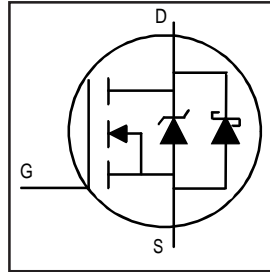


- Copackaged HEXFET® Power MOSFET and Schottky Diode
- Generation 5 Technology
- Logic Level Gate Drive
- Minimize Circuit Inductance
- Ideal For Synchronous Regulator Application

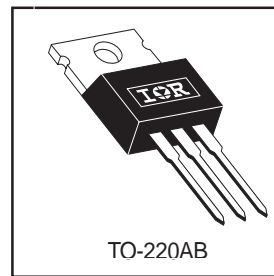


$V_{DSS} = 30V$
$R_{DS(on)} = 0.014\Omega$
$I_D = 54A$

Description

The FETKY family of copackaged HEXFET power MOSFETs and Schottky Diodes offer the designer an innovative board space saving solution for switching regulator applications. A low on resistance Gen 5 MOSFET with a low forward voltage drop Schottky diode and minimized component interconnect inductance and resistance result in maximized converter efficiencies.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



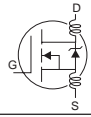
Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	54	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	34	
I_{DM}	Pulsed Drain Current ①	220	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.0	W
$P_D @ T_C = 25^\circ C$	Power Dissipation	70	W
	Linear Derating Factor	0.56	W/°C
V_{GS}	Gate-to-Source Voltage	± 16	V
T_J	Operating Junction and Storage Temperature Range	-55 to + 150	°C
T_{STG}			
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torque, 6-32 or M3 srew	10 lbf•in (1.1N•m)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	1.8	°C/W
$R_{\theta JA}$	Junction-to-Ambient	—	62	

MOSFET Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.037	—	V/°C	Reference to 25°C, I _D = 1mA ^③
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.014	Ω	V _{GS} = 10V, I _D = 32A ^②
		—	—	0.019		V _{GS} = 4.5V, I _D = 27A ^②
V _{GS(th)}	Gate Threshold Voltage	1.0	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance	23	—	—	S	V _{DS} = 25V, I _D = 34A ^③
I _{DSS}	Drain-to-Source Leakage Current	—	—	0.25	mA	V _{DS} = 30V, V _{GS} = 0V
		—	—	35		V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} = 16V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} = -16V
Q _g	Total Gate Charge	—	—	44	nC	I _D = 32A
Q _{gs}	Gate-to-Source Charge	—	—	14		V _{DS} = 24V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	—	24		V _{GS} = 4.5V, See Fig. 6 ^②
t _{d(on)}	Turn-On Delay Time	—	9.0	—	ns	V _{DD} = 15V
t _r	Rise Time	—	210	—		I _D = 34A
t _{d(off)}	Turn-Off Delay Time	—	20	—		R _G = 3.4Ω, V _{GS} = 4.5V
t _f	Fall Time	—	54	—		R _D = 0.43 Ω, ^② ^③
L _D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L _S	Internal Source Inductance	—	7.5	—		
C _{iss}	Input Capacitance	—	2300	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	1100	—		V _{DS} = 25V
C _{rss}	Reverse Transfer Capacitance	—	310	—		f = 1.0MHz, See Fig. 5
C _{iss}	Input Capacitance	—	3500	—		V _{GS} = 0V, V _{DS} = 0V

Body Diode & Schottky Diode Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _F (AV)	(Schottky)	—	—	5.0	A	MOSFET symbol showing the integral reverse p-n junction and Schottky diode.
I _{SM}	Pulsed Source Current (Body Diode) ^①	—	—	220		
V _{SD1}	Diode Forward Voltage	—	—	1.3	V	T _J = 25°C, I _S = 32A, V _{GS} = 0V ^②
V _{SD2}	Diode Forward Voltage	—	—	0.6	V	T _J = 25°C, I _S = 3.0A, V _{GS} = 0V ^②
t _{rr}	Reverse Recovery Time	—	51	77	ns	T _J = 25°C, I _F = 32A
Q _{rr}	Reverse Recovery Charge	—	47	71	nC	di/dt = 100A/μs ^②
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 10)
- ② Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ③ Uses IRL3103 data and test conditions

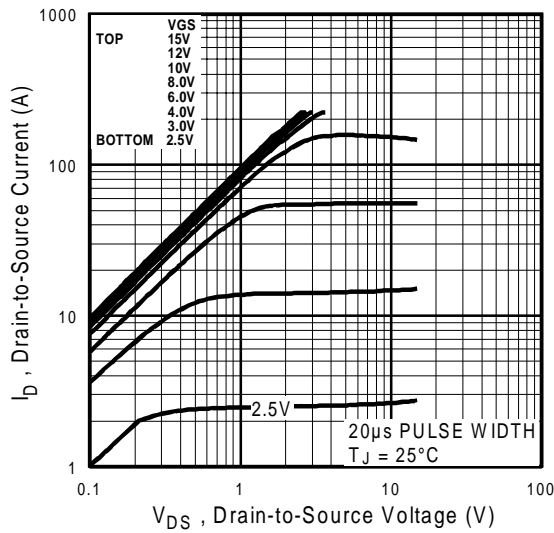


Fig 1. Typical Output Characteristics

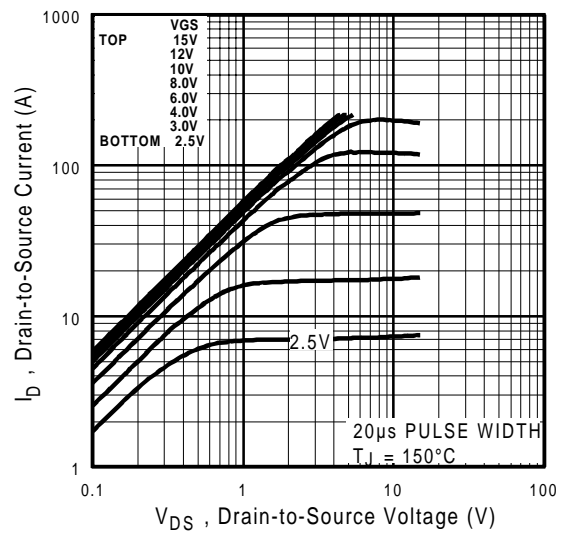


Fig 2. Typical Output Characteristics

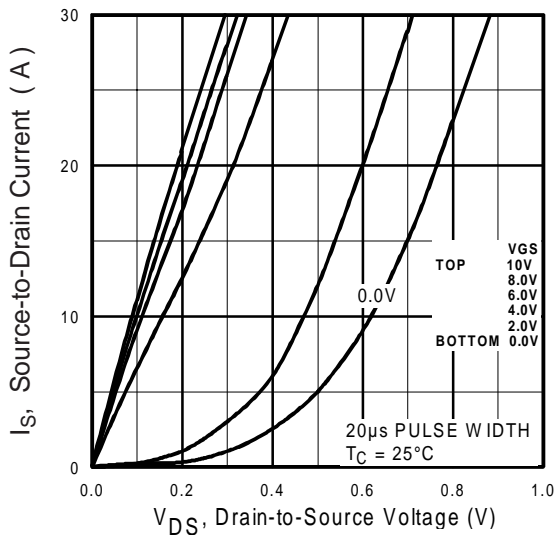


Fig 3. Typical Reverse Output Characteristics

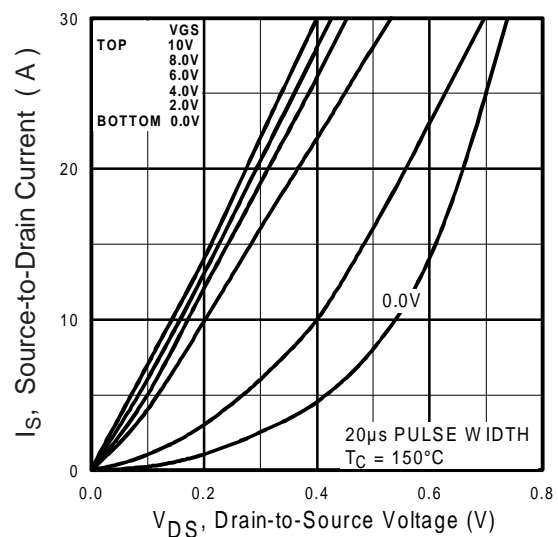


Fig 4. Typical Reverse Output Characteristics

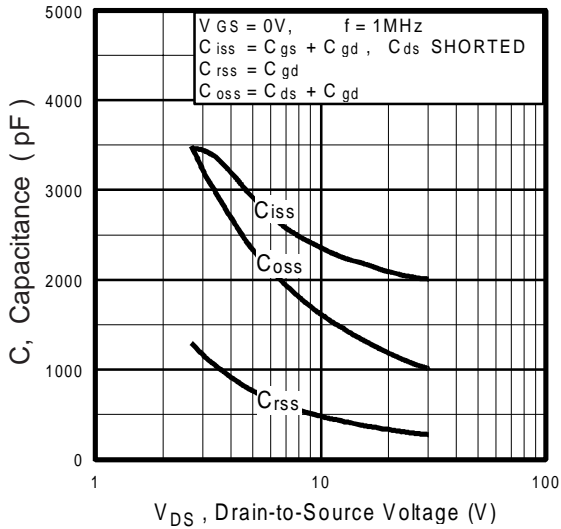


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

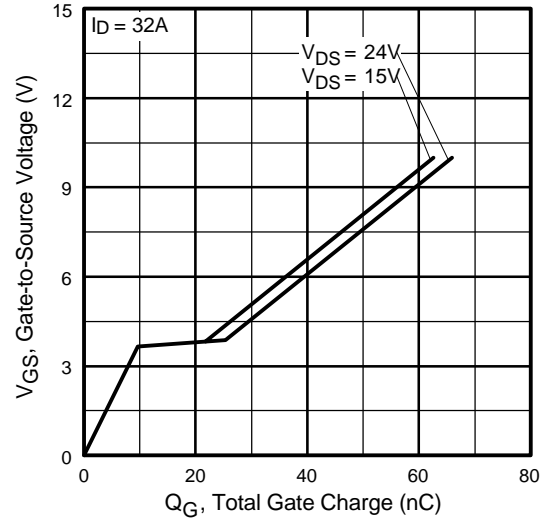


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

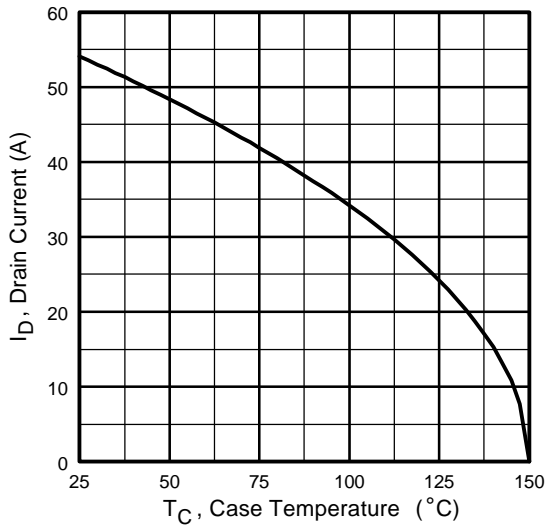


Fig 7. Maximum Drain Current Vs. Case Temperature

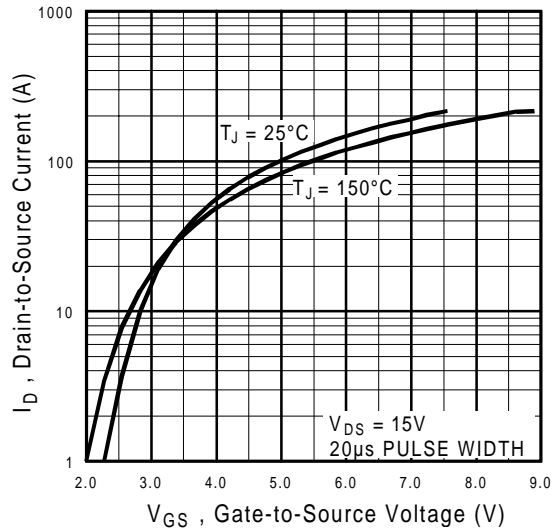


Fig 8. Typical Transfer Characteristics

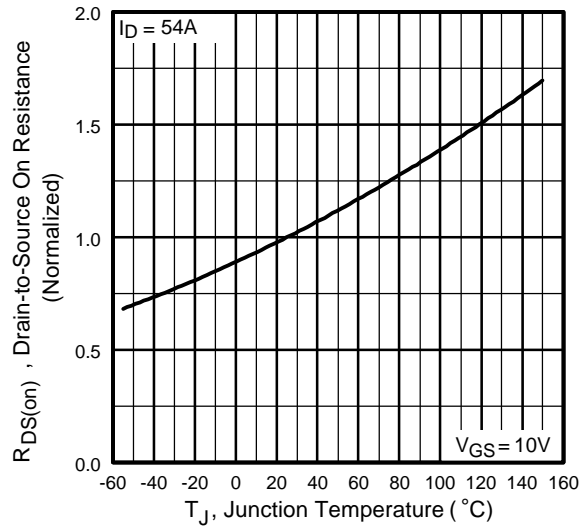


Fig 9. Normalized On-Resistance Vs. Temperature

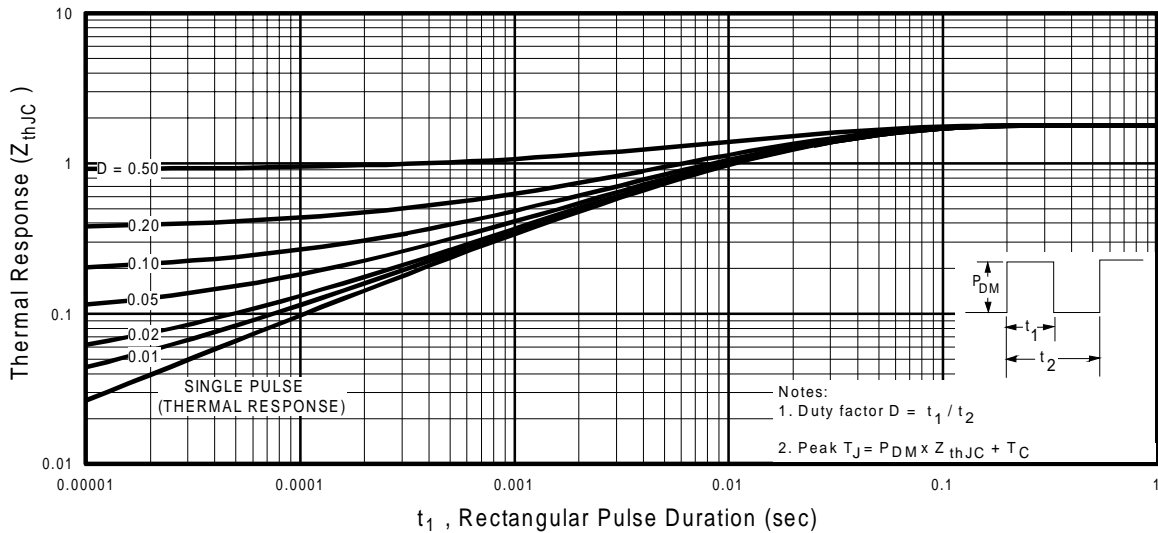


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Case

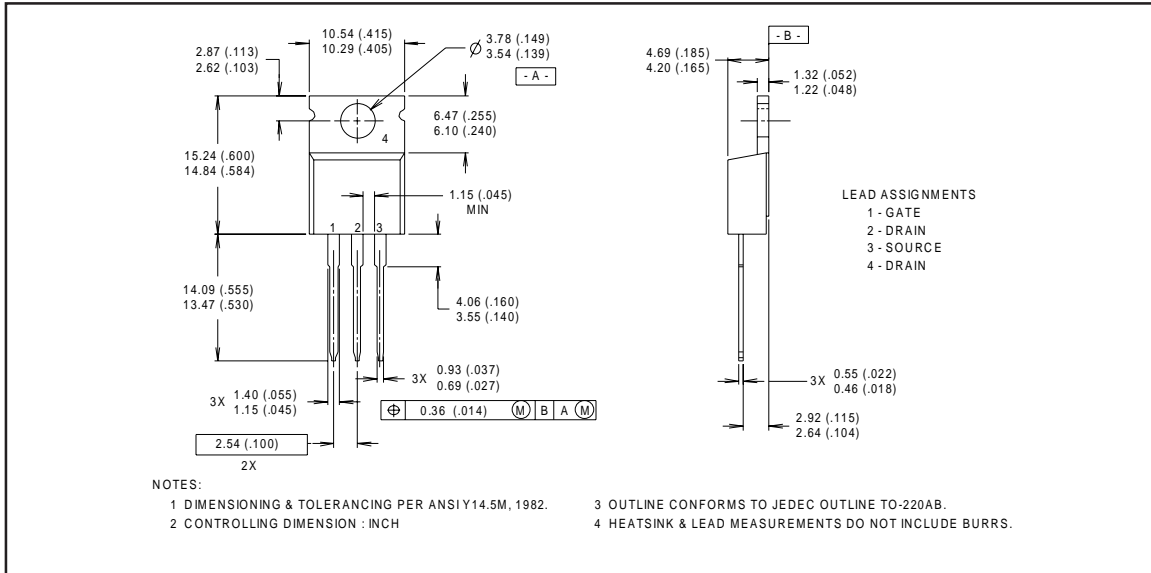
IRL3103D2

International
IR Rectifier

Package Outline

TO-220AB Outline

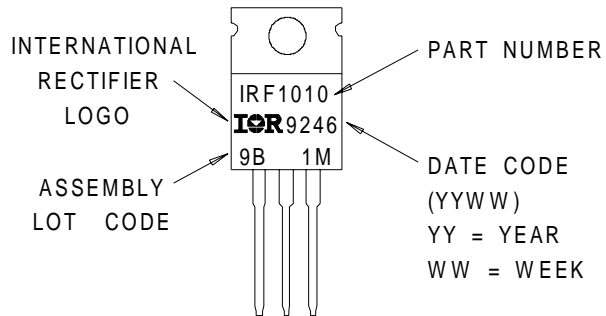
Dimensions are shown in millimeters (inches)



Part Marking Information

TO-220AB

EXAMPLE : THIS IS AN IRF1010
WITH ASSEMBLY
LOT CODE 9B1M



International
IR Rectifier

WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, Tel: (310) 322 3331
EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: ++ 44 1883 732020

IR CANADA: 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 2Z8, Tel: (905) 475 1897

IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590

IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086

IR SOUTHEAST ASIA: 315 Outram Road, #10-02 Tan Boon Liat Building, Singapore 0316 Tel: 65 221 8371

<http://www.irf.com/>

Data and specifications subject to change without notice.

6/97

Note: For the most current drawings please refer to the IR website at:
<http://www.irf.com/package/>