

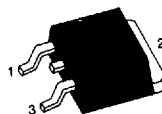
FEATURES

- 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

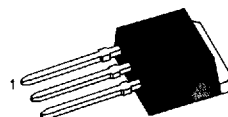
Part Number	V_{DS}	$R_{DS(on)}$	I_D
IRFWZ14/IZ14	60	$0.2\ \Omega$	10A
IRFWZ10/IZ10	50	$0.2\ \Omega$	10A

D²-PAK



1. Gate 2. Drain 3. Source
IRFWZ14/10

I²-PAK



1. Gate 2. Drain 3. Source
IRFIZ14/10

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	IRFWZ14 IRFIZ14	IRFWZ10 IRFIZ10	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	10		Adc
Continuous Drain Current $T_c=100\ ^\circ C$	I_D	7.2		Adc
Drain Current - Pulsed (3)	I_{DM}	40		Adc
Single Pulsed Avalanche Energy (4)	EAS	47		mJ
Avalanche Current	IAS	10		A
Total Power Dissipation $T_c=25\ ^\circ C$	P_D	43		Watts
Derate Above $25\ ^\circ C$		0.29		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 max. junction temperature

(4) $L=548\ \mu H$, $V_{DD}=25V$, $R_G=25\ \Omega$, 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					
	IRFWZ14/IZ14	60	-	-	V	V _{GS} =0V, I _D =250 μ A
	IRFWZ10/IZ10	50	-	-	V	
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.0	V	V _{DS} =V _{GS} , I _D =250 μ A
I _{GSS}	Gate-Source Leakage Forward	-	-	100	nA	V _{GS} =20V
I _{GSS}	Gate-Source Leakage Reverse	-	-	-100	nA	V _{GS} =-20V
I _{DSS}	Zero Gate Voltage Drain Current	-	-	250	μ A	V _{DS} =Max. Rating, V _{GS} =0V
		-	-	1000	μ A	V _{DS} =0.8 Max. Rating, V _{GS} =0V, T _C =150°C
R _{DS(on)}	Static Drain-Source On Resistance(2)	-	-	0.2	Ω	V _{GS} =10V, I _D =5A
g _{fs}	Forward Transconductance (2)	2.4	-	-	mS	V _{GS} =50V, I _D =5A
C _{iss}	Input Capacitance	-	358	-	pF	V _{GS} =0V, V _{DS} =25V, f=1MHz
C _{oss}	Output Capacitance	-	134	-	pF	
C _{rss}	Reverse Transfer Capacitance	-	55	-	pF	
t _{d(on)}	Turn-On Delay Time	-	-	15	ns	V _{DD} =0.5 BV _{DSS} , I _D =10A, Z _O =24 Ω (MOSFET switching times are essentially independent of operating temperature)
t _r	Rise Time	-	-	75	ns	
t _{d(off)}	Turn-Off Delay Time	-	-	20	ns	
t _f	Fall Time	-	-	29	ns	
Q _g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	12	nC	V _{GS} =10V, V _{DS} =10A, V _{DS} =0.8 Max. Rating (Gate charge is essentially independent of operating temperature)
Q _{gs}	Gate-Source Charge	-	3.0	-	nC	
Q _{gd}	Gate-Drain ("Miller") Charge	-	5.8	-	nC	

THERMAL RESISTANCE

Symbol	Characteristics		All	Units	Remark
R _{thJC}	Junction-to-Case	MAX	3.5	K/W	
R _{thJA}	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

 Notes : (1) T_J=25°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

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	10	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	40	A	
V_{SD}	Diode Forward Voltage (2)	-	-	1.6	V	$T_J=25^\circ\text{C}$, $I_S=10\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	-	140	ns	$T_J=25^\circ\text{C}$, $I_F=10\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

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