



SGM48524Q

Dual 5A, High-Speed, Low-Side Gate Driver with Negative Input Voltage Capability

GENERAL DESCRIPTION

The SGM48524Q is a dual high-speed low-side gate driver for MOSFET and IGBT power switches. It has rail-to-rail driving capability and can sink and source up to 5A peak current with capacitive loads. The propagation delays are very short and well matched between the two channels that make the device very fit for applications that need accurate dual gate driving such as synchronous rectifiers. The matched propagation delays also allow for paralleling the two channels when higher driving current is required, such as for paralleled switches. The input voltage thresholds are fixed, independent of supply voltage (V_{DD}) and are compatible with low voltage TTL and CMOS logic. Noise immunity is excellent due to the wide hysteresis window between the input low and high thresholds. The device has internal pull-up/pull-down resistors on the input pins to ensure low state on the driver output when the inputs are floating.

The SGM48524Q is a dual non-inverting driver. It has independent enable pins (ENA and ENB) for each channel with active-high logic that can be left open for normal operation because of internal pull-up to VDD.

The SGM48524Q is available in a Green SOIC-8 package. It operates over a temperature range of -40°C to $+125^{\circ}\text{C}$.

This device is AEC-Q100 qualified (Automotive Electronics Council (AEC) standard Q100 Grade 1) and it is suitable for automotive applications.

FEATURES

- **AEC-Q100 Qualified for Automotive Applications**
Device Temperature Grade 1
 $T_A = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
- **Two Independent Gate Drive Channels**
- **4.5V to 18V Single Supply Range (V_{DD})**
- **5A Peak Source/Sink Pulse Current Drive**
- **Independent Enable Pin for Each Channel**
- **TTL and CMOS Compatible Logic Threshold**
- **Logic Levels Independent of Supply Voltage**
- **Hysteretic Input Logic for High Noise Immunity**
- **Outputs are Logic Low when Inputs are Floating**
- **Negative Voltage Handling Capability:**
 - ◆ **-8V DC at Inputs**
 - ◆ **-2V, 200ns Pulse for Outputs (OUTx)**
- **Glitch-Free Operation at Power-Up and Power-Down: Outputs Pulled Low during Supply UVLO**
- **Fast Propagation Delays: 18ns (TYP)**
- **Fast Rise Time: 7ns (TYP)**
- **Fast Fall Time: 8ns (TYP)**
- **Delay Matching between Two Channels: 1ns (TYP)**
- **Channels can be Paralleled for Higher Drive Current**
- **Available in a Green SOIC-8 Package**

APPLICATIONS

Power MOSFETs
IGBT Driving for Power Supplies
DC/DC Converters
Solar Power, Motor Drivers
Gate Drive for Emerging Wide Bandgap Devices

Dual 5A, High-Speed, Low-Side Gate Driver with Negative Input Voltage Capability

SGM48524Q

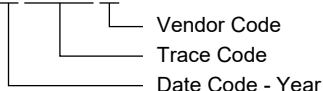
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE TOP MARKING	PACKING OPTION
SGM48524Q	SOIC-8	-40°C to +125°C	SGM48524QS8G/TR	SGM 009S8 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

Supply Voltage, V_{DD} -0.3V to 20V
 INA, INB, ENA, ENB Voltage..... -8V to 20V
 OUTA, OUTB Voltage (DC)..... -0.3V to $V_{DD} + 0.3V$
 OUTA, OUTB Voltage (Pulse < 200ns)..... -2V to $V_{DD} + 0.3V$
 Maximum Output Pulsed Source/Sink Current (0.5 μ s),
 I_{OUT_PULSED} 5A
 Package Thermal Resistance
 SOIC-8, θ_{JA} 120°C/W
 Junction Temperature..... +150°C
 Storage Temperature Range..... -65°C to +150°C
 Lead Temperature (Soldering, 10s)..... +260°C
 ESD Susceptibility
 HBM..... 4000V
 CDM..... 1000V

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range..... 4.5V to 18V
 Input Voltage, INA, INB..... -2V to 18V
 Enable Voltage, ENA and ENB..... -2V to 18V
 Operating 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.

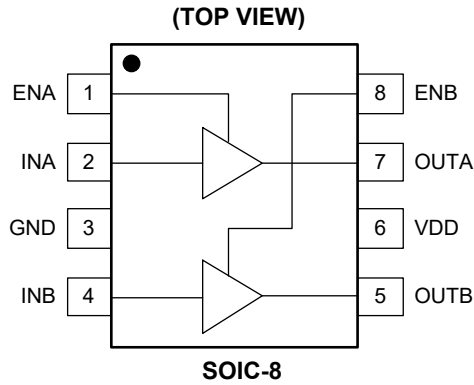
ESD SENSITIVITY CAUTION

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 CONFIGURATION



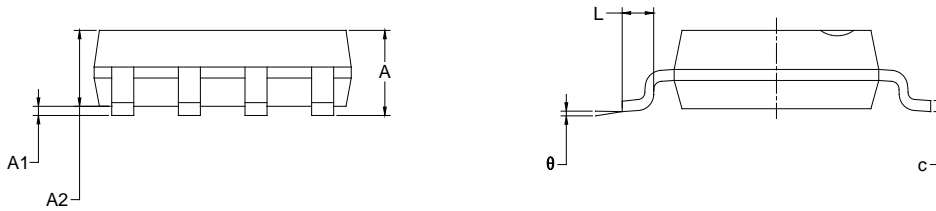
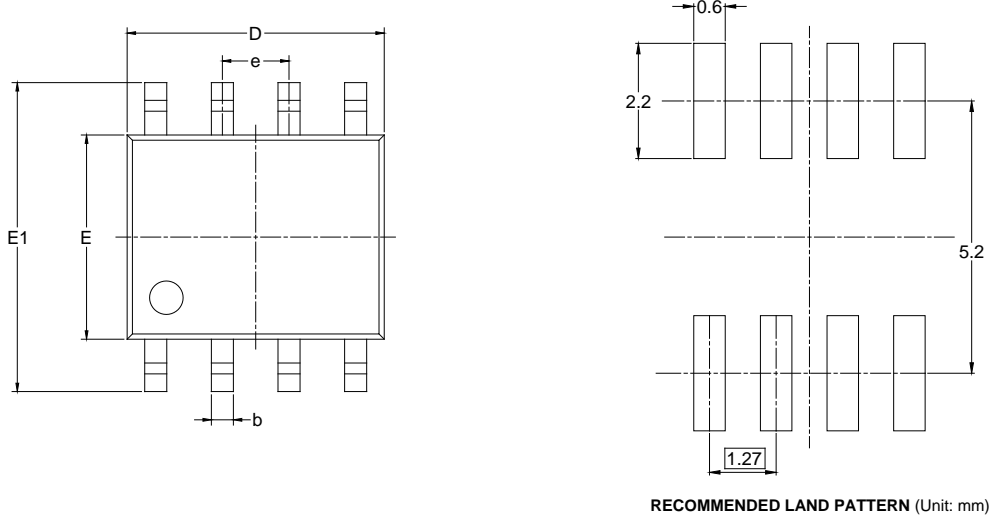
PIN DESCRIPTION

PIN	NAME	I/O	FUNCTION
1	ENA	I	Channel A Enable Input. Pull ENA high or leave it floating to enable OUTA output. Pull ENA low to disable OUTA output, ignoring INA state.
2	INA	I	Channel A Non-Inverting Input. OUTA is logic low if INA is unbiased or left floating.
3	GND	—	Ground. Reference pin for all signals.
4	INB	I	Channel B Non-Inverting Input. OUTB is logic low if INB is unbiased or left floating.
5	OUTB	O	Channel B Output.
6	VDD	I	Power Supply Input.
7	OUTA	O	Channel A Output.
8	ENB	I	Channel B Enable Input. Pull ENB high or leave it floating to enable OUTB output. Pull ENB low to disable OUTB output, ignoring INB state.

NOTE: I: Input; O: Output.

PACKAGE OUTLINE DIMENSIONS

SOIC-8



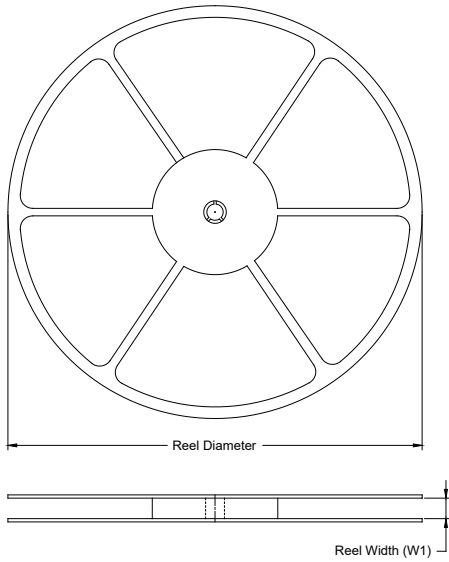
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
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.

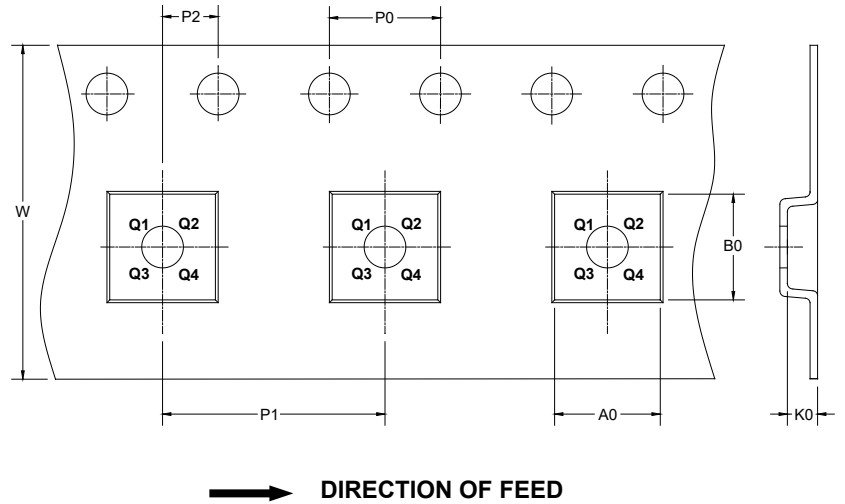
PACKAGE INFORMATION

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
SOIC-8	13"	12.4	6.40	5.40	2.10	4.0	8.0	2.0	12.0	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