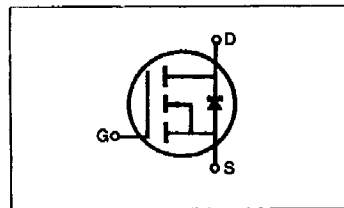
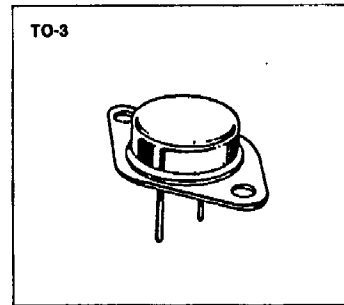


**IRF350/351/352/353**

**N-CHANNEL  
POWER MOSFETS**

**FEATURES**

- Low  $R_{DS(on)}$
- Improved inductive ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Low input capacitance
- Extended safe operating area
- Improved high temperature reliability
- TO-3 package (Standard)



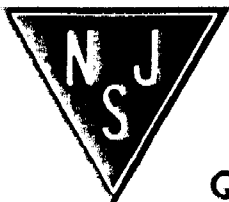
**PRODUCT SUMMARY**

Part Number	$V_{DS}$	$R_{DS(on)}$	$I_D$
IRF260	400V	0.3 $\Omega$	15A
IRF251	360V	0.3 $\Omega$	15A
IRF252	400V	0.4 $\Omega$	13A
IRF253	360V	0.4 $\Omega$	13A

**MAXIMUM RATINGS**

Characteristic	Symbol	IRF350	IRF351	IRF352	IRF353	Unit
Drain-Source Voltage (1)	$V_{DSS}$	400	350	400	350	Vdc
Drain-Gate Voltage ( $R_{GS}=1.0M\Omega$ ) (1)	$V_{DGR}$	400	350	400	350	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$				Vdc
Continuous Drain Current $T_C=25^\circ C$	$I_D$	15	15	13	13	Adc
Continuous Drain Current $T_C=100^\circ C$	$I_D$	9.0	9.0	8.0	8.0	Adc
Drain Current—Pulsed (3)	$I_{DM}$	60	60	52	52	Adc
Gate Current—Pulsed	$I_{GM}$	$\pm 1.5$				Adc
Total Power Dissipation @ $T_C=25^\circ C$ Derate above $25^\circ C$	$P_D$	150 1.2				Watts W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to 150				$^\circ C$
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	$T_L$	300				$^\circ C$

Notes: (1)  $T_J=25^\circ C$  to  $150^\circ C$   
 (2) Pulse test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$   
 (3) Repetitive rating: Pulse width limited by max. junction temperature



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.

# IRF350/351/352/353

# N-CHANNEL POWER MOSFETS

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise specified)

Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	IRF350 IRF352	400	—	—	V	V <sub>GS</sub> =0V
		IRF351 IRF353	350	—	—	V	I <sub>D</sub> =250μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	ALL	2.0	—	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Gate-Source Leakage Forward	I <sub>GSS</sub>	ALL	—	—	100	nA	V <sub>GS</sub> =20V
Gate-Source Leakage Reverse	I <sub>GSS</sub>	ALL	—	—	-100	nA	V <sub>GS</sub> =-20V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	ALL	—	—	250	μA	V <sub>DS</sub> =Max. Rating, V <sub>GS</sub> =0V
		—	—	—	1000	μA	V <sub>DS</sub> =Max. Rating×0.8, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C
On-State Drain-Source Current (2)	I <sub>D(on)</sub>	IRF350 IRF351	15	—	—	A	V <sub>DS</sub> >I <sub>D(on)</sub> ×R <sub>DS(on)</sub> max., V <sub>GS</sub> =10V
		IRF352 IRF353	13	—	—	A	
Static Drain-Source On-State Resistance (2)	R <sub>DS(on)</sub>	IRF350 IRF351	—	0.25	0.3	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =8.0A
		IRF352 IRF353	—	0.3	0.4	Ω	
Forward Transconductance (2)	g <sub>fs</sub>	ALL	8.0	11	—	S	V <sub>DS</sub> >I <sub>D(on)</sub> ×R <sub>DS(on)</sub> max., I <sub>D</sub> =8.0A
Input Capacitance	C <sub>iss</sub>	ALL	—	2630	3000	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz
Output Capacitance	C <sub>oss</sub>	ALL	—	390	600	pF	
Reverse Transfer Capacitance	C <sub>res</sub>	ALL	—	130	200	pF	
Turn-On Delay Time	t <sub>d(on)</sub>	ALL	—	—	35	ns	V <sub>DD</sub> =0.5BV <sub>DSS</sub> , I <sub>D</sub> =8.0A, Z <sub>O</sub> =4.7Ω (MOSFET switching times are essentially independent of operating temperature.)
Rise Time	t <sub>r</sub>	ALL	—	—	65	ns	
Turn-Off Delay Time	t <sub>d(off)</sub>	ALL	—	—	150	ns	
Fall Time	t <sub>f</sub>	ALL	—	—	75	ns	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q <sub>g</sub>	ALL	—	73	120	nC	V <sub>GS</sub> =10V, I <sub>D</sub> =18A, V <sub>DS</sub> =0.8 Max. Rating (Gate charge is essentially independent of operating temperature.)
Gate-Source Charge	Q <sub>gs</sub>	ALL	—	14	—	nC	
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	ALL	—	59	—	nC	

## THERMAL RESISTANCE

Junction-to-Case	R <sub>thJC</sub>	ALL	—	—	0.83	K/W	
Case-to-Sink	R <sub>thCS</sub>	ALL	—	0.1	—	K/W	Mounting surface flat, smooth, and greased
Junction-to-Ambient	R <sub>thJA</sub>	ALL	—	—	30	K/W	Free Air Operation

- Notes: (1) T<sub>J</sub>=25°C to 150°C  
 (2) Pulse test: Pulse width<300μs, Duty Cycle<2%  
 (3) Repetitive rating: Pulse width limited by max. junction temperature