



SGM3705X

0.2Ω, Low THD+N, Wide Positive and Negative Signal Passing, Dual SPST Analog Switch

GENERAL DESCRIPTION

The SGM3705X is a dual SPST (single-pole/single-throw) analog switch with low distortion. It operates from a 2.7V to 5.5V single power supply. The SGM3705X allows a -18V to +18V wide range positive and negative signal passing for 2.7V to 5.5V power supply range.

Other features include ultra-low on-resistance, low voltage and fast switching times. The high performances make it very suitable for multiple applications, such as portable equipment, battery-powered systems, etc. In addition, the SGM3705X can be used as a dual 1-to-1 multiplexer, two single signals or one differential signal switch and power switches.

The SGM3705X is available in Green TQFN-4×4-16L and WLCSP-2.11×2.2-12B packages. It operates over an operating temperature range of -40°C to +125°C.

FEATURES

- **Single Supply Voltage Range: 2.7V to 5.5V**
- **Ultra-Low On-Resistance:**
0.2Ω (TYP) in WLCSP-2.11×2.2-12B Package
- **-18V to +18V Low Distortion, Analog Signal Passing**
- **Fast Switching Times**
- **High Off-Isolation**
- **Very Low Crosstalk**
- **Low Input Leakage Current**
- **1.2V, 1.8V Logic Compatible Control Pin**
- **Break-Before-Make Switching**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green TQFN-4×4-16L and WLCSP-2.11×2.2-12B Packages**

APPLICATIONS

Portable Equipment
Sample-and-Hold Circuits
Battery-Powered Systems
HiFi Audio Switch

0.2Ω, Low THD+N, Wide Positive and Negative Signal Passing, Dual SPST Analog Switch

SGM3705X

PACKAGE/ORDERING INFORMATION

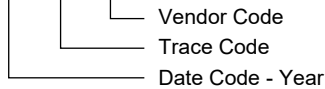
MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM3705X	TQFN-4x4-16L	-40°C to +125°C	SGM3705XTQE16G/TR	SGM3705 XTQE16 XXXXX	Tape and Reel, 3000
	WLCSP-2.11x2.2-12B	-40°C to +125°C	SGM3705XG/TR	31K XXXXX XX#XX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code. XX#XX = Coordinate Information and Wafer ID Number.

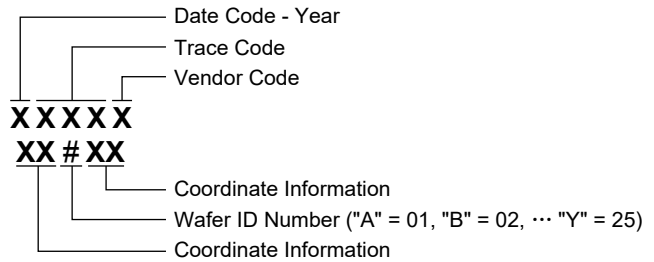
TQFN-4x4-16L

XXXXX



WLCSP-2.11x2.2-12B

XXXXX
XX#XX



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

V _{CC} to GND	0V to 6V
IN1, IN2, EN to GND	0V to 6V
Analog Voltage Range	-19V to +19V
Continuous Current from Sx to Dx	±800mA
Peak Current from Sx to Dx	±2000mA
I/O Clamp Current (V _I < 0)	-30mA
Package Thermal Resistance	
TQFN-4x4-16L, θ _{JA}	42.8°C/W
TQFN-4x4-16L, θ _{JB}	19.3°C/W
TQFN-4x4-16L, θ _{JC (TOP)}	31.1°C/W
TQFN-4x4-16L, θ _{JC (BOT)}	9.3°C/W
WLCSP-2.11x2.2-12B, θ _{JA}	69.3°C/W
WLCSP-2.11x2.2-12B, θ _{JB}	26.5°C/W
WLCSP-2.11x2.2-12B, θ _{JC}	14.8°C/W
Junction Temperature	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility ^{(1) (2)}	
HBM	±3000V
CDM	±1000V

NOTES:

- For human body model (HBM), all pins comply with ANSI/ESDA/JEDEC JS-001 specifications.
- For charged device model (CDM), all pins comply with ANSI/ESDA/JEDEC JS-002 specifications.

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range	2.7V to 5.5V
Operating Temperature Range	-40°C to +125°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.

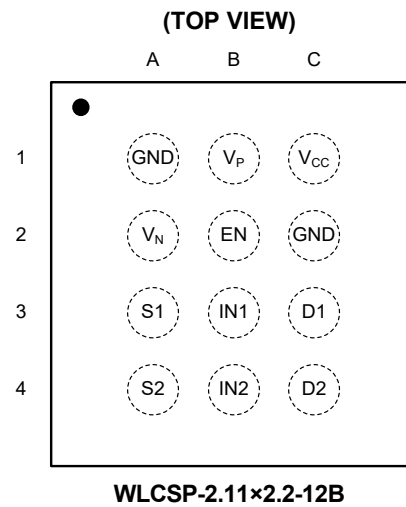
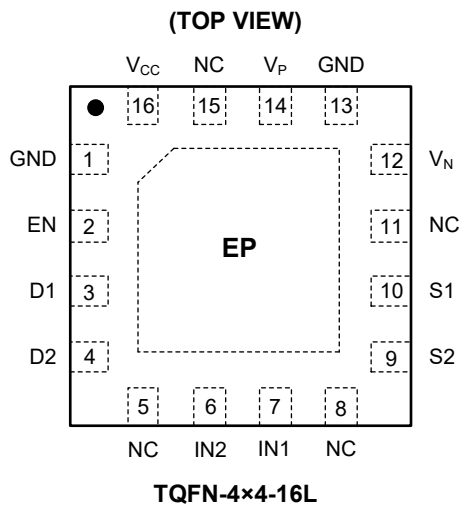
ESD SENSITIVITY CAUTION

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
TQFN-4×4-16L	WLCSP-2.11×2.2-12B		
1, 13	A1, C2	GND	Ground.
2	B2	EN	Enable Control Pin. When EN = "Low", both Sx and Dx will be disconnected, charge pump doesn't work and the SGM3705X will be in shutdown state. When EN = "High", charge pump will work, the SGM3705X will be in working state, and Sx or Dx will be connected or disconnected depending on the logical state of INx.
3	C3	D1	Drain Terminal 1. This pin can be an input or an output of switch 1.
4	C4	D2	Drain Terminal 2. This pin can be an input or an output of switch 2.
5, 8, 11, 15	—	NC	No Connection.
6	B4	IN2	Digital Control Pin of Switch 2. When IN2 = "Low", switch 2 is turned off, and S2 and D2 are disconnected. When IN2 = "High", switch 2 is turned on, and S2 and D2 are connected.
7	B3	IN1	Digital Control Pin of Switch 1. When IN1 = "Low", switch 1 is turned off, and S1 and D1 are disconnected. When IN1 = "High", switch 1 is turned on, and S1 and D1 are connected.
9	A4	S2	Source Terminal 2. This pin can be an input or an output of switch 2.
10	A3	S1	Source Terminal 1. This pin can be an input or an output of switch 1.
12	A2	V _N	Negative Supply Voltage Output Pin. Connect a 10nF ceramic capacitor from V _N pin to GND.
14	B1	V _P	Positive Supply Voltage Output Pin. Connect a 10nF ceramic capacitor from V _P pin to GND.
16	C1	V _{CC}	Positive Power Supply Pin. It is recommended to use a 100nF or larger ceramic capacitor from V _{CC} pin to ground to get good power supply decoupling.
Exposed Pad	—	EP	Exposed Pad. No Connection. This pad is not an electrical connection point.

FUNCTION TABLE

Table 1. Function Table of Switch 1:

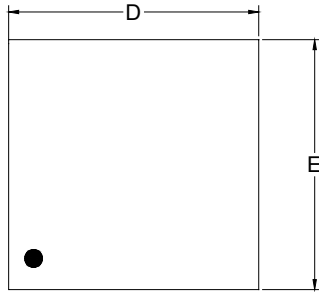
EN	IN1	S1 and D1	Negative Charge Pump
0	X	Disconnected	Turn Off
1	0	Disconnected	Turn On
1	1	Connected (S1 = D1)	Turn On

Table 2. Function Table of Switch 2:

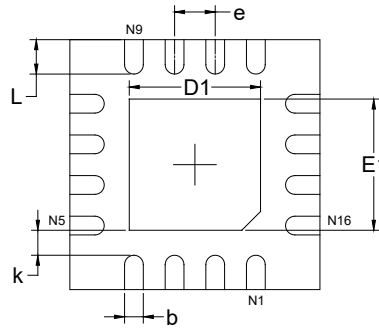
EN	IN2	S2 and D2	Negative Charge Pump
0	X	Disconnected	Turn Off
1	0	Disconnected	Turn On
1	1	Connected (S2 = D2)	Turn On

PACKAGE OUTLINE DIMENSIONS

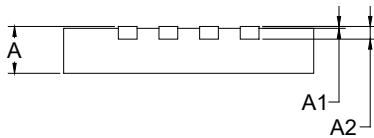
TQFN-4×4-16L



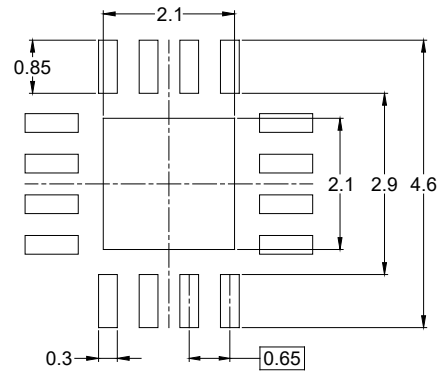
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

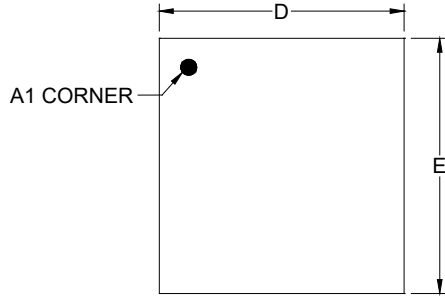
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	3.900	4.100	0.154	0.161
D1	2.000	2.200	0.079	0.087
E	3.900	4.100	0.154	0.161
E1	2.000	2.200	0.079	0.087
k	0.200 MIN		0.008 MIN	
b	0.250	0.350	0.010	0.014
e	0.650 TYP		0.026 TYP	
L	0.450	0.650	0.018	0.026

NOTE: This drawing is subject to change without notice.

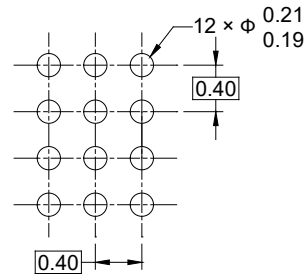
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

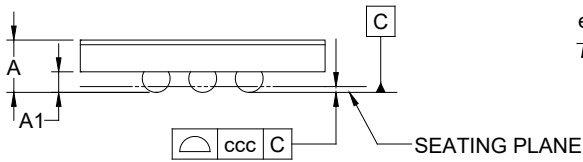
WLCSP-2.11×2.2-12B



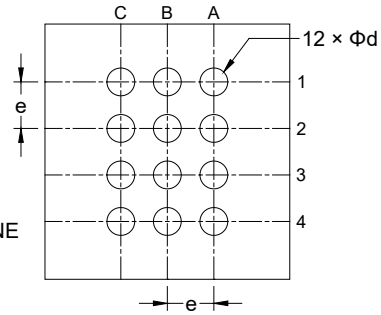
TOP VIEW



RECOMMENDED LAND PATTERN (Unit: mm)



SIDE VIEW



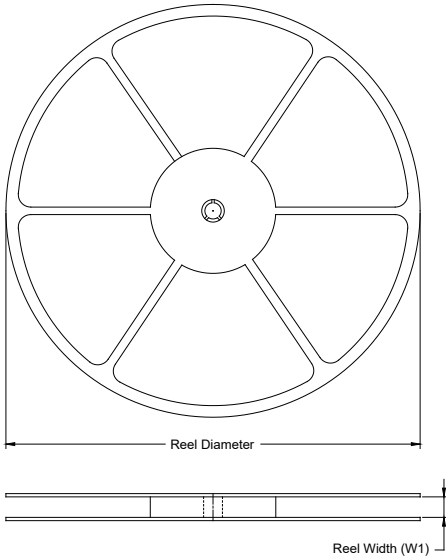
BOTTOM VIEW

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	0.488
A1	0.157	-	0.197
D	2.075	-	2.135
E	2.165	-	2.225
d	0.209	-	0.269
e	0.400 BSC		
ccc	0.050		

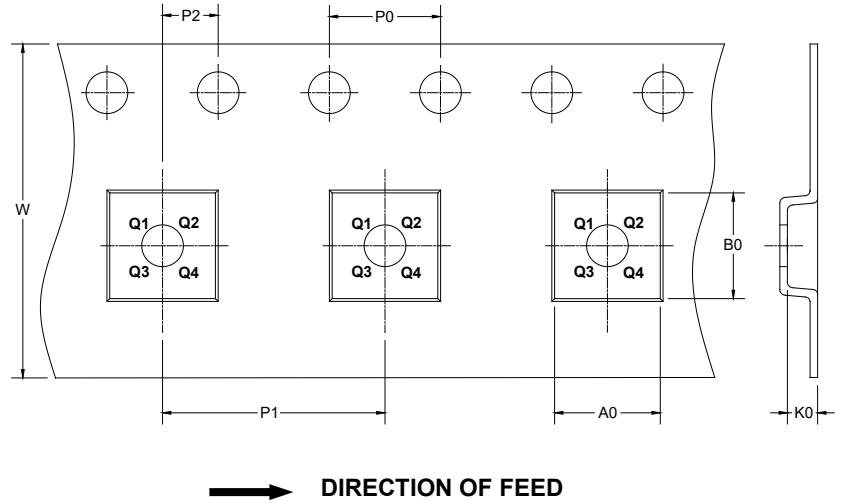
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

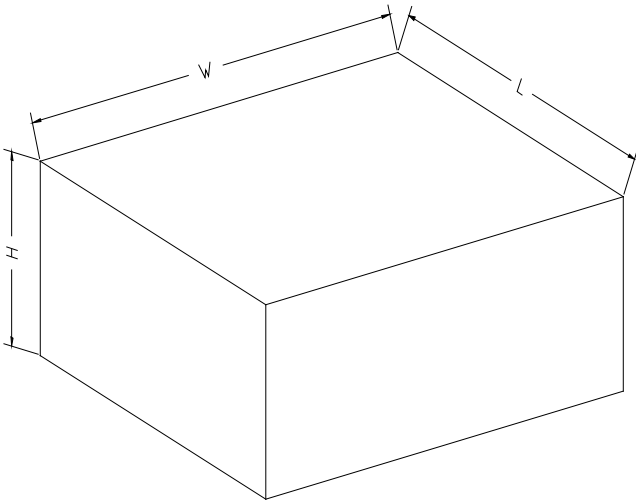
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TQFN-4×4-16L	13"	12.4	4.30	4.30	1.10	4.0	8.0	2.0	12.0	Q2
WLCSP-2.11×2.2-12B	7"	9.5	2.41	2.46	0.77	4.0	4.0	2.0	8.0	Q1

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
13"	386	280	370	5

DD0002