

N-channel Enhancement Mode Power MOSFET

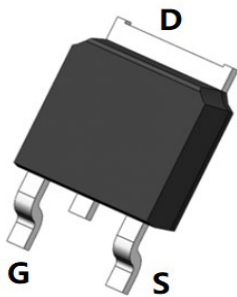
Features

- $V_{DS} = 150V$, $I_D = 20 A$
 $R_{DS(ON)} < 70 m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 80 m\Omega @ V_{GS} = 4.5V$

General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

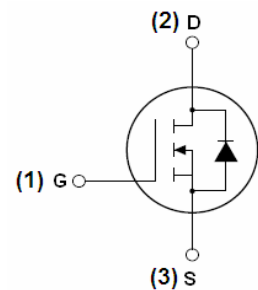
100% UIS TESTED!
 100% ΔV_{ds} TESTED!



TO-252-2L Top View



Pin Assignment



Schematic Diagram

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous	20	A
$I_D(100^\circ C)$	Drain Current-Continuous($T_C = 100^\circ C$)	14	A
I_{DM}	Pulsed Drain Current	40	A
P_D	Maximum Power Dissipation	90	W
	Derating factor	0.6	W/ $^\circ C$
E_{AS}	Single pulse avalanche energy ^(Note 5)	80	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$

Thermal Characteristic

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case ^(Note 2)	1.7	$^\circ C/W$
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Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	150	165	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=150V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2		4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=10A$	-		70	m Ω
		$V_{GS}=7V, I_D=10A$			80	
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=10A$	-	20	-	S
Dynamic Characteristics (Note 4)						
C_{iss}	Input Capacitance	$V_{DS}=75V, V_{GS}=0V,$ $F=1.0MHz$	-	1810	-	PF
C_{oss}	Output Capacitance		-	61	-	PF
C_{riss}	Reverse Transfer Capacitance		-	45	-	PF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=75V, R_L=5\Omega$ $V_{GS}=10V, R_{GEN}=3\Omega$	-	15.5	-	nS
t_r	Turn-on Rise Time		-	8.5	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	19.5	-	nS
t_f	Turn-Off Fall Time		-	7	-	nS
Q_g	Total Gate Charge	$V_{DS}=75V, I_D=10A,$ $V_{GS}=10V$	-	45	-	nC
Q_{gs}	Gate-Source Charge		-	9	-	nC
Q_{gd}	Gate-Drain Charge		-	12	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
I_S	Diode Forward Current (Note 2)	-	-	-	20	A
t_{rr}	Reverse Recovery Time	$T_J = 25^{\circ}\text{C}, I_F = 10A$ $di/dt = 100A/\mu s$ (Note 3)	-	32	-	nS
Q_{rr}	Reverse Recovery Charge		-	53	-	nC
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Electrical and Thermal Characteristics (Curves)

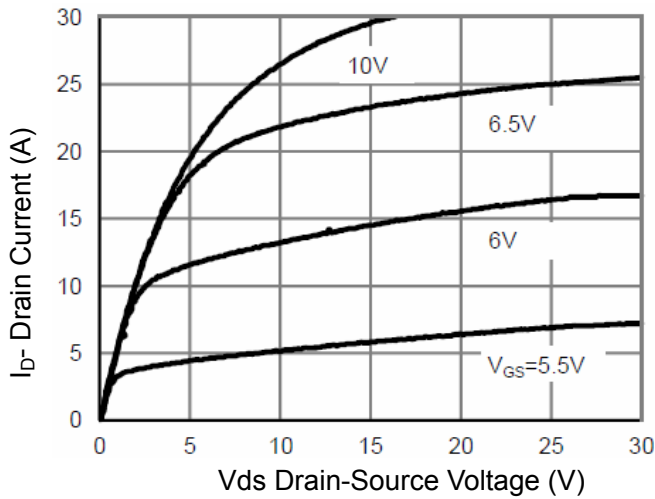


Figure 1 Output Characteristics

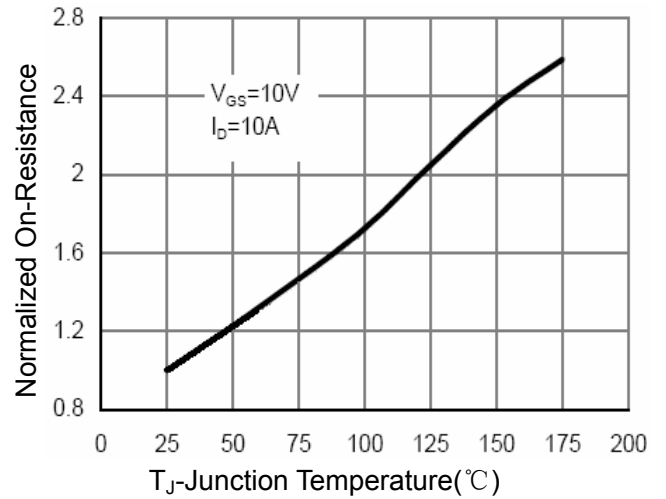


Figure 4 R_{dson} -Junction Temperature

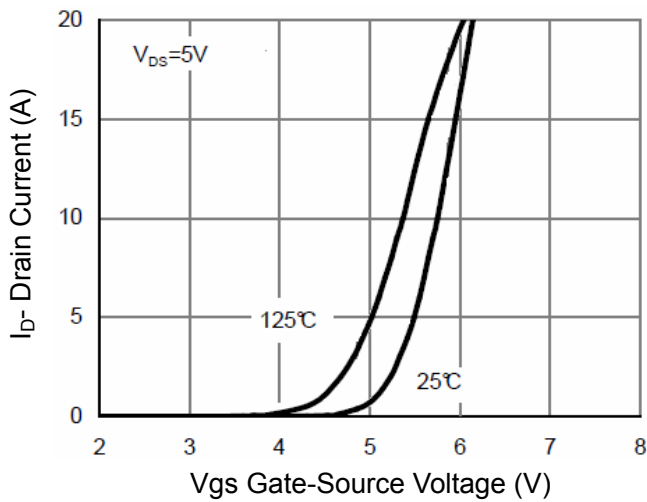


Figure 2 Transfer Characteristics

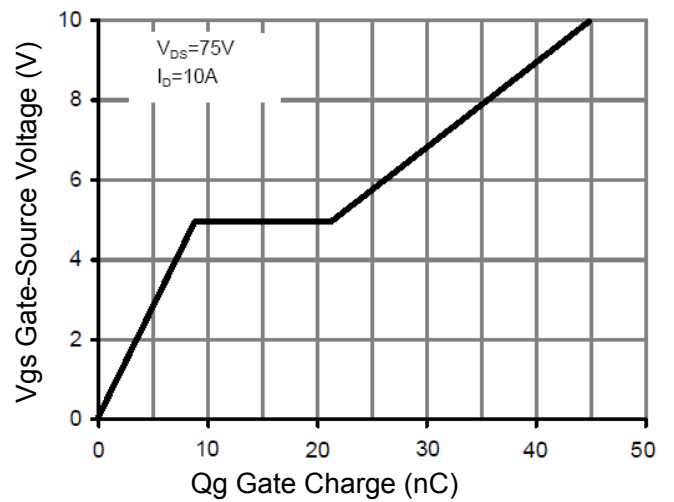


Figure 5 Gate Charge

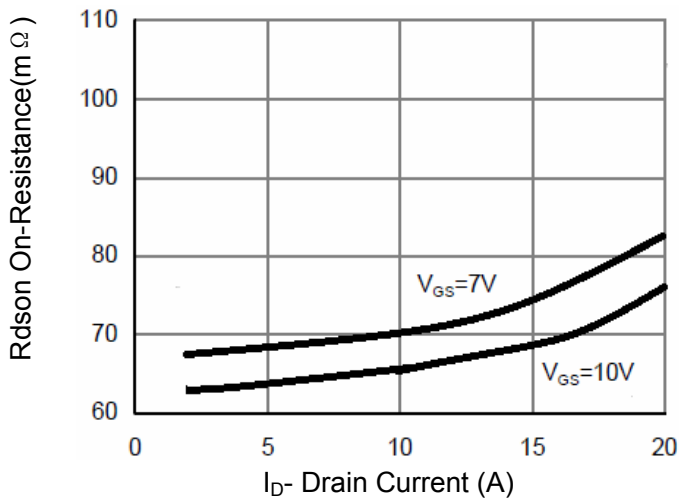


Figure 3 R_{dson} - Drain Current

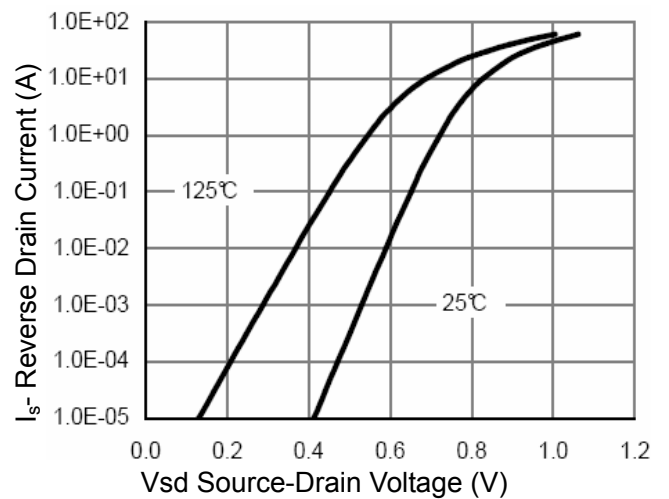


Figure 6 Source- Drain Diode Forward

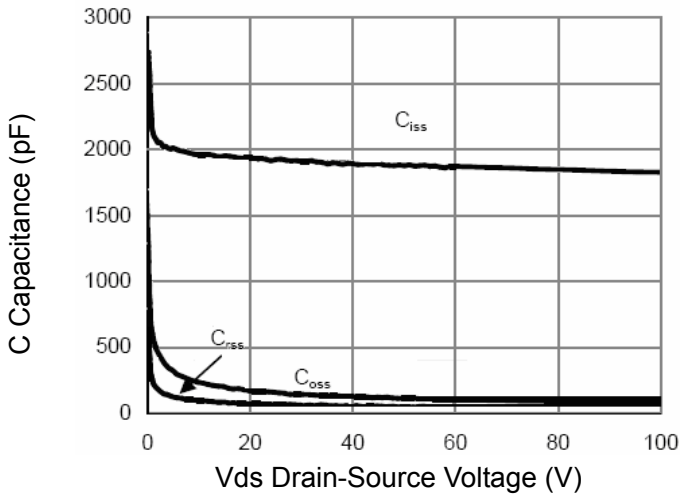


Figure 7 Capacitance vs Vds

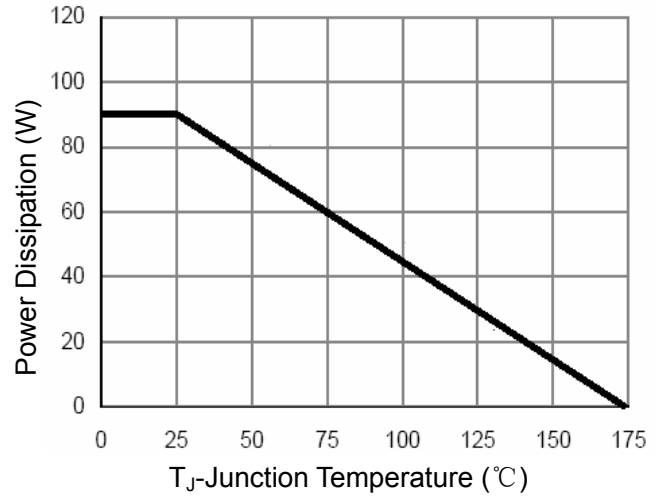


Figure 9 Power De-rating

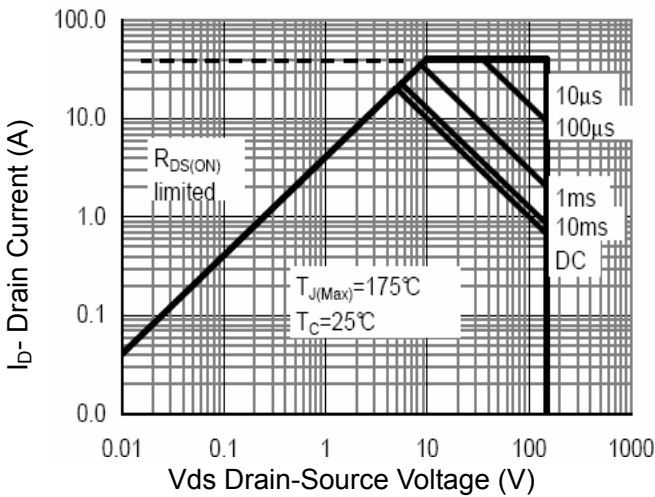


Figure 8 Safe Operation Area

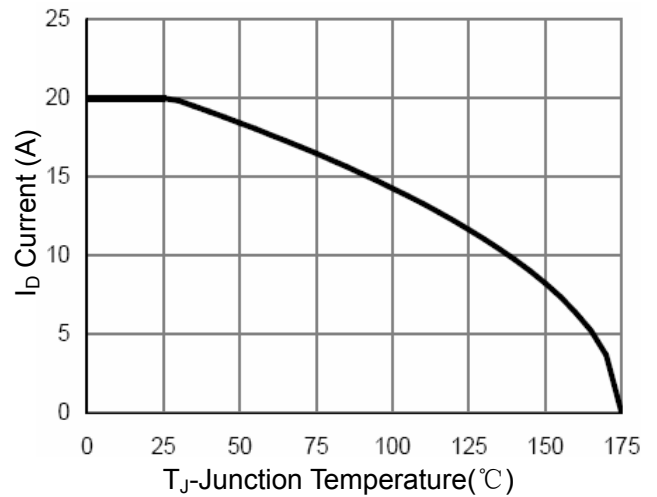


Figure 10 Id Current- Junction Temperature

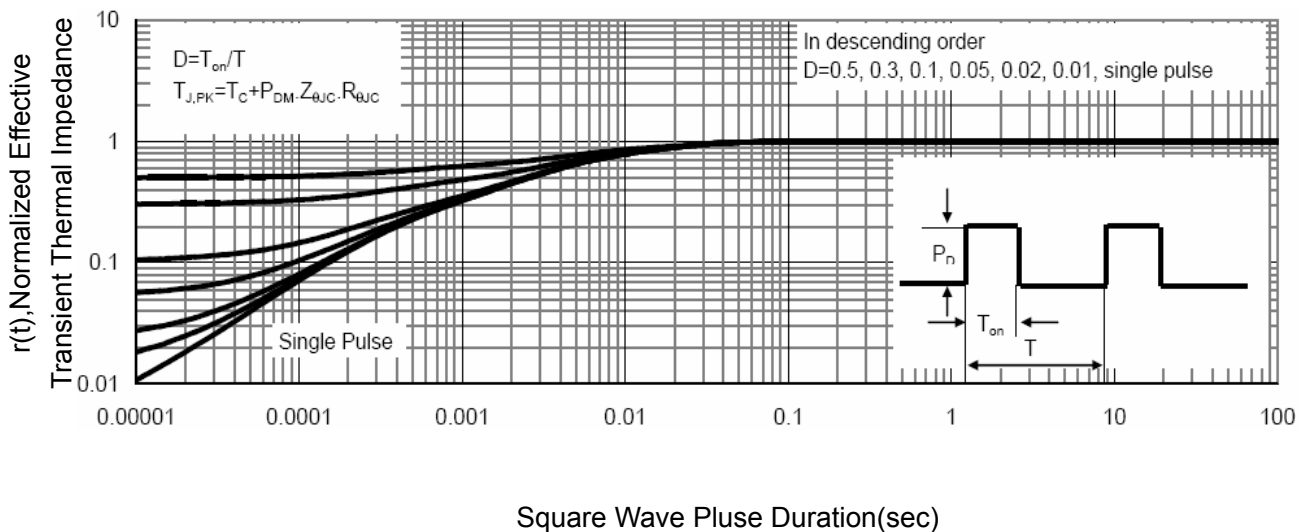


Figure 11 Normalized Maximum Transient Thermal Impedance