

IRFP3703PbF

HEXFET® Power MOSFET

Applications

- Synchronous Rectification
- Active ORing
- Lead-Free

Benefits

- Ultra Low On-Resistance
- Low Gate Impedance to Reduce Switching Losses
- Fully Avalanche Rated

V_{DSS}	$R_{DS(on) \max}$	I_D
30V	0.0028Ω	210A ^⑥



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	210 ^⑥	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	100 ^⑥	
I_{DM}	Pulsed Drain Current ^①	1000	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation	230	W
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation	3.8	
	Linear Derating Factor	1.5	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ^③	5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 175	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	0.65	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.24	—	
$R_{\theta JA}$	Junction-to-Ambient	—	40	

Typical SMPS Topologies

- Forward and Bridge Converters with Synchronous Rectification for Telecom and Industrial Applications
- Offline High Power AC/DC Convertors using Synchronous Rectification

Notes ^① through ^⑥ are on page 8

www.irf.com

IRFP3703PbF

International
IR Rectifier

Static @ 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	—	0.028	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	2.3	2.8	mΩ	V _{GS} = 10V, I _D = 76A ④
		—	2.8	3.9		V _{GS} = 7.0V, I _D = 76A 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} = 24V, V _{GS} = 0V
		—	—	250		V _{DS} = 24V, V _{GS} = 0V, T _J = 150°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-200		V _{GS} = -20V

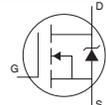
Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g _{fs}	Forward Transconductance	150	—	—	S	V _{DS} = 24V, I _D = 76A
Q _g	Total Gate Charge	—	209	—	nC	I _D = 76A
Q _{gs}	Gate-to-Source Charge	—	62	—		V _{DS} = 24V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	42	—		V _{GS} = 10V, ④
t _{d(on)}	Turn-On Delay Time	—	18	—	ns	V _{DD} = 15V, V _{GS} = 10V
t _r	Rise Time	—	123	—		I _D = 76A
t _{d(off)}	Turn-Off Delay Time	—	53	—		R _G = 1.8Ω
t _f	Fall Time	—	24	—		V _{GS} = 10V ④
C _{iss}	Input Capacitance	—	8250	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	3000	—		V _{DS} = 25V
C _{rss}	Reverse Transfer Capacitance	—	290	—		f = 1.0MHz
C _{oss}	Output Capacitance	—	10360	—		V _{GS} = 0V, V _{DS} = 1.0V, f = 1.0MHz
C _{oss}	Output Capacitance	—	3060	—		V _{GS} = 0V, V _{DS} = 24V, f = 1.0MHz
C _{oss eff.}	Effective Output Capacitance	—	2590	—		V _{GS} = 0V, V _{DS} = 0V to 24V ⑤

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy②	—	1700	mJ
I _{AR}	Avalanche Current③	—	76	A
E _{AR}	Repetitive Avalanche Energy④	—	23	mJ

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	210⑥	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	1000		
V _{SD}	Diode Forward Voltage	—	0.8	1.3	V	T _J = 25°C, I _S = 76A, V _{GS} = 0V ④
t _{rr}	Reverse Recovery Time	—	80	120	ns	T _J = 25°C, I _F = 76A, V _{DS} = 16V
Q _{rr}	Reverse Recovery Charge	—	185	275	nC	di/dt = 100A/μs ④

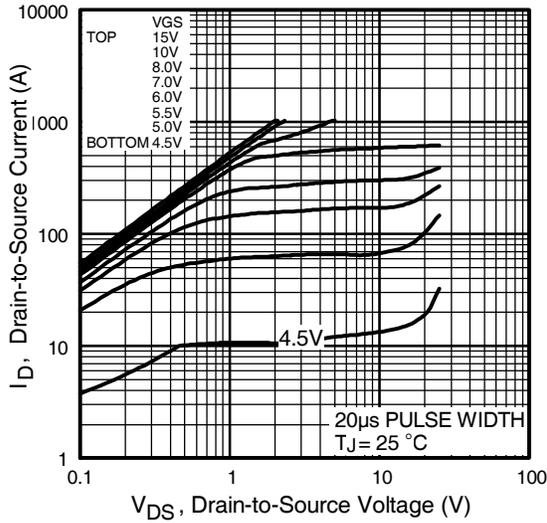


Fig 1. Typical Output Characteristics

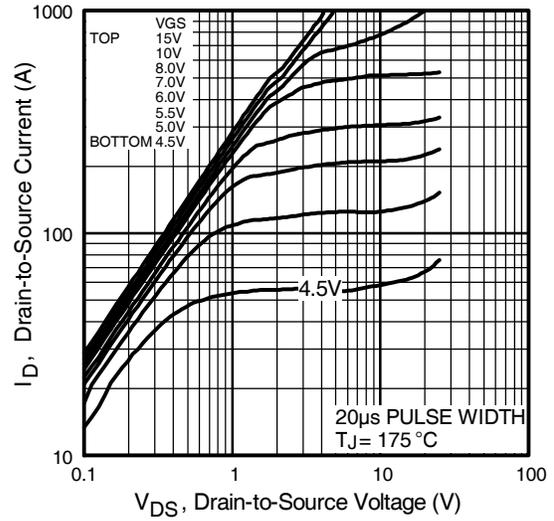


Fig 2. Typical Output Characteristics

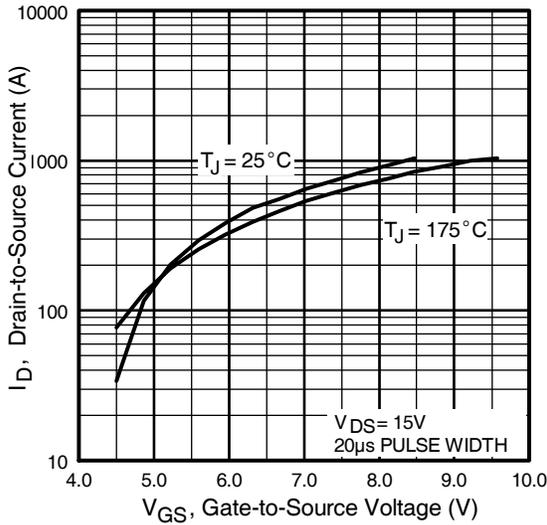


Fig 3. Typical Transfer Characteristics

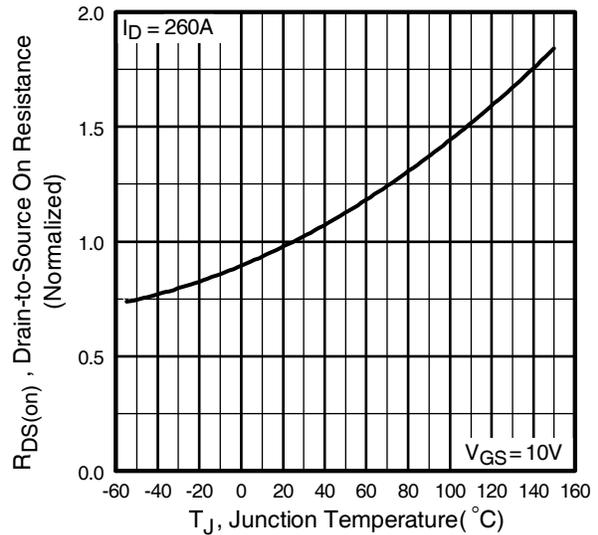


Fig 4. Normalized On-Resistance Vs. Temperature

IRFP3703PbF

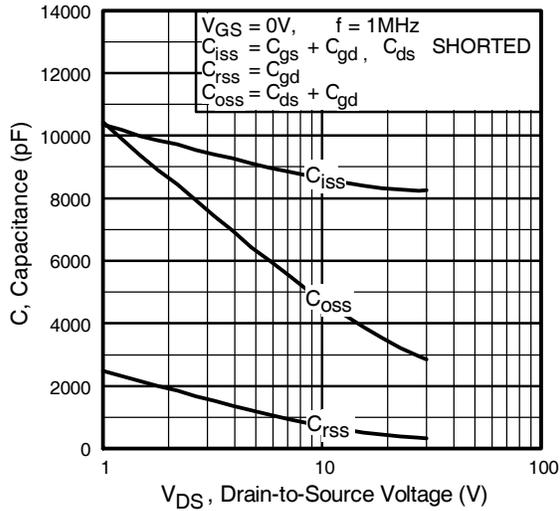


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

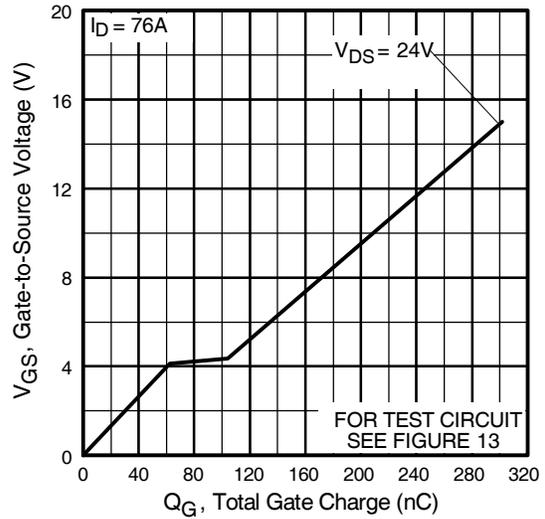


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

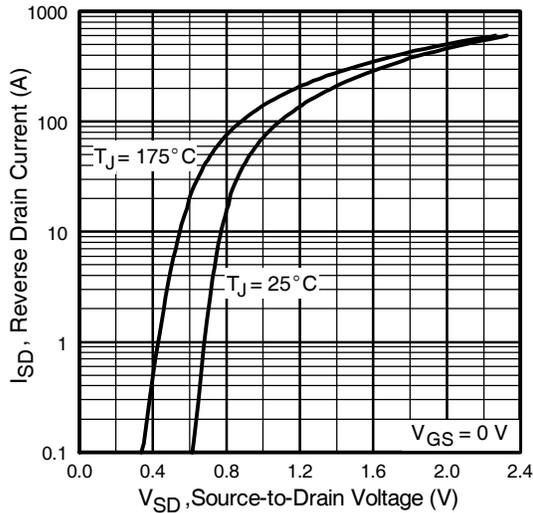


Fig 7. Typical Source-Drain Diode Forward Voltage

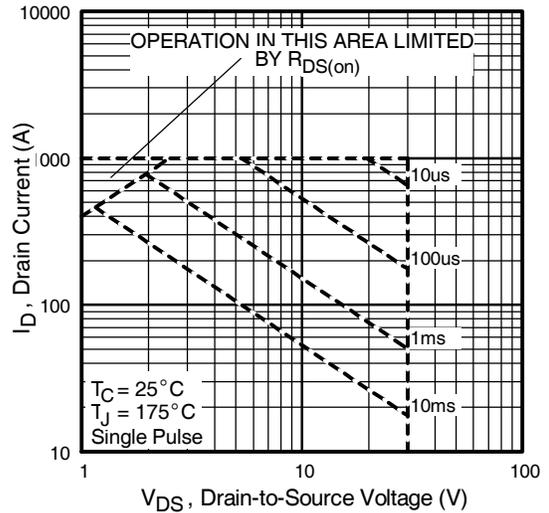


Fig 8. Maximum Safe Operating Area

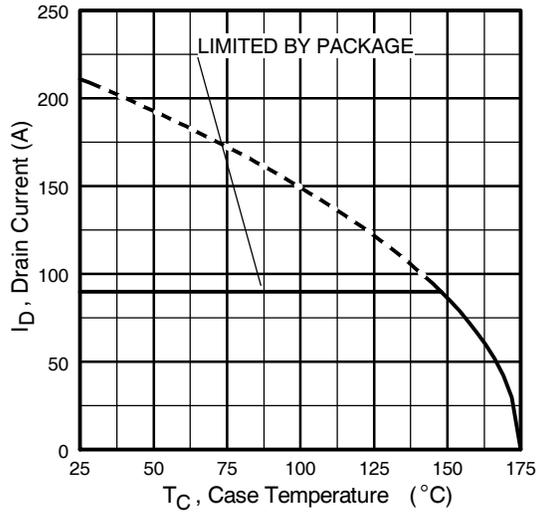


Fig 9. Maximum Drain Current Vs. Case Temperature

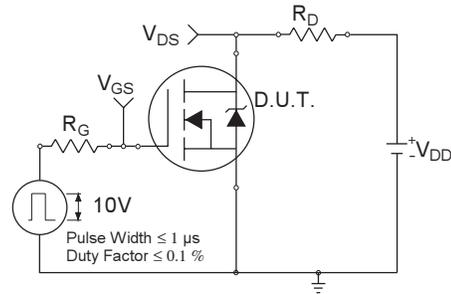


Fig 10a. Switching Time Test Circuit

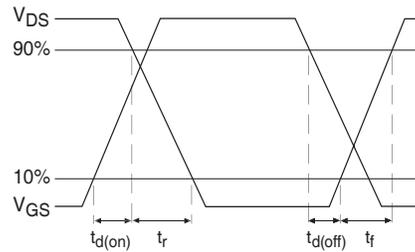


Fig 10b. Switching Time Waveforms

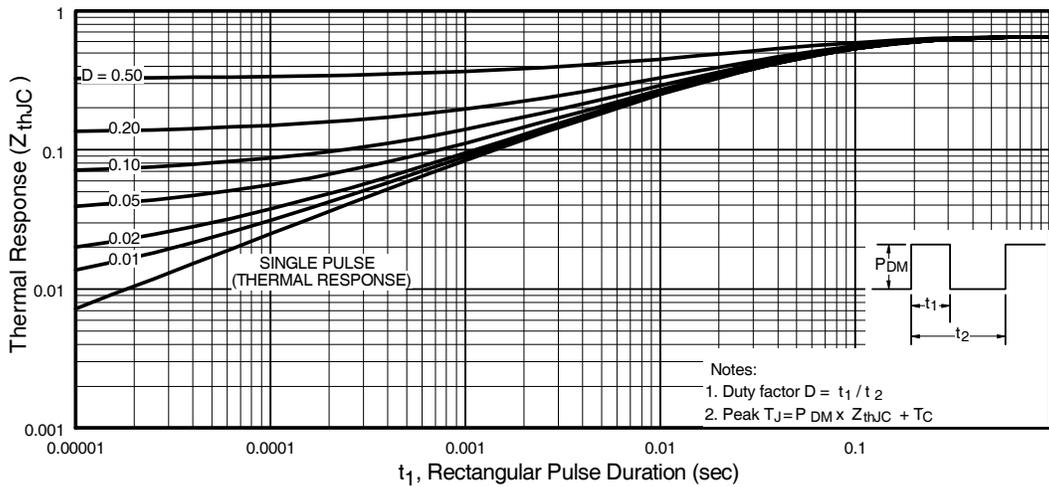


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

IRFP3703PbF

International
IR Rectifier

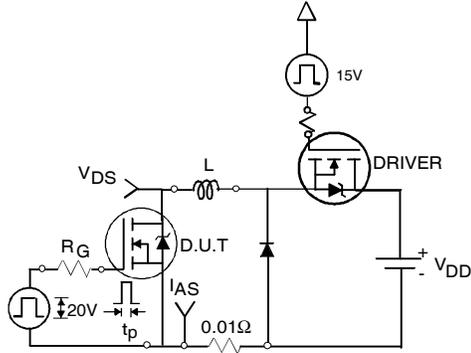


Fig 12a. Unclamped Inductive Test Circuit

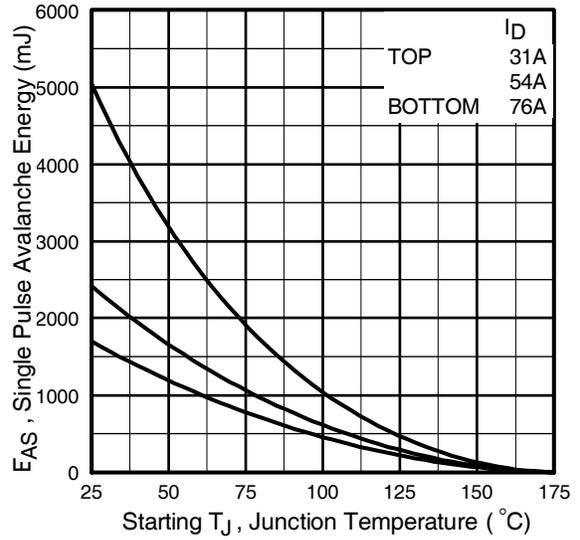


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

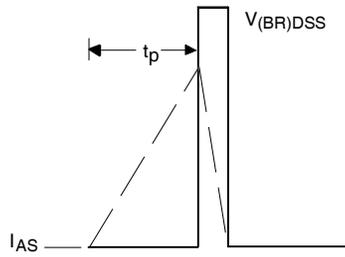


Fig 12b. Unclamped Inductive Waveforms

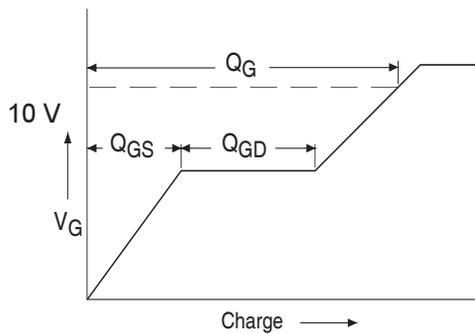


Fig 13a. Basic Gate Charge Waveform

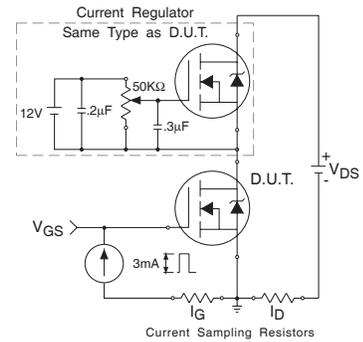
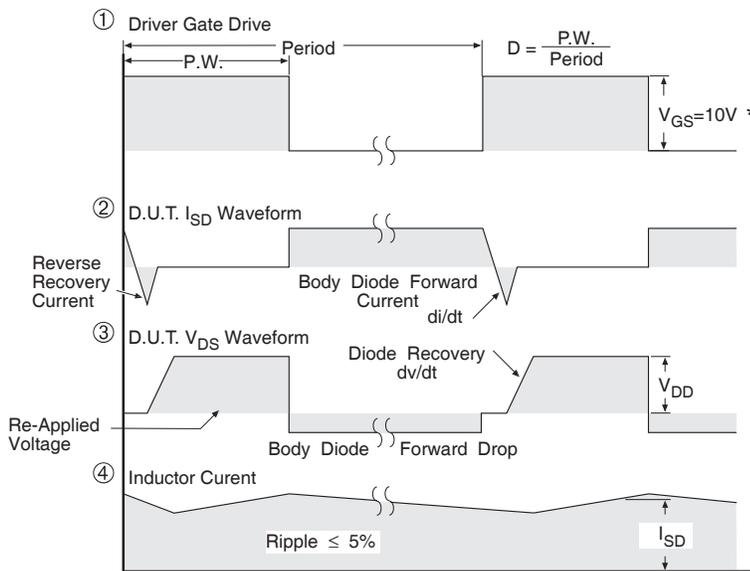
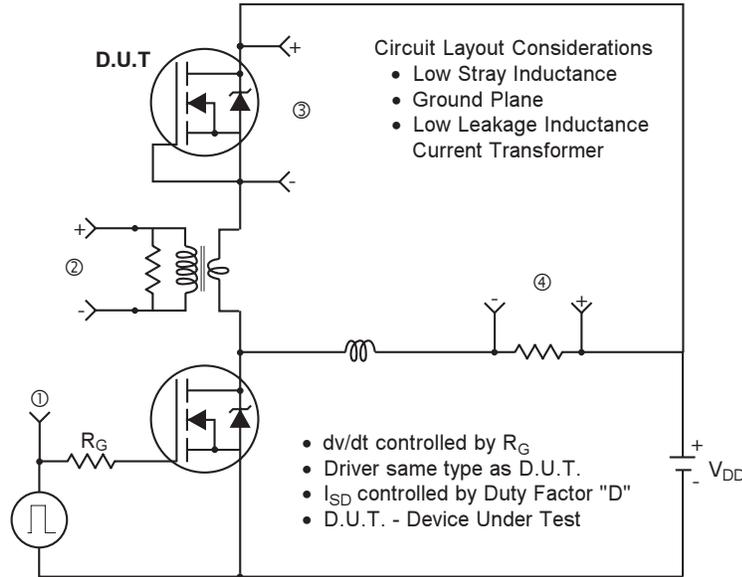


Fig 13b. Gate Charge Test Circuit

Peak Diode Recovery dv/dt Test Circuit



* $V_{GS} = 5V$ for Logic Level Devices

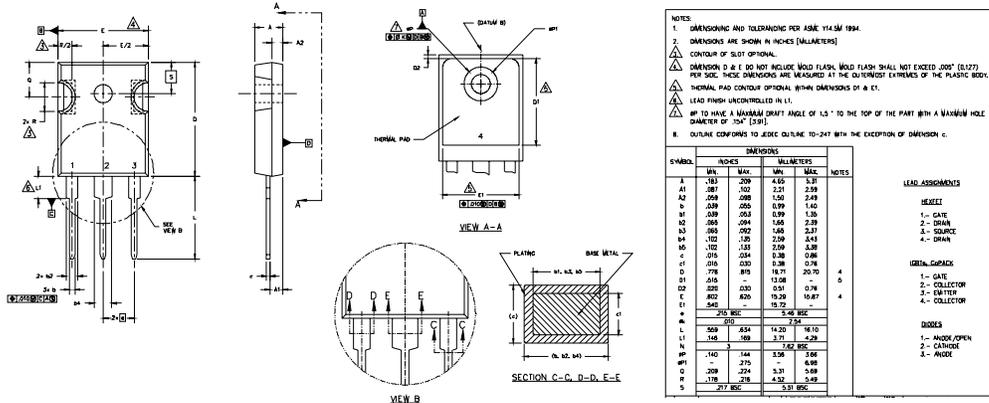
Fig 14. For N-Channel HEXFET® Power MOSFET

IRFP3703PbF

International
IR Rectifier

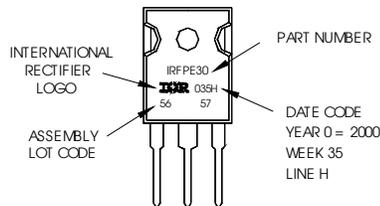
TO-247AC Package Outline

Dimensions are shown in millimeters (inches)



TO-247AC Part Marking Information

EXAMPLE: THIS IS AN IRFPE30
WITH ASSEMBLY
LOT CODE 5667
ASSEMBLED ON WW 35, 2000
IN THE ASSEMBLY LINE "H"
Note: "P" in assembly line
position indicates "Lead-Free"



Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.6\text{mH}$
 $R_G = 25\Omega$, $I_{AS} = 76\text{A}$.
- ③ $I_{SD} \leq 76\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$,
 $T_J \leq 175^\circ\text{C}$
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- 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_{DS}
- ⑥ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 90A

Data and specifications subject to change without notice.
This product has been designed and qualified for the Industrial market.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903

Visit us at www.irf.com for sales contact information.7/04

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



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.