



SGM8773

High Voltage, High Precision, Push-Pull, Dual Differential Comparator

GENERAL DESCRIPTION

The SGM8773 is a dual, high voltage, high precision differential voltage comparator that can operate from a single supply or dual supplies over a wide voltage range. The device has two independent voltage comparators. All the features make the device suitable for industrial equipment.

For single supply application, the difference voltage between the dual supplies is 2.8V to 36V. Input common mode voltage is 1.5V lower than $+V_S$. Low supply current is independent of the supply voltage. The SGM8773 also has a push-pull output structure and can save external pull-up resistance in applications where PCB sizes are limited. Due to the input offset voltage of 2.4mV (MAX), it can be applied as a precision comparator.

The SGM8773 is available in Green TDFN-3×3-8L and SOIC-8 packages. The SGM8773 is specified over the extended -40°C to +125°C temperature range.

FEATURES

- **Wide Supply Ranges**
Single Supply: 2.8V to 36V
Dual Supplies: $\pm 1.4V$ to $\pm 18V$
- **Push-Pull Output Structure**
- **Low Supply Current: 330 μ A (TYP) Independent of Supply Voltage**
- **Ultra-Low Input Offset Voltage: 2.4mV (MAX)**
- **Ultra-Low Input Bias Current: $\pm 20pA$ (TYP)**
- **Minimum Input Common Mode Voltage: $-V_S$**
- **Maximum Differential Input Voltage: +36V/-36V**
- **CMOS/TTL-Compatible Output**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green SOIC-8 and TDFN-3×3-8L Packages**

APPLICATIONS

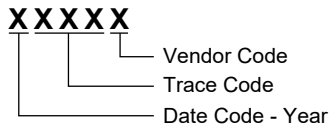
Power System
Battery Monitor
Industrial Control

PACKAGE/ORDERING INFORMATION

| MODEL | PACKAGE DESCRIPTION | SPECIFIED TEMPERATURE RANGE | ORDERING NUMBER | PACKAGE MARKING | PACKING OPTION |
|---------|---------------------|-----------------------------|------------------|-------------------------|---------------------|
| SGM8773 | SOIC-8 | -40°C to +125°C | SGM8773XS8G/TR | SGM 8773XS8 XXXXX | Tape and Reel, 4000 |
| | TDFN-3x3-8L | -40°C to +125°C | SGM8773XTDB8G/TR | SGM 8773DB XXXXX | 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

| | |
|--|--|
| Supply Voltage, +V _S to -V _S | 40V |
| Differential Input Voltage, V _{ID} | 40V |
| Input/Output Voltage Range | (-V _S) - 0.3V to (+V _S) + 0.3V |
| Junction Temperature | +150°C |
| Storage Temperature Range | -65°C to +150°C |
| Lead Temperature (Soldering, 10s) | +260°C |
| ESD Susceptibility | |
| HBM | 2500V |
| MM | 400V |
| CDM | 1000V |

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.

RECOMMENDED OPERATING CONDITIONS

| | |
|-----------------------------------|-----------------|
| Operating Temperature Range | -40°C to +125°C |
| Power Supply Range | 2.8V to 36V |

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.

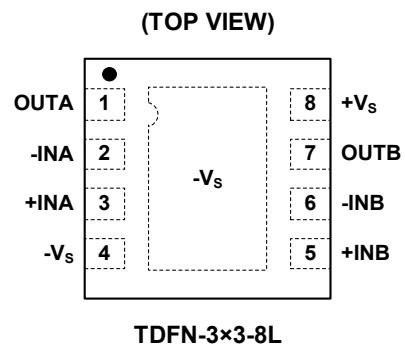
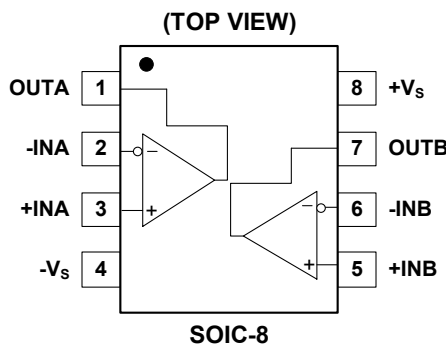
OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATIONS



ELECTRICAL CHARACTERISTICS

(At $T_A = +25^\circ\text{C}$, $V_S = \pm 1.4\text{V}$ to $\pm 18\text{V}$, Full = -40°C to $+125^\circ\text{C}$, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | TEMP | MIN | TYP | MAX | UNITS |
|--|--------------|--|---------------------|--------|----------|-------------------|---------------|
| Input Offset Voltage | V_{OS} | $V_{CM} = 0\text{V}$ | $+25^\circ\text{C}$ | | 0.6 | 2.4 | mV |
| | | | Full | | | 2.8 | |
| Input Bias Current | I_B | $V_{CM} = 0\text{V}$ | $+25^\circ\text{C}$ | | ± 20 | ± 240 | pA |
| Input Offset Current | I_{OS} | $V_{CM} = 0\text{V}$ | $+25^\circ\text{C}$ | | ± 20 | ± 320 | pA |
| Maximum Differential Input Voltage | $ V_{ID} $ | | Full | | | $(+V_S) - (-V_S)$ | V |
| Maximum Input Difference Bias Current | $ I_{ID} $ | $V_S = \pm 18\text{V}$, $V_{ID} = \pm 18\text{V}$ | $+25^\circ\text{C}$ | | 2.2 | 3 | μA |
| | | | Full | | | 5 | |
| Input Common Mode Voltage Range ⁽¹⁾ | V_{CM} | | Full | $-V_S$ | | $(+V_S) - 1.5$ | V |
| Common Mode Rejection Ratio | CMRR | $V_S = \pm 18\text{V}$, $V_{CM} = -V_S$ to $(+V_S) - 1.5\text{V}$ | $+25^\circ\text{C}$ | 96 | 116 | | dB |
| | | | Full | 80 | | | |
| Power Supply Rejection Ratio | PSRR | $V_S = 2.8\text{V}$ to 36V | $+25^\circ\text{C}$ | 98 | 116 | | dB |
| | | | Full | 95 | | | |
| Output Voltage Swing from Rail | V_{OH} | $I_{SOURCE} = 8\text{mA}$, $V_{ID} = 0.2\text{V}$ | $+25^\circ\text{C}$ | | 360 | 450 | mV |
| | | | Full | | | 720 | |
| | V_{OL} | $I_{SINK} = 8\text{mA}$, $V_{ID} = -0.2\text{V}$ | $+25^\circ\text{C}$ | | 200 | 280 | |
| | | | Full | | | 410 | |
| Output Short-Circuit Current | I_{SOURCE} | $V_{OH} = (+V_S) - 1.5\text{V}$, $V_{ID} = 0.2\text{V}$ | $+25^\circ\text{C}$ | 21 | 25 | | mA |
| | I_{SINK} | $V_{OL} = (-V_S) + 1.5\text{V}$, $V_{ID} = -0.2\text{V}$ | $+25^\circ\text{C}$ | 24 | 36 | | mA |
| Total Supply Current | I_S | $I_{OUT} = 0\text{mA}$ | $+25^\circ\text{C}$ | | 330 | 400 | μA |
| | | | Full | | | 450 | |

SWITCHING CHARACTERISTICS

(At $T_A = +25^\circ\text{C}$, $V_S = \pm 2.5\text{V}$, $C_L = 15\text{pF}$, unless otherwise specified.)

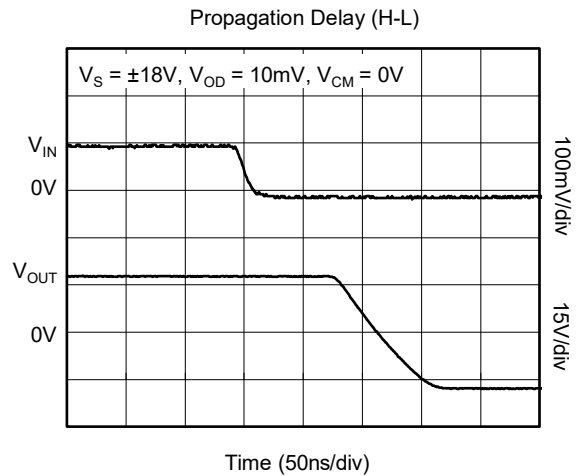
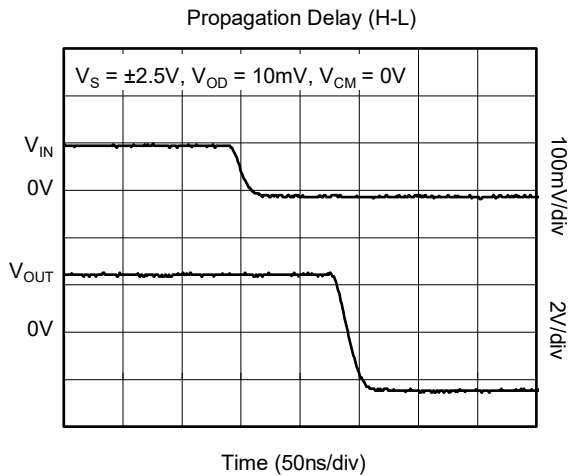
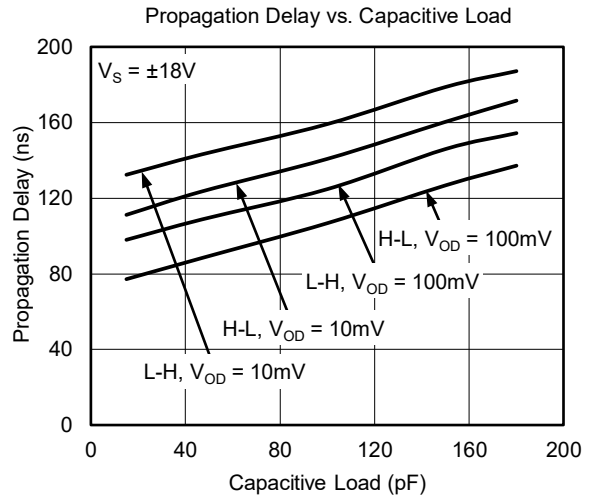
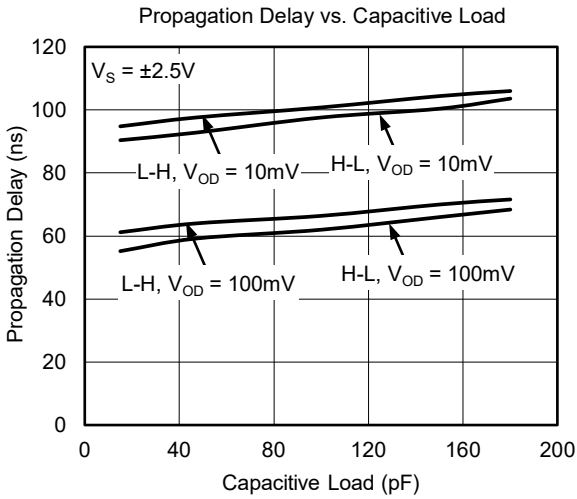
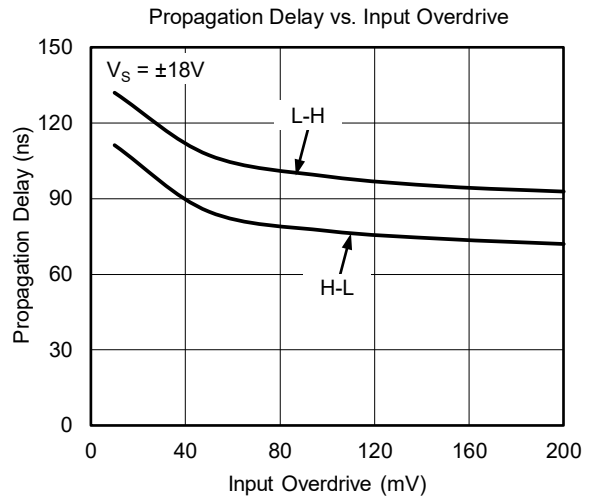
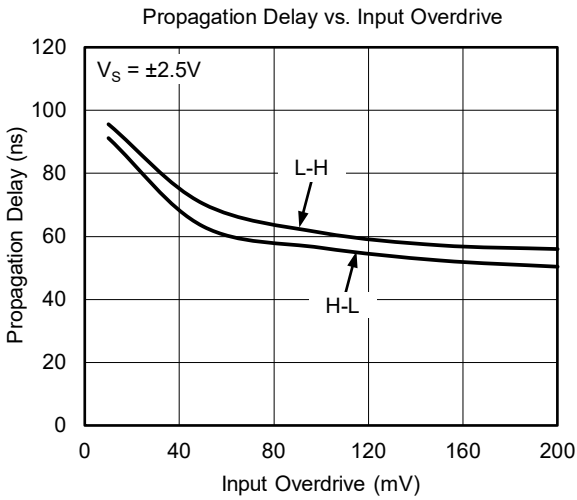
| PARAMETER | SYMBOL | CONDITIONS | TEMP | MIN | TYP | MAX | UNITS |
|---------------------------------|------------|-------------------|---------------------|-----|-----|-----|-------|
| Propagation Delay (High to Low) | t_{PHL} | Overdrive = 10mV | $+25^\circ\text{C}$ | | 90 | | ns |
| | | Overdrive = 100mV | $+25^\circ\text{C}$ | | 60 | | ns |
| Propagation Delay (Low to High) | t_{PLH} | Overdrive = 10mV | $+25^\circ\text{C}$ | | 90 | | ns |
| | | Overdrive = 100mV | $+25^\circ\text{C}$ | | 60 | | ns |
| Fall Time | t_{FALL} | Overdrive = 10mV | $+25^\circ\text{C}$ | | 20 | | ns |
| | | Overdrive = 100mV | $+25^\circ\text{C}$ | | 20 | | ns |
| Rise Time | t_{RISE} | Overdrive = 10mV | $+25^\circ\text{C}$ | | 20 | | ns |
| | | Overdrive = 100mV | $+25^\circ\text{C}$ | | 20 | | ns |

NOTES:

1. The voltage at either input should not be allowed to be lower than $(-V_S) - 0.3\text{V}$. The upper end of the common mode voltage range is $(+V_S) - 1.5\text{V}$, but either input can go up to 36V without damage.

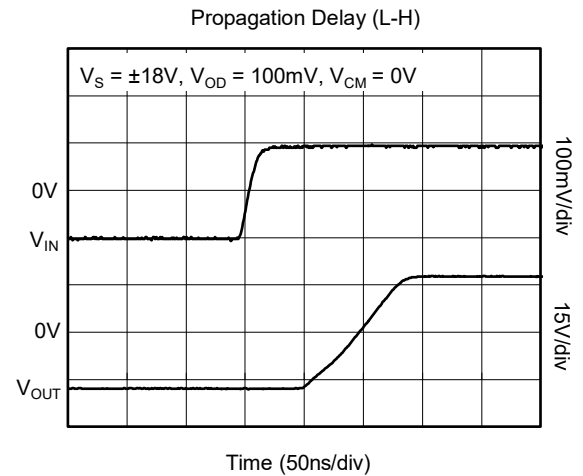
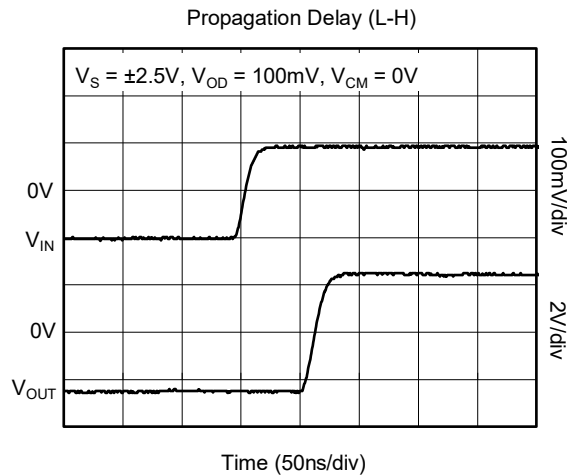
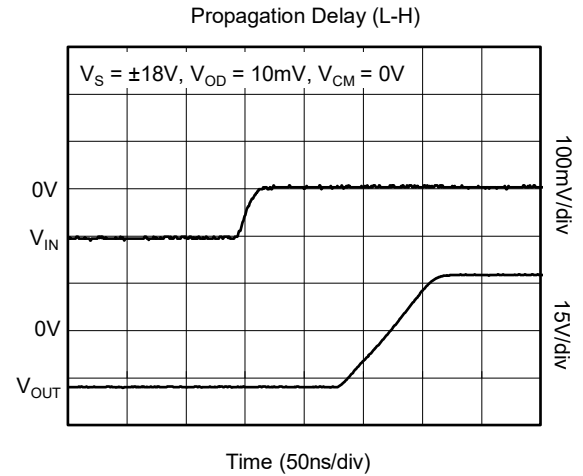
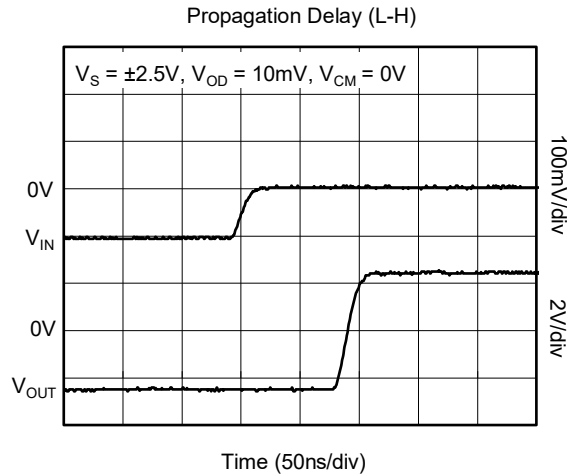
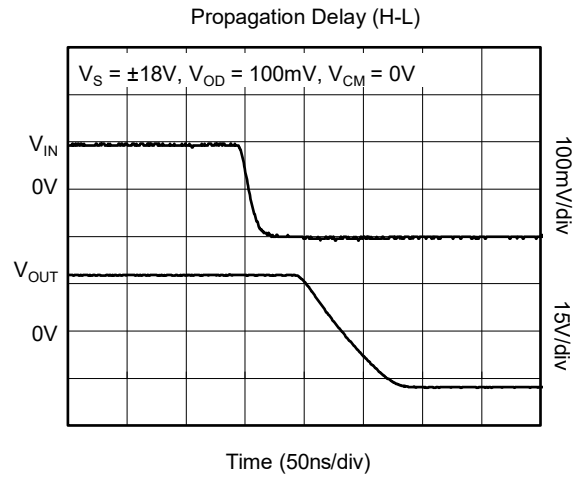
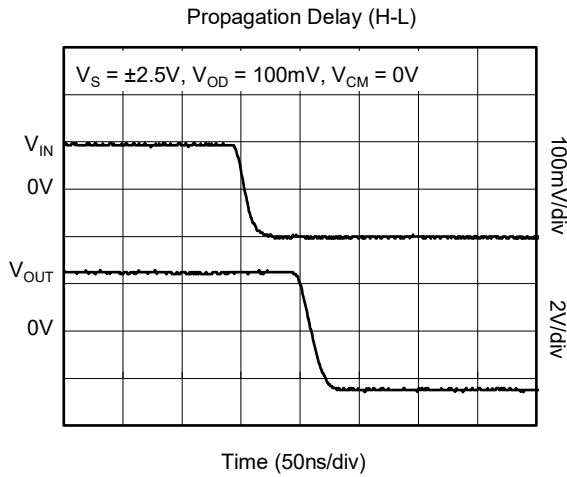
TYPICAL PERFORMANCE CHARACTERISTICS

At $T_A = +25^\circ\text{C}$, $V_S = \pm 18\text{V}$ and $C_L = 15\text{pF}$, unless otherwise noted.



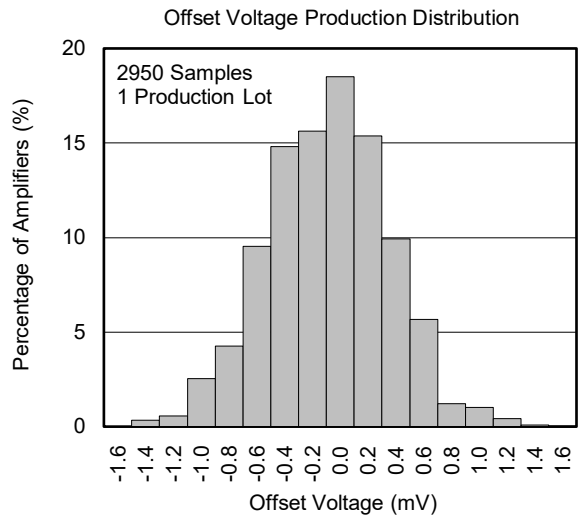
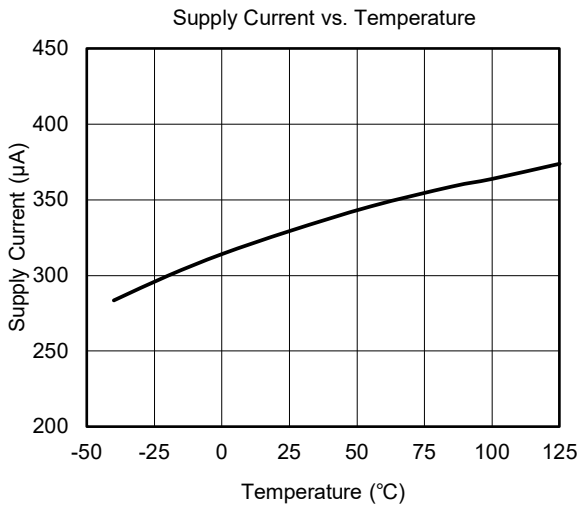
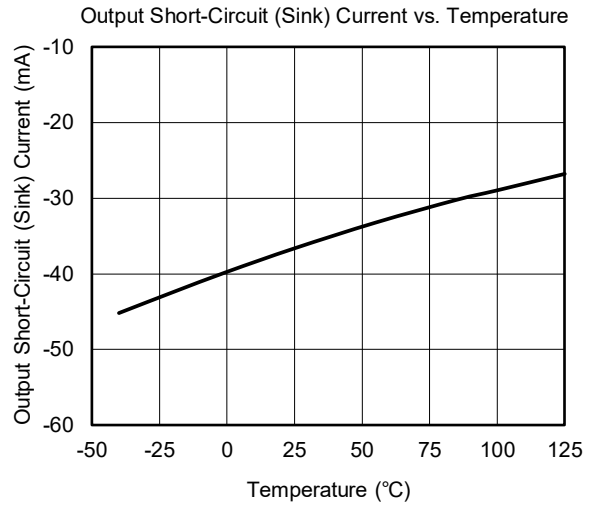
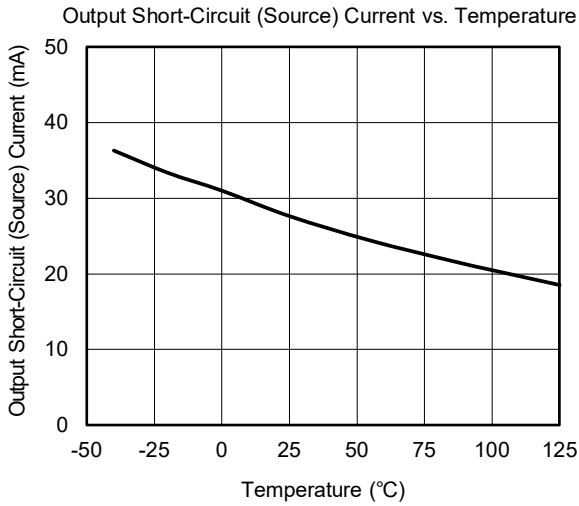
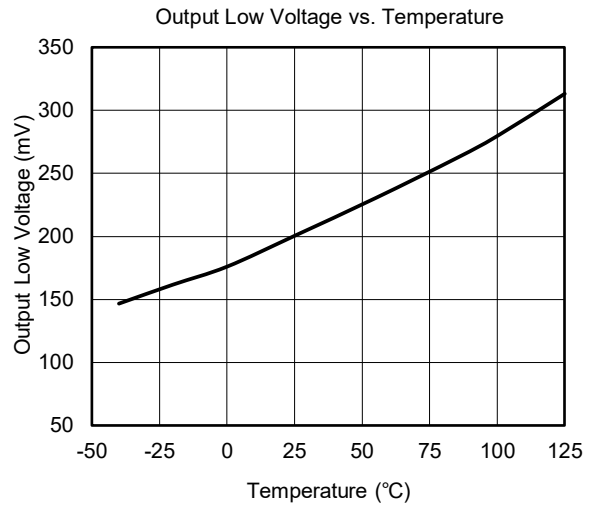
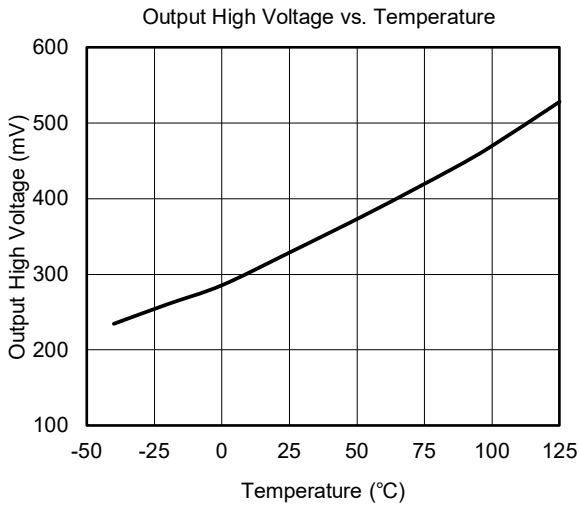
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

At $T_A = +25^\circ\text{C}$, $V_S = \pm 18\text{V}$ and $C_L = 15\text{pF}$, unless otherwise noted.



TYPICAL PERFORMANCE CHARACTERISTICS (continued)

At $T_A = +25^\circ\text{C}$, $V_S = \pm 18\text{V}$ and $C_L = 15\text{pF}$, unless otherwise noted.



REVISION HISTORY

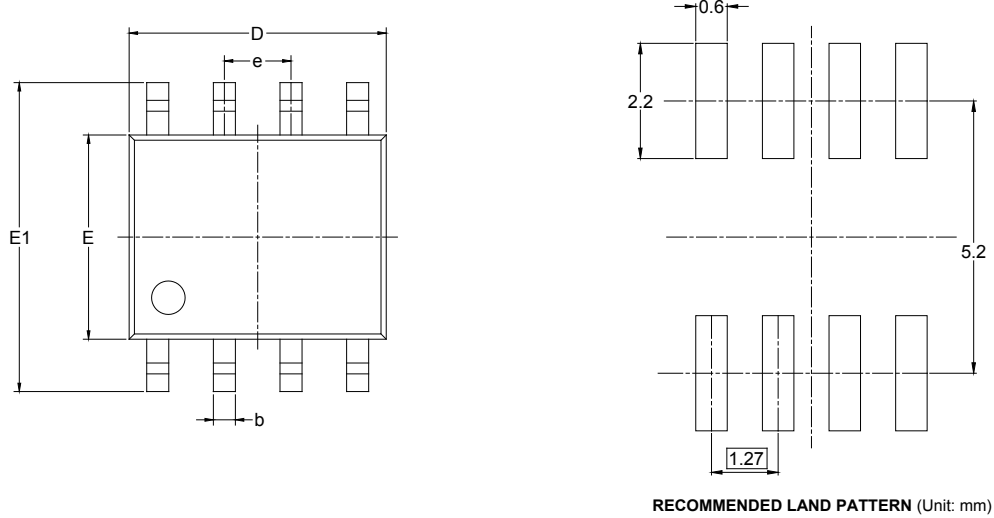
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (DECEMBER 2018) to REV.A

Changed from product preview to production dataAll

PACKAGE OUTLINE DIMENSIONS

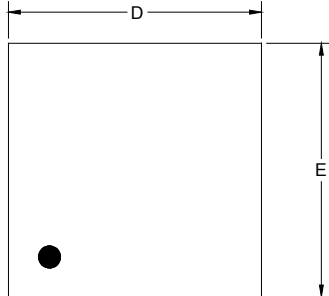
SOIC-8



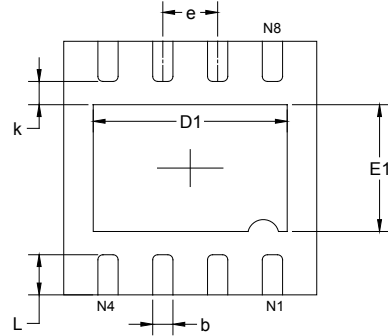
| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|------------------------------|-------|-------------------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.27 BSC | | 0.050 BSC | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

PACKAGE OUTLINE DIMENSIONS

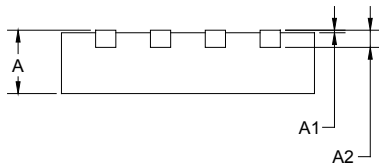
TDFN-3x3-8L



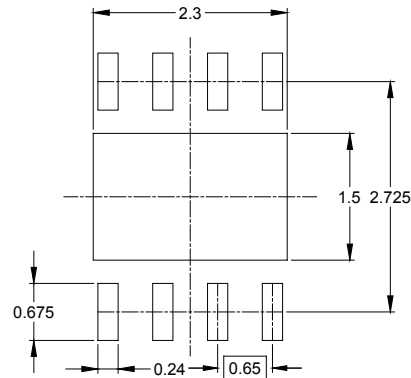
TOP VIEW



BOTTOM VIEW



SIDE VIEW

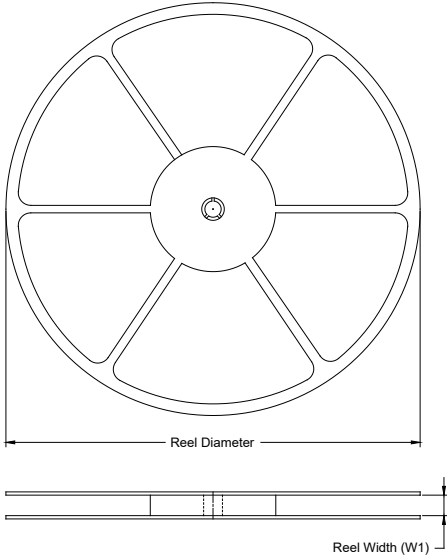


RECOMMENDED LAND PATTERN (Unit: mm)

| 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 |

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 |
|--------------|---------------|--------------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| SOIC-8 | 13" | 12.4 | 6.40 | 5.40 | 2.10 | 4.0 | 8.0 | 2.0 | 12.0 | Q1 |
| TDFN-3x3-8L | 13" | 12.4 | 3.35 | 3.35 | 1.13 | 4.0 | 8.0 | 2.0 | 12.0 | 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 |
|-----------|-------------|------------|-------------|--------------|
| 13" | 386 | 280 | 370 | 5 |

DD0002

单击下面可查看定价，库存，交付和生命周期等信息

[>>SGMICRO\(圣邦微电子\)](#)