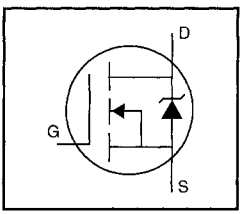
International IOR Rectifier

IRLD024

HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- For Automatic Insertion
- End Stackable
- Logic-Level Gate Drive
- $R_{DS(on)}$ Specified at V_{GS}=4V & 5V
- 175°C Operating Temperature
- Fast Switching



V_{DSS} = 60V

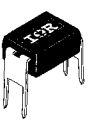
$R_{DS(on)}$ = 0.10Ω

I_D = 2.5A

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The 4-pin DIP package is a low cost machine-insertable case style which can be stacked in multiple combinations on standard 0.1 inch pin centers. The dual drain serves as a thermal link to the mounting surface for power dissipation levels up to 1 watt.



HD-1

DATA SHEETS

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 5.0 V	2.5	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 5.0 V	1.8	
I_{DM}	Pulsed Drain Current ①	20	
P_D @ T_C = 25°C	Power Dissipation	1.3	W
	Linear Derating Factor	0.0083	W/°C
V_{GS}	Gate-to-Source Voltage	±10	V
E_{AS}	Single Pulse Avalanche Energy ②	91	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.5	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient	—	—	120	°C/W

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	—	—	V	V_{GS}=0V, I_D= 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.060	—	V/°C	Reference to 25°C, I_D= 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.10	Ω	V_{GS}=5.0V, I_D=1.5A ④
		—	—	0.14		V_{GS}=4.0V, I_D=1.3A ④
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	2.0	V	V_{DS}=V_{GS}, I_D= 250μA
g_{fs}	Forward Transconductance	3.7	—	—	S	V_{DS}=25V, I_D=1.5A ④
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	V_{DS}=60V, V_{GS}=0V
		—	—	250		V_{DS}=48V, V_{GS}=0V, T_J=150°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS}=10V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS}=-10V
Q_g	Total Gate Charge	—	—	18	nC	I_D=17A
Q_{gs}	Gate-to-Source Charge	—	—	4.5		V_{DS}=48V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	12		V_{GS}=5.0V See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	11	—	ns	V_{DD}=30V
t_r	Rise Time	—	110	—		I_D=17A
$t_{d(off)}$	Turn-Off Delay Time	—	23	—		R_G=9.0Ω
t_f	Fall Time	—	41	—		R_D=1.7Ω See Figure 10 ④
L_D	Internal Drain Inductance	—	4.0	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact 
L_S	Internal Source Inductance	—	6.0	—		
C_{iss}	Input Capacitance	—	870	—	pF	V_{GS}=0V
C_{oss}	Output Capacitance	—	360	—		V_{DS}= 25V
C_{rss}	Reverse Transfer Capacitance	—	53	—		f=1.0MHz See Figure 5

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	20		
V_{SD}	Diode Forward Voltage	—	—	1.5	V	T_J=25°C, I_S=2.5A, V_{GS}=0V ④
t_{rr}	Reverse Recovery Time	—	110	260	ns	T_J=25°C, I_F=17A
Q_{rr}	Reverse Recovery Charge	—	0.49	1.5	μC	di/dt=100A/μs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is neglegible (turn-on is dominated by L_S+L_D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)

② V_{DD}=25V, starting T_J=25°C, L=16mH R_G=25Ω, I_{AS}=2.5A (See Figure 12)

③ I_{SD}≤17A, di/dt≤140A/μs, V_{DD}≤$V_{(BR)DSS}$, T_J≤175°C

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

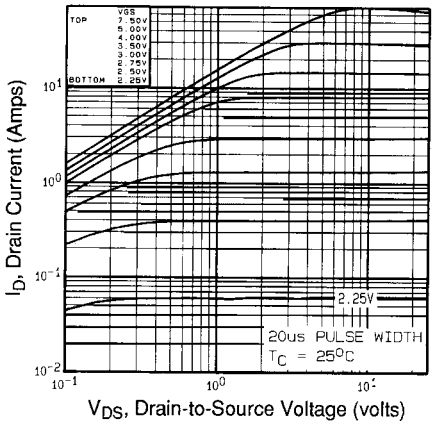


Fig 1. Typical Output Characteristics, T_C=25°C

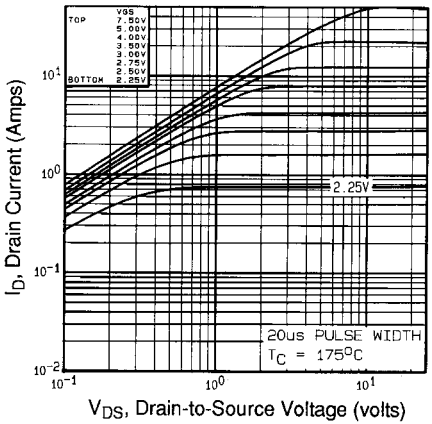


Fig 2. Typical Output Characteristics, T_C=175°C

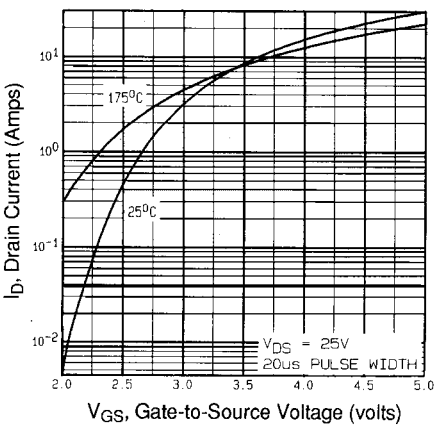


Fig 3. Typical Transfer Characteristics

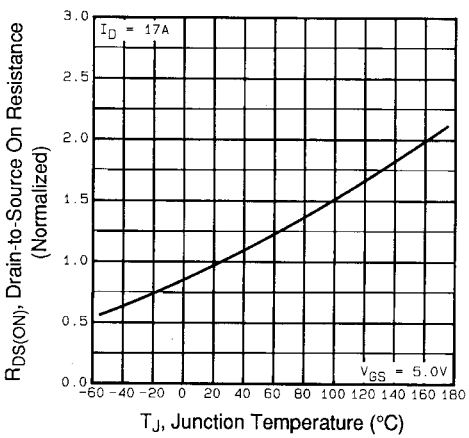


Fig 4. Normalized On-Resistance Vs. Temperature

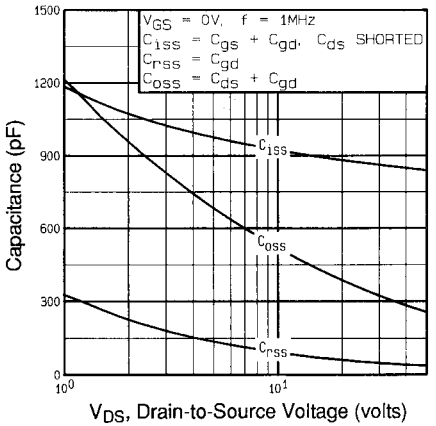


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

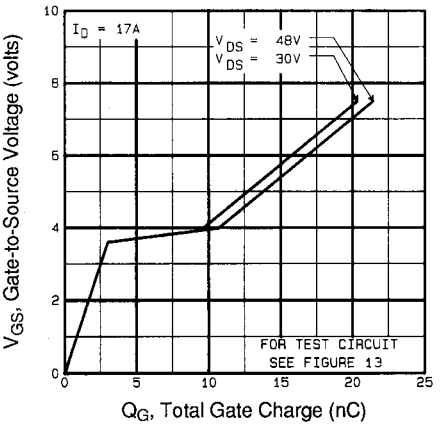


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

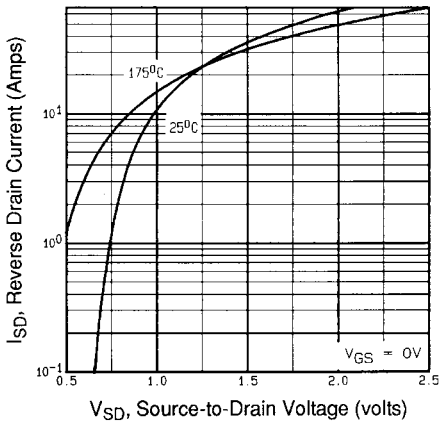


Fig 7. Typical Source-Drain Diode Forward Voltage

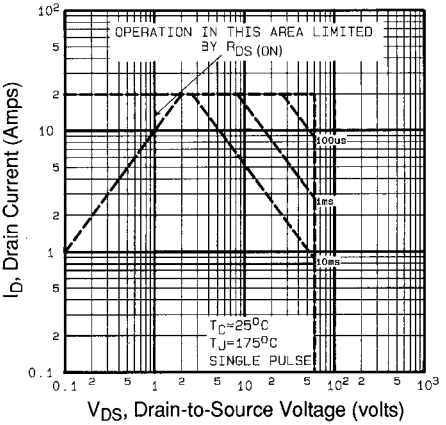


Fig 8. Maximum Safe Operating Area

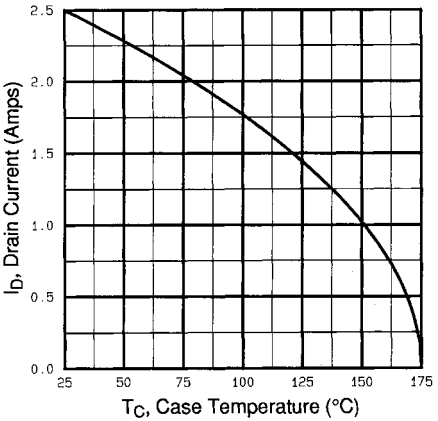


Fig 9. Maximum Drain Current Vs. Case Temperature

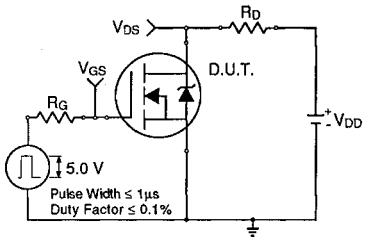


Fig 10a. Switching Time Test Circuit

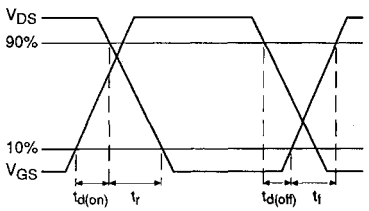


Fig 10b. Switching Time Waveforms

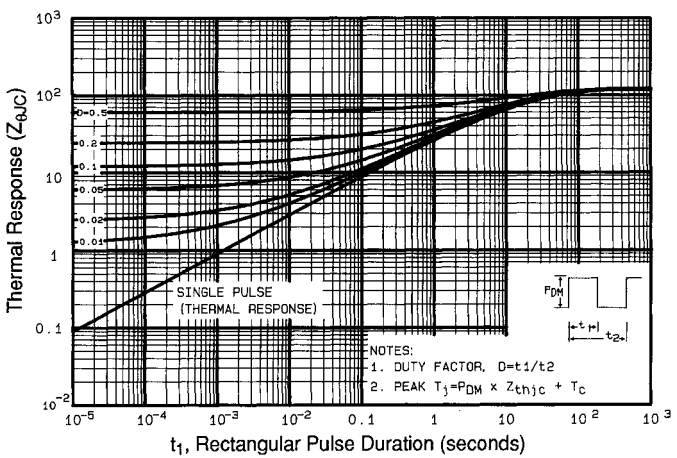


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

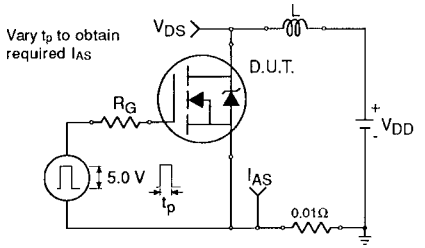


Fig 12a. Unclamped Inductive Test Circuit

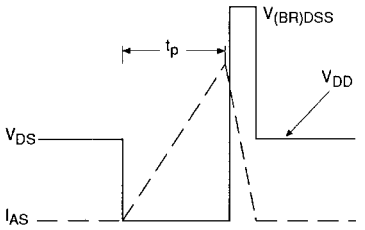


Fig 12b. Unclamped Inductive Waveforms

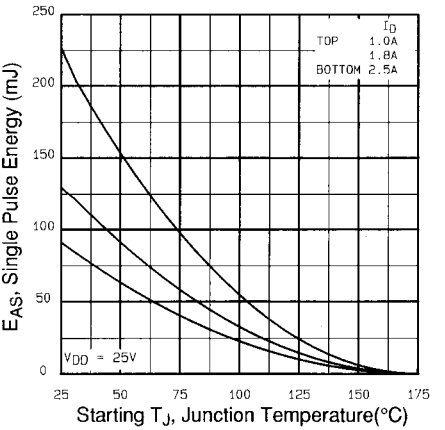


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

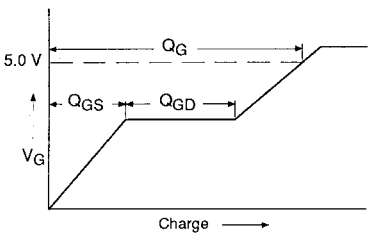


Fig 13a. Basic Gate Charge Waveform

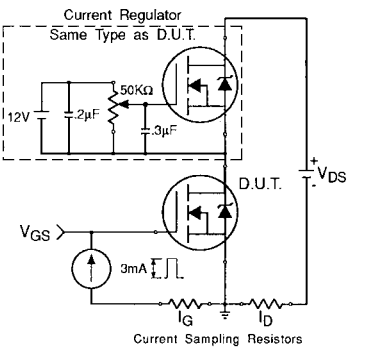


Fig 13b. Gate Charge Test Circuit

Appendix A: Figure 14, Peak Diode Recovery dv/dt Test Circuit – See page 1505

Appendix B: Package Outline Mechanical Drawing – See page 1507

Appendix C: Part Marking Information – See page 1515

International IOR Rectifier

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.