

GENERAL DESCRIPTION

The SGM2021 is a low power, low noise and low dropout voltage RF linear regulator. It is capable of supplying 300mA output current with typical dropout voltage of only 270mV. The operating input voltage range is from 2.5V to 5.5V. The fixed output voltage range is from 0.9V to 5.0V.

Other features include output current limit and thermal shutdown protection.

The SGM2020 is suitable for application which needs low noise and low power supply, such as MP3 players, palmtop computers, etc.

The SGM2021 is available in a Green SOT-23-3 package. It operates over an operating temperature range of -40°C to +85°C.

FEATURES

- Operating Input Voltage Range: 2.5V to 5.5V
- Fixed Output Voltages:
0.9V, 1.2V, 1.3V, 1.5V, 1.8V, 2.1V, 2.5V, 2.6V, 2.7V, 2.8V, 2.85V, 2.9V, 3.0V, 3.1V, 3.2V, 3.3V, 3.6V, 4.2V and 5.0V
- Output Voltage Accuracy: $\pm 2.5\%$ at +25°C
- Low Output Noise: 140 μ V_{RMS} (TYP)
- Low Dropout Voltage: 270mV (TYP) at 300mA
- High PSRR: 69dB (TYP) at 100Hz
- Low No Load Supply Current: 120 μ A (TYP)
- Thermal Shutdown Protection
- Output Current Limit
- -40°C to +85°C Operating Temperature Range
- Available in a Green SOT-23-3 Package

APPLICATIONS

Modems
MP3 Players
Cellular Telephones
PCMCIA Cards
Palmtop Computers
Portable Electronics

TYPICAL APPLICATION

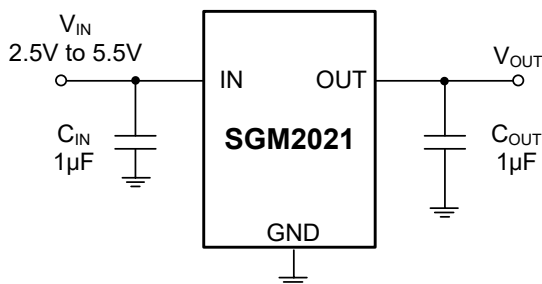
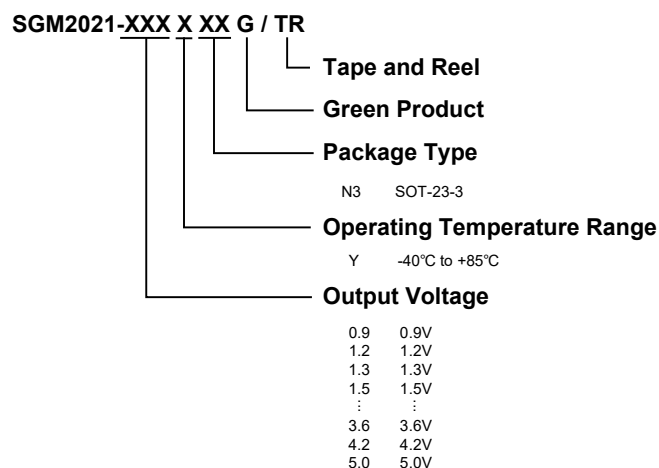


Figure 1. Typical Application Circuit

PRODUCT NAME STRUCTURE



PACKAGE/ORDERING INFORMATION

MODEL	V _{OUT} (V)	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING 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, θ_{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 $+85^\circ C$
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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.

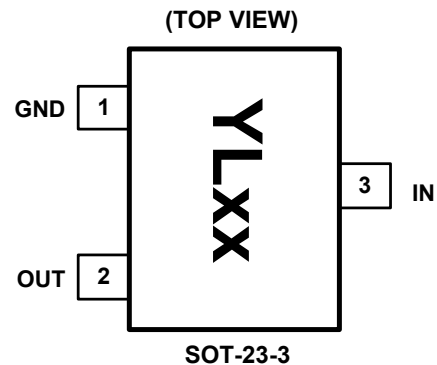
ESD SENSITIVITY CAUTION

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



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 Pin.
3	IN	Regulator Input Pin. It is recommended to use a $10\mu F$ or larger ceramic capacitor from IN pin to ground.

ELECTRICAL CHARACTERISTICS

(V_{IN} = V_{OUT (NOMINAL)} + 0.5V or 2.5V, whichever is greater, T_A = +25°C, unless otherwise noted.)

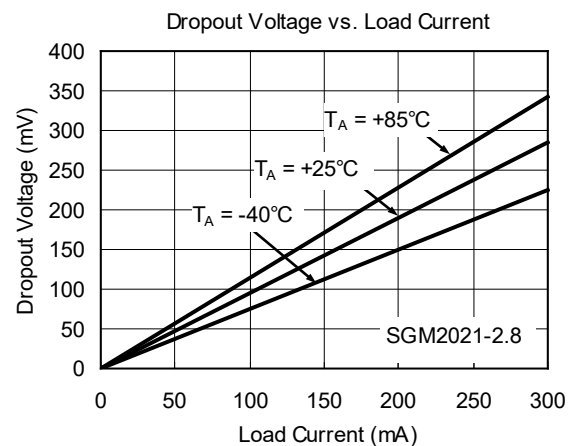
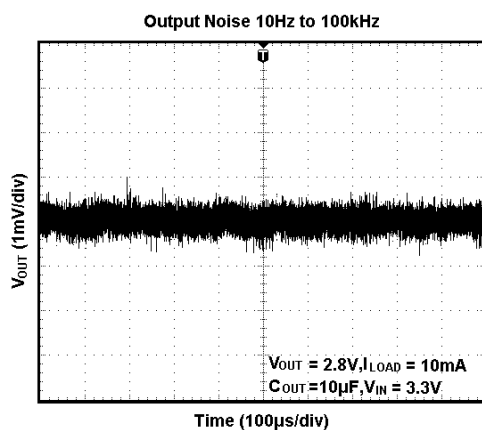
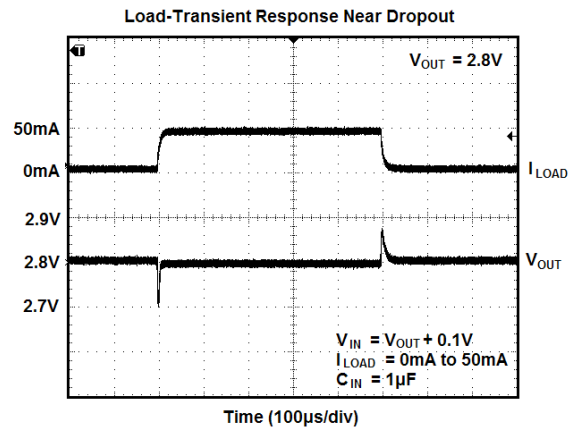
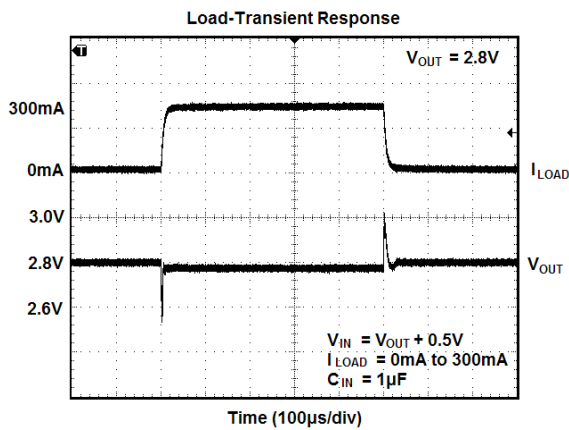
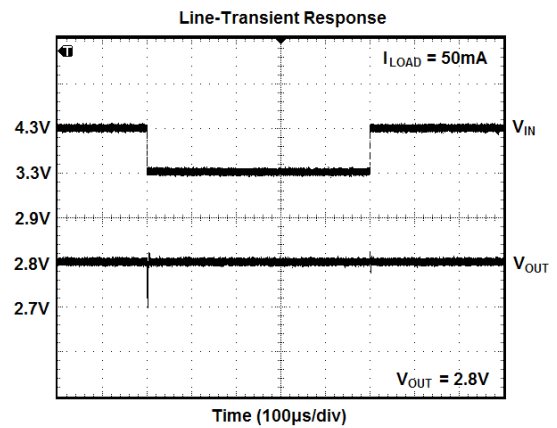
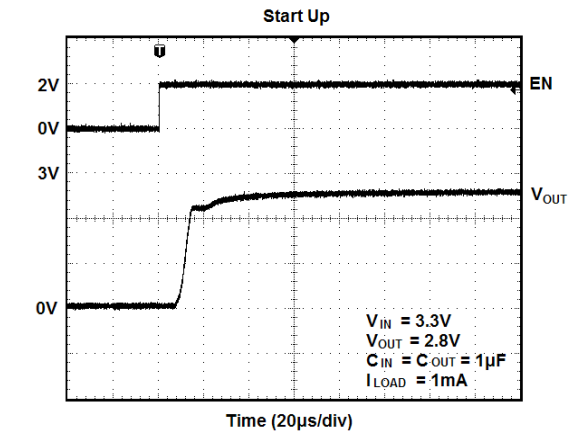
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Input Voltage	V _{IN}			2.5		5.5	V
Output Voltage Accuracy		I _{OUT} = 0.1mA, T _A = +25°C		-2.5		2.5	%
Maximum Output Current				300			mA
Current Limit	I _{LIM}			310	500		mA
Ground Pin Current	I _Q	No load			120	220	μA
Dropout Voltage ⁽¹⁾		I _{OUT} = 1mA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

NOTE:

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

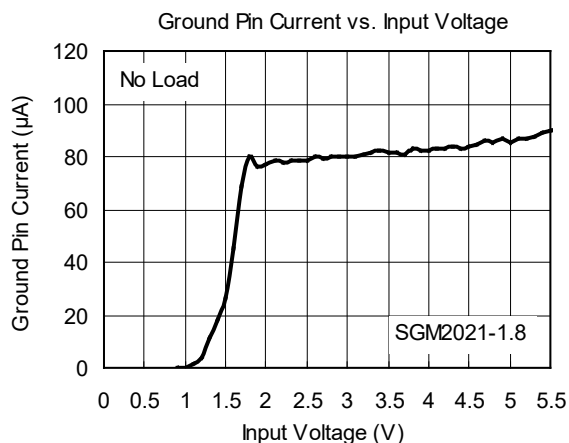
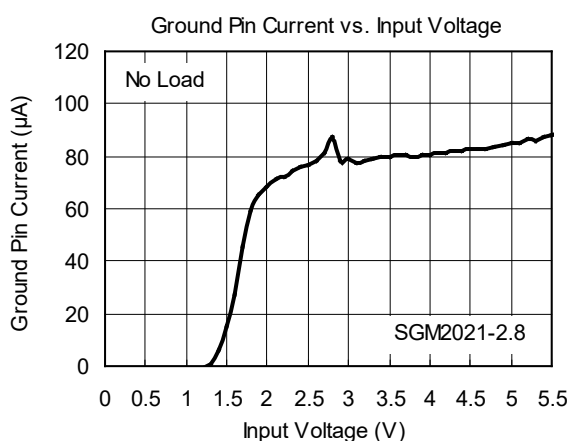
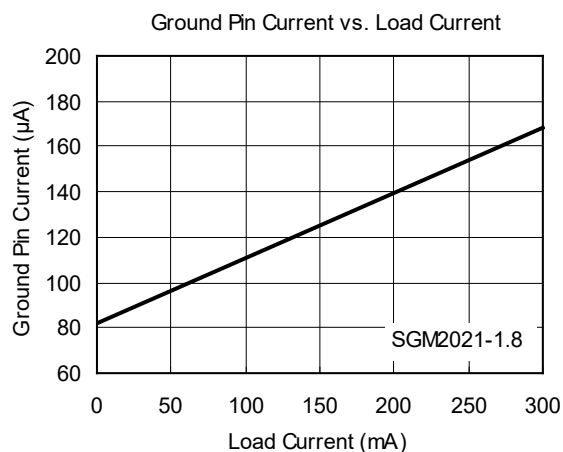
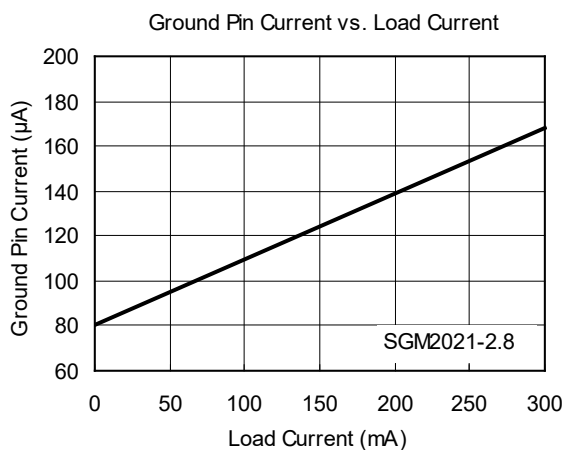
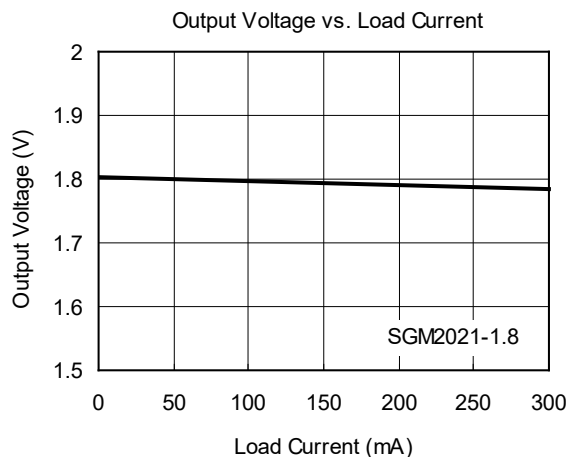
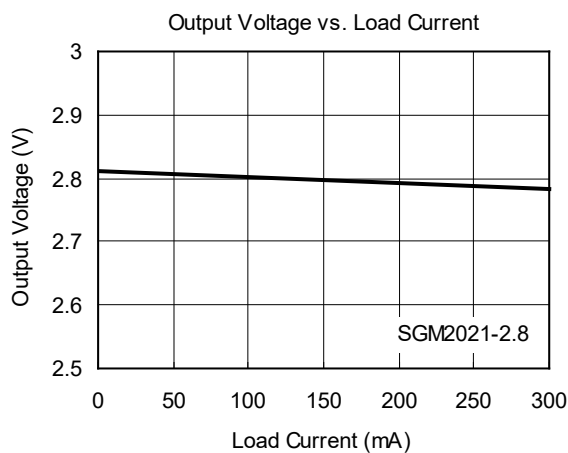
TYPICAL PERFORMANCE CHARACTERISTICS

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



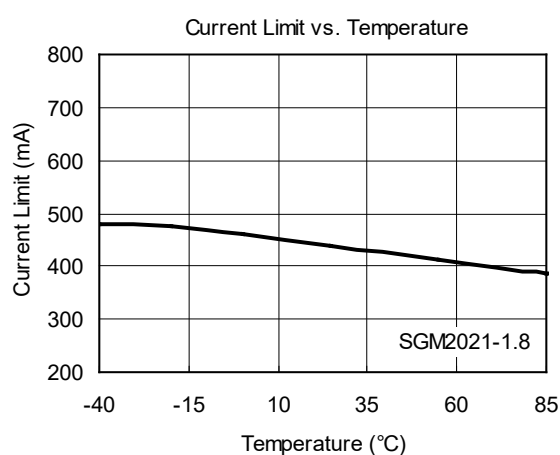
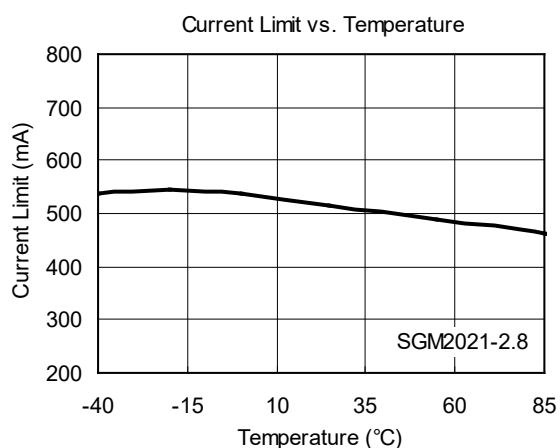
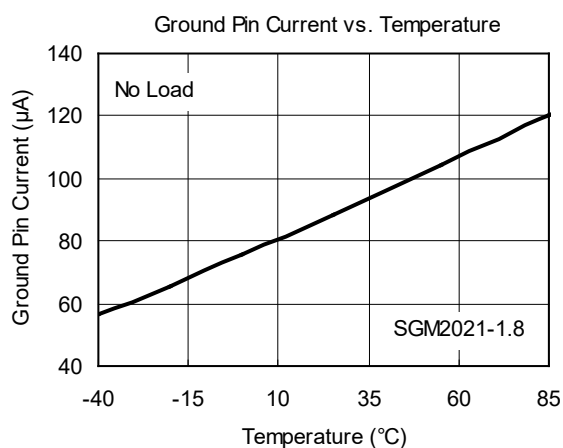
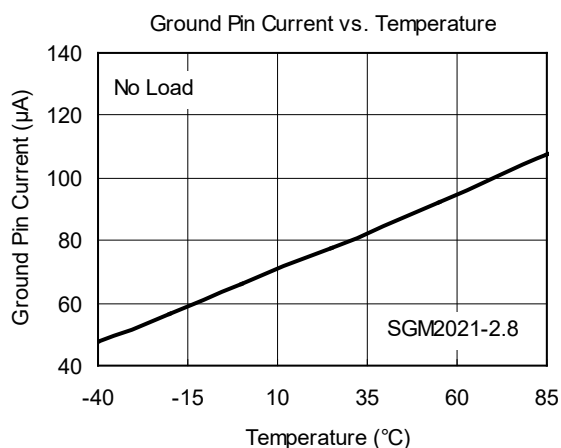
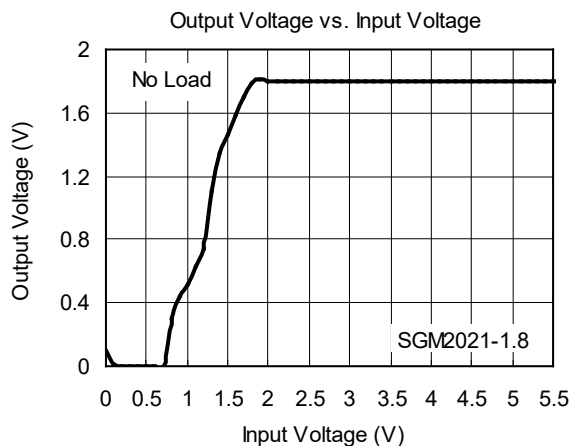
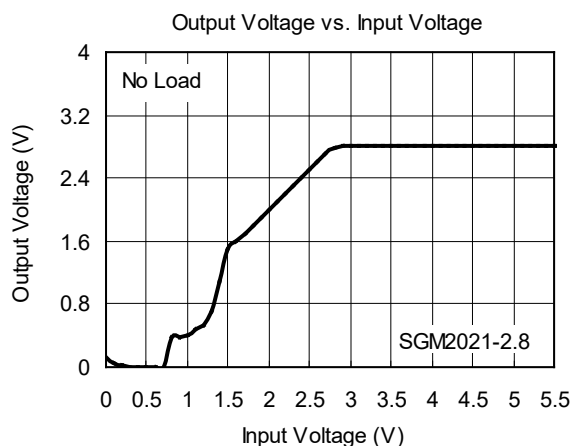
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

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



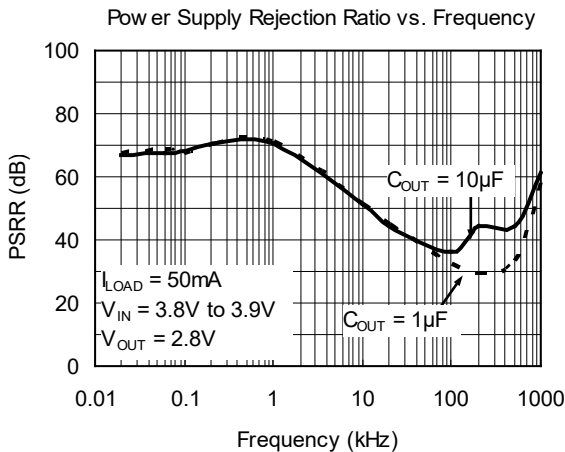
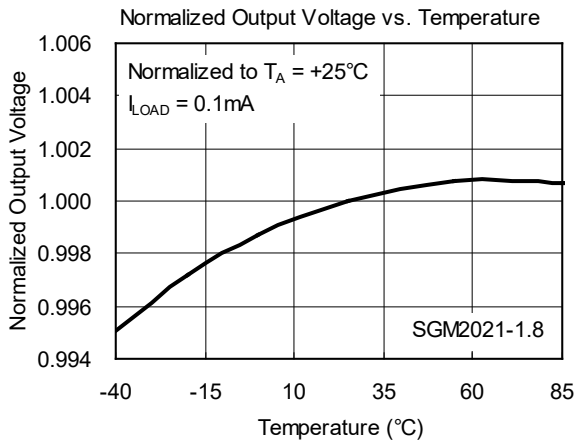
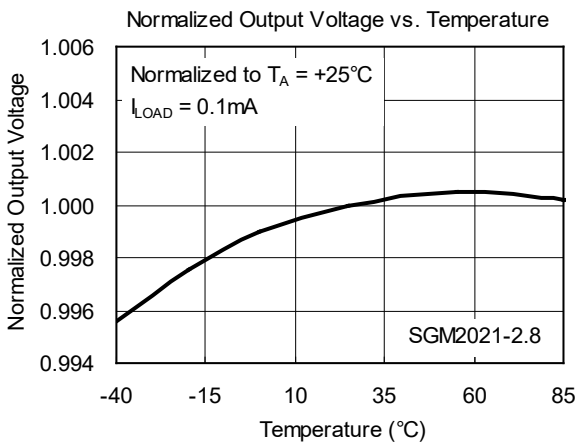
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$ 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.



REVISION HISTORY

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

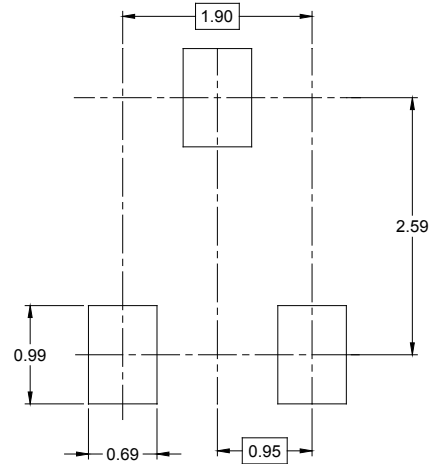
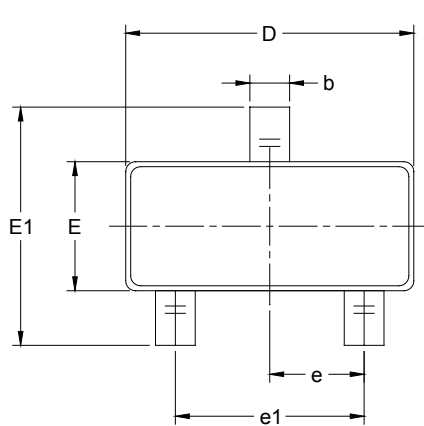
APRIL 2016 – REV.B to REV.B.1

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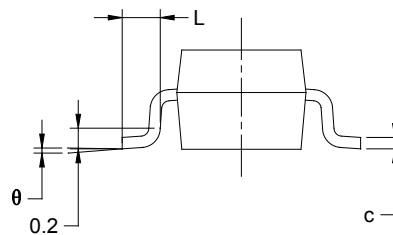
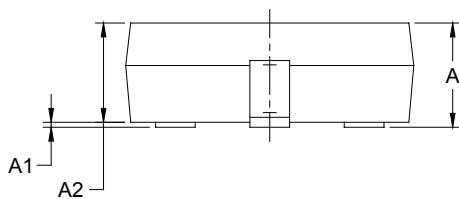
Changed Normalized Output Voltage vs. Temperature (SGM2021-2.8 and SGM2021-1.8) 9

PACKAGE OUTLINE DIMENSIONS

SOT-23-3



RECOMMENDED LAND PATTERN (Unit: mm)

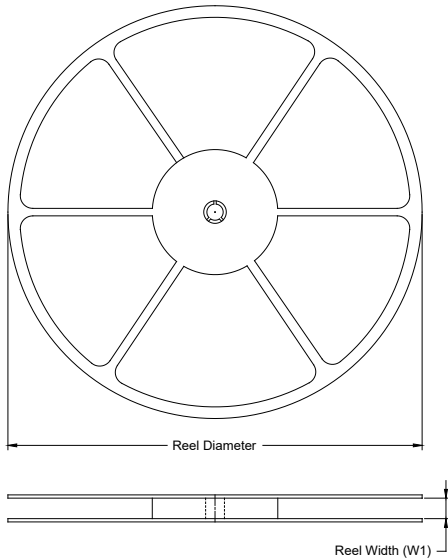


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037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

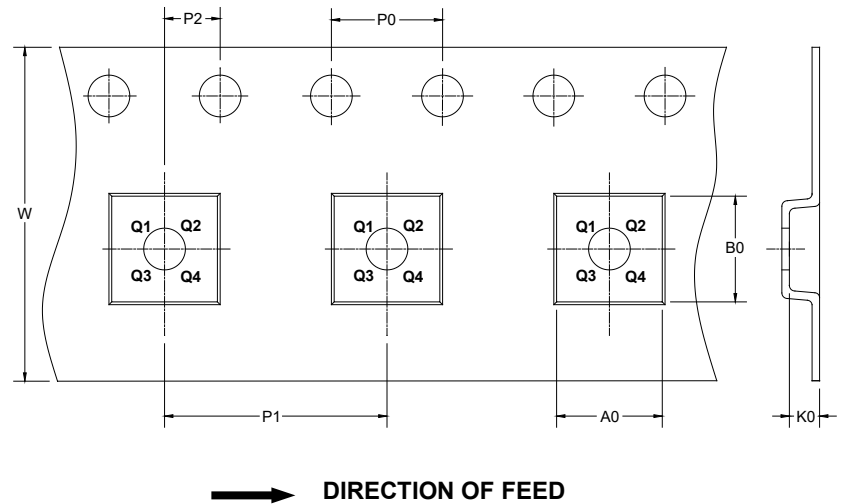
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

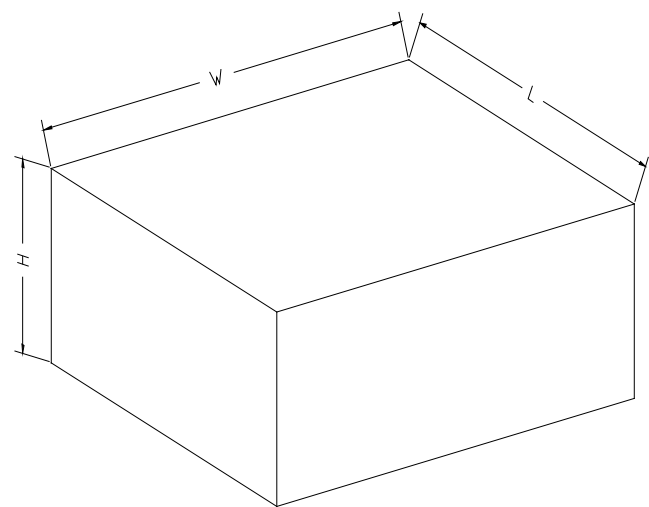
KEY PARAMETER LIST OF TAPE AND REEL

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-23-3	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

DD0002