International TOR Rectifier

IRF7103

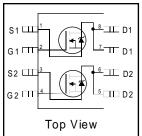
HEXFET® Power MOSFET

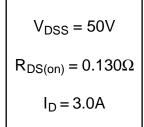
- Adavanced Process Technology
- Ultra Low On-Resistance
- Dual N-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Fast Switching

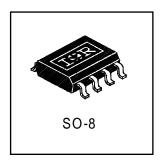
Description

Fourth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve the lowest possible on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient device for use in a wide variety of applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and dual-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.







Absolute Maximum Ratings

	Parameter	Max.	Units
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ 10V	3.0	
I _D @ T _A = 70°C	Continuous Drain Current, V _{GS} @ 10V	2.3	Α
I _{DM}	Pulsed Drain Current ①	10	
$P_D @ T_C = 25^{\circ}C$	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/°C
V _{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ②	4.5	V/nS
$T_{J,}T_{STG}$	Junction and Storage Temperature Range	-55 to + 150	∞

Thermal Resistance Ratings

	Parameter	Min.	Тур.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ®			62.5	°C/W

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

	Parameter	Min.	Тур.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	50			V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		0.049		V/°C	Reference to 25°C, I _D = 1mA
ם	Otatia Basia ta Osama Os Basistana		0.11	0.13	Ω	$V_{GS} = 10V, I_D = 3.0A$ ③
R _{DS(ON)}	Static Drain-to-Source On-Resistance		0.16	0.20	52	V _{GS} = 4.5V, I _D = 1.5A ③
V _{GS(th)}	Gate Threshold Voltage	1.0		3.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
g _{fs}	Forward Transconductance		3.8		S	V _{DS} = 15V, I _D = 3.0A ③
	Durin to Course Lordon Course			2.0	^	V _{DS} = 40V, V _{GS} = 0V
IDSS	Drain-to-Source Leakage Current			25	μΑ	V _{DS} = 40V, V _{GS} = 0V, T _J = 55 °C
1	Gate-to-Source Forward Leakage			100	- 4	V _{GS} = 20V
I _{GSS}	Gate-to-Source Reverse Leakage			-100	nA	V _{GS} = - 20V
Qg	Total Gate Charge		12	30		I _D = 2.0A
Q _{gs}	Gate-to-Source Charge		1.2		nC	$V_{DS} = 25V$
Q_{gd}	Gate-to-Drain ("Miller") Charge		3.5			V _{GS} = 10V ③
t _{d(on)}	Turn-On Delay Time		9.0	20		$V_{DD} = 25V$
t _r	RiseTime		8.0	20		$I_D = 1.0A$
t _{d(off)}	Turn-Off Delay Time		45	70	ns	$R_G = 6.0\Omega$
t _f	FallTime		25	50		$R_D = 25\Omega$ ③
L _D	Internal Drain Inductance		4.0		nH	Between lead,6mm(0.25in.)
L _S	Internal Source Inductance		6.0		1111	from package and center of die contact
C_{iss}	Input Capacitance		290			$V_{GS} = 0V$
C _{oss}	Output Capacitance		140		pF	$V_{DS} = 25V$
C _{rss}	Reverse Transfer Capacitance		37			f = 1.0MHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Тур.	Max.	Units	Conditions			
Is	Continuous Source Current			2.0		MOSFET symbol			
	(Body Diode)		2.0	- 2.0	- 2.0	2.0	2.0	Α	showing the
I _{SM}	Pulsed Source Current			12	4.0	_ A	integral reverse		
	(Body Diode) ①					p-n junction diode.			
V_{SD}	Diode Forward Voltage			1.2	V	$T_J = 25$ °C, $I_S = 1.5$ A, $V_{GS} = 0$ V ③			
t _{rr}	Reverse Recovery Time		70	100	ns	$T_J = 25^{\circ}C$, $I_F = 1.5A$			
Qrr	Reverse RecoveryCharge		110	170	nC	di/dt = 100A/µs ③			
t _{on}	Forward Turn-On Time	Intr	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.
- $\begin{tabular}{ll} @ I_{SD} \le 1.8A, \ di/dt \ \le 90A/\mu s, \ V_{DD} \le V_{(BR)DSS}, \\ T_J \le 150^{\circ}C \end{tabular}$
- 4 Surface mounted on FR-4 board, $t \le 10$ sec.

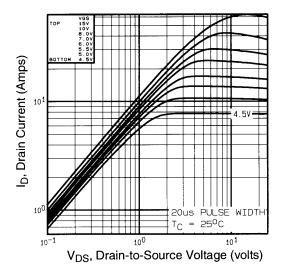


Fig 1. Typical Output Characteristics,

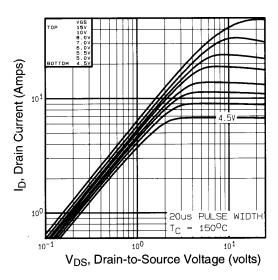


Fig 2. Typical Output Characteristics,

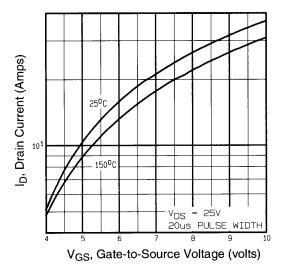


Fig 3. Typical Transfer Characteristics

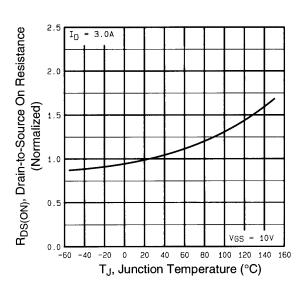


Fig 4. Normalized On-Resistance Vs. Temperature

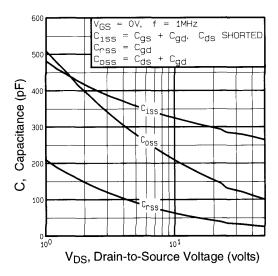


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

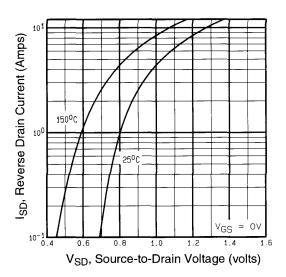


Fig 7. Typical Source-Drain Diode Forward Voltage

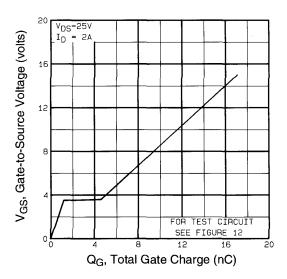


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

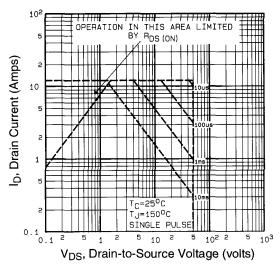


Fig 8. Maximum Safe Operating Area

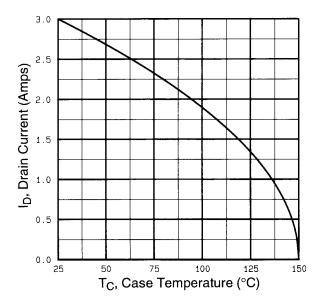


Fig 9. Maximum Drain Current Vs. Case Temperature

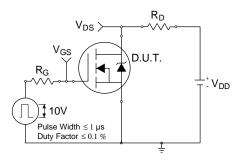


Fig 10a. Switching Time Test Circuit

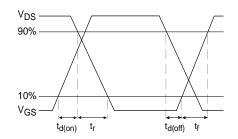


Fig 10b. Switching Time Waveforms

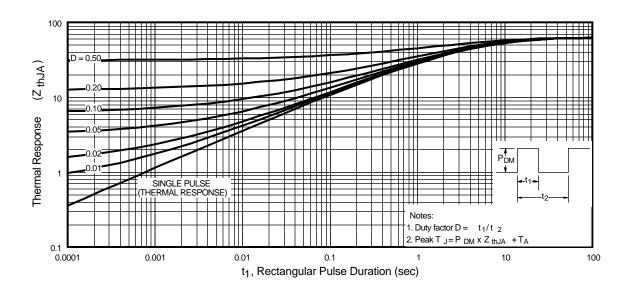
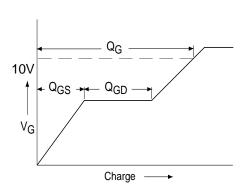


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



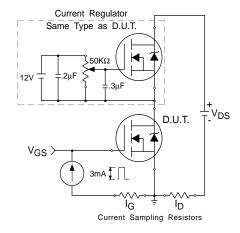
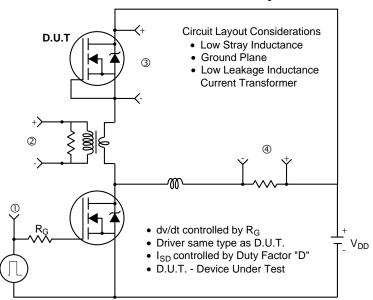


Fig 12a. Basic Gate Charge Waveform

Fig 12b. Gate Charge Test Circuit

Peak Diode Recovery dv/dt Test Circuit



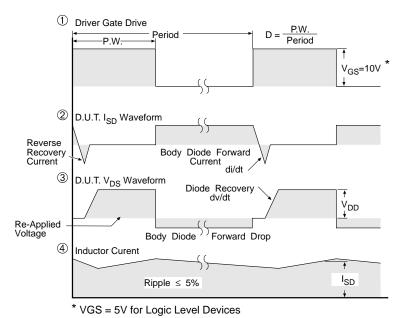
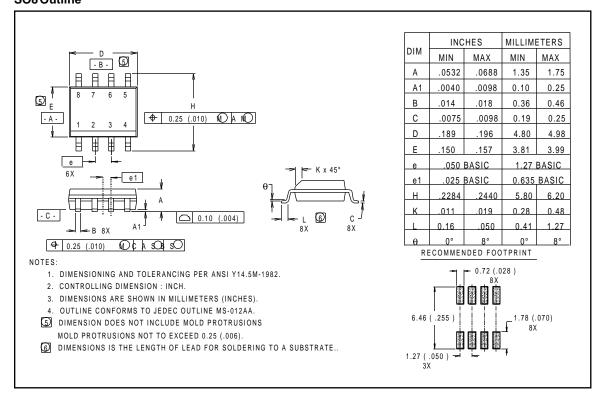


Fig 13. For N-Channel HEXFETS

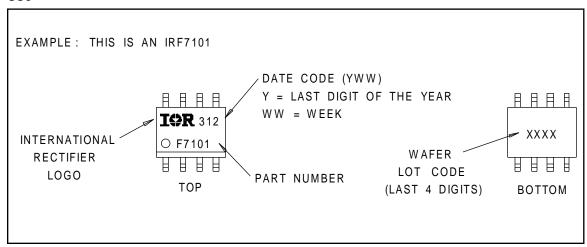
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Package Outline



Part Marking Information

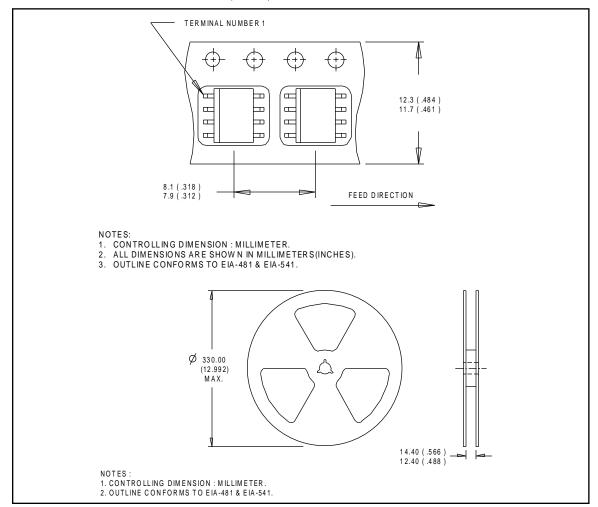
SO8



Tape & Reel Information

SO8

Dimensions are shown in millimeters (inches)



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