SGM11102F
High Linearity SPDT RF Switch

GENERAL DESCRIPTION

The SGM11102F is a single-pole/double-throw (SPDT) antenna switch，which supports from 0.1GHz to 6GHz. The device features low insertion loss and high isolation, which make it suitable for high linearity and 3G/4G/5G transmitting/receiving (TRx) applications. It also has the advantage of high linearity performance. The PS11102F is not subject to cellular interference and is applied to multi-mode and multi-band LTE mobile phones.

The SGM11102F has the ability to integrate SPDT RF switch and GPIO controller on a 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 required on the RF paths as long as no external DC voltage is applied, which can save PCB area and cost.

The SGM11102F is available in a Green UTDFN-1.1×0.7-6L package,

APPLICATIONS

3G/4G/5G Transmitting and Receiving (TRx)

FEATURES

- **Supply Voltage Range: 2.4V to 3V**
- **GPIO Controller**
- **Operating Frequency Range: 0.1GHz to 6GHz**
- **Low Insertion Loss: 0.4dB (TYP) at 2.7GHz**
- **High Isolation: 24dB (MIN) at 2.7GHz**
- **Advanced Silicon-On-Insulator (SOI) Process**
- **No External DC Blocking Capacitors Required**
- **Available in a Green UTDFN-1.1×0.7-6L Package**

BLOCK DIAGRAM

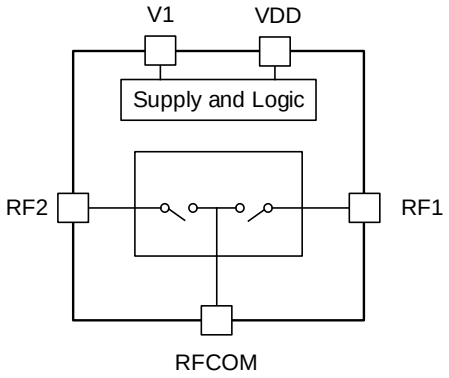


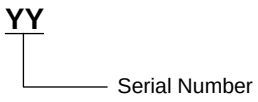
Figure 1 SGM11102F Block Diagram

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM11102F	UTDFN-1.1×0.7-6L	-40℃ to +85℃	SGM11102FYUEC6G/TR	ZQ	Tape and Reel, 10000

MARKING INFORMATION

NOTE: Fixed character for ZQ.



Green (RoHS & HSF): PS 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 PSMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{DD} 3.3V
Control Voltage (V1 P_{IN}), V_{CTL} 3V
RF Input Power, P_{IN} 33dBm
Junction Temperature ..... +150℃
Storage Temperature Range ..... -55℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility
HBM 1000V

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range ..... -40℃ to +85℃
Operating Frequency Range ..... 0.1GHz to 6GHz
Supply Voltage, V_{DD} ..... 2.4V to 3V
Control High Voltage, V_{CTL_H} ..... 1.35V to 3V
Control Low Voltage, V_{CTL_L} ..... 0V to 0.40V

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

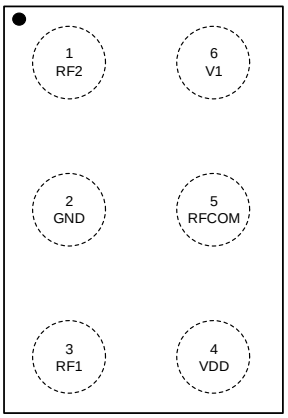
This integrated circuit can be damaged if ESD protections are not considered carefully. PSMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance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

PS Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATION

(TOP VIEW)



UTDFN-1.1×0.7-6L

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	V1	DC Control Voltage 1.

LOGIC TRUTH TABLE

V1	ACTIVE PATH
L	RFCOM to RF1
H	RFCOM to RF2

ELECTRICAL CHARACTERISTICS

(V_{DD} = 2.4V to 3V, T_A = +25℃, P_{IN} = 0dBm, 50Ω, typical values are at V_{DD} = 2.8V, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
DC Specifications						
Supply Voltage	V_{DD}		2.4	2.8	3.3	V
Supply Current	I_{DD}			32	65	μA
Control Voltage	V_{CTL_H}	High	1.35	1.8	3	V
	V_{CTL_L}	Low	0		0.4	
Control Current	I_{CTL}	V_{CTL} = 0V		3	7	μA
Switching Time	t_{SW}	50% of control voltage to 90% of RF power		1	2	μs
Turn-On Time	t_{ON}	Time from V_{DD} = 0V to part on and RF at 90%		5	10	μs
RF Specifications						
Insertion Loss (RFCOM to All RF Ports)	IL	0.1GHz to 1.0GHz		0.26	0.55	dB
		1.0GHz to 2.0GHz		0.31	0.74	
		2.0GHz to 2.7GHz		0.40	0.75	
		2.7GHz to 5.0GHz		0.83	1.15	
		5.0GHz to 6.0GHz		0.90	1.45	
Isolation (RFCOM to All RF Ports)	ISO	0.1GHz to 1.0GHz	28	40		dB
		1.0GHz to 2.0GHz	25	32		
		2.0GHz to 2.7GHz	24	28		
		2.7GHz to 5.0GHz	16	19		
		5.0GHz to 6.0GHz	13	16		
Input Return Loss (RFCOM to All RF Ports)	RL	0.1GHz to 1.0GHz		30		dB
		1.0GHz to 2.0GHz		25		
		2.0GHz to 2.7GHz		20		
		2.7GHz to 5.0GHz		18		
		5.0GHz to 6.0GHz		16		
0.1dB Compression Point (RFCOM to All RF Ports)	$P_{0.1dB}$	0.1GHz to 6GHz		33		dBm
2nd Harmonics	$2f_0$	P_{IN} = 26dBm, 0.1GHz to 6GHz		95		dBc
3rd Harmonics	$3f_0$	P_{IN} = 26dBm, 0.1GHz to 6GHz		85		dBc

TYPICAL APPLICATION CIRCUIT

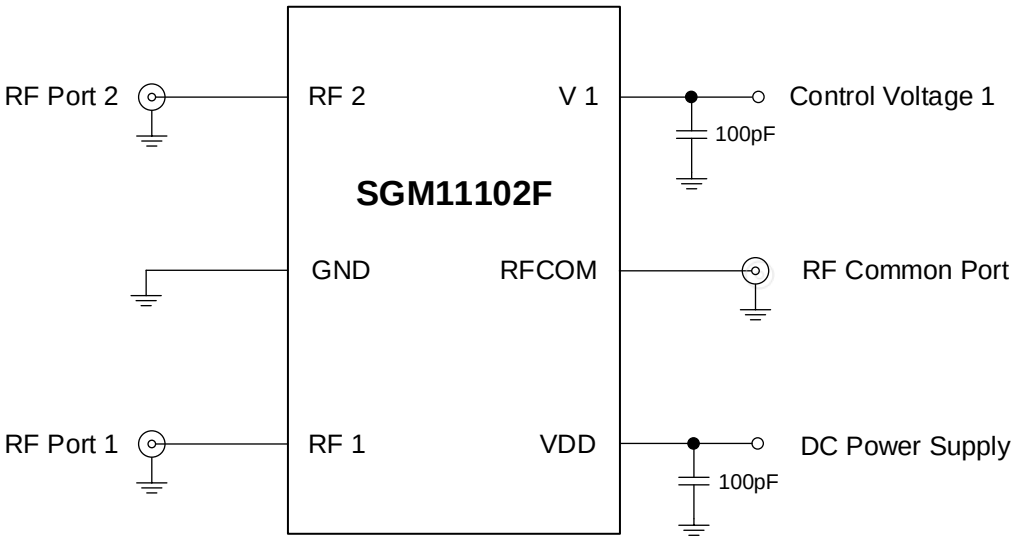


Figure 2. SGM11102F Typical Application Circuit

EVALUATION BOARD LAYOUT

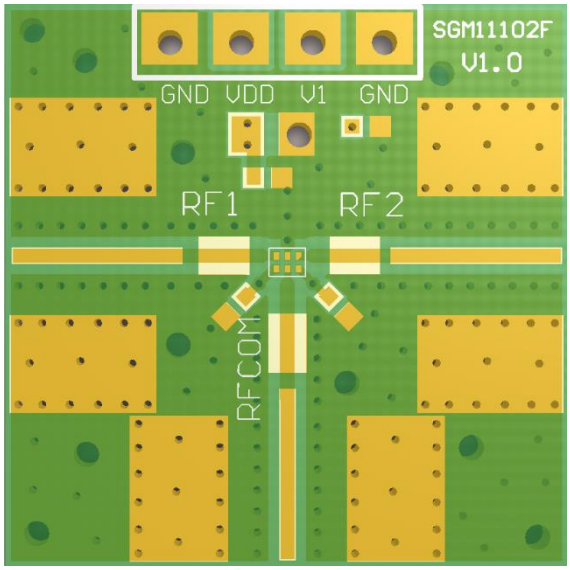
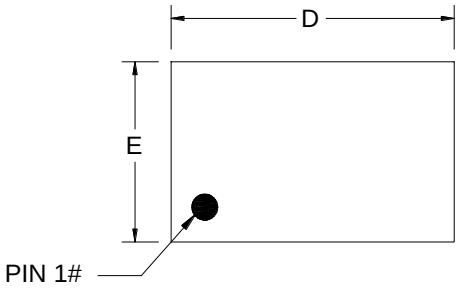


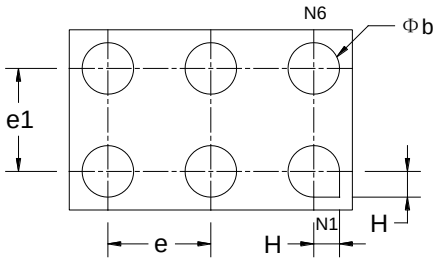
Figure 3. SGM11102F Evaluation Board Layout

PACKAGE OUTLINE DIMENSIONS

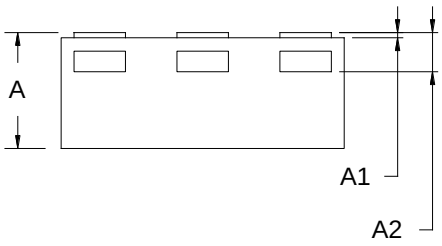
UTDFN-1.1×0.7-6L



TOP VIEW



BOTTOM VIEW



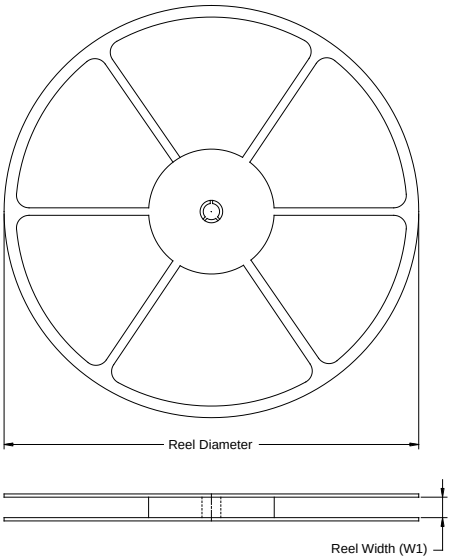
SIDE VIEW

Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	0.400	0.450	0.500
A1	0.000	0.020	0.050
A2	0.152 REF		
D	1.050	1.100	1.150
E	0.650	0.700	0.750
b	0.150	0.200	0.250
e	0.300	0.400	0.500
e1	0.300	0.400	0.500
H	0.100 REF		

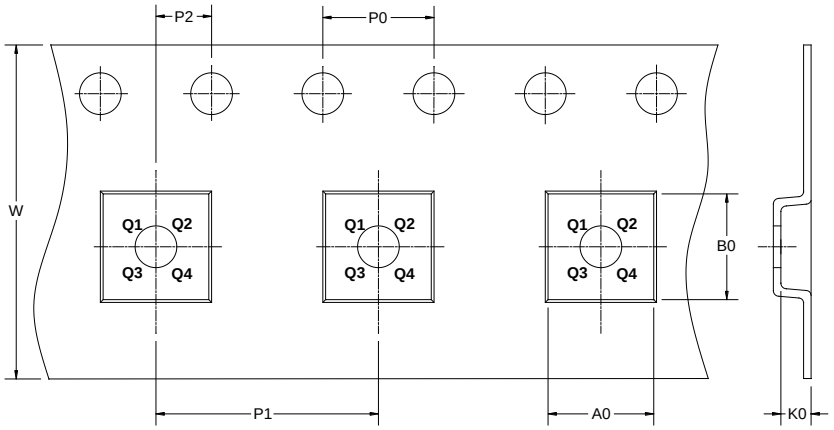
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



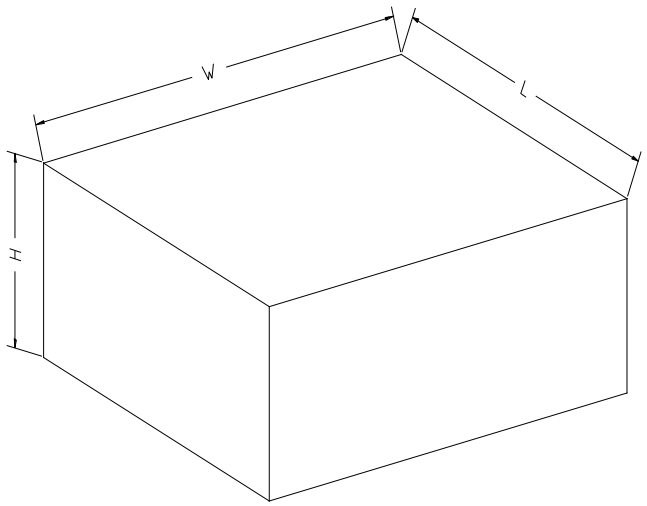
DIRECTION OF FEED

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
UTDFN-1.1×0.7-6L	7″	9.5	0.80	1.20	0.55	4.0	2.0	2.0	8.0	Q1

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

For the latest specifications or product information:

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