

75V N-Channel MOSFET

Features

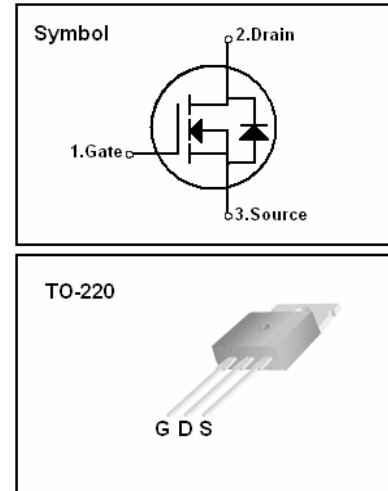
- 80A,75v,RDS(on)=11mΩ@VGS=10V
- Gate charge (Typical 64nC)
- High ruggedness
- Fast switching
- 100% Avalanche Tested
- Improved dv/dt capability

Application

- DC Motor Control
- Solenoid and Relay Drivers
- DC-DC Converters
- Automotive Environment

Advantage

- Easy to Mount
- Space Savings
- High Power Density



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
VDSS	Drain to Source Voltage	75	V
ID	Continuous Drain Current(@TC = 25°C)	80	A
	Continuous Drain Current(@TC = 100°C)	53	A
IDM	Drain Current Pulsed (Note 1)	320	A
VGS	Gate to Source Voltage	±20	V
EAS	Single Pulsed Avalanche Energy (Note 2)	700	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	12	V/ns
PD	Total Power Dissipation(@TC = 25 °C)	300	W
TSTG, TJ	Operating Junction Temperature & Storage Temperature	-55 ~ 175	°C
TL	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	300	°C

Thermal Characteristics

Symbol	Parameter	Value	Units
RθJC	Thermal Resistance, Junction-to-Case	0.5	°C/W
RθJA	Thermal Resistance, Junction	62.5	°C/W
RθJA	Thermal Resistance, Junction-to-Ambient	62.5	°C/W

TSP75N75M

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BVDSS	Drain-Source Breakdown Voltage	VGS = 0V, ID = 250uA	75	83	-	V
IDSS	Drain-Source Leakage Current	VDS = 75V, VGS = 0V	-	-	1	uA
		VDS = 60V, TC = 125 °C	-	-	10	uA
IGSS	Gate-Source Leakage, Forward	VGS = 20V, VDS = 0V	-	-	100	nA
	Gate-source Leakage, Reverse	VGS = -20V, VDS = 0V	-	-	-100	nA
On Characteristics						
VGS(th)	Gate Threshold Voltage	VDS = VGS, ID = 250uA	2.0	2.5	4.0	V
RDS(ON)	Static Drain-Source On-state Resistance	VGS = 10V, ID = 40A	-	9.4	11	mΩ
gFS	Forward Transconductance	VDS = 15V, ID = 40A	-	80	-	S
Dynamic Characteristics						
Ciss	Input Capacitance	VGS = 0V, VDS = 25V, f = 1MHz	-	2950	-	pF
Coss	Output Capacitance		-	768	-	
Crss	Reverse Transfer Capacitance		-	8	-	
Dynamic Characteristics						
td(on)	Turn-on Delay Time	VDD = 37.5V, ID = 45A, VGS = 10V, RG = 4.7Ω (Note 4, 5)	-	34	-	ns
tr	Rise Time		-	3	-	
td(off)	Turn-off Delay Time		-	62	-	
tf	Fall Time		-	13	-	
Qg	Total Gate Charge	VDS = 60V, VGS = 10V, ID = 75A (Note 4, 5)	-	64	-	nC
Qgs	Gate-Source Charge		-	20	-	
Qgd	Gate-Drain Charge(Miller Charge)		-	14	-	

Source-Drain Diode Ratings and Characteristics

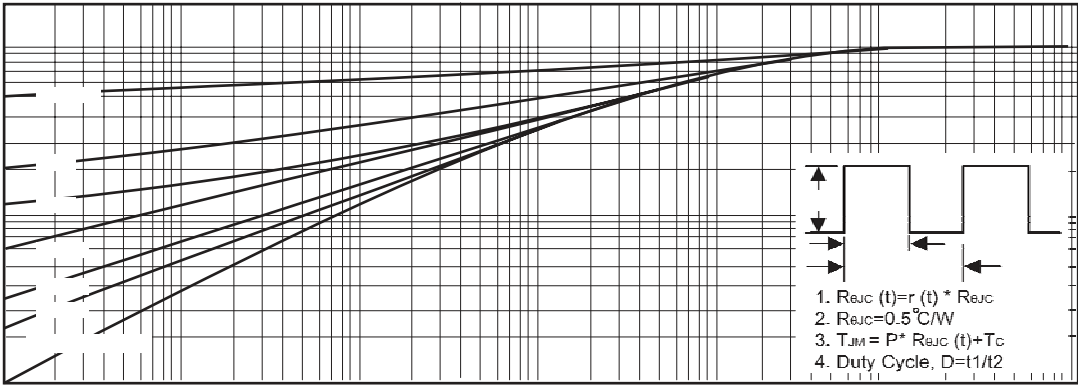
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
IS	Continuous Source Current	Integral Reverse p-n Junction	-	-	80	A
ISM	Pulsed Source Current	Diode in the MOSFET	-	-	320	
VSD	Diode Forward Voltage	IS=80A, VGS=0V	-	0.98	1.4	V
trr	Reverse Recovery Time	IS=80A, VGS=0V, dIF/dt=100A/us	-	130	-	ns
Qrr	Reverse Recovery Charge	IS=80A, VGS=0V, dIF/dt=100A/us	-	0.6	-	uC

※ NOTES

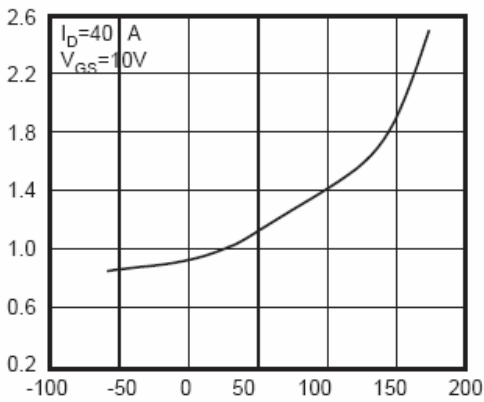
- Repetitive Rating : Pulse width limited by maximum junction temperature.
- Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.
- Guaranteed by design, not subject to production testing.
- L=1mH, VDD = 38V, ID=37.5A, RG = 25Ω, Starting TJ = 25 °C



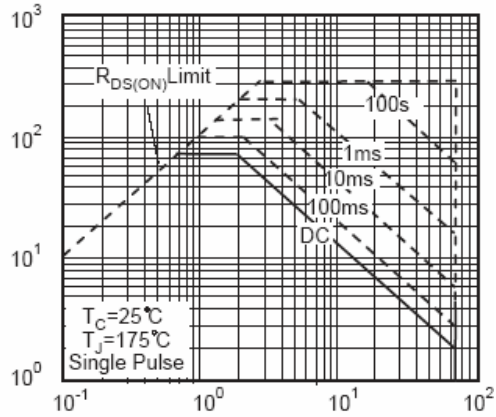
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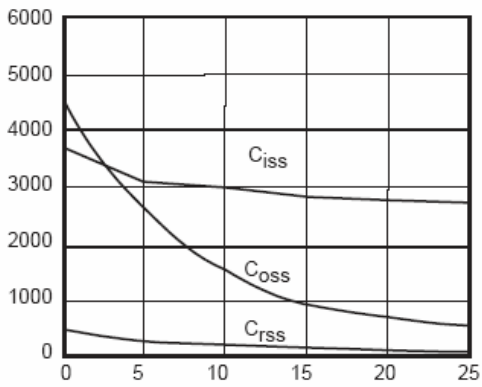
Square Pulse Duration (sec)
Figure 1. Normalized Effective Transient Thermal Impedance With Pulse Duration



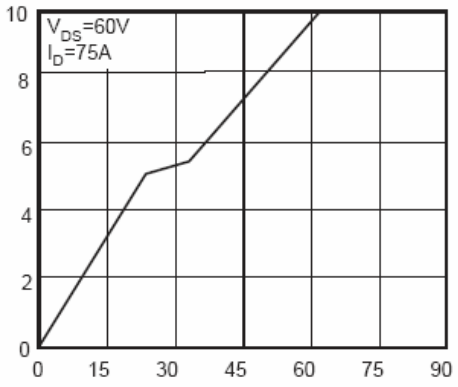
T_J, Junction Temperature (C)
Figure 2. Normalized On-Resistance Variation with Temperature



V_{DS}, Drain-Source Voltage (V)
Figure 3. Maximum Safe Operating Area



V_{DS}, Drain-to-Source Voltage (V)
Figure 4. Capacitance Characteristics



Q_g, Total Gate Charge (nC)
Figure 5. Gate Charge Characteristics



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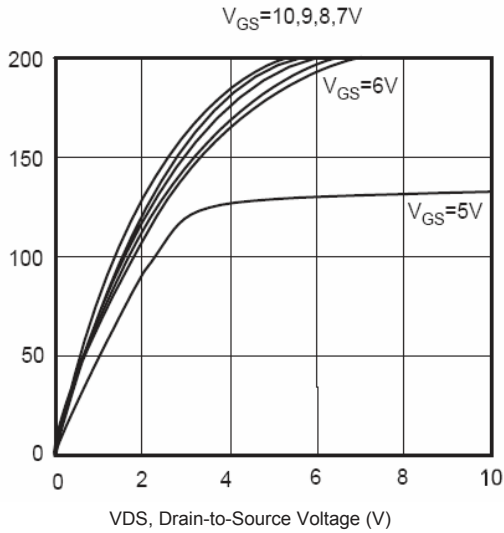


Figure 6. On-State Characteristics

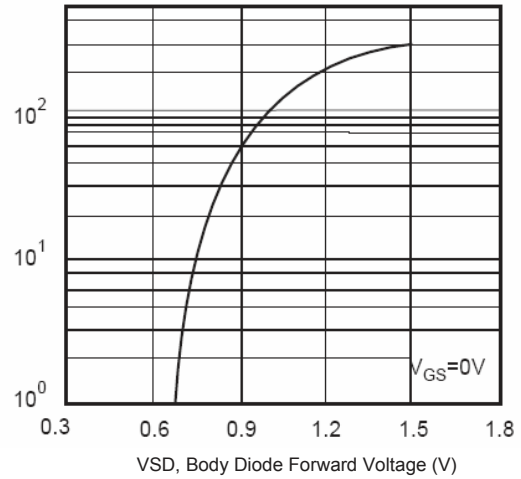


Figure 7. Body Diode Forward Voltage Variation with Source Current

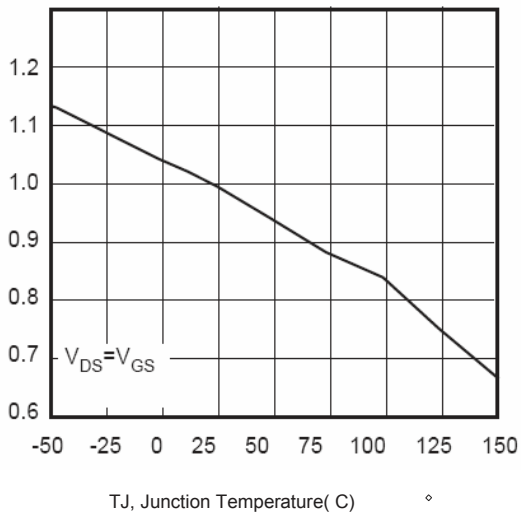


Figure 8. Gate Threshold Variation with Temperature

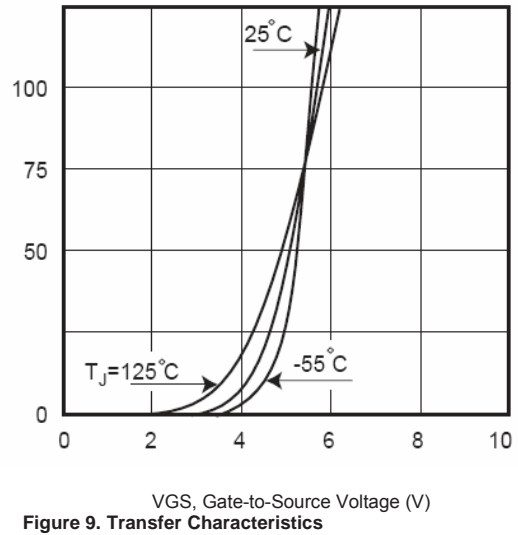


Figure 9. Transfer Characteristics



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Fig. 12. Gate Charge Test Circuit & Waveforms

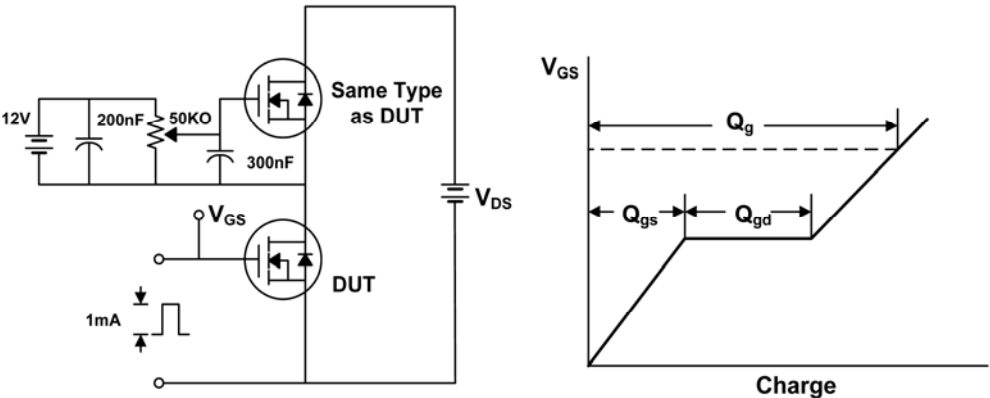


Fig 13. Switching Time Test Circuit & Waveforms

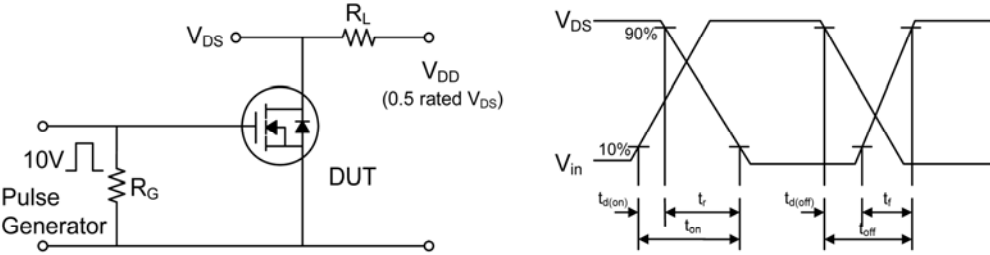
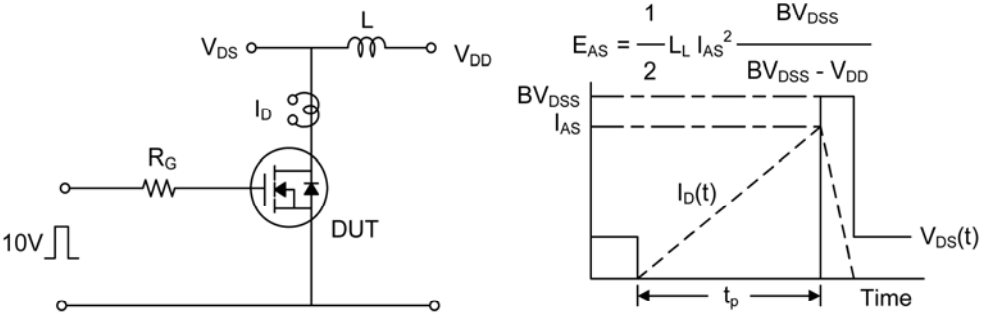


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms



TSP75N75M

Fig. 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

