



SGM2053S

500mA, Ultra-Low Dropout, Low Power, RF Linear Regulator

GENERAL DESCRIPTION

The SGM2053S is a low power, low noise, fast transient response and low dropout voltage linear regulator which is designed using CMOS technology. It provides 500mA output current capability. The operating input voltage range is from 1.6V to 5.5V. The adjustable output voltage range is from 0.8V to 5.0V.

Other features include logic-controlled shutdown mode, short-circuit current limit and thermal shutdown protection. The SGM2053S has automatic discharge function to quickly discharge V_{OUT} in the disabled status.

The SGM2053S is available in Green SOT-23-6 and SOT-23-5 packages. It operates over an operating temperature range of -40°C to $+125^{\circ}\text{C}$.

FEATURES

- **Operating Input Voltage Range: 1.6V to 5.5V**
- **Fixed Outputs of 1.0V, 1.05V, 1.1V, 1.8V, 2.8V, 3.0V and 3.3V**
- **Adjustable Output from 0.8V to 5.0V**
- **500mA Output Current**
- **Ultra-Low Dropout Voltage: 245mV (TYP) at $V_{OUT} = 5.0\text{V}$**
- **High PSRR: 76dB (TYP) at 1kHz**
- **Turn-On Time: 80 μs (TYP)**
- **Current Limiting and Thermal Protection**
- **Excellent Load and Line Transient Responses**
- **With Output Automatic Discharge**
- **Stable with Small Case Size Ceramic Capacitors**
- **Shutdown Supply Current: 0.05 μA (TYP)**
- **-40°C to $+125^{\circ}\text{C}$ Operating Temperature Range**
- **Available in Green SOT-23-6 and SOT-23-5 Packages**

APPLICATIONS

Portable Equipment

Smartphone

Industrial and medical Equipment

PACKAGE/ORDERING INFORMATION

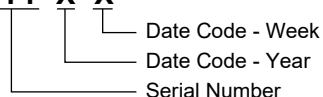
| MODEL | PACKAGE DESCRIPTION | SPECIFIED TEMPERATURE RANGE | ORDERING NUMBER | PACKAGE MARKING | PACKING OPTION |
|---------------|---------------------|-----------------------------|----------------------|-----------------|---------------------|
| SGM2053S-ADJ | SOT-23-6 | -40°C to +125°C | SGM2053S-ADJXN6G/TR | 04TXX | Tape and Reel, 3000 |
| SGM2053S-1.0 | SOT-23-6 | -40°C to +125°C | SGM2053S-1.0XN6G/TR | 09QXX | Tape and Reel, 3000 |
| SGM2053S-1.05 | SOT-23-6 | -40°C to +125°C | SGM2053S-1.05XN6G/TR | 0FOXX | Tape and Reel, 3000 |
| SGM2053S-1.1 | SOT-23-6 | -40°C to +125°C | SGM2053S-1.1XN6G/TR | 0FPXX | Tape and Reel, 3000 |
| SGM2053S-1.8 | SOT-23-6 | -40°C to +125°C | SGM2053S-1.8XN6G/TR | 0FQXX | Tape and Reel, 3000 |
| SGM2053S-2.8 | SOT-23-6 | -40°C to +125°C | SGM2053S-2.8XN6G/TR | 0FRXX | Tape and Reel, 3000 |
| SGM2053S-3.0 | SOT-23-6 | -40°C to +125°C | SGM2053S-3.0XN6G/TR | 0FSXX | Tape and Reel, 3000 |
| SGM2053S-3.3 | SOT-23-6 | -40°C to +125°C | SGM2053S-3.3XN6G/TR | 0FTXX | Tape and Reel, 3000 |
| SGM2053S-ADJ | SOT-23-5 | -40°C to +125°C | SGM2053S-ADJXN5G/TR | 0CNXX | Tape and Reel, 3000 |
| SGM2053S-1.0 | SOT-23-5 | -40°C to +125°C | SGM2053S-1.0XN5G/TR | 0FUXX | Tape and Reel, 3000 |
| SGM2053S-1.05 | SOT-23-5 | -40°C to +125°C | SGM2053S-1.05XN5G/TR | 0DGXX | Tape and Reel, 3000 |
| SGM2053S-1.1 | SOT-23-5 | -40°C to +125°C | SGM2053S-1.1XN5G/TR | 0DHXX | Tape and Reel, 3000 |
| SGM2053S-1.8 | SOT-23-5 | -40°C to +125°C | SGM2053S-1.8XN5G/TR | 0DIXX | Tape and Reel, 3000 |
| SGM2053S-2.8 | SOT-23-5 | -40°C to +125°C | SGM2053S-2.8XN5G/TR | 0FVXX | Tape and Reel, 3000 |
| SGM2053S-3.0 | SOT-23-5 | -40°C to +125°C | SGM2053S-3.0XN5G/TR | 0FWXX | Tape and Reel, 3000 |
| SGM2053S-3.3 | SOT-23-5 | -40°C to +125°C | SGM2053S-3.3XN5G/TR | 0COXX | Tape and Reel, 3000 |

MARKING INFORMATION

NOTE: XX = Date Code.

SOT-23-6/SOT-23-5

YYY X X



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 |
| EN to GND..... | -0.3V to 6V |
| OUT, BP, ADJ to GND..... | -0.3V to ($V_{IN} + 0.3V$) |
| Package Thermal Resistance | |
| SOT-23-6, θ_{JA} | 207°C/W |
| SOT-23-6, θ_{JB} | 70°C/W |
| SOT-23-6, θ_{JC} | 124°C/W |
| SOT-23-5, θ_{JA} | 221°C/W |
| SOT-23-5, θ_{JB} | 74°C/W |
| SOT-23-5, θ_{JC} | 120°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 Supply Voltage Range | 1.6V to 5.5V |
| Input Effective Capacitance, C_{IN} | 0.5 μ F (MIN) |
| Output Effective Capacitance, C_{OUT} | 1 μ F to 10 μ F |
| Operating Junction Temperature Range..... | -40°C to +125°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.

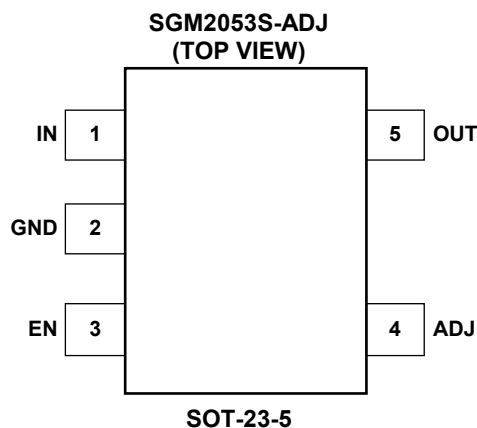
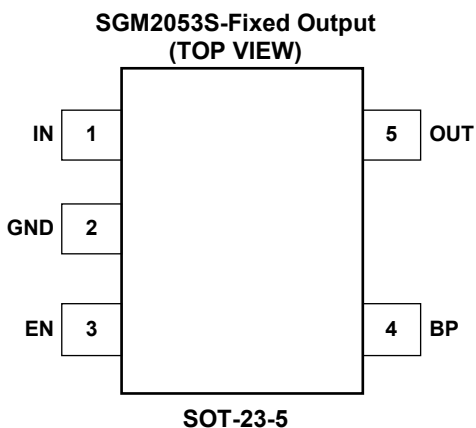
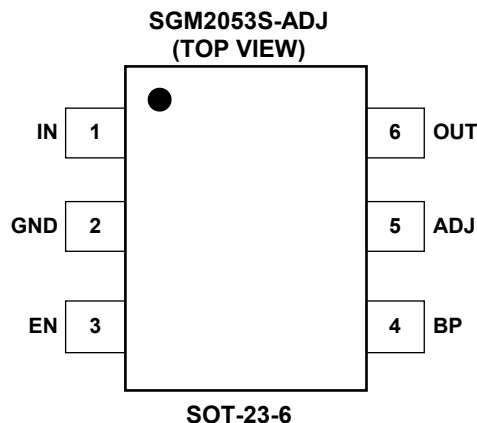
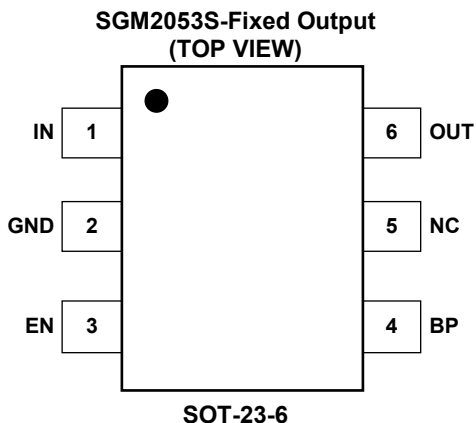
ESD SENSITIVITY CAUTION

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

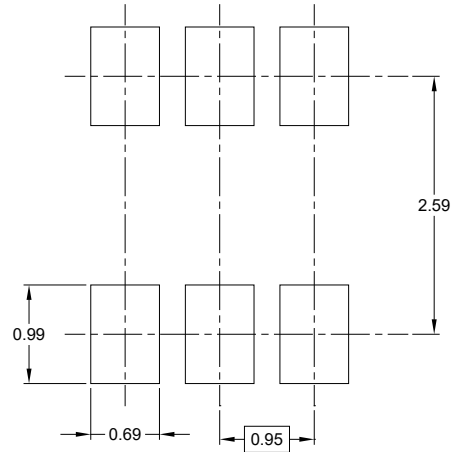
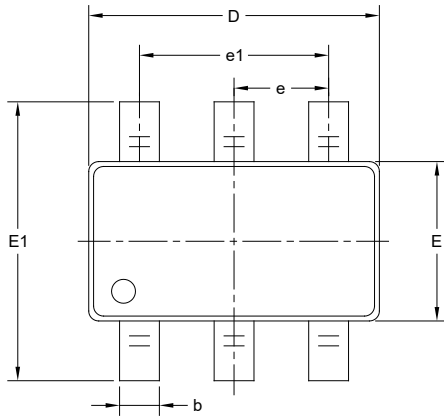


PIN DESCRIPTION

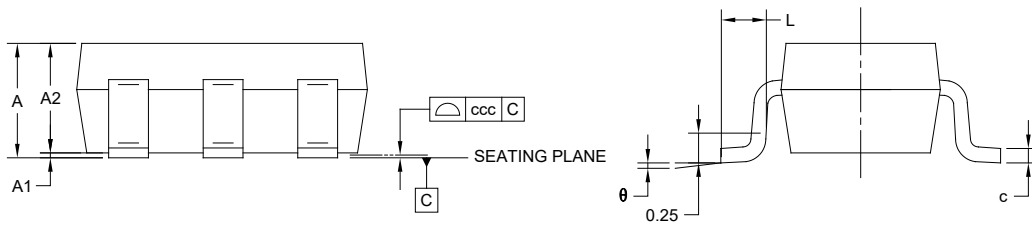
| PIN | | NAME | FUNCTION |
|----------|----------|------|---|
| SOT-23-6 | SOT-23-5 | | |
| 1 | 1 | IN | Input Voltage Supply Pin. It is recommended to use a 1µF or larger ceramic capacitor from IN pin to ground to get good power supply decoupling. |
| 2 | 2 | GND | Ground. |
| 3 | 3 | EN | Enable Pin. Drive EN high to turn on the regulator. Drive EN low to turn off the regulator. The EN pin has an internal pull-down resistance which ensures that the device is turned off when the EN pin is floated. |
| 4 | 4 | BP | Reference-Noise Bypass Pin (fixed voltage version only for SOT-23-5 package). Bypass with an external capacitor C _{BP} can reduce output noise to very low level. |
| 5 | 4 | ADJ | Feedback Input Pin (adjustable voltage version only). Connect this pin to the external resistor divider to adjust the output voltage. Place the resistors as close as possible to this pin. |
| | – | NC | Not Connected (fixed voltage version only). |
| 6 | 5 | OUT | Regulator Output Pin. It is recommended to use an output capacitor with effective capacitance in the range of 1µF to 10µF to ensure stability. This ceramic capacitor should be placed as close as possible to OUT pin. |

PACKAGE OUTLINE DIMENSIONS

SOT-23-6



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 | | |

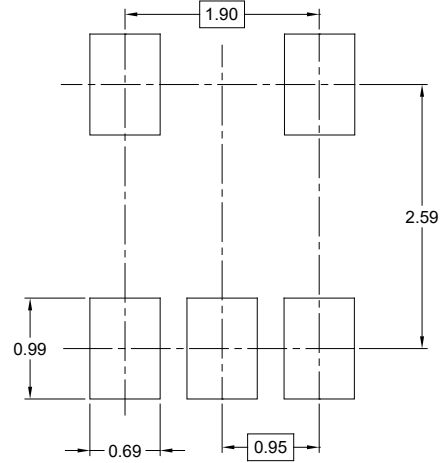
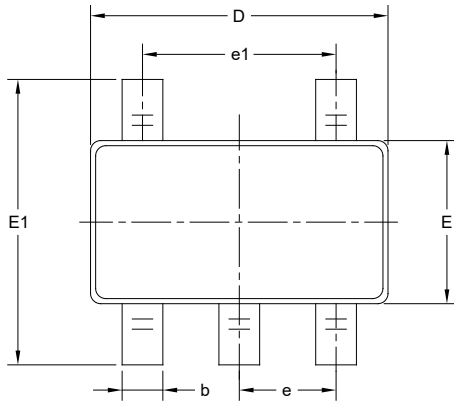
NOTES:

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.

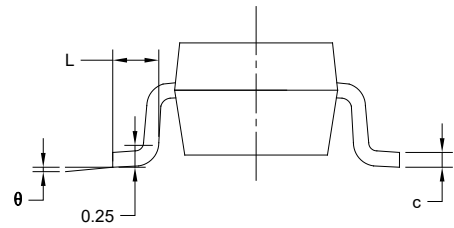
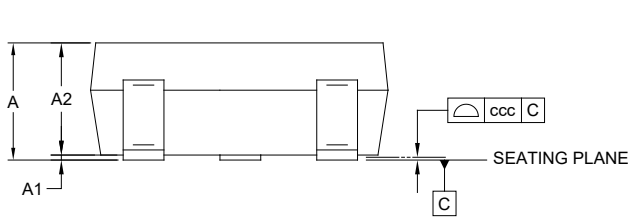
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

SOT-23-5



RECOMMENDED LAND PATTERN (Unit: mm)



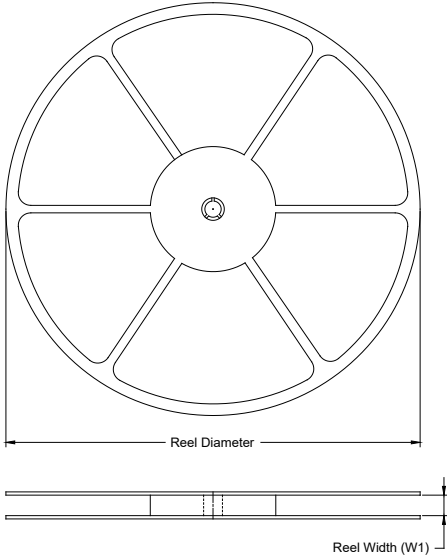
| Symbol | Dimensions In Millimeters | | |
|----------|---------------------------|-----|-------|
| | MIN | MOD | MAX |
| A | - | - | 1.450 |
| A1 | 0.000 | - | 0.150 |
| A2 | 0.900 | - | 1.300 |
| b | 0.300 | - | 0.500 |
| c | 0.080 | - | 0.220 |
| D | 2.750 | - | 3.050 |
| E | 1.450 | - | 1.750 |
| 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:

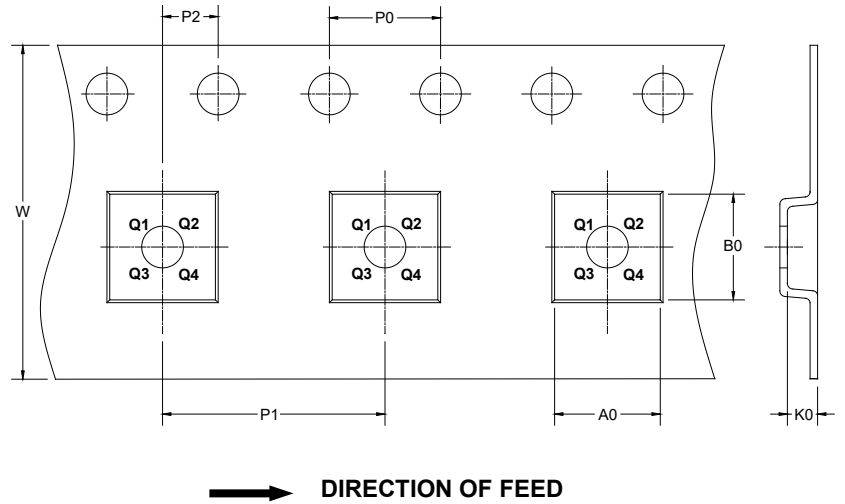
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2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-178.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

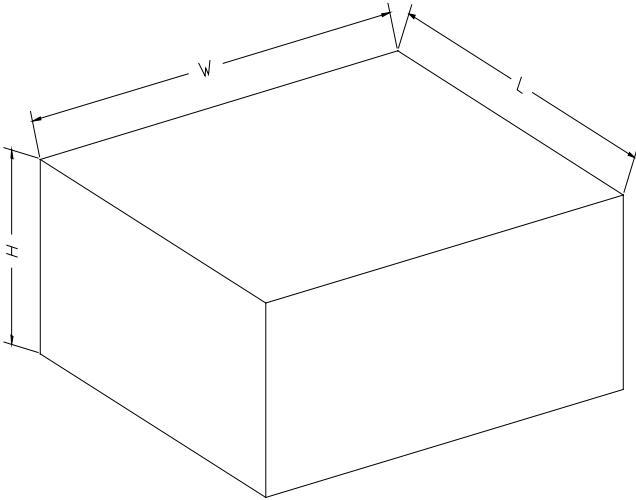
KEY PARAMETER LIST OF TAPE AND REEL

| 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-23-6 | 7" | 9.5 | 3.23 | 3.17 | 1.37 | 4.0 | 4.0 | 2.0 | 8.0 | 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 |

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