

GENERAL DESCRIPTION

The SGM33685L4 is a High Linearity Front-End Module which can support 169MHz to 170MHz. The device uses advanced InGaP/GaAs HBT (heterojunction bipolar transistor) process, so it features high linearity, high efficiency and high ruggedness.

The SGM33685L4 is available in a Green TLGA-4×4-16L package.

APPLICATIONS

Repeater
ISM Band PA
Smart Meters

FEATURES

- **VCC0/VCC1/VCC2 Supply Voltage: 3.3V to 5V**
- **Saturated Output Power at 3.6V: 30.5dBm**
- **High Efficiency PA**
- **Signal Gain at 3.6V:**
36dB at 169MHz to 170MHz
- **Receive Path Loss: 0.8dB**
- **Sleep Mode Current: <1µA**
- **CMOS Controller Integrated**
- **Available in a Green TLGA-4×4-16L Package (MSL3, 260°C per JEDEC J-STD-020)**

BLOCK DIAGRAM

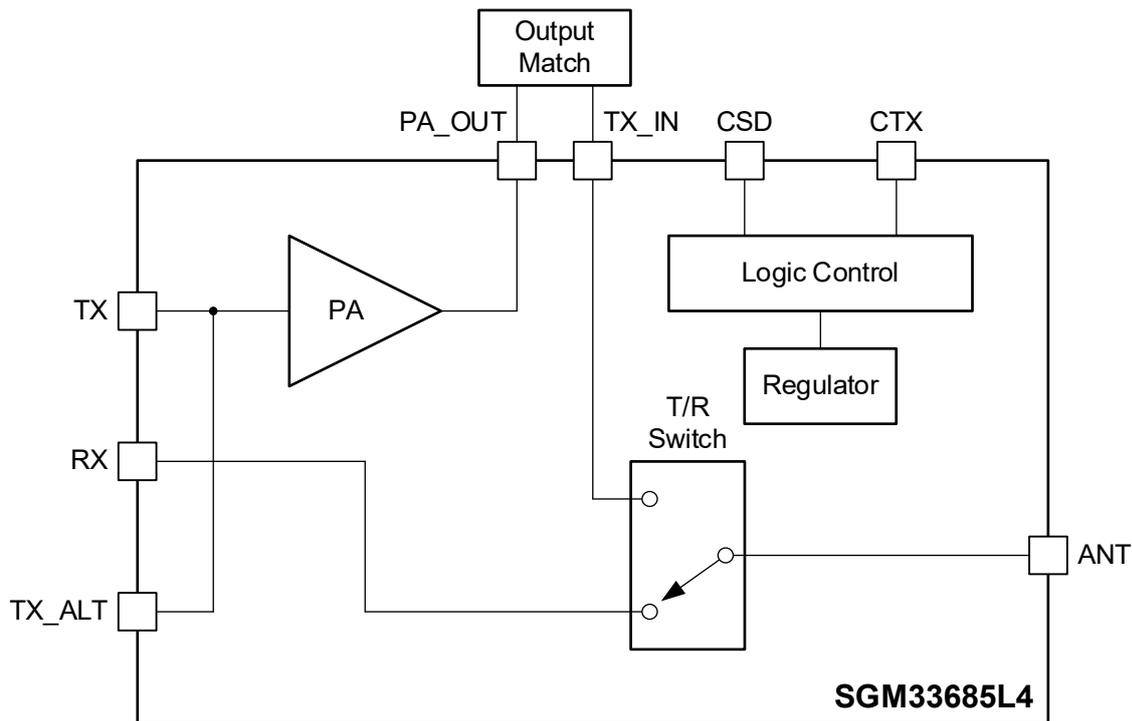


Figure 1. SGM33685L4 Block Diagram

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM33685L4	TLGA-4x4-16L	-40°C to +105°C	SGM33685L4GTLAR16G/TR	SGM2T8 TLAR16 XXXXX	Tape and Reel, 3000

MARKING INFORMATION

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

XXXXX



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}	5.5V
Control Voltage High, CSD, CTX.....	3.6V
RFIN, Under 50Ω Output Terminated, P_{IN}	15dBm
Package Thermal Resistance	
TLGA-4x4-24L, θ_{JA}	43.0°C/W
TLGA-4x4-24L, θ_{JB}	14.7°C/W
TLGA-4x4-24L, $\theta_{JC(TOP)}$	42.1°C/W
TLGA-4x4-24L, $\theta_{JC(BOT)}$	13.5°C/W
Storage Temperature Range.....	-40°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility ⁽¹⁾	
HBM.....	±1000V
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°C to +105°C
Operating Frequency Range.....	169MHz to 170MHz
Supply Voltage Range, V_{CC0} , V_{CC1} , V_{CC2}	3.3V to 5.0V
Control Voltage, CSD _{IH} , CTX _{IH}	1.55V to 3.3V
Control Voltage, CSD _{IL} , CTX _{IL}	0V to 0.45V

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.

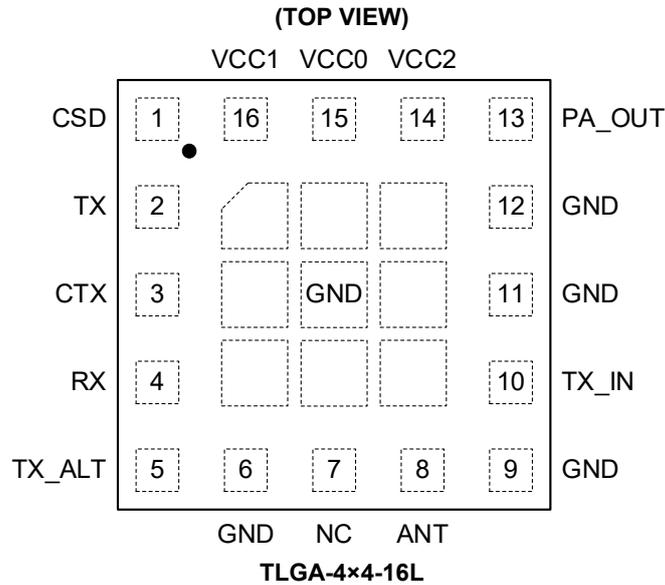
ESD SENSITIVITY CAUTION

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



PIN DESCRIPTION

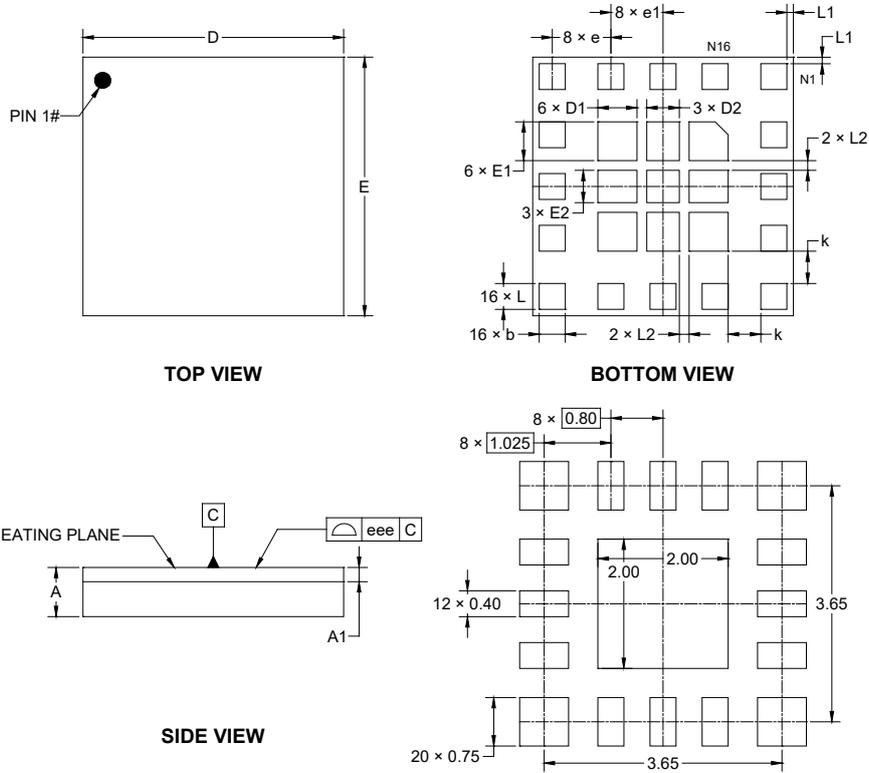
PIN	NAME	FUNCTION
1	CSD	Control Input Shutdown.
2	TX	Transmit Port.
3	CTX	TX Enable.
4	RX	Receive Port.
5	TX_ALT	TX Alternative Input.
6, 9, 11, 12	GND	Ground.
7	NC	No Connection. These pins cannot be connected to ground.
8	ANT	Antenna Port.
10	TX_IN	PA Input from TX_IN Pin.
13	PA_OUT	PA Output.
14	VCC2	Supply Voltage 2 for FEM.
15	VCC0	Supply Voltage 0 for FEM.
16	VCC1	Supply Voltage 1 for FEM.
Exposed Pad	GND	Exposed Pad. Must be connected to ground.

CONTROL LOGIC

MODE	CSD	CTX
Sleep	0	0
Receive (ANT to RX)	1	0
Transmit (TX to PA_OUT and TX_IN to ANT)	1	1

PACKAGE OUTLINE DIMENSIONS

TLGA-4x4-16L



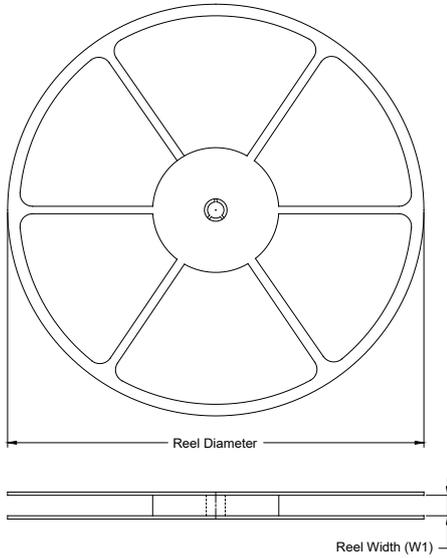
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.710	-	0.810
A1	0.220 REF		
b	0.350	-	0.450
D	3.900	-	4.100
D1	0.600 REF		
D2	0.500 REF		
E	3.900	-	4.100
E1	0.600 REF		
E2	0.500 REF		
e	0.900 BSC		
e1	0.800 BSC		
k	0.500 REF		
L	0.350	-	0.450
L1	0.100 REF		
L2	0.150 REF		
eee	0.100		

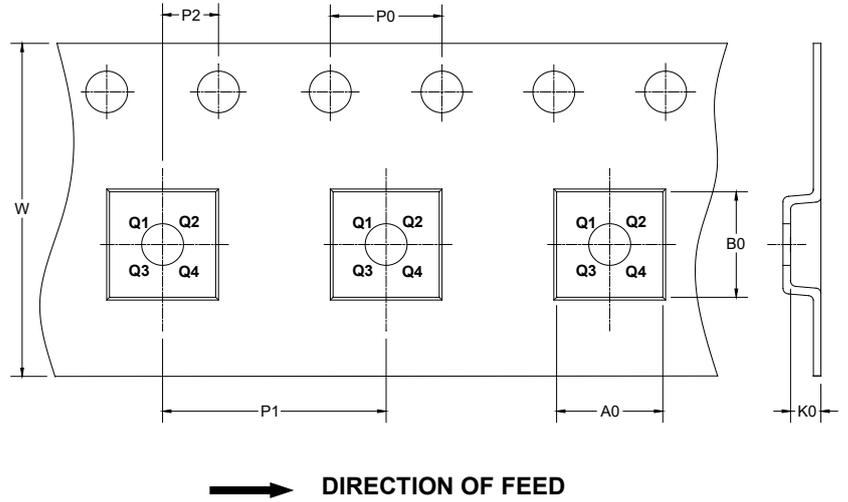
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

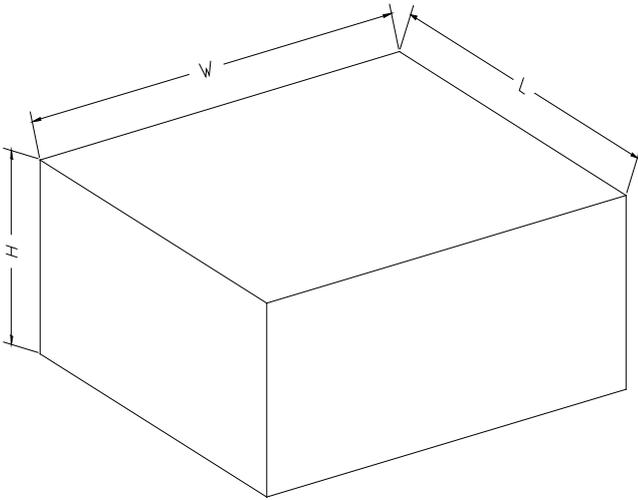
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TLGA-4×4-16L	13"	12.4	4.30	4.30	1.10	4.0	8.0	2.0	12.0	Q1

DD0001

PACKAGE INFORMATION

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