

# IR to Serial Converter – BM009

OPEN SOURCE HARDWARE MODULE



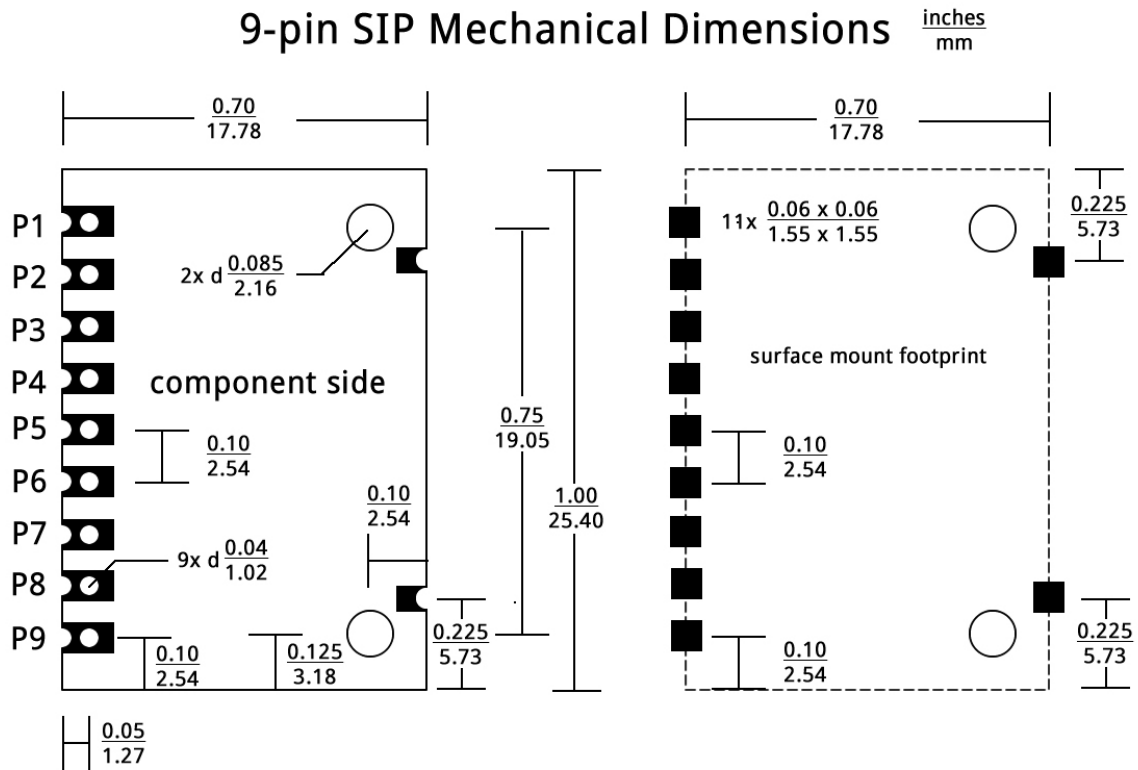
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**Product Description:**

This breakout board carries a Microchip MCP2120 infrared encoder/decoder, and a Vishay TFBS4711 serial infrared transceiver. These components form a serial data infrared transmitter and receiver for short range IR communication links.

- 9600BPS to 115200BPS serial data transmission over an IR link
- 2.5V to 5.5V operation
- 1 meter IR communication link
- MODE pin allows baud rate change through serial interface
- BAUDx pins allow hardware selected baud rate

**Dimensions:****9-pin SIP Mechanical Dimensions**

**Specifications:**

Characteristic	Min	Typ	Max	Unit	Notes
Operating voltage	2.5		5.5	V	VIN
Operating current			10	mA	
Baud rates	9600		115200	BPS	
Transmission range		0.7	1	M	
Maximum power dissipation per switch		1		W	
Operating temperature	-25		+85	°C	

**Pin Functions and Notes**

#	Name	Maximum Voltage	Notes
1	VIN	6V	Power input: power supply for the module
2	GND	0V	Ground return for the power supply
3	MODE	VIN	Logic input: the MODE pin determines whether the baud rate selection is in hardware or software mode. 0: baud rate is determined by software commands 1: baud rate is determined by BAUDx pins
4	BAUD2	VIN	Logic input: used to select the serial data baud rate
5	BAUD1	VIN	Logic input: used to select the serial data baud rate
6	BAUD0	VIN	Logic input: used to select the serial data baud rate
7	DOUT	NA	Logic output: serial data out of the module
8	DIN	VIN	Logic input: serial data into the module
9	SD	VIN	Logic input: shuts down IR transceiver when a logic high, tied 1K $\Omega$ to ground on board so it may be left unconnected

**User Notes/Tips**

- For additional information on Microchip's MCP2120 infrared encoder/decoder, or Vishay's TFBS4711 serial infrared transceiver, visit their web sites and review the datasheets.
- Visit [www.solutions-cubed.com](http://www.solutions-cubed.com) for application notes related to this module.
- If the BAUDx pins are used to establish the baud rate they cannot be used to modify the baud rate after power-up. In other words, if you need to change the baud rate during operation you should do it via the MODE pin functionality.

**BAUDx Pin Hardware Settings**

BAUD2	BAUD1	BAUD0	MODE	Baud Rate
0	0	0	1	9600
0	0	1	1	19200
0	1	0	1	38400
0	1	1	1	57600
1	0	0	1	115200

## Changing the Baud Rate with Software

To change the baud rate in software the BAUD2, BAUD1, and BAUD0 pins should be pulled to a logic 1. The baud rate will default to 9600BPS. Follow these steps to change the baud rate using the serial interface and the MODE pin.

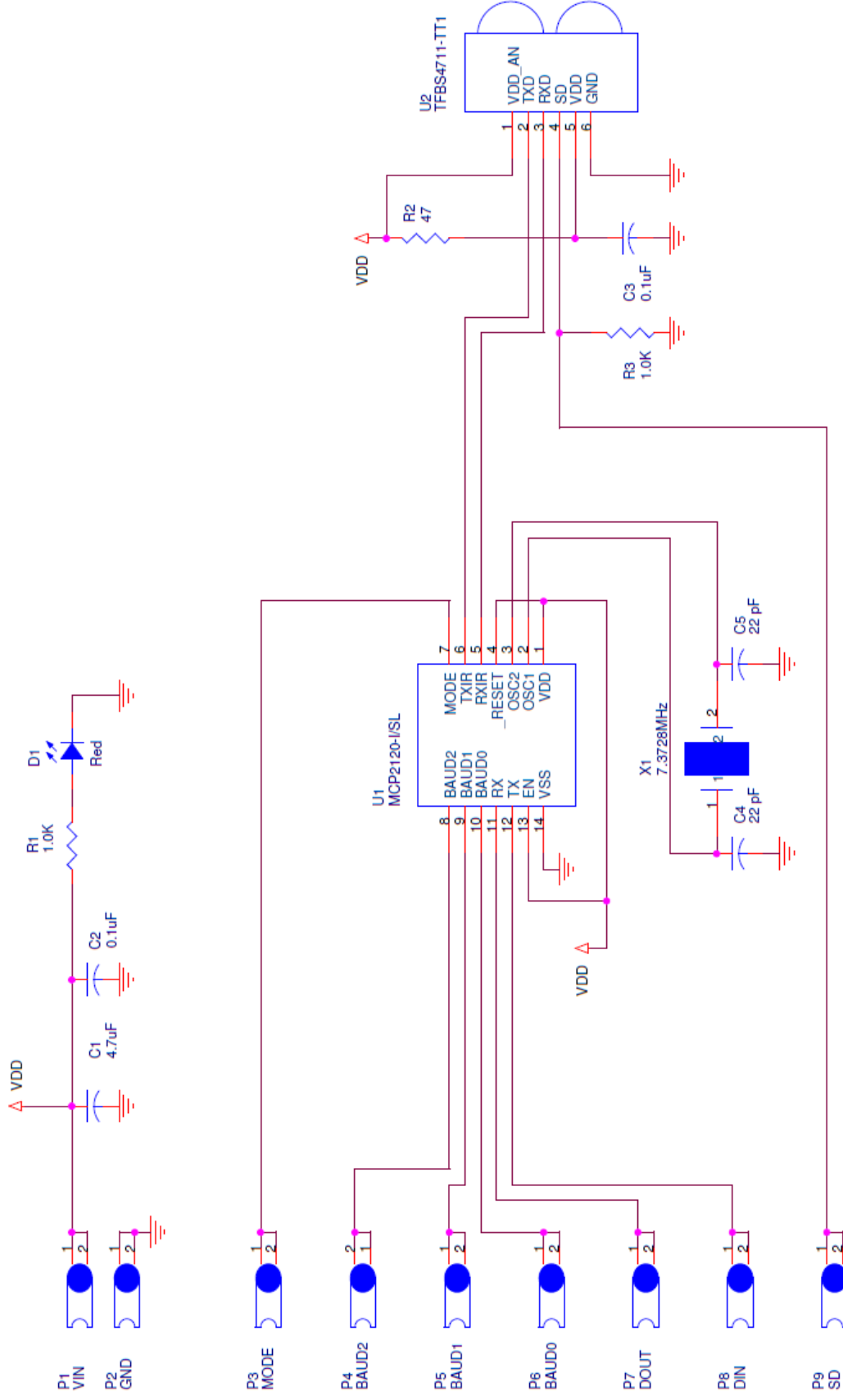
1. Set MODE pin to 0 (0V).
2. Send the hex command (see below) for the desired baud rate on the DIN pin. The command should be sent at the default baud rate. Data sent on the DIN pin will be echoed back on the DOUT pin.
3. Send 0x11 on the DIN pin to initiate the baud rate change. This command will be echoed back on the DOUT pin.
4. Set MODE pin to 1 (VIN). The new baud rate will be in effect.

## Hex Commands For Baud Rates

Hex Command	Baud Rate	Description
0x87	9600	
0x8B	19200	
0x85	38400	
0x83	57600	
0x81	115200	
0x11	NA	This command changes to the new baud rate

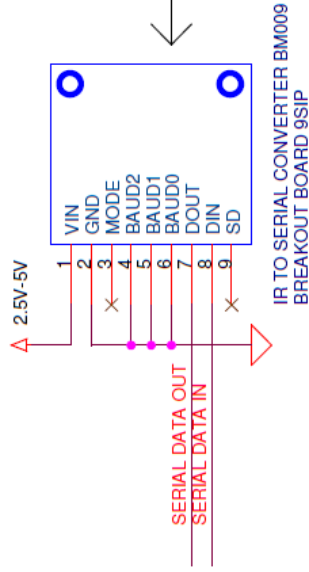
# IR to Serial Converter – BM009 User Datasheet

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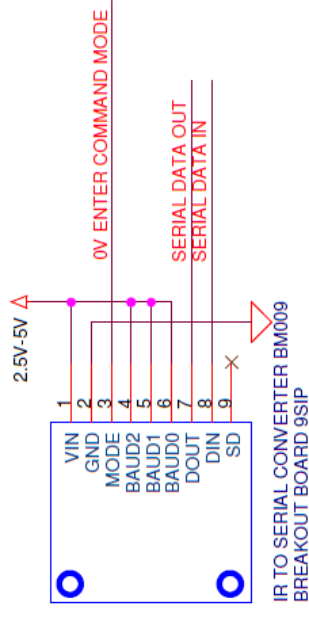
**NOTE: BAUD RATE CANNOT BE CHANGED VIA BAUD PINS AFTER POWER UP  
(USE COMMAND MODE TO CHANGE BAUD RATES ON-THE-FLY).**

9600BPS IR TO SERIAL CONVERTER  
BAUD RATE HARDWARE SELECTED



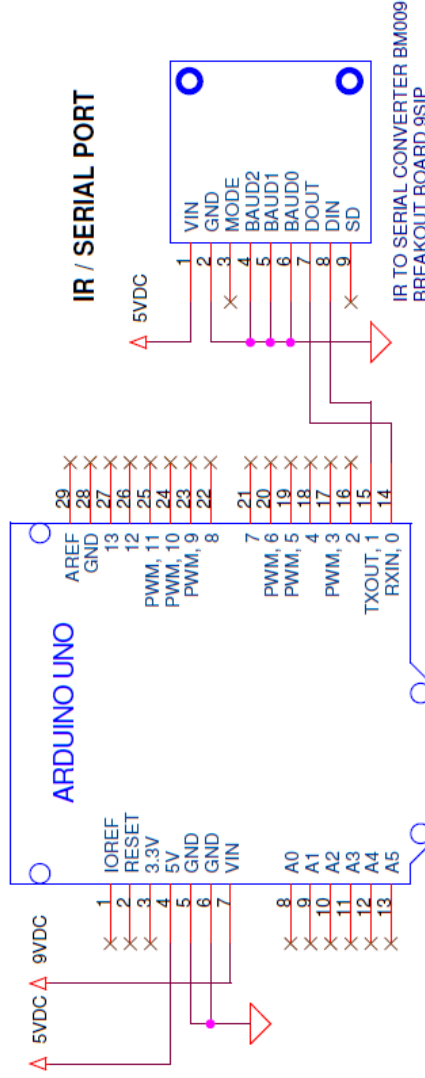
IR LINK

IR TO SERIAL CONVERTER  
BAUD RATE SOFTWARE SELECTED



ARDUINO CONNECTIONS

ARDUINO UNO3



USB TO SERIAL TO IR CONVERSION

