

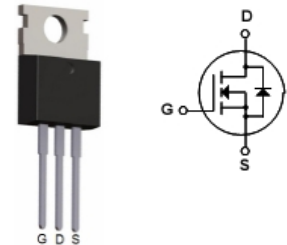
TS75N09A

90A 65V N-Channel Enhancement Mode Power Mosfet

DRAWING

Features

- ◆ 90A,65V, $R_{DS(ON)}=6.8m\Omega@V_{GS}=10V$
- ◆ Special process technology for high ESD capability
- ◆ High density cell design for ultra low Rdson
- ◆ Fully characterized Avalanche voltage and current
- ◆ Good stability and uniformity with high Eas
- ◆ Excellent package for good heat dissipation



General Description

- ◆ Package:TO-220C
- ◆ The TS75N09A uses advanced trench technology and design to provide excellent T_{dson} with low gate charge.It can be used in a wide variety of applications.

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

Symbol	Parameter	Spec	Units
V_{DSS}	Drain-Source Voltage	65	V
I_D	Drain Current -Continuous($T_c=25^\circ C$)	90	A
I_D	Drain Current -Continuous($T_c=100^\circ C$)	63	A
I_{DM}	Drain Current -Pulsed	300	A
V_{GSS}	Gate-Source Voltage	± 25	V
P_D	Maximum Power Dissipation	160	W
	Derating factor	1.07	$w/^\circ C$
E_{AS}	Single Pulsed Avalanche Energy (Note 5)	550	mJ
T_J, T_{DTG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ C$
R_{JC}	Thermal Resistance,Junction-to-Case (Note 2)	0.94	$^\circ C/W$

Electrical Characteristics($T_c=25^\circ C$ unless otherwise noted)

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	65	68	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=65V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current,	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA

On Characteristics (Note 3)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{GTH}	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=40A$	-	6.8	8	$m\Omega$
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=40A$	60	-	-	S

Dynamic Characteristics (Note 4)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Cjss	Input Capacitance	VDS=30V,VGS=0V,f=1.0MHz	—	3590		pF
Coss	Output Capacitance		—	371		pF
Crss	Reverse Transfer Capacitance		—	258		pF

Switching Characteristics (Note 4)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
t _{don}	Turn-On Delay Time	V _{DD} =30V	—	18	—	ns
t _r	Turn-On Rise Time	I _D =30A	—	120	—	ns
t _{doff}	Turn-Off Delay Time	R _G =6.8Ω	—	55	—	ns
t _f	Turn-Off Fall Time	V _{GS} =10V	—	68	—	ns
Q _g	Total Gate Charge	V _{DS} =30V	—	73	—	nc
Q _{gs}	Gate-Source Charge	I _D =30A	—	16.6	—	nc
Q _{gd}	Gate-Drain Charge	V _{GS} =10V	—	26	—	nc

Drain-Source Diode Characteristics and Maximum Ratings

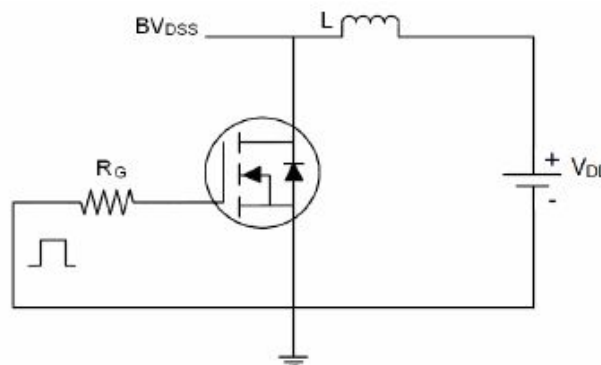
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
I _s	diode forward current (Note 3)		—	—	78	A
V _{sd}	diode forward Voltage (Note 2)	V _{GS} =0V,I _S =20A	—	—	1.2	V
T _{rr}	Reverse Recovery Time	T _J =25°C,I _S =30A	—	45	—	ns
Q _{rr}	Reverse Recovery charge	di/dt=100A/us (Note 3)	—	76	—	uc
T _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible(turn-on is dominated by LS+LD)				

Notes:

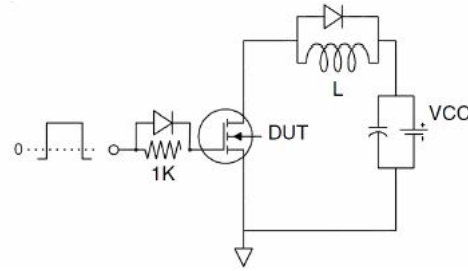
- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.Surface Mounted on FR4 Board, t≤10 sec
- 3.Pulse Test: Pulse Width ≤300us,Duty cycle≤2%
- 4.Guaranteed by design, not subject to production
- 5.EAS condition: T_J=25°C,V_{DD}=30V,V_G=10V,L=0.5mH,R_G=25Ω

Test circuits

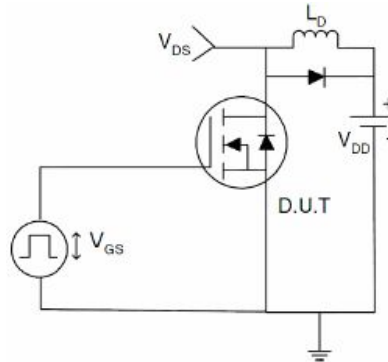
1)EAS Test Circuits



2) Cate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical And Thermal Characteristics(Curves)

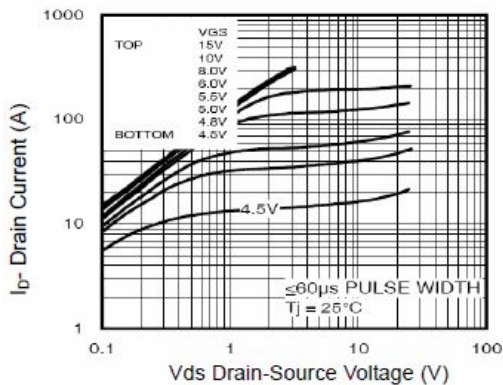


Figure 1 Output Characteristics

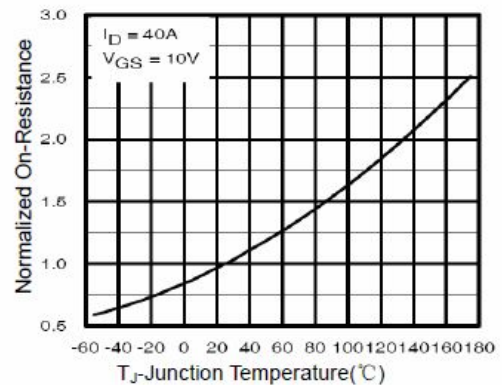


Figure 4 R_{DS(on)}-Junction Temperature

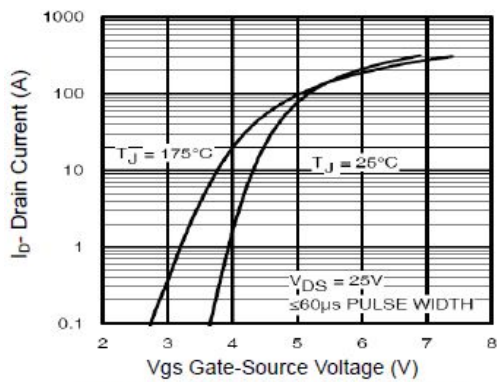


Figure 2 Transfer Characteristics

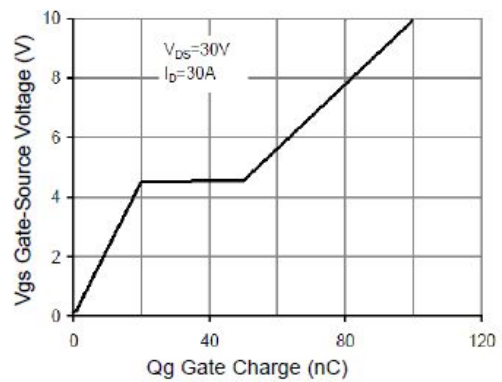


Figure 5 Gate Charge

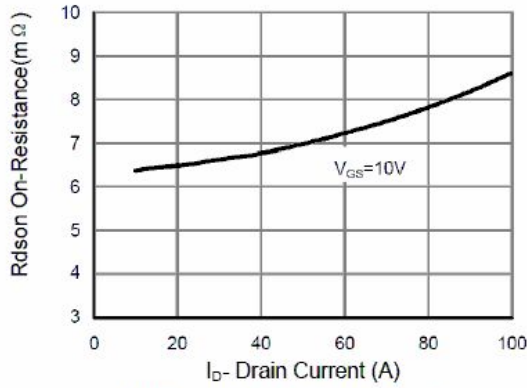


Figure 3 Rdson- Drain Current

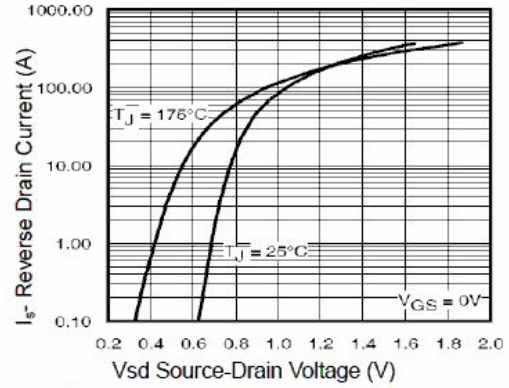


Figure 6 Source- Drain Diode Forward

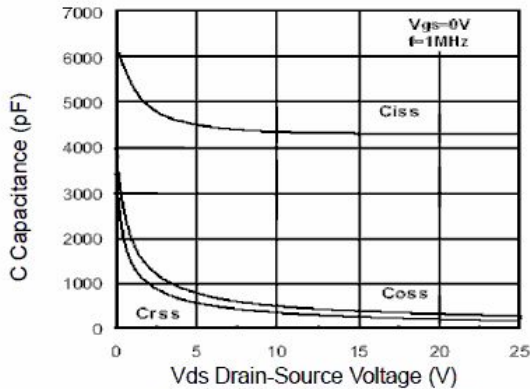


Figure 7 Capacitance vs Vds

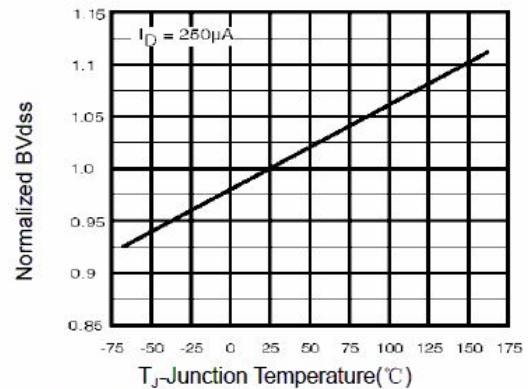


Figure 9 BV_{DSS} vs Junction Temperature

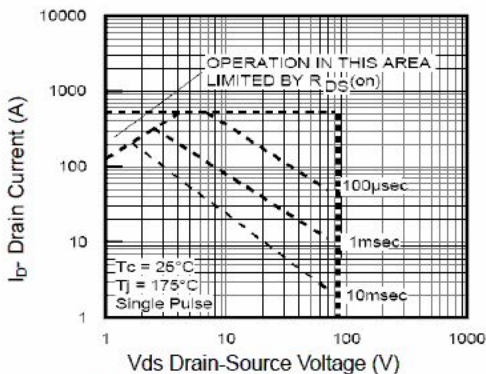


Figure 8 Safe Operation Area

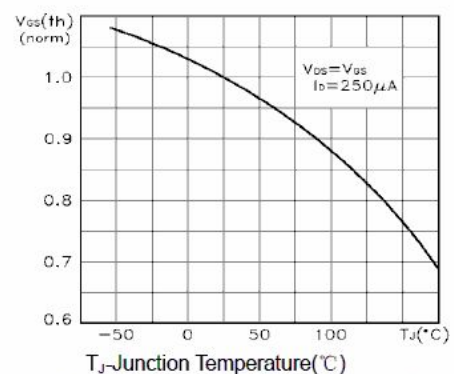


Figure 10 $V_{GS(th)}$ vs Junction Temperature

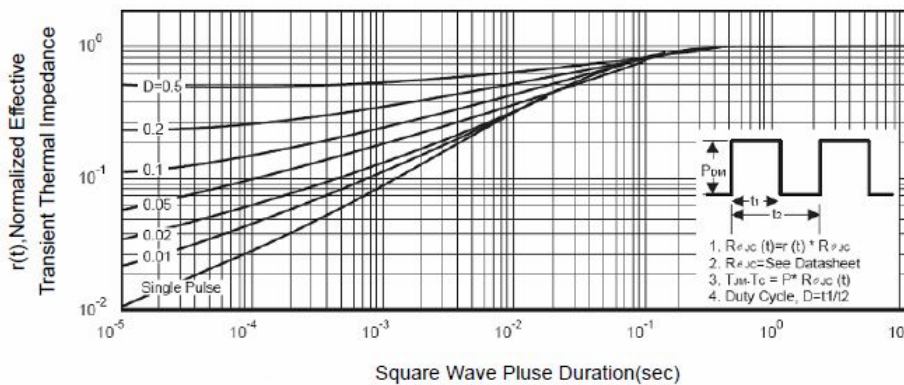


Figure 11 Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions

