

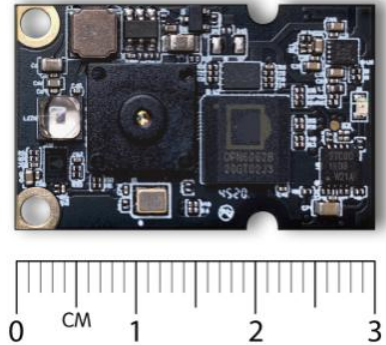
DMOS5030A/5031A

3D ToF Solution for IoT Applications

Datasheet (v1.0)

1. General Description

DMOS5030A/5031A is an all-in-one, low cost, flexible and easy to use 3D ToF(Time-of-Flight) solution for IoT applications. It consists of an on-board 100x100 array ToF sensor and ToF processor -- DM3602, which combines ToF sensing, ToF signal processing and application algorithm on a single board. It integrates algorithms for specific applications, such as range finding, multi-zone human sensing, posture monitoring, gesture control, keystone correction... These features are widely used in IoT applications like white goods, Laser TV, smart projector, smart illumination, smart parking, smart home facilities...



Features

- ✓ Fully integrated solution
 - Integrated IR emitter and optics
 - Integrated ToF processor for advanced ranging data processing
- ✓ Accurate long distance ranging
 - Up to 5m range
 - Less than 2% deviation over full measurement range
- ✓ Class-1 laser eye safety
 - Auto laser turn-off against abnormality
- ✓ Easy system integration
 - Single 5V power supply
 - UART/SPI/I2C/GPIO for configuration and data transmission
- ✓ Small form-factor
 - 30.5 x 19 x 4.05 (mm³)

Applications

- ✓ White goods
- ✓ Smart Lamp
- ✓ Automatic door
- ✓ Range finder
- ✓ Smart home
- ✓ Smart projector
- ✓ Laser TV
- ✓ Smart parking

DMOS5030A/5031A

3D ToF Solution for IoT Applications

Datasheet (v1.0)

2. System overview

DMOS5030A/5031A consists of a high performance ToF sensing sub-system and a ToF processor DM3602. The ToF processor DM3602 processes raw output data from ToF sensing sub-system with on-chip highly efficient ToF ISP engine, then hands them over to on-chip Cortex M3 core for succeeding application specific algorithm processing and finally outputs processed results to host processor via host interface. The host interface could work in UART or SPI mode, which is configurable in DM3602 firmware.

The DMOS5030A/5031A has built-in power management circuit to generate all necessary power rails from a single 5V power supply.

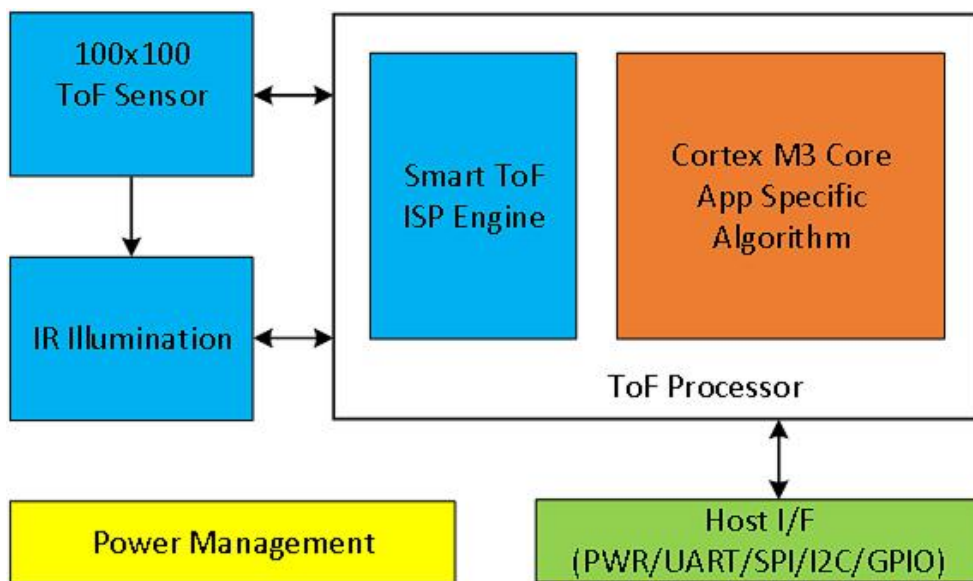


Figure 1 System Diagram

DMOS5030A/5031A

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Datasheet (v1.0)

3. Host Interface

The host interface is for communication between DMOS5030A/5031A and host processor. It is firmware configurable as UART or SPI mode.

Physically, the host interface is a 12-pin 0.5mm-pitch FPC connector on the back side of DMOS5030A/5031A board named CN3. The pin definition is as below table.

Table 1 Host Interface Description

Pin #	Name	Discription
1	VCC_SYS	Power Supply, 5V >=500mA
2	GND	Ground
3	VDD_AP	Reserved, NC
4	SPI_MISO/SDA	SPI_MISO or I2C_SDA, 3.3V
5	SPI_CLK/SCL	SPI_CLK or I2C_SCL, 3.3V
6	SPI_CS	SPI_CS, 3.3V
7	SPI_MOSI	SPI_MOSI, 3.3V
8	AP_SYNC/AP_GPIO1	Strobe signal from AP when module under slave mode, 3.3V; could be config to a GPIO alternatively
9	UART0_RX/AP_GPIO3	Rx of uart, 3.3V; could be config to a GPIO alternatively
10	UART0_TX/AP_GPIO4	Tx of uart, 3.3V; could be config to a GPIO alternatively
11	AP_GPIO2	GPIO, 3.3V
12	AP_EN	Enable signal from AP, 3.3V, AP_EN = 1, module power down; AP_EN = 0, module power on

3.1 UART mode

Pin 9 and 10 of CN3 form a bi-directional UART interface for communication with the host processor. Pin 9 is Rx pin to receive configurations from host and pin 10 is Tx pin to output algorithm processing results from DMOS5030A/5031A.

The UART is compliant with below protocol:

Table 2 UART Protocol

Signaling	3.3V, CMOS level
Baud rate	115200 bps
Data bits	8
Stop bits	1
Parity	None
Flow control	None

DMOS5030A/5031A

3D ToF Solution for IoT Applications

Datasheet (v1.0)

3.2 SPI mode

Pin 4, 5, 6 and 7 of CN3 form a 4-wire bi-directional SPI interface for communication with the host processor.

The SPI frame format is TBD.

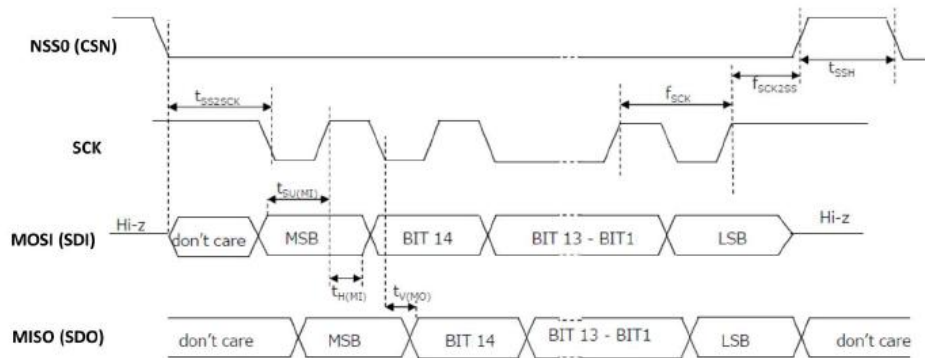


Figure 3 SPI timing of DMOS5030A/5031A

DMOS5030A/5031A

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Datasheet (v1.0)

4. Key Specifications

Table 4 Specifications

Parameter	DMOS5030A	DMOS5031A
Sensor	Global shutter	
Output Resolution	Max 100 x 100, firmware configurable.	
Dimensions (L x W x H)	30mm x 19mm x 3.98mm	
Refreshing rate	Up to 20 FPS, firmware configurable.	
Measurement range	0.2m – 4.8m	0.2m – 2.5m
FOV	30°(H) x 30°(V)	60°(H) x 60°(V)
Emitter	850nm VCSEL	940nm VCSEL
Power consumption	Peak current < 500mA, Average current < 200mA	
Depth deviation	<= 2% ¹	
Interface	UART/SPI, firmware configurable.	

1. Dark room, >85% reflection chart.

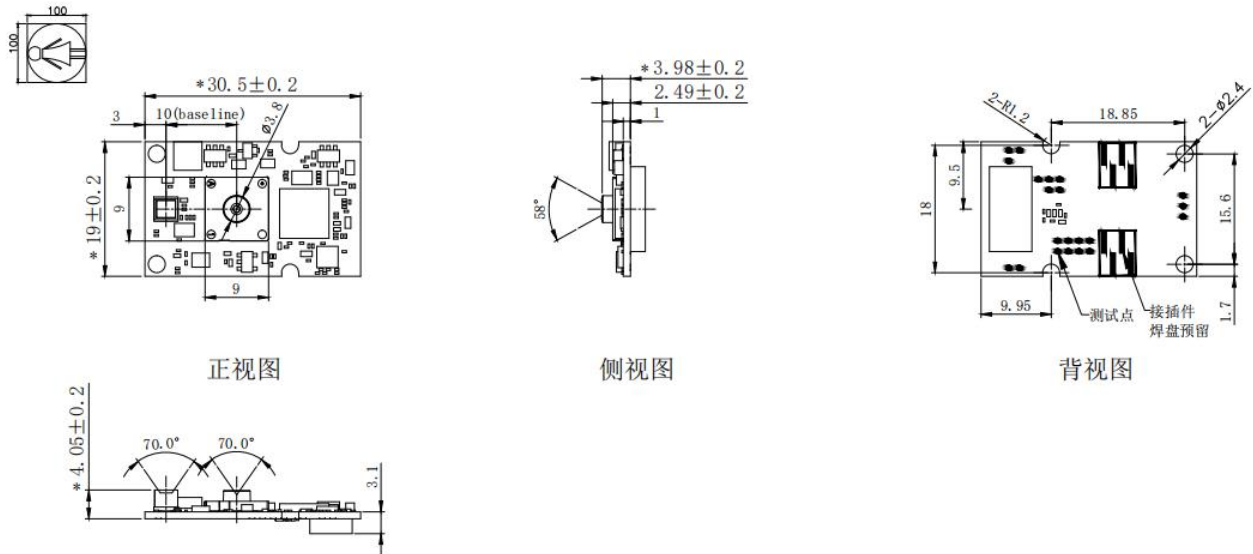


DMOS5030A/5031A

3D ToF Solution for IoT Applications

Datasheet (v1.0)

5. Outline Dimensions



Note:

1. “*” 代表重要尺寸;

Figure 4 Outline Dimensions of DMOS5030A/5031A

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3D ToF Solution for IoT Applications

Datasheet (v1.0)

6. Product Ordering Information

Table 5 Ordering Information

Part Number	Description
DMOS5030A	850nm VCSEL version 3D ToF solution for long-range applications.
DMOS5031A	940nm VCSEL version 3D ToF solution for mid-range applications.



7. Revision History

Revision	Date	Description
v1.0	2021/1/20	Initial public revision.

