Bluetooth 2.0+EDR USB Module (MS-6837D)

Product Specification

MSI P/N List Table

Antenna	Software	P/N	Description
I-Pex	IVT	605-6837D-010	Bluetooth 2.0+EDR USB Module, CSR BC4 ROM, I-Pex antenna, IVT software
I-Pex	Toshiba	605-6837D-020	Bluetooth 2.0+EDR USB Module, CSR BC4 ROM, I-Pex antenna, Toshiba software
Printing	IVT	605-6837D-030	Bluetooth 2.0+EDR USB Module, CSR BC4 ROM, Printing antenna, IVT software
Printing	Toshiba	605-6837D-040	Bluetooth 2.0+EDR USB Module, CSR BC4 ROM, Printing antenna, Toshiba software

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2. Revision History

Revision	Date	Description	Author/Revised-By
0.01	November 9, 2005	1st Draft Created	Ashley Yang
0.02	December 1, 2005	2nd Draft Modified	Jamax Tim
0.03	December 8, 2005	3rd Draft Modified	Jamax Tim
0.04	January 02, 2006	4th Draft Modified	Timdaway Lai
0.05	January 06, 2006	Software, antenna	Ashley Yang

3. Introduction

MSI Bluetooth 2.0+EDR USB module, **BT2RM**, is a **USB 1.1 Full Speed** Module **compatible with USB 2.0**, being used to integrate with systems such as notebook, Barebone computer, PDA, portable PC, Smart Phone. With MSI **BT2RM** embedded inside, a system could provide users with the ability and flexibility to link with peripherals wirelessly through **EDR** (Enhanced Data Rate) technology in **Bluetooth v2.0+EDR** speeding up to 3Mbps, advanced **AFH** (Adaptive Frequency Hopping) techniques in **Bluetooth v1.2** to minimize interference and enhance performance when linking with Bluetooth v1.1 devices and **eSCO** (extended SCO) techniques in **Bluetooth v1.2** optional supported for enhancing the audio performance.

4. Product Features

4.1 Features & Benefits

- **EDR** (Enhanced Data Rate) supported, data rate up to 3Mbps.
- **AFH** (Adaptive Frequency Hopping) supported
- **eSCO** (extended SCO) supported
- **Intel WCS** (Wireless Coexistence System) **Phase I / II** supported - optional
- Forward and backward compatible with Bluetooth v1.1 and v1.2
- Support for up to seven active Bluetooth devices
- Scatternet supported
- Operating range up to 10m

4.2 Applications

Bluetooth Laptop computer
Bluetooth Laptop peripheral
Bluetooth PDA
Bluetooth Web Pad
Bluetooth Gateway
Bluetooth Set Top Box

5. Product Specification

5.1 Bluetooth Specifications

Bluetooth Specifications		
Radio Standard		Bluetooth Class II v2.0+EDR
Frequency Band		2.400-2.4835 GHz
Data Rate		Up to 2169kbps
Channel		79 sub-channels
Transmission		FHSS (Frequency Hopping Spread Spectrum)
Modulation		GFSK@1Mbps, π/4 DQPSK@2Mbps, 8DPSK@3Mbps
Antenna Type		Printed Circuit Antenna or One antenna connector support
Temperature	Operating Temperature	0° to 60°C
	Storage Temperature	-10° to 75°C
Humidity		10%-80% (non-condensing)
Power Consumption		61.37mA in continue Tx 12mA in Standby mode
Output Power		2~4dBm (max.)
Max Input Level		0dBm
Receiver Sensitivity		-82 dBm @ BER<0.1%
Range		Up to 10m operating range
Baseband		
Physical Links		Support ACL and SCO link
Network Capabilities		Support piconet point-to-point and point-to-multipoint connections
Link Manager		
3-slot Packets		Yes
5-slot Packets		Yes
Slot Offset		Yes
Timing Accuracy		Yes
Switch		Yes

Hold Mode	Yes
Sniff Mode	Yes
Test Mode	Yes
Park Mode	Yes
RSSI	Yes
Power Control	Yes
Authentication	Yes
Encryption	Yes
System Support	Windows® 2000/ME/98SE/XP
Profile Support	Generic Access Profile/Service Discovery Profile/Serial Port Profile/Dial-Up Networking Profile/Fax Profile/LAN Access Profile/Generic Object Exchange Profile/File Transfer Profile/Object Push Profile/Synchronization Profile/Personal Area Network Profile/Hard Cable Replacement Profile/Basic Image Profile/Generic Audio Video Distribution Profile/Advanced Audio Distribution Profile/Audio Video Remote Control Profile

5.3 Interface Pin-out and Definitions

PIN#	Signal Name	Description		
Pin1(Input)	+5V	Power supply for whole module		
Pin2	GND	Ground pin		
Pin3(Bidirectional)	USB D-	USB differential pair negative signal		
Pin4(Bidirectional)	USB D+	USB differential pair positive signal		
Pin5(Output)	Status LED (Active High)	Between High (>2.8V) and Low toggle	1 Flash per second	Device standby
		Between High (>2.8V) and Low toggle	continuity Flashes	Search Other Bluetooth Devices& transmit data
Pin6 (Output / Input)	BT_Active / BT_Priority & Ch_Clk (Reserved)	Bluetooth Activity Bluetooth Priority and Wi-Fi module Channel Clock If Wi-Fi module is not support WCS I & II , Host side please keep NC		
Pin7(Input)	WLAN_Active / Ch_Data (Reserved)	Wireless Lan Activity Wi-Fi module Channel Data If Wi-Fi module is not support WCS I & II , Host side please keep NC		
Pin8(Input)	Radio_ON# (Active low)	Low (< 0.4V) (Default value)	Bluetooth enable	Normal Operation
		High (>2.0V)	Bluetooth Disable	Disable Radio

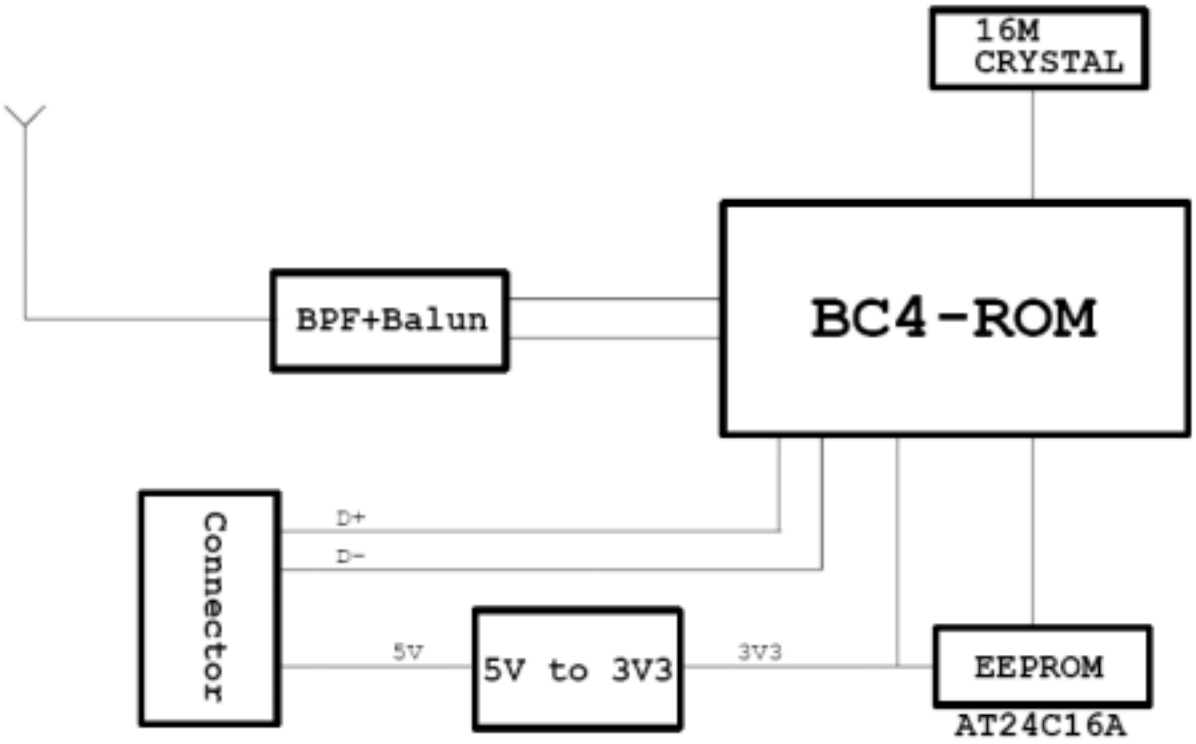
6. Hardware

HW version: REV 0.A

6.1 Antenna

Printing or I-Pex antenna

6.2 Hardware Architecture



6.3 Chip Information

BC04-ROM	CSR Bluetooth baseband/radio processor
AT24C16	ATMEL 16kbits EEPROM

7. Software

7.1 Firmware Version

ZE5-6837D00-001

7.2 Software Version

IVT or Toshiba

7.3 Operating System Support

Windows 98SE, Windows 2000, Windows ME and Windows XP

8. Test Result

8.1 Bluetooth RF Test

Average Current Consumption		
VDD=5V Temperature = 20°C		
Mode	**Typ**	**Unit**
ACL data transfer 1Mbps USB (Slave)	38	mA
ACL data transfer 1Mbps USB (Master)	44	mA
Standby Mode (Connected to host, no RF activity)	12	mA

Peak Current Consumption		
VDD=5V Temperature = 20°C		
Mode	**Typ**	**Unit**
Peak RF current during TX burst (MAX CW mode)	61.37	mA

Peak RF current during TX burst (0 dBm , CW mode)	50.67	mA
Peak RF current during RX burst (-70dBm)	43.45	mA

TRM

/CA/01/C (Output Power)

Hopping ON	**Low**	**Med**	**High**
Average Power	3.09 dBm	3.34 dBm	2.68 dBm
Maximum Power	3.12 dBm	3.36 dBm	2.72 dBm
Minimum Power	3.08 dBm	3.32 dBm	2.65 dBm
Peak Power	3.22 dBm	3.46 dBm	2.83 dBm
Packets Tested	10	10	10
Packets Failed	0	0	0
Result	Pass	Pass	Pass

TRM/CA/08/C (Initial Carrier)

Hopping ON	**Low**	**Med**	**High**
Average Offset	1.6 kHz	3.3 kHz	0.9 kHz
Max +ve Offset	4.4 kHz	6.4 kHz	4.1 kHz
Min -ve Offset	-0.7 kHz	1.8 kHz	-1.4 kHz
Packets Tested	10	10	10
Packets Failed	0	0	0
Result	Pass	Pass	Pass

TRM/CA/09/C (Carrier Drift)

Hopping ON - Low Channel

	DH1	**DH3**	**DH5**
Drift Rate / 50uS	-7.21 kHz	-6.04 kHz	6.90 kHz
Maximum Drift	-6 kHz	-9 kHz	-12 kHz
Average Drift	-2 kHz	-7 kHz	-8 kHz
Packets Tested	10	10	10
Packets Failed	0	0	0

Result	Pass	Pass	Pass
Hopping ON - Med Channel	**DH1**	**DH3**	**DH5**
Drift Rate / 50uS	7.02 kHz	6.90 kHz	7.71 kHz
Maximum Drift	-10 kHz	-9 kHz	-9 kHz
Average Drift	-2 kHz	-6 kHz	-5 kHz
Packets Tested	10	10	10
Packets Failed	0	0	0
Result	Pass	Pass	Pass
Hopping ON - High Channel	**DH1**	**DH3**	**DH5**
Drift Rate / 50uS	6.51 kHz	-7.53 kHz	-8.52 kHz
Maximum Drift	-9 kHz	-11 kHz	9 kHz
Average Drift	0 kHz	-6 kHz	-3 kHz
Packets Tested	10	10	10
Packets Failed	0	0	0
Result	Pass	Pass	Pass

TRM/CA/07/C (Modulation Characteristics)

Hopping OFF	**Low**	**Med**	**High**
F1 Average	165.6 kHz	165.1 kHz	164.9 kHz
F1 maximum	170.9 kHz	169.9 kHz	171.3 kHz
F1 Packets Failed	0	0	0
F2 Average	160.9 kHz	161.5 kHz	161.9 kHz
F2 maximum	150.8 kHz	150.7 kHz	152.9 kHz
F2 pass rate	100.00%	100.00%	100.00%

F1 / F2 Ratio	0.97	0.97	0.98
Total Packets Tested	20	20	20
Overall Result	Pass	Pass	Pass

RCV/CA/01/C (Single Sensitivity)

Hopping OFF	**Low**	**Med**	**High**
Overall BER	0.00%	0.00%	0.00%
Overall FER	0.00%	0.00%	0.00%
Packets Sent	7408	7408	7408
Packets Received	7408	7408	7408
Bit Errors	0	0	0
Frame Errors	0	0	0
CRC errors	0	0	0
Length errors	0	0	0
Lost Packets	0	0	0
Result	Pass	Pass	Pass

Hopping ON	**Any**
Overall BER	0.00%
Overall FER	0.00%
Packets Sent	7408
Packets Received	7408
Bit Errors	0
Frame Errors	0
CRC errors	0
Length errors	0
Lost Packets	0
Result	Pass

RCV/CA/02/C (Multi Slot Sensitivity)

Hopping OFF	Low	Med	High
Overall BER	0.00%	0.00%	0.00%
Overall FER	0.00%	0.00%	0.00%
Packets Sent	590	590	590
Packets Received	590	590	590
Bit Errors	0	0	0
Frame Errors	0	0	0
CRC errors	0	0	0
Length errors	0	0	0
Lost Packets	0	0	0
Result	Pass	Pass	Pass

Hopping ON	Any
Overall BER	0.00%
Overall FER	0.00%
Packets Sent	590
Packets Received	590
Bit Errors	0
Frame Errors	0
CRC errors	0
Length errors	0
Lost Packets	0
Result	Pass

RCV/CA/06/C (Maximum Input Level)

Hopping OFFHopping OFF	Low	Med	High
Overall BER	0.00%	0.00%	0.00%
Overall FER	0.00%	0.00%	0.00%
Packets Sent	7408	7408	7408
Packets Received	7408	7408	7408
Bit Errors	0	0	0
Frame Errors	0	0	0
CRC errors	0	0	0
Length errors	0	0	0
Lost Packets	0	0	0
Result	Pass	Pass	Pass

8.2 Profile Interoperability Test

TBD

8.3 Throughput Test

Transaction

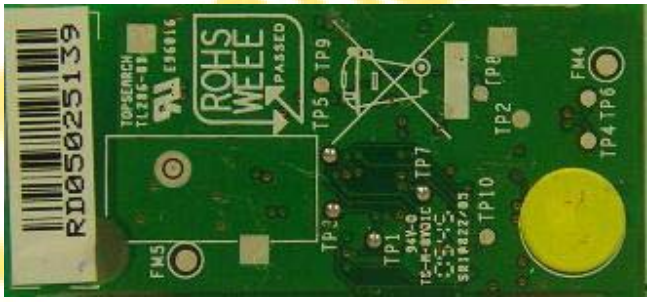
Group/ Pair	Average (Mbps)	Minimum (Mbps)	Maximum (Mbps)	Throughput 95% Confidence Interval	Measured Time (secs)	Relative Precision
All Pairs	1.240	1.084	1.440			
Pair 1	1.242	1.084	1.440	0.021	59.335	1.656
Totals:	1.240	1.084	1.440			

Receiver

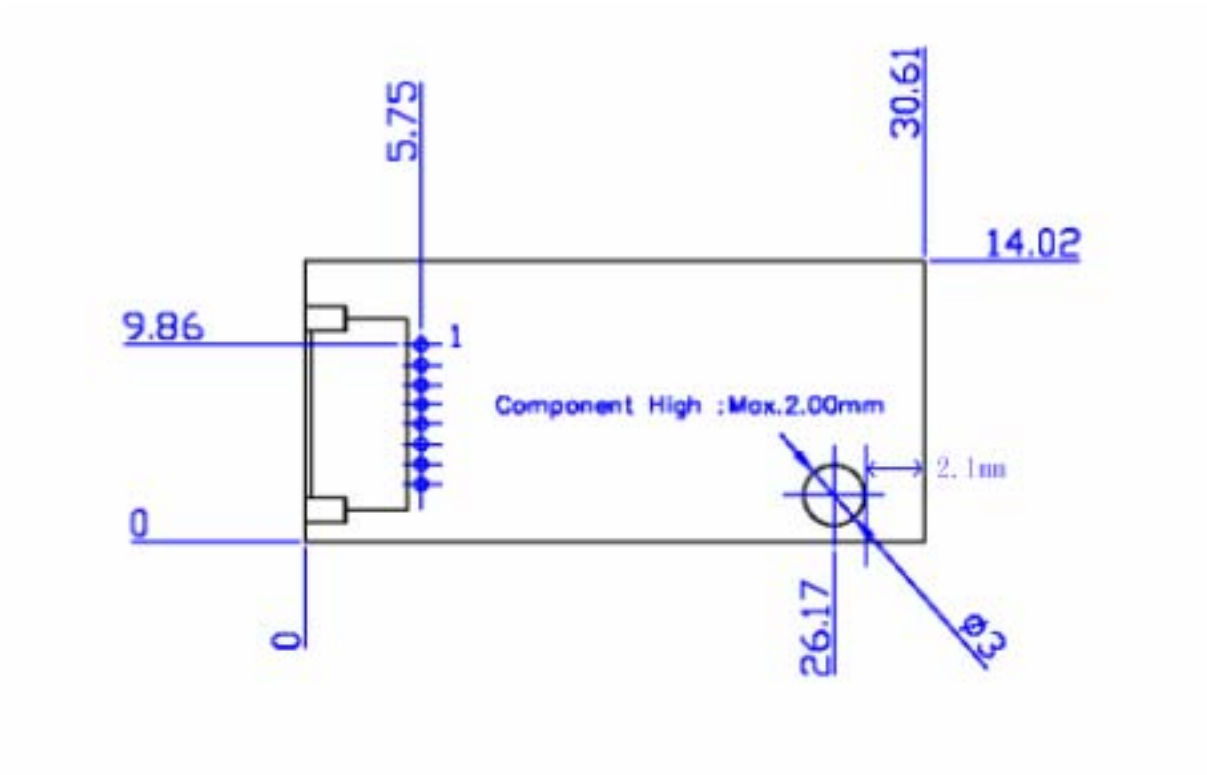
Group/ Pair	Average (Mbps)	Minimum (Mbps)	Maximum (Mbps)	Throughput 95% Confidence Interval	Measured Time (secs)	Relative Precision
All Pairs	1.221	1.100	1.431			
Pair 2	1.223	1.100	1.431	0.020	59.526	1.611
Totals:	1.221	1.100	1.431			

9. Appearance

Front View

Back View


9.1 Mechanical Drawing



Note 1 : Dimension 30.61mm x 14.02mm x 3.9mm +- 0.15mm

10. Certification

10.1 Bluetooth Qualification Body Certification

10.2 CE Certification