

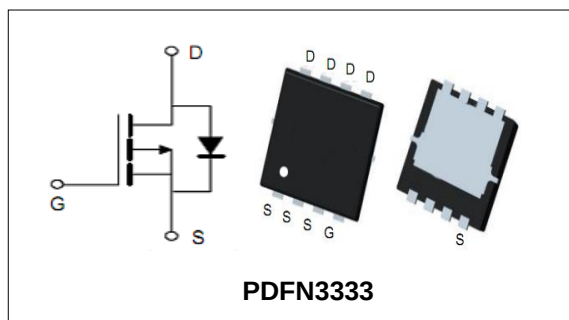
**-20V/-50A P-Channel Advanced Power MOSFET****Features**

- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements

Applications

- High Side Load Switch
- Battery Switch
- Optimized for Power Management Applications for Portable Products, such as Aeromodelling, Power bank, Brushless motor, Main board , and Others

BVDSS	-20	V
ID	-50	A
RDSON@VGS=-4.5V	5.6	mΩ
RDSON@VGS=-2.5V	7.3	mΩ
RDSON@VGS=-1.8V	10	mΩ



PDFN3333

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTQ45P02	PDFN3333	PTQ45P02	13inch	5000PCS	50000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{(BR)DSS}	Drain-Source Breakdown Voltage		-20	V
V _{GS}	Gate-Source Voltage		±12	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	TC =25°C	-50	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested (Note1)	TC =25°C	-200	A
I _D	Continuous Drain current	TC =25°C	-50	A
P _D	Maximum Power Dissipation	TC =25°C	42	W
R _{θJC}	Thermal Resistance Junction-to-Case (Note2)		3	°C/W

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=-20V,VGS=0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4	--	-1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=-4.5V, ID=-20A	--	5.6	9	mΩ
		VGS=-2.5V, ID=-15A	--	7.3	12	
		VGS=-1.8V, ID=-12A	--	10	25	
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS=-10V, VGS=0V, f=1MHz	--	4200	--	pF
C _{oss}	Output Capacitance		--	577	--	pF
C _{rss}	Reverse Transfer Capacitance		--	445	--	pF
Q _g	Total Gate Charge	VDS=-10V, ID=-20A, VGS=-4.5V	--	55	--	nC
Q _{gs}	Gate-Source Charge		--	10	--	nC
Q _{gd}	Gate-Drain Charge		--	15	--	nC
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDD=-10V, RL=0.5Ω, VGS=-4.5V RG=3Ω	--	18	--	nS
t _r	Turn-on Rise Time		--	42	--	nS
t _{d(off)}	Turn-off Delay Time		--	85	--	nS
t _f	Turn-off Fall Time		--	23	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	IS=-30A,VGS=0V	--	-0.8	-1.2	V
t _{rr}	Reverse Recovery Time	ISD=-10A dI/dt=100A/us	--	47	--	nS
Q _{rr}	Reverse Recovery Charge		--	53	--	nC

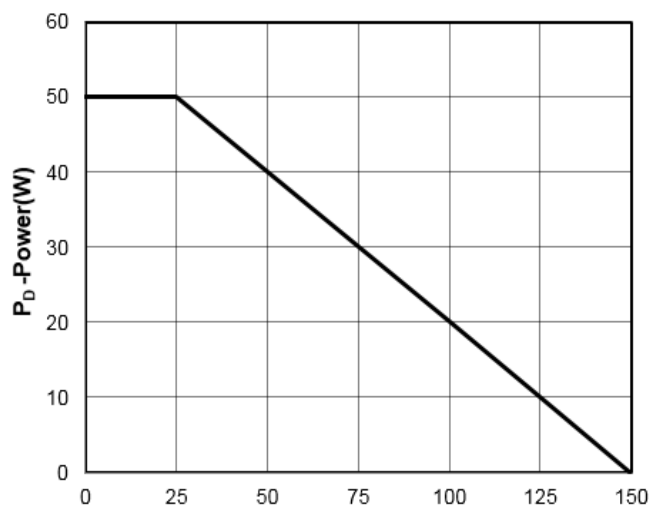
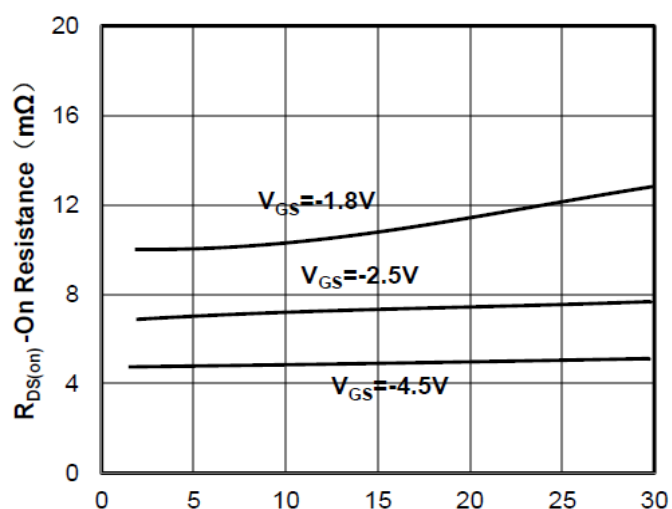
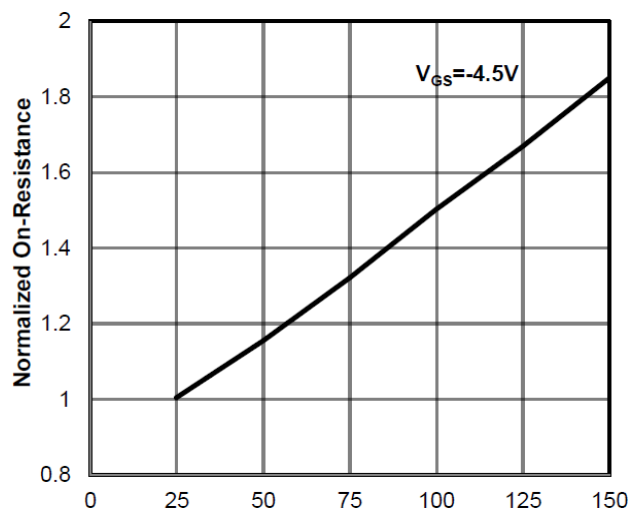
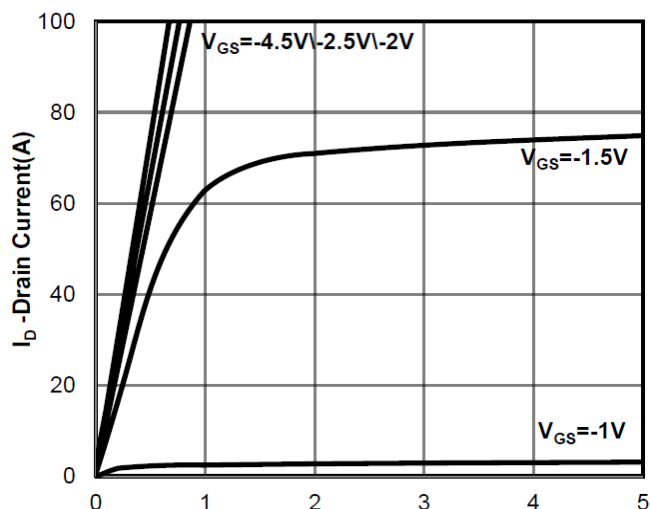
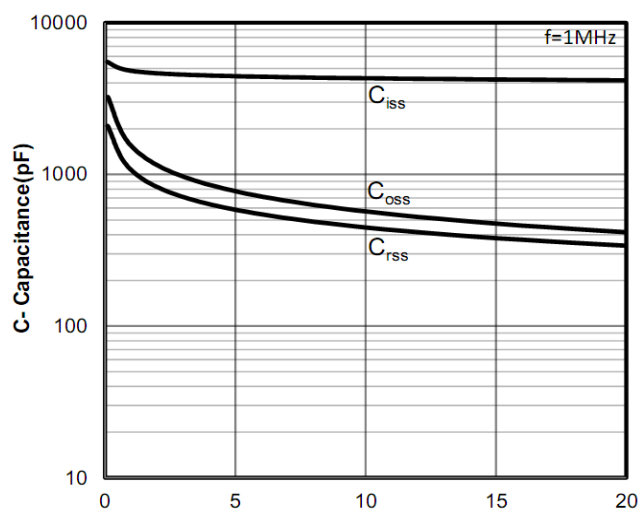
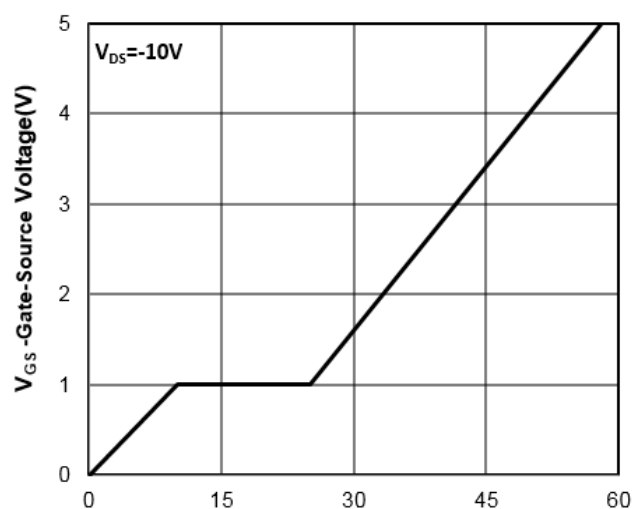
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.
4. Guranteed by design, not subject to production testing.



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Typical Characteristics

Figure1: T_J Junction Temperature (°C)Figure2: -I_D Drain Current (A)Figure3: T_J Junction Temperature (°C)Figure4: -V_{DS} Drain-Source Voltage (V)Figure5: -V_{DS} Drain-Source Voltage (V)Figure6: Q_g Gate Charge (nC)



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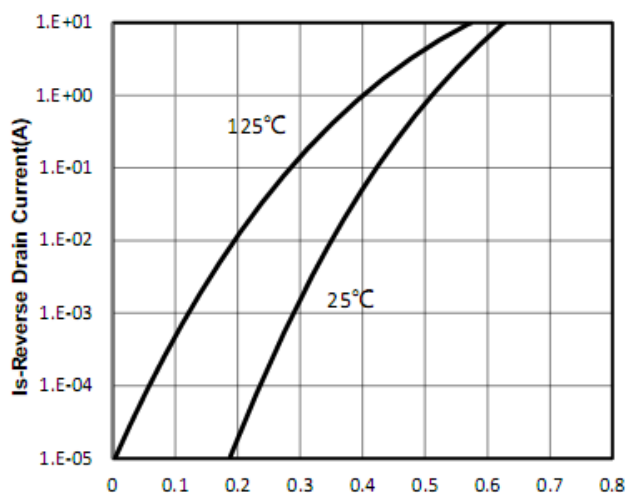


Figure7: -Vsd Source-Drain Voltage (V)

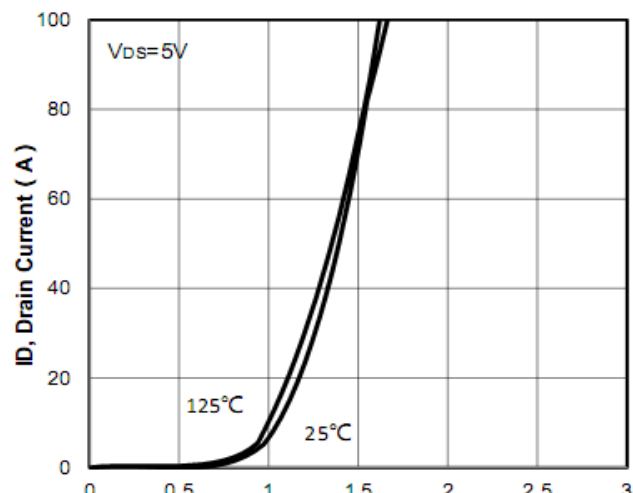


Figure8: -Vgs Gate-Source Voltage (V)

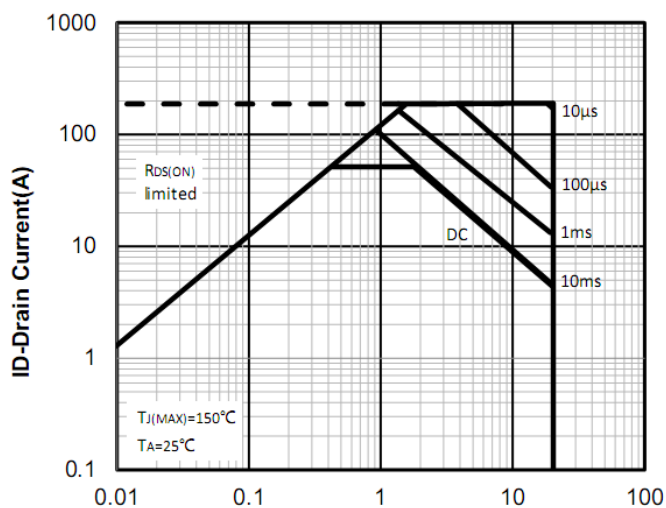


Figure9: -VDS Drain Source Voltage (V)

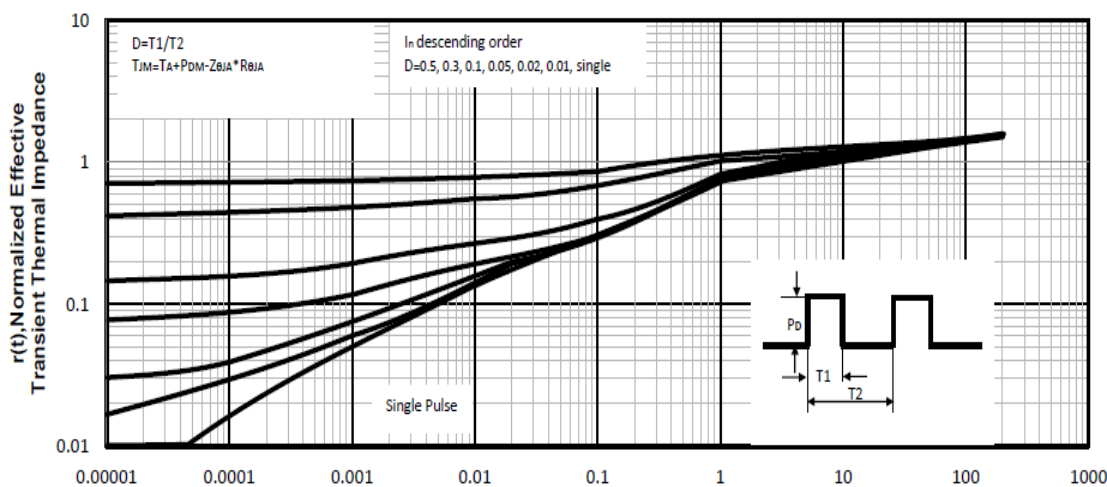


Figure10: Square Wave Pulse Duration (sec)



Test Circuit and Waveform:

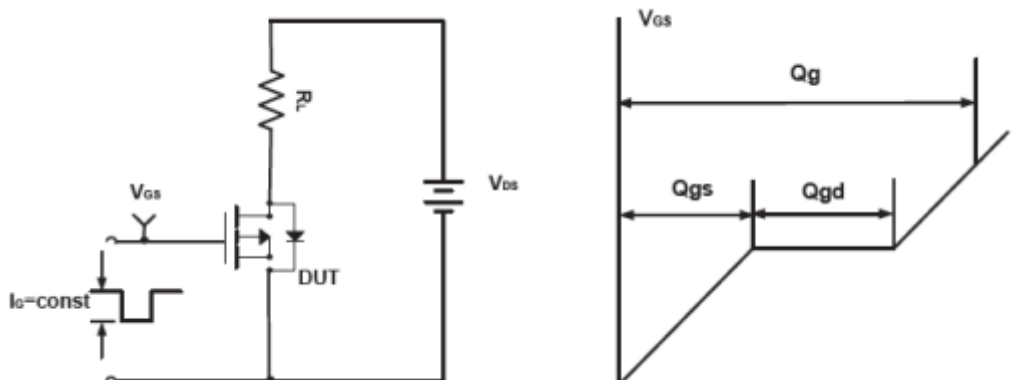


Figure A Gate Charge Test Circuit & Waveforms

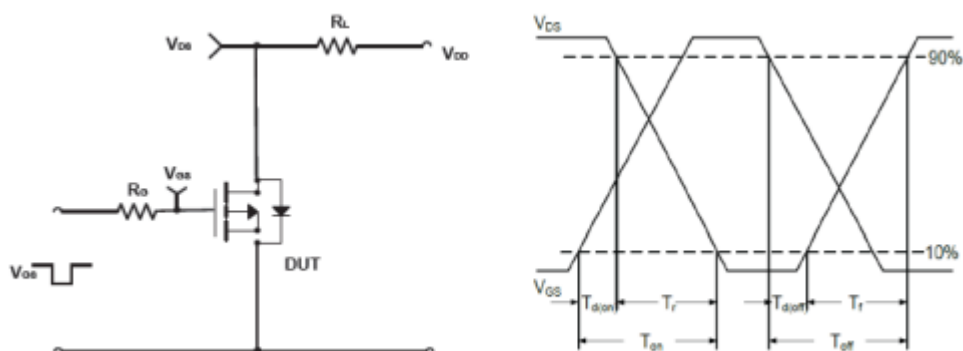
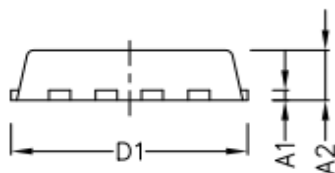
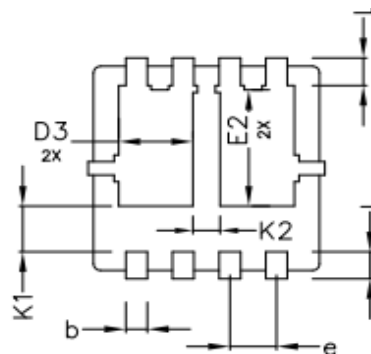
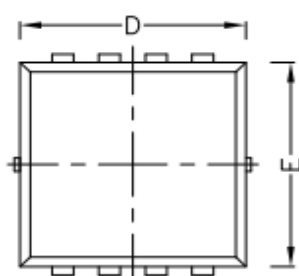
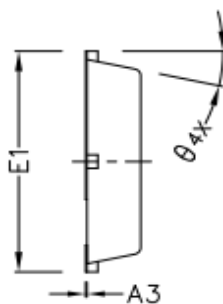
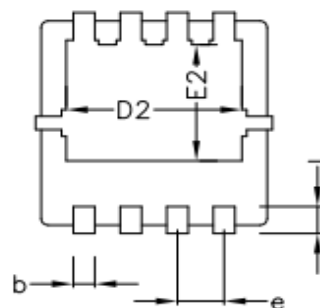


Figure B Switching Test Circuit & Waveforms

**PDFN3333 Package Outline Dimensions (Units: mm)****SIDE VIEW****BOTTOM VIEW
OPTION 2****TOP VIEW****SIDE VIEW****BOTTOM VIEW
OPTION 1**

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.152 BSC		
A2	0.650	0.750	0.850
A3	0.005	—	0.020
b	0.250	0.300	0.350
D	3.050	3.150	3.250
D1	3.200	3.300	3.400
D2	2.350	2.450	2.550
D3	0.935	1.035	1.135
E1	3.150	3.300	3.450
E	2.950	3.050	3.150
E2	1.635	1.735	1.835
e	0.650 TYPE		
L	0.300	0.400	0.500
θ	12° TYPE		
K1	0.680 REF		
K2	0.380 REF		
L1	0.410 REF		