



75N80 N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
75V	8.5mΩ@10V	80A

DESCRIPTION

The 75N80 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

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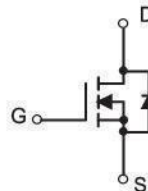


- 1. GATE
- 2. DRAIN
- 3. SOURCE

APPLICATION

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

EQUIVALENT CIRCUIT



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}	±20	
Continuous Drain Current	I_D	80	A
Pulsed Drain Current (note 1)	I_{DM}	320	
Power Dissipation (note 2, $T_a=25^\circ\text{C}$)	P_D	2	W
Maximum Power Dissipation (note 3, $T_c=25^\circ\text{C}$)		170	W
Single Pulsed Avalanche Energy (note 4)	E_{AS}	620	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
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: $T_j=25^\circ\text{C}, V_{DD}=40\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$.

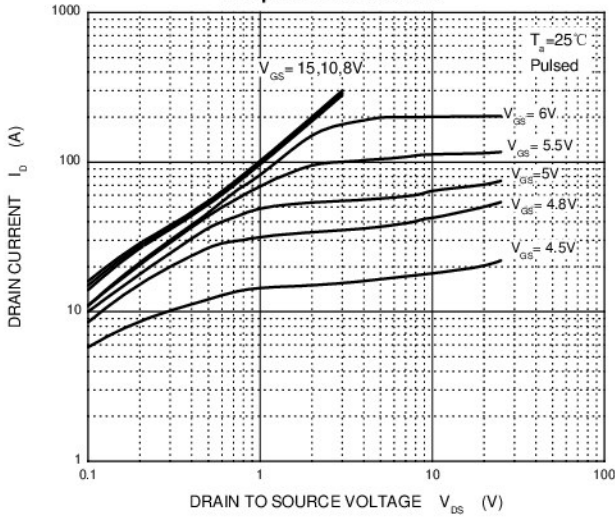
Electrical characteristics (T_a=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0, I _D = 250μA	75			V
Gate-threshold voltage (note 1)	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.0	4.0	
Zero gate voltage drain current	I _{DSS}	V _{DS} = 85V, V _{GS} = 0			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0, V _{GS} = ±20V			±100	nA
Drain-source on-state resistance (note 1)	R _{DS(on)}	V _{GS} = 10V, I _D = 40A		6.8	8.5	mΩ
Forward transconductance (note 1)	g _{FS}	V _{DS} = 10V, I _D = 40A		60		S
Dynamic characteristics (note 2)						
Input capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0, f = 1MHz		4400		pF
Output capacitance	C _{OSS}			340		
Reverse transfer capacitance	C _{rSS}			260		
Switching characteristics (note 2)						
Turn-on delay time	t _{d(on)}	V _{DD} = 30V, I _D = 2A, R _L = 15Ω, V _{GS} = 10V, R _G = 2.5Ω		18		ns
Rise time	t _r			12		
Turn-off delay time	t _{d(off)}			56		
Fall Time	t _f			15		
Total gate charge	Q _g	V _{DS} = 30V, V _{GS} = 10V, I _D = 30A		100		nC
Gate-source charge	Q _{gs}			20		
Gate-drain charge	Q _{gd}			30		
Source-Drain Diode characteristics						
Diode forward current	I _S				80	A
Diode pulsed forward current	I _{SM}				320	A
Diode Forward voltage (note 1)	V _{SD}	V _{GS} = 0, I _S = 40A			1.2	V
Diode reverse recovery time (note 2)	t _{rr}	I _F = 75A, di/dt = 100A/μs			36	ns
Diode reverse recovery charge (note 2)	Q _{rr}				56	nC

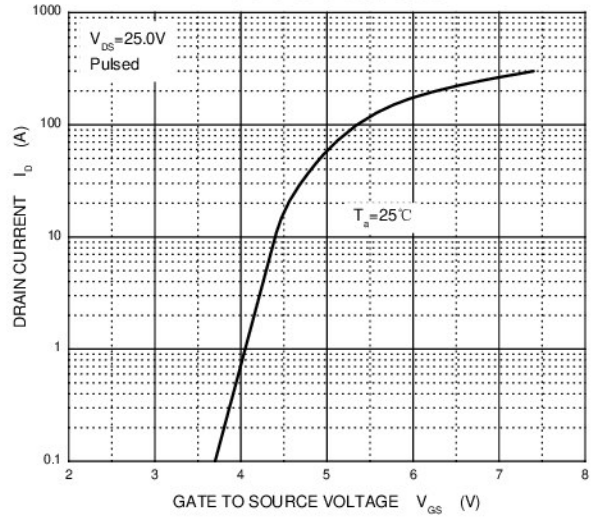
Notes: 1. Pulse Test: Pulse Width ≤ 300μs, duty cycle ≤ 2%.
 2. These parameters have no way to verify.

Typical Characteristics

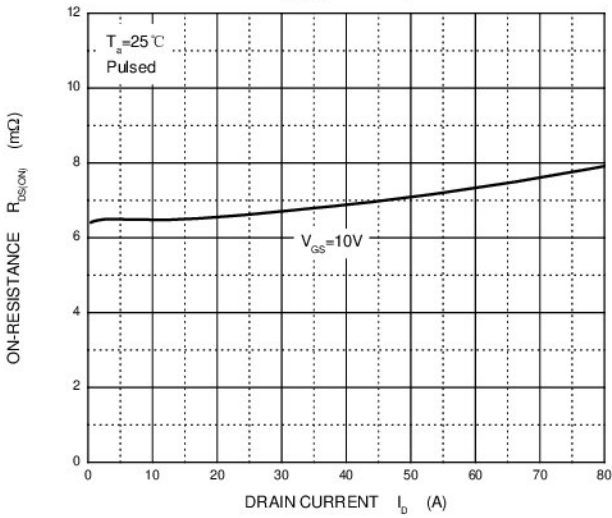
Output Characteristics



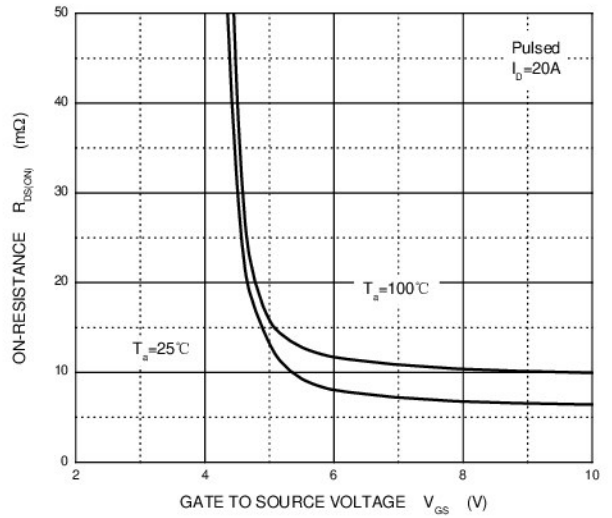
Transfer Characteristics



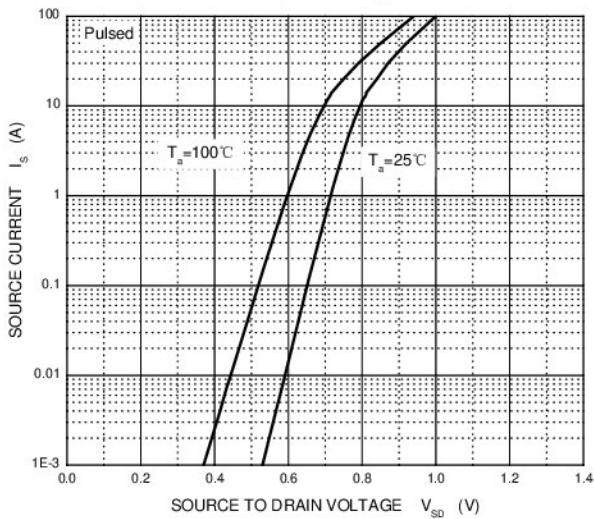
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage

