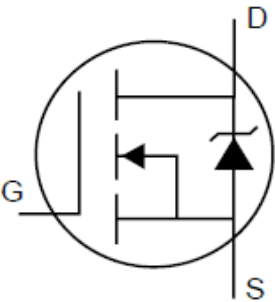
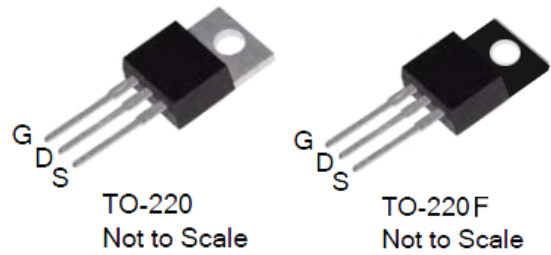


600V N-Channel MOSFET
GENERAL DESCRIPTION

This Power MOSFET is produced using advanced planar stripe DMOS technology. This latest technology has been especially designed to minimize on-state resistance, Have a high rugged avalanche characteristics. These devices are well suited for high efficiency switched mode power supplies, active power factor correction. electronic lamp ballasts based on half bridge topology.

V _{DSS}	R _{DS(ON)}	I _D
600V	1.2Ω	7.5A



Features

- 7.5A, 600V, RDS(on) = 1.2Ω @VGS = 10 V
- Low gate charge (typical 30nC)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Ordering Information

PART NUMBER	PACKAGE	BRAND
8N60/8N60F	TO-220/220F	0GFD

Absolute Maximum Ratings

TC = 25°C unless otherwise noted

Symbol	Parameter	8N60	8N60F	Units
V _{DSS}	Drain-Source Voltage	600		V
I _D	Drain Current - Continuous (TC = 25°C) - Continuous (TC = 100°C)	7.5	7.5	A
		4.5	4.5	A
I _{DM}	Drain Current- Pulsed (Note 1)	30	30	A
V _{GSS}	Gate-Source Voltage	± 30		V
E _{AS}	Single Pulsed Avalanche Energy (Note 2)	285		mJ
E _{AR}	Repetitive Avalanche Energy (Note 1)	15.5		mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5		V/ns
P _D	Power Dissipation (TC = 25°C)	165	165	W
	Derate above 25°C	1.21	1.21	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150		°C
T _L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300		°C

Thermal Characteristics

Symbol	Parameter	8N60	8N60F	Units
R _{θJC}	Thermal Resistance, Junction-to-Case	0.85	0.85	°C/W
R _{θCS}	Thermal Resistance, Case-to-Sink Typ.	0.5	0.5	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	62.5	62.5	°C/W

Electrical Characteristics

TC = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μ A	600	--	--	V
Δ BV _{DSS} / Δ T _J	Breakdown Voltage Temperature Coefficient	I _D = 250 μ A, Referenced to 25°C	--	0.57	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 600 V, V _{GS} = 0 V	--	--	10	μ A
		V _{DS} = 480 V, T _C = 125°C	--	--	100	μ A
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30 V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V	--	--	-100	nA

On Characteristics

V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μ A	2.0	--	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 3.75 A	--	1.0	1.2	Ω

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	1255	--	pF
C _{oss}	Output Capacitance		--	115	--	pF
C _{rss}	Reverse Transfer Capacitance		--	14.2	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 300\text{ V}, I_D = 7.5\text{ A},$ $R_G = 25\ \Omega$ (Note 4, 5)	--	22	--	ns
t_r	Turn-On Rise Time		--	90	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	76	--	ns
t_f	Turn-Off Fall Time		--	44	--	ns
Q_g	Total Gate Charge	$V_{DS} = 480\text{ V}, I_D = 7.5\text{ A},$ $V_{GS} = 10\text{ V}$ (Note 4, 5)	--	30	--	nC
Q_{gs}	Gate-Source Charge		--	5.2	--	nC
Q_{gd}	Gate-Drain Charge		--	16.3	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	7.5	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	30	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 7.5\text{ A},$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$V_{GS} = 0\text{ V}, I_S = 7.5\text{ A},$ $dI_F / dt = 100\text{ A}/\mu\text{s}$ (Note 4)	--	390	--	ns
Q_{rr}	Reverse Recovery Charge		--	3.3	--	μC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 20\text{ mH}, I_{AS} = 7.5\text{ A}, V_{DD} = 50\text{ V}, R_G = 50\ \Omega$, Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq 7.5\text{ A}, di/dt \leq 200\text{ A}/\mu\text{s}, V_{DD} \leq BVDSS$, Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature

Fig 1. On-State Characteristics

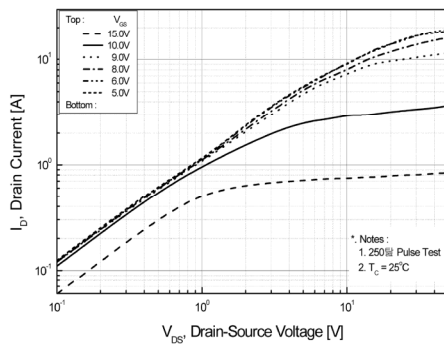


Fig 2. Transfer Characteristics

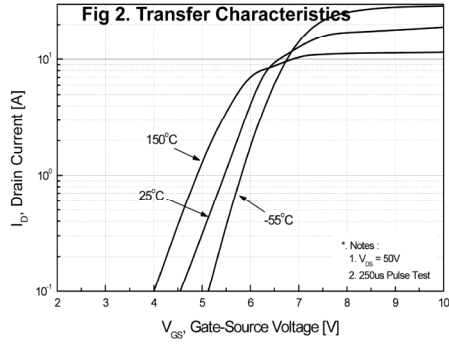


Fig 3. On Resistance Variation vs. Drain Current and Gate Voltage

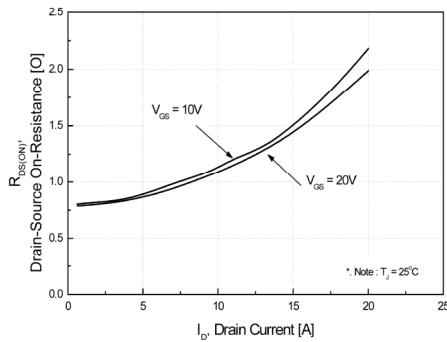


Fig 4. On State Current vs.

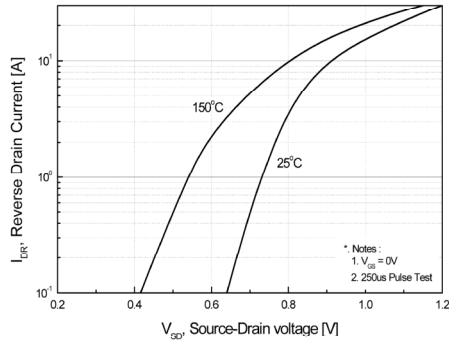


Fig 5. Capacitance Characteristics (Non-Repetitive)

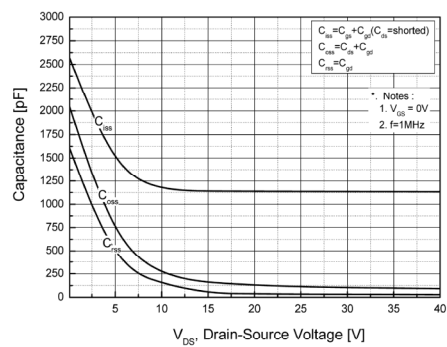


Fig 6. Gate Charge Characteristics

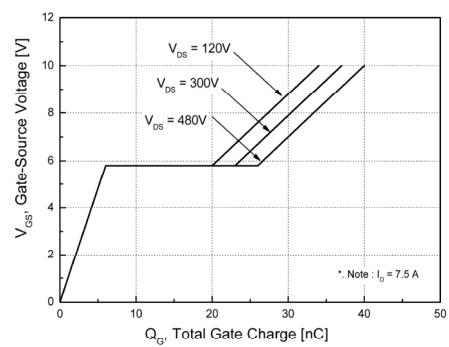


Fig 7. Breakdown Voltage Variation vs. Junction Temperature

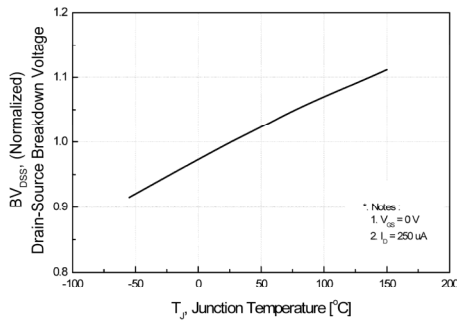


Fig 8. On-Resistance Variation vs. Junction Temperature

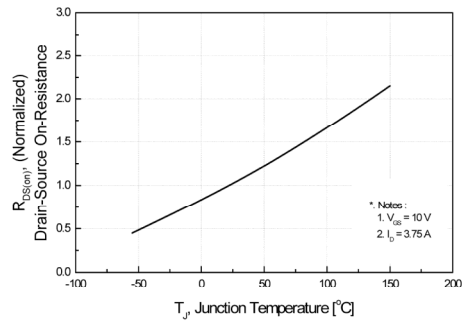


Fig 9-1 . Maximum Safe Operating Area fo TSP8N60M

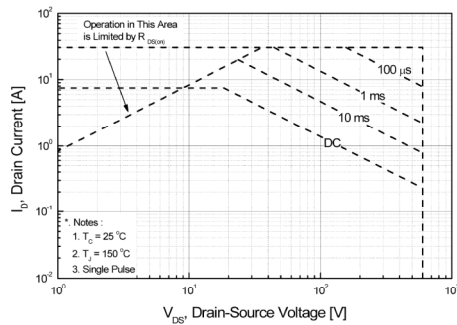


Fig 9-2 . Maximum Safe Operating Area for TSF8N60M

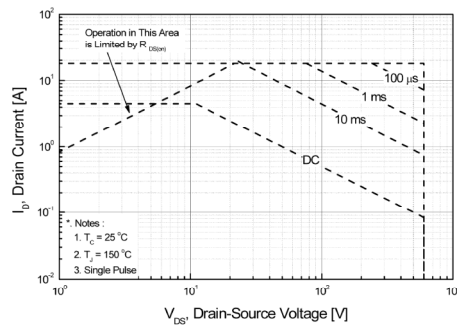


Fig 10. Maximum Drain Current vs. Case Temperature

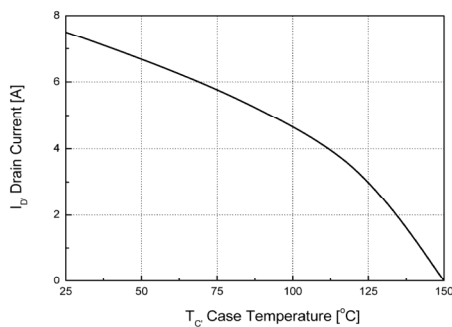


Fig 11-1 . Transient Thermal Response Curve for TSP8N60M

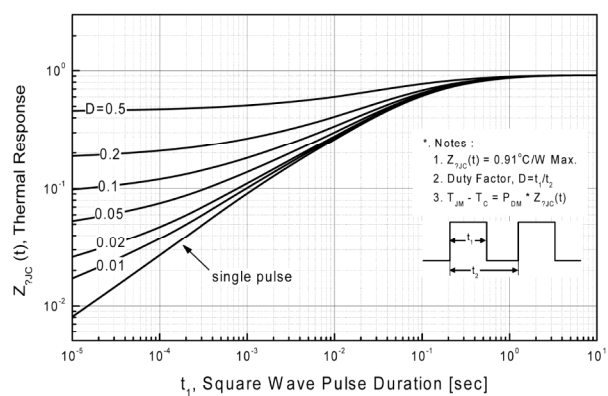


Fig 11-2 . Transient Thermal Response Curve for TSF8N60M

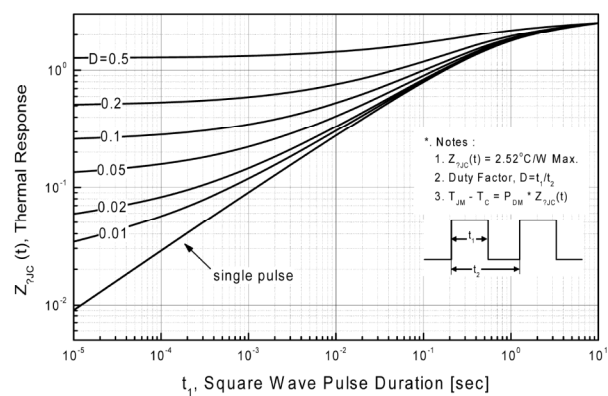


Fig. 12. Gate Charge Test Circuit & Waveforms

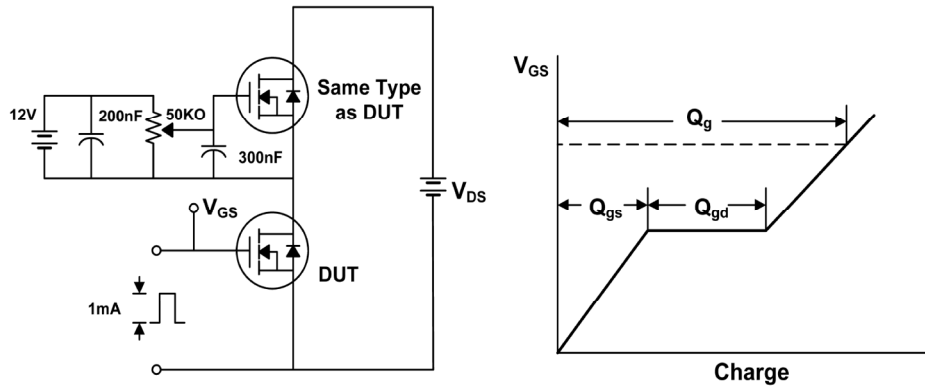


Fig. 13. Switching Time Test Circuit & Waveforms

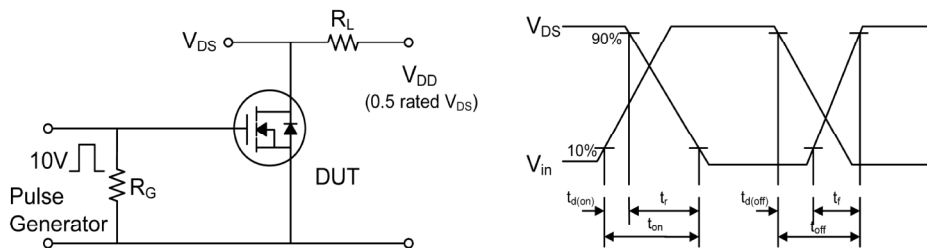


Fig. 14. Unclamped Inductive Switching Test Circuit & Waveforms

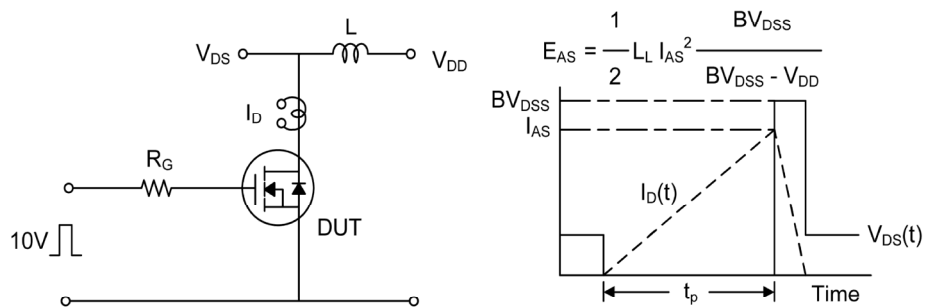


Fig. 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

