



Description

The STP90N6F6 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

$V_{DS} = 60V, I_D = 80A$

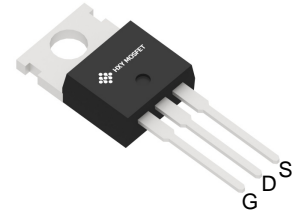
$R_{DS(ON)} < 7m\Omega @ V_{GS} = 10V$

Application

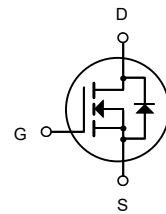
High efficiency switch mode power supplies

Power factor correction

Electronic lamp ballast



TO-220
(TO-220AB)



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Units Tube
STP90N6F6	TO-220(TO-220AB)	HXY MOSFET	50

Absolute Maximum Ratings@ $T_j=25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{Gs}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Drain Current, V _{Gs} @ 10V	80	A
I _{DM}	Pulsed Drain Current	340	A
P _D @T _C =25°C	Total Power Dissipation	120	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C



Electrical Characteristics(Tc=25°C, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
V_{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	2	2.8	4	V
R_{DS(on)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D 30A	---	5.8	7	mΩ
C_{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	3629	---	pF
C_{oss}	Output Capacitance		---	280.25	--	
C_{rss}	Reverse Transfer Capacitance		---	228	---	
t_{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D =30A, R _{ENG} =1.8Ω, V _{GS} =10V	---	18.9	---	ns
t_r	Rise Time		---	83.6	---	ns
t_{d(off)}	Turn-Off Delay Time		---	38.85	---	ns
t_f	Fall Time		---	80.75	---	ns
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =30A	---	80.85	---	nc
Q_{gs}	Gate-Source Charge		---	22.05	---	nc
Q_{gd}	Gate-Drain "Miller" Charge		---	25.2	---	nc
V_{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =30A	---	---	1.2	V
I_S	Continuous Drain Current	VD=VG=0V	---	---	80	A
I_{SM}	Pulsed Drain Current		---	---	340	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting T_J=25C, V_{DD}=30V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=27A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.



Typical Characteristics:

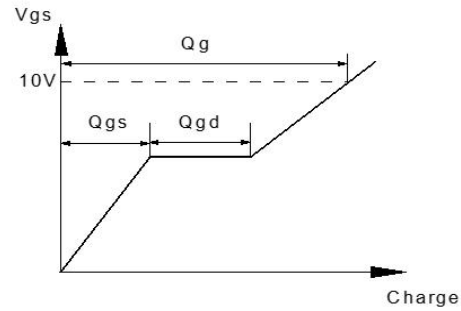
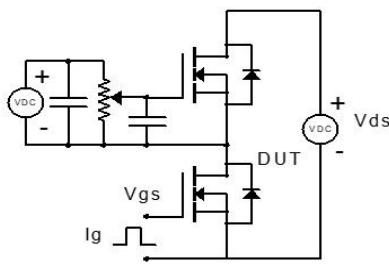


Figure 1: Gate Charge Test Circuit & Waveform

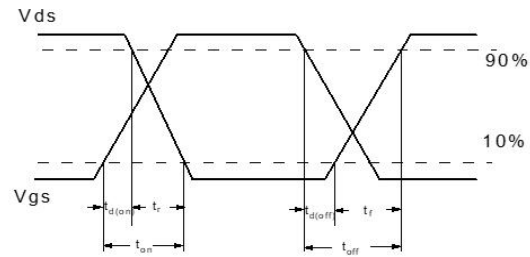
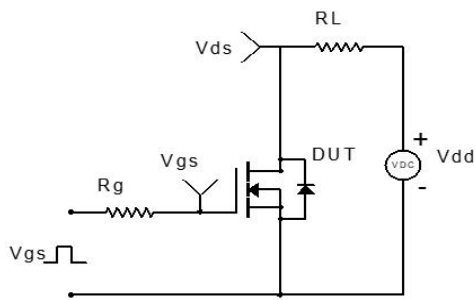


Figure 2: Resistive Switching Test Circuit & Waveform

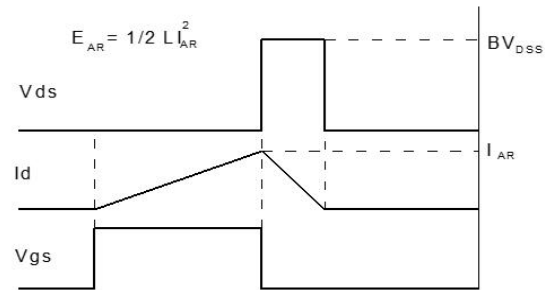
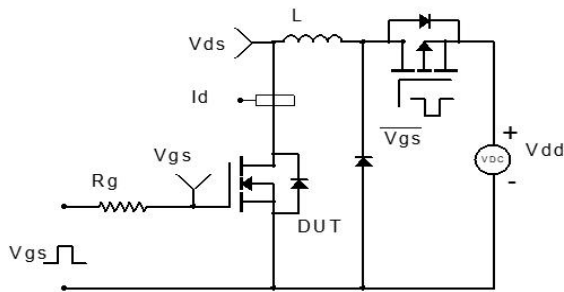


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

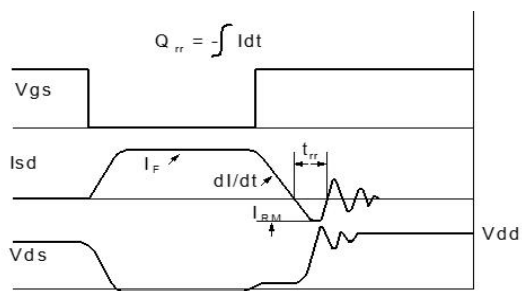
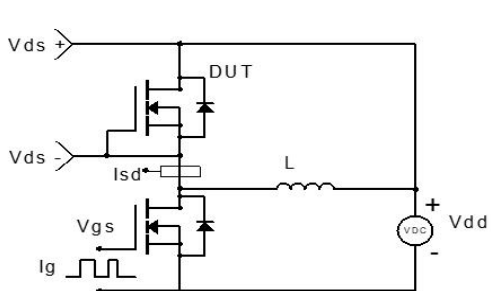
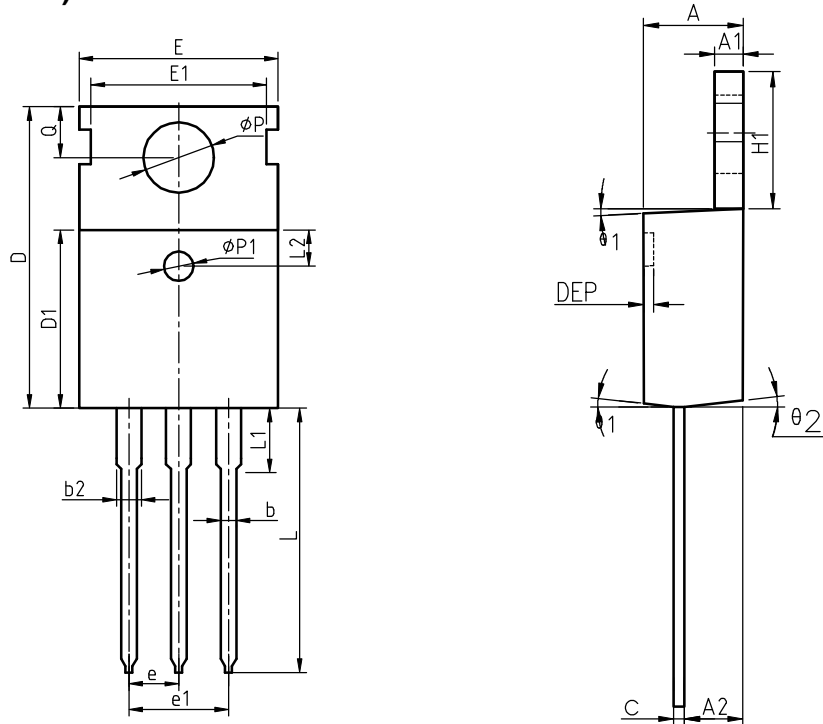


Figure 4: Diode Recovery Test Circuit & Waveform



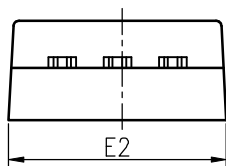
Package Information

TO-220(TO-220AB)



COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.27	1.30	1.33	0.050	0.051	0.052
A2	2.35	2.40	2.50	0.093	0.094	0.098
b	0.77	0.80	0.90	0.030	0.031	0.035
b2	1.17	1.27	1.36	0.046	0.050	0.054
c	0.48	0.50	0.56	0.019	0.020	0.022
D	15.40	15.60	15.80	0.606	0.614	0.622
D1	9.00	9.10	9.20	0.354	0.358	0.362
DEP	0.05	0.10	0.20	0.002	0.004	0.008
E	9.80	10.00	10.20	0.386	0.394	0.402
E1	-	8.70	-	-	0.343	-
E2	9.80	10.00	10.20	0.386	0.394	0.402
e		2.54	BSC		0.100	BSC
e1		5.08	BSC		0.200	BSC
H1	6.40	6.50	6.60	0.252	0.256	0.260
L	12.75	13.50	13.65	0.502	0.531	0.537
L1	-	3.10	3.30	-	0.122	0.130
L2		2.50	REF		0.098	REF
P	3.50	3.60	3.63	0.138	0.142	0.143
P1	3.50	3.60	3.63	0.138	0.142	0.143
Q	2.73	2.80	2.87	0.107	0.110	0.113
theta 1	5°	7°	9°	5°	7°	9°
theta 2	1°	3°	5°	1°	3°	5°
theta 3	1°	3°	5°	1°	3°	5°





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