

FEATURES

- Lower $R_{DS(on)}$
- Improved Inductive Ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Lower input capacitance
- Extended safe operating area
- Improved high temperature reliability

PRODUCT SUMMARY

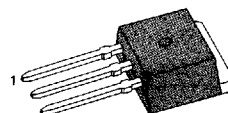
Part Number	V_{DS}	$R_{DS(on)}$	I_D
IRFWZ24/IZ24	60	0.1Ω	15A
IRFWZ20/IZ20	50	0.1Ω	15A

D²-PAK



1. Gate 2. Drain 3. Source
IRFWZ24/20

P-PAK



1. Gate 2. Drain 3. Source
IRFIZ24/20

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	IRFWZ24 IRFIZ24	IRFWZ20 IRFIZ20	Unit
Drain-Source Voltage (1)	V_{DS}	60	50	Vdc
Drain-Gate Voltage ($R_{GS}=1M\Omega$) (1)	V_{DGR}	60	50	Vdc
Gate-Source Voltage	V_{GS}	± 20		Adc
Continuous Drain Current $T_C=25^\circ C$	I_D	15		Adc
Continuous Drain Current $T_C=100^\circ C$	I_D	10		Adc
Drain Current - Pulsed (3)	I_{DM}	60		Adc
Single Pulsed Avalanche Energy (4)	EAS	100		mJ
Avalanche Current	I_{AS}	15		A
Total Power Dissipation $T_C=25^\circ C$	P_D	60		Watts
Derate Above $25^\circ C$		0.48		W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +175		$^\circ C$
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 $175^\circ C$

(2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by junction temperature

(4) $L=403\mu H$, $V_{dd}=25V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

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

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV _{DSS}	Drain-Source Breakdown Voltage					
	IRFWZ24/IZ24	60	-	-	V	$V_{GS}=0V, I_D=250\mu A$
	IRFWZ20/IZ20	50	-	-	V	
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
I _{GSS}	Gate-Source Leakage Forward	-	-	100	nA	$V_{GS}=20V$
I _{GSS}	Gate-Source Leakage Reverse	-	-	-100	nA	$V_{GS}=-20V$
I _{SS}	Zero Gate Voltage Drain Current	-	-	250	μA	$V_{DS}=\text{Max. Rating}, V_{GS}=0V$
		-	-	1000	μA	$V_{DS}=0.8 \text{ Max. Rating}, V_{GS}=0V, T_c=150^\circ\text{C}$
R _{DS(on)}	Static Drain-Source On Resistance(2)	-	0.08	0.1	Ω	$V_{GS}=10V, I_D=7.5A$
g _{fs}	Forward Transconductance (2)	5.6	6.1	-	S	$V_{GS}=50V, I_D=7.5A$
C _{iss}	Input Capacitance	-	635	-	pF	$V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$
C _{oss}	Output Capacitance	-	218	-	pF	
C _{rss}	Reverse Transfer Capacitance	-	105	-	pF	
t _{d(on)}	Turn-On Delay Time	-	-	30	ns	$V_{DD}=0.5 BV_{DSS}, I_D=15A, Z_o=24\Omega$ (MOSFET switching times are essentially independent of operating temperature)
t _r	Rise Time	-	-	90	ns	
t _{d(off)}	Turn-Off Delay Time	-	-	40	ns	
t _f	Fall Time	-	-	30	ns	
Q _g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	27	nC	$V_{GS}=10V, I_D=15A, V_{DS}=0.8 \text{ Max. Rating}$ (Gate charge is essentially independent of operating temperature)
Q _{gs}	Gate-Source Charge	-	7.5	-	nC	
Q _{gd}	Gate-Drain ("Miller") Charge	-	18	-	nC	

THERMAL RESISTANCE

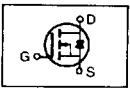
Symbol	Characteristics		All	Units	Remark
R _{thJC}	Junction-to-Case	MAX	2.5	K/W	
R _{thJA}	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

Notes : (1) $T_J=25^\circ\text{C}$ to 175°C

(2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by max. junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	15	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	60	A	
V_{SD}	Diode Forward Voltage (2)	-	-	1.5	V	$T_J=25^\circ\text{C}$, $I_S=15\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	-	310	ns	$T_J=25^\circ\text{C}$, $I_F=15\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

Notes : (1) $T_J=25^\circ\text{C}$ to 175°C

(2) Pulse test : Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by max. Junction temperature