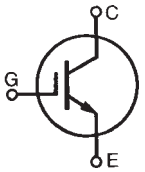
HiPerFAST™ IGBT
B2-Class High Speed IGBTs

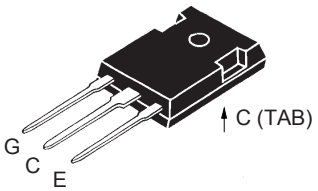
IXGH 50N90B2
IXGT 50N90B2

V_{CES} = 900 V
I_{C25} = 75 A
$V_{CE(sat)}$ = 2.7 V
$t_{fi\,typ}$ = 200 ns

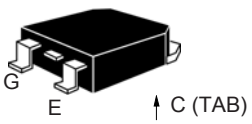


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	900	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	900	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (limited by leads)	75	A
I_{C110}	T_C = 110°C	50	A
I_{CM}	T_C = 25°C, 1 ms	200	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 10 Ω Clamped inductive load @ ≤ 600V	I_{CM} = 100	A
P_C	T_C = 25°C	400	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247 AD	6	g
	TO-268	4	g

TO-247 (IXGH)



TO-268 (IXGT)



G = Gate, C = Collector,
E = Emitter, TAB = Collector

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{GE(th)}$	I_C = 250 μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, T_J = 25°C			50	μA
	V_{GE} = 0 V, T_J = 150°C			1	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V			±100	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15 V		2.2	2.7	V
	T_J = 125°C				V

Features

- High frequency IGBT
- High current handling capability
- MOS Gate turn-on
  - drive simplicity

Applications

- PFC circuits
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

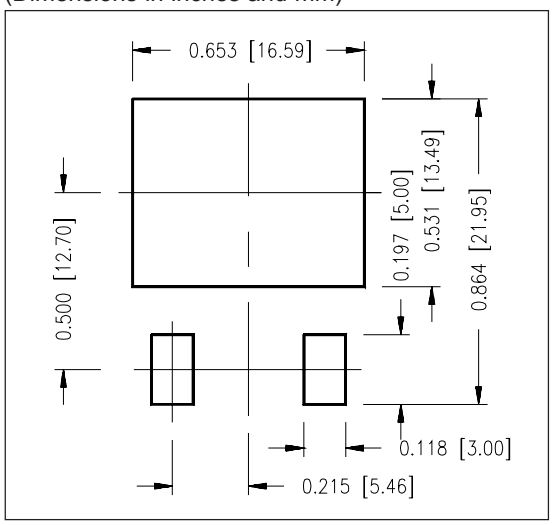
- High power density
- Very fast switching speeds for high frequency applications

© 2004 IXYS All rights reserved

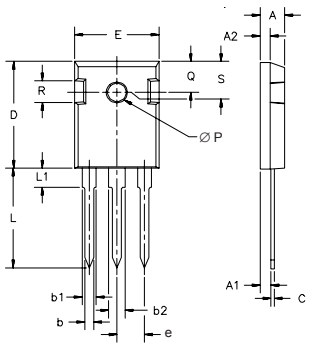
Downloaded from Arrow.com.

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	$I_C = I_{C110}$A; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	25	40		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		2500		pF
C_{oes}			180		pF
C_{res}			75		pF
Q_g	$I_C = I_{C110}$A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		135		nC
Q_{ge}			23		nC
Q_{gc}			50		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C** $I_C = I_{C110}$A, V_{GE} = 15 V V_{CE} = 720 V, $R_G = R_{off}$ = 5 Ω		20		ns
t_{ri}			28		ns
$t_{d(off)}$			350	500	ns
t_{fi}			200		ns
E_{off}			4.7	7.5	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C** $I_C = I_{C110}$A, V_{GE} = 15 V V_{CE} = 720 V, $R_G = R_{off}$ = 5 Ω		20		ns
t_{ri}			28		ns
E_{on}			0.7		mJ
$t_{d(off)}$			400		ns
t_{fi}			420		ns
E_{off}			8.7		mJ
R_{thJC}				0.31	K/W
R_{thCK}	(TO-247)		0.25		K/W

Min. Recommended Footprint
(Dimensions in inches and mm)

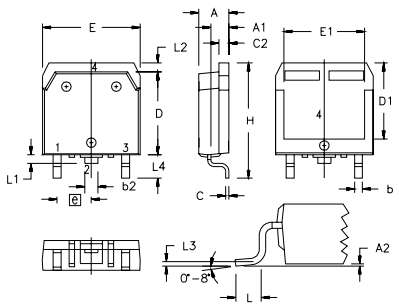


TO-247 AD Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
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	

TO-268 Outline



SYM	INCHES MIN	MAX	MILLIMETERS 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
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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: 4,850,072 4,835,592 4,931,844 4,881,106 5,034,796 5,017,508 5,063,307 5,049,961 5,237,481 5,187,117 5,381,025 5,486,715 6,404,065B1 6,306,728B1 6,162,665 6,259,123B1 6,534,343 6,306,728B1 6,583,505 6,683,344

Downloaded from Arrow.com.

Fig. 1. Output Characteristics @ 25 ºC

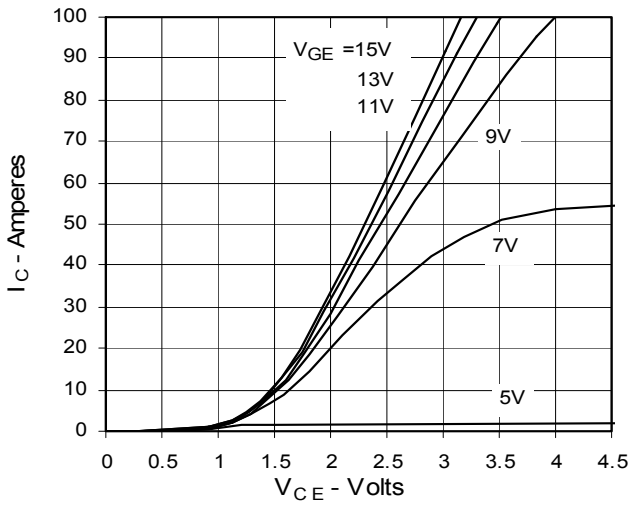


Fig. 2. Extended Output Characteristics @ 25 ºC

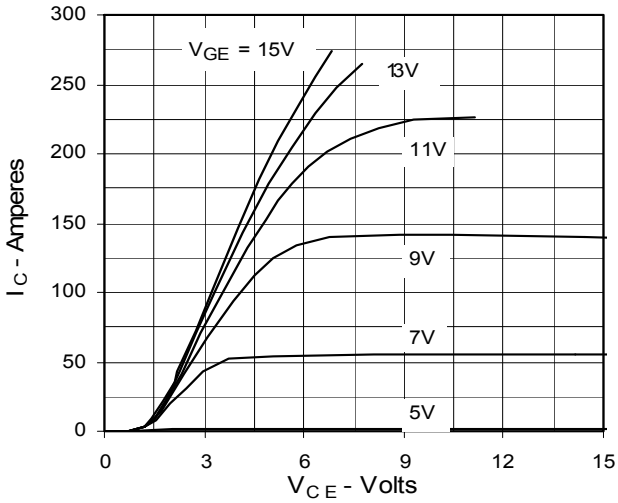


Fig. 3. Output Characteristics @ 125 ºC

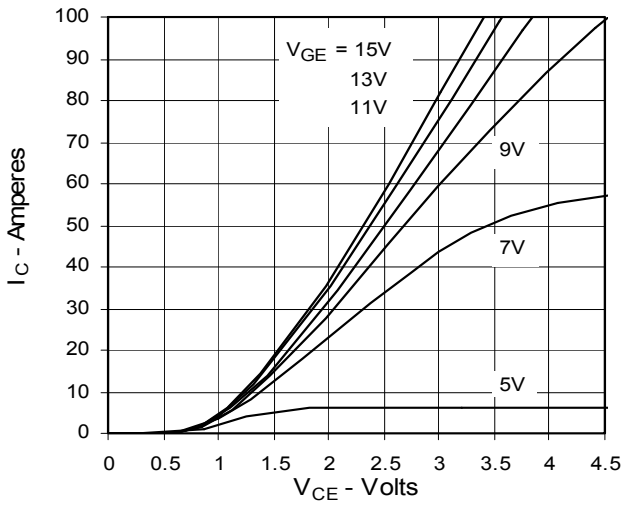


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

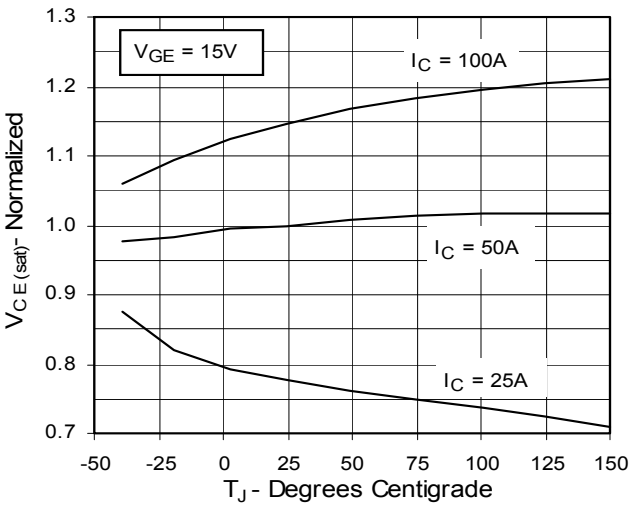


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

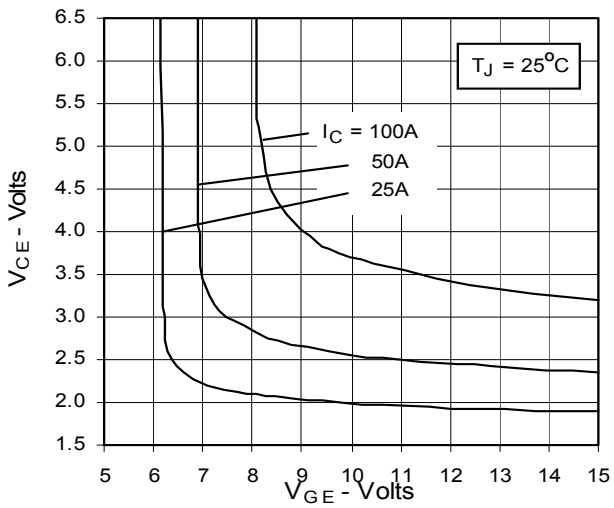
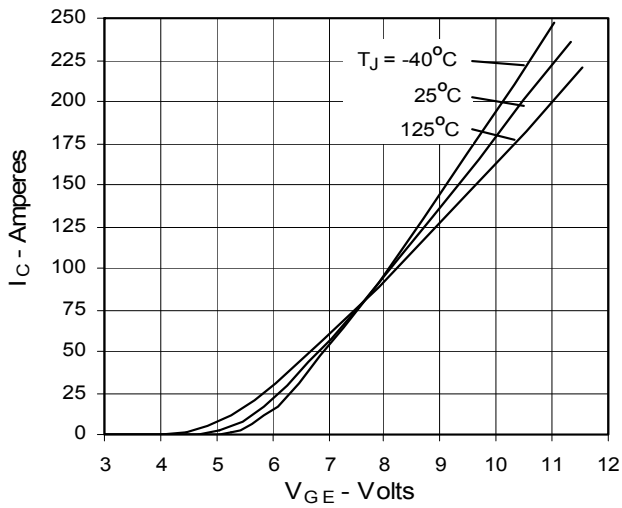


Fig. 6. Input Admittance



© 2004 IXYS All rights reserved

Downloaded from Arrow.com.

Fig. 7. Transconductance

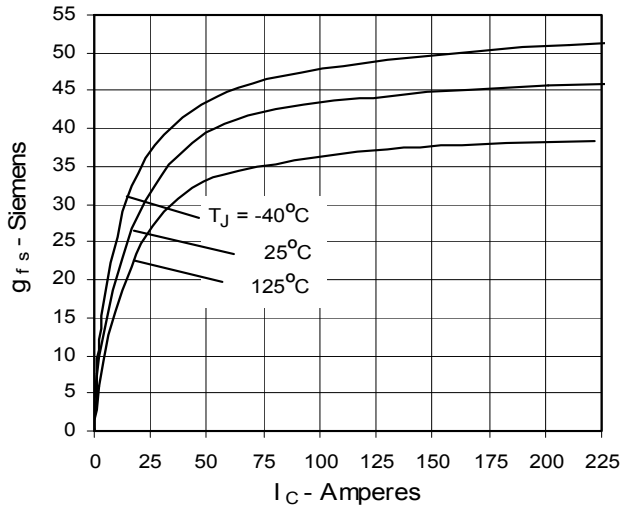


Fig. 8. Dependence of Turn-off Energy Loss on R_G

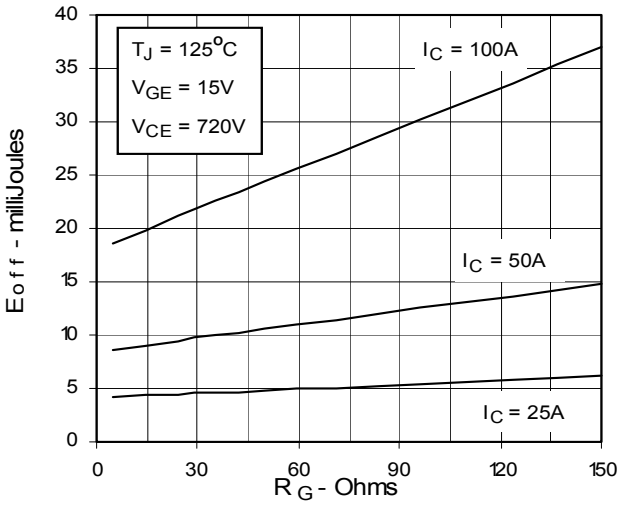


Fig. 9. Dependence of Turn-Off Energy Loss on I_C

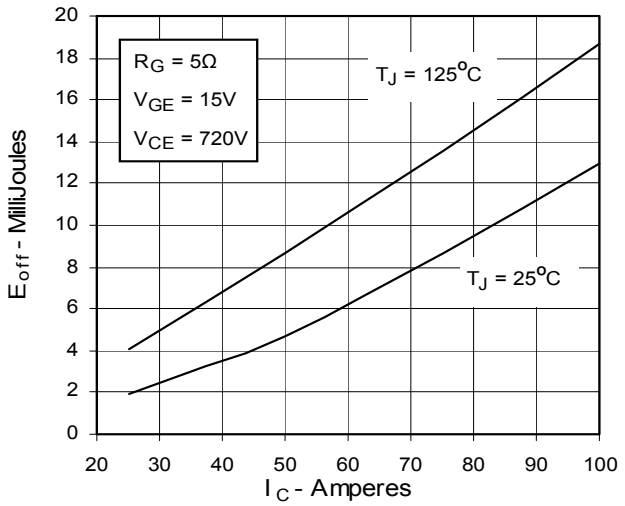


Fig. 10. Dependence of Turn-off Energy Loss on Temperature

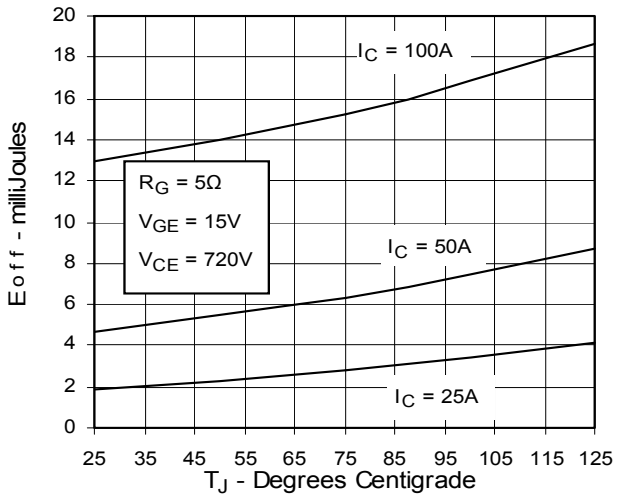


Fig. 11. Dependence of Turn-off Switching Time on R_G

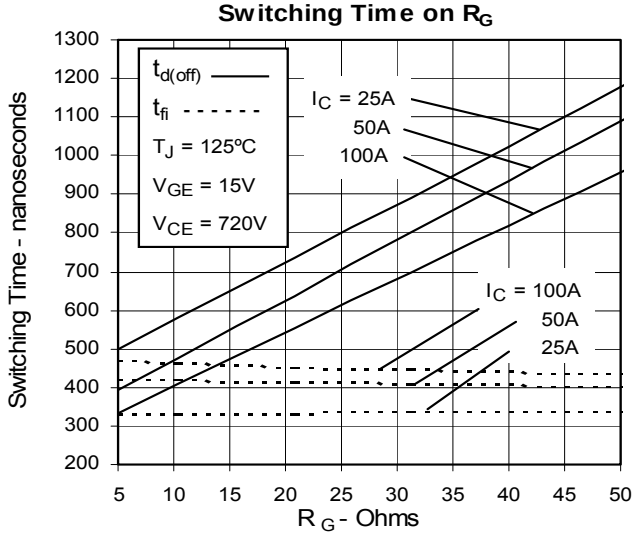
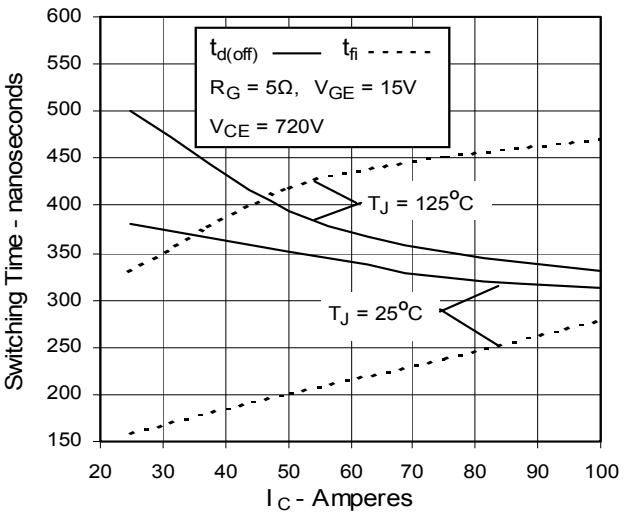


Fig. 12. Dependence of Turn-off Switching Time on I_C



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: 4,850,072 4,835,592 4,931,844 4,881,106 5,034,796 5,017,508 5,063,307 5,049,961 5,237,481 5,187,117 5,381,025 5,486,715 6,404,065B1 6,306,728B1 6,162,665 6,259,123B1 6,534,343 6,306,728B1 6,583,505 6,683,344

Downloaded from Arrow.com.

Fig. 13. Dependence of Turn-off Switching Time on Temperature

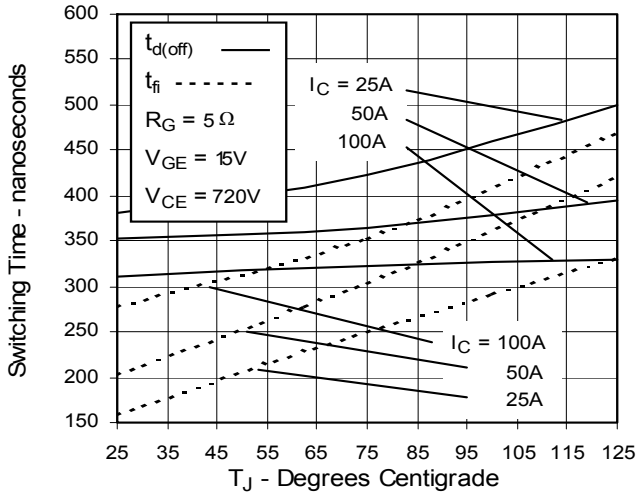


Fig. 14. Gate Charge

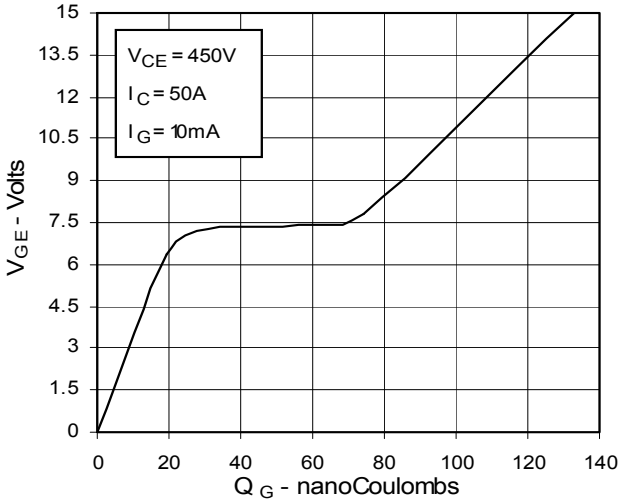


Fig. 15. Capacitance

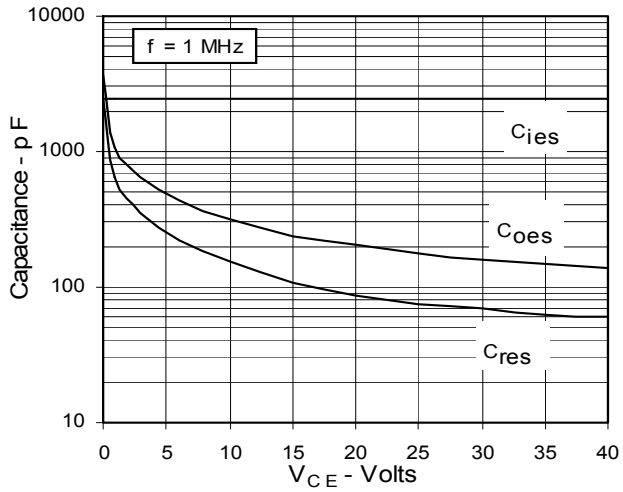


Fig. 16. Reverse-Bias Safe Operating Area

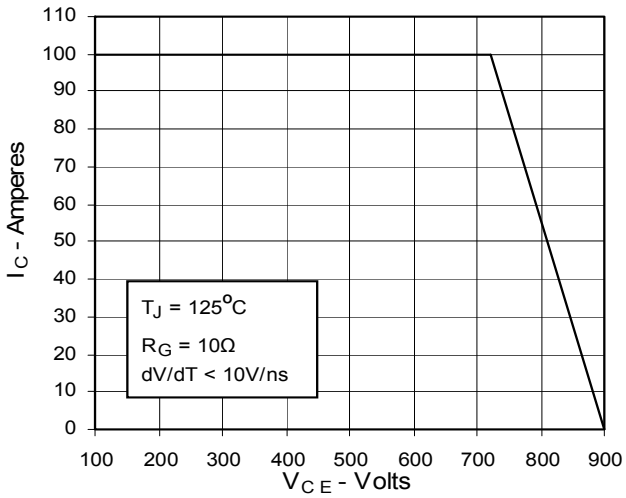
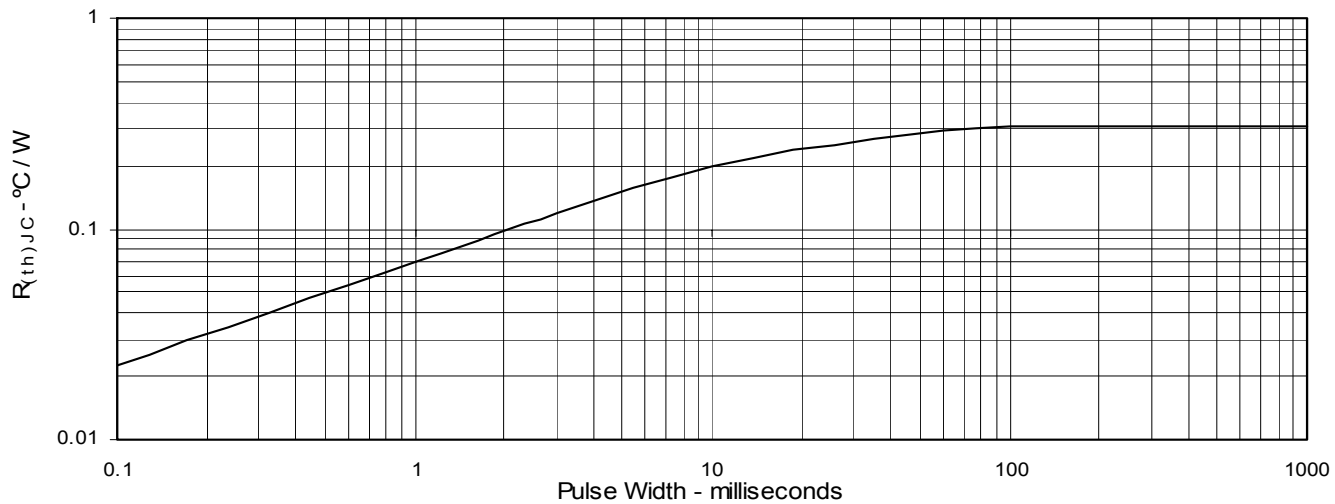


Fig. 17. Maximum Transient Thermal Resistance



© 2004 IXYS All rights reserved

Downloaded from Arrow.com.



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.

Downloaded from Arrow.com.