FEATURES

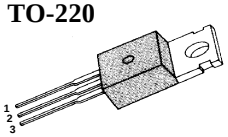
- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current : 10 μA (Max.) @ V_{DS} = 250V
- Low $R_{DS(ON)}$: 0.742 Ω (Typ.)

BV_{DSS} = 250 V

$R_{DS(on)}$ = 1.1 Ω

I_D = 4.1 A

TO-220



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°C)	4.1	A
	Continuous Drain Current (T_C=100°C)	2.6	
I_{DM}	Drain Current-Pulsed (1)	16	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy (2)	84	mJ
I_{AR}	Avalanche Current (1)	4.1	A
E_{AR}	Repetitive Avalanche Energy (1)	4.9	mJ
dv/dt	Peak Diode Recovery dv/dt (3)	4.8	V/ns
P_D	Total Power Dissipation (T_C=25°C) Linear Derating Factor	49 0.39	W W/°C
T_J , T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	°C
T_L	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	--	2.54	°C/W
$R_{\theta CS}$	Case-to-Sink	0.5	--	
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	

Electrical Characteristics (T_C=25 °C unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	250	--	--	V	V_{GS}=0V,I_D=250μA
$\Delta BV/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	0.30	--	V/°C	I_D=250μA ***See Fig 7***
$V_{GS(th)}$	Gate Threshold Voltage	2.0	--	4.0	V	V_{DS}=5V,I_D=250μA
I_{GSS}	Gate-Source Leakage , Forward	--	--	100	nA	V_{GS}=30V
	Gate-Source Leakage , Reverse	--	--	-100		V_{GS}=-30V
I_{DSS}	Drain-to-Source Leakage Current	--	--	10	μA	V_{DS}=250V
		--	--	100		V_{DS}=200V,T_C=125°C
$R_{DS(on)}$	Static Drain-Source On-State Resistance	--	--	1.1	Ω	V_{GS}=10V,I_D=2.05A (4)
g_{fs}	Forward Transconductance	--	2.69	--	℧	V_{DS}=40V,I_D=2.05A (4)
C_{iss}	Input Capacitance	--	335	430	pF	V_{GS}=0V,V_{DS}=25V,f =1MHz ***See Fig 5***
C_{oss}	Output Capacitance	--	55	65		
C_{rss}	Reverse Transfer Capacitance	--	23	28		
$t_{d(on)}$	Turn-On Delay Time	--	11	30	ns	V_{DD}=125V,I_D=4.1A, R_G=18 Ω ***See Fig 13*** (4) (5)
t_r	Rise Time	--	12	35		
$t_{d(off)}$	Turn-Off Delay Time	--	32	75		
t_f	Fall Time	--	15	40		
Q_g	Total Gate Charge	--	14	20	nC	V_{DS}=200V,V_{GS}=10V, I_D=4.1A ***See Fig 6 & Fig 12*** (4) (5)
Q_{gs}	Gate-Source Charge	--	2.8	--		
Q_{gd}	Gate-Drain ("Miller") Charge	--	6.4	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	--	--	4.1	A	Integral reverse pn-diode in the MOSFET
I_{SM}	Pulsed-Source Current (1)	--	--	16		
V_{SD}	Diode Forward Voltage (4)	--	--	1.5	V	T_J=25°C,I_S=4.1A,V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	135	--	ns	T_J=25°C,I_F=4.1A di_F/dt=100A/ μs (4)
Q_{rr}	Reverse Recovery Charge	--	0.65	--	μC	

Notes ;

(1) Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
(2) L=8mH, I_{AS}=4.1A, V_{DD}=50V, R_G=27Ω, Starting T_J=25°C
(3) $I_{SD} \leq$ 4.1A, di/dt ≤ 170A/μs, $V_{DD} \leq BV_{DSS}$, Starting T_J=25°C
(4) Pulse Test : Pulse Width = 250μs, Duty Cycle ≤ 2%
(5) Essentially Independent of Operating Temperature

Fig 1. Output Characteristics

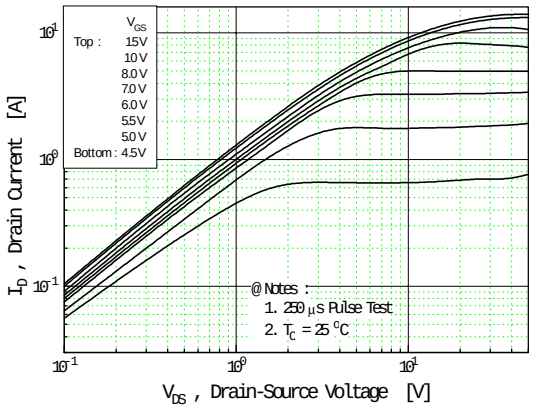


Fig 2. Transfer Characteristics

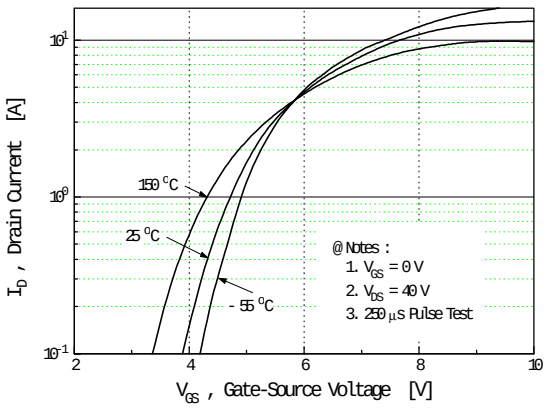


Fig 3. On-Resistance vs. Drain Current

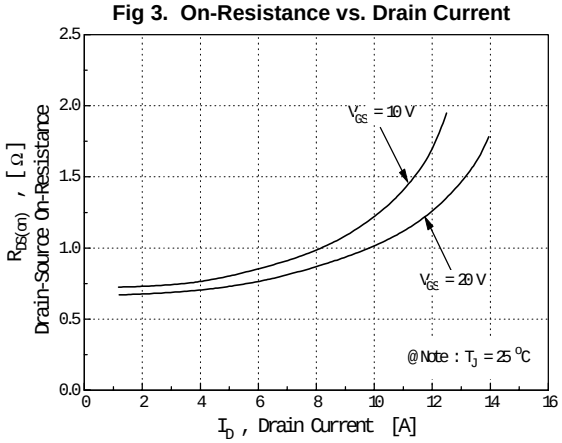


Fig 4. Source-Drain Diode Forward Voltage

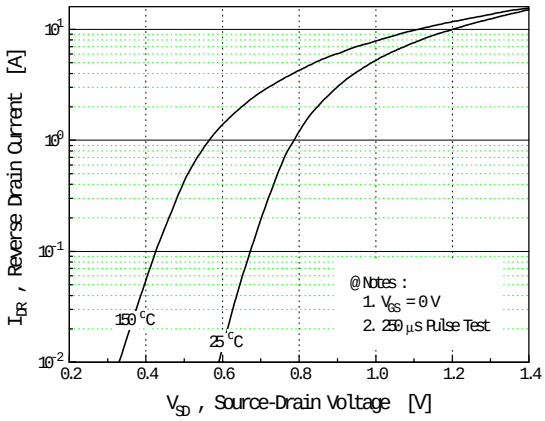


Fig 5. Capacitance vs. Drain-Source Voltage

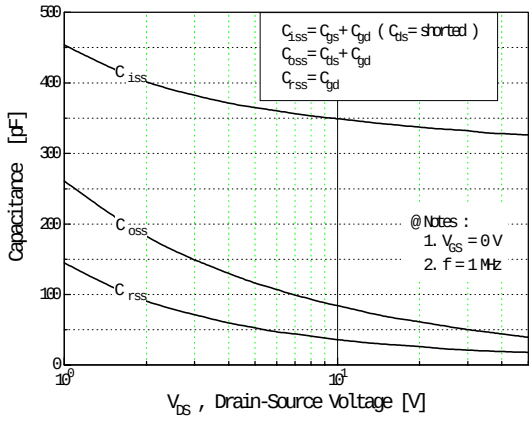


Fig 6. Gate Charge vs. Gate-Source Voltage