

N-channel Enhancement Mode Power MOSFET

Features

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

General Features

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

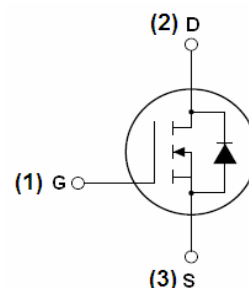
100% UIS TESTED!
 100% ΔV_{ds} TESTED!



TO-252-2L Top View



Pin Assignment



Schematic Diagram

Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ 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
$I_D(100^\circ\text{C})$	Drain Current-Continuous($T_C = 100^\circ\text{C}$)	14	A
I_{DM}	Pulsed Drain Current	40	A
P_D	Maximum Power Dissipation	90	W
	Derating factor	0.6	W/ $^\circ\text{C}$
E_{AS}	Single pulse avalanche energy ^(Note 5)	80	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ\text{C}$

Thermal Characteristic

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case ^(Note 2)	1.7	$^\circ\text{C}/\text{W}$
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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 =250μA	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} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note 3)							
V _{GS(th)}	Gate Threshold Voltage		V _{DS} =V _{GS} , I _D =250μA	2		4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =10A	-		70	mΩ	
		V _{GS} =7V, I _D =10A			80		
g _{FS}	Forward Transconductance		V _{DS} =5V, I _D =10A	-	20	-	S
Dynamic Characteristics ^(Note4)							
C _{ISS}	Input Capacitance		V _{DS} =75V, V _{GS} =0V, F=1.0MHz	-	1810	-	PF
C _{OSS}	Output Capacitance			-	61	-	PF
C _{RSS}	Reverse Transfer Capacitance			-	45	-	PF
Switching Characteristics ^(Note 4)							
t _{d(on)}	Turn-on Delay Time		V _{DD} =75V, R _L =5Ω V _{GS} =10V, R _{GEN} =3Ω	-	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		TJ = 25°C, IF = 10A	-	32	-	nS
Qrr	Reverse Recovery Charge		di/dt = 100A/μs ^(Note3)	-	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)

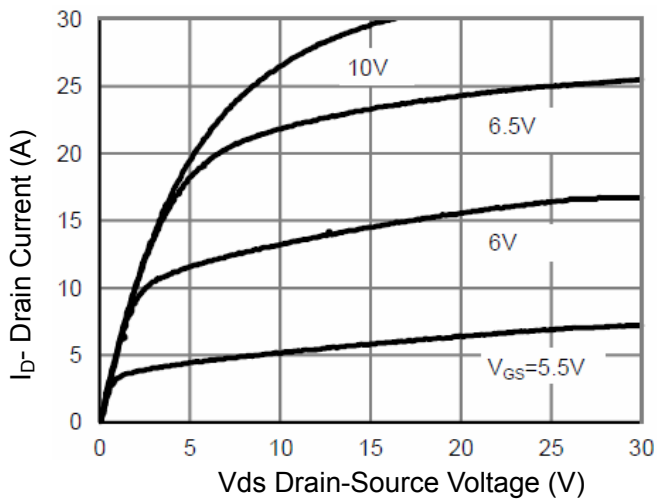


Figure 1 Output Characteristics

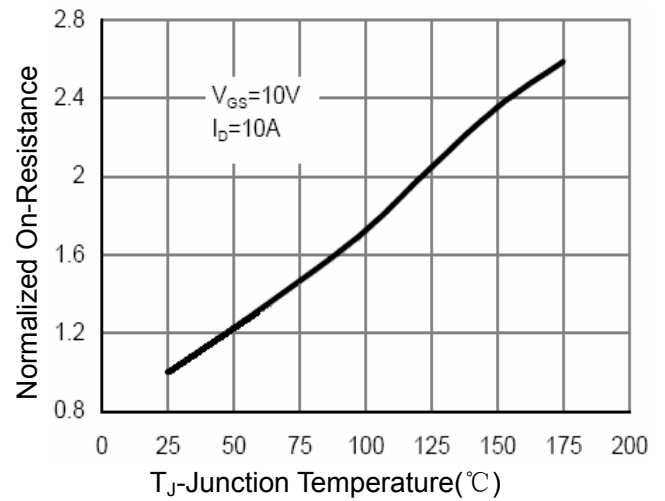


Figure 4 Rdson-Junction Temperature

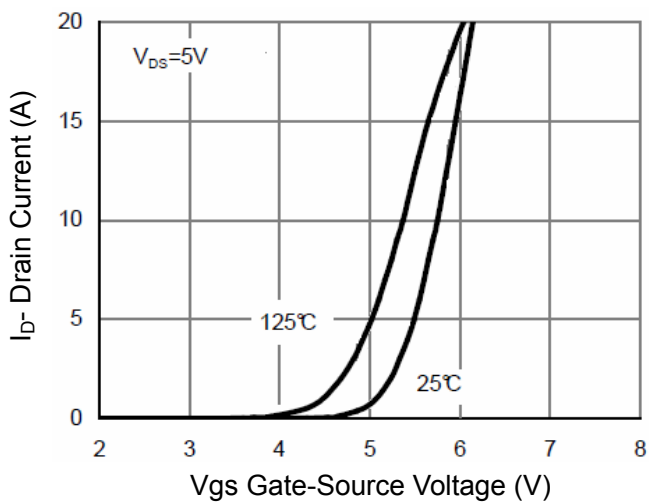


Figure 2 Transfer Characteristics

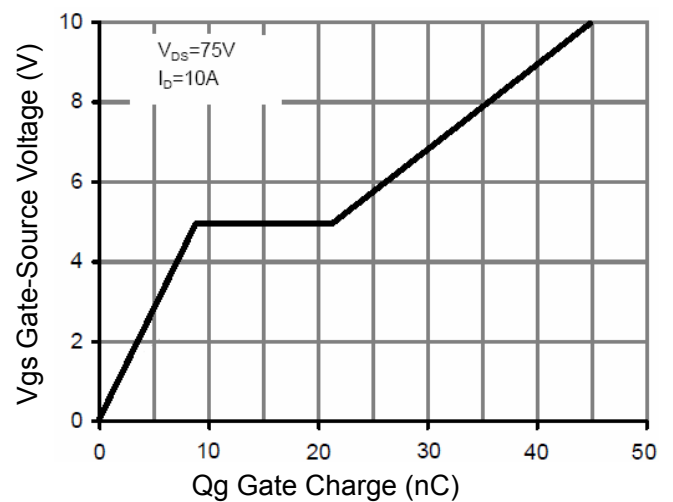


Figure 5 Gate Charge

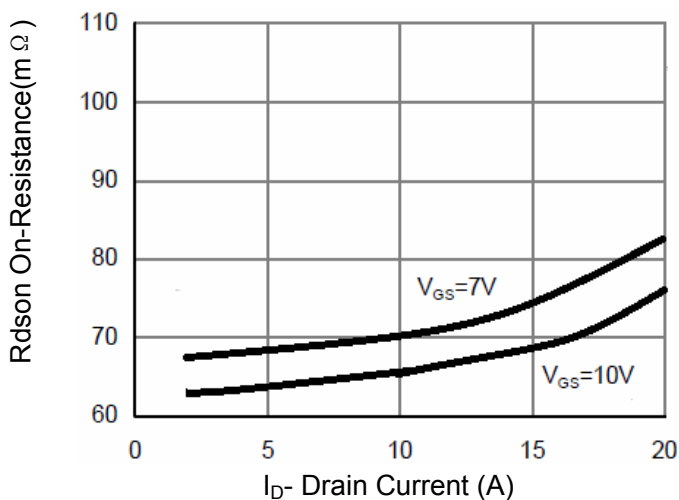


Figure 3 Rdson- Drain Current

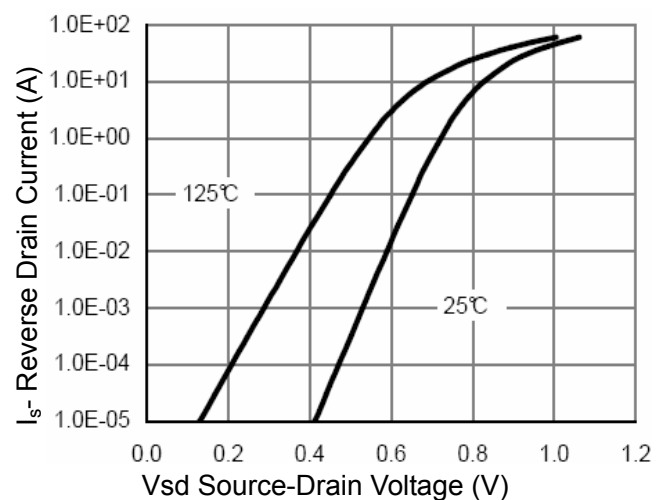


Figure 6 Source- Drain Diode Forward

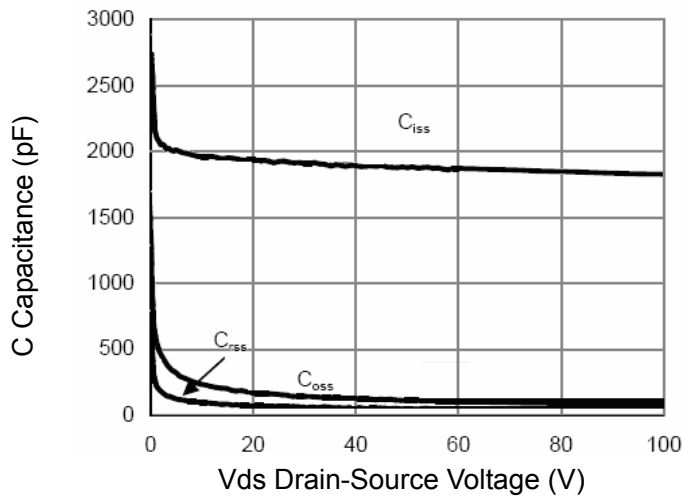


Figure 7 Capacitance vs Vds

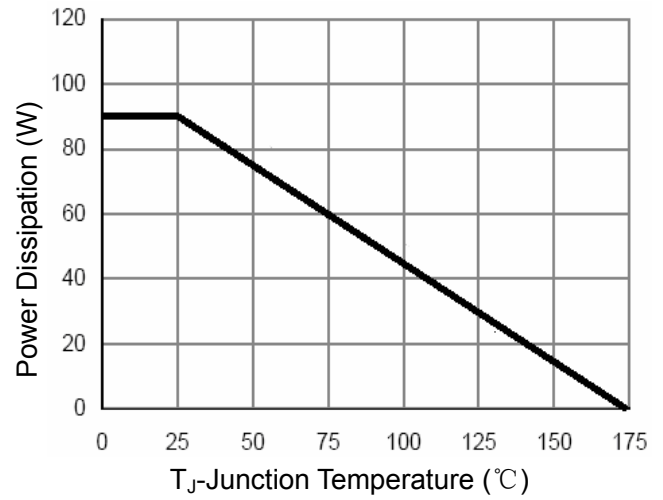


Figure 9 Power De-rating

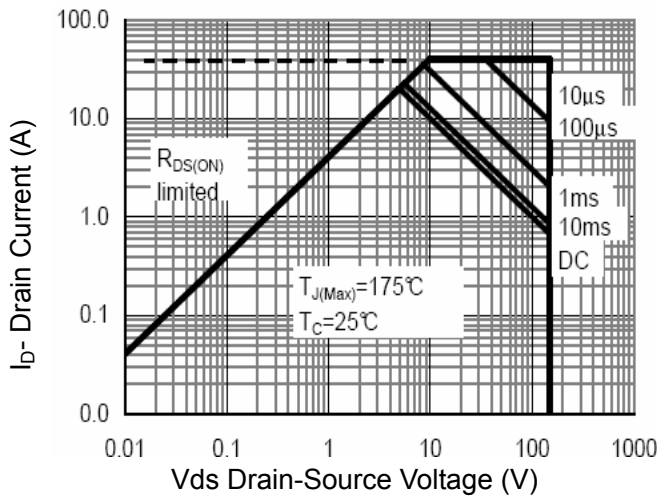


Figure 8 Safe Operation Area

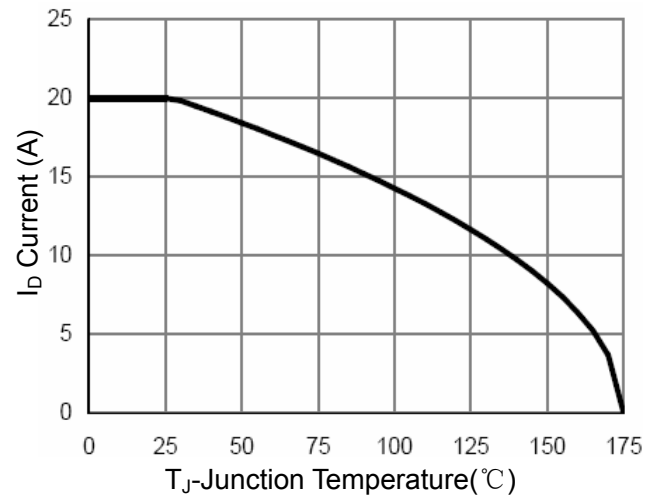


Figure 10 ID Current- Junction Temperature

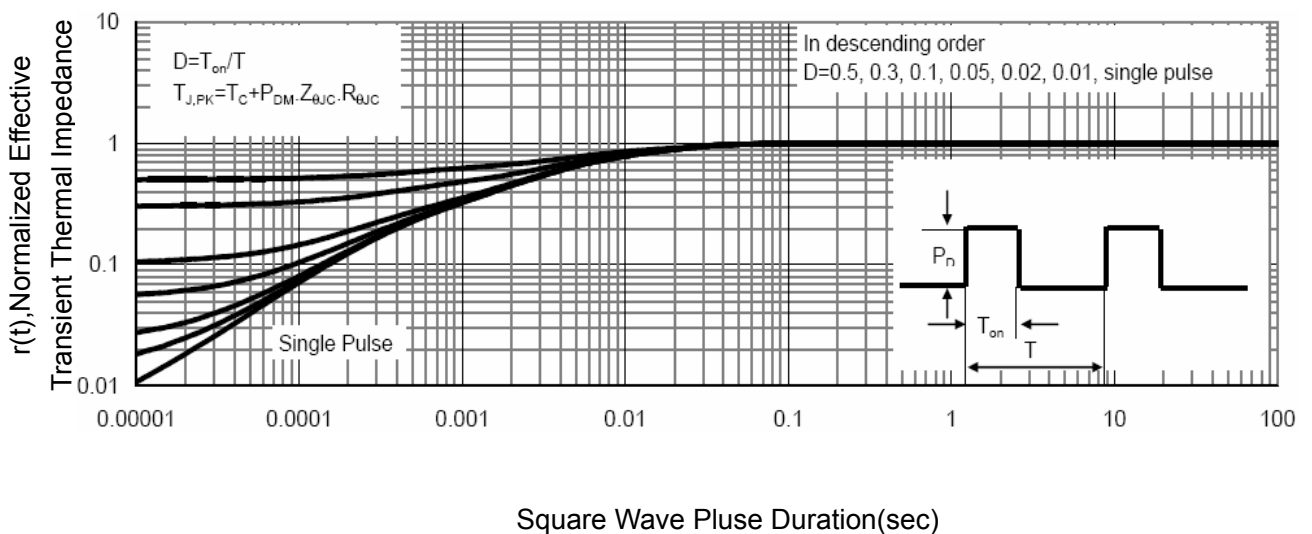


Figure 11 Normalized Maximum Transient Thermal Impedance