



K60168-M Product Brief

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Revision History

Revision Number	Release Date	Description of Revision	
		Reference	Description of the Change
1.00	20-Feb-2021	--	Original release
1.01	05-Aug-2021	--	Template update

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1 Main specifications

Description

K60168-M is a hand gesture recognition SoC. It integrates radar sensor, 1 transmit antenna and 3 receive antennas which are integrated on top of a 6.1 x 3.9mm package, AI accelerator and machine learning algorithm to perform 1D, 2D and 3D tracking. We develop several sets of gestures with over 95% of accuracy rate as an innovative human machine interface. Customers can select the proper gesture sets that are suitable for their application scenarios.

Gesture control feature

- Application distance 1 ~ 30cm.
- Angle, FOV +/- 30° 3dB beamwidth.
- Gesture recognition.
- Initial provide pre-trained gestures classified.
- Gesture recognition accuracy > 95%.
- Gesture tracking, support 3D finger tracking.

SoC/AiP

- Full Integration of millimeter-wave transceiver, baseband, radar DSP, AI accelerator, DC/DC, and PMU.
- Antenna in package design.
- Require external 8Mbits 3.3V flash, QSPI interface.
- Interface for SoC to host: I2C or UART*1/GPIO*/SPI*2.

Transceiver

- Integrated frequency synthesizer, transmitter, receiver, baseband and ADC...
- Radar modulation – FMCW.
- Max modulation bandwidth 10GHz from 57~67GHz.
- Operational modulation bandwidth.
- (FCC Requirement) 7GHz from 57~64GHz.
- Build-in self-test and calibration.

DSP

- Adaptive Interference Cancellation (AIC).
- Self-Interference Cancellation (SIC).

- Fast Fourier Transform (FFT) programmable engine.
- Build-in 3D tracking engine.

AI accelerator for machine learning

- Gesture inference running on AI accelerator to minimize power consumption and latency.

BOM count

Few external components needed.

- IC body size: 6.1*3.9*1.3mm BGA 35.
- 40MHz XTAL (1.6*1.2*0.3 mm).
- 4.7uH*1 (2*1.6*1mm) Inductor.
- 4.7uF*1 (1.6*0.8*0.8mm) Capacitor.
- 0.1uF*1 Capacitor.

2 Block diagram

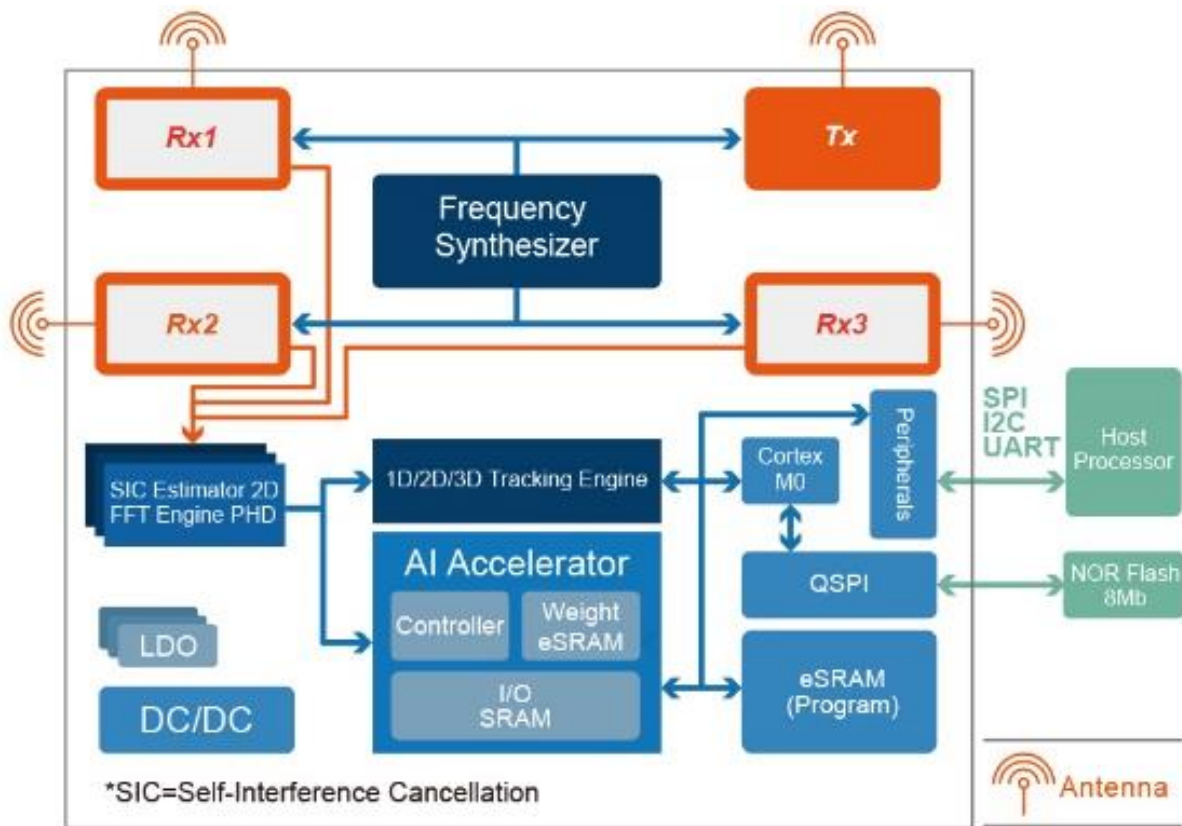
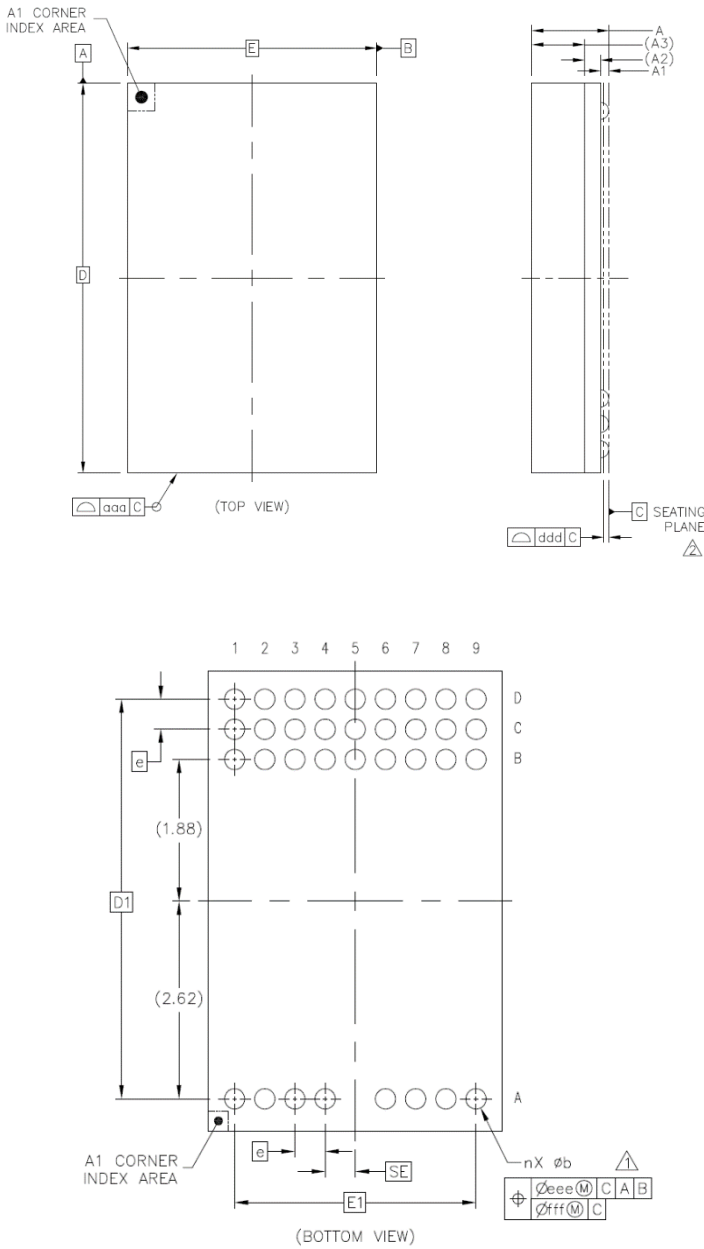


Figure 1 K60168-M Block diagram

3 Package diagram



	SYMBOL	COMMON DIMENSIONS		
		MIN.	NOR.	MAX.
TOTAL THICKNESS	A	---	---	1.3
STAND OFF	A1	0.04	0.09	0.14
MOLD THICKNESS	A2	0.17 REF		
SUBSTRATE THICKNESS	A3	0.825 REF		
BODY SIZE	D	6.1		BSC
	E	3.9		BSC
BALL DIAMETER		0.25		
LASER ABLATION OPENING		0.25		
BALL WIDTH	b	0.22	0.27	0.32
BALL PITCH	e	0.4 BSC		
BALL COUNT	n	35		
EDGE BALL CENTER TO CENTER	D1	5.3 BSC		
	E1	3.2 BSC		
BODY CENTER TO CONTACT BALL	SD	--- BSC		
	SE	0.4 BSC		
PACKAGE EDGE TOLERANCE	aaa	0.1		
MOLD FLATNESS	bbb	---		
COPLANARITY	ddd	0.08		
BALL OFFSET (PACKAGE)	eee	0.15		
BALL OFFSET (BALL)	fff	0.08		

NOTES:

- ⚠ DIMENSION b IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO DATUM PLANE C.
- ⚠ DATUM C (SEATING PLANE) IS DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
- ⚠ PARALLELISM MEASUREMENT SHALL EXCLUDE ANY EFFECT OF MARK ON TOP SURFACE OF PACKAGE.

Figure 2 K60168-M Package diagram



kaikuTek

Echo to the Future