

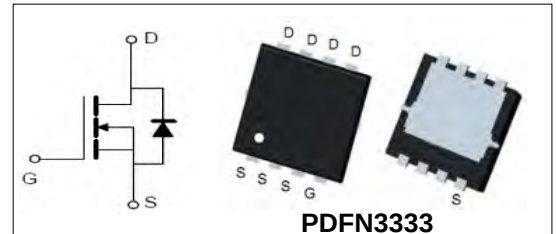
**30V/25A N-Channel Advanced Power MOSFET****Features**

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

- Load Switch
- PWM Application
- Power management

BVDSS	30	V
ID	25	A
$R_{DS(ON)}@V_{GS}=10V$	9	mΩ
$R_{DS(ON)}@V_{GS}=4.5V$	15	mΩ

**Order Information**

Product	Package	Marking	Reel Size	Reel	Carton
PTQ3020	PDFN3333	PTQ3020	13inch	5000PCS	50000PCS

Symbol	Parameter		Rating	Unit
Common Ratings (T _c =25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage		±20	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		30	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	20	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested (Silicon Limit)	T _C =25°C	100	A
I _D	Continuous Drain current @V _{GS} =10V (Note 2)	T _C =25°C	25	A
P _D	Maximum Power Dissipation	T _C =25°C	11	W
EAS	Avalanche Energy, Single Pulsed (Note 3)		40	mJ
R _{θJC}	Thermal Resistance <i>Junction-to-Case</i> ≤ 5 s (Note 1)		11.4	°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).
2. Pulse Test: pulse width ≤ 300 us, duty cycle $\leq 2\%$
3. Limited by T_{jmax} , starting $T_J = 25^\circ\text{C}$, $L = 1\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 5.5\text{A}$, $V_{GS} = 10\text{V}$. Part not recommended for use above this value



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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=30V,VGS=0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	1.0	1.5	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance note A	VGS=10V, ID=10A	--	9	12	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance note A	VGS=4.5V, ID=5A	--	15	21	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated) note B						
C _{iss}	Input Capacitance	VDS=15V,VGS=0V, f=1MHz	--	551	--	pF
C _{oss}	Output Capacitance		--	108	--	pF
C _{rss}	Reverse Transfer Capacitance		--	93	--	pF
Q _g	Total Gate Charge	VDS=15V,ID=10A, VGS=10V	--	15	--	nC
Q _{gs}	Gate-Source Charge		--	4.7	--	nC
Q _{gd}	Gate-Drain Charge		--	3.6	--	nC
Switching Characteristics note B						
t _{d(on)}	Turn-on Delay Time	VDD=30V, ID=20A, RG=3Ω, VGS=10V	--	5	--	nS
t _r	Turn-on Rise Time		--	8	--	nS
t _{d(off)}	Turn-Off Delay Time		--	21	--	nS
t _f	Turn-Off Fall Time		--	7	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
I _{SD}	Source-drain current(Body Diode)	Tc=25°C	--	--	20	A
V _{SD}	Forward on voltage	IS=10A,VGS=0V	--	--	1.0	V
t _{rr}	Reverse Recovery Time	Tj=25°C,ISD=20A, VGS=0V	--	7	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	5.9	--	nC

Note:

A: Pulse Test: pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$

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



Typical Performance Characteristics

Figure1: Output Characteristics

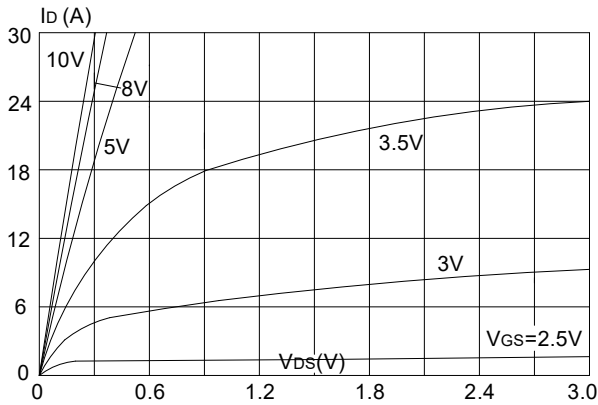


Figure 2: Typical Transfer Characteristics

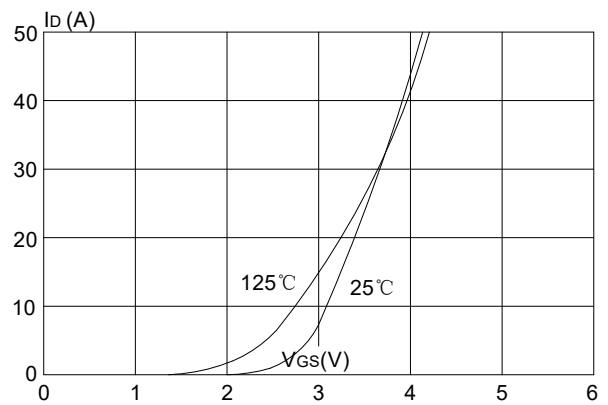


Figure 3: On-resistance vs. Drain Current

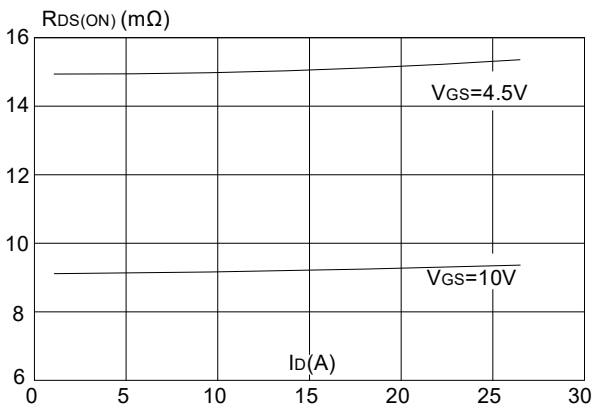


Figure 4: Body Diode Characteristics

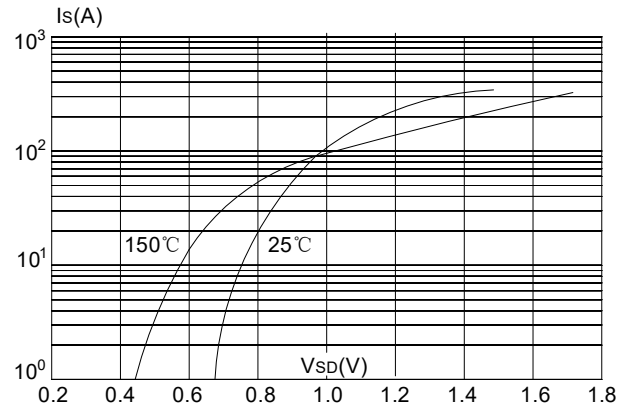


Figure 5: Gate Charge Characteristics

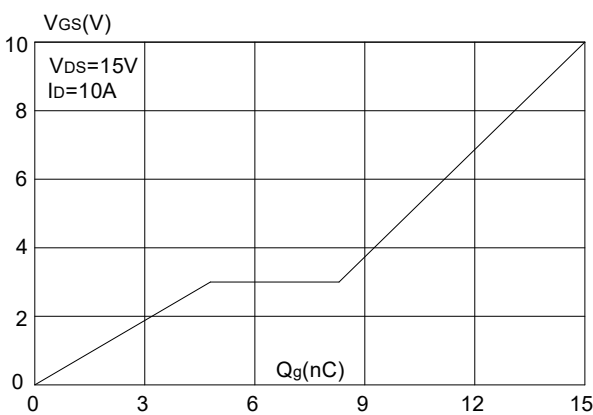
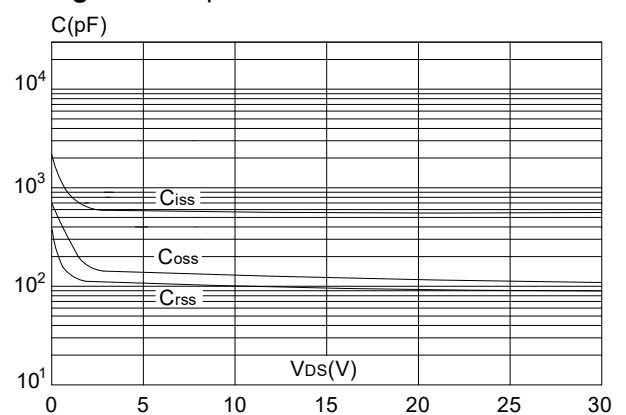


Figure 6: Capacitance Characteristics





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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

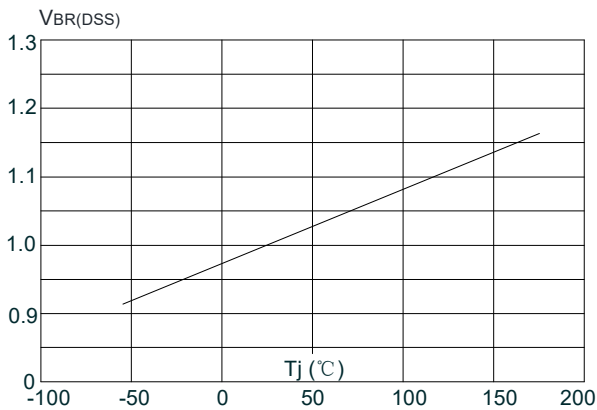


Figure 8: Normalized on Resistance vs. Junction Temperature

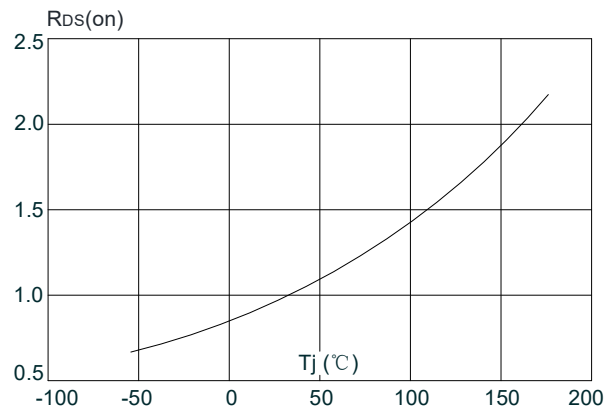


Figure 9: Maximum Safe Operating Area

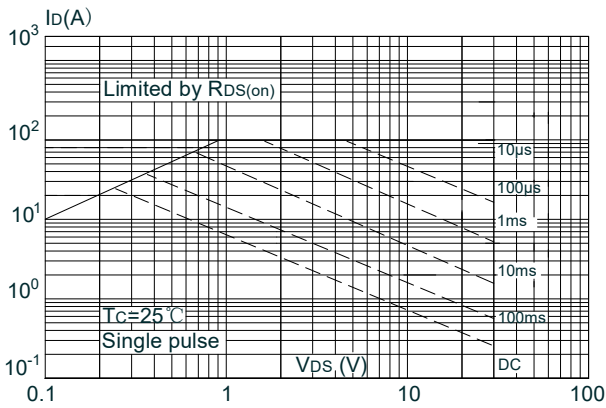


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

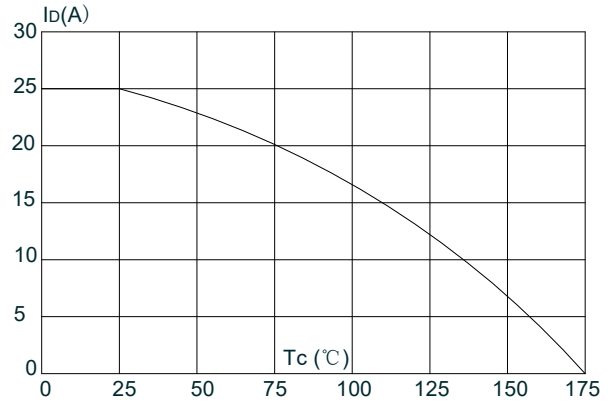
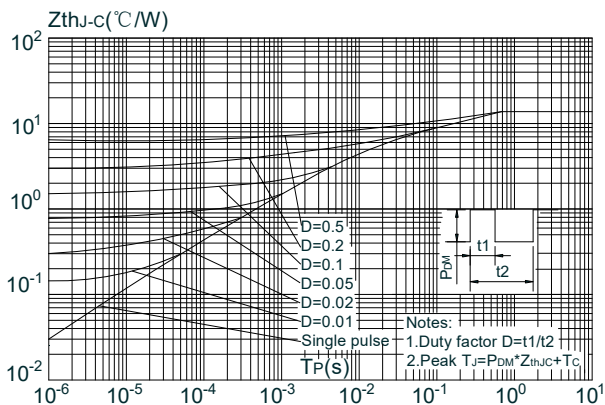
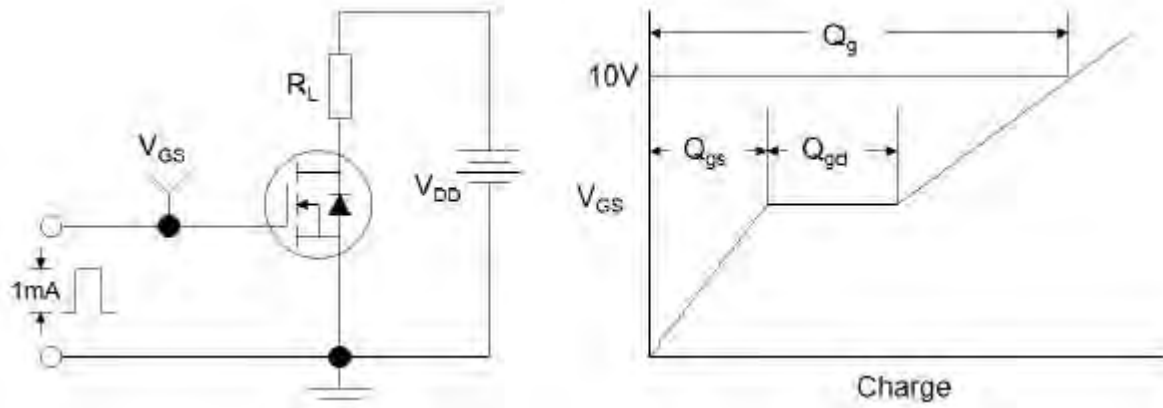
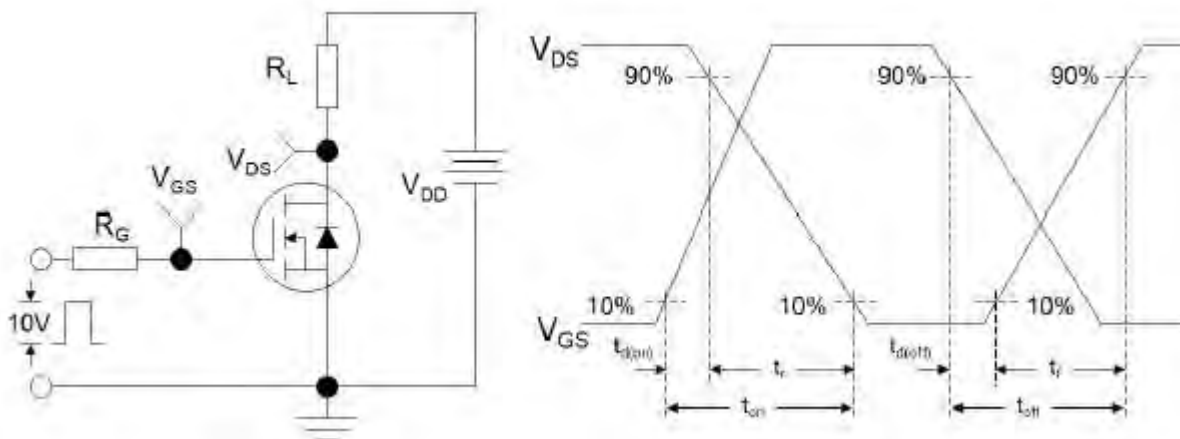
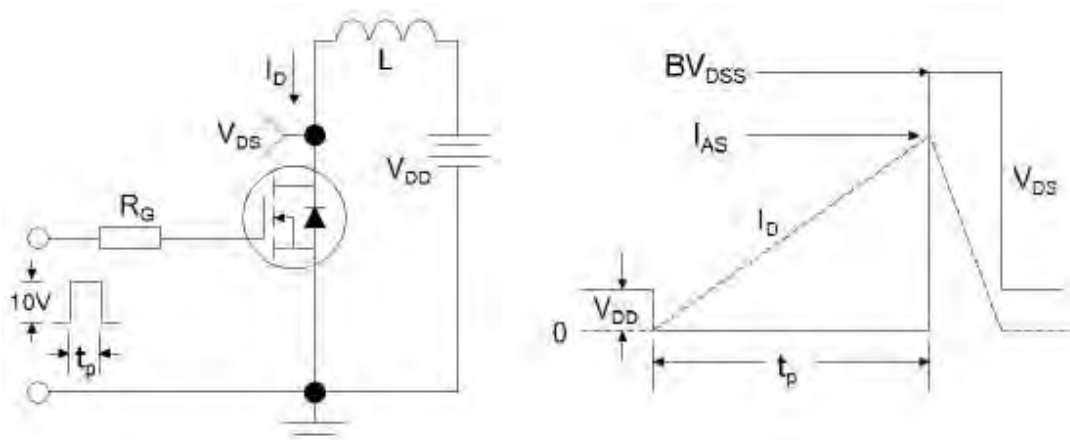
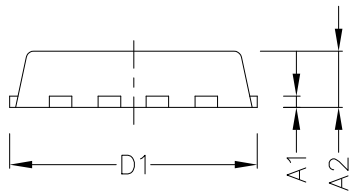


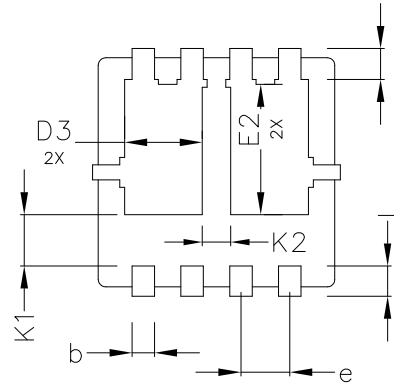
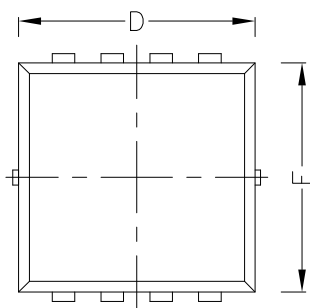
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



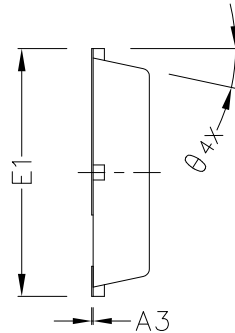
Test Circuit

Figure1:Gate Charge Test Circuit & Waveform

Figure 2: Resistive Switching Test Circuit & Waveforms

Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

**30V/25A N-Channel Advanced Power MOSFET****PDFN3333 Package Outline Dimensions (Units: mm)**

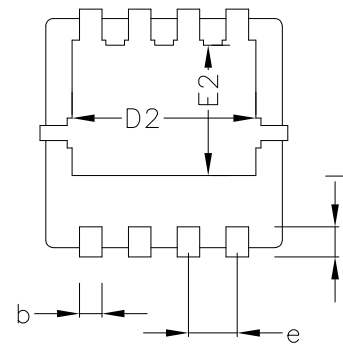
SIDE VIEW

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		