



LM072 Class 1 Bluetooth Serial Data Module

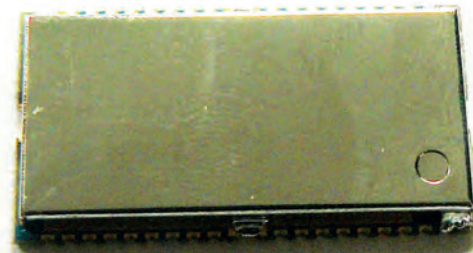
Product: LM072
Part No: 072-0125 for BT2.0 F/W
Part No: 072-0110 for BT2.1 F/W
Datasheet Rev1.2/11-07-12

1 General Description

LM072 is LM Technologies Ltd Class 1 Bluetooth Data module with external antenna. This module is a CSR Bluecore 4 (BC04) chip based surface mount module available with Bluetooth Serial Port Profile (SPP) firmware. This module is ideal for adding long range wireless connectivity to embedded products.

The module acts as a standalone unit (i.e. it does not need a host to drive it) and can interface with embedded microcontrollers via UART. It operates over a voltage range of 3.0 V to 3.6 V and gives excellent performance over a distance of 70-100 m with external antenna. This is a tried and tested module also used in other LM best selling products like LM048 and LM058 serial adapter as well as LM400 and LM410 Data Modules.

This module is available with Bluetooth 2.0+EDR as well as Bluetooth 2.1+EDR compliant SPP firmware.



2 Features

- Bluetooth v2.0 + EDR and v2.1 + EDR compliant firmware available
- Class 1 radio - Output power +13 dBm
- 100 m range in open space
- Secure Simple Pairing supported (in Bluetooth 2.1 + EDR firmware)
- 3V - 3.6V operation
- Full Bluetooth EDR data rate of upto 3 Mbps supported
- Interface : UART (upto 921600 bps), PIO
- Multipoint firmware support
- SPP firmware supported by default. HID firmware available upon request
- CSR Bluecore 04 (BC04) chipset
- AT Command set provided for module configuration
- 802.11 Coexistence supported
- Lead free - RoHS compliant
- Small Size : 28.2 mm x 15.0 mm x 2.8 mm

3 Applications

- Serial Communications
- Medical Devices
- Domestic and Industrial Applications
- Embedded Devices
- Remote Monitoring and Control
- Payment Terminals
- GPS, POS, Barcode Readers



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4 Packaging Options

Tape and Reel

Part No 072-0127

LM072 with BT2.0 + EDR firmware

Part No 072-0112

LM072 with BT2.1 + EDR firmware

Tray Packaging

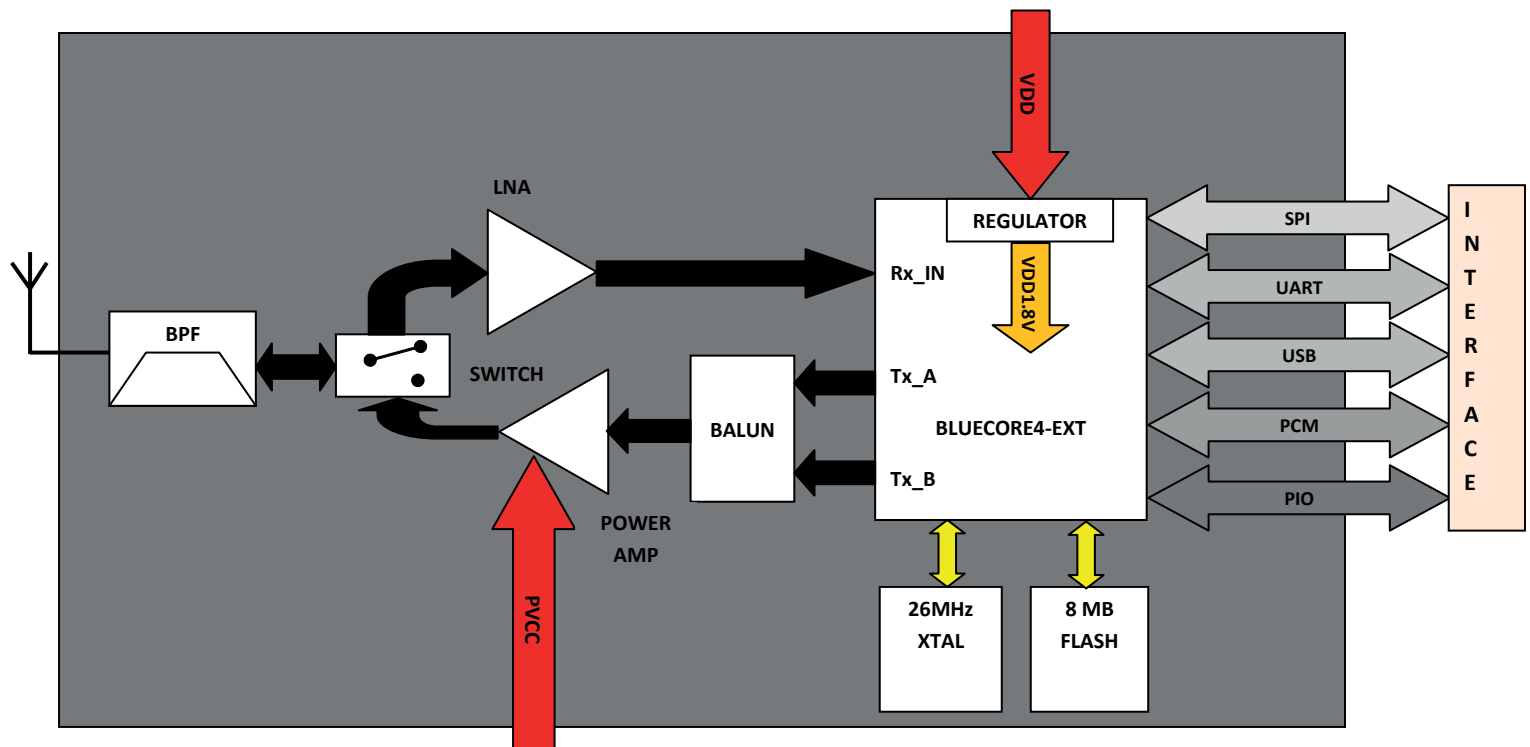
Part No 072-0126

LM072 with BT2.0 + EDR firmware

Part No 072-0111

LM072 with BT2.1 + EDR firmware

5 Block Diagram



Note: USB and PCM interface are not handled by LM firmware at present



6 Electrical Characteristics

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Absolute Maximum Ratings			
Parameter	Min	Max	Unit
Storage Temperature	-40	+85	°C
Supply Voltage (VDD)	+2.7	+3.6	V
Supply Voltage (PVCC)	+3.0	+3.6	V
All other pins	VSS - 0.4	VDD+0.4	V

Recommended Operating Conditions			
Parameter	Min	Max	Unit
Storage Temperature	-20	+75	°C
Supply Voltage (VDD)	+3.0	+3.3	V
Supply Voltage (PVCC)	+3.0	+3.3	V

General Electrical Specification					
Parameter	Description	Min	Typical	Max	Unit
Carrier Frequency		2.402		2.480	GHz
RF Output power	Measured with 50Ω ant	10	11.5	13	dBm
Rx Sensitivity		-	-88	-86	dBm
Load Impedance	No abnormal oscillation			5:1	
Input Low Voltage	RESET, UART, GPIO, PCM	-0.3	-	0.8	DCV
Input High Voltage	RESET, UART, GPIO, PCM	0.7VDD	-	VDD+0.3	DCV
Output Low Voltage	UART, GPIO, PCM	-	-	0.4	DCV
Output High Voltage	UART, GPIO, PCM	VDD-0.4	-	-	DCV
Average Current Consumption	Receive DM1		114		mA

7 Factory Settings

The factory settings of the COM Port are as follows:

Baud Rate: 19200 bps
 Data Bits: 8
 Parity: None
 Stop Bits: 1
 Flow Control: Hardware (BT2.0) or None (BT2.1)



8 Pin Assignments

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Pin Number	Name	Type	Description
1	GND	Ground	Common Ground
2	PVCC	Power	Power Amp. Power supply (3.3V)
3	AIO 0	I/O	Programmable Input Output
4	AIO 1	I/O	Programmable Input Output
5	PIO 0	I/O	Programmable Input Output
6	PIO 1	I/O	Programmable Input Output
7	PIO 2	I/O	Programmable Input Output
8	PIO 3	I/O	Programmable Input Output
9	PIO 4	I/O	Programmable Input Output
10	GND	Ground	Common Ground
11	PIO 5	I/O	Programmable Input Output
12	PIO 6	I/O	Programmable Input Output
13	PIO 7	I/O	Programmable Input Output
14	PIO 8	I/O	Programmable Input Output
15	PIO 9	I/O	Programmable Input Output
16	RESET	CMOS Input	Reset Input of Module, Active Low
17	VCC	Power	Module input Supply, 3.3V DC
18	GND	Ground	Common Ground
19	GND	Ground	Common Ground
20	USB_DP	I/O	USB Data Plus
21	USB_DN	I/O	USB Data Minus
22	PCM_SYNC	I/O	Synchronous Data Sync
23	PCM_IN	CMOS Input	Synchronous Data Input
24	PCM_OUT	CMOS Output	Synchronous Data Output
25	PCM_CLK	I/O	Synchronous Data Clock
26	UART_RX	CMOS Input	UART Data Input
27	UART_TX	CMOS Output	UART Data Output
28	UART_RTS	CMOS Output	UART Request to Send (Active Low)
29	GND	Ground	Common Ground
30	UART_CTS	CMOS Input	UART Clear to Send (Active Low)
31	SPI_MOSI	CMOS Input	Serial Peripheral Interface Data Input
32	SPI_CSB	CMOS Input	Chip Select for Serial Peripheral Interface (Active Low)
33	SPI_CLK	CMOS Input	Serial Peripheral Interface Clock
34	SPI_MISO	CMOS Output	Serial Peripheral Interface Data Output
35	PIO 11	I/O	Programmable Input Output
36	PIO 10	I/O	Programmable Input Output
37	RF_IO	Analogue	Antenna Interface
38	GND	Ground	Common Ground

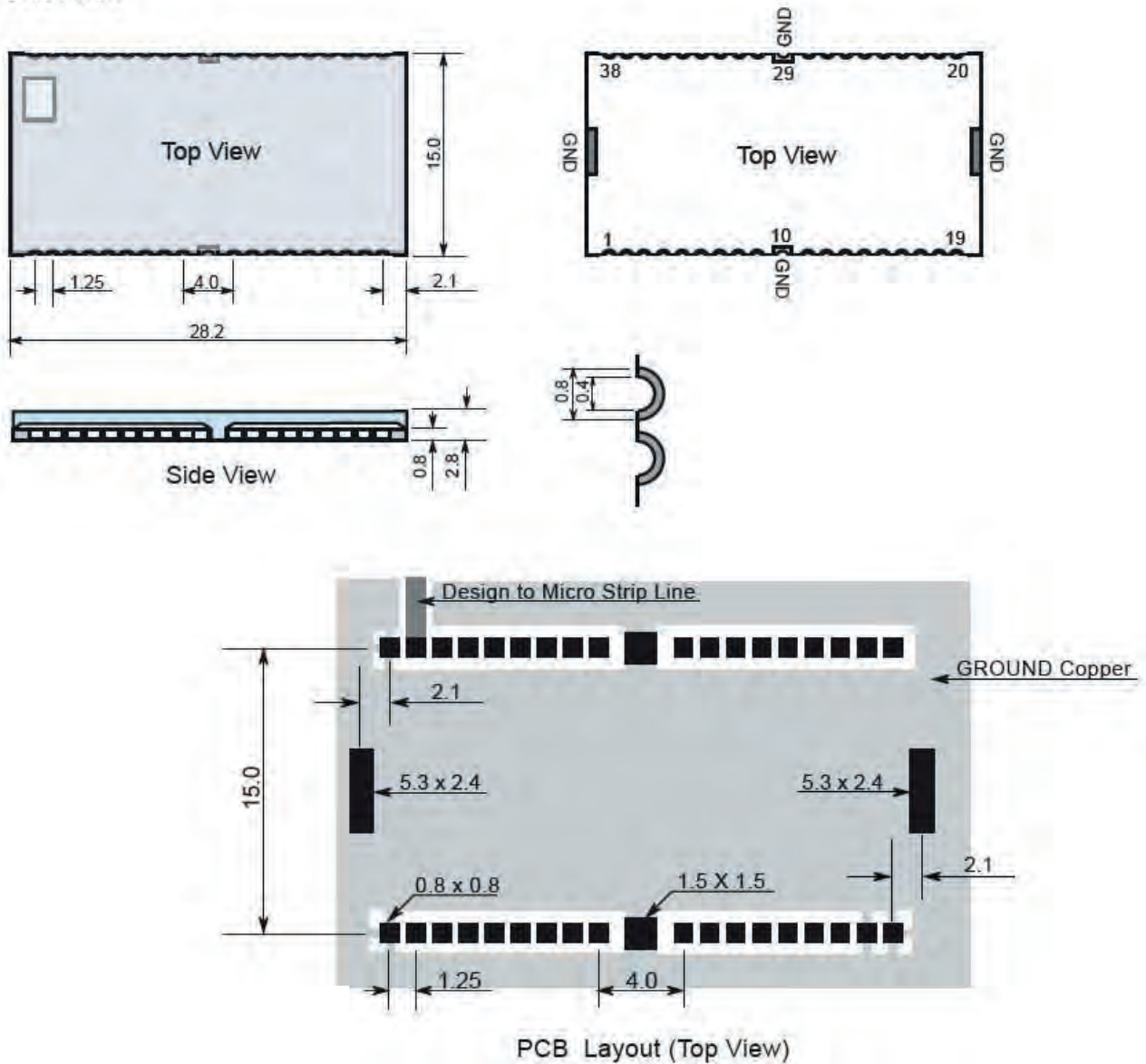


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9 Dimensions

Dimension

Unit : mm





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10 FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

11 FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note 1: This module certified that complies with RF exposure requirement under portable or mobile or fixed condition, this module is to be installed only in portable or mobile or fixed applications.

A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3: The device must not transmit simultaneously with any other antenna or transmitter.



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Note 4: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, LM Technologies Ltd shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

Note 5: FCC ID label on the final system must be labeled with “Contains FCC ID: VVXLM072” or “Contains transmitter module FCC ID: VVXLM072”.

The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the host product. LM Technologies Ltd is responsible for the compliance of the module in all final hosts.

12 Revision History

Revision	Date	Comments
Rev1.0	17/12/2010	First Version
Rev1.1	03/07/2012	<ol style="list-style-type: none"> 1. Reformatted the datasheet 2. Added packaging options 3. Added part number information 4. Added FCC Regulation Statement 5. Added Revision History
Rev1.2	11/07/2012	<ol style="list-style-type: none"> 1. Change to FCC Warning Statement 2. Added FCC Radiation Exposure Statement