PJM20DN30DN

Dual N-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= 30V,I_D= 20A
- $R_{DS(on)}$< 13mΩ @V_{GS}= 10V
- $R_{DS(on)}$< 20mΩ @V_{GS}= 4.5V

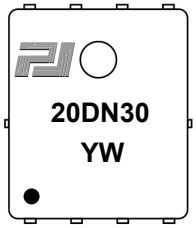
Features

- 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

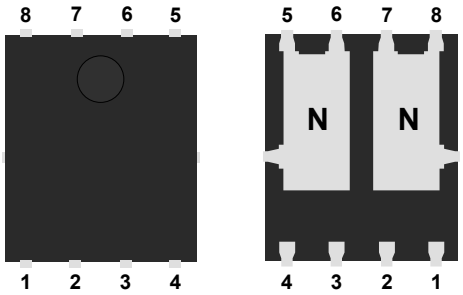
Application

- Load Switch
- PWM Application
- Power Management

Marking Code



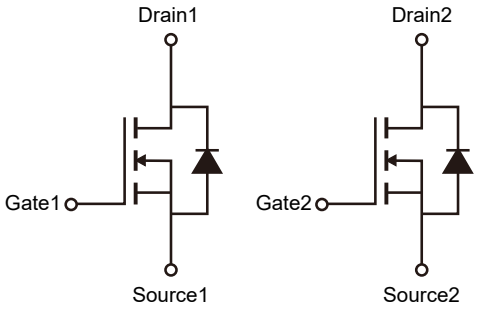
PDFN5x6A-8L



(Top View) (Bottom View)

Pin	Description	Pin	Description
1	Source1	4	Gate2
2	Gate1	5,6	Drain2
3	Source2	7,8	Drain1

Schematic Diagram



N-Channel N-Channel

Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	T_C=25℃	I_D	20	A
	T_C=100℃		12	
Drain Current-Pulsed Note1		I_{DM}	80	A
Single Pulse Avalanche Energy Note2		E_{AS}	25	mJ
Maximum Power Dissipation		P_D	20	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to +150	℃

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note3	$R_{\theta JA}$	62	°C/W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	6.3	°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	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note4	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.5	2.5	V
Drain-Source On-Resistance Note4	$R_{DS(on)}$	V_{GS}=10V,I_D=15A	--	9.4	13	mΩ
		V_{GS}=4.5V,I_D=10A	--	15	20	mΩ
Forward Transconductance Note4	g_{FS}	V_{DS}=5V,I_D=2A	--	5.5	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHz	--	798	--	pF
Output Capacitance	C_{oss}		--	87	--	pF
Reverse Transfer Capacitance	C_{rss}		--	73	--	pF
Gate resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	--	2.9	--	Ω
Total Gate Charge	Q_g	V_{DS}=15V,I_D=15A, V_{GS}=10V	--	16	--	nC
Gate-Source Charge	Q_{gs}		--	3.6	--	nC
Gate-Drain Charge	Q_{gd}		--	3.4	--	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, I_D=15A, V_{GS}=10V, R_{GEN}=3Ω	--	6	--	nS
Turn-on Rise Time	t_r		--	16	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	17	--	nS
Turn-off Fall Time	t_f		--	5	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage Note4	V_{SD}	V_{GS}=0V,I_S=5A	--	--	1.2	V
Diode Forward Current	I_S		--	--	20	A
Reverse Recovery Time	trr	I_F=13A,di/dt=100A/μS	--	9.4	--	nS
Reverse Recovery Charge	Qrr		--	3.3	--	nC

Note：

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. E_{AS} condition: T_J=25℃,V_{DD}=15V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=10A
3. Surface mounted on 1inch^2 FR-4 board with 2OZ copper
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Test Circuit

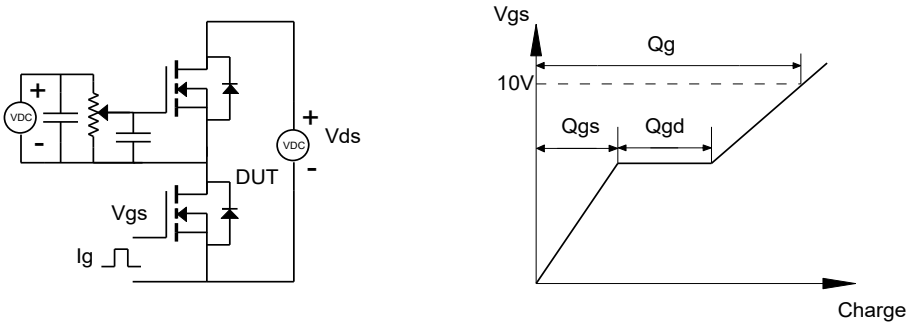


Figure 1: Gate Charge Test Circuit & Waveform

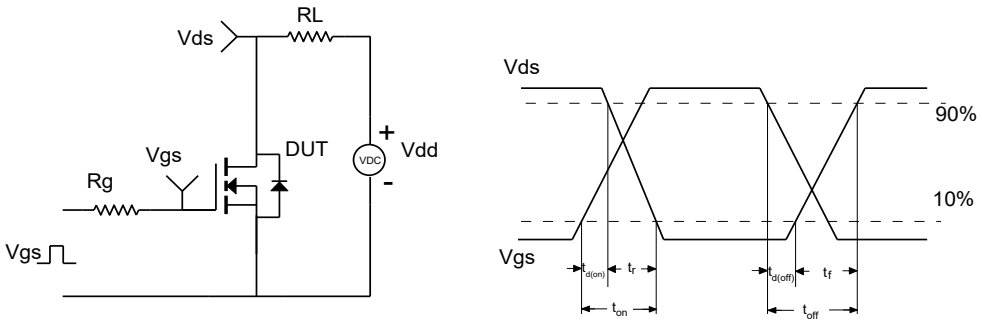


Figure 2: Resistive Switching Test Circuit & Waveform

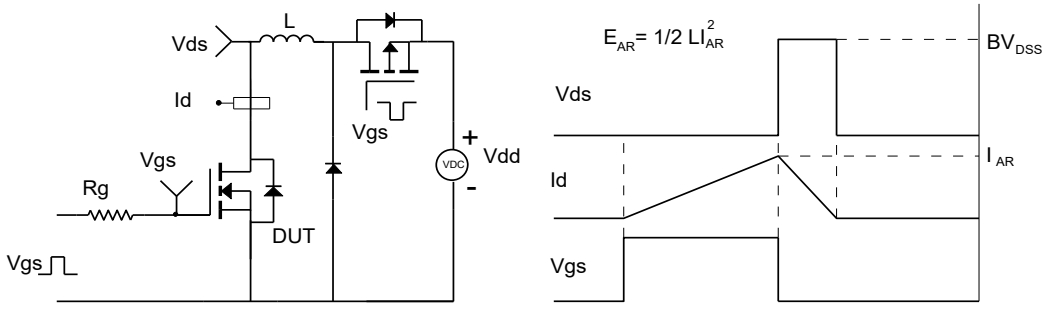


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

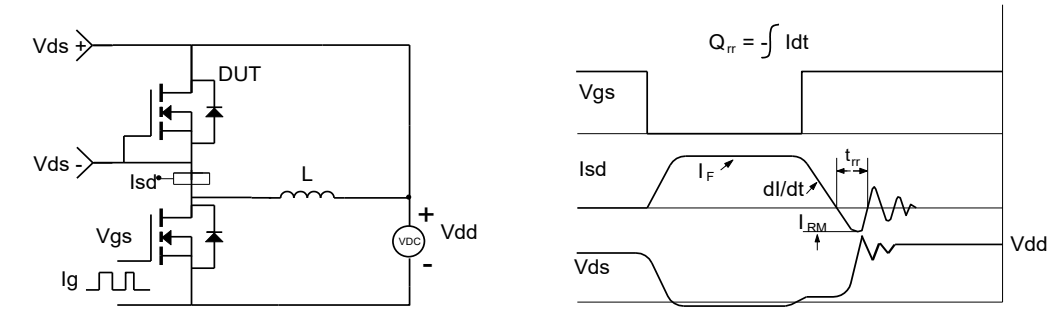
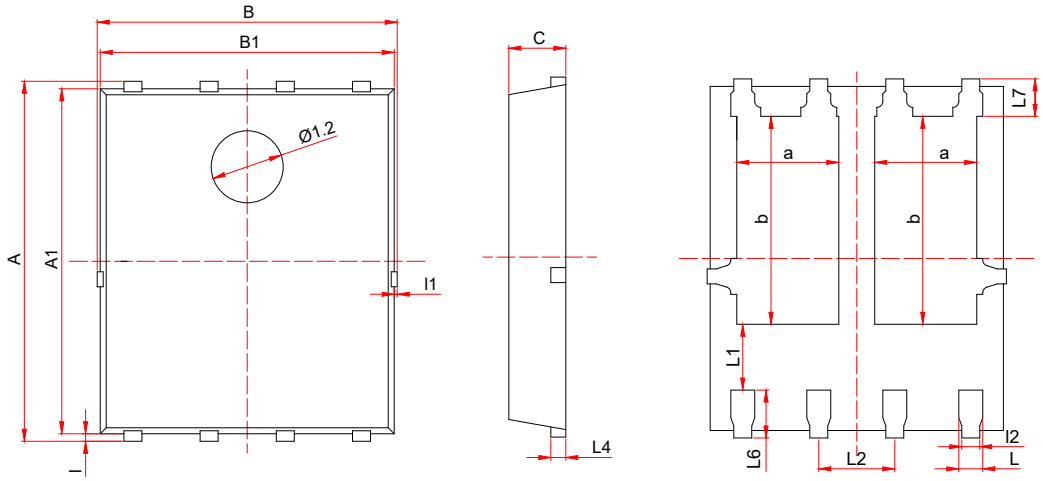


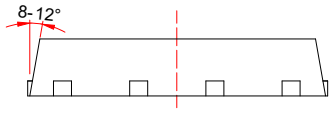
Figure 4: Diode Recovery Test Circuit & Waveform

Package Outline

PDFN5x6A-8L



TOP VIEW SIDE VIEW BOTTOM VIEW

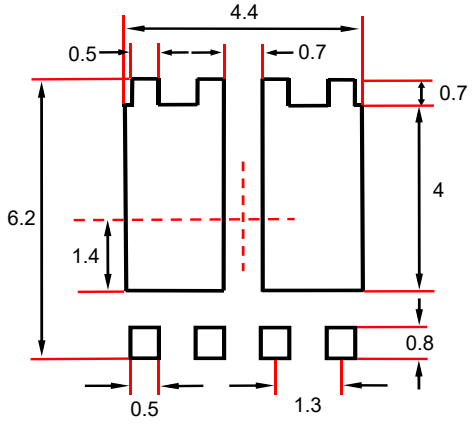


SIDE VIEW

Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	5.800	6.000	6.200	0.228	0.236	0.244
A1	5.750	5.850	5.950	0.226	0.230	0.234
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	0.080	0.130	0.180	0.003	0.005	0.007
I1	0.000	-	0.100	0.000	-	0.004
I2	0.290	0.310	0.330	0.011	0.012	0.013
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	1.650	1.750	1.850	0.065	0.069	0.073
b	3.450	3.550	3.650	0.136	0.140	0.144
L1	1.150	1.250	1.350	0.045	0.049	0.053
L6	0.600	0.700	0.800	0.024	0.028	0.032
L2	1.200	1.300	1.400	0.047	0.051	0.055
L	0.250	0.350	0.450	0.010	0.014	0.018

Suggested Pad Layout

PDFN5x6A-8L

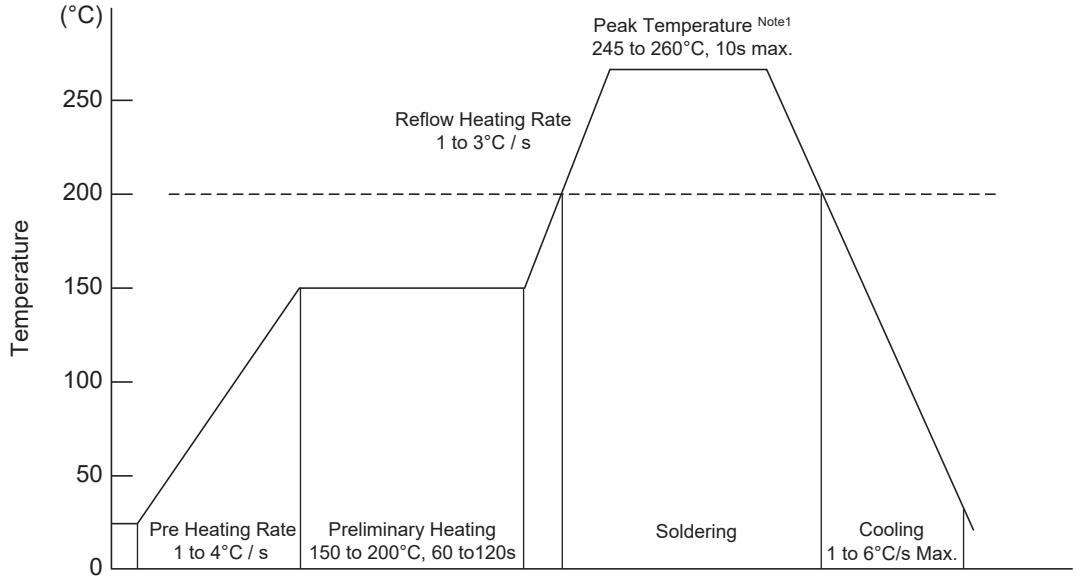


Note:

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**

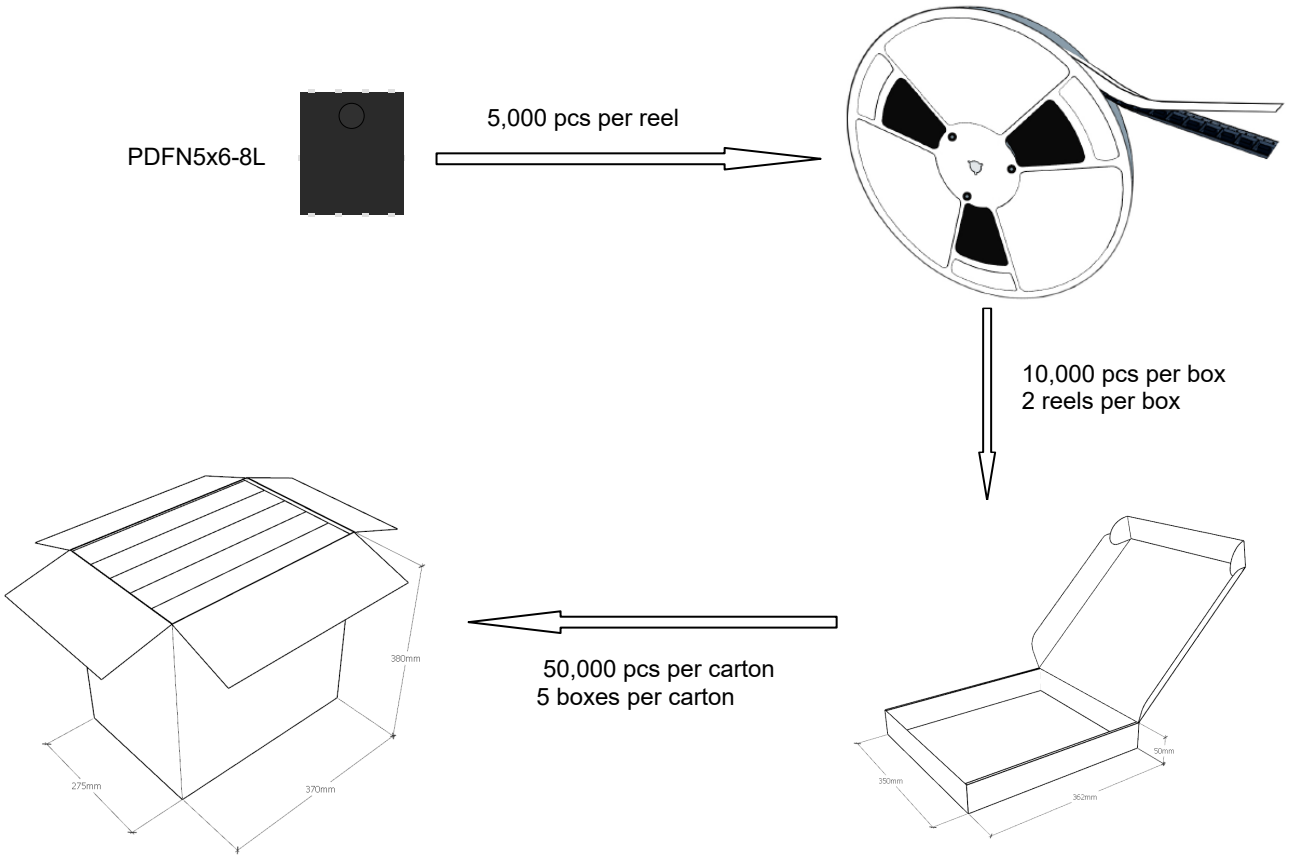
168 Hours

- **Recommended period**

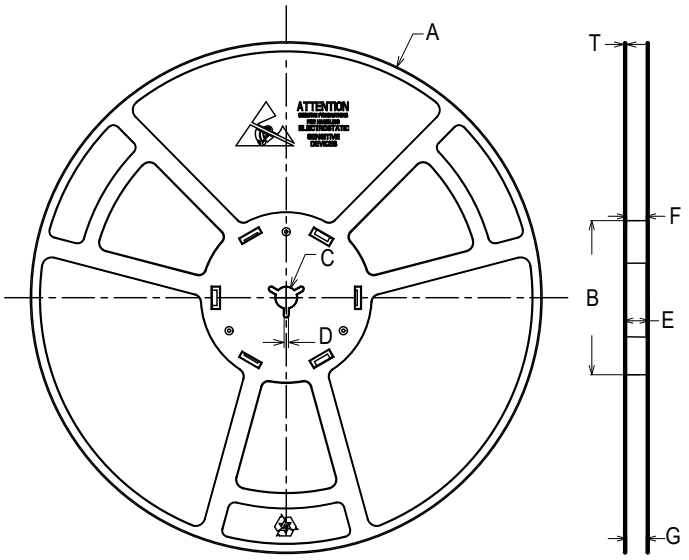
Five year after manufacturing(Depends on storage conditions)

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**

