

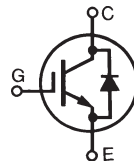
# High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

## IXBF28N300

$$V_{CES} = 3000V$$

$$I_{C90} = 28A$$

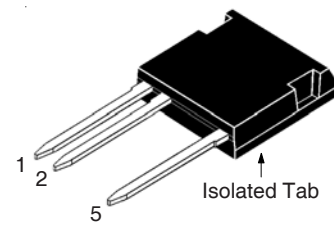
$$V_{CE(sat)} \leq 2.7V$$



(Electrically Isolated Tab)

Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ C$ to $150^\circ C$	3000	V
$V_{CGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$	3000	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ C$	50	A
$I_{C90}$	$T_C = 90^\circ C$	28	A
$I_{CM}$	$T_C = 25^\circ C$ , 1ms	220	A
<b>SSOA</b> <b>(RBSOA)</b>	$V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 15\Omega$ Clamped Inductive Load	$I_{CM} = 220$ $V_{CE} \leq 1500$	A V
<b><math>T_{SC}</math></b> <b>(SCSOA)</b>	$V_{GE} = 15V$ , $T_J = 125^\circ C$ , $R_G = 52\Omega$ , $V_{CE} = 1500V$ , Non-Repetitive	10	$\mu s$
$P_C$	$T_C = 25^\circ C$	216	W
$T_J$		-55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		-55 ... +150	$^\circ C$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ C$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ C$
$F_C$	Mounting Force	20..120 / 4.5..27	N/lb.
$V_{ISOL}$	50/60Hz, 5 Seconds	4000	V~
<b>Weight</b>		5	g

### ISOPLUS i4-Pak™



1 = Gate  
2 = Emitter  
5 = Collector

### Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V~ Electrical Isolation
- High Blocking Voltage
- High Peak Current Capability
- Low Saturation Voltage

### Advantages

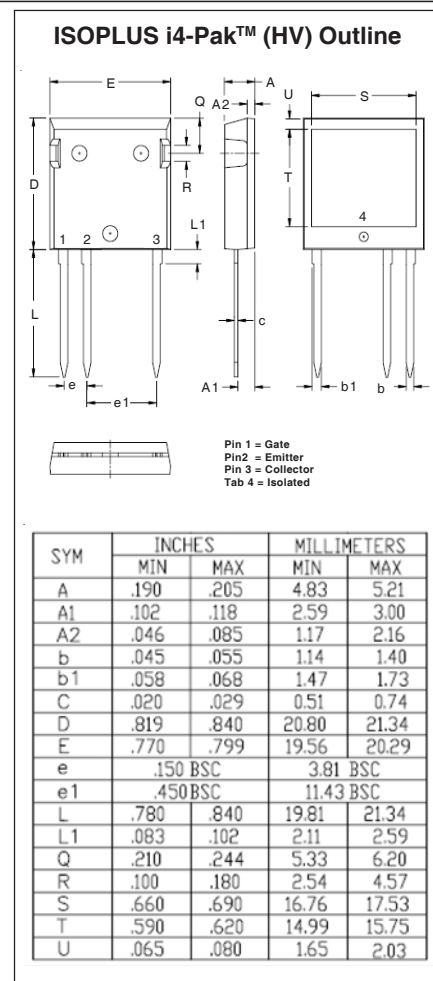
- Low Gate Drive Requirement
- High Power Density

### Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

Symbol	Test Conditions ( $T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{CES}$	$I_C = 250\mu A$ , $V_{GE} = 0V$	3000		V
$V_{GE(th)}$	$I_C = 250\mu A$ , $V_{CE} = V_{GE}$	3.0		V
$I_{CES}$	$V_{CE} = V_{CES}$ , $V_{GE} = 0V$ Note 2, $T_J = 125^\circ C$			35 $\mu A$ 1.5 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 200$ nA
$V_{CE(sat)}$	$I_C = 28A$ , $V_{GE} = 15V$ , Note 1 $T_J = 125^\circ C$		2.3 2.8	V V

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$I_C = 28\text{A}, V_{CE} = 10\text{V}$ , Note 1	14	24	S
$C_{ies}$	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		2370	pF
$C_{oes}$			87	pF
$C_{res}$			30	pF
$Q_g$	$I_C = 28\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1500\text{V}$		110	nC
$Q_{ge}$			14	nC
$Q_{gc}$			50	nC
$t_{d(on)}$	<b>Resistive Switching Times, <math>T_J = 25^\circ\text{C}</math></b> $I_C = 28\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 960\text{V}, R_G = 10\Omega$		50	ns
$t_r$			412	ns
$t_{d(off)}$			125	ns
$t_f$			3660	ns
$t_{d(on)}$		<b>Resistive Switching Times, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 28\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 960\text{V}, R_G = 10\Omega$		74
$t_r$			805	ns
$t_{d(off)}$			245	ns
$t_f$			3280	ns
$R_{thJC}$				0.58
$R_{thCS}$		0.15		$^\circ\text{C}/\text{W}$



## Reverse Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_F$	$I_F = 28\text{A}, V_{GE} = 0\text{V}$ , Note 1			2.7 V
$t_{rr}$	$I_F = 14\text{A}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GE} = 0\text{V}$		1.5	$\mu\text{s}$
$I_{RM}$			31.0	A
$Q_{RM}$			22.5	$\mu\text{C}$

## Notes:

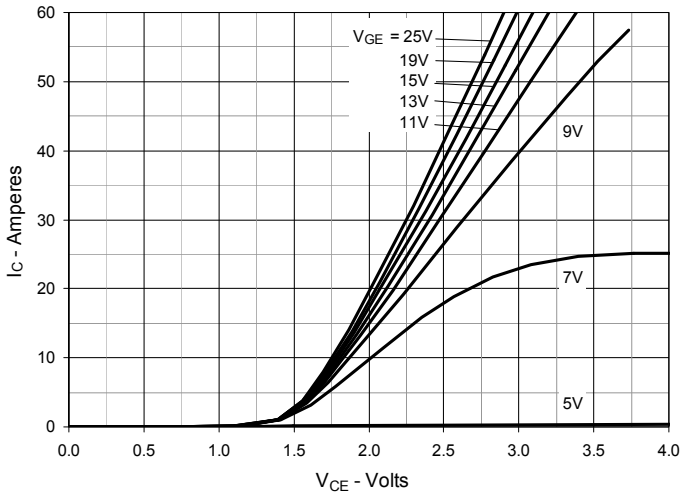
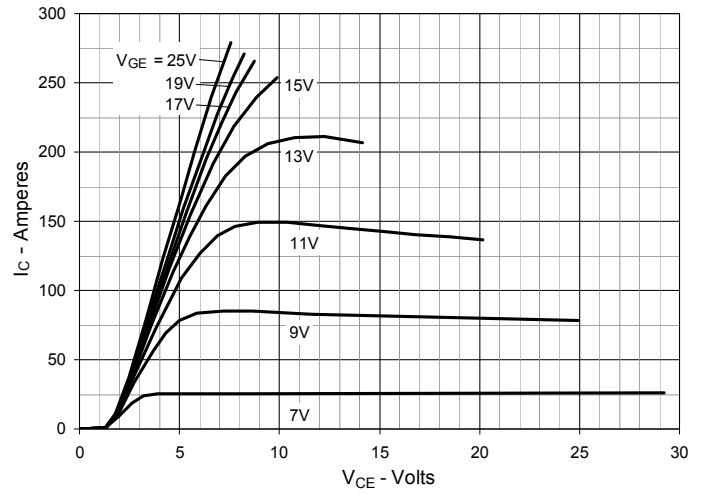
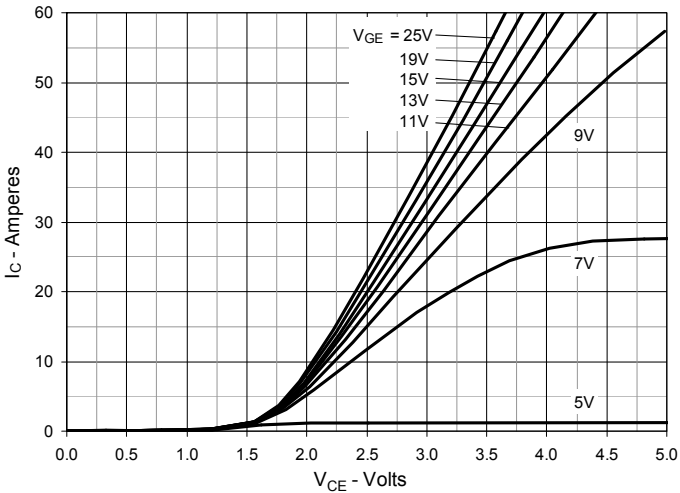
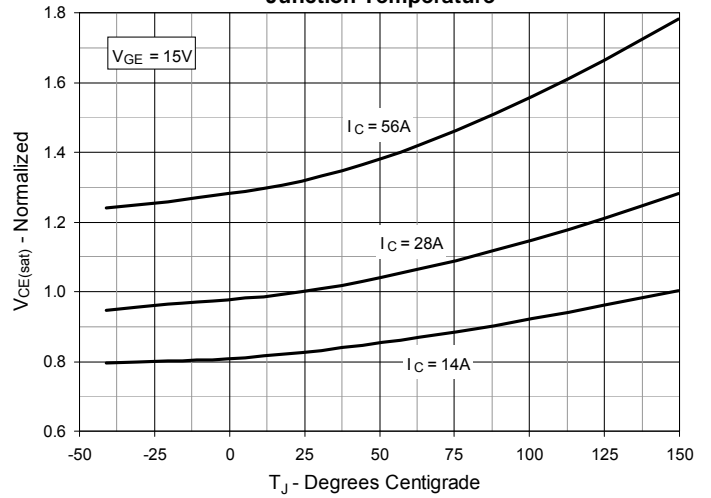
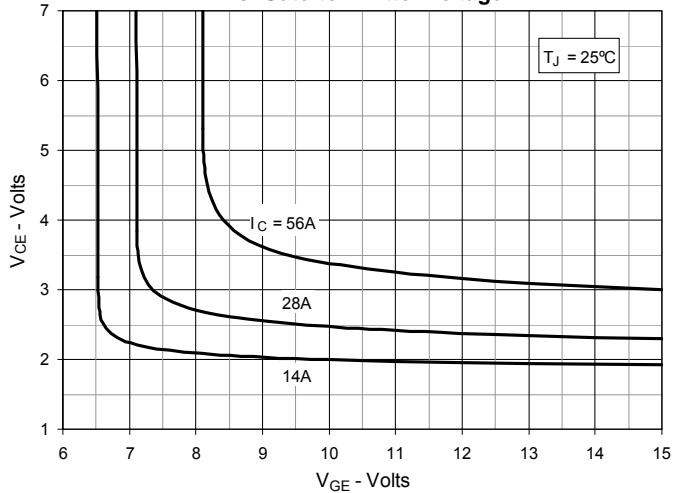
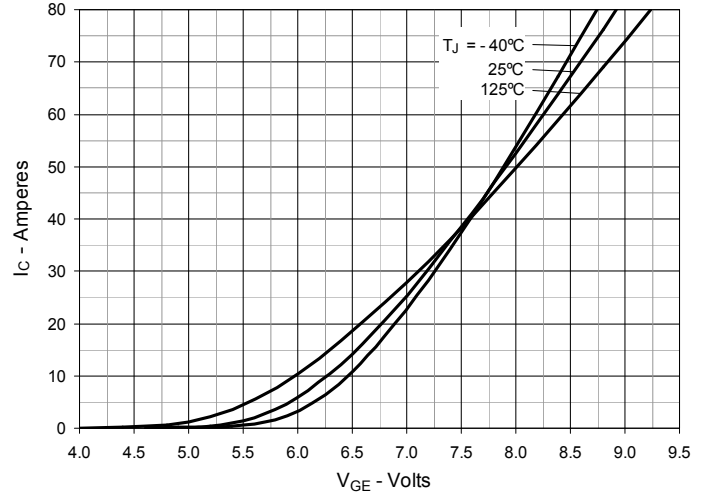
1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

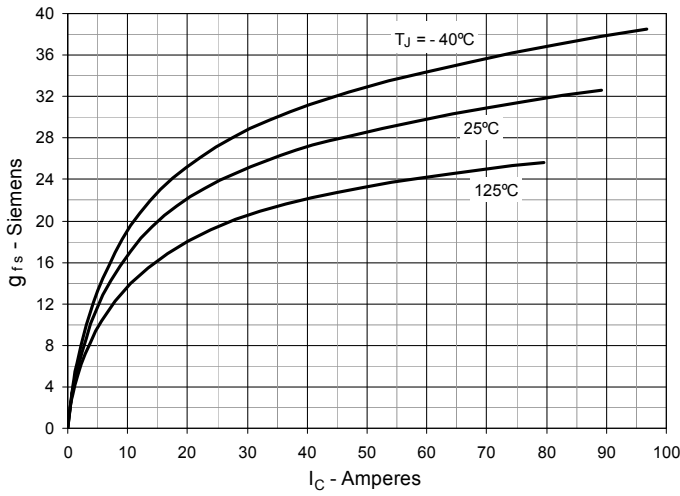
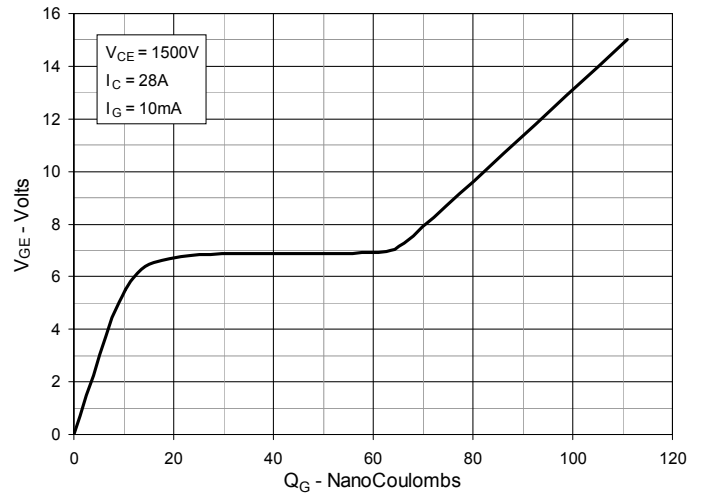
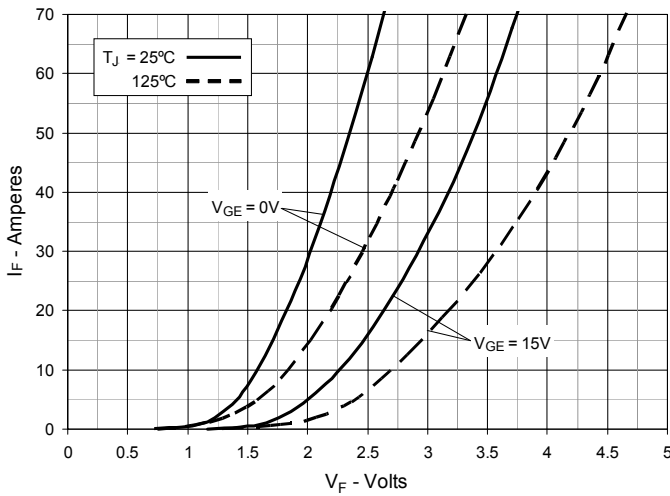
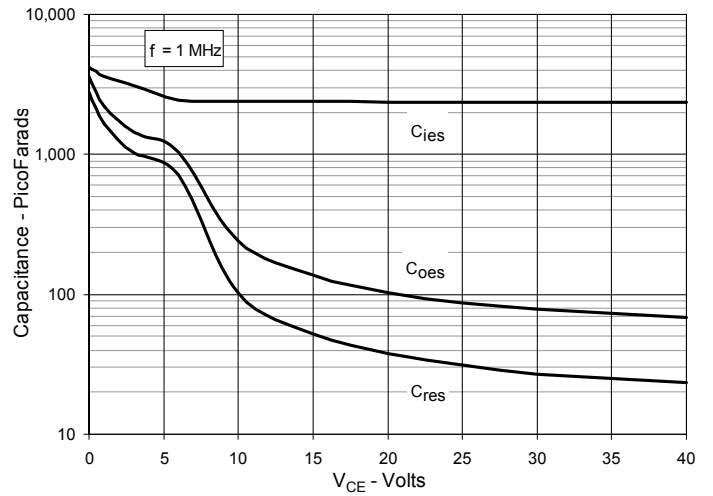
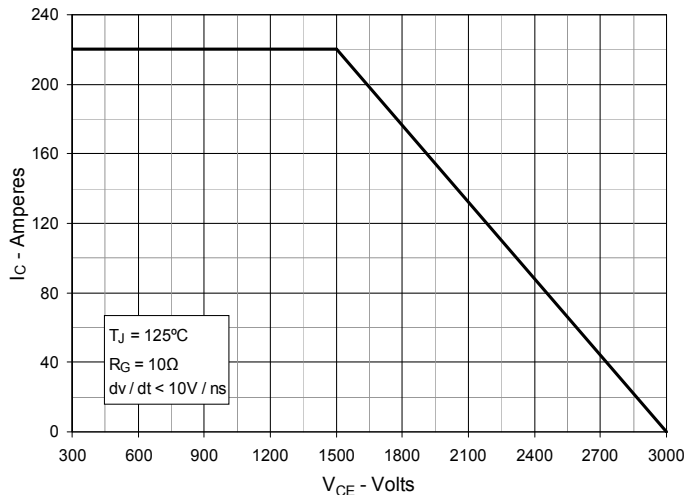
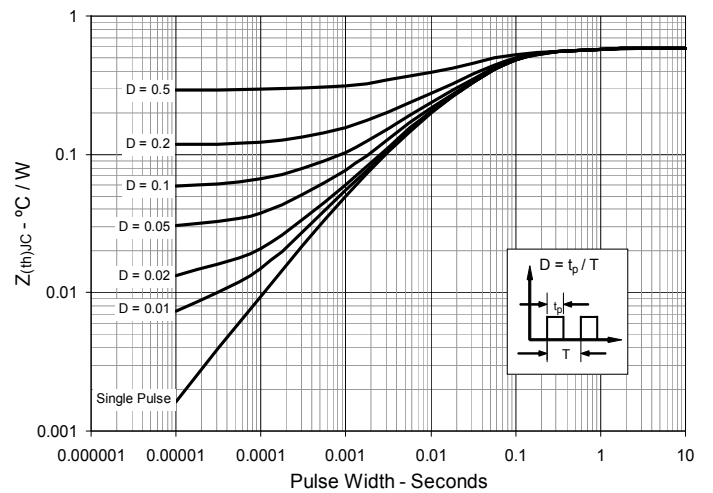
## ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

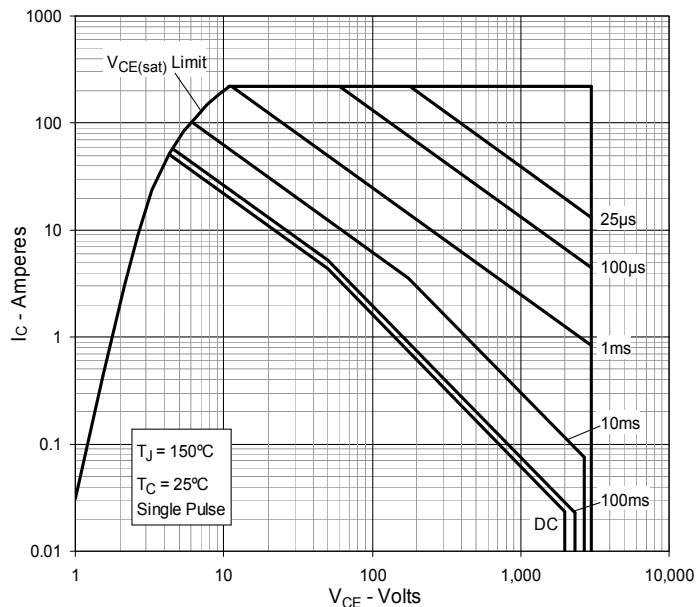
IXYS Reserves the Right to Change Limits, Test Conditions and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

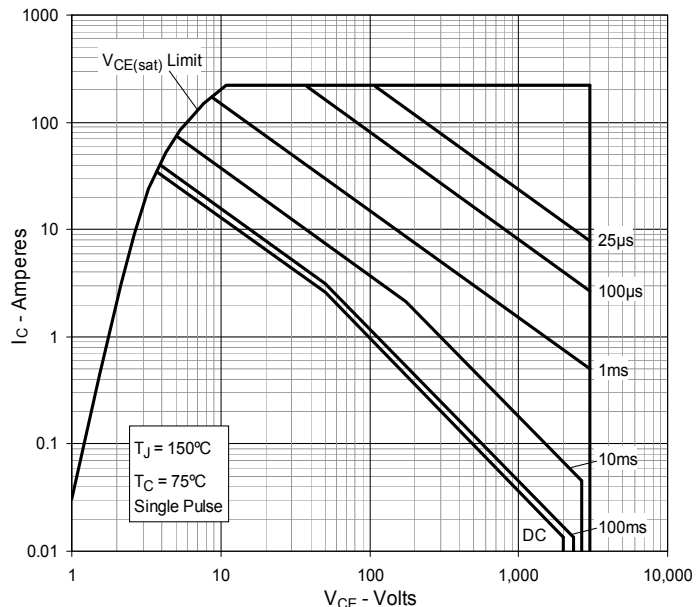
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$** 

**Fig. 4. Dependence of  $V_{CE(sat)}$  on Junction Temperature**

**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

**Fig. 6. Input Admittance**


**Fig. 7. Transconductance**

**Fig. 8. Gate Charge**

**Fig. 9. Forward Voltage Drop of Intrinsic Diode**

**Fig. 10. Capacitance**

**Fig. 11. Reverse-Bias Safe Operating Area**

**Fig. 12. Maximum Transient Thermal Impedance**


**Fig. 13. Forward-Bias Safe Operating Area @  $T_C = 25^\circ\text{C}$**



**Fig. 14. Forward-Bias Safe Operating Area @  $T_C = 75^\circ\text{C}$**





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