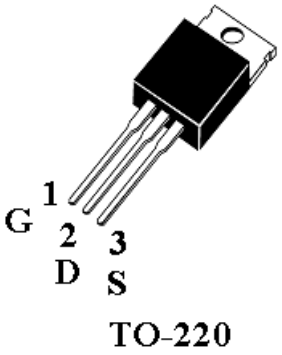
75A 80V N Channel Mosfet Transistor



TO-220

APPLICATIONSL

Low Voltage high-Speed Switching.

T_{stg}——Storage Temperature·····-55~175℃

T_j ——Operating Junction Temperature ·····150℃

P_D —— Allowable Power Dissipation（T_c=25℃）·····173W

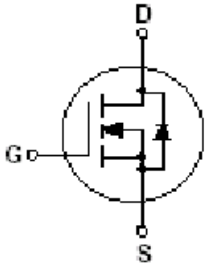
V_{DSS} —— Drain-Source Voltage ·····80V

V_{GSS} —— Gate-Source Voltage ·····±20V

I_D —— Drain Current（T_c=25℃）·····75A

R_{Dson}—— Static Drain Source on-state Resistance····· 0.015Ohm @10V

Qg —— Gate Charge ····· 80nC



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain to Source Voltage		80	V
I_D	Continuous Drain Current(@T_C = 25°C)		75	A
	Continuous Drain Current(@T_C = 100°C)		52.5	A
I_{DM}	Drain Current Pulsed	(Note 1)	300	A
V_{GS}	Gate to Source Voltage		±20	V
E_{AS}	Single Pulsed Avalanche Energy	(Note 2)	1310	mJ
E_{AR}	Repetitive Avalanche Energy	(Note 1)	17.3	mJ
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	7.0	V/ns
P_D	Total Power Dissipation(@T_C = 25 °C)		173	W
	Derating Factor above 25 °C		1.15	W/°C
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature		- 55 ~ 175	°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.		300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	-	0.87	°C/W
$R_{\theta CS}$	Thermal Resistance, Case to Sink	-	0.5	-	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

Electrical Characteristics (T_C = 25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	80	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature coefficient	I_D = 250uA, referenced to 25 °C	-	0.08	-	V/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS} = 80V, V_{GS} = 0V	-	-	10	uA
		V_{DS} = 64V, T_C = 125 °C	-	-	100	uA
I_{GSS}	Gate-Source Leakage, Forward	V_{GS} = 20V, V_{DS} = 0V	-	-	100	nA
	Gate-source Leakage, Reverse	V_{GS} = -20V, V_{DS} = 0V	-	-	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	2.0	-	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	V_{GS} =10 V, I_D = 37.5A	-	0.012	0.015	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} =0 V, V_{DS} =25V, f = 1MHz	-	2600	3380	pF
C_{oss}	Output Capacitance		-	940	1220	
C_{rss}	Reverse Transfer Capacitance		-	210	275	
Dynamic Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} =40V, I_D =75A, R_G =25Ω (Note 4, 5)	-	30	70	ns
t_r	Rise Time		-	225	460	
$t_{d(off)}$	Turn-off Delay Time		-	165	340	
t_f	Fall Time		-	155	320	
Q_g	Total Gate Charge	V_{DS} =64V, V_{GS} =10V, I_D =75A (Note 4, 5)	-	80	105	nC
Q_{gs}	Gate-Source Charge		-	15	-	
Q_{gd}	Gate-Drain Charge(Miller Charge)		-	32	-	

Source-Drain Diode Ratings and Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
I_S	Continuous Source Current	Integral Reverse p-n Junction Diode in the MOSFET	-	-	75	A
I_{SM}	Pulsed Source Current		-	-	300	
V_{SD}	Diode Forward Voltage	I_S =75A, V_{GS} =0V	-	-	1.5	V
t_{rr}	Reverse Recovery Time	I_S=75A, V_{GS}=0V, dI_F/dt=100A/us	-	90	-	ns
Q_{rr}	Reverse Recovery Charge		-	250	-	uC

※ NOTES
1. Repeativity rating : pulse width limited by junction temperature
2. L = 0.32mH, I_{AS} =75A, V_{DD} = 25V, R_G = 25Ω , Starting T_J = 25°C
3. $I_{SD} \leq$ 75A, di/dt $\leq$ 300A/us, $V_{DD} \leq BV_{DSS}$, Starting T_J = 25°C
4. Pulse Test : Pulse Width $\leq$ 300us, Duty Cycle $\leq$ 2%
5. Essentially independent of operating temperature.

Typical Characteristics

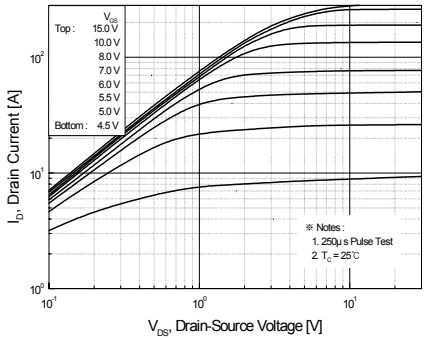


Figure 1. On-Region Characteristics

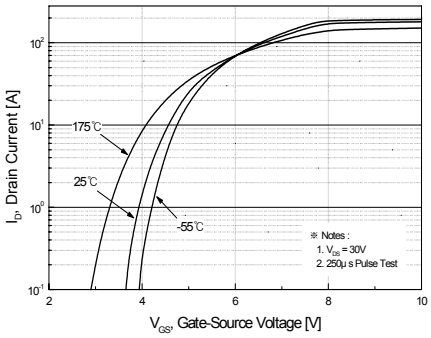


Figure 2. Transfer Characteristics

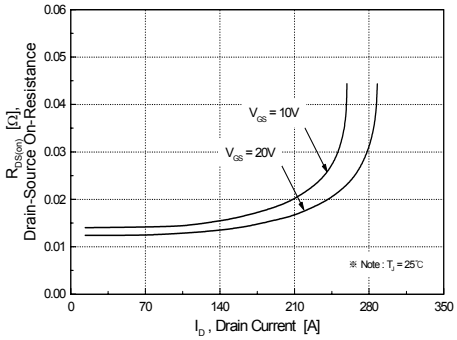


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

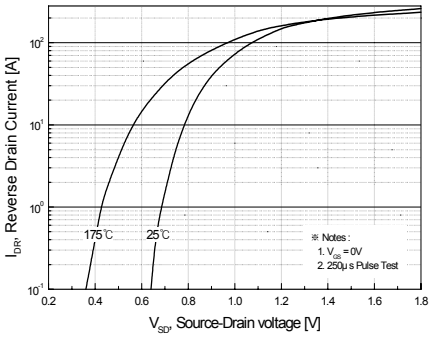


Figure 4. Body Diode Forward Voltage Variation vs. Source Current

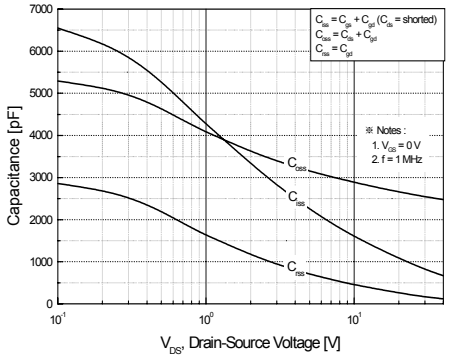


Figure 5. Capacitance Characteristics

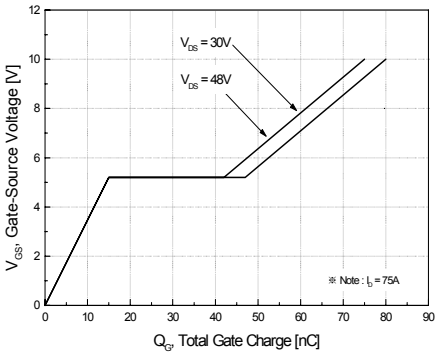


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

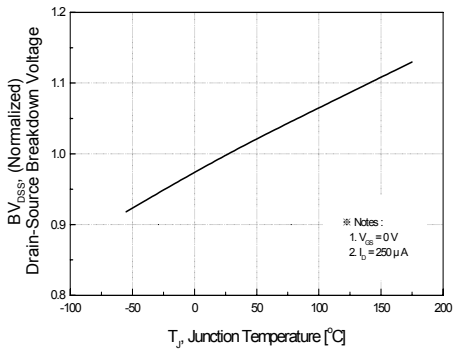


Figure 7. Breakdown Voltage Variation vs. Temperature

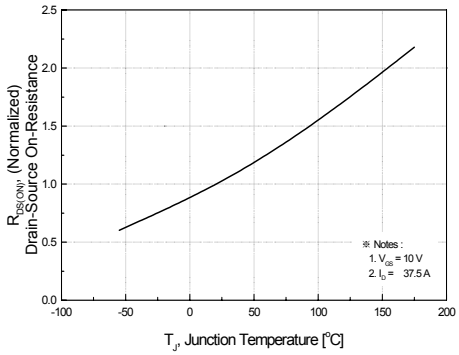


Figure 8. On-Resistance Variation vs. Temperature

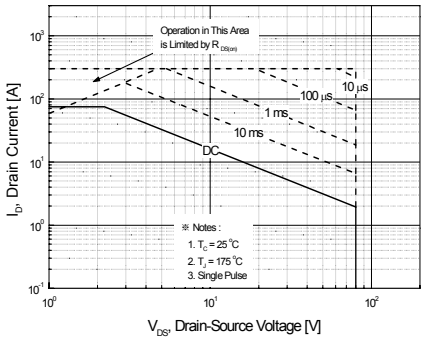


Figure 9. Maximum Safe Operating Area

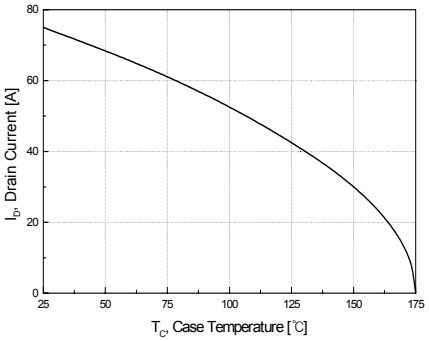


Figure 10. Maximum Drain Current vs. Case Temperature

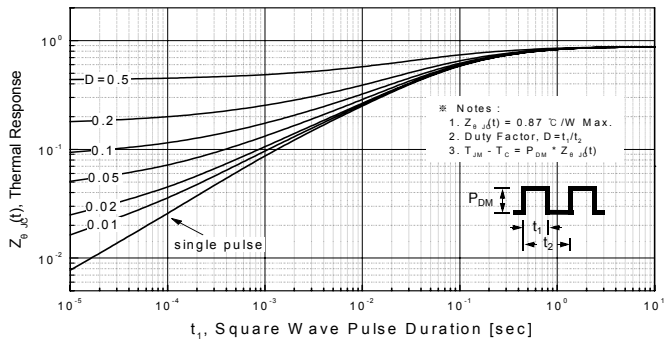
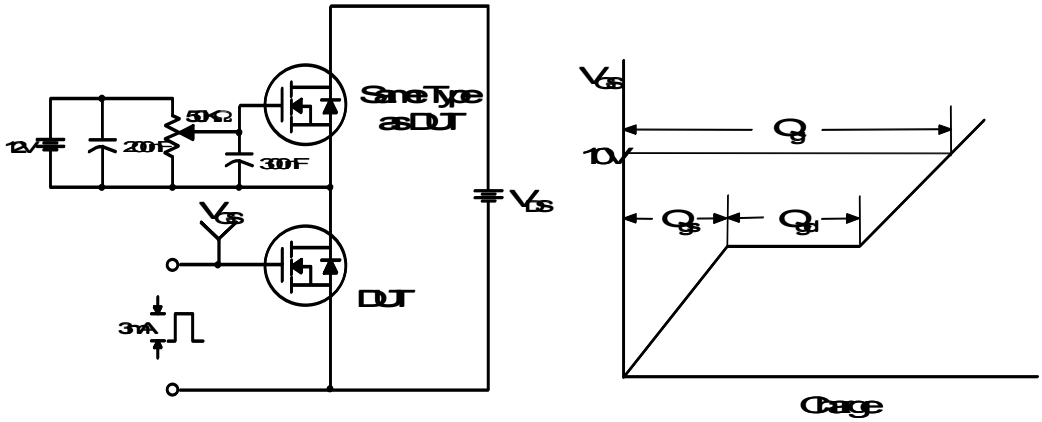
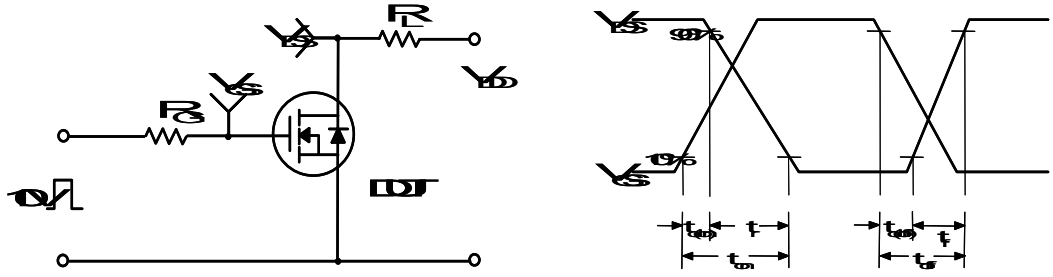


Figure 11. Transient Thermal Response Curve

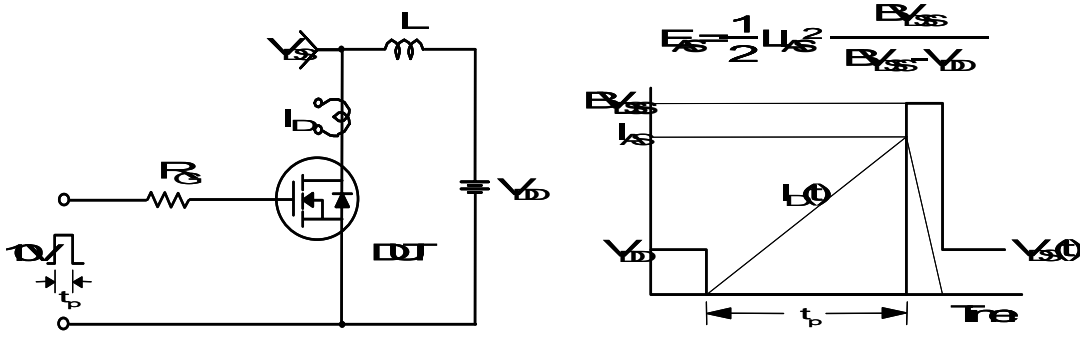
Gate Charge Test Circuit & Waveform



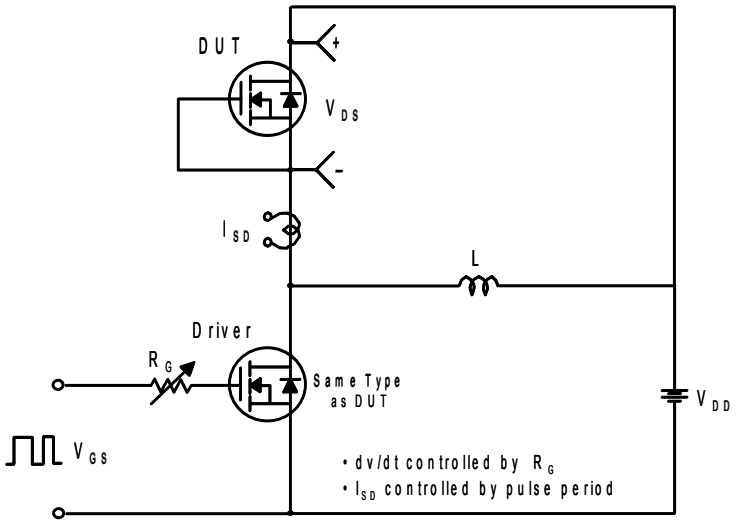
Resistive Switching Test Circuit & Waveforms

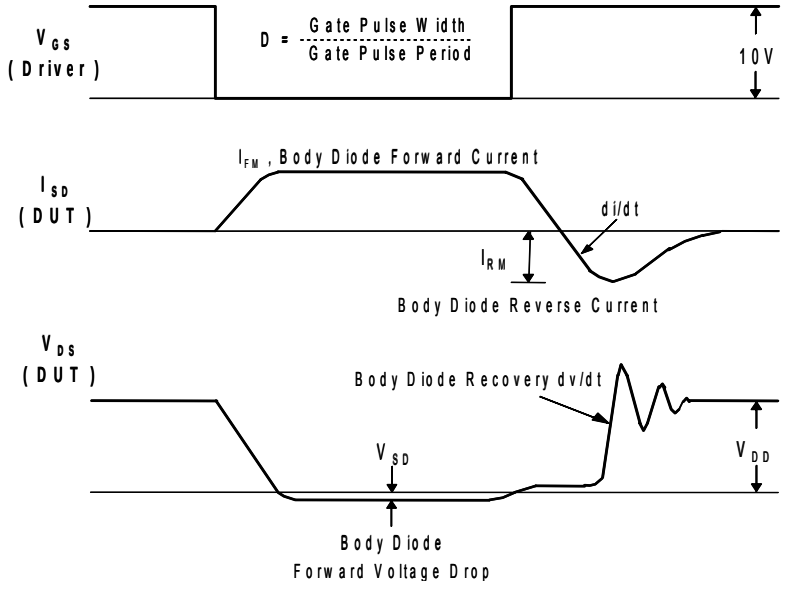


Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms





Package Dimensions

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