCT.2004 20:08:44

GSL.

Bluetooth Keyboard JTB0 (041013029)

FCC

Op Mode: 2402



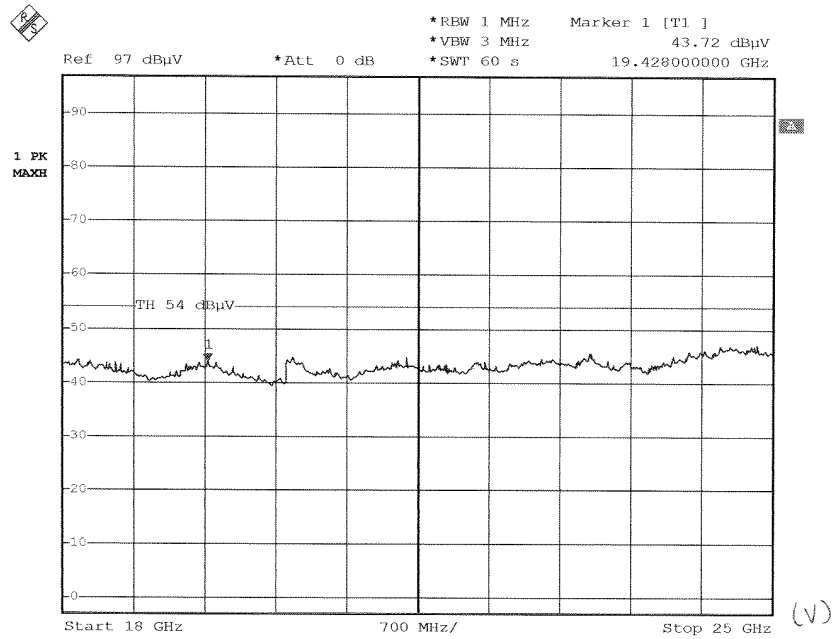
Date: 15.OCT.2004 20:18:12

GSL

Bluetooth Keyboard J700 (041013029)

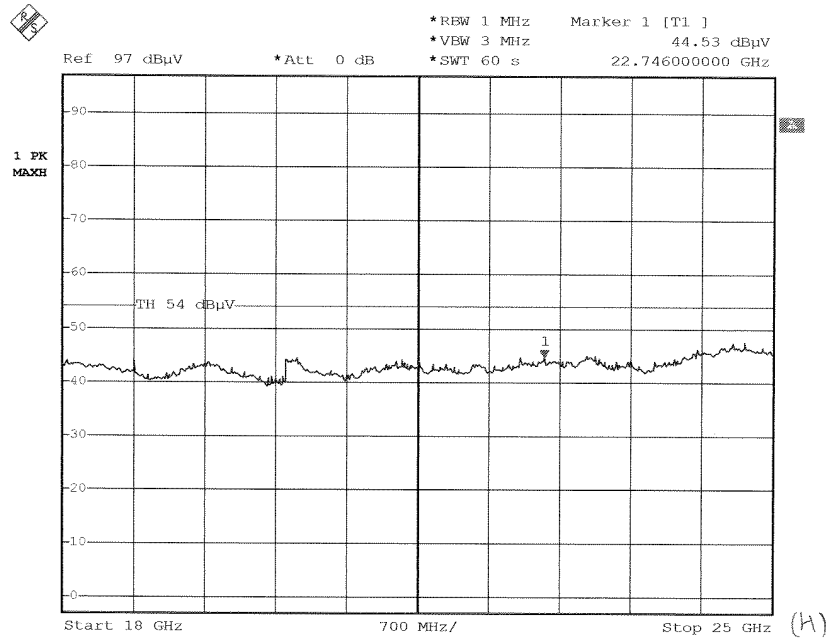
FCC.

Op Mode: 2402.



Date: 15.OCT.2004 20:43:46

G/L
 Bluetooth Keyboard J100 (041013029)
 FCC
 Op Mode: 2402



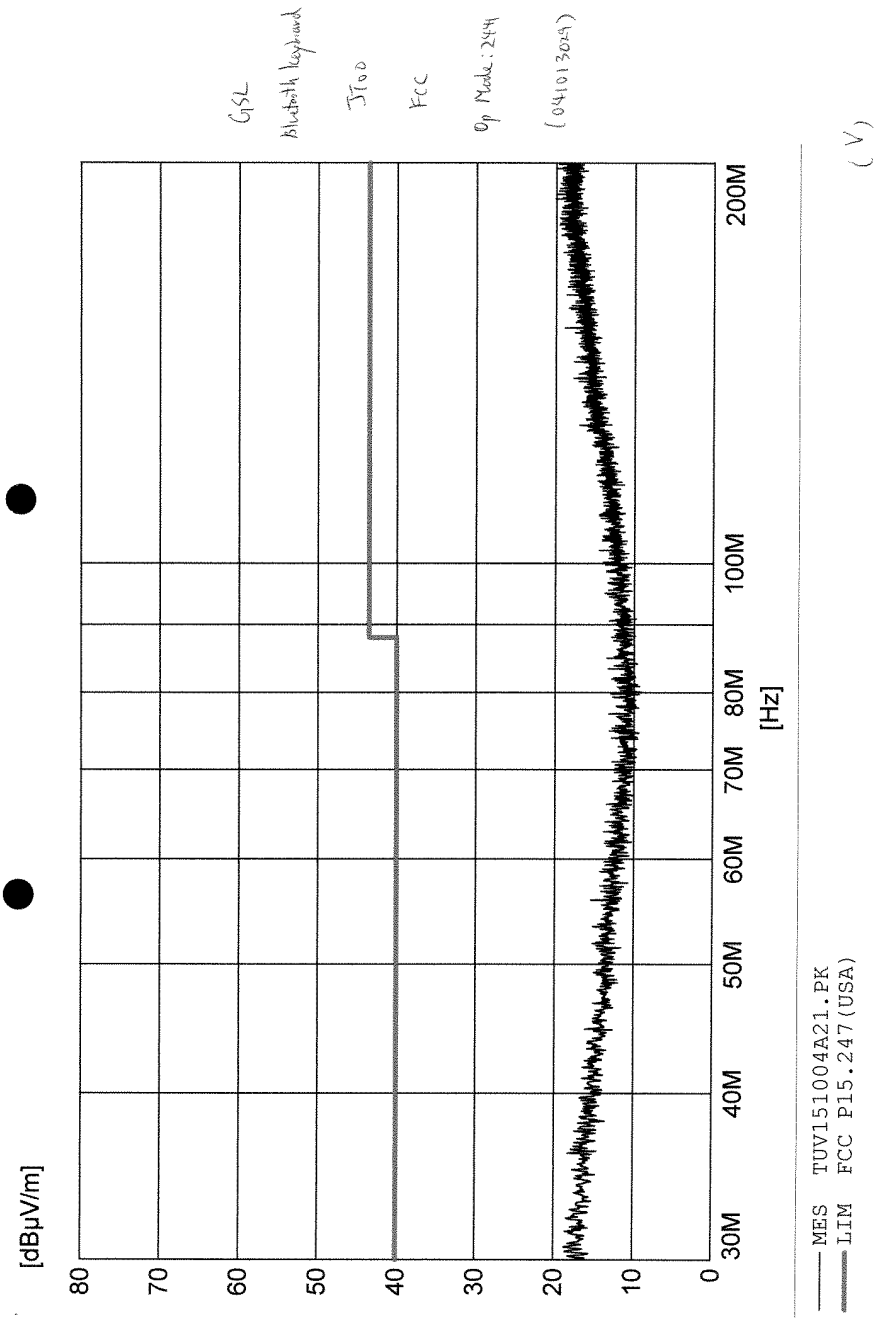
Date: 15.OCT.2004 20:47:38

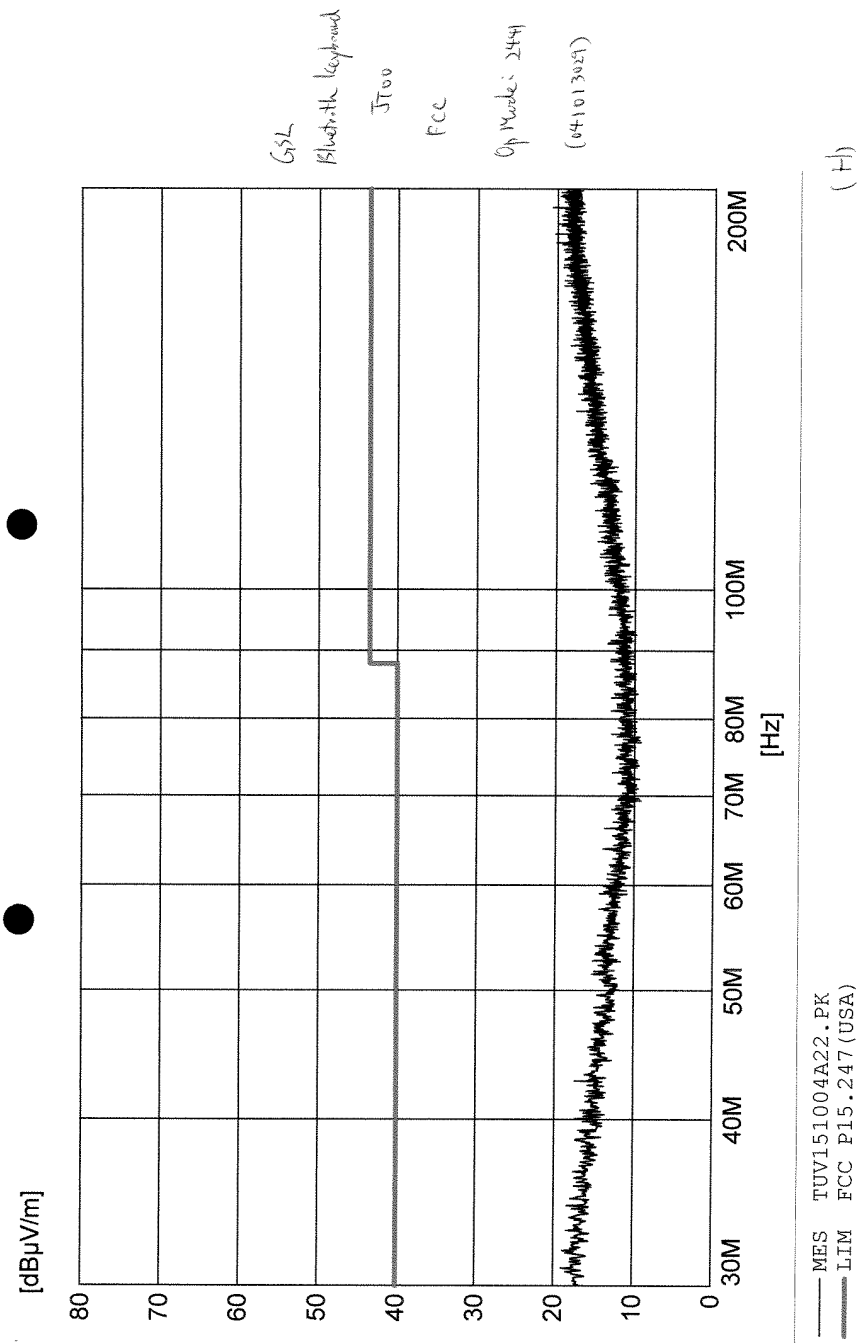
GSL

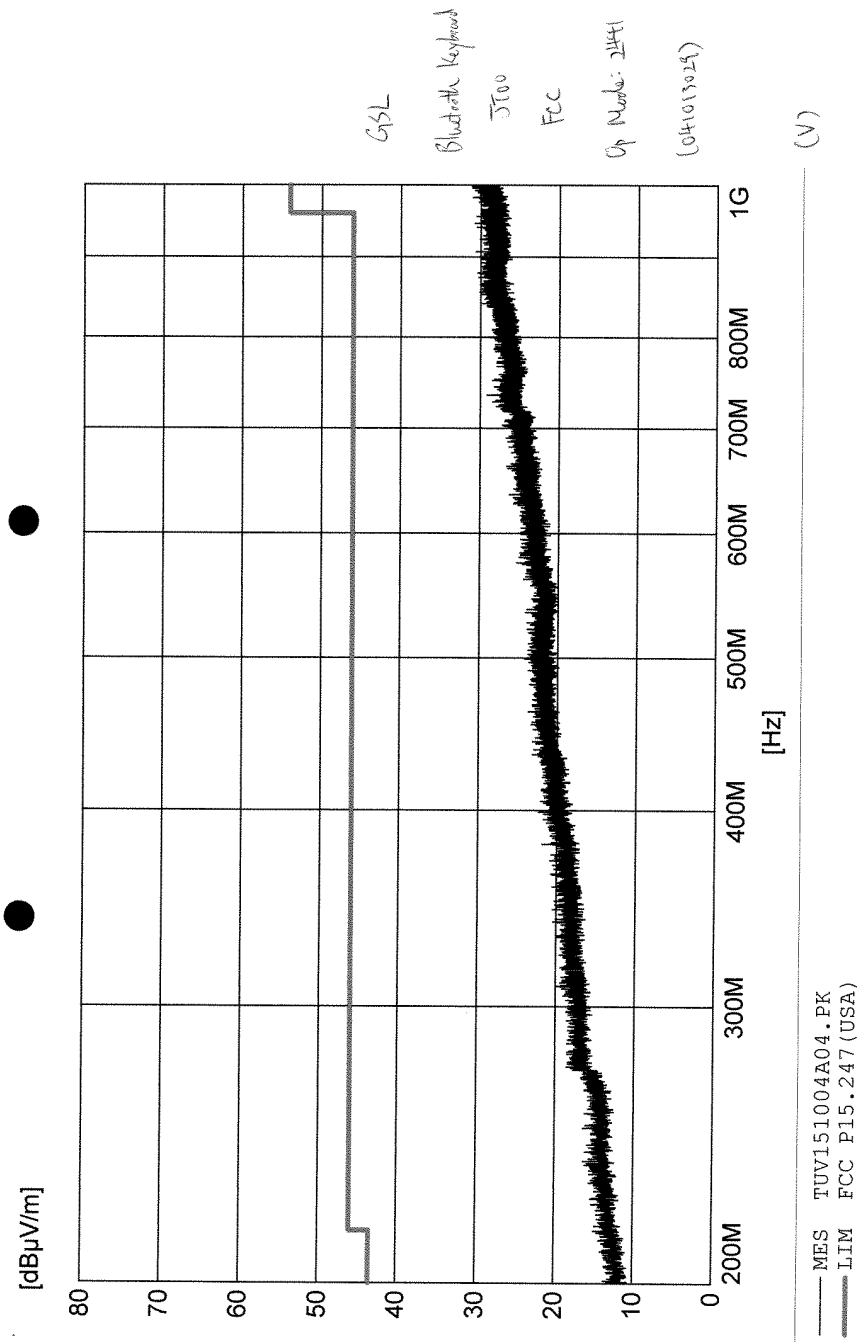
Bluetooth Keyboard J100 (044013029)

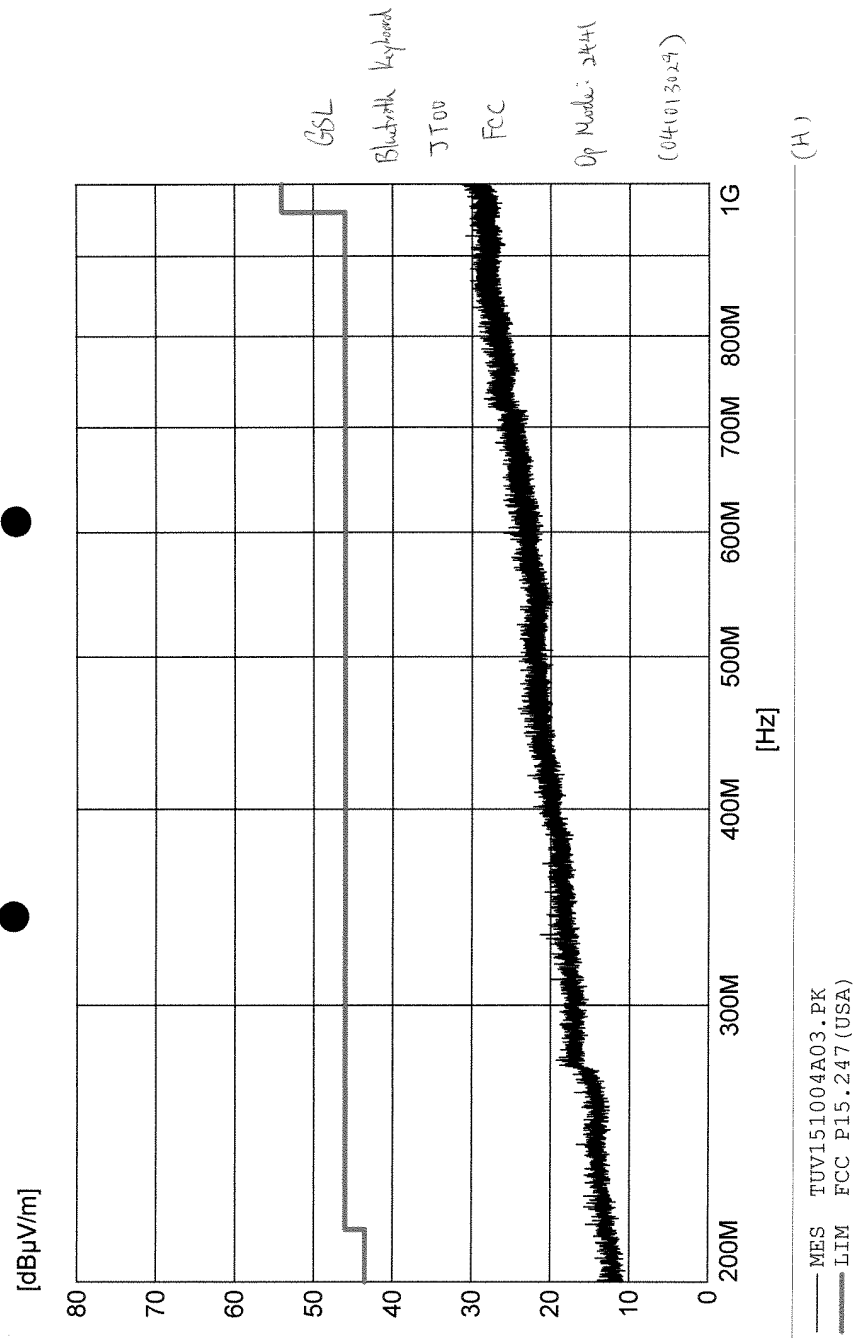
FCC

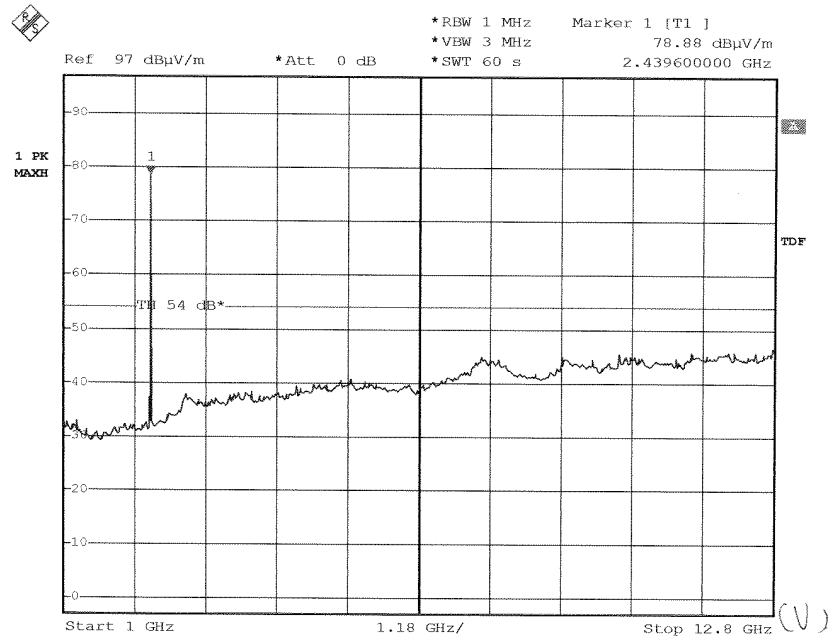
Op Mode: 2402.





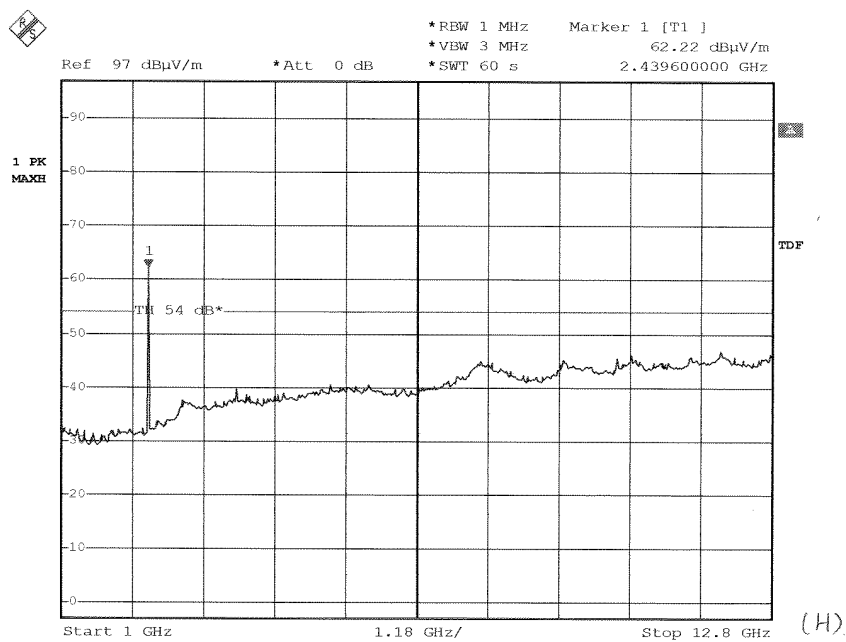






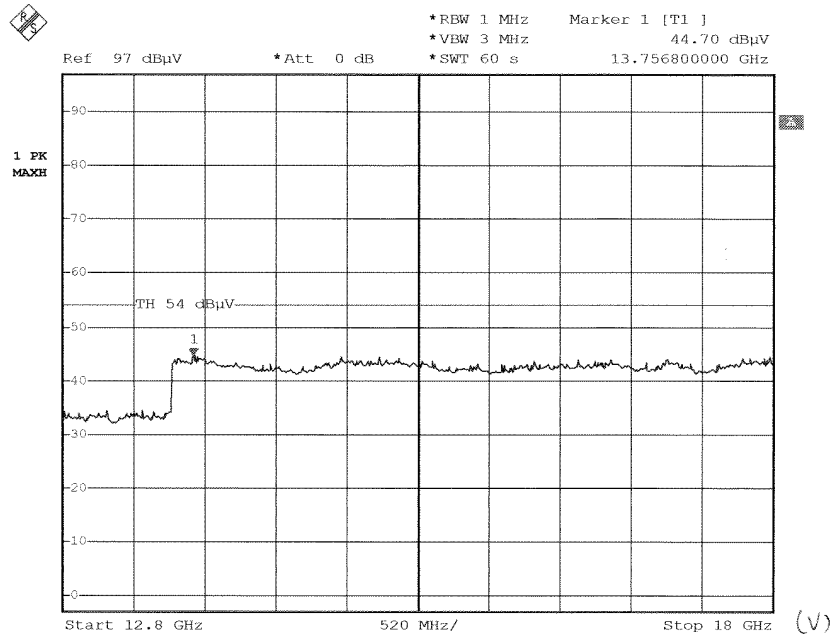
Date: 15.OCT.2004 20:20:48

GSL.
 Bluetooth Keyboard JTOU (041015029)
 FCC
 Op Mode: 2441.



Date: 15.OCT.2004 20:24:27

G152
Bluetooth Keyboard J100 (041013029)
FCC
Op Mode: 2441



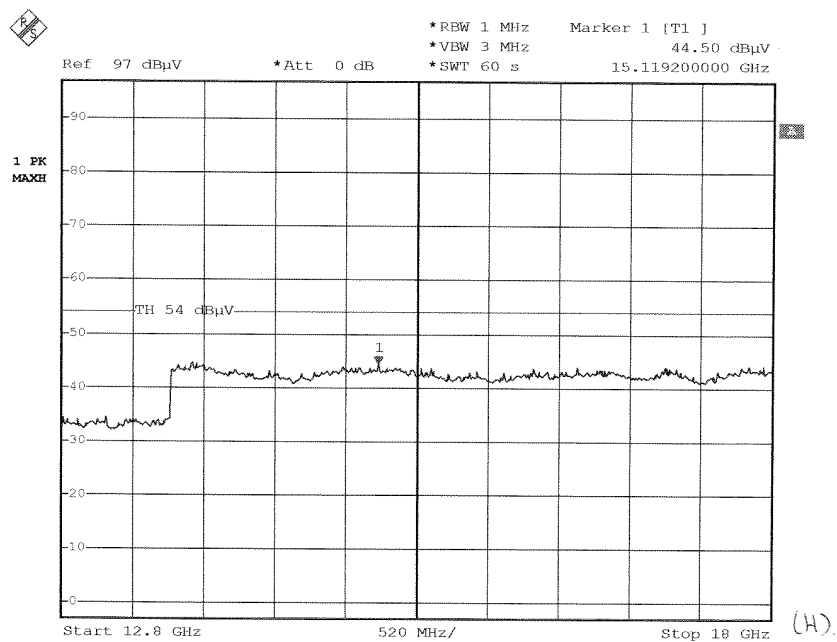
Date: 15.OCT.2004 20:12:24

GSL

Bluetooth Keyboard J100 (041013029)

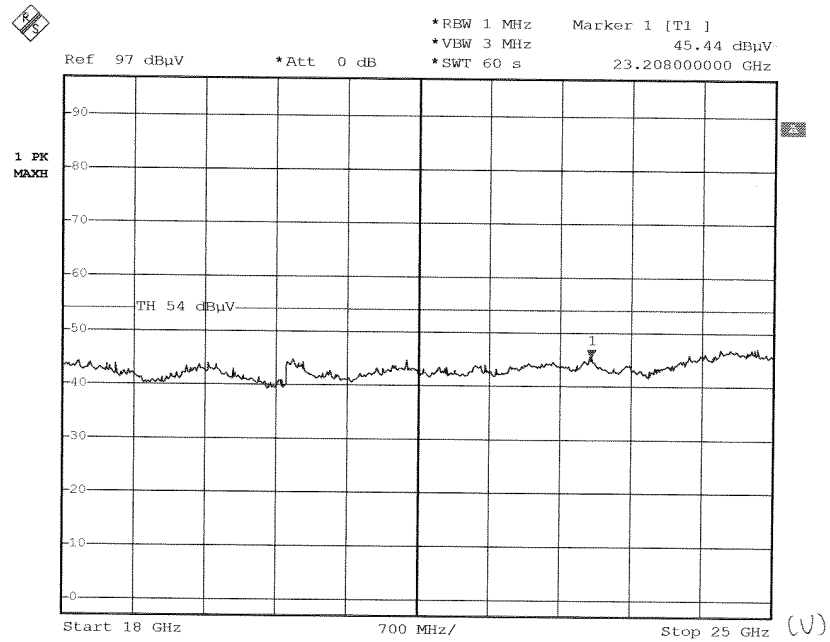
FCC

Op Mode: 24410



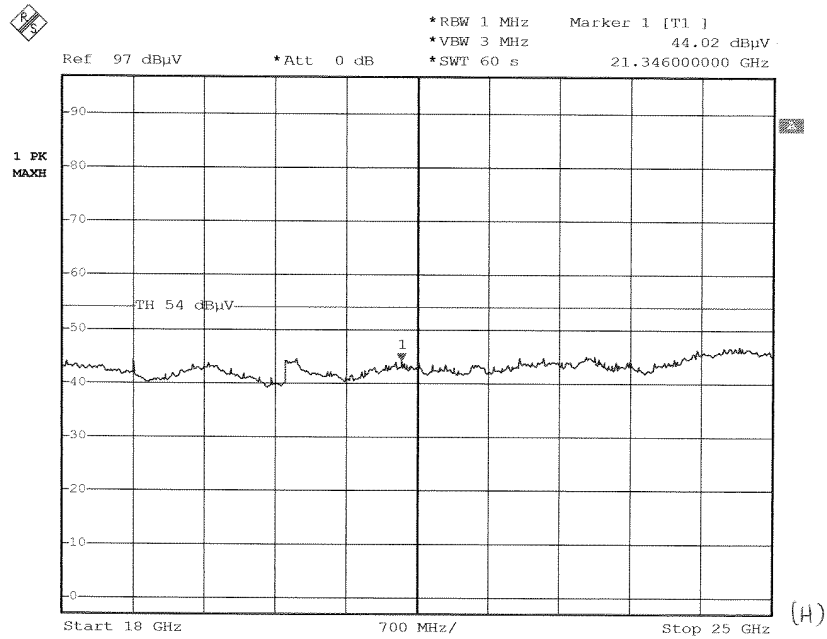
Date: 15.OCT.2004 20:11:18

GSL
 Bluetooth Keyboard J100 (04103029)
 FCC
 Op Mode: 2441



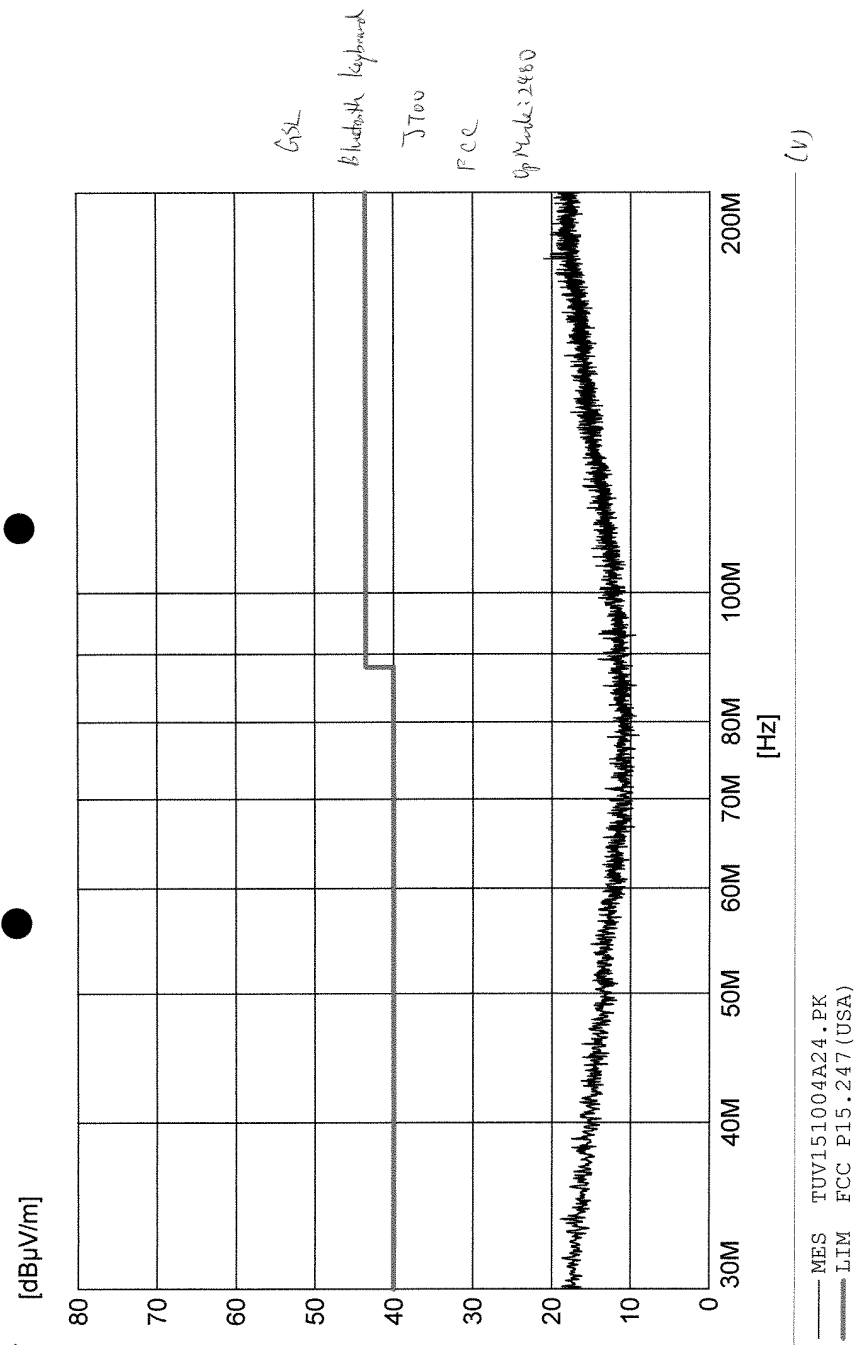
Date: 15.OCT.2004 20:42:54

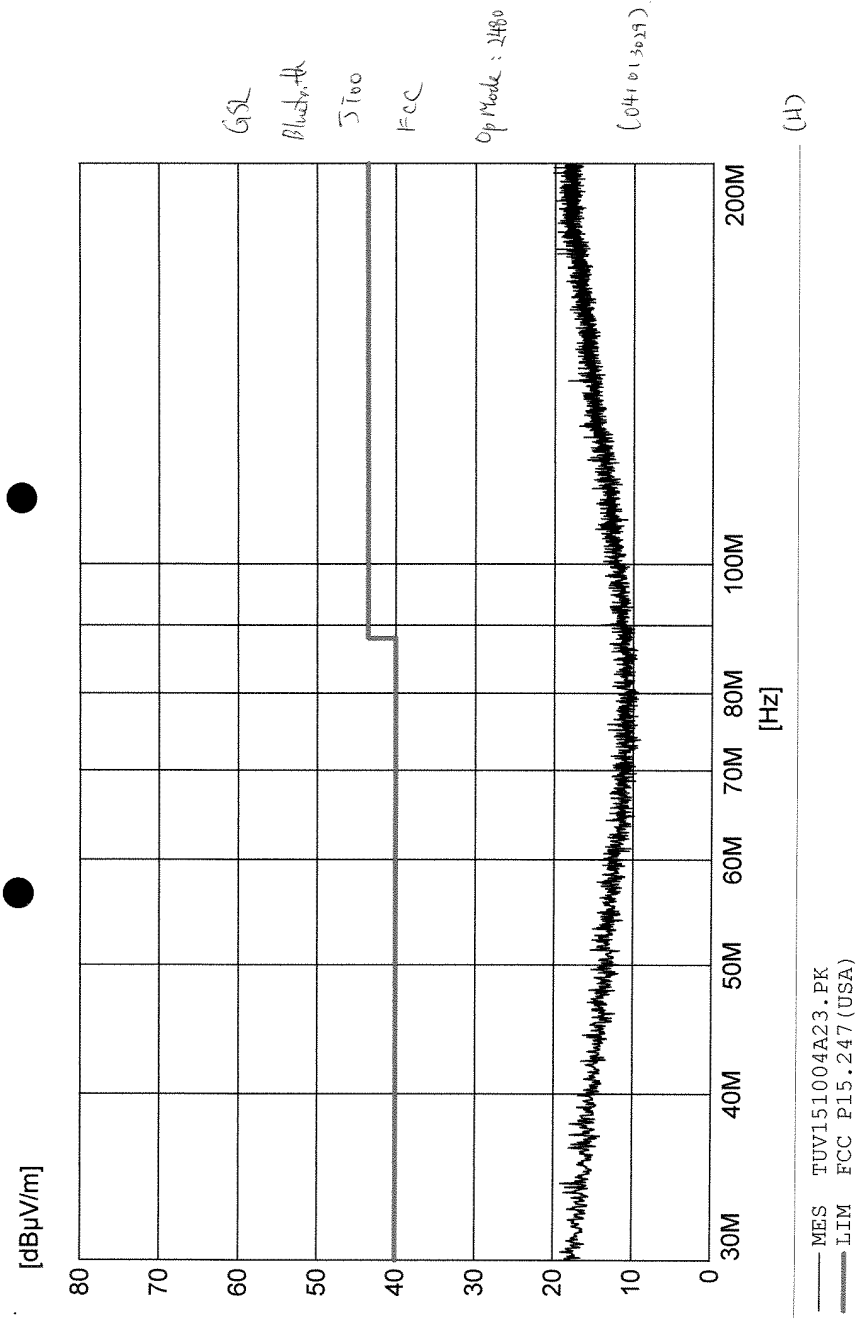
GSL
 Bluetooth Keyboard J100 (041013029)
 FCC
 Op Mode: 2441.

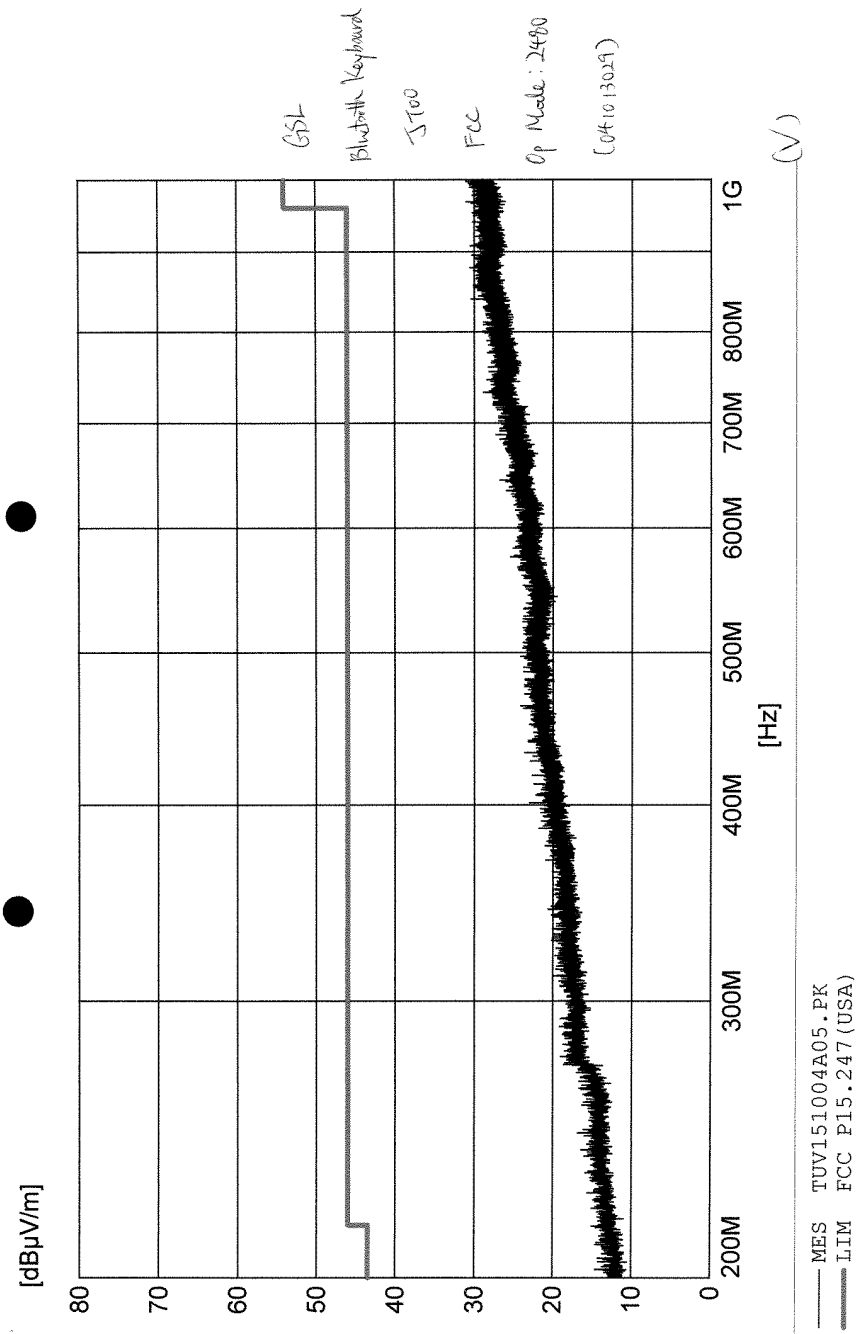


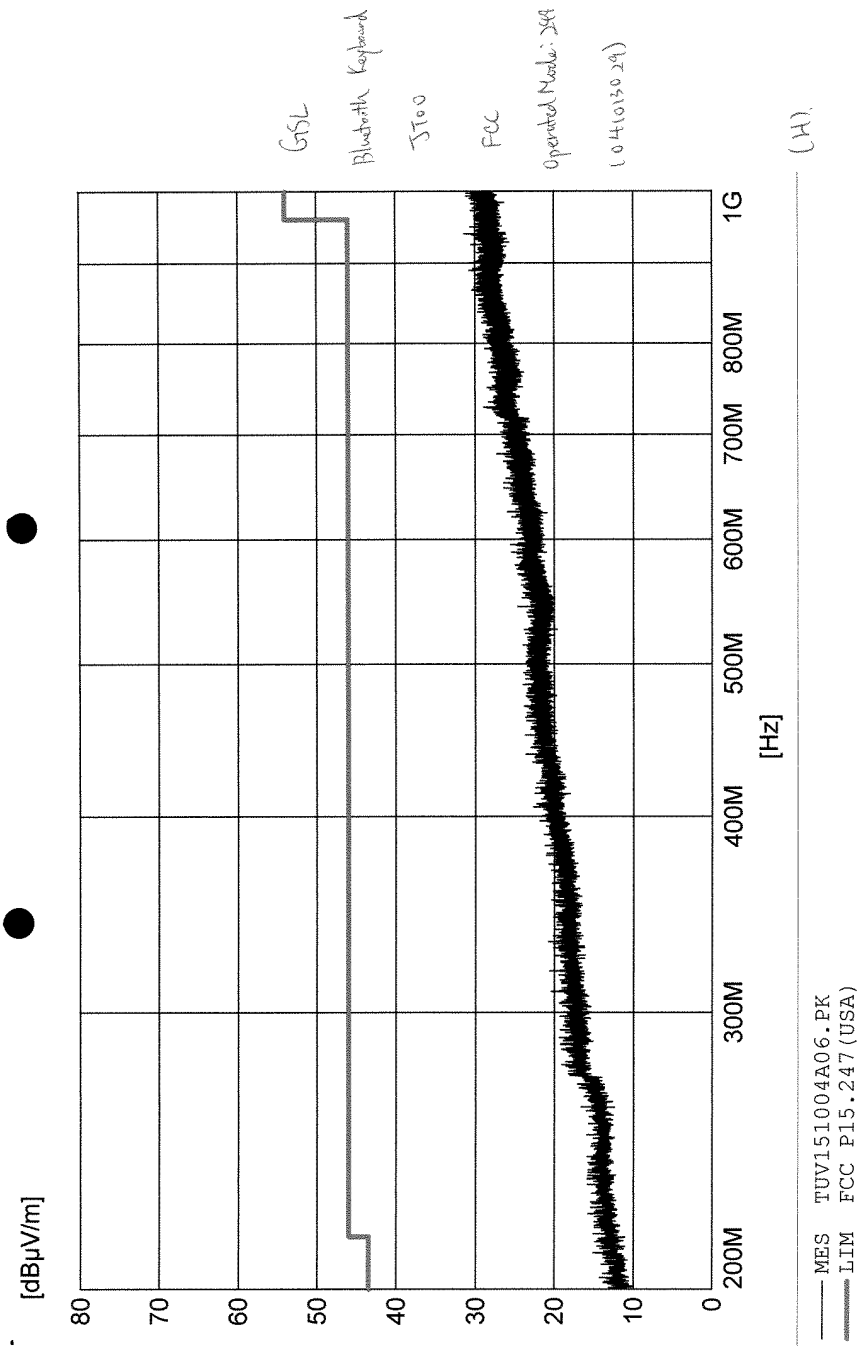
Date: 15.OCT.2004 20:47:07

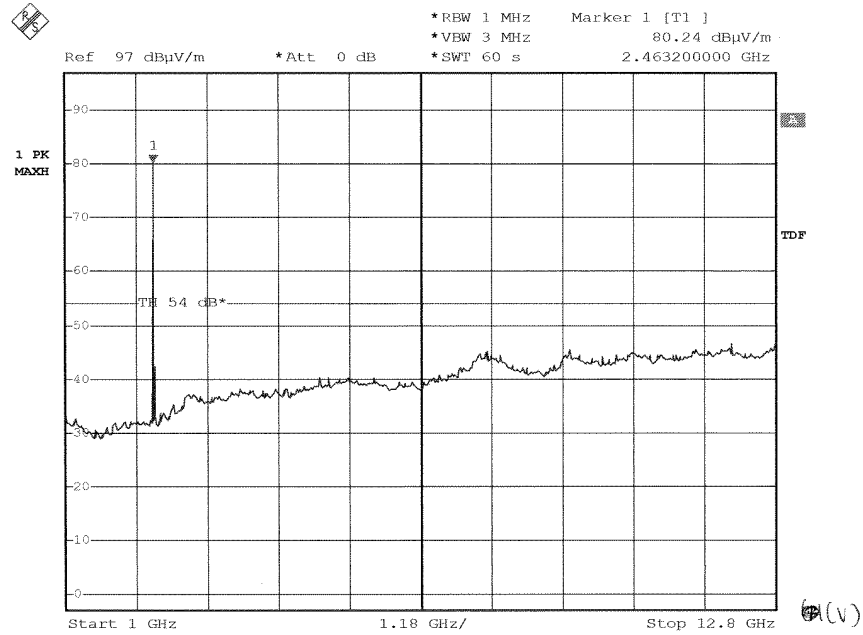
GSL
 Bluetooth Keyboard J100 (041013029)
 FCC
 Op Mode: 2441











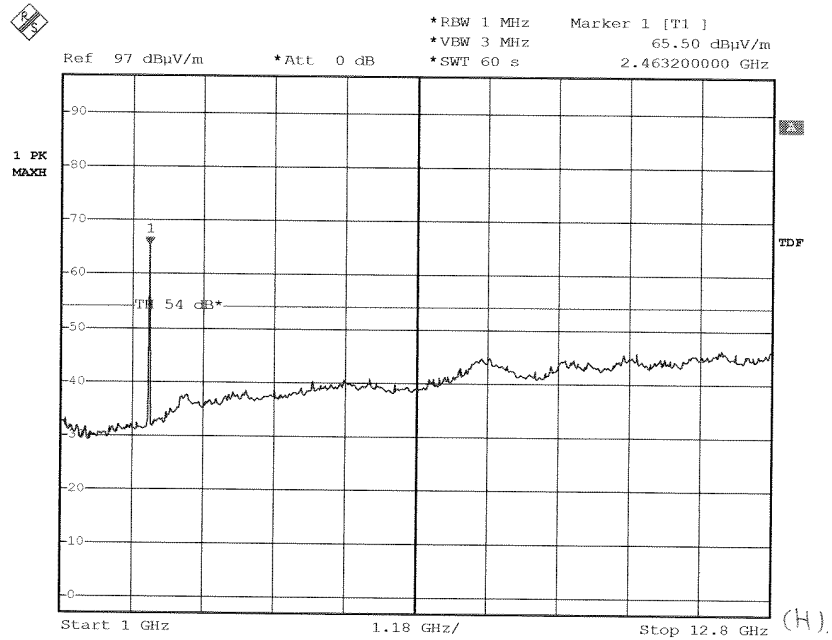
Date: 15.OCT.2004 20:31:42

GSL

Bluetooth Keyboard J100 (041013029)

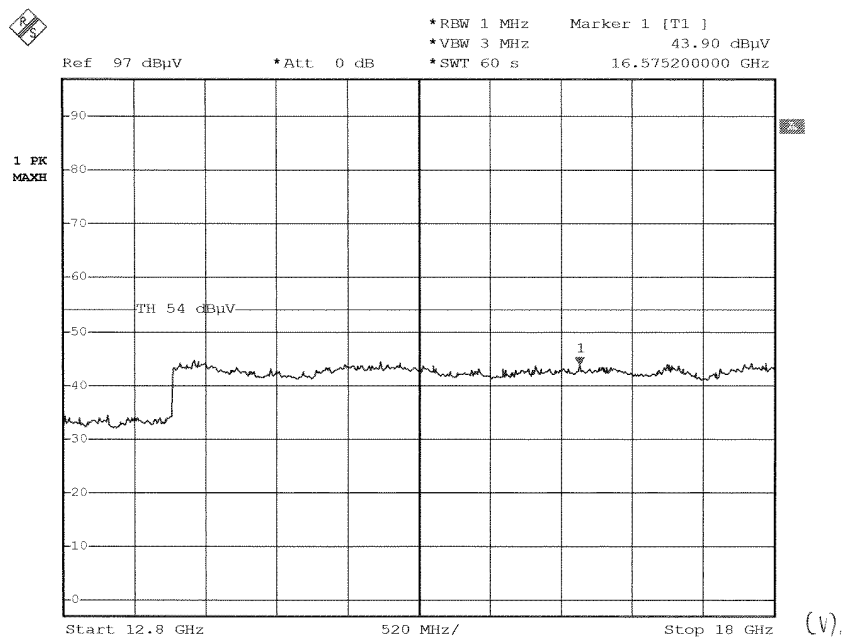
FCC

Op Mode: 2400



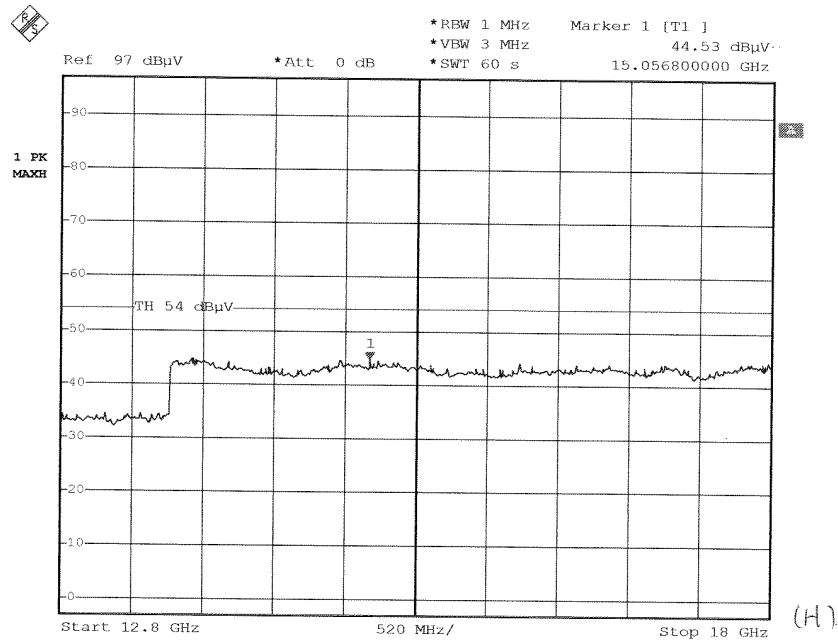
Date: 15.OCT.2004 20:28:34

GSL
 Bluetooth Keyboard J700 (041013029)
 FCC
 Op Mode: 2480.



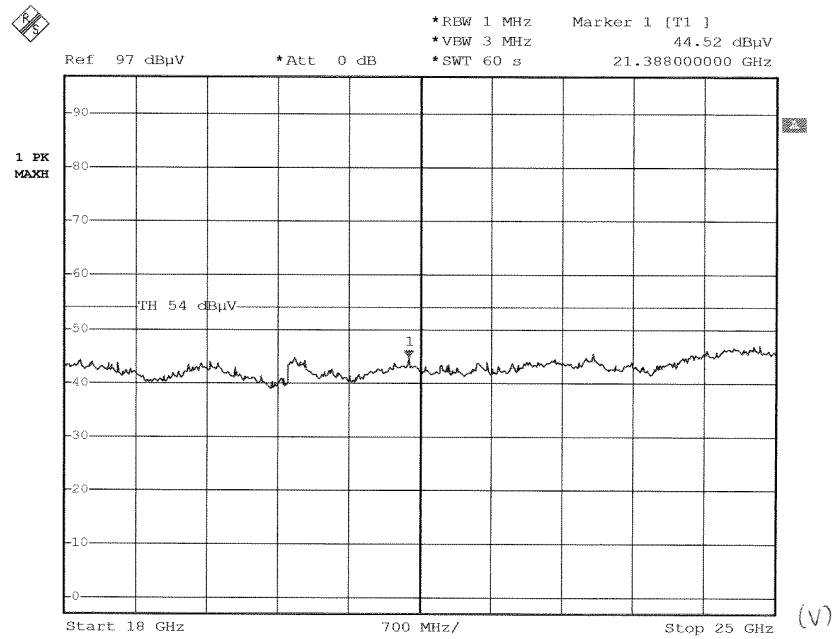
Date: 15.OCT.2004 20:11:42

GSL
 Bluetooth Keyboard J100 (041013025)
 FCC.
 Op Mode: 2400



Date: 15.OCT.2004 20:14:05

GSL
Bluetooth Keyboard J700 (641613029)
Fcc.
Op Mode: 2480



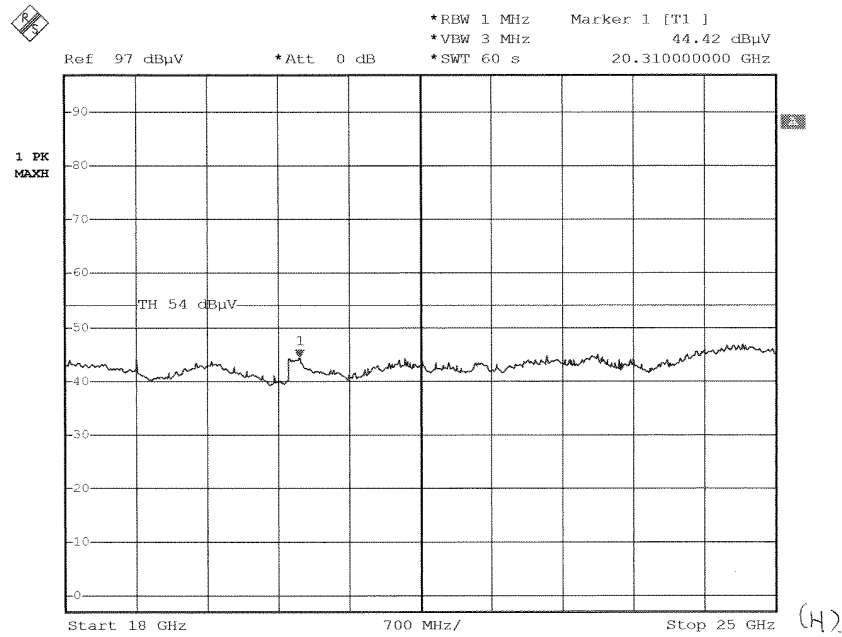
Date: 15.OCT.2004 20:42:06

GSL

Bluetooth Keyboard J100 (041013029)

Fcc

Op Mode: 2400



Date: 15.OCT.2004 20:46:48

GSL
Bluetooth Keyboard JTV0 (041013029)
FCC
Op Mode: 2480.