

GENERAL DESCRIPTION

The SGM13005D1 is a low noise amplifier (LNA) for Sub-1G band receiving application. The device features high gain, low noise figure and high linearity over a supply voltage range from 2.8V to 3.6V. Low noise figure and high gain improve the sensitivity of the SGM13005D1, and high linearity enables the device to provide better immunity to interference signals.

The SGM13005D1 is available in Green SC70-4 (R) and SOT-23 packages.

APPLICATIONS

Two-Way Radios
 Cell Phones
 Tablets
 Other RF Front-End Modules

BLOCK DIAGRAM

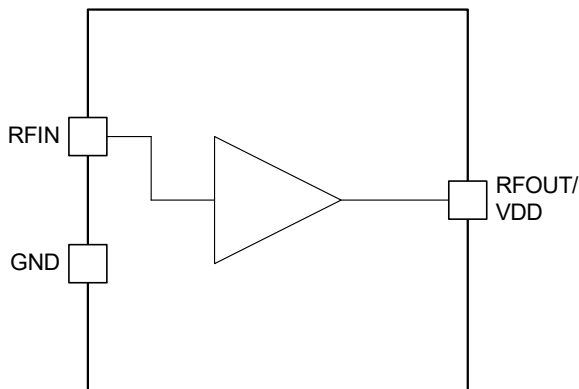


Figure 1. Block Diagram

FEATURES

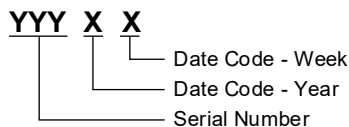
- **Operating Frequency Range:**
 - ♦ f_1 : 136MHz to 174MHz
 - ♦ f_2 : 350MHz to 400MHz
 - ♦ f_3 : 400MHz to 470MHz
 - ♦ f_4 : 850MHz to 940MHz
- **High Gain @ SC70-4 (R) Package:**
 - ♦ 22dB at f_1 : 136MHz to 174MHz
 - ♦ 23dB at f_2 : 350MHz to 400MHz
 - ♦ 23dB at f_3 : 400MHz to 470MHz
 - ♦ 21dB at f_4 : 850MHz to 940MHz
- **High Gain @ SOT-23 Package:**
 - ♦ 23dB at f_1 : 136MHz to 174MHz
 - ♦ 23dB at f_2 : 350MHz to 400MHz
 - ♦ 23dB at f_3 : 400MHz to 470MHz
 - ♦ 20dB at f_4 : 850MHz to 940MHz
- **Low Noise Figure @ SC70-4 (R) Package:**
 - ♦ 1.03dB at f_1 : 136MHz to 174MHz
 - ♦ 0.84dB at f_2 : 350MHz to 400MHz
 - ♦ 0.81dB at f_3 : 400MHz to 470MHz
 - ♦ 0.92dB at f_4 : 850MHz to 940MHz
- **Low Noise Figure @ SOT-23 Package:**
 - ♦ 1.1dB at f_1 : 136MHz to 174MHz
 - ♦ 0.83dB at f_2 : 350MHz to 400MHz
 - ♦ 0.79dB at f_3 : 400MHz to 470MHz
 - ♦ 0.93dB at f_4 : 850MHz to 940MHz
- **Low Operation Current:** 13.5mA
- **Single Supply Voltage Range:** 2.8V to 3.6V
- **Available in Green SC70-4 (R) and SOT-23 Packages**

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM13005D1	SC70-4 (R)	-40°C to +105°C	SGM13005D1GC4G/TR	0GWXX	Tape and Reel, 3000
SGM13005D1	SOT-23	-40°C to +105°C	SGM13005D1GN3LG/TR	2F9XX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XX = Date 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_{DD}	-0.3V to 4.0V
RF Input Power, R_{FIN}	15dBm
Package Thermal Resistance	
SC70-4 (R), θ_{JA}	562.3°C/W
SC70-4 (R), θ_{JB}	491.5°C/W
SC70-4 (R), θ_{JC}	243.7°C/W
SOT-23, θ_{JA}	238.9°C/W
SOT-23, θ_{JB}	81.6°C/W
SOT-23, θ_{JC}	152.7°C/W
Package Thermal Characterization Parameter	
SC70-4 (R), ψ_{JT}	88.2°C/W
SC70-4 (R), ψ_{JB}	471.6°C/W
SOT-23, ψ_{JT}	32.1°C/W
SOT-23, ψ_{JB}	79.9°C/W
Junction Temperature	+135°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility ^{(1) (2)}	
HBM	±2000V
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 Frequency Range:

f_1	136MHz to 174MHz
f_2	350MHz to 400MHz
f_3	400MHz to 470MHz
f_4	850MHz to 940MHz

Supply Voltage, V_{DD} 2.8V to 3.6V

Operating Ambient Temperature Range -40°C to +105°C

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.

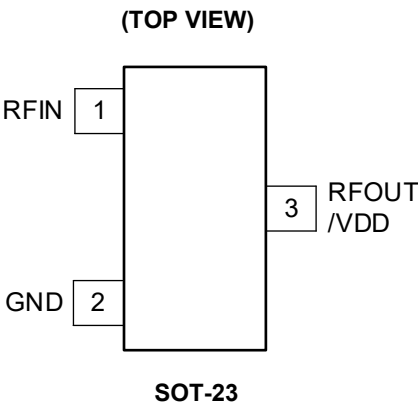
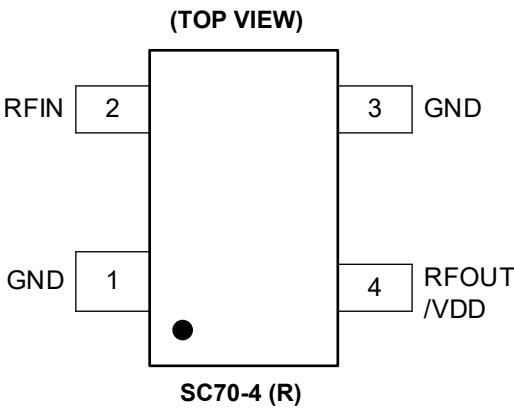
ESD SENSITIVITY CAUTION

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 CONFIGURATIONS

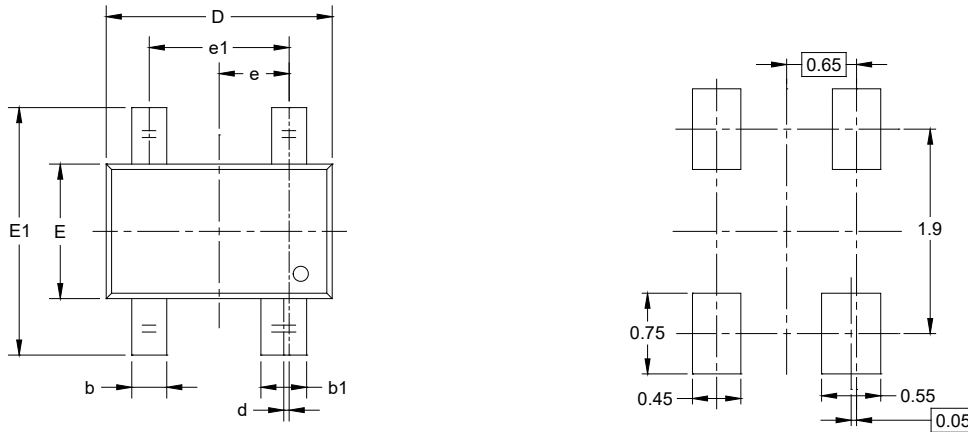


PIN DESCRIPTION

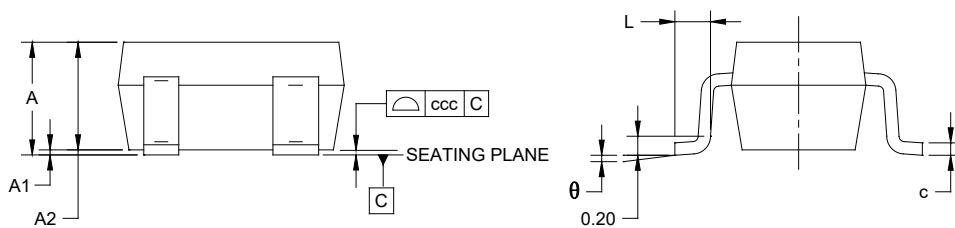
PIN		NAME	FUNCTION
SC70-4 (R)	SOT-23		
1, 3	2	GND	Ground.
2	1	RFIN	LNA Input Port.
4	3	RFOUT/VDD	LNA Output and VDD Port.

PACKAGE OUTLINE DIMENSIONS

SC70-4 (R)



RECOMMENDED LAND PATTERN (Unit: mm)



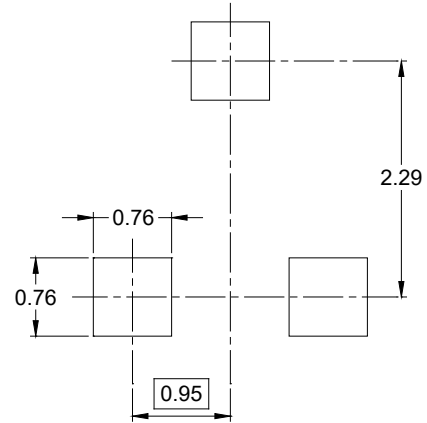
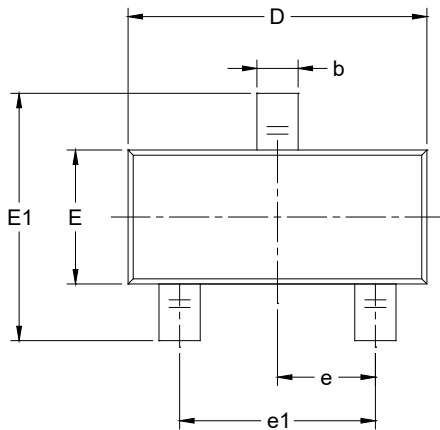
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	1.100
A1	0.000	-	0.100
A2	0.900	-	1.000
b	0.250	-	0.400
b1	0.350	-	0.500
c	0.080	-	0.150
d	0.050 TYP		
D	2.000	-	2.200
E	1.150	-	1.350
E1	2.150	-	2.450
e	0.650 BSC		
e1	1.200	-	1.400
L	0.260	-	0.460
θ	0°	-	8°
ccc	0.100		

NOTES:

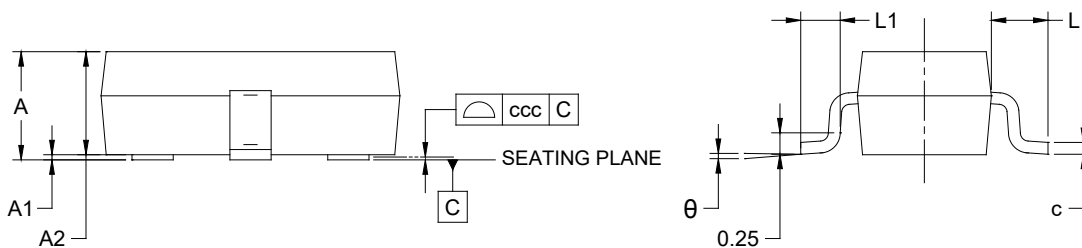
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.

PACKAGE OUTLINE DIMENSIONS

SOT-23



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.890	-	1.120
A1	0.010	-	0.100
A2	0.880	-	1.020
b	0.300	-	0.500
c	0.080	-	0.200
D	2.800	-	3.040
E	1.200	-	1.400
E1	2.100	-	2.640
e	0.950 BSC		
e1	1.900 BSC		
L	0.540 REF		
L1	0.400	-	0.600
θ	0°	-	8°
ccc	0.100		

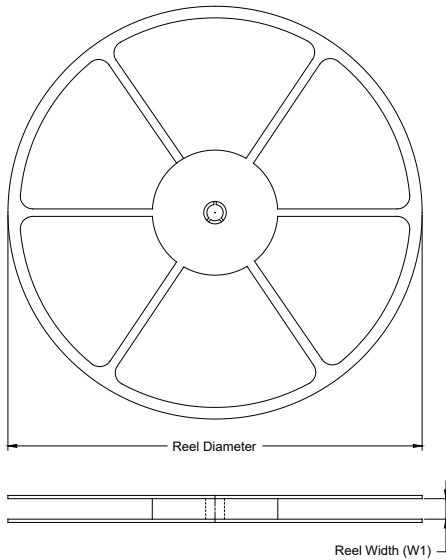
NOTES:

1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC TO-236.

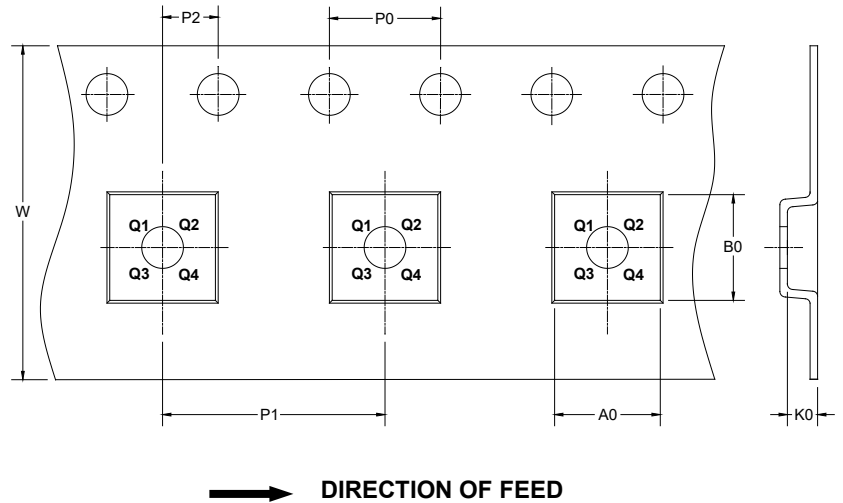
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

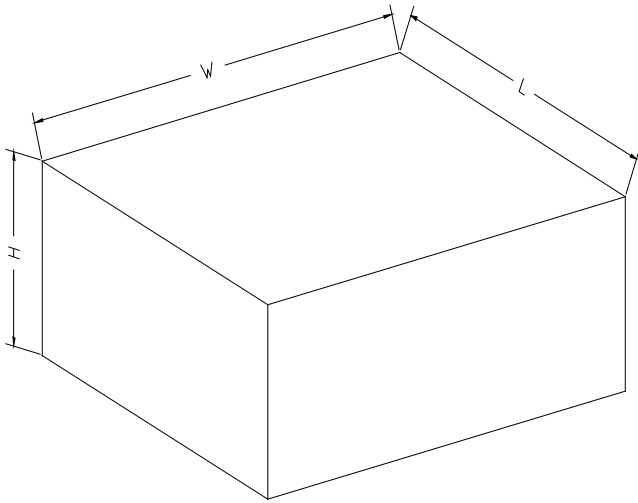
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SC70-4(R)	7"	9.5	3.20	2.80	1.30	4.0	4.0	2.0	8.0	Q1
SOT-23	7"	9.5	3.15	2.77	1.22	4.0	4.0	2.0	8.0	Q3

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
7" (Option)	368	227	224	8
7"	442	410	224	18

DD0002