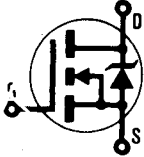


**INTERNATIONAL RECTIFIER** 

**REPETITIVE AVALANCHE RATED AND dv/dt RATED**

**HEXFET® TRANSISTOR**

**IRFV360**



**N-CHANNEL**

**400 Volt, 0.20 Ohm HEXFET**

The 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.

The HEXFET transistors also feature all of the well established advantages of MOSFETs such as voltage control, very fast switching, ease of paralleling and temperature stability of the electrical parameters.

They are well suited for applications such as switching power supplies and virtually any application where military and/or high reliability is required.

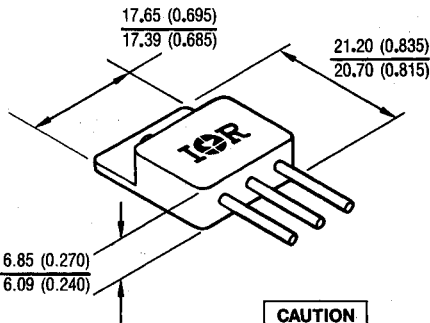
**Product Summary**

Part Number	$V_{DSS}$	$R_{DS(on)}$	$I_D$
IRFV360	400V	0.20Ω	25A

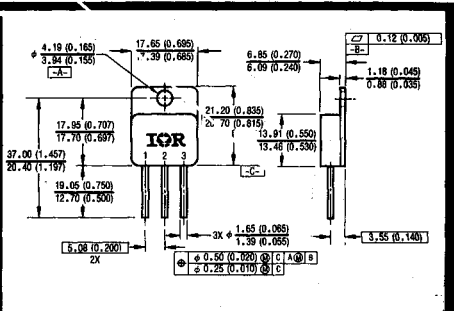
**FEATURES:**

- Repetitive Avalanche Rating
- Dynamic dv/dt Rating
- Isolated and Hermetically Sealed
- Alternative to TO-3 Package
- Simple Drive Requirements
- Ease of Paralleling
- Ceramic Eyelets

**CASE STYLE AND DIMENSIONS**



**BERYLLIA WARNING PER MIL-S-19500  
SEE PAGE I-482.**



**NOTES:**  
 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M - 1982.  
 2 ALL DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).  
 3 GATE

\*For optional leadforms see page I-462, fig. 15

**Conforms to JEDEC Outline TO-258AA\***  
 Dimensions in Millimeters and (Inches)

**Absolute Maximum Ratings**


Parameter	IRFV360	Units
$I_D$ @ $V_{GS} = 10V, T_C = 25^\circ C$	Continuous Drain Current	25
$I_D$ @ $V_{GS} = 10V, T_C = 100^\circ C$	Continuous Drain Current	16
$I_{DM}$	Pulsed Drain Current ①	100
$P_D$ @ $T_C = 25^\circ C$	Max. Power Dissipation	300
	Linear Derating Factor	2.4
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$
$E_{AS}$	Single Pulse Avalanche Energy ②	980
$I_{AR}$	Avalanche Current ①	25
$E_{AR}$	Repetitive Avalanche Energy ①	30
$dv/dt$	Peak Diode Recovery $dv/dt$ ③	4.0
$T_J$	Operating Junction	-55 to 150
$T_{STG}$	Storage Temperature Range	
	Lead Temperature	300 (0.063 in. (1.6 mm) from case for 10s)
	Weight	10.9 (typical)

**Electrical Characteristics @  $T_J = 25^\circ C$  (Unless Otherwise Specified)**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
$BV_{DSS}$	400	—	—	V	$V_{GS} = 0V, I_D = 1.0 mA$
$\Delta BV_{DSS}/\Delta T_J$	—	0.48	—	V/°C	Reference to 25°C, $I_D = 1.0 mA$
$R_{DS(on)}$	—	—	0.20	$\Omega$	$V_{GS} = 10V, I_D = 16A$ ④
	—	—	0.23		$V_{GS} = 10V, I_D = 25A$
$V_{GS(th)}$	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$
$g_{fs}$	14	—	—	S (⑤)	$V_{DS} \geq 15V, I_{DS} = 16A$ ④
$I_{DSS}$	—	—	25	$\mu A$	$V_{DS} = 0.8 \times \text{Max. Rating}, V_{GS} = 0V$
	—	—	250		$V_{DS} = 0.8 \times \text{Max. Rating}$ $V_{GS} = 0V, T_J = 125^\circ C$
$I_{GSS}$	—	—	100	nA	$V_{GS} = 20V$
$I_{GSS}$	—	—	-100		$V_{GS} = -20V$
$Q_g$	—	—	210	nC	$V_{GS} = 10V, I_D = 25A$
$Q_{gs}$	—	—	28		$V_{DS} = 0.5 \times \text{Max. Rating}$
$Q_{gd}$	—	—	120		See Fig. 6 and 14
$t_{d(on)}$	—	—	33	ns	$V_{DD} = 200V, I_D = 25A, R_G = 2.35\Omega$
$t_r$	—	—	140		
$t_{d(off)}$	—	—	120		See Fig. 11
$t_f$	—	—	99		
$L_D$	—	8.7	—	nH	Measured from the drain lead, 6 mm (0.25 in.) from package to center of die.
$L_S$	—	8.7	—		Measured from the source lead, 6 mm (0.25 in.) from package to source bonding pad.
$C_{iss}$	—	4200	—	pF	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1.0 MHz$
$C_{oss}$	—	900	—		
$C_{rss}$	—	400	—		See Fig. 5
$C_{DC}$	—	12	—		$f = 1.0 MHz$



**Source-Drain Diode Ratings and Characteristics**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
$I_S$ Continuous Source Current (Body Diode)	—	—	25	A	Modified MOSFET symbol showing the integral Reverse p-n junction rectifier. 
$I_{SM}$ Pulsed Source Current (Body Diode) ①	—	—	100		
$V_{SD}$ Diode Forward Voltage	—	—	1.8	V	$T_J = 25^\circ\text{C}$ , $I_S = 25\text{A}$ , $V_{GS} = 0\text{V}$ ④
$t_{rr}$ Reverse Recovery Time	—	—	1000	nS	$T_J = 25^\circ\text{C}$ , $I_F = 25\text{A}$ , $dI/dt \leq 100\text{ A}/\mu\text{s}$ ④
$Q_{RR}$ Reverse Recovery Charge	—	—	16	$\mu\text{C}$	$V_{DD} \leq 50\text{V}$
$t_{on}$ 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	
$R_{thCS}$ Case-to-Sink	—	0.21	—		Mounting surface flat, smooth, and greased
$R_{thJA}$ Junction-to-Ambient	—	—	30		Typical socket mount

① Repetitive Rating; Pulse width limited by maximum junction temperature (see figure 9) Refer to current HEXFET reliability report

② @  $V_{DD} = 50\text{V}$ , Starting  $T_J = 25^\circ\text{C}$ ,  $L \geq 2.7\text{ mH}$ ,  $R_G = 25\Omega$ , Peak  $I_L = 25\text{A}$

③  $I_{SD} \leq 25\text{A}$ ,  $dI/dt \leq 170\text{ A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J \leq 150^\circ\text{C}$ , Suggested  $R_G = 2.35\Omega$

④ Pulse width  $\leq 300\ \mu\text{s}$ ; Duty Cycle  $\leq 2\%$

⑤  $K/W = ^\circ\text{C}/W$   
 $W/K = W/^\circ\text{C}$

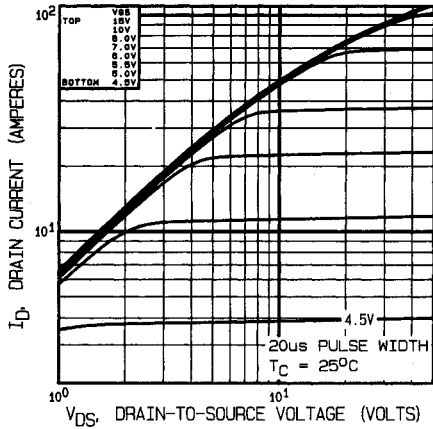


Fig. 1 — Typical Output Characteristics,  $T_C = 25^\circ C$

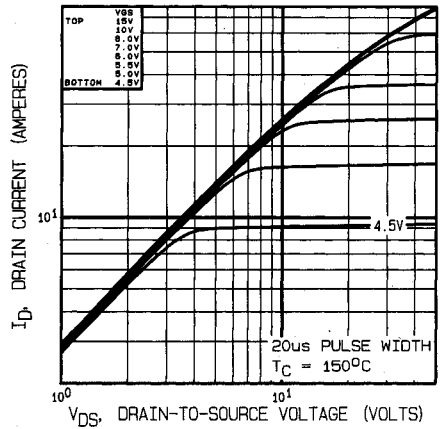


Fig. 2 — Typical Output Characteristics,  $T_C = 150^\circ C$

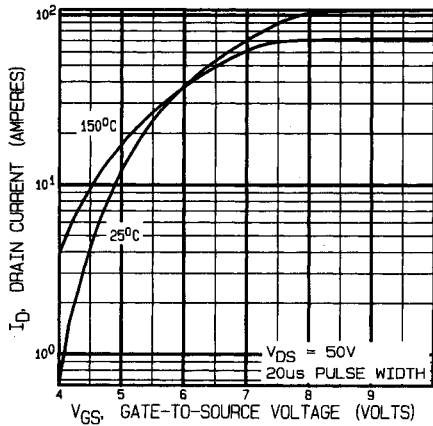


Fig. 3 — Typical Transfer Characteristics

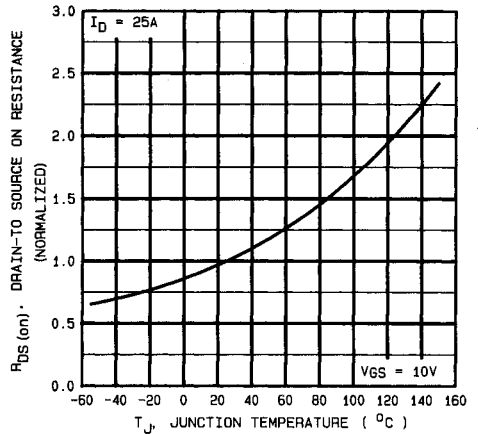


Fig. 4 — Normalized On-Resistance Vs. Temperature

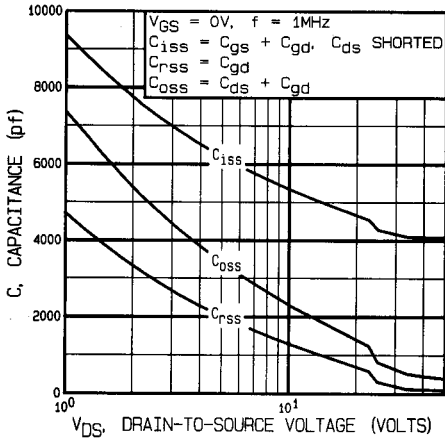


Fig. 5 — Typical Capacitance Vs. Drain-to-Source Voltage

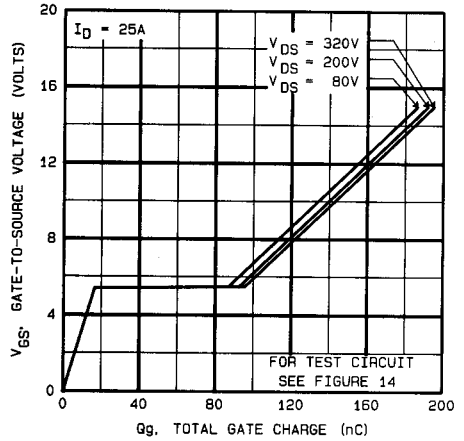


Fig. 6 — Typical Gate Charge Vs. Gate-to-Source Voltage

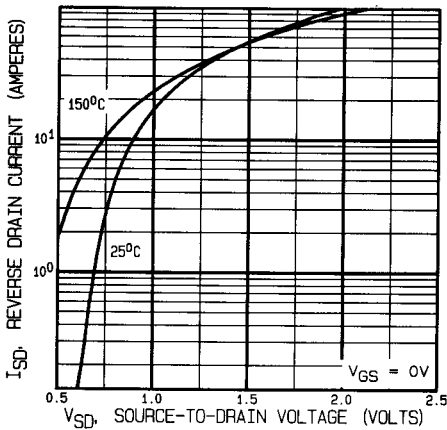


Fig. 7 — Typical Source-Drain Diode Forward Voltage

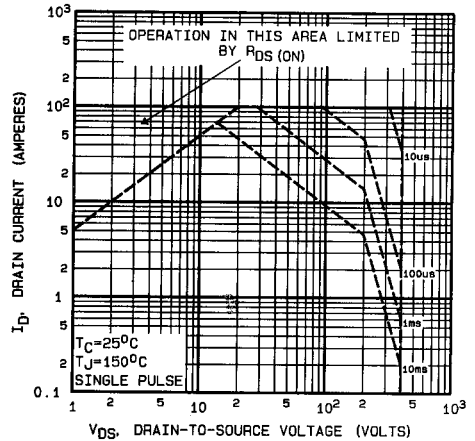


Fig. 8 — Maximum Safe Operating Area

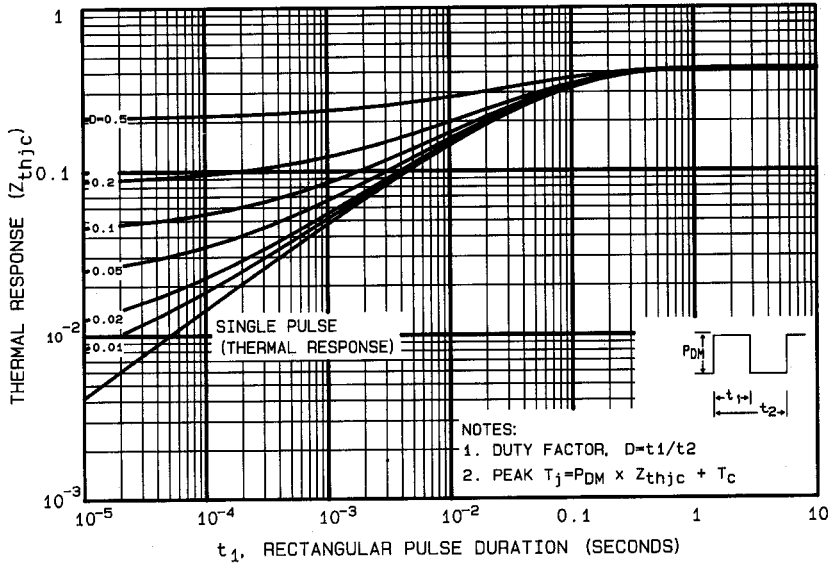


Fig. 9 — Maximum Effective Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration

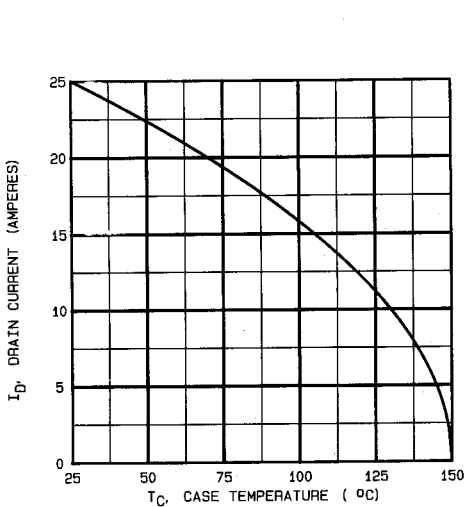


Fig. 10 — Maximum Drain Current Vs. Case Temperature

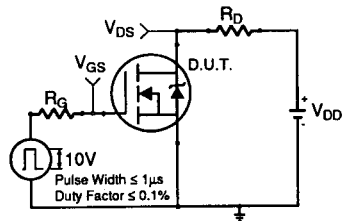


Fig. 11a — Switching Time Test Circuit

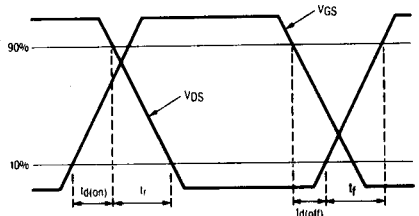
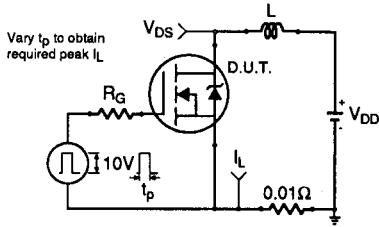
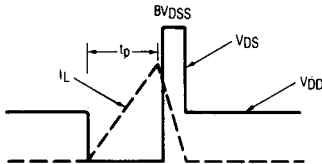
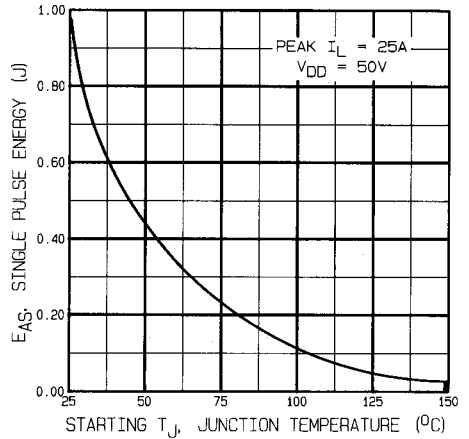
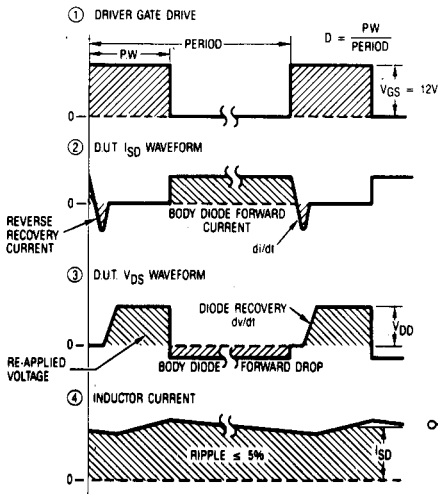
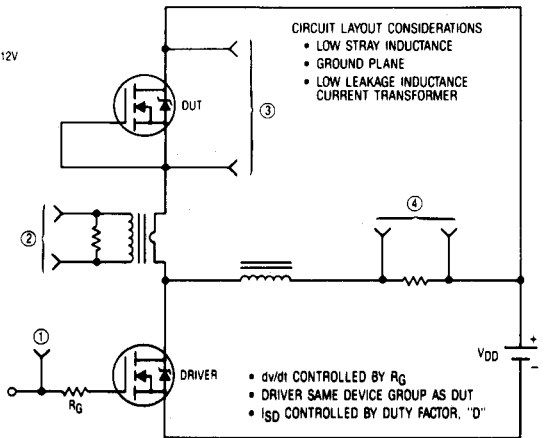


Fig. 11b — Switching Time Waveforms


**Fig. 12a — Unclamped Inductive Test Circuit**

**Fig. 12b — Unclamped Inductive Waveforms**

**Fig. 12c — Maximum Avalanche Energy Vs. Starting Junction Temperature**

**Fig. 13 — Peak Diode Recovery dv/dt Test Circuit**


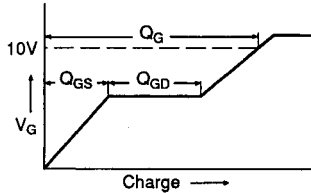


Fig. 14a — Basic Gate Charge Waveform

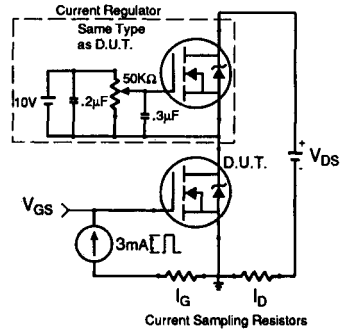


Fig. 14b — Gate Charge Test Circuit

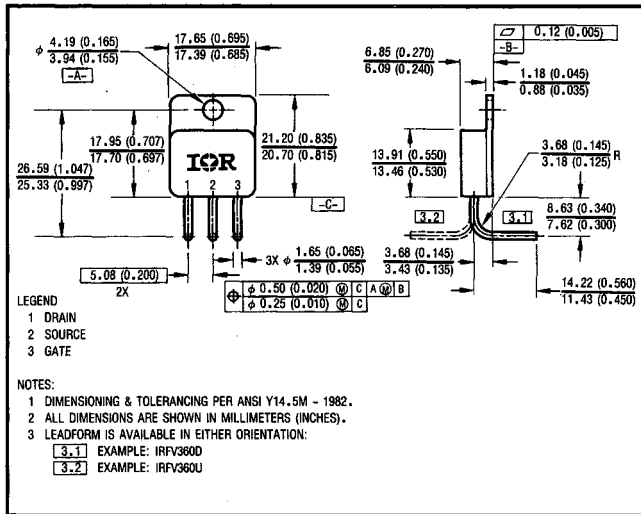


Fig. 15 — Optional Leadforms for Outline TO-258

**BERYLLIA WARNING PER MIL-S-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 oxide packages shall not be placed in acids that will produce fumes containing beryllium.