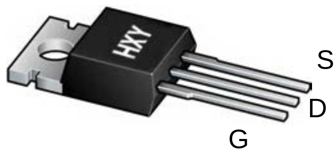
STP75NF75

N-Channel Enhancement Mode MOSFET

Description

The STP75NF75 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gat e charge. It can be used in a wide variety of applications.

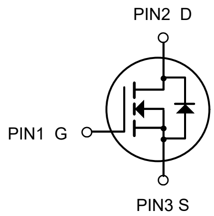


TO-220C (TO-220FPAB-3)

General Features

V_{DS} =80V,I_D =96A

$R_{DS(ON)}$ < 7.2mΩ @ V_{GS}=10V



N-Channel MOSFET

Application

High efficiency switch mode power supplies

Power factor correction

Electronic lamp ballast

Package Marking and Ordering Information

Product ID	Pack	Brand	Units Tube
STP75NF75	TO-220C(TO-220FPAB-3)	HXY MOSFET	50

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

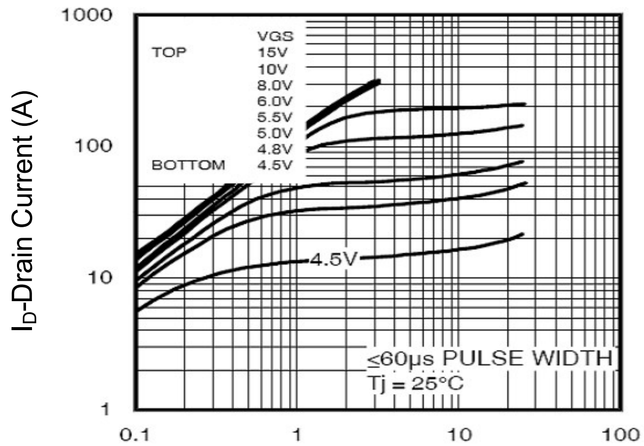
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	96	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	67	A
Pulsed Drain Current	I_{DM}	368	A
Maximum Power Dissipation	P_D	146	W
Derating factor	-	1.06	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	625	mJ
Thermal Resistance,Junction-to-Case(Note 2)	$R_{\theta JC}$	1.02	℃/W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Electrical Characteristics T_J = 25°C unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{DS} = 0, I_D = 250 µA	80			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2.0		4.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80 V , V_{GS} = 0 V			1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 150 °C			250	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 10 V	96			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 40 A		6.2	7.2	mΩ
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 40 A		13		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		6395		pF
Output Capacitance	C_{oss}			386		
Reverse Transfer Capacitance	C_{rss}			255		
Total Gate Charge[c]	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 40 A		116		nC
Gate-Source Charge[c]	Q_{gs}			27		
Gate-Drain Charge[c]	Q_{gd}			39		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 2.5Ω I_D ≅ 40 A, V_{GEN} = 10 V, R_g = 1 Ω		22		ns
Rise Time[c]	t_r			50		
Turn-Off Delay Time[c]	$t_{d(off)}$			65		
Fall Time[c]	t_f			22		
Source-Drain Diode Ratings and Characteristics T_C = 25 °C[b]						
Continuous Current	I_S				96	A
Pulsed Current	I_{SM}				368	
Forward Voltage[a]	V_{SD}	I_F = 40 A, V_{GS} = 0 V		0.89		V
Reverse Recovery Time	t_{rr}	I_F = 10 A, dI/dt = 100 A/µs		41		NS
Peak Reverse Recovery Current	$I_{RM(REC)}$			3.0		A
Reverse Recovery Charge	Q_{rr}			86		nC

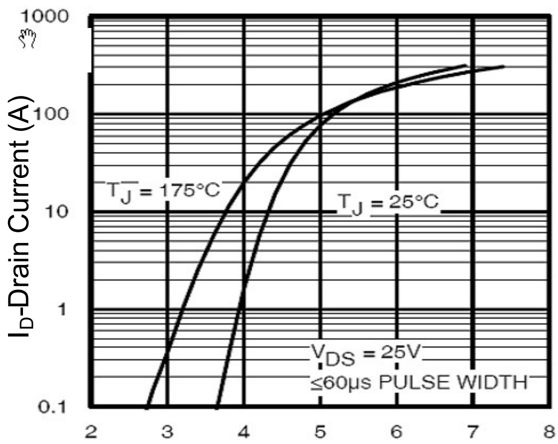
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

Typical Characteristics



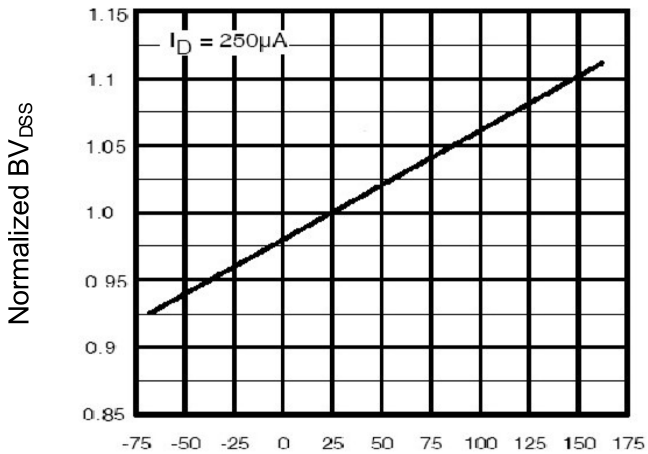
V_{DS} Drain-Source Voltage (V)

Figure1. Output Characteristics



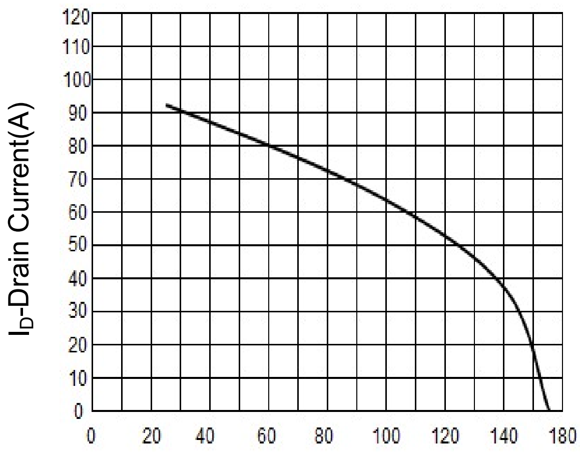
V_{GS} Gate-Source Voltage (V)

Figure2. Transfer Characteristics



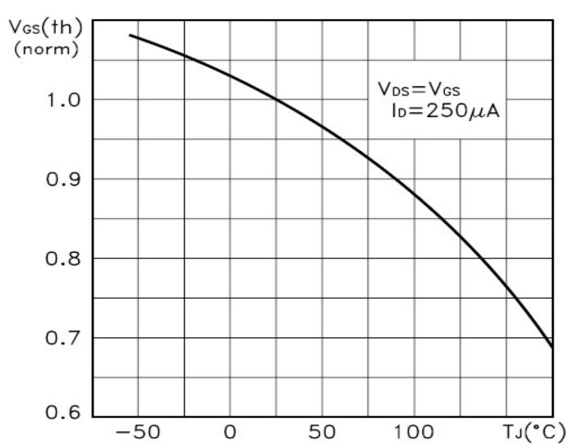
T_J-Junction Temperature(℃)

Figure3.BVDSS vs Junction Temperature



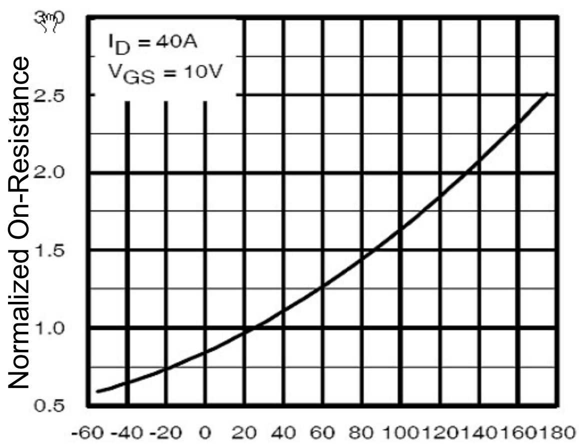
T_J-Junction Temperature(℃)

Figure4.ID vs Junction Temperature



T_J-Junction Temperature(℃)

Figure5.VGS(th) vs Junction Temperature



T_J-Junction Temperature(℃)

Figure6. Rdson Vs Junction Temperature

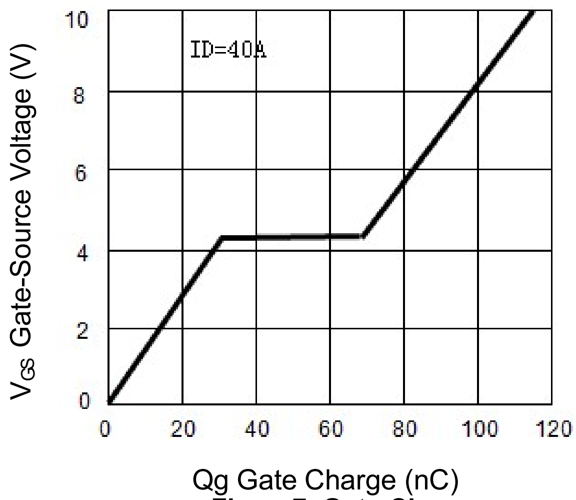


Figure7. Gate Charge

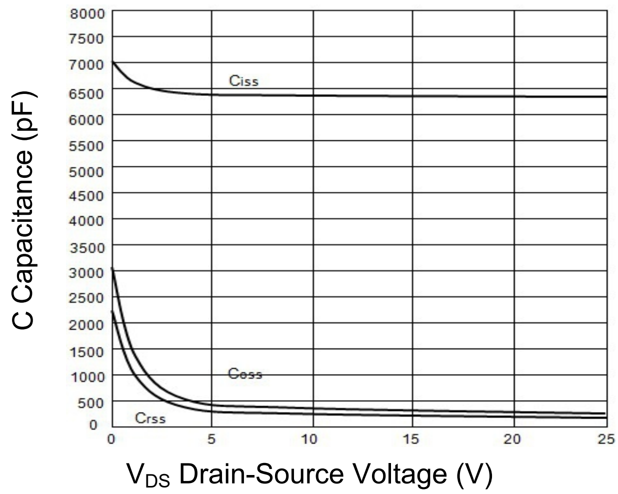


Figure8. Capacitance vs Vds

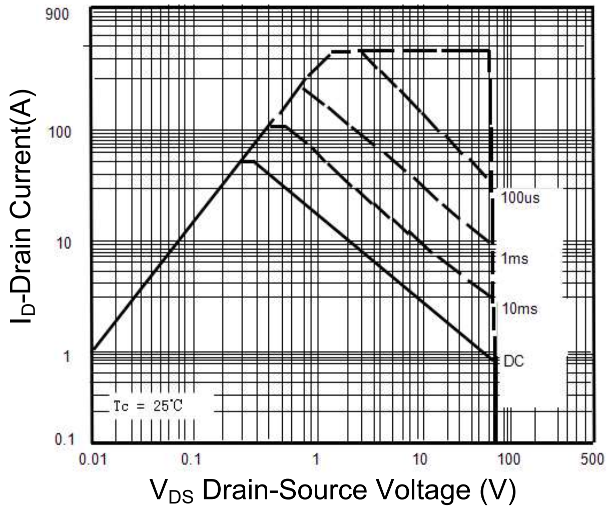


Figure9. Safe Operation Area

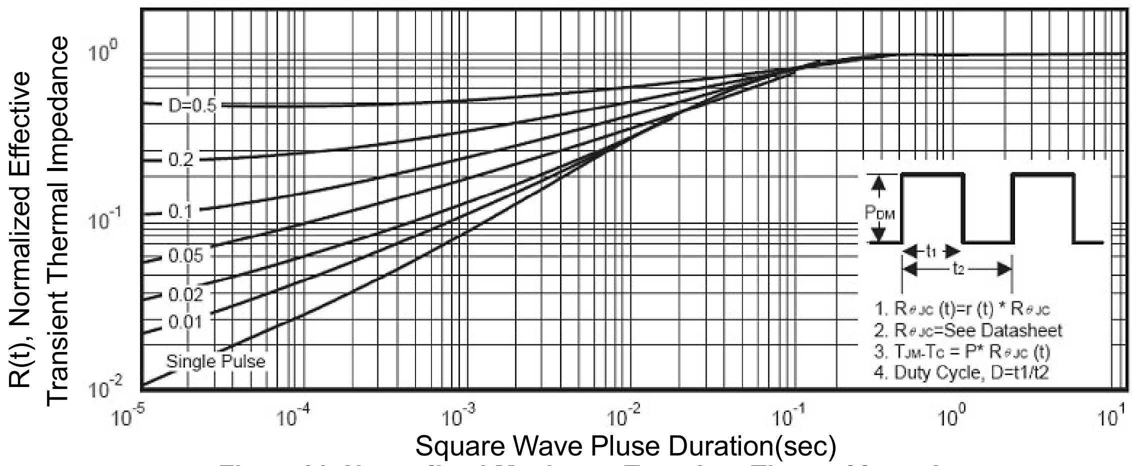
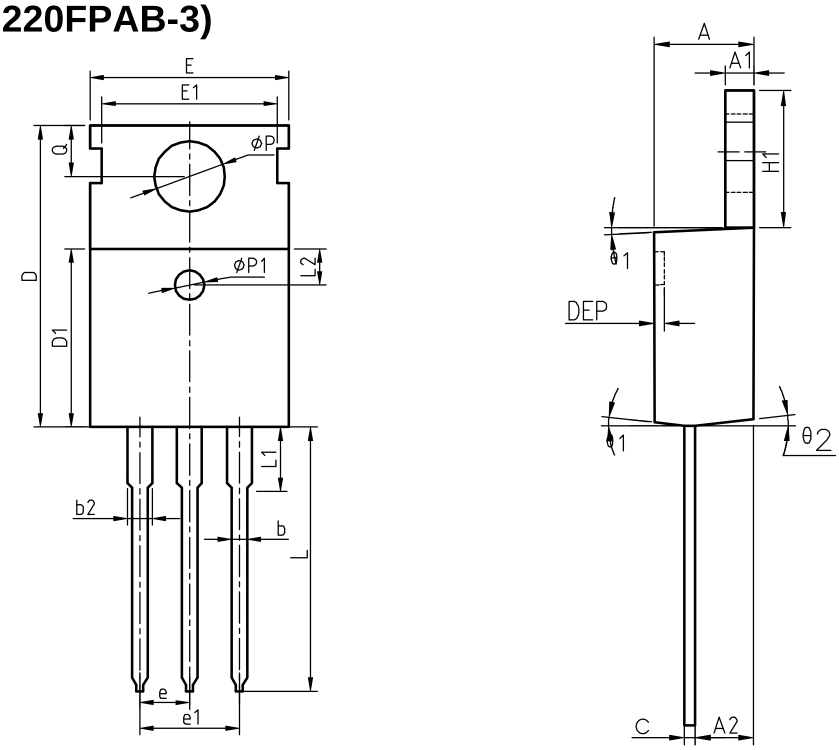
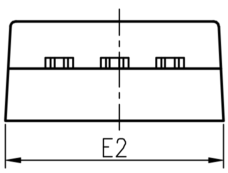


Figure11. Normalized Maximum Transient Thermal Impedance

Package Information
TO-220C(TO-220FPAB-3)





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
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
θ3	1°	3°	5°	1°	3°	5°

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