

### GENERAL DESCRIPTION

The SGM48010 is a high-speed gate driver capable of effectively driving MOSFET and IGBT power switches. It allows for up to 8A source and 12A sink peak currents at  $V_{DD} = 20V$ . The SGM48010 provides a comprehensive set of protection features such as over-voltage protection, thermal shutdown protection, under-voltage lockout and short-circuit protection. It operates with a wide supply voltage of 4.5V to 20V.

The SGM48010 is available in a Green TDFN-2x2-6L package. It operates over a temperature range of  $-40^{\circ}C$  to  $+125^{\circ}C$ .

### APPLICATIONS

- Power MOSFETs
- IGBT Driving for Power Supplies
- Motor Drivers

### FEATURES

- Simple and Reliable
- 8A Source and 12A Sink Peak Drive Currents
- Wide Supply Voltage Range: 4.5V to 20V
- Fast Propagation Delays: 35ns (TYP)
- Fast Rise Time: 10ns (TYP)
- Fast Fall Time: 10ns (TYP)
- Ringing Suppression
- Self-Holding Logic Inputs (IN and SYNC Pins)
- Negative Voltage Capability on IN and SYNC Pins:  $-10V$  ( $V_{DD} - V_{IN\_MIN} \leq 22V$  and  $V_{DD} - V_{SYNC\_MIN} \leq 22V$ )
- Negative Voltage Capability on GD Pin:  $-5V$  (500ns Pulse)
- Comprehensive Protection Features
  - ♦ Over-Voltage Protection
  - ♦ Thermal Shutdown Protection
  - ♦ Under-Voltage Lockout
  - ♦ Short-Circuit Protection
- $-40^{\circ}C$  to  $+125^{\circ}C$  Operating Temperature Range
- Available in a Green TDFN-2x2-6L Package

### TYPICAL APPLICATIONS

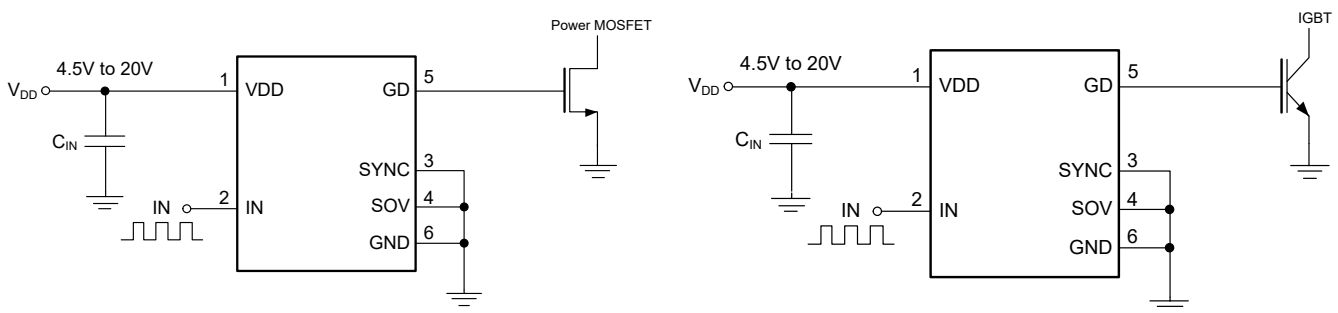


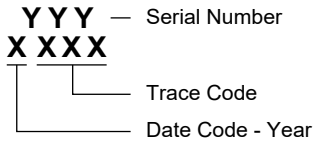
Figure 1. Typical Application Circuits

**PACKAGE/ORDERING INFORMATION**

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM48010	TDFN-2x2-6L	-40°C to +125°C	SGM48010XTDI6G/TR	CB3 XXXX	Tape and Reel, 3000

**MARKING INFORMATION**

NOTE: XXXX = Date Code and Trace 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**

VDD .....	-0.3V to 22V
SOV .....	-0.3V to V <sub>DD</sub> + 0.3V
IN (DC, V <sub>DD</sub> - V <sub>IN_MIN</sub> ≤ 22V) .....	-10V to V <sub>DD</sub> + 0.3V
SYNC (DC, V <sub>DD</sub> - V <sub>SYNC_MIN</sub> ≤ 22V) .....	-10V to V <sub>DD</sub> + 0.3V
GD (DC).....	-0.3V to V <sub>DD</sub> + 0.3V
GD (Pulse < 500ns).....	-5V to V <sub>DD</sub> + 0.3V
Package Thermal Resistance	
TDFN-2x2-6L, θ <sub>JA</sub> .....	107°C/W
Junction Temperature .....	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s) .....	+260°C
ESD Susceptibility	
HBM.....	8000V
CDM .....	1000V

**RECOMMENDED OPERATING CONDITIONS**

Supply Voltage Range .....	4.5V to 20V
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.

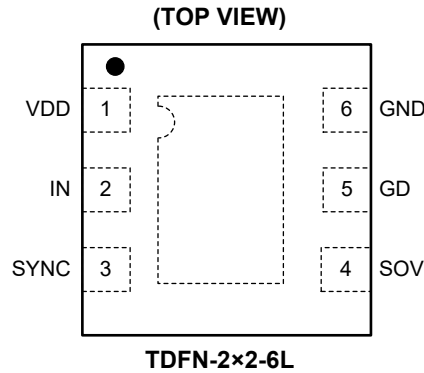
**ESD SENSITIVITY CAUTION**

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	TYPE	FUNCTION
1	VDD	P	Power Supply Input for Driver. Place a decoupling capacitor ( $C_{IN} = 4.7\mu F$ ) between this pin and GND pin close to the device.
2	IN	I	Logic Input for Gate Control. A logic high forces the GD output low if driving is not disabled by SOV or SYNC. This pin is a self-holding input and its status changes only when both input current and voltage exceed the desired thresholds.
3	SYNC	I	Deadtime Lock Input to Prevent Shoot Through. If SYNC is high, the GD output is inhibited. Similar to IN, this input is also self-holding and its status changes only when both input current and voltage exceed the desired thresholds.
4	SOV	IO	1. Input for MOSFET/IGBT On and Off Over-Voltage Detection. When the over-voltage of MOSFET drain/IGBT collector is sensed, the GD output temporarily goes low after a blanking time. 2. Output for Protection Status Indication. If any protection is in action, including over-voltage protection, thermal shutdown protection, under-voltage lockout and short-circuit protection, the pin is driven high.
5	GD	O	Gate Drive Output. Connect it to the gate of the switch.
6	GND	G	Ground.
Exposed Pad	—	—	The exposed pad should be soldered to the ground plane.

NOTE:

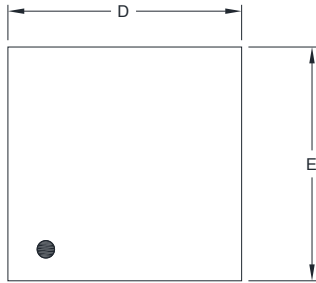
P: power supply; I: input; O: output; IO: input or output; G: ground.

FUNCTION TABLE

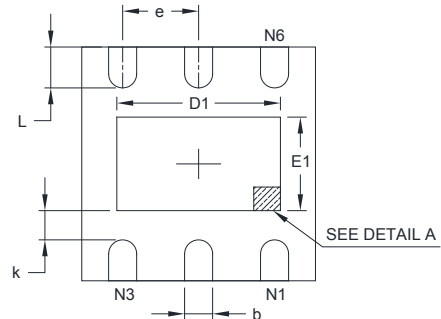
SYNC	IN	GD
L	H	L
L	L	H
H	H	L
H	L	L

PACKAGE OUTLINE DIMENSIONS

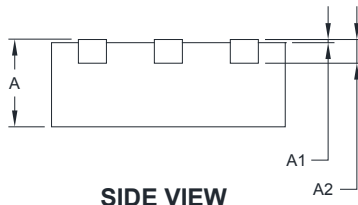
TDFN-2x2-6L



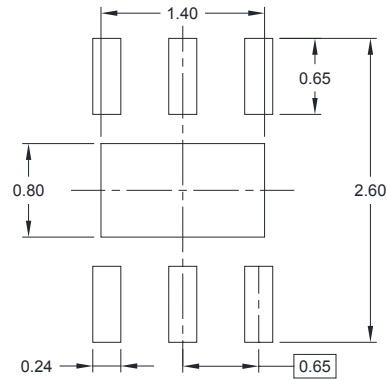
TOP VIEW



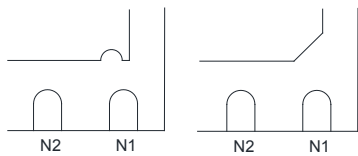
BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)



DETAIL A

Pin #1 ID and Tie Bar Mark Options

NOTE: The configuration of the Pin #1 identifier is optional, but must be located within the zone indicated.

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	1.900	2.100	0.075	0.083
D1	1.100	1.450	0.043	0.057
E	1.900	2.100	0.075	0.083
E1	0.600	0.850	0.024	0.034
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.650 TYP		0.026 TYP	
L	0.250	0.450	0.010	0.018

# 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
TDFN-2×2-6L	7"	9.5	2.30	2.30	1.10	4.0	4.0	2.0	8.0	Q1

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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

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