



SGM2232xQ Automotive, 150mA, High Voltage, Ultra-Low I_Q, High PSRR, Low Dropout Regulator

GENERAL DESCRIPTION

The SGM2232xQ is a high voltage, ultra-low quiescent current, high PSRR and low dropout voltage linear regulator. It is capable of supplying 150mA output current with typical dropout voltage of 570mV. The operating input voltage range is from 4V to 40V and output voltage range is from 2.5V to 5V.

Other features include under-voltage lockout, short-circuit current limit and thermal shutdown protection. The SGM2232xQ is suitable for various automotive applications.

This device is AEC-Q100 qualified (Automotive Electronics Council (AEC) standard Q100 Grade 1) and it is suitable for automotive applications.

The SGM2232xQ is available in Green SOT-223-3 and SOT-23-5 packages. It operates over an operating temperature range of -40°C to +125°C.

APPLICATIONS

Automotive Applications
Industrial Equipment
Medical Equipment
Telecom Equipment
Wireless Equipment

FEATURES

- **AEC-Q100 Qualified for Automotive Applications**
Device Temperature Grade 1
 $T_A = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
- **Operating Input Voltage Range: 4V to 40V**
- **Fixed Output from 2.5V to 5V**
- **150mA Output Current**
- **Output Voltage Accuracy:**
 $\pm 3\%$ at $T_J = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
- **Low Quiescent Current: 16 μA (TYP)**
- **Low Dropout Voltage:**
570mV (TYP) at 150mA, $V_{OUT} = 5.0\text{V}$
- **High PSRR:**
 - ◆ 84dB (TYP) at 1kHz
 - ◆ 56dB (TYP) at 100kHz
 - ◆ 63dB (TYP) at 1MHz
- **Current Limiting and Thermal Protection**
- **Under-Voltage Lockout (UVLO)**
- **Stable with Low ESR Ceramic Capacitors**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green SOT-223-3 and SOT-23-5 Packages**

TYPICAL APPLICATION

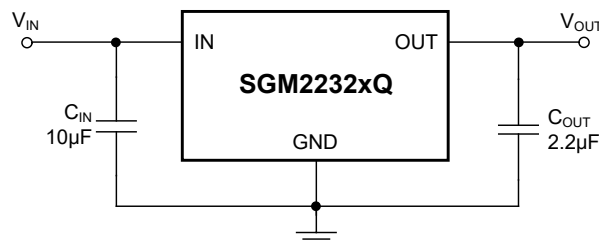


Figure 1. Typical Application Circuit

Automotive, 150mA, High Voltage, Ultra-Low I_Q, High PSRR, Low Dropout Regulator

SGM2232xQ

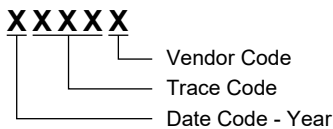
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM2232-2.5Q	SOT-223-3	-40°C to +125°C	SGM2232-2.5QKC3G/TR	0IQ XXXXXX	Tape and Reel, 2500
SGM2232-3.3Q	SOT-223-3	-40°C to +125°C	SGM2232-3.3QKC3G/TR	0MZ XXXXXX	Tape and Reel, 2500
SGM2232-5.0Q	SOT-223-3	-40°C to +125°C	SGM2232-5.0QKC3G/TR	0IP XXXXXX	Tape and Reel, 2500
SGM2232-2.5Q	SOT-23-5	-40°C to +125°C	SGM2232-2.5QN5G/TR	0INXX	Tape and Reel, 3000
SGM2232-3.3Q	SOT-23-5	-40°C to +125°C	SGM2232-3.3QN5G/TR	0IOXX	Tape and Reel, 3000
SGM2232-5.0Q	SOT-23-5	-40°C to +125°C	SGM2232-5.0QN5G/TR	0IMXX	Tape and Reel, 3000

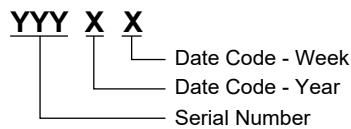
MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code. XX = Date Code.

SOT-223-3



SOT-23-5



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 to GND	-0.3V to 45V
OUT to GND	-0.3V to 7V
Package Thermal Resistance	
SOT-223-3, θ_{JA}	57.7°C/W
SOT-223-3, θ_{JB}	10.4°C/W
SOT-223-3, θ_{JC}	32.6°C/W
SOT-23-5, θ_{JA}	164.1°C/W
SOT-23-5, θ_{JB}	28.6°C/W
SOT-23-5, θ_{JC}	51.8°C/W
Junction Temperature	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility	
HBM	3000V
CDM	1000V

RECOMMENDED OPERATING CONDITIONS

Input Voltage Range	4V to 40V
Input Effective Capacitance, C _{IN}	2.2µF (MIN)
Output Effective Capacitance, C _{OUT}	1.5µF to 100µF
Operating Ambient Temperature Range	-40°C to +125°C
Operating Junction Temperature Range	-40°C to +150°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

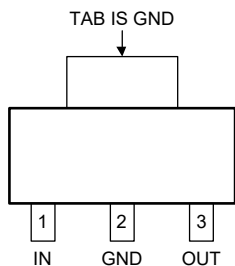
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance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

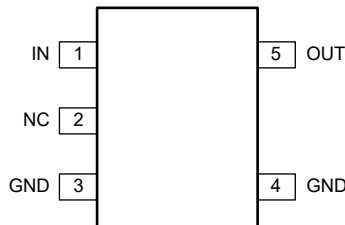
PIN CONFIGURATIONS

SGM2232xQ (TOP VIEW)



SOT-223-3

SGM2232xQ (TOP VIEW)



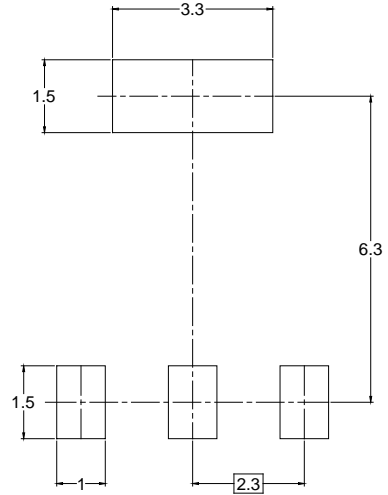
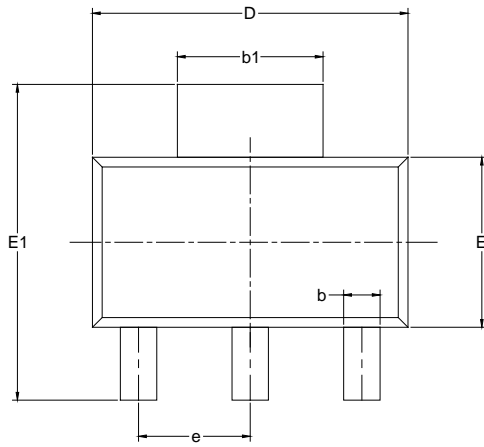
SOT-23-5

PIN DESCRIPTION

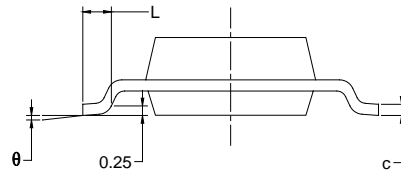
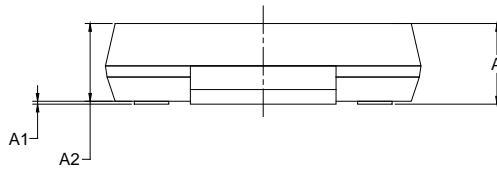
PIN		NAME	FUNCTION
SOT-223-3	SOT-23-5		
1	1	IN	Input Supply Voltage Pin. It is recommended to use a 10 μ F or larger ceramic capacitor from IN pin to ground. This ceramic capacitor should be placed as close as possible to the IN pin.
2, TAB	3, 4	GND	Ground.
3	5	OUT	Regulator Output Pin. It is recommended to use a ceramic capacitor with effective capacitance in the range of 1.5 μ F to 100 μ F. This ceramic capacitor should be placed as close as possible to the OUT pin.
—	2	NC	No Connection.

PACKAGE OUTLINE DIMENSIONS

SOT-223-3



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.800		0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	3.300	3.700	0.130	0.146
E1	6.700	7.300	0.264	0.287
e	2.300 BSC		0.091 BSC	
L	0.750		0.030	
θ	0°	10°	0°	10°

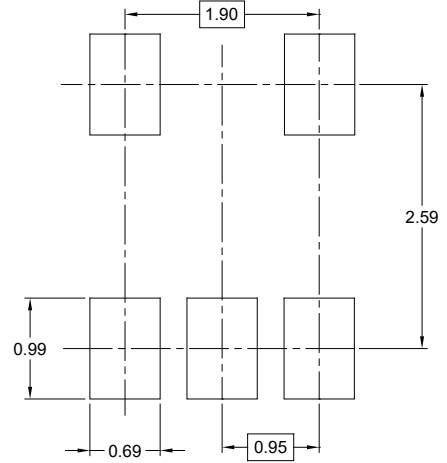
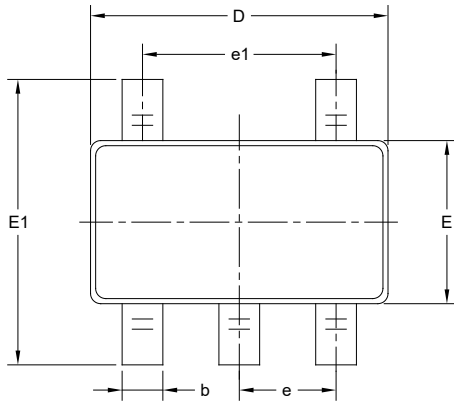
NOTES:

1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

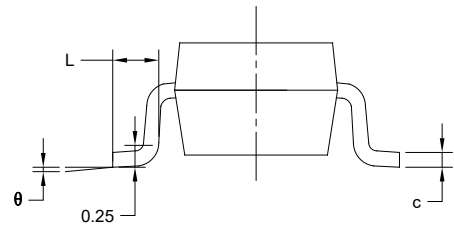
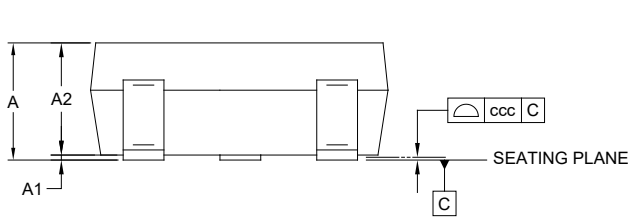
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

SOT-23-5



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.450
A1	0.000	-	0.150
A2	0.900	-	1.300
b	0.300	-	0.500
c	0.080	-	0.220
D	2.750	-	3.050
E	1.450	-	1.750
E1	2.600	-	3.000
e	0.950 BSC		
e1	1.900 BSC		
L	0.300	-	0.600
θ	0°	-	8°
ccc	0.100		

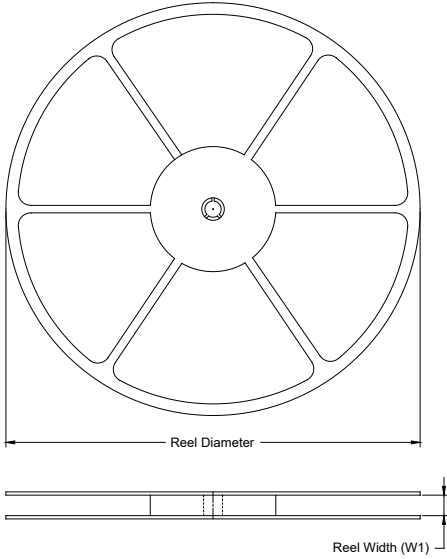
NOTES:

1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-178.

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-223-3	13"	12.4	6.55	7.25	1.90	4.0	8.0	2.0	12.0	Q3
SOT-23-5	7"	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3

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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
13"	386	280	370	5

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