SGM22003D2
2.4GHz, +27dBm ISM Front-End Module

GENERAL DESCRIPTION

The SGM22003D2 is a 2.4GHz ISM Front-End Module (FEM) which integrates a fully matched 2.4GHz power amplifier (PA), a low noise amplifier (LNA), two SPDT T/R switches and a controller inside. It has 4 states which are RX mode, TX mode, LNA bypass mode and off mode with two control pins.

The high power and low noise figure performance make it suitable for Bluetooth, 802.15.4, Zigbee, and any other wireless applications in 2.4GHz ISM band.

The SGM22003D2 is available in a Green TLGA-3×3-16AL package.

FEATURES

- **Output Power: 27dBm**
- **Low Standby Current: 0.5μA**
- **TX Current Consumption: 350mA @ P_{OUT} = 27dBm**
- **RX Noise Figure: 1.8dB**
- **Input and Output Fully Matched to 50Ω**
- **Available in a Green TLGA-3×3-16AL Package**

APPLICATIONS

Wireless Sound and Audio Systems
Home and Industrial Automation
Wireless Sensor Networks
IoT Applications

BLOCK DIAGRAM

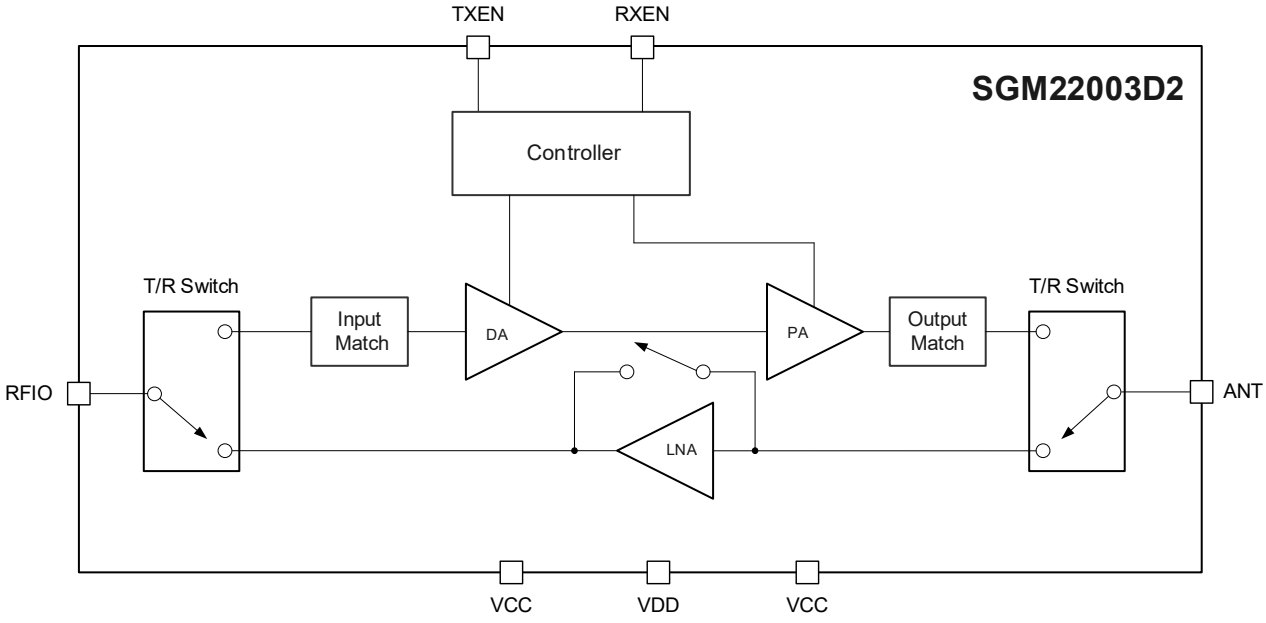


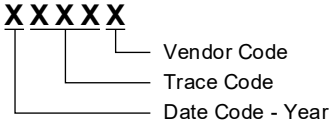
Figure 1. SGM22003D2 Block Diagram

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM22003D2	TLGA-3×3-16AL	-40℃ to +85℃	SGM22003D2YTLAO16G/TR	1F1LAO XXXXX	Tape and Reel, 4000

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code.



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage

V_{CC} 6.0V

V_{DD} 4.0V

Control Voltage, TXEN 3.6V

Control Voltage, RXEN 3.6V

TX Input Power 10dBm

RX Input Power 10dBm

Package Thermal Resistance

TLGA-3×3-16AL, θ_{JA} ..... 39.8℃/W

TLGA-3×3-16AL, θ_{JB} ..... 8.2℃/W

TLGA-3×3-16AL, $\theta_{JC\ (TOP)}$ ..... 54℃/W

TLGA-3×3-16AL, $\theta_{JC\ (BOT)}$ ..... 8.9℃/W

Storage Temperature Range ..... -55℃ to +150℃

Lead Temperature (Soldering, 10s) ..... +260℃

ESD Susceptibility (1) (2)

HBM ..... ±750V

CDM ..... ±2000V

NOTES:

1. For human body model (HBM), all pins comply with ANSI/ESDA/JEDEC JS-001 specifications.

2. For charged device model (CDM), all pins comply with ANSI/ESDA/JEDEC JS-002 specifications.

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range ..... -40℃ to +85℃

Supply Voltage

V_{CC} ..... 3.2V to 5.0V

V_{DD} ..... 3.0V to 3.6V

Control Voltage High, $TXEN_{\_IH}$ (1), $RXEN_{\_IH}$ ..... 1.35V to V_{DD}

Control Voltage Low, $TXEN_{\_IL}$, $RXEN_{\_IL}$ ..... 0V to 0.45V

NOTE:

1. Guaranteed by design, not tested in production.

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

ESD SENSITIVITY CAUTION

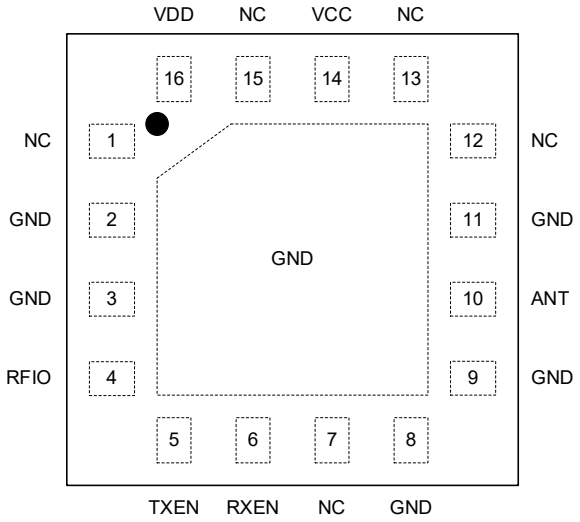
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATION

(TOP VIEW)



TLGA-3×3-16AL

PIN DESCRIPTION

PIN	NAME	FUNCTION
1, 7, 12, 13, 15	NC	No Connection.
2, 3, 8, 9, 11	GND	Ground.
4	RFIO	RF TX Input and Rx Output Port.
5	TXEN	Enable Pin for TX.
6	RXEN	Enable Pin for RX.
10	ANT	Antenna Port.
14	VCC	Supply Voltage for PA.
16	VDD	Supply Voltage for LNA and Controller
Exposed Pad	GND	Ground.

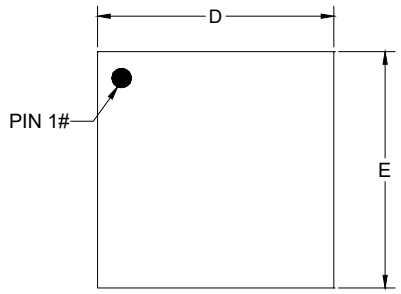
NOTE: External VCC supply must connect pin1 VCC together with pin5 VCC in PCB layout. Don’t leave pin1 or pin5 alone.

CONTROL LOGIC

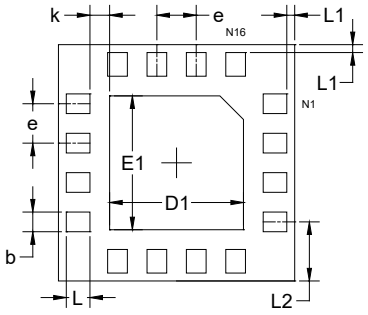
Mode	TXEN	RXEN
TX Mode	1	0
RX Mode	0	1
LNA Bypass	1	1
Off	0	0

PACKAGE OUTLINE DIMENSIONS

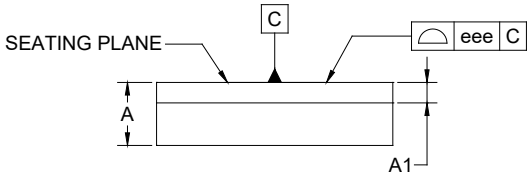
TLGA-3×3-16AL



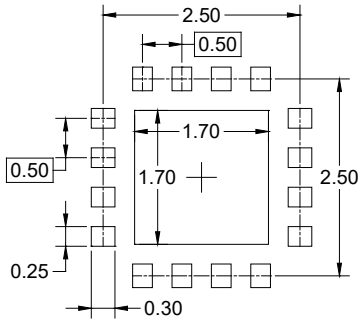
TOP VIEW



BOTTOM VIEW



SIDE VIEW



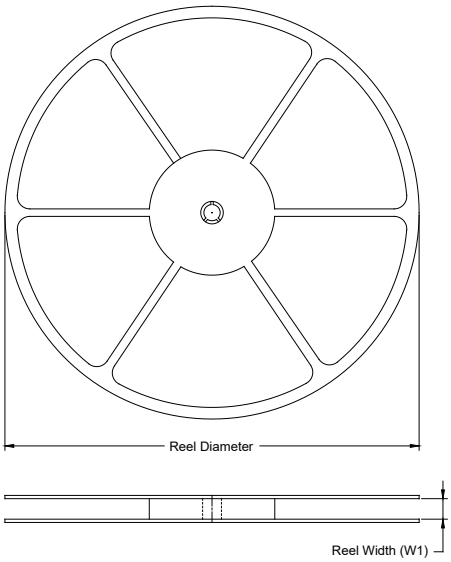
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.750	-	0.850
A1	0.260 REF		
b	0.200	-	0.300
D	2.900	-	3.100
E	2.900	-	3.100
D1	1.600	-	1.800
E1	1.600	-	1.800
e	0.500 BSC		
k	0.250 REF		
L	0.250	-	0.350
L1	0.100 REF		
L2	0.750 REF		
eee	0.100		

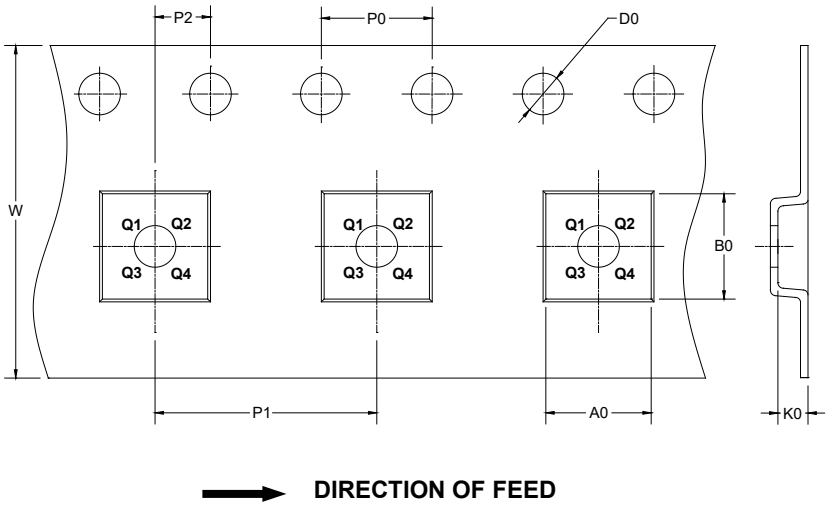
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



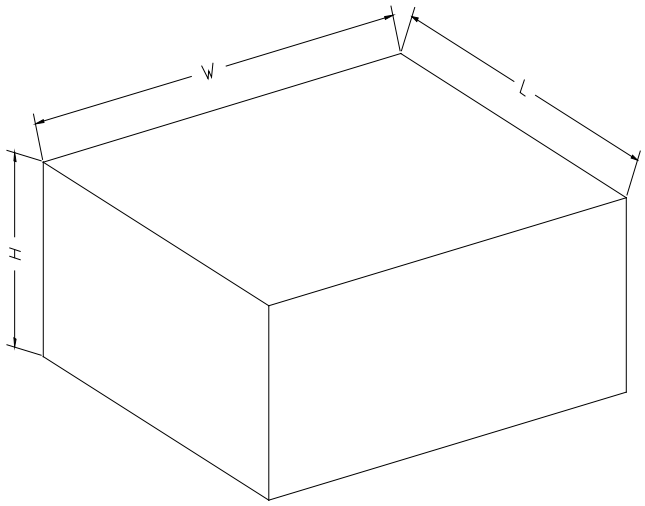
NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	D0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TLGA-3×3-16AL	13"	12.4	3.30	3.30	1.10	1.50	4.0	8.0	2.0	12.0	Q1

DD0001

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13″	386	280	370	5

DD0002