BATMAN BM201

BATMAN BM201 mmWAVE SENSOR MODULE

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Product Dimensions

Joybien Batman BM201 mmWave Sensor Module is a Texas Instruments (TI) IWR6843 ASIC based millimeter-wave (mmWave) Module with Frequency-Modulated Continuous Wave (FMCW) radar technology capable of operation in the 60GHz to 64GHz band with up to 4 GHz continuous chirp, using 3 Transmission Antennas and 4 Receiving Antennas, for sensing target object's range, velocity, and angle parameters.

Batman BM201 mmWave Sensor Module is a small and compact mmWave Module with low-power, self-monitored, ultra-accurate, and lighting condition independent versatilities for various applications including: Education, Engineering, Science, Industrial, Medical, and Business & Consumer.

Applications

- **Education's Practical Radar Introduction**
- **Engineering & Science's Motion Detection, Displacement,**
- **Industrial sensor for Displacement & Safe Guard, Factory Automation, Robotics, along for measuring Range, Velocity, and Angle**
- **Building Automation sensor for Occupancy Detection, Proximity & Position sensing, People Counting, Security and Surveillance**
- **Healthcare's Vital Signs Indication**
- **Business' Traffic Monitoring, and Proximity Advertisement**
- **Consumer's Gesture Recognition, Obstacle Avoidance, etc.**

Features

- **Operating Frequency: 60GHz ~ 64GHz coverage with 4GHz continuous bandwidth**
- **Antenna: 3 Tx and 4 Rx Antennas on Module, with:**
  - **TX Power: 12 dBm**
  - **RX Noise Figure: 12 dB**
  - **(Phase noise at 1MHz:-93dBc/Hz)**
- **Processors: ARM R4F based MCU and C674x DSP for advanced signal processing**
- **On-Chip Memory: 1.75MB**
- **Internal Memories With ECC**
- **Integrated Peripherals**
- **Input Power:3.3Vdc, 2.1A**

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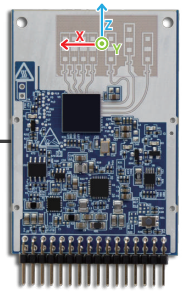
Specifications

mmWave Sensor Evaluation Module



mmWave ASIC	TI IWR6843 Single Chip mmWave Sensor
FMCW Transceiver	● Integrated PLL, Transmitter, Receiver, Baseband, and A2D ● 60GHz to 64GHz Coverage With 4GHz Continuous Bandwidth ● Four Receive Channels ● Three Transmit Channels ● Ultra-Accurate Chirp Engine Based on Fractional-N PLL ● TX Power: 12 dBm ● RX Noise Figure: 12 dB ● Phase Noise at 1 MHz: –93 dBc/Hz ● Antenna Type : ISK Antenna
Built-in Calibration and Self-Test (Monitoring)	● ARM® Cortex® -R4F-Based Radio Control System ● Built-in Firmware (ROM) ● Self-calibrating System Across Frequency and Temperature
DSP	● C674x DSP for Advanced Signal Processing
On-Chip Memory	● 1.75MB
MCU	● ARM R4F Microcontroller for Object Detection, and Interface Control ● Joybien mmWave Protocol (Per configuration)
I/O	● Up to 6 ADC Channels (low sample rate monitoring) ● Up to 2 SPI Ports ● Up to 2 UARTs ● I2C – GPIOs
Power Management	● Built-in LDO Network for Enhanced PSRR ● I/Os Support Dual Voltage 3.3 V/1.8 V
Clock Source	40MHz
Antenna Orientation	4 receive(RX) 3 transmit (TX) antenna with 108° azimuth field of view (FoV) and 44° elevation FoV
Input Power	3.3VDC, 2.1A source
Operating Temperature & Humidity	0°C ~ 40°C 10% ~ 85% Non-Condensing
Dimensions & Weight	67mm x 46mm x 2mm ; 15 grams net

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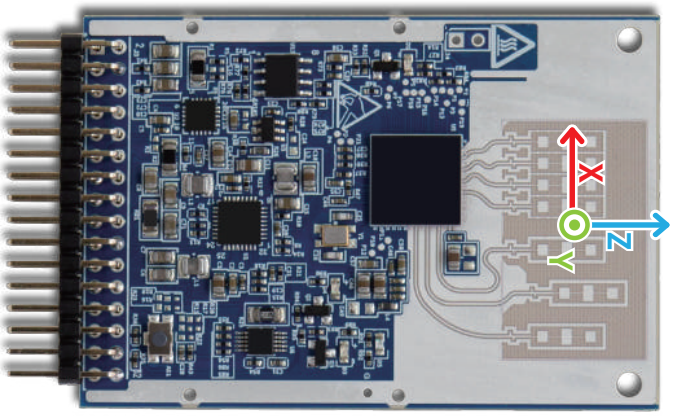
mmWave Pin Assignment

J3 J3 Pin Assignment

Pin#	Name	Name	Pin#
01	D3V3	D3V3	02
03	D3V3	PI SDA	04
05	GND	PI SCL	06
07	RS232 RX	SYNC IN JBRX1	08
09	RS232 TX	GND	10
11	nRST	GPIO 0	12
13	GND	GPIO 1	14
15	DP0	CS1	16
17	DP1	3V3_LS	18
19	GND	MOSI 1	20
21	BSS LOGGER	MISO 1	22
23	MSS LOGGER JBTX1	SPICLK 1	24
25	PMIC CLKOUT SOP2	GND	26
27	SYNC OUT SOP1	nERRIN	28
29	GND(Mistake Proofing Pin)	nERROUT	30
31	WARMRST	GPIO 2	32



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J3 Pin Assignment

Pin No	Name	Pin Type	Function Description
01	D3V3	I	POWER DC 3V3 Input
02	D3V3	I	POWER DC 3V3 Input
03	D3V3	I	POWER DC 3V3 Input
04	SDA	IO	I2C Pin
05	GND	GROUND	Digital ground
06	SCL	IO	I2C Pin
07	RS232 RX0	I	UART A Receive
08	SYNC IN JBRX1	I	Low frequency Synchronization signal input, UART B Receive
09	RS232 TX0	O	UART A Transmit
10	GND	GROUND	Digital ground
11	nRST	I	Power on reset for chip. Active low
12	GOIO 0	I	Select KeyData or RawData
13	GND	GROUND	Digital ground
14	GPIO 1	I	Reserved
15	DP0	IO	GPIO Pin
16	CS1	IO	SPI Channel A - chip Select
17	DP1	IO	GPIO Pin
18	3V3	O	For meaurement only
19	GND	GROUND	Digital ground
20	MOSI 1	IO	SPI Channel A - Master Out Slave In
21	BSS LOGGER	IO	BSS LOGGER
22	MISO 1	IO	SPI Channel A - Master In Slave Out
23	MSS LOGGER JBTX1	O	UART B Transmit
24	SPICLK 1	IO	SPI Channel A - Clock
25	SOP2	I	SOP2
26	GND	GROUND	Digital ground
27	SOP1	I	SOP1
28	nERRIN	I	Failsafe input to the device. Nerror output from any other device can be concentrated in the error signaling monitor module inside the device and appropriate action can be taken by Firmware.
29	GND	GROUND	Mistake Proofing Pin
30	nERROUT	O	Open drain fail safe output signal. Connected to PMIC/Processor/MCU to indicate that some severe criticatlity fault has happened. Recovery would be through reset.
31	WARMRST	IO	Open drain fail safe warm reset signal. Can be driven from PMIC for diagnostic or can be used as status signal that the device is going through reset.
32	GPIO2	O	LED Indicator

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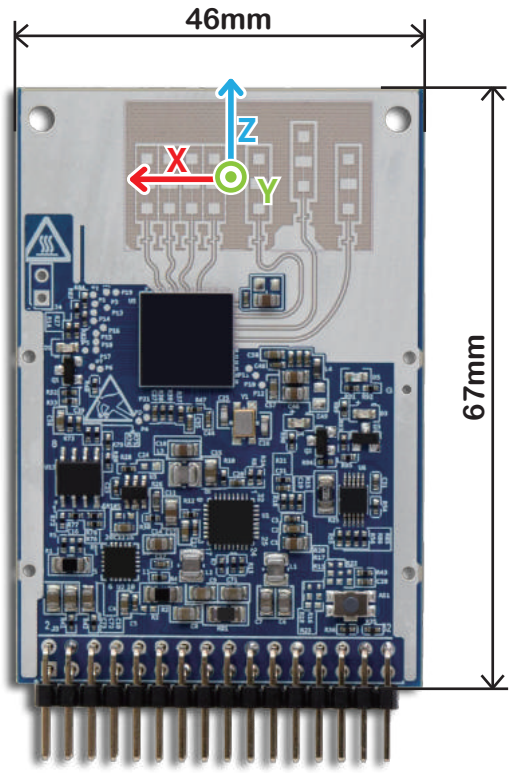

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