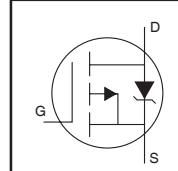


AUTOMOTIVE GRADE

AUIRF6215

Features

- Advanced Planar Technology
- Low On-Resistance
- P-Channel
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Repetitive Avalanche Allowed up to T_{jmax}
- Lead-Free, RoHS Compliant
- Automotive Qualified

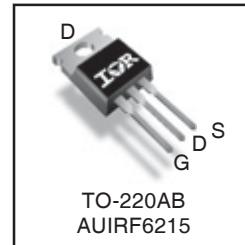


HEXFET® Power MOSFET

V_{(BR)DSS}	-150V
R_{DS(on)} max.	0.29Ω
I_D	-13A

Description

Specifically designed for Automotive applications, this cellular design of HEXFET® Power MOSFETs utilizes the latest processing techniques to achieve low 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 and reliable device for use in Automotive and a wide variety of other applications.



G	D	S
Gate	Drain	Source

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (T_A) is 25°C, unless otherwise specified.

	Parameter	Max.	Units
I _D @ T _C = 25°C	Continuous Drain Current, V _{GS} @ 10V	-13	
I _D @ T _C = 100°C	Continuous Drain Current, V _{GS} @ 10V	-9.0	A
I _{DM}	Pulsed Drain Current ①	-44	
P _D @ T _C = 25°C	Power Dissipation	110	W
	Linear Derating Factor	0.71	W/°C
V _{GS}	Gate-to-Source Voltage	± 20	V
E _{AS}	Single Pulse Avalanche Energy (Thermally Limited) ②	310	mJ
I _{AR}	Avalanche Current ①	-6.6	A
E _{AR}	Repetitive Avalanche Energy ①	11	mJ
dv/dt	Peak Diode Recovery dv/dt ③	-5.0	V/ns
T _J	Operating Junction and	-55 to + 175	°C
T _{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	
	Mounting Torque, 6-32 or M3 screw	10 lbf·in (1.1N·m)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
R _{θJC}	Junction-to-Case ④	—	1.4	
R _{θCS}	Case-to-Sink, Flat, Greased Surface	0.50	—	°C/W
R _{θJA}	Junction-to-Ambient	—	62	

HEXFET® is a registered trademark of International Rectifier.

*Qualification standards can be found at <http://www.irf.com/>

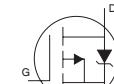
Static Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage	-150	—	—	V	$V_{\text{GS}} = 0\text{V}$, $I_D = -250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}/\Delta T_J}$	Breakdown Voltage Temp. Coefficient	—	-0.20	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = -1\text{mA}$
$R_{\text{DS}(\text{on})}$	Static Drain-to-Source On-Resistance	—	—	0.29	Ω	$V_{\text{GS}} = -10\text{V}$, $I_D = -6.6\text{A}$ ④, $T_J = 25^\circ\text{C}$
		—	—	0.58		$V_{\text{GS}} = -10\text{V}$, $I_D = -6.6\text{A}$ ④, $T_J = 150^\circ\text{C}$
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	-2.0	—	-4.0	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = -250\mu\text{A}$
g_{fs}	Forward Transconductance	3.6	—	—	S	$V_{\text{DS}} = -50\text{V}$, $I_D = -6.6\text{A}$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-25	μA	$V_{\text{DS}} = -150\text{V}$, $V_{\text{GS}} = 0\text{V}$
		—	—	-250		$V_{\text{DS}} = -120\text{V}$, $V_{\text{GS}} = 0\text{V}$, $T_J = 150^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{\text{GS}} = 20\text{V}$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{\text{GS}} = -20\text{V}$

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
Q_g	Total Gate Charge	—	—	66	nC	$I_D = -6.6\text{A}$
Q_{gs}	Gate-to-Source Charge	—	—	8.1		$V_{\text{DS}} = -120\text{V}$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	35		$V_{\text{GS}} = -10\text{V}$, See Fig. 6 & 13 ④
$t_{d(\text{on})}$	Turn-On Delay Time	—	14	—	ns	$V_{\text{DD}} = -75\text{V}$
t_r	Rise Time	—	36	—		$I_D = -6.6\text{A}$
$t_{d(\text{off})}$	Turn-Off Delay Time	—	53	—		$R_G = 6.8 \Omega$
t_f	Fall Time	—	37	—		$R_D = 12 \Omega$, See Fig. 10
L_D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L_s	Internal Source Inductance	—	7.5	—		
C_{iss}	Input Capacitance	—	860	—	pF	$V_{\text{GS}} = 0\text{V}$
C_{oss}	Output Capacitance	—	220	—		$V_{\text{DS}} = -25\text{V}$
C_{rss}	Reverse Transfer Capacitance	—	130	—		$f = 1.0\text{MHz}$, See Fig. 5

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-13	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-44		
V_{SD}	Diode Forward Voltage	—	—	-1.6	V	$T_J = 25^\circ\text{C}$, $I_S = -6.6\text{A}$, $V_{\text{GS}} = 0\text{V}$ ④
t_{rr}	Reverse Recovery Time	—	160	240	ns	$T_J = 25^\circ\text{C}$, $I_F = -6.6\text{A}$ $dI/dt = 100\text{A}/\mu\text{s}$ ④
Q_{rr}	Reverse Recovery Charge	—	1.2	1.7	nC	
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
 ② Starting $T_J = 25^\circ\text{C}$, $L = 14\text{mH}$,
 $R_G = 25\Omega$, $I_{AS} = -6.6\text{A}$. (See Figure 12)

- ③ $I_{SD} \leq -6.6\text{A}$, $di/dt \leq -620\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$,
 $T_J \leq 175^\circ\text{C}$.
 ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
 ⑤ R_θ is measured at T_J approximately 90°C .

Qualification Information[†]

Qualification Level		Automotive (per AEC-Q101) ^{††}	
Comments: This part number(s) passed Automotive qualification. IR's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.			
Moisture Sensitivity Level	TO-220	N/A	
ESD	Machine Model	Class M3 (400V) AEC-Q101-002	
	Human Body Model	Class H1B (1000V) AEC-Q101-001	
	Charged Device Model	Class C5 (1125V) AEC-Q101-005	
RoHS Compliant		Yes	

[†] Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/>

^{††} Exceptions to AEC-Q101 requirements are noted in the qualification report.

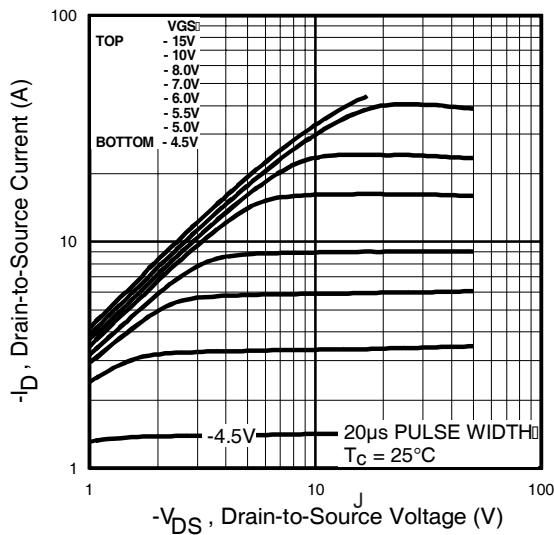


Fig 1. Typical Output Characteristics,

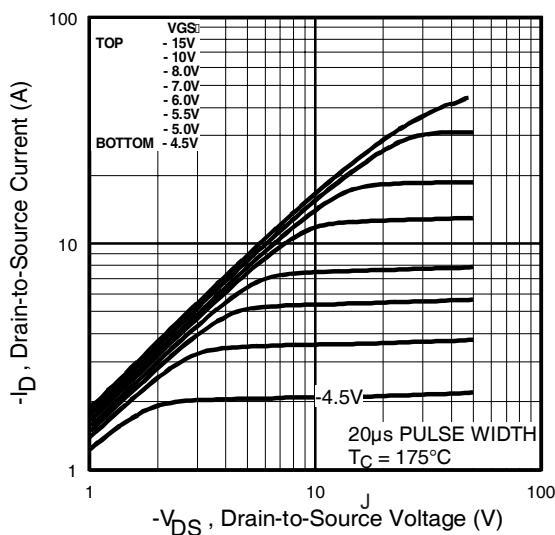


Fig 2. Typical Output Characteristics,

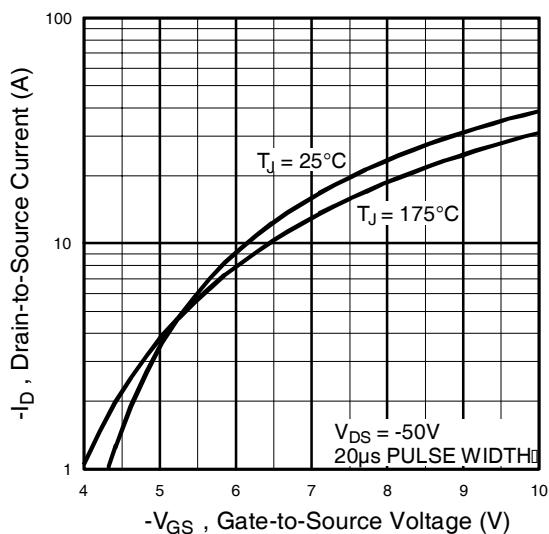


Fig 3. Typical Transfer Characteristics

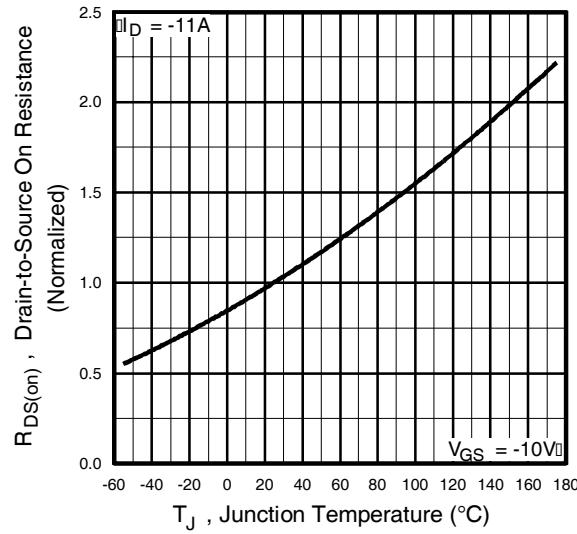


Fig 4. Normalized On-Resistance Vs. Temperature

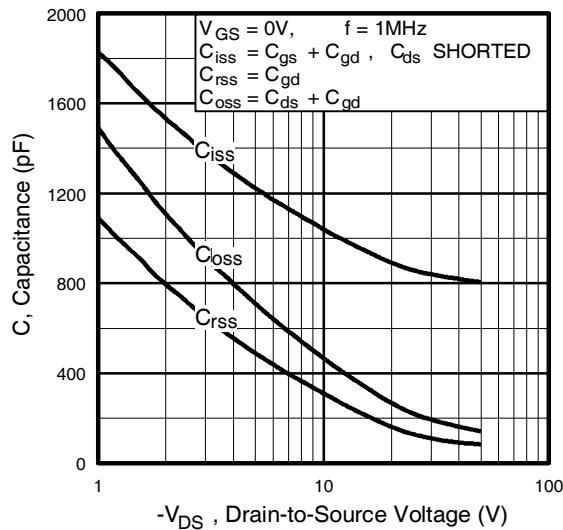


Fig 5. Typical Capacitance Vs.
Drain-to-Source Voltage

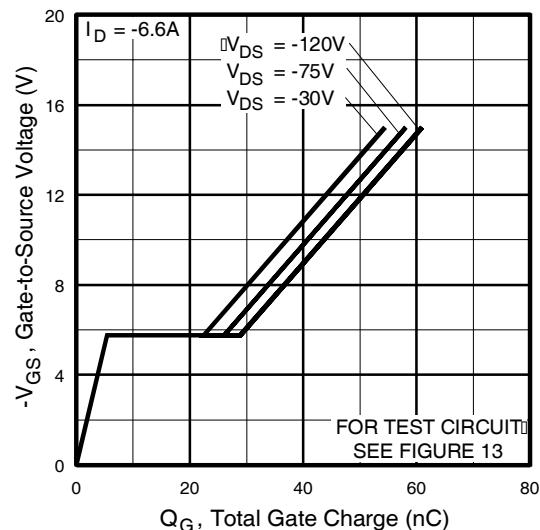


Fig 6. Typical Gate Charge Vs.
Gate-to-Source Voltage

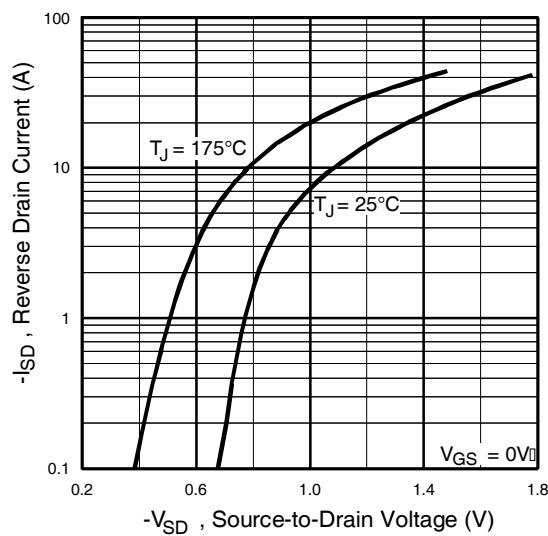


Fig 7. Typical Source-Drain Diode
Forward Voltage

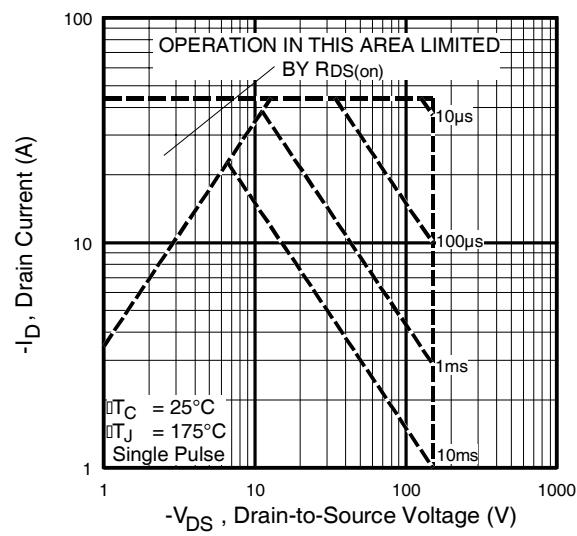


Fig 8. Maximum Safe Operating Area

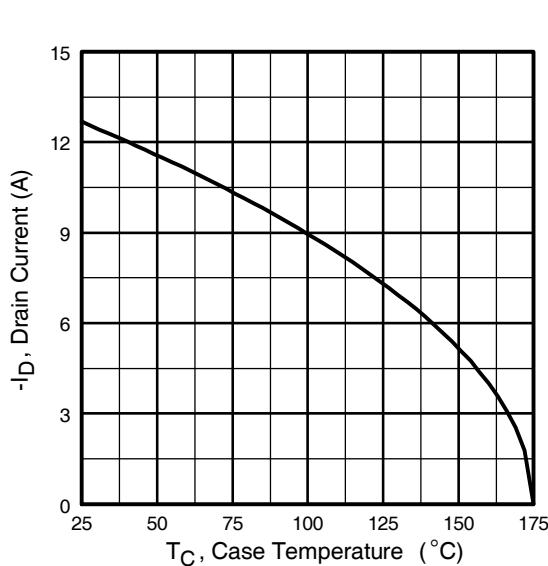


Fig 9. Maximum Drain Current Vs.
Case Temperature

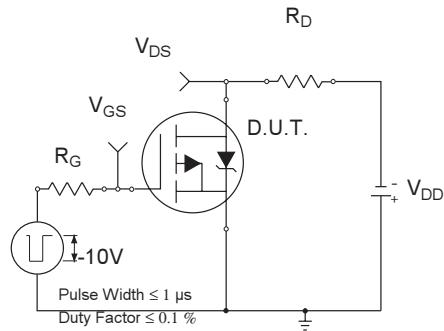


Fig 10a. Switching Time Test Circuit

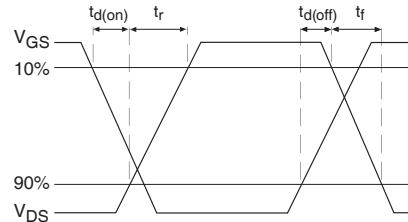


Fig 10b. Switching Time Waveforms

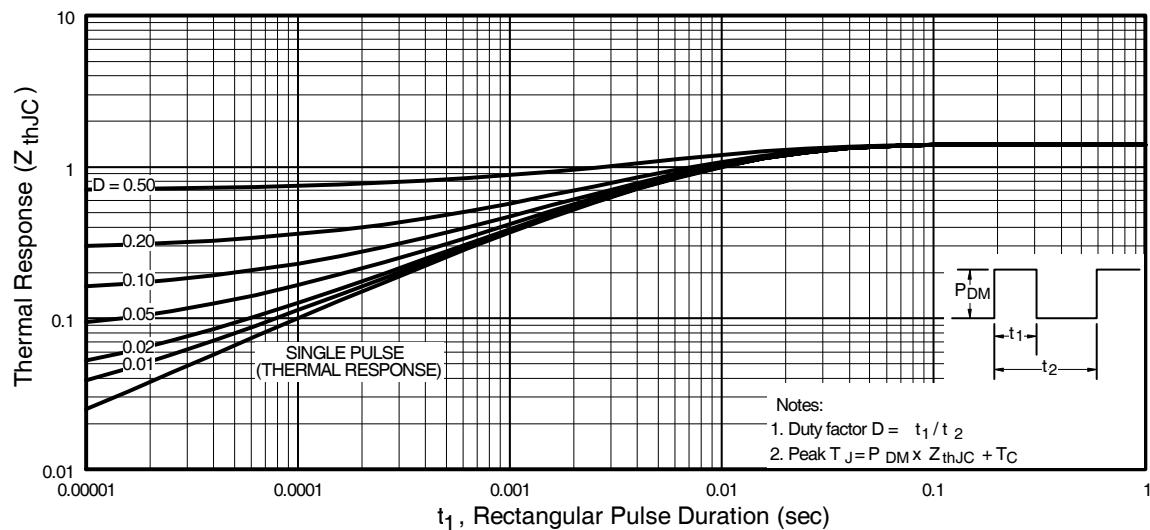


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

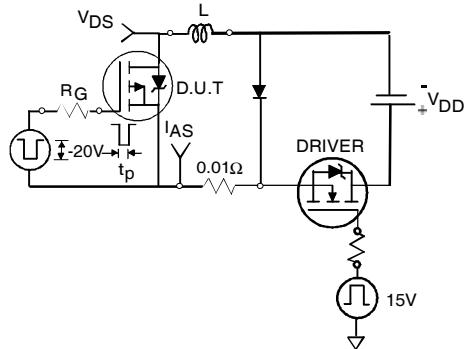


Fig 12a. Unclamped Inductive Test Circuit

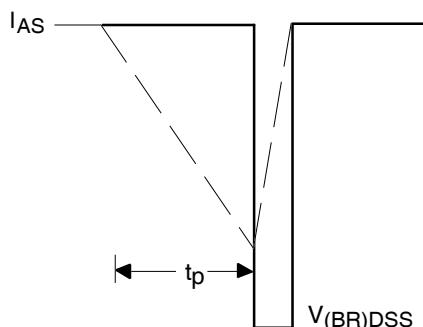
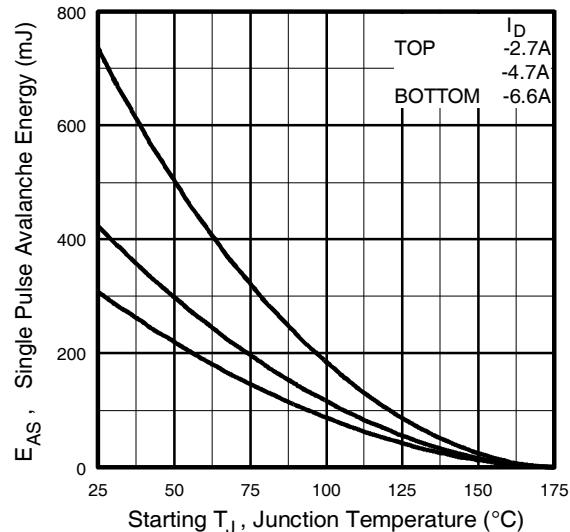


Fig 12b. Unclamped Inductive Waveforms

Fig 12c. Maximum Avalanche Energy Vs. Drain Current

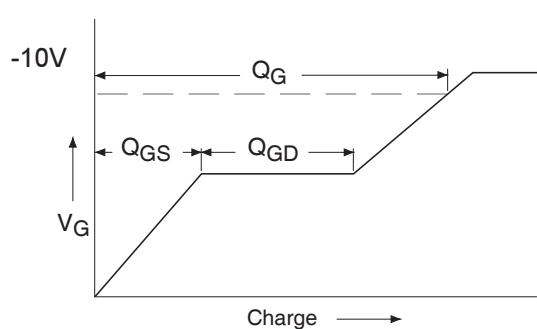


Fig 13a. Basic Gate Charge Waveform

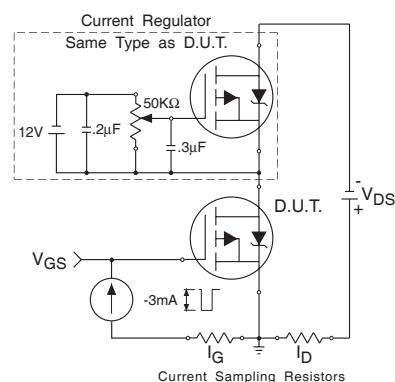
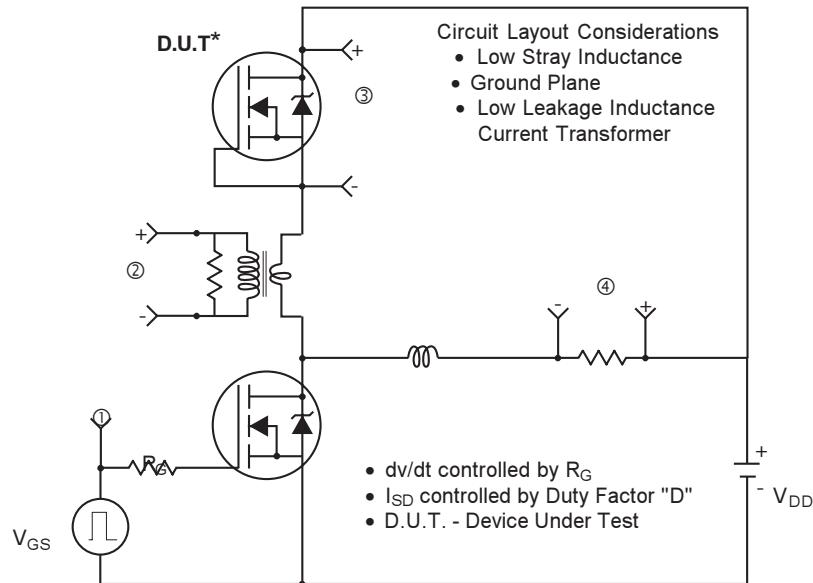
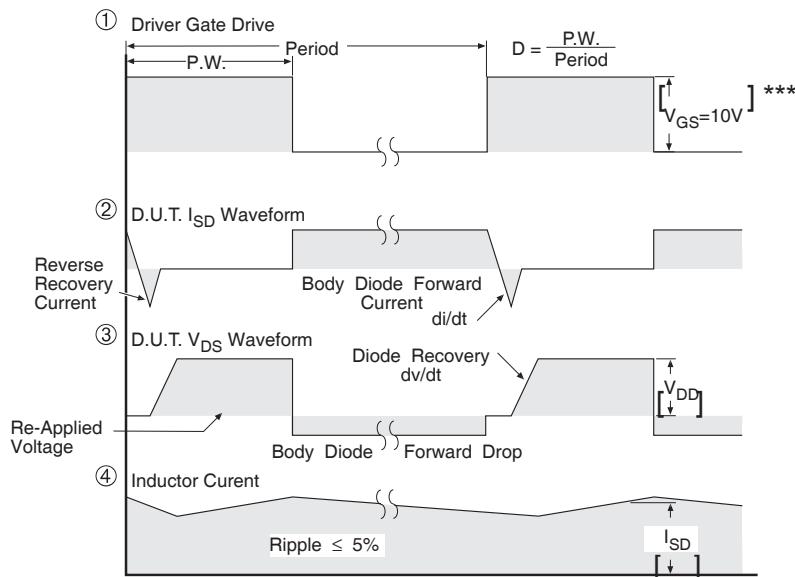


Fig 13b. Gate Charge Test Circuit

Peak Diode Recovery dv/dt Test Circuit



* Reverse Polarity of D.U.T for P-Channel

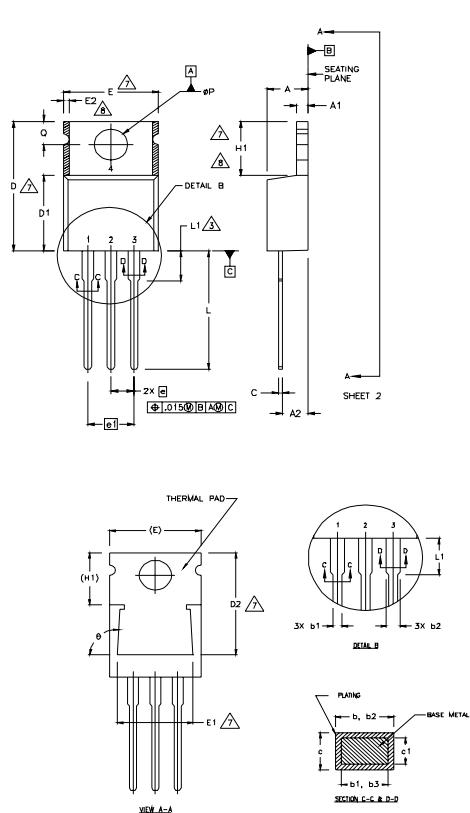


*** $V_{GS} = 5.0\text{V}$ for Logic Level and 3V Drive Devices

Fig 14. For P-Channel HEXFETS

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



NOTES:

- 1 DIMENSIONING AND TOLERANCING PER ASME Y14.5 M- 1994.
- 2 DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS].
- 3 LEAD DIMENSION AND FINISH UNCONTROLLED IN L1.
- 4 DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- 5 DIMENSION b1 & c1 APPLY TO BASE METAL ONLY.
- 6 CONTROLLING DIMENSION : INCHES.
- 7 THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS E,H1,D2 & E1
- 8 DIMENSION E2 X H1 DEFINE A ZONE WHERE STAMPING AND SINGULATION IRRREGULARITIES ARE ALLOWED.

LEAD ASSIGNMENTS

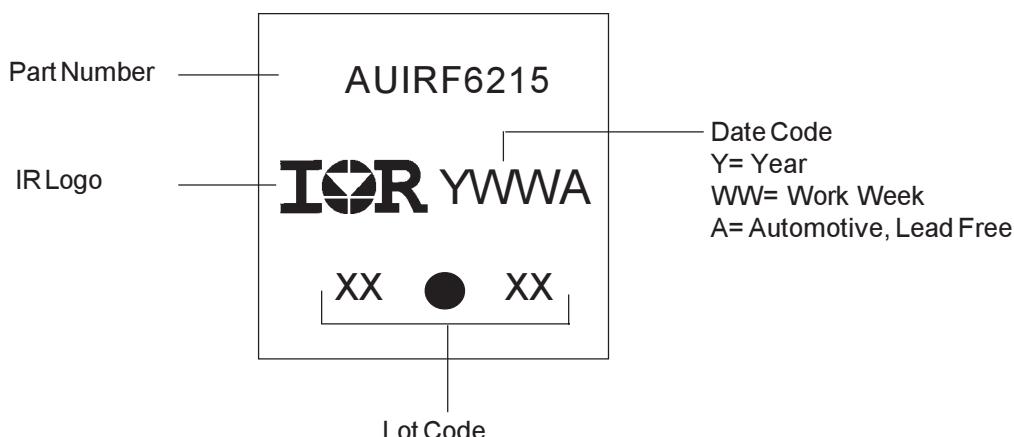
HEXFET
1.- GATE
2.- DRAIN
3.- SOURCE

IGBTs, CoPACK
1.- GATE
2.- COLLECTOR
3.- Emitter

DIODES
1.- ANODE/OPEN
2.- CATHODE
3.- ANODE

SYMBOL	DIMENSIONS			NOTES
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.82	.140	.190
A1	0.51	1.40	.020	.055
A2	2.04	2.92	.080	.115
b	0.58	1.01	.015	.040
b1	0.38	0.96	.015	.038
b2	1.15	1.77	.045	.070
b3	1.15	1.73	.045	.068
c	0.56	0.61	.014	.024
c1	0.36	0.56	.014	.022
D	14.22	16.51	.560	.650
D1	8.58	9.02	.330	.355
D2	12.19	12.88	.480	.507
E	9.66	10.66	.380	.420
E1	8.38	8.89	.330	.350
e	2.54	BSC	.100	BSC
e1	5.08		.200	BSC
H1	5.85	6.55	.230	.270
L	12.70	14.73	.500	.580
L1	-	6.35	-	.250
φP	3.54	4.08	.139	.161
O	2.54	3.42	.100	.135
Ø	90°-93°		90°-93°	

TO-220AB Part Marking Information



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

AUIRF6215

International
IR Rectifier

Ordering Information

Base part number	Package Type	Standard Pack		Complete Part Number
		Form	Quantity	
AUIRF6215	TO-220	Tube	50	AUIRF6215

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ООО "ЛайфЭлектроникс"

"LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибуторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибуторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помочь разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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Email: org@lifeelectronics.ru