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

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	200	——	——	V	$V_{GS} = 0V$, $I_D = 1.0mA$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.29	——	V/°C	Reference to 25°C, $I_D = 1.0mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	0.18	Ω	$V_{GS} = 10V$, $I_{D2} = 11A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	——	4.0	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
Gfs	Forward Transconductance	6.1	——	——	S	$V_{DS} = 15V$, $I_{D2} = 11A$ ④
I_{DSS}	Zero Gate Voltage Drain Current	——	——	25	μA	$V_{DS} = 160V$, $V_{GS} = 0V$
		——	——	250		$V_{DS} = 160V$, $V_{GS} = 0V$, $T_J = 125°C$
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	32	——	60	nC	$I_{D1} = 18A$
Q_{GS}	Gate-to-Source Charge	2.2	——	10.6		$V_{DS} = 100V$
Q_{GD}	Gate-to-Drain ('Miller') Charge	14	——	38		$V_{GS} = 10V$
$t_{d(on)}$	Turn-On Delay Time	——	——	20	ns	$V_{DD} = 100V$
tr	Rise Time	——	——	152		$I_{D1} = 18A$
$t_{d(off)}$	Turn-Off Delay Time	——	——	58		$R_G = 9.1\Omega$
t_f	Fall Time	——	——	67		$V_{GS} = 10V$
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	——	1300	——	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	——	400	——		$V_{DS} = 25V$
C_{rss}	Reverse Transfer Capacitance	——	130	——		$f = 1.0MHz$

Source-Drain Diode Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	——	——	18	A	
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	72		
V_{SD}	Diode Forward Voltage	——	——	1.5	V	$T_J = 25°C$, $I_S = 18A$, $V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	——	——	500	ns	$T_J = 25°C$, $I_F = 18A$, $V_{DD} \leq 50V$
Q_{rr}	Reverse Recovery Charge	——	——	5.3	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	——	——	1.0	°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= 2.7mH, Peak $I_L = 18A$, $V_{GS} = 10V$.

③ $I_{SD} \leq 18A$, di/dt $\leq 160A/\mu s$, $V_{DD} \leq 200V$, $T_J \leq 150°C$.

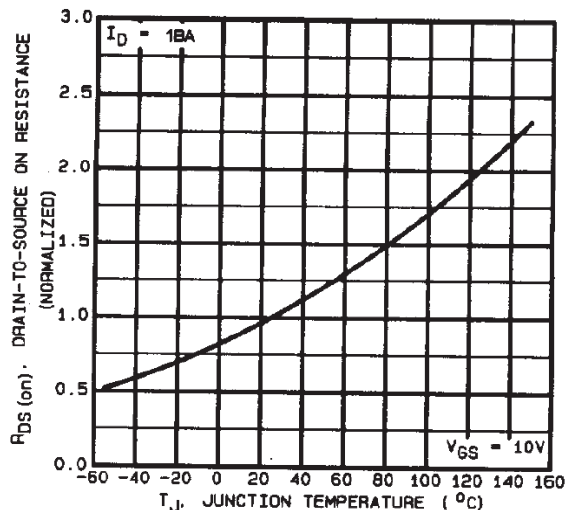④ Pulse width ≤ 300 μs; Duty Cycle $\leq 2\%$
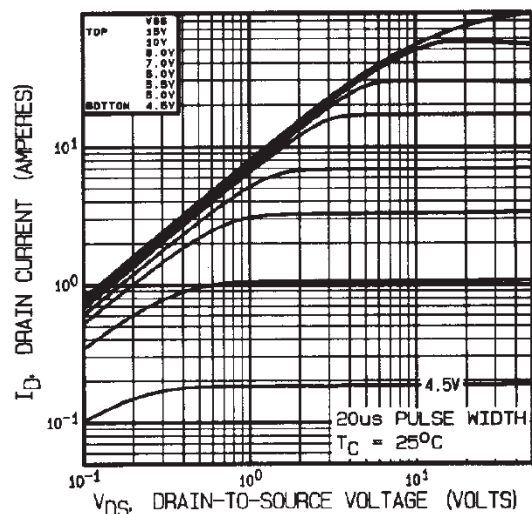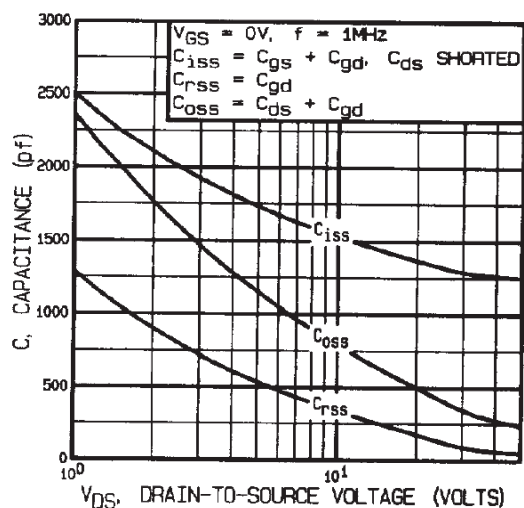
Fig 1. Typical Output Characteristics
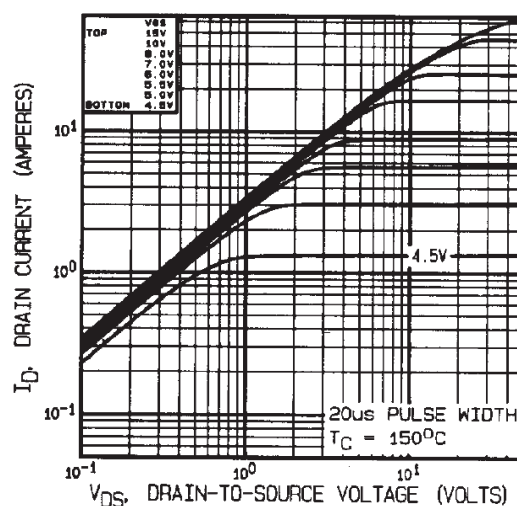
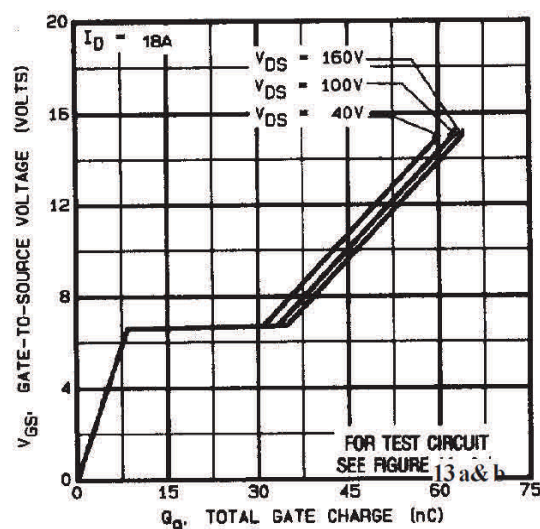**Fig 2.** Typical Output Characteristics
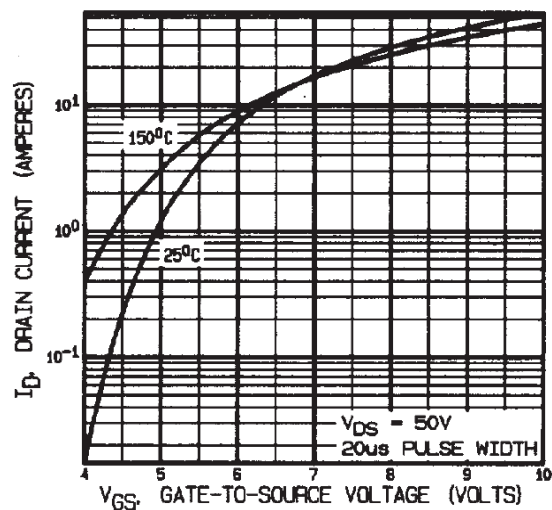
Fig 3. Typical Transfer Characteristics
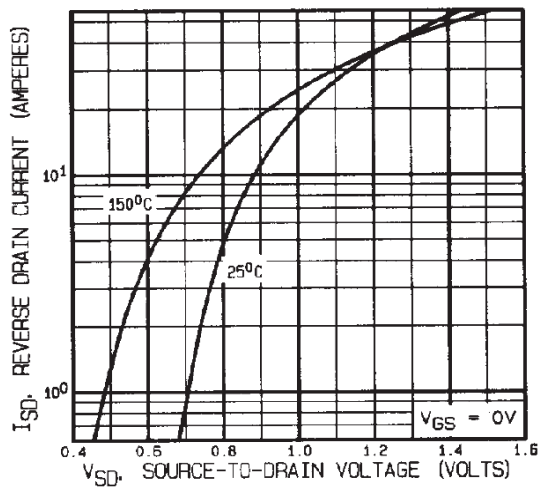

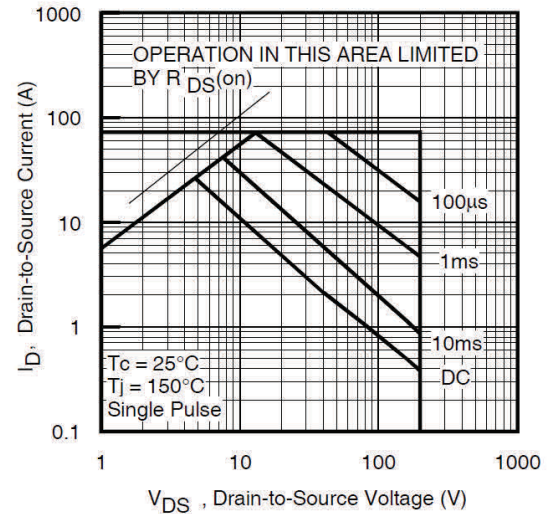**Fig 4.** Normalized On-Resistance Vs. Temperature

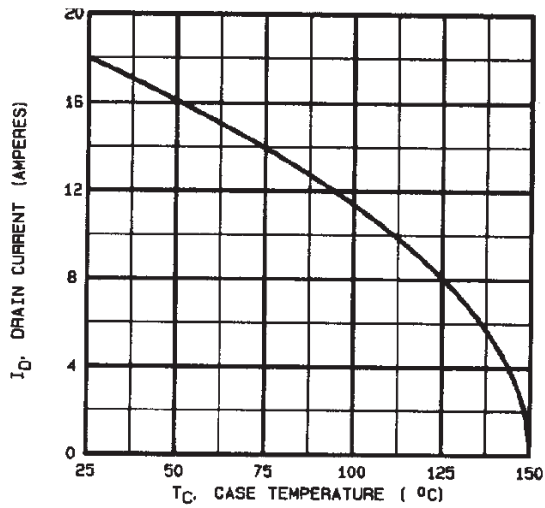**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage

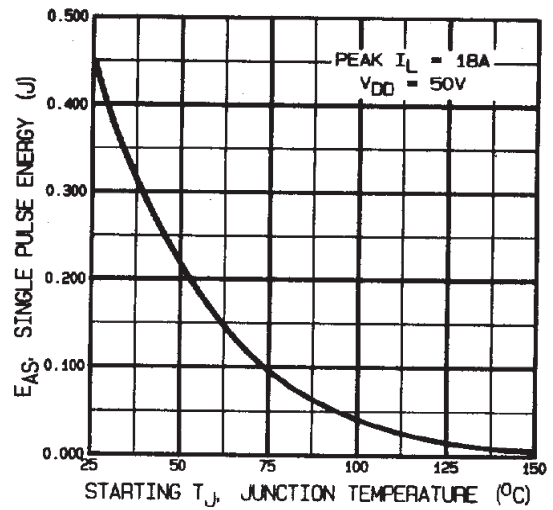**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage

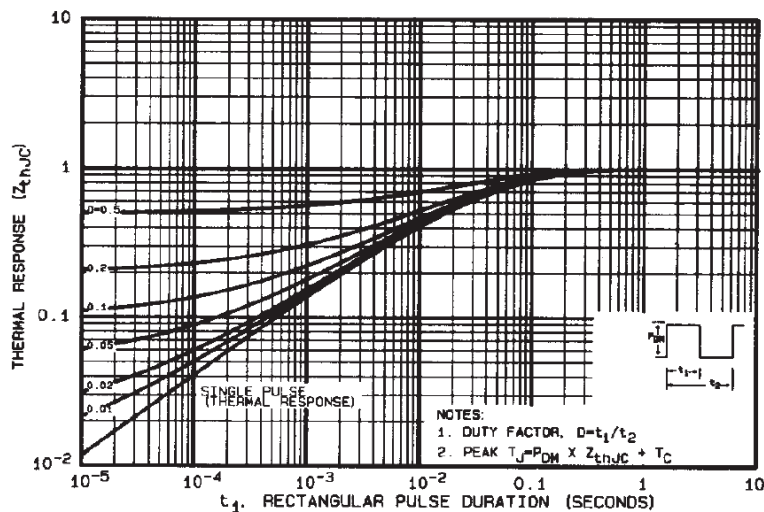**Fig 7.** Typical Source-Drain Diode Forward Voltage

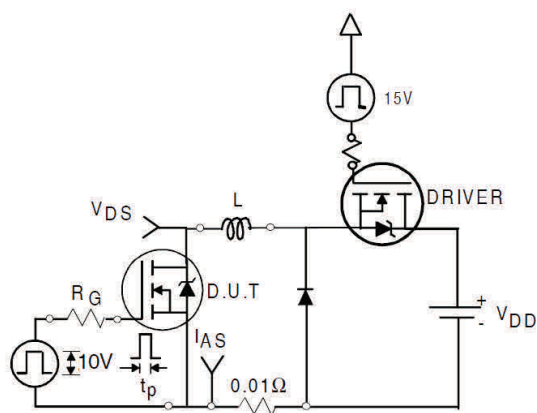**Fig 8.** Maximum Safe Operating Area

Fig 9. Maximum Drain Current Vs. Case Temperature
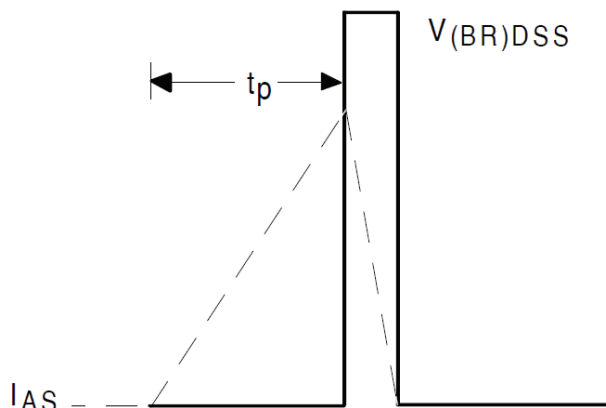

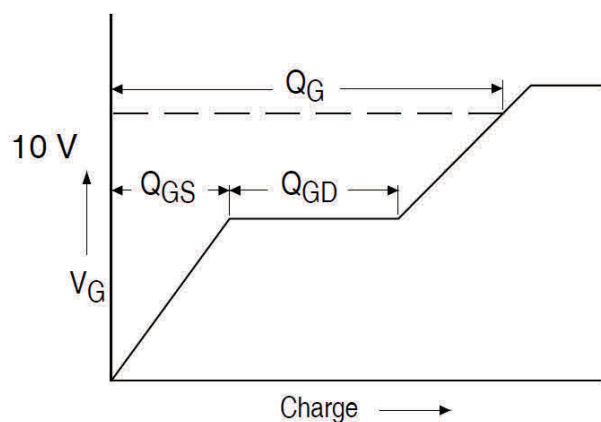**Fig 10.** Maximum Avalanche Energy Vs. Drain Current

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case
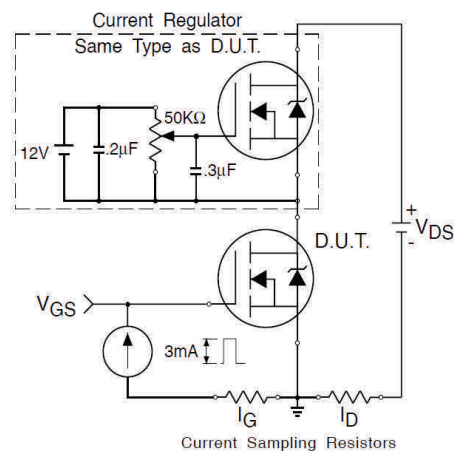
Fig 12a. Unclamped Inductive Test Circuit

Fig 12b. Unclamped Inductive Waveforms

Fig 13a. Gate Charge Waveform

Fig 13b. Gate Charge Test Circuit
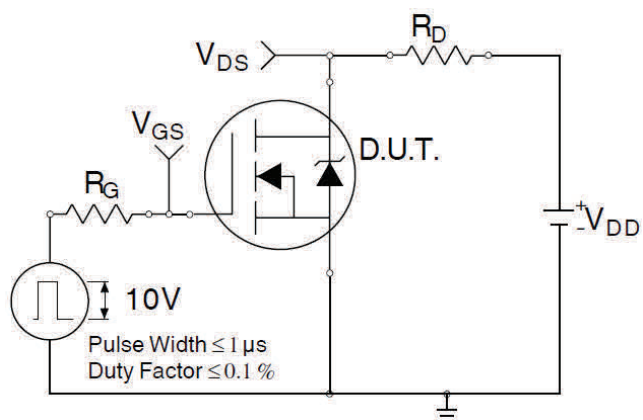
Fig 14a. Switching Time Test Circuit
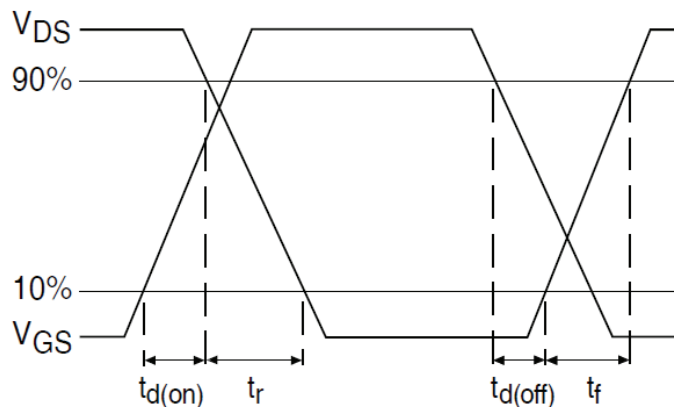
Fig 14b. Switching Time Waveforms

Case Outline and Dimensions - TO-204AE (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 MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE TO -204-AE.

IMPORTANT NOTICE

The information given in this document shall be in no event regarded as guarantee of conditions or characteristic. The data contained herein is a characterization of the component based on internal standards and is intended to demonstrate and provide guidance for typical part performance. It will require further evaluation, qualification and analysis to determine suitability in the application environment to confirm compliance to your system requirements.

With respect to any example hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind including without limitation warranties on non- infringement of intellectual property rights and any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's product and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of any customer's technical departments to evaluate the suitability of the product for the intended applications and the completeness of the product information given in this document with respect to applications.

For further information on the product, technology, delivery terms and conditions and prices, please contact your local sales representative or go to (www.infineon.com/hirel).

WARNING

Due to technical requirements products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.