



## TO-220 Plastic-Encapsulate MOSFETS

### 75NF75

#### N-Channel Power MOSFET

#### DESCRIPTION

The 75NF75 uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. Good stability and uniformity with high  $E_{AS}$ . This device is suitable for use in PWM, load switching and general purpose applications.

#### FEATURE

- Advanced trench process technology
- Special designed for convertors and power controls
- High density cell design for ultra low  $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Fast switching
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

#### APPLICATION

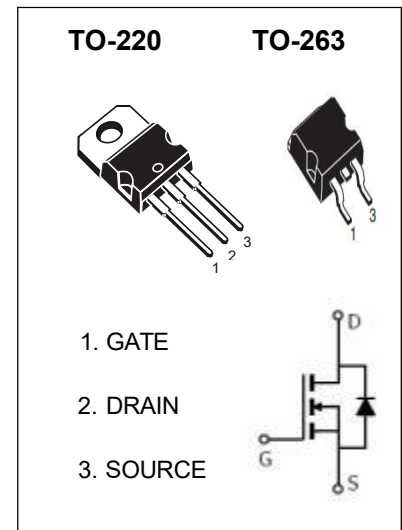
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

#### Maximum ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source voltage	$V_{DS}$	75	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_b$	75	A
Pulsed Drain Current (note 1)	$I_{DM}$	300	
Power Dissipation (note 2, $T_a=25^{\circ}\text{C}$ )	$P_D$	1.8	W
Maximum Power Dissipation (note 3, $T_c=25^{\circ}\text{C}$ )		160	W
Single Pulsed Avalanche Energy (note 4)	$E_{AS}$	550	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	69.4	$^{\circ}\text{C}/\text{W}$
Junction Temperature	$T_j$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-55 ~ +150	

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. This test is performed with no heat sink at  $T_a=25^{\circ}\text{C}$
3. This test is performed with infinite heat sink at  $T_c=25^{\circ}\text{C}$
4.  $E_{AS}$  condition:  $T_j=25^{\circ}\text{C}$ ,  $V_{DD}=37.5\text{V}$ ,  $V_{GS}=10\text{V}$ ,  $L=0.5\text{mH}$ ,  $R_g=25\Omega$ .



**Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static characteristics</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0, I <sub>D</sub> =250μA	75			V
Gate-threshold voltage (note 1)	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2		4	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0, V <sub>GS</sub> =±20V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =75V, V <sub>GS</sub> =0			1	μA
Drain-source on-state resistance (note 1)	R <sub>DSON</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A			8	ma
Forward transconductance (note 1)	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =40A		60		S
<b>Dynamic characteristics (note 2)</b>						
Input capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0, f =1MHz		3100		pF
Output capacitance	C <sub>OSS</sub>			310		
Reverse transfer capacitance	C <sub>RSS</sub>			260		
<b>Switching characteristics (note 2)</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =2A, R <sub>L</sub> =15a, V <sub>GS</sub> =10V, R <sub>G</sub> =2.5a		18.2		ns
Rise time	t <sub>r</sub>			15.6		
Turn-off delay time	t <sub>d(off)</sub>			70.5		
Fall Time	t <sub>f</sub>			13.8		
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A		100		nC
Gate-source charge	Q <sub>gs</sub>			18		
Gate-drain charge	Q <sub>gd</sub>			27		
<b>Source-Drain Diode characteristics</b>						
Diode forward current	I <sub>S</sub>				75	A
Diode pulsed forward current	I <sub>SM</sub>				300	A
Diode Forward voltage (note 1)	V <sub>SD</sub>	V <sub>GS</sub> =0, I <sub>S</sub> =40A			1.2	V
Diode reverse recovery time (note 2)	t <sub>rr</sub>	I <sub>F</sub> =75A, di/dt=100A/μs			33	ns
Diode reverse recovery charge (note 2)	Q <sub>rr</sub>				54	nC

Notes: 1. Pulse Test: Pulse Width≤300μs, duty cycle ≤2%.

2. These parameters have no way to verify.