

SGM2036

300mA, Low Power, Low Dropout, RF Linear Regulators

GENERAL DESCRIPTION

The SGM2036 series low-power, low-dropout, CMOS linear voltage regulators operate from a 1.6V to 5.5V input voltage and deliver up to 300mA output current. They are the perfect choice for low voltage, low power applications. A low ground current makes this part attractive for battery operated power systems. The SGM2036 series also offer low dropout voltage to prolong battery life in portable electronics. Systems requiring a quiet voltage source, such as RF applications, will benefit from the SGM2036 series' low output noise and high PSRR.

Other features include a 10nA logic-controlled shutdown mode, short current limit and thermal shutdown protection.

The SGM2036 has auto-discharge function to quickly discharge V_{OUT} in the disable status.

The SGM2036 is available in Green UTDFN-1×1-4L, SOT-23-5 and SC70-5 packages. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- **Low Dropout Voltage**
- **Thermal Overload Protection**
- **Built-In Fold Back Protection Circuit**
- **20 μ A Low Supply Current**
- **10nA Logic-Controlled Shutdown**
- **1.6V to 5.5V Input Voltage Range**
- **Fixed Outputs of 0.8V, 0.9V, 1.0V, 1.05V, 1.1V, 1.2V, 1.3V, 1.35V, 1.5V, 1.8V, 1.85V, 2.1V, 2.2V, 2.3V, 2.5V, 2.6V, 2.7V, 2.8V, 2.85V, 2.9V, 3.0V, 3.1V, 3.3V, 3.6V, 4.2V, 4.4V and 5.0V**
- **Adjustable Output from 0.8V to 5.0V**
- **Short Auto-Discharge Function**
- **300mA Output Current**
- **High Output Voltage Accuracy**
- **Quick Start-Up Time**
- **-40°C to +85°C Operating Temperature Range**
- **Available in Green UTDFN-1×1-4L, SOT-23-5 and SC70-5 Packages**

APPLICATIONS

Cellular Telephones
Cordless Telephones
PCMCIA Cards
Modems
MP3 Player
Hand-Held Instruments
Palmtop Computers
Electronic Planners
Portable/Battery-Powered Equipment

PACKAGE/ORDERING INFORMATION

| MODEL | V _{OUT} (V) | PACKAGE DESCRIPTION | ORDERING NUMBER | PACKAGE MARKING | PACKING OPTION |
|--------------|----------------------|---------------------|-----------------------|-----------------|----------------------|
| SGM2036-0.8 | 0.8 | UTDFN-1×1-4L | SGM2036-0.8YUDH4G/TR | SF | Tape and Reel, 10000 |
| SGM2036-0.9 | 0.9 | UTDFN-1×1-4L | SGM2036-0.9YUDH4G/TR | NE | Tape and Reel, 10000 |
| SGM2036-1.0 | 1.0 | UTDFN-1×1-4L | SGM2036-1.0YUDH4G/TR | J3 | Tape and Reel, 10000 |
| SGM2036-1.05 | 1.05 | UTDFN-1×1-4L | SGM2036-1.05YUDH4G/TR | NF | Tape and Reel, 10000 |
| SGM2036-1.1 | 1.1 | UTDFN-1×1-4L | SGM2036-1.1YUDH4G/TR | O0 | Tape and Reel, 10000 |
| SGM2036-1.2 | 1.2 | UTDFN-1×1-4L | SGM2036-1.2YUDH4G/TR | HE | Tape and Reel, 10000 |
| SGM2036-1.3 | 1.3 | UTDFN-1×1-4L | SGM2036-1.3YUDH4G/TR | O1 | Tape and Reel, 10000 |
| SGM2036-1.35 | 1.35 | UTDFN-1×1-4L | SGM2036-1.35YUDH4G/TR | Z7 | Tape and Reel, 10000 |
| SGM2036-1.5 | 1.5 | UTDFN-1×1-4L | SGM2036-1.5YUDH4G/TR | HF | Tape and Reel, 10000 |
| SGM2036-1.8 | 1.8 | UTDFN-1×1-4L | SGM2036-1.8YUDH4G/TR | I0 | Tape and Reel, 10000 |
| SGM2036-1.85 | 1.85 | UTDFN-1×1-4L | SGM2036-1.85YUDH4G/TR | O2 | Tape and Reel, 10000 |
| SGM2036-2.1 | 2.1 | UTDFN-1×1-4L | SGM2036-2.1YUDH4G/TR | O3 | Tape and Reel, 10000 |
| SGM2036-2.2 | 2.2 | UTDFN-1×1-4L | SGM2036-2.2YUDH4G/TR | O4 | Tape and Reel, 10000 |
| SGM2036-2.3 | 2.3 | UTDFN-1×1-4L | SGM2036-2.3YUDH4G/TR | SA | Tape and Reel, 10000 |
| SGM2036-2.5 | 2.5 | UTDFN-1×1-4L | SGM2036-2.5YUDH4G/TR | O5 | Tape and Reel, 10000 |
| SGM2036-2.6 | 2.6 | UTDFN-1×1-4L | SGM2036-2.6YUDH4G/TR | N6 | Tape and Reel, 10000 |
| SGM2036-2.7 | 2.7 | UTDFN-1×1-4L | SGM2036-2.7YUDH4G/TR | O6 | Tape and Reel, 10000 |
| SGM2036-2.8 | 2.8 | UTDFN-1×1-4L | SGM2036-2.8YUDH4G/TR | I1 | Tape and Reel, 10000 |
| SGM2036-2.85 | 2.85 | UTDFN-1×1-4L | SGM2036-2.85YUDH4G/TR | O7 | Tape and Reel, 10000 |
| SGM2036-2.9 | 2.9 | UTDFN-1×1-4L | SGM2036-2.9YUDH4G/TR | O8 | Tape and Reel, 10000 |
| SGM2036-3.0 | 3.0 | UTDFN-1×1-4L | SGM2036-3.0YUDH4G/TR | I2 | Tape and Reel, 10000 |
| SGM2036-3.3 | 3.3 | UTDFN-1×1-4L | SGM2036-3.3YUDH4G/TR | I3 | Tape and Reel, 10000 |
| SGM2036-0.8 | 0.8 | SOT-23-5 | SGM2036-0.8YN5G/TR | SS7XX | Tape and Reel, 3000 |
| SGM2036-0.9 | 0.9 | SOT-23-5 | SGM2036-0.9YN5G/TR | SP0XX | Tape and Reel, 3000 |
| SGM2036-1.0 | 1.0 | SOT-23-5 | SGM2036-1.0YN5G/TR | SP1XX | Tape and Reel, 3000 |
| SGM2036-1.05 | 1.05 | SOT-23-5 | SGM2036-1.05YN5G/TR | SP2XX | Tape and Reel, 3000 |
| SGM2036-1.1 | 1.1 | SOT-23-5 | SGM2036-1.1YN5G/TR | SP3XX | Tape and Reel, 3000 |
| SGM2036-1.2 | 1.2 | SOT-23-5 | SGM2036-1.2YN5G/TR | SP4XX | Tape and Reel, 3000 |
| SGM2036-1.3 | 1.3 | SOT-23-5 | SGM2036-1.3YN5G/TR | SP5XX | Tape and Reel, 3000 |
| SGM2036-1.5 | 1.5 | SOT-23-5 | SGM2036-1.5YN5G/TR | SP6XX | Tape and Reel, 3000 |
| SGM2036-1.8 | 1.8 | SOT-23-5 | SGM2036-1.8YN5G/TR | SP7XX | Tape and Reel, 3000 |
| SGM2036-1.85 | 1.85 | SOT-23-5 | SGM2036-1.85YN5G/TR | SP8XX | Tape and Reel, 3000 |
| SGM2036-2.1 | 2.1 | SOT-23-5 | SGM2036-2.1YN5G/TR | SP9XX | Tape and Reel, 3000 |
| SGM2036-2.2 | 2.2 | SOT-23-5 | SGM2036-2.2YN5G/TR | SPAXX | Tape and Reel, 3000 |
| SGM2036-2.3 | 2.3 | SOT-23-5 | SGM2036-2.3YN5G/TR | SS9XX | Tape and Reel, 3000 |
| SGM2036-2.5 | 2.5 | SOT-23-5 | SGM2036-2.5YN5G/TR | SPBXX | Tape and Reel, 3000 |
| SGM2036-2.6 | 2.6 | SOT-23-5 | SGM2036-2.6YN5G/TR | SN5XX | Tape and Reel, 3000 |
| SGM2036-2.7 | 2.7 | SOT-23-5 | SGM2036-2.7YN5G/TR | SPCXX | Tape and Reel, 3000 |
| SGM2036-2.8 | 2.8 | SOT-23-5 | SGM2036-2.8YN5G/TR | SPDXX | Tape and Reel, 3000 |
| SGM2036-2.85 | 2.85 | SOT-23-5 | SGM2036-2.85YN5G/TR | SPEXX | Tape and Reel, 3000 |
| SGM2036-2.9 | 2.9 | SOT-23-5 | SGM2036-2.9YN5G/TR | SPFXX | Tape and Reel, 3000 |

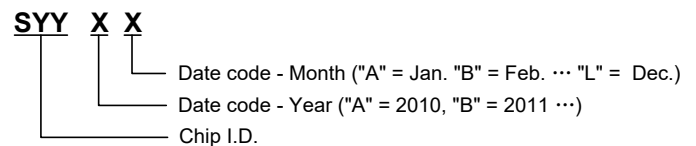
PACKAGE/ORDERING INFORMATION (continued)

| MODEL | V _{out} (V) | PACKAGE DESCRIPTION | ORDERING NUMBER | PACKAGE MARKING | PACKING OPTION |
|--------------|----------------------|---------------------|---------------------|-----------------|---------------------|
| SGM2036-3.0 | 3.0 | SOT-23-5 | SGM2036-3.0YN5G/TR | SQ0XX | Tape and Reel, 3000 |
| SGM2036-3.1 | 3.1 | SOT-23-5 | SGM2036-3.1YN5G/TR | SQ1XX | Tape and Reel, 3000 |
| SGM2036-3.3 | 3.3 | SOT-23-5 | SGM2036-3.3YN5G/TR | SQ2XX | Tape and Reel, 3000 |
| SGM2036-3.6 | 3.6 | SOT-23-5 | SGM2036-3.6YN5G/TR | SQ3XX | Tape and Reel, 3000 |
| SGM2036-4.2 | 4.2 | SOT-23-5 | SGM2036-4.2YN5G/TR | SQ4XX | Tape and Reel, 3000 |
| SGM2036-4.4 | 4.4 | SOT-23-5 | SGM2036-4.4YN5G/TR | SQ5XX | Tape and Reel, 3000 |
| SGM2036-5.0 | 5.0 | SOT-23-5 | SGM2036-5.0YN5G/TR | SQ6XX | Tape and Reel, 3000 |
| SGM2036-ADJ | Adjustable | SOT-23-5 | SGM2036-ADJYN5G/TR | SQ7XX | Tape and Reel, 3000 |
| SGM2036-0.8 | 0.8 | SC70-5 | SGM2036-0.8YC5G/TR | SSBXX | Tape and Reel, 3000 |
| SGM2036-0.9 | 0.9 | SC70-5 | SGM2036-0.9YC5G/TR | SQ8XX | Tape and Reel, 3000 |
| SGM2036-1.0 | 1.0 | SC70-5 | SGM2036-1.0YC5G/TR | SQ9XX | Tape and Reel, 3000 |
| SGM2036-1.05 | 1.05 | SC70-5 | SGM2036-1.05YC5G/TR | SQAXX | Tape and Reel, 3000 |
| SGM2036-1.1 | 1.1 | SC70-5 | SGM2036-1.1YC5G/TR | SQBXX | Tape and Reel, 3000 |
| SGM2036-1.2 | 1.2 | SC70-5 | SGM2036-1.2YC5G/TR | SQCXX | Tape and Reel, 3000 |
| SGM2036-1.3 | 1.3 | SC70-5 | SGM2036-1.3YC5G/TR | SQDXX | Tape and Reel, 3000 |
| SGM2036-1.5 | 1.5 | SC70-5 | SGM2036-1.5YC5G/TR | SQEXX | Tape and Reel, 3000 |
| SGM2036-1.8 | 1.8 | SC70-5 | SGM2036-1.8YC5G/TR | SQFXX | Tape and Reel, 3000 |
| SGM2036-1.85 | 1.85 | SC70-5 | SGM2036-1.85YC5G/TR | SR0XX | Tape and Reel, 3000 |
| SGM2036-2.1 | 2.1 | SC70-5 | SGM2036-2.1YC5G/TR | SR1XX | Tape and Reel, 3000 |
| SGM2036-2.2 | 2.2 | SC70-5 | SGM2036-2.2YC5G/TR | SR2XX | Tape and Reel, 3000 |
| SGM2036-2.3 | 2.3 | SC70-5 | SGM2036-2.3YC5G/TR | SS8XX | Tape and Reel, 3000 |
| SGM2036-2.5 | 2.5 | SC70-5 | SGM2036-2.5YC5G/TR | SR3XX | Tape and Reel, 3000 |
| SGM2036-2.6 | 2.6 | SC70-5 | SGM2036-2.6YC5G/TR | SN4XX | Tape and Reel, 3000 |
| SGM2036-2.7 | 2.7 | SC70-5 | SGM2036-2.7YC5G/TR | SR4XX | Tape and Reel, 3000 |
| SGM2036-2.8 | 2.8 | SC70-5 | SGM2036-2.8YC5G/TR | SR5XX | Tape and Reel, 3000 |
| SGM2036-2.85 | 2.85 | SC70-5 | SGM2036-2.85YC5G/TR | SR6XX | Tape and Reel, 3000 |
| SGM2036-2.9 | 2.9 | SC70-5 | SGM2036-2.9YC5G/TR | SR7XX | Tape and Reel, 3000 |
| SGM2036-3.0 | 3.0 | SC70-5 | SGM2036-3.0YC5G/TR | SR8XX | Tape and Reel, 3000 |
| SGM2036-3.1 | 3.1 | SC70-5 | SGM2036-3.1YC5G/TR | SR9XX | Tape and Reel, 3000 |
| SGM2036-3.3 | 3.3 | SC70-5 | SGM2036-3.3YC5G/TR | SRAXX | Tape and Reel, 3000 |
| SGM2036-3.6 | 3.6 | SC70-5 | SGM2036-3.6YC5G/TR | SRBXX | Tape and Reel, 3000 |
| SGM2036-4.2 | 4.2 | SC70-5 | SGM2036-4.2YC5G/TR | SRCXX | Tape and Reel, 3000 |
| SGM2036-4.4 | 4.4 | SC70-5 | SGM2036-4.4YC5G/TR | SRDXX | Tape and Reel, 3000 |
| SGM2036-5.0 | 5.0 | SC70-5 | SGM2036-5.0YC5G/TR | SREXX | Tape and Reel, 3000 |
| SGM2036-ADJ | Adjustable | SC70-5 | SGM2036-ADJYC5G/TR | SRFXX | Tape and Reel, 3000 |

NOTE:
1. XX = Date 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.

MARKING INFORMATION



For example: SRFFA (2015, January)

ABSOLUTE MAXIMUM RATINGS

| | |
|--|------------------------------|
| IN to GND | -0.3V to 6V |
| Output Short-Circuit Duration..... | Infinite |
| EN to GND..... | -0.3V to 6V |
| OUT, BP/FB to GND | -0.3V to ($V_{IN} + 0.3V$) |
| Power Dissipation, P_D @ $T_A = +25^\circ C$ | |
| UTDFN-1×1-4L | 400mW |
| SOT-23-5..... | 390mW |
| SC70-5..... | 340mW |
| Package Thermal Resistance | |
| UTDFN-1×1-4L, θ_{JA} | 280°C/W |
| SOT-23-5, θ_{JA} | 285°C/W |
| SC70-5, θ_{JA} | 330°C/W |
| Junction Temperature | +150°C |
| Storage Temperature Range..... | -65°C to +150°C |
| Lead Temperature (Soldering, 10s) | +260°C |
| ESD Susceptibility | |
| HBM..... | 4000V |
| MM..... | 400V |

RECOMMENDED OPERATING CONDITIONS

| | |
|-----------------------------------|----------------|
| Operating Voltage Range..... | 1.6V to 5.5V |
| Operating Temperature Range | -40°C to +85°C |

OVERSTRESS CAUTION

Stresses beyond those listed may cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational section of the specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

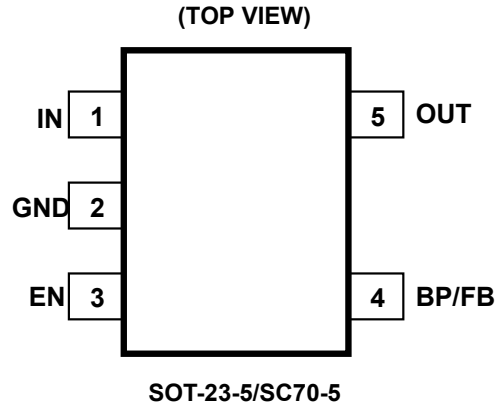
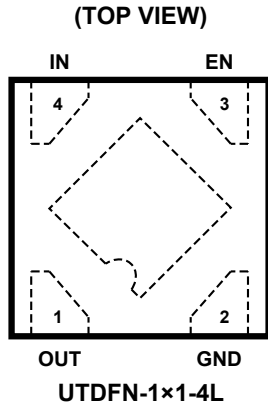
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. 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 very small parametric changes could cause the device not to meet its published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time.

PIN CONFIGURATIONS



PIN DESCRIPTION

| PIN | | NAME | FUNCTION |
|---------------|---------------------|------|---|
| UTDNFN-1x1-4L | SOT-23-5/ SC70-5 | | |
| 1 | 5 | OUT | Regulator Output. |
| 2 | 2 | GND | Ground. |
| 3 | 3 | EN | Enable Pin. This pin has an internal pull-down resistor. A logic low reduces the supply current to less than 1µA. Connect to IN for normal operation. |
| 4 | 1 | IN | Regulator Input. Supply voltage can range from 1.6V to 5.5V. Bypass with a 1µF capacitor to GND. |
| - | 4 | BP | Reference-Noise Bypass Pin (fixed voltage version only). Bypass with a low-leakage 0.01µF ceramic capacitor for reduced noise at the output. The capacitor is recommended to be placed very close to the pin for high PSRR. |
| | | FB | Feedback Pin (adjustable voltage version only). This is used to set the output voltage of the device. |
| Exposed Pad | - | - | The exposed pad should be connected to a large ground plane to maximize thermal performance. |

ELECTRICAL CHARACTERISTICS

(V_{IN} = V_{OUT (NOMINAL)} + 0.5V or 2.5V, whichever is greater, Full = -40°C to +85°C, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | TEMP | MIN | TYP | MAX | UNITS | |
|---|---|---|--|------------------------|-------|------|-------------------|--|
| Input Voltage | V _{IN} | | +25°C | 1.6 | | 5.5 | V | |
| Output Voltage Accuracy | | I _{OUT} = 0.1mA | +25°C | -2.5 | | +2.5 | % | |
| Feedback Voltage | V _{FB} | I _{OUT} = 0.1mA, SGM2036-ADJ | +25°C | 0.78 | 0.8 | 0.82 | V | |
| Maximum Output Current ⁽¹⁾ | | | +25°C | 300 | | | mA | |
| Current Limit | I _{LIM} | | +25°C | 360 | 560 | | mA | |
| Supply Pin Current | I _Q | No Load, V _{EN} = V _{IN} | +25°C | | 20 | 26 | μA | |
| Dropout Voltage ⁽²⁾ | V _{DROP} | I _{OUT} = 300mA | V _{OUT} = 0.8V | +25°C | 940 | 1200 | mV | |
| | | | V _{OUT} = 0.9V | +25°C | 840 | 1100 | | |
| | | | 1.0V ≤ V _{OUT} < 1.1V | +25°C | 780 | 1000 | | |
| | | | 1.1V ≤ V _{OUT} < 1.2V | +25°C | 680 | 900 | | |
| | | | 1.2V ≤ V _{OUT} < 1.5V | +25°C | 590 | 800 | | |
| | | | 1.5V ≤ V _{OUT} < 1.8V | +25°C | 420 | 550 | | |
| | | | 1.8V ≤ V _{OUT} < 2.1V | +25°C | 320 | 420 | | |
| | | | 2.1V ≤ V _{OUT} < 2.5V | +25°C | 260 | 340 | | |
| | | | 2.5V ≤ V _{OUT} < 3.0V | +25°C | 215 | 280 | | |
| | | | 3.0V ≤ V _{OUT} < 3.6V | +25°C | 190 | 250 | | |
| | | 3.6V ≤ V _{OUT} ≤ 5.0V | +25°C | 165 | 210 | | | |
| Line Regulation | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | V _{IN} = 1.6V or (V _{OUT} + 0.5V) to 5.5V, I _{OUT} = 1mA | 1.8V ≤ V _{OUT} ≤ 3.3V | +25°C | 0.01 | 0.06 | %V | |
| | | | V _{OUT} < 1.8V or V _{OUT} > 3.3V | +25°C | 0.01 | 0.1 | | |
| Load Regulation | ΔV _{OUT} | I _{OUT} = 0.1mA to 300mA | +25°C | 12 | 40 | mV | | |
| | | I _{OUT} = 0.1mA to 300mA, SGM2036-ADJ | +25°C | 0.5 | 10 | | | |
| Short Current Limit | I _{SHORT} | V _{OUT} = 0V | +25°C | | 200 | | mA | |
| Power Supply Rejection Ratio | PSRR | C _{BP} = 0μF, I _{OUT} = 30mA, C _{OUT} = 1μF, V _{IN} = V _{OUT} + 1V, ΔV _{RIPPLE} = 0.2V _{P-P} | f = 217Hz | +25°C | 80 | | dB | |
| | | | f = 1kHz | +25°C | 75 | | | |
| | | | C _{BP} = 0.01μF, I _{OUT} = 30mA, C _{OUT} = 1μF, V _{IN} = V _{OUT} + 1V, ΔV _{RIPPLE} = 0.2V _{P-P} | f = 217Hz | +25°C | 82 | | |
| | | | f = 1kHz | +25°C | 70 | | | |
| Output Voltage Noise | e _n | C _{BP} = 0μF, f = 10Hz to 100kHz, C _{OUT} = 1μF, V _{OUT} = 1.8V | I _{OUT} = 0mA | +25°C | 100 | | μV _{RMS} | |
| | | | I _{OUT} = 30mA | +25°C | 200 | | | |
| | | | C _{BP} = 0.01μF, f = 10Hz to 100kHz, C _{OUT} = 1μF, V _{OUT} = 1.8V | I _{OUT} = 0mA | +25°C | 30 | | |
| | | | I _{OUT} = 30mA | +25°C | 75 | | | |
| Output Voltage Temperature Coefficient ⁽³⁾ | $\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$ | I _{OUT} = 0.1mA | Full | | 30 | | ppm/°C | |
| SHUTDOWN | | | | | | | | |
| EN Input Threshold | V _{IH} | V _{IN} = 1.6V to 5.5V | Full | 1.5 | | | V | |
| | V _{IL} | | Full | | | 0.4 | | |
| EN Input Bias Current | I _{BH} | V _{EN} = 5.5V | Full | | 0.8 | 2 | μA | |
| | I _{BL} | V _{EN} = 0V | Full | | 0.01 | 1 | | |
| Shutdown Supply Current | I _{SHDN} | V _{EN} = 0V | Full | | 0.01 | 1 | μA | |
| Start-Up Time ⁽⁴⁾ | t _{STR} | C _{OUT} = 1μF, No Load | +25°C | | 30 | | μs | |
| R _{ON} of Discharge MOSFET | | V _{IN} = 4.0V, V _{EN} = 0V | +25°C | | 50 | | Ω | |

ELECTRICAL CHARACTERISTICS (continued)

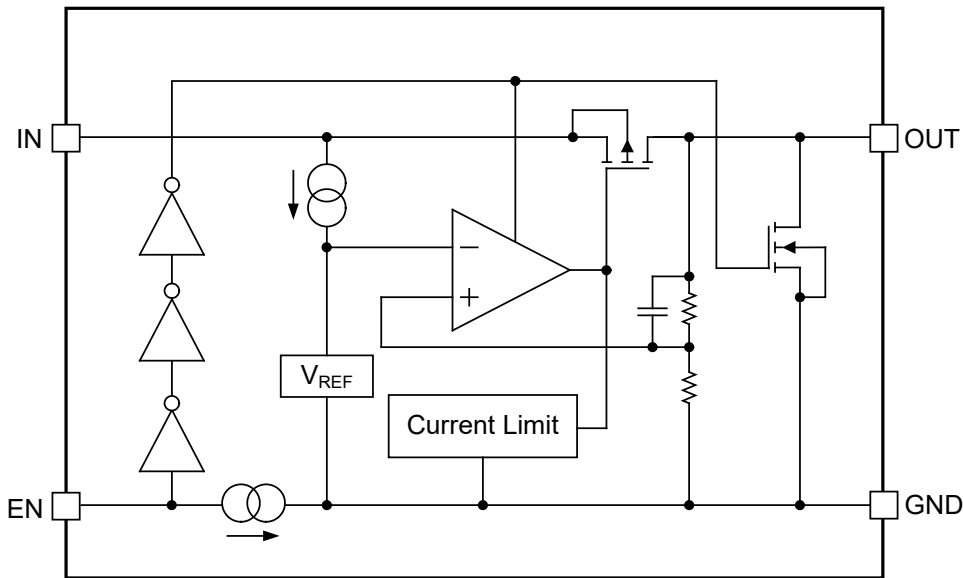
($V_{IN} = V_{OUT(NOMINAL)} + 0.5V$ or $2.5V$, whichever is greater, Full = $-40^{\circ}C$ to $+85^{\circ}C$, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | TEMP | MIN | TYP | MAX | UNITS |
|------------------------------|-------------------|------------|------|-----|-----|-----|-------------|
| THERMAL PROTECTION | | | | | | | |
| Thermal Shutdown Temperature | T_{SHDN} | | | | 140 | | $^{\circ}C$ |
| Thermal Shutdown Hysteresis | ΔT_{SHDN} | | | | 15 | | $^{\circ}C$ |

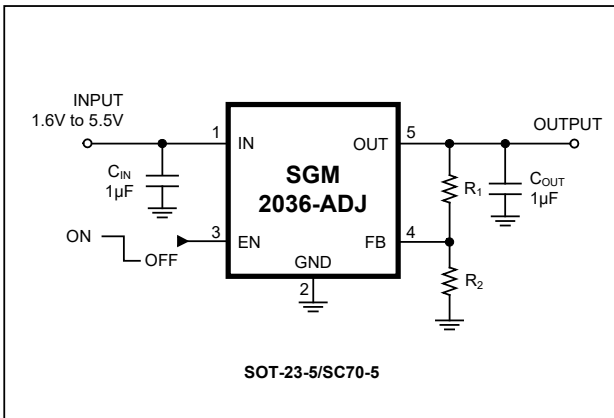
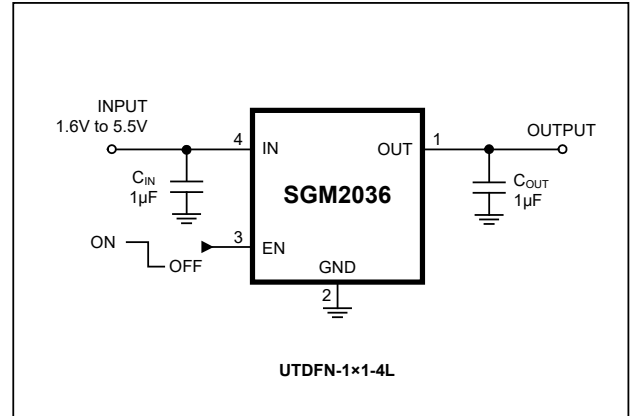
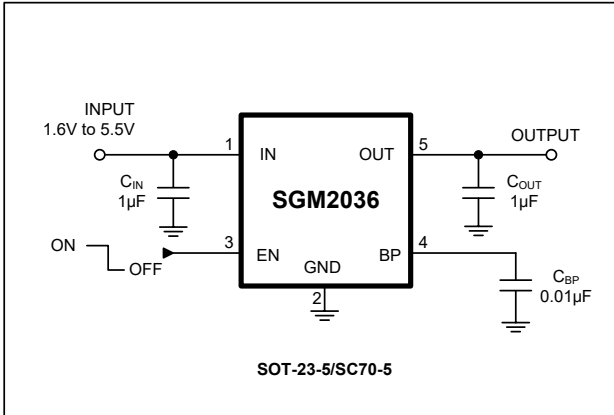
NOTES:

1. Maximum output current is affected by the PCB layout, size of metal trace, the thermal conduction path between metal layers, ambient temperature and the other environment factors of system. Attention should be paid to the dropout voltage when $V_{IN} < V_{OUT} + V_{DROP}$.
2. The dropout voltage is defined as $V_{IN} - V_{OUT}$, when V_{OUT} is 100mV below the value of V_{OUT} for $V_{IN} = V_{OUT} + 0.5V$ or $2.5V$.
3. Output voltage temperature coefficient is defined as the worst-case voltage change divided by the total temperature range.
4. Time needed for V_{OUT} to reach 90% of final value.

BLOCK DIAGRAM



TYPICAL APPLICATION CIRCUITS



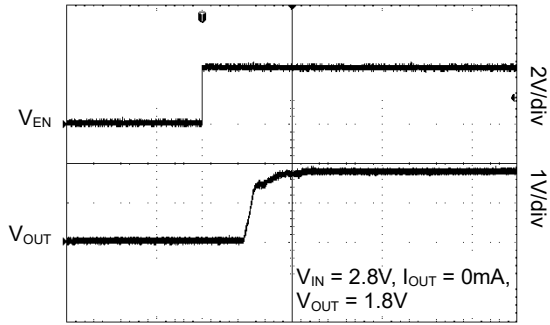
NOTE: Choose $R_2 = 160k\Omega$ to maintain a $5\mu A$ minimum load.
Calculate the value for R_1 using the following equation:

$$R_1 = R_2 \times \left(\frac{V_{OUT}}{0.8V} - 1 \right)$$

TYPICAL PERFORMANCE CHARACTERISTICS

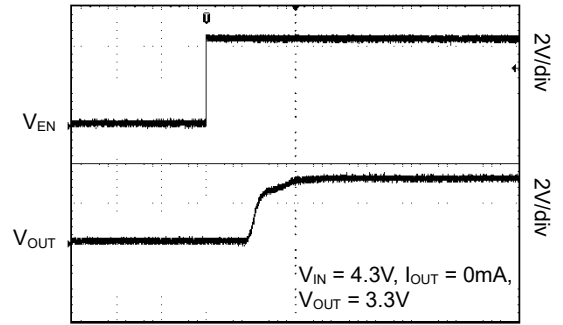
$V_{EN} = V_{IN}$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0\mu F$, $T_A = +25^\circ C$, unless otherwise noted.

Turn On Speed with EN Pin



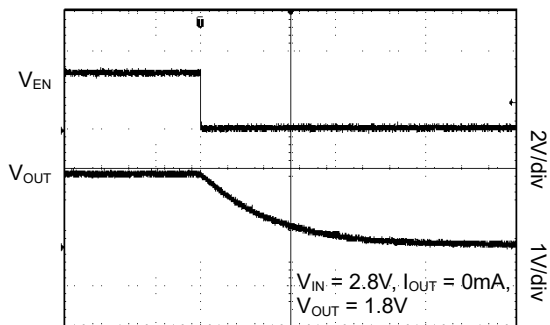
Time (20µs/div)

Turn On Speed with EN Pin



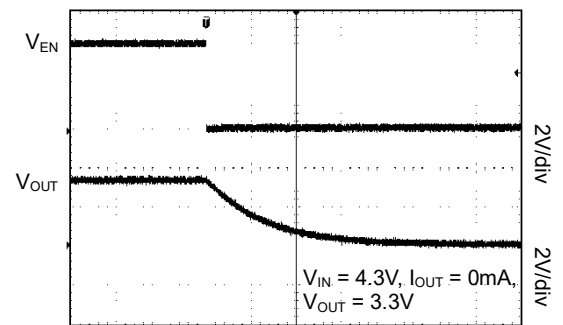
Time (20µs/div)

Turn Off Speed with EN Pin



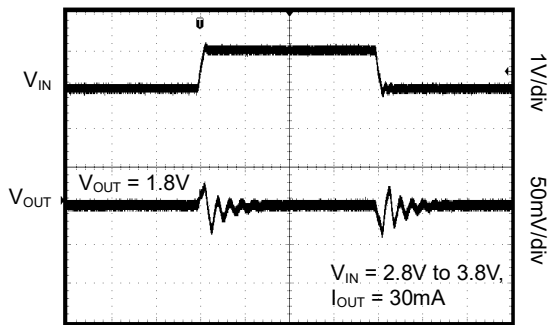
Time (40µs/div)

Turn Off Speed with EN Pin



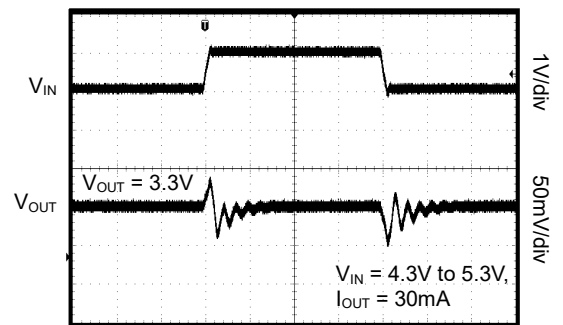
Time (40µs/div)

Line Transient Response



Time (40µs/div)

Line Transient Response

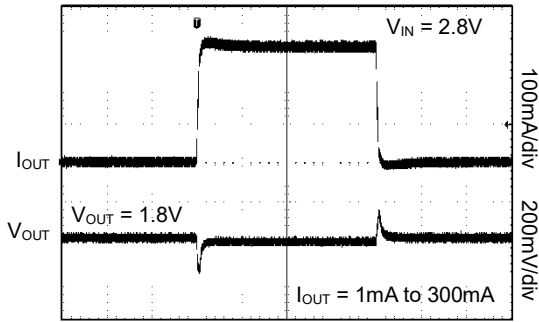


Time (40µs/div)

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

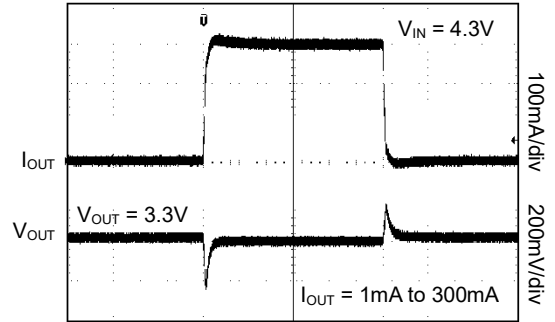
$V_{EN} = V_{IN}$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0\mu F$, $T_A = +25^\circ C$, unless otherwise noted.

Load Transient Response



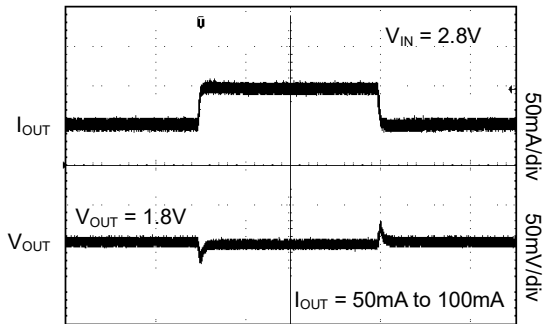
Time (100µs/div)

Load Transient Response



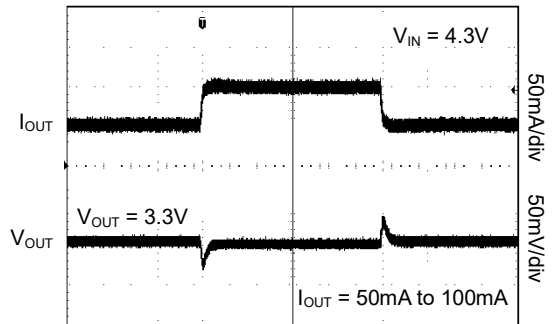
Time (100µs/div)

Load Transient Response



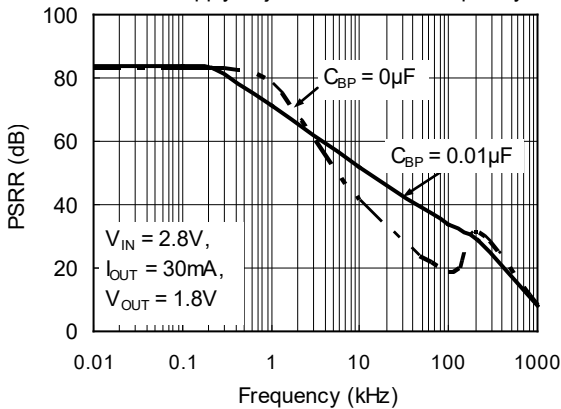
Time (100µs/div)

Load Transient Response

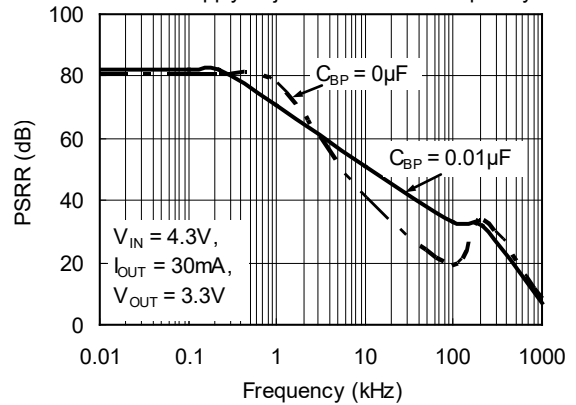


Time (100µs/div)

Power Supply Rejection Ratio vs. Frequency

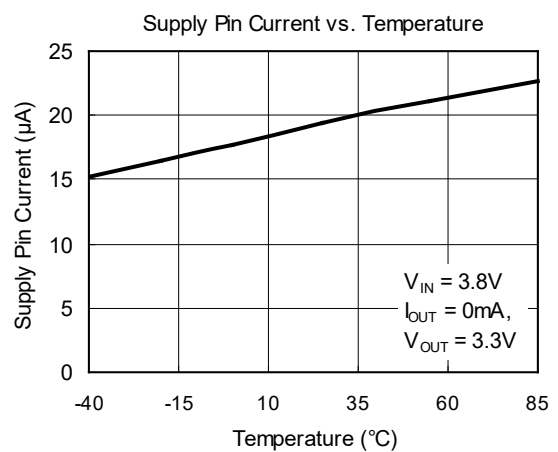
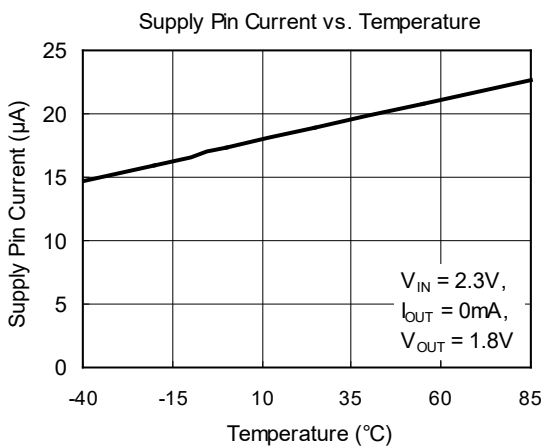
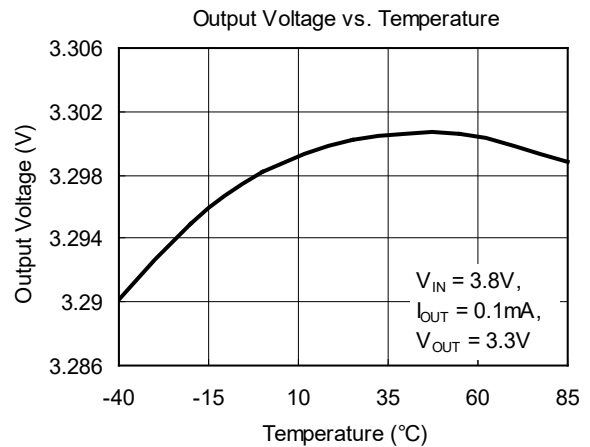
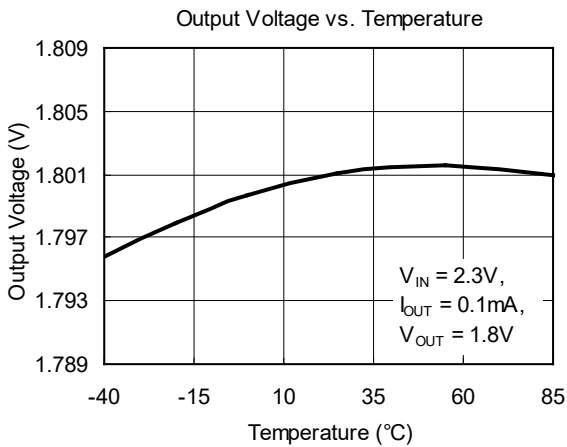
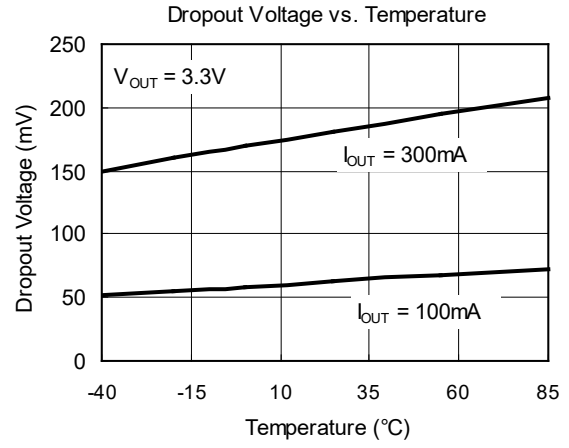
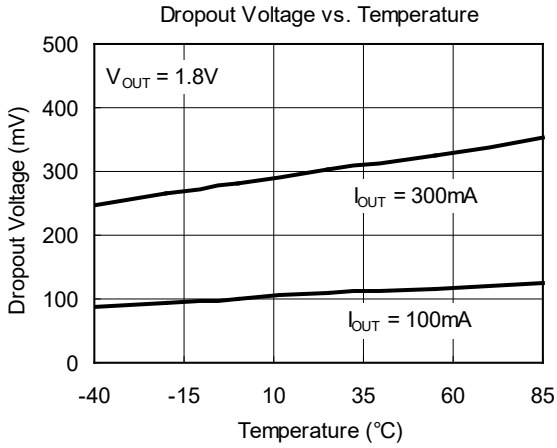


Power Supply Rejection Ratio vs. Frequency



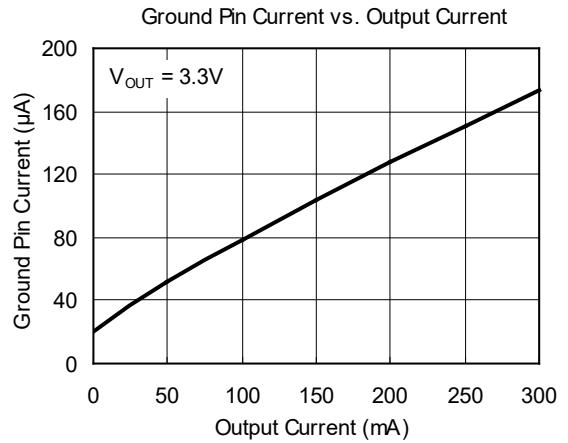
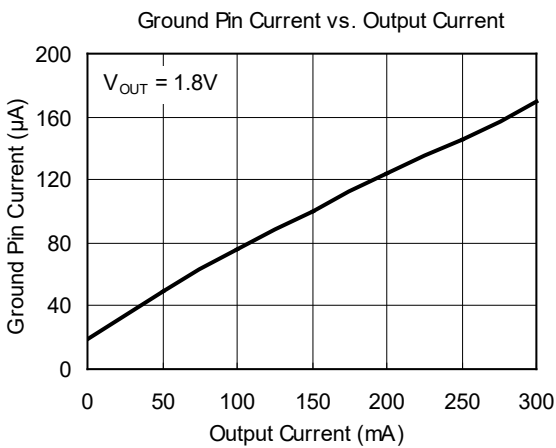
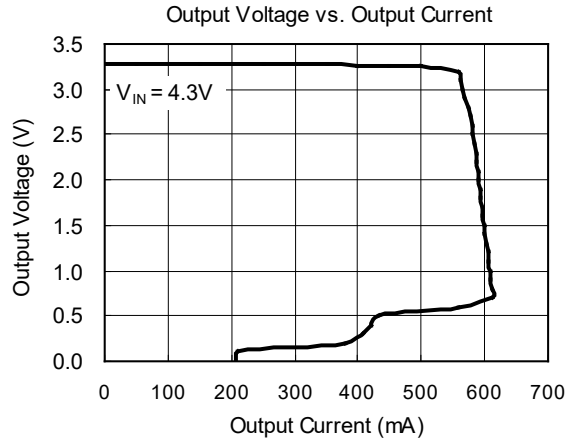
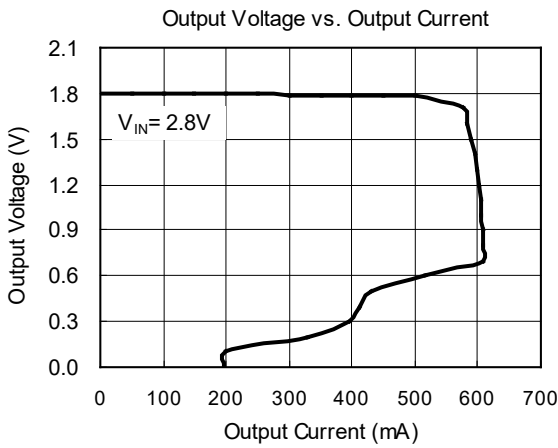
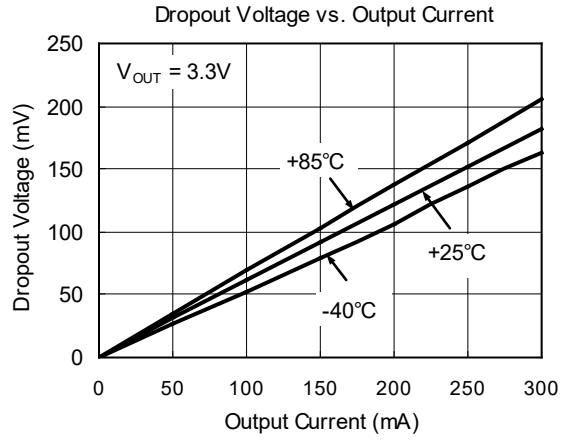
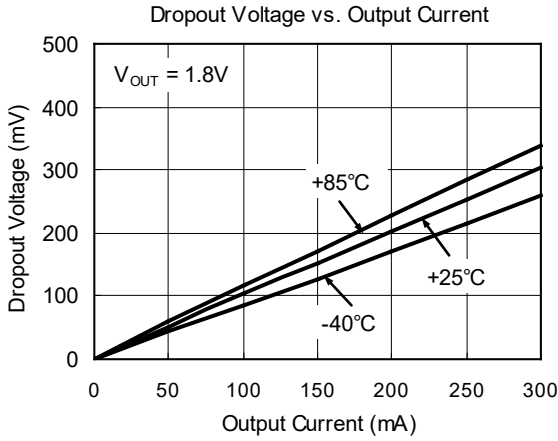
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{EN} = V_{IN}$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0\mu F$, $T_A = +25^\circ C$, unless otherwise noted.



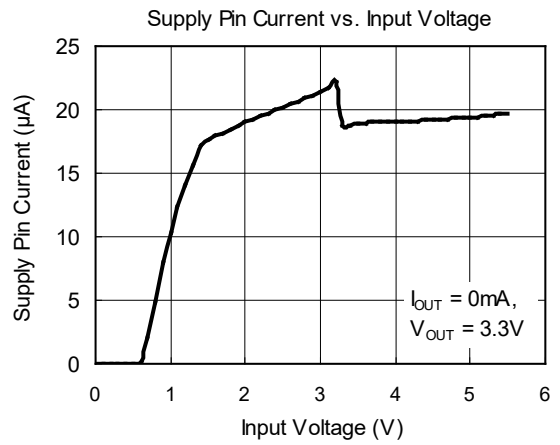
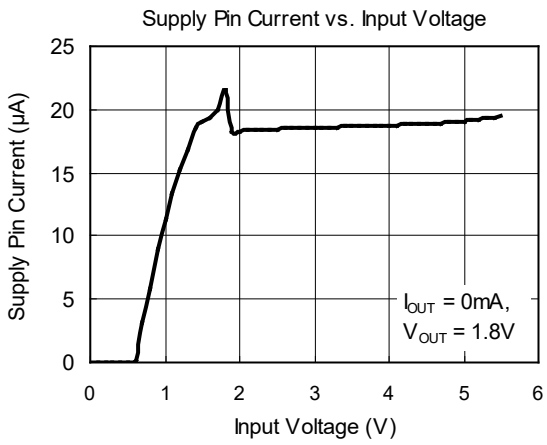
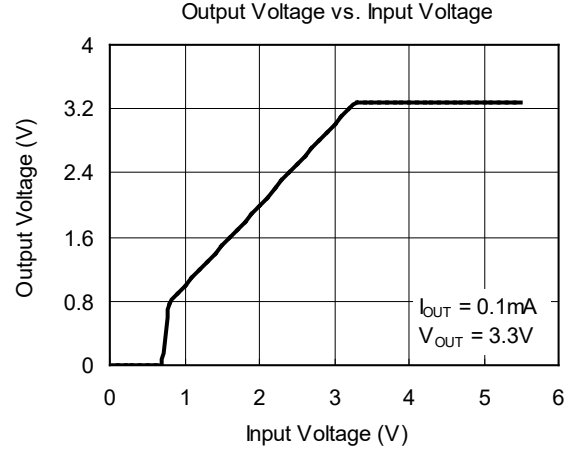
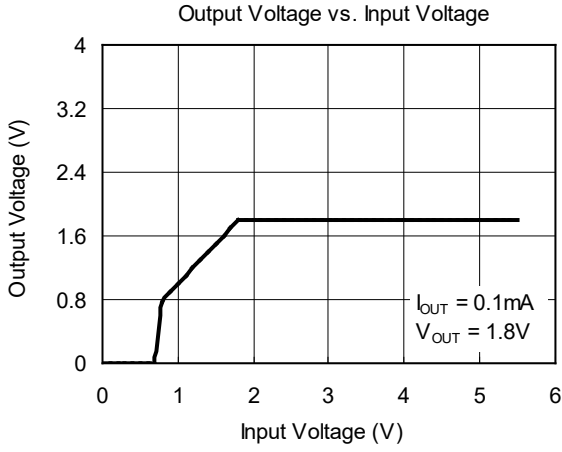
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{EN} = V_{IN}$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0\mu F$, $T_A = +25^\circ C$, unless otherwise noted.



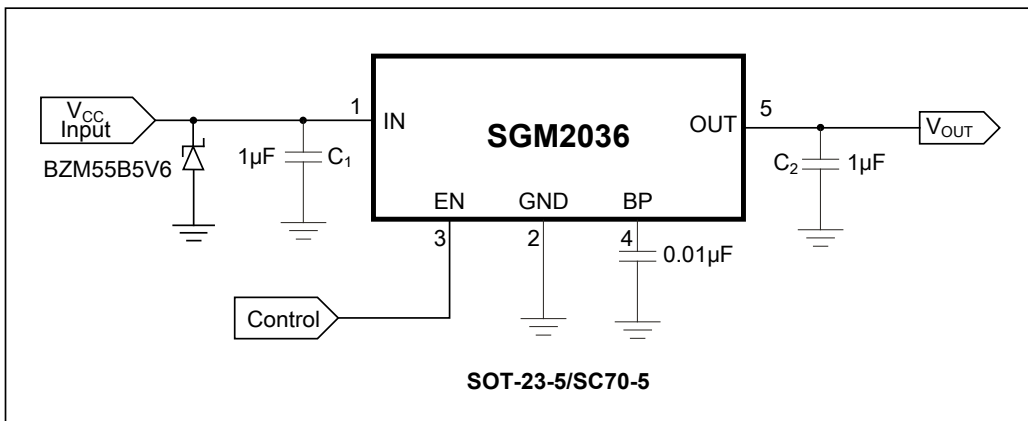
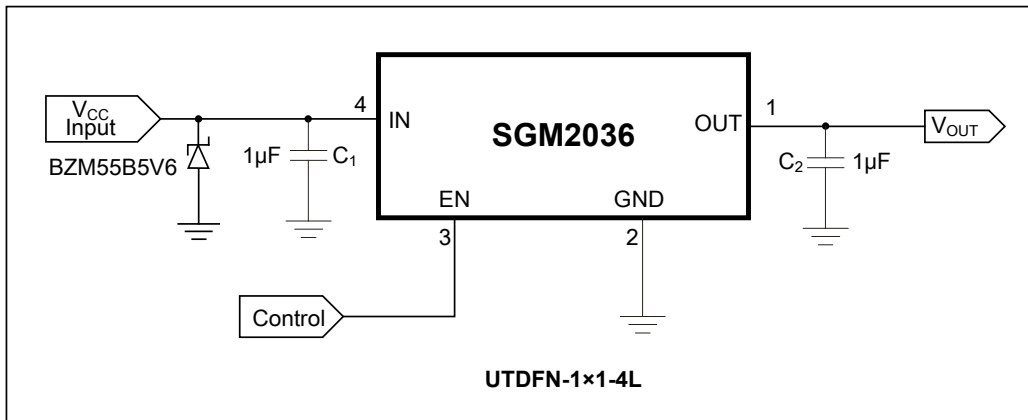
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$V_{EN} = V_{IN}$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0\mu F$, $T_A = +25^\circ C$, unless otherwise noted.



APPLICATION NOTE

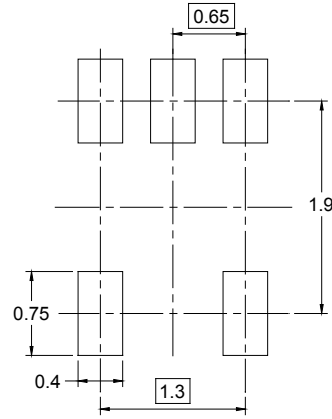
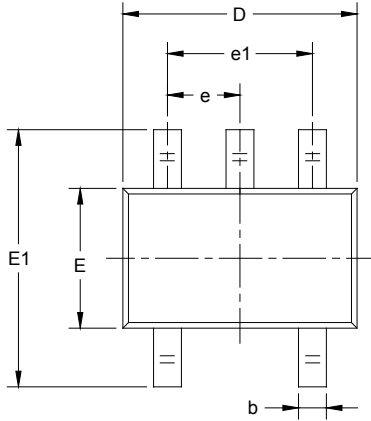
When LDO is used in handheld products, attention must be paid to voltage spikes which could damage SGM2036. In such applications, voltage spikes will be generated at charger interface and V_{BUS} pin of USB interface when charger adapters and USB equipments are hot-plugged. Besides this, handheld products will be tested on the production line without battery. Test engineer will apply power from the connector pin which connects with positive pole of the battery. When external power supply is turned on suddenly, the voltage spikes will be generated at the battery connector. The voltage spikes will be very high, and it always exceeds the absolute maximum input voltage (6.0V) of LDO. In order to get robust design, design engineer needs to clear up this voltage spike. Zener diode is a cheap and effective solution to eliminate such voltage spike. For example, BZM55B5V6 is a 5.6V small package Zener diode which can be used to remove voltage spikes in cell phone designs. The schematic is shown below.



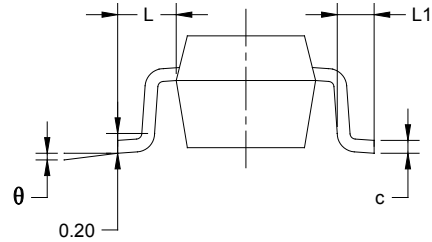
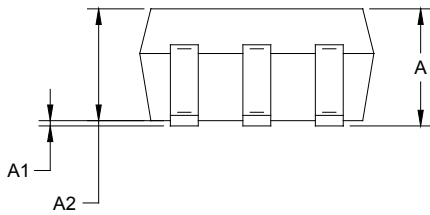
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

SC70-5



RECOMMENDED LAND PATTERN (Unit: mm)

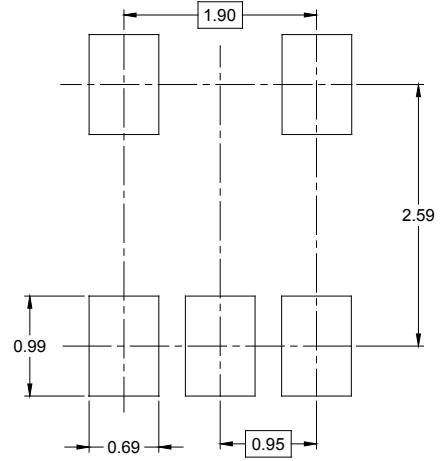
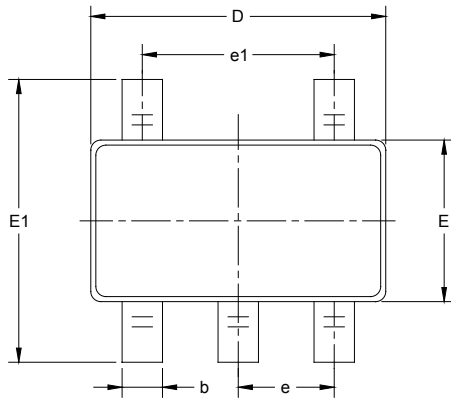


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|------------------------------|-------|-------------------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.150 | 0.350 | 0.006 | 0.014 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.65 TYP | | 0.026 TYP | |
| e1 | 1.300 BSC | | 0.051 BSC | |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

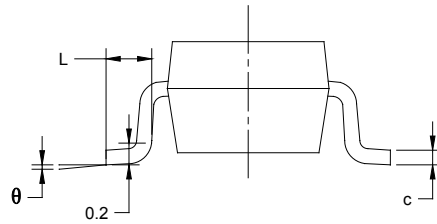
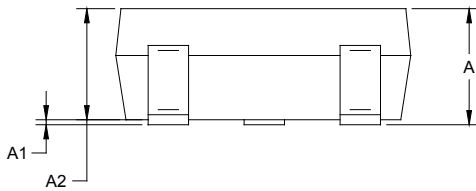
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

SOT-23-5



RECOMMENDED LAND PATTERN (Unit: mm)

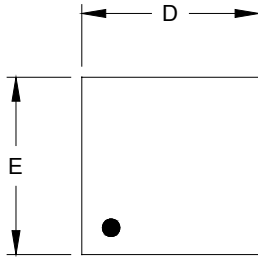


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|------------------------------|-------|-------------------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 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° |

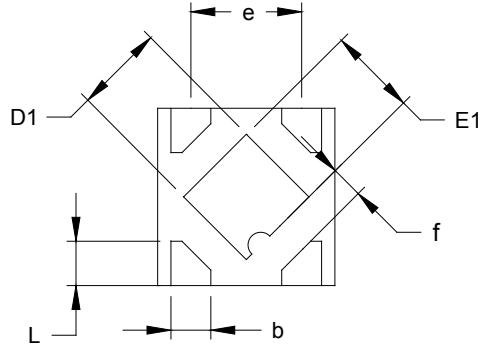
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

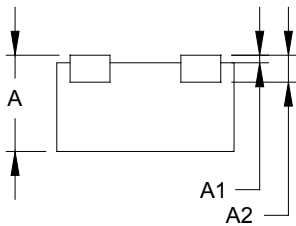
UTDFN-1×1-4L



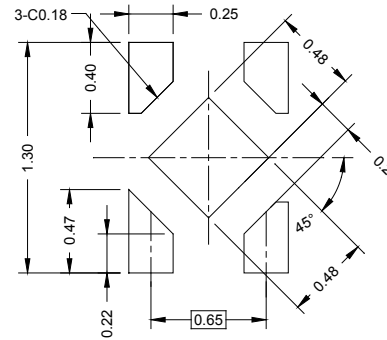
TOP VIEW



BOTTOM VIEW



SIDE VIEW



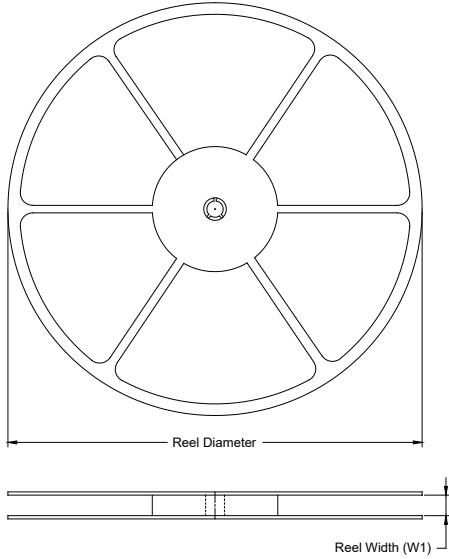
RECOMMENDED LAND PATTERN (Unit: mm)

| Symbol | Dimensions In Millimeters | | |
|--------|------------------------------|-------|-------|
| | MIN | MOD | MAX |
| A | 0.500 | 0.550 | 0.600 |
| A1 | 0.000 | | 0.050 |
| A2 | 0.152 REF | | |
| D | 0.950 | 1.000 | 1.050 |
| D1 | 0.450 | 0.500 | 0.550 |
| E | 0.950 | 1.000 | 1.050 |
| E1 | 0.450 | 0.500 | 0.550 |
| b | 0.175 | 0.225 | 0.275 |
| e | 0.625 BSC | | |
| f | 0.195 REF | | |
| L | 0.200 | 0.250 | 0.300 |

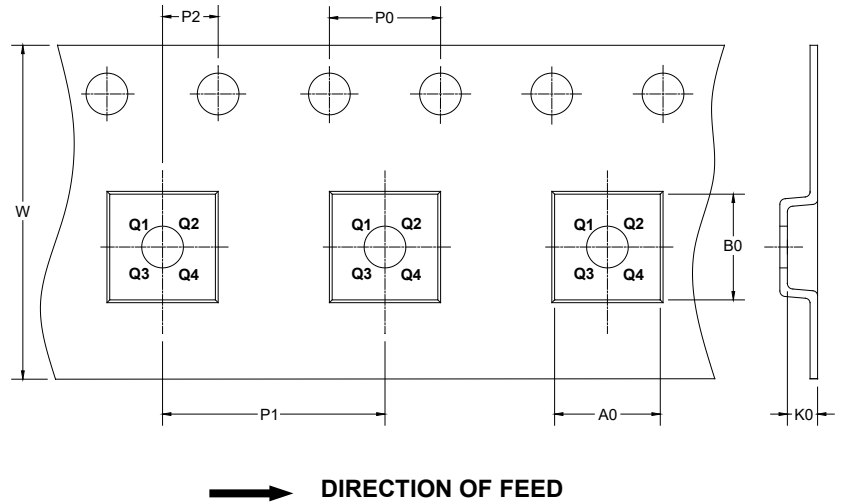
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

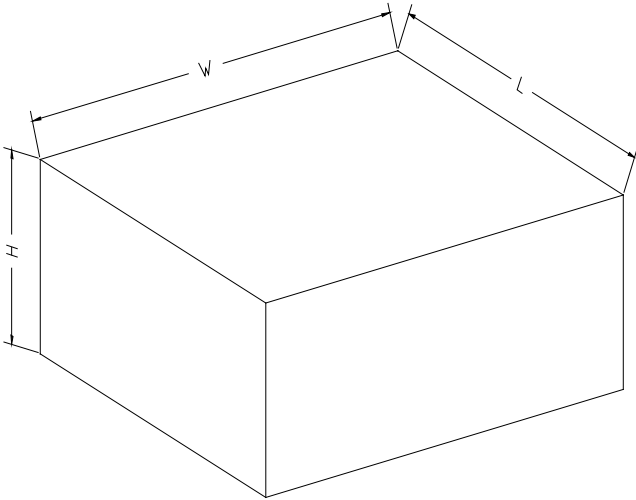
KEY PARAMETER LIST OF TAPE AND REEL

| Package Type | Reel Diameter | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P0 (mm) | P1 (mm) | P2 (mm) | W (mm) | Pin1 Quadrant |
|--------------|---------------|--------------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| SC70-5 | 7" | 9.5 | 2.25 | 2.55 | 1.20 | 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 |
| UTDFN-1×1-4L | 7" | 9.0 | 1.20 | 1.20 | 0.60 | 4.0 | 2.0 | 2.0 | 8.0 | Q1 |

DD0001

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