

IRF6218PBF Datasheet

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DiGi Electronics Part Number	IRF6218PBF-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	IRF6218PBF
Description	MOSFET P-CH 150V 27A TO220AB
Detailed Description	P-Channel 150 V 27A (Tc) 250W (Tc) Through Hole T O-220AB



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Purchase and inquiry

Manufacturer Product Number:

IRF6218PBF

Series:

HEXFET®

FET Type:

P-Channel

Drain to Source Voltage (Vdss):

150 V

Drive Voltage (Max Rds On, Min Rds On):

10V

Vgs(th) (Max) @ Id:

5V @ 250µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

TO-220AB

Manufacturer:

Infineon Technologies

Product Status:

Obsolete

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

27A (Tc)

Rds On (Max) @ Id, Vgs:

150mOhm @ 16A, 10V

Gate Charge (Qg) (Max) @ Vgs:

110 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

2210 pF @ 25 V

Power Dissipation (Max):

250W (Tc)

Mounting Type:

Through Hole

Package / Case:

TO-220-3

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

International
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SMPS MOSFET **IRF6218PbF**
HEXFET® Power MOSFET

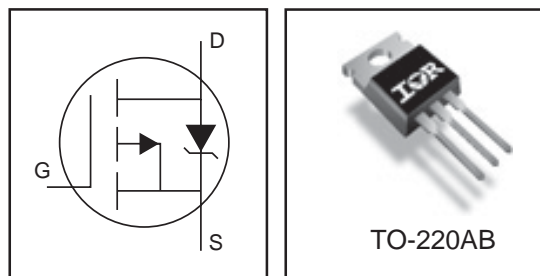
Applications

- Reset Switch for Active Clamp Reset DC-DC converters
- Lead-Free

V_{DS}	$R_{DS(on) \text{ max}}$	I_D
-150V	150mΩ@$V_{GS} = -10V$	-27A

Benefits

- Low Gate to Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	-150	V
V_{GS}	Gate-to-Source Voltage	± 20	
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$	-27	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$	-19	
I_{DM}	Pulsed Drain Current ①	-110	
$P_D @ T_C = 25^\circ\text{C}$	Maximum Power Dissipation	250	W
	Linear Derating Factor	1.6	W/°C
dv/dt	Peak Diode Recovery dv/dt ②	8.2	V/ns
T_J	Operating Junction and	-55 to + 175	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torque, 6-32 or M3 screw	10 lbf•in (1.1N•m)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ③	—	0.61	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface ④	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient ⑤	—	62	

Notes ① through ⑤ are on page 7

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	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-150	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	-0.17	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = -1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	120	150	m Ω	$V_{GS} = -10V, I_D = -16A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	-3.0	—	-5.0	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-25	μA	$V_{DS} = -120V, V_{GS} = 0V$
		—	—	-250		$V_{DS} = -120V, V_{GS} = 0V, T_J = 150^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -20V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 20V$

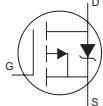
Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	11	—	—	S	$V_{DS} = -50V, I_D = -16A$
Q_g	Total Gate Charge	—	71	110		$I_D = -16A$
Q_{gs}	Gate-to-Source Charge	—	21	—	nC	$V_{DS} = -120V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	32	—		$V_{GS} = -10V$ ④
$t_{d(on)}$	Turn-On Delay Time	—	21	—		$V_{DD} = -75V$
t_r	Rise Time	—	70	—	ns	$I_D = -16A$
$t_{d(off)}$	Turn-Off Delay Time	—	35	—		$R_G = 3.9\Omega$
t_f	Fall Time	—	30	—		$V_{GS} = -10V$ ④
C_{iss}	Input Capacitance	—	2210	—		$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	370	—		$V_{DS} = -25V$
C_{riss}	Reverse Transfer Capacitance	—	89	—	pF	$f = 1.0MHz$
C_{oss}	Output Capacitance	—	2220	—		$V_{GS} = 0V, V_{DS} = -1.0V, f = 1.0MHz$
C_{oss}	Output Capacitance	—	170	—		$V_{GS} = 0V, V_{DS} = -120V, f = 1.0MHz$
$C_{oss\ eff.}$	Effective Output Capacitance	—	340	—		$V_{GS} = 0V, V_{DS} = 0V\ to\ -120V$

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ^②	—	210	mJ
I_{AR}	Avalanche Current ①	—	-16	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-27	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-110		
V_{SD}	Diode Forward Voltage	—	—	-1.6	V	$T_J = 25^\circ\text{C}, I_S = -16A, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	150	—	ns	$T_J = 25^\circ\text{C}, I_F = -16A, V_{DD} = -25V$
Q_{rr}	Reverse Recovery Charge	—	860	—	nC	$di/dt = -100A/\mu s$ ④

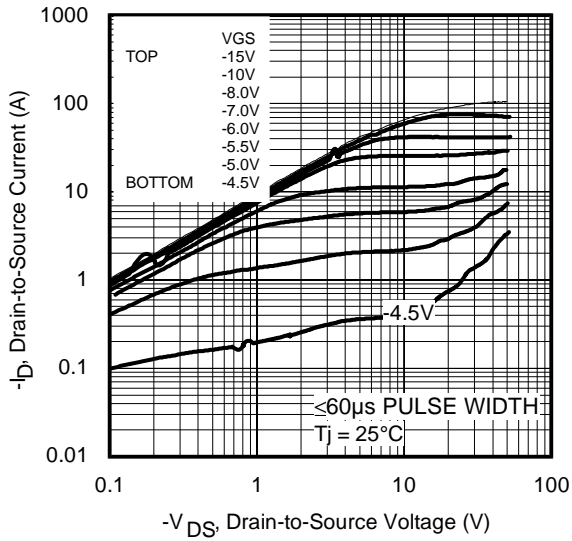


Fig 1. Typical Output Characteristics

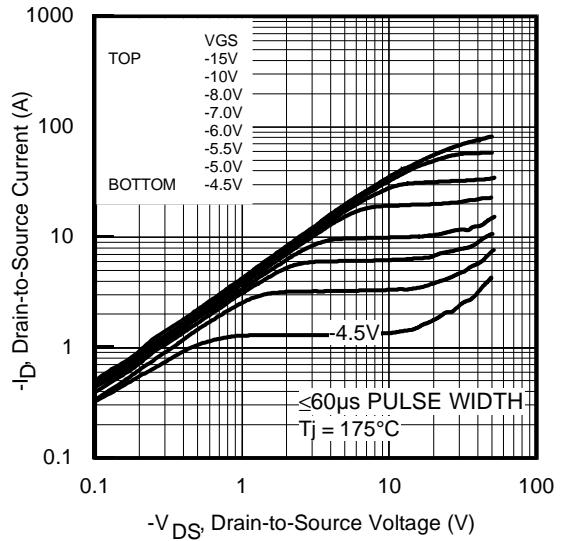


Fig 2. Typical Output Characteristics

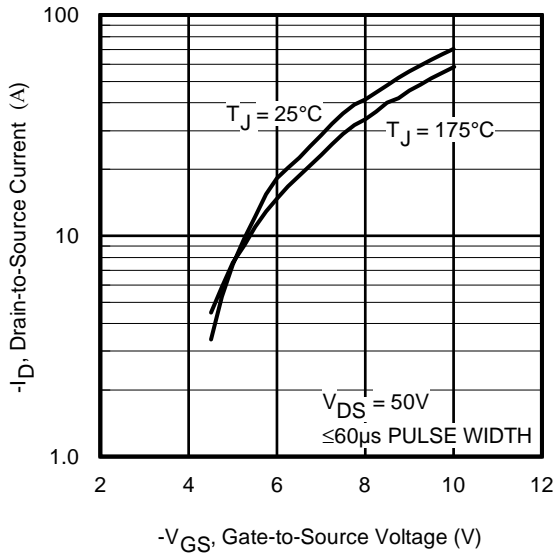


Fig 3. Typical Transfer Characteristics

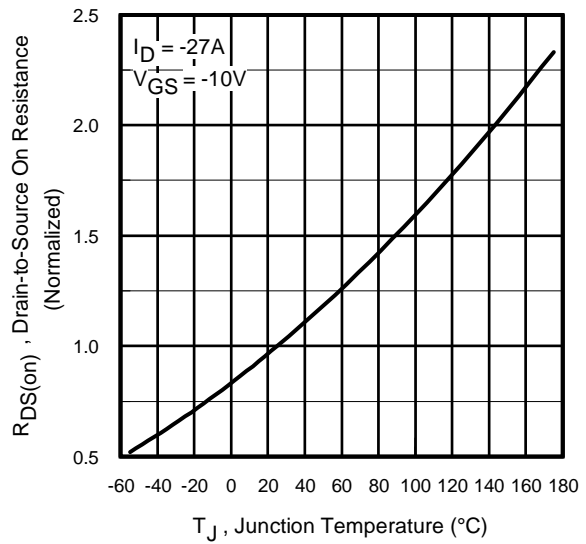


Fig 4. Normalized On-Resistance vs. Temperature

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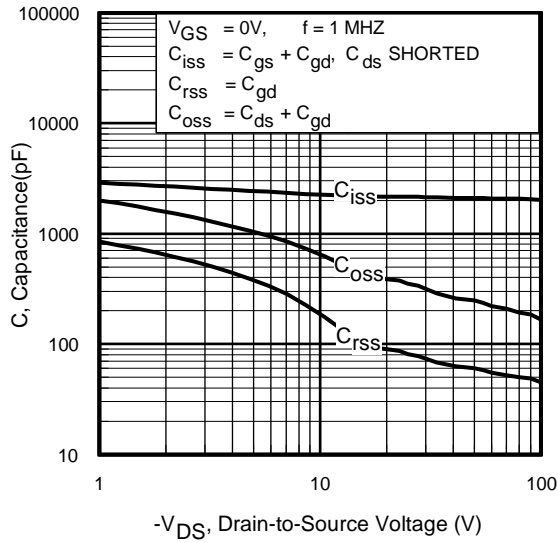


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

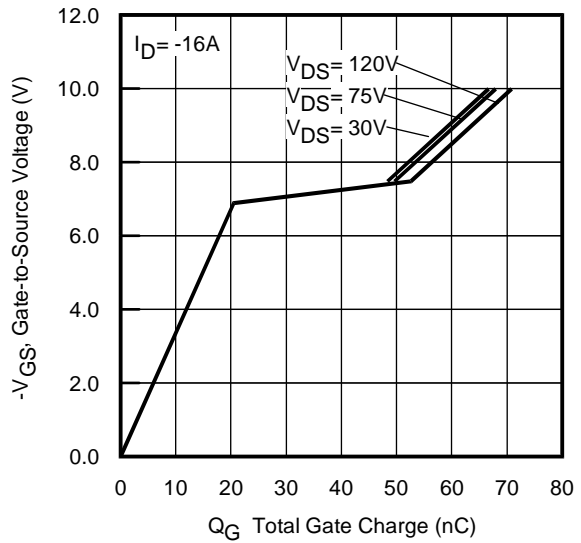


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

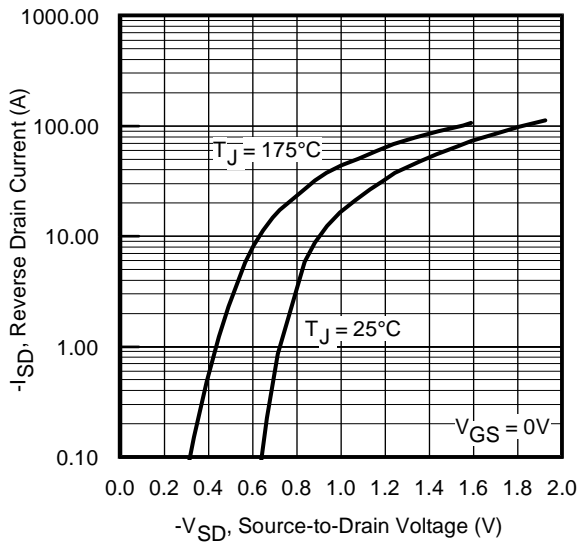


Fig 7. Typical Source-Drain Diode Forward Voltage

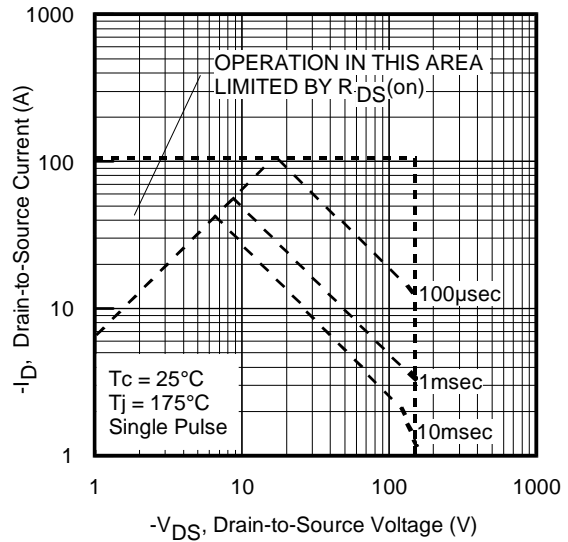


Fig 8. Maximum Safe Operating Area

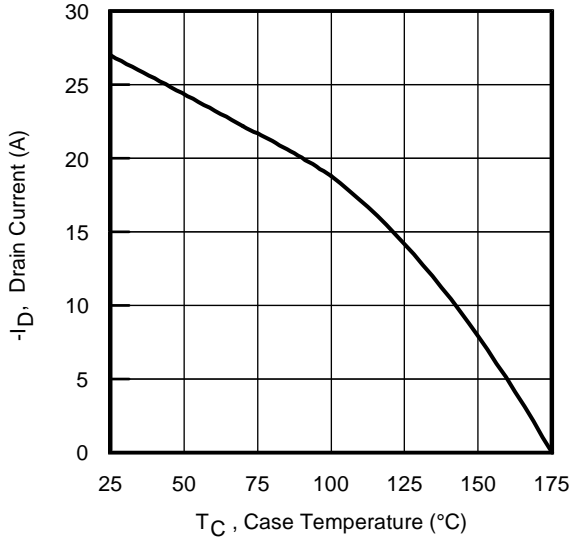


Fig 9. Maximum Drain Current vs. Ambient Temperature

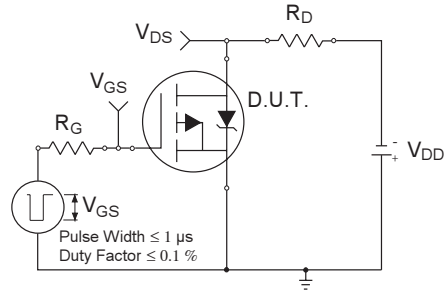


Fig 10a. Switching Time Test Circuit

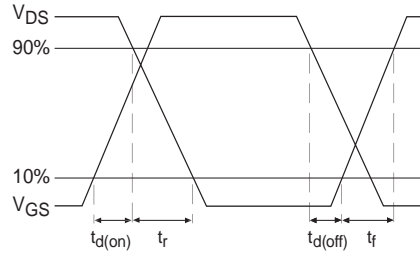


Fig 10b. Switching Time Waveforms

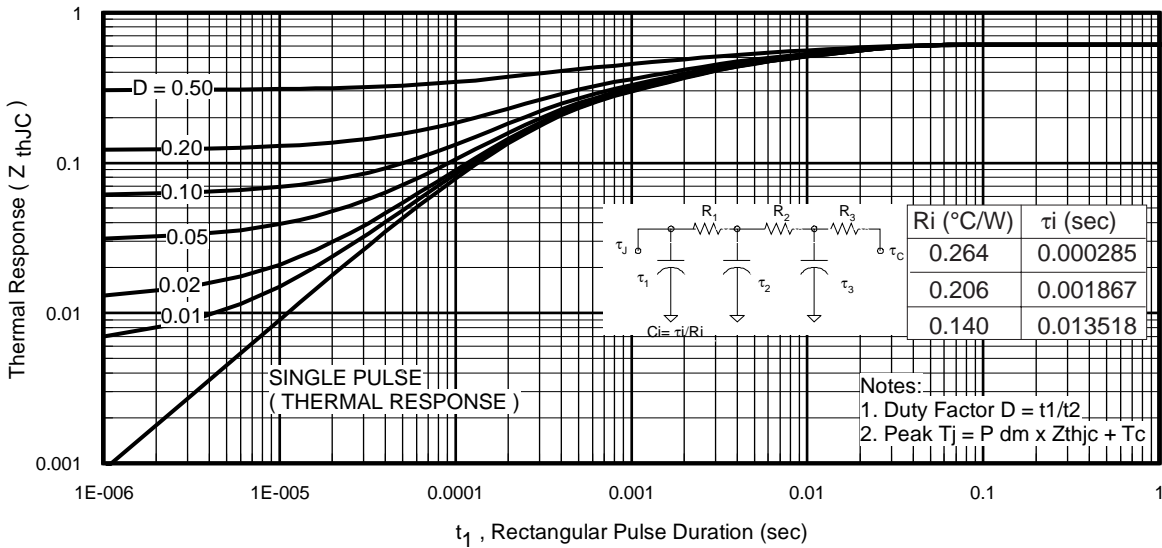


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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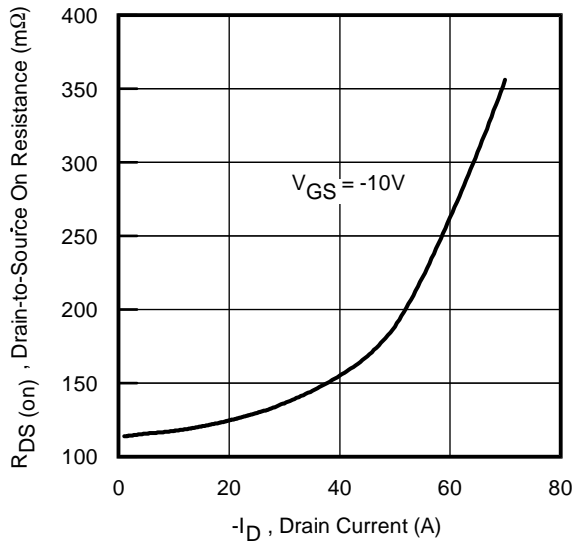


Fig 12. On-Resistance vs. Drain Current

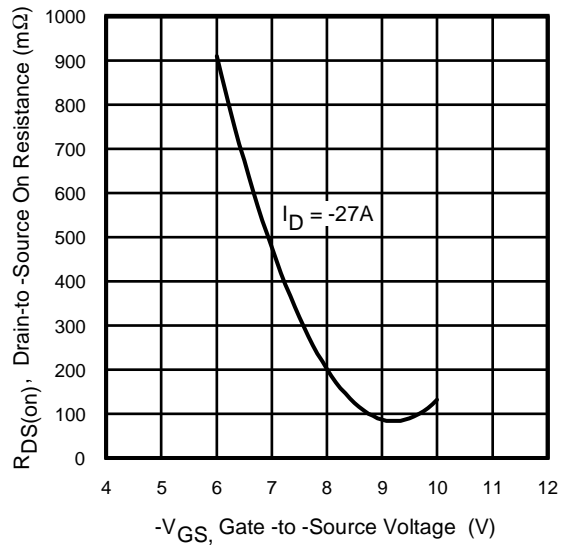


Fig 13. On-Resistance vs. Gate Voltage

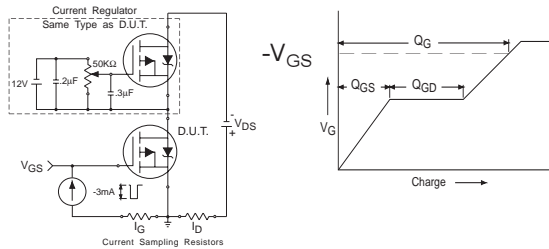


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform

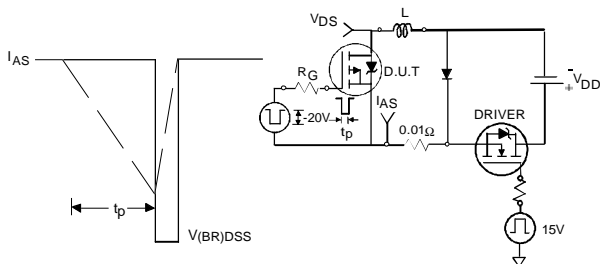


Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

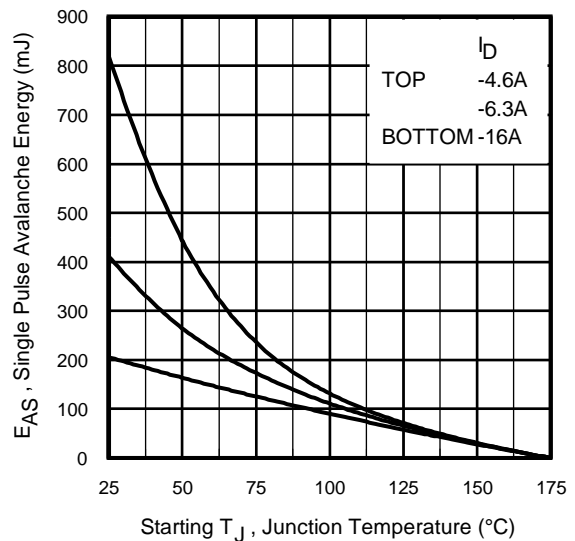


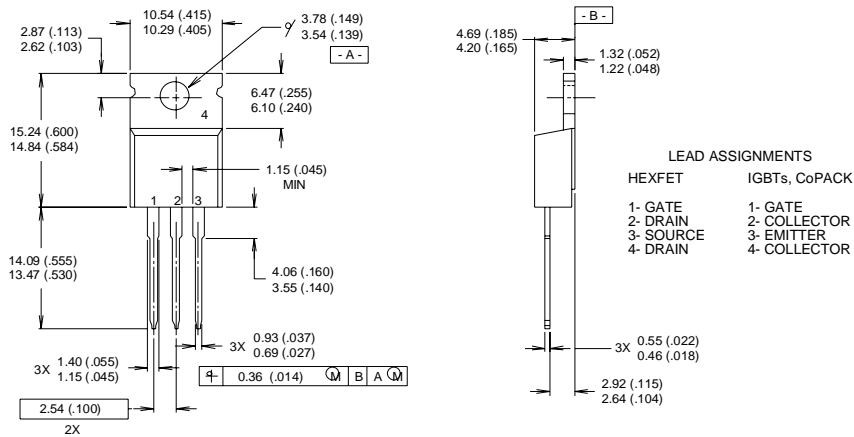
Fig 15c. Maximum Avalanche Energy vs. Drain Current

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TO-220AB Package Outline

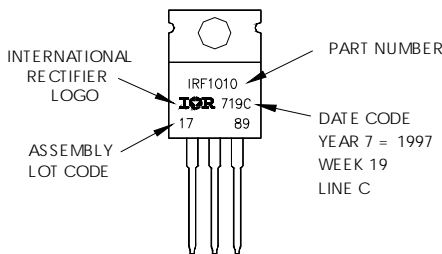
Dimensions are shown in millimeters (inches)



- NOTES:
- 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
 - 2 CONTROLLING DIMENSION : INCH
 - 3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
 - 4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

TO-220AB Part Marking Information

EXAMPLE: THIS IS AN IRF1010
 LOT CODE 1789
 ASSEMBLED ON WW 19, 1997
 IN THE ASSEMBLY LINE "C"
Note: "P" in assembly line position indicates "Lead-Free"



Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 1.6\text{mH}$, $R_G = 25\Omega$, $I_{AS} = -17\text{A}$.
- ③ $I_{SD} \leq -17\text{A}$, $di/dt \leq -520\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175^\circ\text{C}$.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ R_{θ} is measured at T_J of approximately 90°C .

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.

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

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