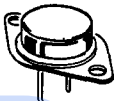
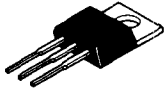


# MOSPOWER Selector Guide (Continued)

## N-Channel MOSPOWER (Continued)

Device	Breakdown Voltage (Volts)	r <sub>DS(on)</sub> (Ohms)	I <sub>D</sub> Continuous (Amps)	Power Dissipation (Watts)	Part Number	
 TO-3	100	0.055	40.0	150	IRF150	
	100	0.08	33.0	150	IRF152	
	100	0.085	27.0	125	IRF140	
	100	0.11	24.0	125	IRF142	
	100	0.18	14.0	100	VN1000A	
	100	0.18	14.0	75	IRF130	
	100	0.25	12.0	100	VN1001A	
	100	0.25	12.0	75	IRF132	
	100	0.3	8.0	40	IRF120	
	100	0.4	7.0	40	IRF122	
	90	4.0	1.9	25	2N6658	
	90	4.5	1.8	25	VN99AA	
	90	5.0	1.7	25	VN90AA	
	80	0.18	14.0	100	VN0800A	
	80	0.25	12.0	100	VN0801A	
	60	0.055	40.0	150	IRF151	
	60	0.08	33.0	150	IRF153	
	60	0.085	27.0	125	IRF141	
	60	0.11	24.0	125	IRF143	
	60	0.12	18.0	100	VN0600A	
	60	0.15	16.0	100	VN0601A	
	60	0.18	14.0	75	IRF131	
	60	0.25	12.0	75	IRF133	
	60	0.3	8.0	40	IRF121	
	60	0.4	10.0	80	VN64GA	
	60	0.4	7.0	40	IRF123	
	60	3.0	2.0	25	2N6657	
	60	3.5	2.0	25	VN67AA	
	40	0.12	18.0	100	VN0400A	
	40	0.15	16.0	100	VN0401A	
	35	1.8	2.0	25	2N6656	
	35	2.5	2.0	25	VN35AA	
	 TO-220AB	500	0.85	8.0	125	IRF840
		500	1.10	7.0	125	IRF842
		500	1.5	4.5	75	VN5001D
500		1.5	4.5	75	IRF830	
500		2.0	4.0	75	VN5002D	
500		2.0	4.0	75	IRF832	
500		3.0	2.5	40	IRF820	
500		4.0	2.0	40	IRF822	
450		0.85	8.0	125	IRF841	
450		1.10	7.0	125	IRF843	
450		1.5	4.5	75	VN4501D	
450		1.5	4.5	75	IRF831	
450		2.0	4.0	75	VN4502D	
450		2.0	4.0	75	IRF833	
450		3.0	2.5	40	IRF821	
450		4.0	2.0	40	IRF823	
400		0.55	10.0	125	IRF740	
400		0.80	8.0	125	IRF742	
400		1.0	6.0	75	VN4000D	
400		1.0	5.5	75	IRF730	
400		1.5	5.0	75	VN4001D	
400		1.5	4.5	75	IRF732	
400		1.8	3.0	40	IRF720	
400		2.5	2.5	40	IRF722	
350		0.55	10.0	125	IRF741	
350		0.80	8.0	125	IRF743	
350		1.0	6.0	75	VN3500D	
350		1.0	5.5	75	IRF731	
350		1.5	5.0	75	VN3501D	
350		1.5	4.5	75	IRF733	
350		1.8	3.0	40	IRF721	
350		2.5	2.5	40	IRF723	
240		6.0	1.4	20	VN2406D	

Datasheet Directory

IRF320 ■ IRF321 ■ IRF322 ■ IRF323  
 IRF720 ■ IRF721 ■ IRF722 ■ IRF723

IRF320 ■ IRF321 ■ IRF322 ■ IRF323  
 IRF720 ■ IRF721 ■ IRF722 ■ IRF723



Advanced Information

# 400V N-Channel Enhancement Mode MOSPOWER

These power FETs are designed especially for off-line switching regulators, converters, solenoid and relay drivers.

## FEATURES

- High Voltage
- No Second Breakdown
- High Input Impedance
- Internal Drain-Source Diode
- Very Rugged: Excellent SOA
- Extremely Fast Switching

## BENEFITS

- Reduced Component Count
- Improved Performance
- Simpler Designs
- Improved Reliability

## Product Summary

Part Number	$V_{DSS}$	$R_{DS(ON)}$	$I_D$	Package
IRF320	400V	1.8Ω	3A	TO-3
IRF321	350V			
IRF322	400V	2.5Ω	2.5A	
IRF323	350V			
IRF720	400V	1.8Ω	3A	TO-220AB
IRF721	350V			
IRF722	400V	2.5Ω	2.5A	
IRF723	350V			

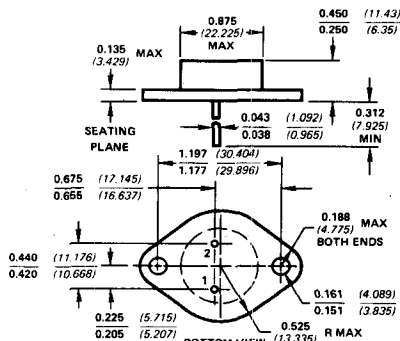


## ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

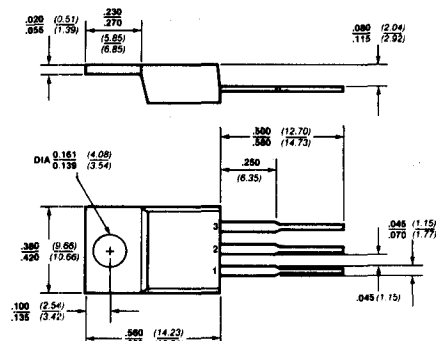
Drain-Source Voltage	
IRF320, 322, 720, 722	400V
IRF321, 323, 721, 723	350V
Drain-Gate Voltage	
IRF320, 322, 720, 722	400V
IRF321, 323, 721, 723	350V
Drain Current Continuous	
IRF320, 321, 720, 721	±3A
IRF322, 323, 722, 723	±2.5A

Drain Current	
Pulsed ( $80\mu\text{s}$ to $300\mu\text{s}$ , 1% duty cycle)	±12A
Gate Current (Peak)	±1A
Gate-Source Voltage	±40V
Total Power Dissipation	40W
Linear Derating Factor	0.32 W/°C
Operating and Storage Temperature	-55°C to +150°C

## PACKAGE DIMENSIONS



PIN 1 — Gate  
 PIN 2 — Source  
 CASE — Drain



PIN 1 — Gate  
 PIN 2 & TAB — Drain  
 PIN 3 — Source

# ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Part Number	Min	Typ	Max	Unit	Test Conditions
<b>Static</b>						
$BV_{DSS}$ Drain-Source Breakdown Voltage	IRF320, 322 IRF720, 722	400			V	$V_{GS} = 0, I_D = 250\mu\text{A}$
	IRF321, 323 IRF721, 723	350				
$V_{GS(th)}$ Gate Threshold Voltage	All	2.0		4.0	V	$V_{DS} = V_{GS}, I_D = 1.0\text{ mA}$
$I_{GSS}$ Gate-Body Leakage	All			$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$
$I_{DSS}$ Zero Gate Voltage Drain Current	All		0.1	0.25	mA	$V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0$ $V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0, T_C = 125^\circ\text{C}$
			0.2	1.0		
$I_{D(on)}$ On-State Drain Current	All	3.0			A	$V_{DS} = 25\text{V}, V_{GS} = 10\text{V}$ (Note 1)
$r_{DS(on)}$ Static Drain-Source On-State Resistance	IRF320, 321 IRF720, 721		1.5	1.8	$\Omega$	$V_{GS} = 10\text{V}, I_D = 1.5\text{A}$ (Note 1)
	IRF322, 323 IRF722, 723		1.8	2.5		
<b>Dynamic</b>						
$g_{fs}$ Forward Transconductance	All	1.0	2.0		S	$V_{DS} = 25\text{V}, I_D = 1.5\text{A}$ (Note 1)
$C_{iss}$ Input Capacitance	All		450	600	pF	$V_{GS} = 0, V_{DS} = 25\text{V}, f = 1\text{ MHz}$
$C_{oss}$ Output Capacitance			100	200		
$C_{rss}$ Reverse Transfer Capacitance			20	40		
$t_{d(on)}$ Turn-On Delay Time	All		20	40	ns	$V_{DD} = 200\text{V}, I_D \approx 1.5\text{A}, R_L = 130\Omega,$ $R_g = 25\Omega$ , (Fig. 1)
$t_r$ Rise Time	All		25	50		
$t_{d(off)}$ Turn-Off Delay Time	All		50	100		
$t_f$ Fall Time	All		25	50		
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$ Forward On Voltage	All		-1.3		V	$I_S = -3\text{A}, V_{GS} = 0$ (Note 1)
$t_{rr}$ Reverse Recovery Time	All		400		ns	$I_F = -3\text{A}, V_{GS} = 0, di/dt = 100\text{A}/\mu\text{s}$ (Fig. 1)

Note 1: Pulse test — 80  $\mu\text{s}$  to 300  $\mu\text{s}$ , 1% duty cycle

## TEST CIRCUITS

FIGURE 1 Switching Test Circuit

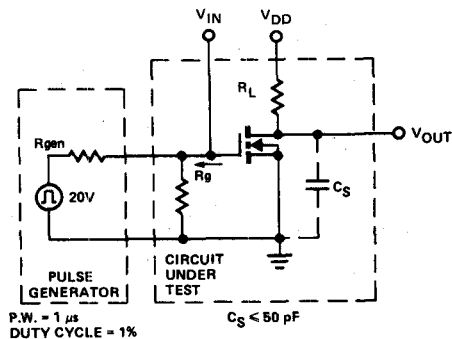


FIGURE 2 JEDEC Reverse Recovery Circuit

