

Electrical Characteristics @ T_j = 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 = 1.0mA
ΔBV _{DSS} /ΔT _J	Temperature Coefficient of Breakdown Voltage	—	0.28	—	V/°C	Reference to 25°C, I _D = 1.0mA
R _{DS(on)}	Static Drain-to-Source On-State Resistance	—	—	0.100 0.105	Ω	V _{GS} = 10V, I _D = 17A ④ V _{GS} = 10V, I _D = 27.4A
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} = V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance	9.0	—	—	S	V _{DS} = 15V, I _{DS} = 17A ④
I _{DSS}	Zero Gate Voltage Drain Current	—	—	25 250	μA	V _{DS} = 160V, V _{GS} = 0V V _{DS} = 160V, 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	nA	V _{GS} = -20V
Q _g	Total Gate Charge	—	—	115	nC	V _{GS} = 10V, I _D = 27.4A V _{DS} = 100V
Q _{gs}	Gate-to-Source Charge	—	—	22	nC	
Q _{gd}	Gate-to-Drain ('Miller') Charge	—	—	60	nC	
t _{d(on)}	Turn-On Delay Time	—	—	35	ns	V _{DD} = 100V, I _D = 27.4A, V _{GS} = 10V, R _G = 2.35Ω
t _r	Rise Time	—	—	190		
t _{d(off)}	Turn-Off Delay Time	—	—	170		
t _f	Fall Time	—	—	130		
L _S + L _D	Total Inductance	—	6.8	—	nH	Measured from drain lead (6mm/0.25in. from package) to source lead (6mm/0.25in. from package)
C _{iss}	Input Capacitance	—	3500	—	pF	V _{GS} = 0V, V _{DS} = 25V f = 1.0MHz
C _{oss}	Output Capacitance	—	700	—		
C _{rss}	Reverse Transfer Capacitance	—	110	—		
C _{DC}	Drain-to-Case Capacitance	—	12	—		

Source-Drain Diode Ratings and Characteristics

	Parameter	Min	Typ	Max	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	27.4	A	
I _{SM}	Pulse Source Current (Body Diode) ①	—	—	110		
V _{SD}	Diode Forward Voltage	—	—	1.9	V	T _J = 25°C, I _S = 27.4A, V _{GS} = 0V ④
t _{rr}	Reverse Recovery Time	—	—	950	ns	T _J = 25°C, I _F = 27.4A, di/dt ≤ 100A/μs V _{DD} ≤ 50V ④
Q _{RR}	Reverse Recovery Charge	—	—	9.0	μC	
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	—	—	0.83	°C/W	Typical socket mount
R _{thJS}	Case-to-Sink	—	0.21	—		
R _{thJA}	Junction-to-Ambient	—	—	48		

Note: Corresponding Spice and Saber models are available on International Rectifier website.

For footnotes refer to the last page

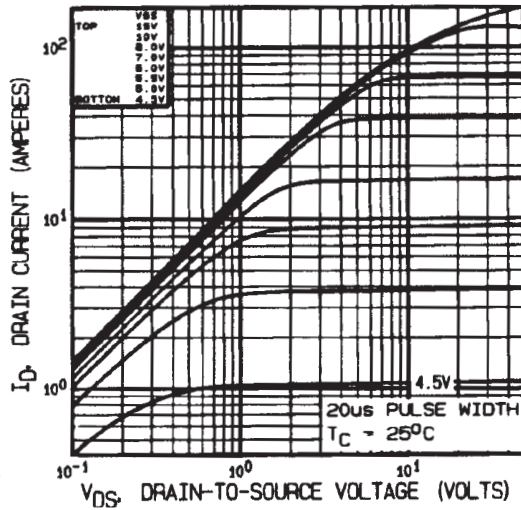


Fig 1. Typical Output Characteristics

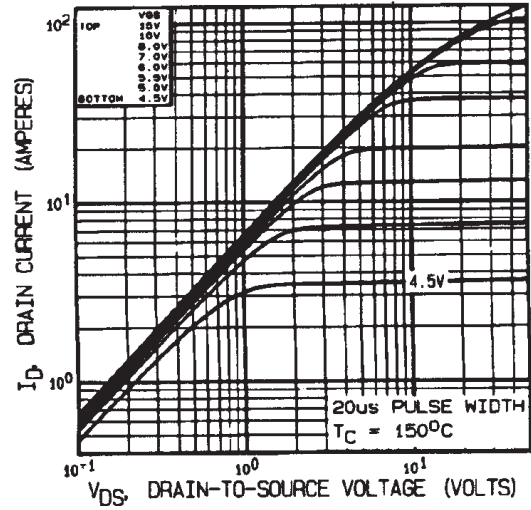


Fig 2. Typical Output Characteristics

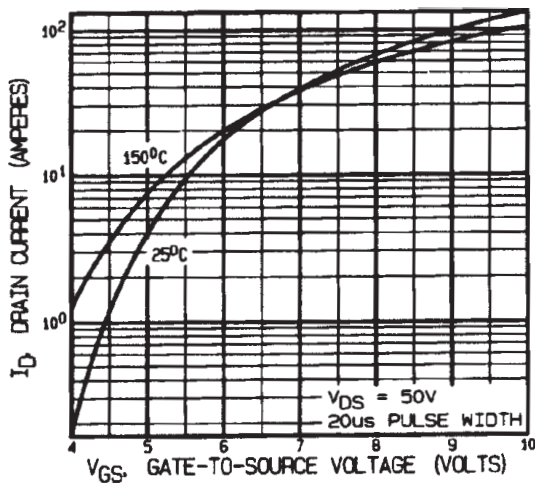


Fig 3. Typical Transfer Characteristics

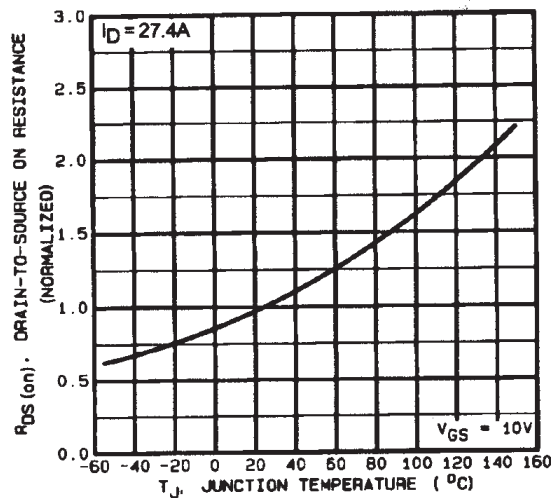


Fig 4. Normalized On-Resistance
Vs. Temperature

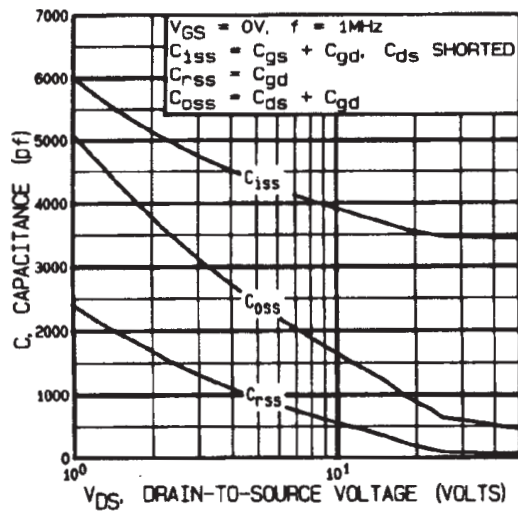


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

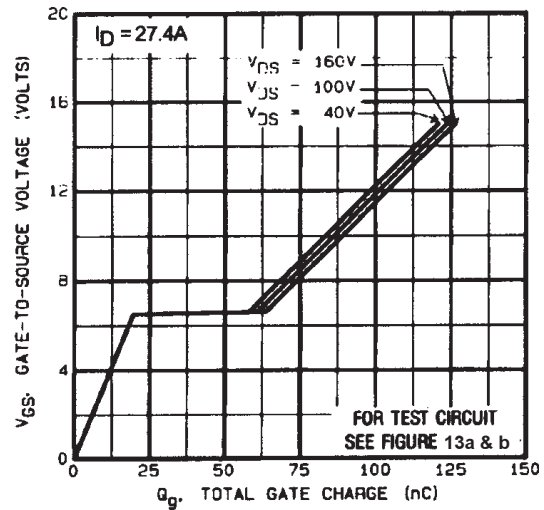


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

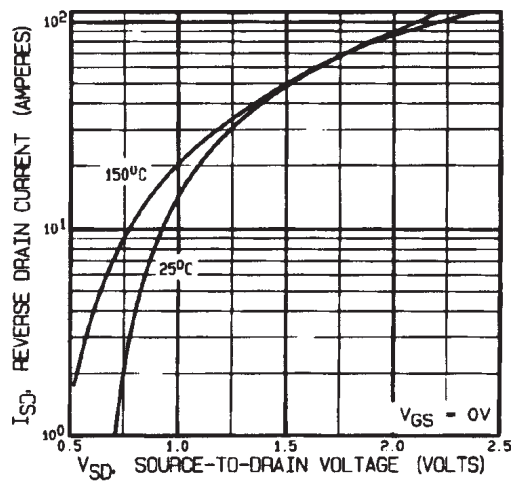


Fig 7. Typical Source-Drain Diode Forward Voltage

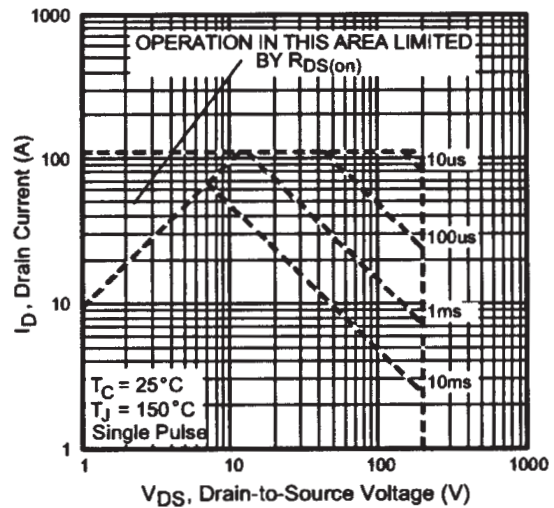


Fig 8. Maximum Safe Operating Area

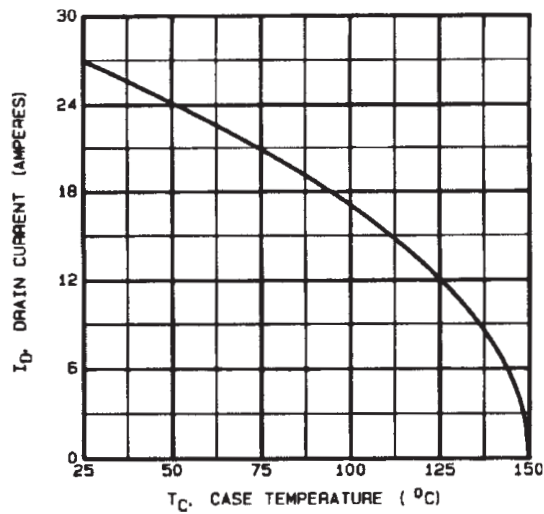


Fig 9. Maximum Drain Current Vs. Case Temperature

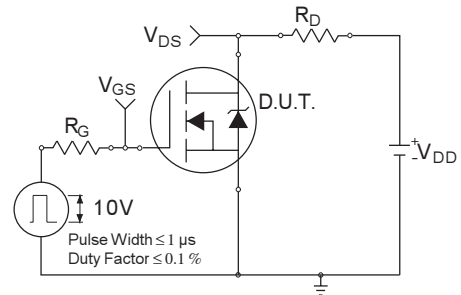


Fig 10a. Switching Time Test Circuit

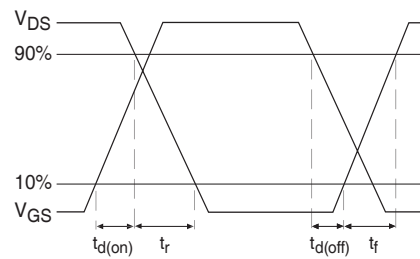


Fig 10b. Switching Time Waveforms

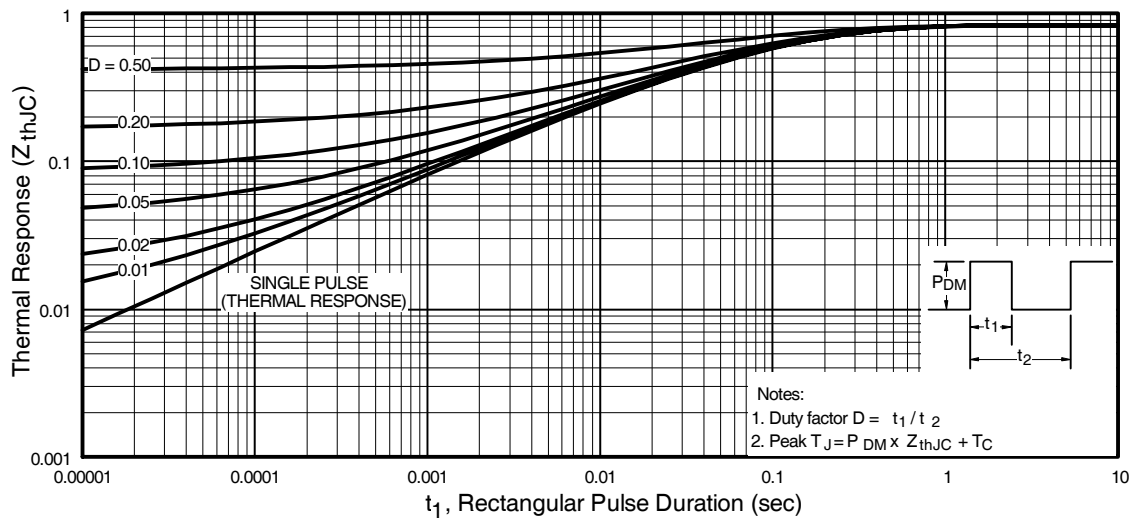


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

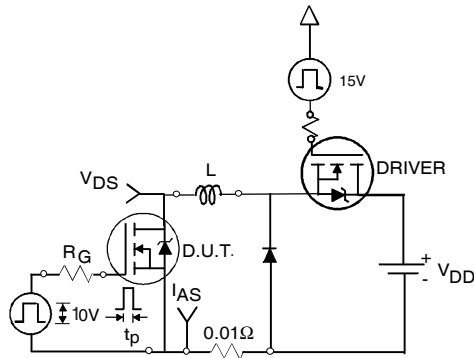


Fig 12a. Unclamped Inductive Test Circuit

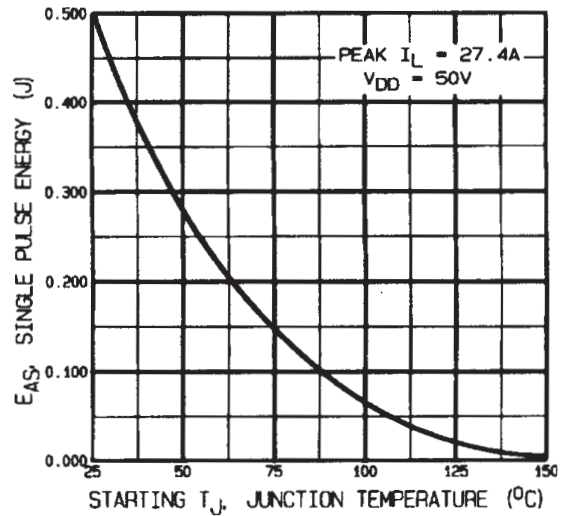
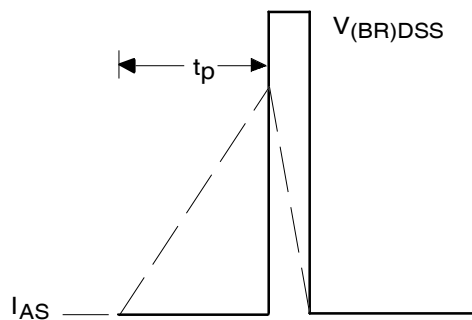
Fig 12c. Maximum Avalanche Energy
Vs. Drain Current

Fig 12b. Unclamped Inductive Waveforms

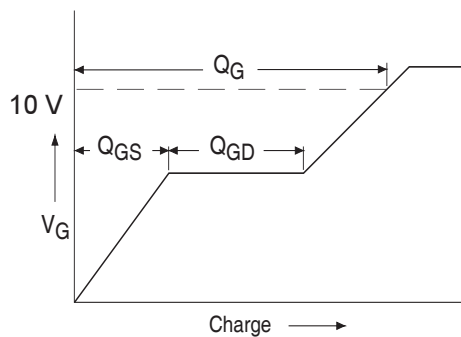


Fig 13a. Basic Gate Charge Waveform

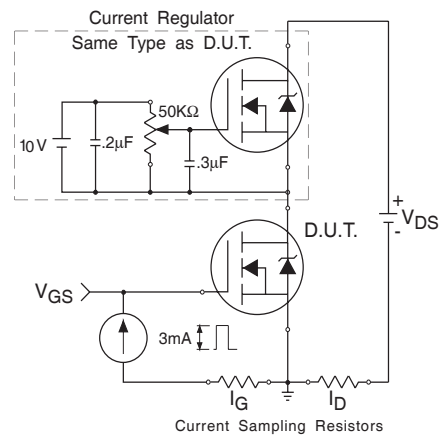
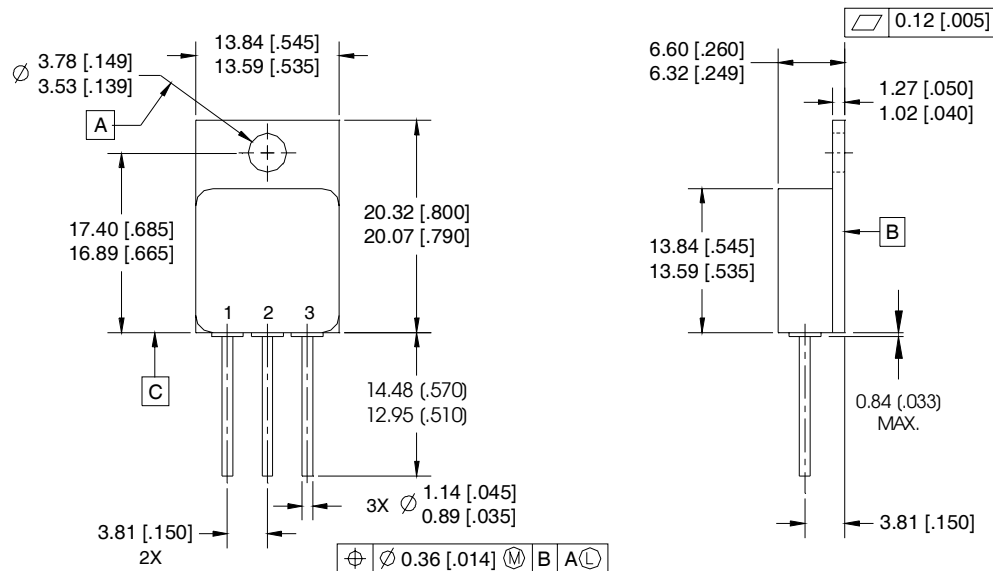


Fig 13b. Gate Charge Test Circuit

Footnotes:

- ① Repetitive Rating; Pulse width limited by maximum junction temperature.
- ② $V_{DD} = 50V$, starting $T_J = 25^\circ C$, $L = 1.3mH$
Peak $I_L = 27.4A$, $V_{GS} = 10V$
- ③ $I_{SD} \leq 27.4A$, $di/dt \leq 190A/\mu s$,
 $V_{DD} \leq 200V$, $T_J \leq 150^\circ C$
- ④ Pulse width $\leq 300 \mu s$; Duty Cycle $\leq 2\%$

Case Outline and Dimensions — TO-254AA



NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. CONTROLLING DIMENSION: INCH.
4. CONFORMS TO JEDEC OUTLINE TO-254AA.

PIN ASSIGNMENTS

- 1 = DRAIN
- 2 = SOURCE
- 3 = GATE

CAUTION

BERYLLIA WARNING PER MIL-PRF-19500

Package 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.

International
IR Rectifier

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IR LEOMINSTER : 205 Crawford St., Leominster, Massachusetts 01453, USA Tel: (978) 534-5776

TAC Fax: (310) 252-7903

Visit us at www.irf.com for sales contact information.

Data and specifications subject to change without notice. 10/2011