

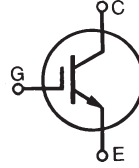
High Voltage IGBT For Capacitor Discharge Applications

IXGH25N250
IXGT25N250
IXGV25N250S

$$V_{CES} = 2500 \text{ V}$$

$$I_{C25} = 60 \text{ A}$$

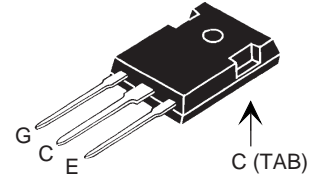
$$V_{CE(sat)} \leq 2.9 \text{ V}$$



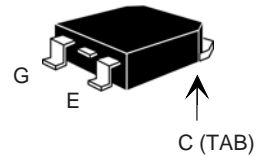
Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	2500	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	2500	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	60	A
I_{C110}	$T_C = 110^\circ\text{C}$	25	A
I_{CM}	$T_C = 25^\circ\text{C}, V_{GE} = 20 \text{ V}, 1 \text{ ms}$	200	A
SSOA (RBSOA)	$V_{GE} = 20 \text{ V}, T_J = 125^\circ\text{C}, R_G = 20 \Omega$ Clamped inductive load @ 1250V	$I_{CM} = 240$	A
P_C	$T_C = 25^\circ\text{C}$	250	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
T_{SOLD}	Plastic body for 10 s	260	$^\circ\text{C}$
M_d	Mounting torque (TO-247)	1.13/10	Nm/lb-in
Weight		TO-247	6 g
		TO-268	4 g

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	2500		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			50 μA 1 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = 25 \text{ A}, V_{GE} = 15 \text{ V}$			2.9 V
	$I_C = 75 \text{ A}$			5.2 V

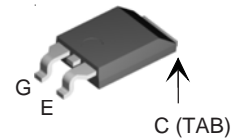
TO-247 (IXGH)



TO-268 (IXGT)



PLUS220SMD (IXGV...S)



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

Features

- High peak current capability
- Low saturation voltage
- MOS Gate turn-on -drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

- Capacitor discharge
- Pulser circuits

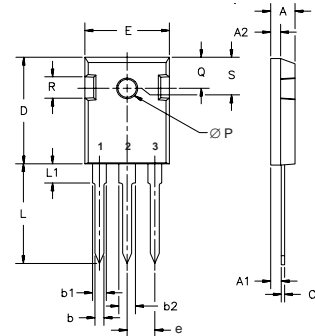
Advantages

- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw, (isolated mounting screw hole)

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$I_C = 50\text{ A}$; $V_{CE} = 10\text{ V}$, Note 1	16	26	S
$I_{C(ON)}$	$V_{GE} = 15\text{ V}$, $V_{CE} = 20\text{ V}$, Note 1		240	A
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		2310	pF
C_{oes}			75	pF
C_{res}			23	pF
Q_g	$I_C = 50\text{ A}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		75	nC
Q_{ge}			15	nC
Q_{gc}			30	nC
$t_{d(on)}$	Resistive load		68	ns
t_{ri}	$I_C = 50\text{ A}$, $V_{GE} = 15\text{ V}$, Note 1		233	ns
$t_{d(off)}$	$V_{CE} = 1250\text{ V}$, $R_G = 5\ \Omega$		209	ns
t_{fi}			200	ns
R_{thJC}			0.5	$^\circ\text{C/W}$
R_{thCS}	(TO-247)	0.25		$^\circ\text{C/W}$

- Notes: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle, $d \leq 2\%$
 2. Additional provisions for lead-to-lead voltage isolation are required at $V_{CE} > 1200\text{ V}$

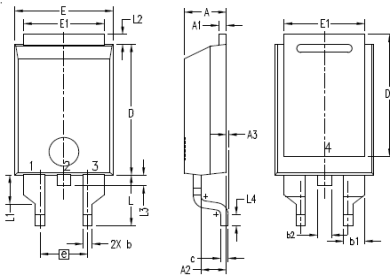
TO-247 (IXGH) Outline



Terminals: 1 - Gate 2 - Drain (Collector)
 3 - Source (Emitter) Tab - Drain (Collector)

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
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

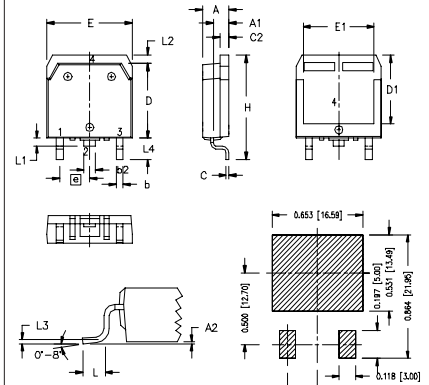
PLUS220SMD (IXGV_S) Outline



1. GATE
 2. DRAIN (COLLECTOR)
 3. SOURCE (EMITTER)
 4. DRAIN (COLLECTOR)

SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.169	.185	4.30	4.70
A ₁	.028	.035	0.70	0.90
A ₂	.098	.118	2.50	3.00
A ₃	.000	.010	0.00	0.25
b	.035	.047	0.90	1.20
b ₁	.080	.095	2.03	2.41
b ₂	.054	.064	1.37	1.63
c	.028	.035	0.70	0.90
D	.551	.591	14.00	15.00
D ₁	.512	.539	13.00	13.70
E	.394	.433	10.00	11.00
E ₁	.331	.346	8.40	8.80
e	.200 BSC		5.08 BSC	
L	.209	.228	5.30	5.80
L ₁	.118	.138	3.00	3.50
L ₂	.035	.051	0.90	1.30
L ₃	.047	.059	1.20	1.50
L ₄	.039	.059	1.00	1.50

TO-268 (IXGT) Outline (D3-Pak)



- 1 - GATE
 2 - DRAIN (COLLECTOR)
 3 - SOURCE (EMITTER)
 4 - DRAIN (COLLECTOR)

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

Ref: IXYS CO 0052 RA

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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IXYS MOSFETs and IGBTs are covered 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
 by one or more of the following U.S. patents: 4,850,072 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 @ 25°C

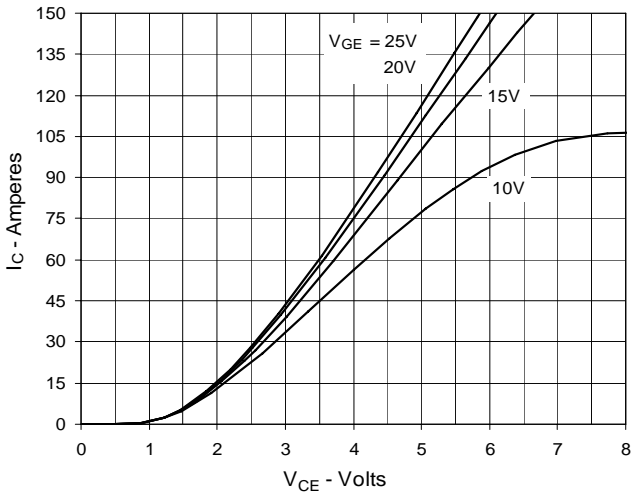


Fig. 2. Extended Output Characteristics @ 25°C

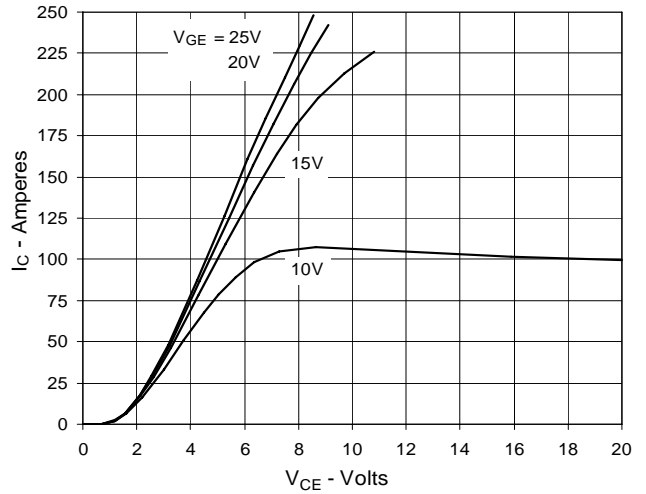


Fig. 3. Output Characteristics @ 125°C

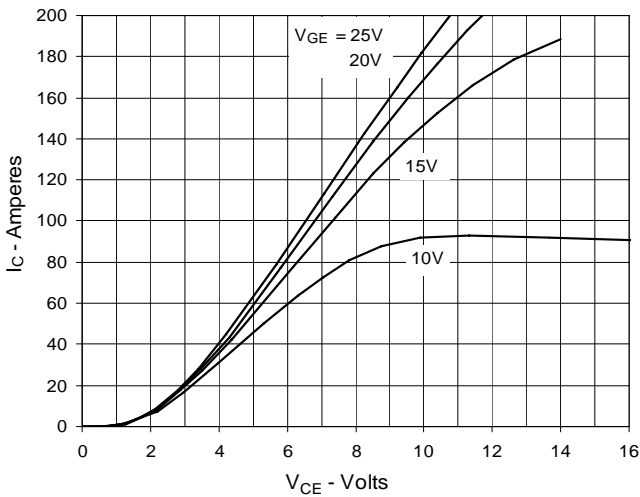


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

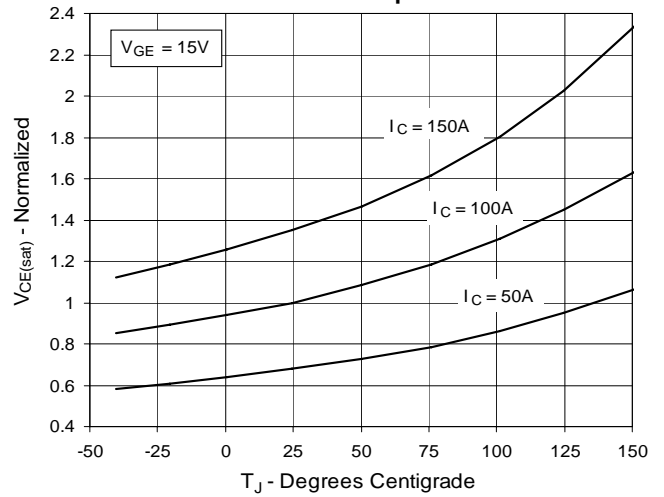


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

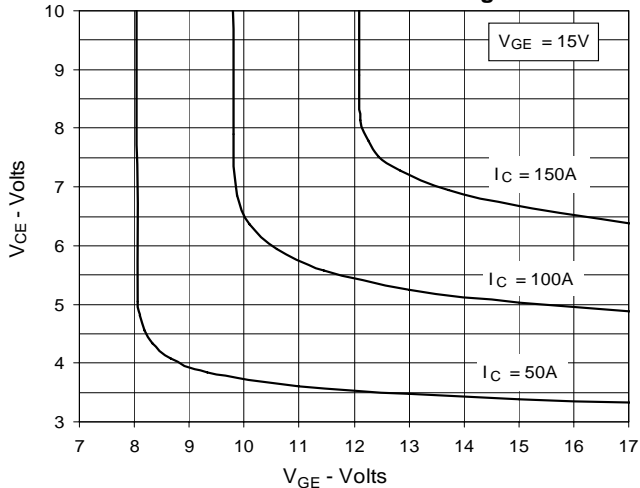


Fig. 6. Input Admittance

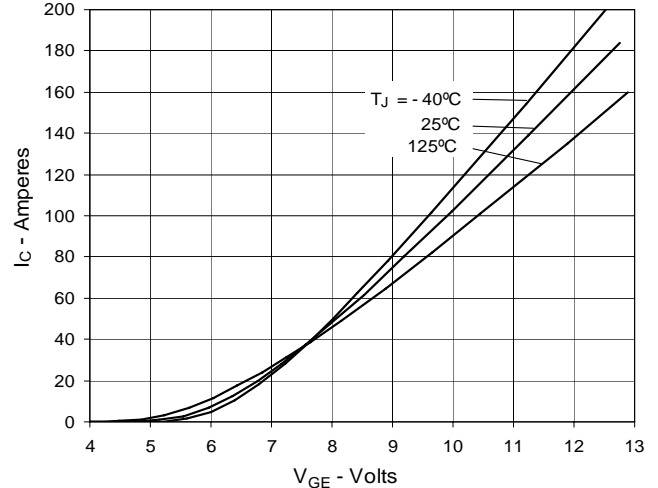


Fig. 7. Transconductance

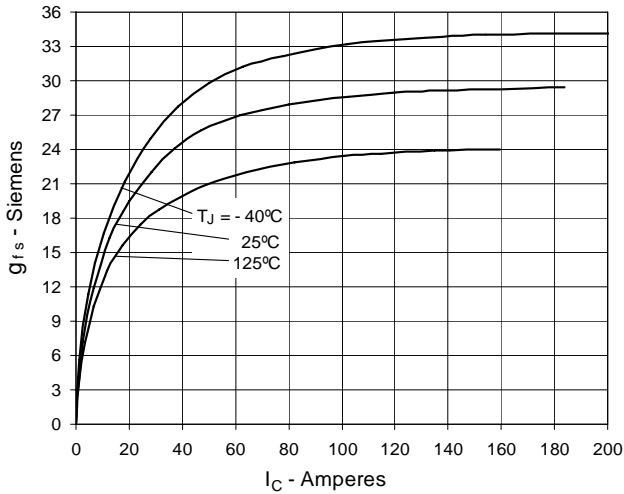


Fig. 8. Resistive Turn-on Rise Time vs. Junction Temperature

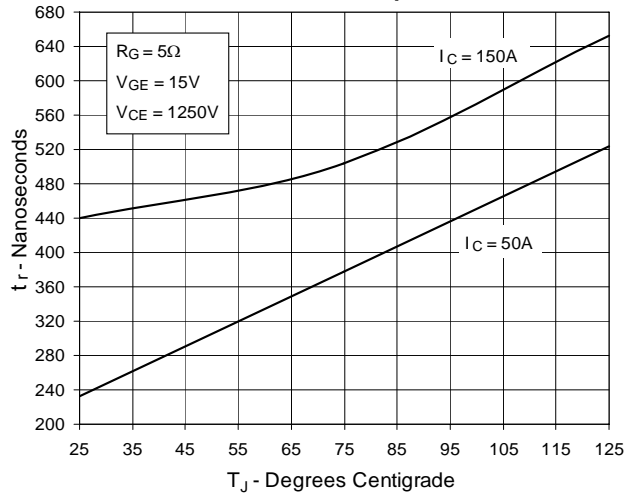


Fig. 9. Resistive Turn-on Rise Time vs. Collector Current

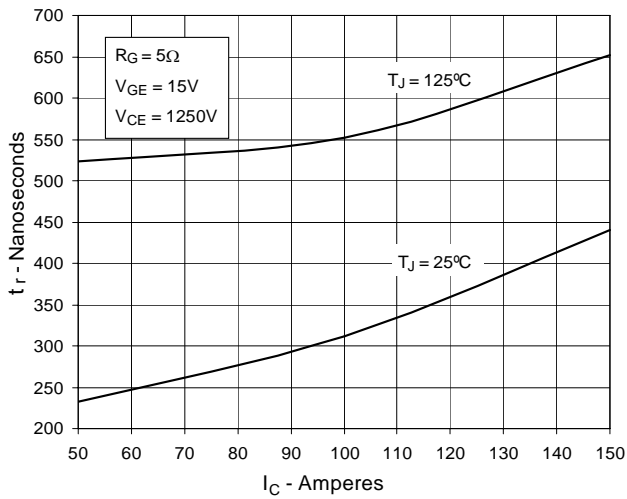


Fig. 10. Resistive Turn-on Switching Times vs. Gate Resistance

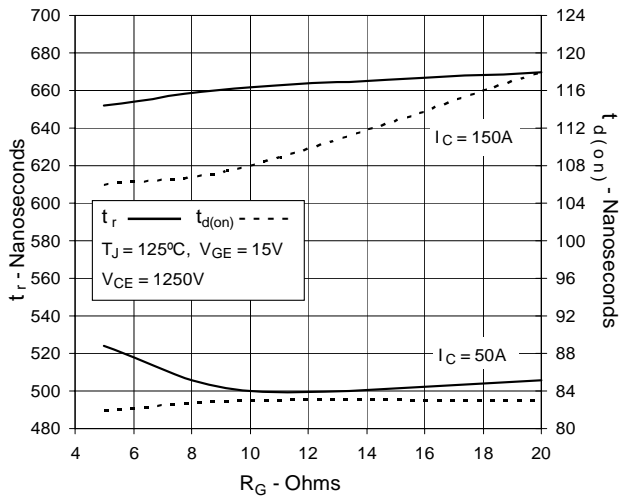


Fig. 11. Resistive Turn-off Switching Times vs. Junction Temperature

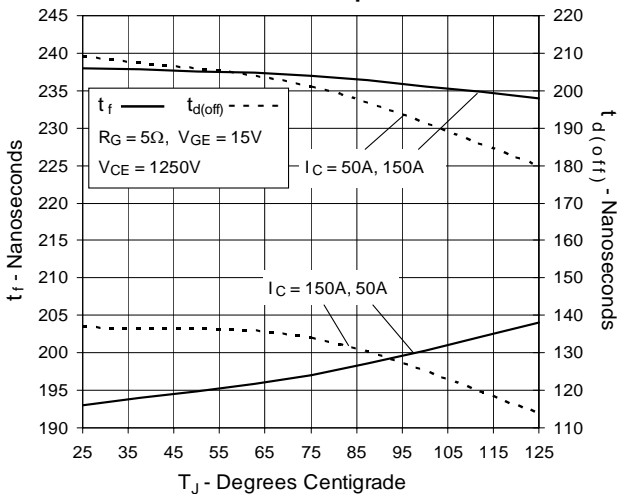


Fig. 12. Resistive Turn-off Switching Times vs. Collector Current

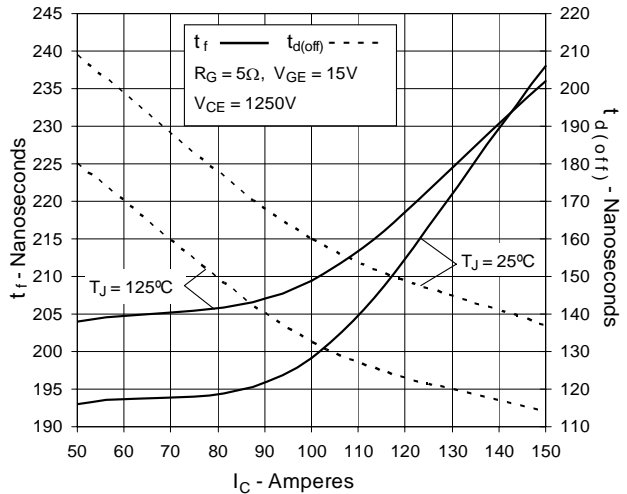


Fig. 13. Resistive Turn-off Switching Times vs. Gate Resistance

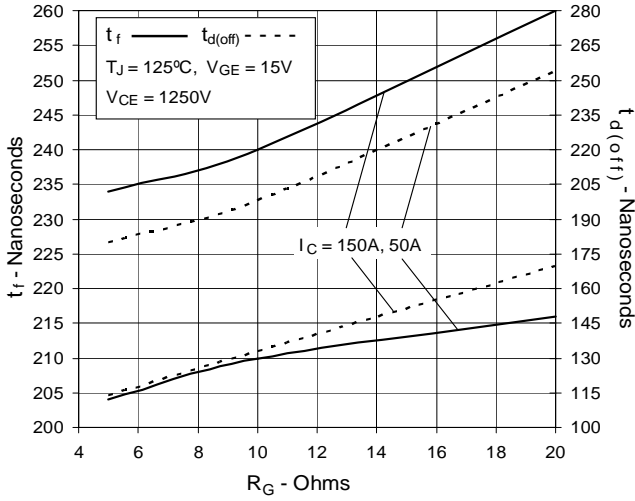


Fig. 14. Gate Charge

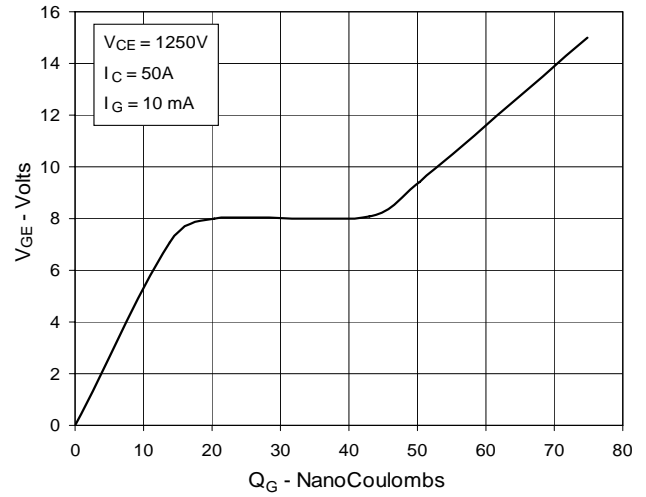


Fig. 15. Reverse-Bias Safe Operating Area

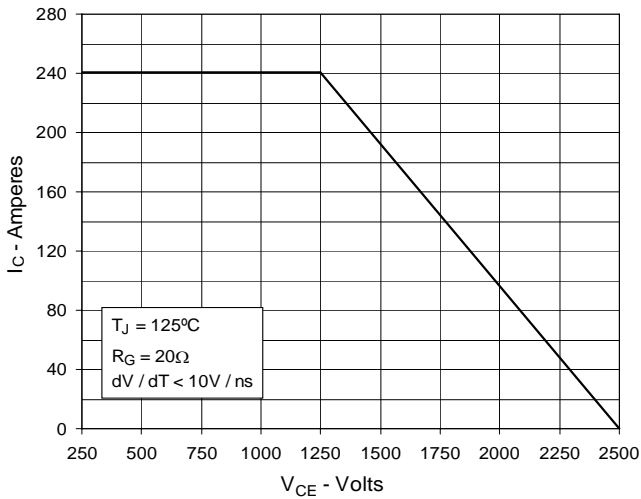


Fig. 16. Capacitance

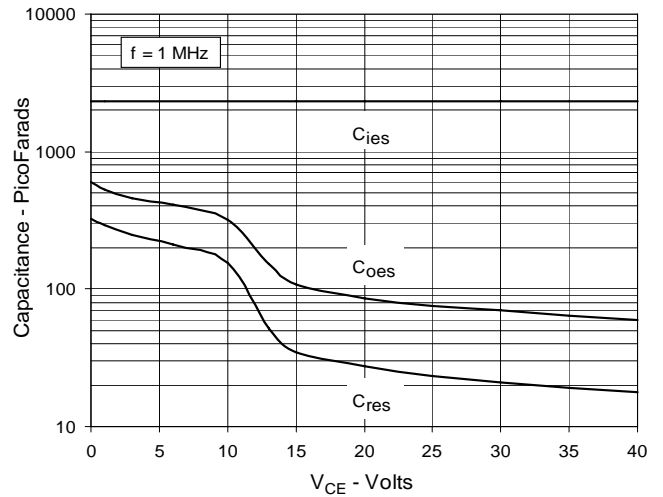
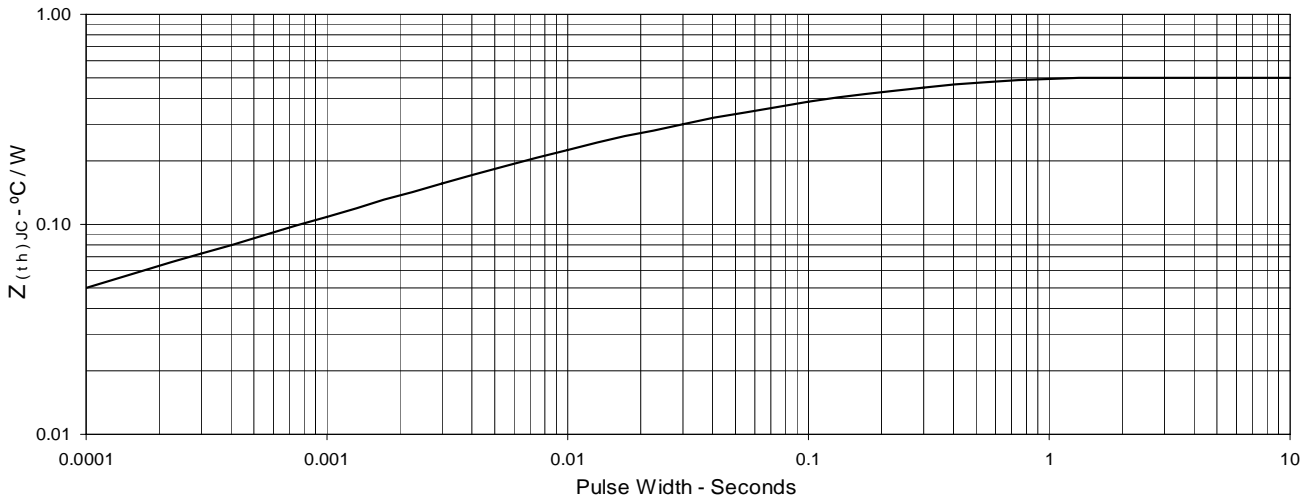


Fig. 17. Maximum Transient Thermal Impedance





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