International
IOR Rectifier

PD-90396H

IRFG110
JANTX2N7334
JANTXV2N7334
REF:MIL-PRF-19500/597

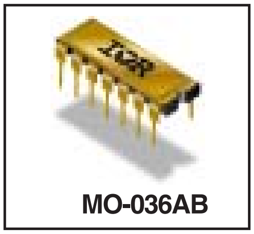
100V, QUAD N-CHANNEL

HEXFET® MOSFET TECHNOLOGY

POWER MOSFET
THRU-HOLE (MO-036AB)

Product Summary

Part Number	$R_{DS(on)}$	I_D
IRFG110	0.7 Ω	1.0A



MO-036AB

HEXFET® MOSFET technology is the key to International Rectifier's advanced line of power MOSFET transistors. The efficient geometry design achieves very low on-state resistance combined with high transconductance. HEXFET transistors also feature all of the well-established advantages of MOSFETs, such as voltage control, very fast switching, ease of paralleling and electrical parameter temperature stability. They are well-suited for applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers, high energy pulse circuits, and virtually any application where high reliability is required. The HEXFET transistor's totally isolated package eliminates the need for additional isolating material between the device and the heatsink. This improves thermal efficiency and reduces drain capacitance.

Features:

- Simple Drive Requirements
- Ease of Paralleling
- Hermetically Sealed
- Electrically Isolated
- Dynamic dv/dt Rating
- Light-weight

Absolute Maximum Ratings

	Parameter		Units
I_D @ V_{GS} = 10V, T_C = 25°C	Continuous Drain Current	1.0	A
I_D @ V_{GS} = 10V, T_C = 100°C	Continuous Drain Current	0.6	
I_{DM}	Pulsed Drain Current ①	4.0	
P_D @ T_C = 25°C	Max. Power Dissipation	1.4	W
	Linear Derating Factor	0.011	W/°C
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy ②	75	mJ
I_{AR}	Avalanche Current ①	1.0	A
E_{AR}	Repetitive Avalanche Energy ①	0.14	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.5	V/ns
T_J T_{STG}	Operating Junction Storage Temperature Range	-55 to 150	°C
	Lead Temperature	300 (0.63 in./1.6 mm from case for 10s)	
	Weight	1.3 (Typical)	g

For footnotes refer to the last page

03/01/10

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Electrical Characteristics @ Tj = 25°C (Unless Otherwise Specified)

	Parameter	Min	Typ	Max	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	$V_{GS} = 0V$, $I_D = 1.0mA$
$\Delta BV_{DSS}/\Delta T_J$	Temperature Coefficient of Breakdown Voltage	—	0.13	—	V/°C	Reference to 25°C, $I_D = 1.0mA$
$R_{DS(on)}$	Static Drain-to-Source On-State Resistance	—	—	0.7	Ω	$V_{GS} = 10V$, $I_D = 0.6A$ ④
		—	—	0.8		$V_{GS} = 10V$, $I_D = 1.0A$
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
g_{fs}	Forward Transconductance	0.86	—	—	S	$V_{DS} > 15V$, $I_{DS} = 0.6A$ ④
I_{DSS}	Zero Gate Voltage Drain Current	—	—	25	µA	$V_{DS} = 80V$, $V_{GS} = 0V$
		—	—	250		$V_{DS} = 80V$, $V_{GS} = 0V$, $T_J = 125°C$
I_{GSS}	Gate-to-Source Leakage Forward	—	—	100	nA	$V_{GS} = 20V$
I_{GSS}	Gate-to-Source Leakage Reverse	—	—	-100		$V_{GS} = -20V$
Q_g	Total Gate Charge	—	—	15	nC	$V_{GS} = 10V$, $I_D = 1.0A$ $V_{DS} = 50V$
Q_{gs}	Gate-to-Source Charge	—	—	7.5		
Q_{gd}	Gate-to-Drain ('Miller') Charge	—	—	7.5		
$t_{d(on)}$	Turn-On Delay Time	—	—	20	ns	$V_{DD} = 50V$, $I_D = 1.0A$, $V_{GS} = 10V$, $R_G = 7.5\Omega$
t_r	Rise Time	—	—	25		
$t_{d(off)}$	Turn-Off Delay Time	—	—	40		
t_f	Fall Time	—	—	40		
$L_S + L_D$	Total Inductance	—	10	—	nH	Measured from drain lead (6mm/0.25in. from package) to source lead (6mm/0.25in. from package)
C_{iss}	Input Capacitance	—	180	—	pF	$V_{GS} = 0V$, $V_{DS} = 25V$ f = 1.0MHz
C_{oss}	Output Capacitance	—	82	—		
C_{rss}	Reverse Transfer Capacitance	—	15	—		

Source-Drain Diode Ratings and Characteristics

	Parameter	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	1.0	A	
I_{SM}	Pulse Source Current (Body Diode) ①	—	—	4.0		
V_{SD}	Diode Forward Voltage	—	—	1.5	V	$T_j = 25°C$, $I_S = 1.0A$, $V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	—	200	ns	$T_j = 25°C$, $I_F = 1.0A$, $di/dt \leq 100A/\mu s$ $V_{DD} \leq 30V$ ④
Q_{RR}	Reverse Recovery Charge	—	—	0.83	µC	
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by $L_S + L_D$.				

Thermal Resistance

	Parameter	Min	Typ	Max	Units	Test Conditions
R_{thJC}	Junction-to-Case	—	—	17	°C/W	
R_{thJA}	Junction-to-Ambient	—	—	90		Typical socket mount

Note: Corresponding Spice and Saber models are available on International Rectifier Website.

For footnotes refer to the last page

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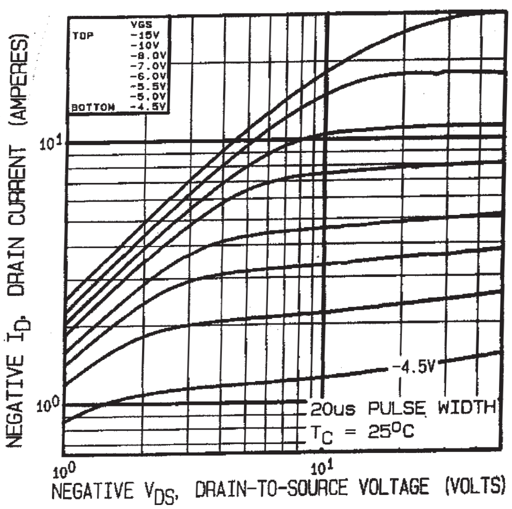

Fig 1. Typical Output Characteristics

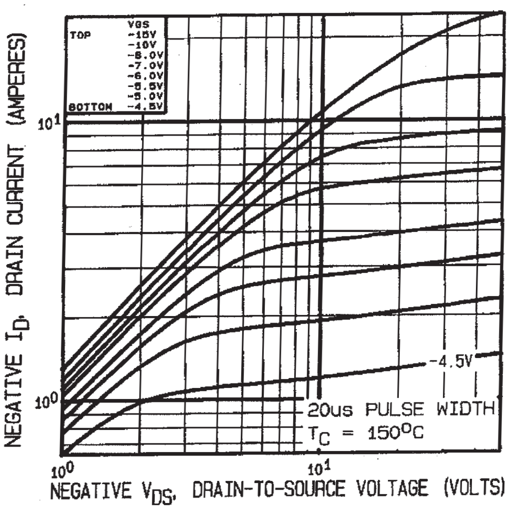

Fig 2. Typical Output Characteristics

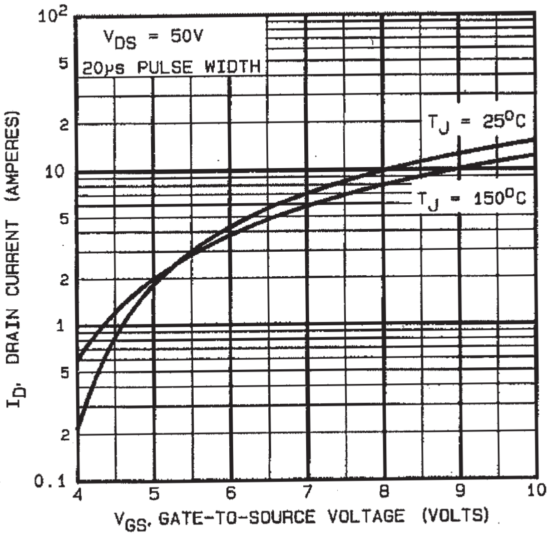

Fig 3. Typical Transfer Characteristics

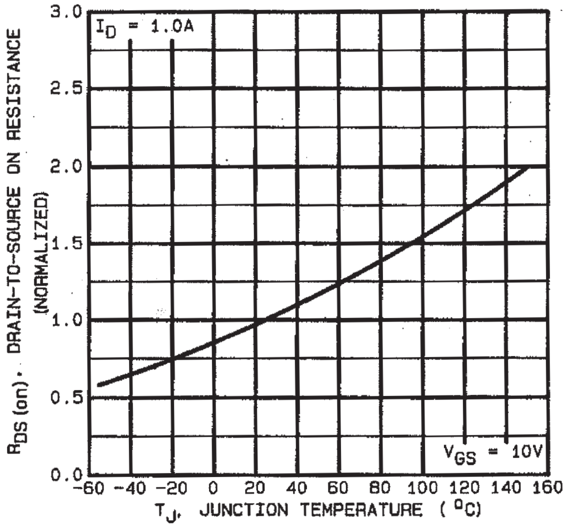

Fig 4. Normalized On-Resistance
Vs. Temperature

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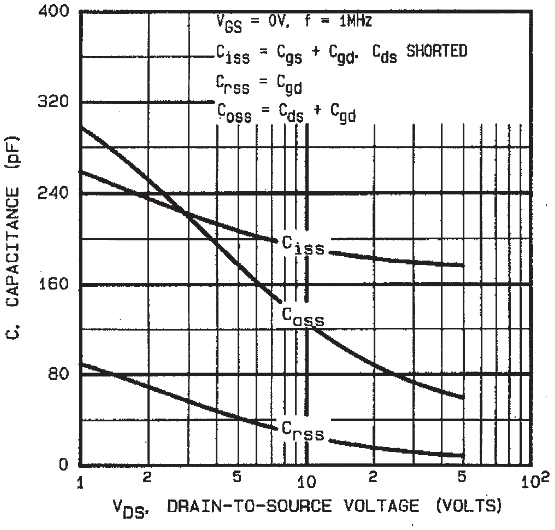

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

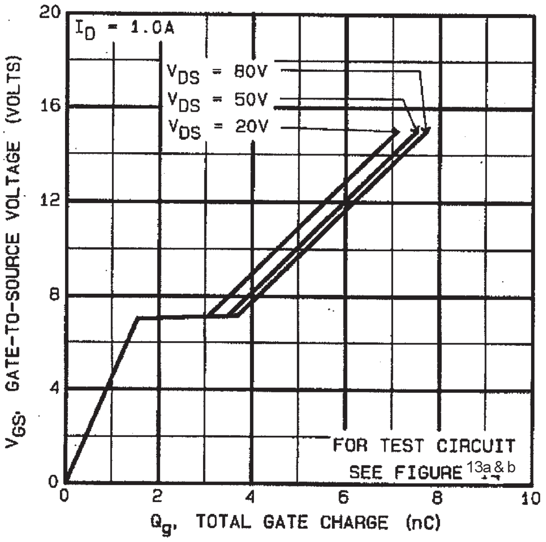

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

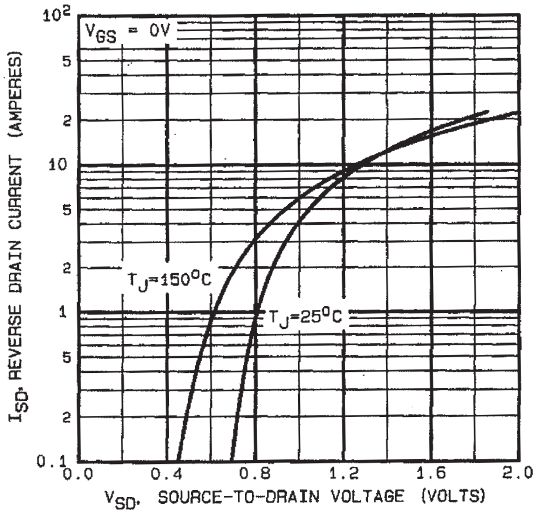

Fig 7. Typical Source-Drain Diode Forward Voltage

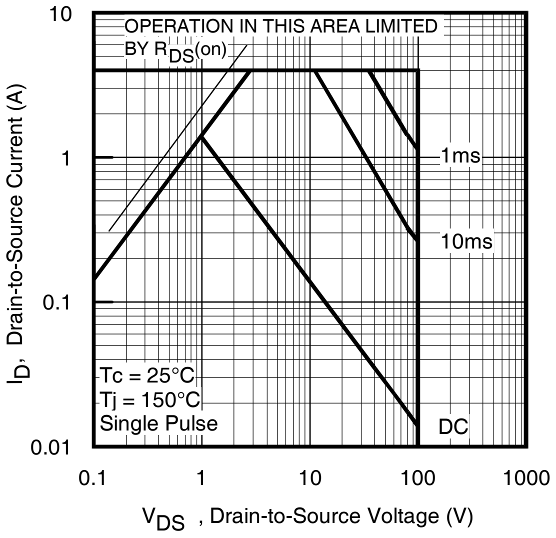

Fig 8. Maximum Safe Operating Area

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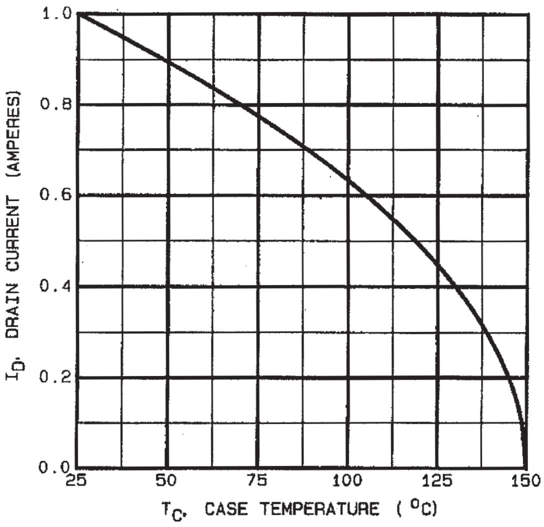

Fig 9. Maximum Drain Current Vs. Case Temperature

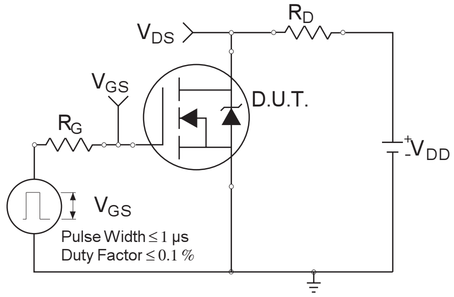

Fig 10a. Switching Time Test Circuit

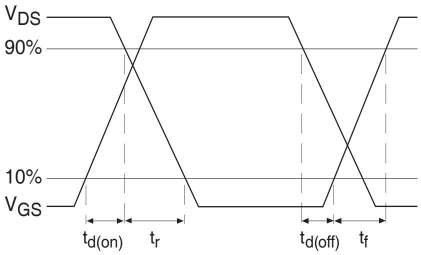

Fig 10b. Switching Time Waveforms

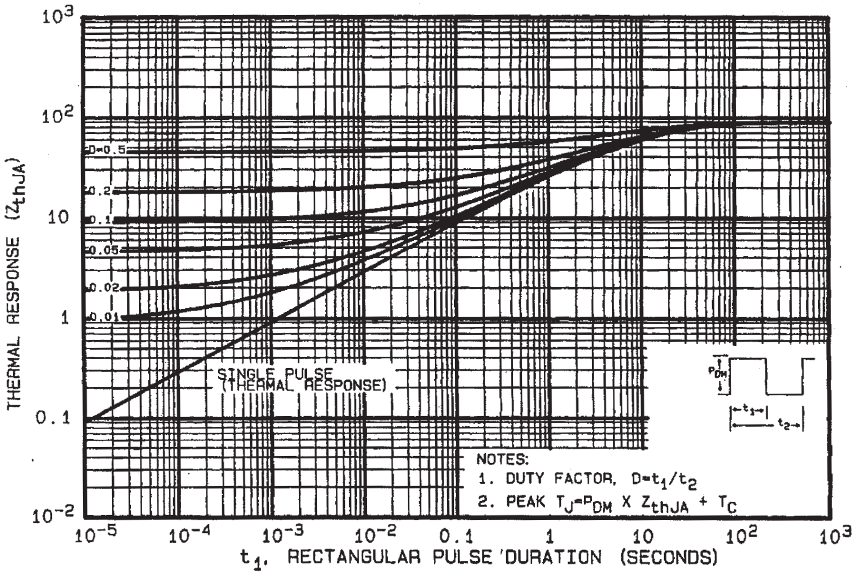

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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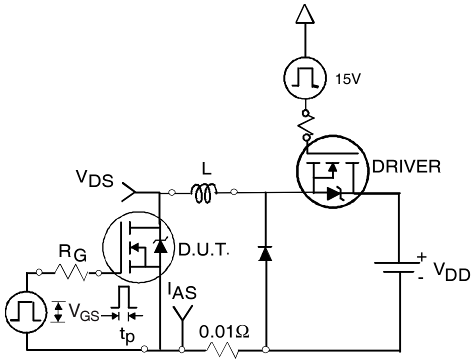

Fig 12a. Unclamped Inductive Test Circuit

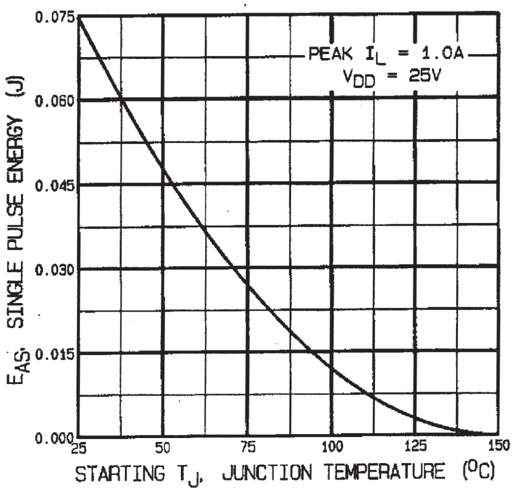

Fig 12c. Maximum Avalanche Energy Vs. Drain Current

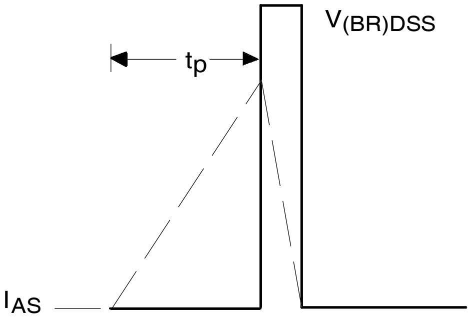

Fig 12b. Unclamped Inductive Waveforms

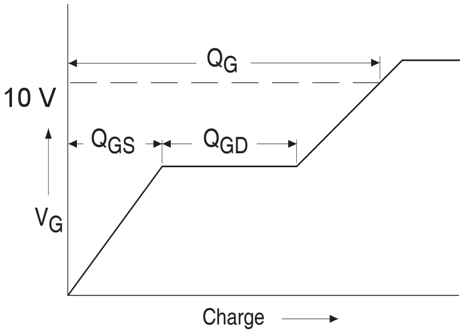

Fig 13a. Basic Gate Charge Waveform

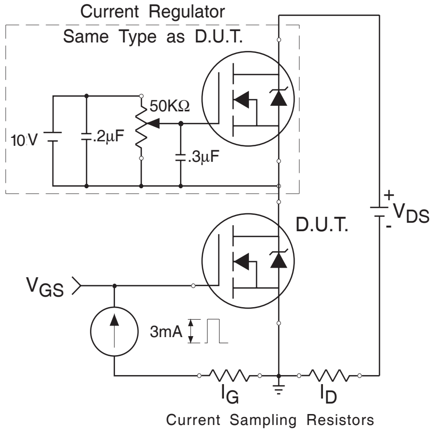

Fig 13b. Gate Charge Test Circuit

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Footnotes:

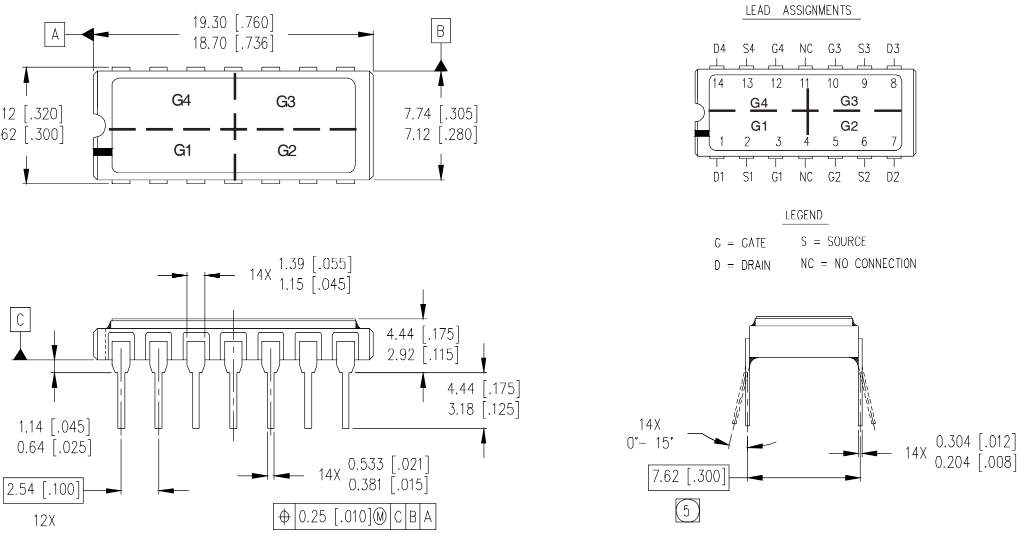
① Repetitive Rating; Pulse width limited by maximum junction temperature.

② V_{DD} = 25V, starting T_J = 25°C, L= 150mH
Peak I_L = 1.0A, V_{GS} = 10V

③ $I_{SD} \le 1.0A$, di/dt ≤ 75A/µs,
$V_{DD} \le 100V$, $T_J \le 150°C$

④ Pulse width ≤ 300 µs; Duty Cycle ≤ 2%

Case Outline and Dimensions — MO-036AB



NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MO-036AB.

5 MEASURED WITH THE LEADS CONSTRAINED TO BE PERPENDICULAR TO DATUM PLANE C.

International
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Data and specifications subject to change without notice. 03/2010

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