

### GENERAL DESCRIPTION

The SGMNM12330 is a power MOSFET with low gate charge and a low on-state resistance. This feature makes it a good choice for load switches and PWM applications.

### FEATURES

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

### APPLICATIONS

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

### ABSOLUTE MAXIMUM RATINGS

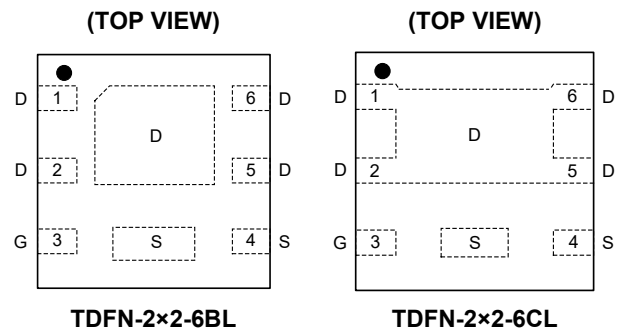
PARAMETER	SYMBOL	VALUE	UNITS
Drain-to-Source Voltage	$V_{DS}$	30	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (DC)	$I_D$	10	A
Continuous Drain Current (Pulse)	$I_D$	40	A
Total Dissipation	$P_D$	2.4	W
Avalanche Current	$I_{AS}$	26	A
Avalanche Energy	$E_{AS}$	33.8	mJ
Junction Temperature	$T_J$	+150	$^{\circ}C$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^{\circ}C$
Lead Temperature (Soldering, 10s)		+260	$^{\circ}C$

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.

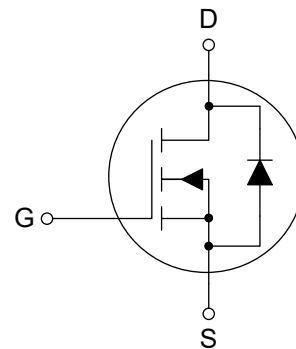
### PRODUCT SUMMARY

$R_{DS(ON)}$ (TYP)	$R_{DS(ON)}$ (MAX)	$I_D$ (MAX)
9m $\Omega$	11.5m $\Omega$	10A

### PIN CONFIGURATIONS



### EQUIVALENT CIRCUIT

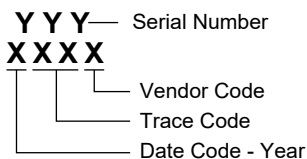


**PACKAGE/ORDERING INFORMATION**

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNM12330	TDFN-2x2-6BL	-55°C to +150°C	SGMNM12330TTEN6G/TR	SZN XXXX	Tape and Reel, 3000
	TDFN-2x2-6CL	-55°C to +150°C	SGMNM12330TTEO6G/TR	SZP XXXX	Tape and Reel, 3000

**MARKING INFORMATION**

NOTE: XXXX = Date Code, Trace Code and Vendor Code.



Green (RoHS & HF): SG Micro Corp defines "Green" to mean RoHS Compliant and Halogen Free.

**DISCLAIMER**

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

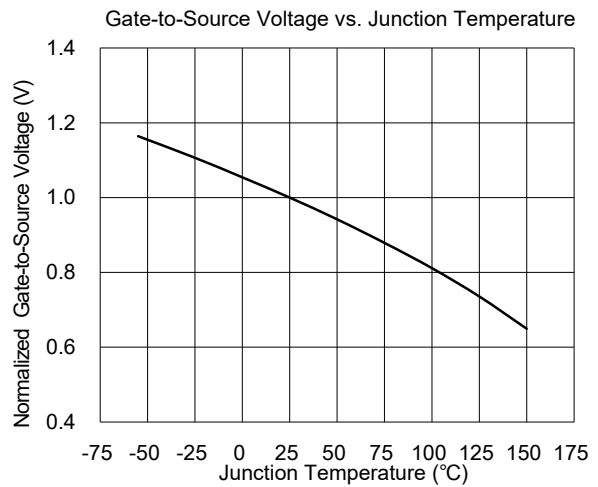
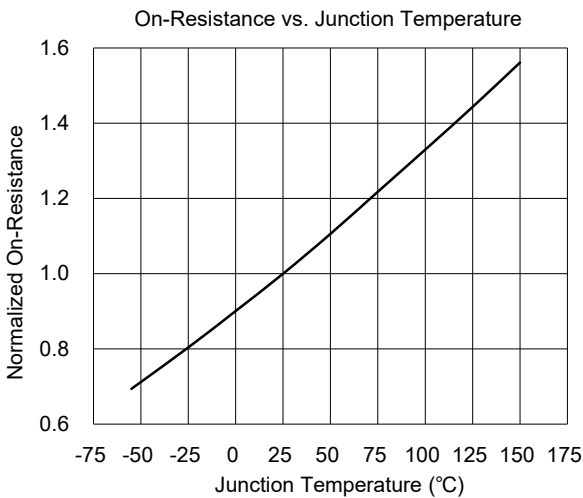
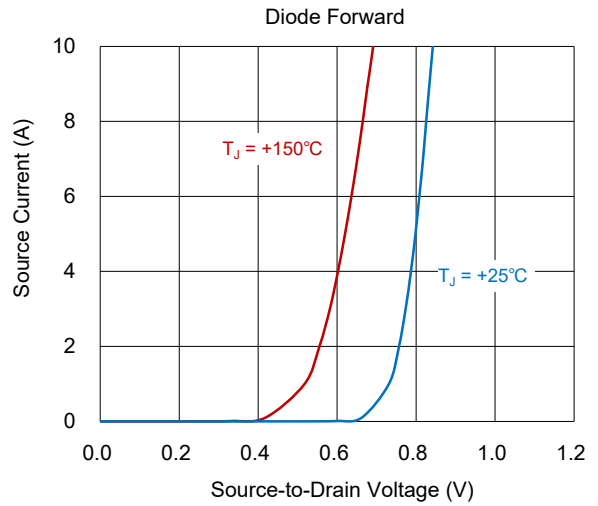
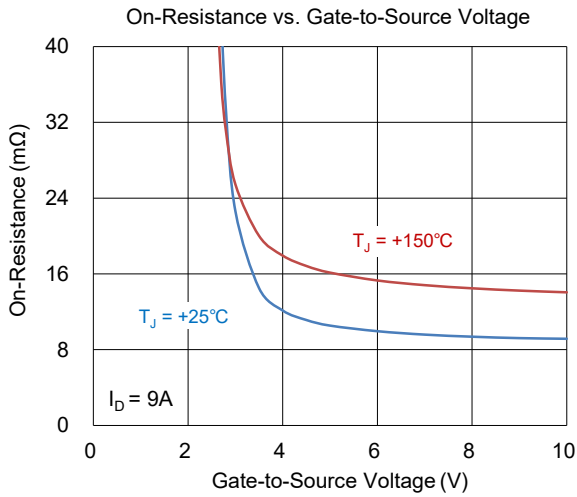
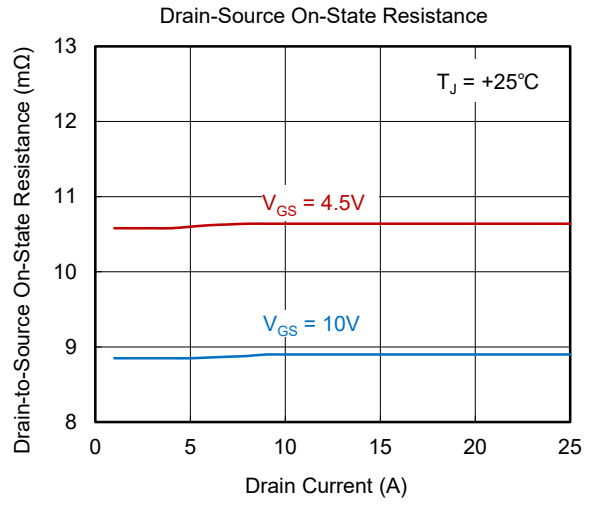
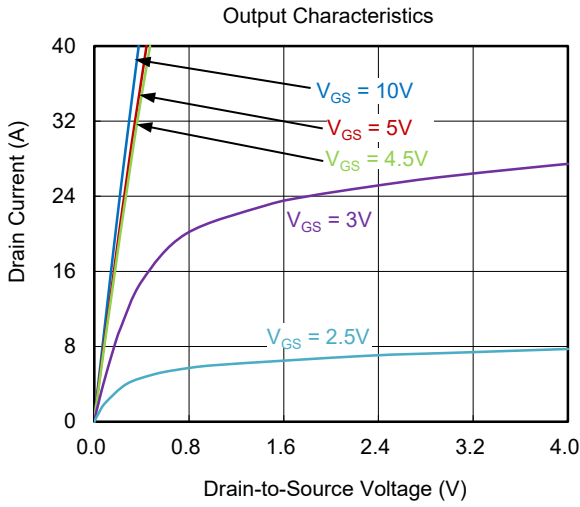
**THERMAL RESISTANCE MAXIMUM RATINGS**

PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	56	°C/W

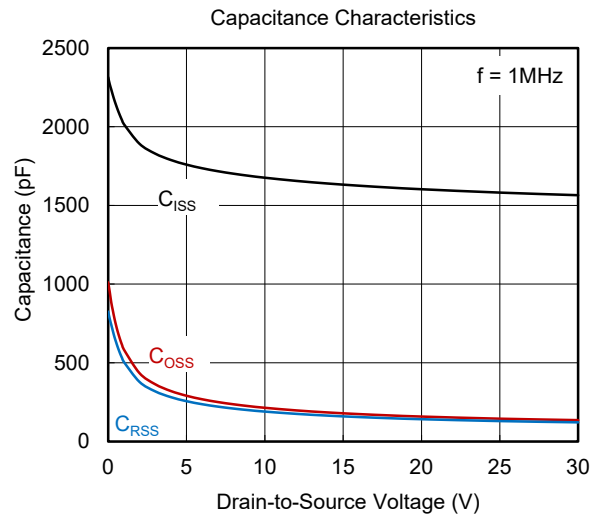
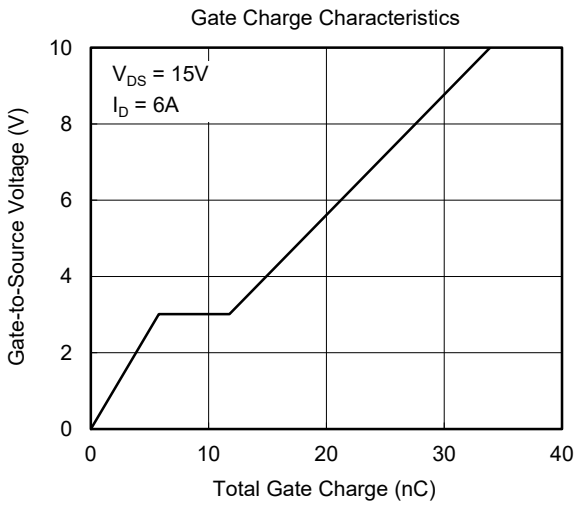
**ELECTRICAL CHARACTERISTICS**(T<sub>A</sub> = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>Static OFF Characteristics</b>						
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
<b>Static ON Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	1	1.5	2.0	V
Drain-to-Source On-State Resistance	R <sub>DS(ON)</sub>	I <sub>D</sub> = 9A, V <sub>GS</sub> = 10V		9	11.5	mΩ
		I <sub>D</sub> = 7A, V <sub>GS</sub> = 4.5V		11	14.3	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 9A		16		S
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		1.0		Ω
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>F(SD)</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A		0.7	1.2	V
Reverse Recovery Time	t <sub>RR</sub>	I <sub>S</sub> = 5A, V <sub>GS</sub> = 0V, di/dt = 100A/μs		16.7		ns
Reverse Recovery Charge	Q <sub>RR</sub>			7.5		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1MHz		1629		pF
Output Capacitance	C <sub>OSS</sub>			191		
Reverse Transfer Capacitance	C <sub>RSS</sub>			160		
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 6A		33.9		nC
Gate-to-Source Charge	Q <sub>GS</sub>			5.8		
Gate-to-Drain Charge	Q <sub>GD</sub>			6		
<b>Switch Characteristics</b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 5A, R <sub>G</sub> = 3Ω		11.2		ns
Rise Time	t <sub>R</sub>			3.5		
Turn-Off Delay Time	t <sub>D(OFF)</sub>			42.3		
Fall Time	t <sub>F</sub>			4.4		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



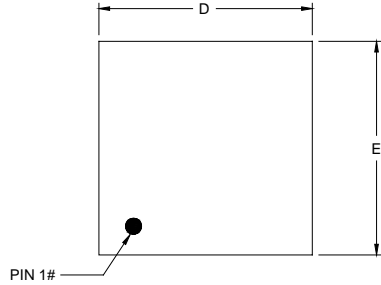
REVISION HISTORY

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

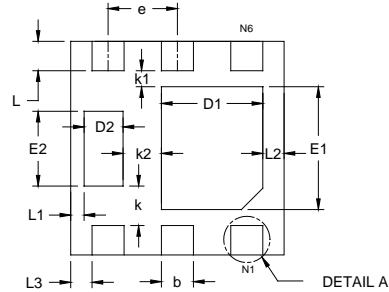
Changes from Original (OCTOBER 2022) to REV.A	Page
Changed from product preview to production data .....	All

PACKAGE OUTLINE DIMENSIONS

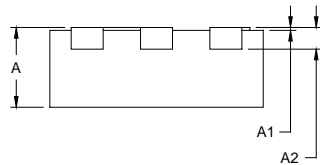
TDFN-2x2-6BL



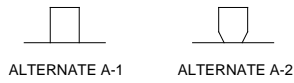
TOP VIEW



BOTTOM VIEW

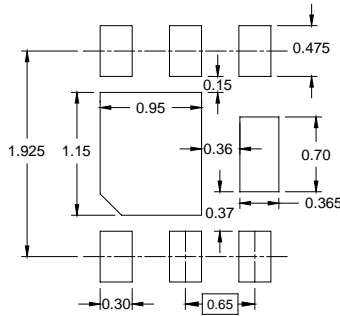


SIDE VIEW



DETAIL A

ALTERNATE TERMINAL CONSTRUCTION



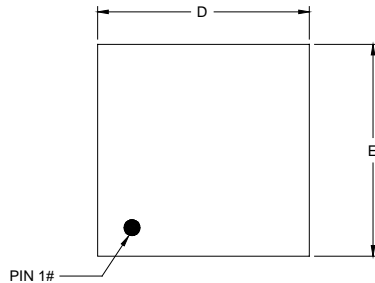
RECOMMENDED LAND PATTERN (Unit: mm)

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		

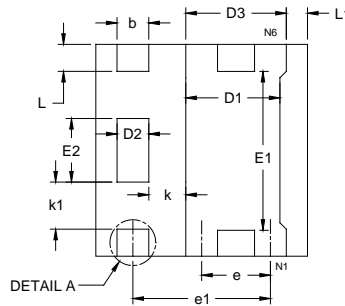
NOTE: This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

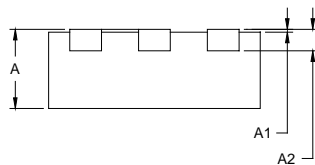
TDFN-2x2-6CL



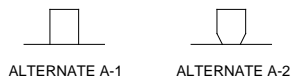
TOP VIEW



BOTTOM VIEW

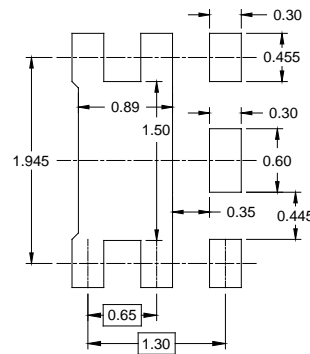


SIDE VIEW



DETAIL A

ALTERNATE TERMINAL CONSTRUCTION



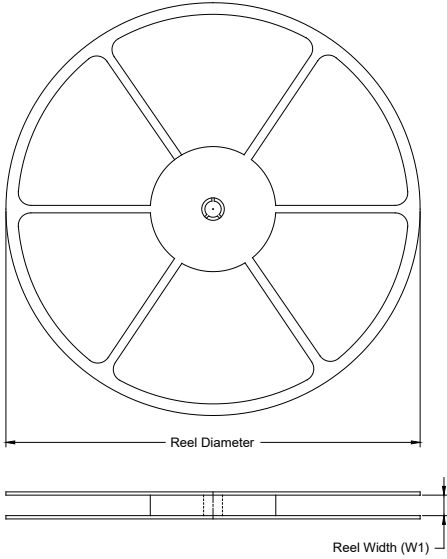
RECOMMENDED LAND PATTERN (Unit: mm)

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	0.790	0.890	0.990
E1	1.400	1.500	1.600
D2	0.200	0.300	0.400
E2	0.500	0.600	0.700
D3	0.950 REF		
e	0.650 BSC		
e1	1.300 BSC		
k	0.350 REF		
k1	0.445 REF		
L	0.180	0.255	0.355
L1	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	Q1
TDFN-2×2-6CL	7"	9.5	2.30	2.30	1.00	4.0	4.0	2.0	8.0	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