SGM2082
1A, High Accuracy, Low Noise, Low Dropout Voltage Regulator

GENERAL DESCRIPTION

The SGM2082 is a high accuracy, low noise and low dropout linear regulator. It is capable of supplying 1A output current with typical dropout voltage of only 95mV. The operating input voltage range is from 1.4V to 6.5V. The adjustable output voltage range is from 0.8V to 5.2V.

Other features include an open-drain power-good (PG) output, logic-controlled shutdown mode and thermal shutdown protection. The SGM2082 has automatic discharge function to quickly discharge V_{OUT} in the disabled status.

The SGM2082 is available in a Green TDFN-2.5×2.5-10L package. It operates over an operating temperature range of -40℃ to +125℃.

APPLICATIONS

Instruments and Apparatuses
Precision Power Supply
Image Sensor
Consumer Electronics
Audio Player

FEATURES

- **Wide Input Voltage Range: 1.4V to 6.5V**
- **Adjustable Output from 0.8V to 5.2V**
- **1A Output Current**
- **Output Voltage Accuracy: ±0.7% at T_J = +25℃**
- **Low Output Noise: 4.9μV_{RMS} (10Hz to 100kHz)**
- **Low Dropout: 95mV (TYP) at 1A**
- **High PSRR:**
  - **76dB at 1kHz**
  - **47dB at 100kHz**
  - **44dB at 1MHz**
- **Current Limiting and Thermal Protection**
- **Excellent Load and Line Transient Responses**
- **With Output Automatic Discharge**
- **UVLO with Hysteresis**
- **Support Power-Good Indicator Function**
- **Stable with Small Case Size Ceramic Capacitors**
- **Adjustable Start-Up In-Rush Control with Selectable Soft-Start Charging Current**
- **-40℃ to +125℃ Operating Temperature Range**
- **Available in a Green TDFN-2.5×2.5-10L Package**

TYPICAL APPLICATION

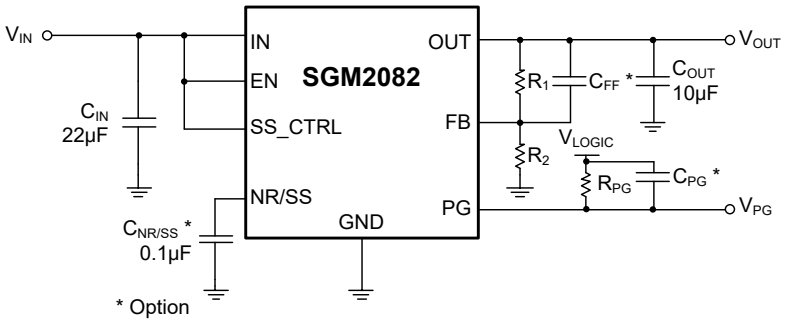


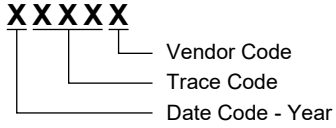
Figure 1. Typical Application Circuit

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM2082	TDFN-2.5×2.5-10L	-40℃ to +125℃	SGM2082XTHP10G/TR	2082 XXXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor 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

IN, PG, EN, SS_CTRL to GND ..... -0.3V to 7V
NR/SS, OUT to GND ..... -0.3V to MIN(V_{IN} + 0.3V, 6V)
FB to GND ..... -0.3V to 6V
PG Current (sink current into the device)..... 5mA
Package Thermal Resistance
TDFN-2.5×2.5-10L, θ_{JA} ..... 51.2℃/W
TDFN-2.5×2.5-10L, θ_{JB} ..... 23.5℃/W
TDFN-2.5×2.5-10L, $\theta_{JC(TOP)}$ ..... 56.3℃/W
TDFN-2.5×2.5-10L, $\theta_{JC(BOT)}$ ..... 4.9℃/W
Junction Temperature ..... +150℃
Storage Temperature Range..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
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

Input Voltage Range ..... 1.4V to 6.5V
Enable Input Voltage Range ..... 0V to 6.5V
Output Voltage Range ..... 0.8V to 5.2V
Input Effective Capacitance, C_{IN} ..... 10μF (MIN)
Output Effective Capacitance, C_{OUT} ..... 3.3μF to 1000μF
Noise-Reduction Capacitor, $C_{NR/SS}$ ..... 1μF (MAX)
C_{FF} Effective Capacitance..... 100nF (MAX)
Power-Good Pull-Up Resistance ..... 10kΩ to 100kΩ
Operating Junction Temperature Range..... -40℃ to +125℃

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

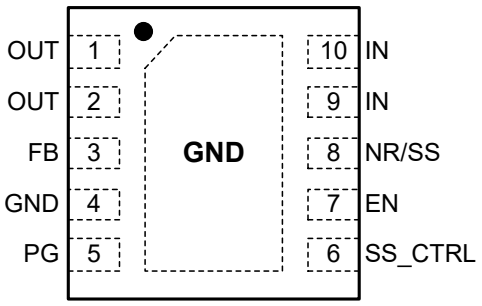
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance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

SGM2082 (TOP VIEW)



TDFN-2.5×2.5-10L

PIN DESCRIPTION

PIN	NAME	FUNCTION
1, 2	OUT	Regulator Output Pin. It is recommended to use a ceramic capacitor with minimum effective capacitance of 3.3μF to ensure stability. This ceramic capacitor should be placed as close as possible to OUT pin.
3	FB	Feedback Input Pin. Connect this pin to the midpoint of an external resistor divider to adjust the output voltage. Place the resistors as close as possible to this pin.
4	GND	Ground.
5	PG	Power-Good Indicator Output Pin. An open-drain, active-high output that indicates the status of V_{OUT}. When the output voltage reaches PG_{HTH} of the target, the PG pin goes into a high-impedance state.
6	SS_CTRL	Soft-Start Control Pin. This pin can be connected to IN pin or GND. Connect this pin to IN pin to provide the $C_{NR/SS}$ with a larger charging current for fast startup. To avoid output overshoot, this pin must be connected to GND when there is no $C_{NR/SS}$.
7	EN	Enable Pin. Drive EN high to turn on the regulator. Drive EN low to turn off the regulator. The EN pin must be connected to IN if the enable function is not used.
8	NR/SS	Noise-Reduction and Soft-Start Pin. Using an external capacitor $C_{NR/SS}$ to decouple this pin to GND can not only reduce output noise to very low level but also slow down the V_{OUT} rise like a soft-start behavior.
9, 10	IN	Input Supply Voltage Pin. It is recommended to use a 22μF or larger ceramic capacitor from IN pin to ground to get good power supply decoupling. This ceramic capacitor should be placed as close as possible to IN pin.
Exposed Pad	GND	Exposed Pad. Connect it to GND internally. Connect it to a large ground plane to maximize thermal performance. This pad is not an electrical connection point.

FUNCTIONAL BLOCK DIAGRAM

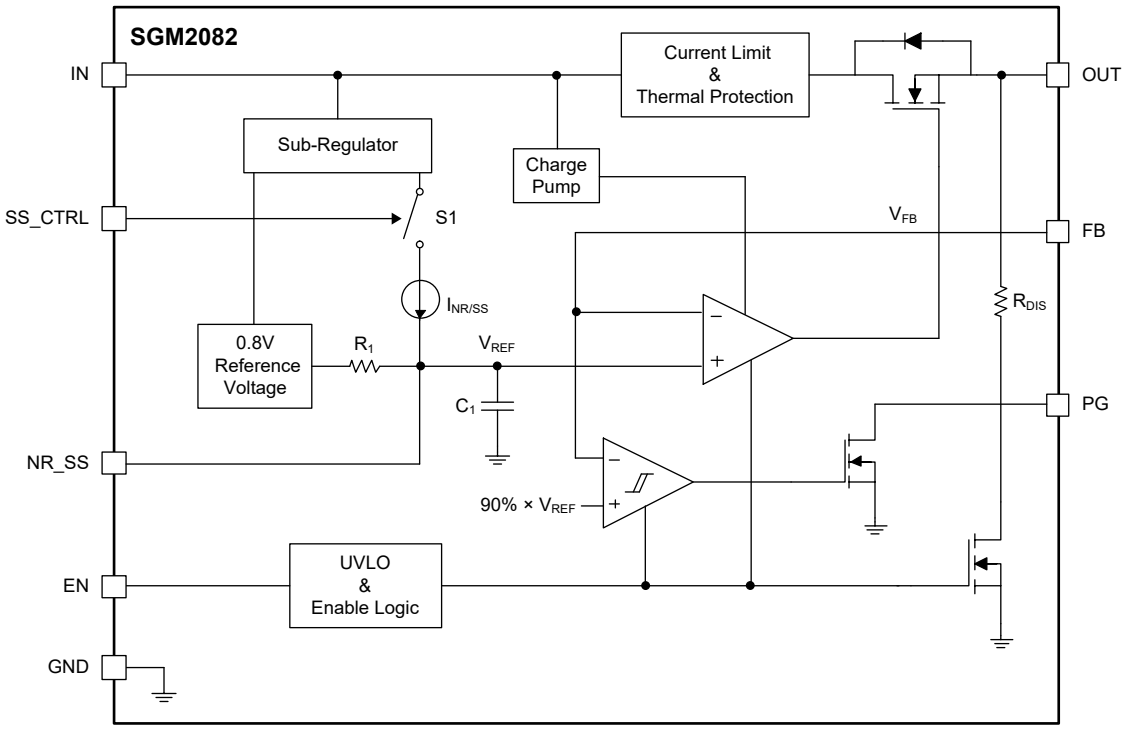
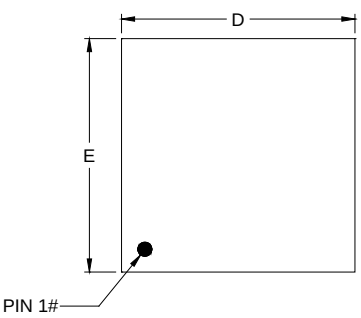


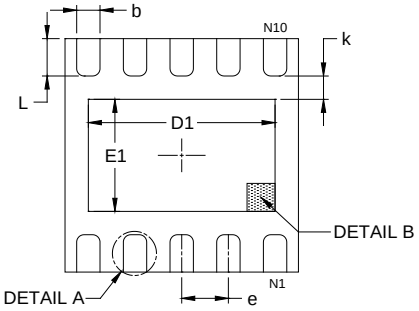
Figure 2. Block Diagram

PACKAGE OUTLINE DIMENSIONS

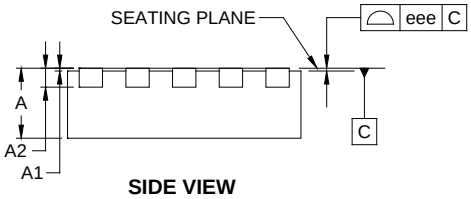
TDFN-2.5×2.5-10L



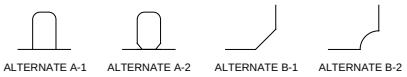
TOP VIEW



BOTTOM VIEW

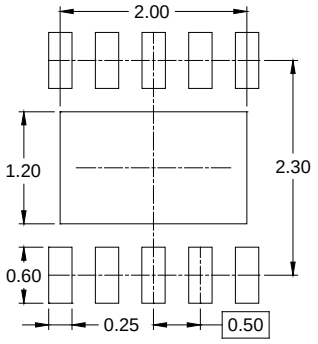


SIDE VIEW



DETAIL A
ALTERNATE TERMINAL CONSTRUCTION

DETAIL B
ALTERNATE PIN1 CONSTRUCTION



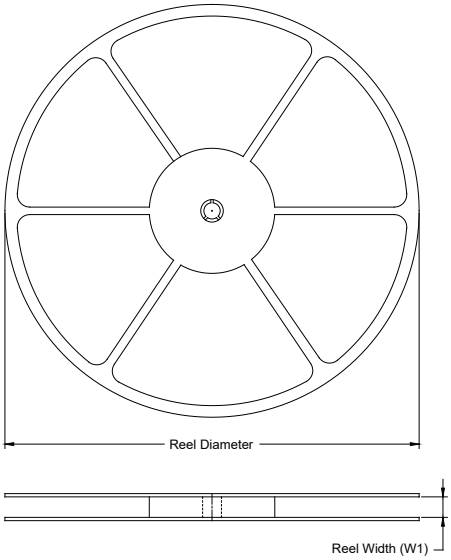
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.700	-	0.800
A1	0.000	-	0.050
A2	0.203 REF		
b	0.200	-	0.300
D	2.400	-	2.600
E	2.400	-	2.600
D1	1.900	-	2.100
E1	1.100	-	1.300
L	0.300	-	0.500
k	0.250 REF		
e	0.500 BSC		
eee	0.080		

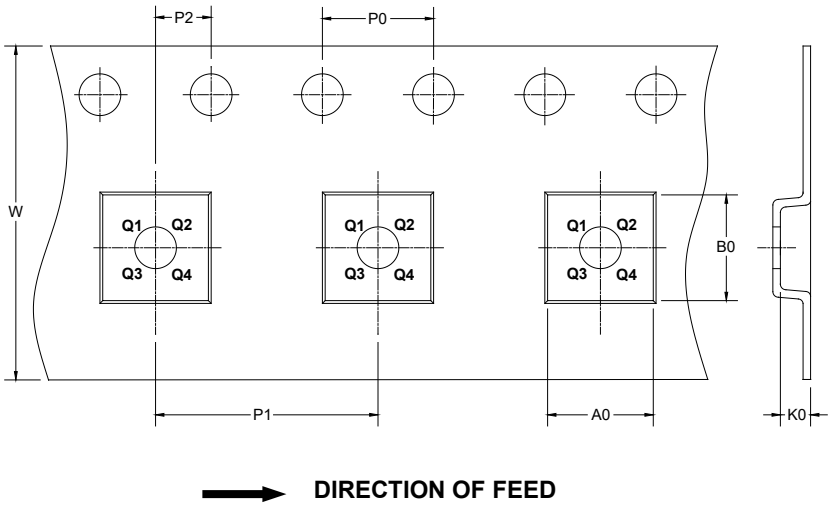
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



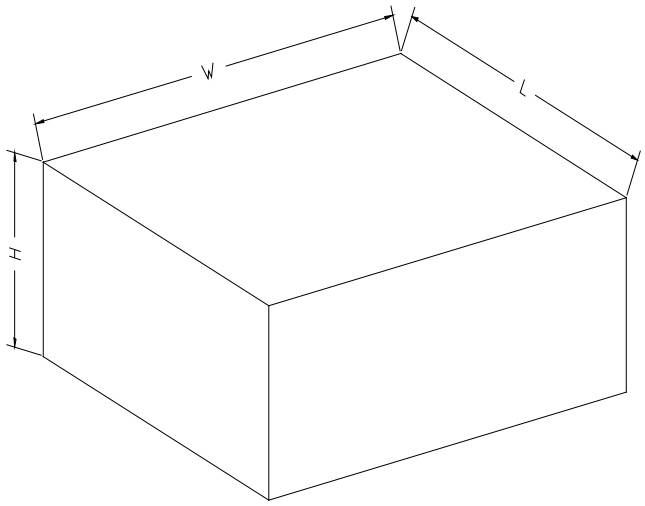
NOTE: The picture is only for reference. Please make the object as the standard.

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
TDFN-2.5×2.5-10L	7"	12.4	2.75	2.75	0.85	4.0	4.0	2.0	12.0	Q2

DD0001

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