SGM2086xQ
Automotive
500mA, Low Noise, High PSRR, Low I_Q and Low Dropout Regulator

GENERAL DESCRIPTION

The SGM2086xQ is an ultra-low noise, high PSRR and low dropout voltage linear regulator. It capable of supplying 500mA output current. The operating input voltage range is from 2V to 5.5V and output voltage range is from 0.8V to 5.0V.

Other features include 1.2V logic-controlled shutdown mode, under-voltage lockout, current limit and thermal shutdown protection. The SGM2086xQ has automatic discharge function to quickly discharge V_{OUT} in the disabled status.

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

The SGM2086xQ is available in a Green SOT-23-5 package. It operates over an operating temperature range of -40℃ to +125℃.

APPLICATIONS

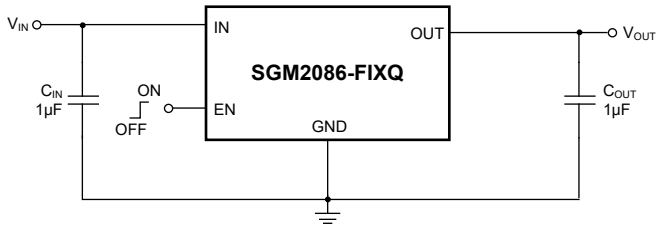
General Purpose Automotive & Industrial
Automotive Camera Modules
Automotive ADAS, Infotainment and Body

FEATURES

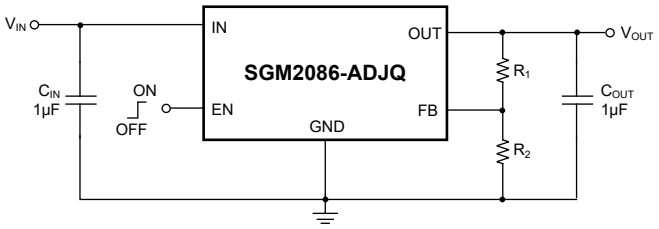
- **AEC-Q100 Qualified for Automotive Applications**
  Device Temperature Grade 1
  T_A = -40℃ to +125℃
- **Operating Input Voltage Range: 2V to 5.5V**
- **Enable Pin Accept Voltages Higher than the Supply Voltage and up to 5.5V**
- **Fixed Output from 1.2V to 4.2V**
- **Adjustable Output from 0.8V to 5.0V**
- **500mA Output Current**
- **Output Voltage Accuracy: ±1% at +25℃**
- **Low Quiescent Current: 30μA(TYP)**
- **Low Dropout: 295mV(TYP) at 500mA**
- **Power Supply Rejection Ratio:**
  SGM2086-ADJQ:
  - **72dB (TYP) at 1kHz**
  - **47dB (TYP) at 1MHz**
  SGM2086-1.8Q:
  - **70dB (TYP) at 1kHz**
  - **61dB (TYP) at 1MHz**
- **Current Limiting and Thermal Protection**
- **Low Start-Up Current**
- **UVLO with Hysteresis**
- **Supports 1.2V Logic Enable Input for ON/OFF Control**
- **With Output Automatic Discharge**
- **Stable with Small Case Size Ceramic Capacitors**
- **-40℃ to +125℃ Operating Temperature Range**
- **Available in a Green SOT-23-5 Package**

代理商 威尔边 www.visvie.com 联系电话 138 2526 5270

TYPICAL APPLICATION



Fixed Voltage Typical Application Circuit



Adjustable Voltage Typical Application Circuit

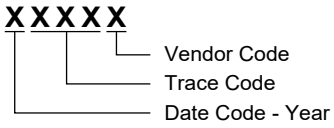
Figure 1. Typical Application Circuits

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM2086-1.2Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-1.2QN5G/TR	1EQ XXXXX	Tape and Reel, 3000
SGM2086-1.5Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-1.5QN5G/TR	1ER XXXXX	Tape and Reel, 3000
SGM2086-1.8Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-1.8QN5G/TR	19A XXXXX	Tape and Reel, 3000
SGM2086-2.5Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-2.5QN5G/TR	1ES XXXXX	Tape and Reel, 3000
SGM2086-2.8Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-2.8QN5G/TR	1ET XXXXX	Tape and Reel, 3000
SGM2086-2.9Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-2.9QN5G/TR	1EU XXXXX	Tape and Reel, 3000
SGM2086-3.0Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-3.0QN5G/TR	1EV XXXXX	Tape and Reel, 3000
SGM2086-3.3Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-3.3QN5G/TR	19B XXXXX	Tape and Reel, 3000
SGM2086-4.2Q	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-4.2QN5G/TR	1EW XXXXX	Tape and Reel, 3000
SGM2086-ADJQ	SOT-23-5	-40℃ to +125℃ (T_A)	SGM2086-ADJQN5G/TR	199 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 to GND ..... -0.3V to 6V
OUT to GND ..... -0.3V to 6V
EN to GND ..... -0.3V to 6V
Package Thermal Resistance
SOT-23-5, θ_{JA} ..... 179.7℃/W
SOT-23-5, θ_{JB} ..... 45.6℃/W
SOT-23-5, θ_{JC} ..... 66.5℃/W
Junction Temperature ..... +150℃
Storage Temperature Range ..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility (1) (2)
HBM ..... ±8000V
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

Operating Input Voltage Range, V_{IN} ..... 2V to 5.5V
Adjustable Output Voltage Range ..... 0.8V to 5.0V
Enable Voltage Range ..... 0V to 5.5V
Input Effective Capacitance, C_{IN} ..... 0.5μF (MIN)
Output Effective Capacitance, C_{OUT} ..... 0.5μF 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

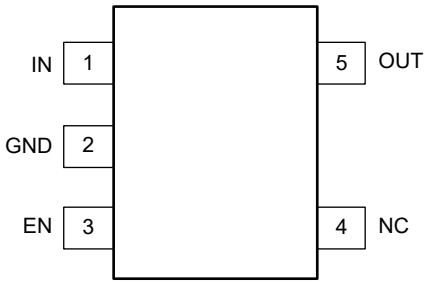
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance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

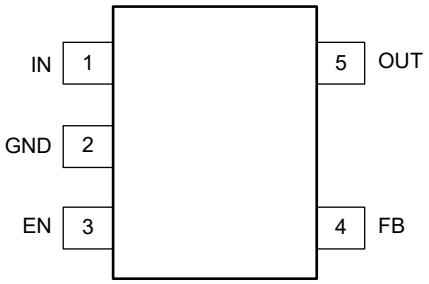
PIN CONFIGURATIONS

SGM2086-FIXQ (TOP VIEW)



SOT-23-5

SGM2086-ADJQ (TOP VIEW)



SOT-23-5

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	GND	Ground Pin.
3	EN	Enable Pin. Drive EN high to turn on the regulator. Drive EN low to turn off the regulator.
4	FB	Feedback Voltage Input Pin (adjustable voltage version only). 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.
	NC	No Connection (fixed voltage version).
5	OUT	Regulator Output Pin. It is recommended to use a 1μF ceramic capacitor to ensure stability. This ceramic capacitor should be placed as close as possible to OUT pin.

FUNCTIONAL BLOCK DIAGRAMS

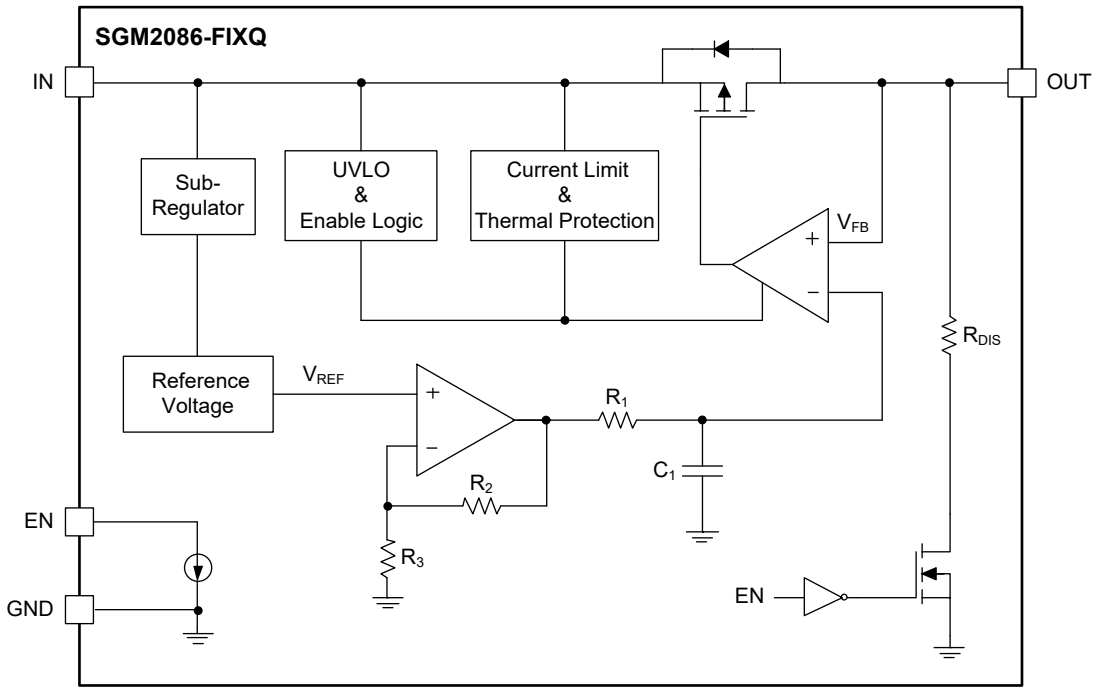


Figure 2. Fixed Output Regulator Block Diagram

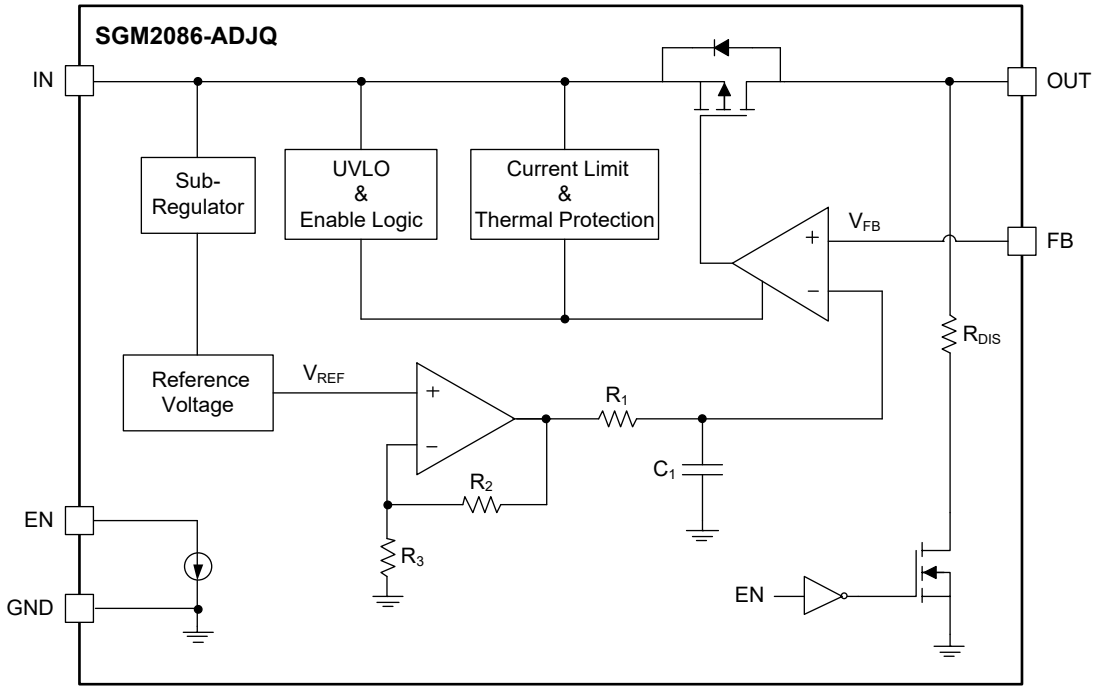
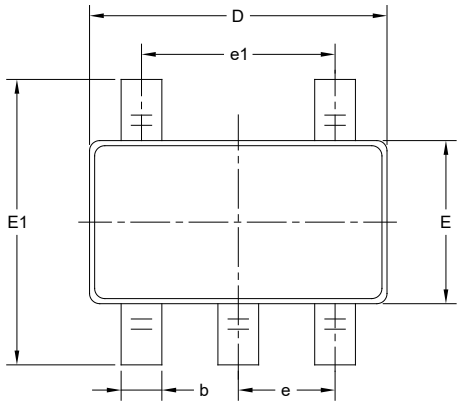
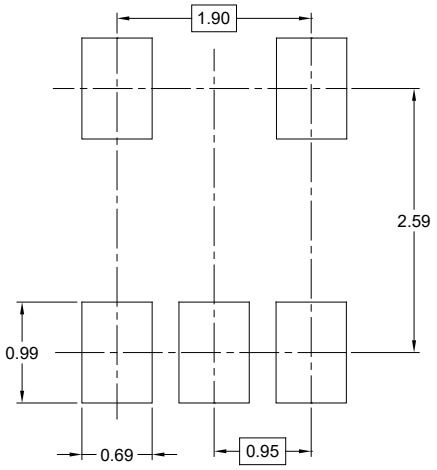


Figure 3. Adjustable Output Regulator Block Diagram

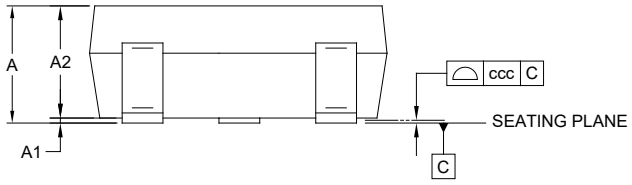
PACKAGE OUTLINE DIMENSIONS

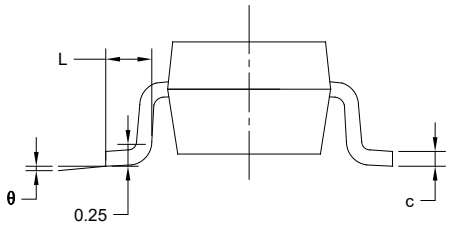
SOT-23-5





RECOMMENDED LAND PATTERN (Unit: mm)



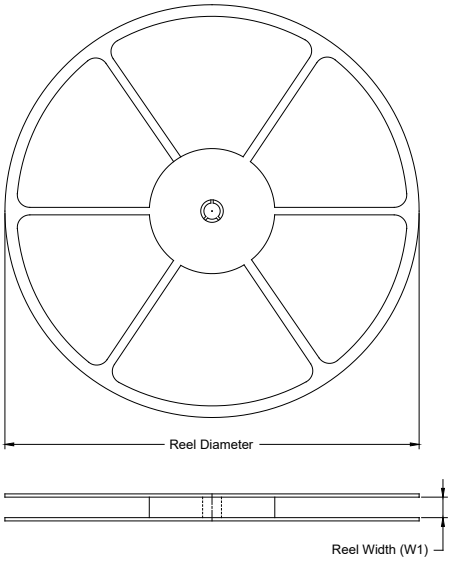


Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.450
A1	0.000	-	0.150
A2	0.900	-	1.300
b	0.300	-	0.500
c	0.080	-	0.220
D	2.750	-	3.050
E	1.450	-	1.750
E1	2.600	-	3.000
e	0.950 BSC		
e1	1.900 BSC		
L	0.300	-	0.600
θ	0°	-	8°
ccc	0.100		

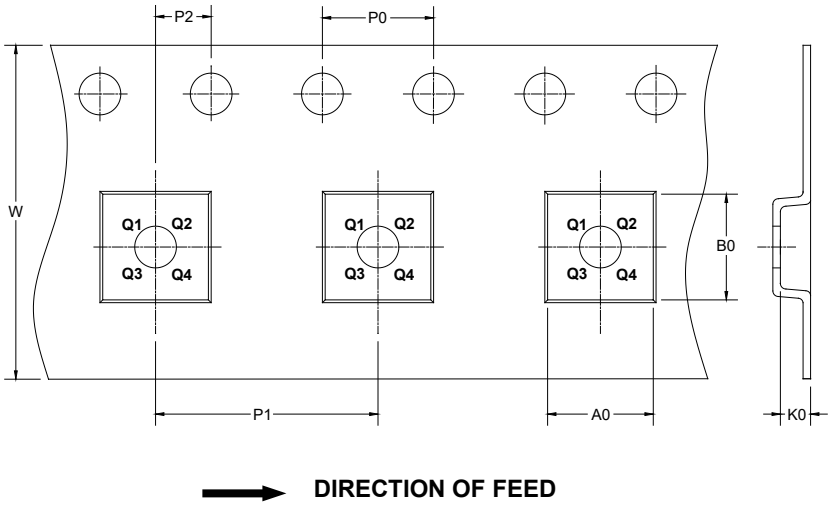
NOTES:
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-178.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



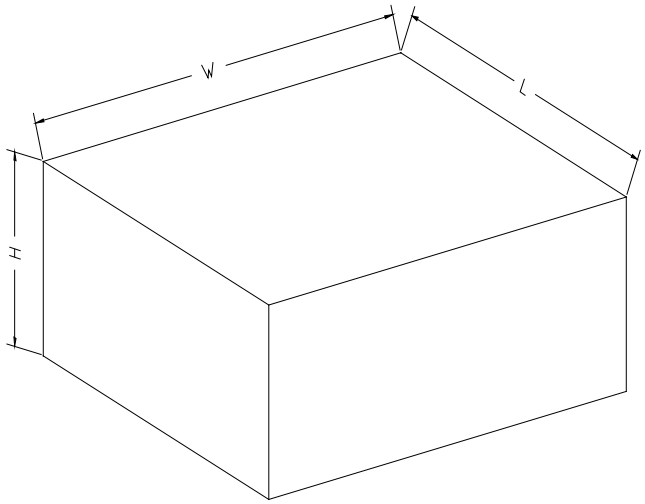
NOTE: The picture is only for reference. Please make the object as the standard.

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-23-5	7"	9.5	3.20	3.20	1.40	4.0	4.0	2.0	8.0	Q3

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