

GENERAL DESCRIPTION

The SGM42544A provides four half-bridge drivers, each channel is controlled by separate individually controllable input. It is suitable for driving inductive loads, including four solenoids, relays, DC motors or other loads. The device allows operation with single or bipolar power supplies (such as $\pm 24V$).

With proper heatsinking, the SGM42544A can deliver up to 2.5A peak output current per channel (at $T_J = +25^\circ C$). Paralleling the outputs is possible for higher current applications.

Protection features include under-voltage lockout, over-current, short-circuit and thermal shutdown. Fault conditions are indicated on the nFAULT pin.

The SGM42544A is available in a Green TSSOP-28 (Exposed Pad) package.

FEATURES

- **Wide Power Supply Voltage Range: 8V to 55V**
- **On-Resistance: 0.45Ω for HS + LS, $T_J = +25^\circ C$**
- **Flexible Control Interface for Different Loads**
- **Individual Controllable Input**
- **Up to 2.5A Drive Current at $V_M = 24V$, $T_J = +25^\circ C$**
- **Single or Bipolar Power Supplies (up to $\pm 27.5V$)**
- **Built-in 3.3V Reference Output**
- **Parallel Digital Control Interface**
- **Full Set of Protections**
 - ◆ **V_M Under-Voltage Lockout (UVLO)**
 - ◆ **Over-Current Protection (OCP)**
 - ◆ **Thermal Shutdown (TSD)**
 - ◆ **Fault Condition Indication Pin (nFAULT)**
- **Available in a Green TSSOP-28 (Exposed Pad) Package**

APPLICATIONS

Robotics
Textile Machines
Gaming Machines
Office/Factory Automation Machines

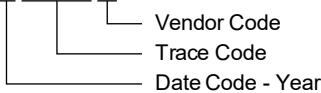
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM42544A	TSSOP-28 (Exposed Pad)	-40°C to +125°C	SGM42544AXPTS28G/TR	SGM42544A XPTS28 XXXXX	Tape and Reel, 4000

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code.

XXXXX



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

- Power Supply Voltage Range, V_M -0.3V to 60V
- Logic Ground Voltage, LGND-0.5V to V_M - 8V
- Digital Pins Voltage RangeLGND - 0.5V to LGND + 6V
- SRC12, SRC34 (with Optional Sense Resistor) to VNEG Pins -0.5V to 0.7V
- OUTx Pin Voltage Range..... V_{NEG} -0.7V to V_M + 0.7V
- Peak Output Current, $t < 1\mu s$ Internally Limited
- Package Thermal Resistance
 - TSSOP-28 (Exposed Pad), θ_{JA} 26.7°C/W
 - TSSOP-28 (Exposed Pad), θ_{JB} 8.6°C/W
 - TSSOP-28 (Exposed Pad), $\theta_{JC (TOP)}$ 16.7°C/W
 - TSSOP-28 (Exposed Pad), $\theta_{JC (BOT)}$ 1.5°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 ±4000V
- CDM ±1000V

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.

RECOMMENDED OPERATING CONDITIONS

- Power Supply Voltage Range, V_M 8V to 55V
- V3P3 Load Current..... 0mA to 10mA
- 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.

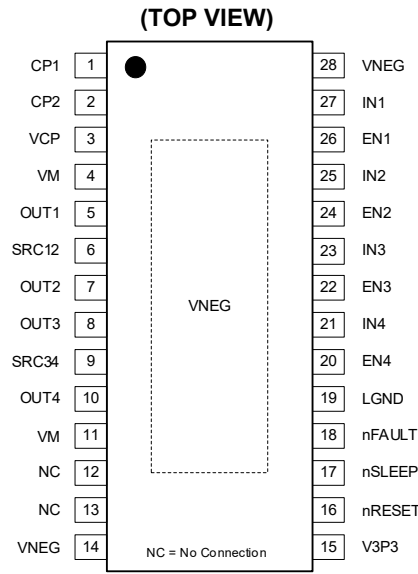
DISCLAIMER

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

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.

PIN CONFIGURATION



TSSOP-28 (Exposed Pad)

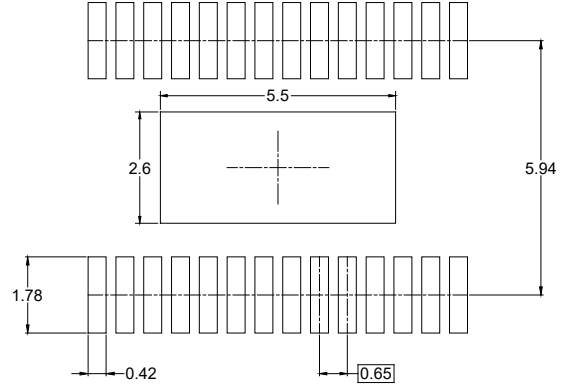
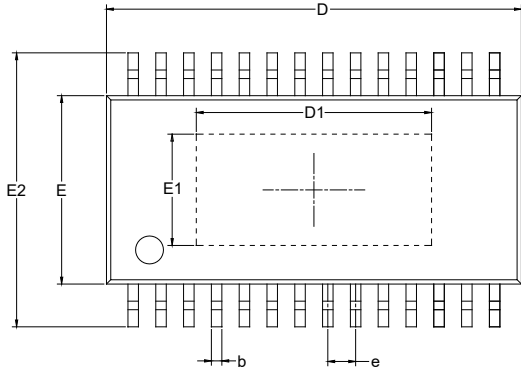
PIN DESCRIPTION

PIN	NAME	TYPE	FUNCTION
1	CP1	I/O	Charge Pump Flying Capacitor. A 0.01µF/100V capacitor is used between CP1 and CP2 pins.
2	CP2	I/O	
3	VCP	I/O	Gate Drive Voltage of the High-side Switches. Decouple with a 0.1µF/16V ceramic capacitor to VM pin.
4, 11	VM	-	Power Supply. Connect these pins to the same motor supply (8V to 55V) and bypass with a 100µF (MIN) capacitor.
5	OUT1	O	Output 1 of the Device.
7	OUT2	O	Output 2 of the Device.
8	OUT3	O	Output 3 of the Device.
10	OUT4	O	Output 4 of the Device.
6	SRC12	-	Low-side FET Source for OUT1 and OUT2. Short to VNEG directly or connect an optional sense resistor to VNEG.
9	SRC34	-	Low-side FET Source for OUT3 and OUT4. Short to VNEG directly or connect an optional sense resistor to VNEG.
12, 13	NC	-	No Connection.
14, 28	VNEG	-	Negative Power Supply. Connect to LGND for single supply or connect to negative power supply for dual supplies.
15	V3P3	O	3.3V Regulator Output. Bypass with a 0.47µF/6.3V ceramic capacitor to VNEG.
16	nRESET	I	Reset Input. Active-low reset input with weak internal pull-down initializes internal logic and disables half-bridge outputs.
17	nSLEEP	I	Sleep Mode Input. Active-low sleep mode logic input with weak internal pull-down. Apply high to enable device, and low to enter into the low-power sleep mode.
18	nFAULT	OD	Fault Indication Pin. Open-drain output type, logic low when in fault conditions.
19	LGND	-	Logic Input Reference Ground. Connect to logic ground.
20	EN4	I	Enable Input for Channel 4. Active-high enable logic input with weak internal pull-down.
21	IN4	I	Input Power for Channel 4. Internal pull-down.
22	EN3	I	Enable Input for Channel 3. Active-high enable logic input with weak internal pull-down.
23	IN3	I	Input Power for Channel 3. Internal pull-down.
24	EN2	I	Enable Input for Channel 2. Active-high enable logic input with weak internal pull-down.
25	IN2	I	Input Power for Channel 2. Internal pull-down.
26	EN1	I	Enable Input for Channel 1. Active-high enable logic input with weak internal pull-down.
27	IN1	I	Input Power for Channel 1. Internal pull-down.
Exposed Pad	VNEG	-	Exposed Pad. Exposed pad for thermal dissipation, connect to VNEG.

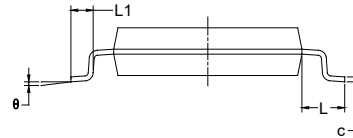
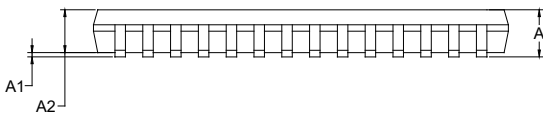
NOTE: I = input, O = output, OD = open-drain output, I/O = input/output.

PACKAGE OUTLINE DIMENSIONS

TSSOP-28 (Exposed Pad)



RECOMMENDED LAND PATTERN (Unit: mm)



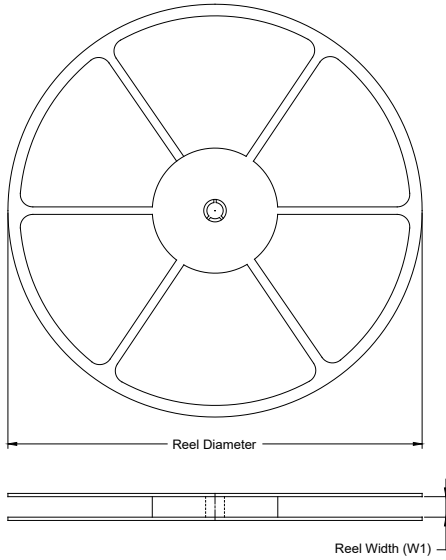
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.200		0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
D	9.600	9.800	0.378	0.386
D1	5.300	5.700	0.209	0.224
E	4.300	4.500	0.169	0.177
E1	2.400	2.800	0.094	0.110
E2	6.200	6.600	0.244	0.260
e	0.650 BSC		0.026 BSC	
L	1.000 BSC		0.039 BSC	
L1	0.450	0.750	0.018	0.030
θ	0°	8°	0°	8°

NOTES:

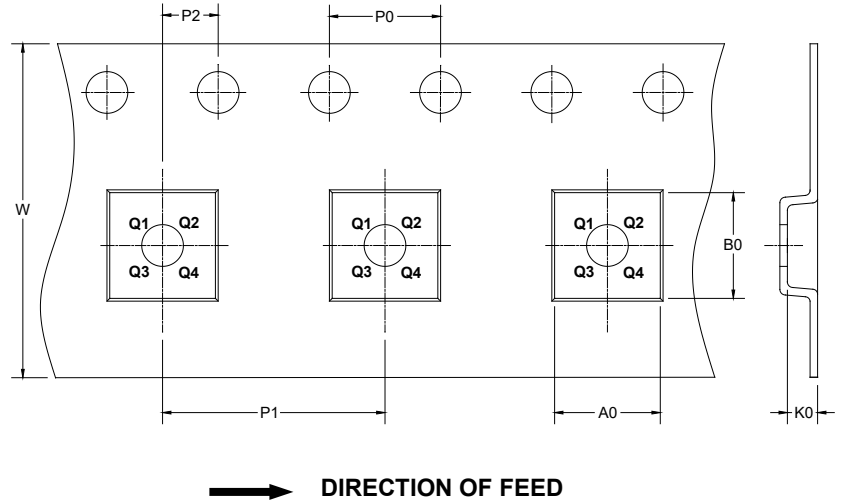
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.
3. Reference JEDEC MO-153.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

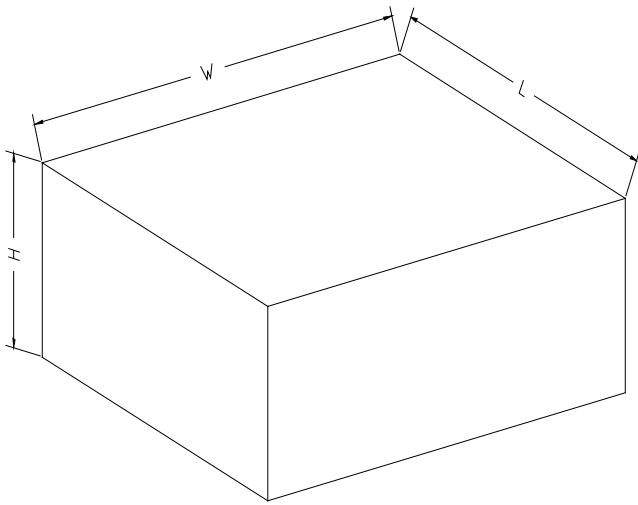
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TSSOP-28 (Exposed Pad)	13"	16.4	6.80	10.25	1.60	4.0	8.0	2.0	16.0	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
13"	386	280	370	5

DD0002