

## LM074 Bluetooth® 5.0 Dual Mode Module

Standalone (With Embedded Bluetooth® 5.0 Stack)

Revised

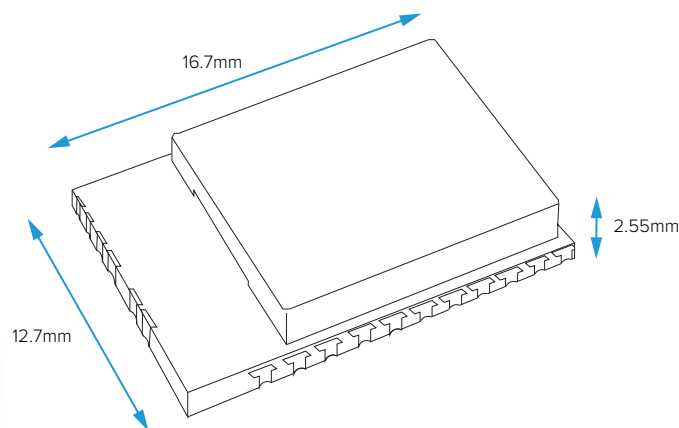
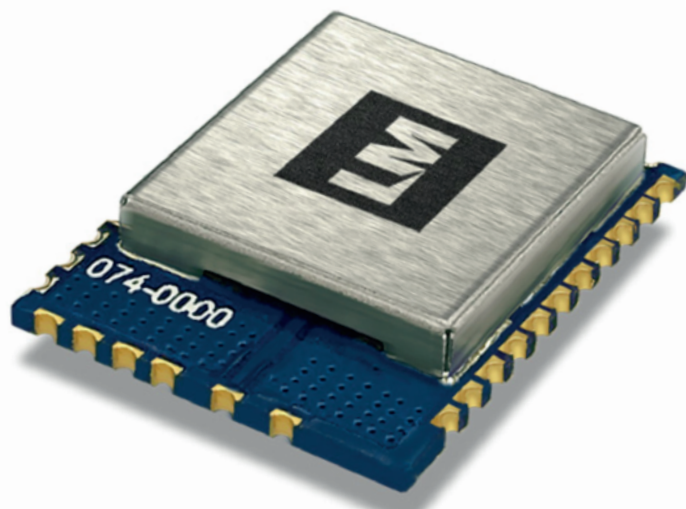
19/FEB/2021

Datasheet Version

1.3

Ordering Options

See last page



### Features

- Bluetooth® 5.0 specification (Dual Mode)
- Class 1 Tx Out Power
- Low Power Consumption
- Applications available including SPP with GAP Central, SPP or GAP Peripheral and SPP to Serial Bridge
- Over-the-Air Upgrade (OTAU) available
- Application firmware support
- Configurable with AT Command Set
- Configurations pre-installed on production
- RF Antenna Interface
- Requires no external hardware
- I2C, UART and USB 2.0
- DTR / DSR Handshaking and RTS / CTS Flow control lines
- 11 digital and 3 analogue I/O
- SMT Side and Bottom Pads for easy production
- RoHS, REACH and WEEE Compliant Solution
- See our website for this products certifications

### Overview

The LM074 Bluetooth® 5.0 Dual Mode module is a powerful, flexible and versatile solution, allowing your embedded system to wirelessly communicate with other nearby Bluetooth® enabled devices (e.g. PC, Android, Tablet, mobile or Bluetooth low energy devices).

Its RF antenna interface provides the option to add an antenna that suits your requirements e.g. a dipole and PCB antenna. The selected antenna could provide a longer range, omnidirectional or unidirectional connection.

This single core standalone module combines a Bluetooth® low energy and v2.0, v2.1 radio using a dual mode Bluetooth® 5.0 stack, plus a microcontroller unit with an 8 Mbit flash memory for running the application. It also incorporates 38 pin outs, including I2C, UART and USB for interfacing with peripheral devices. It's SMT side and bottom pads allow for easy manufacture and placement within your product.

LM offer bespoke integration into your product by supporting your developer, including development of new applications for the module. We also offer Bluetooth® Dual Mode demo applications, which can be customised to your specification. The AT Command set makes configuration of the firmware simple. The developed firmware and settings can be preloaded to the module, simplifying the manufacturing and testing process.

## LM074 Bluetooth® 5.0 Dual Mode Module

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### General Specification

#### Wireless

Bluetooth® Standard	5.0 (Dual Mode)
Module Type	Standalone (Configurable with AT Commands)
Profiles	SPP and GATT-Based

#### Hardware

Chipset	Qualcomm
Antenna	RF Antenna Interface (Pin 37)
Microcontroller (MCU)	16-bit RISC 80 MHz MCU
Flash Memory	8 Mbit
RAM	56 KB (12K x 24-bit)
Program Interface	SPI
Interfaces	I2C, UART, USB 2.0, AIO, PIO and LED
Power Supply	5V (VCHG/ VBUS) or 2V8 (VBAT)
Crystal Oscillators	26 MHz

#### RF Characteristics

Tx Output Power	9.1 dBm
Rx Sensitivity	-80 dBm
Data Rate	Up to 3Mbps
Frequency	2.4 GHz to 2.485 GHz

#### Physical Characteristics

Operating Temperature	-40°C to +85°C (TBC)
Dimensions (L x W x H)	16.7mm x 12.7mm x 2.55mm
Weight	0.81g +/- 0.25g tolerance
Certifications	See our website for this products certifications.
Compliance	RoHS, REACH and WEEE

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### Firmware

The LM074 Bluetooth® 5.0 Dual Mode module is configured by using AT commands in configuration mode. The AT command set controls the primary operations such as information enquiry, connection/disconnection set up and settings. The LM074 module can be configured via its UART interface from a microcontroller or computer, using MCU software or a serial terminal (e.g. Hercules SETUP utility) respectively. At the start of every power up cycle the LM074 enters the configuration mode.

When the LM074 is connected to another Bluetooth device it enters into data mode. In data mode, users can send/receive data between the module and the remote device via UART. To exit data mode, the user can use the escape sequence. If the LM074 responds with "OK" to the escape sequence it enters into the online\_command\_mode (i.e. the connection is still active, AT commands can be entered via UART or the connection can be dropped). The LM074 can re-enter into data mode by using AT commands.

### Firmware Upgrade

- Over-the-Air Upgrade (OTAU): The firmware is upgradable wirelessly with Bluetooth SPP connection.

### Default Factory Settings

#### Device Settings

- Discoverable: ON
- Device Name: LM074\_SPP+GAPCEN\_0106
- Echo of command: ON
- Response to commands: ON
- Pairable State: ON

#### UART Settings

- Baud rate : 19200
- Stop bit : ONE
- Parity bits: NONE
- Flow Control: OFF

#### Bluetooth® (v1.0 - v3.0) Profile Settings

- SPP Role: Dual
- Escape sequence check enabled: YES

#### Bluetooth® low energy Settings

- GAP Role: Central or Peripheral (dependent on the application)

#### Security Settings

- Pin: 1234
- DPIN: OFF
- MITM: OFF
- IOTYPE: No Input Output



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### Bluetooth® Applications

The LM074 module can run full application code for a wide range of industries. This includes the M2M (industrial cable replacement), EPOS, health & fitness and consumer electronics industries.

The LM074 modules can run all Bluetooth® applications. Depending on whether the embedded developer requires a Bluetooth® low energy connection, a high-quality data stream Bluetooth® connection or both simultaneously.

LM Technologies offer application support, including designing new applications such as:

- Alert Tag
- Beacon
- Blood Pressure Sensor
- Cycling Speed and Cadence Sensor
- Environment Sensor
- Health Thermometer
- Heart Rate Sensor
- Keyboard & Mouse
- Multifunction Steering Wheel
- Printer
- Security Tag
- Serial Communication
- Time Client
- Temperature and Pressure
- Weight Scale

### Firmware Available

- SPP with GAP Central
- SPP or GAP Peripheral
- SPP to Serial Bridge



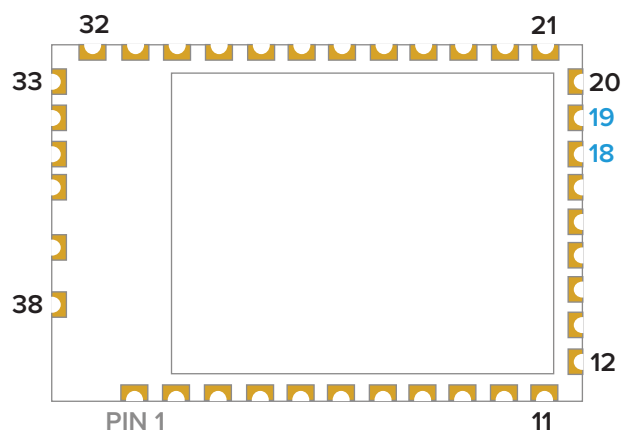
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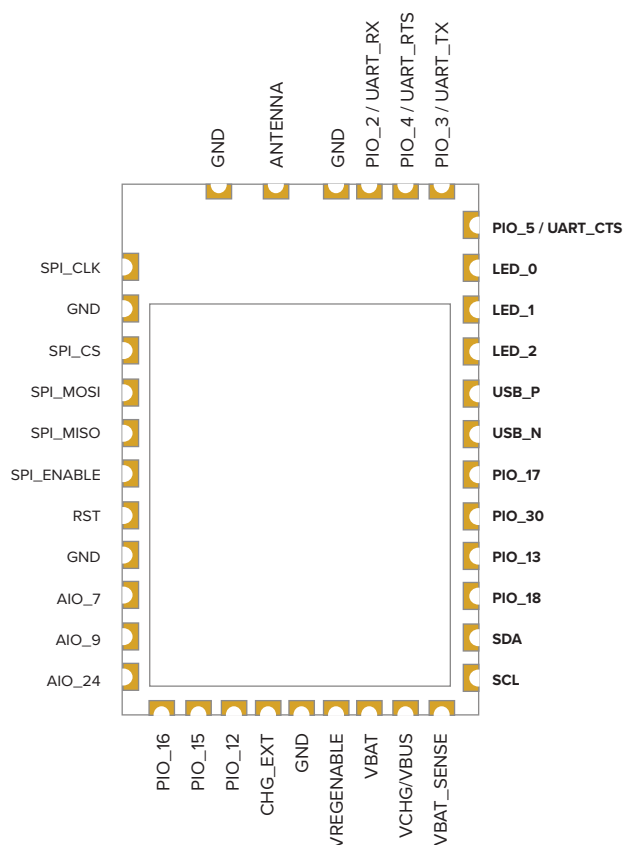
### Powering

- The LM074 can be powered in one of 2 ways:

- 1) Powered through the VCHG/VBUS (Pin 19)
- 2) Powered from a Lithium ion / Lithium polymer battery through VBAT (Pin 18)



### Pin Outs



## LM074 Bluetooth® 5.0 Dual Mode Module

### Standalone (With Embedded Bluetooth® 5.0 Stack)

#### Pin Assignments

Pin	Name	Type	Description	Typical
1	SPI_CLK	I/O	SPI Clock	0V - VDD
2	GND	Ground	Common Ground	0V
3	SPI_CS	I/O	SPI Chip Select	0V - VDD
4	SPI_MOSI	I/O	SPI Master Out Slave In	0V - VDD
5	SPI_MISO	I/O	SPI Master In Slave Out	0V - VDD
6	SPI_ENABLE	I/O	SPI Enable (CSR)	0V - VDD
7	RST	Input	Reset	0V - VDD
8	GND	Ground	Common Ground	0V
9	AIO_7	I/O	Analog Input / Output	0V - VDD
10	AIO_9	I/O	Analog Input / Output	0V - VDD
11	AIO_24	I/O	Analog Input / Output	0V - VDD
12	PIO_16	I/O	Programmable Input / Output	0V - VDD
13	PIO_15	I/O	Programmable Input / Output	0V - VDD
14	PIO_12	I/O	Programmable Input / Output	0V - VDD
15	CHG_EXT	Power	External Battery Charge Control	0V - 6.5V & 0mA - 20mA
16	GND	Ground	Common Ground	0V
17	VREGENABLE	Power	Voltage Regulator Enable	1V
18	VBAT	Power	Battery Input	2V8
19	VCHG/VBUS	Power	Battery Charger Input / Positive Power Supply	5V (3V - 6.5V)
20	VBAT_SENSE	Power	Battery Charger Sense Input	200mV (195mV - 205mV)
21	SCL	I/O	I2C Serial Clock	0V - VDD
22	SDA	I/O	I2C Serial Data	0V - VDD
23	PIO_18	I/O	Programmable Input / Output	0V - VDD
24	PIO_13	I/O	Programmable Input / Output	0V - VDD
25	PIO_30	I/O	Programmable Input / Output	0V - VDD
26	PIO_17	I/O	Programmable Input / Output	0V - VDD
27	USB_N	I/O	USB Negative	0V - VDD
28	USB_P	I/O	USB Positive	0V - VDD
29	LED_2	Output	LED 2	0V - VDD
30	LED_1	Output	LED 1	0V - VDD

## LM074 Bluetooth® 5.0 Dual Mode Module

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### Pin Assignments (Continued)

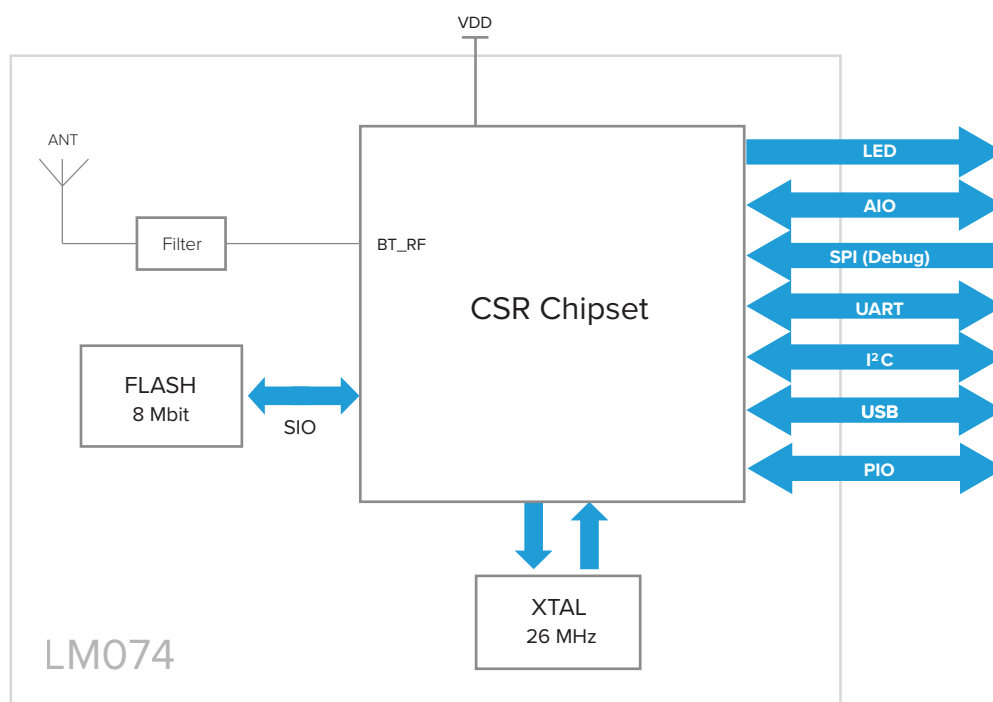
Pin	Name	Type	Description	Typical
31	LED_0	Output	LED 0	0V - VDD
32	PIO_5 / UART_CTS	I/O	Programmable Input / Output or UART CTS	0V - VDD
33	PIO_3 / UART_TX	I/O	Programmable Input / Output or UART Transmit	0V - VDD
34	PIO_4 / UART_RTS	I/O	Programmable Input / Output or UART RTS	0V - VDD
35	PIO_2 / UART_RX	I/O	Programmable Input / Output or UART Receive	0V - VDD
36	GND	Ground	Common Ground	0V
37	ANTENNA	Analogue	Antenna Interface	0V - VDD
38	GND	Ground	Common Ground	0V



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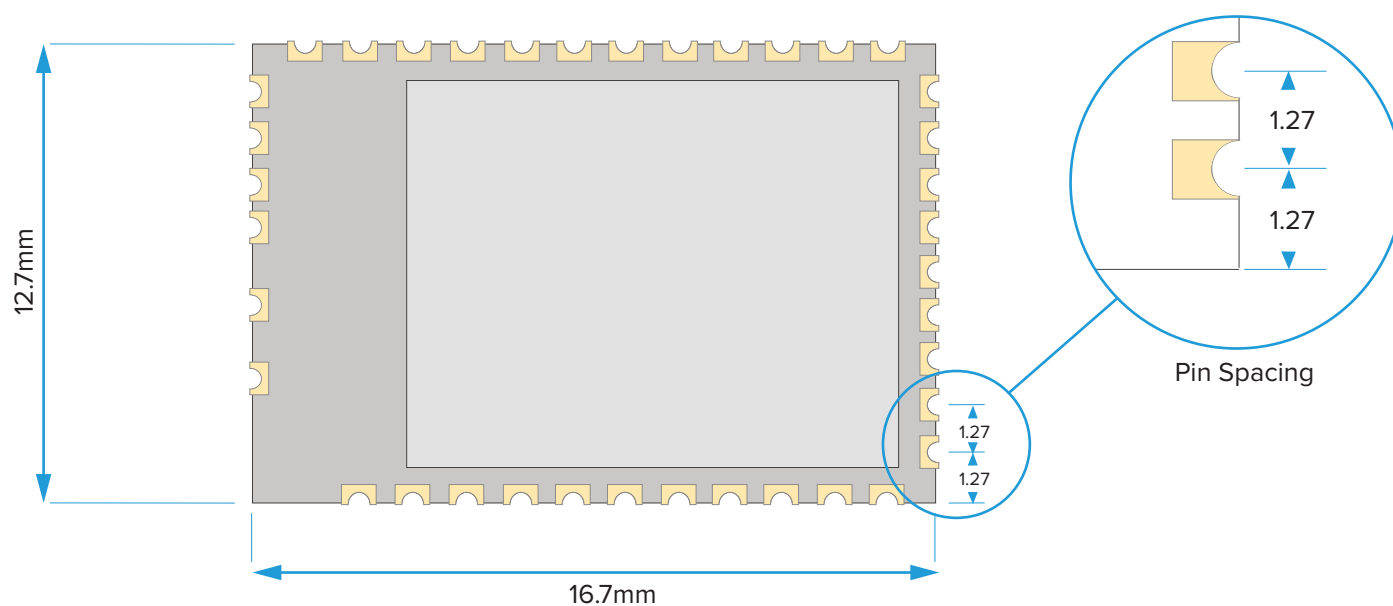
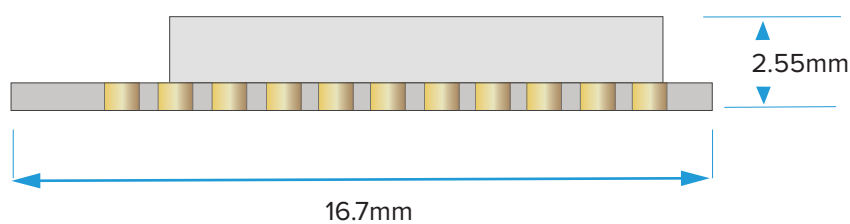
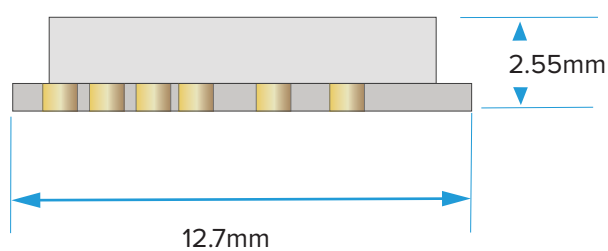
### Module Block Diagram





**LM074 Bluetooth® 5.0 Dual Mode Module**

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**Physical Dimensions****Top View****Front View****Side View**



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### Datasheet Version Notes

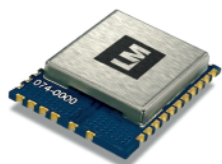
v1.0	13 MAR 2018	Added version notes to datasheet.
v1.1	14 MAR 2018	Updated default firmware name and settings
v1.2	22 MAY 2019	Updated Bluetooth® core version references.
v1.3	18 FEB 2021	Datasheet branding update.



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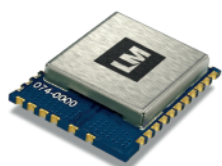
### Ordering Options



074-0190

#### LM074 Module

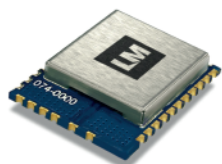
MOD SMT PROG BT5.0 D/Mode SPPwithGAPCentral\_0106 9dBm NO-ANT PCS



074-0191

#### LM074 Module

MOD SMT PROG BT5.0 D/Mode SPPwithGAPCentral\_0106 9dBm NO-ANT Tray



074-0192

#### LM074 Module

MOD SMT PROG BT5.0 D/Mode SPPwithGAPCentral\_0106 9dBm NO-ANT T&R