Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	1.35mΩ@10V	145A
	2.2mΩ@4.5V	

合肥矽普半导体
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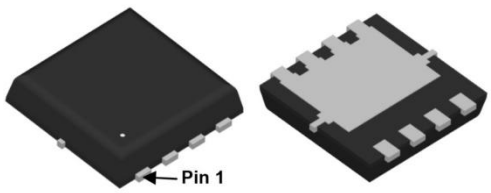
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

- Power switching application
- DC-DC Converters

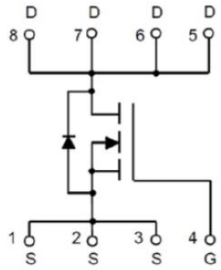
Package



Top View Bottom View

PDFN3X3-8L

Circuit diagram



Marking

SP30N01BGNL :Device Code
** :Week Code

Order Information

Device	Package	Unit/Tape
SP30N01BGNL	PDFN3X3-8L	5000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)	I_D	145	A
Continuous Drain Current (Tc=100℃)	I_D	90	A
Pulsed Drain Current	I_{DM}	580	A
Single Pulse Avalanche Energy[1]	E_{AS}	92	mJ
Power Dissipation (Tc=25℃)	P_D	69	W
Power Dissipation (Tc=100℃)	P_D	28	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.82	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

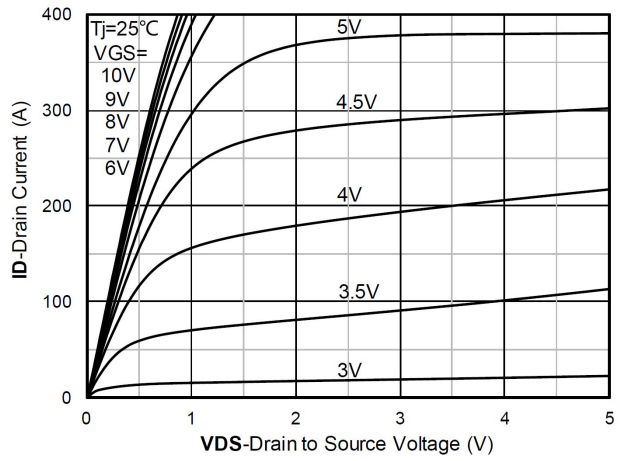
Electrical characteristics (Ta=25℃, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	30	-	-	V
Drain Cut-Off Current	I_{DSS}	VDS=24V , VGS=0V	-	-	1	uA
Gate Leakage Current	I_{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID=250uA	1.3	1.7	2.3	V
Drain-Source ON Resistance	$R_{DS(ON)}$	VGS=10V , ID=20A	-	1.35	1.75	mΩ
		VGS=4.5V , ID=15A	-	2.2	2.9	
Gate Resistance	R_G	VDS=15V , VGS=0V , f=1MHZ	-	0.8	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS=15V , VGS=0V , f=1MHZ	-	1980	-	pF
Output Capacitance	C_{oss}		-	880	-	
Reverse Transfer Capacitance	C_{rss}		-	24	-	
Total Gate Charge	Q_g	VGS=10V , VDS=15V , ID=20A	-	33	-	nC
Gate-Source Charge	Q_{gs}		-	9.5	-	
Gate-Drain Charge	Q_{gd}		-	8.5	-	
Gate Plateau Voltage	$V_{plateau}$		-	3.8	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	VGS=10V , VDD=15V , ID=20A , RG=2Ω	-	5.4	-	nS
Rise Time	t_r		-	6.8	-	
Turn-Off Delay Time	$t_{d(off)}$		-	27	-	
Fall Time	t_f		-	5.2	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	IS=1A , VGS=0V , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	145	A
Reverse Recovery Time	Trr	IS=20A , di/dt=100A/us , TJ=25℃	-	52	-	nS
Reverse Recovery Charge	Qrr		-	20	-	nC

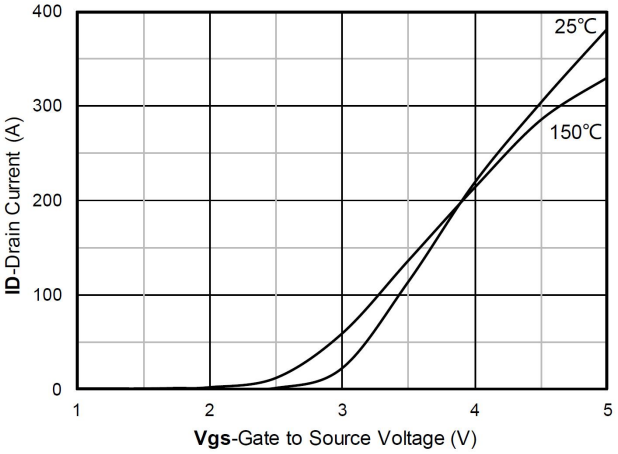
Note :

1. The test condition is VDD=24V, VGS=10V, L=0.1mH, RG=25Ω;

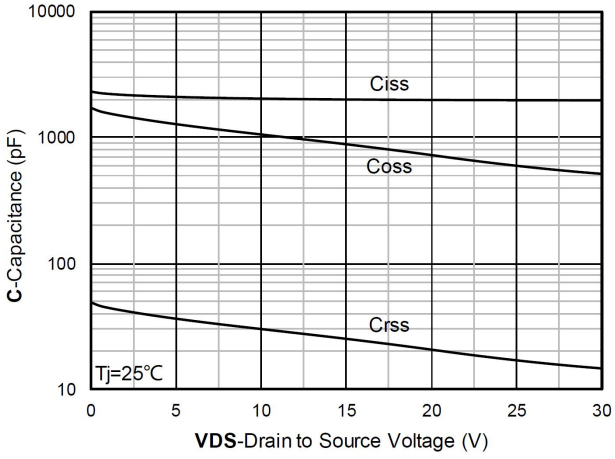
Typical Characteristics



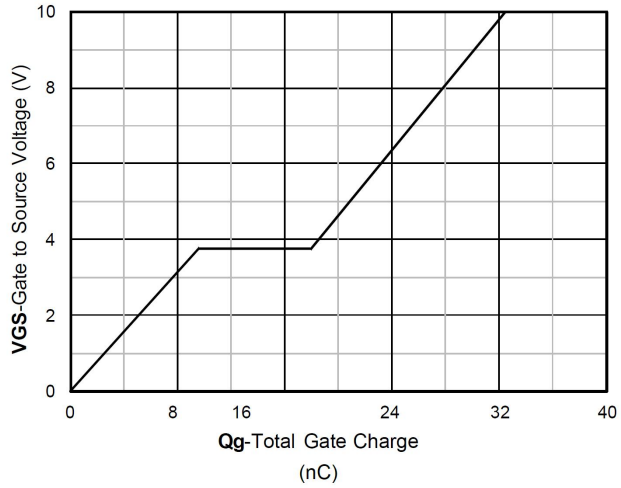
Output Characteristics



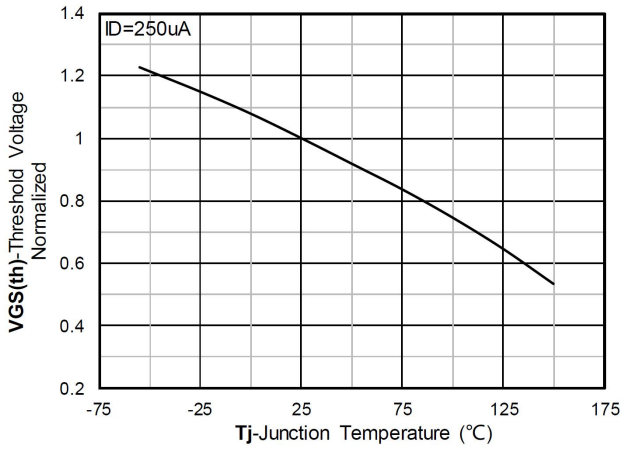
Transfer Characteristics



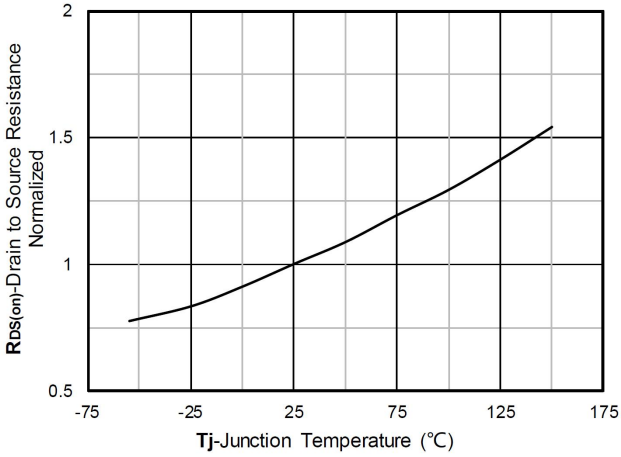
Capacitance Characteristics



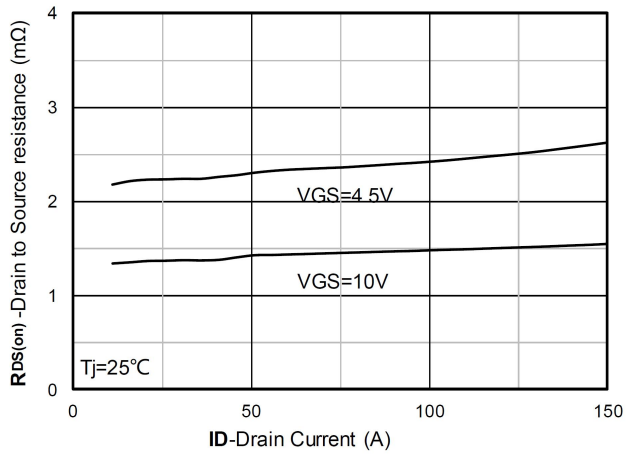
Gate Charge



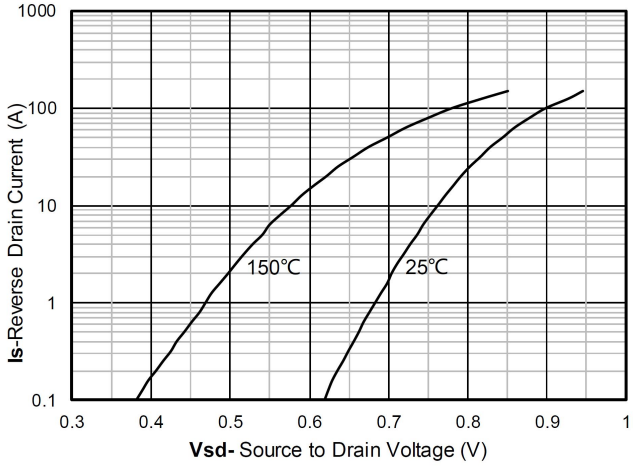
Normalized Threshold voltage



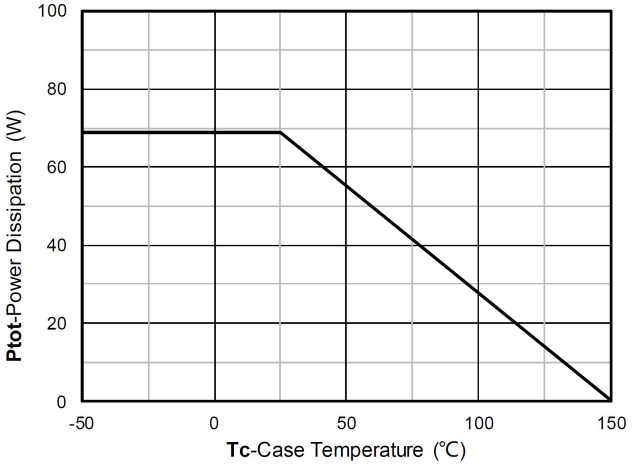
Normalized On-Resistance



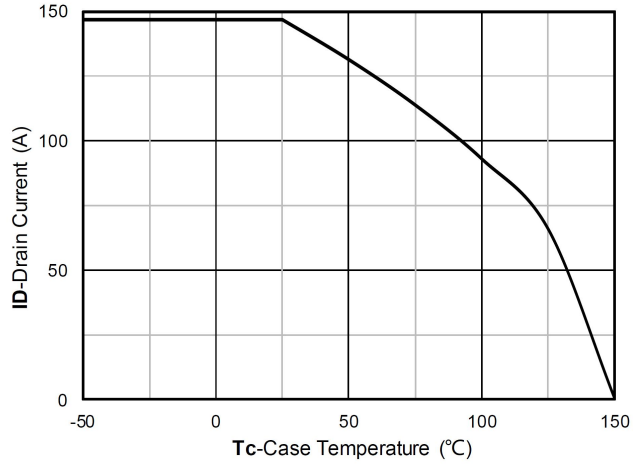
RDS(on) VS Drain Current



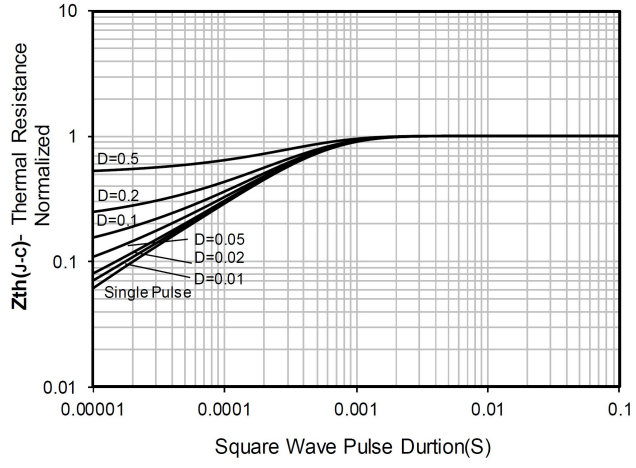
Forward characteristics of reverse diode



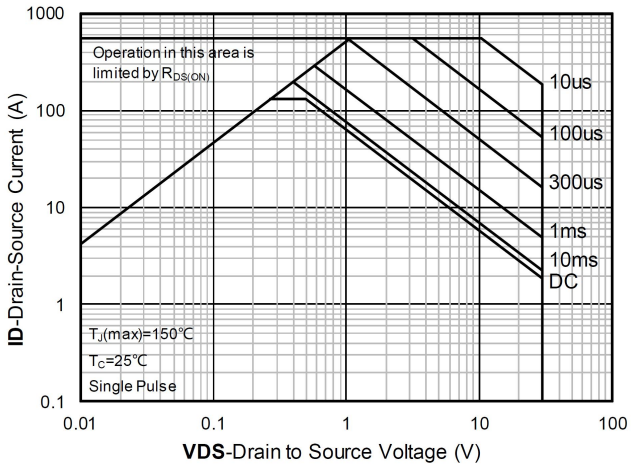
Power dissipation



Current dissipation



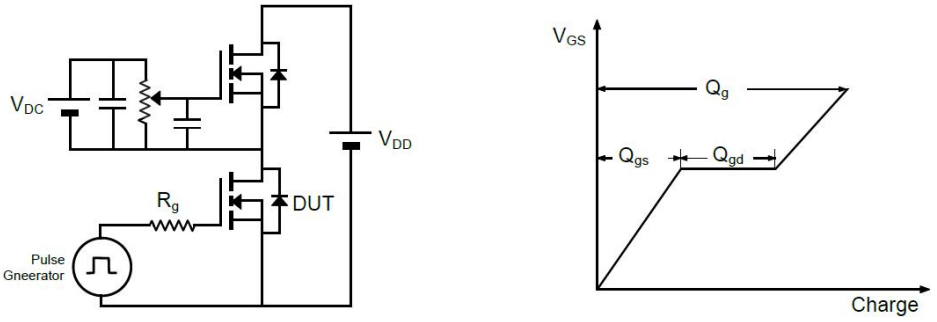
Normalized Maximum Transient Thermal Impedance



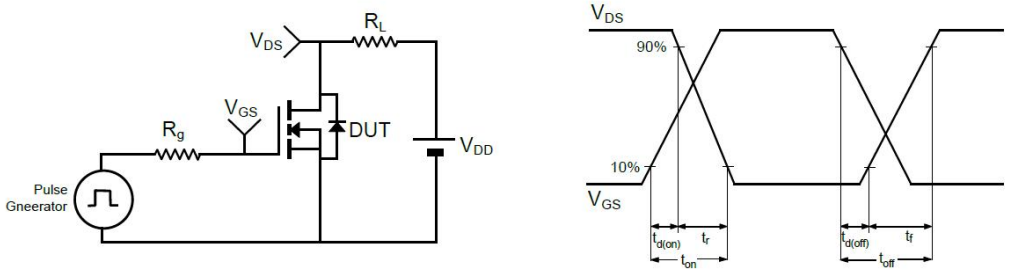
Safe Operation Area

Test Circuit

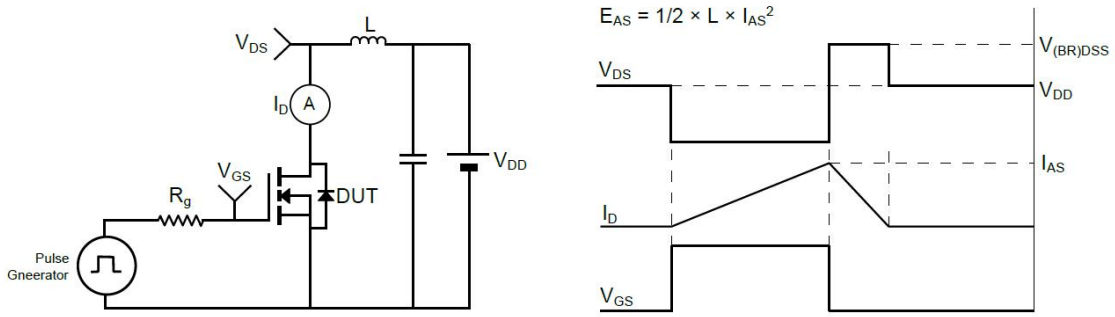
Gate Charge



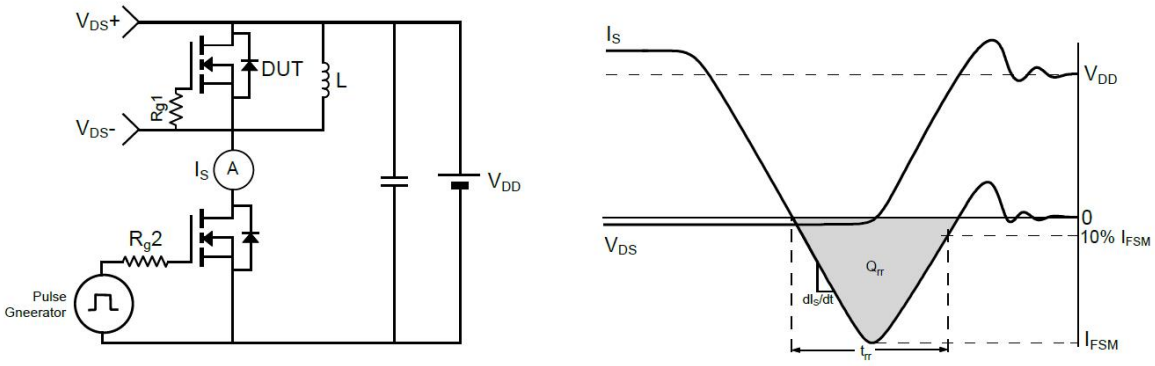
Resistive Load Switching Time



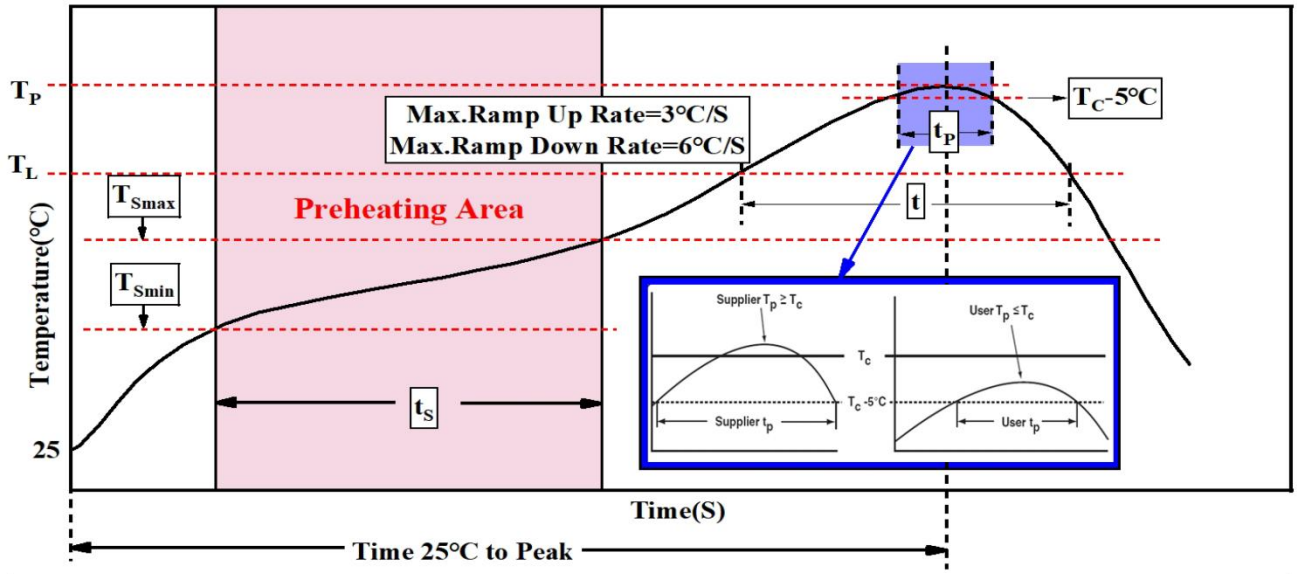
Un-clamped Inductive Load Switching



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 (Tsmin) Temperature max (Tsmax) Time (Tsmin to Tsmax) (ts)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-120 seconds
Average ramp-up rate (Tsmax to Tp)	3 °C/second max.	3°C/second max.
Liquidous temperature (TL) Time at liquidous (tL)	183 °C 60-150 seconds	217°C 60-150 seconds
Peak package body Temperature e (Tp)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (tp)** within 5°C of the specified classification temperature (Tc)	20** seconds	30** seconds
Average ramp-down rate (Tp to Tsmax)	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 (Tp) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum		

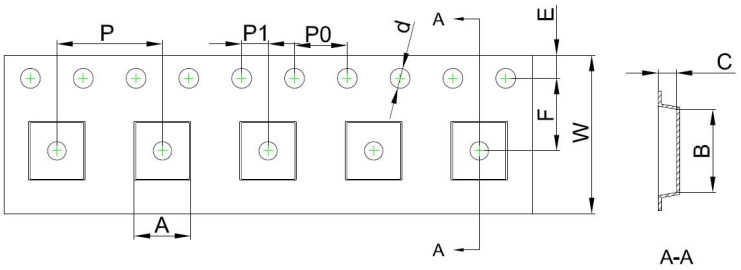
Table 1. SnPb Eutectic Process – Classification Temperatures (Tc)

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 (Tc)

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

PDFN3X3-8L Reel Information

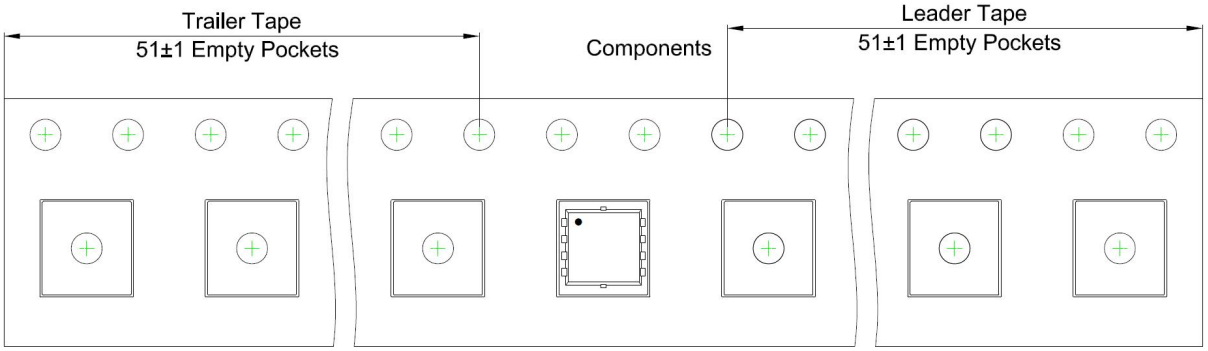


Packaging Description:

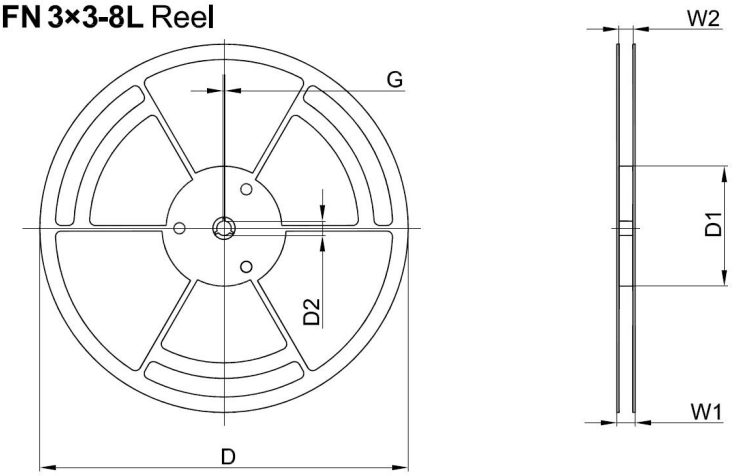
PDFN 3x3-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
PDFN 3×3-8L	3.55	3.55	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN 3×3-8L Tape Leader and Trailer



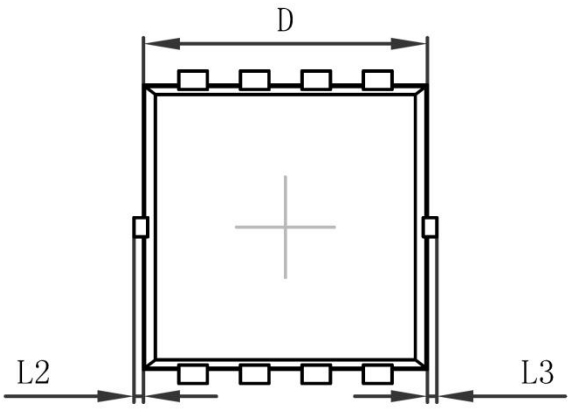
PDFN 3×3-8L Reel



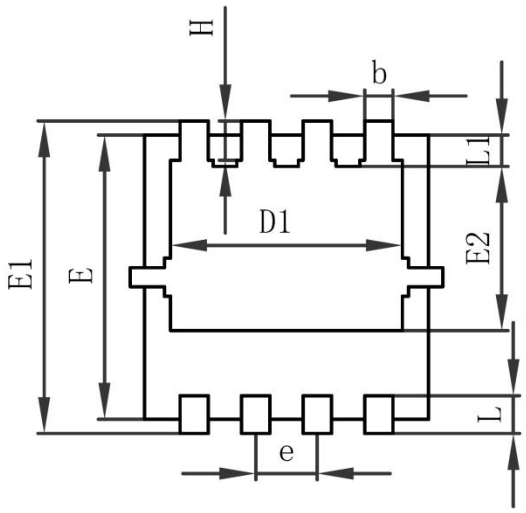
Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"Dia	Ø330.00	100.00	13.00	1.90	17.60	12.40

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
5,000 pcs	13 inch	5,000 pcs	340×336×29	50,000 pcs	353×346×365

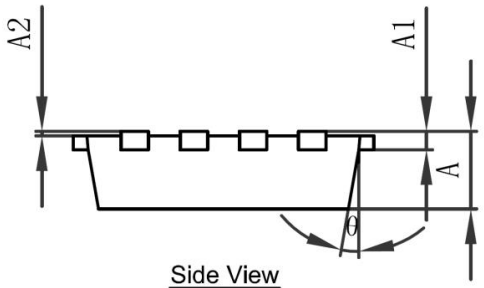
PDFN3X3-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.650	0.850
A1	0.152 REF.	
A2	0~0.05	
D	2.900	3.200
D1	2.300	2.600
E	2.900	3.100
E1	3.100	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	9°	13°