PTD45P02A

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

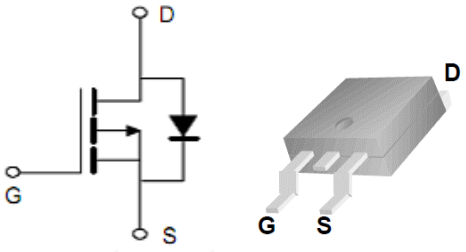
Features

- Improved dv/dt Capability, High Ruggedness·
- Maximum Junction Temperature Range (150°C)

BVDSS	-20	V
ID	-45	A
RDSON@VGS=-4.5V	6.6	mΩ
RDSON@VGS=-2.5V	8.1	mΩ
RDSON@VGS=-1.8V	11	mΩ

Applications

- PWM applications
- Load switch
- Power management



TO-252

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTD45P02A	TO-252	PTD45P02	13inch	2500PCS	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	-45	A
Mounted on Large Heat Sink				
E_{AS}	Single Pulse Avalanche Energy (Note1)		77	mJ
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note2)	TC =25°C	-180	A
I_D	Continuous Drain current	TC =25°C	-45	A
P_D	Maximum Power Dissipation	TC =25°C	35	W
$R_{\theta JC}$	Thermal Resistance Junction−to−Case (Note3)		3.6	°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	-0.5	-0.65	-0.9	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note4)	VGS=-4.5V, ID=-20A	--	6.6	9	mΩ
		VGS=-2.5V, ID=-10A	--	8.1	14	mΩ
		VGS=-1.8V, ID=-10A	--	11	20	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note5)						
C_{iss}	Input Capacitance	VDS= -10V, VGS=0V, F=1MHz	--	4800	--	pF
C_{oss}	Output Capacitance		--	483	--	pF
C_{rss}	Reverse Transfer Capacitance		--	458	--	pF
Q_g	Total Gate Charge	VDS= -10V, ID= -20A, VGS= -4.5V	--	58	--	nC
Q_{gs}	Gate-Source Charge		--	11	--	nC
Q_{gd}	Gate-Drain Charge		--	16	--	nC
Switching Characteristics (Note5)						
$t_{d(on)}$	Turn-on Delay Time	VDD=-10V, RL=0.5Ω, RG=3Ω, VGS=-4.5V	--	20	--	nS
t_r	Turn-on Rise Time		--	45	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	83	--	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=-20A,VGS=0V	--	--	-1.2	V

Note:

1. Limited by TJmax, starting TJ = 25° C, RG = 25Ω, VD =-10V, VGS =-10V. Part not recommended for use above this value.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Surface Mounted on FR4 Board, t ≤ 10 sec.
4. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
5. Guranteed by design, not subject to production testing.

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

Typical Characteristics

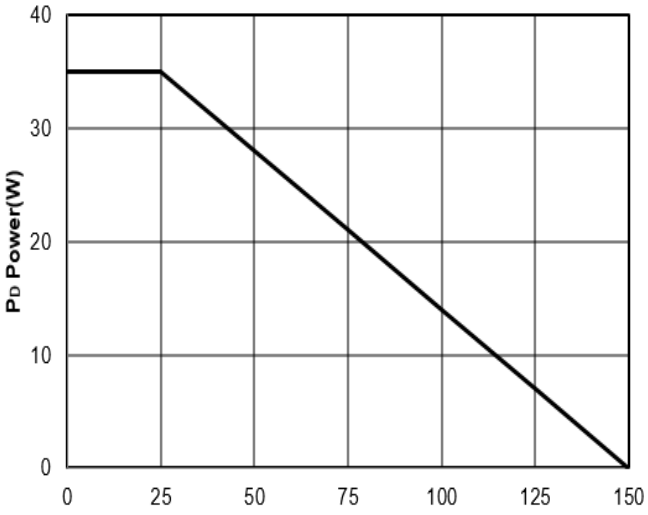


Figure1：TJ -Junction Temperature（°C）

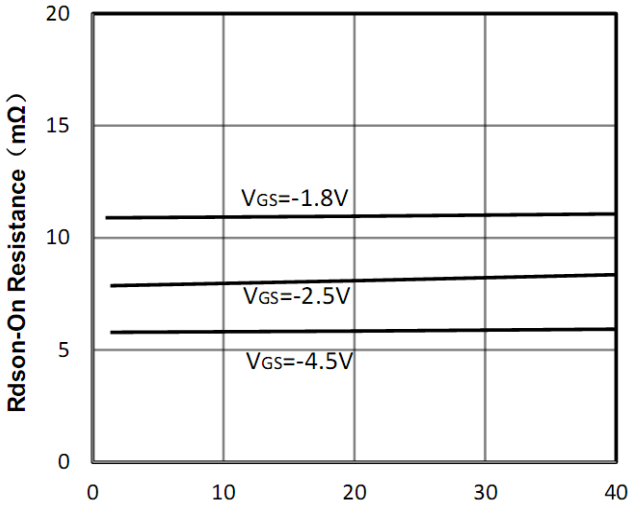


Figure2：-ID -Drain Current（A）

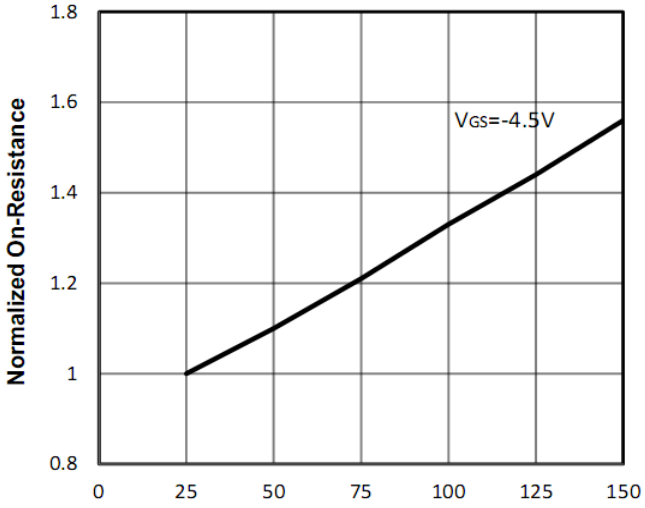


Figure3：TJ -Junction Temperature（°C）

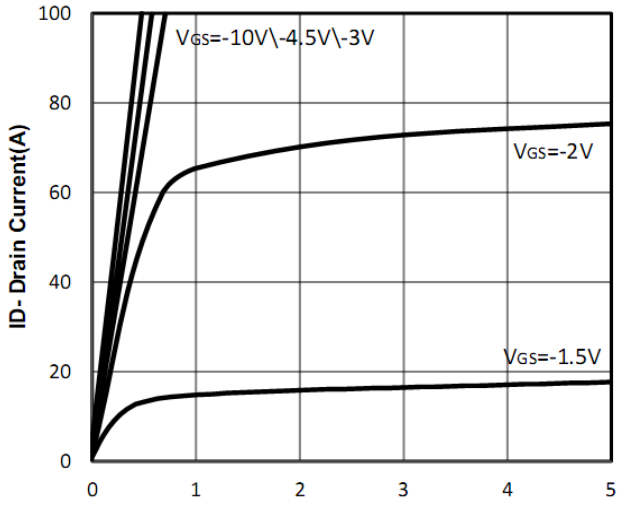


Figure4：-VDS Drain Source Voltage（V）

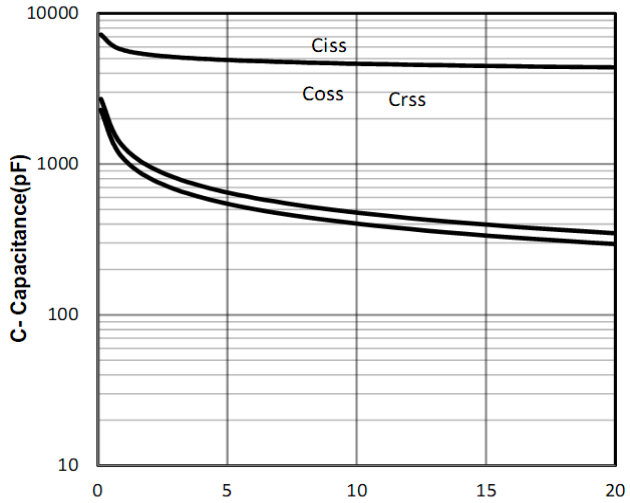


Figure5：-VDS –Drain Source Voltage（V）

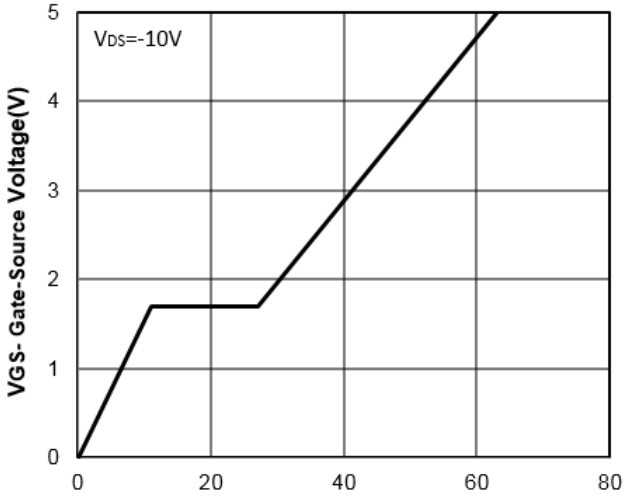


Figure6：Qg -Gate Charge（nC）

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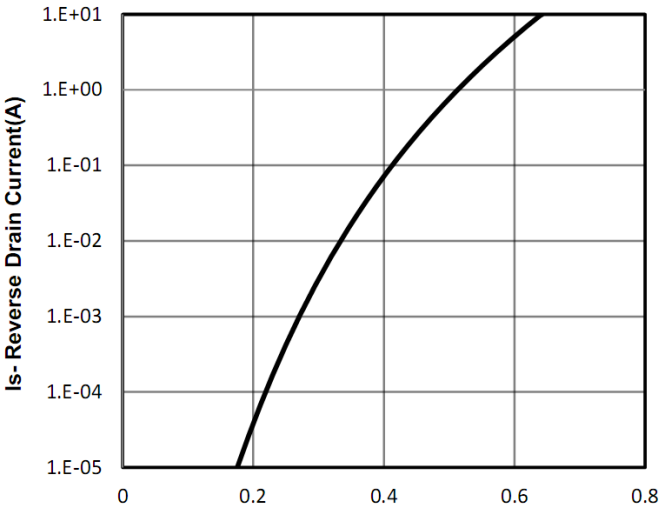


Figure7：-Vsd -Source Drain Voltage（V）

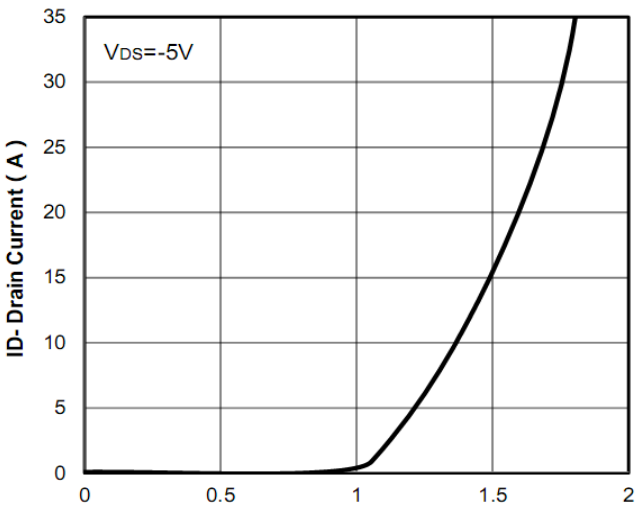


Figure8：-Vgs -Gate Source Voltage（V）

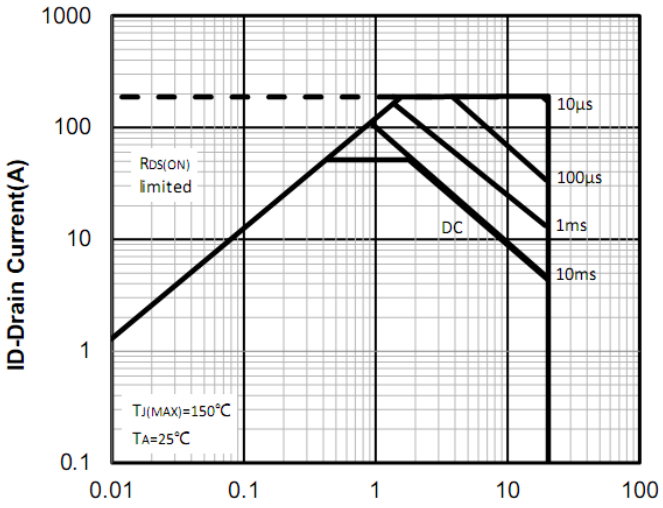


Figure9：-Vds -Drain Source Voltage（V）

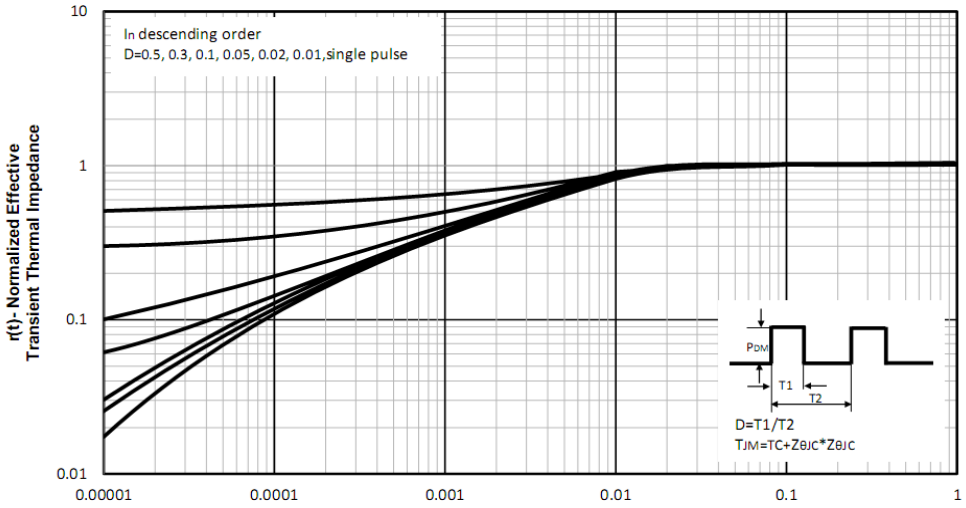


Figure10：Square Wave Pulse Duration（sec）

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

Test Circuit and Waveform:

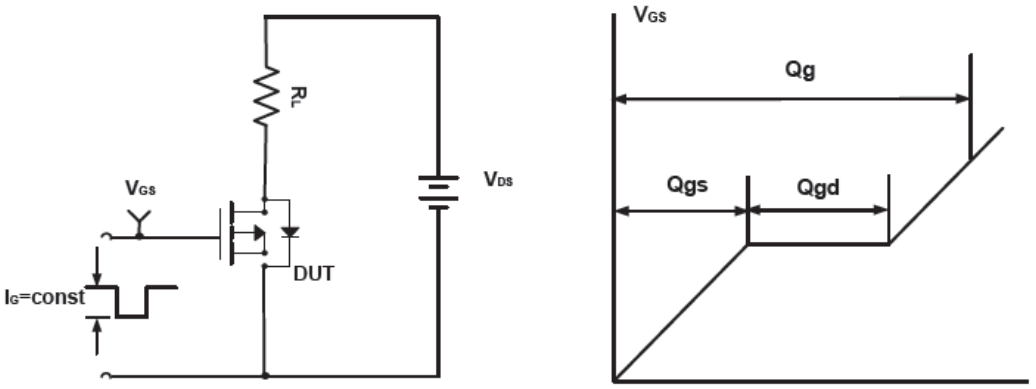


Figure A Gate Charge Test Circuit &Waveforms

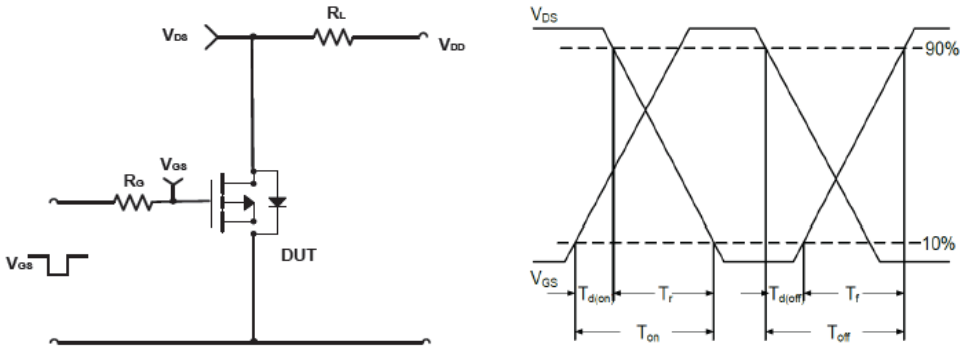


Figure B Switching Test Circuit & Waveforms

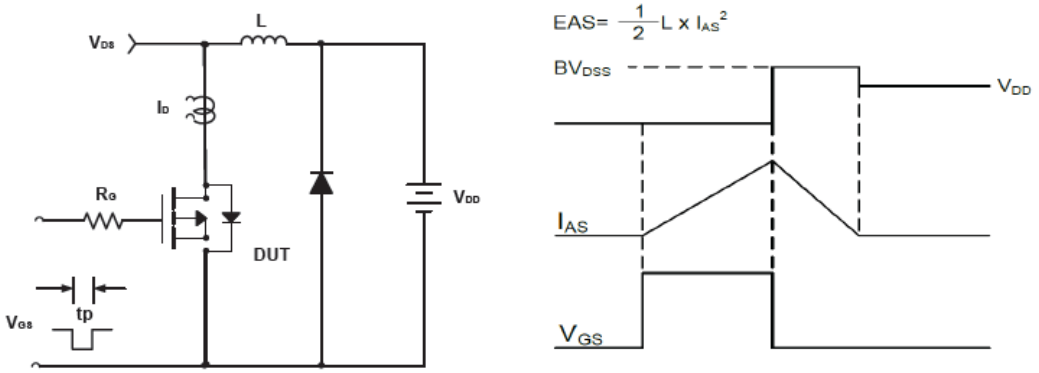
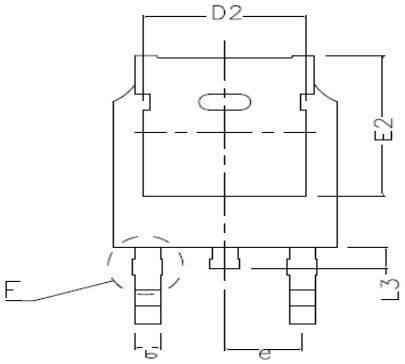


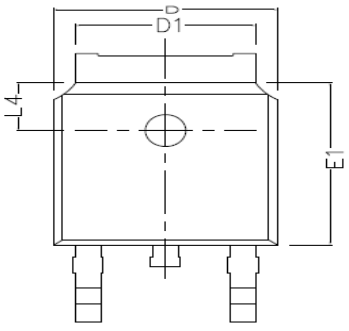
Figure C Unclamped Inductive Switching Circuit & Waveforms

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

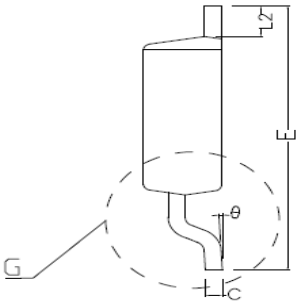
TO-252 Package Outline Dimensions (Units: mm)



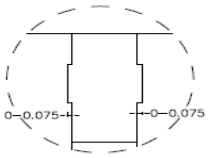
BOTTOM VIEW



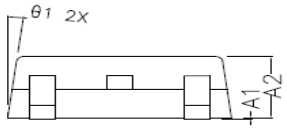
TOP VIEW



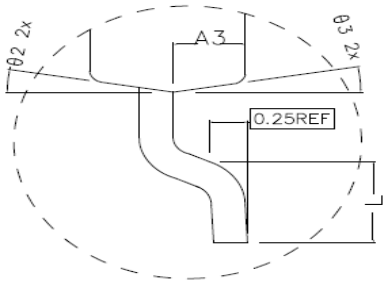
SIDE VIEW



DETAIL F



SIDE VIEW



DETAIL G

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.000	0.100	0.150
A2	2.200	2.300	2.400
A3	1.020	1.070	1.120
b	0.710	0.760	0.810
c	0.460	0.508	0.550
D	6.500	6.600	6.700
D1	5.330REF		
D2	4.830REF		
E	9.900	10.100	10.300
E1	6.000	6.100	6.200
E2	5.600REF		
e	2.286TYPE		
L	1.400	1.550	1.700
L2	1.10REF		
L3	0.80REF		
L4	1.80REF		
θ	0~8°		
θ1	7° TYPE		
θ2	10° TYPE		
θ3	10° TYPE		