

GENERAL DESCRIPTION

The SGM42507 is an integrated driver IC for driving motors and coils in industrial applications. The PH and EN/FAULT pins allow simple interfacing to controller circuits.

Internal protection functions are provided for under-voltage lockout (UVLO), over-current protection (OCP) and over-temperature protection (OTP). Fault conditions are indicated by the EN/FAULT pin.

The SGM42507A is available in a Green TSOT-23-6 package. The SGM42507B/C are available in Green SC70-6 and TSOT-23-6 packages. They operate over an ambient temperature range of -40°C to +125°C.

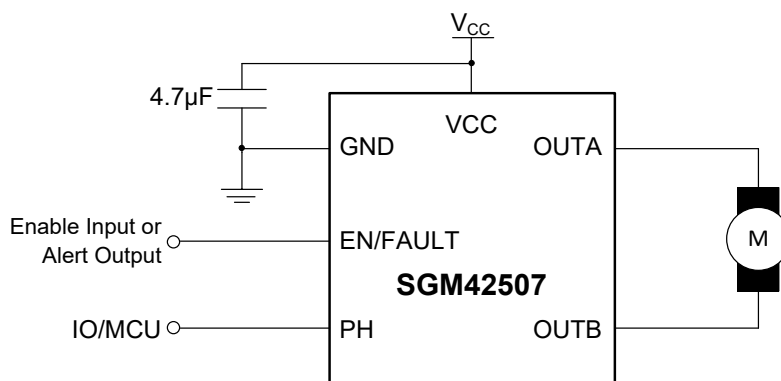
APPLICATIONS

- Robot
- Utility Meter
- Solenoid

FEATURES

- **Internal OC/UV/OT Protections**
 - ♦ **Over-Current Threshold Options:**
0.45A/0.9A/1.5A
 - ♦ **Under-Voltage Threshold Options:**
1.75V/2.8V/3.6V
 - ♦ **Over-Temperature Protection**
- **Up to 7.5V Supply Range for Applications Powered by:**
 - ♦ **1 Li+/Poly Cell**
 - ♦ **2/3/4 Dry Cells**
 - ♦ **1/2 LiSOCl₂ Cell(s)**
- **Selectable Slow or Fast Decay Modes**
- **-40°C to +125°C Operating Temperature Range**
- **SGM42507A is Available in a Green TSOT-23-6 Package**
SGM42507B/C are Available in Green SC70-6 and TSOT-23-6 Packages

TYPICAL APPLICATION



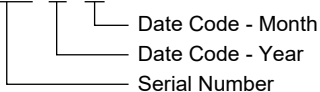
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM42507A-1.75	TSOT-23-6	-40°C to +125°C	SGM42507A-1.75XTN6G/TR	GM5XX	Tape and Reel, 3000
SGM42507A-2.8	TSOT-23-6	-40°C to +125°C	SGM42507A-2.8XTN6G/TR	GS0XX	Tape and Reel, 3000
SGM42507A-3.6	TSOT-23-6	-40°C to +125°C	SGM42507A-3.6XTN6G/TR	GS1XX	Tape and Reel, 3000
SGM42507B-1.75	SC70-6	-40°C to +125°C	SGM42507B-1.75XC6G/TR	GPBXX	Tape and Reel, 3000
	TSOT-23-6	-40°C to +125°C	SGM42507B-1.75XTN6G/TR	M09XX	Tape and Reel, 3000
SGM42507B-2.8	SC70-6	-40°C to +125°C	SGM42507B-2.8XC6G/TR	GW8XX	Tape and Reel, 3000
	TSOT-23-6	-40°C to +125°C	SGM42507B-2.8XTN6G/TR	M0AXX	Tape and Reel, 3000
SGM42507B-3.6	SC70-6	-40°C to +125°C	SGM42507B-3.6XC6G/TR	GW9XX	Tape and Reel, 3000
	TSOT-23-6	-40°C to +125°C	SGM42507B-3.6XTN6G/TR	M0BXX	Tape and Reel, 3000
SGM42507C-1.75	SC70-6	-40°C to +125°C	SGM42507C-1.75XC6G/TR	GWAXX	Tape and Reel, 3000
	TSOT-23-6	-40°C to +125°C	SGM42507C-1.75XTN6G/TR	M0CXX	Tape and Reel, 3000
SGM42507C-2.8	SC70-6	-40°C to +125°C	SGM42507C-2.8XC6G/TR	GWBXX	Tape and Reel, 3000
	TSOT-23-6	-40°C to +125°C	SGM42507C-2.8XTN6G/TR	M0DXX	Tape and Reel, 3000
SGM42507C-3.6	SC70-6	-40°C to +125°C	SGM42507C-3.6XC6G/TR	GCWXX	Tape and Reel, 3000
	TSOT-23-6	-40°C to +125°C	SGM42507C-3.6XTN6G/TR	M0EXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XX = Date Code.

YYY X X



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.

SELECTABLE MODEL

MODEL	OVER-CURRENT PROTECTION THRESHOLD (A)	UNDER-VOLTAGE PROTECTION THRESHOLD (V)
SGM42507A-1.75	1.5	1.75
SGM42507A-2.8	1.5	2.8
SGM42507A-3.6	1.5	3.6
SGM42507B-1.75	0.9	1.75
SGM42507B-2.8	0.9	2.8
SGM42507B-3.6	0.9	3.6
SGM42507C-1.75	0.45	1.75
SGM42507C-2.8	0.45	2.8
SGM42507C-3.6	0.45	3.6

ABSOLUTE MAXIMUM RATINGS

V _{CC}	-0.3V to 9V ⁽¹⁾
Digital Input Pin Voltage Range	-0.3V to 6V
Package Thermal Resistance	
SC70-6, θ_{JA}	245.8°C/W
TSOT-23-6, θ_{JA}	217.8°C/W
Junction Temperature.....	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility	
HBM.....	5000V
MM.....	300V
CDM	1000V

NOTE 1: Guaranteed SGM42507 work at 7.5V DC and surge to 9V.

RECOMMENDED OPERATING CONDITIONS

V _{CC}	1.9V to 7.5V
Digital Input Pin Voltage Range	0V to 5.5V
Ambient 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.

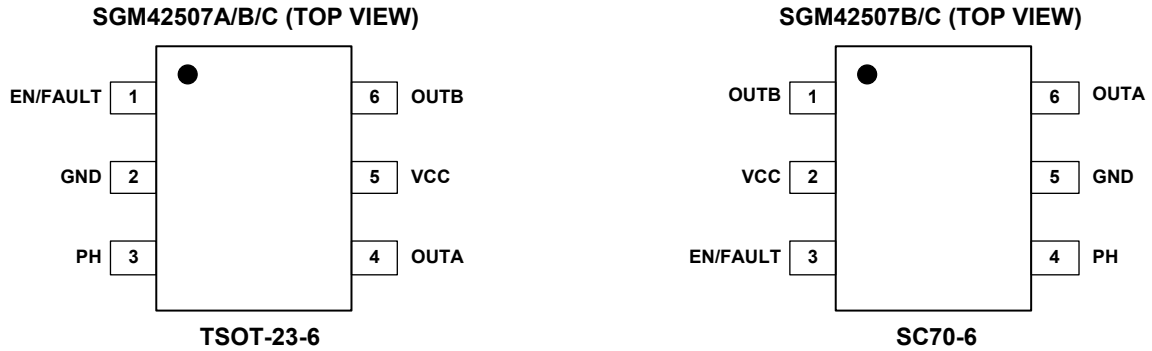
ESD SENSITIVITY CAUTION

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

NAME	TYPE	FUNCTION
EN/FAULT	I/O	Enable Input or Alert Output (OTP, OCP, UVLO) Pin. Logic high to enable normal operation, logic low to enter low power dissipation sleep mode and reset all internal logic. Internal pull-down. This output is not valid when the device into minimum power dissipation sleep mode.
GND	G	Ground.
PH	I	Direction Input Pin ($V_{PH} \leq V_{CC}$). Logic high for sourcing from OUTA and sinking into OUTB, logic low for reverse driving. Internal pull-down.
OUTA	O	H-Bridge Output A.
VCC	P	Power Input Pin. A 4.7µF (MIN) ceramic bypass capacitor to GND is recommended.
OUTB	O	H-Bridge Output B.

NOTE: I: input, O: output, I/O: input or output, G: ground, P: power for the circuit.

ELECTRICAL CHARACTERISTICS

(T_A = +25°C, V_{CC} = 5V, EN/FAULT pin connected to 5V through 500Ω resistor, Full = -40°C to +125°C, unless otherwise noted.)

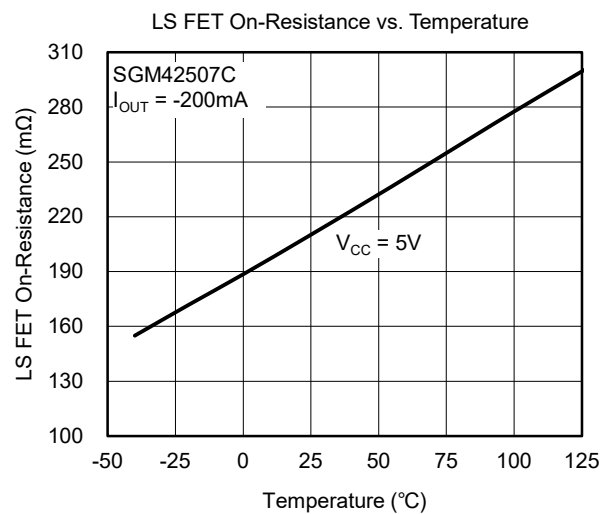
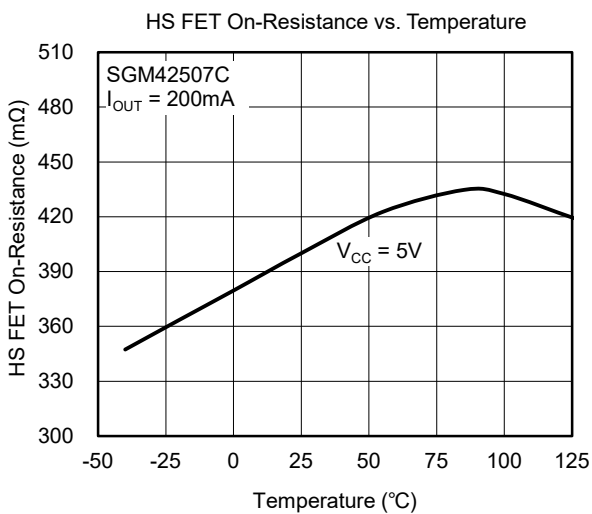
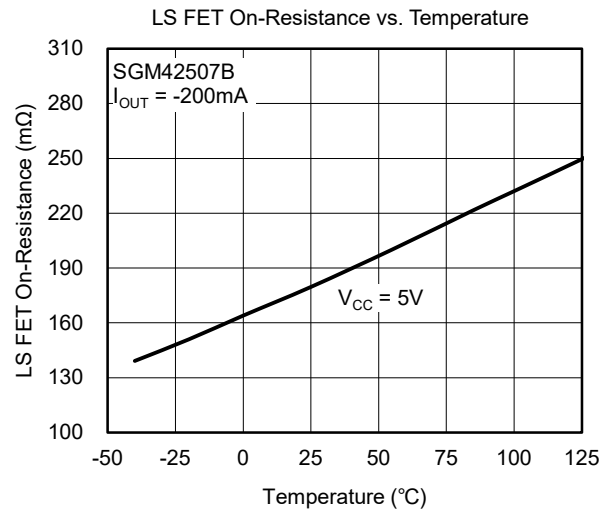
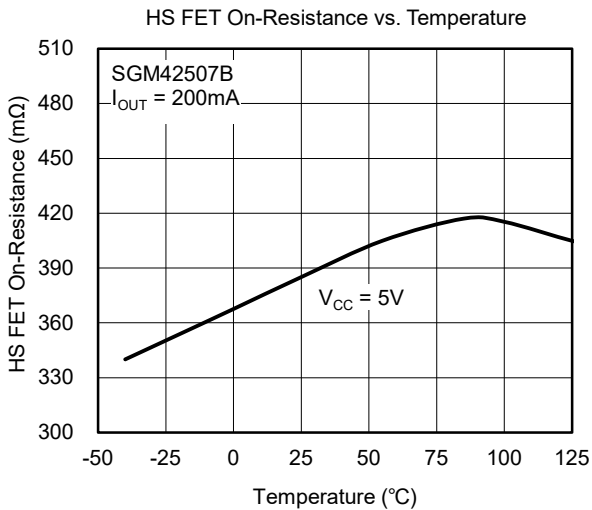
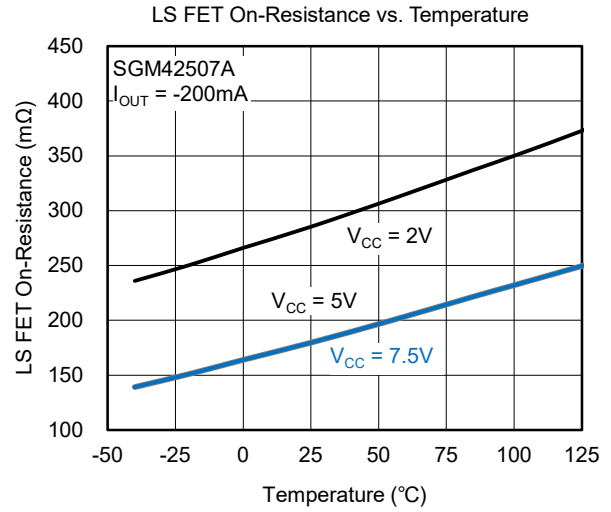
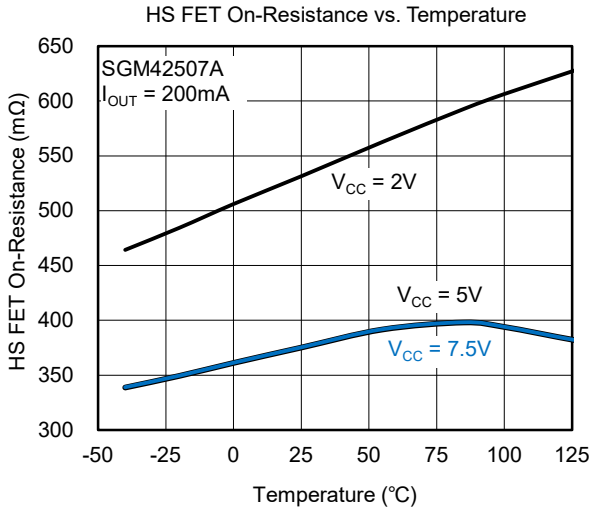
PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
Power Supplies							
Power Supply Voltage	V _{CC}		+25°C	1.9		7.5	V
Digital Input Voltage Range (EN/FAULT, PH)	V _{IN}		+25°C	0		5.5	V
Power Supply Current	I _{VCC}	No PWM	+25°C		45	74	μA
Sleep Mode Supply Current	I _{VCCQ}	EN/FAULT = GND	+25°C		1.3	2	μA
VCC Under-Voltage Lockout Voltage	V _{UVLO}	SGM42507A/B/C-1.75	+25°C		1.7	1.9	V
		SGM42507A/B/C-2.8	+25°C		1.95	2.15	
		SGM42507A/B/C-3.6	+25°C		1.7	1.85	
VCC Under-Voltage Lockout Voltage Hysteresis	V _{HYS}		+25°C		100		mV
VCC Under-Voltage Protection Voltage	V _{UVP}	SGM42507A/B/C-1.75	+25°C		1.75	1.9	V
		SGM42507A/B/C-2.8	+25°C		2.8	3.05	
		SGM42507A/B/C-3.6	+25°C		3.6	3.75	
VCC Under-Voltage Protection Voltage Hysteresis	V _{HYS}		+25°C		100		mV
Logic Level Inputs							
Input Low Voltage	V _{IL}		Full			0.6	V
Input High Voltage	V _{IH}		Full	1.6			V
Input Low Current	I _{IL}	V _{IN} = 0V	+25°C	-500		500	nA
Input High Weak Pull-Down Current	I _{IH_weak}	V _{IN} = 5.5V	+25°C		60	85	μA
Input High Strong Pull-Down Current	I _{IH_strong}	V _{IN} = 1.1V	+25°C		300	380	μA
Input Deglitch Time	t _{DEG}		+25°C		300		ns
EN/FAULT Output (Open-Drain Output)							
Output Low Voltage	V _{OL}	V _{CC} = 1.8V, I _{OUT} = -5mA	+25°C			170	mV
Output High Leakage Current	I _{OH}		+25°C			95	μA
H-Bridge FETs							
HS FET On-Resistance	R _{DS(ON)}	SGM42507A-X, I _{OUT} = 200mA	+25°C		375		mΩ
			Full			550	
		SGM42507B-X, I _{OUT} = 200mA	+25°C		385		
			Full			570	
LS FET On-Resistance	R _{DS(ON)}	SGM42507A-X, I _{OUT} = -200mA	+25°C		180		mΩ
			Full			335	
		SGM42507B-X, I _{OUT} = -200mA	+25°C		185		
			Full			360	
SGM42507C-X, I _{OUT} = -200mA	+25°C		210				
	Full			395			
Off-State Leakage Current	I _{OFF}	V _{OUT} = 0V or 7.5V	+25°C	-800		800	nA

ELECTRICAL CHARACTERISTICS (continued)(T_A = +25°C, V_{CC} = 5V, EN/FAULT pin connected to 5V through 500Ω resistor, Full = -40°C to +125°C, unless otherwise noted.)

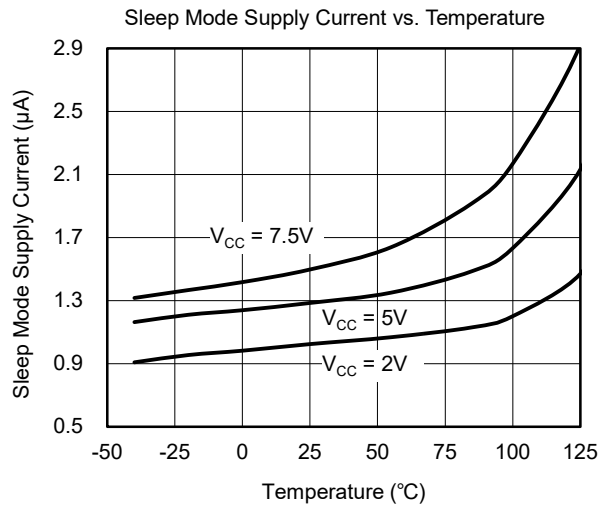
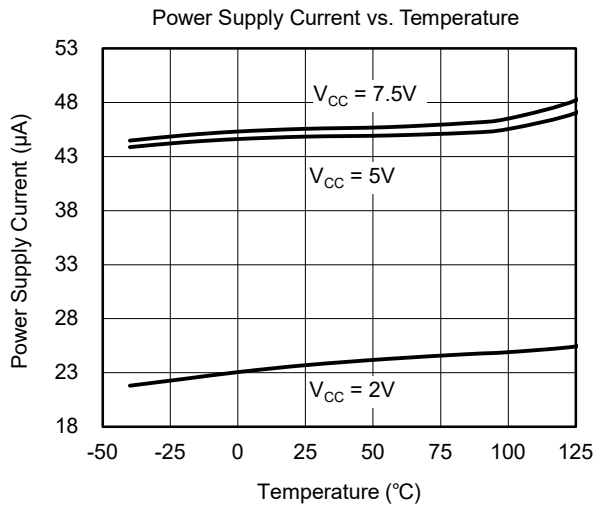
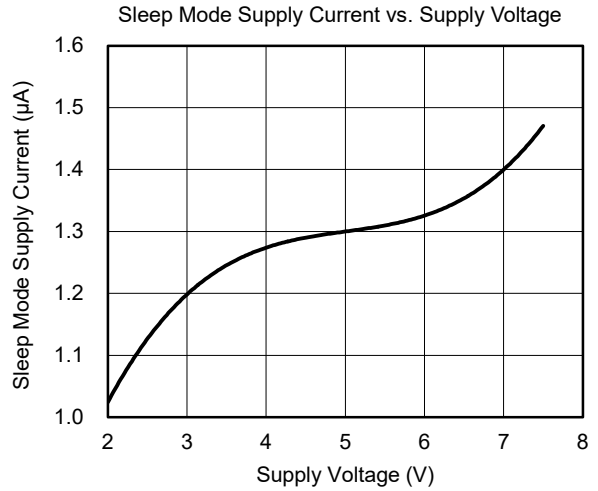
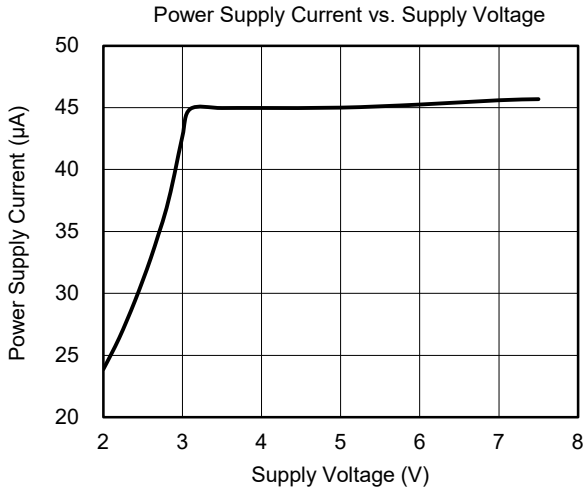
PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
Motor Driver							
Rise Time	t _R	R _L = 16Ω to GND, 10% to 90% V _{CC}	+25°C		125		ns
Fall Time	t _F	R _L = 16Ω to V _{CC} , 90% to 10% V _{CC}	+25°C		155		ns
Propagation Delay INx to OUTx	t _{PROP}		+25°C		1		μs
Dead Time ⁽¹⁾	t _{DEAD}		+25°C		255		ns
Protection Circuits							
Over-Current Protection Trip Level	I _{OC} P	SGM42507A-X	+25°C		1.5		A
		SGM42507B-X	+25°C		0.9		
		SGM42507C-X	+25°C		0.45		
Thermal Shutdown							
Thermal Shutdown Temperature	T _{TSD}				165		°C
Thermal Shutdown Temperature Hysteresis	T _{HYS}				30		°C
nSLEEP Mode							
Time to Enter Sleep Mode	t _{SLEEP}		+25°C	60		105	ms
Wake Time	t _{WAKE}	EN/FAULT inactive high to H-bridge on	+25°C			4.5	ms

NOTE: 1. Internal dead time. External implementation is not necessary.

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

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

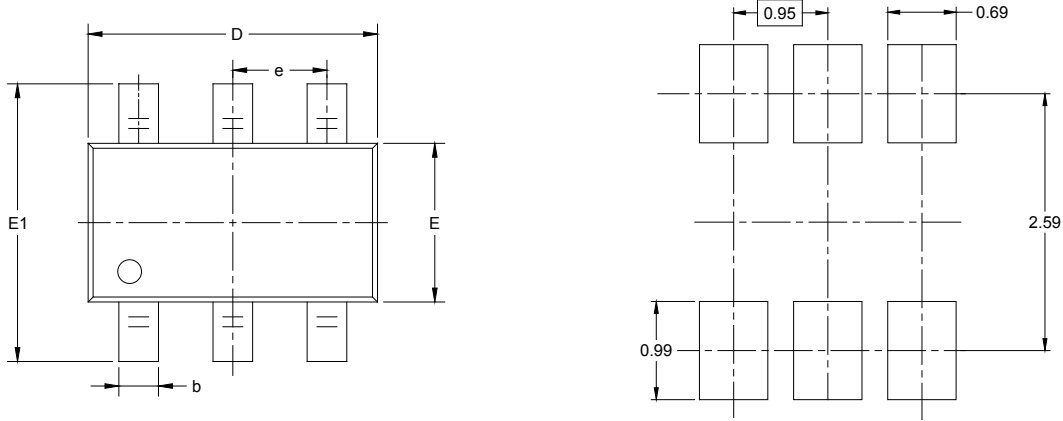
Changes from Original (NOVEMBER 2018) to REV.A

Changed from product preview to production data.....All

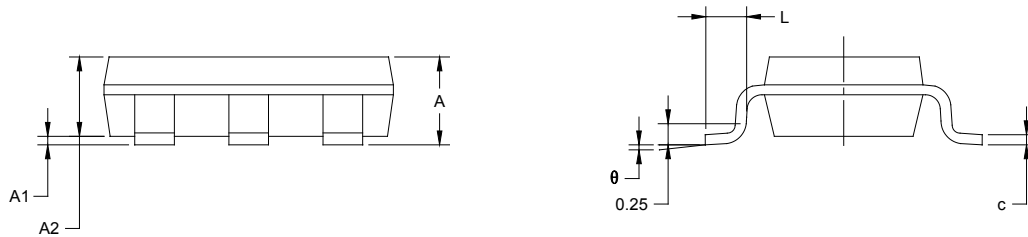
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

TSOT-23-6



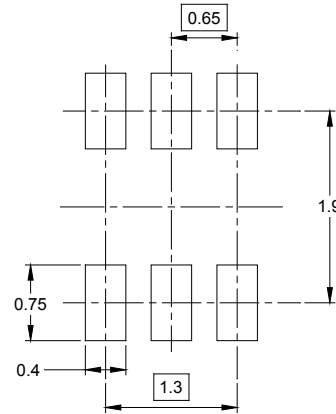
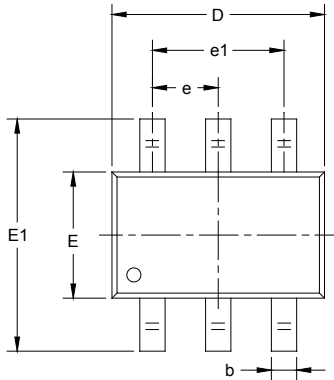
RECOMMENDED LAND PATTERN (Unit: mm)



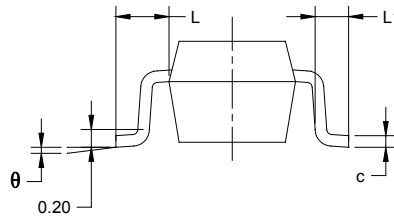
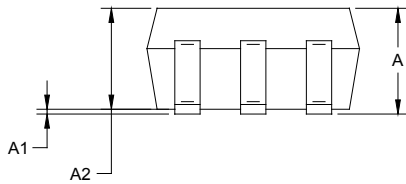
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.000		0.043
A1	0.000	0.100	0.000	0.004
A2	0.700	0.900	0.028	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.200	0.003	0.008
D	2.850	2.950	0.112	0.116
E	1.550	1.650	0.061	0.065
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

PACKAGE OUTLINE DIMENSIONS

SC70-6



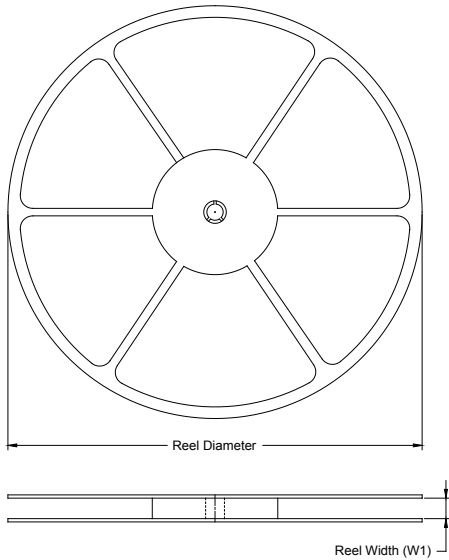
RECOMMENDED LAND PATTERN (Unit: mm)



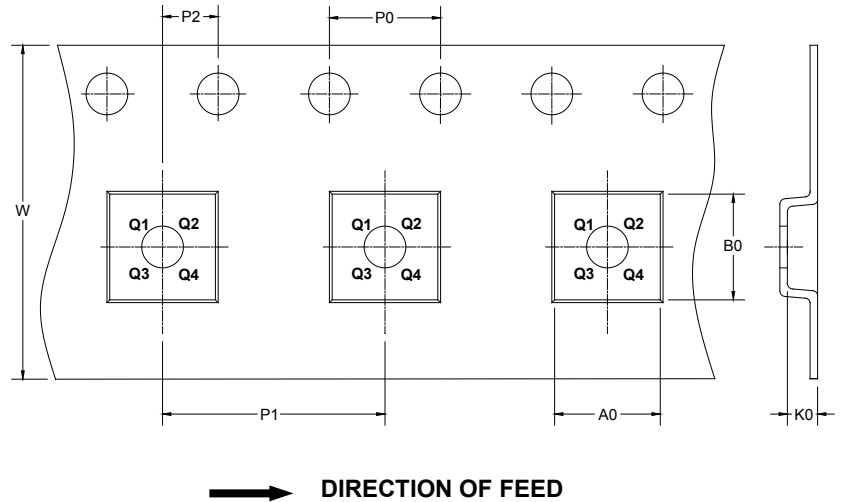
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.65 TYP		0.026 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°

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
TSOT-23-6	7"	9.5	3.20	3.10	1.10	4.0	4.0	2.0	8.0	Q3

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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

单击下面可查看定价，库存，交付和生命周期等信息

[>>SGMICRO\(圣邦微电子\)](#)