SGM2243xQ
Automotive
40V, 300mA, Low Quiescent Current and Low Dropout Voltage Linear Regulator

GENERAL DESCRIPTION

The SGM2243xQ is a high voltage, low quiescent current and low dropout voltage linear regulator. It is capable of supplying 300mA output current with typical dropout voltage of 900mV. The operating input voltage range is from 2.5V to 40V and output voltage range is from 1.8V to 12V.

Other features include current limit and thermal shutdown protection. The SGM2243xQ 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 SGM2243xQ is available in a Green TDFN-3×3-8L package. It operates over an operating temperature range of -40℃ to +125℃.

FEATURES

- **AEC-Q100 Qualified for Automotive Applications**
  Device Temperature Grade 1
  T_A = -40℃ to +125℃
- **Operating Input Voltage Range: 2.5V to 40V**
- **Enable Pin Accept Voltages Higher than the Supply Voltage and up to 40V**
- **Fixed Output from 1.8V to 12V**
- **300mA Output Current**
- **Output Voltage Accuracy: ±1% at +25℃**
- **Low Quiescent Current: 3.2μA (TYP)**
- **Low Dropout Voltage:**
  900mV (TYP) at 300mA, V_{OUT} = 5.0V
- **Current Limiting and Thermal Protection**
- **With Output Automatic Discharge**
- **Stable with Small Case Size Ceramic Capacitors**
- **-40℃ to +125℃ Operating Temperature Range**
- **Available in a Green TDFN-3×3-8L Package**

APPLICATIONS

Industrial Equipment
Automotive Applications
Battery-Powered Equipment
Medical Equipment

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TYPICAL APPLICATION

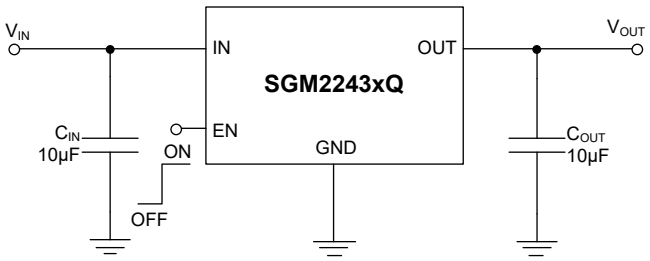


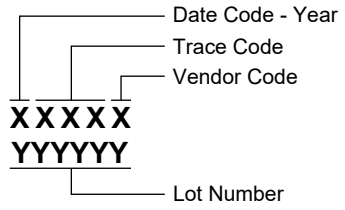
Figure 1. Typical Application Circuit

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM2243-1.8Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-1.8QTDB8G/TR	1DBTDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-2.5Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-2.5QTDB8G/TR	1DCTDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-3.0Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-3.0QTDB8G/TR	1DDTDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-3.3Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-3.3QTDB8G/TR	0YETDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-3.6Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-3.6QTDB8G/TR	1DETDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-4.2Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-4.2QTDB8G/TR	1DFTDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-5.0Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-5.0QTDB8G/TR	15ITDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-8.0Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-8.0QTDB8G/TR	1DGTDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-9.0Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-9.0QTDB8G/TR	1DHTDB XXXXX YYYYYY	Tape and Reel, 4000
SGM2243-12Q	TDFN-3×3-8L	-40℃ to +125℃ (T_A)	SGM2243-12QTDB8G/TR	1DITDB XXXXX YYYYYY	Tape and Reel, 4000

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, EN to GND ..... -0.3V to 45V
OUT to GND ..... -0.3V to 45V
Package Thermal Resistance
TDFN-3×3-8L, θ_{JA} ..... 48.1℃/W
TDFN-3×3-8L, θ_{JB} ..... 20.5℃/W
TDFN-3×3-8L, $\theta_{JC(TOP)}$ ..... 51.4℃/W
TDFN-3×3-8L, $\theta_{JC(BOT)}$ ..... 8℃/W
Junction Temperature ..... +150℃
Storage Temperature Range ..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility (1) (2)
HBM ..... ±6000V
CDM ..... ±1000V

NOTES:

1. For human body model (HBM), all pins comply with AEC-Q100-002 specification.

2. For charged device model (CDM), all pins comply with AEC-Q100-011 specification

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range, V_{IN} ..... 2.5V to 40V
Enable Input Voltage Range ..... 0V to 40V
Input Effective Capacitance, C_{IN} ..... 0.5μF (MIN)
Output Effective Capacitance, C_{OUT} ..... 1μF to 100μF
Operating Ambient Temperature Range ..... -40℃ to +125℃
Operating Junction Temperature Range ..... -40℃ to +150℃

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.

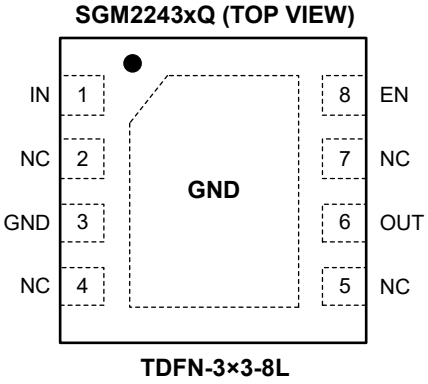
ESD SENSITIVITY CAUTION

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	FUNCTION
1	IN	Input Supply Voltage Pin. It is recommended to use a 1μF 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.
2, 4, 5, 7	NC	No Connection.
3	GND	Ground.
6	OUT	Regulator Output Pin. It is recommended to use a ceramic capacitor with effective capacitance in the range of 1μF to 100μF to ensure stability. This ceramic capacitor should be placed as close as possible to OUT pin.
8	EN	Enable Pin. Drive EN high to turn on the regulator. Drive EN low to turn off the regulator.
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

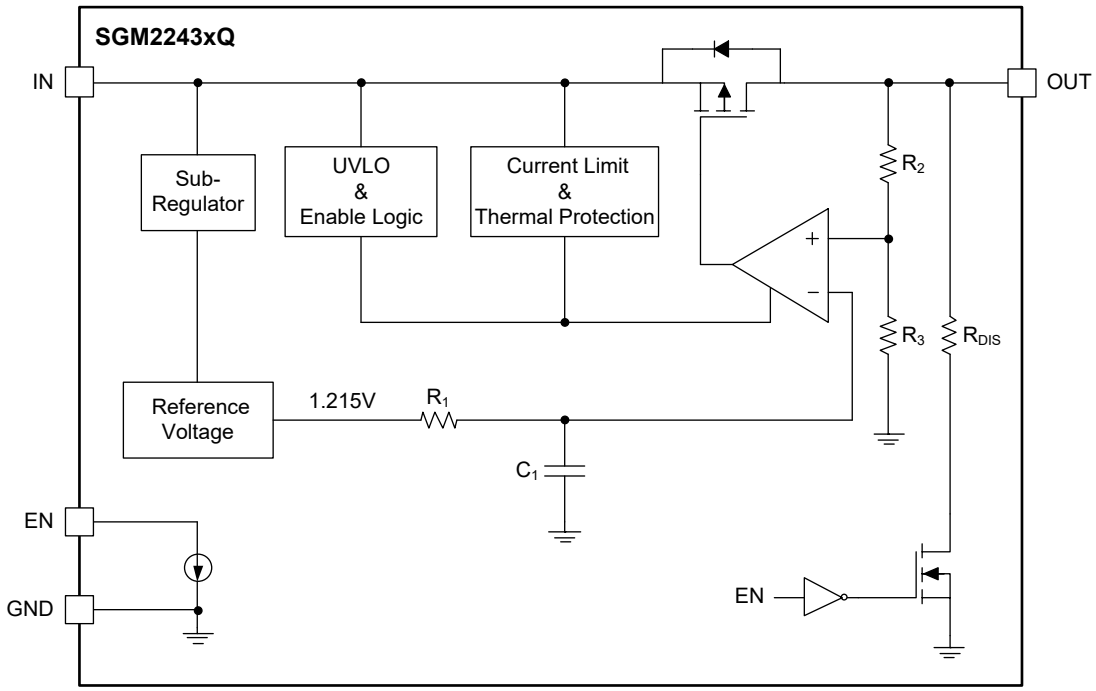
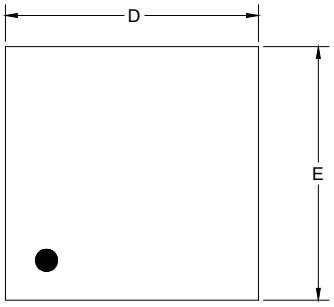


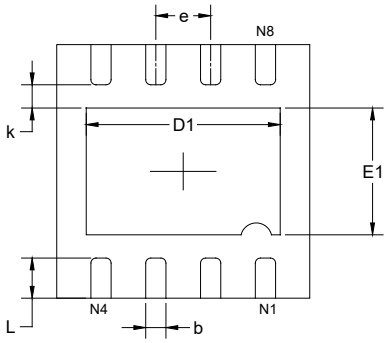
Figure 2. Block Diagram

PACKAGE OUTLINE DIMENSIONS

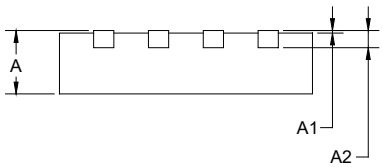
TDFN-3×3-8L



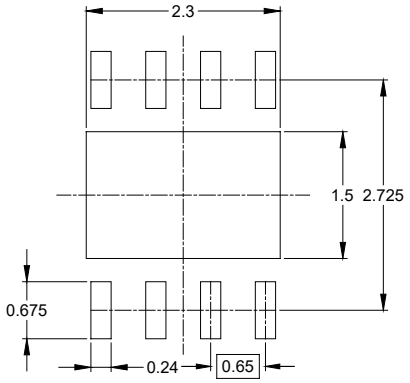
TOP VIEW



BOTTOM VIEW



SIDE VIEW



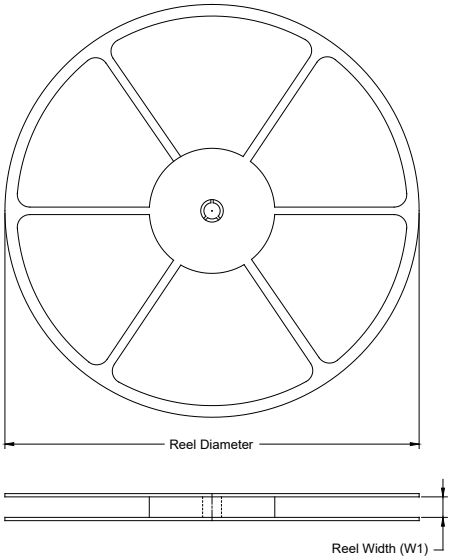
RECOMMENDED LAND PATTERN (Unit: mm)

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	2.900	3.100	0.114	0.122
D1	2.200	2.400	0.087	0.094
E	2.900	3.100	0.114	0.122
E1	1.400	1.600	0.055	0.063
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.650 TYP		0.026 TYP	
L	0.375	0.575	0.015	0.023

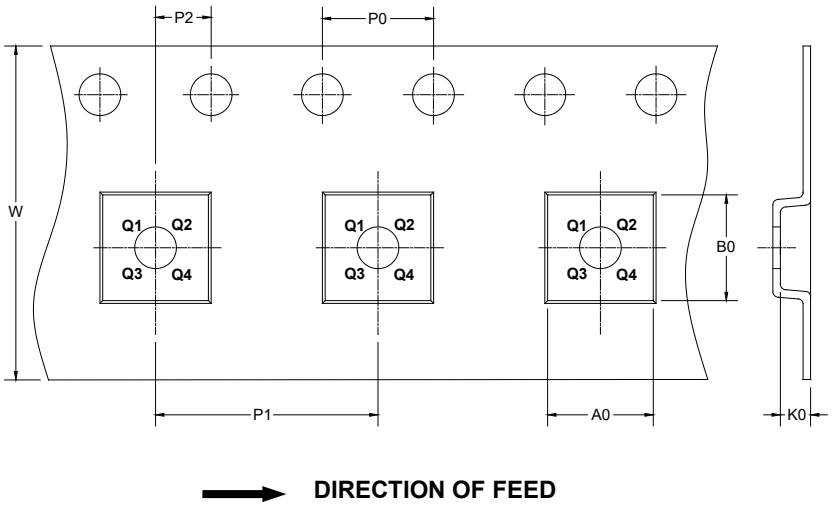
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



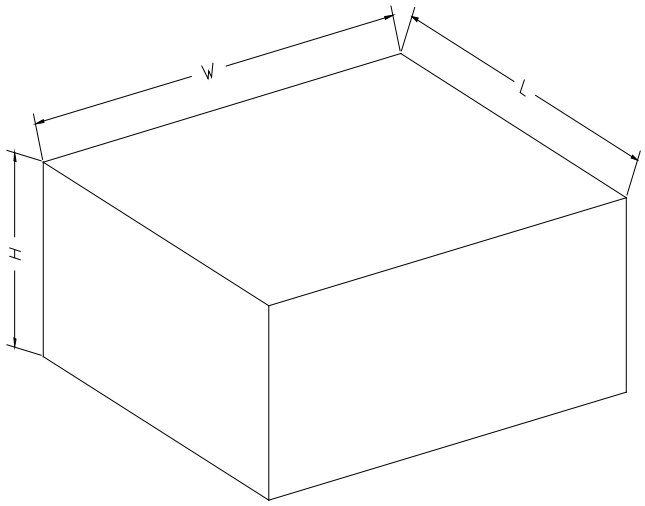
NOTE: The picture is only for reference. Please make the object as the standard.

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-3×3-8L	13"	12.4	3.35	3.35	1.13	4.0	8.0	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
13″	386	280	370	5

DD0002