

**REPETITIVE AVALANCHE AND dv/dt RATED
HEXFET[®] TRANSISTORS
THRU-HOLE (TO-204AA/AE)**

**IRF460
500V, N-CHANNEL**

Product Summary

Part Number	BVDSS	RDS(on)	ID
IRF460	500V	0.27 Ω	21

The HEXFET transistors also feature all of the well established advantages of MOSFETs such as voltage control, very fast switching, ease of paralleling and temperature stability of the electrical parameters.

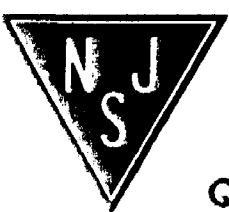
They are well suited for applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

Features:

- Repetitive Avalanche Ratings
- Dynamic dv/dt Rating
- Hermetically Sealed
- Simple Drive Requirements
- Ease of Paralleling

Absolute Maximum Ratings

	Parameter		Units
ID @ VGS = 0V, TC = 25°C	Continuous Drain Current	21	A
ID @ VGS = 0V, TC = 100°C	Continuous Drain Current	14	
IDM	Pulsed Drain Current ①	84	
PD @ TC = 25°C	Max. Power Dissipation	300	W
	Linear Derating Factor	2.4	W/°C
VGS	Gate-to-Source Voltage	± 20	V
EAS	Single Pulse Avalanche Energy ②	1200	mJ
IAR	Avalanche Current ①	21	A
EAR	Repetitive Avalanche Energy ①	30	mJ
dv/dt	Peak Diode Recovery dv/dt ③	3.5	V/ns
TJ	Operating Junction	-55 to 150	°C
TSTG	Storage Temperature Range		
	Lead Temperature	300 (0.063 in. (1.6mm) from case for 10s)	
	Weight	11.5(typical)	g



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.

IRF460

Electrical Characteristics @ $T_j = 25^\circ\text{C}$ (Unless Otherwise Specified)

	Parameter	Min	Typ	Max	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	500	—	—	V	$V_{GS} = 0V, I_D = 1.0mA$
$\Delta BV_{DSS}/\Delta T_j$	Temperature Coefficient of Breakdown Voltage		0.78	—	$V/^\circ\text{C}$	Reference to 25°C , $I_D = 1.0mA$
$R_{DS(on)}$	Static Drain-to-Source On-State Resistance	—	—	0.27	Ω	$V_{GS} = 10V, I_D = 14A$ ④
		—	—	0.31		$V_{GS} = 10V, I_D = 21A$ 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	13	—	—	S (⑤)	$V_{DS} > 15V, I_{DS} = 14A$ ④
I_{DSS}	Zero Gate Voltage Drain Current	—	—	25	μA	$V_{DS} = 400V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 400V$ $V_{GS} = 0V, T_j = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Leakage Forward	—	—	100	nA	$V_{GS} = 20V$
I_{GSS}	Gate-to-Source Leakage Reverse	—	—	-100	nA	$V_{GS} = -20V$
Q_g	Total Gate Charge	84	—	190	nC	$V_{GS} = 10V, I_D = 21A$ $V_{DS} = 250V$
Q_{gs}	Gate-to-Source Charge	12	—	27		
Q_{gd}	Gate-to-Drain ('Miller') Charge	60	—	135		
$t_{d(on)}$	Turn-On Delay Time	—	—	35	ns	$V_{DD} = 250V, I_D = 21A,$ $R_G = 2.35\Omega$
t_r	Rise Time	—	—	120		
$t_{d(off)}$	Turn-Off Delay Time	—	—	130		
t_f	Fall Time	—	—	98		
$L_S + L_D$	Total Inductance	—	6.1	—	nH	Measured from drain lead (6mm/0.25in. from package) to source lead (6mm/0.25in. from package)
C_{iss}	Input Capacitance	—	4300	—	pF	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1.0MHz$
C_{oss}	Output Capacitance	—	1000	—		
C_{rss}	Reverse Transfer Capacitance	—	250	—		

Source-Drain Diode Ratings and Characteristics

	Parameter	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	21	A	
I_{SM}	Pulse Source Current (Body Diode) ①	—	—	84		
V_{SD}	Diode Forward Voltage	—	—	1.8	V	$T_j = 25^\circ\text{C}, I_S = 21A, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	—	580	nS	$T_j = 25^\circ\text{C}, I_F = 21A, di/dt \leq 100A/\mu s$
Q_{RR}	Reverse Recovery Charge	—	—	8.1	μC	$V_{DD} \leq 50V$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by $L_S + L_D$.				

Thermal Resistance

	Parameter	Min	Typ	Max	Units	Test Conditions
R_{thJC}	Junction to Case	—	—	0.42	$^\circ\text{C}/W$	Typical socket mount
R_{thJA}	Junction to Ambient	—	—	30		