SGMNM05330
30V, Power, Single N-Channel, TDFN Package, MOSFET

FEATURES

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

PRODUCT SUMMARY

R_{DSON} (TYP) V_{GS} = 10V	R_{DSON} (MAX) V_{GS} = 10V	I_D (MAX) T_A = +25℃
4.3mΩ	5mΩ	20A

ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	VALUE	UNITS
Drain-to-Source Voltage		V_{DS}	30	V
Gate-to-Source Voltage		V_{GS}	±20	V
Drain Current (1)	T_A = +25℃	I_D	20	A
	T_A = +70℃		13	
Drain Current (Pulse) (2)		I_{DM}	60	A
Total Dissipation	T_A = +25℃	P_D	2.4	W
	T_A = +70℃		1.5	
Avalanche Current (3)		I_{AS}	37	A
Avalanche Energy (3)		E_{AS}	68.4	mJ
Junction Temperature		T_J	+150	℃
Storage Temperature Range		T_{STG}	-55 to +150	℃
Lead Temperature (Soldering, 10s)			+260	℃

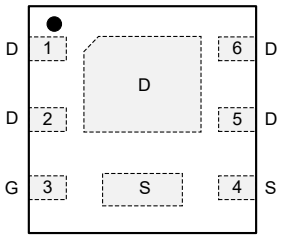
Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

NOTES:

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

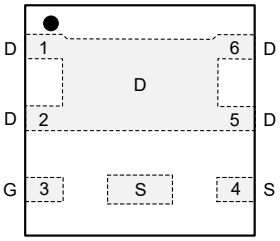
PIN CONFIGURATIONS

(TOP VIEW)



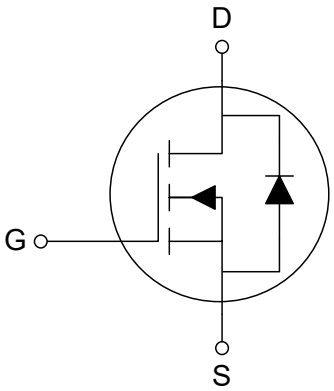
TDFN-2×2-6BL

(TOP VIEW)



TDFN-2×2-6CL

EQUIVALENT CIRCUIT



APPLICATIONS

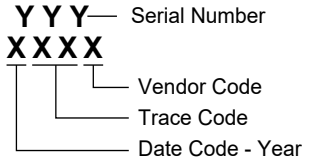
PWM Applications
Power Load Switch
Battery Management
Wireless Chargers

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNM05330	TDFN-2×2-6BL	-55℃ to +150℃	SGMNM05330TTEN6G/TR	ON5 XXXX	Tape and Reel, 3000
	TDFN-2×2-6CL	-55℃ to +150℃	SGMNM05330TTEO6G/TR	OPA XXXX	Tape and Reel, 3000

MARKING INFORMATION

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



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	$R_{\theta JA}$	52	℃/W

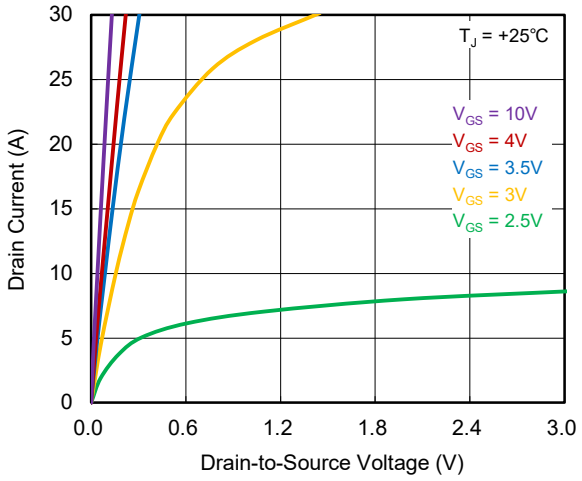
ELECTRICAL CHARACTERISTICS

(T_A = +25℃, unless otherwise noted.)

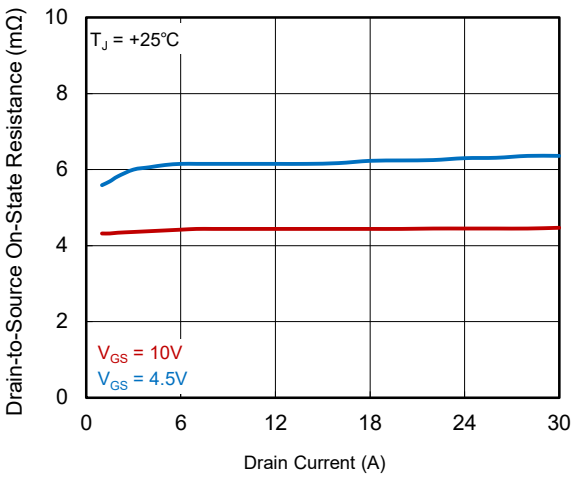
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Static OFF Characteristics							
Drain-to-Source Breakdown Voltage	V_{BR_DSS}	V_{GS} = 0V, I_D = 250μA		30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0V, V_{DS} = 30V				1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V				±100	nA
Static ON Characteristics							
Gate-to-Source Threshold Voltage	V_{GS_TH}	V_{GS} = V_{DS}, I_D = 250μA		1	1.5	2	V
Drain-to-Source On-State Resistance	R_{DSON}	I_D = 10A	V_{GS} = 10V		4.3	5	mΩ
			V_{GS} = 4.5V		6.1	8	
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 10A			13		S
Gate Resistance	R_G	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz			1		Ω
Diode Characteristics							
Diode Forward Voltage	V_{F_SD}	V_{GS} = 0V, I_S = 1A			0.7	1.2	V
Reverse Recovery Time	t_{RR}	V_{GS} = 0V, I_S = 10A, di/dt = 100A/μs			11		ns
Reverse Recovery Charge	Q_{RR}				3.4		nC
Dynamic Characteristics							
Input Capacitance	C_{ISS}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz			1557		pF
Output Capacitance	C_{OSS}				189		
Reverse Transfer Capacitance	C_{RSS}				178		
Total Gate Charge	Q_G	V_{GS} = 10V, V_{DS} = 15V, I_D = 10A			34.2		nC
Gate-to-Source Charge	Q_{GS}				4.6		
Gate-to-Drain Charge	Q_{GD}				7.2		
Switch Characteristics							
Turn-On Delay Time	t_{D_ON}	V_{GS} = 10V, V_{DS} = 15V, I_D = 10A, R_G = 6Ω			17		ns
Rise Time	t_R				48		
Turn-Off Delay Time	t_{D_OFF}				32		
Fall Time	t_F				23		

TYPICAL PERFORMANCE CHARACTERISTICS

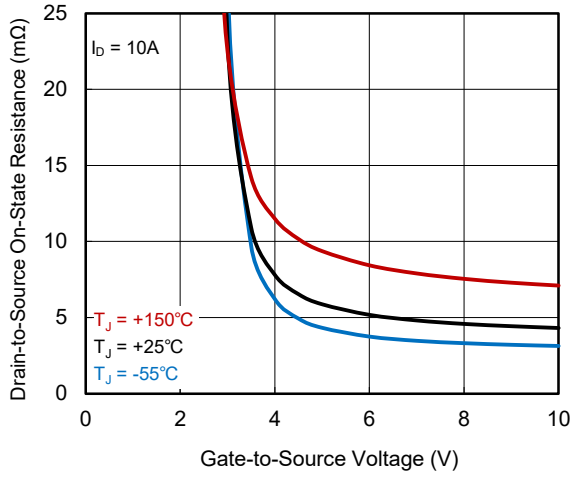
Output Characteristics



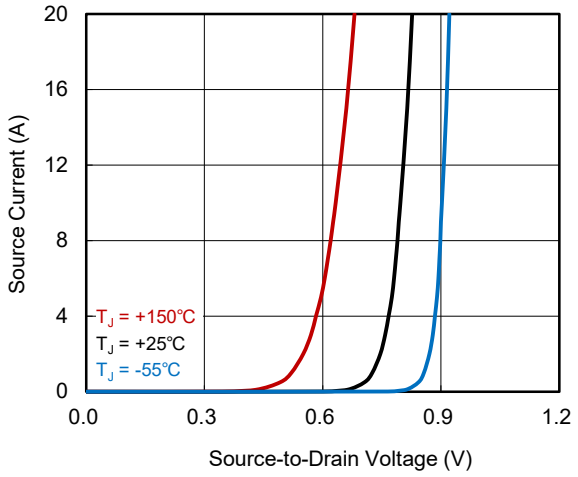
Drain-to-Source On-State Resistance vs. Drain Current



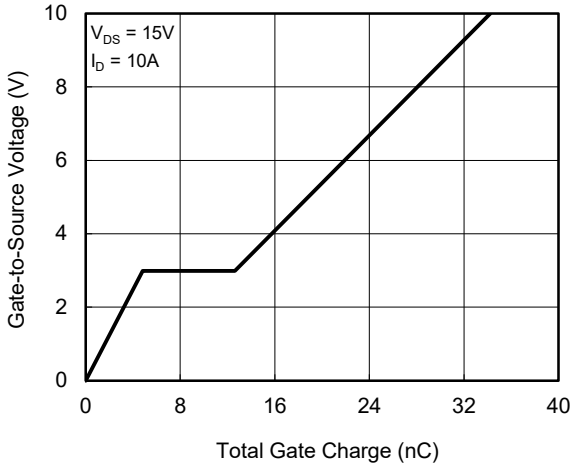
Drain-to-Source On-State Resistance vs. Gate-to-Source Voltage



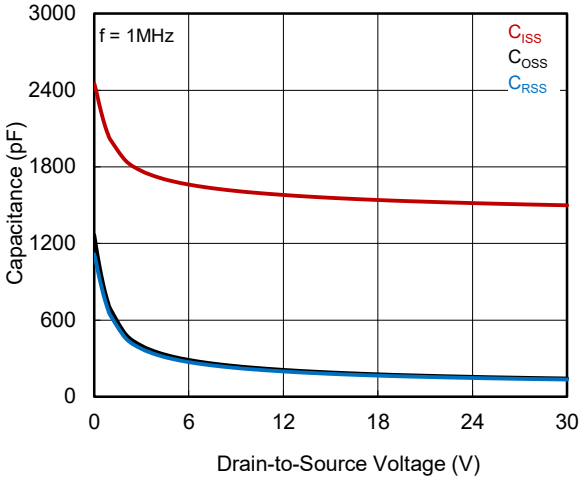
Diode Forward



Gate Charge Characteristics

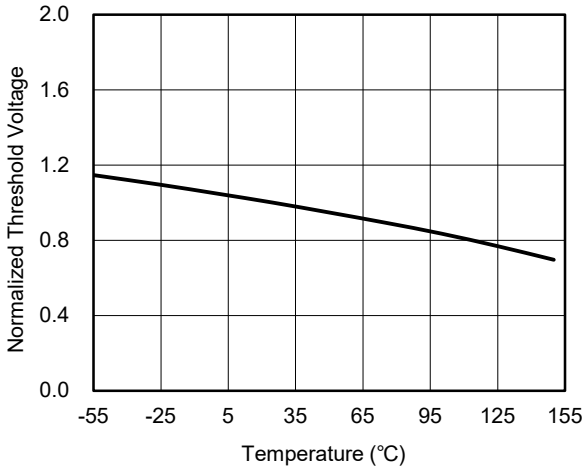


Capacitance Characteristics

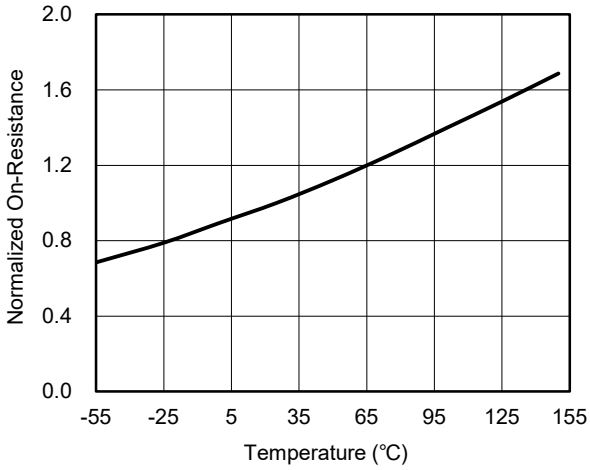


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

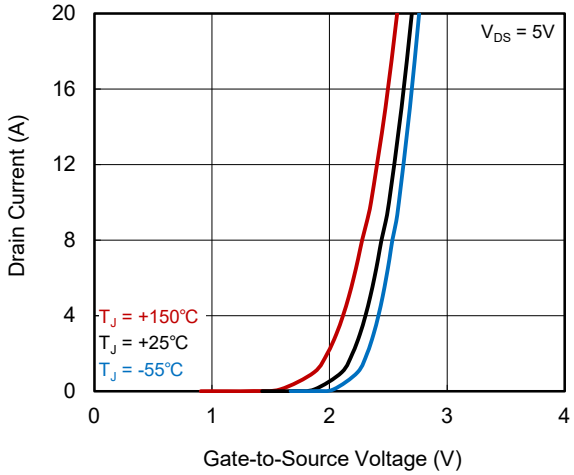
Normalized Threshold Voltage vs. Junction Temperature



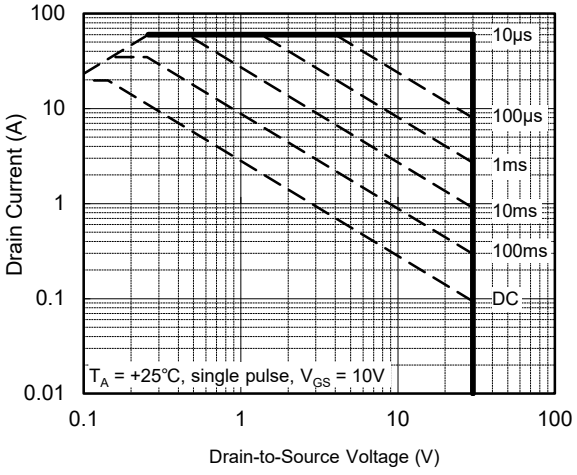
Normalized On-Resistance vs. Junction Temperature



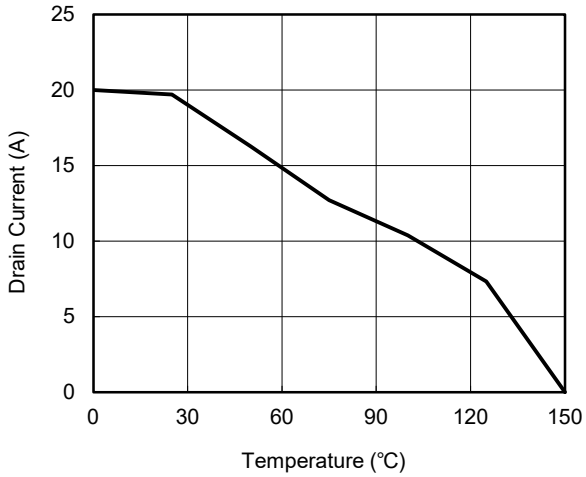
Transfer Characteristics



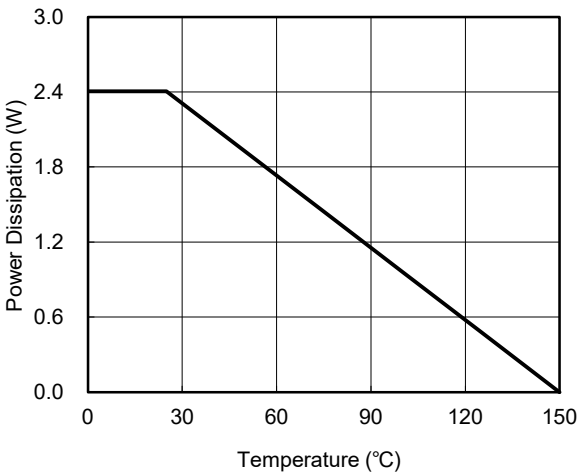
Safe Operating Area



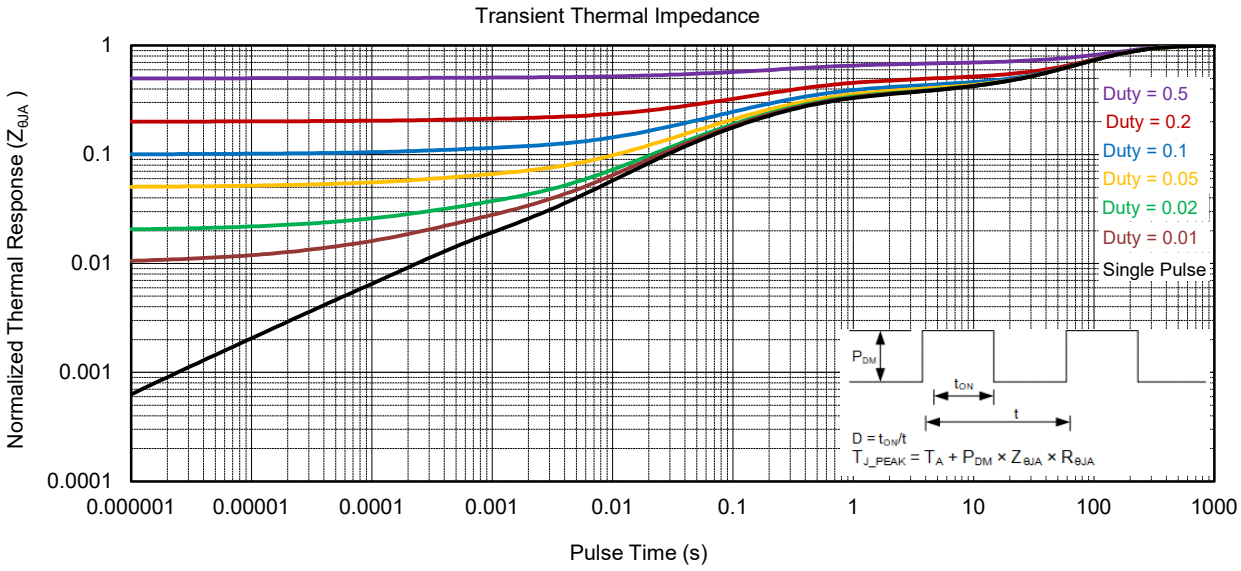
Drain Current vs. Junction Temperature



Power Dissipation vs. Junction Temperature



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

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

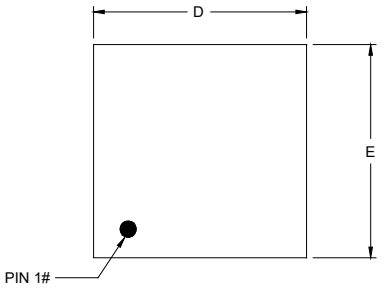
AUGUST 2025 – REV.A.1 to REV.A.2	Page
Updated thermal resistance	2

MARCH 2025 – REV.A to REV.A.1	Page
Update typical performance characteristics	4, 5, 6

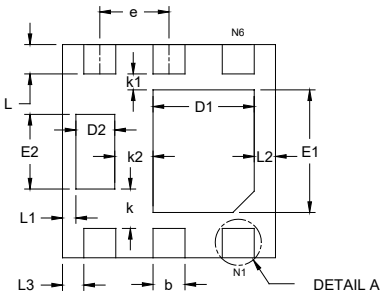
Changes from Original (DECEMBER 2021) to REV.A	Page
Changed from product preview to production data	All

PACKAGE OUTLINE DIMENSIONS

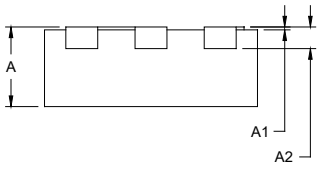
TDFN-2×2-6BL



TOP VIEW



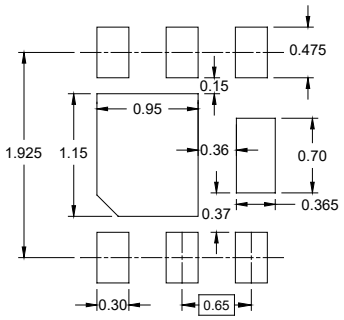
BOTTOM VIEW



SIDE VIEW

DETAIL A

ALTERNATE TERMINAL CONSTRUCTION



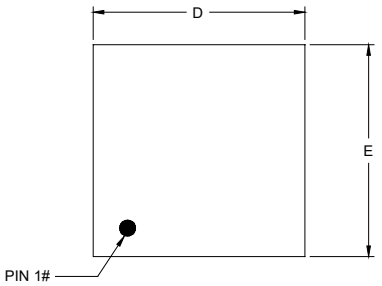
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	NOM	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-2×2-6CL



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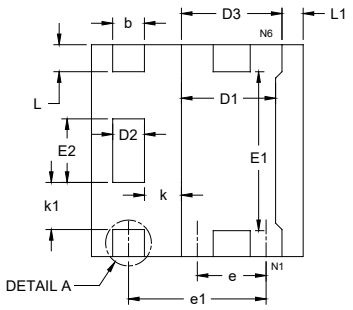
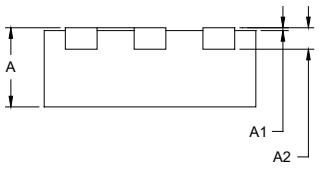
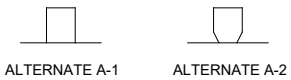


BOTTOM VIEW

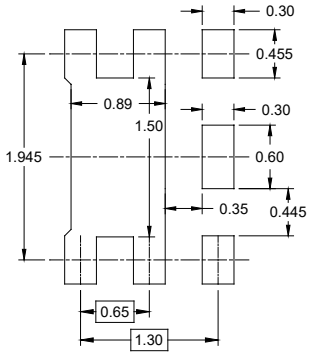


SIDE VIEW



DETAIL A

ALTERNATE TERMINAL CONSTRUCTION



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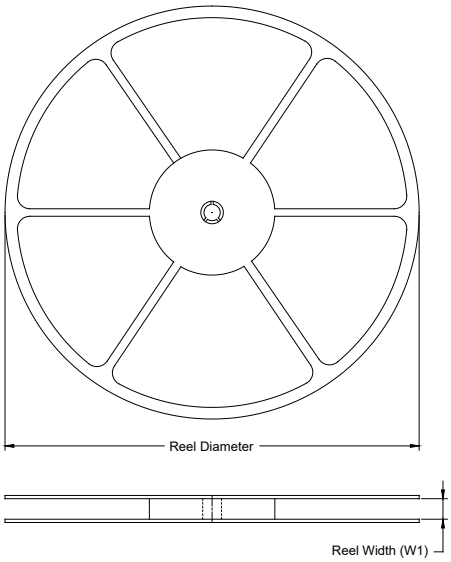
A2		0.200 REF	
b	0.250	0.300	0.350
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D1	0.790	0.890	0.990
E1	1.400	1.500	1.600
D2	0.200	0.300	0.400
E2	0.500	0.600	0.700
D3		0.950 REF	
e		0.650 BSC	
e1		1.300 BSC	
k		0.350 REF	
k1		0.445 REF	
L	0.180	0.255	0.355
L1		0.200 REF	

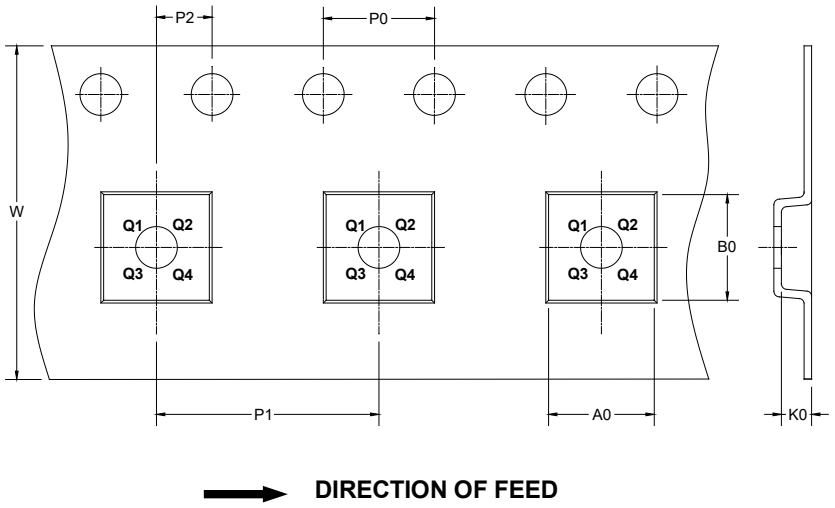
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



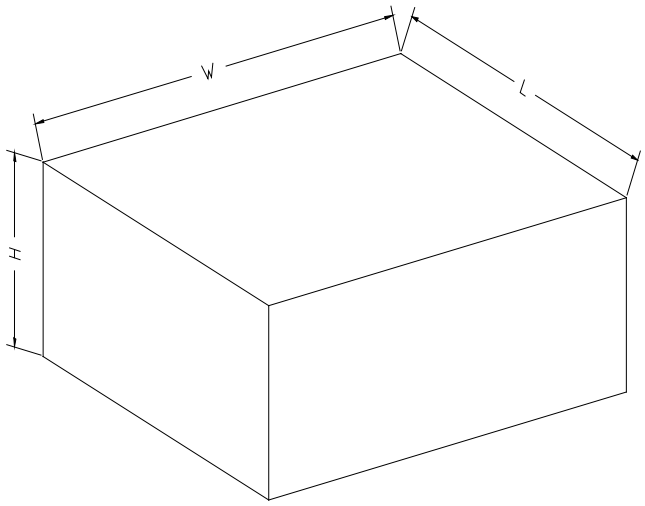
NOTE: The picture is only for reference. Please make the object as the standard.

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

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