



SGM8712

Micro-Power, CMOS Input, RRIO, 1.4V, Push-Pull Output Comparator

GENERAL DESCRIPTION

The SGM8712 is a dual, rail-to-rail input CMOS comparator with typical 300nA ultra-low power supply current per channel. The comparator operates from a wide range of 1.4V to 5.5V supply voltage, and is guaranteed to operate at 1.4V, 2.5V and 5.0V. This feature is suitable for battery-powered applications.

The SGM8712 is optimized for micro-power, single-supply operation. The push-pull output stage supports rail-to-rail output swing and allows for operation with absolute minimum power consumption when driving any capacitive or resistive load.

The SGM8712 is available in a Green MSOP-8 package. The small package makes this device ideal for use in hand-held electronics and mobile phone applications. It is rated over the -40°C to +85°C temperature range.

FEATURES

- **Ultra-Low Quiescent Current:**
300nA/Channel (TYP) at $V_S = 1.4V$
- **Wide Single-Supply Voltage Range: 1.4V to 5.5V**
- **Typical 6 μ s Propagation Delay at $V_S = 1.4V$**
- **Rail-to-Rail Input and Output**
- **Push-Pull Output Current Drive:**
19mA (TYP) at $V_S = 5V$
- **-40°C to +85°C Operating Temperature Range**
- **Available in a Green MSOP-8 Package**

APPLICATIONS

Portable and Battery-Powered Applications
Alarm and Surveillance Circuits
Mobile Phones
RC Timers
Hand-Held Electronics
Window Detectors
IR Receiver

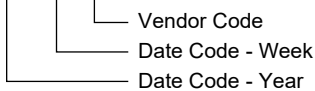
PACKAGE/ORDERING INFORMATION

| MODEL | PACKAGE DESCRIPTION | SPECIFIED TEMPERATURE RANGE | ORDERING NUMBER | PACKAGE MARKING | PACKING OPTION |
|---------|---------------------|-----------------------------|-----------------|--------------------------|---------------------|
| SGM8712 | MSOP-8 | -40°C to +85°C | SGM8712YMS8G/TR | SGM8712 YMS8 XXXXX | Tape and Reel, 4000 |

MARKING INFORMATION

NOTE: XXXXX = Date Code and Vendor Code.

XXXXX



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, +Vs to -Vs6V
- V_{IN} Differential..... ±2.5V
- Voltage at Input/Output Pins
..... (-Vs) - 0.3V to (+Vs) + 0.3V
- Junction Temperature..... +150°C
- Storage Temperature..... -65°C to +150°C
- Lead Temperature (soldering, 10s)..... +260°C
- ESD Susceptibility
- HBM..... 4000V
- MM..... 400V

RECOMMENDED OPERATING CONDITIONS

- Operating Temperature Range..... -40°C to +85°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

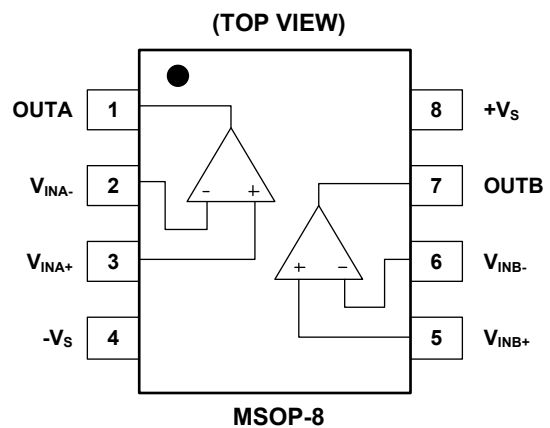
This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures

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, or specifications without prior notice.

PIN CONFIGURATION



ELECTRICAL CHARACTERISTICS(At $T_A = +25^\circ\text{C}$, $+V_S = 1.4\text{V}$, $-V_S = 0\text{V}$, $V_{CM} = +V_S/2$, and $V_{OUT} = -V_S$, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|------------------------------------|------------|--|-------|-------|------|------------------------------|
| Supply Current (per channel) | I_S | $V_{CM} = 0.3\text{V}$ | | 300 | 1000 | nA |
| | | $V_{CM} = 1.1\text{V}$ | | 250 | 1000 | |
| Input Offset Voltage | V_{OS} | $V_{CM} = 0\text{V}$ | -3 | 0.5 | 3 | mV |
| | | $V_{CM} = 1.4\text{V}$ | -3 | 0.5 | 3 | |
| Input Offset Average Drift | | | | 2 | | $\mu\text{V}/^\circ\text{C}$ |
| Common Mode Rejection Ratio | CMRR | V_{CM} Stepped from 0V to 0.3V | | 65 | | dB |
| | | V_{CM} Stepped from 0.8V to 1.4V | | 75 | | |
| | | V_{CM} Stepped from 0V to 1.4V | | 75 | | |
| Power Supply Rejection Ratio | PSRR | $V_S = 1.8\text{V to } 5.5\text{V}$, $V_{CM} = 0\text{V}$ | 66 | 95 | | dB |
| Large Signal Voltage Gain | A_{VO} | | | 100 | | dB |
| Output Swing High | V_{OH} | $V_S = 1.8\text{V}$, $I_{OUT} = 500\mu\text{A}$ | 1.598 | 1.669 | | V |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | 1.581 | | | |
| | | $V_S = 1.8\text{V}$, $I_{OUT} = 1\text{mA}$ | 1.324 | 1.508 | | |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | 1.288 | | | |
| Output Swing Low | V_{OL} | $V_S = 1.8\text{V}$, $I_{OUT} = -500\mu\text{A}$ | | 82 | 112 | mV |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | | | 127 | |
| | | $V_S = 1.8\text{V}$, $I_{OUT} = -1\text{mA}$ | | 167 | 225 | |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | | | 253 | |
| Output Current | I_{OUT} | Source | | 0.7 | | mA |
| | | Sink | | 2.0 | | |
| Propagation Delay (High to Low) | | Overdrive = 10mV | | 12 | | μs |
| | | Overdrive = 100mV | | 6 | | |
| Propagation Delay (Low to High) | | Overdrive = 10mV | | 26 | | μs |
| | | Overdrive = 100mV | | 17 | | |
| Rise Time | t_{Rise} | Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 220 | | ns |
| | | Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 220 | | |
| Fall Time | t_{Fall} | Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 155 | | ns |
| | | Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 155 | | |

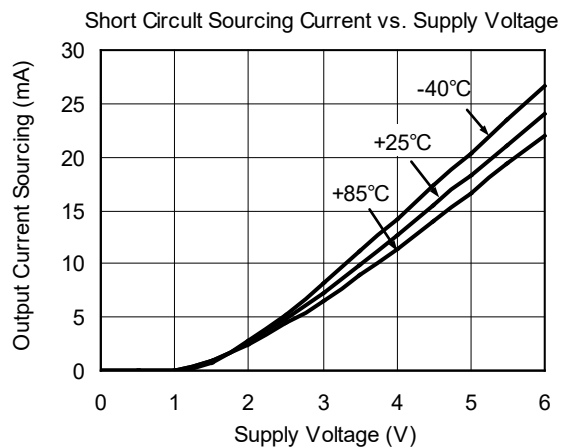
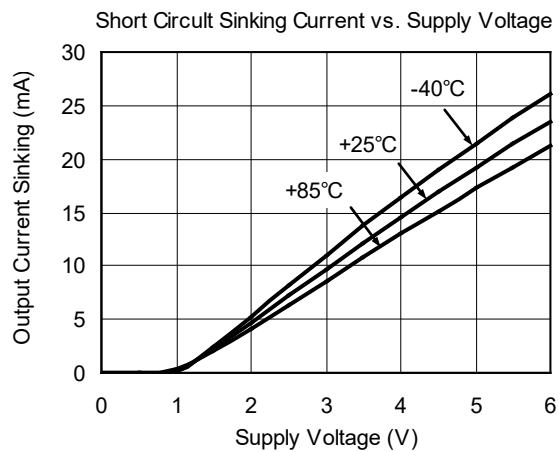
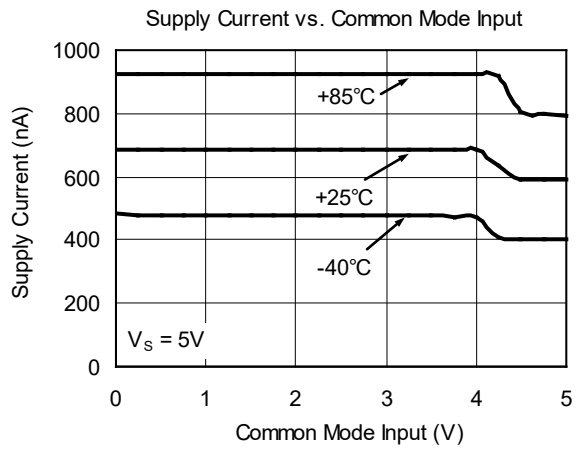
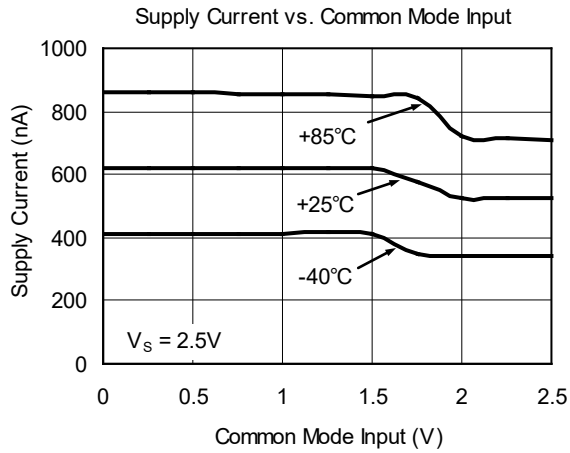
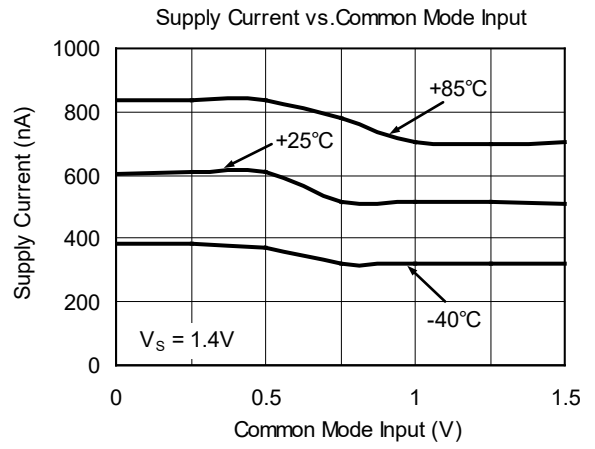
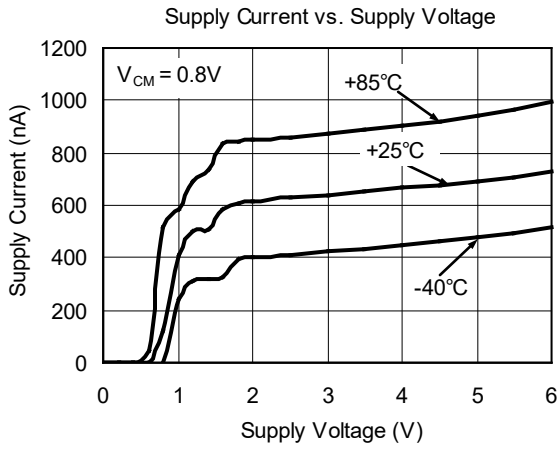
ELECTRICAL CHARACTERISTICS (continued)(At $T_A = +25^\circ\text{C}$, $+V_S = 2.5\text{V}$, $-V_S = 0\text{V}$, $V_{CM} = +V_S/2$, and $V_{OUT} = -V_S$, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|------------------------------------|------------|--|-----|-------|-----|------------------------------|
| Supply Current (per channel) | I_S | $V_{CM} = 0.3\text{V}$ | | 310 | | nA |
| | | $V_{CM} = 2.2\text{V}$ | | 260 | | |
| Input Offset Voltage | V_{OS} | $V_{CM} = 0\text{V}$ | | 0.5 | | mV |
| | | $V_{CM} = 2.5\text{V}$ | | 0.5 | | |
| Input Offset Average Drift | | | | 2 | | $\mu\text{V}/^\circ\text{C}$ |
| Common Mode Rejection Ratio | CMRR | V_{CM} Stepped from 0V to 1.4V | | 75 | | dB |
| | | V_{CM} Stepped from 1.9V to 2.5V | | 80 | | |
| | | V_{CM} Stepped from 0V to 2.5V | | 80 | | |
| Power Supply Rejection Ratio | PSRR | $V_S = 1.8\text{V to } 5.5\text{V}$, $V_{CM} = 0\text{V}$ | | 95 | | dB |
| Large Signal Voltage Gain | A_{VO} | | | 100 | | dB |
| Output Swing High | V_{OH} | $I_{OUT} = 500\mu\text{A}$ | | 2.419 | | V |
| | | $I_{OUT} = 1\text{mA}$ | | 2.333 | | |
| Output Swing Low | V_{OL} | $I_{OUT} = -500\mu\text{A}$ | | 66 | | mV |
| | | $I_{OUT} = -1\text{mA}$ | | 133 | | |
| Output Current | I_{OUT} | Source | | 5.3 | | mA |
| | | Sink | | 7.7 | | |
| Propagation Delay (High to Low) | | Overdrive = 10mV | | 12 | | μs |
| | | Overdrive = 100mV | | 5 | | |
| Propagation Delay (Low to High) | | Overdrive = 10mV | | 28 | | μs |
| | | Overdrive = 100mV | | 19 | | |
| Rise Time | t_{Rise} | Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 120 | | ns |
| | | Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 120 | | |
| Fall Time | t_{Fall} | Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 85 | | ns |
| | | Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 70 | | |

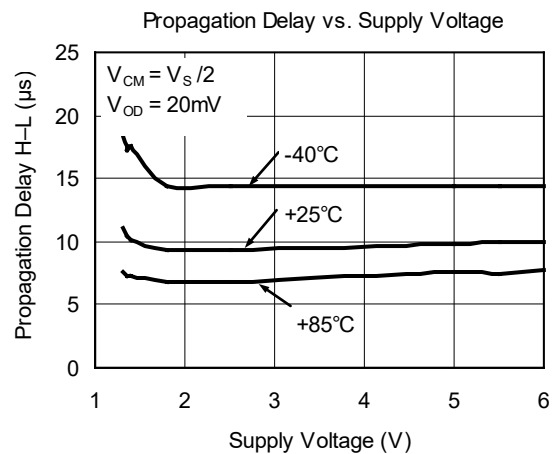
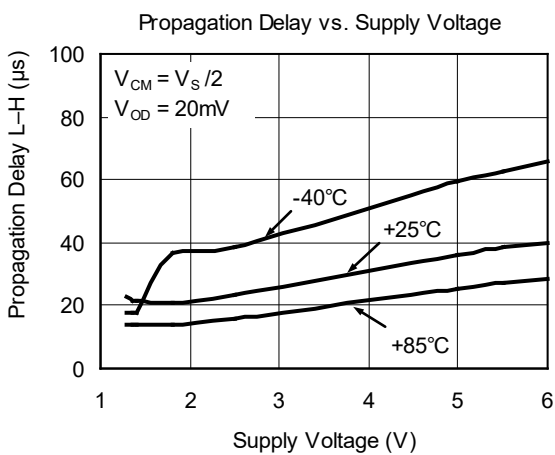
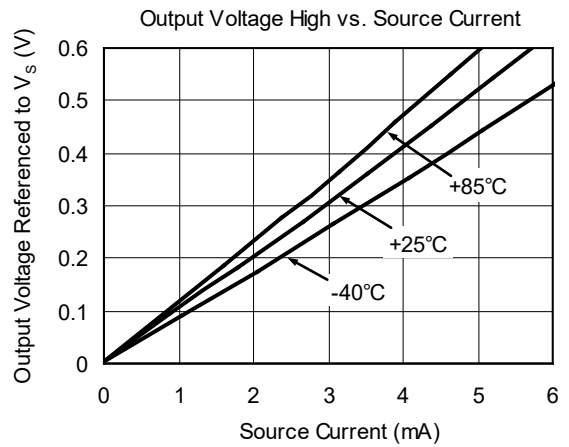
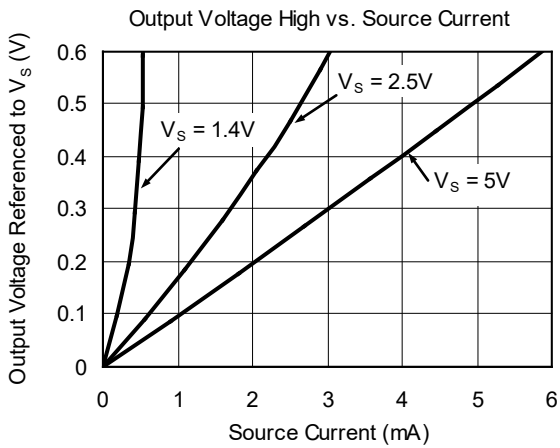
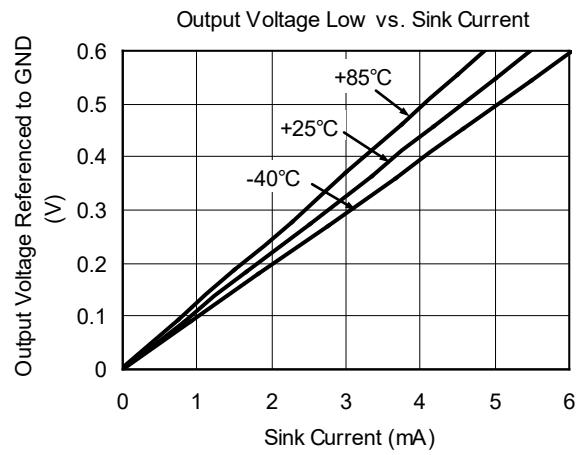
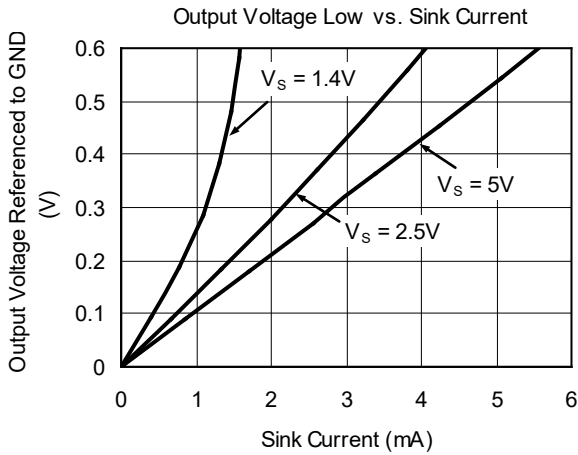
ELECTRICAL CHARACTERISTICS(At $T_A = +25^\circ\text{C}$, $+V_S = 5.0\text{V}$, $-V_S = 0\text{V}$, $V_{CM} = +V_S/2$, and $V_{OUT} = -V_S$, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------|------------|--|-------|-------|------|------------------------------|
| Supply Current (per channel) | I_S | $V_{CM} = 0.3\text{V}$ | | 350 | 1500 | nA |
| | | $V_{CM} = 4.7\text{V}$ | | 300 | 1500 | |
| Input Offset Voltage | V_{OS} | $V_{CM} = 0\text{V}$ | -3 | 0.5 | 3 | mV |
| | | $V_{CM} = 5\text{V}$ | -3 | 0.5 | 3 | |
| Input Offset Average Drift | | | | 2 | | $\mu\text{V}/^\circ\text{C}$ |
| Common Mode Rejection Ratio | CMRR | V_{CM} Stepped from 0V to 3.9V | | 85 | | dB |
| | | V_{CM} Stepped from 4.4V to 5.0V | | 85 | | |
| | | V_{CM} Stepped from 0V to 5.0V | | 85 | | |
| Power Supply Rejection Ratio | PSRR | $V_S = 1.8\text{V to } 5.5\text{V}$, $V_{CM} = 0\text{V}$ | 66 | 95 | | dB |
| Large Signal Voltage Gain | A_{VO} | | | 105 | | dB |
| Output Swing High | V_{OH} | $I_{OUT} = 500\mu\text{A}$ | 4.923 | 4.952 | | V |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | 4.916 | | | |
| | | $I_{OUT} = 1\text{mA}$ | 4.864 | 4.904 | | |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | 4.848 | | | |
| Output Swing Low | V_{OL} | $I_{OUT} = -500\mu\text{A}$ | | 52 | 80 | mV |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | | | 90 | |
| | | $I_{OUT} = -1\text{mA}$ | | 104 | 130 | |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | | | 143 | |
| Output Current | I_{OUT} | Source | 14 | 18 | | mA |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | 12.1 | | | |
| | | Sink | 15 | 19 | | |
| | | $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ | 12.9 | | | |
| Propagation Delay (High to Low) | | Overdrive = 10mV | | 13 | | μs |
| | | Overdrive = 100mV | | 6 | | |
| Propagation Delay (Low to High) | | Overdrive = 10mV | | 42 | | μs |
| | | Overdrive = 100mV | | 33 | | |
| Rise Time | t_{Rise} | Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 85 | | ns |
| | | Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 85 | | |
| Fall Time | t_{Fall} | Overdrive = 10mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 70 | | ns |
| | | Overdrive = 100mV, $C_L = 30\text{pF}$, $R_L = 1\text{M}\Omega$ | | 60 | | |

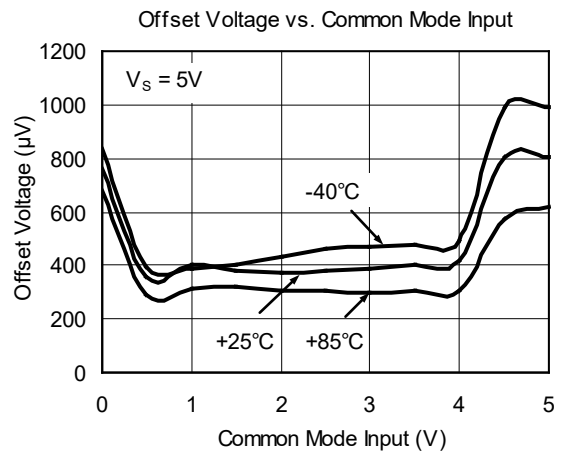
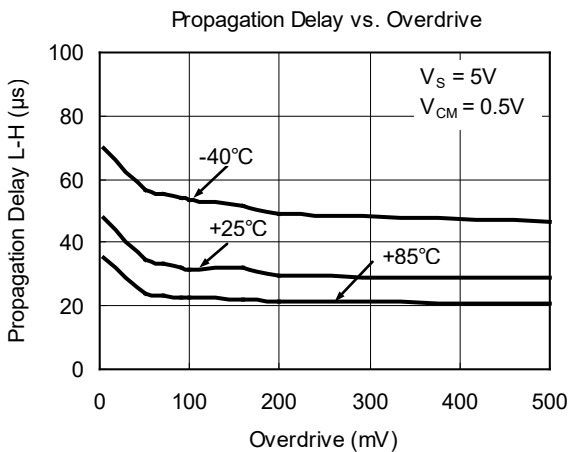
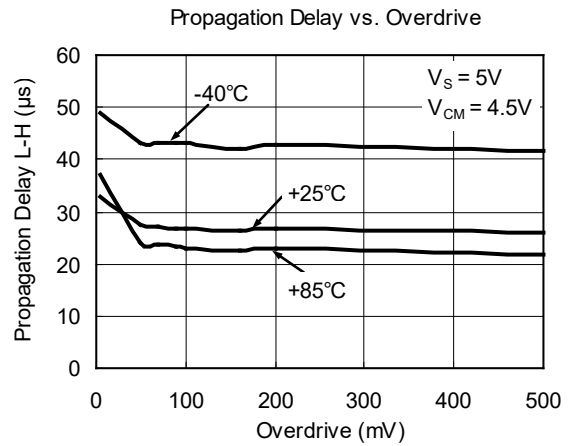
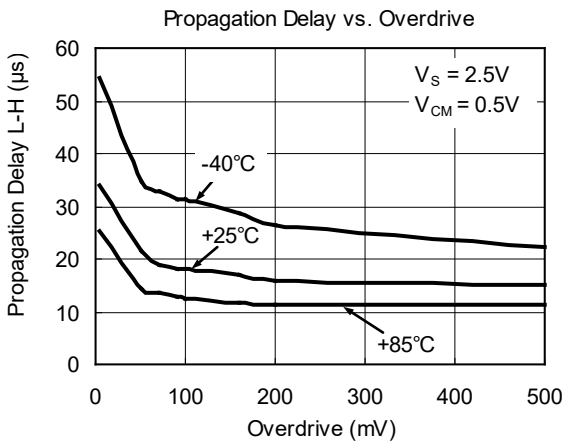
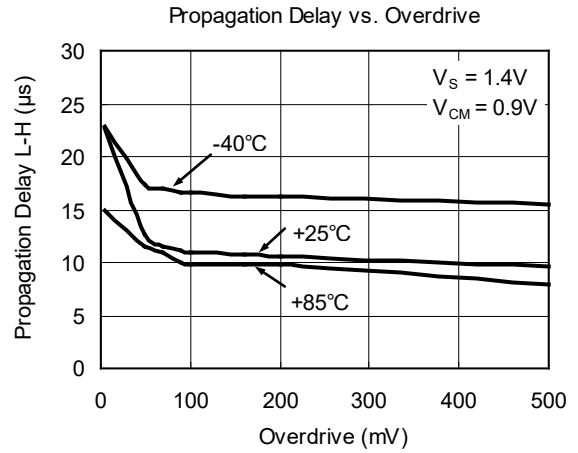
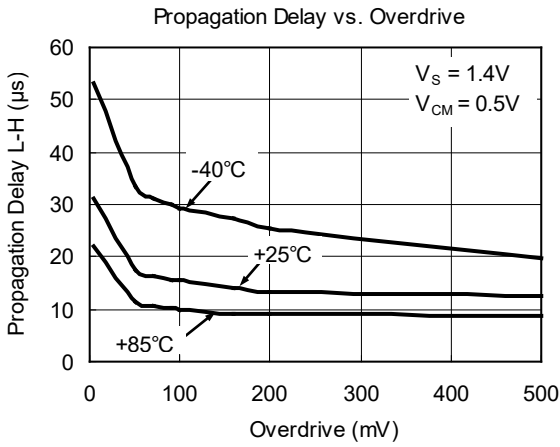
TYPICAL PERFORMANCE CHARACTERISTICS



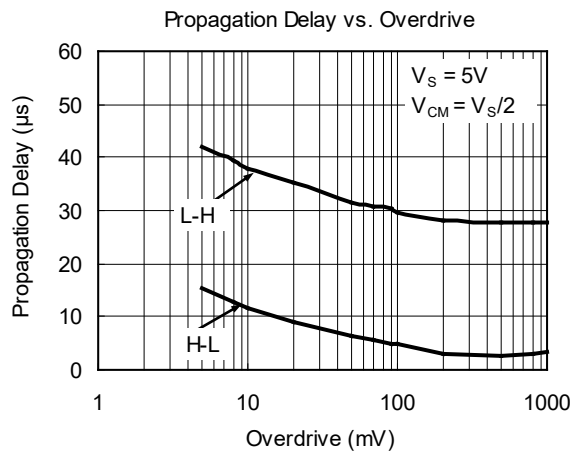
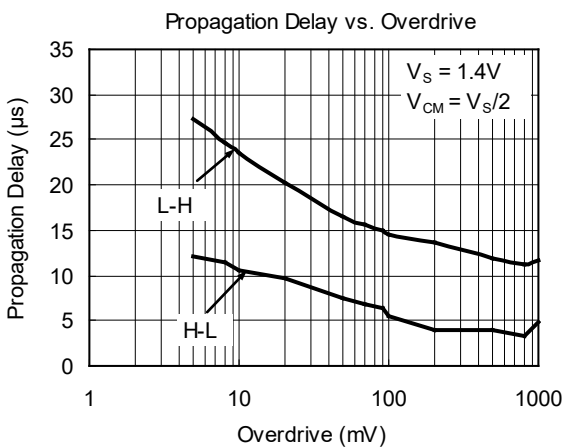
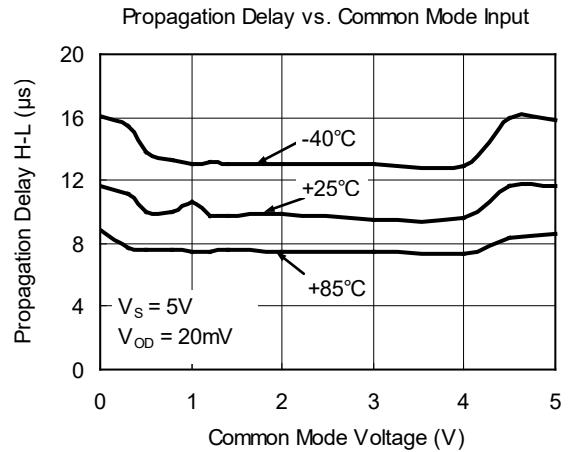
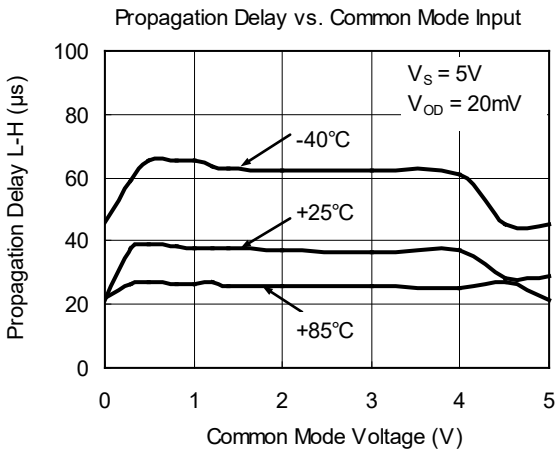
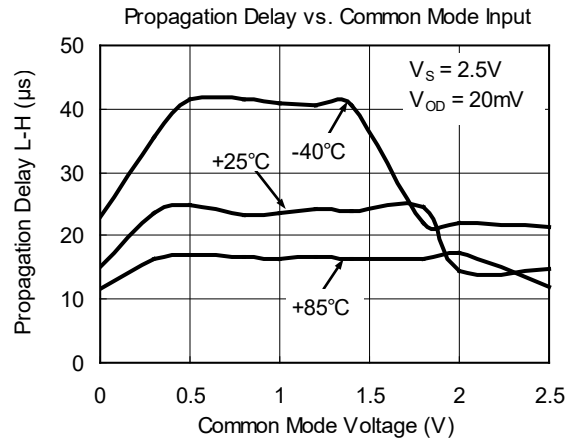
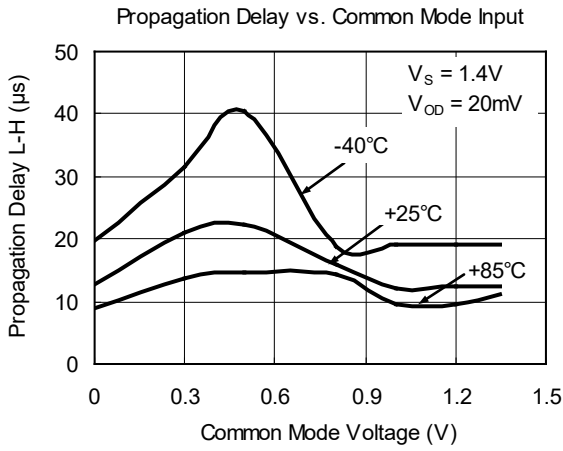
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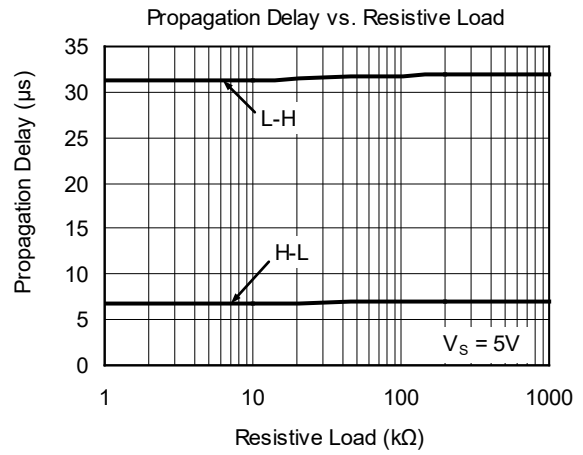
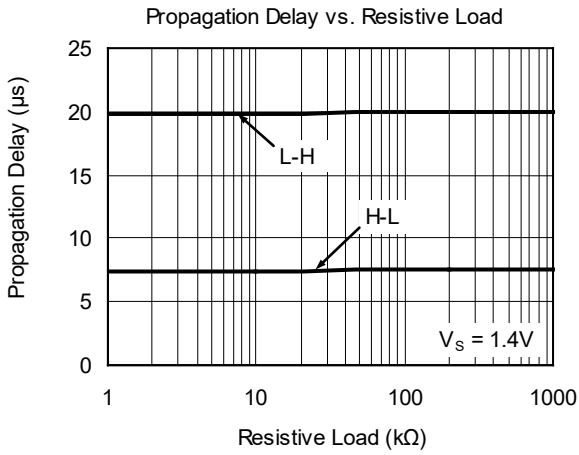
TYPICAL PERFORMANCE CHARACTERISTICS (continued)



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

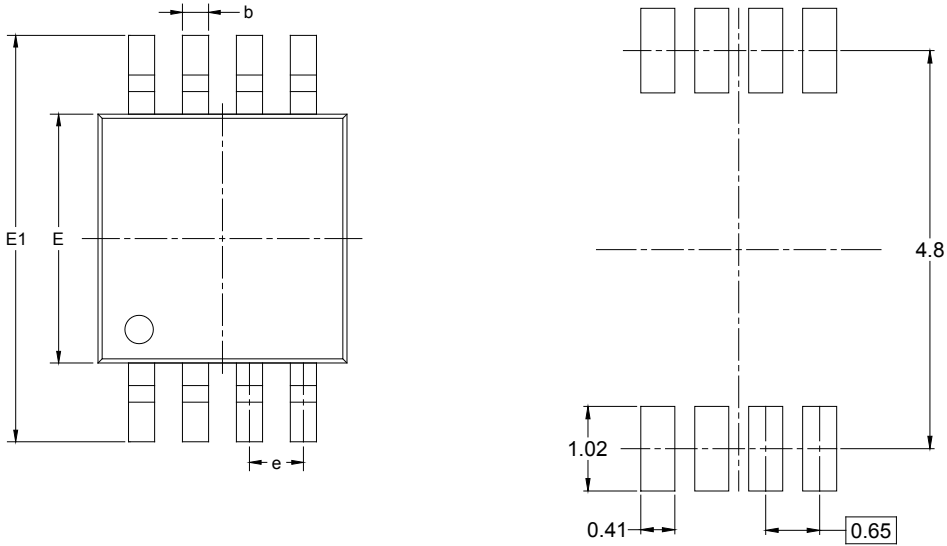
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (JULY 2016) to REV.A

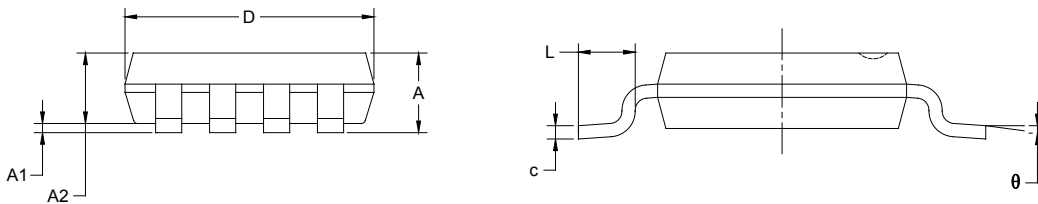
Changed from product preview to production data.....All

PACKAGE OUTLINE DIMENSIONS

MSOP-8



RECOMMENDED LAND PATTERN (Unit: mm)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.820 | 1.100 | 0.032 | 0.043 |
| A1 | 0.020 | 0.150 | 0.001 | 0.006 |
| A2 | 0.750 | 0.950 | 0.030 | 0.037 |
| b | 0.250 | 0.380 | 0.010 | 0.015 |
| c | 0.090 | 0.230 | 0.004 | 0.009 |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 2.900 | 3.100 | 0.114 | 0.122 |
| E1 | 4.750 | 5.050 | 0.187 | 0.199 |
| e | 0.650 BSC | | 0.026 BSC | |
| L | 0.400 | 0.800 | 0.016 | 0.031 |
| θ | 0° | 6° | 0° | 6° |

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 |
|--------------|---------------|--------------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| MSOP-8 | 13" | 12.4 | 5.20 | 3.30 | 1.50 | 4.0 | 8.0 | 2.0 | 12.0 | Q1 |

000001

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\(圣邦微电子\)](#)