

GENERAL DESCRIPTION

The SGM42601 is a motor driver device with two integrated H-bridges that can run a bipolar stepper motor. The device can operate over a wide input voltage range of 2.5V to 12V, and each H-bridge of the SGM42601 can deliver up to 600mA RMS (or DC) continuously (at $V_{CC} = 5V$, $T_J = +25^{\circ}C$).

Internal over-current and over-temperature circuits prevent the device from being in over-stress condition, while a fault output simplifies stalling sensing, which is a useful feature for most applications. Aiming for battery-powered applications, it can go into low-power mode for increased battery life.

The device is available in a Green TQFN-4x4-16L package.

APPLICATIONS

Robotics
Point-of-Sale Printers
Portable Printers
Toys
Video Security Cameras

FEATURES

- **Power Supply Voltage Range: 2.5V to 12V**
- **Dual H-Bridge Motor Driver**
- **Low Quiescent Current: 150 μ A (TYP)**
- **Sleep Mode Supply Current: 0.32 μ A (TYP)**
- **xINx (PWM) Interface**
- **Output Current Capability (at $V_{CC} = 5V$, $+25^{\circ}C$)**
 - 0.6A RMS, 1A Peak per H-Bridge**
 - 1.2A RMS in Parallel Mode**
- **UVLO for VCC Voltage**
- **Over-Current Protection (OCP)**
- **Thermal Shutdown (TSD)**
- **Fault Indication Pin (nFAULT)**
- **Available in a Green TQFN-4x4-16L Package**

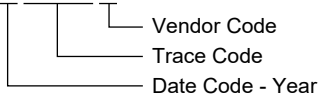
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM42601	TQFN-4x4-16L	-40°C to +125°C	SGM42601XTQE16G/TR	SGM42601 XTQE16 XXXXX	Tape and Reel, 3000

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_{CC} -0.3V to 13.2V
- Control Pins
(AIN1, AIN2, BIN1, BIN2, nSLEEP, nFAULT) to GND.....
.....-0.3V to 6V
- Package Thermal Resistance
TQFN-4x4-16L, θ_{JA} 46°C/W
- Operating Junction Temperature..... +150°C
- Storage Temperature Range-65°C to +150°C
- Lead Temperature (Soldering, 10s) +260°C
- ESD Susceptibility
- HBM..... 6000V
- CDM..... 1000V

RECOMMENDED OPERATING CONDITIONS

- Power Supply Voltage Range, V_{CC} 2.5V to 12V
- Motor RMS Current, I_{RMS} 0A to 0.6A
- Applied PWM Signal to AIN1, AIN2, BIN1, or BIN2, f_{PWM}
..... 0 to 200kHz
- Operating Ambient Temperature Range..... -40°C to +125°C
- 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.

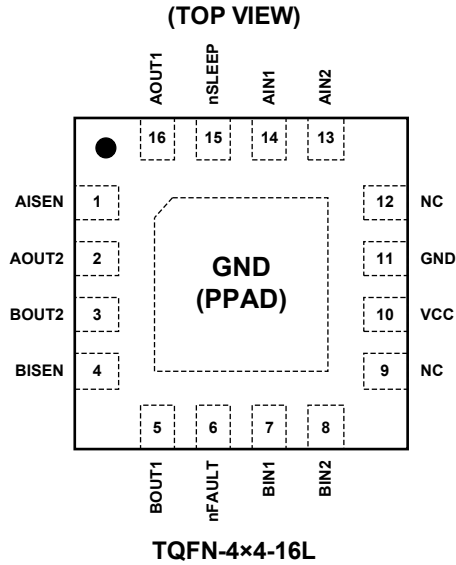
ESD SENSITIVITY CAUTION

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



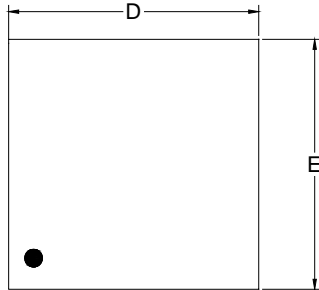
PIN DESCRIPTION

PIN	NAME	TYPE	FUNCTION
1	AISEN	I/O	Bridge A Ground or I _{CHOP} .
16	AOUT1	O	Bridge A Nodes.
2	AOUT2		
5	BOUT1	O	Bridge B Nodes.
3	BOUT2		
4	BISEN	I/O	Bridge B Ground or I _{CHOP} .
6	nFAULT	OD	Fault Indication Pin. The logic is pulled low with a fault condition. Open-drain output requires an external pull-up.
7	BIN1	I	H-Bridge B PWM Inputs. Control the state of BOUT1 and BOUT2. Internal pull-down.
8	BIN2	I	
9, 12	NC	–	No Connection.
10	VCC	P	Device Power Supply. Connect to motor supply. A 10µF (MIN) ceramic bypass capacitor to GND is recommended.
11	GND	G	Ground.
14	AIN1	I	H-Bridge A PWM Inputs. Control the state of AOUT1 and AOUT2. Internal pull-down.
13	AIN2	I	
15	nSLEEP	I	Sleep Mode Input. Apply logic high to enable device, and apply logic low to enter in the low power sleep mode. Internal pull-down.
Exposed Pad	GND (PPAD)	G	Exposed Pad. Exposed pad is internally connected to GND. Connect it to a large ground plane to maximize thermal performance. It is not intended as an electrical connection point.

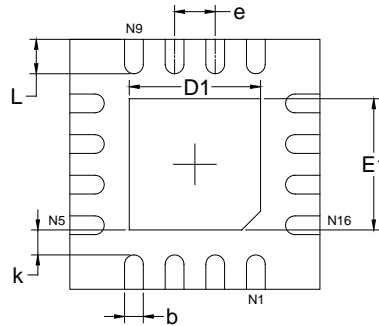
NOTE: I = input, O = output, I/O = input or output, OD = open-drain output, G = ground, P = power for the circuit.

PACKAGE OUTLINE DIMENSIONS

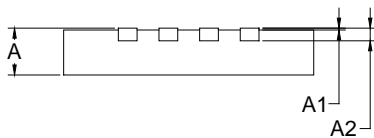
TQFN-4x4-16L



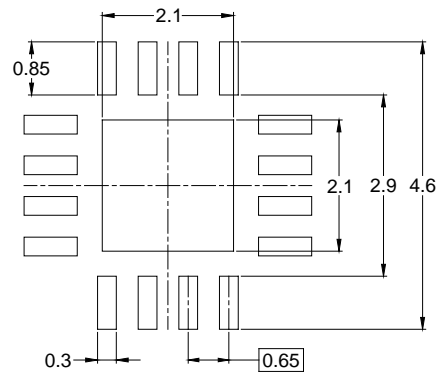
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

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	3.900	4.100	0.154	0.161
D1	2.000	2.200	0.079	0.087
E	3.900	4.100	0.154	0.161
E1	2.000	2.200	0.079	0.087
k	0.200 MIN		0.008 MIN	
b	0.250	0.350	0.010	0.014
e	0.650 TYP		0.026 TYP	
L	0.450	0.650	0.018	0.026

NOTE: This drawing is subject to change without notice.

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
TQFN-4x4-16L	13"	12.4	4.30	4.30	1.10	4.0	8.0	2.0	12.0	Q2

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