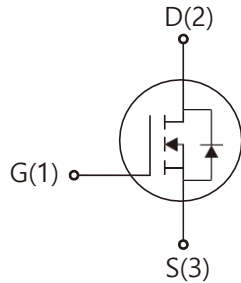
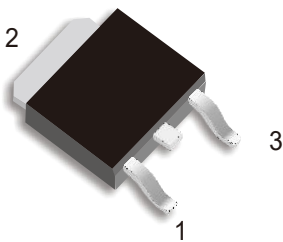
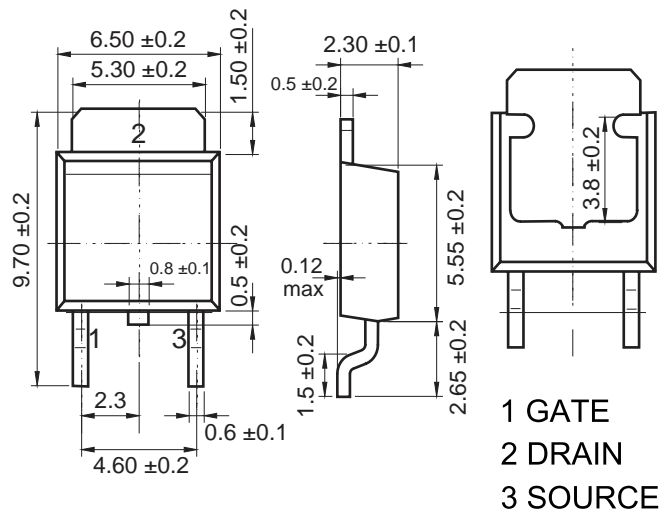


**Features:**

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge : $Q_g=35nC$  (Typ.).
- $V_{DSS}=650V, I_D=10A$
- $R_{DS(on)} : 0.9 \Omega$  (Max) @ $V_G=10V$
- 100% Avalanche Tested


**TO-252**


Dimensions in millimeters

**Absolute Maximum Ratings** ( $T_a=25^\circ C$  unless otherwise noted)

Sy mbol	Parameter	Value	Unit
$V_{DSS}$	Drain-Source Voltage	650	V
$I_D$	Drain Current	$T_j=25^\circ C$	10
		$T_j=100^\circ C$	6.7
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulse Avalanche Energy (note1)	380	mJ
$I_{AR}$	Avalanche Current (note2)	10	A
$P_D$	Power Dissipation ( $T_j=25^\circ C$ )	45	W
$T_j$	Junction Temperature(Max)	150	$^\circ C$
$T_{stg}$	Storage Temperature	-55~+150	$^\circ C$
TL	Maximum lead temperature for soldering purpose,1/8' from case for 5 seconds	300	$^\circ C$

**Thermal Characteristics**

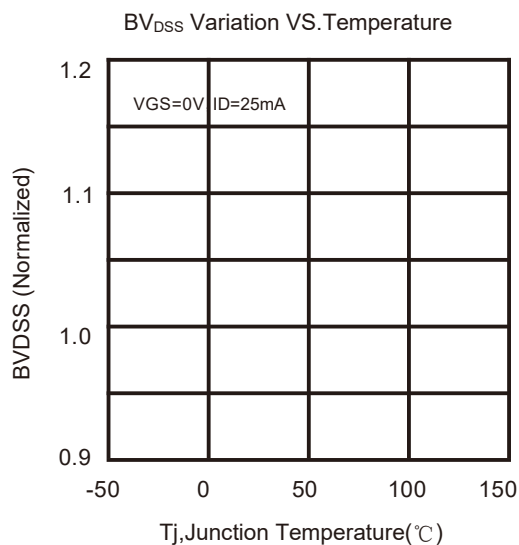
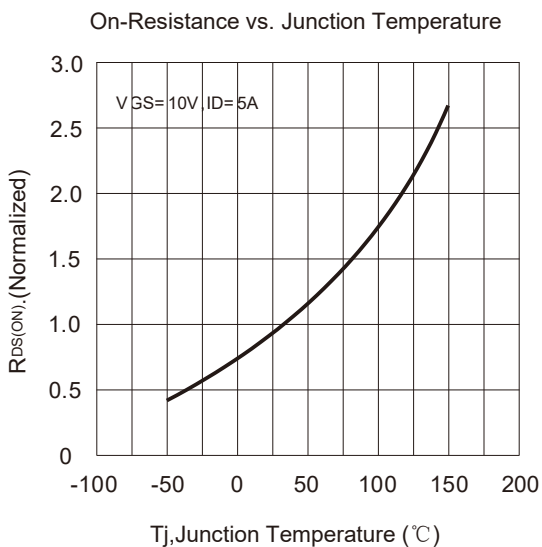
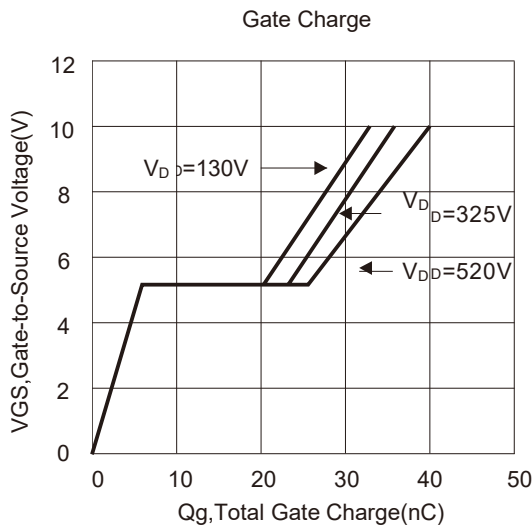
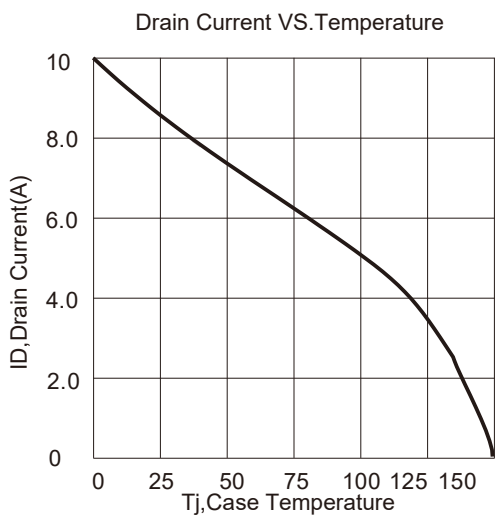
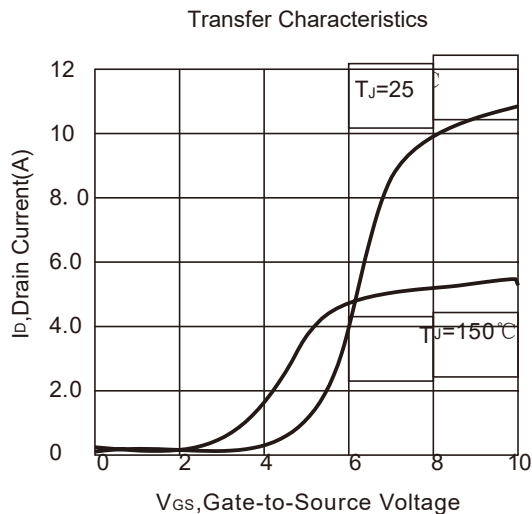
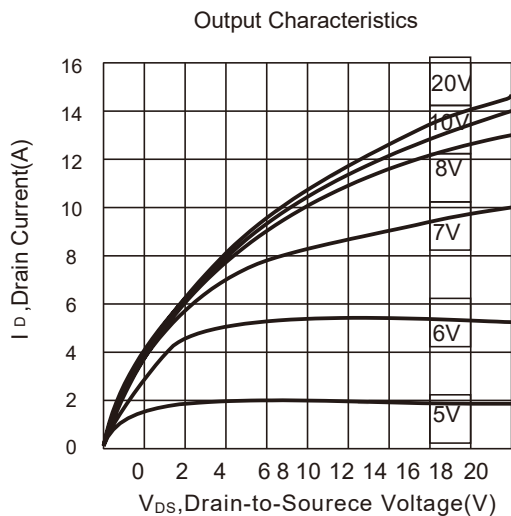
Sy mbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case	-	2.4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	-	62.5	$^\circ C/W$

**Electrical Characteristics** (Ta=25°C unless otherwise noted)

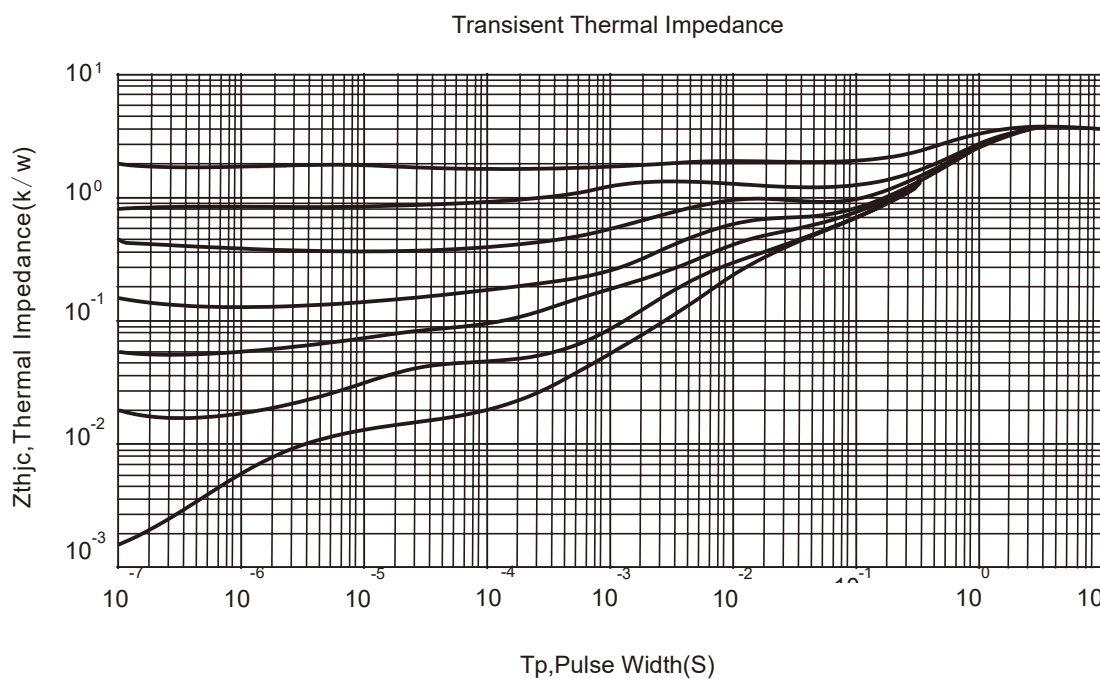
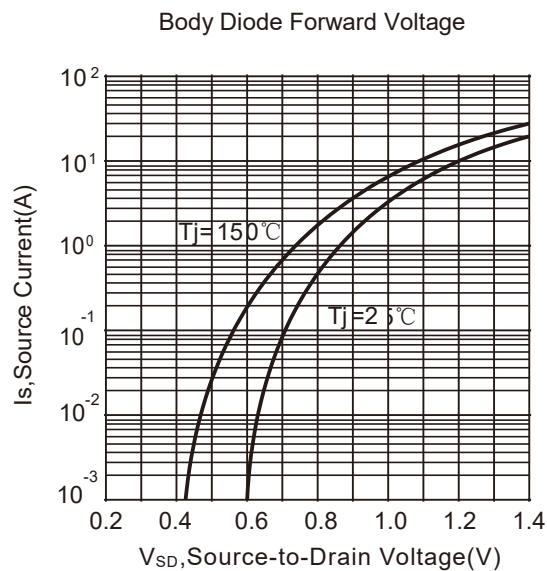
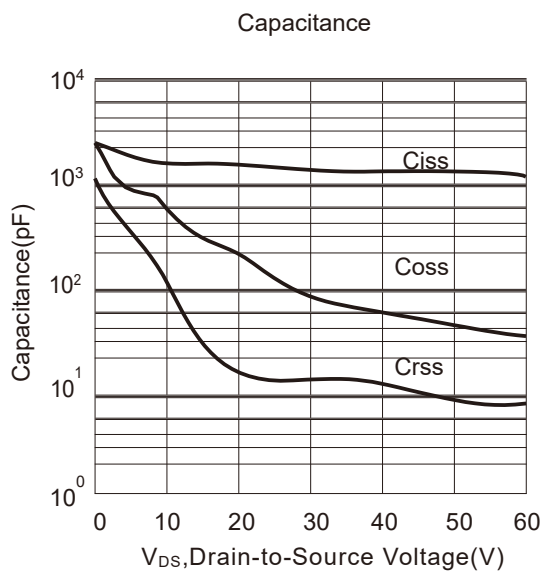
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu A, V_{GS}=0$	650	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$ , Reference to 25°C	-	0.67	-	V/°C
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	-	-	10	$\mu A$
		$V_{DS}=520V, T_J=125^\circ C$			100	
$I_{GSSF}$	Gate-body leakage Current, Forward	$V_{GS}=+30V, V_{DS}=0V$	-	-	100	nA
$I_{GSSR}$	Gate-body leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	-	-	-100	
<b>On Characteristics</b>						
$V_{GS(TH)}$	Date Threshold Voltage	$I_D=250\mu A, V_{DS}=V_{GS}$	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$I_D=5.0A, V_{GS}=10V$	-	0.8	0.9	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0, f=1.0MHz$	-	1500	-	$\mu F$
$C_{oss}$	Output Capacitance		-	194	-	
$C_{rss}$	Reverse Transfer Capacitance		-	18	-	
<b>Switching Characteristics</b>						
$T_d(on)$	Turn-On Delay Time	$V_{DD}=325V, I_D=10A, R_G=25\Omega$ (Note 3,4)	-	23		nS
$T_r$	Turn-On Rise Time		-	15		
$T_d(off)$	Turn-Off Delay Time		-	90		
$T_f$	Turn-Off Rise Time		-	30		
$Q_g$	Total Gate Charge	$V_{DS}=520V, V_{GS}=10V, I_D=10A$ (Note3,4)	-	35		nC
$Q_{gs}$	Gate-Source Charge		-	7	-	
$Q_{gd}$	Gate-Drain Charge		-	18	-	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Max. Diode Forward Current	-		-	10	A
$I_{SM}$	Max. Pulsed Forward Current	-		-	40	
$V_{SD}$	Diode Forward Voltage	$I_D=10A$	-	-	1.4	V
$T_{rr}$	Reverse Recovery Time	$I_S=10A, V_{GS}=0V, diF/dt=100A/\mu s$	-	320	-	nS
$Q_{rr}$	Reverse Recovery Charge	(Note3)	-	4.2	-	$\mu C$

Notes : 1, L=0.5mH, IAS= 10A, VDD=50V, RG=25 $\Omega$ , Starting T<sub>J</sub> =25°C  
 2, Repetitive Rating : Pulse width limited by maximum junction temperature  
 3, Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$   
 4, Essentially Independent of Operating Temperature

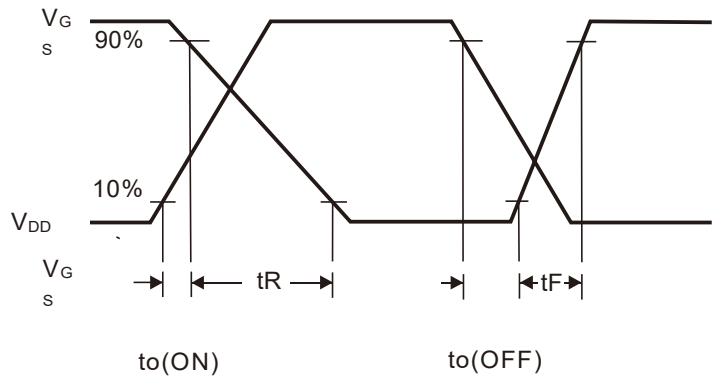
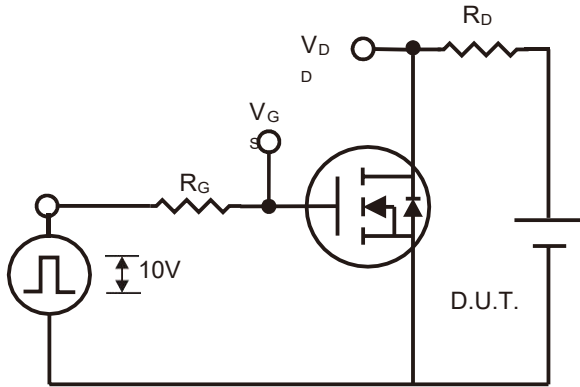
## Typical Characteristics



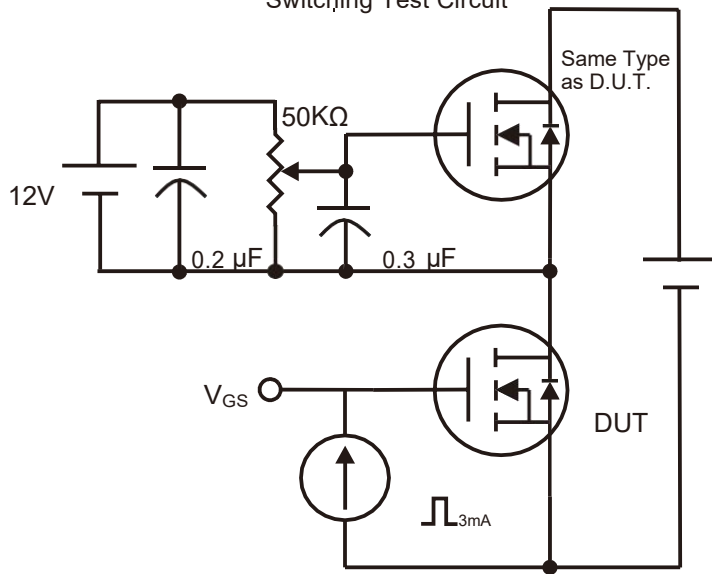
## Typical Characteristics (Continued)



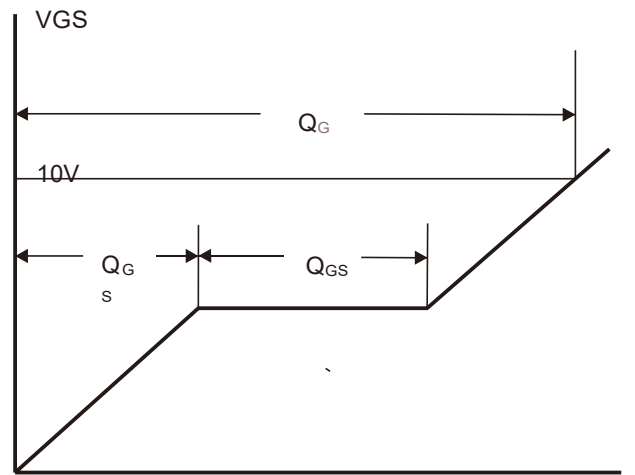
Gate Charge Test Circuit & Waveform



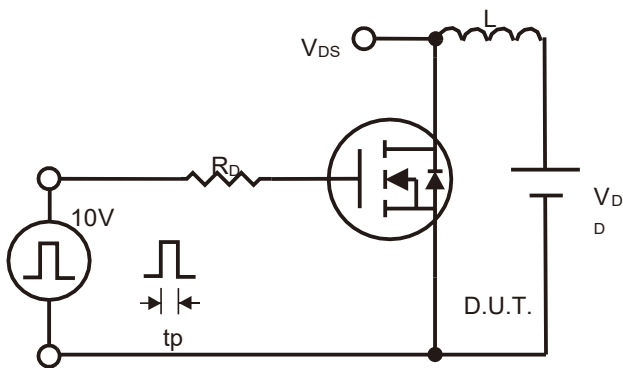
Switching Test Circuit



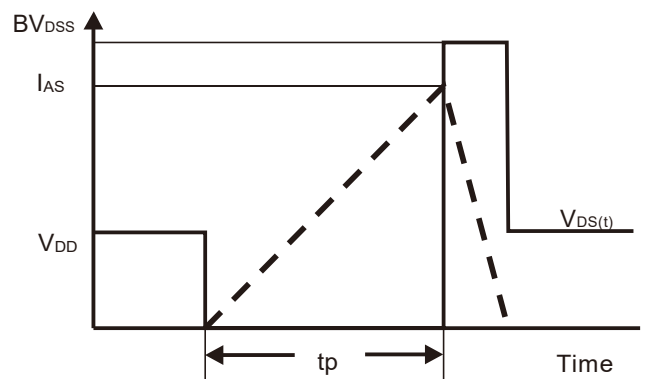
Switching Waveforms



Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

**Peak Diode Recovery dv/dt Test Circuit & Waveform**

