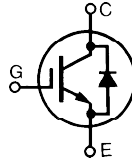


High Voltage, BiMOSFET™ Monolithic Bipolar MOS Transistor

IXBT42N300HV IXBH42N300HV

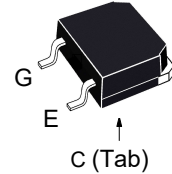


$$V_{CES} = 3000V$$

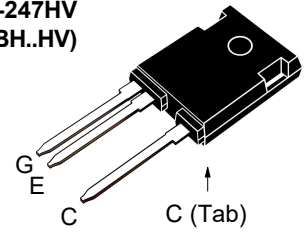
$$I_{C110} = 42A$$

$$V_{CE(sat)} \leq 3.0V$$

TO-268HV
(IXBT..HV)



TO-247HV
(IXBH..HV)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_C = 25^\circ C$ 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	± 25	V
V_{GEM}	Transient	± 35	V
I_{C25}	$T_C = 25^\circ C$	104	A
I_{C110}	$T_C = 110^\circ C$	42	A
I_{CM}	$T_C = 25^\circ C$, 1ms	400	A
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 20\Omega$ Clamped Inductive Load	$I_{CM} = 84$ 1500	A V
T_{SC} (SCSOA)	$V_{GE} = 15V$, $T_J = 125^\circ C$, $R_G = 82\Omega$, $V_{CE} = 1500V$, Non-Repetitive	10	μs
P_C	$T_C = 25^\circ C$	500	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	$^\circ C$
M_d	Mounting Torque (TO-247HV)	1.13/10	Nm/lb.in
Weight	TO-268HV	4	g
	TO-247HV	6	g

Features

- High Voltage Package
- High Blocking Voltage
- High Peak Current Capability
- Low Saturation Voltage
- FBSOA
- SCSOA

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Laser Generators
- Capacitor Discharge Circuits
- AC Switches
- Protection Circuits

Symbol	Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 1mA$, $V_{GE} = 0V$	3000		V
$V_{GE(th)}$	$I_C = 1mA$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$		250	50 μA μA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 25V$			± 200 nA
$V_{CE(sat)}$	$I_C = 42A$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$		2.5 3.1	3.0 V V

Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = 42\text{A}, V_{CE} = 10\text{V}$, Note 1	28	45	S
C_{ies}	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		4780	pF
C_{oes}			170	pF
C_{res}			56	pF
R_{Gi}	Gate Input Resistance		3.0	Ω
Q_g	$I_C = 42\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1000\text{V}$		200	nC
Q_{ge}			28	nC
Q_{gc}			75	nC
$t_{d(on)}$	Resistive Switching Times, $T_J = 25^\circ\text{C}$ $I_C = 42\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1500\text{V}, R_G = 20\Omega$		72	ns
t_r			330	ns
$t_{d(off)}$			445	ns
t_f			610	ns
$t_{d(on)}$	Resistive Switching Times, $T_J = 125^\circ\text{C}$ $I_C = 42\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 1500\text{V}, R_G = 20\Omega$		72	ns
t_r			580	ns
$t_{d(off)}$			460	ns
t_f			490	ns
R_{thJC}				0.25 $^\circ\text{C/W}$
R_{thCS}	TO-247HV		0.21	$^\circ\text{C/W}$

Reverse Diode

Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)		Characteristic Values		
		Min.	Typ.	Max.
V_F	$I_F = 42\text{A}, V_{GE} = 0\text{V}$, Note 1			2.5 V
t_{rr}	$I_F = 21\text{A}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$		1.7	μs
I_{RM}		$V_R = 100\text{V}, V_{GE} = 0\text{V}$		43

Note 1. Pulse test, $t < 300\mu\text{s}$, duty cycle, $d < 2\%$.

Littelfuse reserves the right to change limits, test conditions and dimensions.

LFMOSFETs 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	7,157,338 B2
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 @ $T_J = 25^\circ\text{C}$

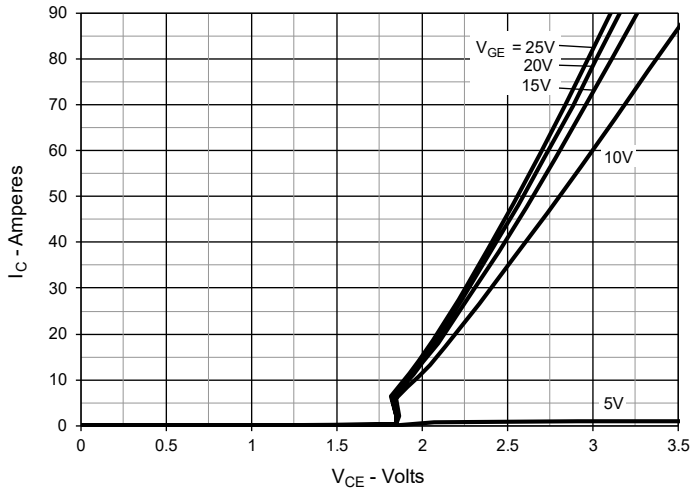


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

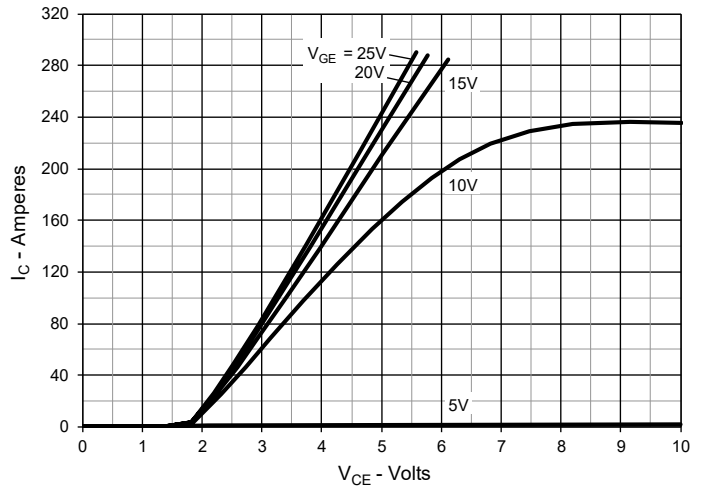


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

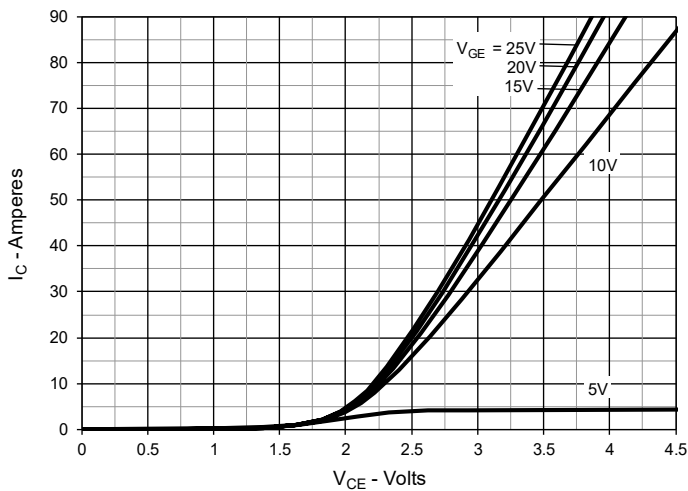


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

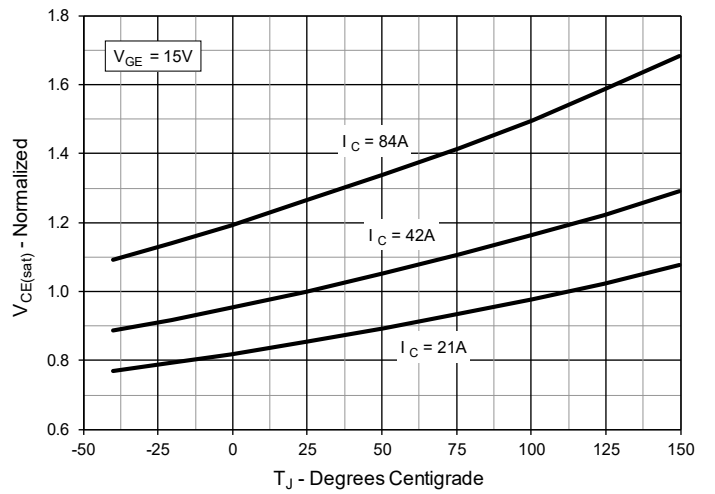


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

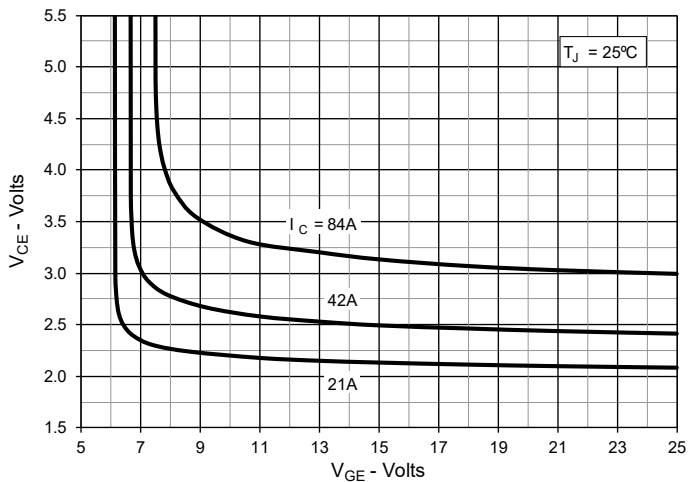


Fig. 6. Input Admittance

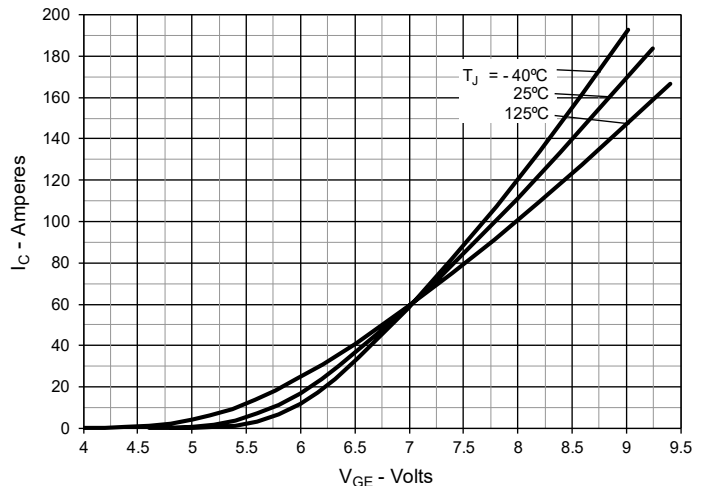


Fig. 7. Transconductance

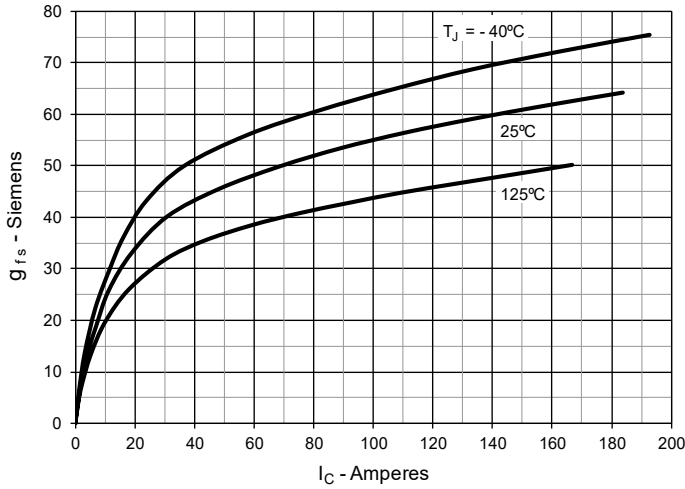


Fig. 8. Forward Voltage Drop of Intrinsic Diode

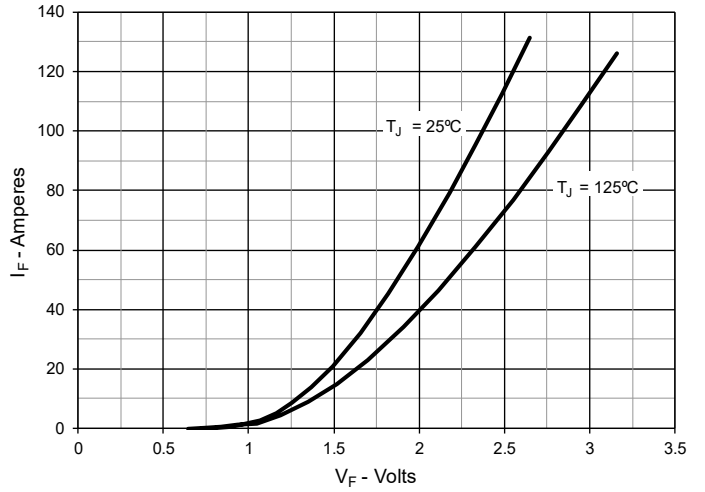


Fig. 9. Gate Charge

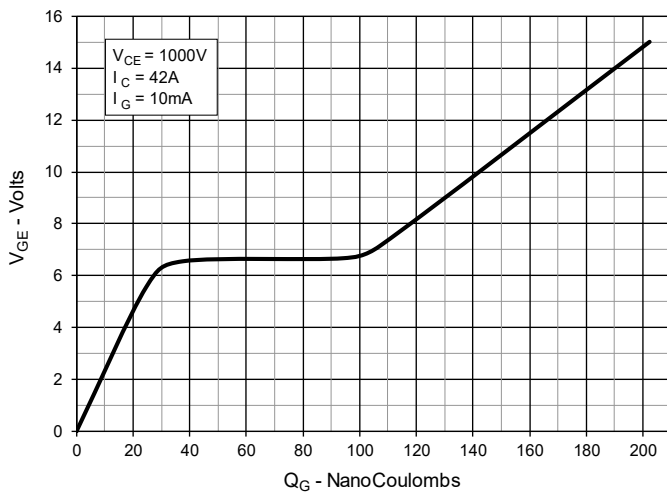


Fig. 10. Capacitance

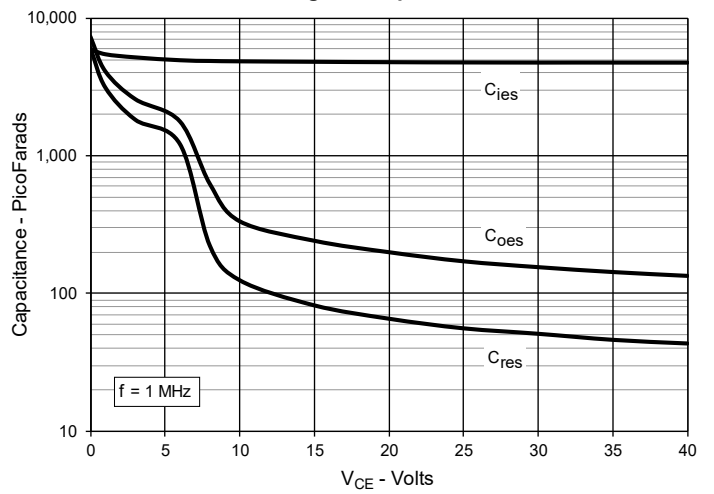


Fig. 11. Reverse-Bias Safe Operating Area

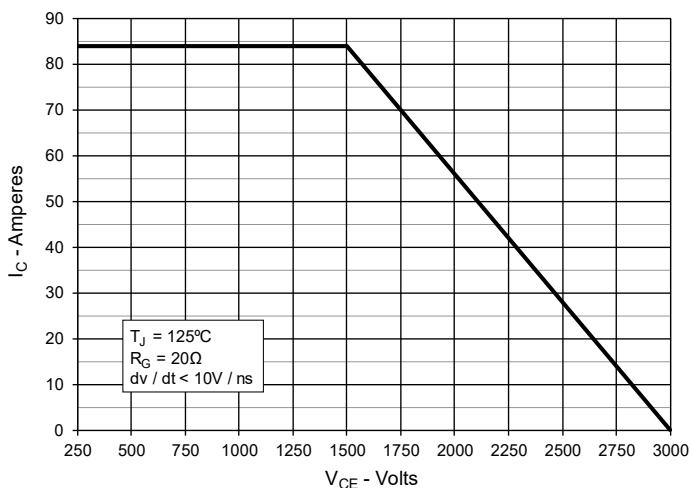


Fig. 12. Maximum Transient Thermal Impedance

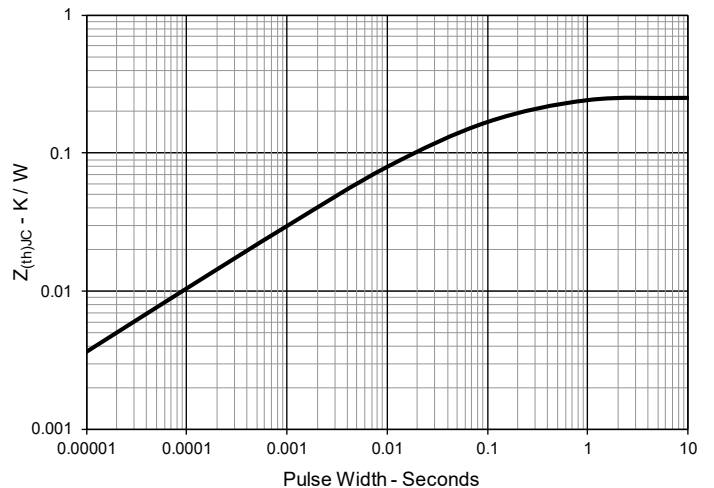


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

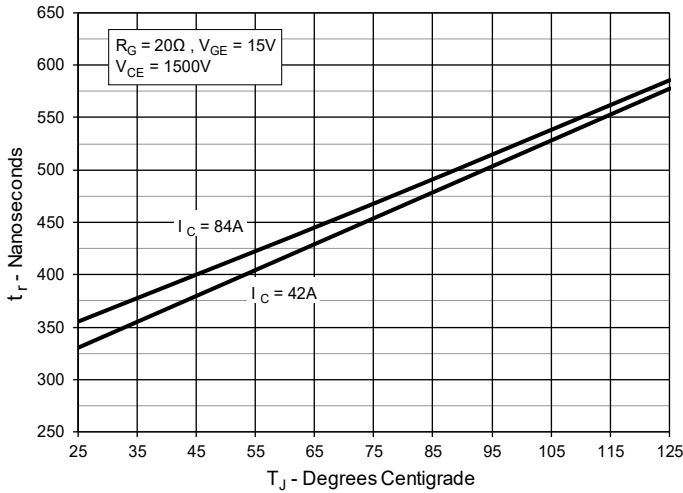


Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

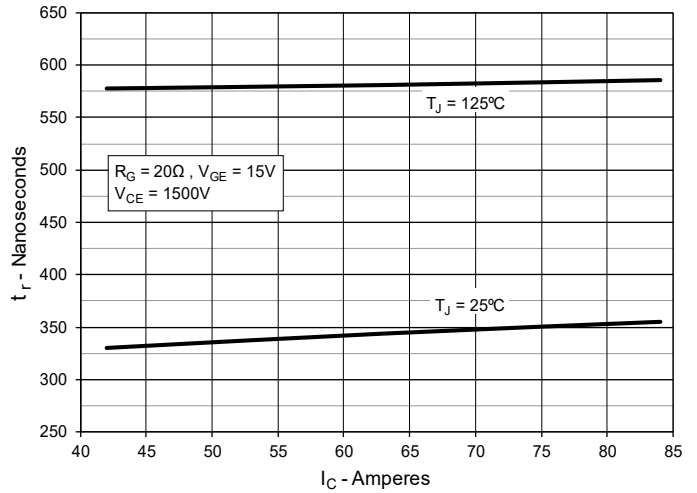


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

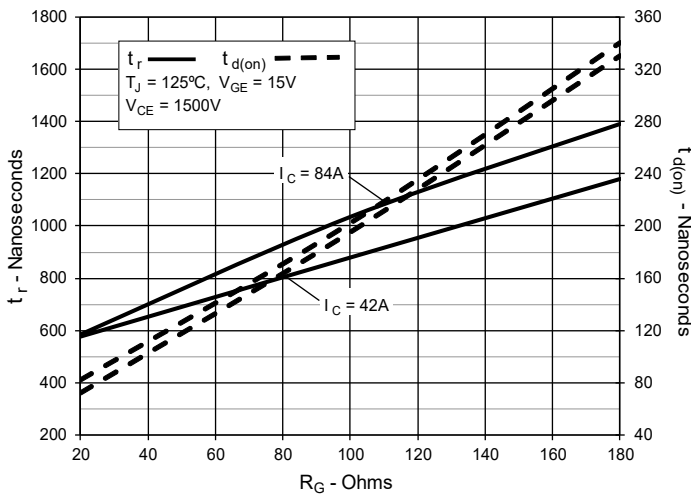


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

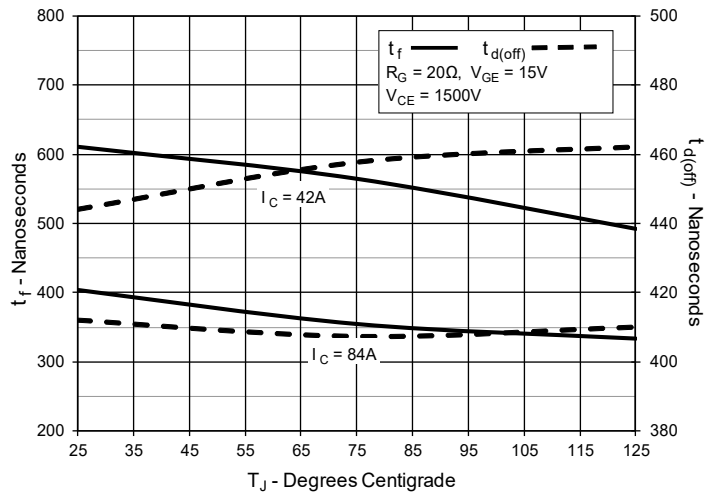


Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

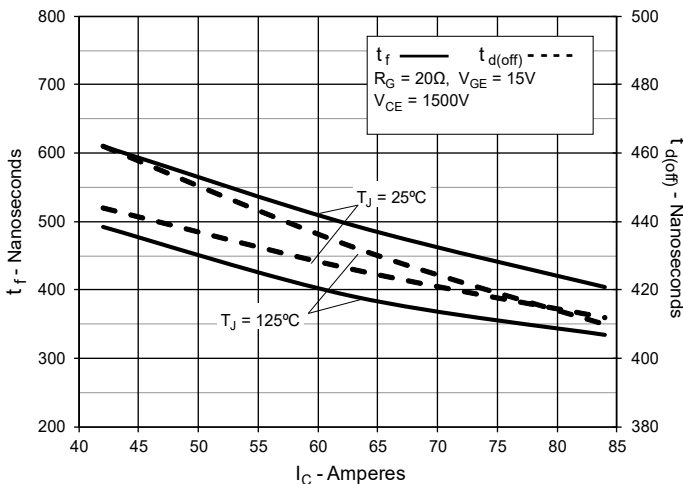


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

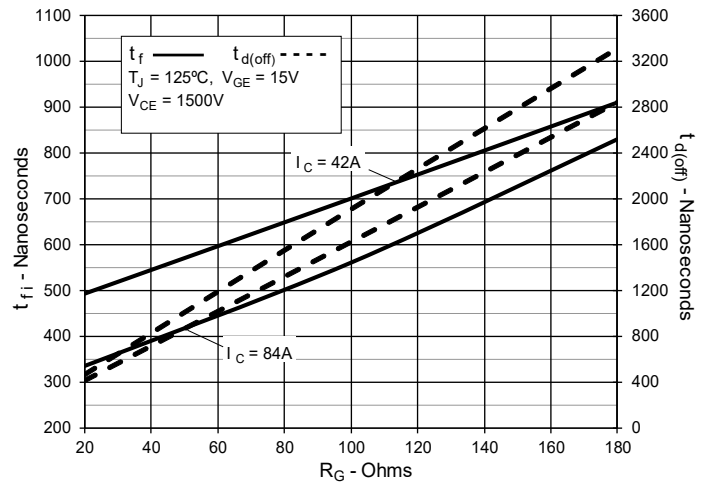


Fig. 19. Forward-Bias Safe Operating Area @ $T_C = 25^\circ\text{C}$

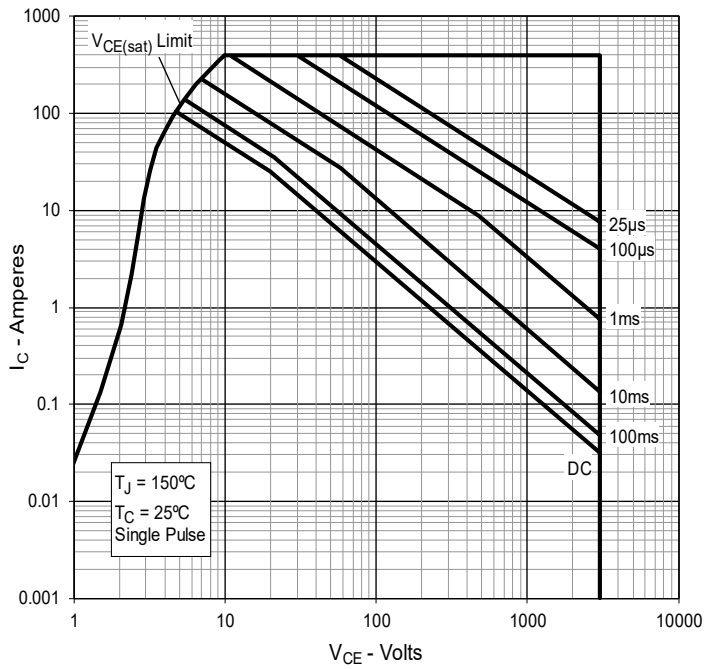
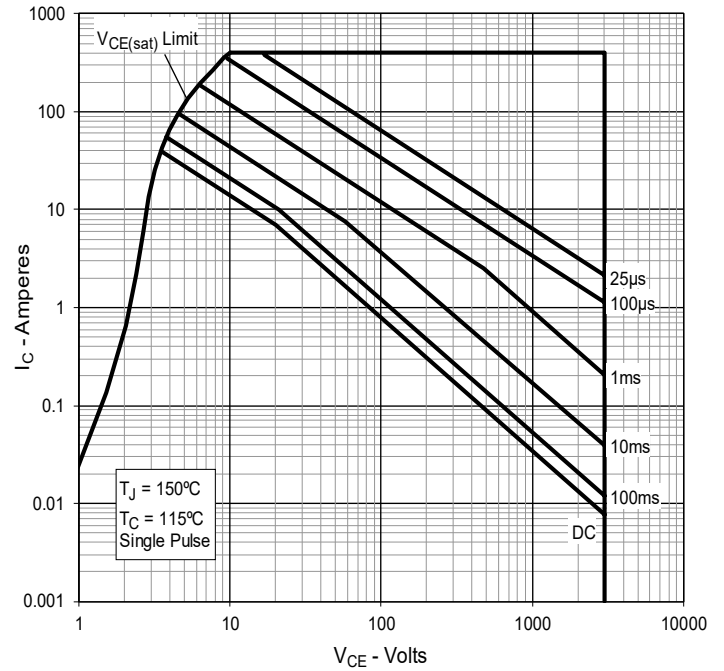
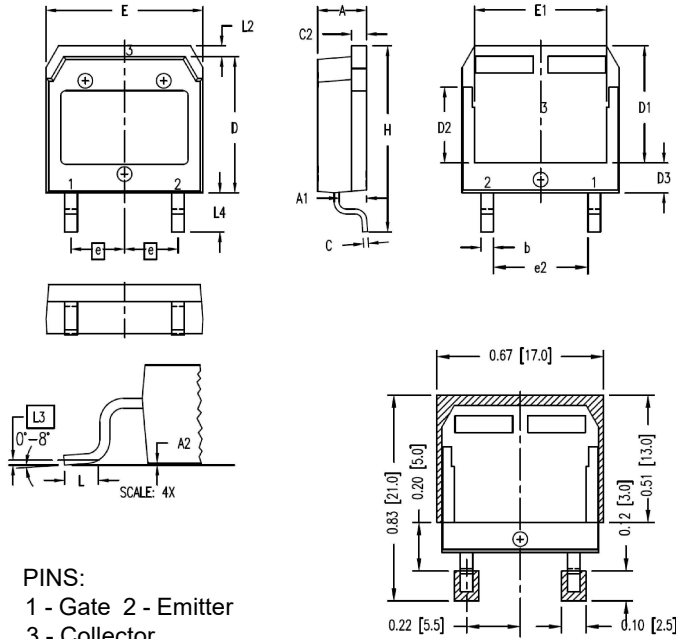


Fig. 20. Forward-Bias Safe Operating Area @ $T_C = 115^\circ\text{C}$



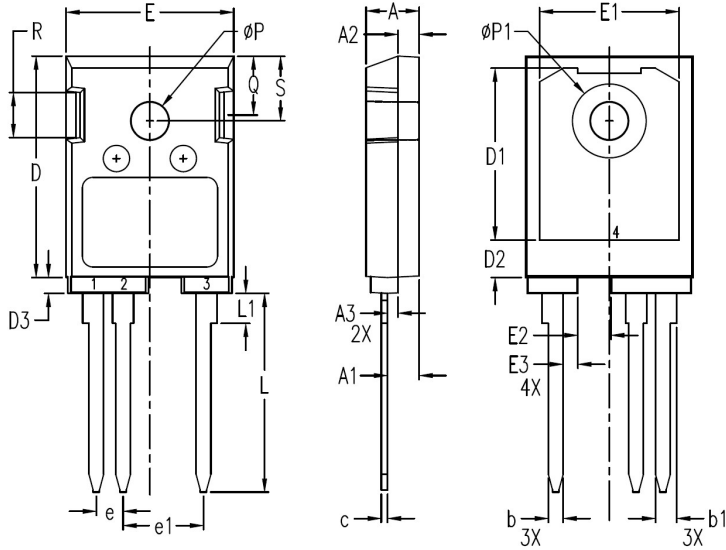
TO-268HV Outline



PINS:
1 - Gate 2 - Emitter
3 - Collector

SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.465	.476	11.80	12.10
D2	.295	.307	7.50	7.80
D3	.114	.126	2.90	3.20
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
(e2)	.374	.386	9.50	9.80
H	.736	.752	18.70	19.10
L	.067	.079	1.70	2.00
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

TO-247HV Outline



PINS:
1 - Gate 2 - Emitter
3,4 - 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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