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

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	500	—	—	V	V_{GS} = 0V, I_D = 1.0mA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.78	—	V/°C	Reference to 25°C, I_D = 1.0mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.4	Ω	V_{GS} = 10V, I_{D2} = 7.75A ④
		—	—	0.5		V_{GS} = 10V, I_{D1} = 12A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
Gfs	Forward Transconductance	5.5	—	—	S	V_{DS} = 15V, I_{D2} = 7.75A ④
I_{DSS}	Zero Gate Voltage Drain Current	—	—	25	µA	V_{DS} = 400V, V_{GS} = 0V
		—	—	250		V_{DS} = 400V,V_{GS} = 0V,T_J =125°C
I_{GSS}	Gate-to-Source Leakage Forward	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Leakage Reverse	—	—	-100		V_{GS} = -20V
Q_G	Total Gate Charge	55	—	120	nC	I_{D1} = 12A
Q_{GS}	Gate-to-Source Charge	5.0	—	19		V_{DS} = 250V
Q_{GD}	Gate-to-Drain (‘Miller’) Charge	27	—	70		V_{GS} = 10V
$t_{d(on)}$	Turn-On Delay Time	—	—	35	ns	V_{DD} = 250V
tr	Rise Time	—	—	190		I_{D1} = 12A
$t_{d(off)}$	Turn-Off Delay Time	—	—	170		R_G = 2.35Ω
t_f	Fall Time	—	—	130		V_{GS} = 10V
Ls +L_D	Total Inductance	—	6.1	—	nH	Measured from Drain lead (6mm / 0.25 in from package) to Source lead (6mm/ 0.25 in from package)
C_{iss}	Input Capacitance	—	2700	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	600	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	240	—		f = 1.0MHz

Source-Drain Diode Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	12	A	
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	48		
V_{SD}	Diode Forward Voltage	—	—	1.7	V	T_J = 25°C,I_S= 12A, V_{GS} = 0V④
t_{rr}	Reverse Recovery Time	—	—	1600	ns	T_J = 25°C,I_F = 12A,V_{DD} ≤ 30V
Q_{rr}	Reverse Recovery Charge	—	—	14	µC	di/dt = 100A/µs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Thermal Resistance

Symbol	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	0.83	°C/W
$R_{\theta JA}$	Junction-to-Ambient (Typical socket mount)	—	—	30	

Footnotes:

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

② V_{DD} = 50V, starting T_J = 25°C, L= 0.111mH, Peak I_L = 12A, V_{GS} = 10V.

③ I_{SD} ≤ 12A, di/dt ≤ 130A/µs, V_{DD} ≤ 500V, T_J ≤ 150°C. Suggested R_G =2.35 Ω

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

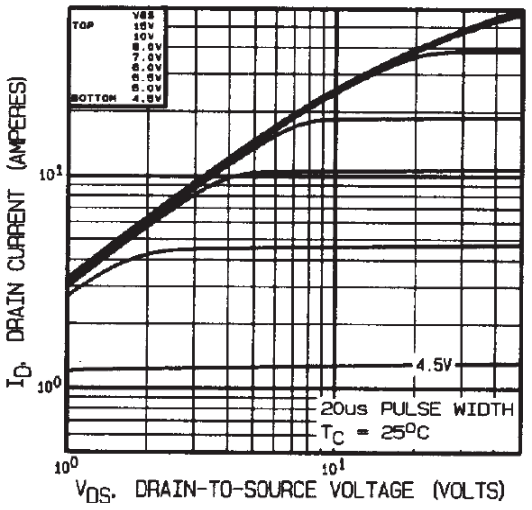


Fig 1. Typical Output Characteristics

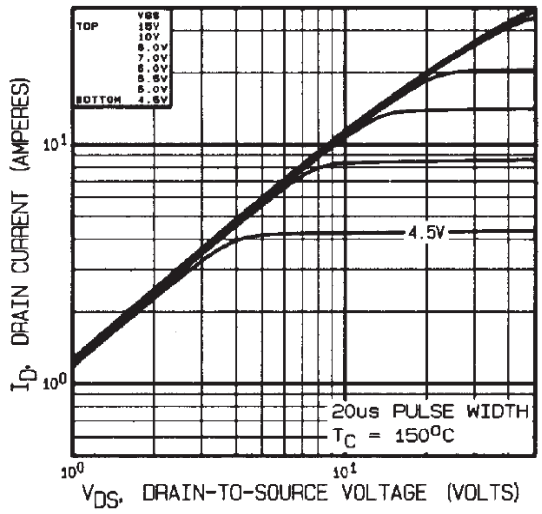


Fig 2. Typical Output Characteristics

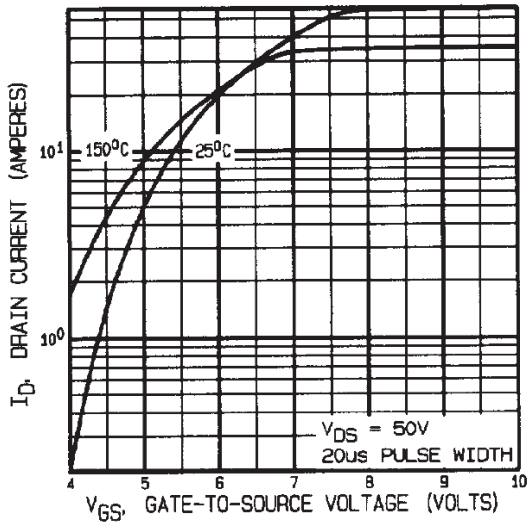


Fig 3. Typical Transfer Characteristics

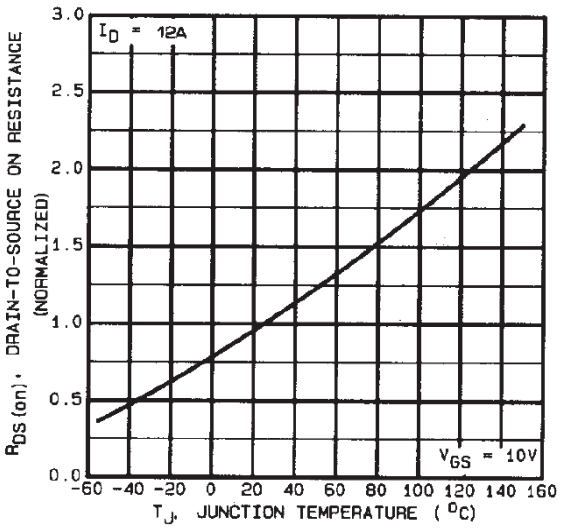


Fig 4. Normalized On-Resistance Vs. Temperature

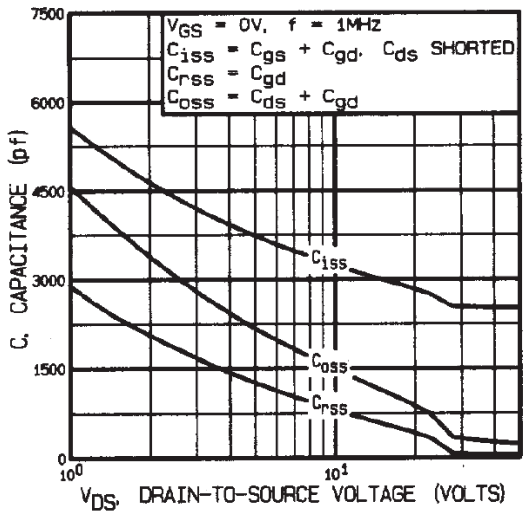


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

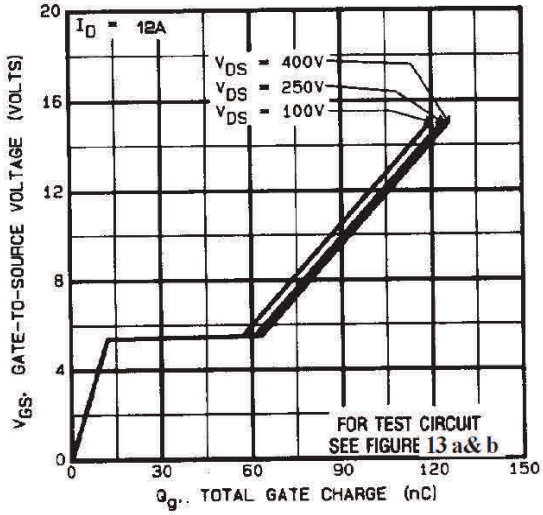


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

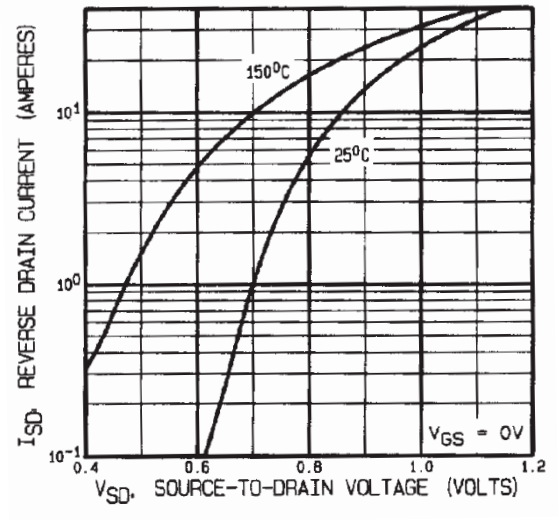


Fig 7. Typical Source-Drain Diode Forward Voltage

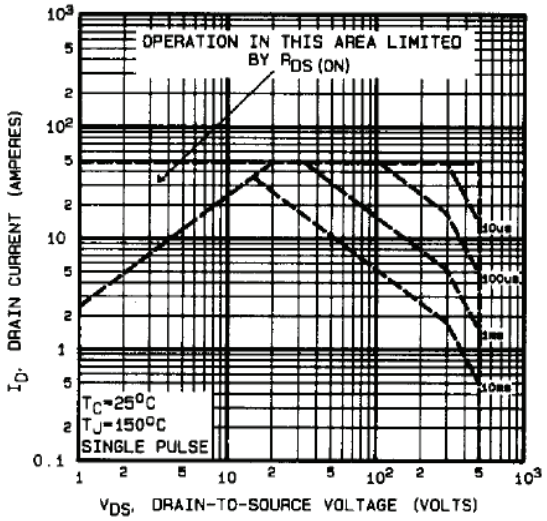


Fig 8. Maximum Safe Operating Area

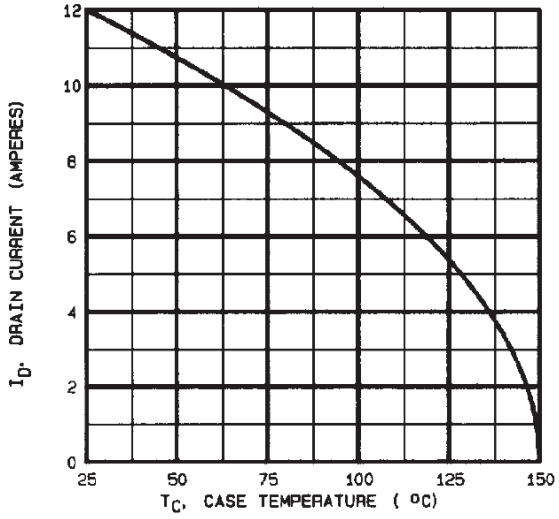


Fig 9. Maximum Drain Current Vs. Case Temperature

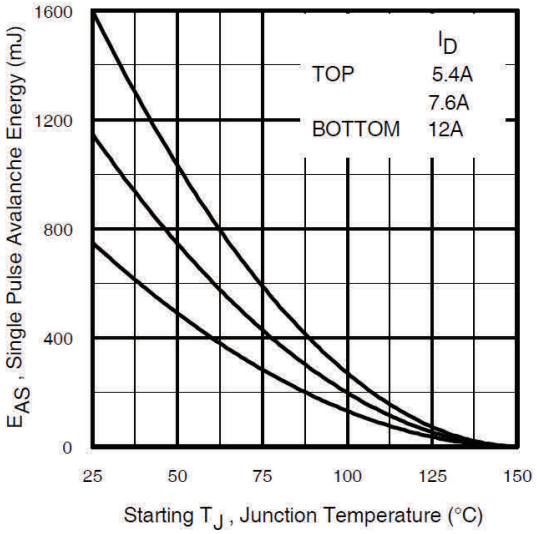


Fig 10. Maximum Avalanche Energy Vs. Drain Current

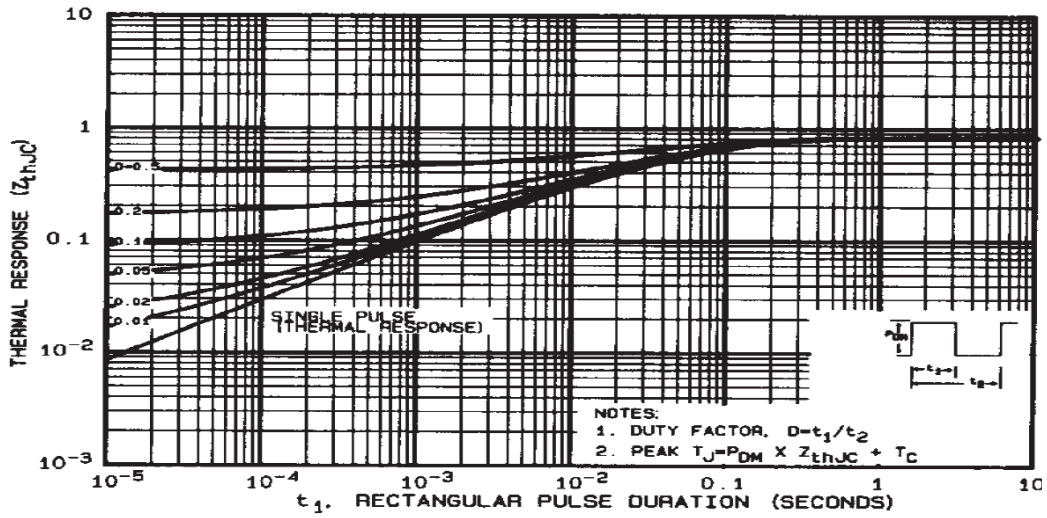


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

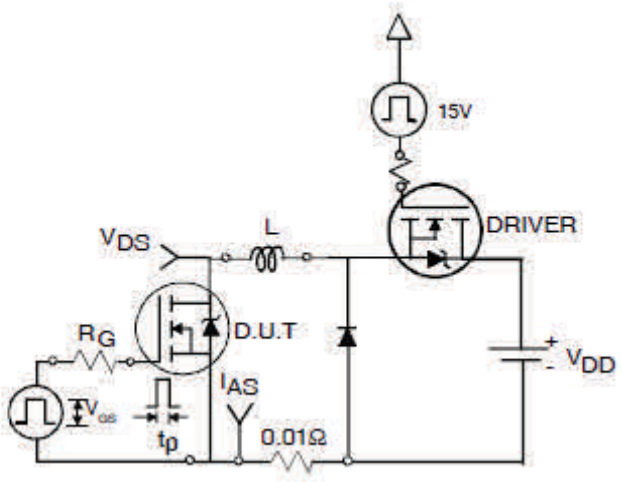


Fig 12a. Unclamped Inductive Test Circuit

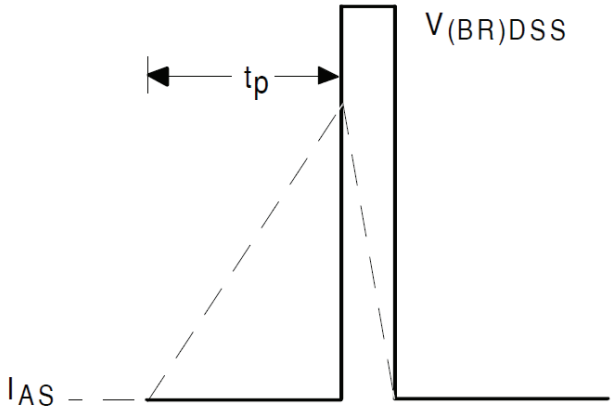


Fig 12b. Unclamped Inductive Waveforms

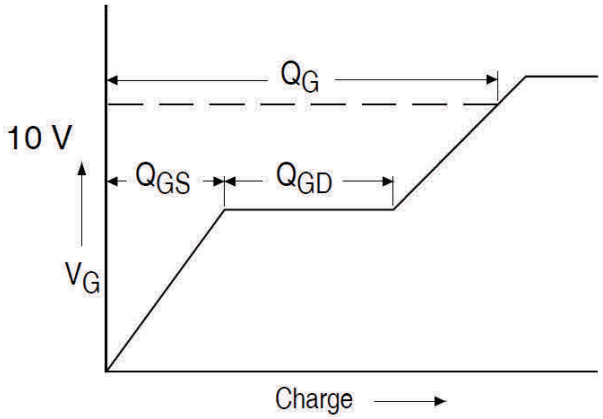


Fig 13a. Gate Charge Waveform

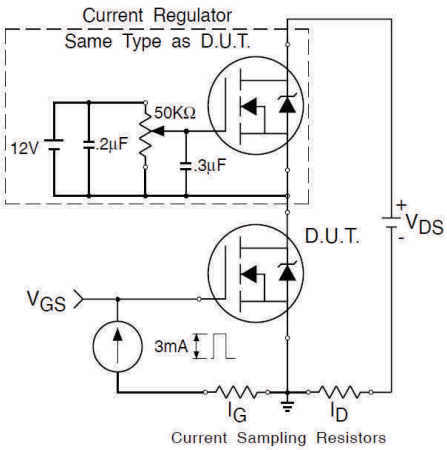


Fig 13b. Gate Charge Test Circuit

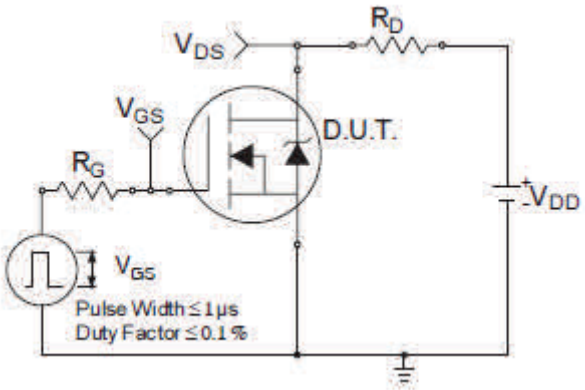


Fig 14a. Switching Time Test Circuit

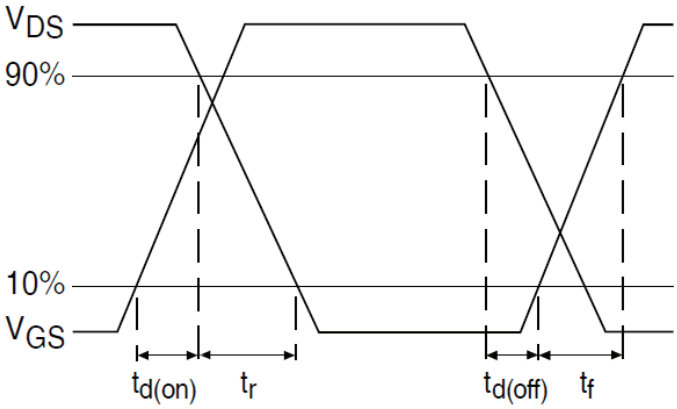
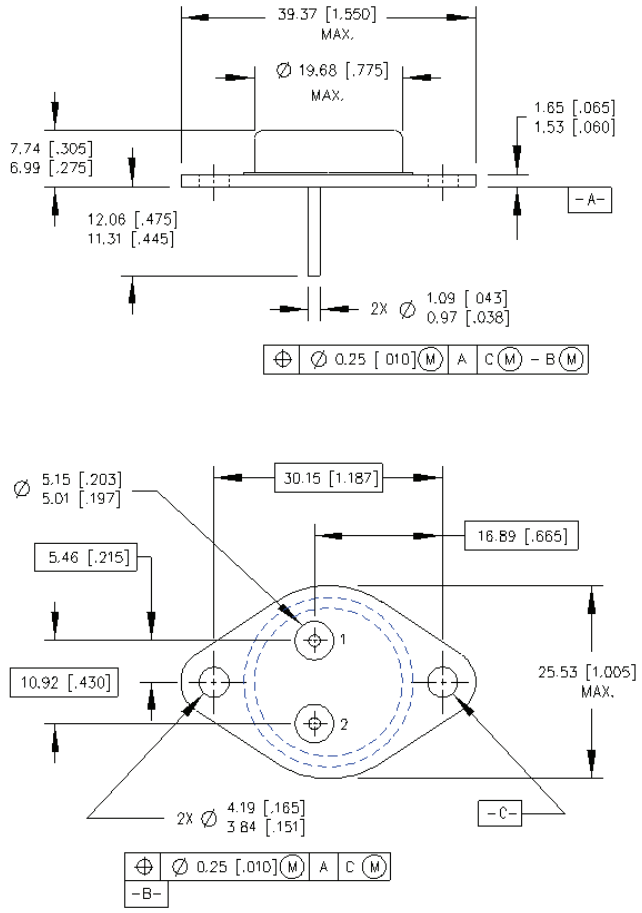


Fig 14b. Switching Time Waveforms

Case Outline and Dimensions - TO-204AA (Modified TO-3)



PIN ASSIGNMENTS

HEXFET	SCHOTTKY	IGBT
1 - SOURCE	1 - ANODE 1	1 - GATE
2 - GATE	2 - ANODE 2	2 - EMITTER
3 - DRAIN (CASE)	3 - COMMON CATHOD (CASE)	3 - COLLECTOR (CASE)

NOTES:
1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M - 1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILIMETERS [INCHES]
4. OUTLINE CONFORMS TO JEDEC OUTLINE TO -204-AA.

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Infineon Technologies Service Center: USA Tel: +1 (866) 951-9519 and International Tel: +49 89 234 65555
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