Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-20V	6.6mΩ@-4.5V	-45A
	8mΩ@-2.5V	

合肥矽普半导体
Siliup Semiconductor Technology Co.Ltd
技术 品质 服务
www.siliup.com

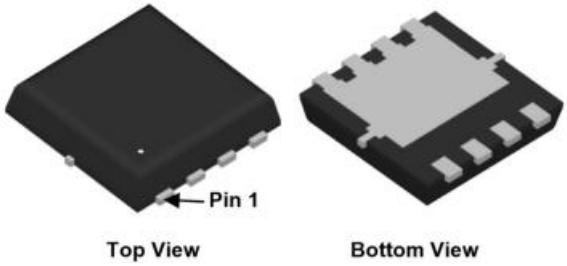
Feature

- Fast switching speed
- Low On-Resistance
- 100% Single Pulse avalanche energy Test

Applications

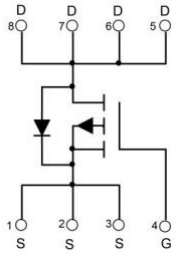
- DC-DC Converters.
- Power Management

Package

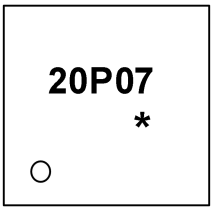


PDFN3X3-8L

Circuit diagram



Marking



20P07 :Device Code
***** :Month Code

Order Information

Device	Package	Unit/Tape
SP20P07NJ	PDFN3X3-8L	5000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current (Tc=25°C)	I_D	-45	A
Continuous Drain Current (Tc=100°C)	I_D	-30	A
Pulse Drain Current Tested	I_{DM}	-180	A
Single Pulse Avalanche Energy[1]	E_{AS}	72	mJ
Power Dissipation (Tc=25°C)	P_D	38	W
Power Dissipation (T_C=100℃)	P_D	15.2	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	3.3	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

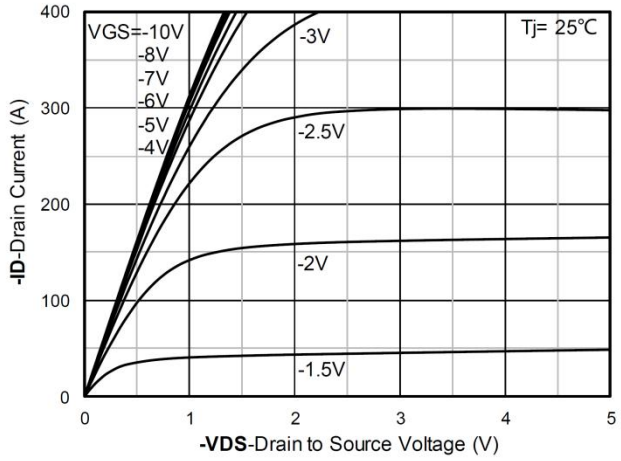
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=-250uA	-20	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS=-16V , VGS=0V , TJ=25℃	-	-	-1	uA
Gate-Source Leakage Current	I_{GSS}	VGS=±12V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =-250uA	-0.65	-0.85	-1.15	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=-4.5V , ID=-15A	-	6.6	9	mΩ
		VGS=-2.5V , ID=-12A	-	8	12	
Gate Resistance	R_G	VDS=-10V , VGS=0V , f=1MHz	-	4.5	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=-10V , VGS=0V , f=1MHz	-	4600	-	pF
Output Capacitance	C_{oss}		-	460	-	
Reverse Transfer Capacitance	C_{rss}		-	459	-	
Total Gate Charge	Q_g	VDS=-10V , VGS=-4.5V , ID=-10A	-	46	-	nC
Gate-Source Charge	Q_{gs}		-	7.3	-	
Gate-Drain Charge	Q_{gd}		-	10	-	
Gate Plateau Voltage	$V_{plateau}$		-	-1.7	-	V
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDD=-10V, VGS=-10V ,RG=3Ω, ID=-10A	-	8	-	nS
Rise Time	T_r		-	59	-	
Turn-Off Delay Time	$T_{d(off)}$		-	111	-	
Fall Time	T_f		-	43	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V
Diode Continuous Current	I_S		-	-	-45	A
Reverse recover time	T_{rr}	I_S=-15A, di/dt=100A/us, Tj=25℃	-	24	-	nS
Reverse recovery charge	Q_{rr}		-	13	-	nC

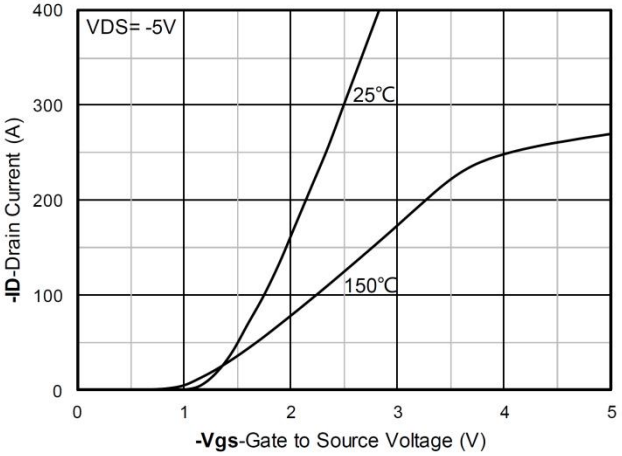
Note：

1. The EAS test condition is VDD=-10V, VG=-10V, L=0.5mH, Rg=25Ω

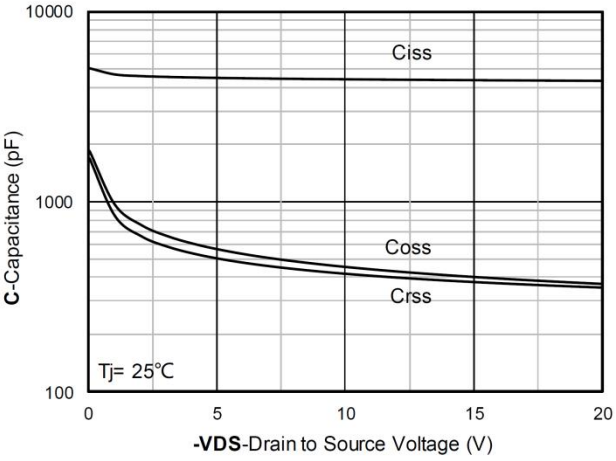
Typical Characteristics



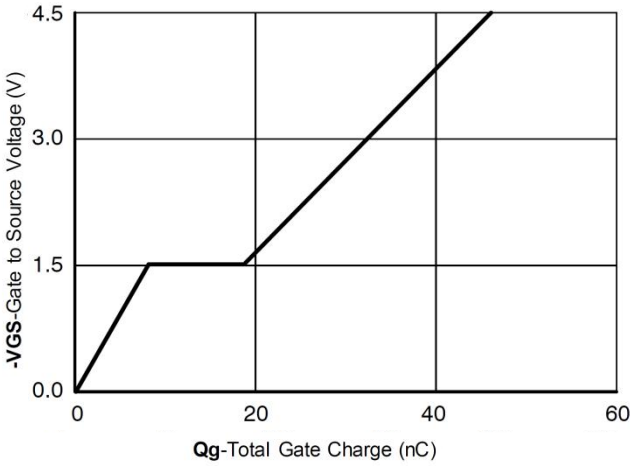
Output Characteristics



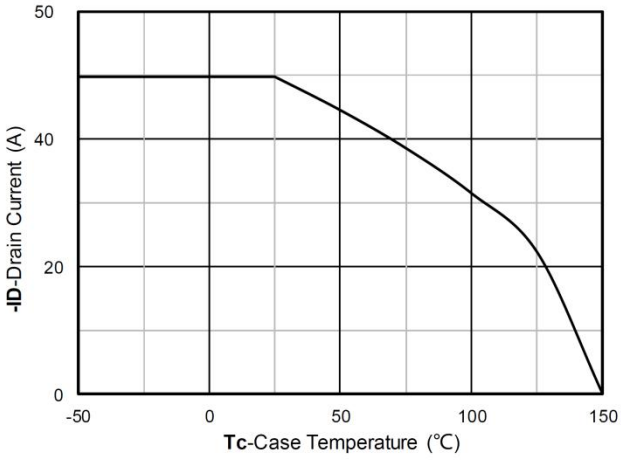
Transfer Characteristics



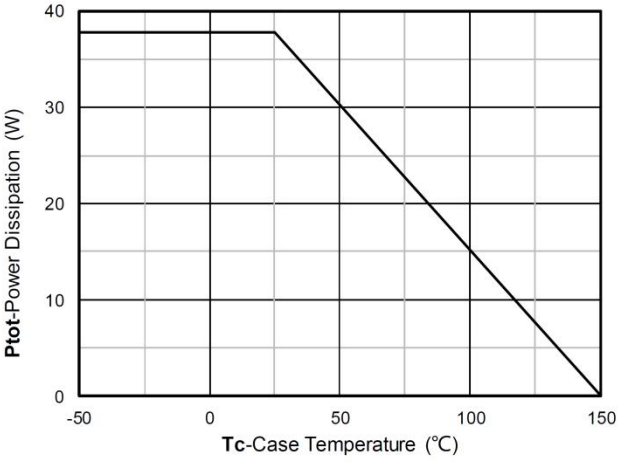
Capacitance Characteristics



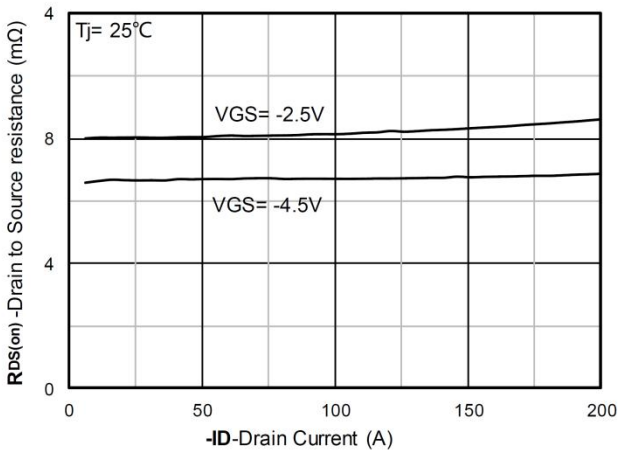
Gate Charge



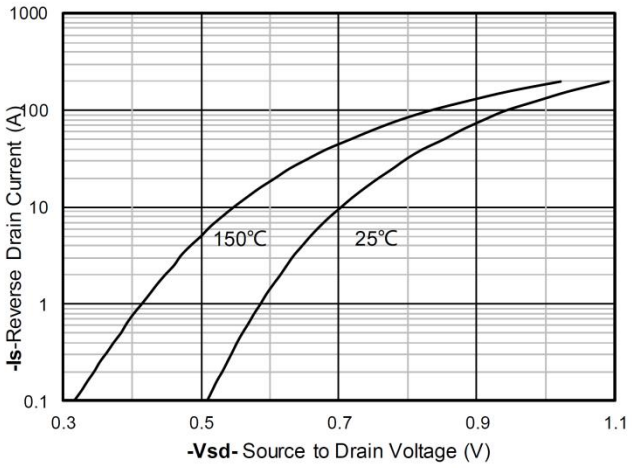
Current dissipation



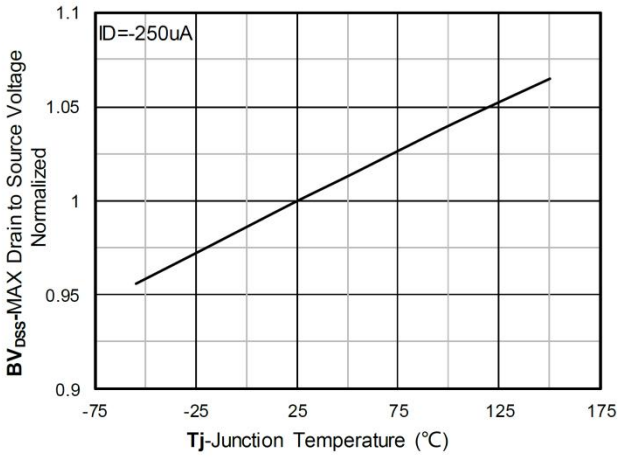
Power dissipation



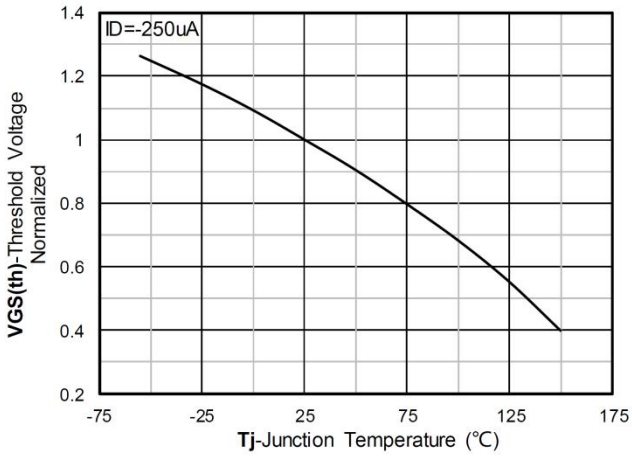
RDS(on) VS Drain Current



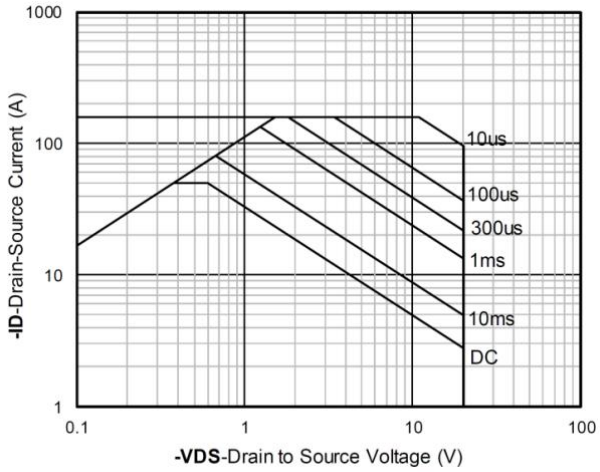
Forward characteristics of reverse diode



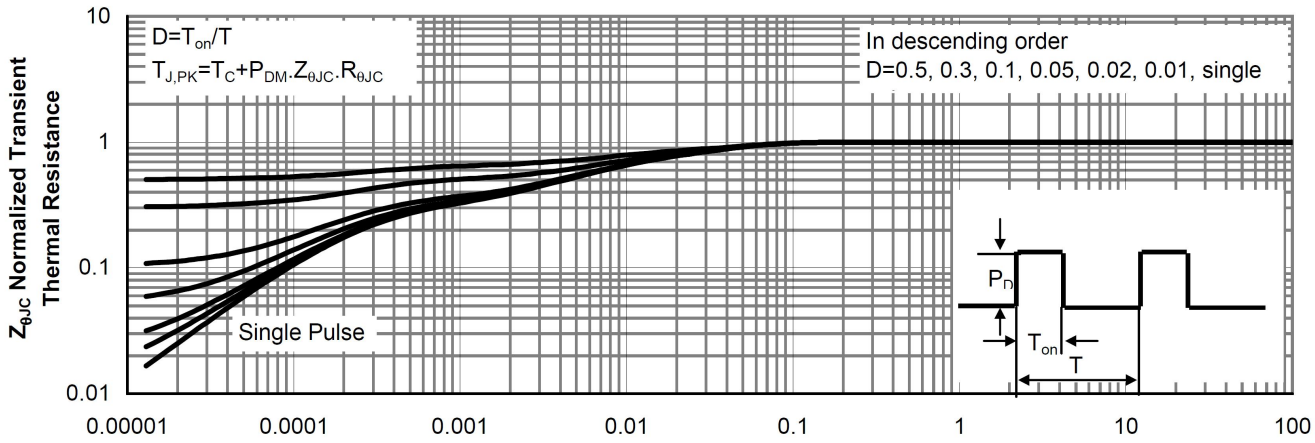
Normalized breakdown voltage



Normalized Threshold voltage



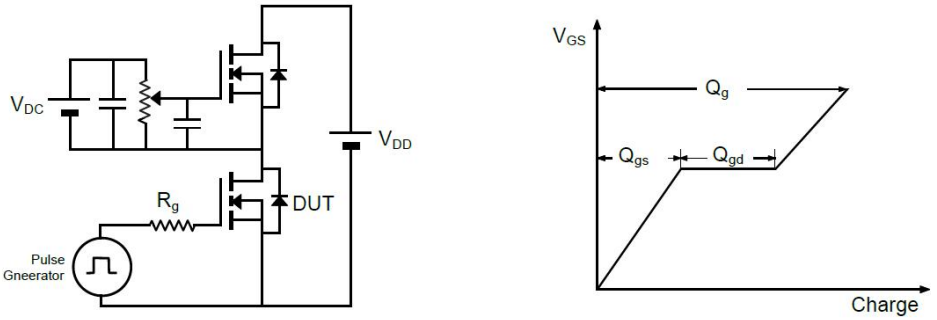
Safe Operation Area



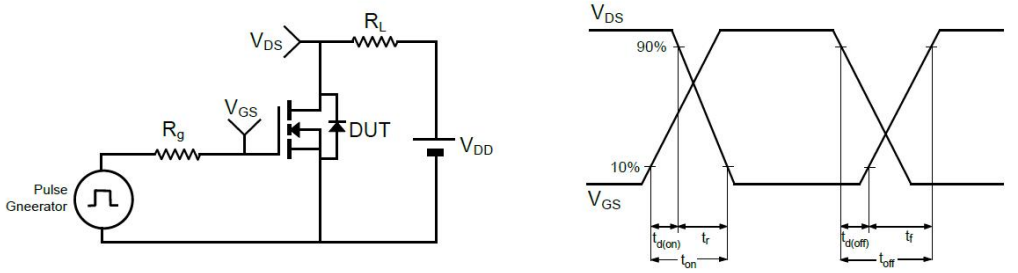
Normalized Maximum Transient Thermal Impedance

Test Circuit

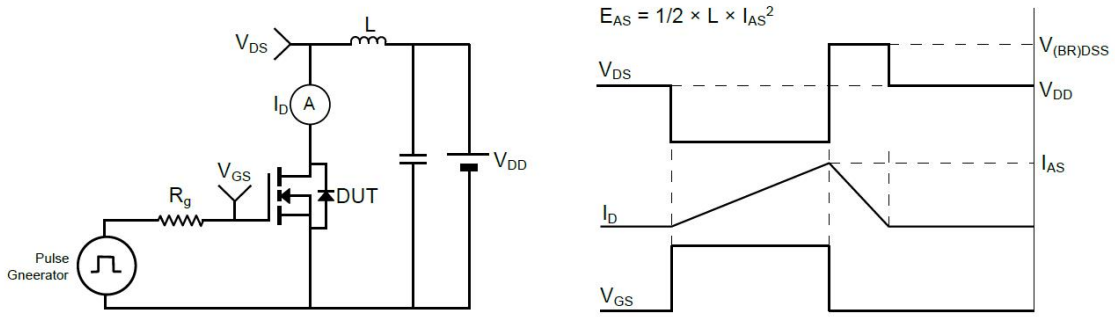
Gate Charge



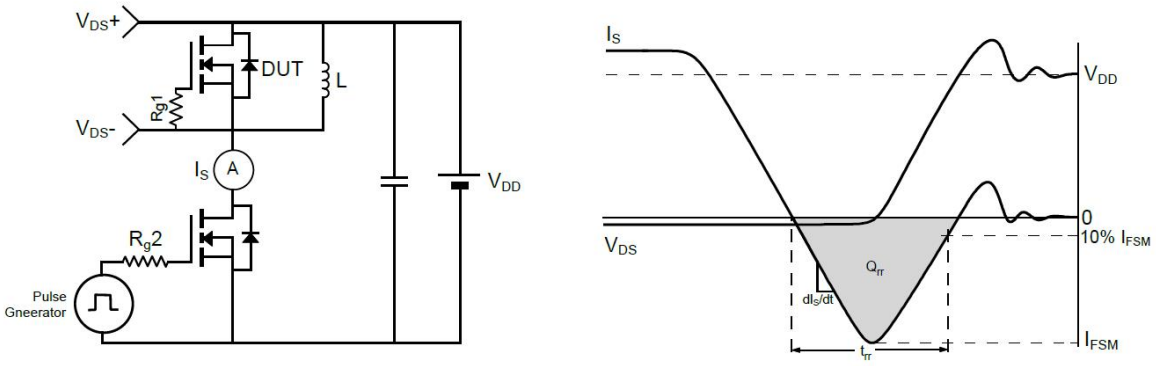
Resistive Load Switching Time



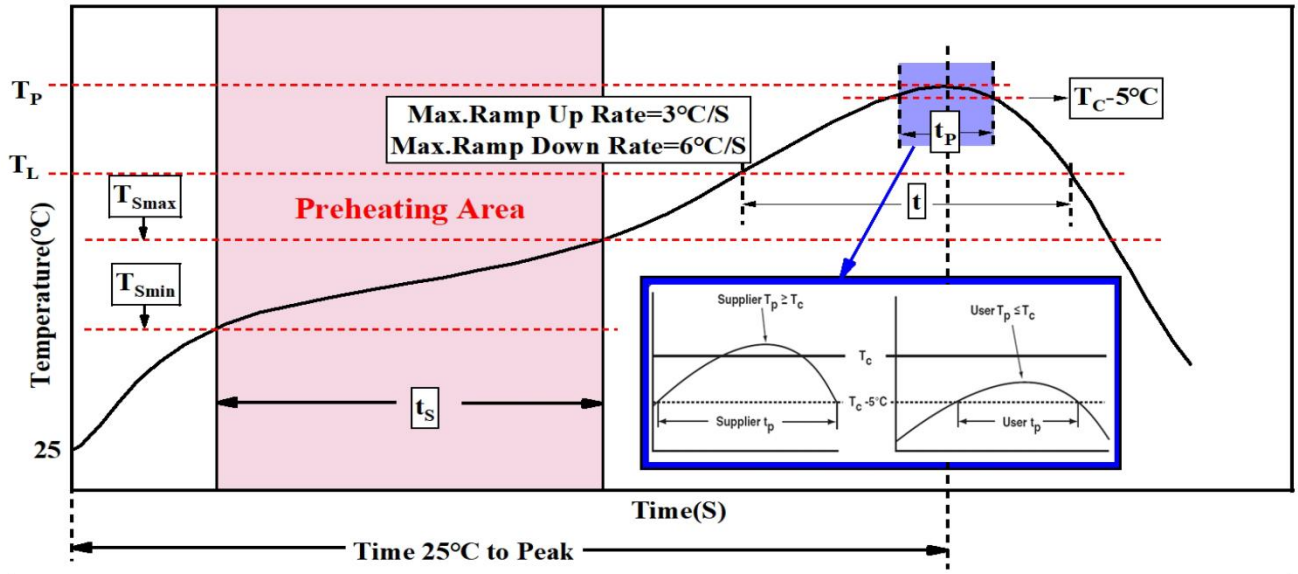
Un-clamped Inductive Load Switching



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		

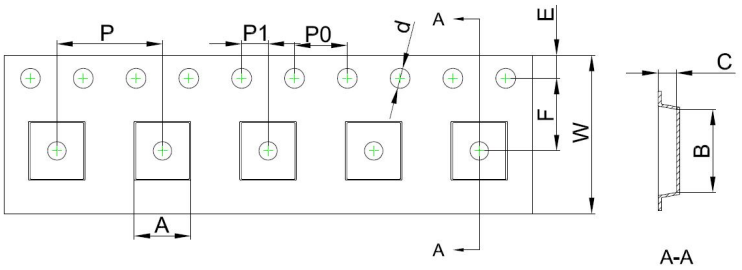
Table 1. SnPb Eutectic Process – Classification Temperatures (Tc)

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

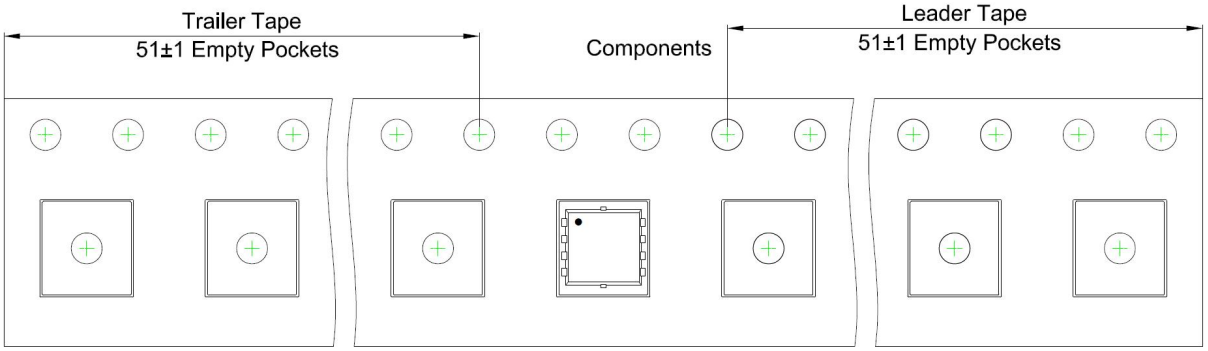


Packaging Description:

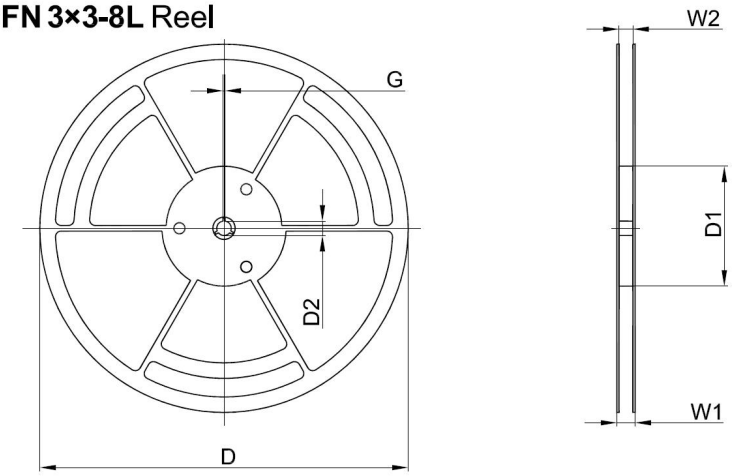
PDFN 3x3-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts 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



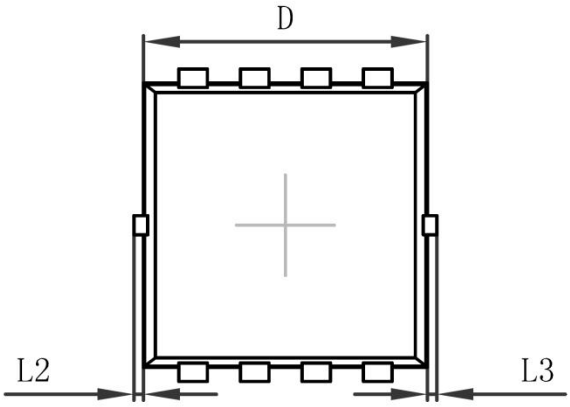
PDFN 3×3-8L Reel



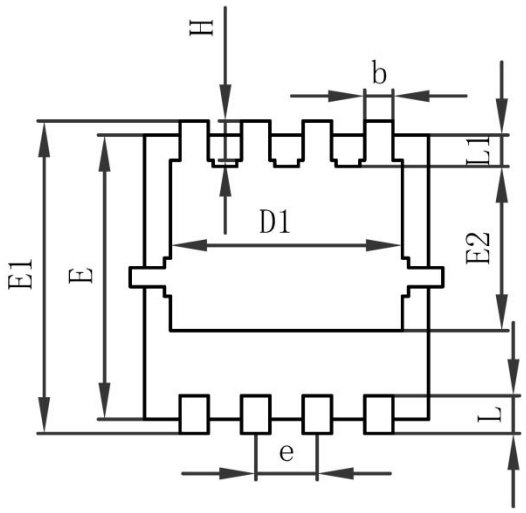
Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"Dia	Ø330.00	100.00	13.00	1.90	17.60	12.40

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

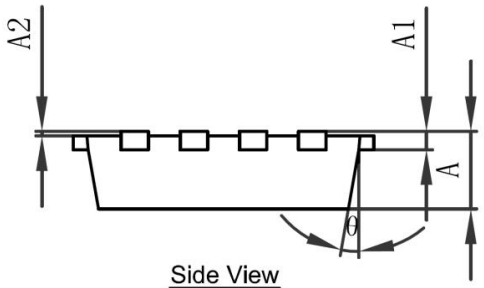
PDFN3X3-8L Package Information



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°