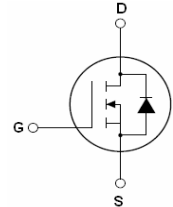
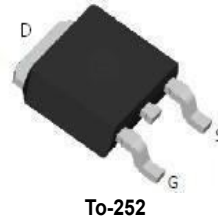


**100V/15A N-Channel Advanced Power MOSFET**
**Features**

- N-Channel, 5V Logic Level Control
- Enhancement mode
- Very low on-resistance @  $V_{GS}=4.5\text{ V}$
- Fast Switching
- 100% Avalanche test
- Pb-free lead plating; RoHS compliant

$V_{DS}$	100	V
$R_{DS(on),typ@VGS=10V}$	95	m $\Omega$
$R_{DS(on),typ@VGS=4.5V}$	100	m $\Omega$
$I_D$	15	A


**Order Information**

Product	Package	Marking	Packing
PTD15N10	TO-252	PTD15N10	2500PCS/REF

**Maximum ratings, at  $T_j=25\text{ }^\circ\text{C}$ , unless otherwise specified**

Symbol	Parameter	Rating	Unit	
$V_{(BR)DSS}$	Drain-Source breakdown voltage	100	V	
$V_{GS}$	Gate-Source voltage	$\pm 20$	V	
$I_D$	Continuous drain current@ $V_{GS}=10V$	$T_C=25^\circ\text{C}$	15	A
		$T_C=70^\circ\text{C}$	9.6	A
$I_{DM}$	Pulse drain current tested ①	$T_C=25^\circ\text{C}$	40	A
$P_D$	Maximum power dissipation	$T_C=25^\circ\text{C}$	30	W
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	15	A
IAS	Avalanche Current Max	$L=0.5\text{mH}$	11	A
EAS	Avalanche energy, single pulsed ②		9	mJ
$T_{STG}, T_J$	Storage and operating temperature range		-55 to 175	$^\circ\text{C}$
<b>Thermal characteristics</b>				
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	60	$^\circ\text{C/W}$	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5	$^\circ\text{C/W}$	



## 100V/15A N-Channel Advanced Power MOSFET

## Typical Electrical Characteristics

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	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current(Tc=25°C)	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tc=125°C)	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	2.0	3.0	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>③</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	--	95	110	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>③</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	--	110	120	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	--	525	--	pF
C <sub>oss</sub>	Output Capacitance		--	41	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	36	--	pF
R <sub>g</sub>	Gate Resistance		--	2.6	--	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, I <sub>D</sub> =3A, V <sub>GS</sub> =10V	--	15.6	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	3.2	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	4.4	--	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =50V, I <sub>D</sub> =1A, R <sub>G</sub> =6.8Ω, V <sub>GS</sub> =4.5V	--	8	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	4.5	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	26	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	3.8	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage	I <sub>SD</sub> =10A, V <sub>GS</sub> =0V	--	0.89	1.20	V
t <sub>rr</sub>	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>sd</sub> =10A, V <sub>GS</sub> =0V di/dt=500A/μs	--	26	--	nS
Q <sub>rr</sub>	Reverse Recovery Charge		--	115	--	nC

## NOTE:

- ① Repetitive rating; pulse width limited by max. junction temperature
- ② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.5mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 6A, V<sub>GS</sub> = 10V. Part not recommended for use above this value.
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.



# 100V/15A N-Channel Advanced Power MOSFET Typical Characteristics

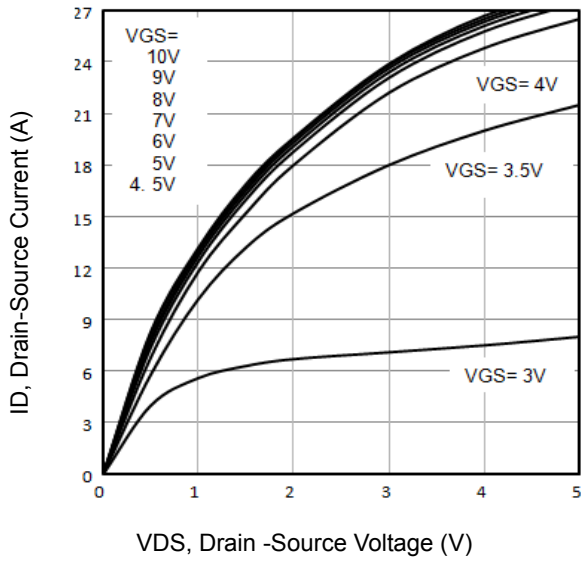


Fig1. Typical Output Characteristics

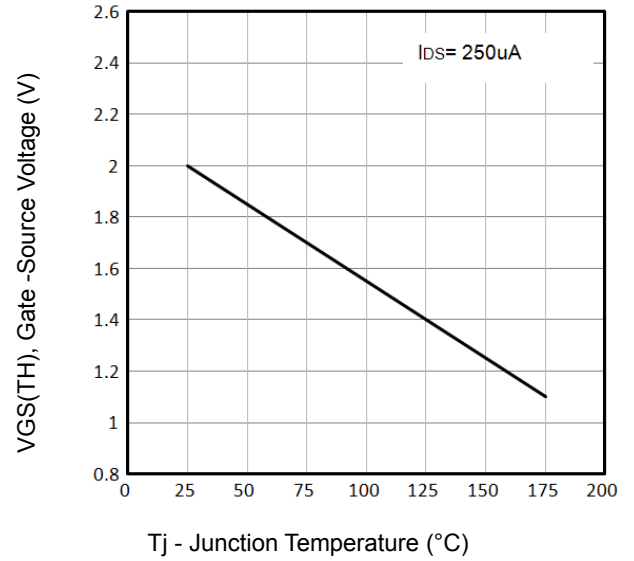


Fig2.  $V_{GS(TH)}$  Gate-Source Voltage Vs.  $T_j$

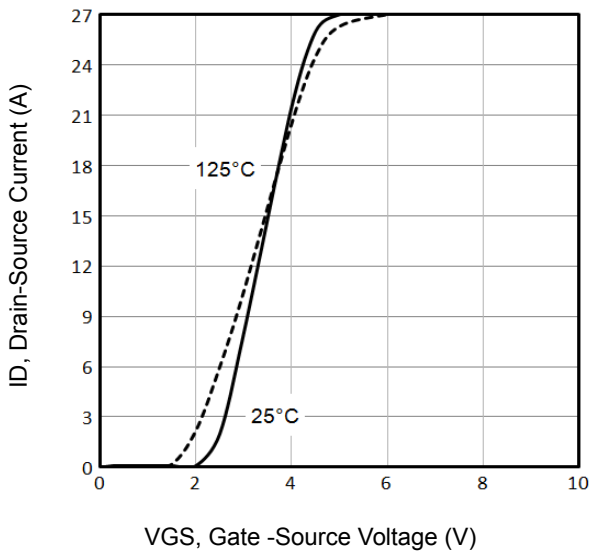


Fig3. Typical Transfer Characteristics

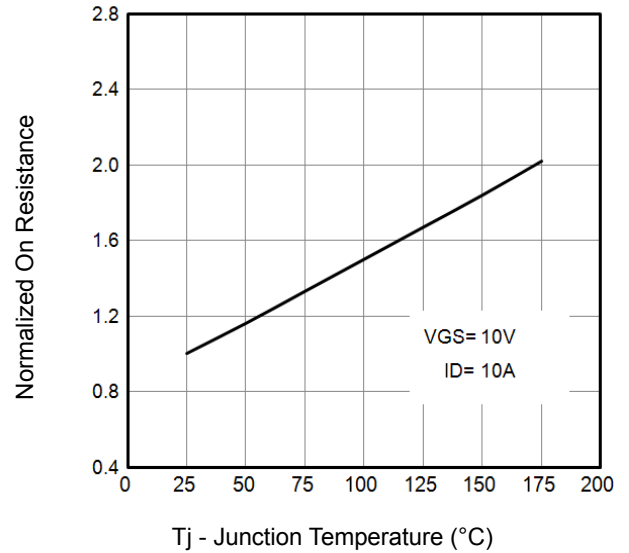


Fig4. Normalized On-Resistance Vs.  $T_j$

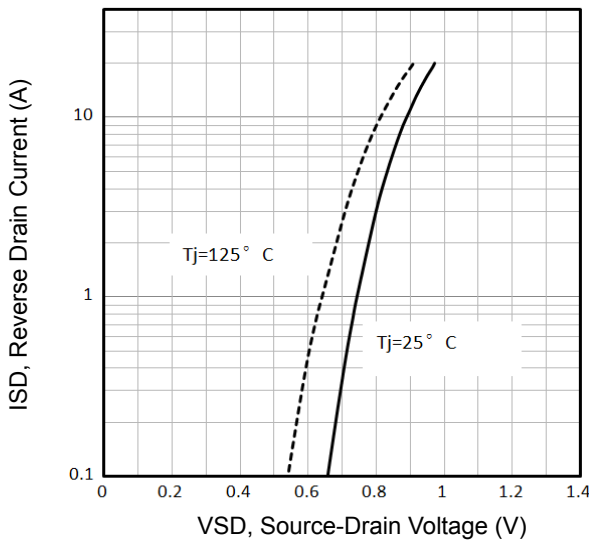


Fig5. Typical Source-Drain Diode Forward Voltage

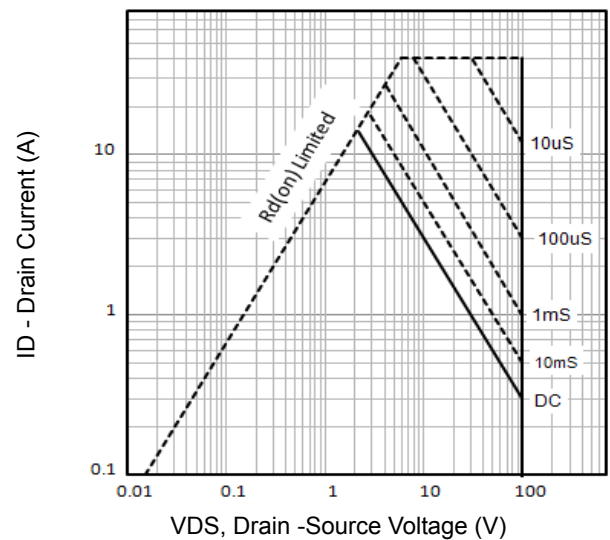
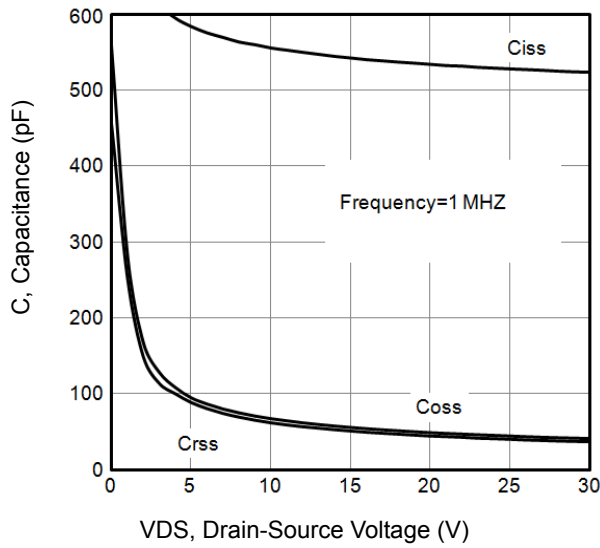
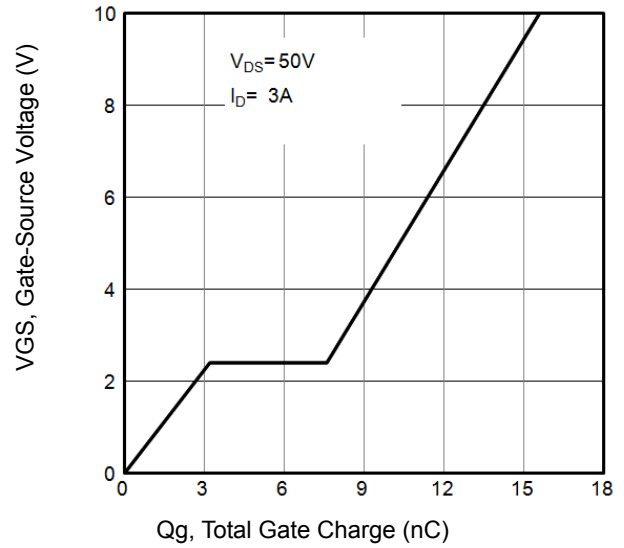
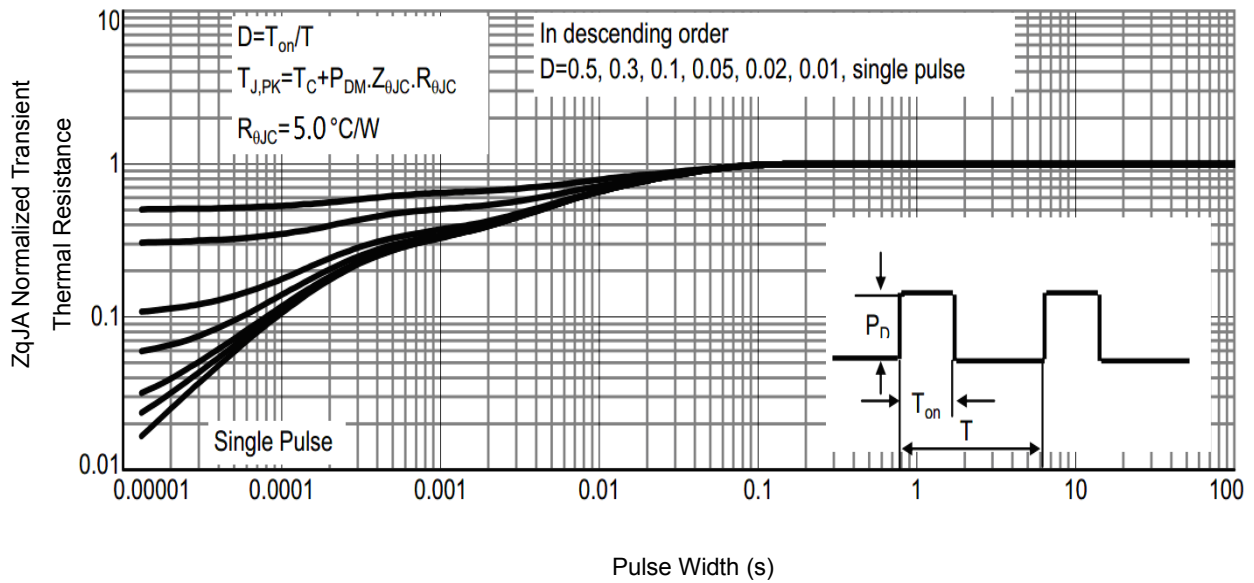
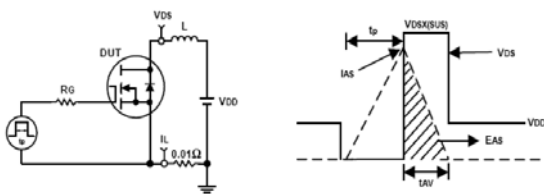
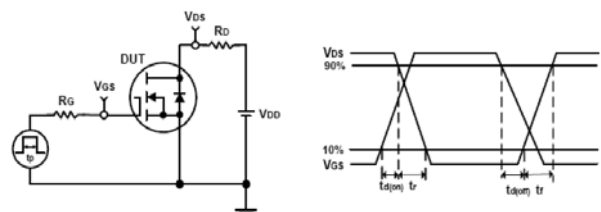
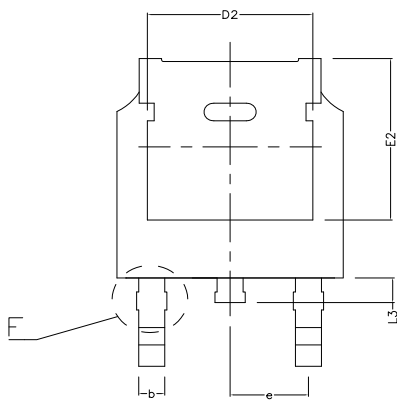
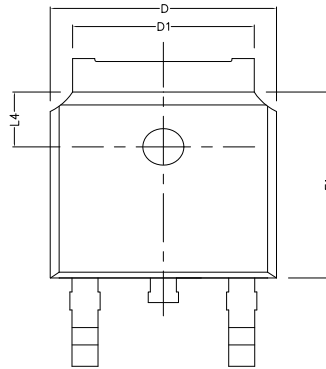


Fig6. Maximum Safe Operating Area

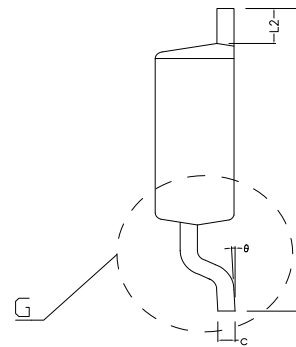
**100V/15A N-Channel Advanced Power MOSFET**
**Typical Characteristics**

**Fig7.** Typical Capacitance Vs. Drain-Source Voltage

**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage

**Fig9.** Normalized Maximum Transient Thermal Impedance

**Fig10.** Unclamped Inductive Test Circuit and waveforms

**Fig11.** Switching Time Test Circuit and waveforms

**100V/15A N-Channel Advanced Power MOSFET**
**TO-252 Package Outline Dimensions (Units: mm)**


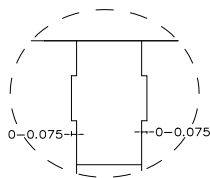
BOTTOM VIEW



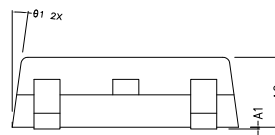
TOP VIEW



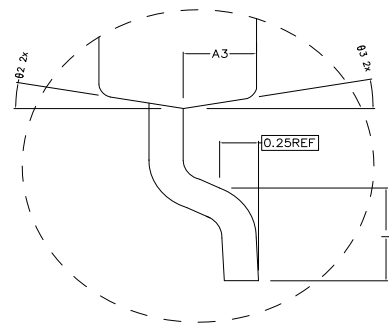
SIDE VIEW



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		