Batman BM601

BATMAN BM601 mmWAVE SENSOR MODULE

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Joybien Batman BM601 mmWave Sensor Module is a Texas Instruments (TI) IWR1843 ASIC based millimeter-wave (mmWave) Module with Frequency-Modulated Continuous Wave (FMCW) radar technology capable of operation in the 76GHz to 81GHz 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 BM601 mmWave Sensor Module is an extremely light 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, etc.
- Industrial sensor for Displacement & Safe Guard, Factory Automation, Robotics, etc.
- Building Automation sensor for Occupancy Detection, Proximity & Position sensing, People Counting, People Density, Security and Surveillance,
- Healthcare's Vital Signs Detection, People Fall Detection, etc.
- Business' Traffic Monitoring, Parking Space occupancy and Proximity Advertisement
- Consumer's Gesture Recognition, Obstacle Avoidance, etc.

Features

- Operating Frequency: 76GHz ~ 81GHz coverage
  with 4GHz continuous bandwidth
- Antenna: 3 Tx and 4 Rx with:
  TX Power: 12 dBm
  RX Noise Figure: 14 dB(76~77 GHz)
  15 dB(77~81GHz)
- Processors: ARM R4F based MCU, and C674x DSP
  for FMCW signal processing
- On-Chip Memory: 2MB
- Internal Memories With ECC
- Integrated Peripherals
- Extremely light and compact Module design.
- Supplied Voltage: 3.3VDC & 1.5A

Joybien Technologies Co., Ltd. TEL:02-8227-3098 http://www.joybien.com
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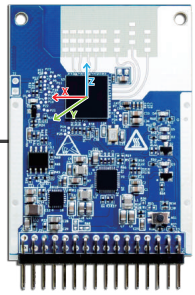
mmWAVE SENSOR EVALUATION SOLUTION

Specifications

mmWave Sensor Evaluation Module



mmWave ASIC	TI IWR1843 Single Chip mmWave Sensor
FMCW Transceiver	● Integrated PLL, Transmitter, Receiver, Baseband, and A2D ● 76GHz to 81GHz 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: 14 dB(76GHz ~ 77GHz) / 15 dB(77GHz ~ 81GHz) ● Phase Noise at 1 MHz: –92 dBc/Hz ● Antenna Type : PCB Antenna ● Max real sampling rate: 25 Msps ● Max complex sampling rate :12.5 Msps
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	● 2MB
MCU	● ARM R4F Microcontroller for Object Detection, and Interface Control ● Joybien mmWave Protocol (Per configuration)
I/O	● UART x 2 ● GPIO x 2(GPIO_31,GPIO_32)
Power Management	● Built-in LDO Network for Enhanced PSRR ● I/Os Support Dual Voltage 3.3 V
Clock Source	40MHz
Antenna Orientation	4 receive(RX) 3 transmit (TX) antenna with 120° azimuth field of view (FoV) and 40° elevation FoV
Input Power	3.3VDC, 1.5A source
Operating Temperature & Humidity	0°C ~ 40°C 10% ~ 85% Non-Condensing
Dimensions & Weight	70.2mm x 45.9mm x 9mm ; 16 grams net

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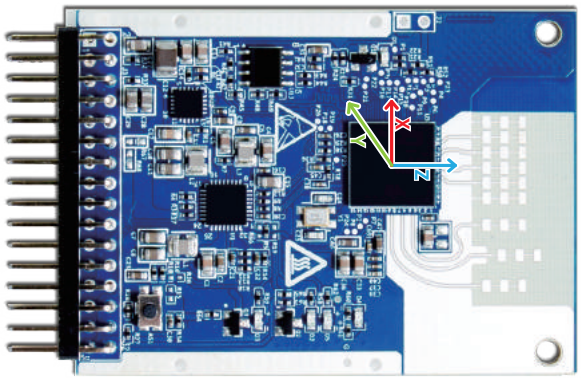
mmWave Pin Assignment

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	SOP0	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	GPIO 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	SOP0	O	SOP0
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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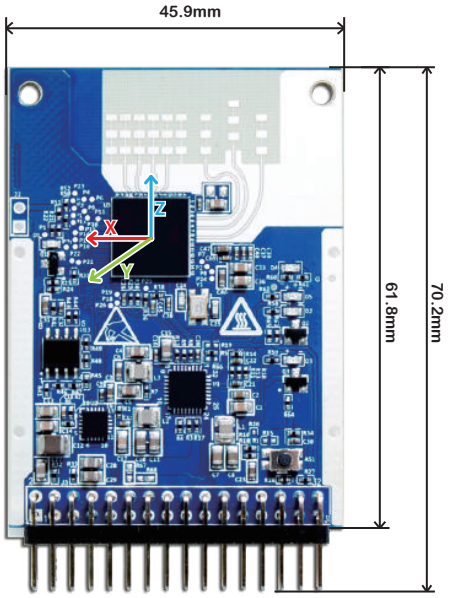
Product Dimensions



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Note:
Please contact us at Joybien in advance for BM601 commercial application for mass production.