THE DATASHEET OF

IXBH10N300HV

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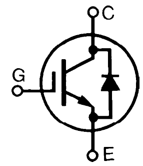
IXYS

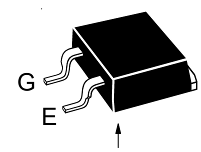
High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBA10N300HV
IXBH10N300HV

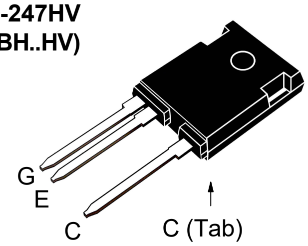
V_{CES} = 3000V
I_{C110} = 10A
$V_{CE(sat)} \leq$ 2.8V



TO-263HV (IXBA..HV)



TO-247HV (IXBH..HV)



G = Gate C = Collector
E = Emitter Tab = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	3000	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	3000	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	34	A
I_{C110}	T_C = 110°C	10	A
I_{CM}	T_C = 25°C, 1ms	88	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 10Ω Clamped Inductive Load	I_{CM} = 80 1500	A V
T_{SC} (SCSOA)	V_{GE} = 15V, T_J = 125°C, R_G = 82Ω, V_{CE} = 1500V, Non-Repetitive	10	µs
P_C	T_C = 25°C	180	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10s	260	°C
F_C	Mounting Force (TO-263HV)	10..65 / 2.2..14.6	N/lb
M_d	Mounting Torque (TO-247HV)	1.13/10	Nm/lb.in
Weight	TO-263HV TO-247HV	2.5 6.0	g g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V		3000			V
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}		3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V				25	µA
		T_J = 125°C			500	µA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V				±100	nA
$V_{CE(sat)}$	I_C = 10A, V_{GE} = 15V, Note 1			2.2	2.8	V
		T_J = 125°C		2.7		V

Features

- High Blocking Voltage
- Anti-Parallel Diode
- Low Conduction Losses

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

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Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fS}	I_C = 10A, V_{CE} = 10V, Note 1	6	11		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		1044		pF
C_{oes}			42		pF
C_{res}			14		pF
Q_g	I_C = 10A, V_{GE} = 15V, V_{CE} = 1000V		46		nC
Q_{ge}			5		nC
Q_{gc}			20		nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		36		ns
t_r	I_C = 10A, V_{GE} = 15V		340		ns
$t_{d(off)}$	V_{CE} = 960V, R_G = 10Ω		100		ns
t_f			1850		ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		40		ns
t_r	I_C = 10A, V_{GE} = 15V		765		ns
$t_{d(off)}$	V_{CE} = 960V, R_G = 10Ω		120		ns
t_f			2010		ns
R_{thJC}				0.69	°C/W
R_{thCS}	TO-247HV		0.21		°C/W

Reverse Diode

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 10A, V_{GE} = 0V			2.7	V
t_{rr}	I_F = 5A, V_{GE} = 0V, $-di_F/dt$ = 100A/μs		1.6		μs
I_{RM}	V_R = 100V, V_{GE} = 0V		23		A
Q_{RM}			18.6		μC

Note 1: Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

Littelfuse 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 = 25ºC

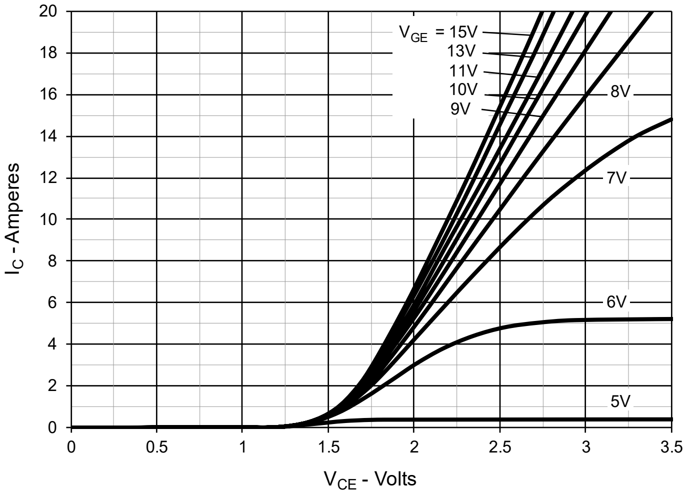

Fig. 2. Extended Output Characteristics @ T_J = 25ºC

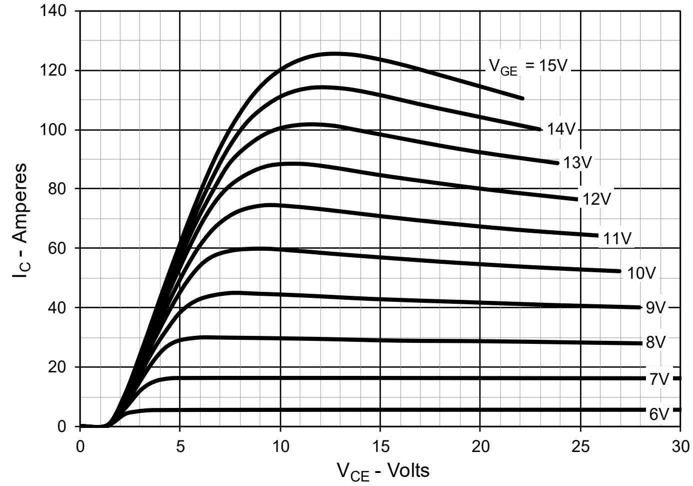

Fig. 3. Output Characteristics @ T_J = 125ºC

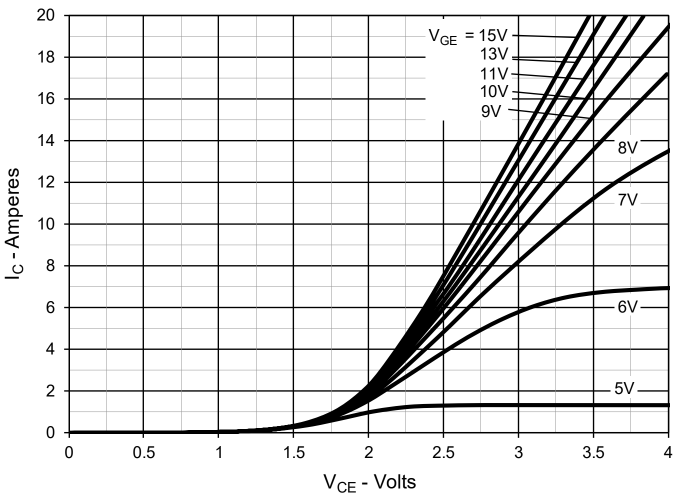

Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

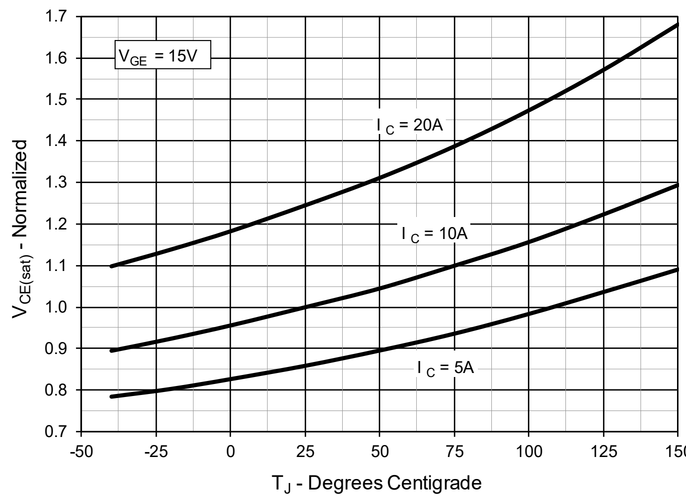

Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

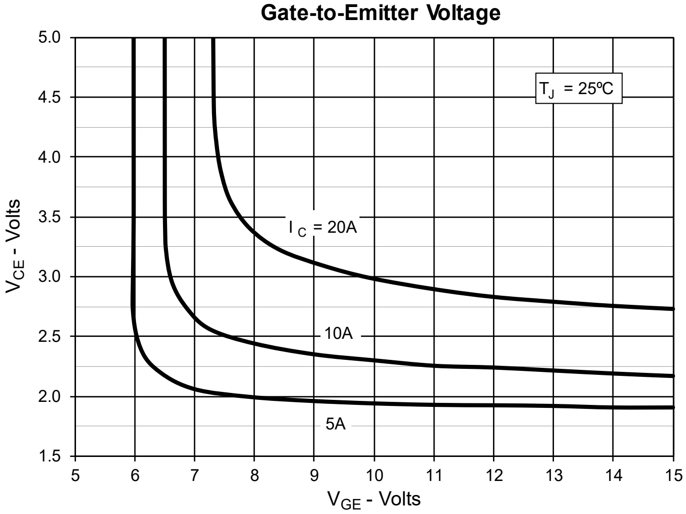

Fig. 6. Input Admittance

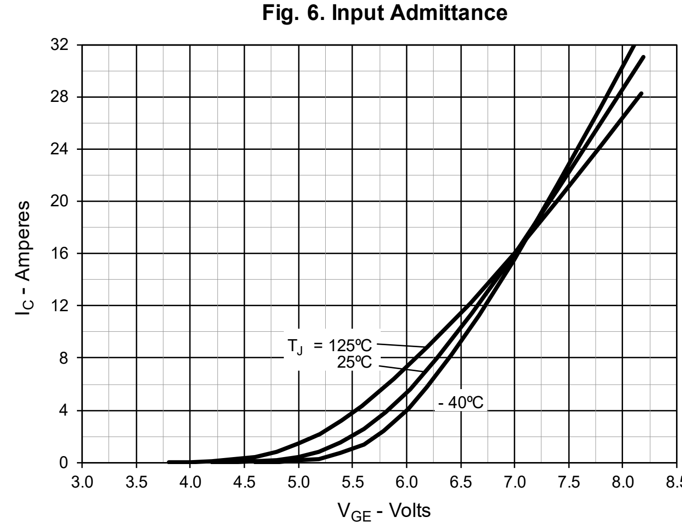

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Fig. 7. Transconductance

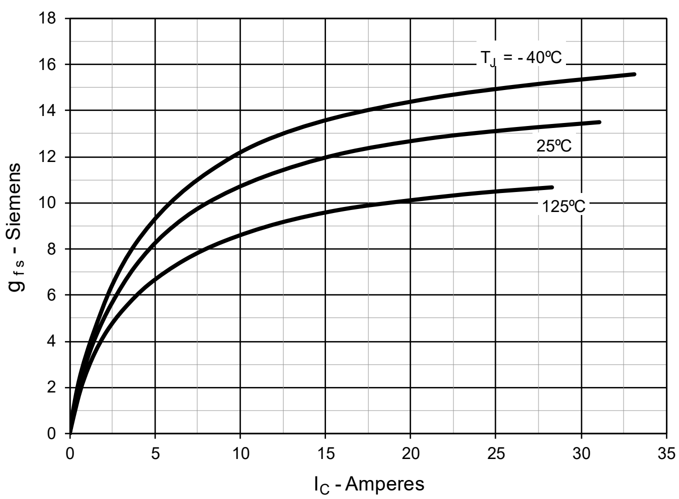

Fig. 8. Forward Voltage Drop of Intrinsic Diode

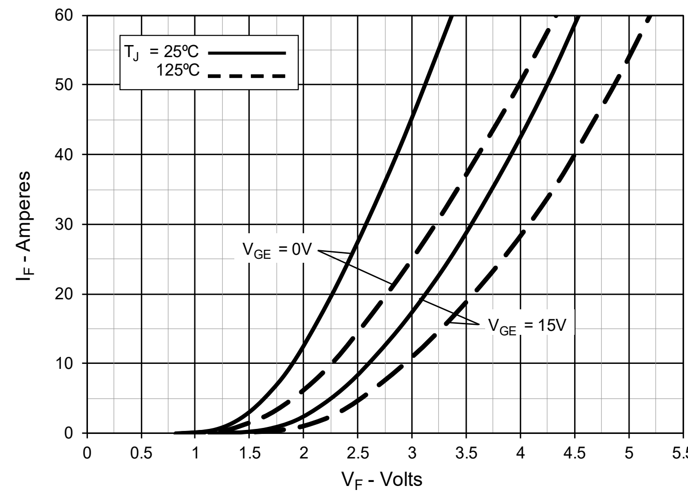

Fig. 9. Gate Charge

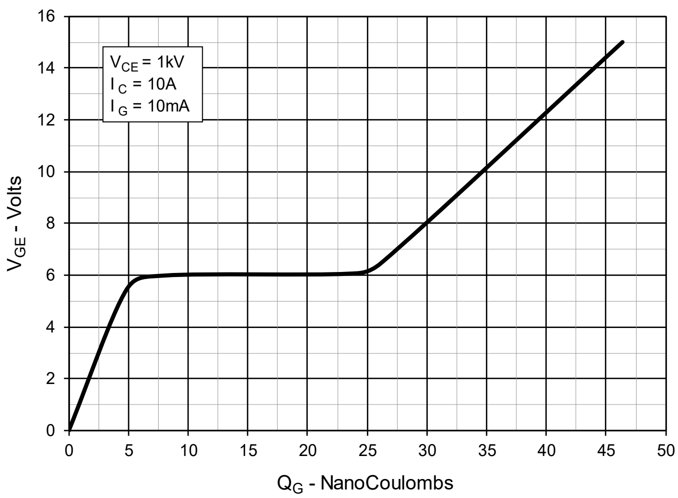

Fig. 10. Capacitance

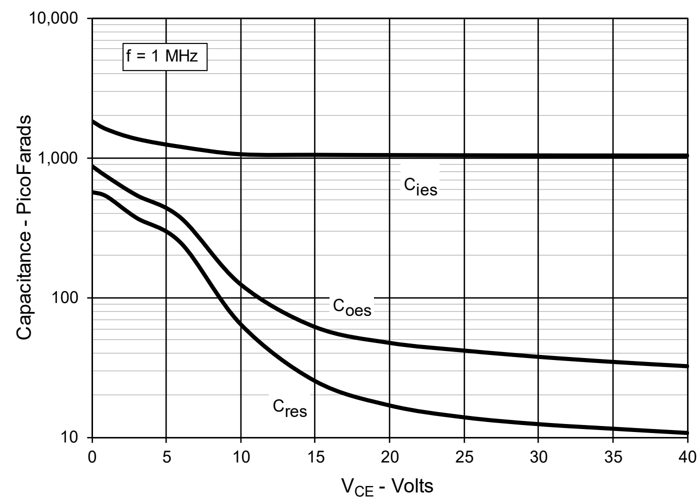

Fig. 11. Reverse-Bias Safe Operating Area

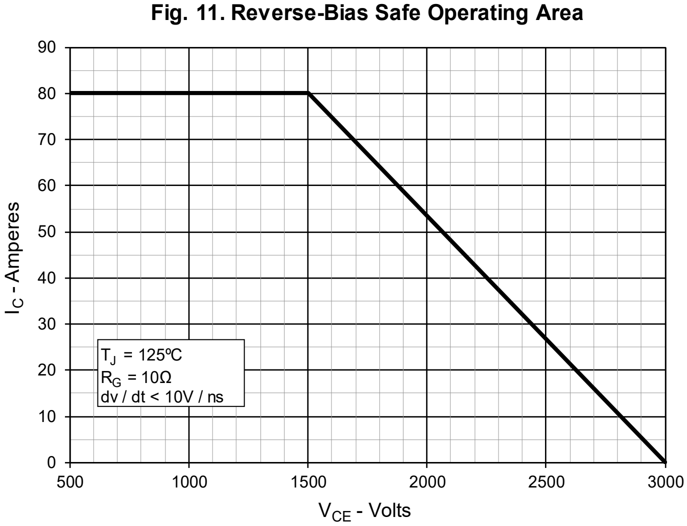

Fig. 12. Maximum Transient Thermal Impedance

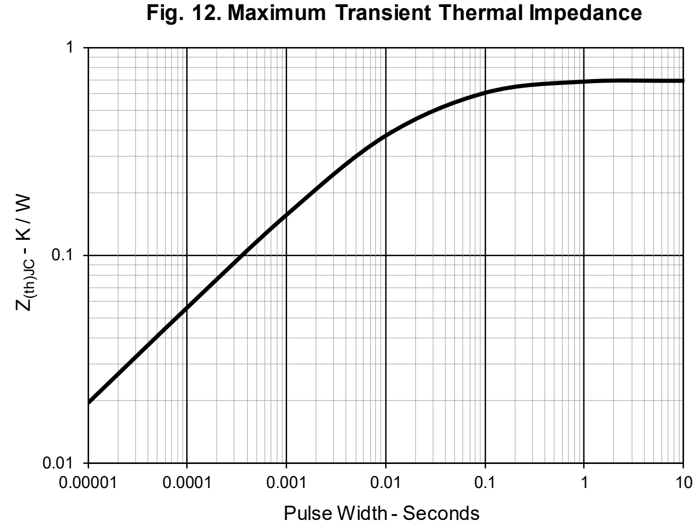

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Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

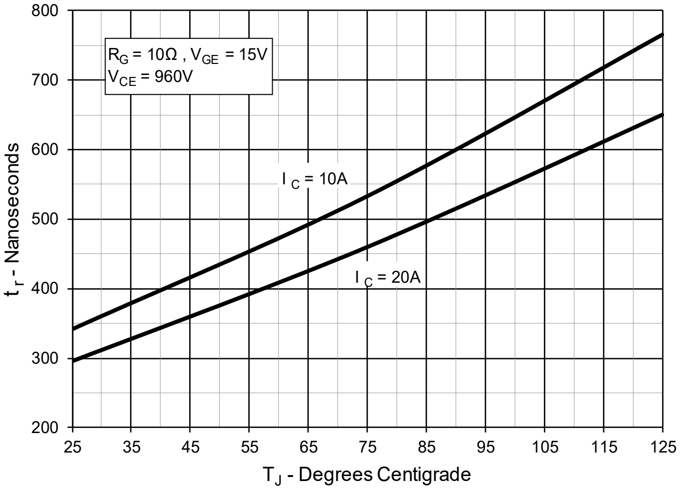

Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

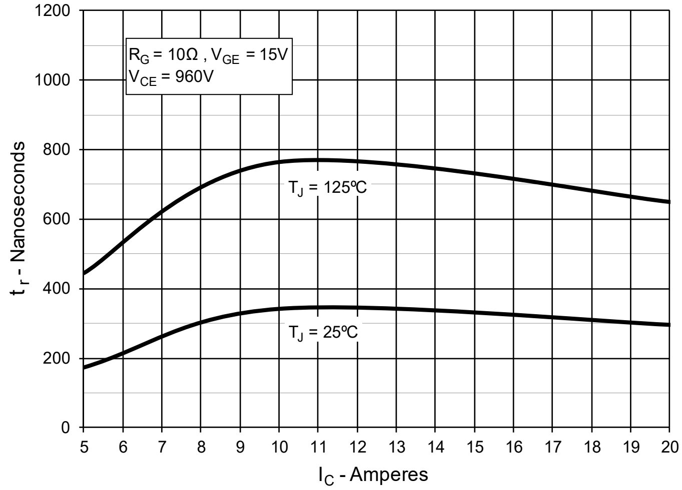

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

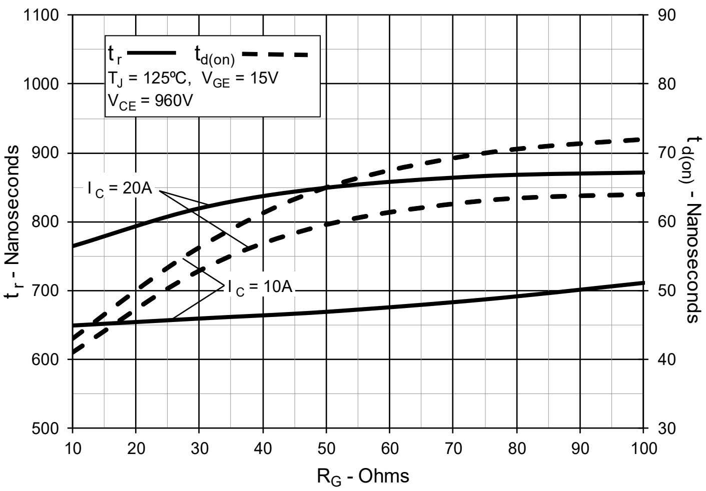

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

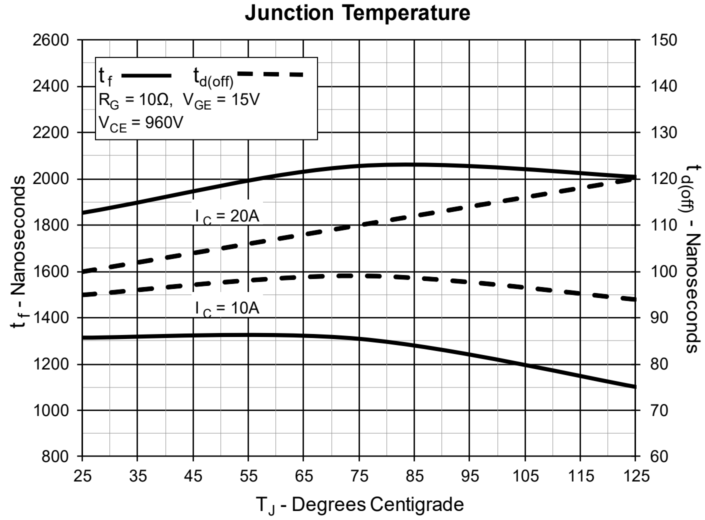

Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

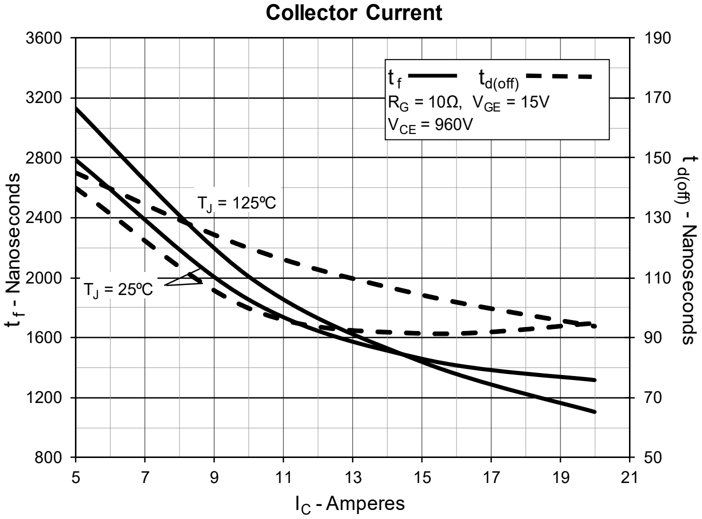

Fig. 28. Resistive Turn-off Switching Times vs. Gate Resistance

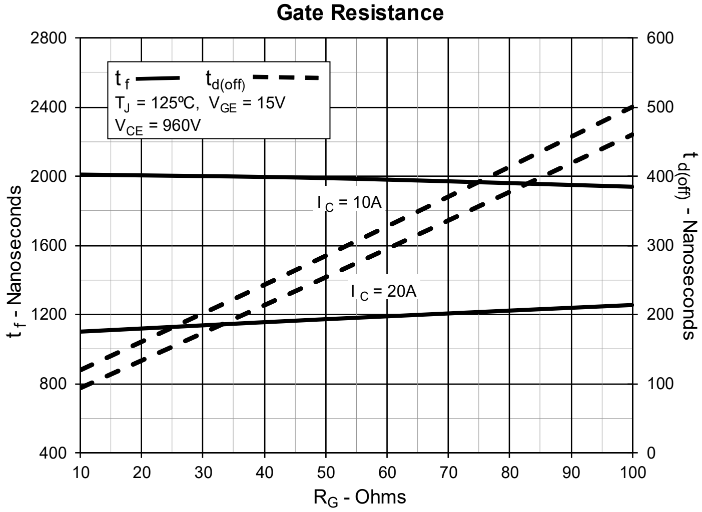

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Fig. 19. Forward-Bias Safe Operating Area @ T_C = 25ºC

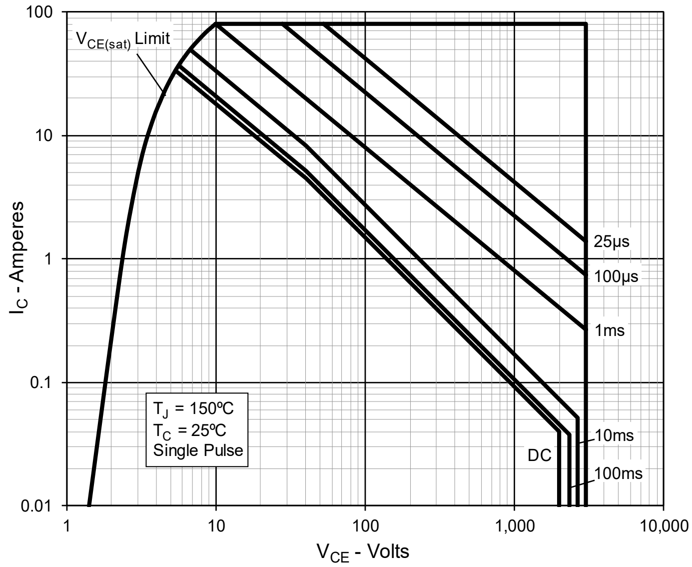
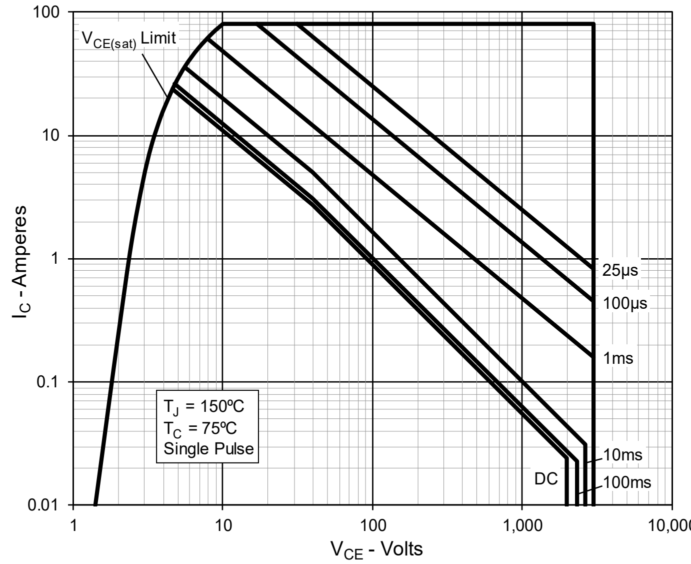


Fig. 20. Forward-Bias Safe Operating Area @ T_C = 75ºC



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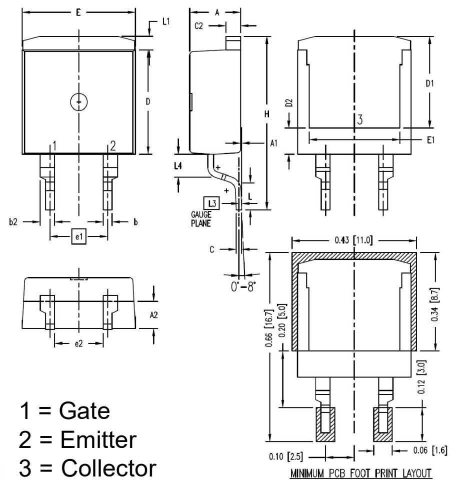
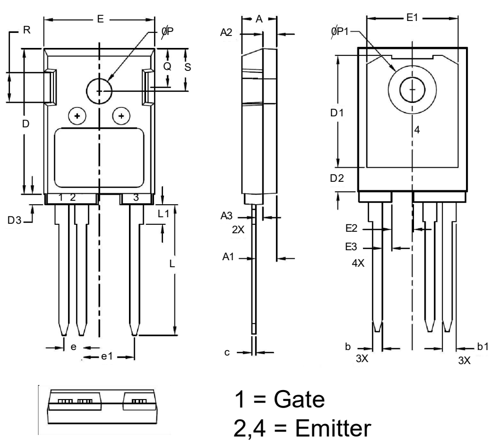
TO-263HV Outline



1 = Gate
2 = Emitter
3 = Collector

SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.054	1.18	1.38
C	.018	.024	0.45	0.60
C2	.049	.055	1.25	1.40
D	.354	.370	9.00	9.40
D1	.311	.327	7.90	8.30
D2	.083	.098	2.10	2.50
E	.386	.402	9.80	10.20
E1	.307	.323	7.80	8.20
e1	.200 BSC		5.08 BSC	
(e2)	.163	.174	4.13	4.43
H	.591	.614	15.00	15.60
L	.079	.102	2.00	2.60
L1	.039	.055	1.00	1.40
L3	.010 BSC		0.254 BSC	
(L4)	.071	.087	1.80	2.20

TO-247HV Outline



1 = Gate
2,4 = Emitter
3 = Collector

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.114	.122	2.90	3.10
A2	.075	.083	1.90	2.10
A3	.035	.043	0.90	1.10
b	.053	.059	1.35	1.50
b1	.075	.083	1.90	2.10
c	.022	.030	0.55	0.75
D	.819	.843	20.80	21.40
D1	.638	.646	16.20	16.40
D2	.134	.146	3.40	3.70
D3	.055	.063	1.40	1.60
E	.622	.638	15.80	16.20
E1	.520	.528	13.20	13.40
E2	.118	.126	3.00	3.20
E3	.051	.059	1.30	1.50
e	.100 BSC		2.54 BSC	
e1	.300 BSC		7.62 BSC	
L	.724	.748	18.40	19.00
L1	.106	.118	2.70	3.00
øP	.138	.142	3.50	3.60
øP1	.272	.280	6.90	7.10
Q	.216	.224	5.50	5.70
R	.165	.169	4.20	4.30
S	.240	.248	6.10	6.30

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