Provisional Data Sheet No. PD-9.2002

International
IOR Rectifier

IRFV260

HEXFET® TRANSISTOR

N-CHANNEL

200 Volt, 0.060Ω, HEXFET

HEXFET technology is the key to International Rectifier's advanced line of power MOSFET transistors. The efficient geometry design achieves very low on-state resistance combined with high transconductance.

HEXFET transistors also feature all of the well-established advantages of MOSFETs, such as voltage control, very fast switching, ease of paralleling and electrical parameter temperature stability. They are well-suited for applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers, high energy pulse circuits and virtually any application where high reliability is required.

The HEXFET transistor's totally isolated package eliminates the need for additional isolating material between the device and the heatsink. This improves thermal efficiency and reduces drain capacitance.

Product Summary

Part Number	BV_{DSS}	$R_{DS(on)}$	I_D
IRFV260	200V	0.060Ω	45A*

Features:

- Hermetically Sealed
- Electrically Isolated
- Simple Drive Requirements
- Ease of Paralleling
- Ceramic Eyelets

Absolute Maximum Ratings

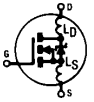
	Parameter	IRFV260	Units
I_D @ V_{GS} = 10V, T_C = 25°C	Continuous Drain Current	45*	A
I_D @ V_{GS} = 10V, T_C = 100°C	Continuous Drain Current	29	
I_{DM}	Pulsed Drain Current ①	180	
P_D @ T_C = 25°C	Max. Power Dissipation	300	W
	Linear Derating Factor	2.4	W/K ⑤
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy ②	700	mJ
I_{AR}	Avalanche Current ①	45	A
E_{AR}	Repetitive Avalanche Energy ①	30	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.3	V/ns
T_J	Operating Junction	-55 to 150	°C
T_{STG}	Storage Temperature Range		
	Lead Temperature	300 (0.063 in. (1.6mm) from case for 10 sec.)	
	Weight	10.9 (typical)	g

* I_D current limited by pin diameter

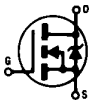
Electrical Characteristics @ Tj = 25°C (Unless Otherwise Specified)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	200	—	—	V	V_{GS} = 0V, I_D = 1.0 mA
$\Delta BV_{DSS}/\Delta T_J$	Temp. Coefficient of Breakdown Voltage	—	0.24	—	V/°C	Reference to 25°C, I_D = 1.0 mA
$R_{DS(on)}$	Static Drain-to-Source	—	—	0.060	Ω	V_{GS} = 10V, I_D =29A ④
	On-State Resistance	—	—	0.068		V_{GS} = 10V, I_D = 45A
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	22	—	—	S (℧)	V_{DS} ≥ 15V, I_{DS} = 29A ④
I_{DSS}	Zero Gate Voltage Drain Current	—	—	25	µA	V_{DS}=0.8 x Max Rating,V_{GS}=0V
		—	—	250		V_{DS} = 0.8 x Max Rating V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Leakage Forward	—	—	100	nA	V_{GS} = 20V
I_{GSS}	Gate-to-Source Leakage Reverse	—	—	-100		V_{GS} = -20V
Q_g	Total Gate Charge	—	—	230	nC	V_{GS} =10V, I_D = 45A V_{DS} = Max. Rating x 0.5
Q_{gs}	Gate-to-Source Charge	—	—	40		
Q_{gd}	Gate-to-Drain (“Miller”) Charge	—	—	110		
$t_{d(on)}$	Turn-On Delay Time	—	—	29	ns	V_{DD} = 100V, I_D =45A, R_G = 2.35Ω, V_{GS} =10V
t_r	Rise Time	—	—	120		
$t_{d(off)}$	Turn-Off Delay Time	—	—	110		
t_f	Fall Time	—	—	92		
L_D	Internal Drain Inductance	—	8.7	—	nH	Measured from the drain lead, 6mm (0.25 in.) from package to center of die.
L_S	Internal Source Inductance	—	8.7	—		Measured from the source lead, 6mm (0.25 in.) from package to source bonding pad.
C_{iss}	Input Capacitance	—	5100	—	pF	V_{GS} = 0V, V_{DS} = 25V f = 1.0 MHz
C_{oss}	Output Capacitance	—	1100	—		
C_{rss}	Reverse Transfer Capacitance	—	280	—		

Modified MOSFET symbol showing the internal inductances.



Source-Drain Diode Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	45*	A	Modified MOSFET symbol showing the integral reverse p-n junction rectifier. 
I_{SM}	Pulse Source Current (Body Diode) ①	—	—	180		
V_{SD}	Diode Forward Voltage	—	—	1.8	V	T_j = 25°C, I_S = 45A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	—	420	ns	T_j = 25°C, I_F = 45A, di/dt ≤ 100A/µs
Q_{RR}	Reverse Recovery Charge	—	—	4.9	µC	V_{DD} ≤ 50V ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by L_S + L_D.				

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R_{thJC}	Junction-to-Case	—	—	0.42	K/W ⑤	
R_{thJA}	Junction-to-Ambient	—	—	30		typical socket mount
R_{thCS}	Case-to-Sink	—	0.21	—		mounting surface flat, smooth

① Repetitive Rating; Pulse width limited by maximum junction temperature.

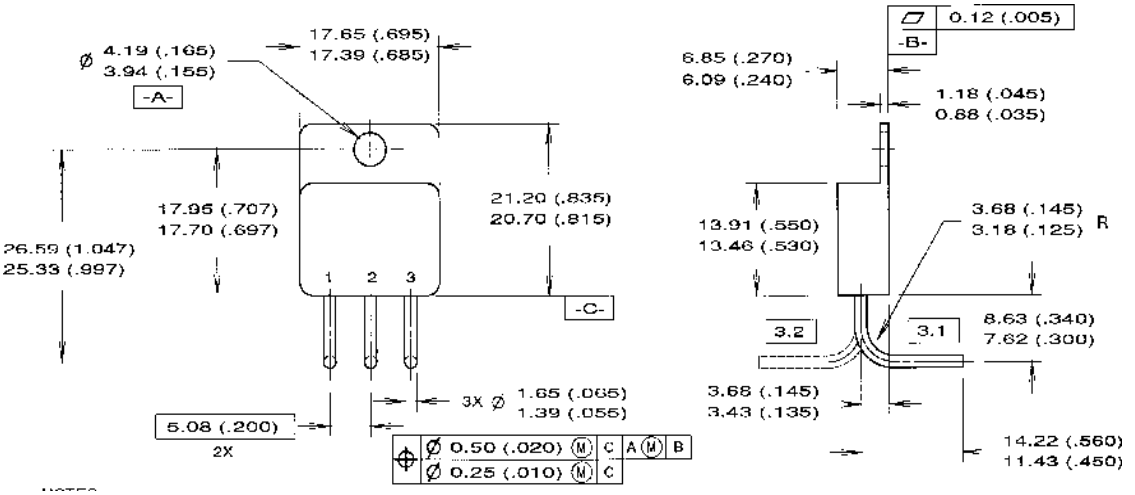
② @ V_{DD} = 50V, Starting T_J = 25°C,
E_{AS} = [0.5 * L * (I_L^2) * [BV_{DSS}/(BV_{DSS}-V_{DD})]
Peak I_L = 45A, V_{GS} = 10V, 25 ≤ R_G ≤ 200Ω

③ I_{SD} ≤ 45A, di/dt ≤ 130 A/µs,
V_{DD} ≤ BV_{DSS}, T_J ≤ 150°C
Suggested RG = 2.35Ω

④ Pulse width ≤ 300 µs; Duty Cycle ≤ 2%

⑤ K/W = °C/W
W/K = W/°C

Case Outline and Dimensions — TO-258AA



NOTES:
1. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
2. All dimensions in millimeters (inches)

LEGEND:
1. Drain
2.. Source
3. Gate

CAUTION

BERYLLIA WARNING PER MIL-PRF-19500

Packages containing beryllia shall not be ground, sandblasted, machined, or have other operations performed on them which will produce beryllia or beryllium dust. Furthermore, beryllium oxides packages shall not be placed in acids that will produce fumes containing beryllium.

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