

### FEATURES

- Low On-State Resistance
- With ESD Protection: HBM > 2kV
- WLCSP with Footprint 3.01×1.52 mm<sup>2</sup>
- RoHS Compliant and Halogen Free

### ABSOLUTE MAXIMUM RATINGS

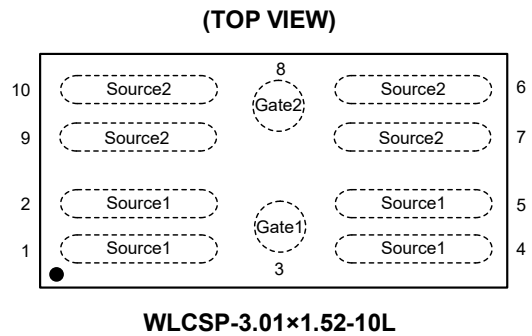
PARAMETER	SYMBOL	VALUE	UNITS
Source-to-Source Voltage	V <sub>SS</sub>	12	V
Gate-to-Source Voltage	V <sub>GS</sub>	±8	V
Source Current <sup>(1)</sup>	I <sub>S</sub>	T <sub>A</sub> = +25°C	12
		T <sub>A</sub> = +70°C	9
Source Current (Pulse) <sup>(2)</sup>	I <sub>SM</sub>	24	A
Total Dissipation	P <sub>D</sub>	T <sub>A</sub> = +25°C	0.45
		T <sub>A</sub> = +70°C	0.29
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature Range	T <sub>STG</sub>	-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.

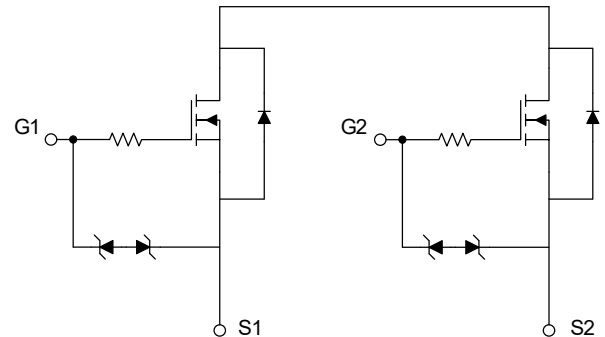
### PRODUCT SUMMARY

R <sub>SSON</sub> (TYP) V <sub>GS</sub> = 4.5V	R <sub>SSON</sub> (MAX) V <sub>GS</sub> = 4.5V	I <sub>S</sub> (MAX) T <sub>A</sub> = +25°C
2.1mΩ	2.8mΩ	12A

### PIN CONFIGURATION



### EQUIVALENT CIRCUIT



### APPLICATIONS

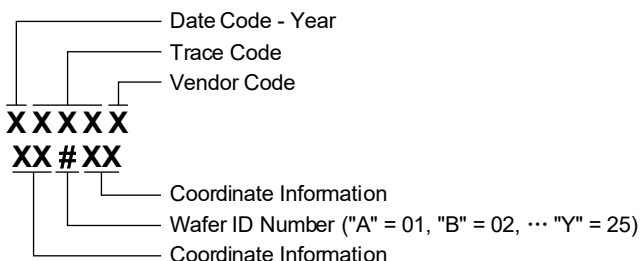
- Battery Protection
- Battery Management
- Load Switch

**PACKAGE/ORDERING INFORMATION**

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMTC28412	WLCSP-3.01×1.52-10L	-55°C to +150°C	SGMTC28412TG/TR	SGM08W 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.

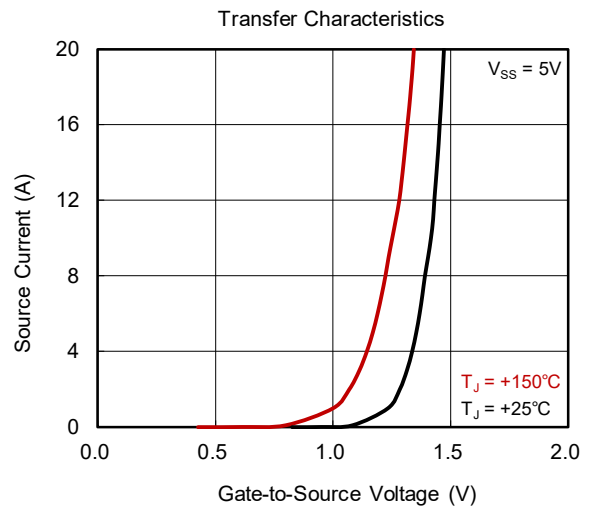
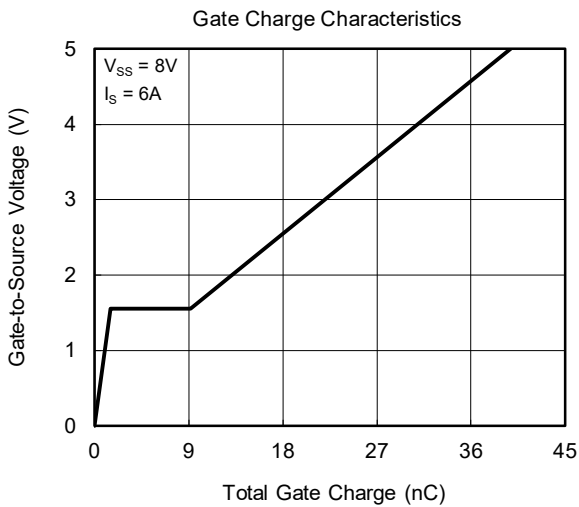
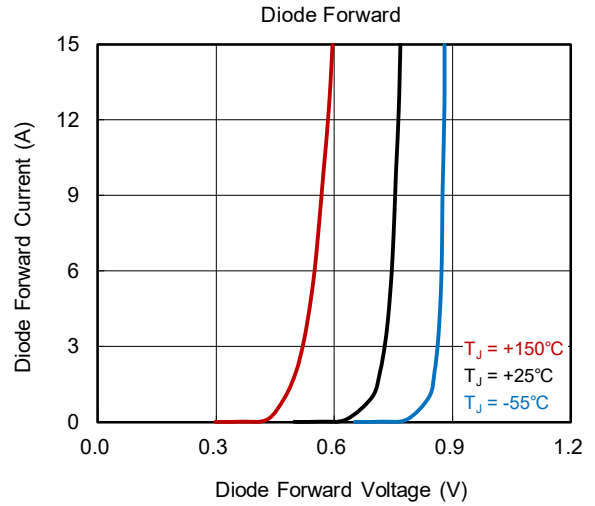
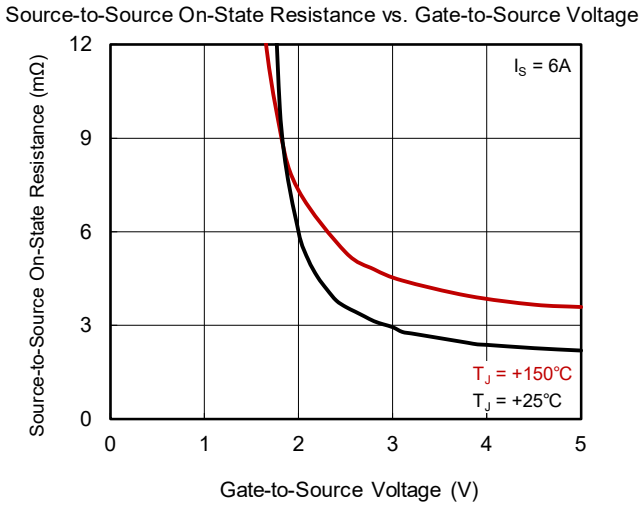
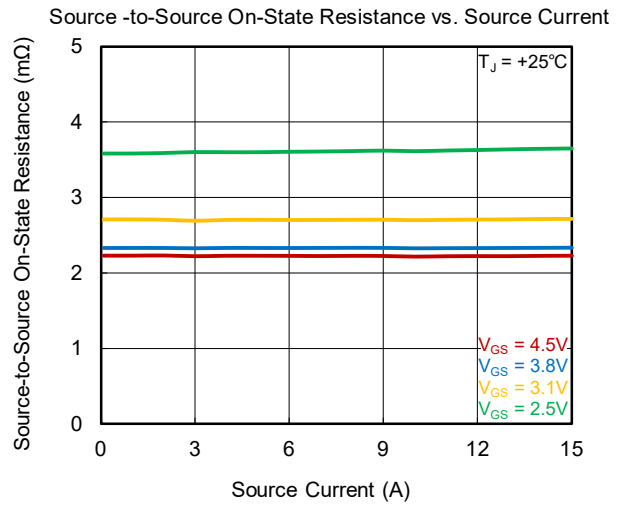
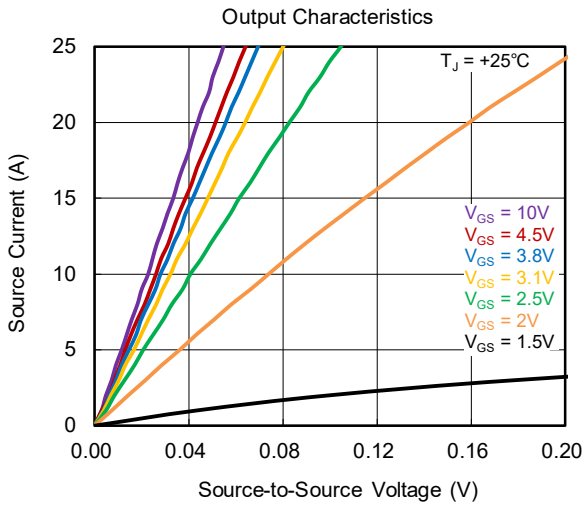
**THERMAL RESISTANCE MAXIMUM RATINGS**

PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Ambient Thermal Resistance	R <sub>θJA</sub>	286	°C/W

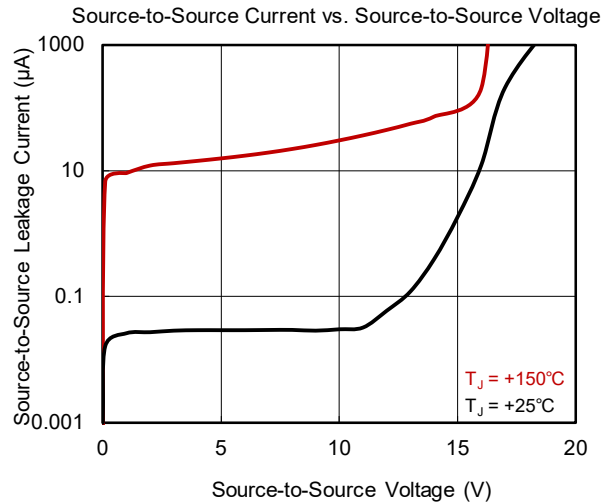
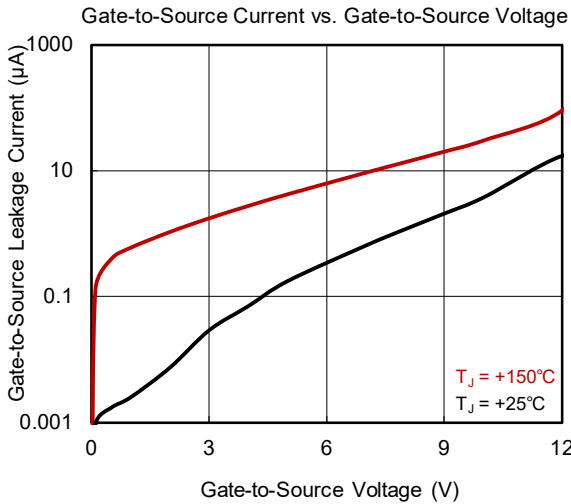
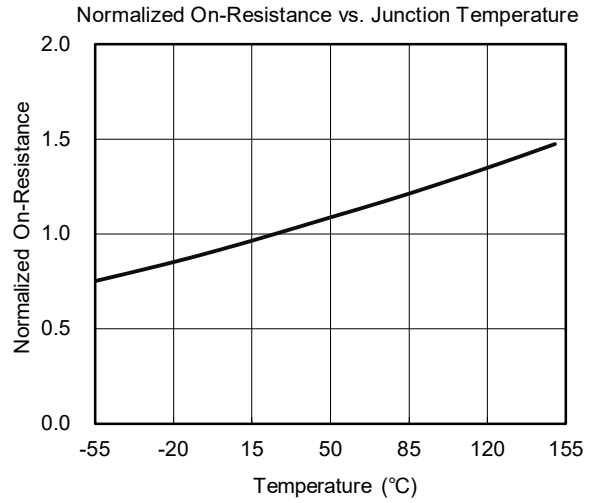
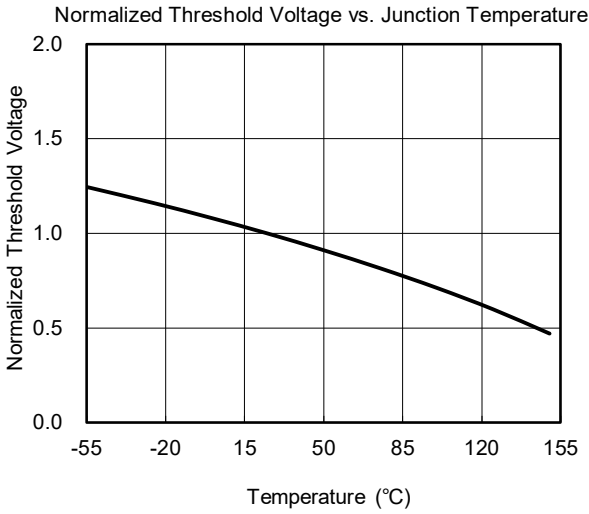
**ELECTRICAL CHARACTERISTICS**(T<sub>A</sub> = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>Static OFF Characteristics</b>						
Source-to-Source Breakdown Voltage	V <sub>BR_SSS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 250μA	12			V
Zero Gate Voltage Source Current	I <sub>SSS</sub>	V <sub>GS</sub> = 0V, V <sub>SS</sub> = 12V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±8V, V <sub>SS</sub> = 0V			±10	μA
<b>Static ON Characteristics</b>						
Gate-to-Source Threshold Voltage	V <sub>GS_TH</sub>	V <sub>GS</sub> = V <sub>SS</sub> , I <sub>S</sub> = 250μA	0.5	0.8	1.2	V
Source-to-Source On-State Resistance	R <sub>SSON</sub>	V <sub>GS</sub> = 4.5V, I <sub>S</sub> = 6A		2.1	2.8	mΩ
		V <sub>GS</sub> = 3.8V, I <sub>S</sub> = 6A		2.2	2.9	
		V <sub>GS</sub> = 3.1V, I <sub>S</sub> = 6A		2.6	4.0	
		V <sub>GS</sub> = 2.5V, I <sub>S</sub> = 6A		3.4	6.45	
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>F_S-S</sub>	V <sub>GS</sub> = 0V, I <sub>F</sub> = 6A		0.7	1.2	V
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> = 0V, V <sub>SS</sub> = 10V, f = 1MHz		2069		pF
Output Capacitance	C <sub>OSS</sub>			553		
Reverse Transfer Capacitance	C <sub>RSS</sub>			134		
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> = 4.5V, V <sub>SS</sub> = 8V, I <sub>S</sub> = 6A		39.8		nC
Gate-to-Source Charge	Q <sub>GS</sub>			1.5		
Gate-to-Drain Charge	Q <sub>GD</sub>			7.7		
<b>Switch Characteristics</b>						
Turn-On Delay Time	t <sub>D_ON</sub>	V <sub>GS</sub> = 4.5V, V <sub>SS</sub> = 8V, I <sub>S</sub> = 6A		0.7		μs
Rise Time	t <sub>R</sub>			2.0		
Turn-Off Delay Time	t <sub>D_OFF</sub>			2.0		
Fall Time	t <sub>F</sub>			6.9		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

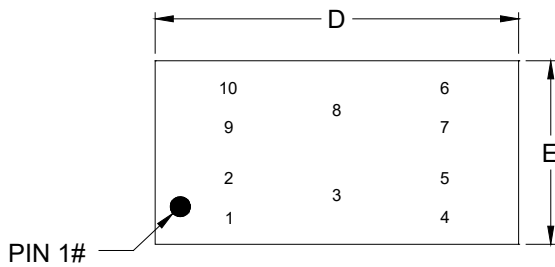
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

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

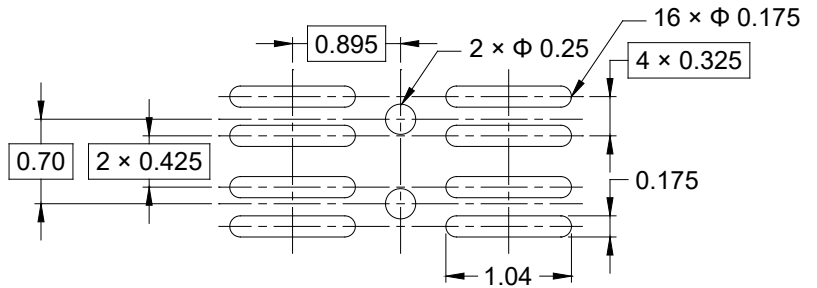
# PACKAGE INFORMATION

## PACKAGE OUTLINE DIMENSIONS

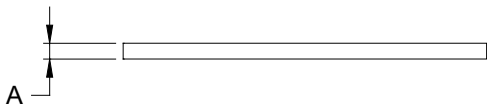
### WLCSP-3.01×1.52-10L



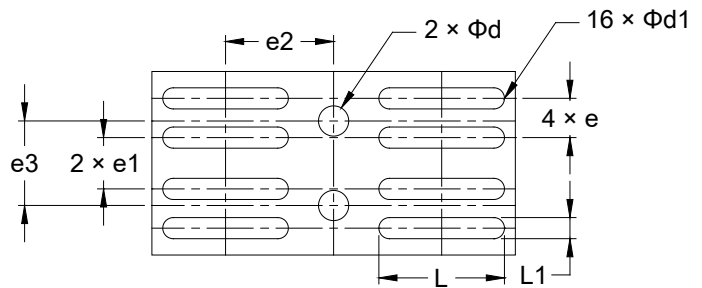
TOP VIEW



RECOMMENDED LAND PATTERN (Unit: mm)



SIDE VIEW



BOTTOM VIEW

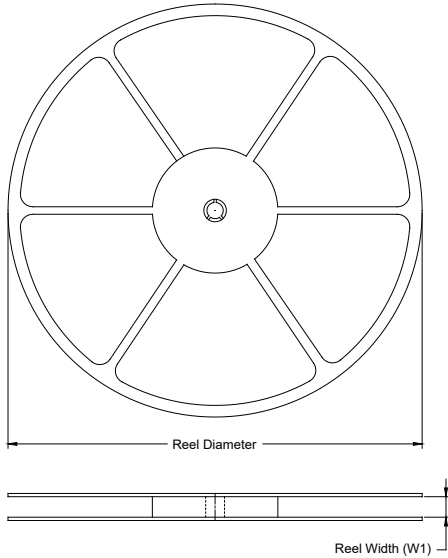
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	0.152
D	2.980	-	3.040
E	1.490	-	1.550
d	0.220	-	0.280
d1	0.145	-	0.205
e	0.325 BSC		
e1	0.425 BSC		
e2	0.895 BSC		
e3	0.700 BSC		
L	1.010	-	1.070
L1	0.145	-	0.205

NOTE: This drawing is subject to change without notice.

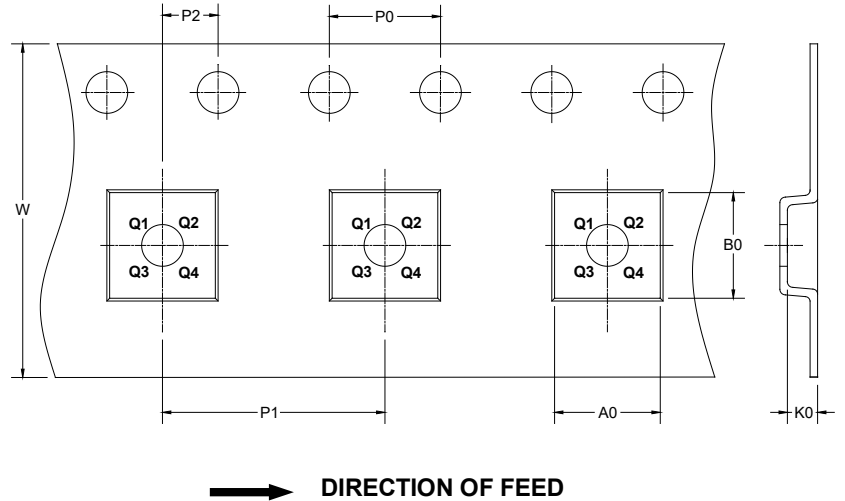
# PACKAGE INFORMATION

## TAPE AND REEL INFORMATION

### REEL DIMENSIONS



### TAPE DIMENSIONS



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

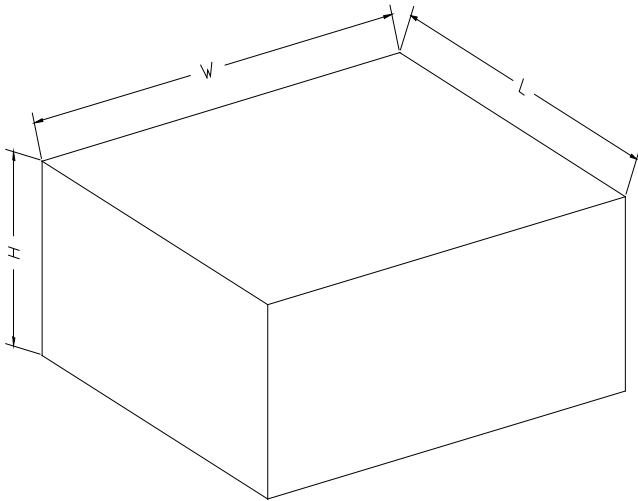
### KEY PARAMETER LIST OF TAPE AND REEL

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-3.01×1.52-10L	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