



SGMTC28412

12V, Power, Dual N-Channel, WLCSP Package, MOSFET

FEATURES

- Low On-State Resistance
- With ESD Protection: HBM > 2kV
- WLCSP with Footprint 3.01×1.52mm²
- RoHS Compliant and Halogen Free

ABSOLUTE MAXIMUM RATINGS

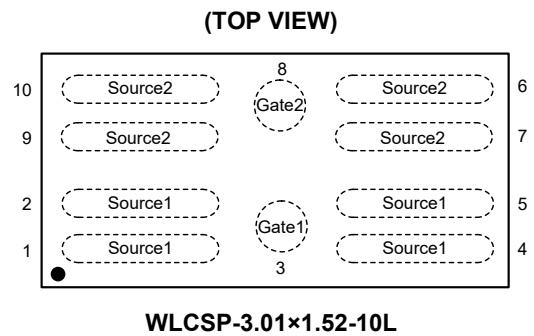
PARAMETER	SYMBOL	VALUE	UNITS
Source-to-Source Voltage	V_{SS}	12	V
Gate-to-Source Voltage	V_{GS}	±8	V
Source Current ⁽¹⁾	I_S	12	A
		9	
Source Current (Pulse) ⁽²⁾	I_{SM}	24	A
Total Dissipation	P_D	0.45	W
		0.29	
Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Lead Temperature (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.

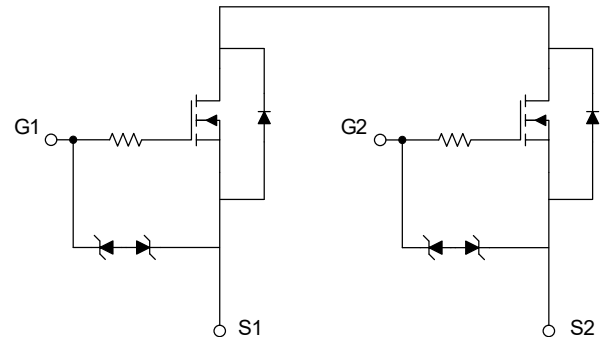
PRODUCT SUMMARY

R_{SSON} (TYP) $V_{GS} = 4.5V$	R_{SSON} (MAX) $V_{GS} = 4.5V$	I_S (MAX) $T_A = +25^\circ C$
2.1mΩ	2.8mΩ	12A

PIN CONFIGURATION



EQUIVALENT CIRCUIT



APPLICATIONS

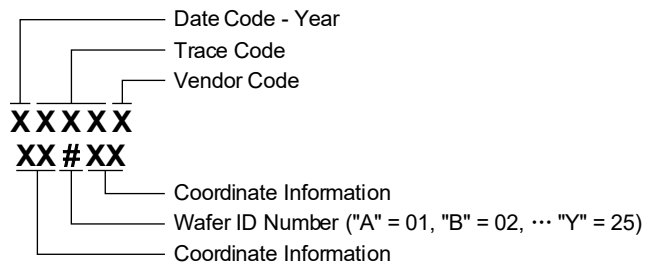
- Battery Protection
- Battery Management
- Load Switch

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

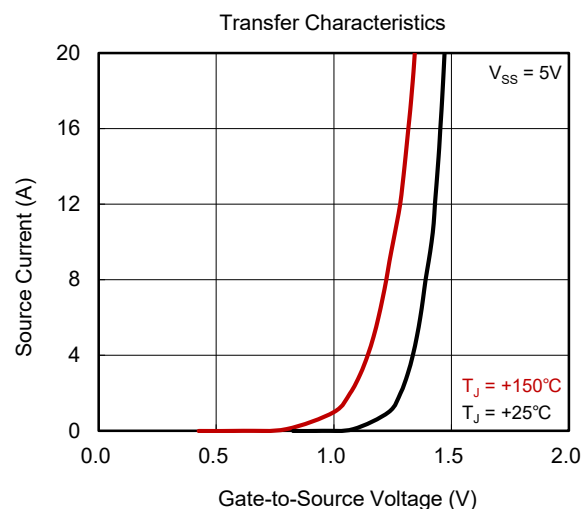
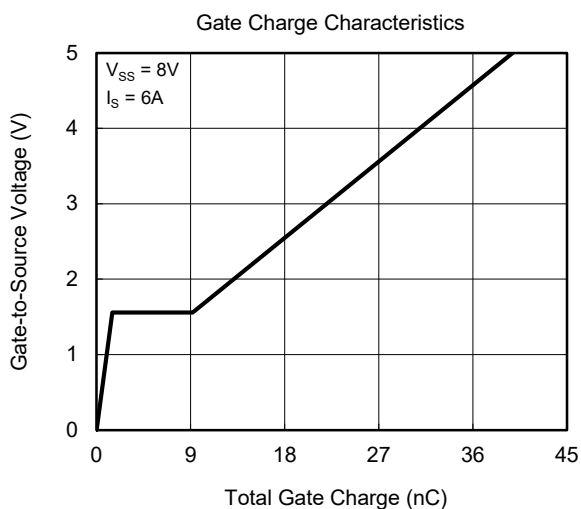
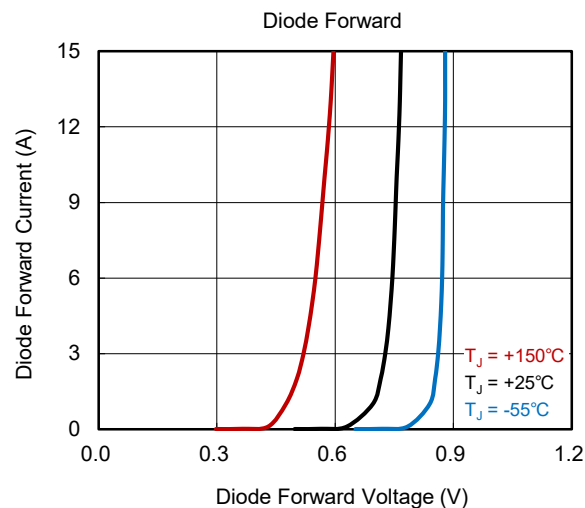
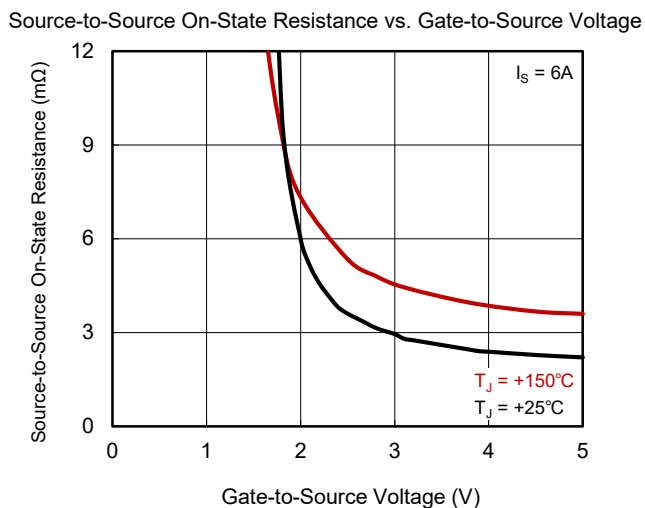
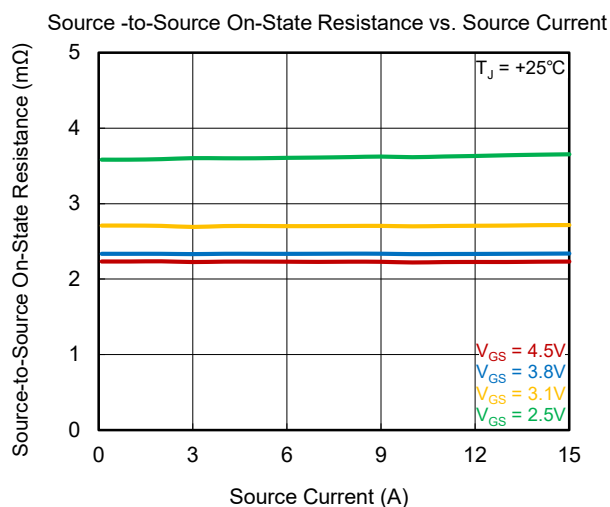
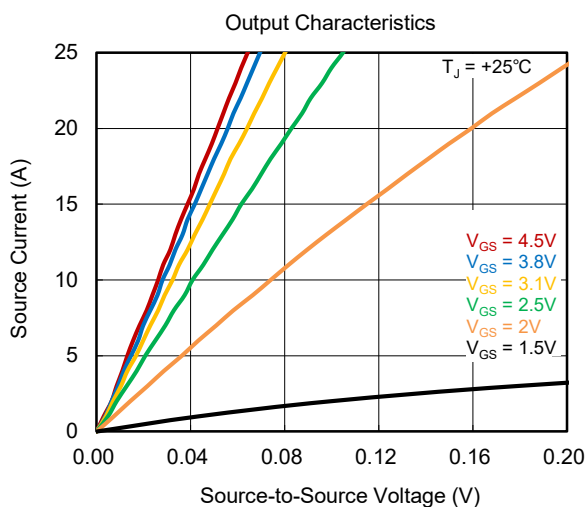
PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	286	°C/W

ELECTRICAL CHARACTERISTICS

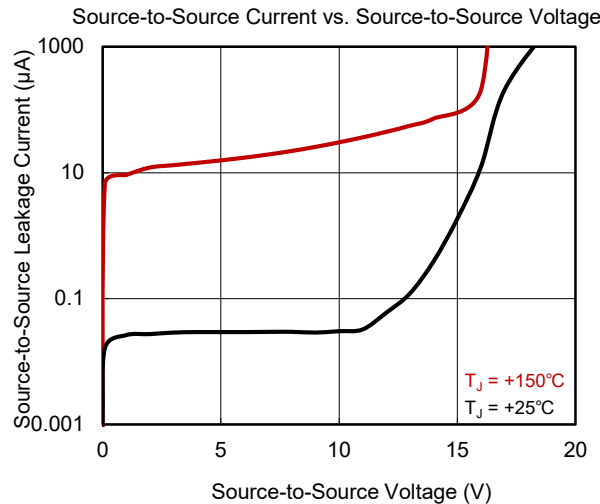
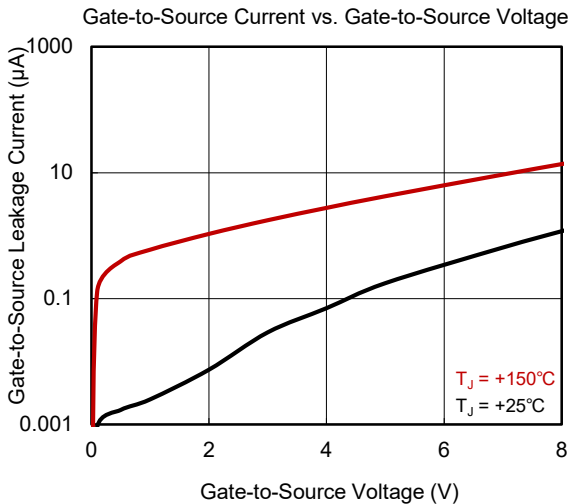
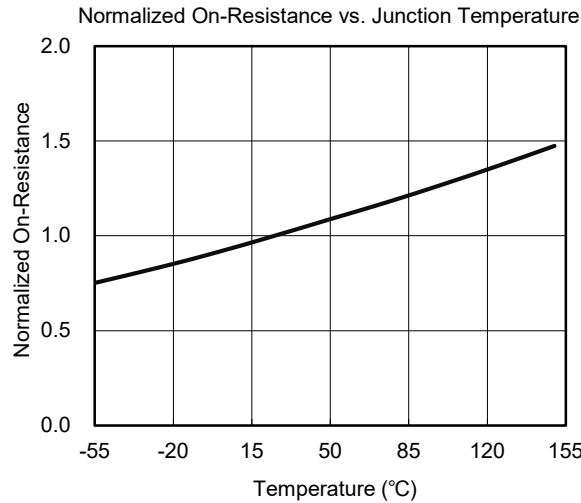
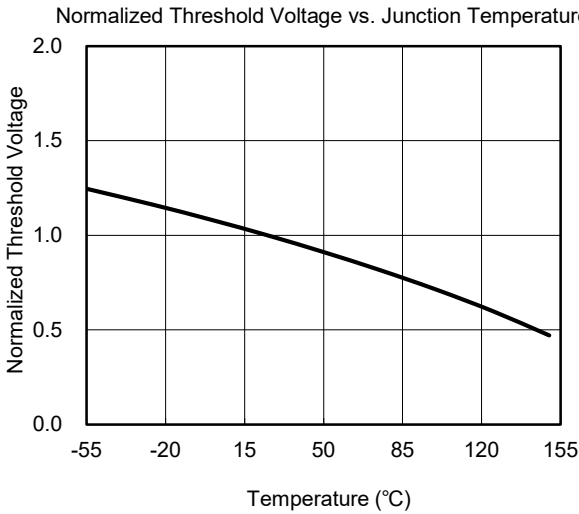
(T_A = +25°C, unless otherwise noted.)

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	2.8	mΩ
		V _{GS} = 3.8V, I _S = 6A		2.2	2.9	
		V _{GS} = 3.1V, I _S = 6A		2.6	4.0	
		V _{GS} = 2.5V, I _S = 6A		3.4	6.45	
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		2069		pF
Output Capacitance	C _{OSS}			553		
Reverse Transfer Capacitance	C _{RSS}			134		
Total Gate Charge	Q _G	V _{GS} = 4.5V, V _{SS} = 8V, I _S = 6A		39.8		nC
Gate-to-Source Charge	Q _{GS}			1.5		
Gate-to-Drain Charge	Q _{GD}			7.7		
Switch Characteristics						
Turn-On Delay Time	t _{D_ON}	V _{GS} = 4.5V, V _{SS} = 8V, I _S = 6A		0.7		μs
Rise Time	t _R			2.0		
Turn-Off Delay Time	t _{D_OFF}			2.0		
Fall Time	t _F			6.9		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

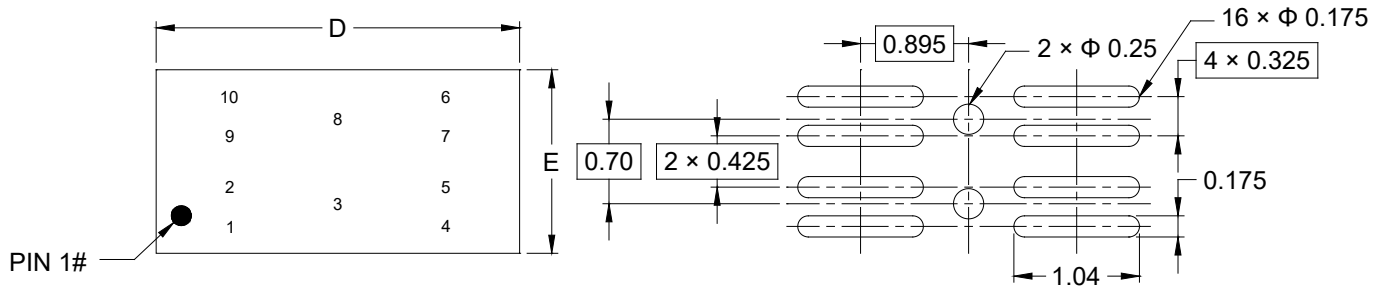
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

MAY 2025 – REV.A to REV.A.1	Page
Updated thermal resistance maximum ratings	2
Updated typical performance characteristics.....	4, 5
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

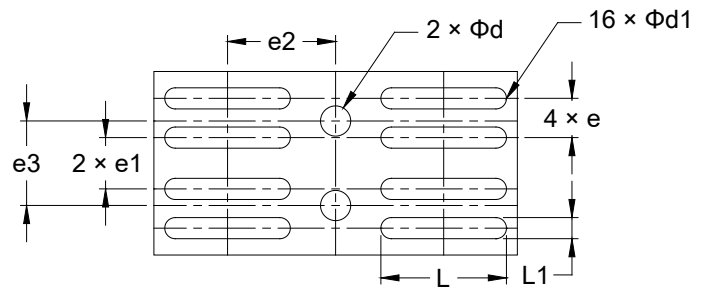


TOP VIEW

RECOMMENDED LAND PATTERN (Unit: mm)



SIDE VIEW



BOTTOM VIEW

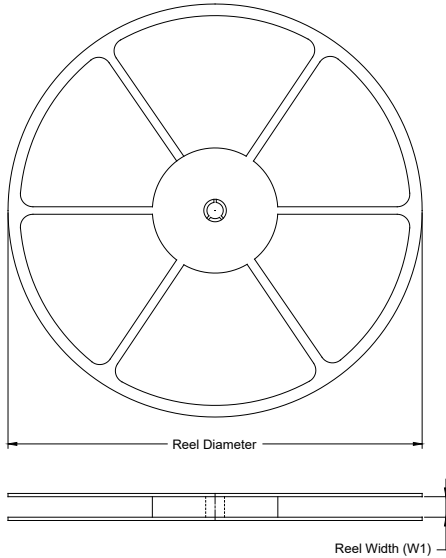
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	0.152
D	2.980	-	3.040
E	1.490	-	1.550
d	0.220	-	0.280
d1	0.145	-	0.205
e	0.325 BSC		
e1	0.425 BSC		
e2	0.895 BSC		
e3	0.700 BSC		
L	1.010	-	1.070
L1	0.145	-	0.205

NOTE: This drawing is subject to change without notice.

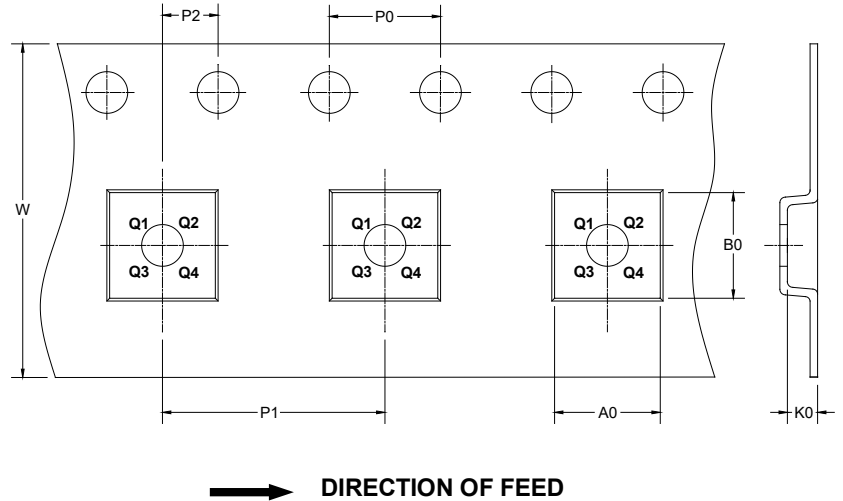
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

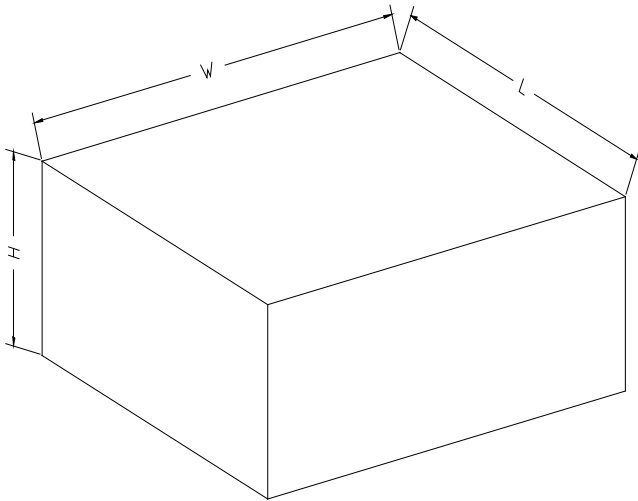
KEY PARAMETER LIST OF TAPE AND REEL

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