PD - 95505

International
IOR Rectifier

IRF8010PbF

SMPS MOSFET

HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ max	I_D
100V	15mΩ	80A⑥

Applications

- High frequency DC-DC converters
- UPS and Motor Control
- Lead-Free

Benefits

- Low Gate-to-Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current
- Typical $R_{DS(on)}$ = 12mΩ

TO-220AB

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	80⑥	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	57	
I_{DM}	Pulsed Drain Current ①	320	
P_D @T_C = 25°C	Power Dissipation	260	W
	Linear Derating Factor	1.8	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ③	16	V/ns
T_J	Operating Junction and	-55 to + 175	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torque, 6-32 or M3 screw	1.1(10)	N•m (lbf•in)

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	0.57	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	62	

Notes ① through ⑥ are on page 8

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	100	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.11	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	12	15	mΩ	V_{GS} = 10V, I_D = 45A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	µA	V_{DS} = 100V, V_{GS} = 0V
		—	—	250		V_{DS} = 100V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-200		V_{GS} = -20V

Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
gfs	Forward Transconductance	82	—	—	V	V_{DS} = 25V, I_D = 45A
Q_g	Total Gate Charge	—	81	120		I_D = 80A
Q_{gs}	Gate-to-Source Charge	—	22	—	nC	V_{DS} = 80V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	26	—		V_{GS} = 10V ④
$t_{d(on)}$	Turn-On Delay Time	—	15	—		V_{DD} = 50V
t_r	Rise Time	—	130	—		I_D = 80A
$t_{d(off)}$	Turn-Off Delay Time	—	61	—	ns	R_G = 39Ω
t_f	Fall Time	—	120	—		V_{GS} = 10V ④
C_{iss}	Input Capacitance	—	3830	—		V_{GS} = 0V
C_{oss}	Output Capacitance	—	480	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	59	—	pF	f = 1.0MHz
C_{oss}	Output Capacitance	—	3830	—		V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0MHz
C_{oss}	Output Capacitance	—	280	—		V_{GS} = 0V, V_{DS} = 80V, f = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	—	530	—		V_{GS} = 0V, V_{DS} = 0V to 80V ③

Avalanche Characteristics

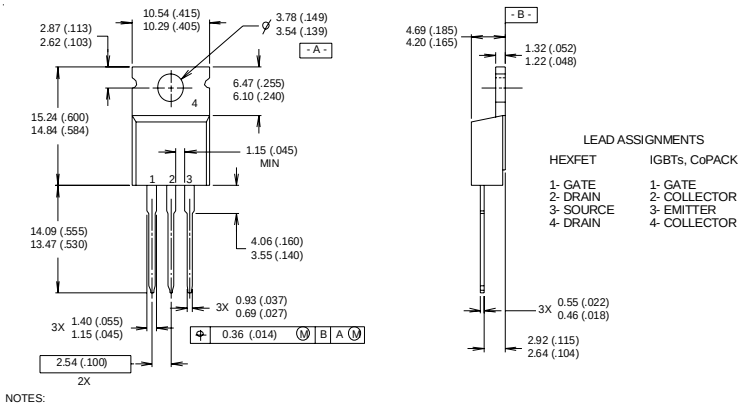
	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②⑥	—	310	mJ
I_{AR}	Avalanche Current ①	—	45	A
E_{AR}	Repetitive Avalanche Energy ①	—	26	mJ

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①⑥	—	—	320		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C, I_S = 80A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	99	150	ns	T_J = 150°C, I_F = 80A, V_{DD} = 50V
Q_{rr}	Reverse RecoveryCharge	—	460	700	nC	di/dt = 100A/µs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



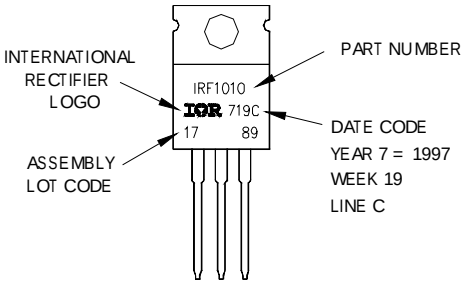
NOTES:

1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2 CONTROLLING DIMENSION : INCH
3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010
LOT CODE 1789
ASSEMBLED ON WW 19, 1997
IN THE ASSEMBLY LINE "C"

Note: "P" in assembly line position indicates "Lead-Free"



Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Starting T_J = 25°C, L = 0.31mH, R_G = 25Ω, I_{AS} = 45A.

③ $I_{SD} \leq 45A$, di/dt ≤ 110A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175°C$.

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}.

⑥ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

TO-220 package is not recommended for Surface Mount Application.

Data and specifications subject to change without notice.
This product has been designed and qualified for the Industrial market.

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