SGM11102S
High Isolation SPDT Switch

GENERAL DESCRIPTION

The SGM11102S is a 1-bit control high isolation SPDT switch. The SGM11102S features very high isolation and low control voltage.

The ESD protection circuits are integrated in the IC to achieve high ESD tolerance.

This product is available in a Green ULGA-1×1-6L package, RoHS compliant and halogen free. When no external DC is applied, there is no need for external DC blocking capacitors, thus saving PCB area and cost.

FEATURES

- **High Isolation:**
  - **f_0 = 1.0GHz, P_{IN} = 0dBm: 60dB (TYP)**
  - **f_0 = 2.0GHz, P_{IN} = 0dBm: 57dB (TYP)**
  - **f_0 = 2.7GHz, P_{IN} = 0dBm: 55dB (TYP)**
- **Low Insertion Loss:**
  - **f_0 = 1.0GHz, P_{IN} = 0dBm: 0.53dB (TYP)**
  - **f_0 = 2.0GHz, P_{IN} = 0dBm: 0.55dB (TYP)**
  - **f_0 = 2.7GHz, P_{IN} = 0dBm: 0.60dB (TYP)**
- **Available in a Green ULGA-1×1-6L Package**

APPLICATIONS

Multi-Mode 2G/3G and LTE Application Receive System
Pre PA Switching, Reception Bands Switching Applications
General Purpose Switching Applications

BLOCK DIAGRAM

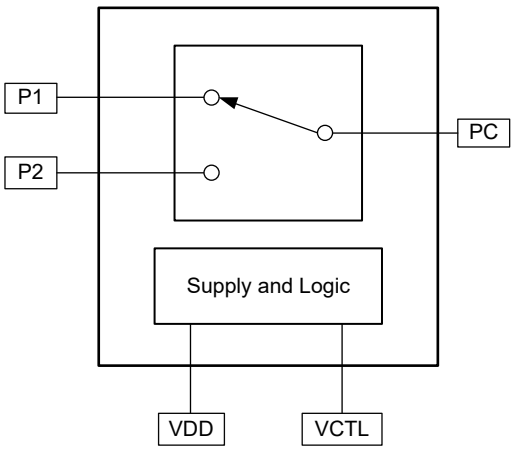


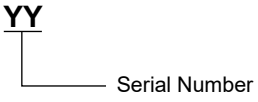
Figure 1. SGM11102S Block Diagram

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM11102S	ULGA-1×1-6L	-40℃ to +85℃	SGM11102SYULI6G/TR	ZU	Tape and Reel, 5000

MARKING INFORMATION

NOTE: Fixed character for ZU.



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} 3.6V
Control Voltage, V_{CTL} 3.6V
RF Input Power, P_{IN} 27dBm
Junction Temperature ..... +150℃
Storage Temperature Range ..... -55℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range ..... -40℃ to +85℃
Operating Frequency, f_0 ..... 0.1GHz to 3.0GHz
Supply Voltage, V_{DD} ..... 2.5V to 3.3V
Control High Voltage, $V_{CTL(H)}$ ..... 1.35V to 3.3V
Control Low Voltage, $V_{CTL(L)}$ ..... 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

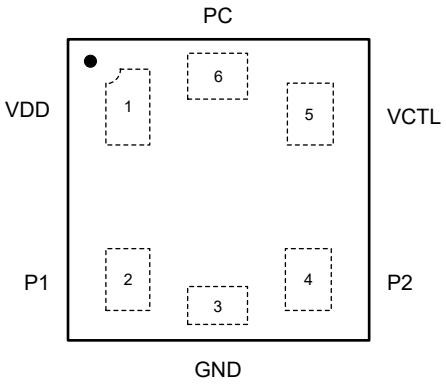
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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

(TOP VIEW)



ULGA-1×1-6L

PIN DESCRIPTION

PIN	NAME	FUNCTION
1	VDD	Positive Voltage Supply Terminal. The positive voltage (2.5V to 3.3V) has to be supplied. Please connect a bypass capacitor with GND terminal for excellent RF performance.
2	P1	RF Input/Output Port.
3	GND	Ground Terminal. Please connect this terminal with ground plane as close as possible for excellent RF performance.
4	P2	RF Input/Output Port.
5	VCTL	Control Signal Input Terminal. This terminal is set to high-level (1.35V to 3.3V) or low-level (0 to 0.45V). Please connect a bypass capacitor with GND terminal for excellent RF performance.
6	PC	RF Input/Output Port.

LOGIC TRUTH TABLE

VCTL	On Path
High	PC-P1
Low	PC-P2

ELECTRICAL CHARACTERISTICS

(For test circuit, see Figure 2. T_A = +25℃, V_{DD} = 2.8V, Z_S = Z_I = 50Ω, $V_{CTL(L)}$ = 0V, $V_{CTL(H)}$ = 1.8V, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
DC Specifications						
Supply Voltage	V_{DD}		2.5	2.8	3.3	V
Operating Current	I_{DD}			20	30	μA
Control Voltage	$V_{CTL(L)}$		0	0	0.45	V
Control Voltage	$V_{CTL(H)}$		1.35	1.8	3.3	V
Control Current	I_{CTL}	$V_{CTL(H)}$ = 1.8V		2	5	μA
RF Specifications						
Insertion Loss1	LOSS1	f_0 = 0.5GHz, P_{IN} = 0dBm		0.50	0.55	dB
Insertion Loss2	LOSS2	f_0 = 1.0GHz, P_{IN} = 0dBm		0.53	0.58	dB
Insertion Loss3	LOSS3	f_0 = 2.0GHz, P_{IN} = 0dBm		0.55	0.60	dB
Insertion Loss4	LOSS4	f_0 = 2.7GHz, P_{IN} = 0dBm		0.60	0.65	dB
Isolation1	ISL1	PC-P1, P2 f_0 = 0.5GHz, P_{IN} =0dBm	60	65		dB
Isolation2	ISL2	PC-P1, P2 f_0 = 1.0GHz, P_{IN} =0dBm	55	60		dB
Isolation3	ISL3	PC-P1, P2 f_0 = 2.0GHz, P_{IN} =0dBm	53	57		dB
Isolation4	ISL4	PC-P1, P2 f_0 = 2.7GHz, P_{IN} =0dBm	50	55		dB
Input Power at 0.1dB Compression Point	$P_{-0.1dB}$	f_0 = 2.0GHz		27		dBm
VSWR	VSWR	f_0 = 2.0GHz, on port		1.2		
Switching Time	t_{SW}	50% V_{CTL} to 10/90% RF		2	3	μs

TYPICAL APPLICATION CIRCUIT

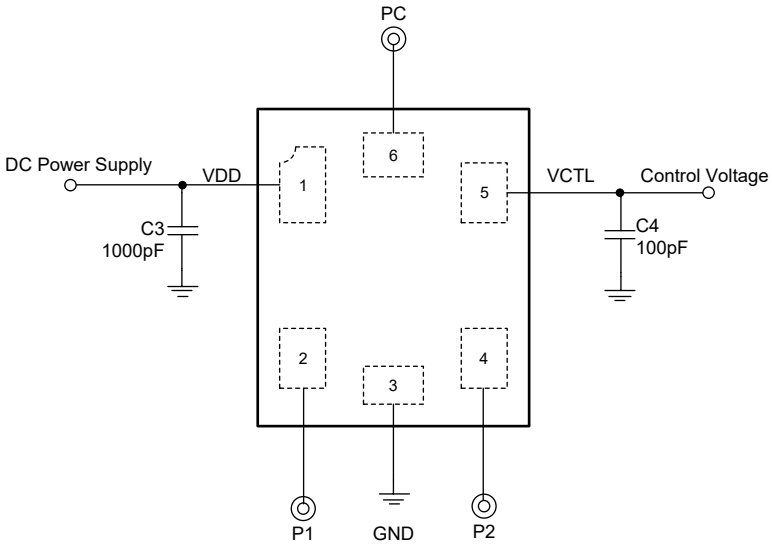


Figure 2. SGM11102S Typical Application Circuit

EVALUATION BOARD LAYOUT

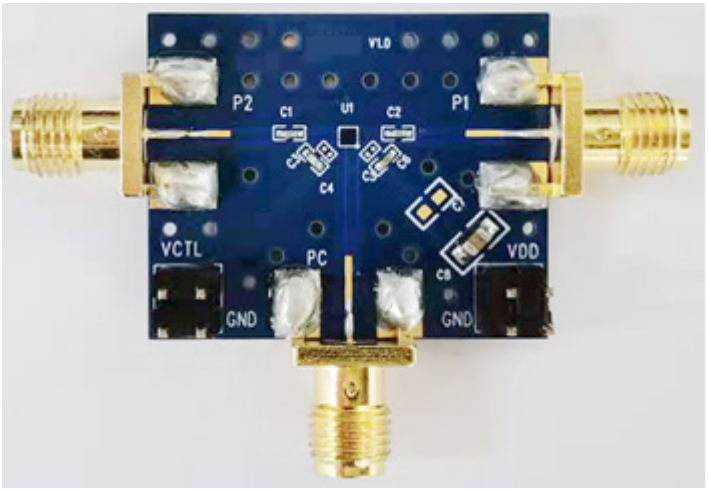
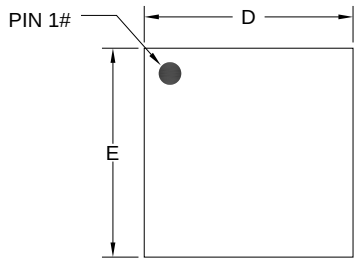


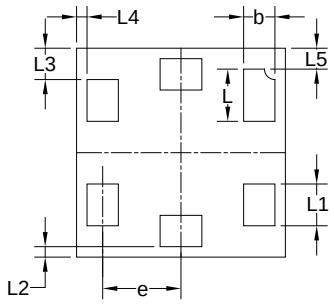
Figure 3. SGM11102S Evaluation Board Layout

PACKAGE OUTLINE DIMENSIONS

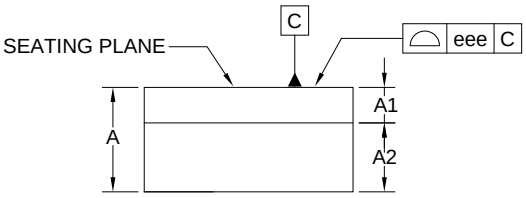
ULGA-1×1-6L



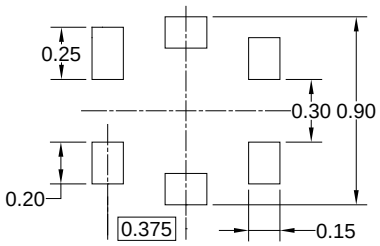
TOP VIEW



BOTTOM VIEW



SIDE VIEW



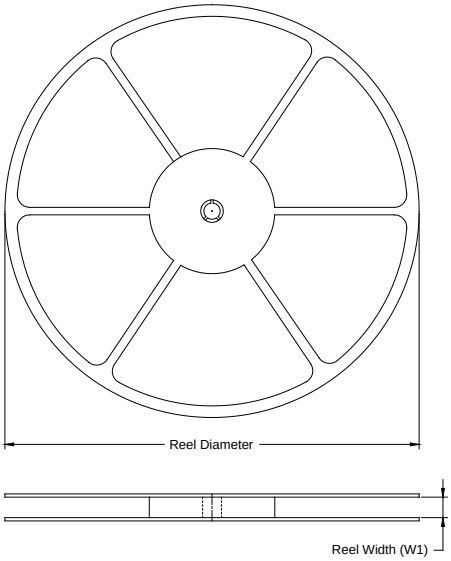
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	0.450	0.500	0.550
A1	0.140	0.170	0.200
A2	0.290	0.330	0.370
b	0.100	0.150	0.200
D	0.950	1.000	1.050
E	0.950	1.000	1.050
e	0.375 BSC		
L	0.200	0.250	0.300
L1	0.150	0.200	0.250
L2	0.000	0.050	0.100
L3	0.150 REF		
L4	0.000	0.050	0.100
L5	0.100 REF		
eee	0.100		

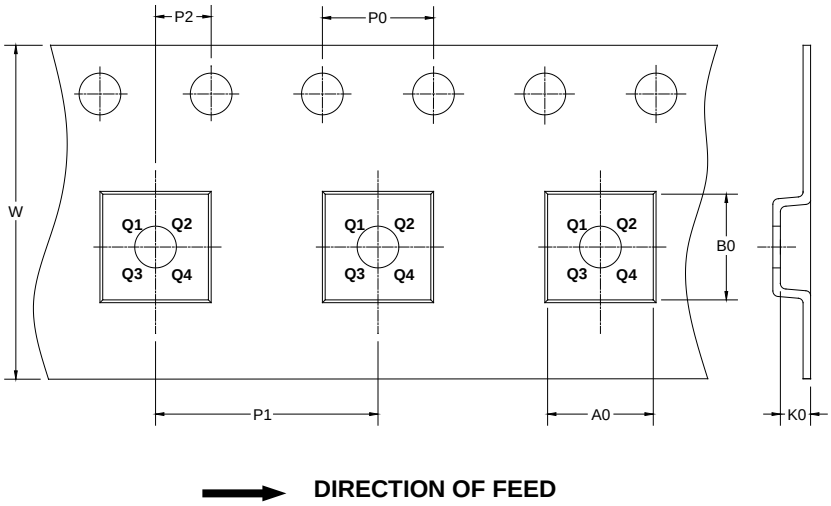
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



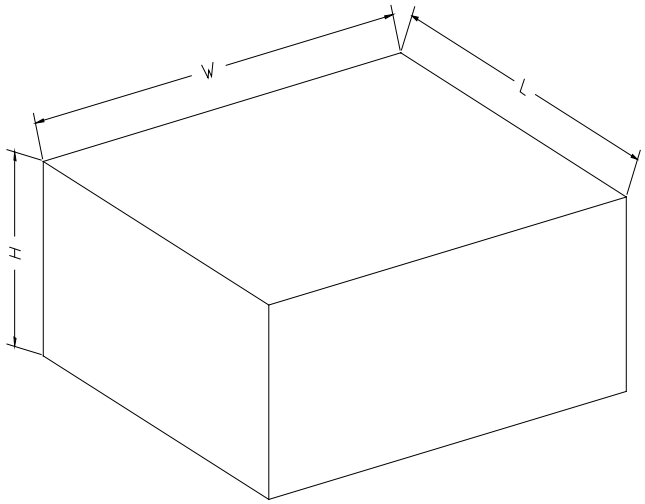
NOTE: The picture is only for reference. Please make the object as the standard.

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
ULGA-1×1-6L	7″	9.5	1.13	1.13	0.72	4.0	4.0	2.0	8.0	Q2

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

DD0002