

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	6mΩ@10V	13A
	8.5mΩ@4.5V	



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

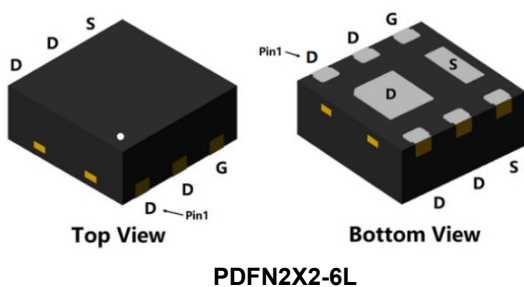
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Feature

- Low On-Resistance
- Low Input Capacitance

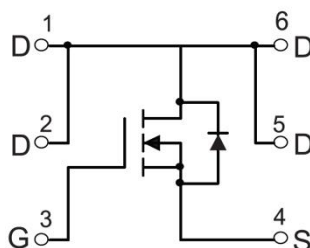
Package



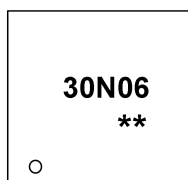
Application

- Power Management Functions
- DC-DC Converters

Circuit diagram



Marking



30N06
**

:Device Code
:Week Code

Order Information

Device	Package	Unit/Tape
SP30N06NQ	PDFN2X2-6L	3000

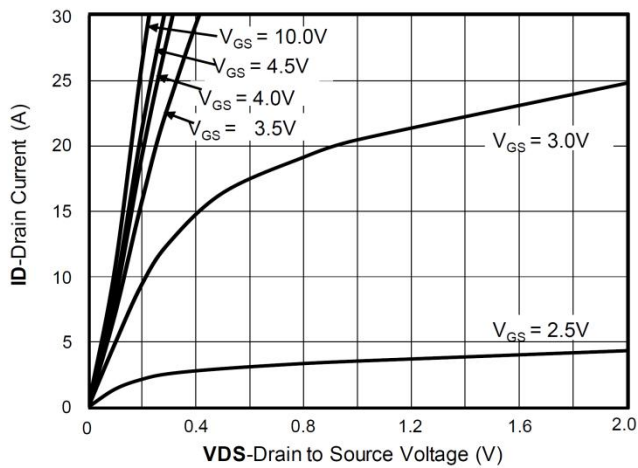
Absolute maximum ratings (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Ta=25°C)	I_D	13	A
Continuous Drain Current (Ta=100°C)	I_D	8.6	A
Pulsed Drain Current	I_{DM}	52	A
Power Dissipation (Ta=25°C)	P_D	3.5	W
Power Dissipation (Ta=100°C)	P_D	1.4	W
Thermal Resistance from Junction-to-Ambient	$R_{\theta JA}$	35.7	°C/W
Operating Junction Temperature Range	T_{STG}	-55 ~ +150	°C
Storage Temperature Range	T_J	-55 ~ +150	°C

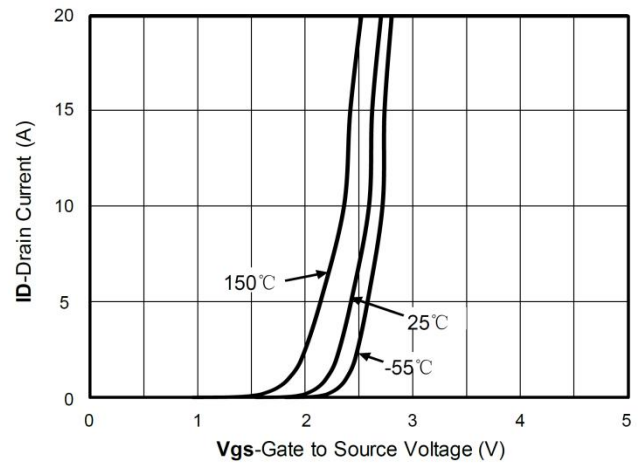
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	30	-	-	V
Drain-Source Leakage Current	IDSS	VDS=24V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID=250uA	1.0	1.6	2.2	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=10V , ID=10A	-	6	8	mΩ
		VGS=4.5V , ID=10A	-	8.5	11.5	
Gate Resistance	RG	VDS=15V , VGS=0V , f=1MHz	-	1.5	-	Ω
Dynamic characteristics						
Input Capacitance	Ciss	VDS=15V , VGS=0V , f=1MHz	-	1560	-	pF
Output Capacitance	Coss		-	236	-	
Reverse Transfer Capacitance	Crss		-	202	-	
Total Gate Charge	Qg	VDS=15V , VGS=10V , ID=10A	-	36	-	nC
Gate-Source Charge	Qgs		-	6	-	
Gate-Drain Charge	Qgd		-	10	-	
Gate Plateau Voltage	Vplateau		-	3.5	-	V
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=15V , VGS=10V , RG=3Ω , ID=10A	-	8	-	nS
Rise Time	Tr		-	8.5	-	
Turn-Off Delay Time	Td(off)		-	24	-	
Fall Time	Tf		-	6.8	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	13	A
Reverse Recovery Time	Trr	IS=10A , di/dt=100A/us , TJ=25℃	-	24	-	nS
Reverse Recovery Charge	Qrr		-	18	-	nC

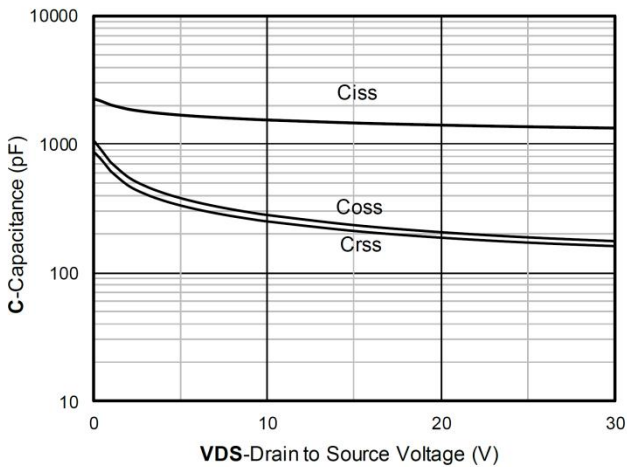
Typical Characteristics



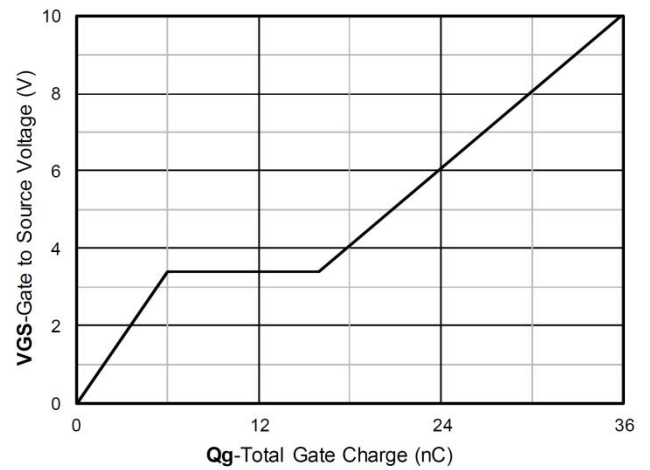
Output Characteristics



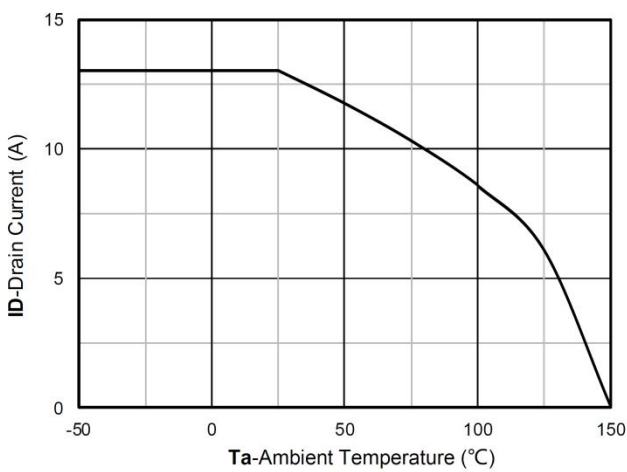
Transfer Characteristics



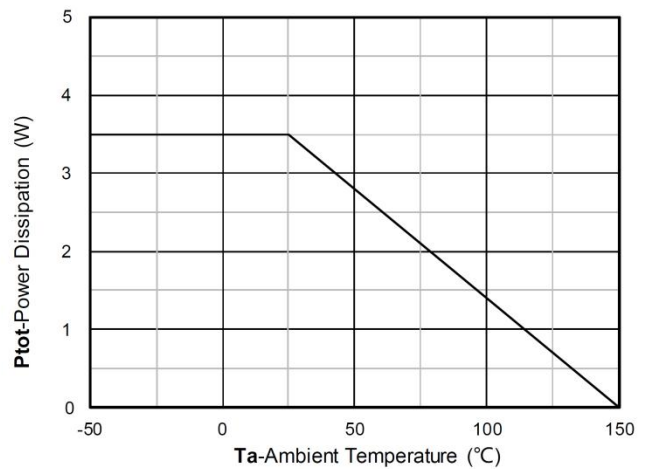
Capacitance Characteristics



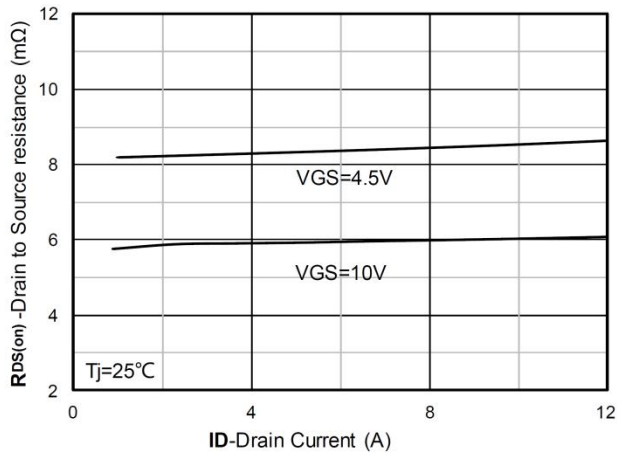
Gate Charge



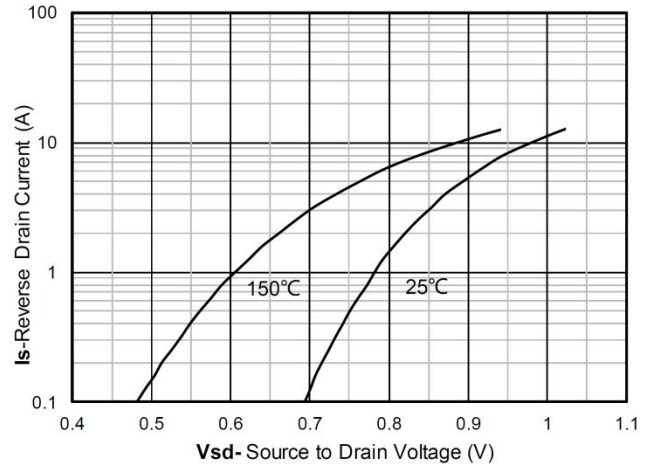
Current dissipation



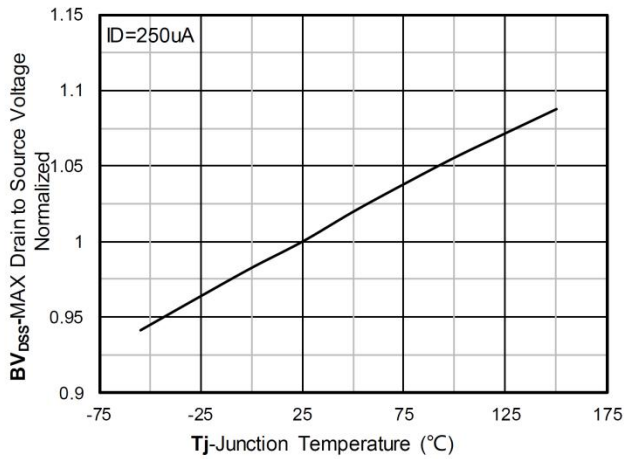
Power dissipation



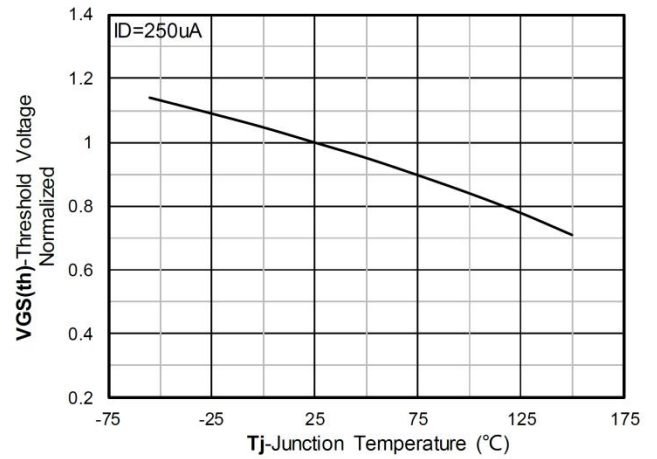
$R_{DS(on)}$ VS Drain Current



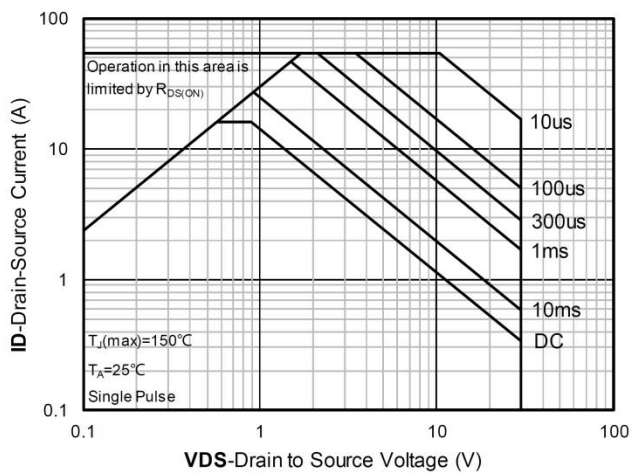
Forward characteristics of reverse diode



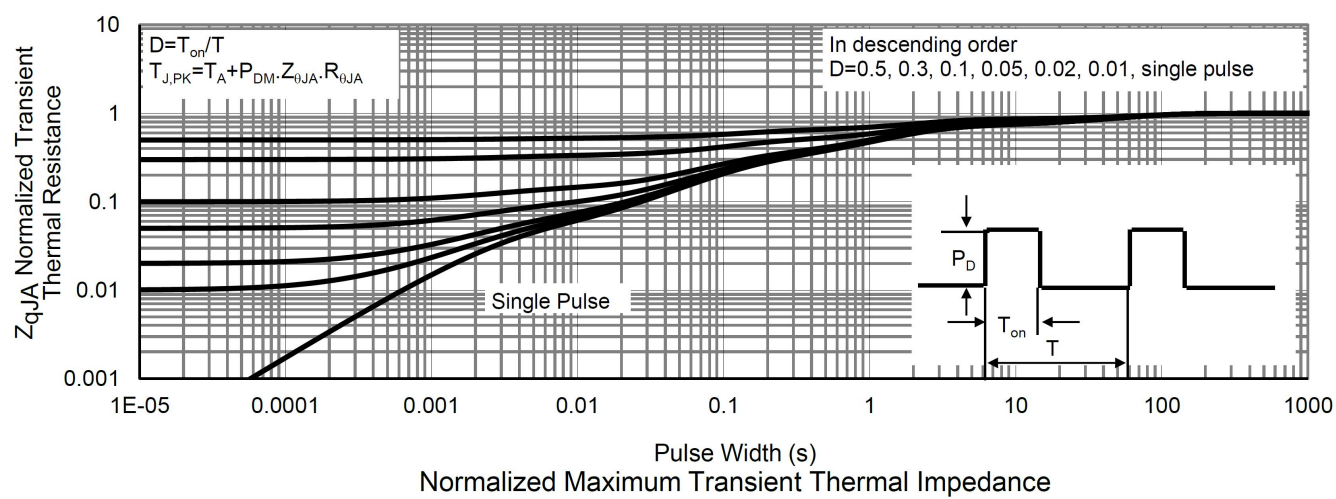
Normalized breakdown voltage



Normalized Threshold voltage

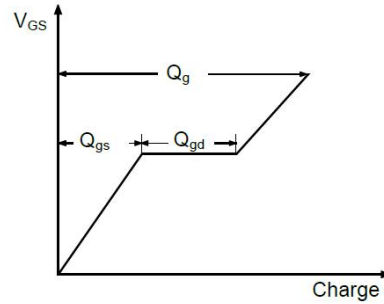
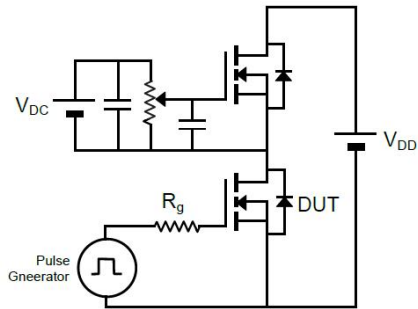


Safe Operation Area

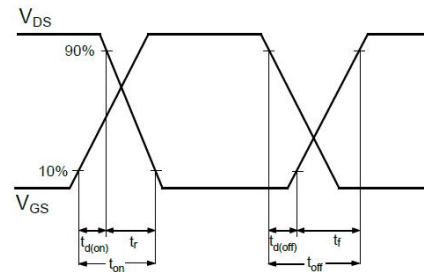
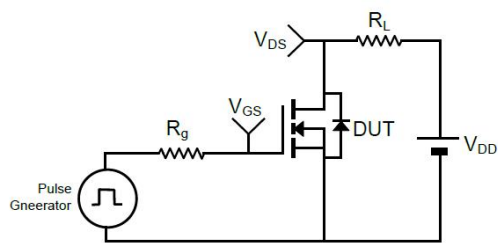


Test Circuit

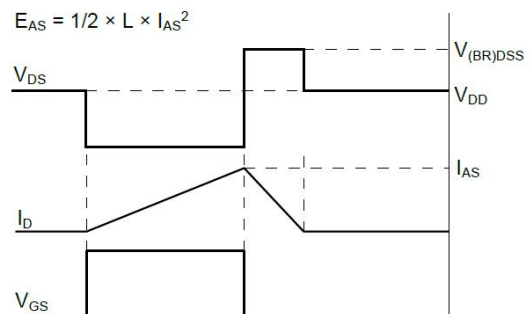
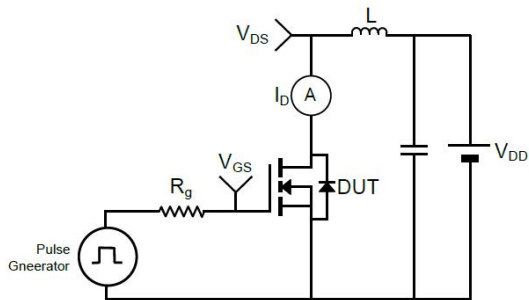
Gate Charge



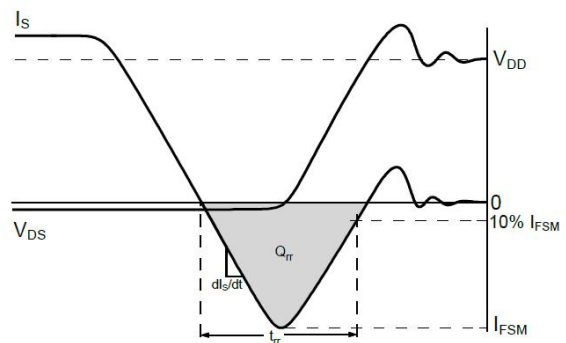
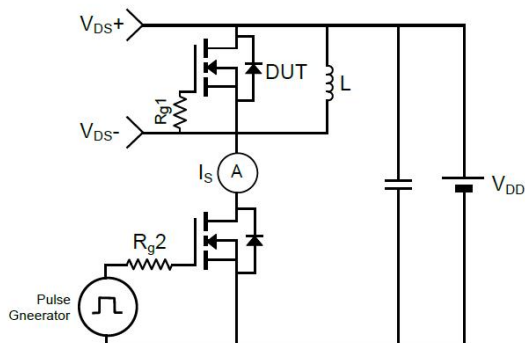
Resistive Load Switching Time



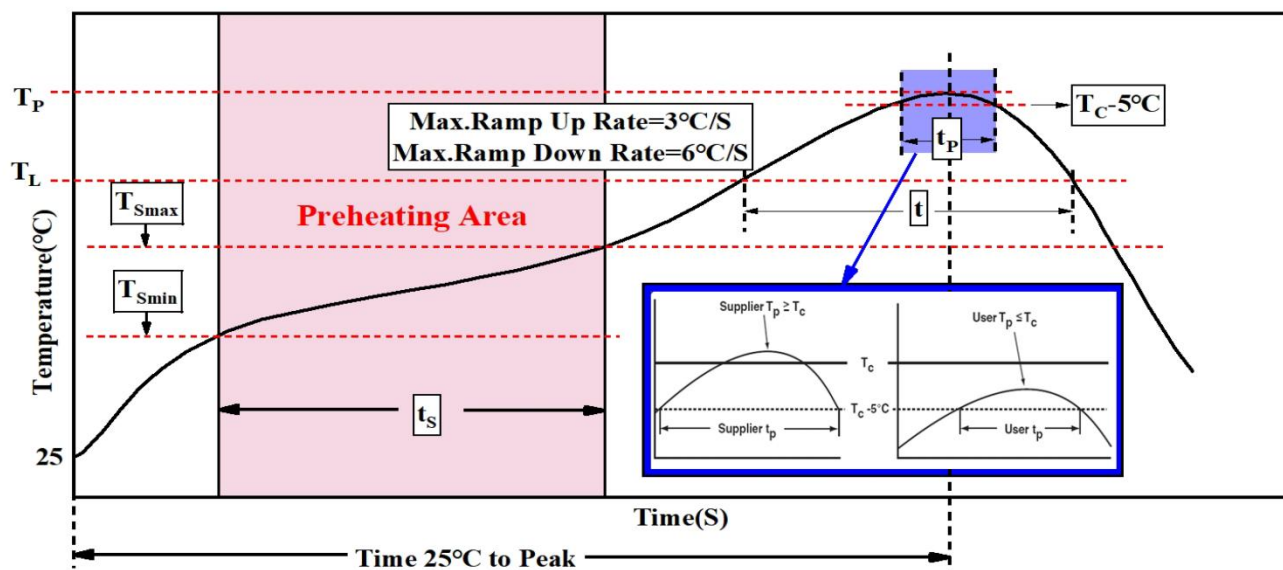
Un-clamped Inductive Load Switching



Drain-Source Body Diode Reverse Recovery



Temperature Profile for IR Reflow Soldering



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{Smin})	100°C	150°C
Temperature max (T_{Smax})	150°C	200°C
Time (T_{Smin} to T_{Smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{Smax} to T_P)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L)	183 °C	217°C
Time at liquidous (t_L)	60-150 seconds	60-150 seconds
Peak package body Temperature e (T_P)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (t_P)** within 5°C of the specified classification temperature (T_C)	20** seconds	30** seconds
Average ramp-down rate (T_P to T_{Smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile Temperature (T_P) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (t_P) is defined as a supplier minimum and a user maximum		

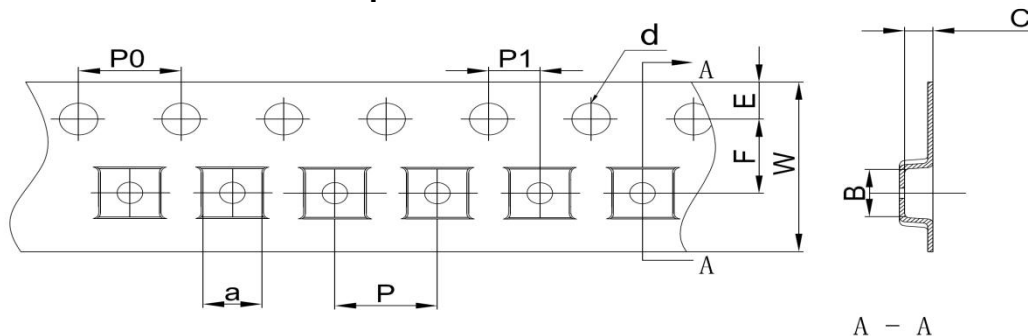
Table 1. SnPb Eutectic Process – Classification Temperatures (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures (T_C)

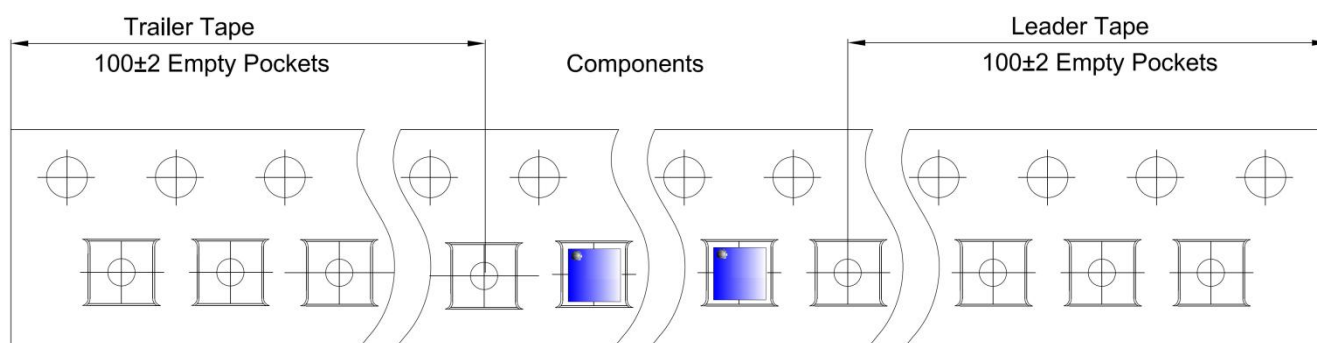
Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

PDFN2×2-6L Embossed Carrier Tape

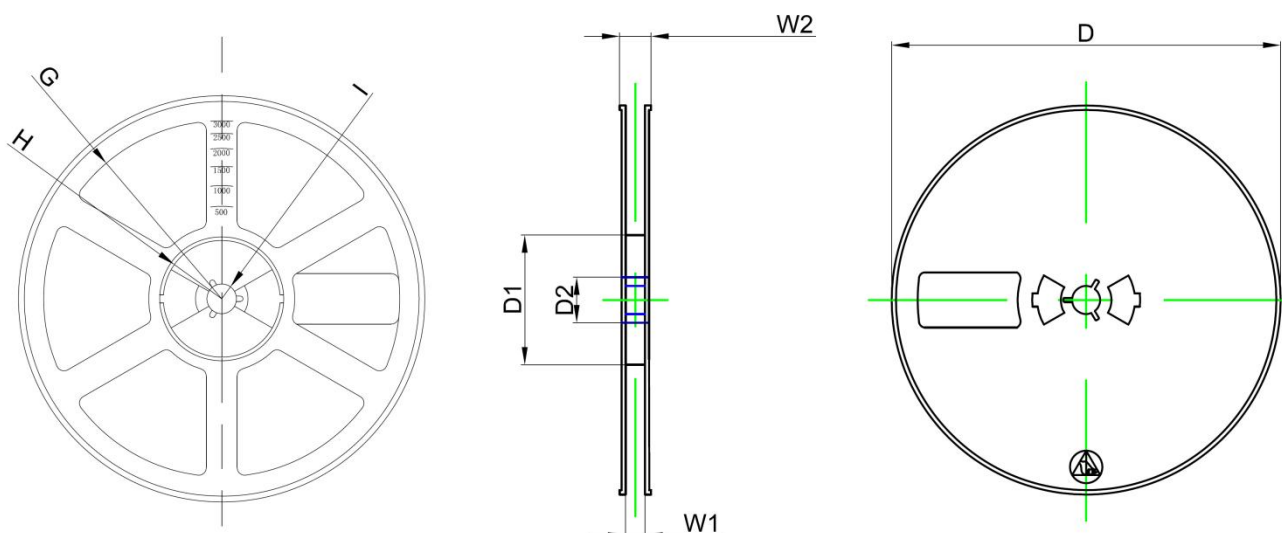


Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
PDFN2×2-6L	2.30	2.30	1.10	Φ1.50	1.75	3.50	4.00	2.00	2.00	8.00

PDFN2×2-6L Tape Leader and Trailer

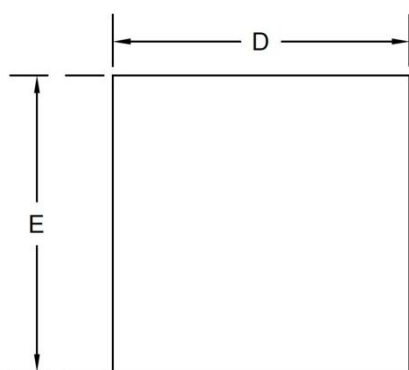


PDFN2×2-6L Reel

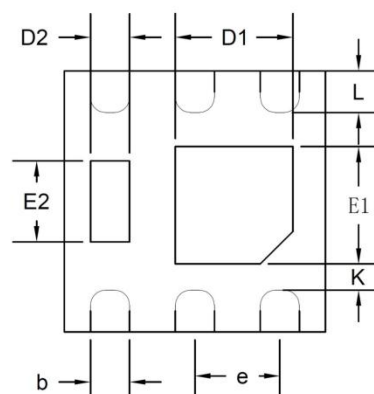


Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø180.00	60.00	13.00	R78.00	R25.60	R6.50	9.50	13.10

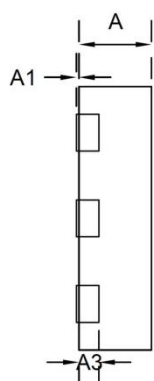
REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	

PDFN2X2-6L Package Information


TOP VIEW
[顶视图]



BOTTOM VIEW
[底视图]



SIDE VIEW
[侧视图]

Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.45	0.55	0.65
A1	0.00	0.02	0.05
A3	0.152BSC		
b	0.25	0.30	0.35
D	1.90	2.00	2.10
D1	0.80	0.90	1.05
D2	0.15	0.30	0.45
E	1.95	2.00	2.05
E1	0.70	0.95	1.25
E2	0.55	0.65	0.75
e	0.65BSC		
L	0.20	0.30	0.40
K	0.20BSC		