

GENERAL DESCRIPTION

The SGM4541A is a low I_q I²C bus over-voltage protector which supports with IEC61000-4-2 Standard ±12kV (Air / Contact) ESD protection on SCLA, SCLB, SDAA and SDAB pins. Transient voltage suppression (TVS) protection diodes are integrated on each SCLA, SCLB, SDAA and SDAB pins. When the voltage at SCLA or SDAA pin exceeds V_{CC} + 0.68V, the switches (S1 and S2) between SCLA and SCLB, SDAB and SDAA will be turned off. When the voltage at SCLA or SDAA pin is less than V_{CC} + 0.68V, the switches (S1 and S2) will be turned on automatically. All these I/O signals (SCLA, SCLB, SDAA and SDAB) can endure continuous 22V high voltage without any damage. These pins can endure continuous 24V high voltage without any damage during 3 hours.

The SGM4541A is available in Green UTDFN-1.5×1.5-6AL package.

FEATURES

- ESD Complies with IEC61000-4-2 Standard: ±12kV (Air), ±12kV (Contact)
- SCLA/B and SDAA/B OV Protection
 - ◆ Short to VBUS (USB PD up to 22V)
 - ◆ Endure 24V High Voltage Continuous for 3 Hours
- Threshold for OVP: V_{TH_OFF} = V_{CC} + 0.68V
- Quick OVP Response Time (t_{ovp}): < 5μs
- I²C Bus Speed: 1Mbps
- V_{CC} Range: 1.62V to 1.98V (V_{CC} = 1.8V in Application)
- Low Quiescent Current: 2.8μA
- Low C_{ON}: C_{ON} < 30pF
- Operating Temperature Range: -40°C to +125°C
- Available in Green UTDFN-1.5×1.5-6AL Package

APPLICATIONS

I²C Bus/ PMBus
 Smart and Feature Phones
 Tablets, eBooks
 Notebook

TYPICAL APPLICATION

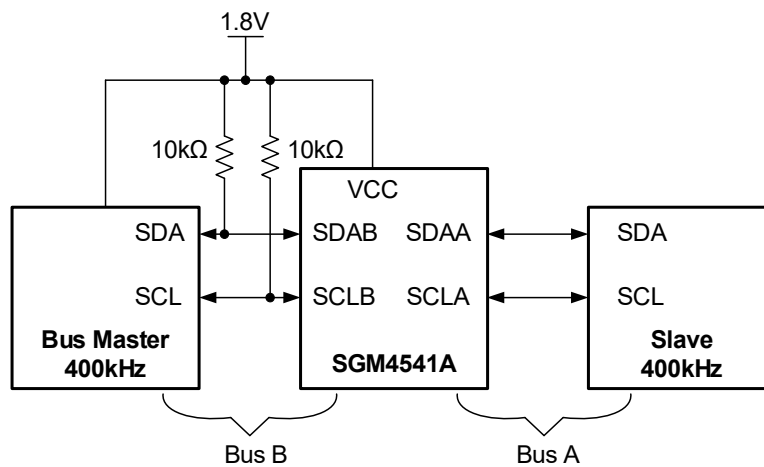


Figure 1. Typical Application Circuit

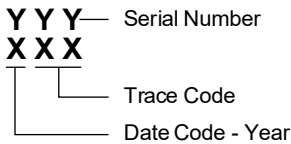
SGM4541A

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4541A	UTDFN-1.5×1.5-6AL	-40°C to +125°C	SGM4541AXUHC6G/TR	0YH XXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: X = Date Code. 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_{CC} -0.3V to 2.2V
- SCLA, SCLB, SDAA and SDAB, DC -0.3V to 22V
- -0.3V to 24V
- SCLA, SCLB, SDAA and SDAB, DC (3 Hours).....
- -0.3V to 24V
- Package Thermal Resistance
- UTDFN-1.5×1.5-6AL, θ_{JA}..... 106.1°C/W
- UTDFN-1.5×1.5-6AL, θ_{JB}..... 61.5°C/W
- UTDFN-1.5×1.5-6AL, θ_{JC(TOP)}..... 91.2°C/W
- UTDFN-1.5×1.5-6AL, θ_{JC(BOT)}..... 40.4°C/W
- Junction Temperature +150°C
- Storage Temperature Range -65°C to +150°C
- Lead Temperature (Soldering, 10s) +260°C
- ESD Susceptibility
- HBM ⁽¹⁾ ±2000V
- CDM ⁽²⁾ ±500V
- SCLA/SDAA (IEC 61000-4-2 Contact Discharge) ⁽³⁾ ... ±12kV
- SCLB/SDAB (IEC 61000-4-2 Contact Discharge) ⁽³⁾ ... ±12kV
- SCLA/SDAA (IEC 61000-4-2 Air Discharge) ⁽³⁾..... ±12kV
- SCLB/SDAB (IEC 61000-4-2 Air Discharge) ⁽³⁾..... ±12kV

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.
3. See Figure 2 for details on system level ESD testing setup.

RECOMMENDED OPERATING CONDITIONS

- Supply Input Voltage V_{CC} 1.62V to 1.98V
- SCLA, SCLB, SDAA and SDAB 0V to V_{CC}
- Operating Junction 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.

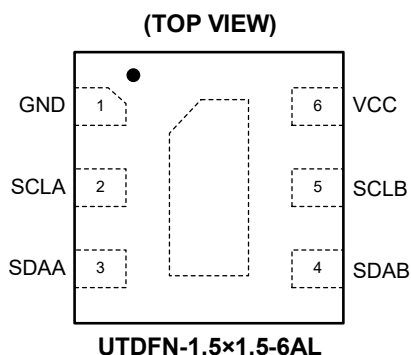
ESD SENSITIVITY CAUTION

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 CONFIGURATION



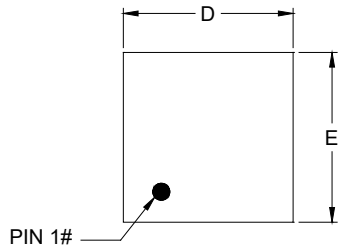
PIN DESCRIPTION

PIN	NAME	FUNCTION
1	GND	Ground.
2	SCLA	Input/Output Signal at A Side for SCL.
3	SDAA	Input/Output Signal at A Side for SDA.
4	SDAB	Input/Output Signal at B Side for SDA.
5	SCLB	Input/Output Signal at B Side for SCL.
6	VCC	Power Supply.
Exposed Pad	EP	—

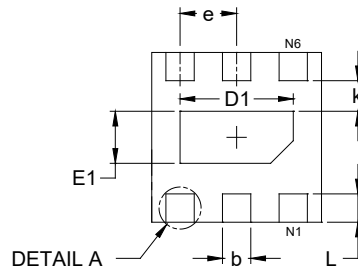
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

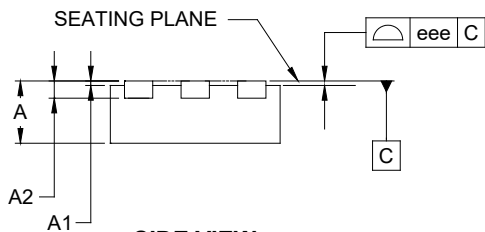
UTDFN-1.5×1.5-6AL



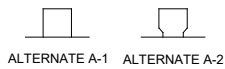
TOP VIEW



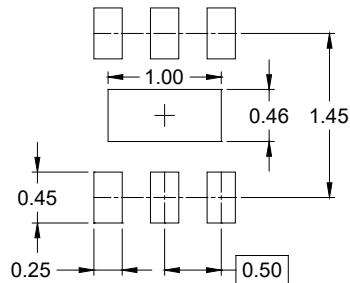
BOTTOM VIEW



SIDE VIEW



DETAIL A
ALTERNATE TERMINAL
CONSTRUCTION



RECOMMENDED LAND PATTERN (Unit: mm)

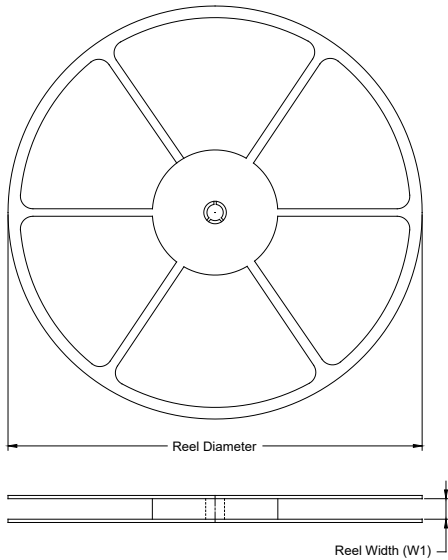
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.500	-	0.600
A1	0.000	-	0.050
A2	0.152 REF		
b	0.200	-	0.300
D	1.400	-	1.600
E	1.400	-	1.600
D1	0.900	-	1.100
E1	0.360	-	0.560
e	0.500 BSC		
L	0.150	-	0.350
k	0.270 REF		
eee	0.050		

NOTE: This drawing is subject to change without notice.

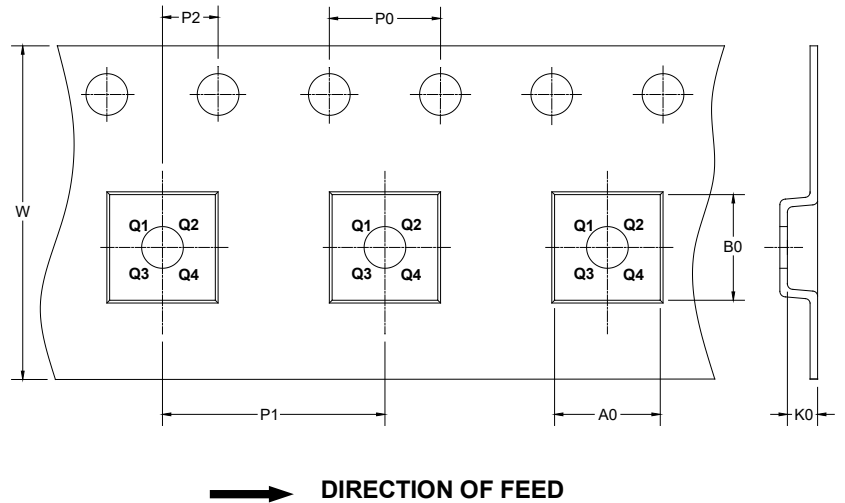
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

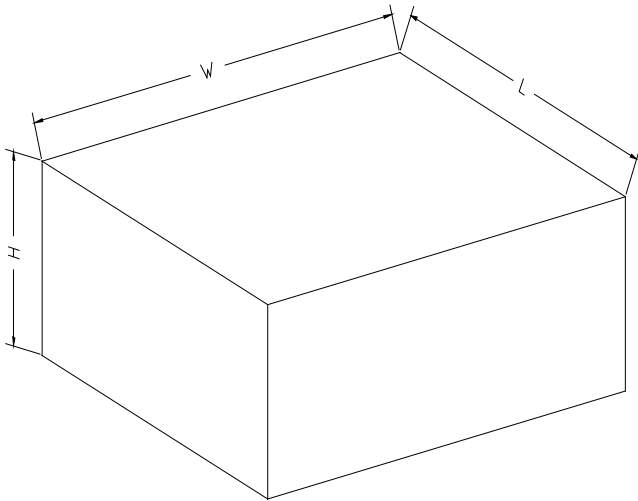
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
UTDFN-1.5×1.5-6AL	7"	9.5	1.70	1.70	0.76	4.0	4.0	2.0	8.0	Q2

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