

GENERAL DESCRIPTION

The SGM33685F1 is a power amplifier (PA) which can support 450MHz to 460MHz and 405MHz to 415MHz. The device uses advanced InGaP/GaAs HBT (heterojunction bipolar transistor) process, so it features high linearity, high efficiency and high ruggedness. There is a CMOS controller integrated, hence external V_{REF} is not required. It includes three power modes, which are HPM, LPM and ULPM.

The SGM33685F1 is available in a Green TLGA-4×4-10L package.

FEATURES

- **Signal Gain**
 - ♦ 30dB @ $P_{OUT} = 27dBm$, Frequency = 455MHz
 - ♦ 30dB @ $P_{OUT} = 27dBm$, Frequency = 410MHz
- **Adjacent Power Leakage Ratio E-UTRA**
 - ♦ -38dBc @ $P_{OUT} = 27dBm$, Frequency = 455MHz
 - ♦ -37dBc @ $P_{OUT} = 27dBm$, Frequency = 410MHz
- **CMOS Controller Integrated**
- **On-Chip 50Ω Matching for Input Port and Output Port**
- **Available in a Green TLGA-4×4-10L Package**

APPLICATIONS

Repeater
ISM Band PA
LTE CatM/Cat4

BLOCK DIAGRAM

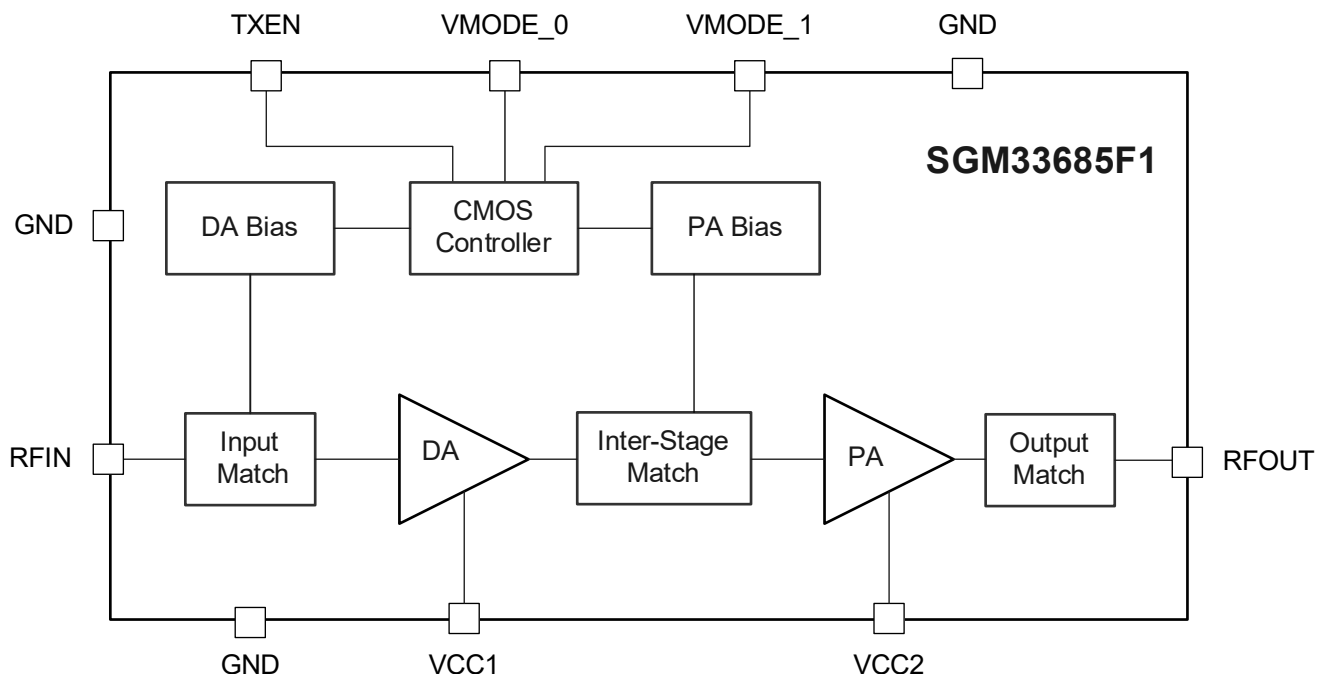


Figure 1. SGM33685F1 Block Diagram

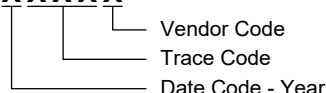
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM33685F1	TLGA-4×4-10L	-40°C to +105°C	SGM33685F1GTLAL10G/TR	SGM1O5 GTLAL10 XXXXXX	Tape and Reel, 3000

MARKING INFORMATION

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

XXXXXX



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_{CC1} , V_{CC2}	5.5V
Control Voltage, V_{MODE_0} , V_{MODE_1}	5.5V
TX Enable Voltage, TX_{EN}	5.5V
RFIN, Under 50Ω Output Terminated, P_{IN}	+10dBm
Package Thermal Resistance	
TLGA-4×4-10L, θ_{JA}	39.4°C/W
TLGA-4×4-10L, θ_{JB}	15.2°C/W
TLGA-4×4-10L, $\theta_{JC (TOP)}$	49.6°C/W
TLGA-4×4-10L, $\theta_{JC (BOT)}$	14.9°C/W
Storage Temperature Range	-40°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility ^{(1) (2)}	
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 Ambient Temperature Range	-40°C to +105°C
Operating Frequency Range 1	450MHz to 460MHz
Operating Frequency Range 2	405MHz to 415MHz
Supply Voltage, V_{CC1} , V_{CC2}	3.2V to 4.5V
Control Voltage High, V_{MODE_0} , V_{MODE_1}	1.35V to 3.6V
Control Voltage Low, V_{MODE_0} , V_{MODE_1}	0V to 0.5V
TX Enable Voltage High, TX_{EN}	1.35V to 3.6V
TX Enable Voltage Low, TX_{EN}	0V to 0.5V

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.

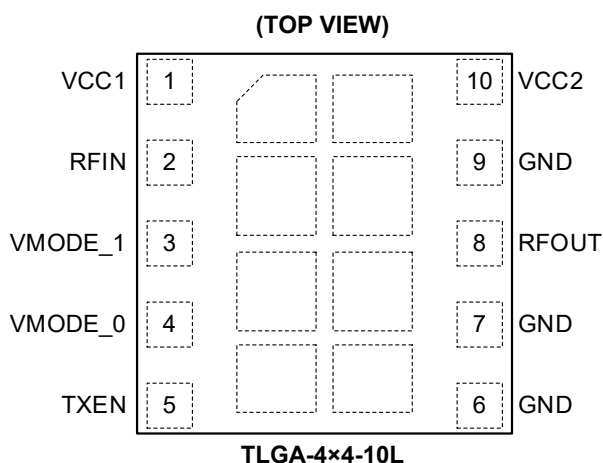
ESD SENSITIVITY CAUTION

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

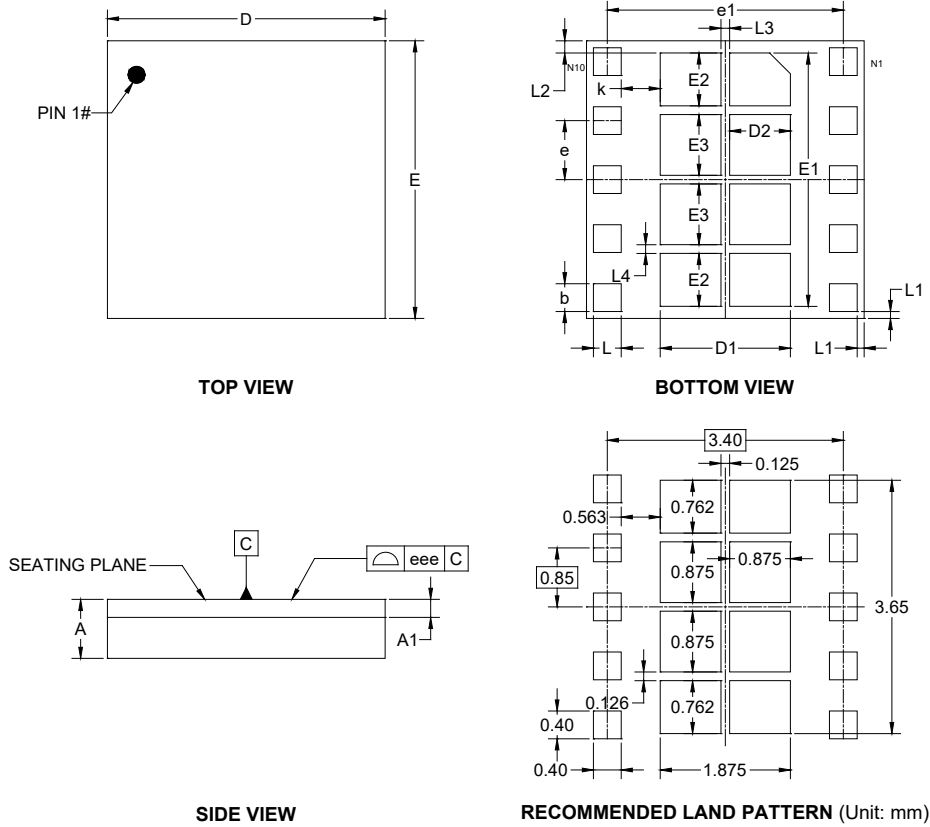
PIN	NAME	FUNCTION
1	VCC1	Supply Voltage 1 for PA.
2	RFIN	RF Input.
3	VMODE_1	Mode Control Voltage 1 for PA.
4	VMODE_0	Mode Control Voltage 0 for PA.
5	TXEN	TX Enable Voltage for PA.
6, 7, 9	GND	Ground.
8	RFOUT	RF Output.
10	VCC2	Supply Voltage 2 for PA.
Exposed Pad	GND	Ground. Exposed pad must be connected to ground.

CONTROL LOGIC

Mode	V _{CC1}	V _{CC2}	TX _{EN}	V _{MODE_0}	V _{MODE_1}
Power Down Mode	3.4V	3.4V	0	0	0
High Power Mode (17dBm ≤ P _{OUT} ≤ 29dBm)	3.4V	3.4V	1	0	0
Low Power Mode (-30dBm ≤ P _{OUT} ≤ 17dBm)	3.4V	3.4V	1	1	0
Ultra Low Power Mode (P _{OUT} ≤ -30dBm)	3.4V	3.4V	1	1	1

PACKAGE OUTLINE DIMENSIONS

TLGA-4×4-10L



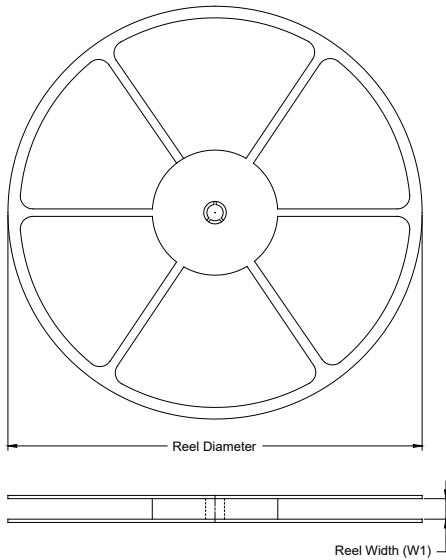
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.800	-	0.900
A1	0.260 REF		
b	0.350	-	0.450
D	3.900	-	4.100
E	3.900	-	4.100
D1	1.775	-	1.975
D2	0.875 REF		
E1	3.550	-	3.750
E2	0.762 REF		
E3	0.875 REF		
e	0.850 BSC		
e1	3.400 BSC		
k	0.563 REF		
L	0.350	-	0.450
L1	0.100 REF		
L2	0.175 REF		
L3	0.125 REF		
L4	0.126 REF		
eee	0.100		

NOTE: This drawing is subject to change without notice.

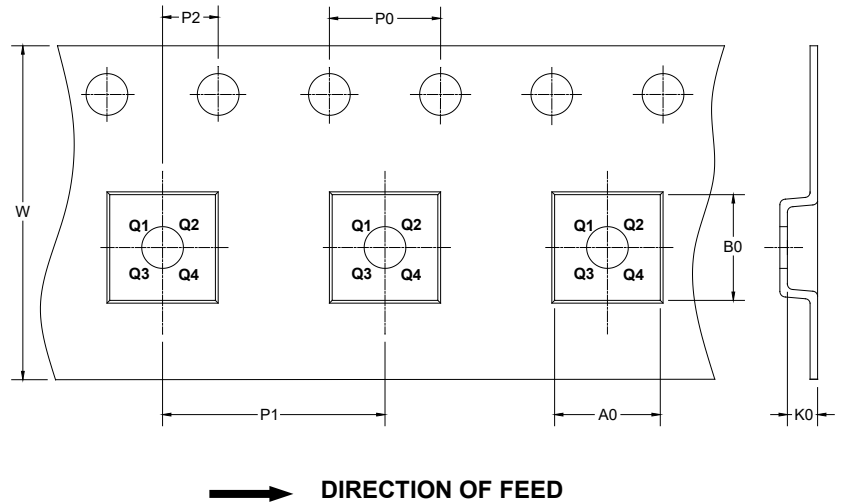
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

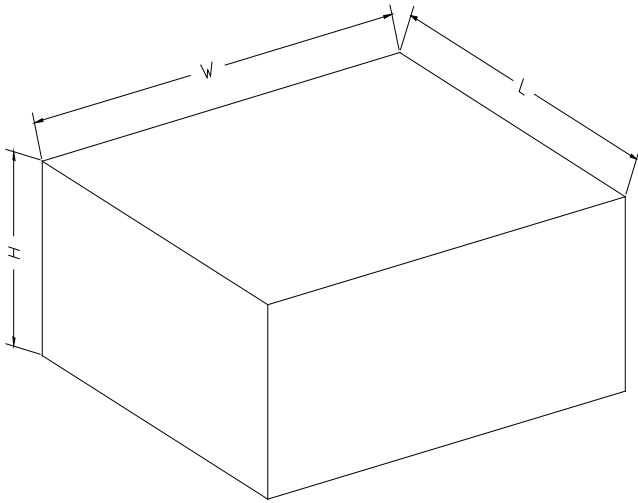
KEY PARAMETER LIST OF TAPE AND REEL

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-4×4-10L	13"	12.4	4.30	4.30	1.10	4.0	8.0	2.0	12.0	Q2

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