



**THE DATASHEET OF
IXGH50N60B2**

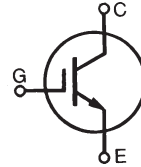


HiPerFAST™ IGBT

B2-Class High Speed IGBTs

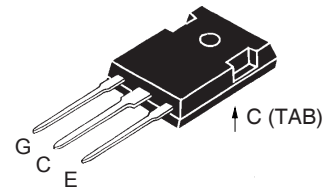
IXGH 50N60B2
IXGT 50N60B2

V_{CES} = 600 V
 I_{C25} = 75 A
 $V_{CE(sat)}$ = 2.0 V
 $t_{fi typ}$ = 65 ns

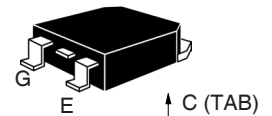


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	600	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$ (limited by leads)	75	A
I_{C110}	$T_C = 110^\circ\text{C}$	50	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	200	A
SSOA (RBSOA)	$V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10\ \Omega$ Clamped inductive load @ $\leq 600\text{V}$	$I_{CM} = 80$	A
P_C	$T_C = 25^\circ\text{C}$	400	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque (TO-247)	1.13/10Nm/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

Features

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

Applications

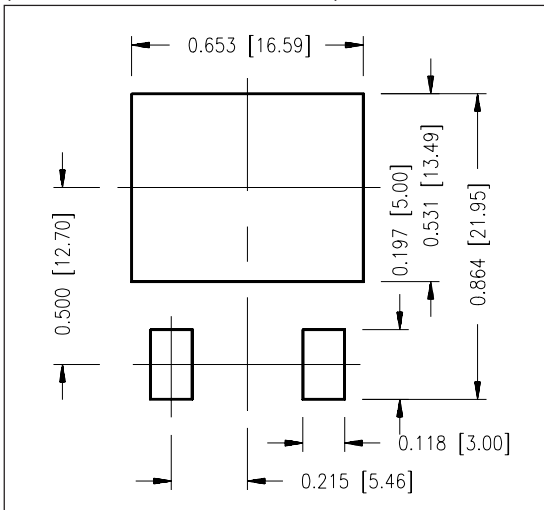
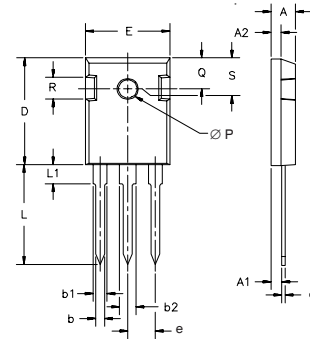
- PFC circuits
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

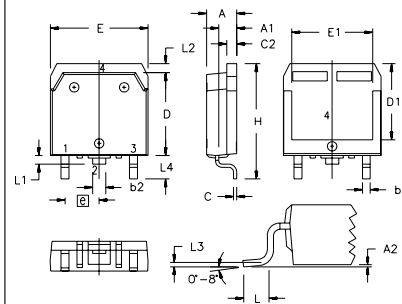
- High power density
- Very fast switching speeds for high frequency applications

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{GE(th)}$	$I_C = 250\ \mu\text{A}$, $V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = V_{CES}$, $V_{GE} = 0\text{ V}$			50 μA 1 mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$I_C = 40\text{ A}$, $V_{GE} = 15\text{ V}$		1.6 1.5	2.0 V V
				$T_J = 125^\circ\text{C}$

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
g_{fs}	$I_C = 40\text{ A}; V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$	40	55	S	
C_{ies} C_{oes} C_{res}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		3500	pF	
			240	pF	
			50	pF	
Q_g Q_{ge} Q_{gc}	$I_C = 40\text{ A}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		140	nC	
			23	nC	
			44	nC	
$t_{d(on)}$ t_{ri} $t_{d(off)}$ t_{fi} E_{off}	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 40\text{ A}, V_{GE} = 15\text{ V}$ $V_{CE} = 480\text{ V}, R_G = R_{off} = 5\ \Omega$		18	ns	
			25	ns	
			190	300	ns
			65	ns	
			0.55	0.85	mJ
$t_{d(on)}$ t_{ri} E_{on} $t_{d(off)}$ t_{fi} E_{off}	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 40\text{ A}, V_{GE} = 15\text{ V}$ $V_{CE} = 480\text{ V}, R_G = R_{off} = 5\ \Omega$		18	ns	
			25	ns	
			0.45	mJ	
			290	ns	
			140	ns	
			1.55	mJ	
R_{thJC} R_{thCK}	(TO-247)			0.31 KW KW	
		0.25			

Min. Recommended Footprint
 (Dimensions in inches and mm)

TO-247 AD Outline


Dim.	Millimeter		Inches	
	Min.	Max.	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
L ₁		4.50		.177
∅P	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		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A ₁	.106	.114	2.70	2.90
A ₂	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b ₂	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C ₂	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D ₁	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E ₁	.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
L ₁	.047	.055	1.20	1.40
L ₂	.039	.045	1.00	1.15
L ₃	.010 BSC		0.25 BSC	
L ₄	.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	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505
	4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1	6,259,123B1	6,306,728B1	6,683,344

Fig. 1. Output Characteristics @ 25 Deg. C

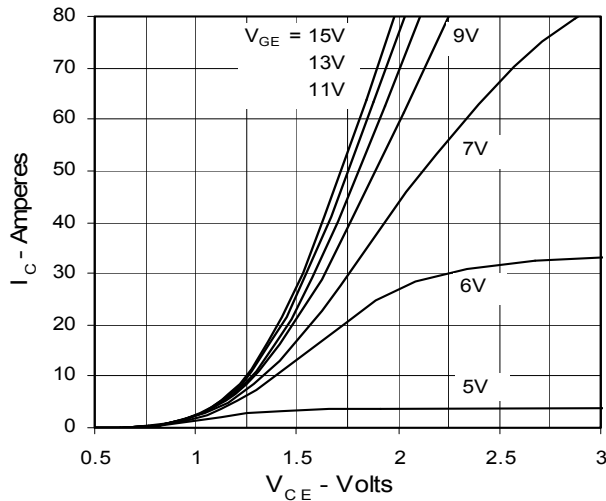


Fig. 2. Extended Output Characteristics @ 25 deg. C

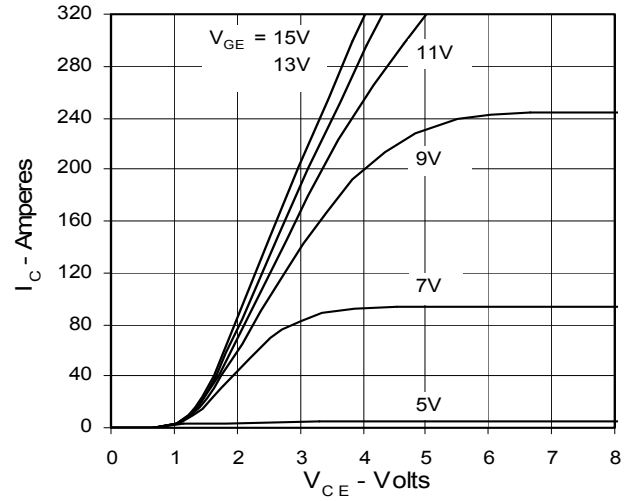


Fig. 3. Output Characteristics @ 125 Deg. C

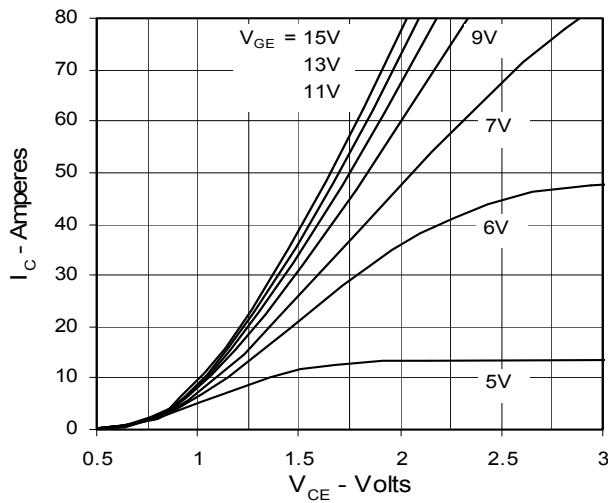


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

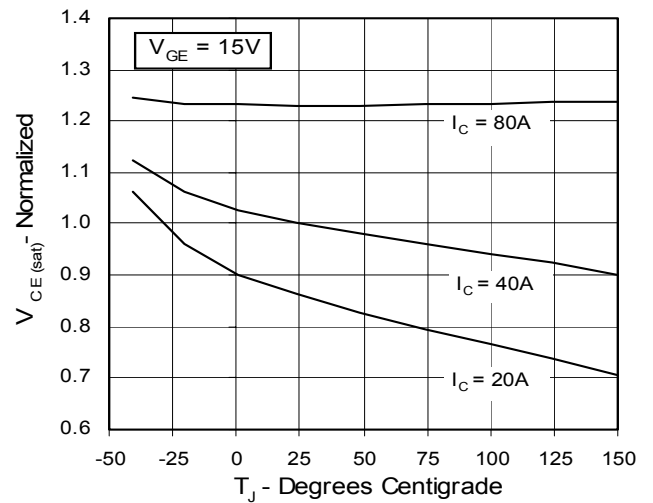


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

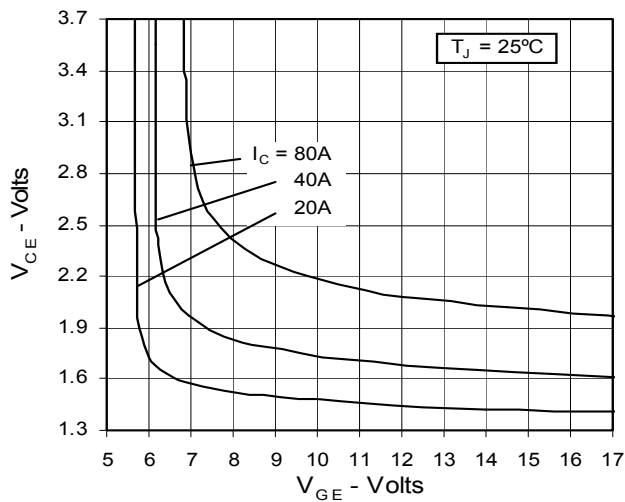


Fig. 6. Input Admittance

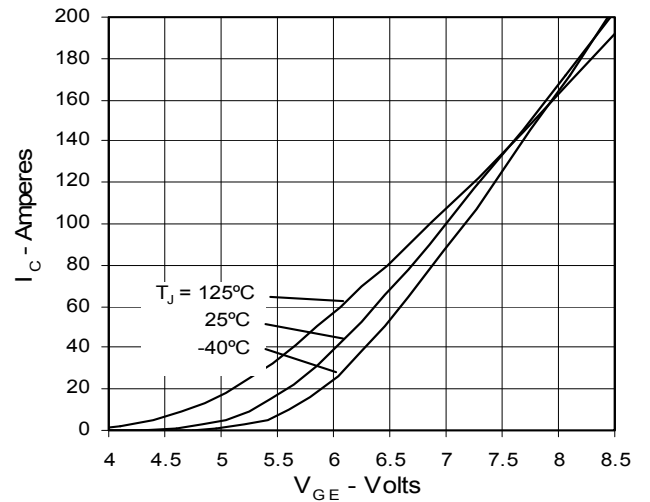


Fig. 7. Transconductance

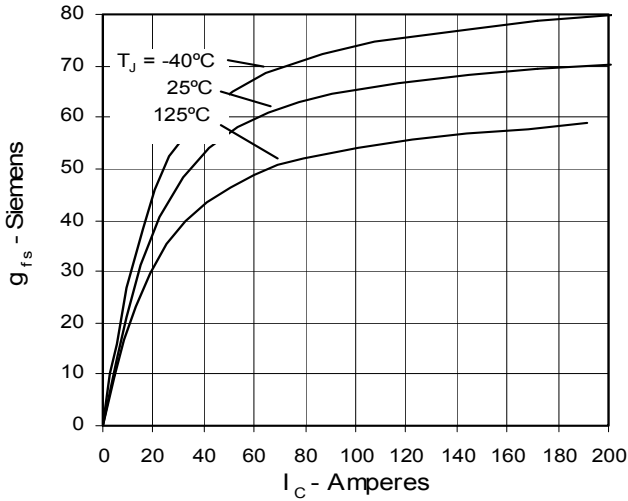


Fig. 8. Dependence of Turn-Off Energy on R_G

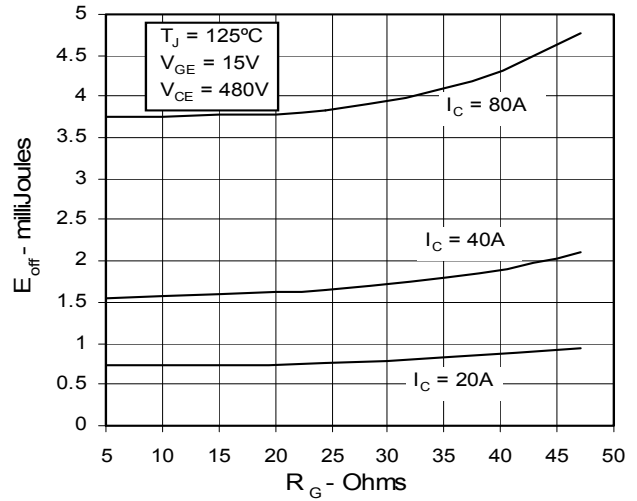


Fig. 9. Dependence of Turn-Off Energy on I_C

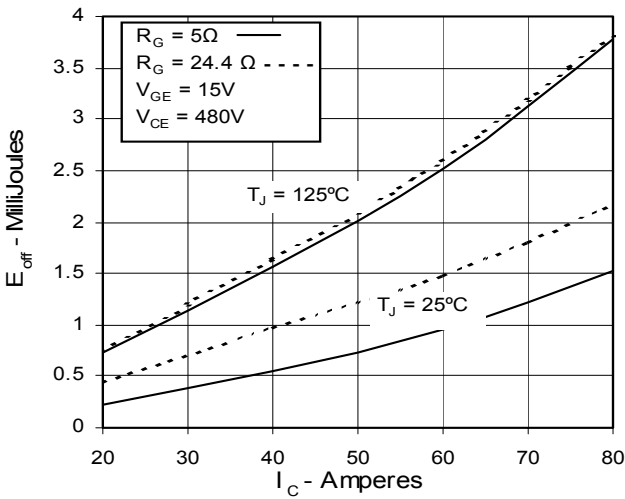


Fig. 10. Dependence of Turn-Off Energy on Temperature

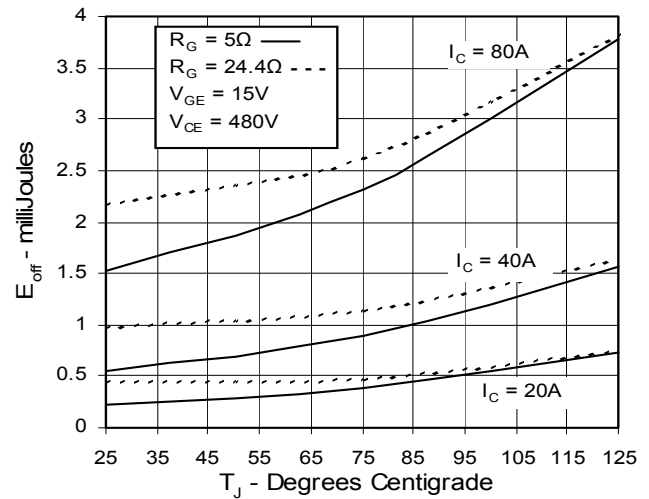


Fig. 11. Dependence of Turn-Off Switching Time on R_G

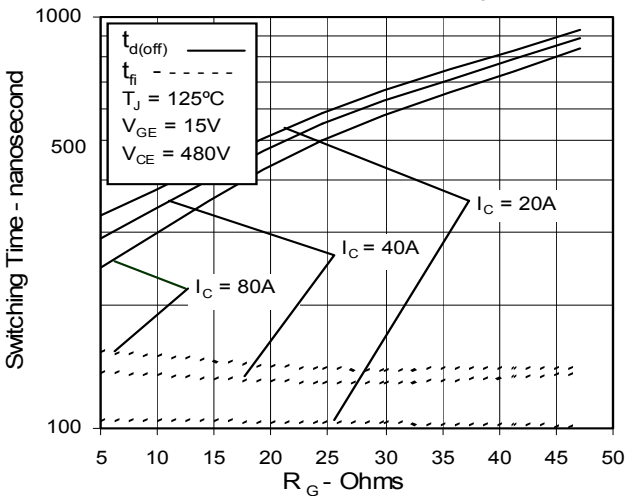
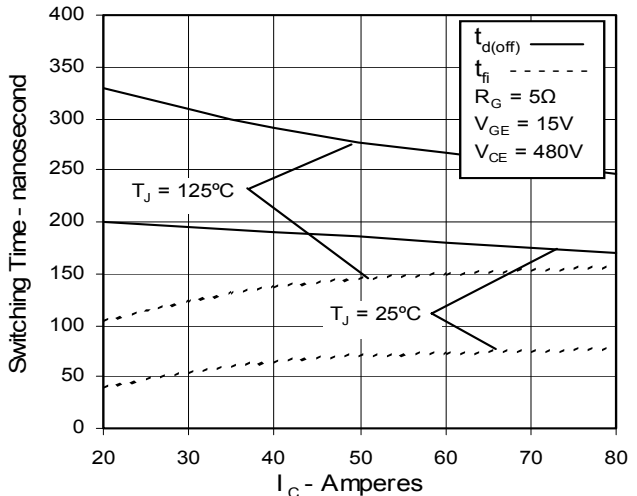


Fig. 12. Dependence of Turn-Off Switching Time on I_C



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

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

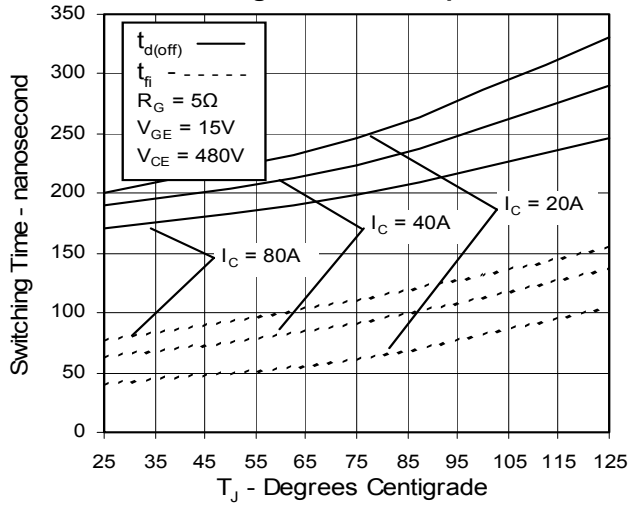


Fig. 14. Reverse-Bias Safe Operating Area

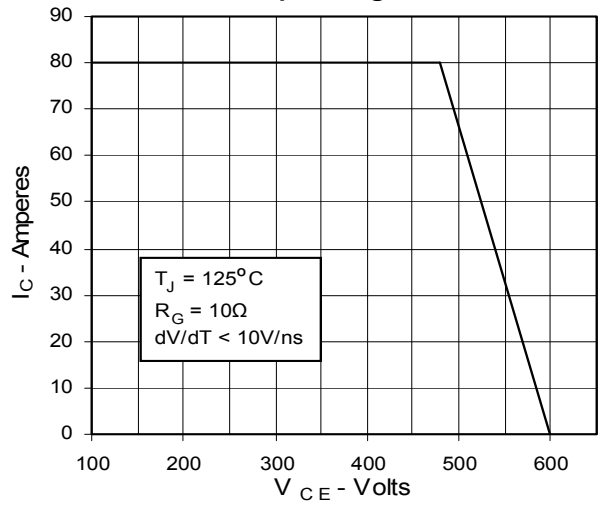


Fig. 15. Gate Charge

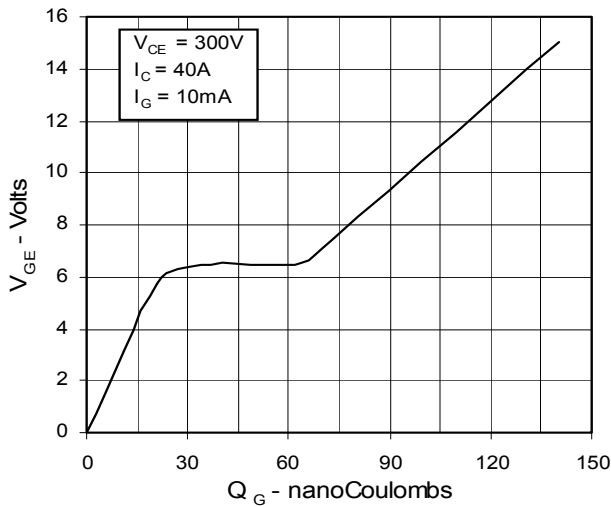


Fig. 16. Capacitance

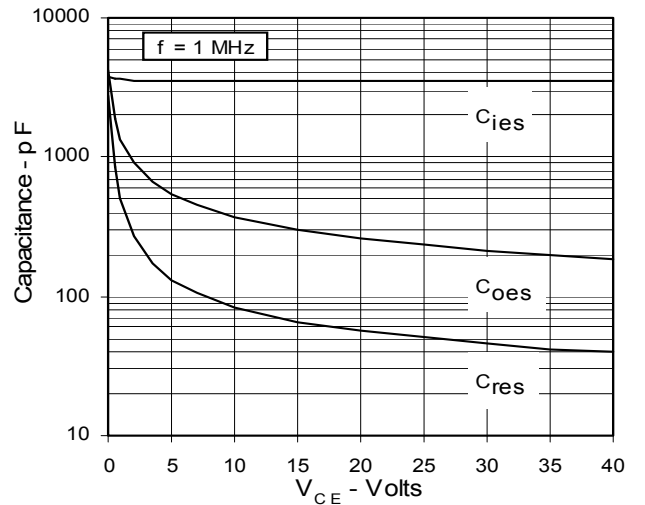
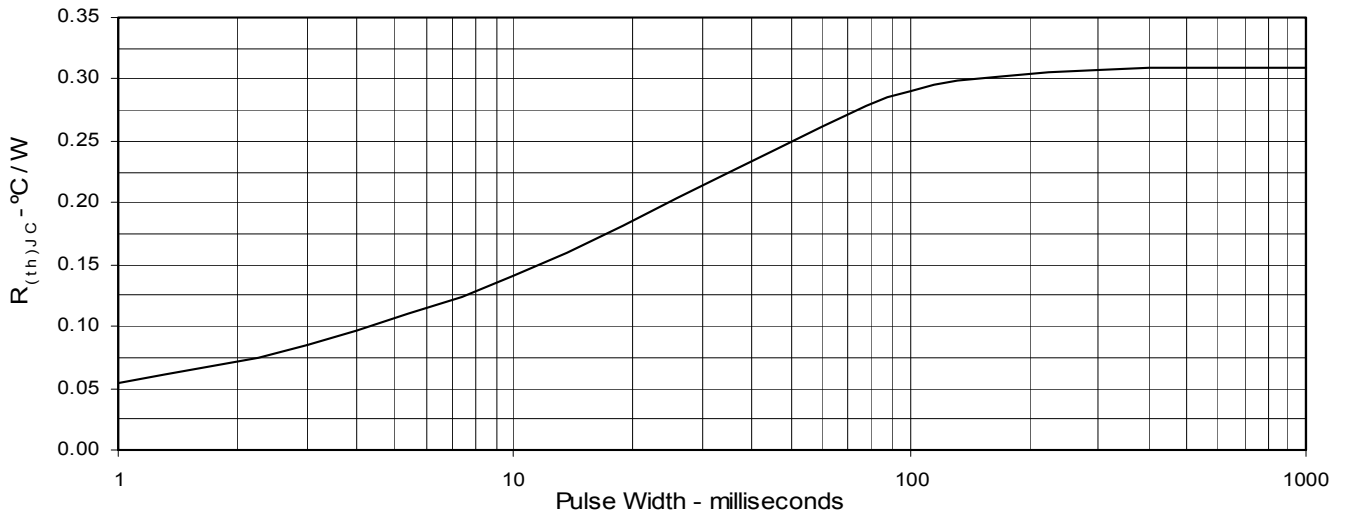


Fig. 17. Maximum Transient Thermal Resistance









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