

FEATURES

- Low On-State Resistance
- With ESD Protection: HBM > 2kV
- WLCSP with Footprint 3.08×1.80 mm²
- RoHS Compliant and Halogen Free

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | VALUE | UNITS |
|---------------------------------------|------------------|------------------------|-------|
| Source-to-Source Voltage | V _{SS} | 12 | V |
| Gate-to-Source Voltage | V _{GS} | ±8 | V |
| Source Current ⁽¹⁾ | I _S | T _A = +25°C | 12 |
| | | T _A = +70°C | 9 |
| Source Current (Pulse) ⁽²⁾ | I _{SM} | 24 | A |
| Total Dissipation | P _D | T _A = +25°C | 0.45 |
| | | T _A = +70°C | 0.29 |
| Junction Temperature | T _J | +150 | °C |
| Storage Temperature Range | T _{STG} | -55 to +150 | °C |
| Lead Temperature (Soldering, 10s) | | +260 | °C |

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.

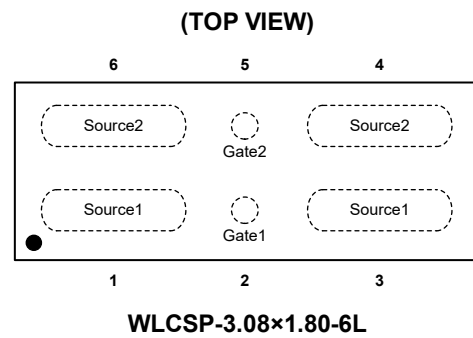
NOTES:

1. The current will be limited by PCB, thermal design and operating temperature.
2. t_{PULSE} < 10μs.

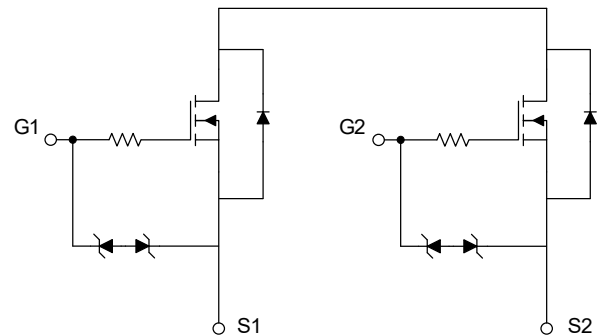
PRODUCT SUMMARY

| R _{SSON} (TYP) V _{GS} = 4.5V | R _{SSON} (MAX) V _{GS} = 4.5V | I _S (MAX) T _A = +25°C |
|---|---|--|
| 2.1mΩ | 2.75mΩ | 12A |

PIN CONFIGURATION



EQUIVALENT CIRCUIT



APPLICATIONS

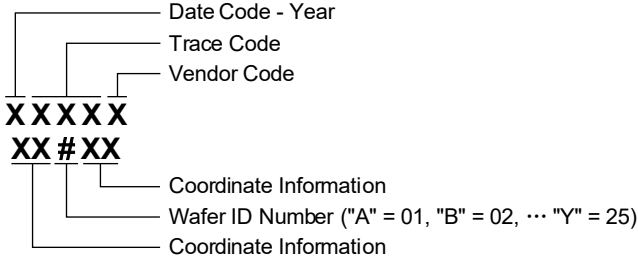
- Load Switch
- Battery Protection
- Battery Management

PACKAGE/ORDERING INFORMATION

| MODEL | PACKAGE DESCRIPTION | SPECIFIED TEMPERATURE RANGE | ORDERING NUMBER | PACKAGE MARKING | PACKING OPTION |
|------------|---------------------|-----------------------------|-----------------|--------------------------|---------------------|
| SGMTC27412 | WLCSP-3.08×1.80-6L | -55°C to +150°C | SGMTC27412TG/TR | SGM08V XXXXX XX#XX | Tape and Reel, 3000 |

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code. XX#XX = Coordinate Information and Wafer ID Number.



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.

DISCLAIMER

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

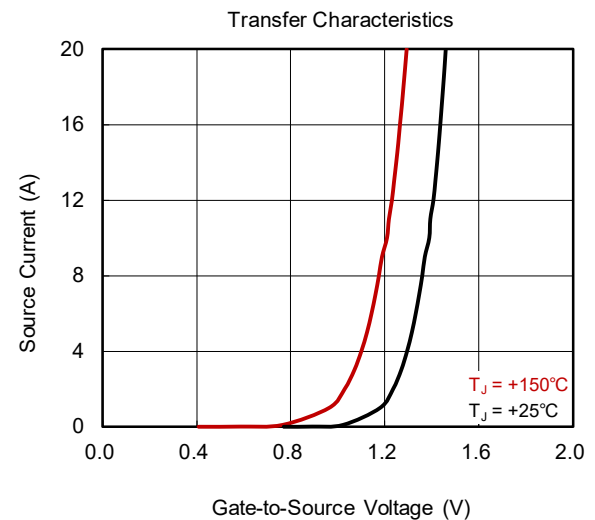
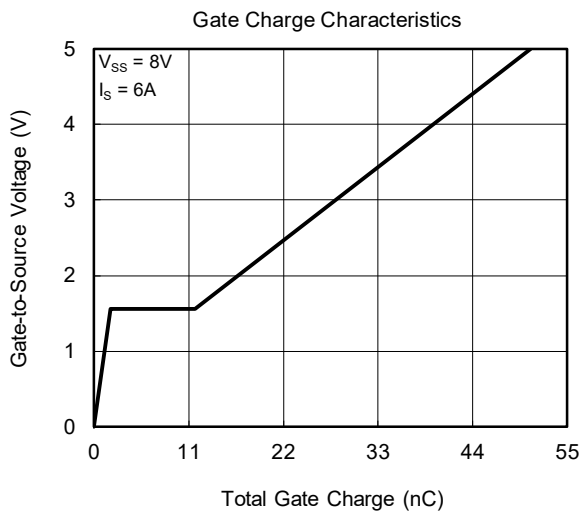
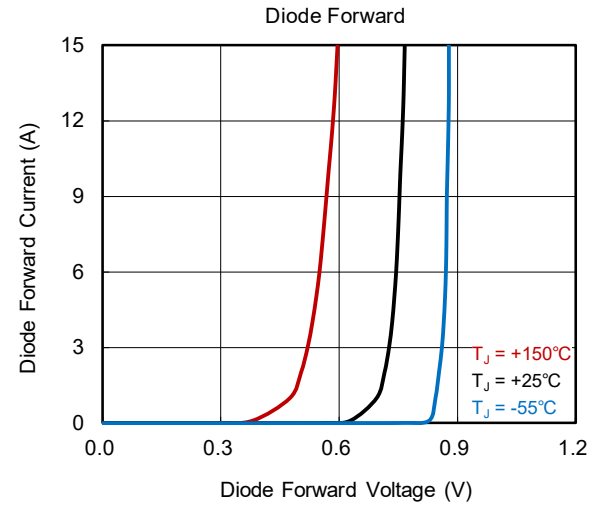
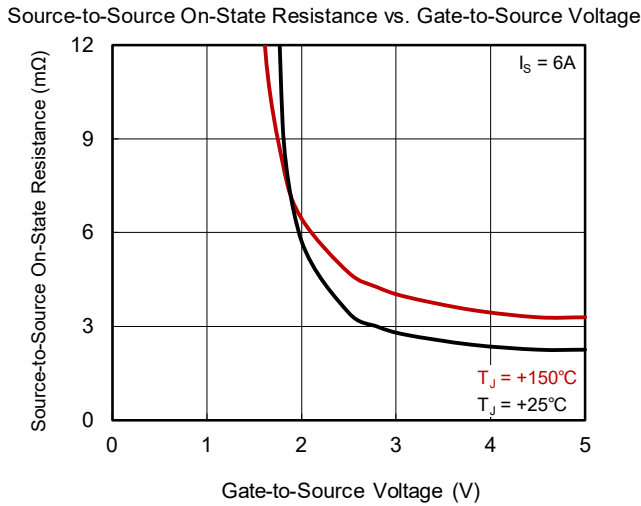
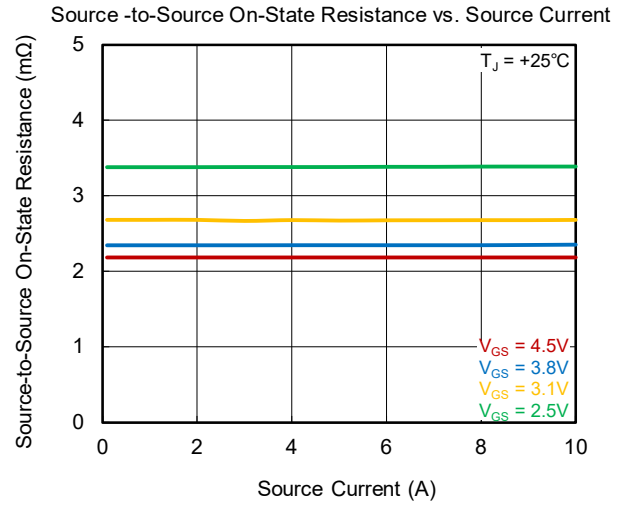
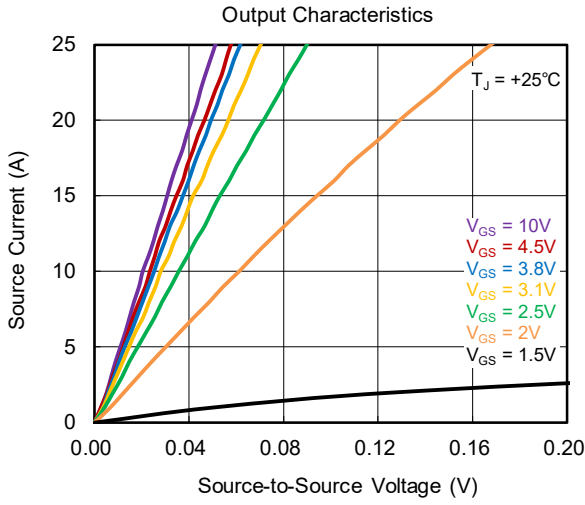
THERMAL RESISTANCE MAXIMUM RATINGS

| PARAMETER | SYMBOL | VALUE | UNITS |
|--|------------------|-------|-------|
| Junction-to-Ambient Thermal Resistance | R _{θJA} | 278 | °C/W |

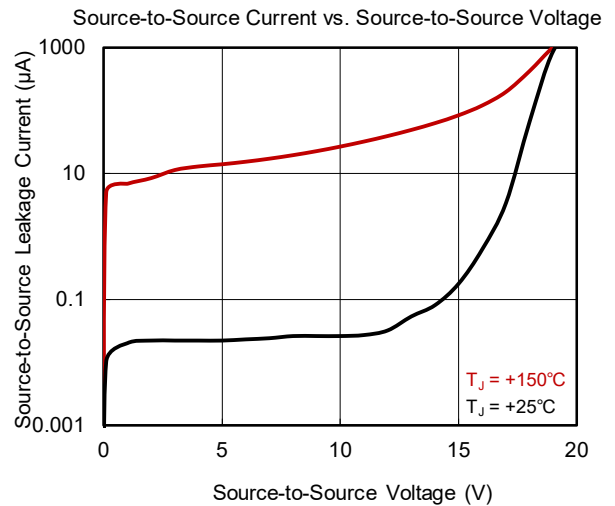
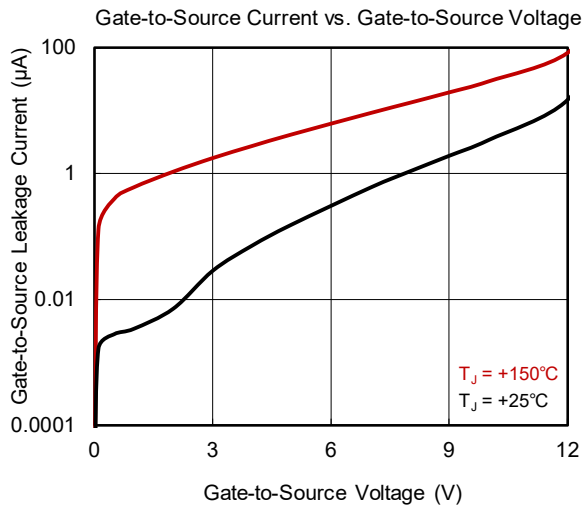
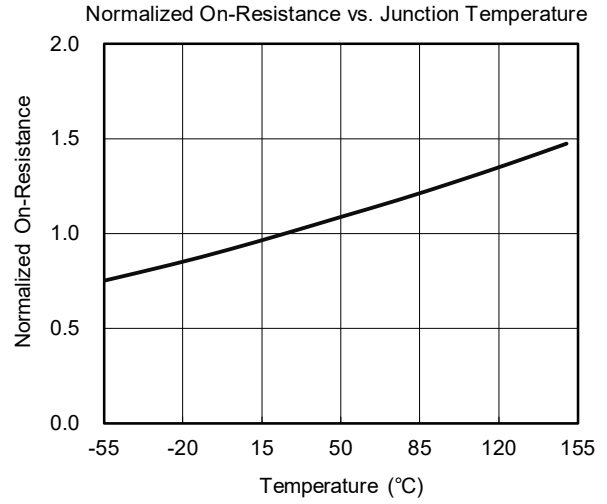
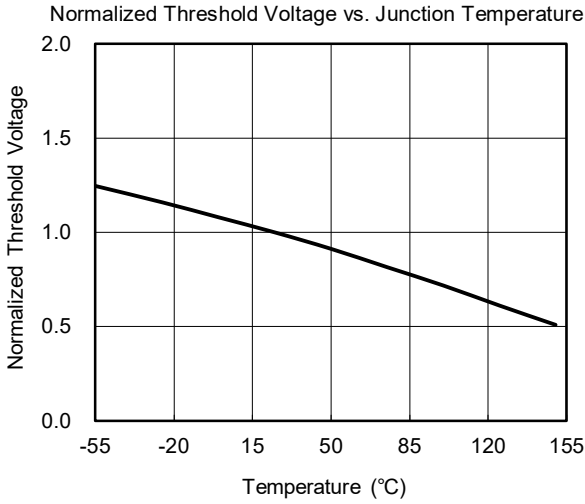
ELECTRICAL CHARACTERISTICS(T_A = +25°C, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|--------------------------------------|---------------------|---|-----|------|------|-------|
| Static OFF Characteristics | | | | | | |
| Source-to-Source Breakdown Voltage | V _{BR_SSS} | V _{GS} = 0V, I _S = 250μA | 12 | | | V |
| Zero Gate Voltage Source Current | I _{SSS} | V _{GS} = 0V, V _{SS} = 12V | | | 1 | μA |
| Gate-to-Source Leakage Current | I _{GSS} | V _{GS} = ±8V, V _{SS} = 0V | | | ±10 | μA |
| Static ON Characteristics | | | | | | |
| Gate-to-Source Threshold Voltage | V _{GS_TH} | V _{GS} = V _{SS} , I _S = 250μA | 0.5 | 0.8 | 1.2 | V |
| Source-to-Source On-State Resistance | R _{SSON} | V _{GS} = 4.5V, I _S = 6A | | 2.1 | 2.75 | mΩ |
| | | V _{GS} = 3.8V, I _S = 6A | | 2.2 | 2.85 | |
| | | V _{GS} = 3.1V, I _S = 6A | | 2.6 | 3.95 | |
| | | V _{GS} = 2.5V, I _S = 6A | | 3.4 | 6.4 | |
| Diode Characteristics | | | | | | |
| Diode Forward Voltage | V _{F_S-S} | V _{GS} = 0V, I _F = 6A | | 0.7 | 1.2 | V |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C _{ISS} | V _{GS} = 0V, V _{SS} = 10V, f = 1MHz | | 2411 | | pF |
| Output Capacitance | C _{OSS} | | | 682 | | |
| Reverse Transfer Capacitance | C _{RSS} | | | 134 | | |
| Total Gate Charge | Q _G | V _{GS} = 4.5V, V _{SS} = 8V, I _S = 6A | | 50.7 | | nC |
| Gate-to-Source Charge | Q _{GS} | | | 1.9 | | |
| Gate-to-Drain Charge | Q _{GD} | | | 9.8 | | |
| Switch Characteristics | | | | | | |
| Turn-On Delay Time | t _{d_ON} | V _{GS} = 4.5V, V _{SS} = 8V, I _S = 6A | | 0.9 | | μs |
| Rise Time | t _R | | | 2.6 | | |
| Turn-Off Delay Time | t _{d_OFF} | | | 4.3 | | |
| Fall Time | t _F | | | 6.5 | | |

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

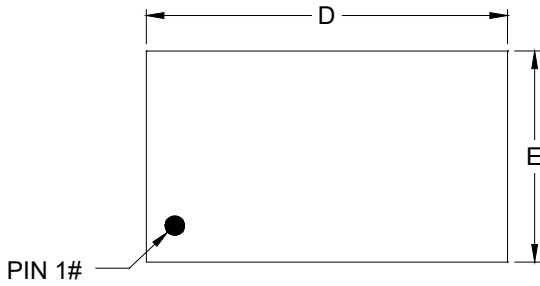
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| Changes from Original (OCTOBER 2024) to REV.A | Page |
|--|------|
| Changed from product preview to production data..... | All |

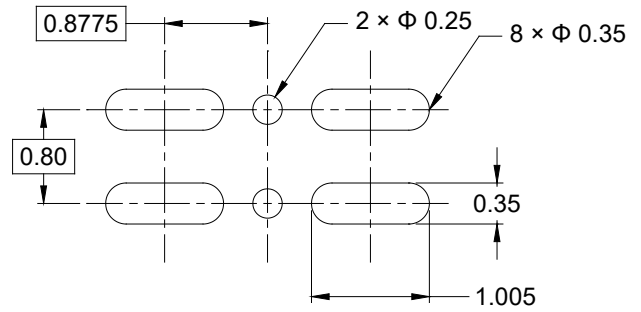
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

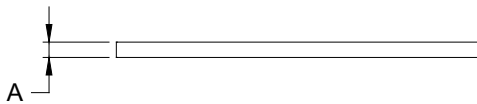
WLCSP-3.08×1.80-6L



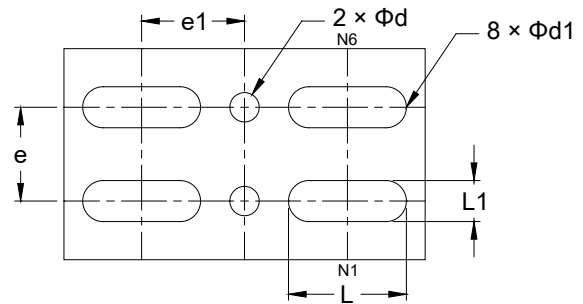
TOP VIEW



RECOMMENDED LAND PATTERN (Unit: mm)



SIDE VIEW



BOTTOM VIEW

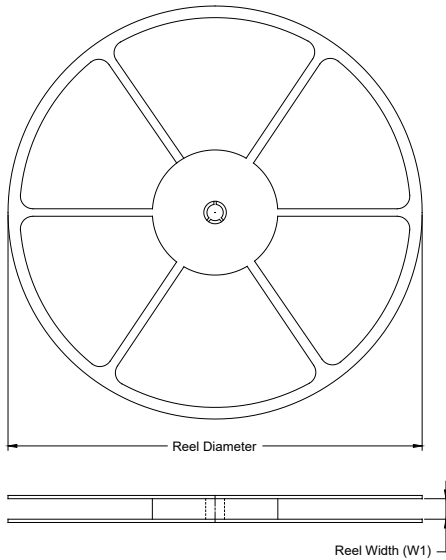
| Symbol | Dimensions In Millimeters | | |
|--------|---------------------------|-----|-------|
| | MIN | NOM | MAX |
| A | - | - | 0.152 |
| D | 3.050 | - | 3.110 |
| E | 1.770 | - | 1.830 |
| d | 0.220 | - | 0.280 |
| d1 | 0.320 | - | 0.380 |
| e | 0.800 BSC | | |
| e1 | 0.8775 BSC | | |
| L | 0.975 | - | 1.035 |
| L1 | 0.320 | - | 0.380 |

NOTE: This drawing is subject to change without notice.

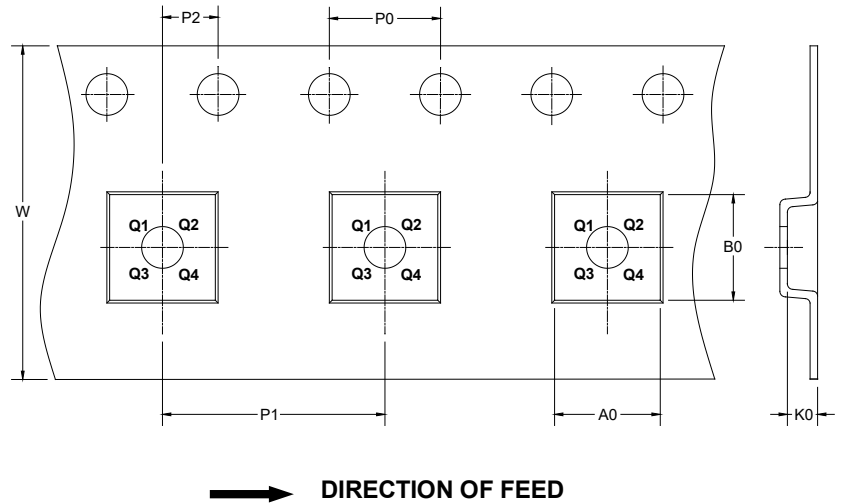
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

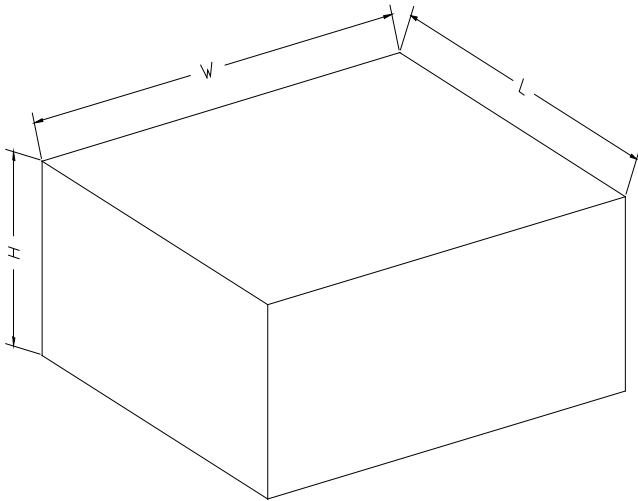
KEY PARAMETER LIST OF TAPE AND REEL

| Package Type | Reel Diameter | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P0 (mm) | P1 (mm) | P2 (mm) | W (mm) | Pin1 Quadrant |
|--------------------|---------------|--------------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| WLCSP-3.08×1.80-6L | 7" | 12.4 | 1.93 | 3.27 | 0.25 | 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 |
|-------------|-------------|------------|-------------|--------------|
| 7" (Option) | 368 | 227 | 224 | 8 |
| 7" | 442 | 410 | 224 | 18 |

DD0002