

FEATURES

- High Power and Current Handling Capability
- Low On-State Resistance
- Low Total Gate Charge and Capacitance Losses
- RoHS Compliant and Halogen Free

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Drain-to-Source Voltage	V_{DS}	30	V
Gate-to-Source Voltage	V_{GS}	± 12	V
Drain Current ⁽¹⁾	I_D	$T_A = +25^\circ\text{C}$	10
		$T_A = +70^\circ\text{C}$	8.5
Drain Current (Pulse) ⁽²⁾	I_{DM}	40	A
Total Dissipation	P_D	$T_A = +25^\circ\text{C}$	2
		$T_A = +70^\circ\text{C}$	1.3
Avalanche Current ⁽³⁾	I_{AS}	36.7	A
Avalanche Energy ⁽³⁾	E_{AS}	67.3	mJ
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Lead Temperature (Soldering, 10s)		+260	$^\circ\text{C}$

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.

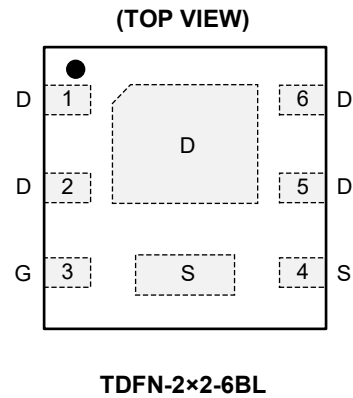
NOTES:

1. The current will be limited by Package, PCB, thermal design and operating temperature.
2. $t_{PULSE} < 10\mu\text{s}$.
3. Parts are 100% tested at $V_{GS} = 10\text{V}$, $I_L = 26\text{A}$, and $E_{AS} = 33.8\text{mJ}$.

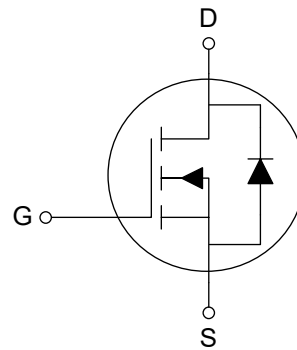
PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 4.5\text{V}$	$R_{DS(on)}$ (MAX) $V_{GS} = 4.5\text{V}$	I_D (MAX) $T_A = +25^\circ\text{C}$
9m Ω	11.3m Ω	10A

PIN CONFIGURATION



EQUIVALENT CIRCUIT



APPLICATIONS

- PWM Applications
- Power Load Switch
- Battery Management
- Wireless Chargers

SGMNL12330

30V, Power, Single N-Channel, TDFN Package, MOSFET

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNL12330	TDFN-2x2-6BL	-55°C to +150°C	SGMNL12330TTEN6G/TR	03P XXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXX = Date Code and Trace Code.

YYY— Serial Number

XXXX

Vendor Code

Trace Code

Date Code - Year

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.

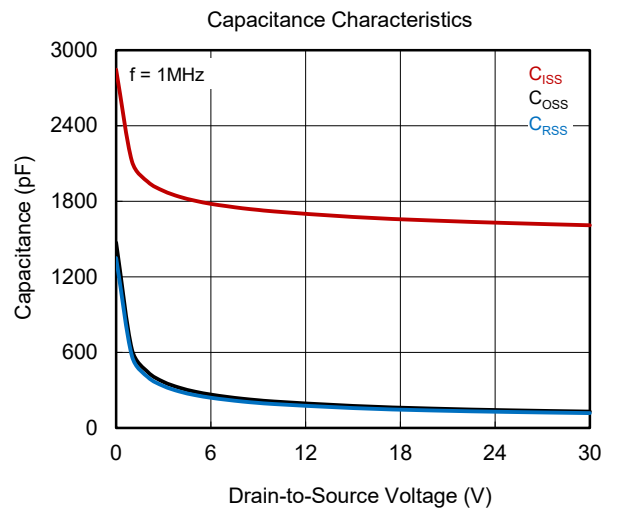
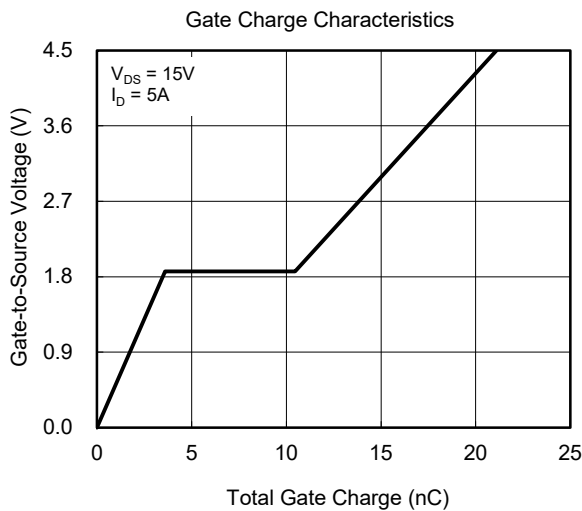
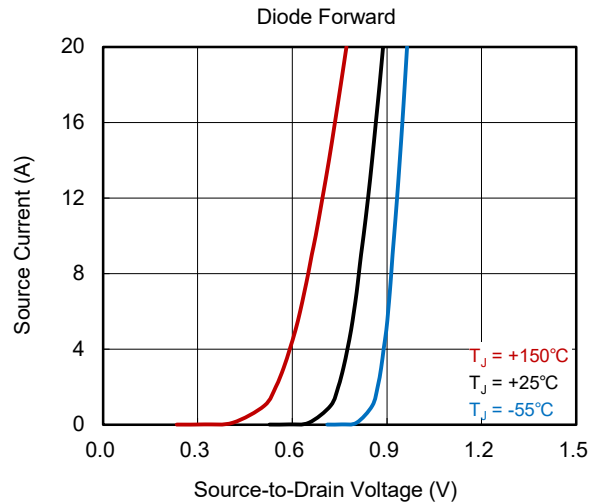
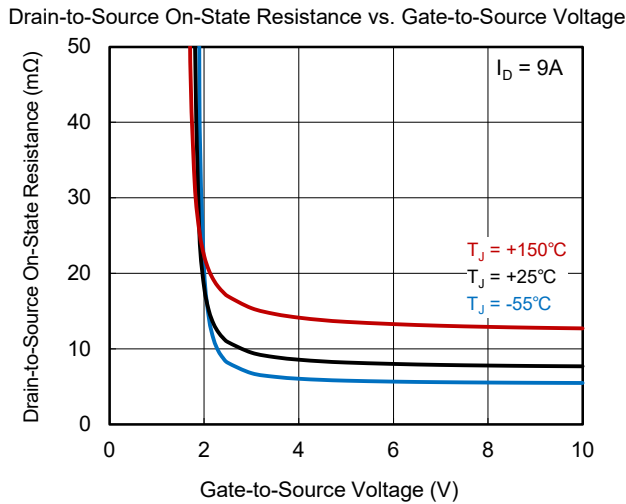
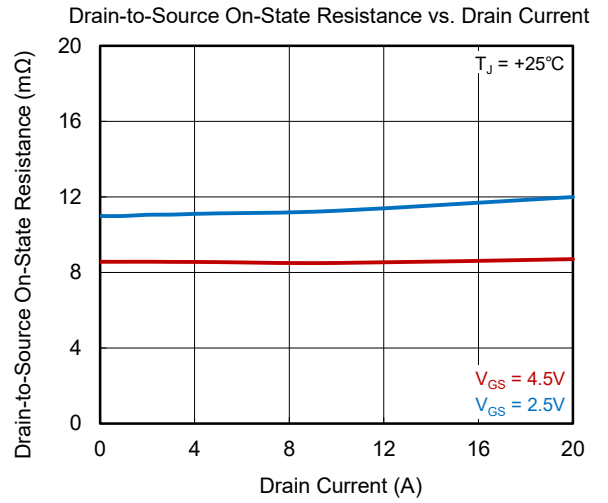
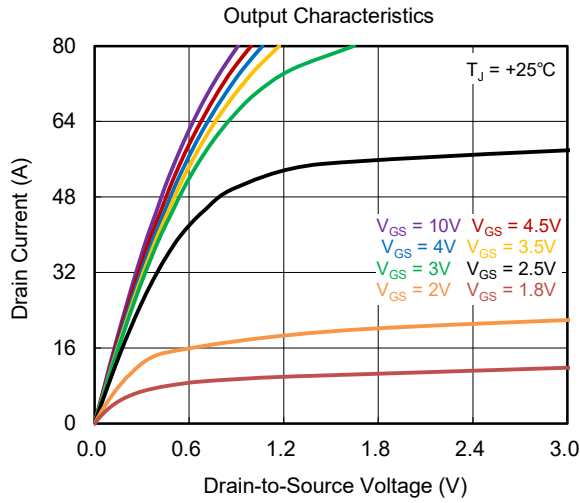
THERMAL RESISTANCE

PARAMETER	SYMBOL	TYP	UNITS
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	60	°C/W

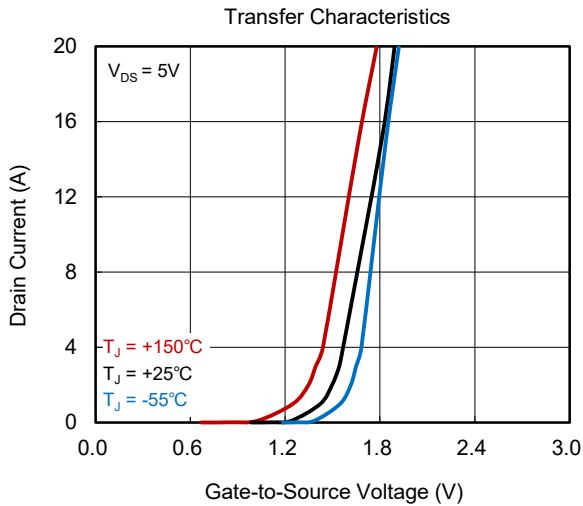
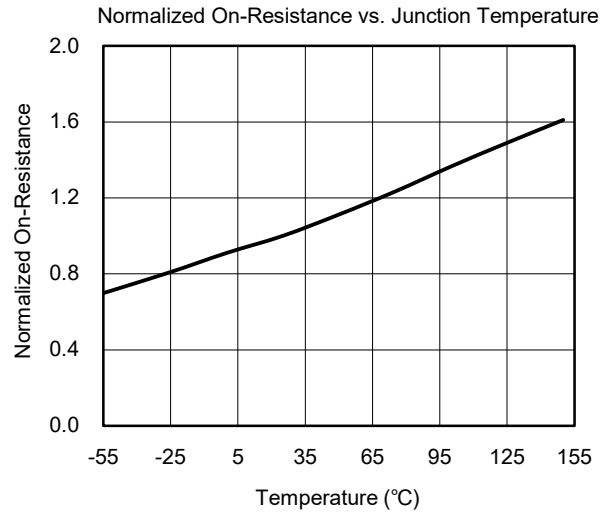
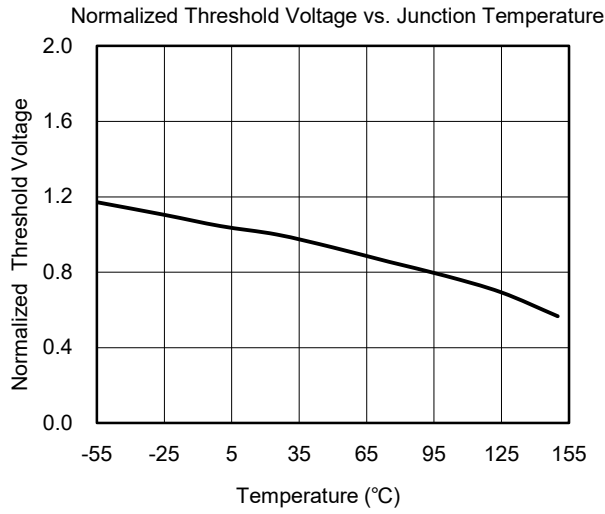
ELECTRICAL CHARACTERISTICS(T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Static OFF Characteristics						
Drain-to-Source Breakdown Voltage	V _{BR_DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0V, V _{DS} = 24V			1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V			±100	nA
Static ON Characteristics						
Gate-to-Source Threshold Voltage	V _{GS_TH}	V _{GS} = V _{DS} , I _D = 250μA	0.5	0.85	1.3	V
Drain-to-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 9A		8.1	10.2	mΩ
		V _{GS} = 4.5V, I _D = 9A		9	11.3	
		V _{GS} = 2.5V, I _D = 7A		11	14.3	
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 9A		27		S
Diode Characteristics						
Diode Forward Voltage	V _{F_SD}	V _{GS} = 0V, I _S = 9A		0.8	1.2	V
Reverse Recovery Time	t _{RR}	V _{GS} = 0V, I _S = 5A, di/dt = 100A/μs		12		ns
Reverse Recovery Charge	Q _{RR}			3.2		nC
Dynamic Characteristics						
Gate Resistance	R _G	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		1.0		Ω
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz		1680		pF
Output Capacitance	C _{OSS}			175		
Reverse Transfer Capacitance	C _{RSS}			158		
Total Gate Charge	Q _G		V _{GS} = 4.5V, V _{DS} = 15V, I _D = 5A		21.1	
Gate-to-Source Charge	Q _{GS}			3.6		
Gate-to-Drain Charge	Q _{GD}			6.9		
Switch Characteristics						
Turn-On Delay Time	t _{D_ON}	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 5A, R _G = 3Ω		10.9		ns
Rise Time	t _R			22.4		
Turn-Off Delay Time	t _{D_OFF}			28.5		
Fall Time	t _F			8.5		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

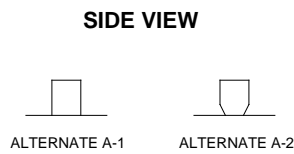
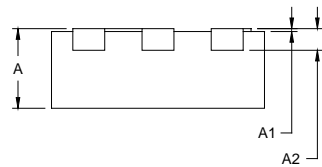
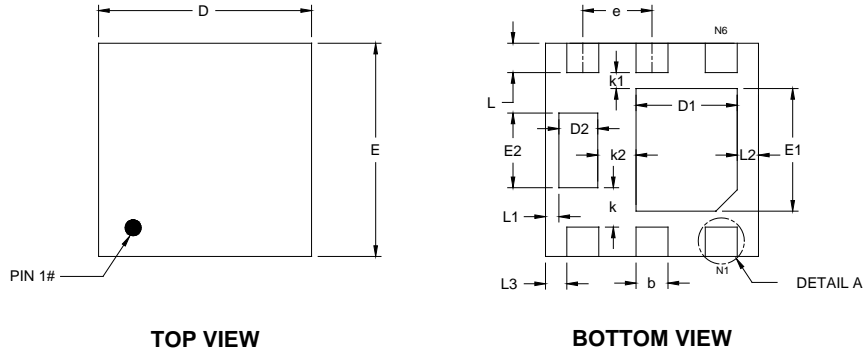
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

AUGUST 2025 – REV.A to REV.A.1	Page
Updated thermal resistance	2

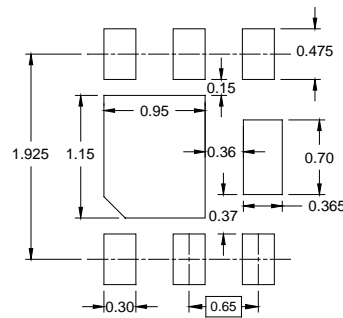
Changes from Original (FEBRUARY 2025) to REV.A	Page
Changed from Product Preview to Production Data	All

PACKAGE OUTLINE DIMENSIONS

TDFN-2x2-6BL



DETAIL A
ALTERNATE TERMINAL CONSTRUCTION



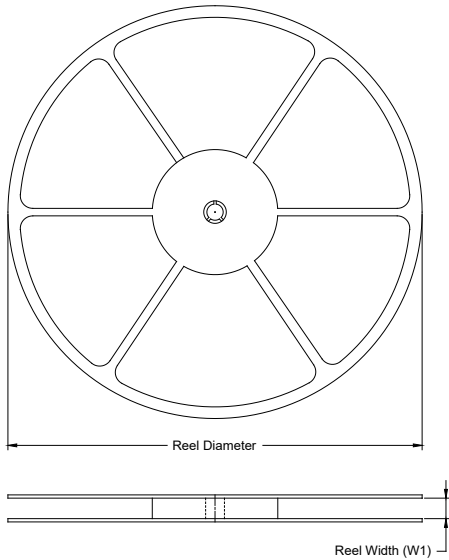
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	0.700	0.750	0.800
A1	0.000	0.020	0.050
A2	0.200 REF		
b	0.250	0.300	0.350
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D1	0.850	0.950	1.050
E1	1.050	1.150	1.250
D2	0.315	0.365	0.415
E2	0.650	0.700	0.750
e	0.650 BSC		
k	0.370 REF		
k1	0.150 REF		
k2	0.360 REF		
L	0.225	0.275	0.325
L1	0.125 REF		
L2	0.200 REF		
L3	0.200 REF		

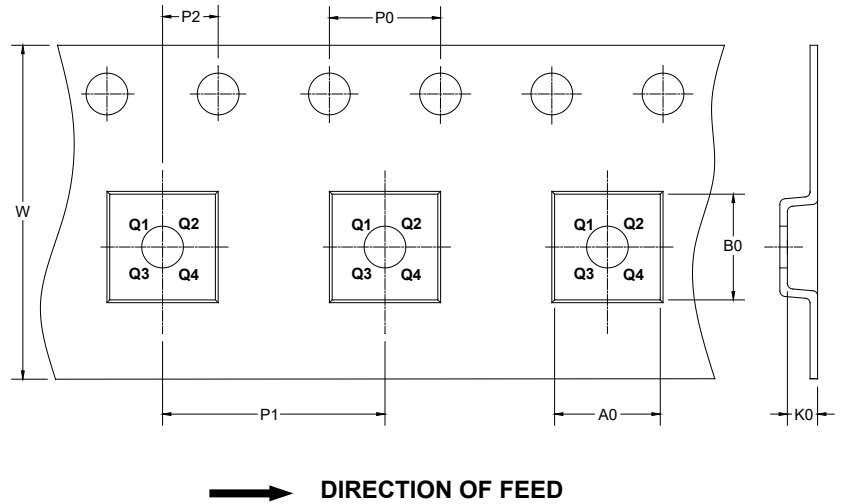
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

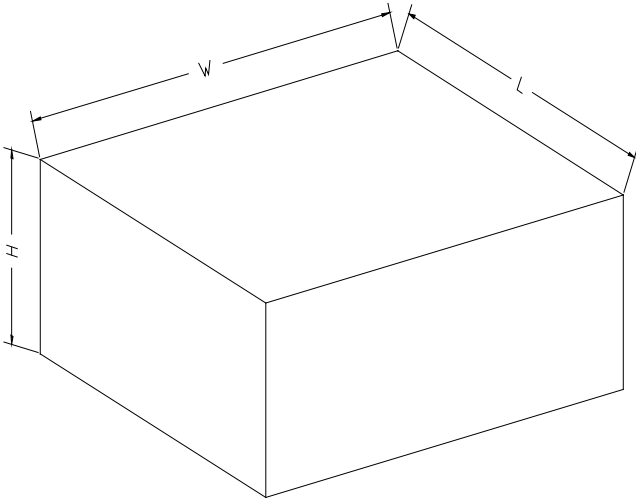
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TDFN-2×2-6BL	7"	9.5	2.30	2.30	1.00	4.0	4.0	2.0	8.0	Q2

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