

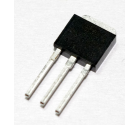
TS8N60

7.5Amps, 600V N-Channel Power Mosfet

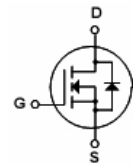
DRAWING

Features

- ◆ 7.5A,600V, $R_{DS(ON)}=1.0\Omega@V_{GS}=10V$
- ◆ Ultra low gate charge(typical 28nc)
- ◆ Low reverse transfer capacitance (C_{RSS} =typical 12.0 PF)
- ◆ Fast switching capability
- ◆ Avalanche energy specified
- ◆ Improved dv/dt capability, high ruggedness



G D S



General Description

- ◆ Package:TO-251
- ◆ This is a high voltage and high current power MOSFET ,Designed to have better characteristics, such as fast switching time , low gate charge, low on-state resistance and have a high rugged avalanche characteristics.This power MOSFET is usually used at high speed switching applications in power supplies ,PWM motor controls. High Efficient DC to DC converters and bridge circuits.

Absolute Maximum Ratings

Symbol	Parameter	Spec	Units
V_{DSS}	Drain-Source Voltage	600	V
I_D	Drain Current -Continuous($T_c=25^\circ C$)	7.5	A
	Drain Current -Continuous($T_c=100^\circ C$)	4.6	
I_{DM}	Drain Current -Pulsed	30	A
I_{AR}	Avalanche Current	7.5	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	230	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	14.7	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
P_D	Power Dissipation	50	W
T_j	Junction Temperature	+150	$^\circ C$
T_{opr}	Operating Temperature Range	-55 to +150	$^\circ C$
T_{stg}	Storage Temperature	-55 to +150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	—	1.67	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	—	62.5	°C/W

Electrical Characteristics(Tc=25°C unless otherwise noted)
Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	600	—	—	V
BV_{DSS}/T_J	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$, Referenced to 25°C	—	0.7	—	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=600V, V_{GS}=0V$	—	—	1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS}=30V, V_{DS}=0V$	—	—	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	—	—	-100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{Gsth}	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	—	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=4A$	—	0.78	1.0	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C_{jss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	—	1740	2500	pF
C_{oss}	Output Capacitance		—	137	185	pF
C_{rss}	Reverse Transfer Capacitance		—	12	16	pF

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
t_{don}	Turn-On Delay Time	$V_{DD}=300V$ $I_D=7.5A$ $R_G=25\Omega$ (Note 4 .5)	—	16.5	45	ns
t_r	Turn-On Rise Time		—	60.5	130	ns
t_{doff}	Turn-Off Delay Time		—	81	170	ns
t_f	Turn-Off Fall Time		—	64.5	140	ns
Q_g	Total Gate Charge	$V_{DS}=480V$	—	28	36	nc
Q_{gs}	Gate-Source Charge	$I_D=7.5A$	—	4.5		nc
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$ (Note 4 .5)	—	12		nc

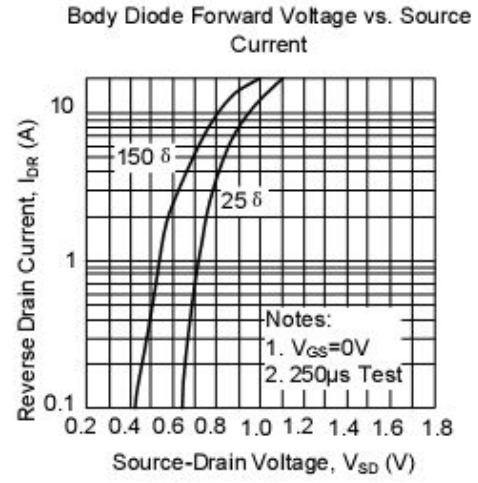
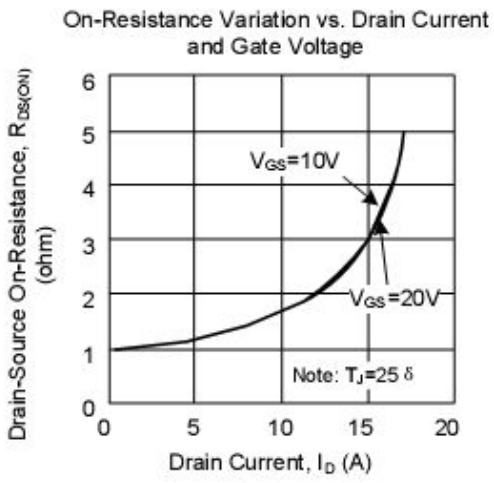
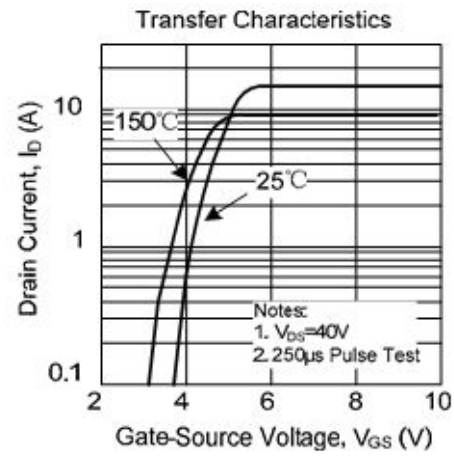
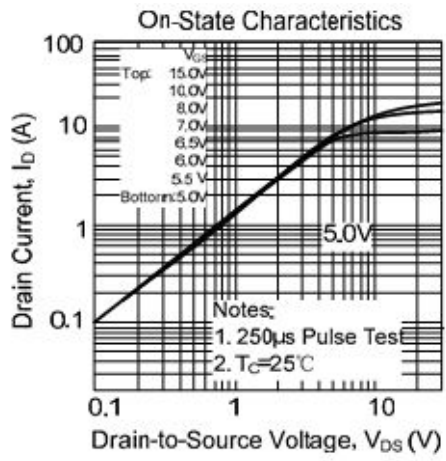
Drain-Source Diode Characteristics and Maximum Ratings

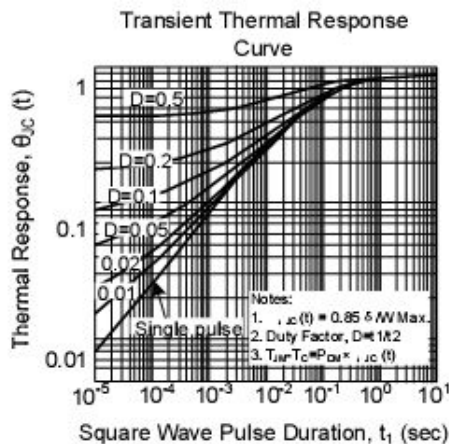
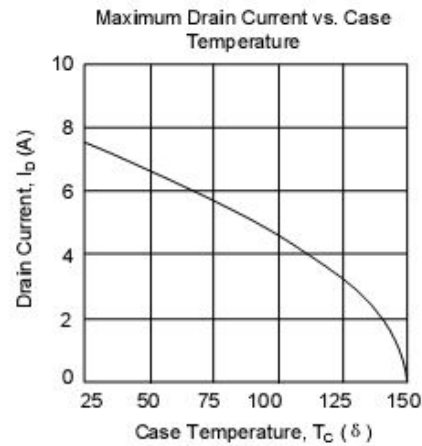
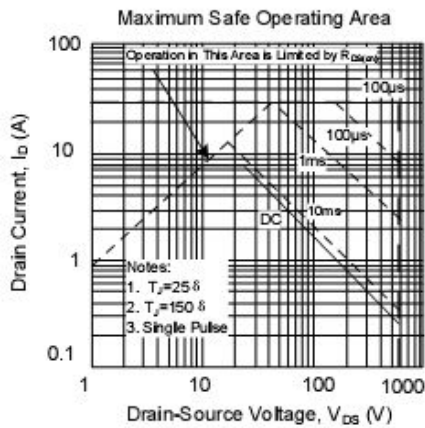
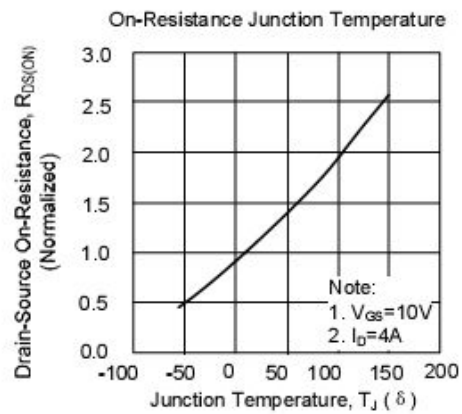
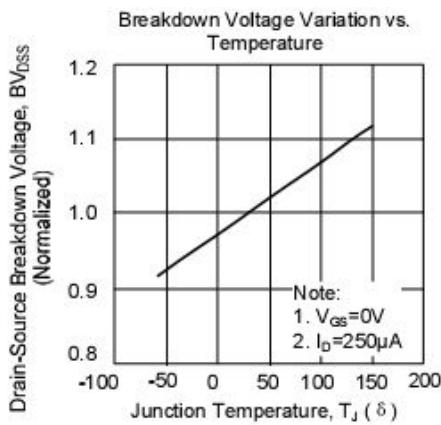
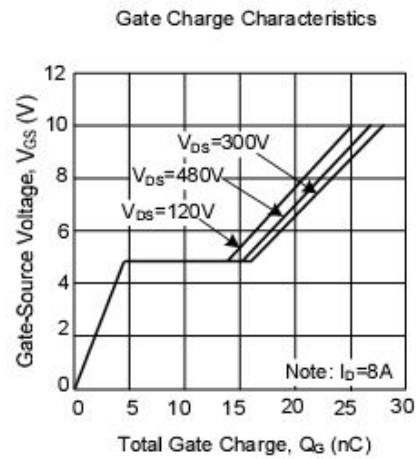
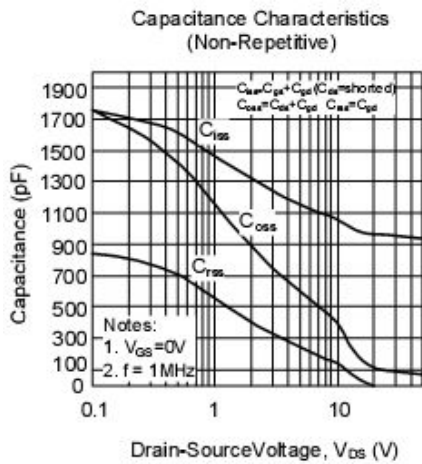
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
I _s	Maximum Continuous Drain-source diode forward current		-	-	7.5	A
I _{sm}	Maximum pulsed drain-source diode diode forward current		-	-	30	A
V _{sd}	Drain-source diode forward Voltage	V _{GS} =0V, I _S =7.5A	-	-	1.4	V
T _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =7.5A	-	365	-	ns
Q _{rr}	Reverse Recovery charge	di/dt=100A/us (Note 4)	-	3.4	-	uc

Notes:

1. Repetitive Rating : Pulse width limited by T_j
2. L = 7.3mH, I_{AS} = 7.5A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3. I_{SD} ≤ 7.5A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

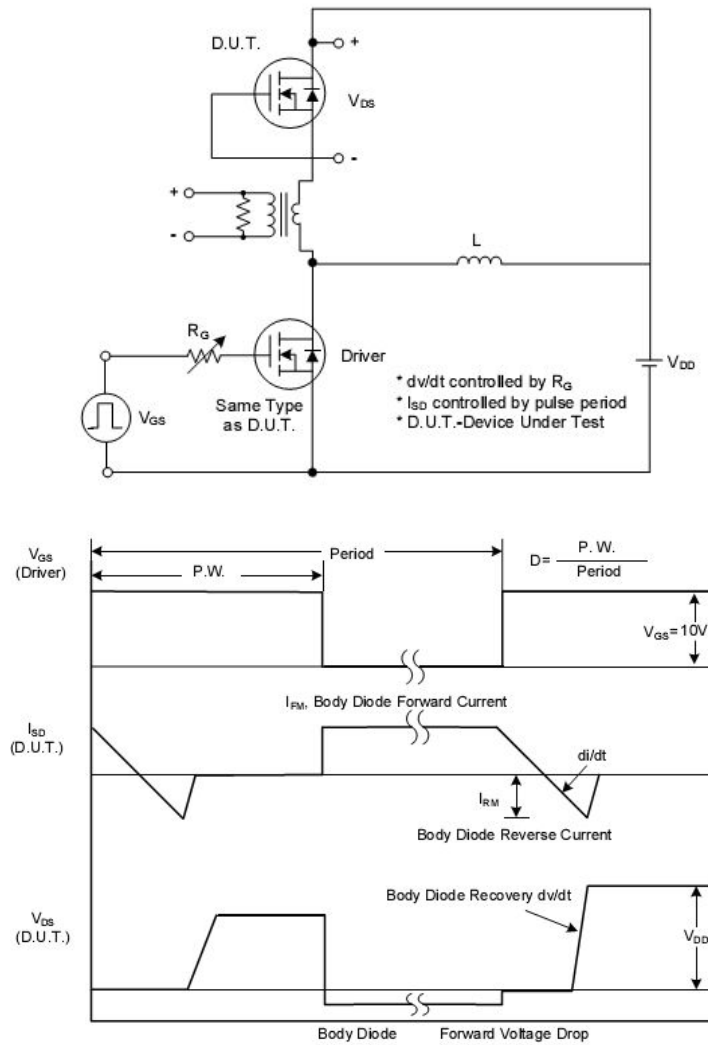
Typical Characteristics



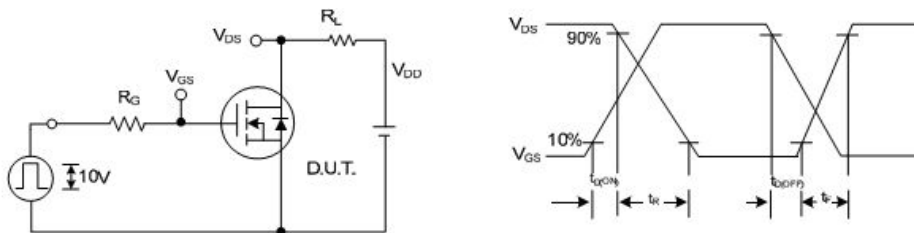


Test circuits and waveforms

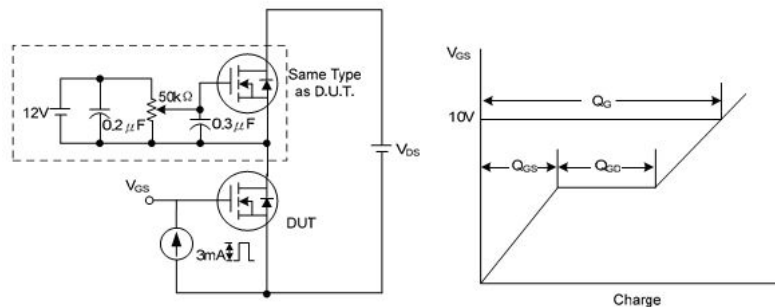
Peak Diode Recovery dv/dt Circuit & Waveforms



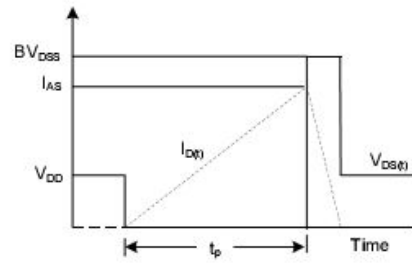
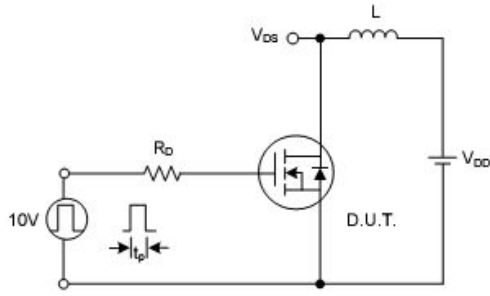
Switching Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveforms



Mechanical Dimensions

