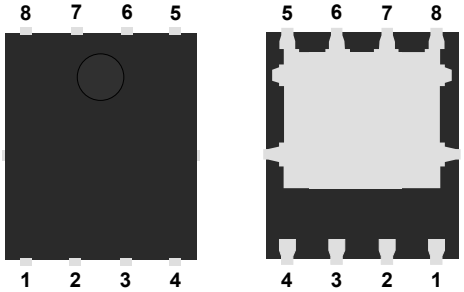
PJM100P20DN

P-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= -20V,I_D= -100A
- $R_{DS(on)}$< 3.1mΩ @V_{GS}= -4.5V
- $R_{DS(on)}$< 4.3mΩ @V_{GS}= -2.5V

PDFN5x6-8L



(Top View) (Bottom View)

Features

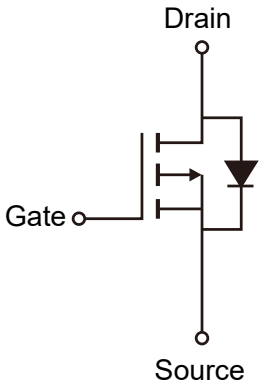
- Advanced Trench Technology
- 100% Avalanche Tested
- 100% DVDS
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3
- Molding Compound Meets UL 94 V-0 Flammability Rating

Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

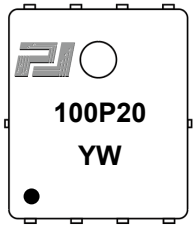
Application

- Load Switch
- PWM Application
- Power Management

Schematic Diagram



Marking Code



Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter		Symbol	Value	Unit
Drain-Source Voltage		$-V_{DS}$	20	V
Gate-Source Voltage		V_{GS}	±12	V
Drain Current-Continuous	T_C=25℃	$-I_D$	100	A
	T_C=100℃		60	
Drain Current-Pulsed Note1		$-I_{DM}$	400	A
Single Pulse Avalanche Energy Note2		E_{AS}	182	mJ
Maximum Power Dissipation		P_D	69	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note3	$R_{\theta JA}$	35	°C/W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.8	°C/W

Electrical Characteristics

(T_J=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$-V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	20	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	V_{DS}=-20V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note4	$-V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	0.4	0.62	1	V
Drain-Source On-Resistance Note4	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-20A	--	2.4	3.1	mΩ
		V_{GS}=-2.5V,I_D=-15A	--	3.3	4.3	mΩ
Forward Transconductance Note4	g_{FS}	V_{DS}=-5V,I_D=-2A	--	11	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHz	--	8615	--	pF
Output Capacitance	C_{oss}		--	1113	--	pF
Reverse Transfer Capacitance	C_{rss}		--	914	--	pF
Gate resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	--	4.6	--	Ω
Total Gate Charge	Q_g	V_{DS}=-10V,I_D=-20A, V_{GS}=-4.5V	--	65	--	nC
Gate-Source Charge	Q_{gs}		--	12	--	nC
Gate-Drain Charge	Q_{gd}		--	22	--	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V,I_D=-20A, V_{GS}=-10V,R_{GEN}=6Ω	--	13	--	nS
Turn-on Rise Time	t_r		--	12	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	120	--	nS
Turn-off Fall Time	t_f		--	90	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage Note4	$-V_{SD}$	V_{GS}=0V,I_S=-20A	--	--	1.2	V
Diode Forward Current	$-I_S$		--	--	100	A
Reverse Recovery Time	trr	I_F=-20A, di/dt=100A/μs	--	31	--	nS
Reverse Recovery Charge	Qrr		--	20	--	nC

Note：

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. E_{AS} condition: T_J=25℃,V_{DD}=-10V, V_G=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-27A
3. Surface mounted on 1inch^2 FR-4 board with 2OZ copper
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Test Circuit

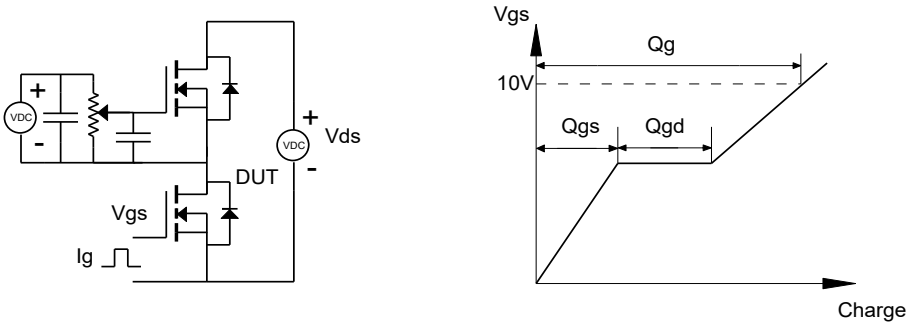


Figure 1: Gate Charge Test Circuit & Waveform

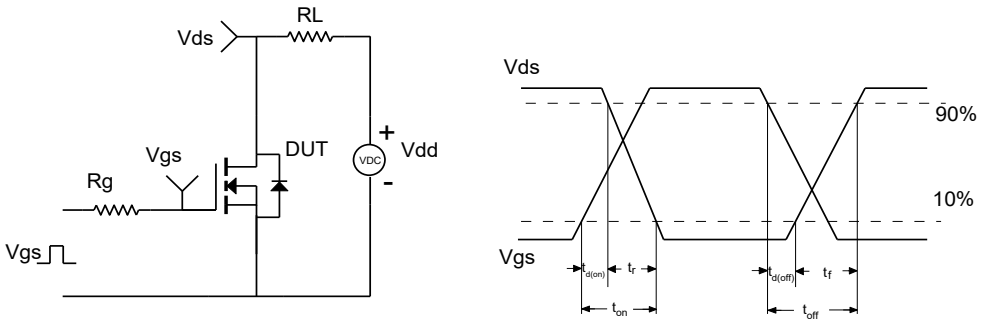


Figure 2: Resistive Switching Test Circuit & Waveform

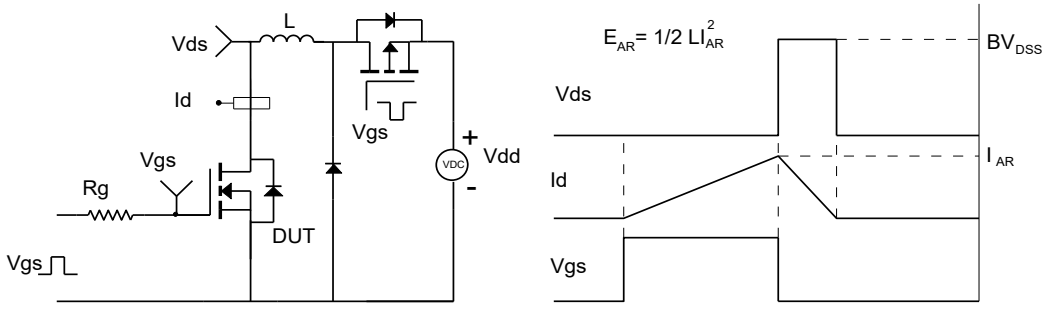


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

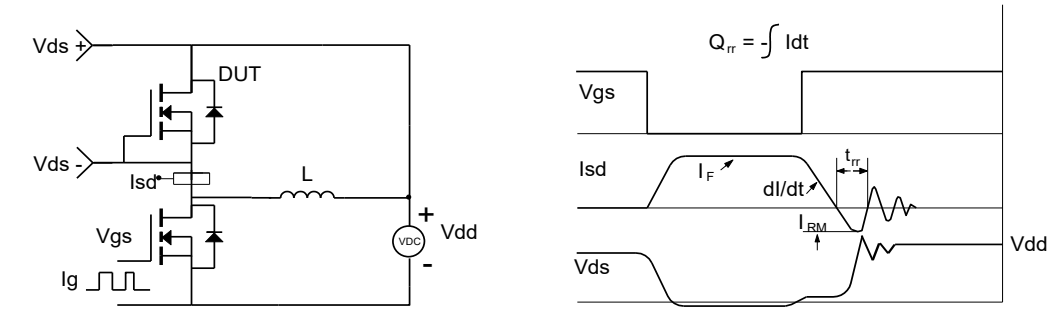
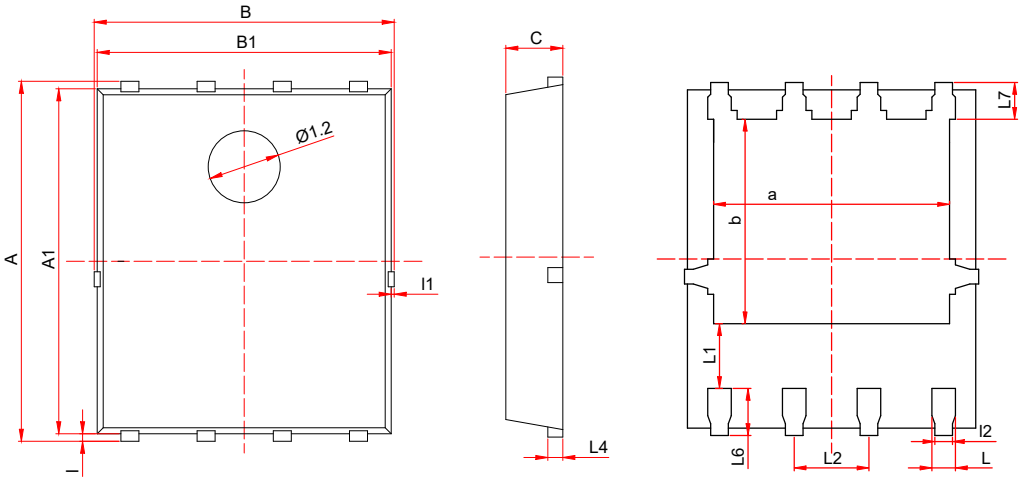


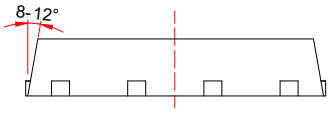
Figure 4: Diode Recovery Test Circuit & Waveform

Package Outline

PDFN5x6-8L



TOP VIEW SIDE VIEW BOTTOM VIEW

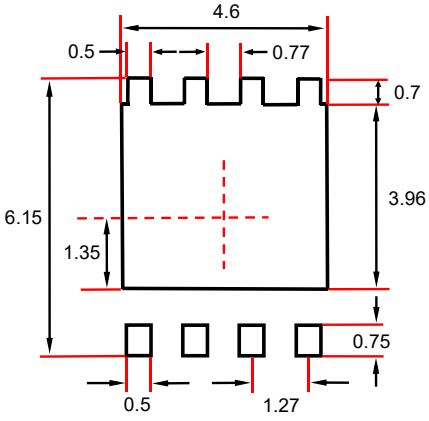


SIDE VIEW

Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	5.850	6.000	6.150	0.230	0.236	0.242
A1	5.700	5.800	5.900	0.224	0.228	0.232
B	4.900	5.100	5.300	0.193	0.201	0.209
B1	4.800	5.000	5.200	0.189	0.197	0.205
I	0.060	0.130	0.200	0.002	0.005	0.008
I1	0.000	-	0.100	0.000	-	0.004
I2	0.250	0.300	0.350	0.010	0.012	0.014
C	0.950	1.000	1.050	0.037	0.039	0.041
L4	0.200	0.250	0.300	0.008	0.010	0.012
L7	0.500	0.600	0.700	0.020	0.024	0.028
a	4.100	4.200	4.300	0.161	0.165	0.169
b	3.400	3.500	3.600	0.134	0.138	0.142
L1	1.200	1.300	1.400	0.047	0.051	0.055
L6	0.550	0.650	0.750	0.022	0.026	0.030
L2	1.170	1.270	1.370	0.046	0.050	0.054
L	0.300	0.400	0.500	0.012	0.016	0.020

Suggested Pad Layout

PDFN5x6-8L

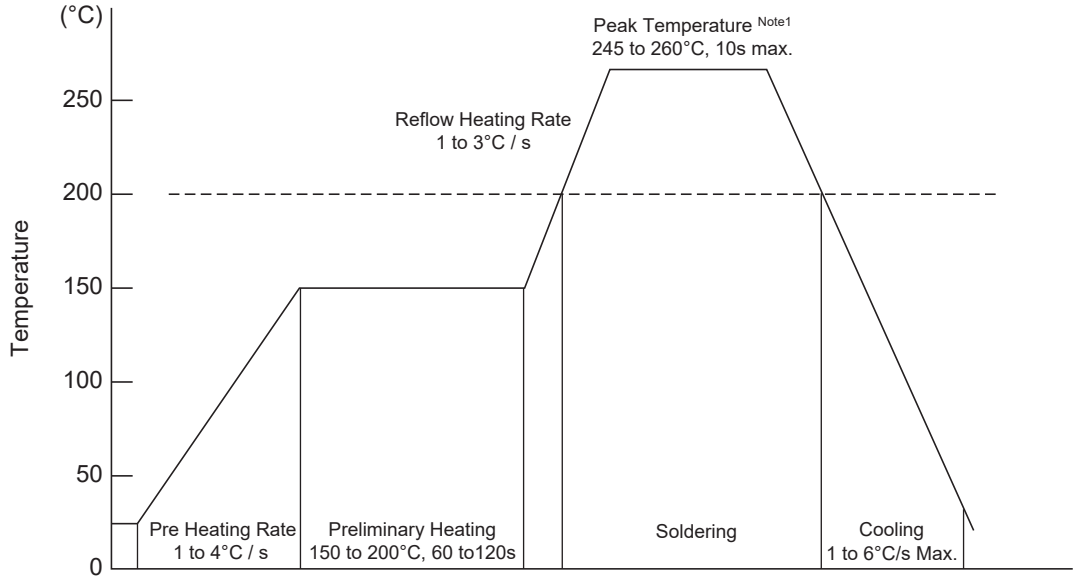


Note:

1. Package Body Sizes Exclude Mold Flash and Gate Burrs
2. Controlling Dimension: In millimeters
3. General Tolerance:±0.1mm
4. The Pad Layout is for reference purposes only

Conditions of Soldering and Storage

◆ **Recommended condition of Reflow Soldering(Pb-Free Solder)**



Recommended peak temperature is over 245°C. If peak temperature is below 245°C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

Note1:

Maximum thermal excursion allowed during the reflow assembly is as follow:

- Temperature: 255°C~260°C
- Duration at peak soak : 30 seconds
- Number of reflow: 3

- **Conditions of hand soldering** Note2

- Temperature: 320±10°C
- Time: 3s max.
- Times: one time

Note2: Not recommended for mass production, an engineering project, or re-work, it is allowed. It should be used with caution

- **Storage conditions**

- **Temperature**

5 to 30°C

- **Humidity**

≤ 60% RH

- **Floor Life**

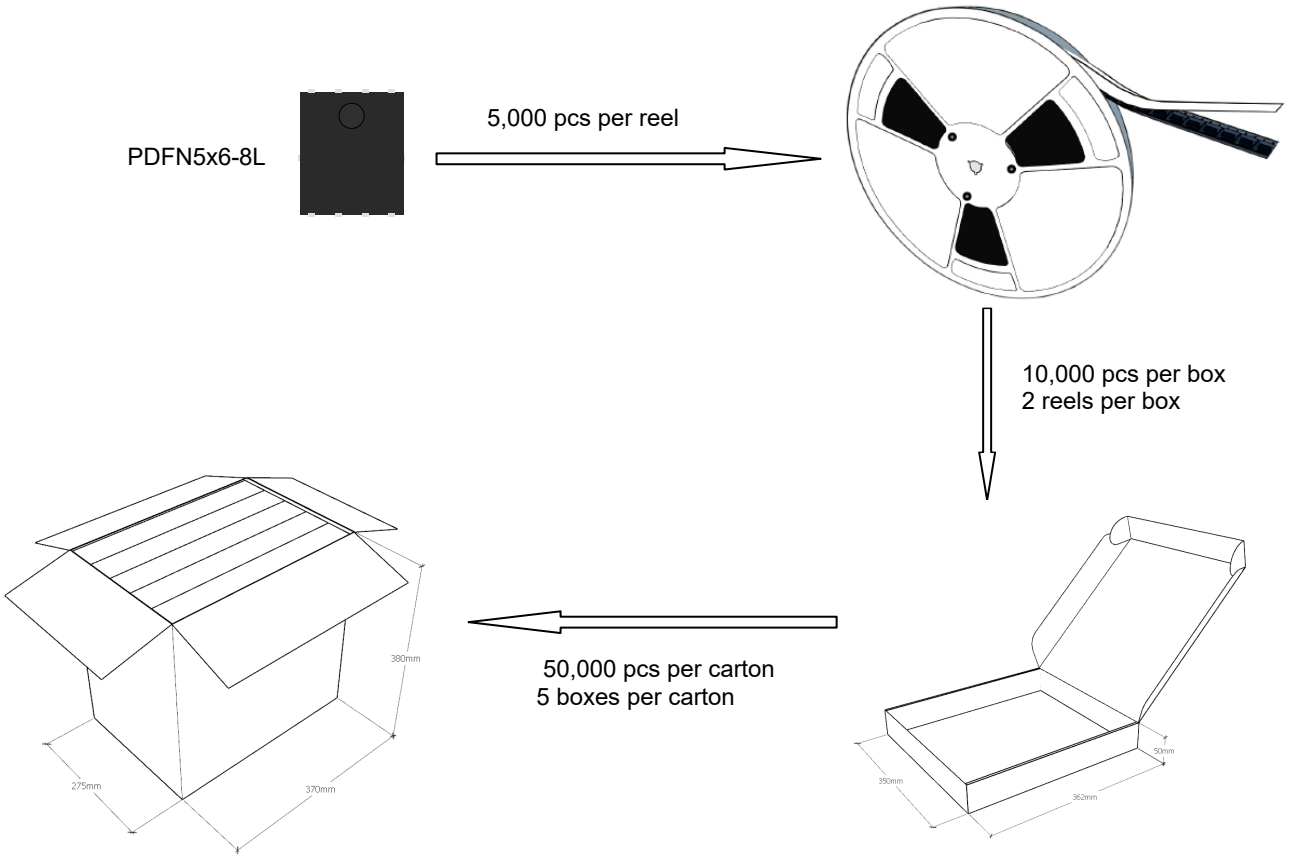
168 Hours

- **Recommended period**

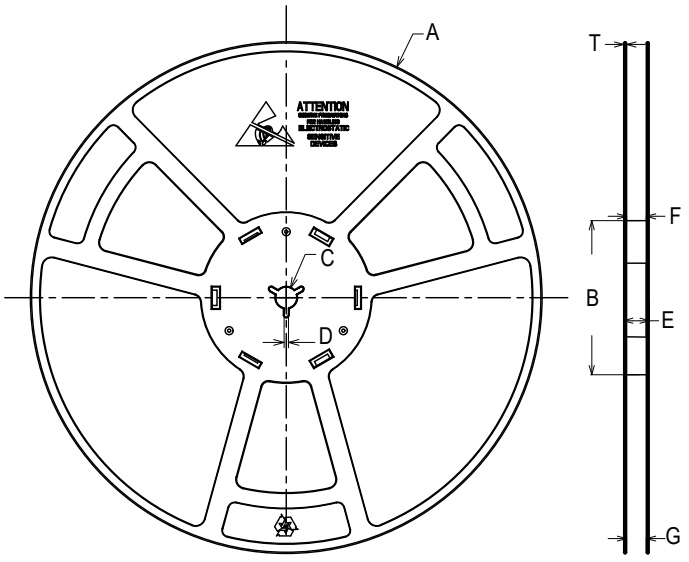
Five year after manufacturing(Depends on storage conditions)

Package Specifications

- The method of packaging



◆ **reel data**



Reel (13")

Symbol	Value(unit:mm)
A	Φ330±2
B	Φ99.5±0.5
C	13.6±0.3
D	2.8±0.2
E	16.2±0.5
F	$13^{+0.8}_{-0.3}$
G	13±3
T	1.6±0.2

◆ **Embossed tape data**