

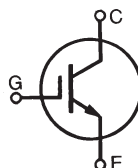
GenX3™ 1200V IGBTs

IXGA12N120A3
IXGP12N120A3
IXGH12N120A3

$V_{CES} = 1200V$
 $I_{C90} = 12A$
 $V_{CE(sat)} \leq 3.0V$

High Surge Current

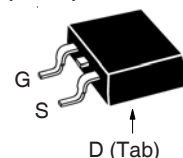
**Ultra-Low V_{sat} PT IGBTs for
up to 3kHz Switching**



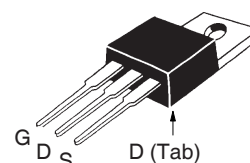
Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ C$ to $150^\circ C$	1200	V
V_{CGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ C$	22	A
I_{C90}	$T_C = 90^\circ C$	12	A
I_{CM}	$T_C = 25^\circ C$, 1ms	60	A
SSOA (RBSOA)	$V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 10\Omega$ Clamped Inductive Load	$I_{CM} = 24$ $V_{CE} \leq 0.8 \cdot V_{CES}$	A
P_C	$T_C = 25^\circ C$	100	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}	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
F_C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb.
M_d	Mounting Torque (TO-220 & TO-247)	1.13 / 10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-220	3.0	g
	TO-247	6.0	g

Symbol	Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\mu A$, $V_{GE} = 0V$	1200		V
$V_{GE(th)}$	$I_C = 250\mu A$, $V_{CE} = V_{GE}$	2.5		5.0 V
I_{CES}	$V_{CE} = V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$			10 μA 275 μA
I_{GES}	$V_{CE} = 0V$, $V_{GE} = \pm 20V$			± 100 nA
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$		2.40 2.75	3.0 V V

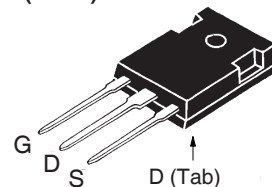
TO-263 AA (IXGA)



TO-220AB (IXGP)



TO-247 (IXGH)



G = Gate D = Drain
S = Source Tab = Drain

Features

- Optimized for Low Conduction Losses
- International Standard Packages

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts
- Inrush Current Protection Circuits

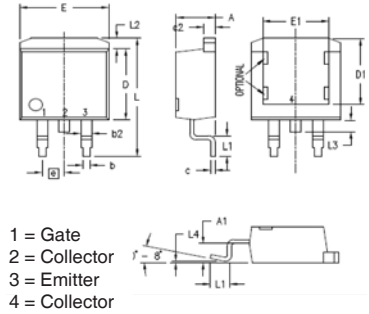
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = I_{C90}$, $V_{CE} = 10\text{V}$, Note 1	5.2	8.8	S
$I_{C(on)}$	$V_{GE} = 10\text{V}$, $V_{CE} = 10\text{V}$, Note 1		44	A
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		550	pF
C_{oes}			30	pF
C_{res}			8	pF
Q_g	$I_C = I_{C90}$, $V_{GE} = 15\text{V}$, $V_{CE} = 600\text{V}$		20.4	nC
Q_{ge}			3.1	nC
Q_{gc}			8.5	nC
$t_{d(on)}$	Resistive Switching Times, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{V}$ $V_{CE} = 960\text{V}$, $R_G = 10\Omega$		35	ns
t_r			140	ns
$t_{d(off)}$			62	ns
t_f			1035	ns
$t_{d(on)}$	Resistive Switching Times, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{V}$ $V_{CE} = 960\text{V}$, $R_G = 10\Omega$		35	ns
t_r			167	ns
$t_{d(off)}$			70	ns
t_f			1475	ns
R_{thJC}				1.25 $^\circ\text{C/W}$
R_{thCS}	TO-247		0.21	$^\circ\text{C/W}$
	TO-220		0.50	$^\circ\text{C/W}$

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

TO-247 Outline		Dim.		Millimeter		Inches	
		Min.		Max.		Min.	
		A	4.7	5.3	.185	.209	
		A ₁	2.2	2.54	.087	.102	
		A ₂	2.2	2.6	.059	.098	
		b	1.0	1.4	.040	.055	
		b ₁	1.65	2.13	.065	.084	
		b ₂	2.87	3.12	.113	.123	
		C	.4	.8	.016	.031	
		D	20.80	21.46	.819	.845	
		E	15.75	16.26	.610	.640	
		e	5.20	5.72	0.205	0.225	
		L	19.81	20.32	.780	.800	
		L1		4.50		.177	
		ØP	3.55	3.65	.140	.144	
		Q	5.89	6.40	0.232	0.252	
		R	4.32	5.49	.170	.216	
		S	6.15	BSC	242	BSC	

Terminals: 1 - Gate
2 - Collector
3 - Emitter

TO-263 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100	BSC	2.54	BSC
L	.575	.625	14.61	15.88
L1	.090	.110	2.29	2.79
L2	.040	.055	1.02	1.40
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

TO-220 Outline

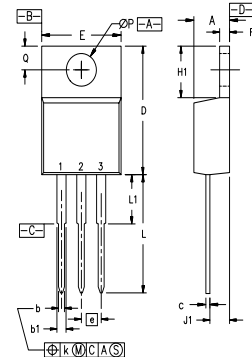


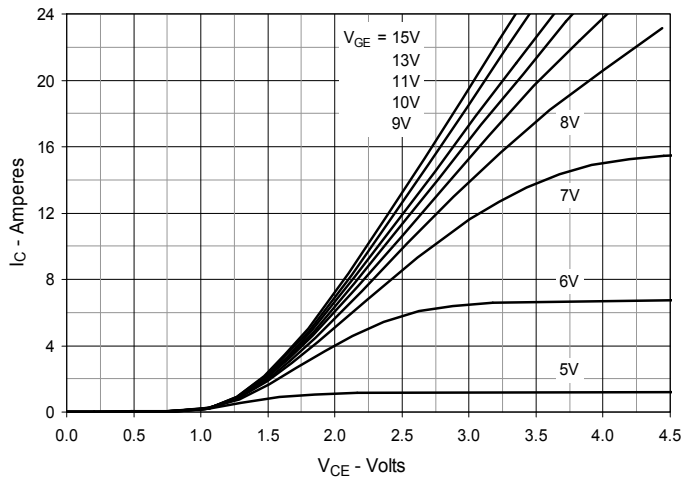
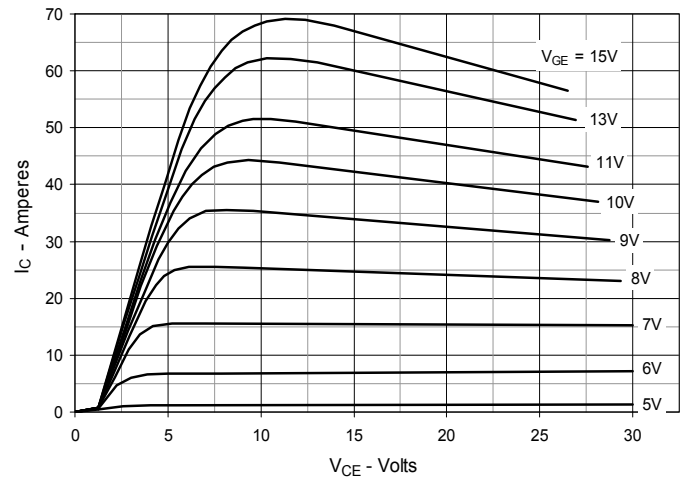
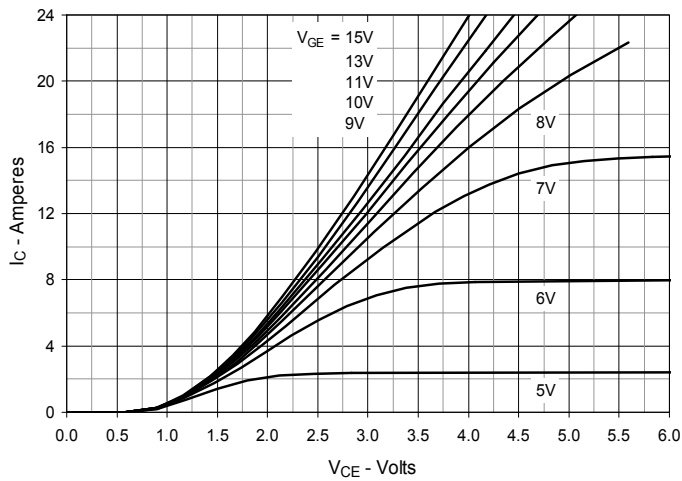
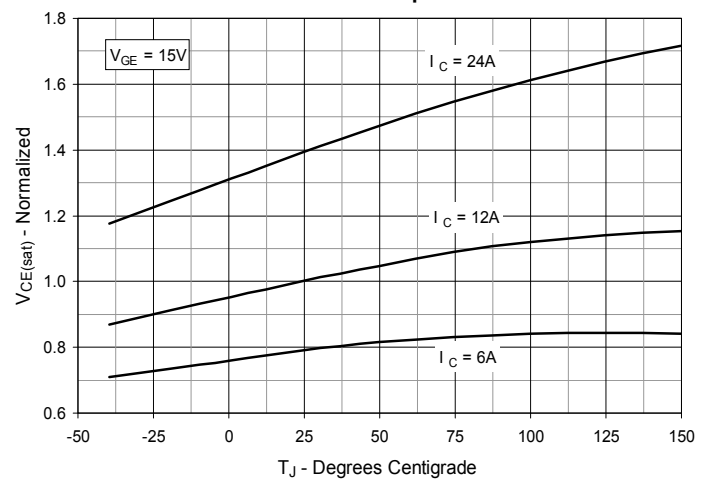
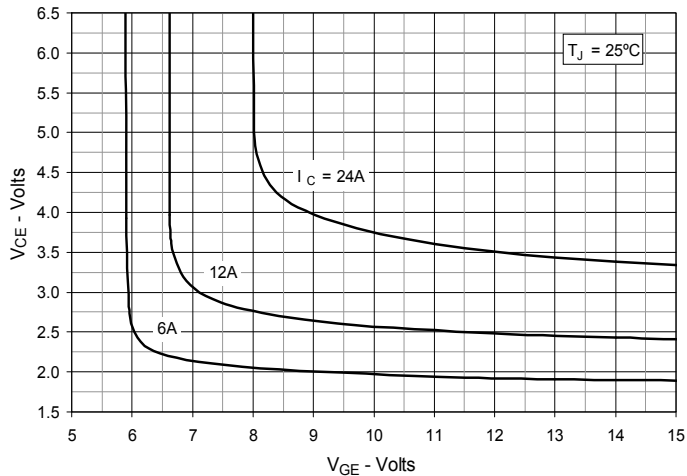
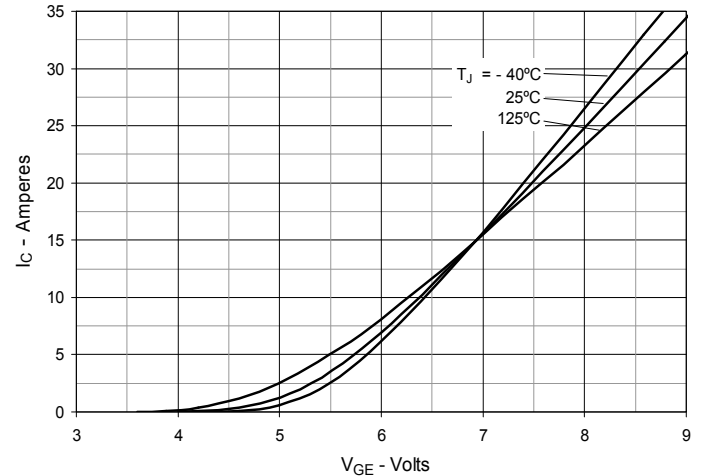
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

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

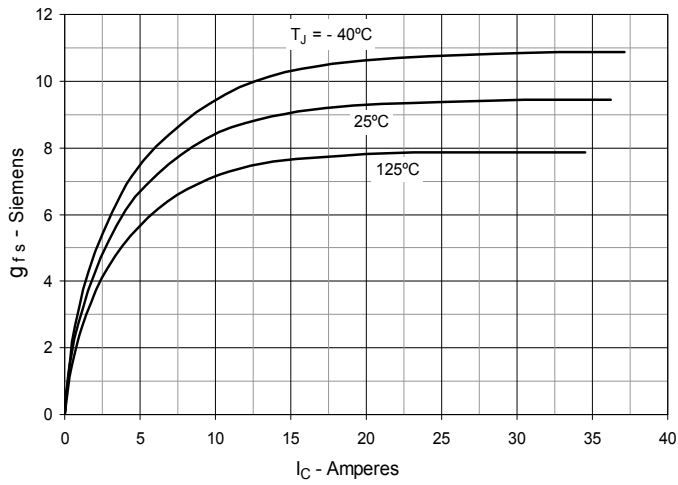


Fig. 8. Gate Charge

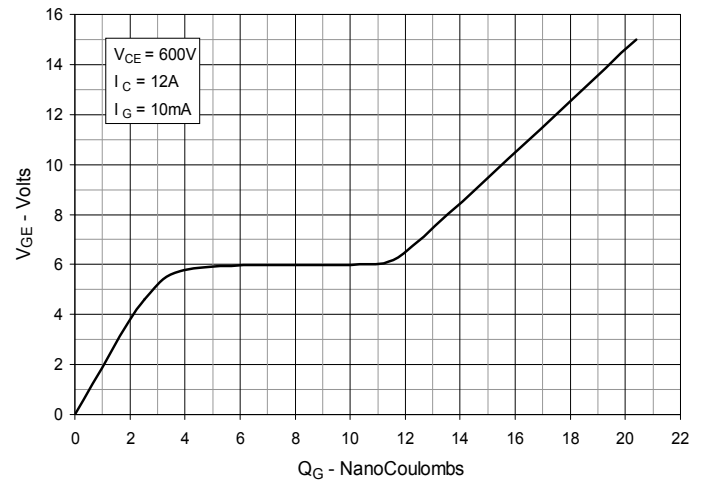


Fig. 9. Reverse-Bias Safe Operating Area

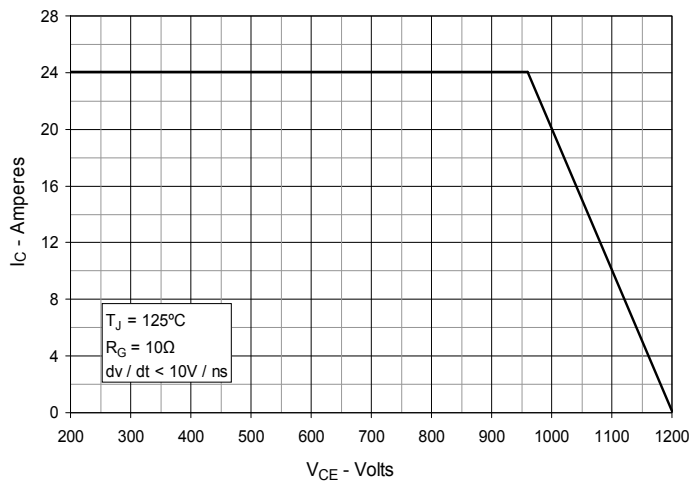


Fig. 10. Capacitance

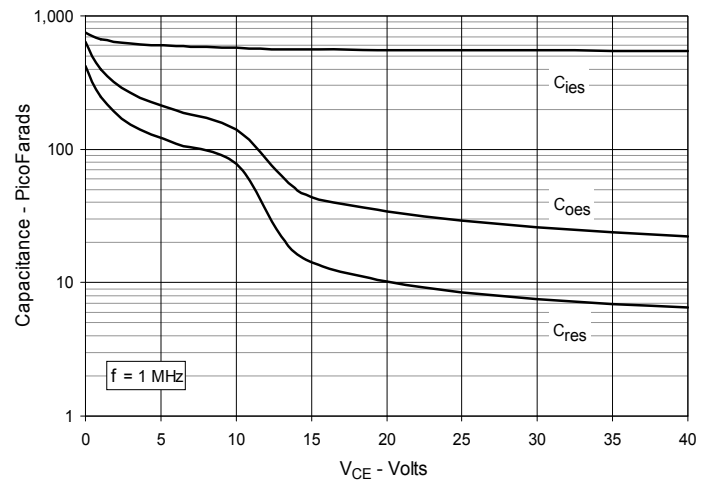


Fig. 11. Maximum Transient Thermal Impedance

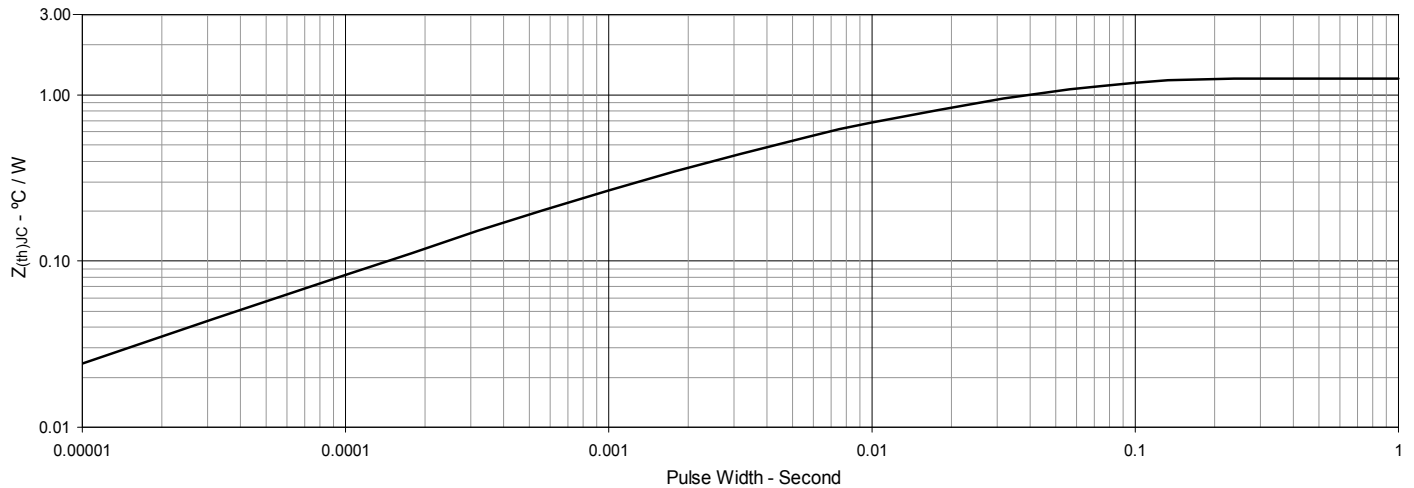


Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature

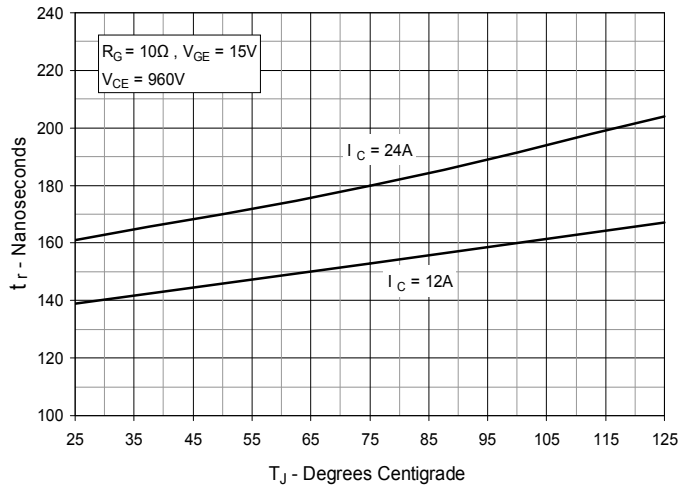


Fig. 13. Resistive Turn-on Rise Time vs. Collector Current

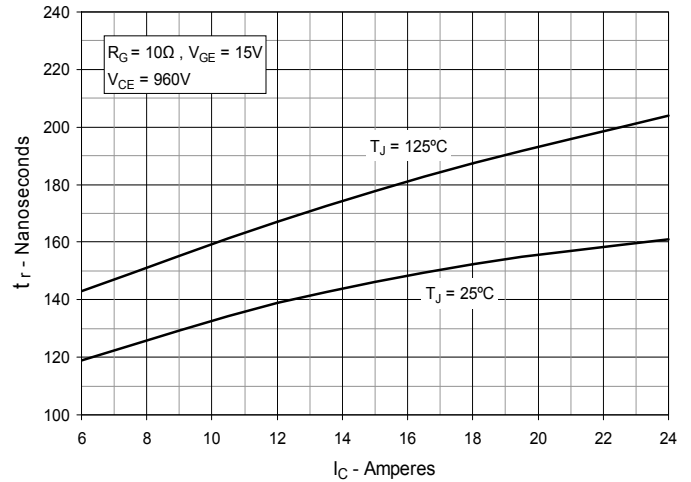


Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance

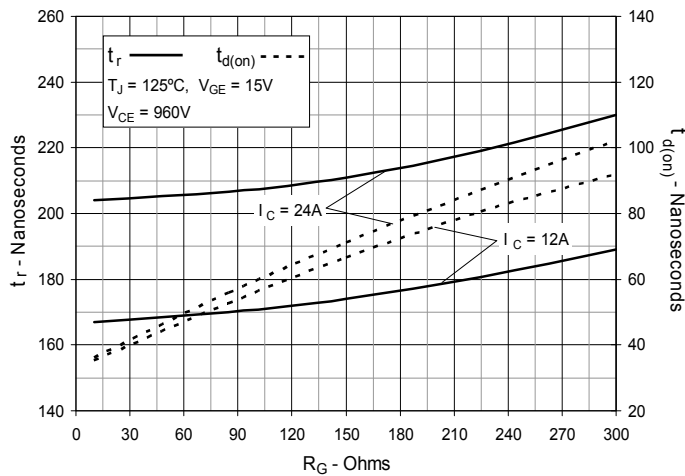


Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature

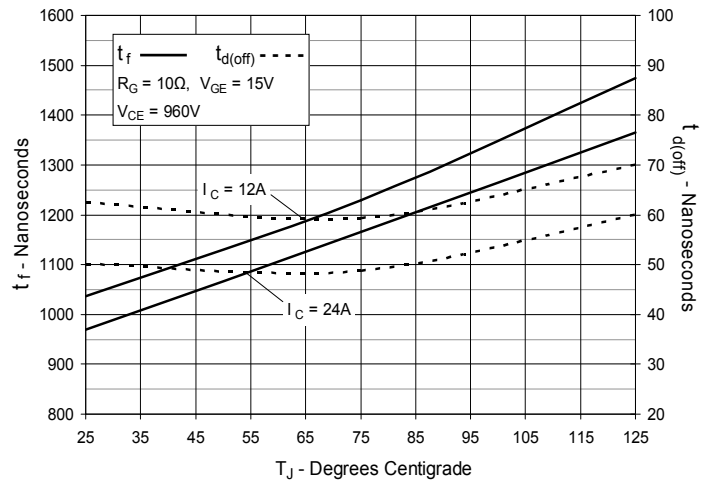


Fig. 16. Resistive Turn-off Switching Times vs. Collector Current

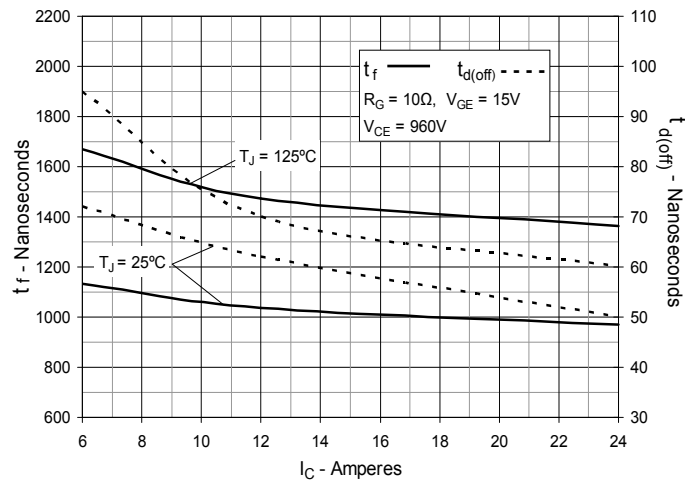
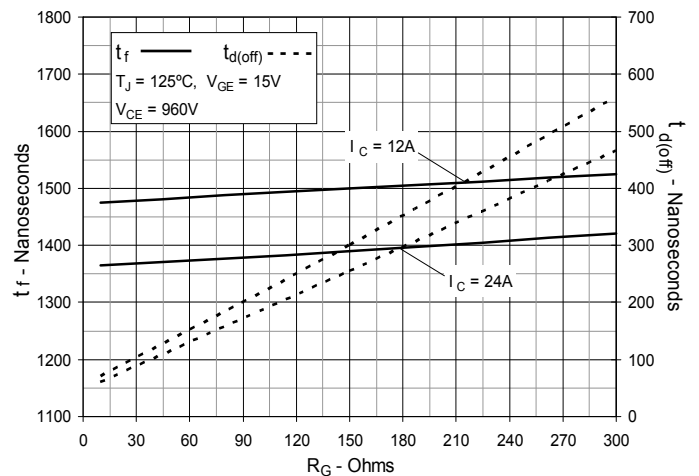


Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance





Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.