

Product Name	:	MEGA BOOK
Model No.	:	MS-1022, S425, S425B
FCC ID.	:	I4L-MD560B-01

Applicant : MICRO-STAR INT'L CO., LTD

Address : No.69,Li-De St,Jung-He City ,Taipei Hsien 235,Taiwan

Date of Receip	t :	July 29, 2005
Issued Date	:	Sep. 19, 2005
Report No.	:	058L036FI

The Test Results relate only to the samples tested.

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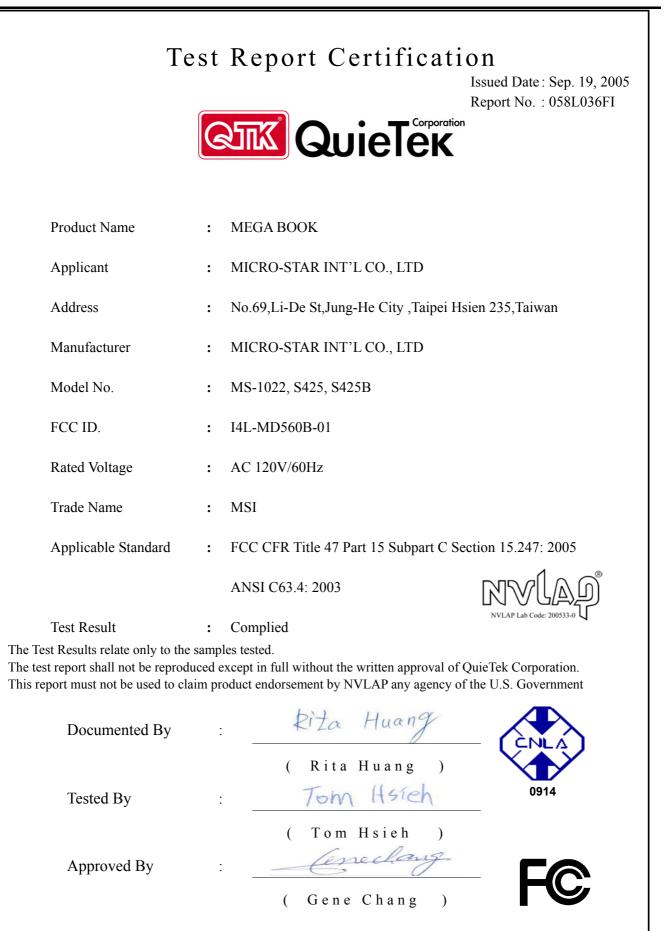


TABLE OF CONTENTS

	Description	Page
1.	GENERAL INFORMATION	5
1.1.	EUT Description	5
1.2.	Operational Description	
1.3.	Tested System Details	
1.4.	Configuration of Tested System	
1.5.	EUT Exercise Software	7
1.6.	Test Facility	
2.	CONDUCTED EMISSION	9
2.1.	Test Equipment	9
2.2.	Test Setup	9
2.3.	Limits	9
2.4.	Test Procedure	
2.5.	Uncertainty	
2.6.	Test Result of Conducted Emission	
3.	PEAK POWER OUTPUT	
3.1.	Test Equipment	
3.2.	Test Setup	
3.3.	Limit	
3.4.	Uncertainty	
3.5.	Test Result of Peak Power Output	14
4.	RADIATED EMISSION	15
4.1.	Test Equipment	
4.2.	Test Setup	
4.3.	Limits	
4.4.	Test Procedure	16
4.5.	Uncertainty	16
4.6.	Test Result of Radiated Emission	17
5.	BAND EDGE	23
5.1.	Test Equipment	
5.2.	Test Setup	
5.3.	Limit	
5.4.	Test Procedure	
5.5.	Uncertainty	
5.6.	Test Result of Band Edge	
6.	CHANNEL NUMBER	
6.1.	Test Equipment	

QuieTer

6.2.	Test Setup	
6.3.	Limit	
6.4.	Uncertainty	
6.5.	Test Result of Channel Number	
7.	CHANNEL SEPARATION	32
7.1.	Test Equipment	
7.2.	Test Setup	
7.3.	Limit	
7.4.	Uncertainty	
7.5.	Test Result of Channel Separation	
8.	DWELL TIME	34
8.1.	Test Equipment	
8.2.	Test Setup	
8.3.	Limit	
8.4.	Uncertainty	
8.5.	Test Result of Dwell Time	
9.	OCCUPIED BANDWIDTH	
9.1.	Test Equipment	
9.2.	Test Setup	
9.3.	Limits	
9.4.	Uncertainty	
9.5.	Test Result of Occupied Bandwidth	
10.	EMI REDUCTION METHOD DURING COMPLIANCE TESTING	41
Attach	ment 1: EUT Test Photographs	

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	: MEGA BOOK
Trade Name	: MSI
FCC ID.	: I4L-MD560B-01
Model No.	[:] MS-1022, S425, S425B
Frequency Range	: 2400 - 2483.5MHz
Antenna Gain	Refer to the table "Antenna List"
Channel Number	: 79
Type of Modulation	: Frequency Hopping Spread Spectrum
Antenna Type	: Connector
Channel Control	: Auto
Power Adapter	 FSP Group Inc., FSP090-1ADC21 Cable Out: Non-Shielded, 1.8m, with two ferrite cores bonded Power Cord: Non-Shielded, 1.8m

Antenna List

No.	Manufacturer	Model No.	Part No.	Peak Gain
1	High-Tek	MS-1022	S79-1800210-H39	-2.92dBi

Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Note:

- 1. The EUT is including three models, The MS-1022 for MSI and the S425, S425B PRO for different marketing requirement.
- 2. This device is MEGA BOOK including a 2.4GHz receiver and a 2.4GHz transmitter of Bluetooth.
- These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
- 3. Regards to the frequency band operation; the lowest

 middle and highest frequency of channel were selected to perform the test, then shown on this report.
- 4. This device is a composite device in accordance with Part 15 Subpart B regulations. The function for the receiver was measured and made a test report that the report number is 058L036F, certified under Declaration of Conformity.
- 5. QuieTek had verified among construction and function in typical operation, then shown in this test report.

1.2. Operational Description

The EUT is a MEGA BOOK with 79 channels.

This device provides wireless technology that revolutionizes personal connectivity. It is the solution for the seamless integration of Bluetooth technology into personal computer enabling short-range wireless connections between desktop/laptop computers, Bluetooth-enabled peripherals, and portable handheld devices.

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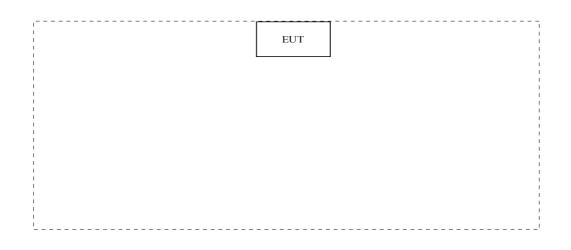
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
(1)	N/A	N/A	N/A	N/A	N/A	N/A

Signa	ıl Cable Type	Signal cable Description
A.	N/A	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT and simulators as shown on 1.4
- (2) Turn on the power of all equipment.
- (3) Messages will be transmitted and received through EUT.
- (4) Test is based on the mandatory continuous transmitter.
- (5) Repeat the above procedure (3) to (4).

1.6. Test Facility

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description:	June 22, 2001 File on Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046 Reference 31040/SIT1300F2	0914
Site Name:	July 03, 2001 Accreditation on NVLAP NVLAP Lab Code: 200533-0 Quietek Corporation	FC
Site Address:	No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C. TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : <u>service@quietek.com</u>	NVLAP Lab Code: 200533-0



2. Conducted Emission

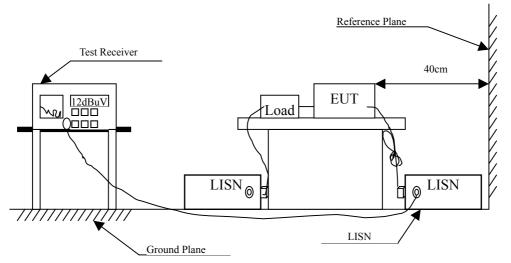
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2005	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2005	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2005	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2005	
5	No.1 Shielded Room	m		N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit			
Frequency	Limits		
MHz	QP	AV	
0.15 - 0.50	66-56	56-46	
0.50-5.0	56	46	
5.0 - 30	60	50	

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

The measurement uncertainty is defined as $\pm 2.02 \text{ dB}$

2.6. Test Result of Conducted Emission

	Product Test Item Power Line Test Mode	 MEGA BOOK Conducted Emission Test Line 1 Mode 1: Transmitter (Channel 39) 				
	Frequency	Correct	Reading	Measurement	Margin	Limit
		Factor	Level	Level		
	MHz	dB	dBuV	dBuV	dB	dBuV
	Quasi-Peak					
*	0.151	0.202	47.750	47.952	-18.019	65.971
	0.216	0.202	23.340	23.542	-40.572	64.114
	0.291	0.204	23.870	24.074	-37.898	61.971
	4.544	0.260	25.320	25.580	-30.420	56.000
	22.341	0.659	28.710	29.369	-30.631	60.000
	22.629	0.669	27.700	28.369	-31.631	60.000
	Average					
	0.151	0.202	28.250	28.452	-27.519	55.971
	0.216	0.202	21.890	22.092	-32.022	54.114
	0.291	0.204	19.440	19.644	-32.328	51.971
*	4.544	0.260	21.550	21.810	-24.190	46.000
	22.341	0.659	20.900	21.559	-28.441	50.000
	22.629	0.669	21.390	22.059	-27.941	50.000

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " * " means this data is the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor

	Product	: MEGA BOOK				
	Test Item Power Line	: Conducted Emission Test				
	Test Mode	: Line 2 : Mode 1: 7	Fransmitter (Cha	annel 30)		
	Test Widde	. Widde 1. 1		anner 59)		
	Frequency	Correct	Reading	Measurement	Margin	Limit
		Factor	Level	Level		
	MHz	dB	dBuV	dBuV	dB	dBuV
(Quasi-Peak					
*	0.154	0.202	47.250	47.452	-18.434	65.886
	0.219	0.202	21.920	22.122	-41.906	64.029
	0.439	0.206	21.730	21.936	-35.807	57.743
	1.246	0.216	17.680	17.896	-38.104	56.000
	4.636	0.262	24.790	25.052	-30.948	56.000
	22.584	0.733	28.710	29.443	-30.557	60.000
	Average					
	0.154	0.202	26.780	26.982	-28.904	55.886
	0.219	0.202	21.240	21.442	-32.586	54.029
	0.439	0.206	15.090	15.296	-32.447	47.743
	1.246	0.216	15.560	15.776	-30.224	46.000
*	4.636	0.262	21.280	21.542	-24.458	46.000
	22.584	0.733	20.790	21.523	-28.477	50.000

1. All Reading Levels are Quasi-Peak and average value.

2. " * " means this data is the worst emission level.

3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

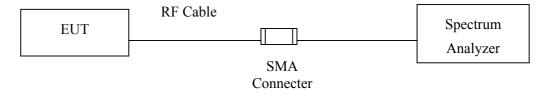
3.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup



3.3. Limit

The maximum peak power shall be less 1Watt.

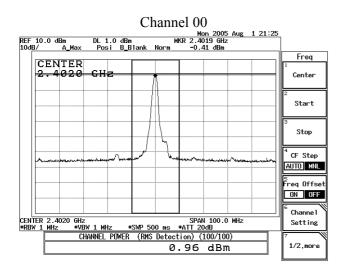
3.4. Uncertainty

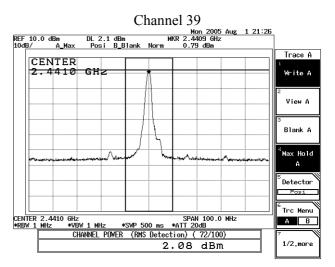
The measurement uncertainty is defined as \pm 1.27 dB

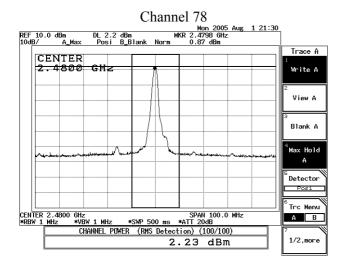
3.5. Test Result of Peak Power Output

Product	:	MEGA BOOK
Test Item	:	Peak Power Output
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
Channel 00	2402.00	0.96dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	2.08dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	2.23dBm	1 Watt= 30 dBm	Pass







Note:

1. Receiver setting (Peak Detector): RBW: 1MHz; VBW: 1MHz; Span: 100MHz \circ

4. Radiated Emission

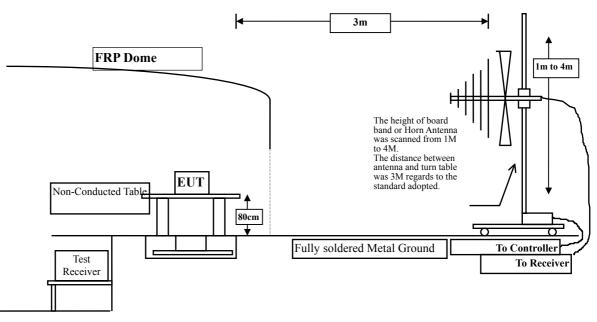
4.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	May, 2005
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2005
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2005
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Sep., 2005
Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	May, 2005
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2005
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2005
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	May, 2005
	Horn Antenna	ETS	3115 / 0005-6160	Sep., 2005
	Pre-Amplifier	QTK	QTK-AMP-01/0001	May, 2005
Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2005
	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2005
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2005
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2005
	Horn Antenna	ETS	3115 / 0005-6160	July, 2005
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2005

Note: 1. All equipments that need to calibrate are with calibration period of 1 year. 2. Mark "X" test instruments are used to measure the final test results.

4.2. Test Setup



4.3. Limits

General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits				
Frequency MHz	uV/m@3m dBuV/m@3n			
30-88	100	40		
88-216	150	43.5		
216-960	200	46		
Above 960	500	54		

Remarks: 1. RF Voltage $(dBuV) = 20 \log RF$ Voltage (uV)

- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field dtrength of harmonics measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

The frequency range from 30MHz to 10th harminics is checked.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as \pm 3.9 dB under 1G is defined as \pm 3.8 dB Product

Test Item

Test Site	: No.3 OA	ГS			
Test Mode	: Mode 1:	Transmitter (Char	nnel 00)		
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal Peak Detector:					
4804.116	3.663	39.632	43.295	-30.705	74.000
7186.784	9.304	37.838	47.142	-26.858	74.000
9608.116	11.842	37.141	48.983	-25.017	74.000
Average Detector:					
Vertical Peak Detector:					
4803.807	3.662	42.010	45.672	-28.328	74.000
7206.116	9.357	36.710	46.067	-27.933	74.000
9608.039	11.842	37.438	49.280	-24.720	74.000

4.6. Test Result of Radiated Emission

:

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MEGA BOOK

Harmonic Radiated Emission

Average Detector:

- 1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- 2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
- 3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz •
- 4. Emission Level = Reading Level + Correct Factor- PreAMP.
- 5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	MEGA BOOK
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (Channel 39)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.075	3.922	38.827	42.749	-31.251	74.000
7323.225	9.657	37.025	46.682	-27.318	74.000
9764.225	11.798	37.181	48.979	-25.021	74.000
Average Detector:					
Vertical Peak Detector:					
4882.000	3.921	38.566	42.487	-31.513	74.000
7323.075	9.657	36.937	46.594	-27.406	74.000
9726.500	11.816	37.137	48.953	-25.047	74.000
720.500		57.157	10.900	23.017	/ 1.000

Average Detector:

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- 1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- 2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz •
- 3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz •
- 4. Emission Level = Reading Level + Correct Factor- PreAMP..
- 5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	:	MEGA BOOK
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (Channel 78)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.075	4.197	38.668	42.865	-31.135	74.000
7440.376	9.952	38.727	48.679	-25.321	74.000
9920.075	11.856	38.245	50.101	-23.899	74.000
Average Detector:					
Vertical Peak Detector:					
4960.075	4.197	41.755	45.952	-28.048	74.000
7440.376	9.952	37.637	47.589	-26.411	74.000
9920.225	11.856	37.706	49.562	-24.438	74.000

Average Detector:

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- 1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- 2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
- 3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz •
- 4. Emission Level = Reading Level + Correct Factor- PreAMP..
- 5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

	Produc	t :	MEG	A BOOK					
	Test Ite	m :	Gene	ral Radiate	d Emission	1			
	Test Sit	te :	No.3	OATS					
	Test M	ode :	Mode	1: Transm	nitter (Char	nnel 00)			
I	Freq.	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit	
		Loss	Factor		Level	Level			
ľ	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m	
== Ho	rizontal:	 :	:						
	206.89	0 1.78	8 8.40	6 0.00	17.36	27.60	15.90	43.50	
	272.90	0 2.12	2 11.88	8 0.00	12.45	26.45	19.55	46.00	
	344.90	0 2.49) 12.7	7 0.00	15.10	30.36	15.64	46.00	
*	432.28	0 2.94	15.8	1 0.00	15.91	34.66	11.34	46.00	
	549.02	0 3.54	18.34	4 0.00	12.36	34.25	11.75	46.00	
	620.90	0 3.91	18.68	8 0.00	11.97	34.56	11.44	46.00	
•									
ve	rtical:								
	206.89	3 1.78	8 8.72	2 0.00	20.23	30.73	12.77	43.50	
	325.47	0 2.39) 12.5	1 0.00	18.30	33.21	12.79	46.00	
	479.04	0 3.18	8 16.60	0.00	14.40	34.19	11.81	46.00	
	498.48	0 3.28	8 16.30	0.00	14.71	34.28	11.72	46.00	
	615.11	0 3.88	3 19.3	3 0.00	11.98	35.19	10.81	46.00	
*	760.90	0 4.63	3 20.49	9 0.00	10.47	35.60	10.40	46.00	

- 1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- 2. "*" means this data is the worst emission level.
- 3. Emission Level = Reading Level + Probe Factor + Cable Loss PreAMP.

	Product Test Item Test Site Test Mod	:	No.3 OA	Radiated I	Emission er (Channe	1 39)		
	Freq.	Cable	Probe	PreAMP	Reading	Emission	Margi	n Limit
		Loss	Factor		Level	Level	C	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Ho	orizontal:							
	432.380	2.94	15.81	0.00	15.70	34.45	11.55	46.00
	500.420	3.30	16.36	0.00	13.19	32.85	13.15	46.00
*	620.400	3.91	18.68	0.00	11.97	34.56	11.44	46.00
	755.070	4.61	18.92	0.00	10.99	34.52	11.48	46.00
	792.000	4.79	19.42	0.00	7.97	32.18	13.82	46.00
	825.050	4.96	19.25	0.00	8.07	32.28	13.72	46.00
Ve	rtical:							
	329.360	2.41	12.44	0.00	15.57	30.42	15.58	46.00
	432.280	2.94	17.36	0.00	10.96	31.27	14.73	46.00
	498.480	3.28	16.30	0.00	14.65	34.22	11.78	46.00
*	760.900	4.63	20.49	0.00	9.39	34.52	11.48	46.00
	801.700	4.85	19.26	0.00	10.14	34.25	11.75	46.00
	813.300	4.90	19.13	0.00	8.54	32.57	13.43	46.00

- 1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- 2. "*" means this data is the worst emission level.
- 3. Emission Level = Reading Level + Probe Factor + Cable Loss PreAMP.

	Product	:	MEGA	A BOOK				
	Test Iten	n :	Gener	al Radiate	d Emission	L		
	Test Site	;	No.3 (DATS				
	Test Mo	de :	Mode	1: Transm	itter (Chan	nel 78)		
						,		
]	Freq.	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
]	Loss	Factor		Level	Level		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
==								
Ho	rizontal:							
	399.340	2.77	14.62	0.00	11.05	28.44	17.56	46.00
	432.280	2.94	15.81	0.00	15.50	34.25	11.75	46.00
	484.870	3.22	16.48	0.00	14.43	34.13	11.87	46.00
	545.120	3.52	18.02	0.00	14.16	35.70	10.30	46.00
*	760.900	4.63	19.54	0.00	14.34	38.52	7.48	46.00
	792.000	4.79	19.42	0.00	7.94	32.15	13.85	46.00
Ver	tical:							
	325.480	2.39	12.51	0.00	15.19	30.10	15.90	46.00
	409.060	2.82	17.37	0.00	11.99	32.18	13.82	46.00
	615.110	3.88	19.33	0.00	10.79	34.00	12.00	46.00
	753.100	4.59	20.66	0.00	9.25	34.51	11.49	46.00
*	797.840	4.83	19.34	0.00	10.78	34.95	11.05	46.00
	813.280	4.90	19.13	0.00	6.12	30.15	15.85	46.00

- 1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- 2. "*" means this data is the worst emission level.
- 3. Emission Level = Reading Level + Probe Factor + Cable Loss PreAMP.

5. Band Edge

5.1. Test Equipment

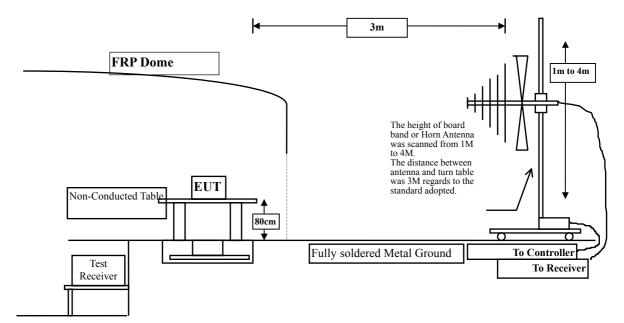
The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2005
Х	Test Receiver	R & S	ESCS 30 / 825442/14	May, 2005
Х	Spectrum Analyzer	HP	E4407B / US39440758	May, 2005
Х	Pre-Amplifier	HP	8447D/3307A01812	May, 2005
Х	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2005
Х	Horn Antenna	EM	EM6917 / 103325	May, 2005

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.2. Mark "X" test instruments are used to measure the final test results.

5.2. Test Setup

RF Radiated Measurement:



5.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

5.5. Uncertainty

The measurement uncertainty above 1G is defined as \pm 3.9 dB under 1G is defined as \pm 3.8 dB

5.6. Test Result of Band Edge

Product	:	MEGA BOOK
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (Channel 00)

RF Radiated Measurement:

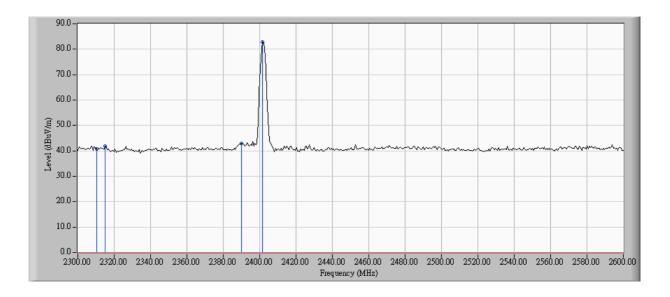
Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
0	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2315.030	41.393	41.890	74.00	54.00	Pass
00 (Average)				74.00	54.00	Pass

Figure Channel 00:

(Horizontal)



Product	:	MEGA BOOK			
Test Item	:	Band Edge			
Test Site	:	No.3 OATS			
Test Mode	:	Mode 1: Transmitter (Channel 00)			
RF Radiated Measurement:					

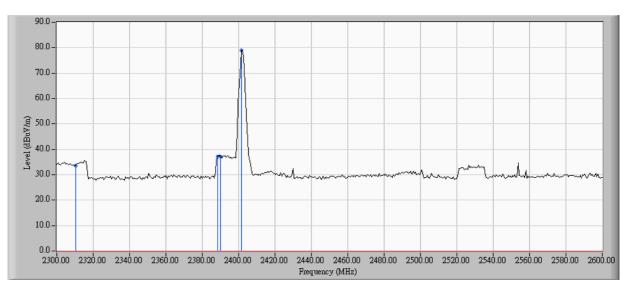
Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
0	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2388.380	48.173	37.150	74.00	54.00	Pass
00(Average)				74.00	54.00	Pass



(Vertical)



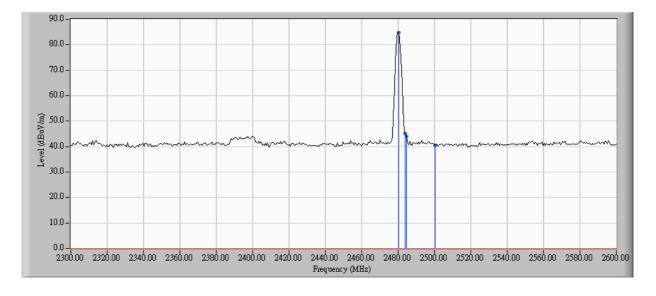
Product	:	MEGA BOOK
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (Channel 78)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2484.570	43.260	43.980	74.00	54.00	Pass
78(Average)				74.00	54.00	Pass

Figure Channel 78:

(Horizontal)



Product	:	MEGA BOOK
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (Channel 78)

	the fundation (forboar).								
Channel No.	Frequency (MHz)	Reading Level (dBuV)	e		Average Limit (dBuV/m)	Result			
78(Peak)	2485.170	45.669	34.770	74.00	54.00	Pass			
78(Average)				74.00	54.00	Pass			



Figure Channel 78:	(Vertical)
90.0 -	
80.0 -	
70.0 -	
60.0 -	
(40.0 - 19) 40.0 -	
9 40.0 -	
30.0- 30.0-	man man man man man and hange and man man and and
20.0 -	
10.0 -	
0.0-	
2300.00 2320.00 2340	0 2360.00 2380.00 2400.00 2420.00 2440.00 2460.00 2480.00 2500.00 2520.00 2540.00 2560.00 2580.00 2600.00 Frequency (MHz)

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

6. Channel Number

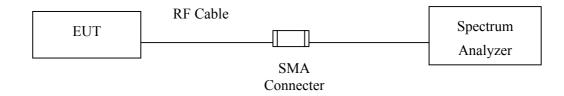
6.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Spectrum Analyzer	Advantest	R3162/91700545	March, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.2. Mark "X" test instruments are used to measure the final test results.

6.2. Test Setup



6.3. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

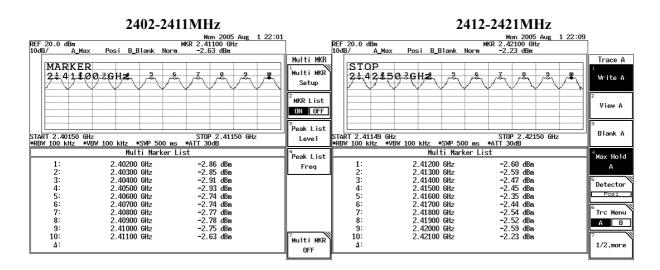
6.4. Uncertainty

The measurement uncertainty is defined as ± 200 kHz

6.5. Test Result of Channel Number

Product	:	MEGA BOOK
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter

Frequency Range	Measurement	Required Limit	Result
(MHz)	(Hopping Channel)	(Hopping Channel)	
$2402 \sim 2480$	79	>75	Pass



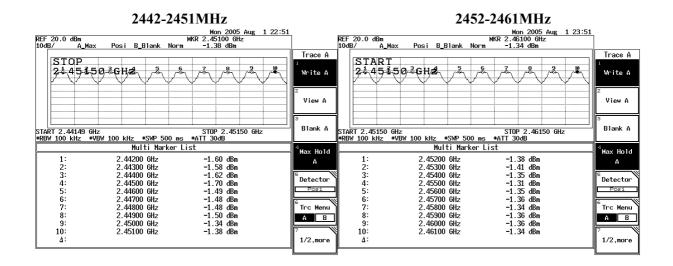
2422-2431MHz

2432-2441MHz

	Mon 2005 Aug 1 22:32 MKR 2.44100 GHz rrm -1.70 dBm	REF 20.0 dBm 10d <u>B/ A_Max Posi B_Blank Norm</u>		MKR 2.43100 GHz Norm -2.75 dBm		EF 20.0 dBm Dd <u>B/ A_Ma</u>
Trace A ! Write A		STOP 2\$44\$503GH# \$	Trace A ! Write A		Т \$50.3GH老 ~ रै	START 21421
2 View A			Z View A			
Blank A		START 2.43150 GHz *RBW 100 kHz *VBW 100 kHz *SWP 500 ms			*VBW 100 kHz *SWP 500 ms *ATT	TART 2.42150 G RBW 100 kHz *
Max Hold	List	Multi Marker	- ⁴ Max Hold	ker List	Multi Marker List	
A	-2.00 dBm	1: 2.43200 GHz 2: 2.43300 GHz 3: 2.43400 GHz	A	-2.48 dBm		1:
	-1.98 dBm -2.06 dBm	2: 2.43300 GHz 3: 2.43400 GHz	5	-2.28 dBm -2.26 dBm		2: 3: 4:
5			Detector Y			J.
⁵ Detector	-1 86 dBm	4: 2 43500 GHz	Detector	-2 18 dBm	2 42500 GHz -	4:
5 Detector Posi	-1.86 dBm -1.86 dBm	4: 2.43500 GHz 5: 2.43600 GHz	Posi	-2.18 dBm -2.12 dBm		4: 5:
	-1.86 dBm -1.92 dBm	4: 2.43500 GHz 5: 2.43600 GHz 6: 2.43700 GHz		-2.12 dBm -2.23 dBm	2.42600 GHz - 2.42700 GHz -	5: 6:
	-1.86 dBm -1.92 dBm -1.73 dBm	4: 2.43500 GHz 5: 2.43600 GHz 6: 2.43700 GHz 7: 2.43800 GHz		-2.12 dBm -2.23 dBm -2.34 dBm	2.42600 GHz - 2.42700 GHz - 2.42800 GHz -	5: 6:
Posi	-1.86 dBm -1.92 dBm -1.73 dBm -1.76 dBm	4: 2.43500 GHz 5: 2.43600 GHz 6: 2.43700 GHz 7: 2.43800 GHz 8: 2.43800 GHz	Posi	-2.12 dBm -2.23 dBm -2.34 dBm -2.09 dBm	2.42600 6Hz - 2.42700 6Hz - 2.42800 6Hz - 2.42800 6Hz -	5: 6:
⁶ Trc Menu	-1.86 dBm -1.92 dBm -1.73 dBm	4: 2.43500 GHz 5: 2.43600 GHz 6: 2.43700 GHz 7: 2.43800 GHz	⁶ Trc Menu	-2.12 dBm -2.23 dBm -2.34 dBm	2.42600 GHz - 2.42700 GHz - 2.42800 GHz - 2.42900 GHz - 2.43000 GHz -	4: 5: 6: 7: 8: 9: 10:



Product	:	MEGA BOOK
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter



2462-2471MHz

2472-2481MHz

REF 20.0 dBm 10dB/ A_M	lax Posi B_Blank Nor	Tue 2005 Aug 2 00:00 MKR 2.47100 GHz m -1.38 dBm]	Tue 2005 Aug 2 00:0 REF 20.0 dBm MKR 2.48000 GHz 10dB/ A_Max Posi B_Blank Norm -1.46 dBm	9
START 2\$461			Trace A ! Write A	MARKER 2 48 800 3 GH2 2 5 3 4 4	MKR Setup Marker No.
			² View A		² Marker 0N
START 2.46150 *RBW 100 kHz	*VBW 100 kHz *SWP 500 m			START 2.47150 GHz STOP 2.48150 GHz WRW 100 kHz *VBW 100 kHz *SWP 500 ms *ATT 30dB	Marker OFF
	Multi Marker	List	Max Hold	Multi Marker List	4 Active
1: 2:	2.46200 GHz 2.46300 GHz	-1.58 dBm -1.30 dBm	A	1: 2.47200 GHz -1.47 dBm 2: 2.47300 GHz -1.45 dBm	Marker
2: 3:	2.46400 GHz	-1.62 dBm	5 Detector	3: 2.47400 GHz -1.43 dBm	
4: 5: 6: 7:	2.46500 GHz	-1.58 dBm		4: 2.47500 GHz −1.45 dBm	
5:	2.46600 GHz	-1.38 dBm	Posi	5: 2.47600 GHz -1.42 dBm	
6:	2.46700 GHz 2.46800 GHz	-1.46 dBm -1.52 dBm	6 Trc Menu	6: 2.47700 GHz -1.54 dBm 7: 2.47800 GHz -1.60 dBm	
8:	2.46900 GHz	-1.32 dBm -1.36 dBm		8: 2.47800 GHz -1.52 dBm	
9:	2.47000 GHz	-1.41 dBm	A B	9: 2.48000 GHz -1.46 dBm	
10:	2.47100 GHz	-1.38 dBm	7	10:	7 Reset
Δ:			1/2,more	Δ:	
L			_	L	Marker

7. Channel Separation

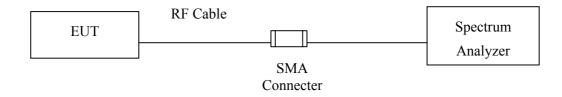
7.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.2. Mark "X" test instruments are used to measure the final test results.

7.2. Test Setup



7.3. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

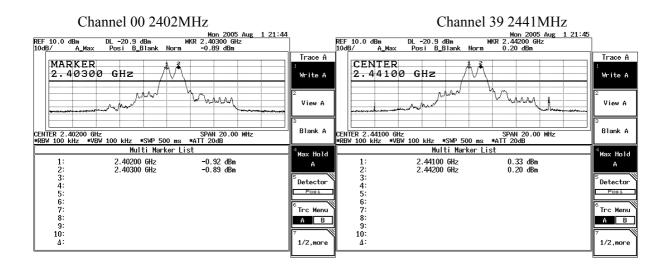
7.4. Uncertainty

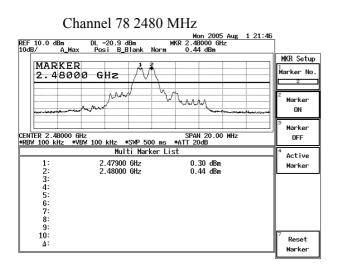
The measurement uncertainty is defined as \pm 150Hz

7.5. Test Result of Channel Separation

Product	:	MEGA BOOK
Test Item	:	Channel Separation
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter

Frequency (MHz)	Measurement Level (MHz)	Required Limit	Result
2402	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2441	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2480	1.00	>25 kHz or 2/3 * 20 dB BW	Pass





8. Dwell Time

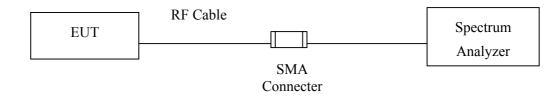
8.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Spectrum Analyzer	Advantest	R3162/91700545	March, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.2. Mark "X" test instruments are used to measure the final test results.

8.2. Test Setup



8.3. Limit

The dwell time shall be the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

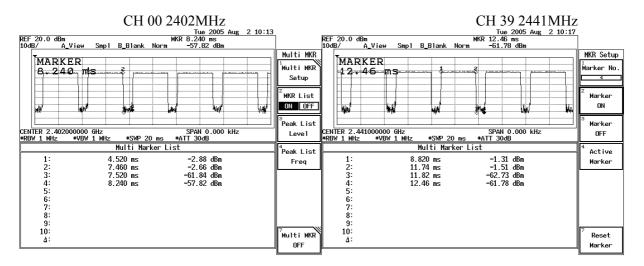
8.4. Uncertainty

The measurement uncertainty is defined as \pm 25msec

8.5. Test Result of Dwell Time

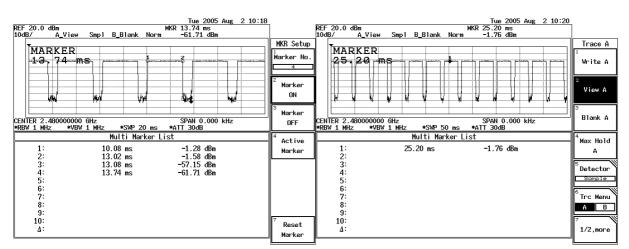
Product	:	MEGA BOOK
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (Channel 00,39,78 –DH5)

Channel (MHz)	Measurement Level (ms)	Required Limit (sec.)	Result
CH 00 2402	306.201	< 0.4	Pass
СН 39 2441	304.118	< 0.4	Pass
CH 78 2480	306.201	< 0.4	Pass



CH 78 2480MHz

Total



Note: Dwell time=time slot length * hop rate / number of hopping channels * period

Occupancy Time of Frequency Hopping System

Test Time Period: 0.4*79=31.6sec , Hopping Times Within 1sec: 13/50msec=0.260 /sec

A) 2402MHz The Maximum Occupancy Time Within 31.6sec: $(2940 \ \mu \ s^{*}260)/(79^{*}31.6)=306.201$ msec \circ

B) 2441MHz The Maximum Occupancy Time Within 31.6sec: $(2920 \ \mu \ s^{*}260)/(79^{*}31.6)=304.118$ msec \circ

C) 2480MHz The Maximum Occupancy Time Within 31.6sec: $(2940 \ \mu \ s^{*}260)/(79^{*}31.6)=306.201 \text{ msec} \circ$

Test Result: The Average Occupancy Time of Each Highest $\,$ Middle and Lowest Channel Is Less Than 0.4sec $\,$ And Corresponds to The Standard $\,$

PS: (1) From Bluetooth Specification, It Hops 1600 Times in 1sec • The Average Occupancy Time of Each 79 Channels is 1600/79 Times, Therefore, We Calculate The Maximum Occupancy Time (worse cars)As Below:

A) 2402Mhz The Occupancy Time of Each Pulse is 0.4msec , The Maximum Occupancy Time within 31.6sec is 0.4msec*1640/79*31.6=289.056msec

B) 2441MHz The Occupancy Time of Each Pulse is 0.4msec , The Maximum Occupancy Time within 31.6sec is 0.4msec*1640/79*31.6=289.056msec

C) 2480MHz The Occupancy Time of Each Pulse is 0.4msec , The Maximum Occupancy Time within 31.6sec is 0.4msec*1640/79*31.6=289.056msec

Test Result: The Maximum Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard \circ

9. Occupied Bandwidth

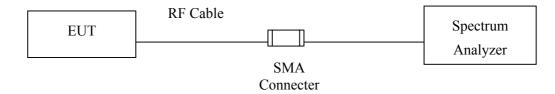
9.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.2. Mark "X" test instruments are used to measure the final test results.

9.2. Test Setup



9.3. Limits

The minimum bandwidth shall be at least 500kHz.

9.4. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

9.5. Test Result of Occupied Bandwidth

Product	:	MEGA BOOK	
Test Item	:	Occupied Bandwidth I	Data
Test Site	:	No.3 OATS	
Test Mode	:	Mode 1: Transmitter	(2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	840	>500	Pass

Figure Channel 00:

Mon 2005 Aug 1 21:42 REF 10.0 dBm DL -20.9 dBm MKR 2.40238 GHz ACAD // A Max Date // A Max 20.54 dBr	2
10dB/ A_Max Posi B_Blank Norm -20.54 dBm MARKER 1 1 1 1 2.40238 GHz 1 1	MKR Setup ¹ Marker No. <u>3</u>
hard the har	² Marker ON
CENTER 2.40200 GHz SPAN 20.00 MHz *RBW 30 kHz *VBW 30 kHz *SWP 500 ms *ATT 20dB	Marker OFF
Multi Marker List	4 Active
1: 2.40198 GHz -0.90 dBm 2: 2.40154 GHz -21.01 dBm	Marker
3: 2.40238 GHz −20.54 dBm 4:	
5: 6:	
7: 8:	
9:	7
10: 	Reset Marker

Product	:	MEGA BOOK	
Test Item	:	Occupied Bandwidth I	Data
Test Site	:	No.3 OATS	
Test Mode	:	Mode 1: Transmitter	(2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	840	>500	Pass

Figure Channel 39:

	Mon 2005 Aug 1 21:41
	MKR 2.44138 GHz
10dB/ A_Max PosiB_Blank	
	MKR Setup
MARKER	Marker No.
2.44138 GHz a	B
halv Mer	Marker
had and	ON ON
and the second s	
	Marker
CENTER 2.44100 GHz	
*RBW 30 kHz *VBW 30 kHz *SWP 50	
Multi Mark	er List Active
1: 2.44098 GHz	0.24 JB-
2: 2.44054 GHz	-19.90 dBm Marker
3: 2.44138 GHz	-19.30 dBm
4:	10.00 (D)
5:	
6:	
7:	
8:	
9:	
10:	7
Δ:	Reset
	Marker

Product	:	MEGA BOOK
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmitter (2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	840	>500	Pass

Figure Channel 78:

Mon 2005 Aug 1 21:39 REF 10.0 dBm DL -19.6 dBm MKR 2.48038 GHz 10dB/ A_Max Posi B_Blank Norm -19.43 dBm)
MARKER 2.48038 GHz	MKR Setup Marker No. 3 2 Marker 0N
CENTER 2.48000 GHz *RBW 30 kHz *VBW 30 kHz *SWP 500 ms *ATT 20dB Multi Marker List	Marker OFF
1: 2.47998 6Hz 0.43 dBm 2: 2.47954 6Hz -19.48 dBm 3: 2.48038 6Hz -19.43 dBm 4: 2.48038 6Hz -19.43 dBm	= Active Marker
4. 5: 6: 7: 8:	
9: 10: <u>A</u> :	7 Reset Marker

10. EMI Reduction Method During Compliance Testing

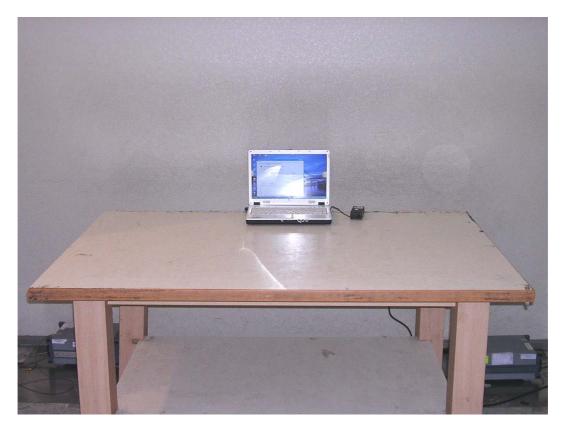
No modification was made during testing.

Attachment 1: EUT Test Photographs



Attachment 1: EUT Test Setup Photographs

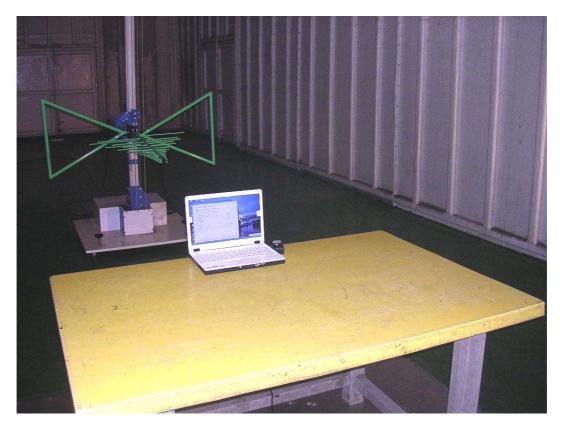
Front View of Conducted Test



Back View of Conducted Test

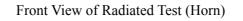


Front View of Radiated Test



Back View of Radiated Test







Back View of Radiated Test (Horn)



Attachment 2: EUT Detailed Photographs



Attachment 2 : EUT Detailed Photographs

(1) EUT Photo



(2) EUT Photo



Page: 1 of 7

(3) EUT Photo



(4) EUT Photo

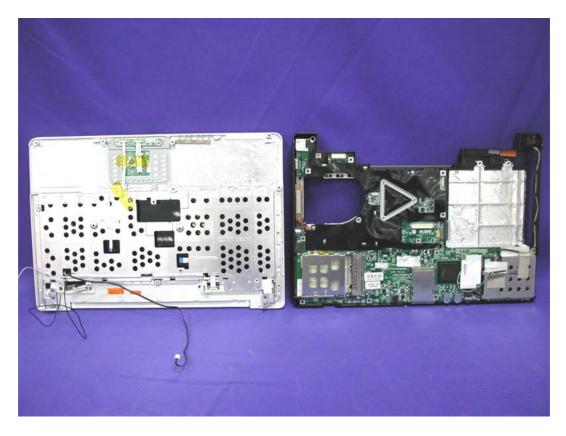




(5) EUT Photo



(6) EUT Photo

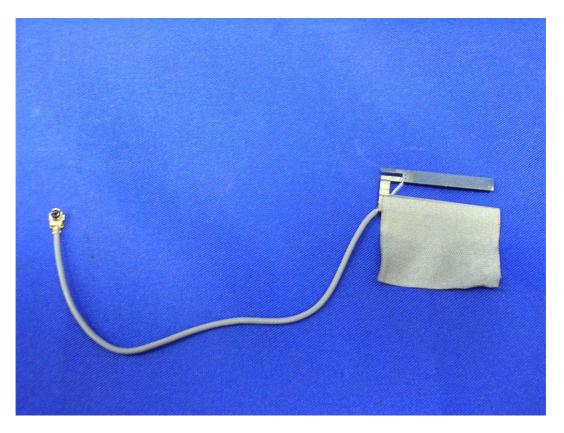




(7) EUT Photo

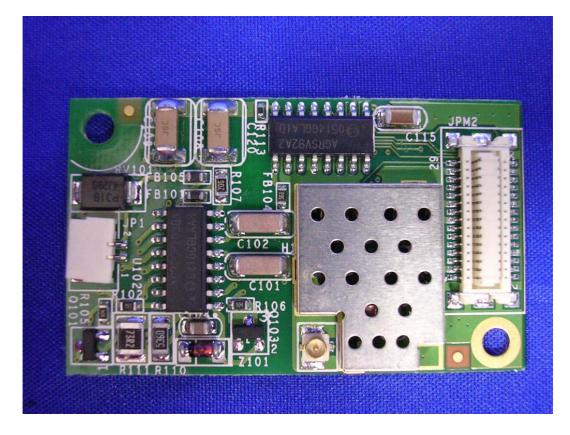


(8) EUT Photo

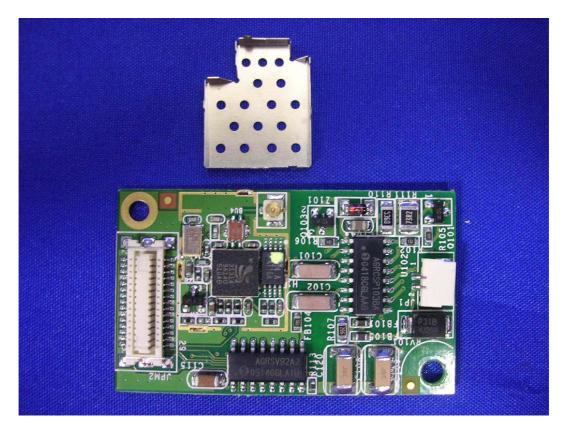




(9) EUT Photo



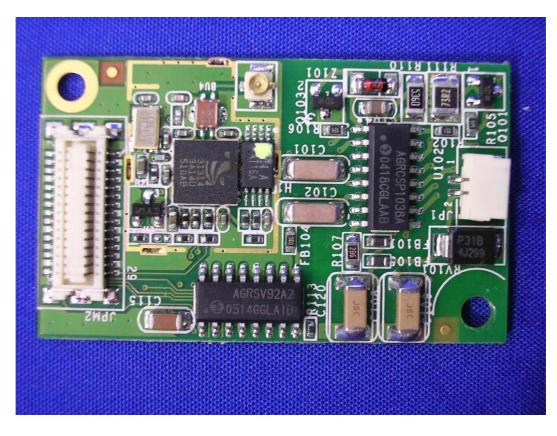
(10) EUT Photo



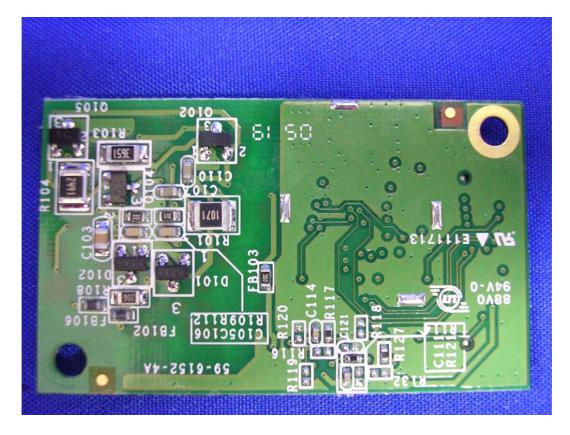
(11) EUT Photo



(12) EUT Photo



(13) EUT Photo



(14) EUT Photo

