

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-100V	35mΩ@-10V	-25A
	45mΩ@-4.5V	



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

技术 品质 服务

www.siliup.com

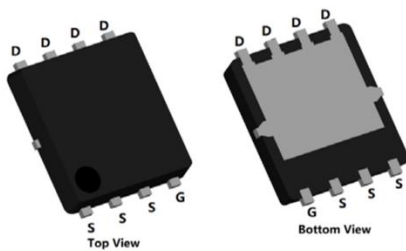
Feature

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

Applications

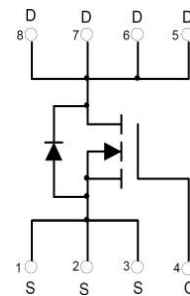
- Power switching application
- Battery management
- Uninterruptible power supply

Package

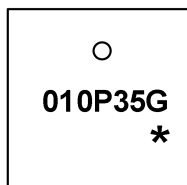


PDFN5X6-8L

Circuit diagram



Marking



010P35G : Product code
* : Month code

Order Information

Device	Package	Unit/Tube
SP010P35GNK	PDFN5×6-8L	5000

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

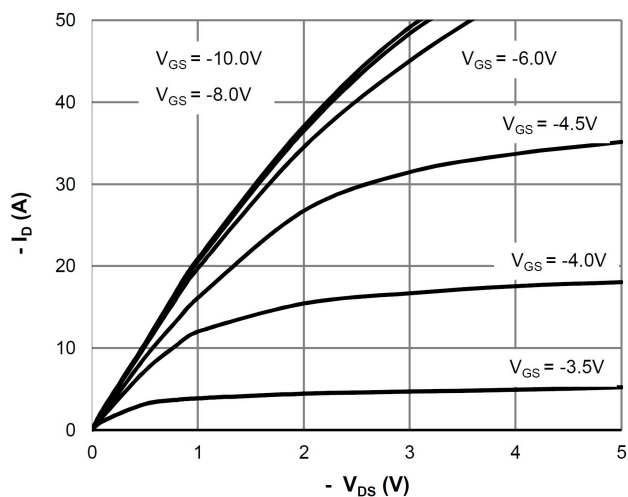
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	-25	A
Continuous Drain Current (Tc=100°C)	I_D	-17	A
Pulsed Drain Current	I_{DM}	-100	A
Single Pulse Avalanche Energy ¹	E_{AS}	240	mJ
Power Dissipation (Tc=25°C)	P_D	100	W
Power Dissipation (Tc=100°C)	P_D	40	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.25	°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°C, unless otherwise noted)

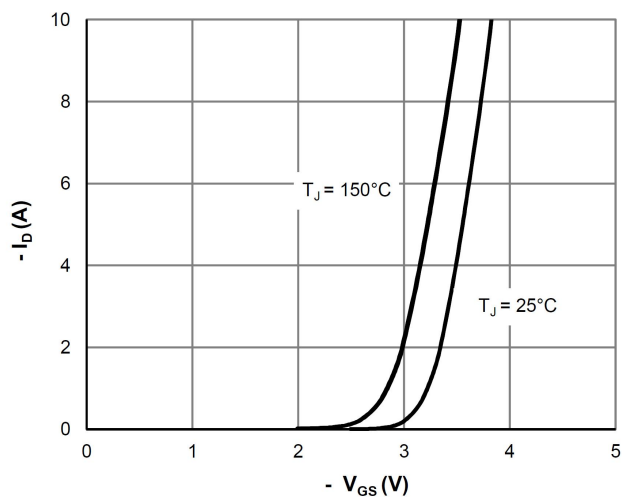
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID=-250μA , VGS=0V	-100	-	-	V
Drain Cut-Off Current	IDSS	VDS=-80V , VGS=0V	-	-	-1	uA
Gate Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID=-250uA	-1.5	-2.0	-2.5	V
Drain-Source ON Resistance	RDS(ON)	VGS=-10V , ID=-15A	-	35	45	mΩ
		VGS=-4.5V , ID=-10A	-	45	60	
Gate Resistance	RG	VDS=-50V , VGS=0V , f=1MHz	-	10.5	-	Ω
Dynamic Characteristics						
Input Capacitance	Ciss	VDS=-50V , VGS=-10V , f=1.0MHz	-	1218	-	pF
Output Capacitance	Coss		-	268	-	
Reverse Transfer Capacitance	Crss		-	16	-	
Total Gate Charge	Qg	VDS=-50V , VGS=-10V , ID=20A	-	21	-	nC
Gate-Source Charge	Qgs		-	6.6	-	
Gate-Drain Charge	Qgd		-	3.4	-	
Gate Plateau Voltage	Vplateau		-	-4.3	-	V
Switching Characteristics						
Turn-On Delay Time	td(on)	VGS=-10V , VDD=-50V , ID=-5A , RG=6Ω	-	11.8	-	nS
Rise Time	tr		-	56	-	
Turn-Off Delay Time	td(off)		-	48	-	
Fall Time	tf		-	81	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	-25	A
Reverse Recovery Time	Trr	IS=-15A, di/dt=- 100A/us, TJ=25℃	-	52	-	nS
Reverse Recovery Charge	Qrr		-	128	-	nC

Note:

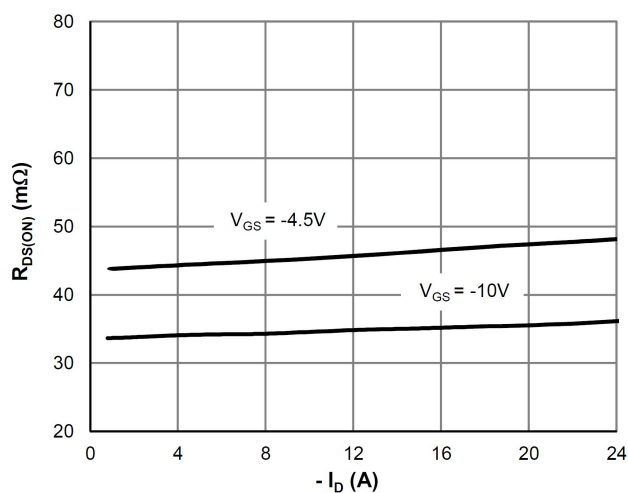
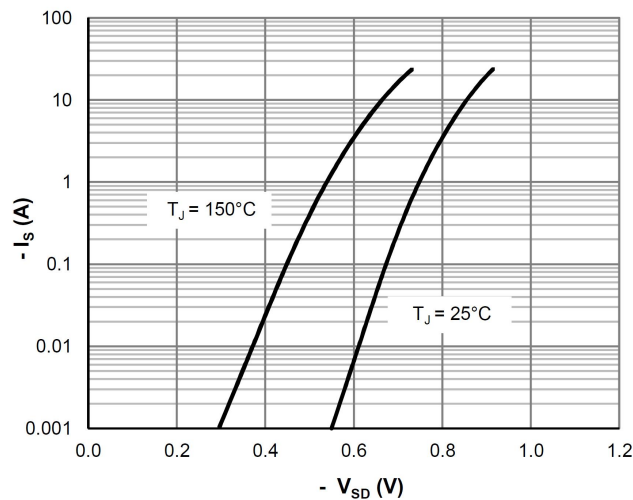
- The EAS test condition is $V_{DD} = -50V$, $V_{GS} = -10V$, $L = 0.5mH$, $R_G = 25\Omega$

**Typical Characteristics**

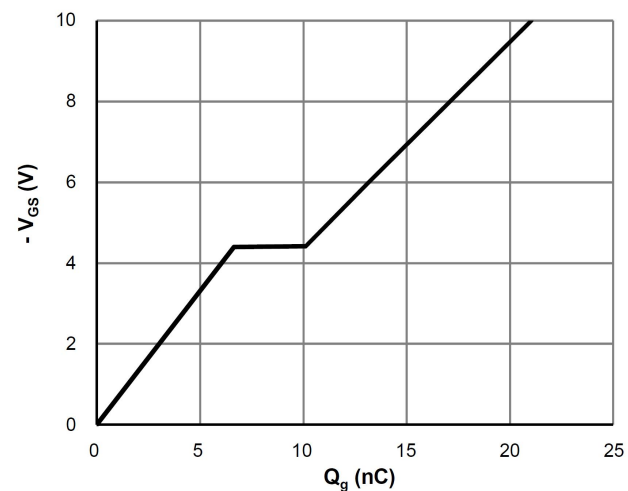
Saturation Characteristics



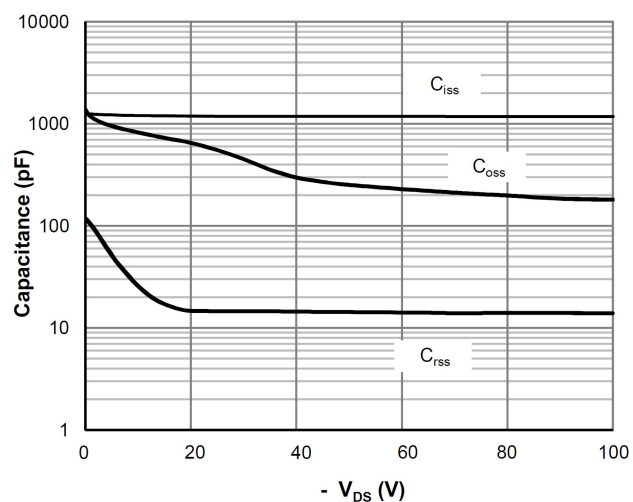
Transfer Characteristics

 $R_{DS(ON)}$ vs. Drain Current

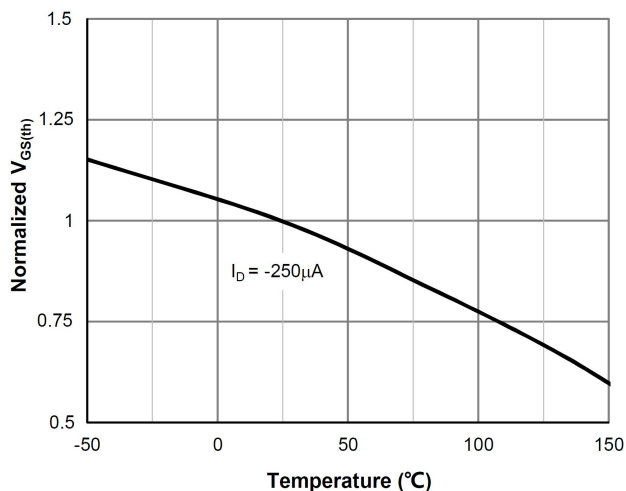
Body-Diode Characteristics



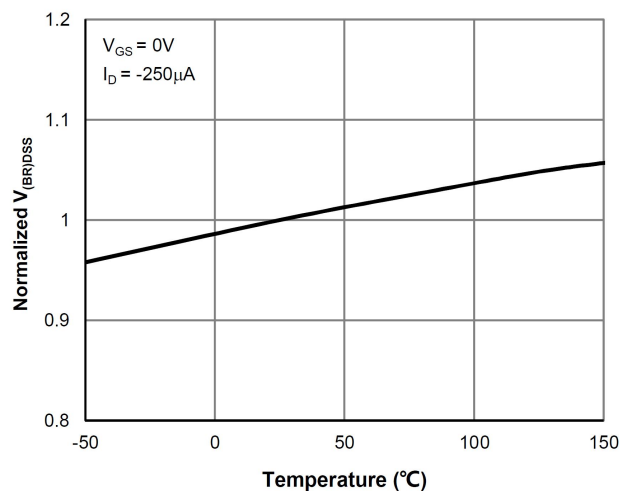
Gate Charge



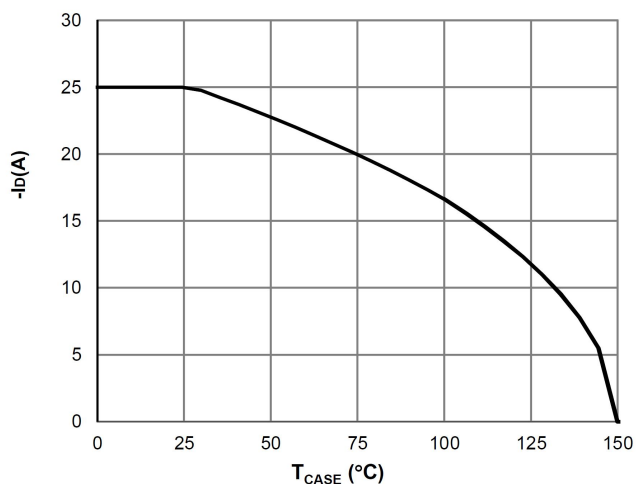
Capacitance Characteristics



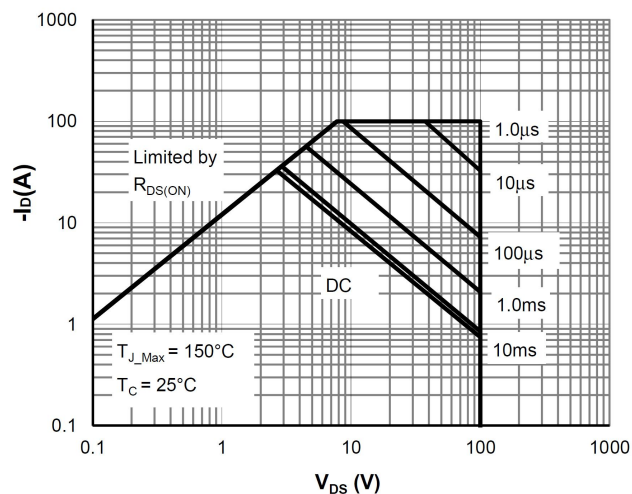
Normalized $V_{GS(th)}$ vs. Junction Temperature



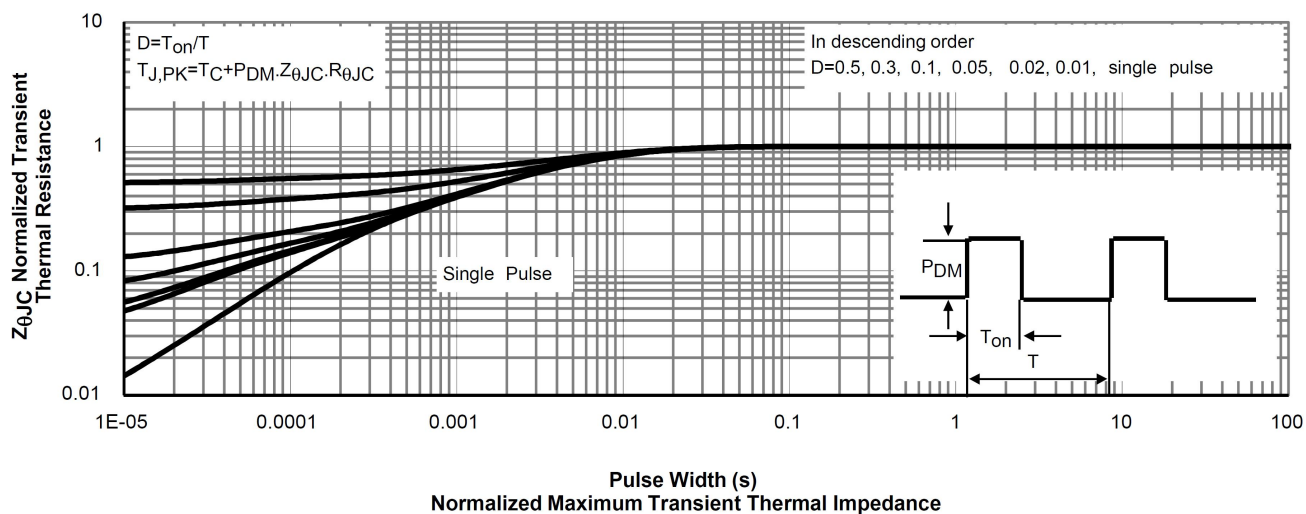
Normalized $V_{BR(DSS)}$ vs. Junction Temperature



Current De-rating



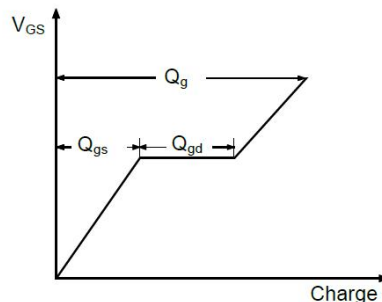
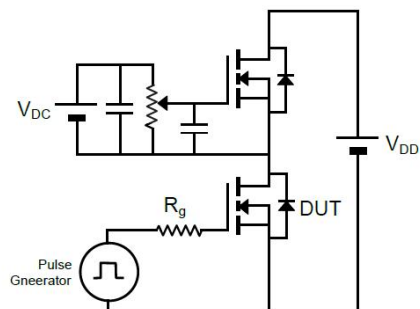
Maximum Safe Operating Area



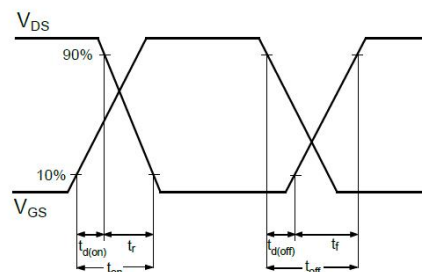
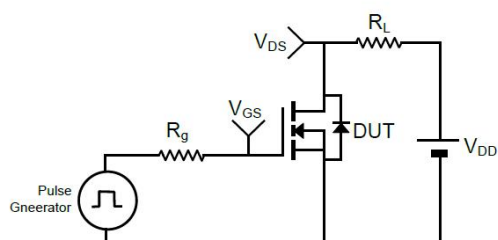
Normalized Maximum Transient Thermal Impedance

Test Circuit

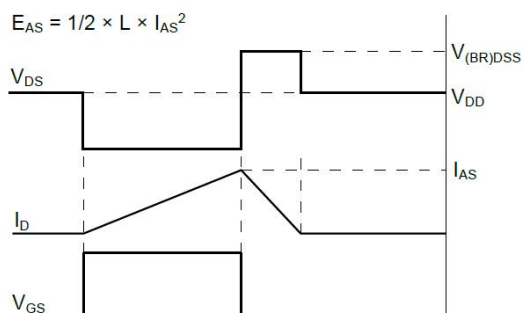
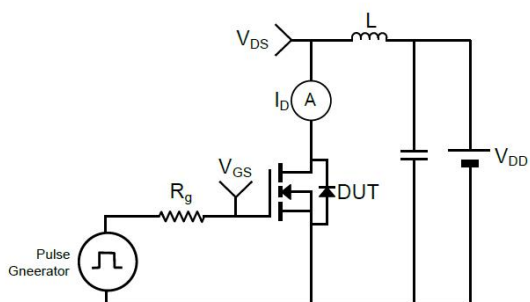
Gate Charge



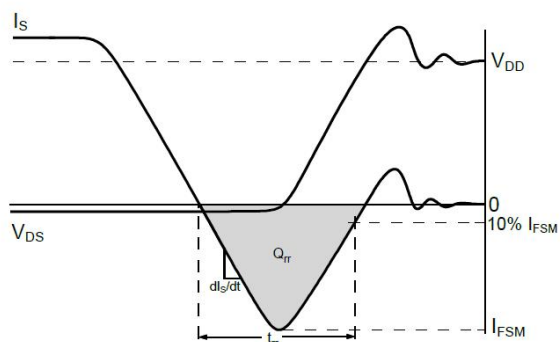
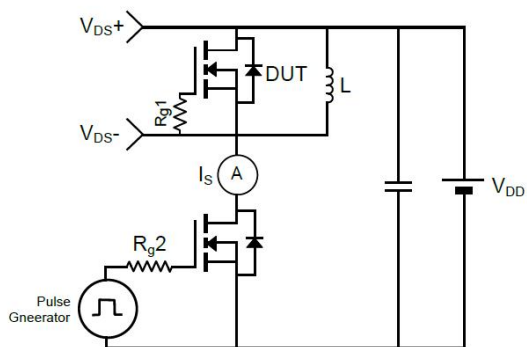
Resistive Load Switching Time



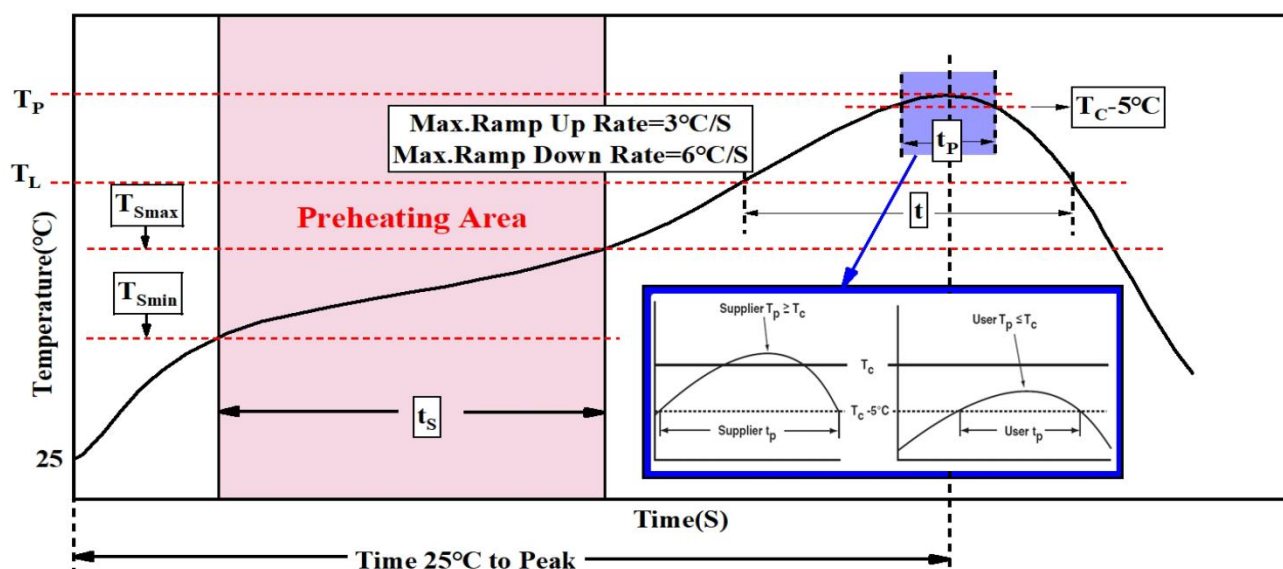
Un-clamped Inductive Load Switching



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 (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)

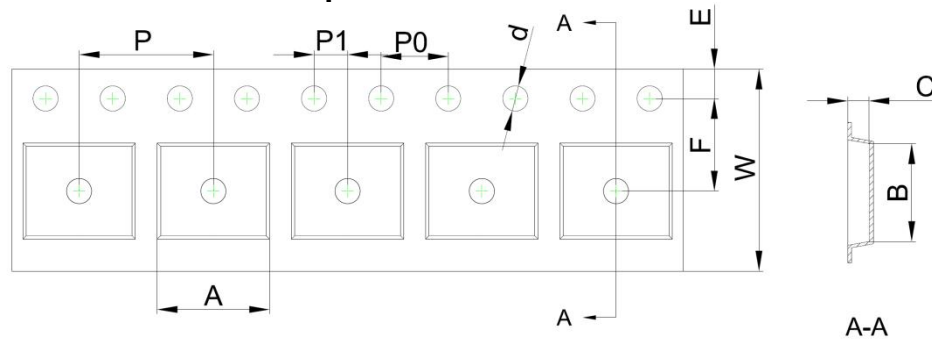
Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

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



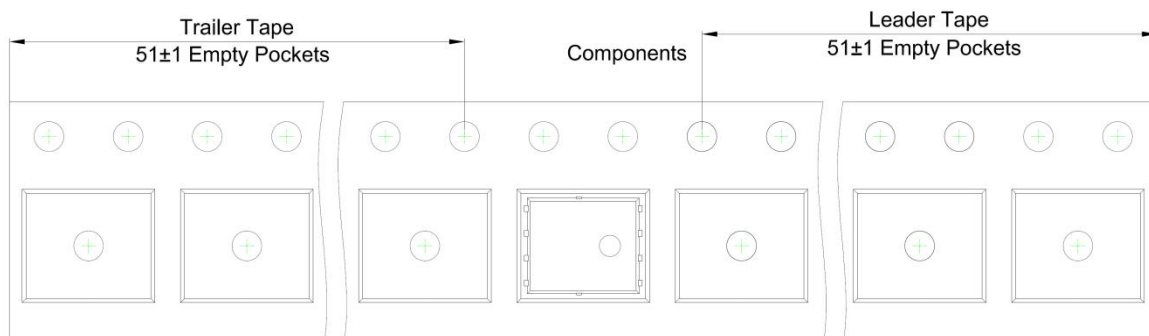
PDFN5X6-8L Embossed Carrier Tape



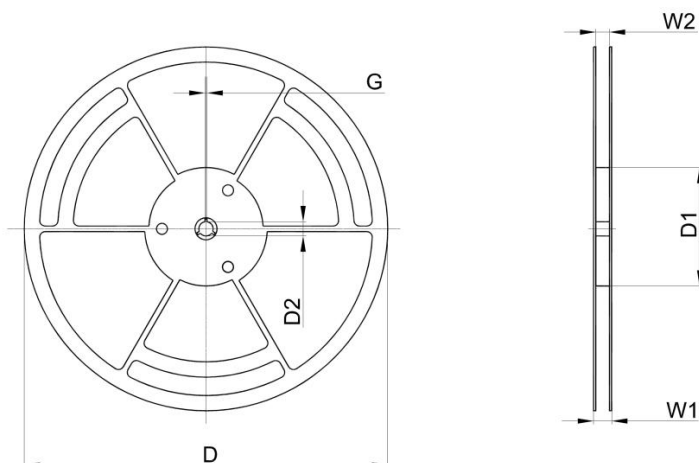
Dimensions are in millimeter

Pkg type	A	B	C	d	E	F	P0	P	P1	W
PDFN5X6-8L	6.30	5.30	1.10	Φ1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN5X6-8L Tape Leader and Trailer



PDFN5X6-8L Reel



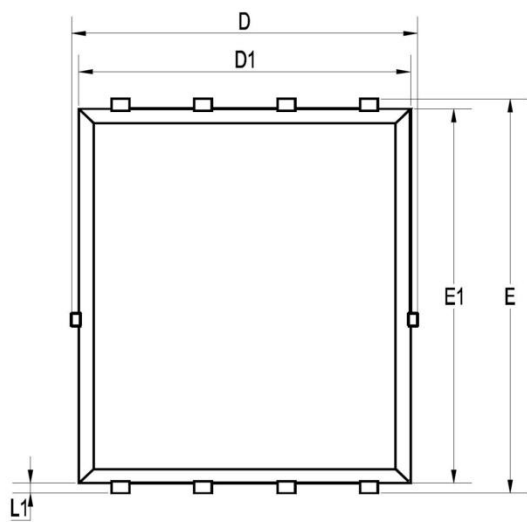
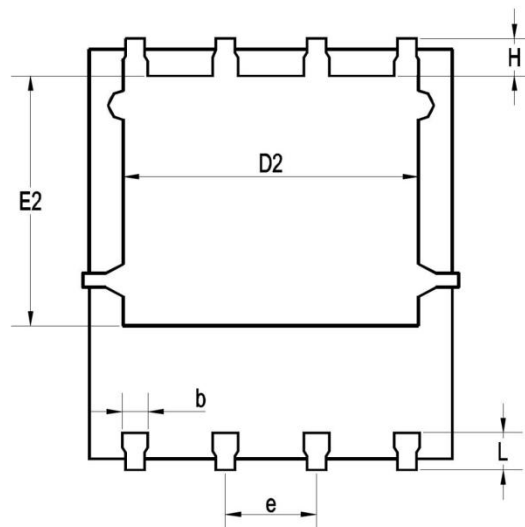
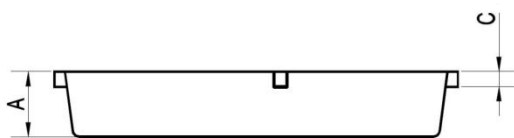
Dimensions are in millimeter

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



PDFN5X6-8L Package Information

Top View
[顶视图]Bottom View
[背视图]Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.120	0.035	0.044
b	0.330	0.510	0.013	0.020
C	0.110	0.340	0.004	0.013
D	4.700	5.260	0.185	0.207
D1	4.700	5.100	0.185	0.201
D2	3.560	4.500	0.140	0.177
E	5.750	6.250	0.226	0.246
E1	5.600	6.000	0.220	0.236
E2	3.180	3.660	0.125	0.144
e	1.170	1.370	0.046	0.054
L	0.350	0.710	0.014	0.028
L1	0.060	0.200	0.002	0.008
H	0.350	0.710	0.014	0.028