



# MPC80N75

## N-Channel POWER MOSFET

### Features

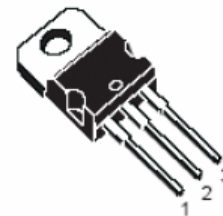
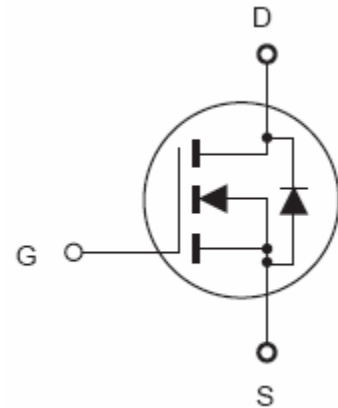
- ◆ 75V, 80A,  $R_{DS(ON)} = 9.7m\Omega$ , @VGS = 10V.
- ◆ Extremely High dv/dt Capability
- ◆ 100% Avalanche Tested
- ◆ Low Intrinsic Capacitances

### Application

- ◆ DC Motor Control
- ◆ Solenoid and Relay Drivers
- ◆ DC-DC Converters
- ◆ Automotive Environment

### Advantage

- ◆ Easy to Mount
- ◆ Space Savings
- ◆ High Power Density



TO-220

### ABSOLUTE MAXIMUM RATINGS $T_c = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Limit	Units
$V_{DS}$	Drain-Source Voltage	75	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current-Continuous	80	A
$I_{DM}$	Drain Current-Pulsed <sup>a</sup>	320	A
$P_D$	Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$	300	W
$E_{AS}$	Single Pulsed Avalanche Energy <sup>d</sup>	700	mJ
dv/dt	Peak Diode Recovery voltage slope	12	V/ns
$T_J, T_{stg}$	Operating and Store Temperature Range	-55 to 175	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Limit	Units
$R_{\theta JC}$	Thermal Resistance, Junction	0.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction	62.5	$^\circ\text{C/W}$



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## Electrical Characteristics $T_c=25^\circ\text{C}$ unless otherwise notes

### ■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	75	81		V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 75V, V_{GS} = 0V$			1	$\mu A$
$I_{GSSF}$	Forward Gate Body Leakage Current	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
$I_{GSSR}$	Reverse Gate Body Leakage Current	$V_{GS} = -20V, V_{DS} = 0V$			100	nA

### ■ On Characteristics <sup>b</sup>

$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$	2	2.8	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10V, I_D = 40A$		9.7	11	m $\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS} = 15V, I_D = 40A$		20		S

### ■ Dynamic Characteristics <sup>c</sup>

$C_{iss}$	Input Capacitance	$V_{DS} = 25V,$ $V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		3179		pF
$C_{oss}$	Reverse Transfer Capacitance			768		pF
$C_{riss}$	Output Capacitance			63		pF

### ■ Switching Characteristics <sup>c</sup>

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 37.5V,$ $I_D = 45A,$ $V_{GS} = 10V,$ $R_{GEN} = 4.7\Omega$		25		ns
$t_r$	Turn-On Rise Time			4		ns
$t_{d(off)}$	Turn-Off Delay Time			62		ns
$t_f$	Turn-Off Fall Time			13		ns
$Q_g$	Total Gate Charge	$V_{DS} = 60V,$ $I_D = 75A,$ $V_{GS} = 10V$		62		nC
$Q_{gs}$	Gate-Source Charge			9.3		nC
$Q_{gd}$	Gate-Drain Charge			30		nC

### ■ Drain-Source Diode Characteristics

$I_S$	Drain-Source Diode Forward Current			80		A
$V_{SD}$	Drain-Source Diode Forward Voltage Pulse test, $t \leq 300\mu s$ , duty cycle $d \leq 2\%$	$V_{GS} = 0V, I_S = 80A$		1	1.5	V

#### Notes : \_

- Repetitive Rating : Pulse width limited by maximum junction temperature.\_
- Pulse Test : Pulse Width < 300 $\mu s$ , Duty Cycle < 2%.
- Guaranteed by design, not subject to production testing.\_
- $L=0.87mH, V_{DD} = 38V, R_G = 25\Omega, \text{Starting } T_J = 25\text{ C}$