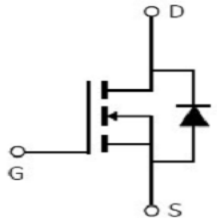
650V/4A N-Channel Advanced Power MOSFET

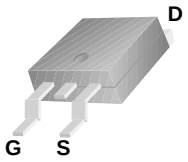
Features

- $R_{DS(on)}$ (Typical 2.6Ω)@V_{GS}=10V
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)



Order Information

Product	Package	Marking	Packing
PTD4N65	TO-252	PTD4N65	2500PCS/REF



TO-252

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
Common Ratings (T_J=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±30	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		650	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		50 to + 150	°C
I_S	Diode Continuous Forward Current		4	A
Mounted on Large Heat Sink (T_J=25°C Unless Otherwise Noted)				
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note1)		16	A
I_D	Continuous Drain current@V_{GS}=10V	T_C=25°C	4	A
P_D	Maximum Power Dissipation		39	W
E_{AS}	Sing Pulsed Avalanche Energy (Note2)		200	mJ
$R_{\theta JC}$	Thermal Resistance Junction−to−Case		3.2	°C/W
$R_{\theta JA}$	Thermal Resistance Junction−to−Ambient		65	°C/W

Note :

1. Repetitive Rating:Pulse width limited by maximum junction temperature.
2. IL=25mH,IAS=4 A,VDD=50V,RG=25Ω,Tj=25 °C

650V/4A N-Channel Advanced Power MOSFET

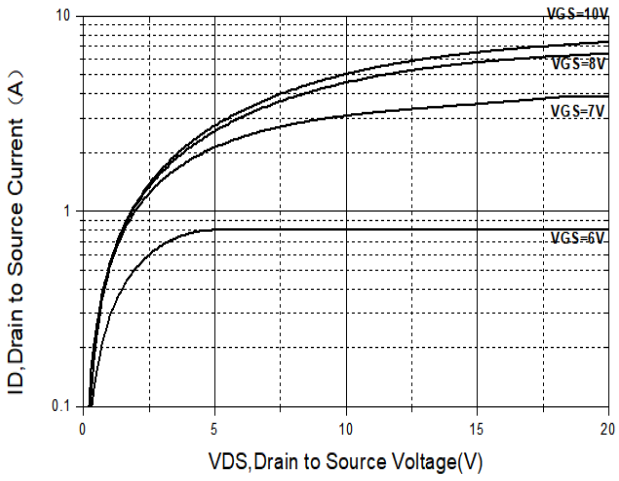
Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J= 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain current(Tc=25℃)	VDS=650V,VGS=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±30V,VDS=0V	--		±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	2	3	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance note A	VGS=10V,ID=2A	--	2.6	3.0	Ω
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) note B						
C_{iss}	Input Capacitance	VDS=25V,VGS=0V, f=1MHz	--	550	--	pF
C_{oss}	Output Capacitance		--	46	--	pF
C_{rss}	Reverse Transfer Capacitance		--	2.3	--	pF
Q_g	Total Gate Charge	VDS=480V,ID=4A VGS=10V	--	10.2	--	nC
Q_{gs}	Gate-Source Charge		--	2.3	--	nC
Q_{gd}	Gate-Drain Charge		--	2.1	--	nC
Switching Characteristics note B						
$t_{d(on)}$	Turn-on Delay Time	VDS=300V ID=4A, RG=25Ω VGS=10V	--	15.5	--	nS
t_r	Turn-on Rise Time		--	13	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	40	--	nS
t_f	Turn-Off Fall Time		--	16	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	IS= 4 A,VGS=0V	--	0.8	1.4	V

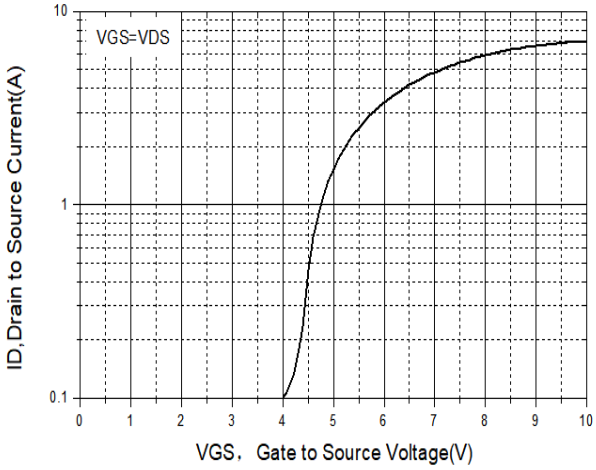
Note:

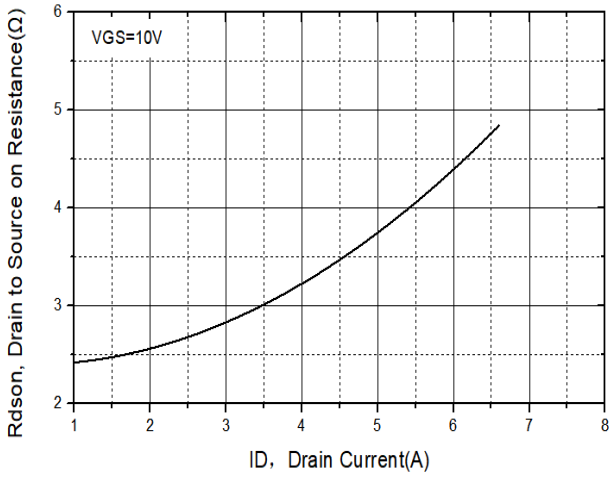
A: Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%

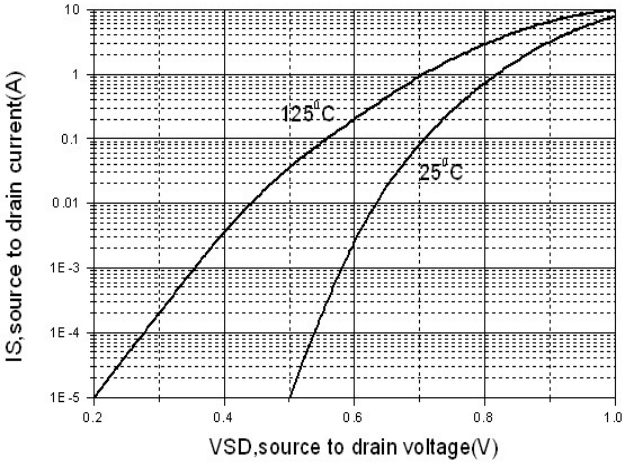
B:Guranteed by design, not subject to production testing.

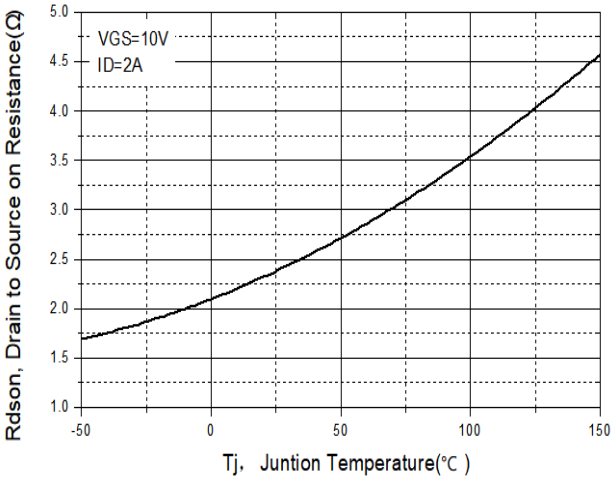
Typical characteristic curve:

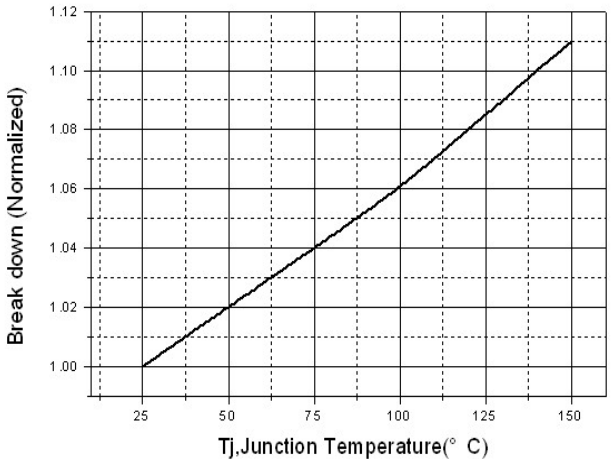












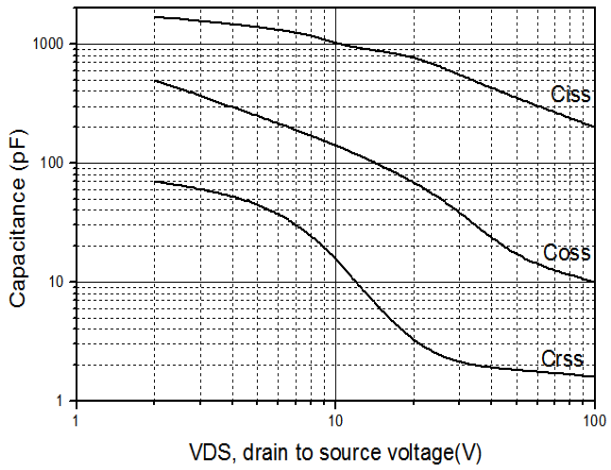


图 7: 电容特性

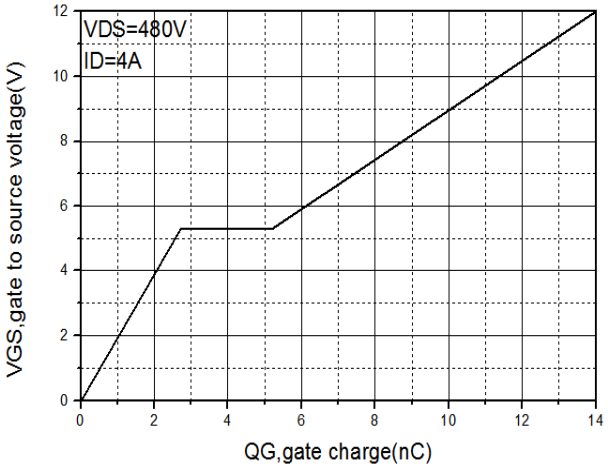


图 8: 栅电荷特性

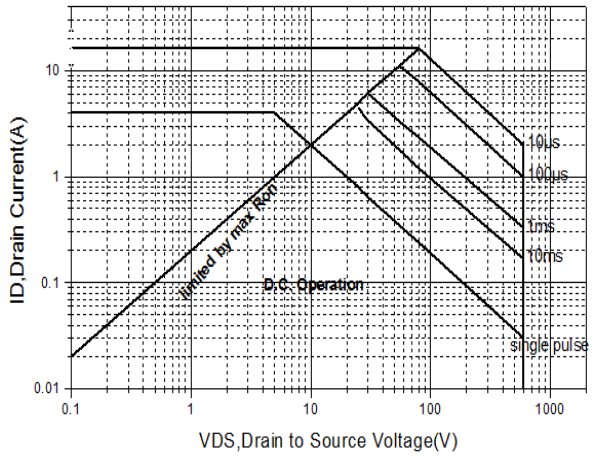


图 9: 安全工作区

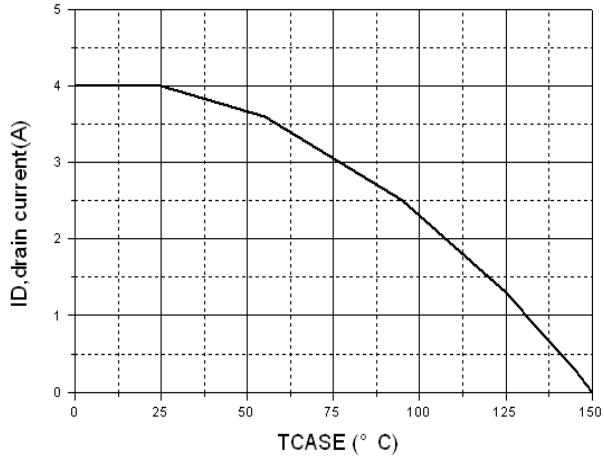
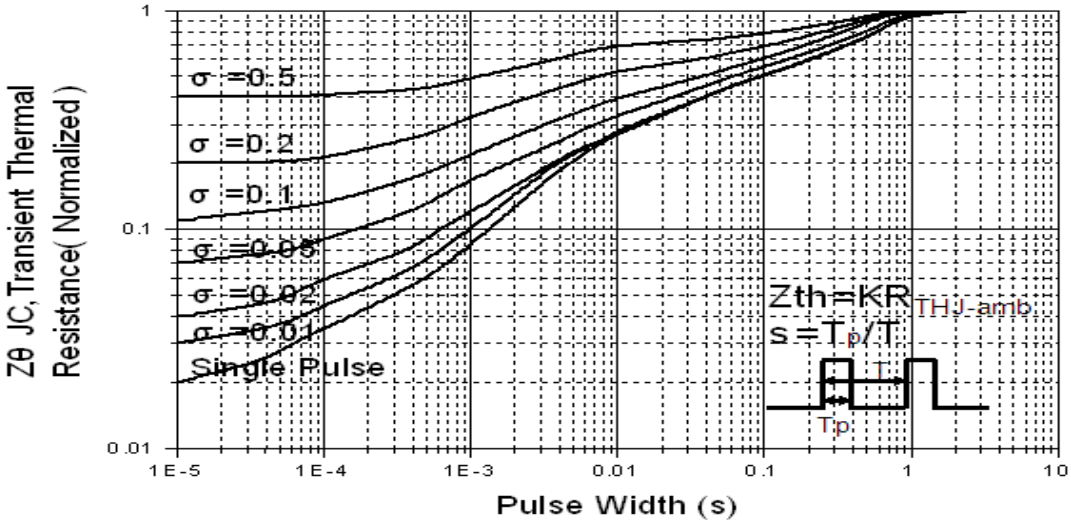


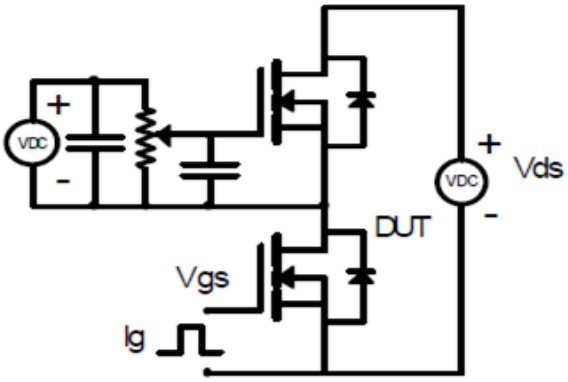
图 10: 最大电流衰减

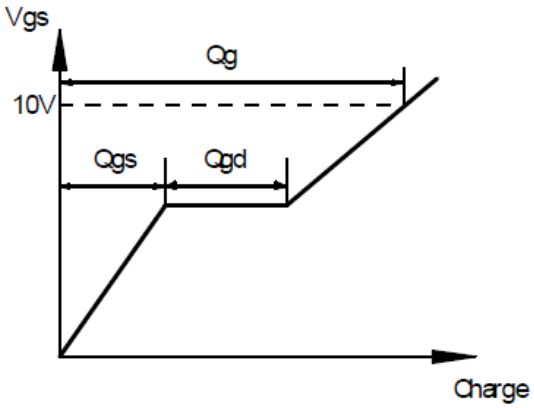


650V/4A N-Channel Advanced Power MOSFET

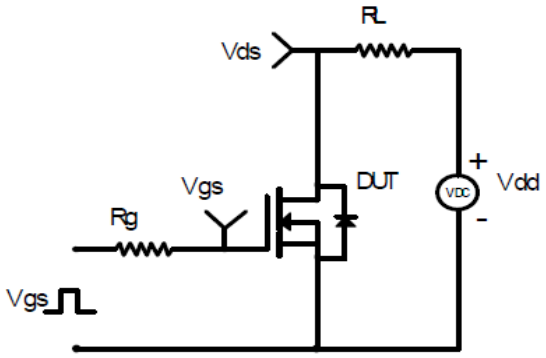
Test Circuit and Waveform

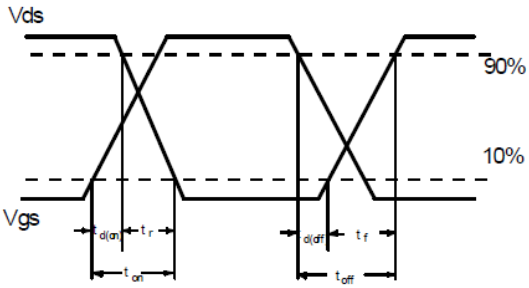
Gate Charge Test Circuit and Waveform



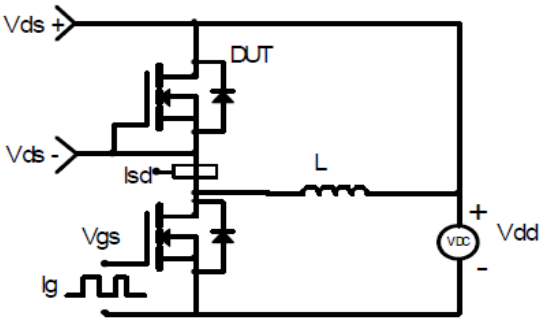


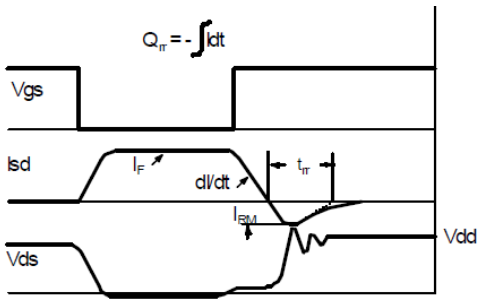
Switching time test circuit and waveform



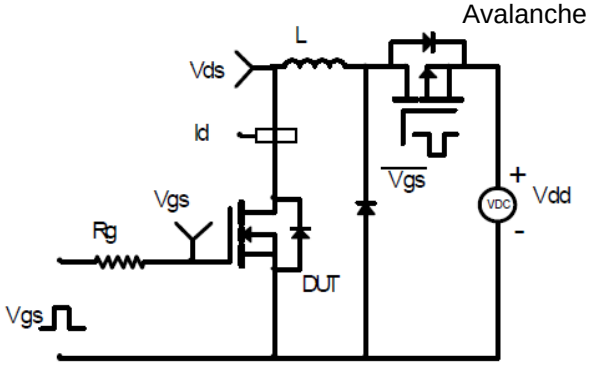


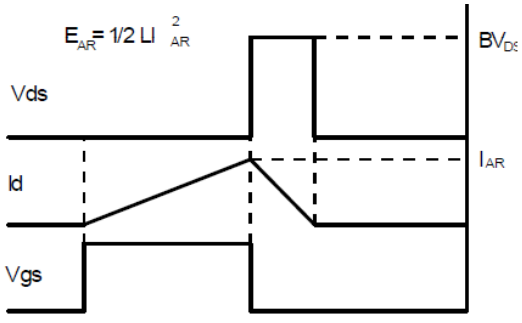
Reverse Recovery Test Circuit and Waveform





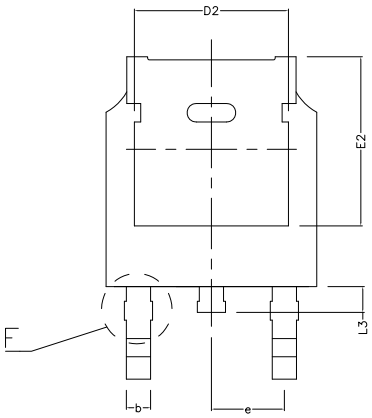
Avalanche Test Circuit and Waveform



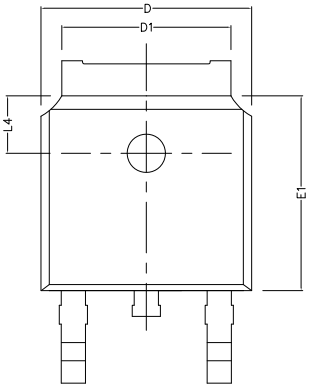


650V/4A N-Channel Advanced Power MOSFET

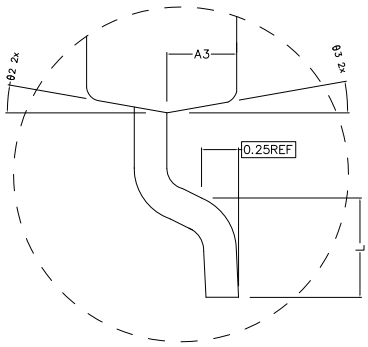
TO-252 **Package Outline Dimensions (Units: mm)**



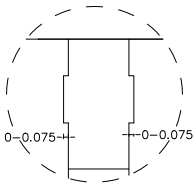
BOTTOM VIEW



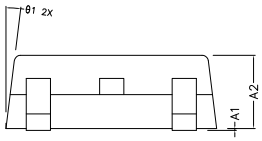
TOP VIEW



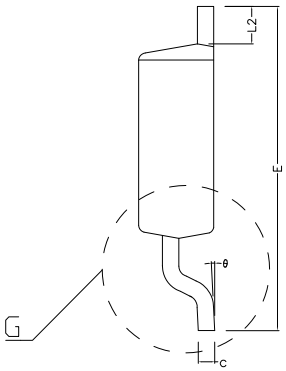
DETAIL G



DETAIL F



SIDE VIEW



SIDE VIEW

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		