

GENERAL DESCRIPTION

The SGM48017/8/9 are high-speed gate drivers capable of effectively driving MOSFET and IGBT power switches. They allow for up to 8A source and 13A sink peak currents at $V_{DD} = 20V$. The SGM48017/8/9 provide a set of comprehensive protection features such as thermal shutdown protection, under-voltage lockout and short-circuit protection. They operate with a wide supply range of 4.5V to 20V.

The SGM48017/8/9 are available in a Green SOT-23-5 package. They operate 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 13A Sink Peak Currents
- Wide Supply Voltage Range: 4.5V to 20V
- Fast Propagation Delay: 30ns (TYP)
- Fast Rise Time: 7ns (TYP)
- Fast Fall Time: 8ns (TYP)
- Ringing Suppression
- Negative Voltage Capability on INx Pin:
 - 10V when $(V_{DD} - V_{INx}) \leq 22V$
- Negative Voltage Capability on EN Pin:
 - 10V when $(V_{DD} - V_{EN}) \leq 22V$
- Negative Voltage Capability on OUT Pin:
 - 5V (Pulse < 500ns)
- Comprehensive Protection Features
 - Thermal Shutdown Protection
 - Under-Voltage Lockout
 - Short-Circuit Protection
- $-40^{\circ}C$ to $+125^{\circ}C$ Operating Temperature Range
- Available in a Green SOT-23-5 Package

TYPICAL APPLICATIONS

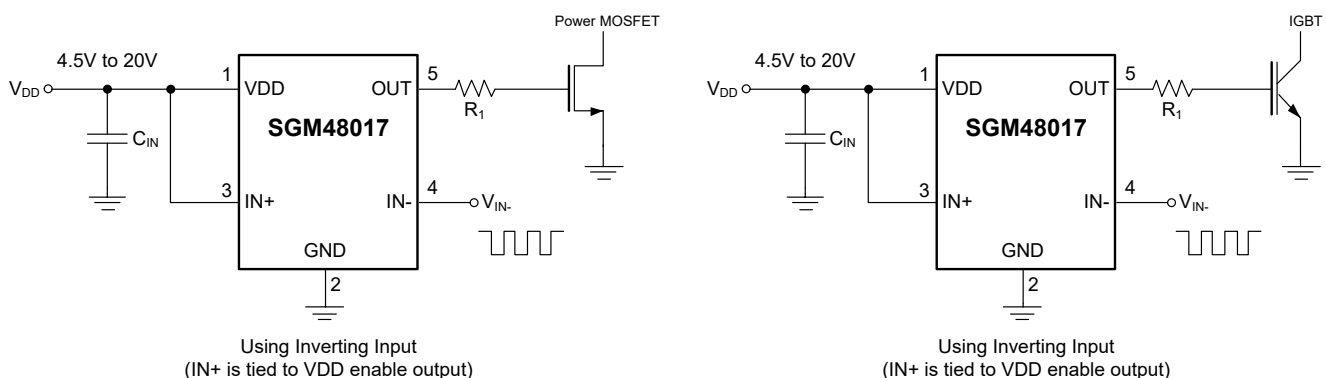


Figure 1. Typical Application Circuits

SGM48017/SGM48018/SGM48019

with Comprehensive Protections

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM48017	SOT-23-5	-40°C to +125°C	SGM48017XN5G/TR	CLFXX	Tape and Reel, 3000
SGM48018	SOT-23-5	-40°C to +125°C	SGM48018XN5G/TR	R74XX	Tape and Reel, 3000
SGM48019	SOT-23-5	-40°C to +125°C	SGM48019XN5G/TR	CM0XX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XX = Date Code.

YYY X X

Date Code - Week

Date Code - Year

Serial Number

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

Continuous I_{NX} , when $(V_{DD} - V_{INX}) \leq 22V$

.....-10V to $V_{DD} + 0.3V$

Continuous EN, when $(V_{DD} - V_{EN}) \leq 22V$

.....-10V to $V_{DD} + 0.3V$

Continuous OUT (DC).....-0.3V to $V_{DD} + 0.3V$

Pulse OUT (Pulse < 500ns) -5V to $V_{DD} + 0.3V$

Power Dissipation, P_D @ $T_A = +25^\circ\text{C}$

SOT-23-5 0.67W

Package Thermal Resistance

SOT-23-5, θ_{JA} 185°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 Range4.5V 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

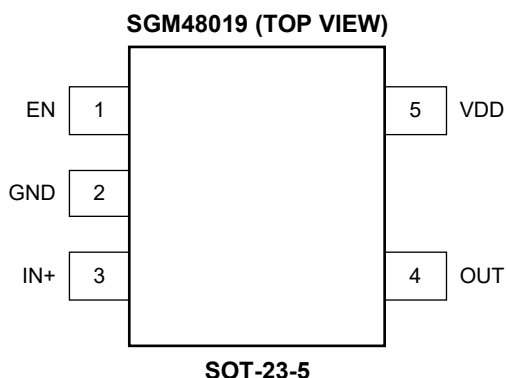
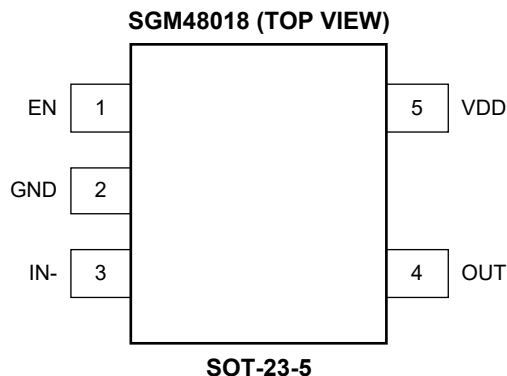
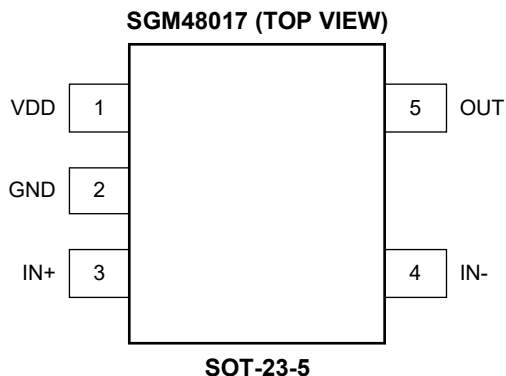
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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.

Power MOSFET and IGBT Gate Drivers SGM48017/SGM48018/SGM48019 with Comprehensive Protections

PIN CONFIGURATIONS



PIN DESCRIPTION

PIN			NAME	I/O	FUNCTION
SGM48017	SGM48018	SGM48019			
1	5	5	VDD	P	Supply Input. Place a 4.7μF decoupling capacitor between this pin and GND pin close to the device.
2	2	2	GND	G	Ground. All signals are referenced to this pin.
3	—	3	IN+	I	Non-Inverting Input. OUT is held low if IN+ is floating. For the SGM48017, when the driver is used in inverting configuration, pull IN+ high in order to enable output.
4	3	—	IN-	I	Inverting Input. OUT is held low if IN- is floating. For the SGM48017, when the driver is used in non-inverting configuration, pull IN- low in order to enable output.
5	4	4	OUT	O	Source/Sink Current Output of Driver.
—	1	1	EN	I	Enable Input. EN is biased low to disable output regardless of input state. EN is biased high or left floating to enable output. EN is allowed to float.

NOTE:

P: power supply, I: input, O: output, G: ground.

Power MOSFET and IGBT Gate Drivers SGM48017/SGM48018/SGM48019 with Comprehensive Protections

FUNCTION TABLE

SGM48017			SGM48018			SGM48019		
IN+	IN-	OUT	EN	IN-	OUT	EN	IN+	OUT
L	L	L	L	L	L	L	L	L
L	H	L	L	H	L	L	H	L
H	L	H	H	L	H	H	L	L
H	H	L	H	H	L	H	H	H
–	Floating	L	Floating	L	H	Floating	L	L
Floating	–	L	Floating	H	L	Floating	H	H
–	–	–	–	Floating	L	–	Floating	L

FUNCTIONAL BLOCK DIAGRAMS

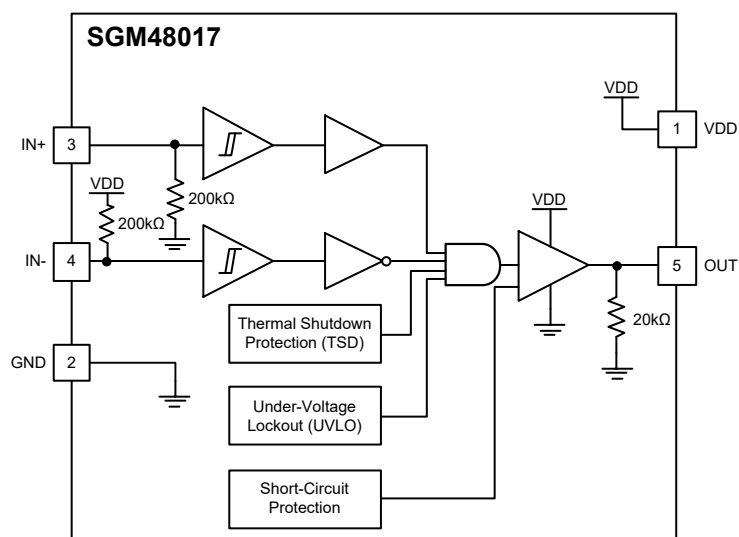


Figure 2. SGM48017 Block Diagram

Power MOSFET and IGBT Gate Drivers SGM48017/SGM48018/SGM48019 with Comprehensive Protections

FUNCTIONAL BLOCK DIAGRAMS (continued)

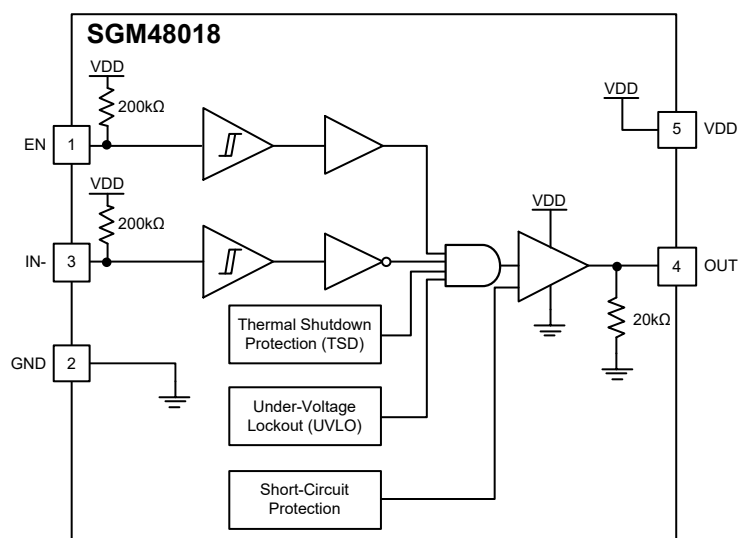


Figure 3. SGM48018 Block Diagram

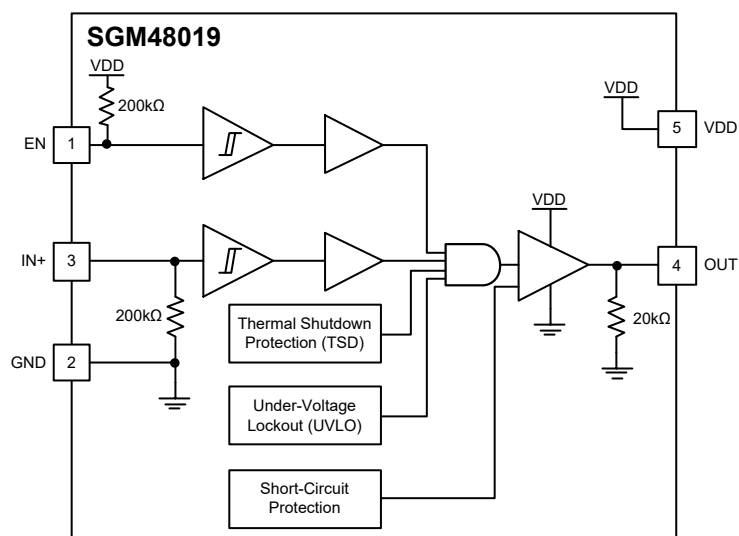
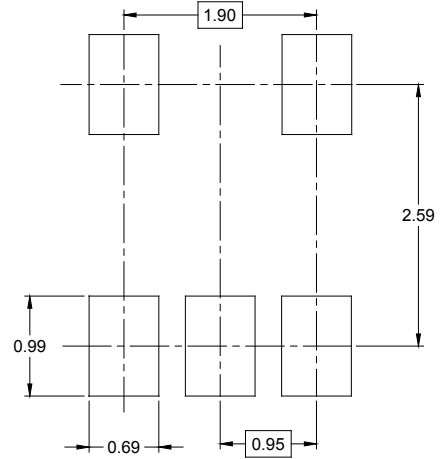
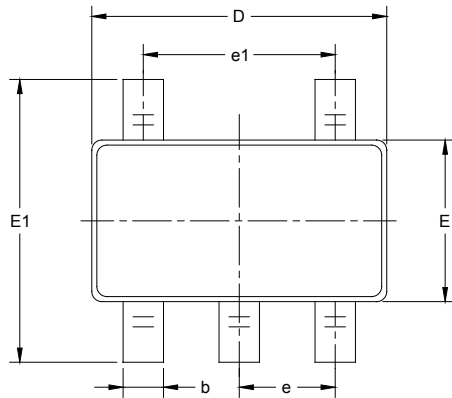


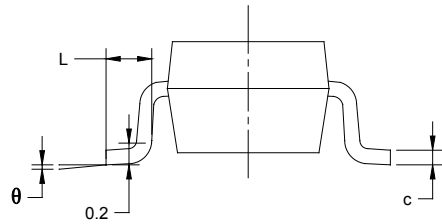
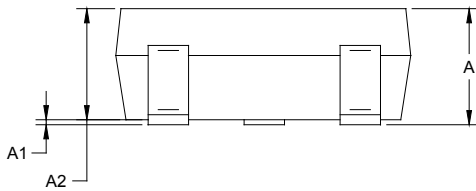
Figure 4. SGM48019 Block Diagram

PACKAGE OUTLINE DIMENSIONS

SOT-23-5



RECOMMENDED LAND PATTERN (Unit: mm)

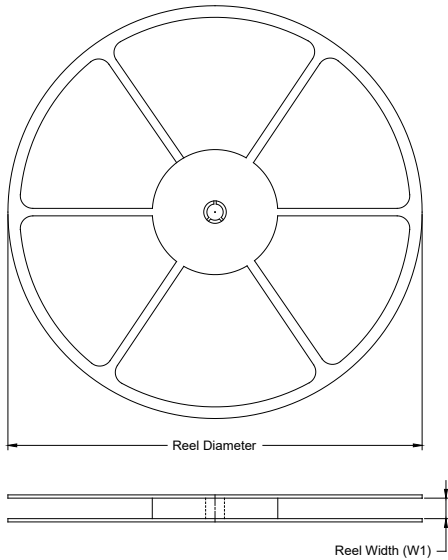


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

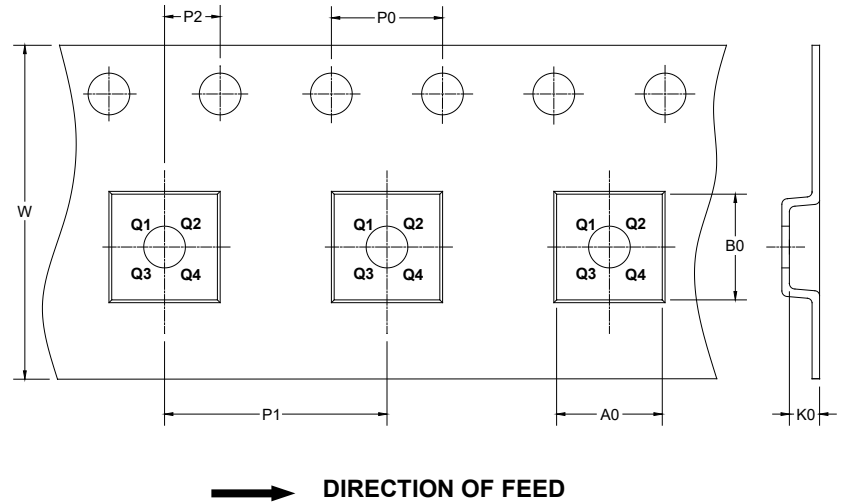
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

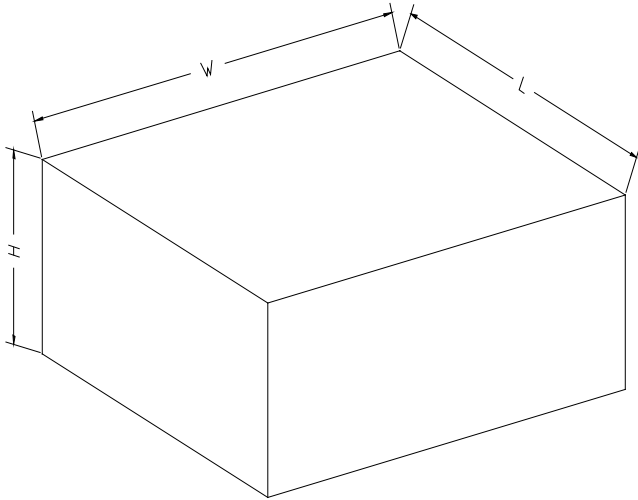
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-23-5	7"	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3

DD00001

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