

Low power 60 GHz Doppler radar sensor module

The module is based on the Infineon BGT60LTR11AIP sensor and includes all necessary components to operate BGT60LTR11AIP in autonomous mode.

Features

- Wide operating voltage 2.3 to 5.5V for compatibility with voltages available on the mainboard.
- Powerful open-drain TDet output up to 3A 12V for direct drive of LEDs, optocouplers, and relay coils.
- Powerful inverted TDet output (open-drain nTDet) up to 3A 5.5V for more flexibility.
- No external components required: the module can be supplied with an internal reset MLCC, sensitivity resistor, and hold time resistor.
- Tuneable option with external reset MLCC, sensitivity resistor, and hold time resistor available.
- Compact size (15x10mm) and thin (1.5mm max).
- SMT friendly.

Pinout

#	Name	Function
1,16	VDD	DC supply: 2.3 to 5.5V, 130mA peak, 4mA average.
2	nRST	Module reset, active low, pulled-up to internal 1.5V via 10k resistor. Leave it open when the 100nF option has been chosen.
3	QS2	Analog input to configure the sensitivity. Leave it open if the pre-programmed option has been chosen.
4	QS3	Analog input to configure hold time. Leave it open if the pre-programmed option has been chosen.
5,11,12,13,14,15	GND	Ground.
6	PDet	Direction of movement detector output, push-pull 1.5V, low for approaching target, high for departing target.
7,10	TDet	Motion detector output, open-drain, active low, up to 3A 12V.
8,9	nTDet	Motion detector output, open-drain, active high, tied to VDD via 10k resistor, up to 3A 5.5V.

Absolute maximum ratings

T_{OP} = -20°C .. 85°C; all voltages with respect to ground, positive current flowing into pin (unless otherwise specified).

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Supply voltage	V _{DD}	-0.3	3.3	5.5	V
Voltage applied to nRST, QS2, QS3, PDet, nTDet pins	V _I	-0.3	-	1.8	V
Voltage applied to TDet pin	V _I	-0.3	-	12	V
Voltage applied to nTDet pin	V _I	-0.3	-	8	V
Continuous drain current (TDet, nTDet to GND)	I _D	-	-	4.4	A
Total power dissipation	P _{DISS}	-	-	300	mW
Storage temperature range	T _{STG}	-40	-	+150	°C
Operational temperature range	T _{OP}	-20	-	+85	°C

Attention: Stresses above the max. values listed here may cause permanent damage to the device.

Power supply

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Supply voltage	V _{DD}	2.3	3.3	5.0	V
Current consumption in pulse-on phase	I _{PULSE}		130		mA
Current consumption, average	I _{AVG}		4		mA
Power consumption, average	P _{avg}	10	15	20	mW

Ordering information

BGT60MV-RST

BGT60: core sensor BGT60LTR11AIP;

M: module;

V: module version;

R: reset MLCC –

S: sensitivity resistor (QS2 to GND)

T: hold time resistor (QS3 to GND)

R (Reset MLCC)	
0	none
1	100nF

S (Sensitivity)		
	QS2 to GND, kOhm	Range*, m
1	1.1	7
2	1.8	6
3	2.8	5
4	3.9	4.5
5	5.1	4
6	6.8	3.5
7	9.1	3
8	11	2.6
9	15	2.2
A	20	1.8
B	24	1.4
C	39	1
D	51	0.8
E	91	0.6
F	270	0.5
0	none	0.5

T (hold Time)		
	QS3 to GND, kOhm	Time
1	1.1	0.5 s
2	1.8	1 s
3	2.8	2 s
4	3.9	3 s
5	5.1	5 s
6	6.8	10 s
7	9.1	30 s
8	11	45 s
9	15	1 m
A	20	1.5 m
B	24	2 m
C	39	5 m
D	51	10 m
E	91	15 m
F	270	30 m
0	none	30 m

*) Range is estimated just for reference and not guaranteed.

Example 1: BGT60M1-15A

Modul Version 1, 100nF reset MLCC, average sensitivity, 1.5min hold time.

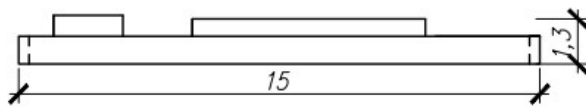
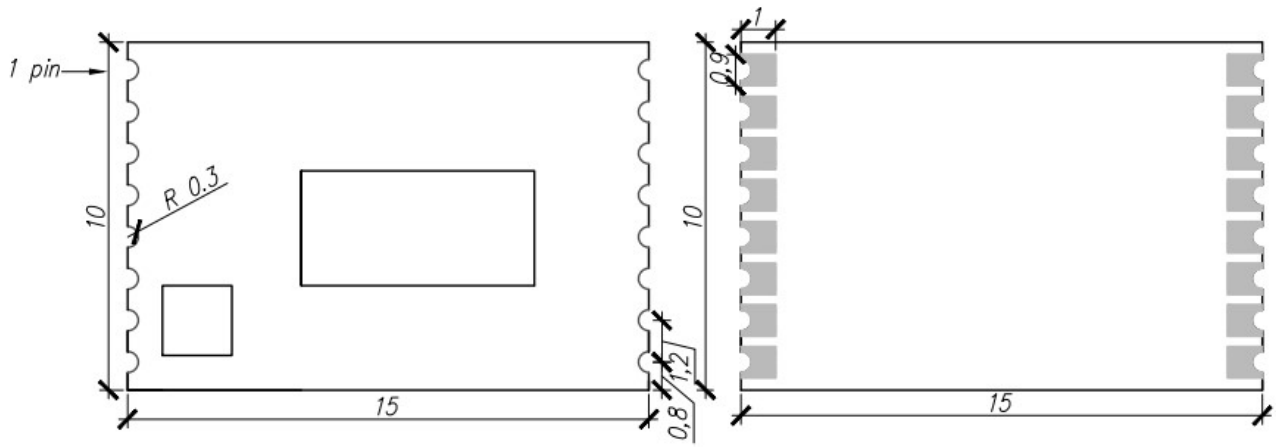
Example 2: BGT60M1-000

Modul Version 1, no reset MLCC, no QS2 resistor, no hold time resistor.

Module drawing

Top view

Bottom view



Recommended land pattern:

