

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

**IRF054
 60V, N-CHANNEL**

Product Summary

Part Number	BVDSS	RDS(on)	ID
IRF054	60V	0.022Ω	45A*

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.

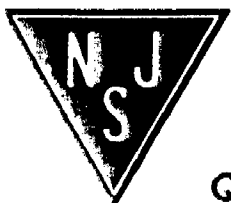
Features:

- 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	45*	A
ID @ VGS = 0V, TC = 100°C	Continuous Drain Current	31	
IDM	Pulsed Drain Current ①	220	
PD @ TC = 25°C	Max. Power Dissipation	150	W
	Linear Derating Factor	1.2	W/°C
VGS	Gate-to-Source Voltage	±20	V
EAS	Single Pulse Avalanche Energy ②	480	mJ
IAR	Avalanche Current ①	-	A
EAR	Repetitive Avalanche Energy ①	-	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.5	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

* Current limited by pin diameter.
 For footnotes refer to the last page



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.

IRF054

Electrical Characteristics @ Tj = 25°C (Unless Otherwise Specified)

	Parameter	Min	Typ	Max	Units	Test Conditions
BVDSS	Drain-to-Source Breakdown Voltage	60	—	—	V	VGS = 0V, ID = 1.0mA
ΔBVDSS/ΔTj	Temperature Coefficient of Breakdown Voltage	—	0.68	—	V/°C	Reference to 25°C, ID = 1.0mA
RDS(on)	Static Drain-to-Source On-State Resistance	—	—	0.022	Ω	VGS = 10V, ID = 31A ④
		—	—	0.025		VGS = 10V, ID = 45A ④
VGS(th)	Gate Threshold Voltage	2.0	—	4.0	V	VDS = VGS, ID = 250μA
gfs	Forward Transconductance	20	—	—	S (Ω)	VDS > 15V, IDS = 31A ④
IDSS	Zero Gate Voltage Drain Current	—	—	25	μA	VDS = 48V, VGS = 0V
		—	—	250		VDS = 48V VGS = 0V, Tj = 125°C
IGSS	Gate-to-Source Leakage Forward	—	—	100	nA	VGS = 20V
IGSS	Gate-to-Source Leakage Reverse	—	—	-100		VGS = -20V
Qg	Total Gate Charge	80	—	180	nC	VGS = 10V, ID = 45A
Qgs	Gate-to-Source Charge	20	—	45		VDS = 30V
Qgd	Gate-to-Drain ('Miller') Charge	34	—	105		
td(on)	Turn-On Delay Time	—	—	33	ns	VDD = 30V, ID = 45A, RG = 2.35Ω
tr	Rise Time	—	—	180		
td(off)	Turn-Off Delay Time	—	—	100		
tf	Fall Time	—	—	100		
LS + LD	Total Inductance	—	6.1	—	nH	Measured from drain lead (6mm/0.25in. from package) to source lead (6mm/0.25in. from package)
Ciss	Input Capacitance	—	4600	—	pF	VGS = 0V, VDS = 25V f = 1.0MHz
Coss	Output Capacitance	—	2000	—		
Crss	Reverse Transfer Capacitance	—	340	—		

Source-Drain Diode Ratings and Characteristics

	Parameter	Min	Typ	Max	Units	Test Conditions
IS	Continuous Source Current (Body Diode)	—	—	45*	A	
ISM	Pulse Source Current (Body Diode) ①	—	—	220		
VSD	Diode Forward Voltage	—	—	2.5	V	Tj = 25°C, IS = 45A, VGS = 0V ④
trr	Reverse Recovery Time	—	—	280	nS	Tj = 25°C, IF = 45A, di/dt ≤ 100A/μs
QRR	Reverse Recovery Charge	—	—	2.2	μC	VDD ≤ 50V ④
ton	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by LS + LD.				

*Current limited by pin diameter.

Thermal Resistance

	Parameter	Min	Typ	Max	Units	Test Conditions
RthJC	Junction to Case	—	—	0.83	°C/W	Typical socket mount
RthJA	Junction to Ambient	—	—	30		