

GENERAL DESCRIPTION

The SGM11102W is a single-pole/double-throw (SPDT) transmit and receive switch, which supports from 0.1GHz to 3.8GHz. The device features low control voltage and high isolation.

The SGM11102W has the ability to integrate SPDT RF switch and GPIO controller on an SOI chip. Internal driver and decoder for switch control signals are offered by the GPIO controller, which makes it flexible in RF path band and routing selection.

No external DC blocking capacitors are required on the RF paths as long as no external DC voltage is applied, which can save PCB area and cost.

The SGM11102W is available in a Green SC70-6 package.

APPLICATIONS

- 2G/3G/4G/5G Applications
- Sub-1G RF System
- ISM Band Application
- Industry Application

FEATURES

- **Operation Frequency Range: 0.1GHz to 3.8GHz**
- **Supply Voltage Range: 1.65V to 3.3V**
- **High Isolation:**
 - $f_0 = 0.1\text{GHz}, P_{IN} = 0\text{dBm}: 55\text{dB (TYP)}$
 - $f_0 = 0.8\text{GHz}, P_{IN} = 0\text{dBm}: 41\text{dB (TYP)}$
 - $f_0 = 1.7\text{GHz}, P_{IN} = 0\text{dBm}: 34\text{dB (TYP)}$
 - $f_0 = 2.7\text{GHz}, P_{IN} = 0\text{dBm}: 29\text{dB (TYP)}$
 - $f_0 = 3.8\text{GHz}, P_{IN} = 0\text{dBm}: 22\text{dB (TYP)}$
- **Low Insertion Loss:**
 - $f_0 = 0.1\text{GHz}, P_{IN} = 0\text{dBm}: 0.23\text{dB (TYP)}$
 - $f_0 = 0.8\text{GHz}, P_{IN} = 0\text{dBm}: 0.32\text{dB (TYP)}$
 - $f_0 = 1.7\text{GHz}, P_{IN} = 0\text{dBm}: 0.37\text{dB (TYP)}$
 - $f_0 = 2.7\text{GHz}, P_{IN} = 0\text{dBm}: 0.46\text{dB (TYP)}$
 - $f_0 = 3.8\text{GHz}, P_{IN} = 0\text{dBm}: 0.48\text{dB (TYP)}$
- **Available in a Green SC70-6 Package**

BLOCK DIAGRAM

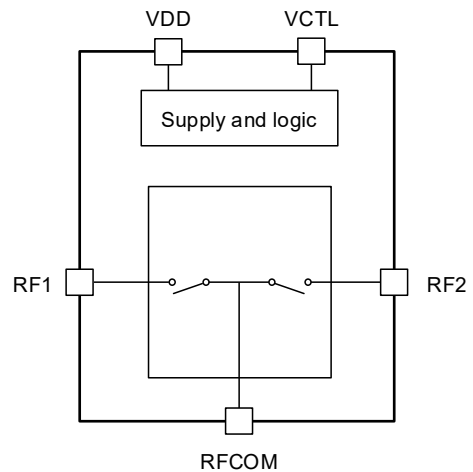
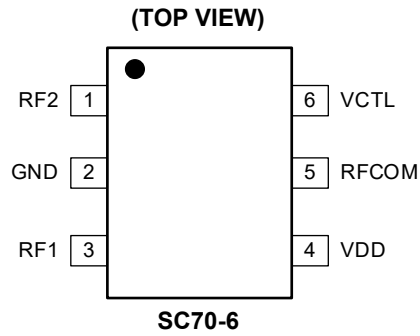


Figure 1. SGM11102W Block Diagram

PIN CONFIGURATION



PIN DESCRIPTION

PIN	NAME	FUNCTION
1	RF2	RF Port 2.
2	GND	Ground.
3	RF1	RF Port 1.
4	VDD	DC Power Supply.
5	RFCOM	RF Common Port.
6	VCTL	DC Control Voltage.

LOGIC TRUTH TABLE

VCTL	ON PATH
Low	RFCOM to RF1
High	RFCOM to RF2

ELECTRICAL CHARACTERISTICS

(T_A = +25°C, V_{DD} = 1.65V to 3.3V, P_{IN} = 0dBm, Z_S = Z_L = 50Ω, V_{CTL_L} = 0V, V_{CTL_H} = 1.8V, typical values are at V_{DD} = 1.8V, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
DC Characteristics						
Supply Voltage	V _{DD}		1.65	1.8	3.3	V
Supply Current	I _{VDD}			62	90	μA
Control Current	I _{CTL}				7	μA
Control Voltage	V _{CTL_H}	High	1.3		3.3	V
	V _{CTL_L}	Low	0		0.3	
Switching Time	t _{SW}	50% of control voltage to 90%/10% RF power		1.3	2.0	μs
Turn-On Time	t _{ON}	Time from V _{DD} = 0V to part on and RF at 90%		20		μs
RF Characteristics						
Insertion Loss	IL	f ₀ = 0.1GHz, P _{IN} = 0dBm		0.23	0.45	dB
		f ₀ = 0.8GHz, P _{IN} = 0dBm		0.32	0.51	
		f ₀ = 1.7GHz, P _{IN} = 0dBm		0.37	0.57	
		f ₀ = 2.7GHz, P _{IN} = 0dBm		0.46	0.66	
		f ₀ = 3.8GHz, P _{IN} = 0dBm		0.48	0.70	
Isolation (RFCOM to All RF Ports)	ISO	f ₀ = 0.1GHz, P _{IN} = 0dBm	50	55		dB
		f ₀ = 0.8GHz, P _{IN} = 0dBm	36	41		
		f ₀ = 1.7GHz, P _{IN} = 0dBm	29	34		
		f ₀ = 2.7GHz, P _{IN} = 0dBm	24	29		
		f ₀ = 3.8GHz, P _{IN} = 0dBm	18	22		
VSWR	VSWR	f ₀ = 0.1GHz to 3.8GHz		1.2:1		
Input Power at 0.1dB Compression Point	P _{0.1dB}	f ₀ = 0.1GHz to 2.7GHz		38		dBm
		f ₀ = 2.7GHz to 3.8GHz		37		
2 nd Harmonic	2f ₀	P _{IN} = 26dBm, f ₀ = 910MHz		-100		dBc
		P _{IN} = 35dBm, f ₀ = 910MHz		-90		
		P _{IN} = 32dBm, f ₀ = 1900MHz		-91		
3 rd Harmonic	3f ₀	P _{IN} = 26dBm, f ₀ = 910MHz		-101		dBc
		P _{IN} = 35dBm, f ₀ = 910MHz		-91		
		P _{IN} = 32dBm, f ₀ = 1900MHz		-92		

TYPICAL APPLICATION CIRCUIT

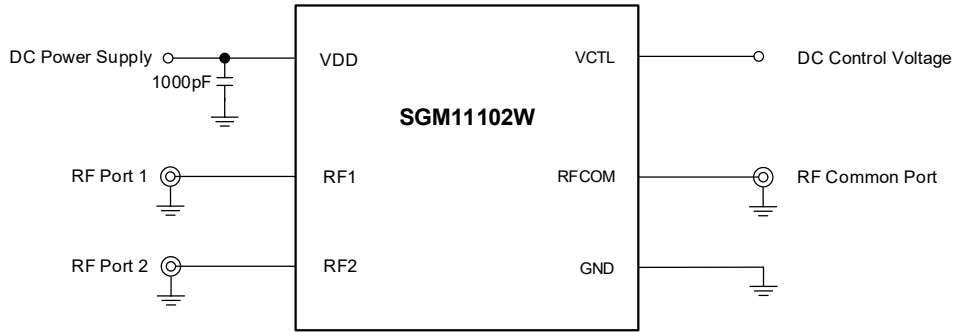


Figure 2. SGM11102W Typical Application Circuit

EVALUATION BOARD LAYOUT

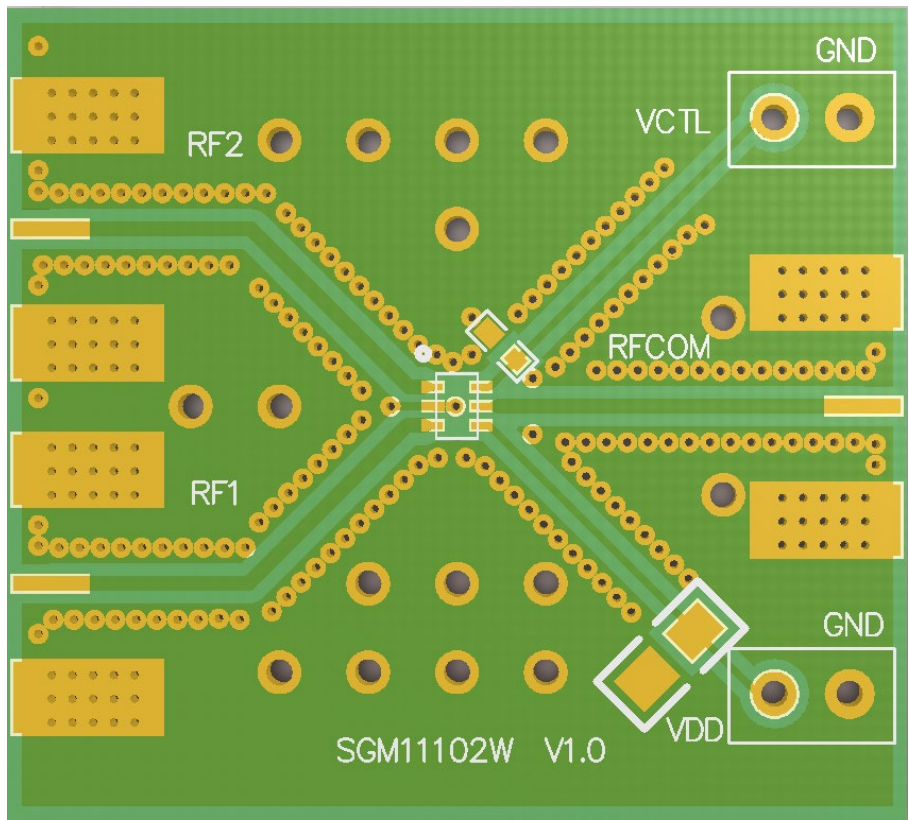


Figure 3. SGM11102W Evaluation Board Layout

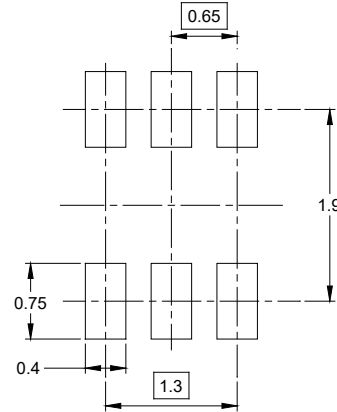
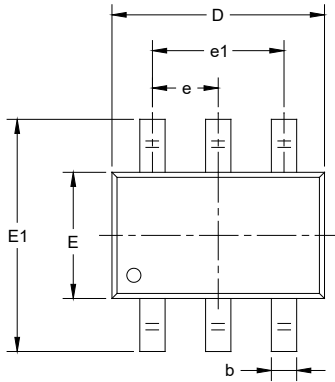
REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

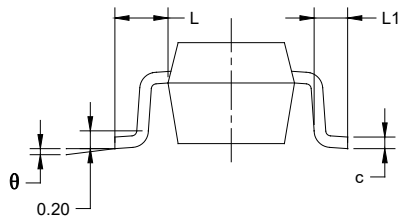
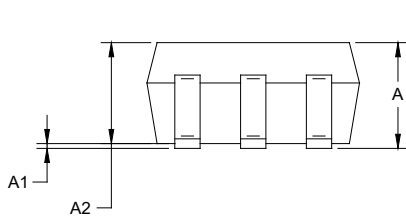
Changes from Original (SEPTEMBER 2024) to REV.A	Page
Changed from product preview to production data.....	All

PACKAGE OUTLINE DIMENSIONS

SC70-6



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.800	1.100	0.031	0.043
A1	0.000	0.100	0.000	0.004
A2	0.800	1.000	0.031	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.220	0.003	0.009
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.65 TYP		0.026 TYP	
e1	1.300 BSC		0.051 BSC	
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

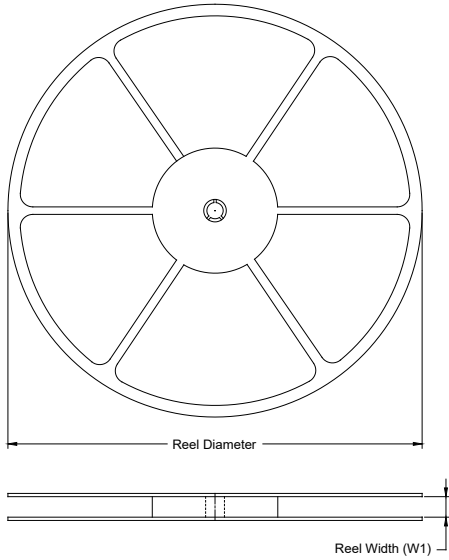
NOTES:

1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

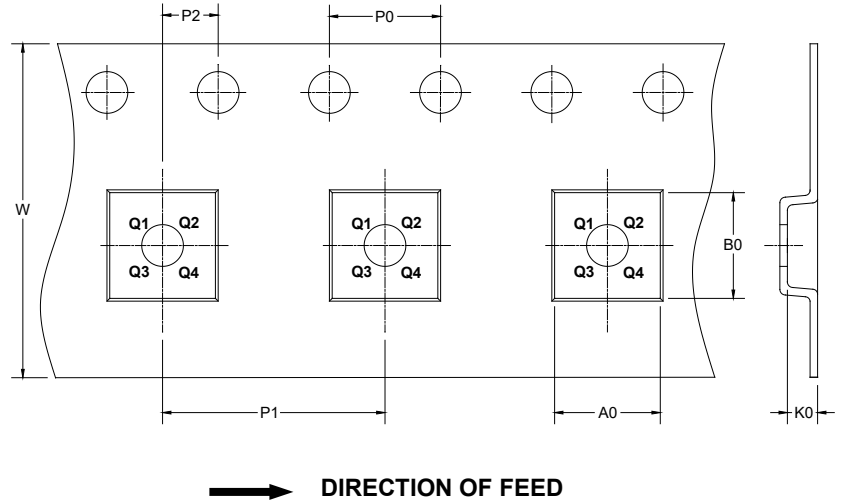
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

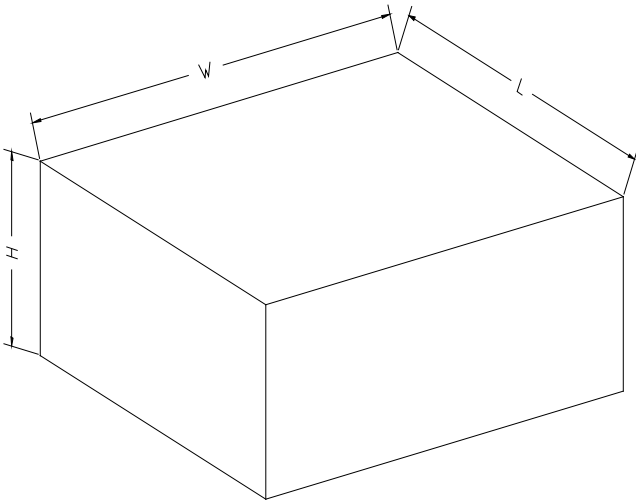
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SC70-6	7"	9.5	2.40	2.50	1.20	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

D00002