

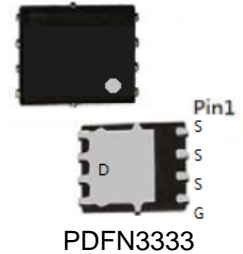
**Features**

- - 1.8V Logic Level Control
- PDFN3333 SMD Package

**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	-45	A
R <sub>DS(on)</sub> @V <sub>GS</sub> =-4.5V	9	mΩ
R <sub>DS(on)</sub> @V <sub>GS</sub> =-2.5V	12	mΩ
R <sub>DS(on)</sub> @V <sub>GS</sub> =-1.8V	16	mΩ



**Absolute Maximum Ratings**

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter	Rating	Unit
<b>Common Ratings (T<sub>c</sub>=25°C Unless Otherwise Noted)</b>			
V <sub>GS</sub>	Gate-Source Voltage	±12	V
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	-20	V
T <sub>J</sub>	Maximum Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 175	°C
<b>Mounted on Large Heat Sink <small>note B</small></b>			
I <sub>DM</sub>	Pulse Drain Current Tested (Silicon Limit)	T <sub>c</sub> =25°C -180	A
I <sub>D</sub>	Continuous Drain current @V <sub>GS</sub> =10V	T <sub>c</sub> =25°C -45	A
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> =25°C 3.5	W
		T <sub>c</sub> =25°C 35	W
R <sub>θJA</sub>	Thermal Resistance <i>Junction-to-Ambient</i> – Steady State (Note 1)	36	°C/W

Note :

1. Surface-mounted on FR4 board using 1 in sq. pad size (Cu area = 1.127 in sq. [2 oz] including traces).

**PTQ45P02**
**-20V/-45A P-Channel Advanced Power MOSFET**

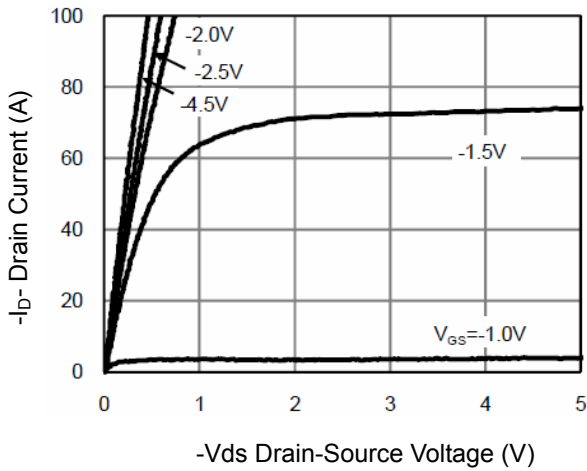
Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain current(Tc=25°C)	VDS=-20V,VGS=0V	--	--	-1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4		-1.0	V
R <sub>DS(ON)</sub> <sup>A</sup>	Drain-Source On-State Resistance note A	VGS=-4.5V, ID=-20A		7.5	9	mΩ
R <sub>DS(ON)</sub> <sup>B</sup>	Drain-Source On-State Resistance note A	VGS=-2.5V, ID=-15A		9.2	12	mΩ
R <sub>DS(ON)</sub> <sup>C</sup>	Drain-Source On-State Resistance note A	VGS=-1.8V, ID=-12A		12.3	16	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) note B</b>						
C <sub>iss</sub>	Input Capacitance	VDS=-10V,VGS=0V, f=1MHz	--	3500	--	pF
C <sub>oss</sub>	Output Capacitance		--	577	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	445	--	pF
Q <sub>g</sub>	Total Gate Charge	VDS=-10V,ID=-20A, VGS=-4.5V	--	55	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	10	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	15	--	nC
<b>Switching Characteristics note B</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	VDD=-10V, R <sub>L</sub> =0.5 Ω RG=3Ω, VGS=-4.5V	--	18	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	42	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	85	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	23	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
I <sub>SD</sub>	Source-drain current(Body Diode)	Tc=25°C	--	--	-30	A
V <sub>SD</sub>	Forward on voltage	IS=-30A,VGS=0V	--	-0.80	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	Tj=25°C,ISD=-10A, VGS=0V	--	47	--	nS
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=-100A/μs	--	53	--	nC

Note:

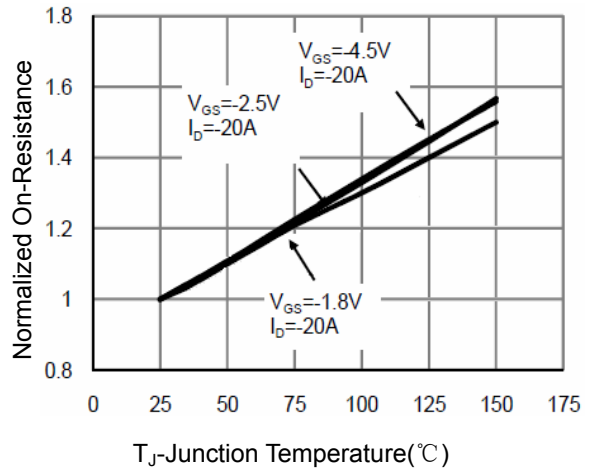
A: Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%

B: Guaranteed by design, not subject to production testing.

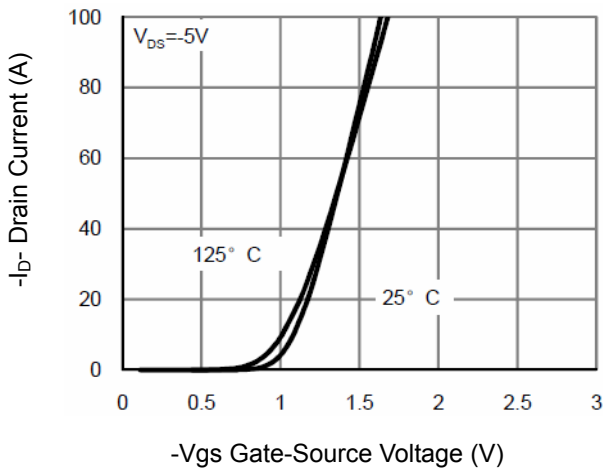
**Typical Electrical and Thermal Characteristics (Curves)**



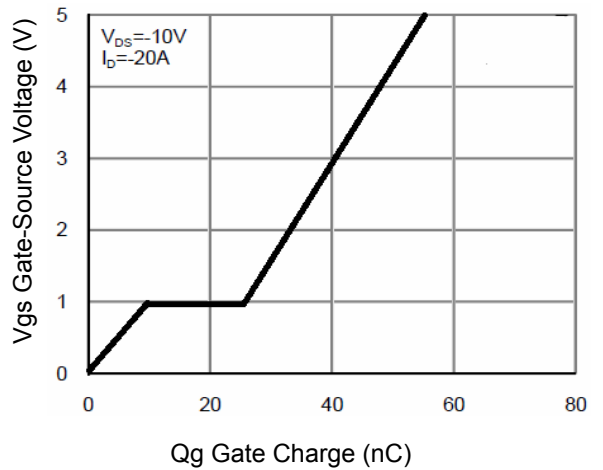
**Figure 1 Output Characteristics**



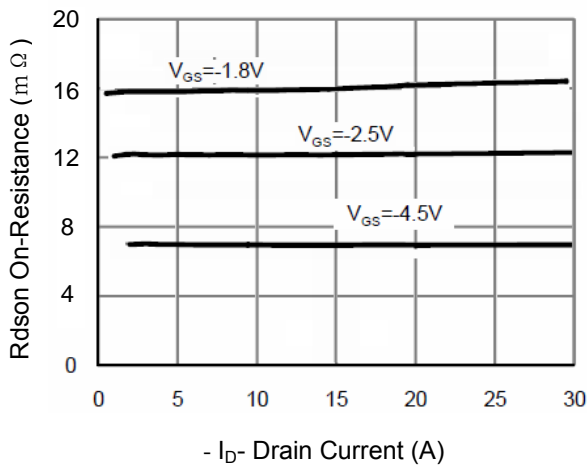
**Figure 4 Rdson-Junction Temperature**



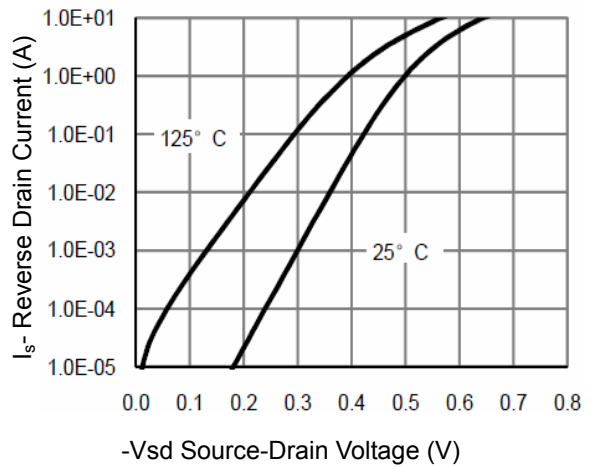
**Figure 2 Transfer Characteristics**



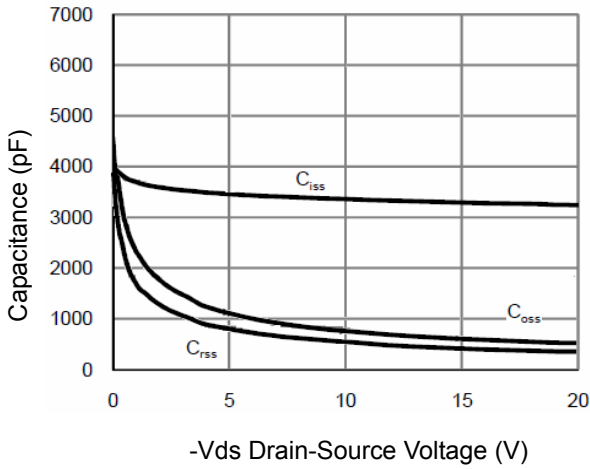
**Figure 5 Gate Charge**



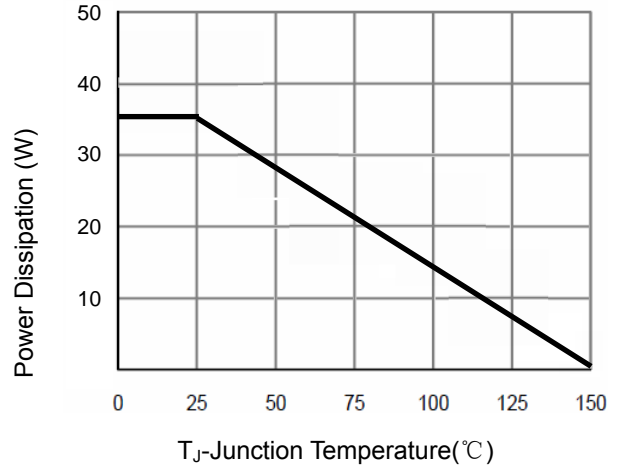
**Figure 3 Rdson- Drain Current**



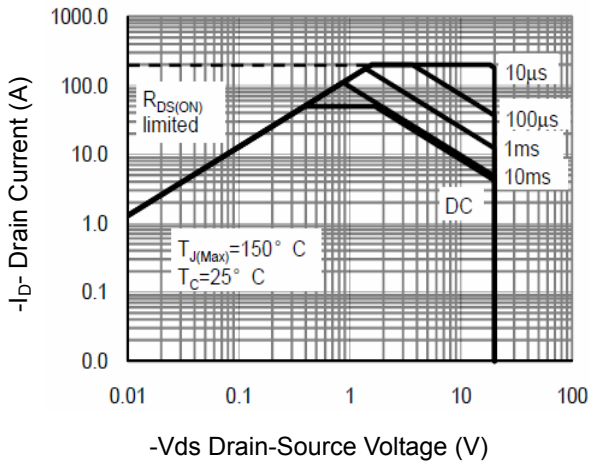
**Figure 6 Source- Drain Diode Forward**



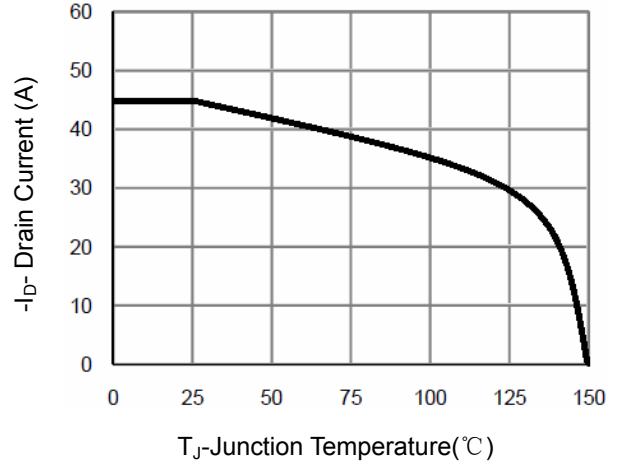
**Figure 7 Capacitance vs Vds**



**Figure 9 Power De-rating**



**Figure 8 Safe Operation Area**



**Figure 10 -Current De-rating**

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