

## PACKAGE/ORDERING INFORMATION

| MODEL        | V <sub>OUT</sub><br>(V) | PACKAGE<br>DESCRIPTION | SPECIFIED<br>TEMPERATURE<br>RANGE | ORDERING<br>NUMBER  | PACKAGE<br>MARKING | PACKING<br>OPTION   |
|--------------|-------------------------|------------------------|-----------------------------------|---------------------|--------------------|---------------------|
| SGM2021-0.9  | 0.9V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-0.9YN3G/TR  | YL09               | Tape and Reel, 3000 |
| SGM2021-1.2  | 1.2V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-1.2YN3G/TR  | YL12               | Tape and Reel, 3000 |
| SGM2021-1.3  | 1.3V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-1.3YN3G/TR  | YL13               | Tape and Reel, 3000 |
| SGM2021-1.5  | 1.5V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-1.5YN3G/TR  | YL15               | Tape and Reel, 3000 |
| SGM2021-1.8  | 1.8V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-1.8YN3G/TR  | YL18               | Tape and Reel, 3000 |
| SGM2021-2.1  | 2.1V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.1YN3G/TR  | YL21               | Tape and Reel, 3000 |
| SGM2021-2.5  | 2.5V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.5YN3G/TR  | YL25               | Tape and Reel, 3000 |
| SGM2021-2.6  | 2.6V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.6YN3G/TR  | YL26               | Tape and Reel, 3000 |
| SGM2021-2.7  | 2.7V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.7YN3G/TR  | YL27               | Tape and Reel, 3000 |
| SGM2021-2.8  | 2.8V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.8YN3G/TR  | YL28               | Tape and Reel, 3000 |
| SGM2021-2.85 | 2.85V                   | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.85YN3G/TR | YL2J               | Tape and Reel, 3000 |
| SGM2021-2.9  | 2.9V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-2.9YN3G/TR  | YL29               | Tape and Reel, 3000 |
| SGM2021-3.0  | 3.0V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-3.0YN3G/TR  | YL30               | Tape and Reel, 3000 |
| SGM2021-3.1  | 3.1V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-3.1YN3G/TR  | YL31               | Tape and Reel, 3000 |
| SGM2021-3.2  | 3.2V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-3.2YN3G/TR  | YL32               | Tape and Reel, 3000 |
| SGM2021-3.3  | 3.3V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-3.3YN3G/TR  | YL33               | Tape and Reel, 3000 |
| SGM2021-3.6  | 3.6V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-3.6YN3G/TR  | YL36               | Tape and Reel, 3000 |
| SGM2021-4.2  | 4.2V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-4.2YN3G/TR  | YL42               | Tape and Reel, 3000 |
| SGM2021-5.0  | 5.0V                    | SOT-23-3               | -40°C to +85°C                    | SGM2021-5.0YN3G/TR  | YL50               | Tape and Reel, 3000 |

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.

## SGM2021

### ABSOLUTE MAXIMUM RATINGS

|                                               |                                 |
|-----------------------------------------------|---------------------------------|
| IN to GND .....                               | -0.3V to 6V                     |
| Output Short-Circuit Duration.....            | Infinite                        |
| OUT to GND .....                              | -0.3V to ( $V_{IN} + 0.3V$ )    |
| Power Dissipation, $P_D$ @ $T_A = 25^\circ C$ |                                 |
| SOT-23-3 .....                                | 0.4W                            |
| Package Thermal Resistance                    |                                 |
| SOT-23-3, $\theta_{JA}$ .....                 | $250^\circ C/W$                 |
| Junction Temperature .....                    | $+150^\circ C$                  |
| Storage Temperature Range .....               | $-65^\circ C$ to $+150^\circ C$ |
| Lead Temperature (Soldering, 10s) .....       | $+260^\circ C$                  |
| ESD Susceptibility                            |                                 |
| HBM.....                                      | 4000V                           |
| MM.....                                       | 400V                            |

### RECOMMENDED OPERATING CONDITIONS

|                                   |                                |
|-----------------------------------|--------------------------------|
| Operating Temperature Range ..... | $-40^\circ C$ to $+85^\circ C$ |
|-----------------------------------|--------------------------------|

### 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.

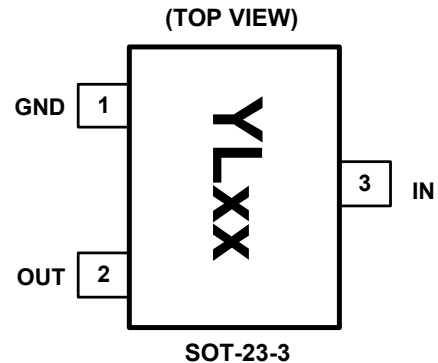
### ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. 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 very small parametric changes could cause the device not to meet its published specifications.

### DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

### PIN CONFIGURATION



#### NOTE:

- (1) The location of pin 1 on the YLxx is determined by orienting the package marking as shown.
- (2) "xx" is the output voltage code. (For example: when the output voltage is 1.8V, it is expressed as 18.)

### PIN DESCRIPTION

| PIN | NAME | FUNCTION                                                                                              |
|-----|------|-------------------------------------------------------------------------------------------------------|
| 1   | GND  | Ground.                                                                                               |
| 2   | OUT  | Regulator Output.                                                                                     |
| 3   | IN   | Regulator Input. Supply voltage can range from 2.5V to 5.5V. Bypass with a $1\mu F$ capacitor to GND. |

## ELECTRICAL CHARACTERISTICS

(V<sub>IN</sub> = V<sub>OUT</sub> (NOMINAL) + 0.5V or 2.5V, whichever is greater, T<sub>A</sub> = +25°C, unless otherwise noted.)

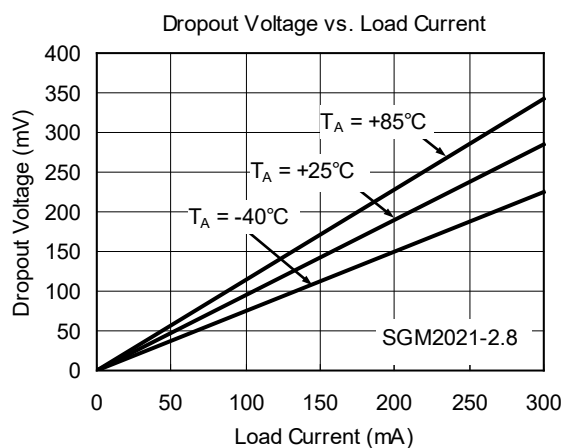
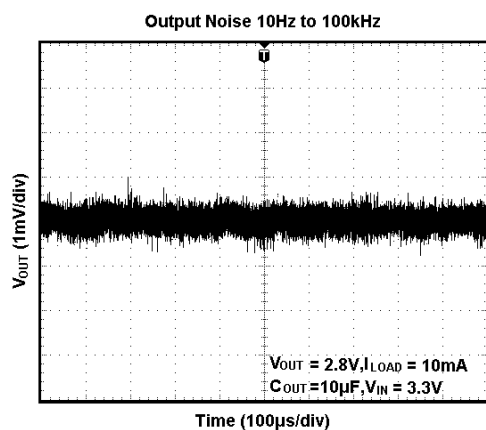
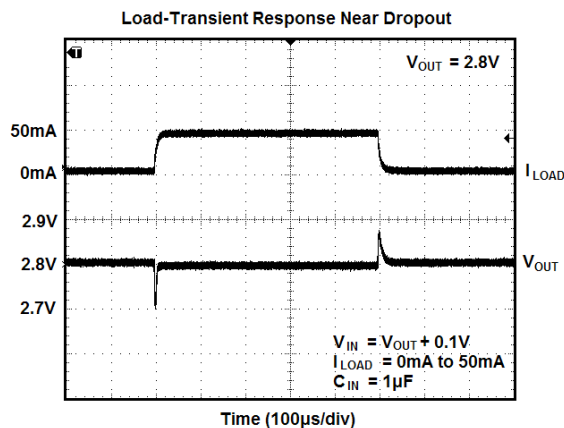
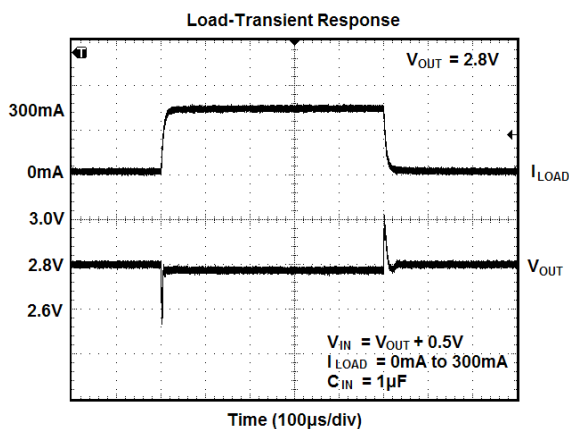
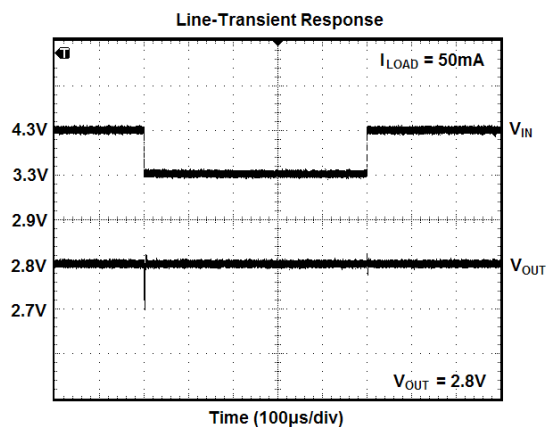
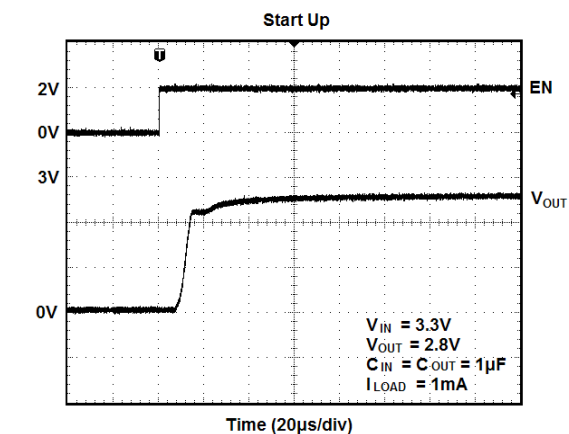
| PARAMETER                      | SYMBOL             | CONDITIONS                                                                                  |           | MIN  | TYP   | MAX   | UNITS             |
|--------------------------------|--------------------|---------------------------------------------------------------------------------------------|-----------|------|-------|-------|-------------------|
| Input Voltage                  | V <sub>IN</sub>    |                                                                                             |           | 2.5  |       | 5.5   | V                 |
| Output Voltage Accuracy        |                    | I <sub>OUT</sub> = 0.1mA, T <sub>A</sub> = +25°C                                            |           | -2.5 |       | 2.5   | %                 |
| Maximum Output Current         |                    |                                                                                             |           | 300  |       |       | mA                |
| Current Limit                  | I <sub>LIM</sub>   |                                                                                             |           | 310  | 500   |       | mA                |
| Ground Pin Current             | I <sub>Q</sub>     | No load                                                                                     |           |      | 120   | 220   | μA                |
| Dropout Voltage <sup>(1)</sup> |                    | I <sub>OUT</sub> = 1mA                                                                      |           |      | 0.9   |       | mV                |
|                                |                    | I <sub>OUT</sub> = 300mA                                                                    |           |      | 270   | 400   |                   |
| Line Regulation                | ΔV <sub>LNR</sub>  | V <sub>IN</sub> = 2.5V or (V <sub>OUT</sub> + 0.5V) to 5.5V, I <sub>OUT</sub> = 1mA         |           |      | 0.02  | 0.05  | %/V               |
| Load Regulation                | ΔV <sub>LDR</sub>  | I <sub>OUT</sub> = 0.1mA to 300mA, C <sub>OUT</sub> = 1μF, V <sub>OUT</sub> > 2V            |           |      | 0.002 | 0.005 | %/mA              |
|                                |                    | I <sub>OUT</sub> = 0.1mA to 300mA, C <sub>OUT</sub> = 1μF, V <sub>OUT</sub> ≤ 2V            |           |      | 0.004 | 0.008 |                   |
| Output Voltage Noise           | e <sub>n</sub>     | f = 10Hz to 100kHz, C <sub>OUT</sub> = 10μF                                                 |           |      | 140   |       | μV <sub>RMS</sub> |
| Power Supply Rejection Rate    | PSRR               | I <sub>OUT</sub> = 50mA,<br>C <sub>OUT</sub> = 1μF, V <sub>IN</sub> = V <sub>OUT</sub> + 1V | f = 217Hz |      | 62    |       | dB                |
|                                |                    |                                                                                             | f = 100Hz |      | 69    |       | dB                |
| Thermal Protection             |                    |                                                                                             |           |      |       |       |                   |
| Thermal Shutdown Temperature   | T <sub>SHDN</sub>  |                                                                                             |           |      | 150   |       | °C                |
| Thermal Shutdown Hysteresis    | ΔT <sub>SHDN</sub> |                                                                                             |           |      | 15    |       | °C                |

## NOTE:

1. The dropout voltage is defined as V<sub>IN</sub> - V<sub>OUT</sub>, when V<sub>OUT</sub> is 100mV below the value of V<sub>OUT</sub> for V<sub>IN</sub> = V<sub>OUT</sub> + 0.5V (only applicable for V<sub>OUT</sub> = +2.5V to +5.0V).

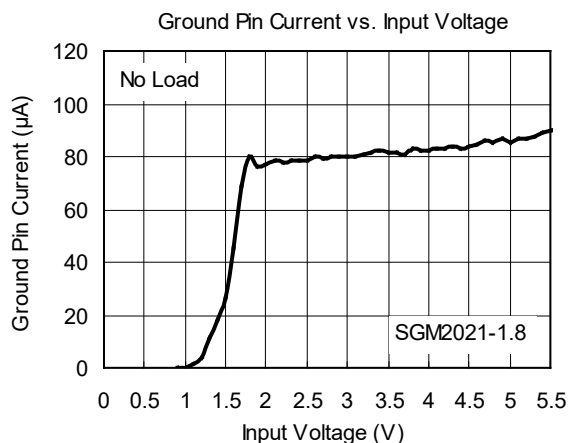
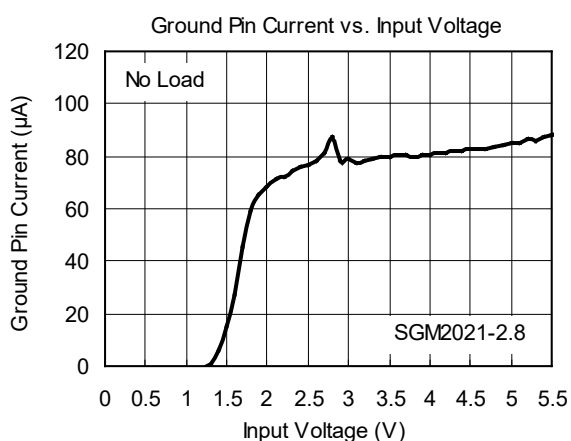
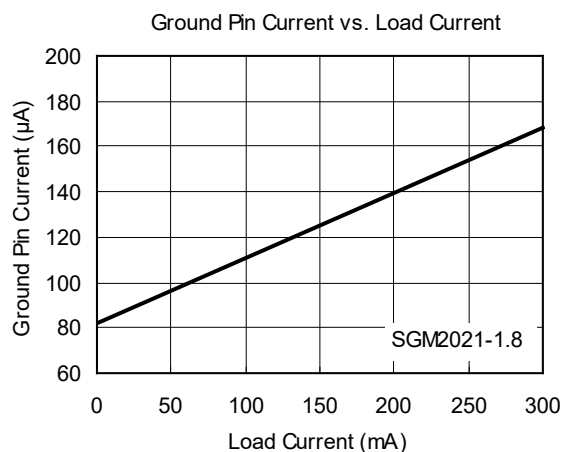
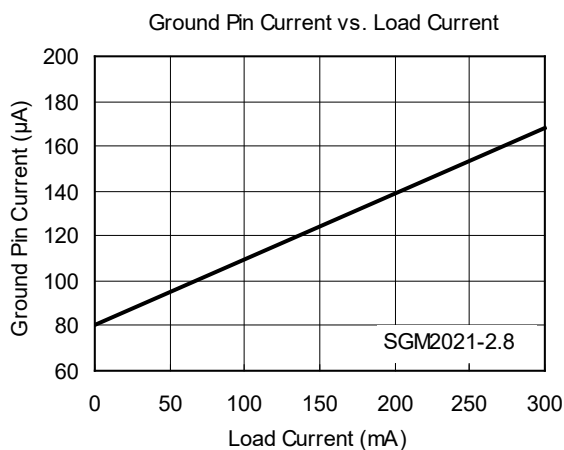
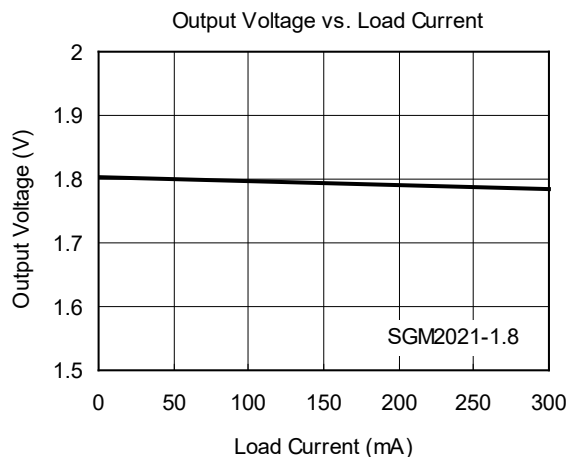
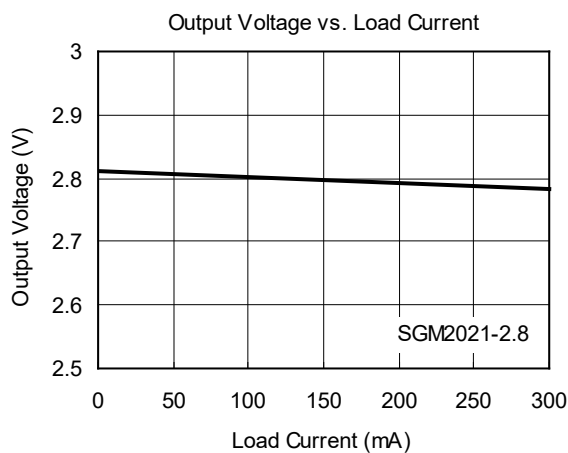
## TYPICAL PERFORMANCE CHARACTERISTICS

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$  or  $2.5V$  (whichever is greater),  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ ,  $T_A = +25^\circ C$ , unless otherwise noted.



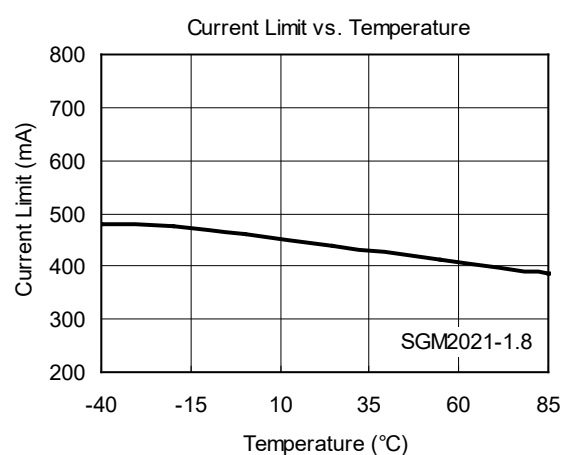
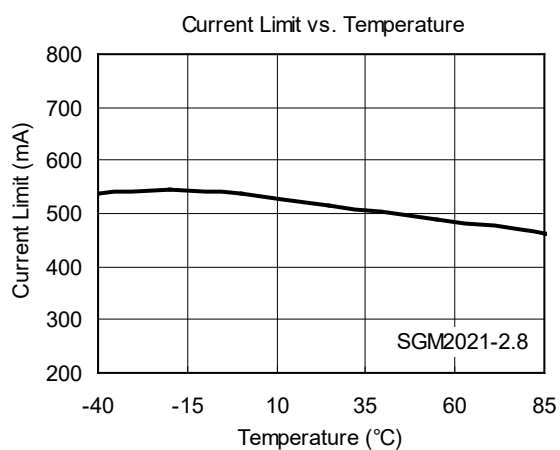
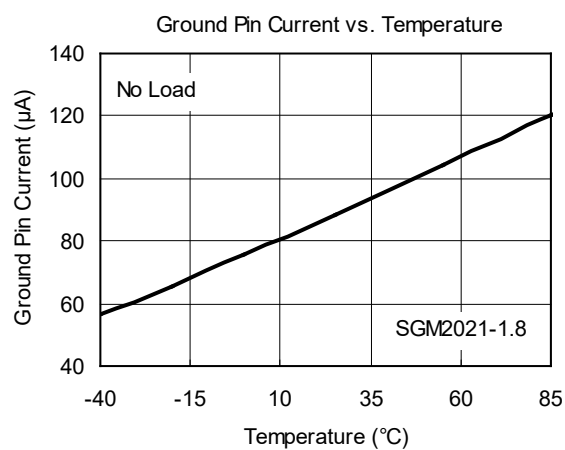
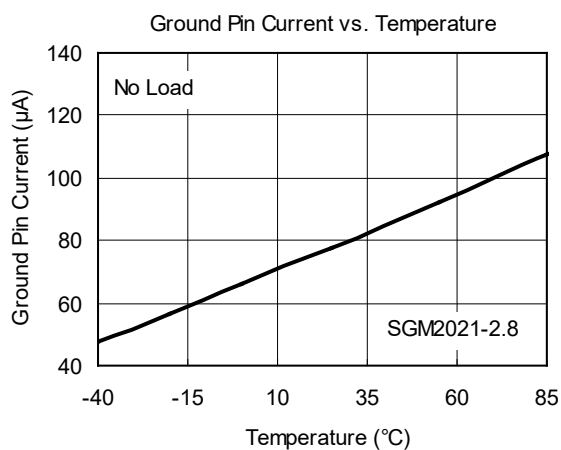
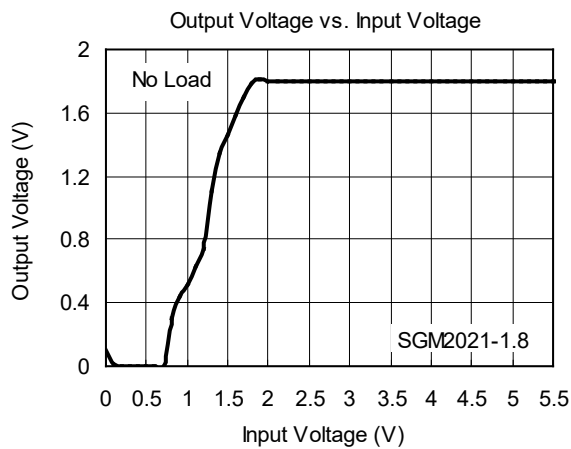
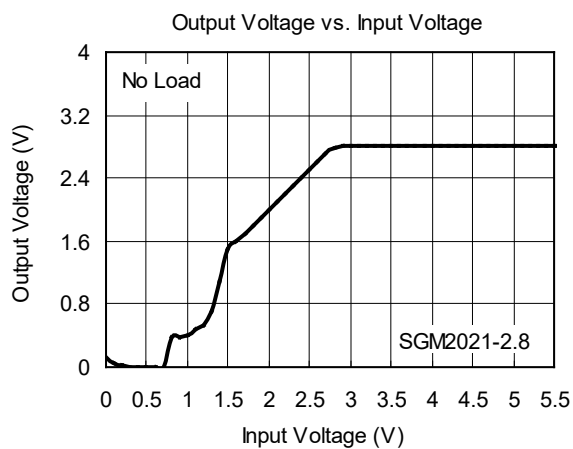
## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$  or  $2.5V$  (whichever is greater),  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ ,  $T_A = +25^\circ C$ , unless otherwise noted.



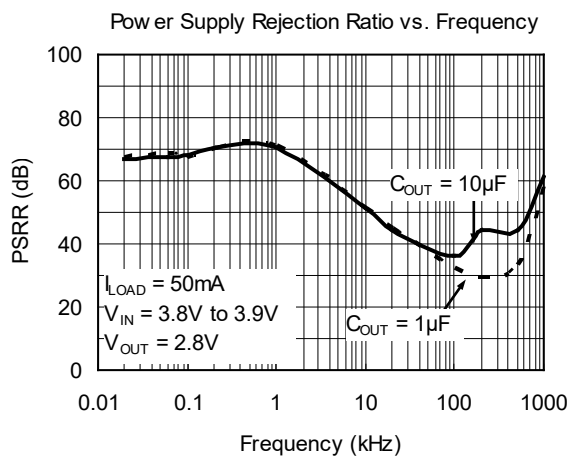
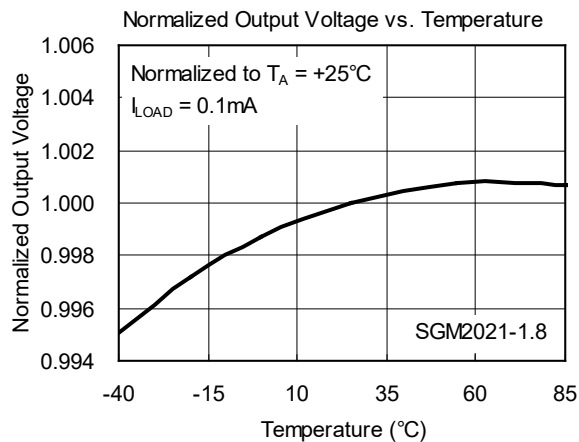
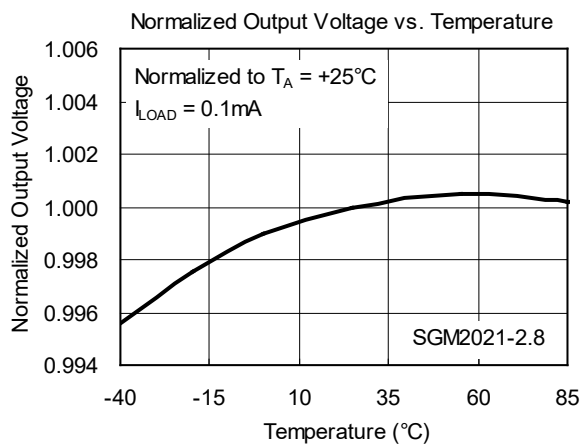
## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$  or  $2.5V$  (whichever is greater),  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ ,  $T_A = +25^\circ C$ , unless otherwise noted.



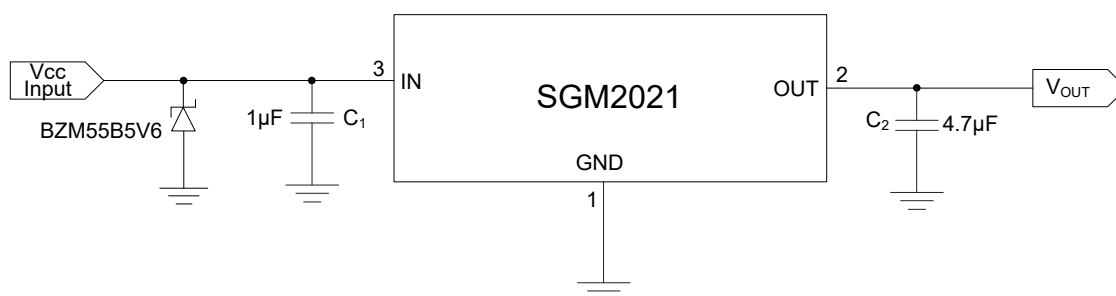
## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$  or  $2.5V$  (whichever is greater),  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ ,  $T_A = +25^\circ C$ , unless otherwise noted.



### APPLICATION NOTE

When LDO is used in handheld products, attention must be paid to voltage spikes which could damage SGM2021. In such applications, voltage spikes will be generated at charger interface and  $V_{BUS}$  pin of USB interface when charger adapters and USB equipments are hot-plugged. Besides this, handheld products will be tested on the production line without battery. Test engineer will apply power from the connector pin which connects with positive pole of the battery. When external power supply is turned on suddenly, the voltage spikes will be generated at the battery connector. The voltage spikes will be very high, and it always exceeds the absolute maximum input voltage (6.0V) of LDO. In order to get robust design, design engineer needs to clear up this voltage spike. Zener diode is a cheap and effective solution to eliminate such voltage spike. For example, BZM55B5V6 is a 5.6V small package Zener diode which can be used to remove voltage spikes in cell phone designs. The schematic is shown below.



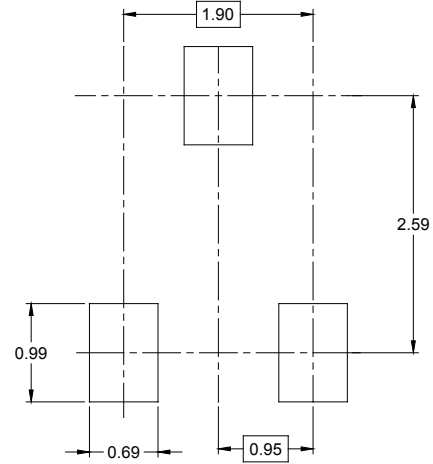
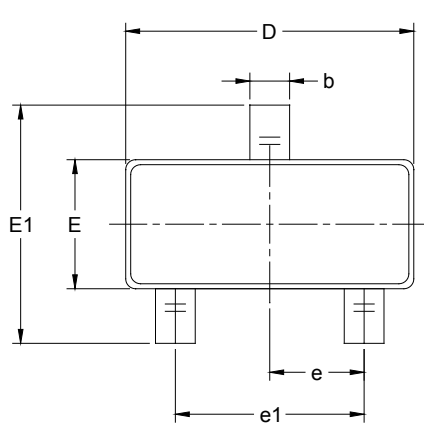
### REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

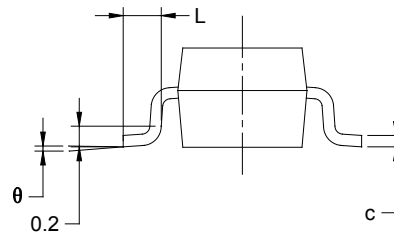
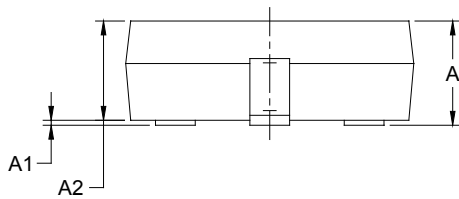
| APRIL 2016 – REV.B to REV.B.1                                                         | Page |
|---------------------------------------------------------------------------------------|------|
| Changed Normalized Output Voltage vs. Temperature (SGM2021-2.8 and SGM2021-1.8) ..... | 9    |

## PACKAGE OUTLINE DIMENSIONS

### SOT-23-3



RECOMMENDED LAND PATTERN (Unit: mm)

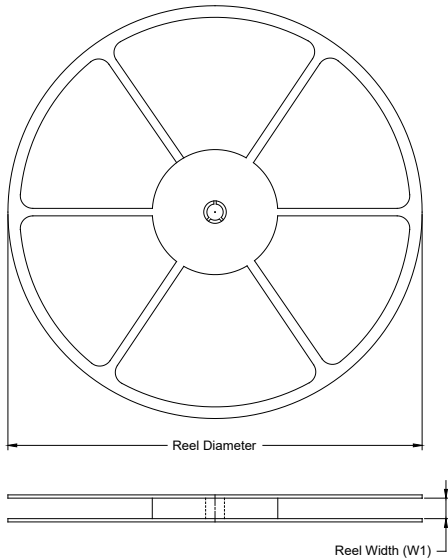


| Symbol   | Dimensions<br>In Millimeters |       | Dimensions<br>In Inches |       |
|----------|------------------------------|-------|-------------------------|-------|
|          | MIN                          | MAX   | MIN                     | MAX   |
| A        | 1.050                        | 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 |
| $\theta$ | 0°                           | 8°    | 0°                      | 8°    |

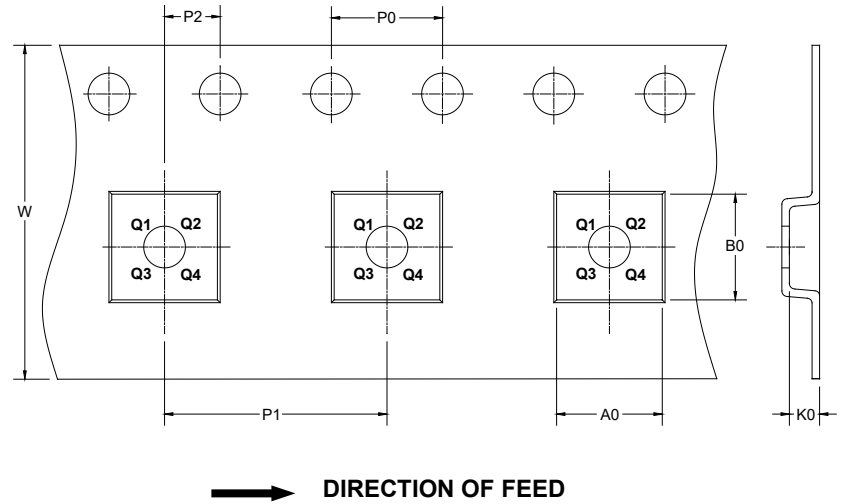
# PACKAGE INFORMATION

## TAPE AND REEL INFORMATION

### REEL DIMENSIONS



### TAPE DIMENSIONS



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

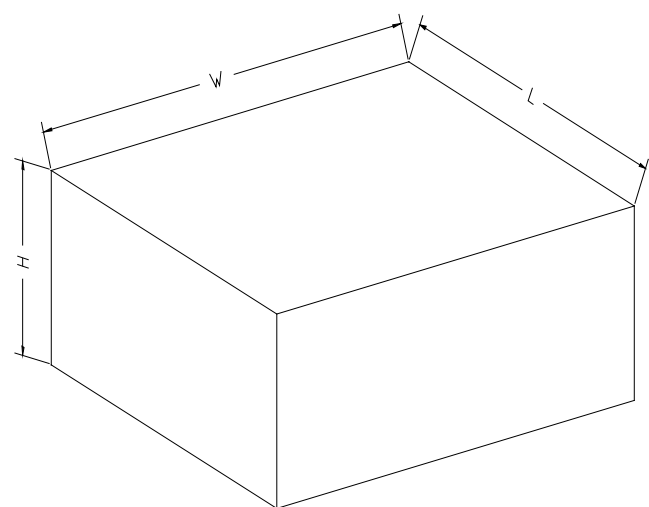
### KEY PARAMETER LIST OF TAPE AND REEL

| 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-23-3     | 7"            | 9.0                | 3.20    | 3.30    | 1.30    | 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           |

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