
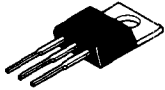


MOSPOWER Selector Guide (Continued)

N-Channel MOSPOWER (Continued)

Device	Breakdown Voltage (Volts)	r _{DS(on)} (Ohms)	I _D 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	

IRF120 ■ IRF121 ■ IRF122 ■ IRF123
 IRF520 ■ IRF521 ■ IRF522 ■ IRF523

IRF120 ■ IRF121 ■ IRF122 ■ IRF123
 IRF520 ■ IRF521 ■ IRF522 ■ IRF523



Advanced Information

100V N-Channel Enhancement Mode MOSPOWER

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

FEATURES

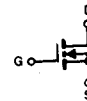
- High Voltage
- No Second Breakdown
- High Input Impedance
- Internal Drain-Source Diode
- Very Rugged: Excellent SOA
- Extremely Fast Switching

BENEFITS

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

Product Summary

Part Number	V_{DSS}	$R_{DS(ON)}$	I_D	Package
IRF120	100V	0.30 Ω	8A	TO-3
IRF121	60V		8A	
IRF122	100V	0.40 Ω	7A	
IRF123	60V		7A	
IRF520	100V	0.30 Ω	8A	TO-220AB
IRF521	60V		8A	
IRF522	100V	0.40 Ω	7A	
IRF523	60V		7A	

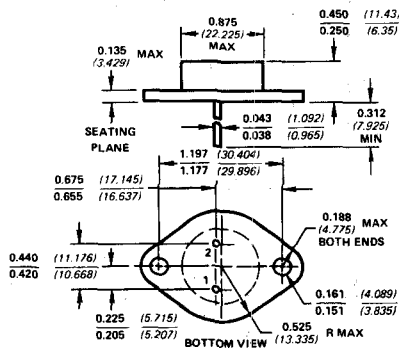


ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Drain-Source Voltage	
IRF120, 122, 520, 522	100V
IRF121, 123, 521, 523	60V
Drain-Gate Voltage	
IRF120, 122, 520, 522	100V
IRF121, 123, 521, 523	60V
Drain Current Continuous	
IRF120, 121, 520, 521	$\pm 8\text{A}$
IRF122, 123, 522, 523	$\pm 7\text{A}$

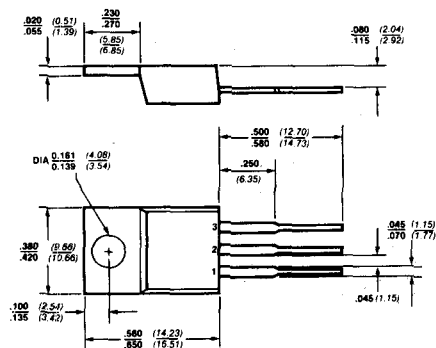
Drain Current	
Pulsed (80 μs to 300 μs , 1% duty cycle)	$\pm 32\text{A}$
Gate Current (Peak)	$\pm 3\text{A}$
Gate-Source Voltage	$\pm 40\text{V}$
Total Power Dissipation	40 W
Linear Derating Factor	0.32 W/ $^\circ\text{C}$
Operating and Storage Temperature	-55°C to $+150^\circ\text{C}$

PACKAGE DIMENSIONS



PIN 1 — Gate
 PIN 2 — Source
 CASE — Drain

TO-3



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

TO-220AB

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

Parameter	Part Number	Min	Typ	Max	Unit	Test Conditions
Static						
$B_{V_{DS}}$ Drain-Source Breakdown Voltage	IRF120, 520 IRF122, 522	100			V	$V_{GS} = 0, I_D = 250\mu\text{A}$
	IRF121, 521 IRF123, 523	60				
$V_{GS(th)}$ Gate Threshold Voltage	All	2.0		4.0	V	$V_{DS} = V_{GS}, I_D = 1\text{ mA}$
I_{GSS} Gate-Body Leakage	All			± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$
I_{DSS} Zero Gate Voltage Drain Current	All		0.1	0.25	mA	$V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0$
			0.2	1.0		$V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0, T_C = 125^\circ\text{C}$
$I_{D(on)}$ On-State Drain Current	All	8.0			A	$V_{DS} = 25\text{V}, V_{GS} = 10\text{V}$ (Note 1)
$r_{DS(on)}$ Static Drain-Source On-State Resistance	IRF120, 121 IRF520, 521		0.25	0.30	Ω	$V_{GS} = 10\text{V}, I_D = 4\text{A}$ (Note 1)
	IRF122, 123 IRF522, 523		0.30	0.40		
Dynamic						
g_{fs} Forward Transconductance	All	1.5	2.5		S	$V_{DS} = 25\text{V}, I_D = 4\text{A}$ (Note 1)
C_{iss} Input Capacitance	All		450	600	pF	$V_{GS} = 0, V_{DS} = 25\text{V}, f = 0.1\text{ MHz}$
C_{oss} Output Capacitance			200	400		
C_{rss} Reverse Transfer Capacitance			50	100		
$t_{d(on)}$ Turn-On Delay Time	All		20	40	ns	$V_{DD} = 30\text{V}, I_D \approx 4\text{A}, R_L = 7\Omega, R_\theta = 25\Omega$ (Figure 1)
t_r Rise Time	All		35	70		
$t_{d(off)}$ Turn-Off Delay Time	All		50	100		
t_f Fall Time	All		35	70		
Drain-Source Diode Characteristics						
V_{SD} Forward On Voltage	All		-1.9		V	$I_S = -8\text{A}$ (Note 1)
t_{rr} Reverse Recovery Time	All		150		ns	$I_F = -8\text{A}, V_{GS} = 0, di/dt = 100\text{A}/\mu\text{s}$ (Fig. 2)

Note 1: Pulse test — 80 μs to 300 μs , 1% duty cycle

TEST CIRCUITS

FIGURE 1 Switching Test Circuit

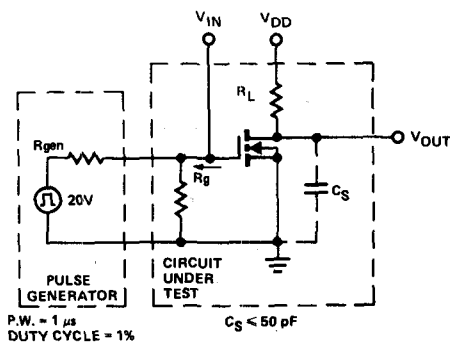
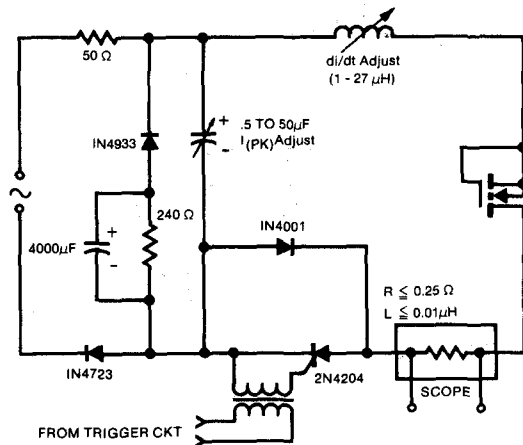


FIGURE 2 JEDEC Reverse Recovery Circuit



IRF120 ■ IRF121 ■ IRF122 ■ IRF123
IRF520 ■ IRF521 ■ IRF522 ■ IRF523

