

FEATURES

- Low On-State Resistance
- High-Speed Switching
- RoHS Compliant and Halogen Free

PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = -10V$	$R_{DS(on)}$ (MAX) $V_{GS} = -10V$	I_D (MAX) $T_A = +25^\circ C$
16m Ω	21m Ω	-7.5A

ABSOLUTE MAXIMUM RATINGS

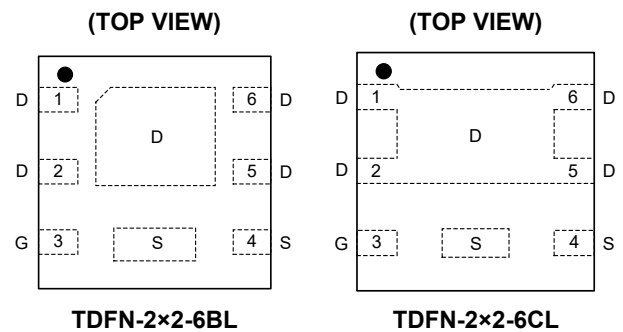
PARAMETER		SYMBOL	VALUE	UNITS
Drain-to-Source Voltage		V _{DS}	-30	V
Gate-to-Source Voltage		V _{GS}	±20	V
Drain Current ⁽¹⁾	T _A = +25°C	I _D	-7.5	A
	T _A = +70°C		-6	
Drain Current (Pulse) ⁽²⁾		I _D	-30	A
Total Dissipation	T _A = +25°C	P _D	2	W
	T _A = +70°C		1.2	
Avalanche Current ⁽³⁾		I _{AS}	-37.1	A
Avalanche Energy ⁽³⁾		E _{AS}	68.8	mJ
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.

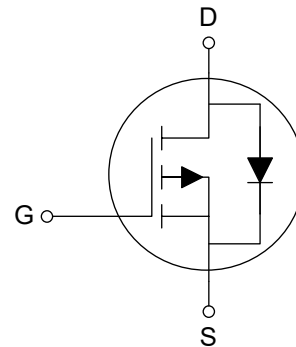
NOTES:

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

PIN CONFIGURATIONS



EQUIVALENT CIRCUIT



APPLICATIONS

- Load Switch Applications
- High-Speed Line Driver
- Relay Driver Applications
- Handheld and Mobile Applications
- USB Connector VBUS Power Switch

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMPM21330	TDFN-2×2-6BL	-55°C to +150°C	SGMPM21330TTEN6G/TR	MEL XXXX	Tape and Reel, 3000
	TDFN-2×2-6CL	-55°C to +150°C	SGMPM21330TTEO6G/TR	MEM XXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor 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 MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Ambient Thermal Resistance ⁽¹⁾	$R_{\theta JA}$	62.5	°C/W

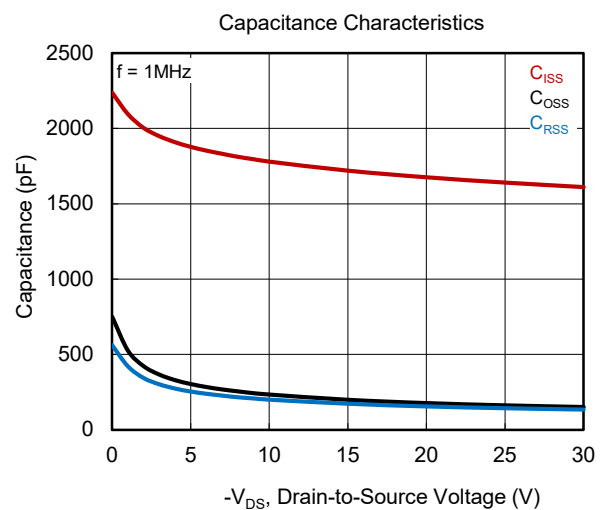
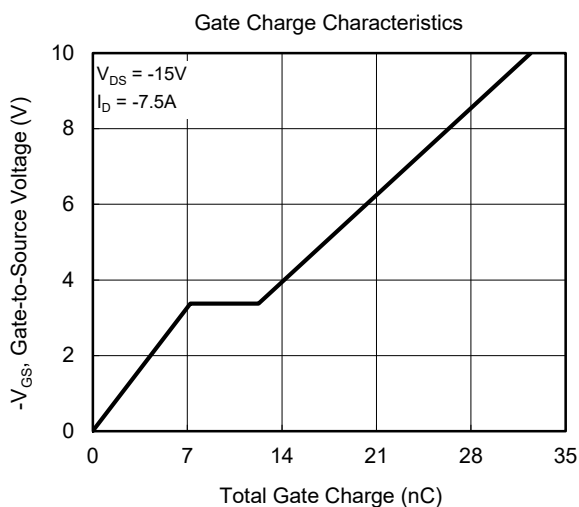
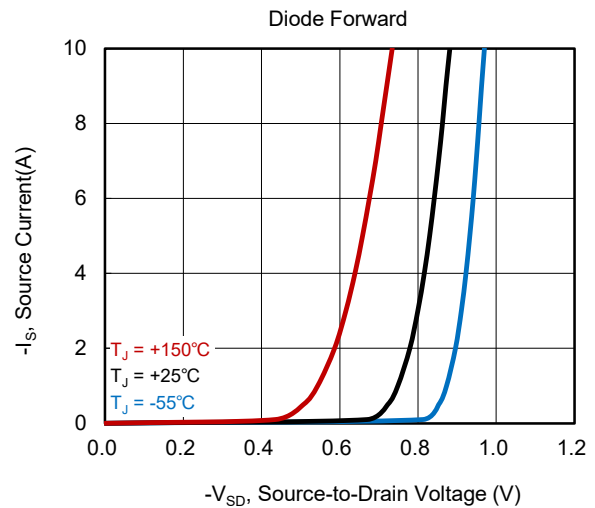
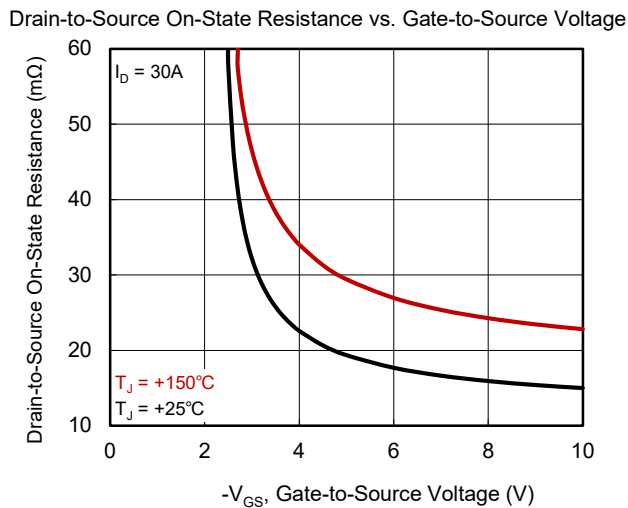
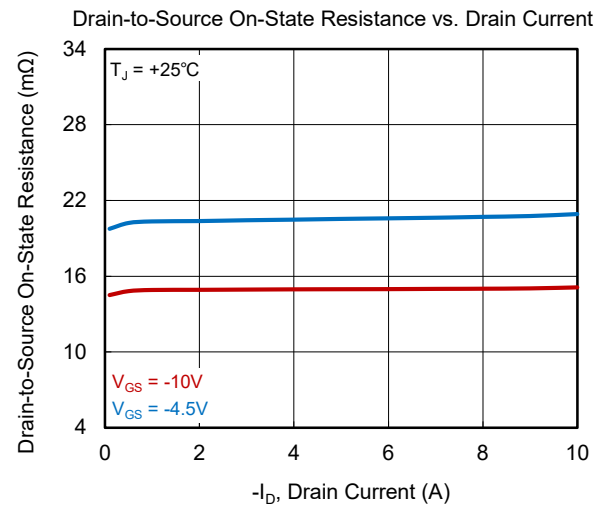
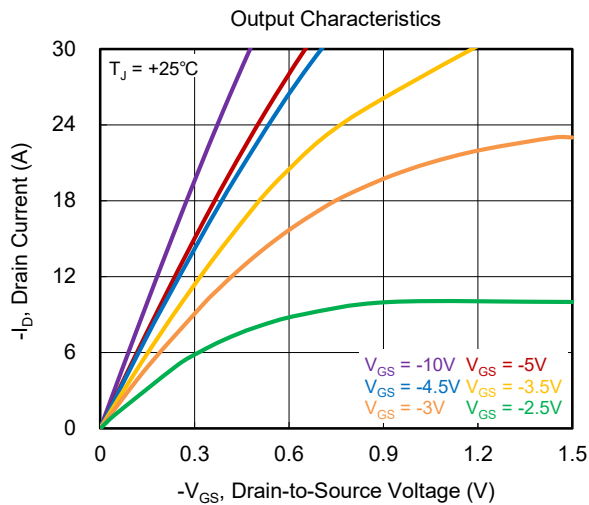
NOTE: 1. $R_{\theta JA}$ is determined with the device mounted on one square inch of copper pad, 2oz copper on FR4 board.

ELECTRICAL CHARACTERISTICS

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

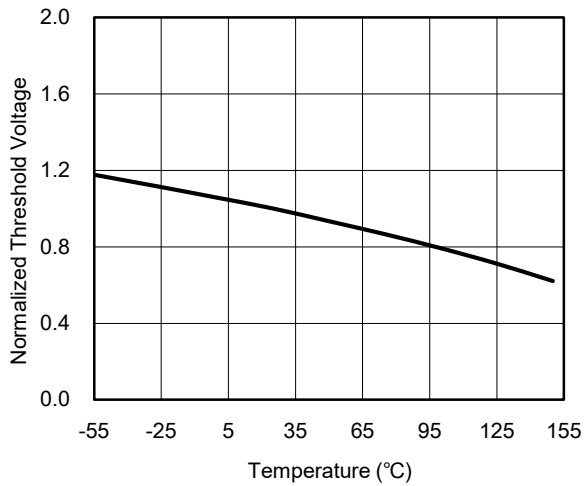
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Static Off Characteristics							
Drain-to-Source Breakdown Voltage	V _{BR_DSS}	V _{GS} = 0V, I _D = -250μA		-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0V, V _{DS} = - 30V				-1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V				±100	nA
Static On Characteristics							
Gate-to-Source Threshold Voltage	V _{GS_TH}	V _{GS} = V _{DS} , I _D = -250μA		-1		-2.5	V
Static Drain-to-Source On-State Resistance	R _{DS(on)}	I _D = -7.5A	V _{GS} = -10V		16	21	mΩ
			V _{GS} = -4.5V		24	31	
Forward Transconductance	g _{FS}	V _{DS} = -5V, I _D = -7.5A			17.5		S
Diode Characteristics							
Diode Forward Voltage	V _{F_SD}	V _{GS} = 0V, I _S = -1A			-0.7	-1.2	V
Dynamic Characteristics							
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = -15V, f = 1MHz			1791		pF
Output Capacitance	C _{OSS}				194		
Reverse Transfer Capacitance	C _{RSS}				156		
Total Gate Charge	Q _G	V _{DS} = -15V, I _D = -7.5A	V _{GS} = -10V		32		nC
			V _{GS} = -4.5V		15		
Gate-to-Source Charge	Q _{GS}	V _{GS} = -4.5V, V _{DS} = -15V, I _D = -7.5 A			7.2		
Gate-to-Drain Charge	Q _{GD}				5		
Switch Characteristics							
Turn-On Delay Time	t _{D_ON}	V _{GS} = -10V, V _{DS} = -15V, I _D = -3.75A, R _G = 3Ω			8.6		ns
Rise Time	t _R				16.8		
Turn-Off Delay Time	t _{D_OFF}				37		
Fall Time	t _F				28.8		

TYPICAL PERFORMANCE CHARACTERISTICS

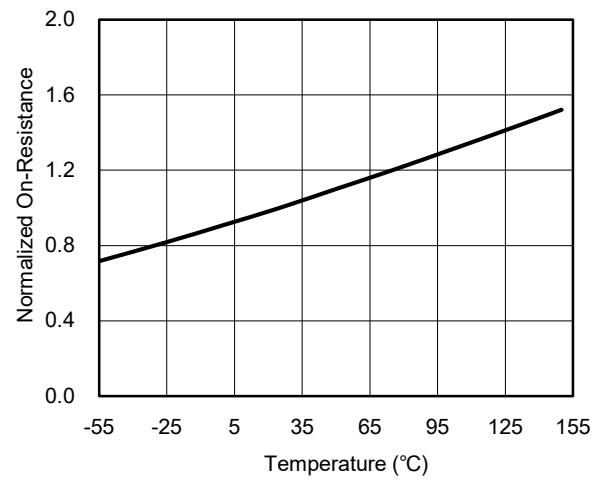


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

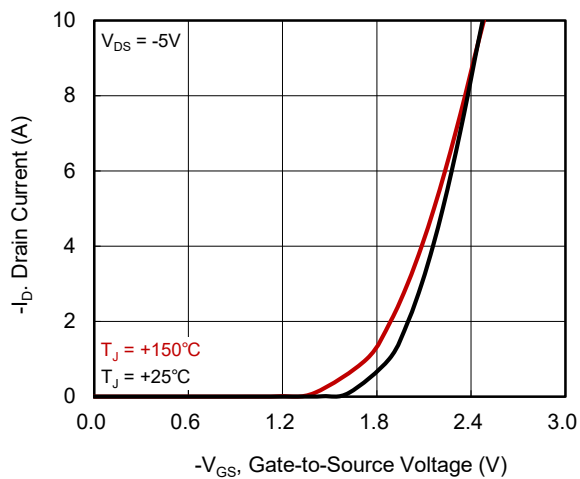
Normalized Threshold Voltage vs. Junction Temperature



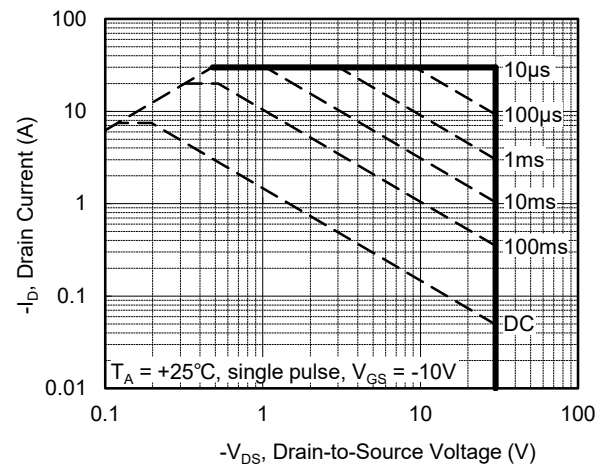
Normalized On-Resistance vs. Junction Temperature



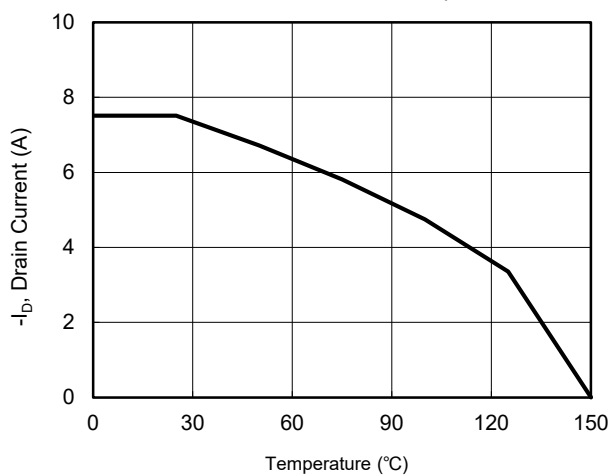
Transfer Characteristics



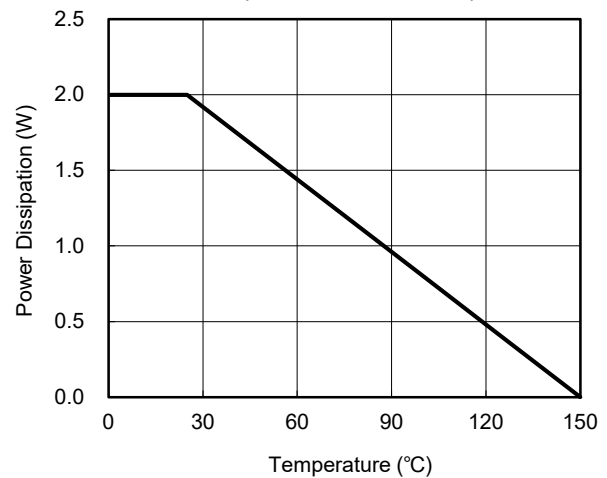
Safe Operating Area



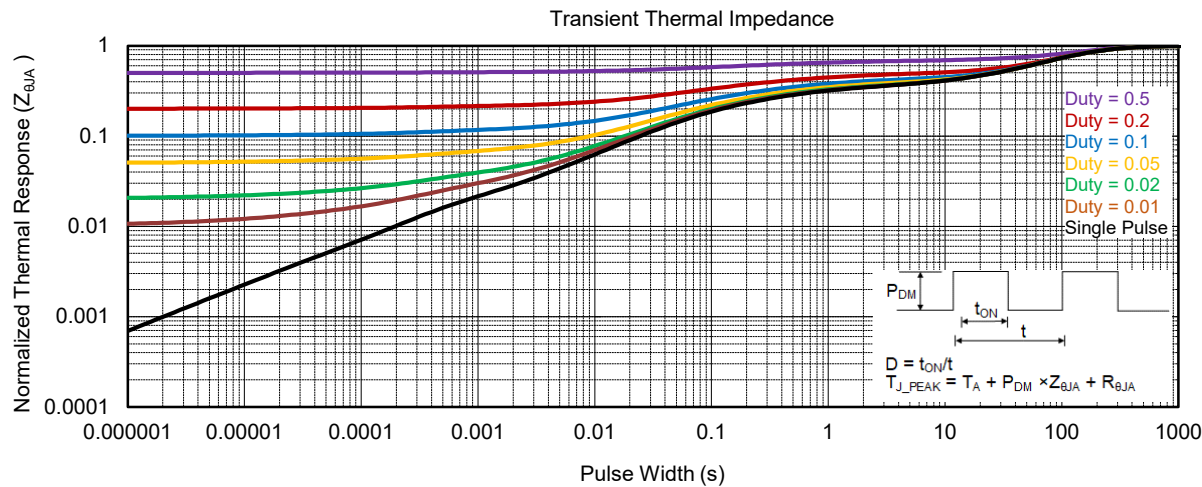
Drain Current vs. Junction Temperature



Power Dissipation vs. Junction Temperature



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



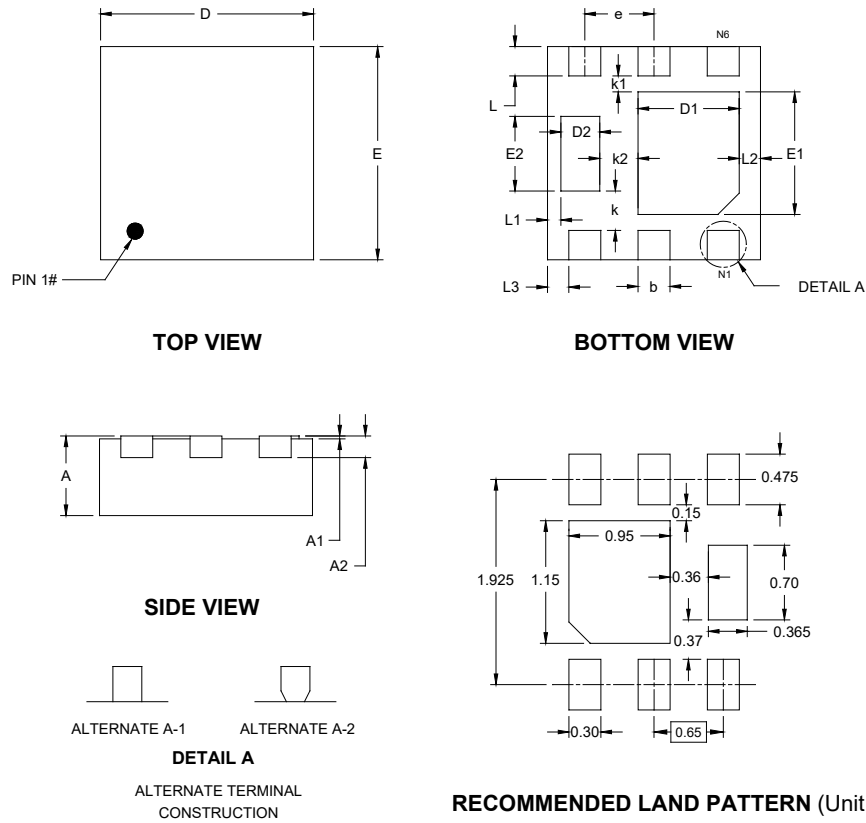
REVISION HISTORY

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

MAY 2025 – REV.A.2 to REV.A.3	Page
Updated absolute maximum ratings.....	1
Updated thermal resistance maximum ratings	2
Updated typical performance characteristics.....	5, 6
OCTOBER 2024 – REV.A.1 to REV.A.2	Page
Updated product summary	1
JANUARY 2024 – REV.A to REV.A.1	Page
Updated product summary and diode forward curve	1, 4
Changes from Original (OCTOBER 2023) to REV.A	Page
Changed from Product Preview to Production Data	All

PACKAGE OUTLINE DIMENSIONS

TDFN-2×2-6BL

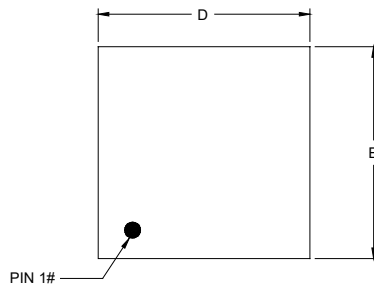


Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.700	0.750	0.800
A1	0.000	0.020	0.050
A2	0.200 REF		
b	0.250	0.300	0.350
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D1	0.850	0.950	1.050
E1	1.050	1.150	1.250
D2	0.315	0.365	0.415
E2	0.650	0.700	0.750
e	0.650 BSC		
k	0.370 REF		
k1	0.150 REF		
k2	0.360 REF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

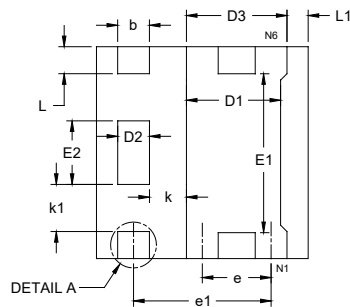
NOTE: This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

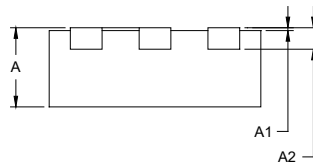
TDFN-2×2-6CL



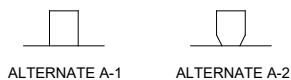
TOP VIEW



BOTTOM VIEW

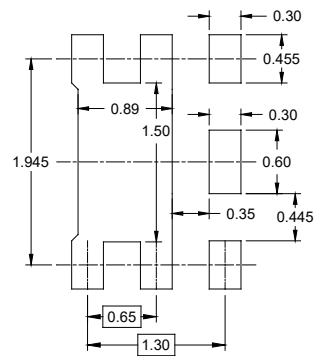


SIDE VIEW



DETAIL A

ALTERNATE TERMINAL
CONSTRUCTION



RECOMMENDED LAND PATTERN (Unit: mm)

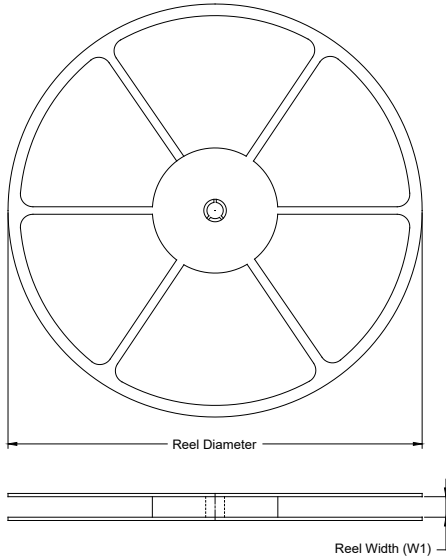
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.700	0.750	0.800
A1	0.000	0.020	0.050
A2	0.200 REF		
b	0.250	0.300	0.350
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D1	0.790	0.890	0.990
E1	1.400	1.500	1.600
D2	0.200	0.300	0.400
E2	0.500	0.600	0.700
D3	0.950 REF		
e	0.650 BSC		
e1	1.300 BSC		
k	0.350 REF		
k1	0.445 REF		
L	0.180	0.255	0.355
L1	0.200 REF		

NOTE: This drawing is subject to change without notice.

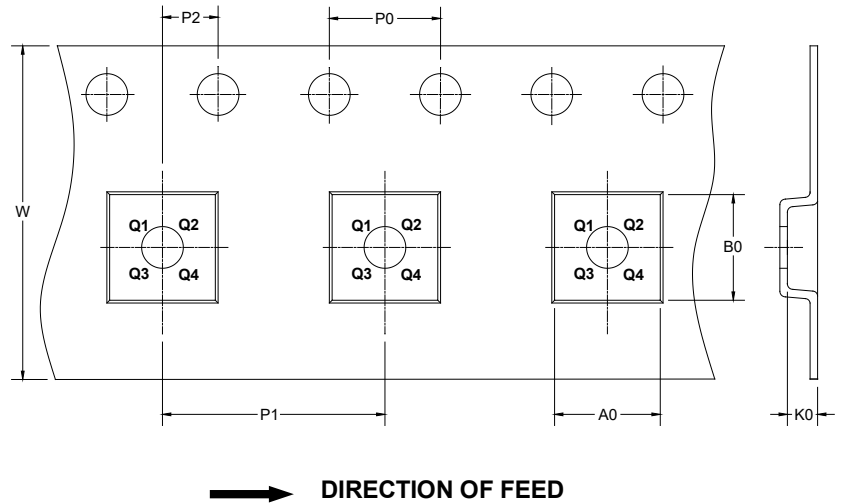
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

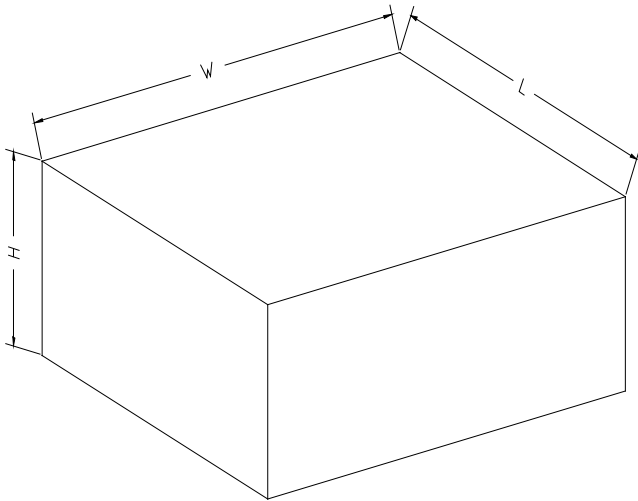
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
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