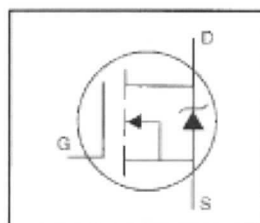


# IRFZ10

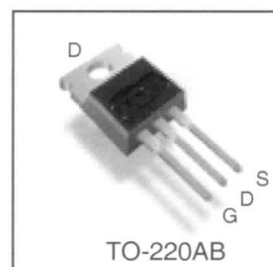
## HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



$V_{DSS} = 60V$
$R_{DS(on)} = 0.20\Omega$
$I_D = 10A$

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



<b>G</b>	<b>D</b>	<b>S</b>
Gate	Drain	Source

### Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	10	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	7.2	
$I_{DM}$	Pulsed Drain Current ①	40	
$P_D @ T_C = 25^\circ C$	Power Dissipation	43	W
	Linear Derating Factor	0.29	
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy ②	47	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.5	V/ns
$T_J$	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ C$
$T_{STG}$			
	Mounting Torque, 6-32 or M3 screw	10 lbf·in (1.1 N·m)	

### Thermal Resistance

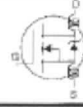
	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	3.5	$^\circ C/W$
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	62	



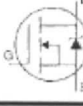
NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

# IRFZ10

## Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	—	—	V	$V_{GS}=0V, I_D=250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.063	—	V/°C	Reference to $25^\circ\text{C}, I_D=1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.20	$\Omega$	$V_{GS}=10V, I_D=6.0A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
$g_{fs}$	Forward Transconductance	2.4	—	—	S	$V_{DS}=25V, I_D=6.0A$ ④
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	25	$\mu A$	$V_{DS}=60V, V_{GS}=0V$
		—	—	250		$V_{DS}=48V, V_{GS}=0V, T_J=150^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS}=20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS}=-20V$
$Q_g$	Total Gate Charge	—	—	11	nC	$I_D=10A$
$Q_{gs}$	Gate-to-Source Charge	—	—	3.1		$V_{DS}=48V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	—	5.8		$V_{GS}=10V$ See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	10	—		$V_{DD}=30V$
$t_r$	Rise Time	—	50	—	ns	$I_D=10A$
$t_{d(off)}$	Turn-Off Delay Time	—	13	—		$R_G=24\Omega$
$t_f$	Fall Time	—	19	—		$R_D=2.7\Omega$ See Figure 10 ④
$L_D$	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact
$L_S$	Internal Source Inductance	—	7.5	—		
$C_{iss}$	Input Capacitance	—	300	—	pF	$V_{GS}=0V$
$C_{oss}$	Output Capacitance	—	160	—		$V_{DS}=25V$
$C_{riss}$	Reverse Transfer Capacitance	—	29	—		$f=1.0\text{MHz}$ See Figure 5

## Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	10	A	MOSFET symbol showing the integral reverse p-n junction diode.
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	40		
$V_{SD}$	Diode Forward Voltage	—	—	1.6	V	$T_J=25^\circ\text{C}, I_S=10A, V_{GS}=0V$ ④
$t_{rr}$	Reverse Recovery Time	—	70	140	ns	$T_J=25^\circ\text{C}, I_F=10A$
$Q_{rr}$	Reverse Recovery Charge	—	0.20	0.40	$\mu C$	$di/dt=100A/\mu s$ ④
$t_{on}$	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S+L_D$ )				

### Notes:

① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)

④  $I_{SD} \leq 10A, di/dt \leq 90A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 175^\circ\text{C}$