STB75NF75
STP75NF75 - STP75NF75FP

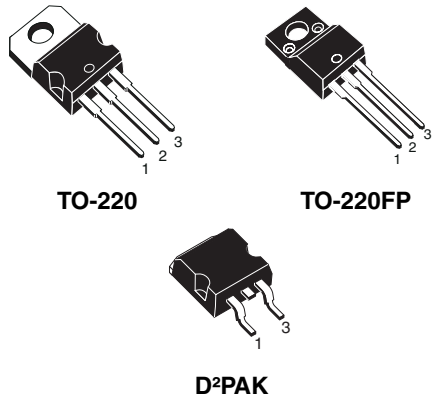
N-channel 75V - 0.0095Ω - 80A - TO-220 - TO-220FP - D^2PAK
STripFET™ II Power MOSFET

General features

Type	V_{DSS}	$R_{DS(on)}$	I_D
STB75NF75	75V	<0.011Ω	80A(1)
STP75NF75	75V	<0.011Ω	80A(1)
STP75NF75FP	75V	<0.011Ω	80A(1)

1. Current limited by package

- Exceptional dv/dt capability
- 100% avalanche tested



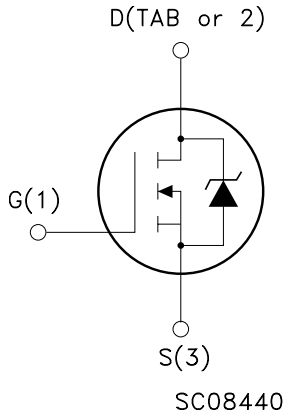
Description

This Power MOSFET series realized with STMicroelectronics unique STripFET™ process has specifically been designed to minimize input capacitance and gate charge. It is therefore suitable as primary switch in advanced high-efficiency, high-frequency isolated DC-DC converters for Telecom and Computer applications. It is also intended for any applications with low gate drive requirements.

Applications

- Switching application

Internal schematic diagram



Order codes

Part number	Marking	Package	Packaging
STB75NF75T4	B75NF75	D²PAK	Tape & reel
STP75NF75	P75NF75	TO-220	Tube
STP75NF75FP	P75NF75	TO-220FP	Tube

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		D^2PAK /TO-220	TO-220FP	
V_{DS}	Drain-source voltage (V_{GS} = 0)	75		V
V_{DGR}	Drain-gate voltage (R_{GS} = 20KΩ)	75		V
V_{GS}	Gate-source voltage	± 20		V
I_D (1)	Drain current (continuous) at T_C = 25°C	80	80	A
I_D(1)	Drain current (continuous) at T_C=100°C	70	70	A
I_{DM}(2)	Drain current (pulsed)	320	320	A
P_{TOT}	Total dissipation at T_C = 25°C	300	45	W
	Derating factor	2.0	0.3	W/°C
dv/dt (3)	Peak diode recovery voltage slope	12		V/ns
E_{AS} (4)	Single pulse avalanche energy	700		mJ
V_{ISO}	Insulation withstand voltage (RMS) from all three leads to external heat sink (t=1s;T_C=25°C)	--	2000	V
T_J T_{stg}	Operating junction temperature Storage temperature	-55 to 175		°C

1. Current limited by package
2. Pulse width limited by safe operating area
3. I_{SD} ≤80A, di/dt ≤300A/µs, V_{DD} ≤$V_{(BR)DSS}$, T_j ≤T_{JMAX}
4. Starting T_J = 25 °C, I_D = 40A, V_{DD} = 37.5V

Table 2. Thermal data

Symbol	Parameter	Value		Unit
		D^2PAK /TO-220	TO-220FP	
R_{thJC}	Thermal resistance junction-case max	0.5	3.33	°C/W
R_{thJA}	Thermal resistance junction-ambient max	62.5		°C/W
T_l	Maximum lead temperature for soldering purpose(1)	300		°C

1. 1.6mm from case for 10sec)

2 Electrical characteristics

(T_{CASE}=25°C unless otherwise specified)

Table 3. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 250µA, V_{GS}= 0	75			V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = Max rating, V_{DS} = Max rating @125°C			1 10	µA µA
I_{GSS}	Gate body leakage current (V_{DS} = 0)	V_{GS} = ±20V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}= V_{GS}, I_D = 250µA	2	3	4	V
$R_{DS(on)}$	Static drain-source on resistance	V_{GS}= 10V, I_D= 40A		0.0095	0.011	Ω

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward transconductance	V_{DS} = 15V, I_D = 40A		20		S
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} =25V, f = 1 MHz, V_{GS} = 0		3700 730 240		pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	V_{DD} = 60V, I_D = 80A V_{GS} =10V		117 27 47	160	nC nC nC

1. Pulsed: pulse duration=300µs, duty cycle 1.5%

Table 5. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	Turn-on delay time Rise time Turn-off delay time Fall time	V_{DD}= 37.5V, I_D= 45A, R_G=4.7Ω, V_{GS}=10V		25 100 66 30		ns ns ns ns

Table 6. Source drain diode

Symbol	Parameter	Test conditions	Min	Typ.	Max	Unit
I_{SD}	Source-drain current				80	A
I_{SDM}(1)	Source-drain current (pulsed)				320	A
V_{SD}(2)	Forward on voltage	I_{SD} = 80A, V_{GS} = 0			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	I_{SD} = 80A, di/dt = 100A/µs, V_{DD} = 25V, T_J = 150°C		132 660 10		ns nC A

1. Pulse width limited by safe operating area
2. Pulsed: pulse duration=300µs, duty cycle 1.5%

2.1 Electrical characteristics (curves)

Figure 1. Safe operating area for TO-220 - D²PAK

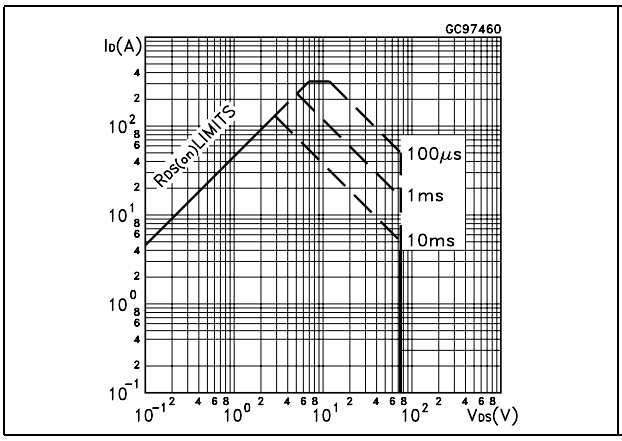


Figure 2. Thermal impedancefor TO-220 - D²PAK

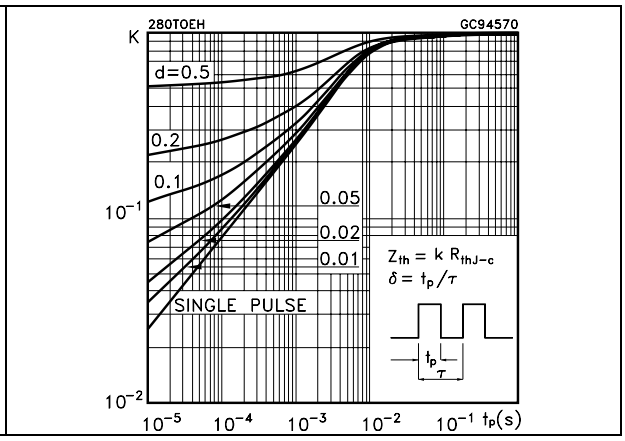


Figure 3. Safe operating area for TO-220FP

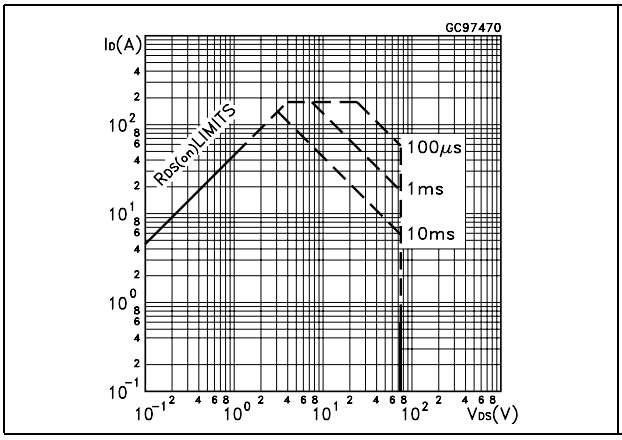


Figure 4. Thermal impedance for TO-220FP

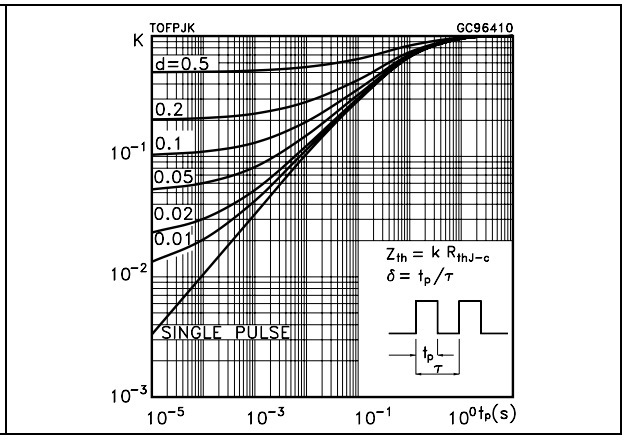


Figure 5. Output characterisics

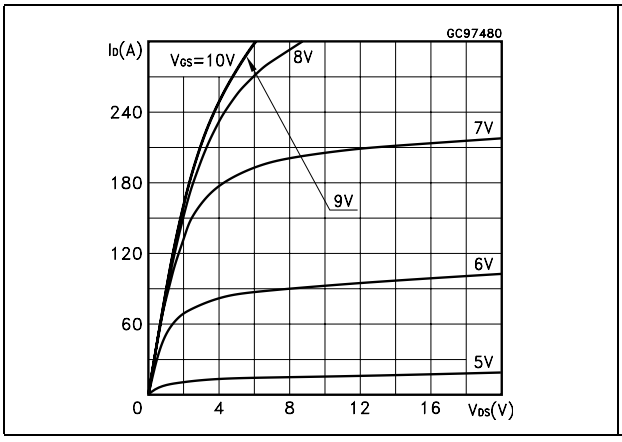


Figure 6. Transfer characteristics