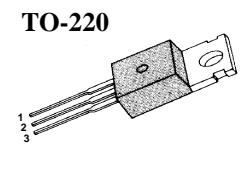


**FEATURES**

- ◆ Avalanche Rugged Technology
- ◆ Rugged Gate Oxide Technology
- ◆ Lower Input Capacitance
- ◆ Improved Gate Charge
- ◆ Extended Safe Operating Area
- ◆ Lower Leakage Current : 10  $\mu$ A (Max.) @  $V_{DS} = 250V$
- ◆ Low  $R_{DS(ON)}$  : 0.108  $\Omega$  (Typ.)

$BV_{DSS} = 250 V$   
 $R_{DS(on)} = 0.14 \Omega$   
 $I_D = 21 A$



1.Gate 2. Drain 3. Source

**Absolute Maximum Ratings**

Symbol	Characteristic	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	250	V
$I_D$	Continuous Drain Current ( $T_c=25^\circ C$ )	21	A
	Continuous Drain Current ( $T_c=100^\circ C$ )	13.3	
$I_{DM}$	Drain Current-Pulsed (1)	84	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy (2)	551	mJ
$I_{AR}$	Avalanche Current (1)	21	A
$E_{AR}$	Repetitive Avalanche Energy (1)	15.6	mJ
$dv/dt$	Peak Diode Recovery $dv/dt$ (3)	4.8	V/ns
$P_D$	Total Power Dissipation ( $T_c=25^\circ C$ )	156	W
	Linear Derating Factor	1.25	W/ $^\circ C$
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	- 55 to +150	$^\circ C$
	Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5-seconds	300	

**Thermal Resistance**

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	0.8	$^\circ C/W$
$R_{\theta CS}$	Case-to-Sink	0.5	--	
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	

**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	250	--	--	V	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$
$\Delta \text{BV}/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	0.27	--	V/ $^\circ\text{C}$	$\text{I}_D=250\mu\text{A}$ See Fig 7
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	2.0	--	4.0	V	$\text{V}_{\text{DS}}=5\text{V}, \text{I}_D=250\mu\text{A}$
$\text{I}_{\text{GSS}}$	Gate-Source Leakage , Forward	--	--	100	nA	$\text{V}_{\text{GS}}=30\text{V}$
	Gate-Source Leakage , Reverse	--	--	-100		$\text{V}_{\text{GS}}=-30\text{V}$
$\text{I}_{\text{DSS}}$	Drain-to-Source Leakage Current	--	--	10	$\mu\text{A}$	$\text{V}_{\text{DS}}=250\text{V}$
		--	--	100		$\text{V}_{\text{DS}}=200\text{V}, T_C=125^\circ\text{C}$
$\text{R}_{\text{DS(on)}}$	Static Drain-Source On-State Resistance	--	--	0.14	$\Omega$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=10.5\text{A}$ (4)
$\text{g}_{\text{fs}}$	Forward Transconductance	--	15.7	--	$\text{S}$	$\text{V}_{\text{DS}}=40\text{V}, \text{I}_D=10.5\text{A}$ (4)
$\text{C}_{\text{iss}}$	Input Capacitance	--	2300	3000	pF	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=25\text{V}, f=1\text{MHz}$ See Fig 5
$\text{C}_{\text{oss}}$	Output Capacitance	--	345	400		
$\text{C}_{\text{rss}}$	Reverse Transfer Capacitance	--	155	180		
$t_{\text{d(on)}}$	Turn-On Delay Time	--	21	60	ns	$\text{V}_{\text{DD}}=125\text{V}, \text{I}_D=25\text{A},$ $\text{R}_G=5.3\Omega$ See Fig 13 (4) (5)
$t_r$	Rise Time	--	20	60		
$t_{\text{d(off)}}$	Turn-Off Delay Time	--	86	190		
$t_f$	Fall Time	--	40	100		
$\text{Q}_g$	Total Gate Charge	--	88	114	nC	$\text{V}_{\text{DS}}=200\text{V}, \text{V}_{\text{GS}}=10\text{V},$ $\text{I}_D=25\text{A}$ See Fig 6 & Fig 12 (4) (5)
$\text{Q}_{\text{gs}}$	Gate-Source Charge	--	16	--		
$\text{Q}_{\text{gd}}$	Gate-Drain ("Miller") Charge	--	35.6	--		

**Source-Drain Diode Ratings and Characteristics**

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
$\text{I}_S$	Continuous Source Current	--	--	21	A	Integral reverse pn-diode in the MOSFET
$\text{I}_{\text{SM}}$	Pulsed-Source Current (1)	--	--	84		
$\text{V}_{\text{SD}}$	Diode Forward Voltage (4)	--	--	1.5	V	$T_J=25^\circ\text{C}, \text{I}_S=21\text{A}, \text{V}_{\text{GS}}=0\text{V}$
$t_{\text{rr}}$	Reverse Recovery Time	--	255	--	ns	$T_J=25^\circ\text{C}, \text{I}_F=25\text{A}$
$\text{Q}_{\text{rr}}$	Reverse Recovery Charge	--	2.3	--	$\mu\text{C}$	$d\text{I}/dt=100\text{A}/\mu\text{s}$ (4)

**Notes :**

- (1) Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- (2)  $L=2\text{mH}, \text{I}_{\text{AS}}=21\text{A}, \text{V}_{\text{DD}}=50\text{V}, \text{R}_G=27\Omega$ , Starting  $T_J=25^\circ\text{C}$
- (3)  $\text{I}_{\text{SD}} \leq 25\text{A}, d\text{I}/dt \leq 300\text{A}/\mu\text{s}, \text{V}_{\text{DD}} \leq \text{BV}_{\text{DSS}}$ , Starting  $T_J=25^\circ\text{C}$
- (4) Pulse Test : Pulse Width =  $250\mu\text{s}$ , Duty Cycle  $\leq 2\%$
- (5) Essentially Independent of Operating Temperature