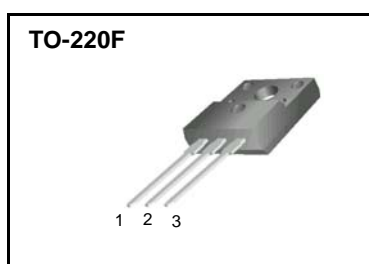
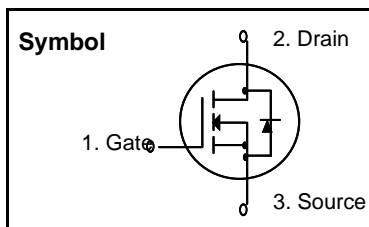


## N-Channel MOSFET

## Features

- $R_{DS(on)}$  (Max 0.70  $\Omega$ ) @  $V_{GS}=10V$
- Gate Charge (Typical 50nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)



## Absolute Maximum Ratings (\* Drain current limited by junction temperature)

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain to Source Voltage	600	V
$I_D$	Continuous Drain Current(@ $T_C = 25^\circ C$ )	12*	A
	Continuous Drain Current(@ $T_C = 100^\circ C$ )	7.5*	A
$I_{DM}$	Drain Current Pulsed (Note 1)	48*	A
$V_{GS}$	Gate to Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy (Note 2)	940	mJ
$E_{AR}$	Repetitive Avalanche Energy (Note 1)	22.7	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
$P_D$	Total Power Dissipation(@ $T_C = 25^\circ C$ )	52	W
	Derating Factor above 25 °C	0.42	W/°C
$T_{STG}, T_J$	Operating Junction Temperature & Storage Temperature	- 55 ~ 150	°C
$T_L$	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	300	°C

## Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	-	2.40	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	600	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature coefficient	$I_D = 250\mu A$ , referenced to $25\text{ }^\circ\text{C}$	-	0.7	-	V/ $^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS} = 600V, V_{GS} = 0V$	-	-	10	$\mu A$
		$V_{DS} = 480V, T_C = 125\text{ }^\circ\text{C}$	-	-	100	$\mu A$
$I_{GSS}$	Gate-Source Leakage, Forward	$V_{GS} = 30V, V_{DS} = 0V$	-	-	100	nA
	Gate-source Leakage, Reverse	$V_{GS} = -30V, V_{DS} = 0V$	-	-	-100	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	$V_{GS} = 10V, I_D = 6.0A$	-	0.55	0.70	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$	-	1800	-	pF
$C_{oss}$	Output Capacitance		-	200	-	
$C_{rss}$	Reverse Transfer Capacitance		-	25	-	
<b>Dynamic Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 300V, I_D = 12.0A, R_G = 4.7\Omega$ (Note 4, 5)	-	30	-	ns
$t_r$	Rise Time		-	90	-	
$t_{d(off)}$	Turn-off Delay Time		-	160	-	
$t_f$	Fall Time		-	90	-	
$Q_g$	Total Gate Charge	$V_{DS} = 480V, V_{GS} = 10V, I_D = 12.0A$ (Note 4, 5)	-	50	-	nC
$Q_{gs}$	Gate-Source Charge		-	20	-	
$Q_{gd}$	Gate-Drain Charge(Miller Charge)		-	22	-	

**Source-Drain Diode Ratings and Characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
$I_S$	Continuous Source Current	Integral Reverse p-n Junction Diode in the MOSFET	-	-	12	A
$I_{SM}$	Pulsed Source Current		-	-	48	
$V_{SD}$	Diode Forward Voltage	$I_S = 12.0A, V_{GS} = 0V$	-	-	1.4	V
$t_{rr}$	Reverse Recovery Time	$I_S = 12A, V_{GS} = 0V, di/dt = 100A/\mu s$	-	430	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	500	-	nC

## \* NOTES

1. Repeatability rating : pulse width limited by junction temperature
2.  $L = 12.0mH, I_{AS} = 12.0A, V_{DD} = 50V, R_G = 25\Omega$ , Starting  $T_J = 25\text{ }^\circ\text{C}$
3.  $I_{SD} \leq 12A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25\text{ }^\circ\text{C}$
4. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
5. Essentially independent of operating temperature.