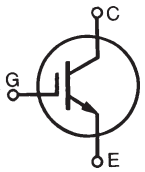
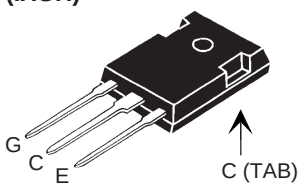
High Voltage IGBT
For Capacitor Discharge Applications

IXGH25N250
IXGT25N250
IXGV25N250S

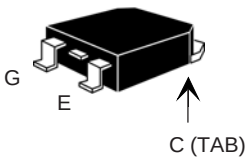
V_{CES} = 2500 V
I_{C25} = 60 A
$V_{CE(sat)}$ ≤ 2.9 V



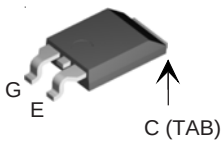
TO-247 (IXGH)



TO-268 (IXGT)



PLUS220SMD (IXGV...S)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	2500	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	2500	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	60	A
I_{C110}	T_C = 110°C	25	A
I_{CM}	T_C = 25°C, V_{GE} = 20 V, 1 ms	200	A
SSOA (RBSOA)	V_{GE} = 20 V, T_J = 125°C, R_G = 20 Ω Clamped inductive load @ 1250V	I_{CM} = 240	A
P_C	T_C = 25°C	250	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°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°C unless otherwise specified) Min.	Typ.	Max.	
BV_{CES}	I_C = 250 μA, V_{GE} = 0 V	2500			V
$V_{GE(th)}$	I_C = 250 μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}			50	μA
	V_{GE} = 0 V, T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V			±100	nA
$V_{CE(sat)}$	I_C = 25 A, V_{GE} = 15 V			2.9	V
	I_C = 75 A			5.2	V

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

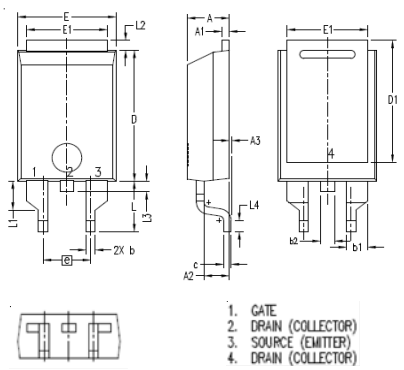
Advantages

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

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

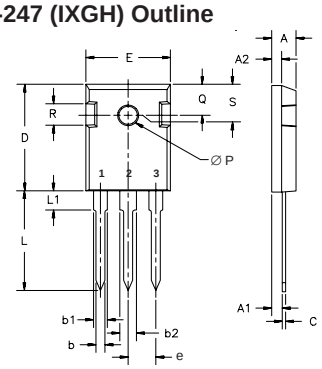
Notes: 1. Pulse test, t ≤ 300 µs, duty cycle, d ≤ 2 %
2. Additional provisions for lead-to-lead voltage isolation are required at V_{CE} > 1200 V

PLUS220SMD (IXGV_S) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.169	.185	4.30	4.70
A1	.028	.035	0.70	0.90
A2	.098	.118	2.50	3.00
A3	.000	.010	0.00	0.25
b	.035	.047	0.90	1.20
b1	.080	.095	2.03	2.41
b2	.054	.064	1.37	1.63
c	.028	.035	0.70	0.90
D	.551	.591	14.00	15.00
D1	.512	.539	13.00	13.70
E	.394	.433	10.00	11.00
E1	.331	.346	8.40	8.80
e	.200BSC		5.08 BSC	
L	.209	.228	5.30	5.80
L1	.118	.138	3.00	3.50
L2	.035	.051	0.90	1.30
L3	.047	.059	1.20	1.50
L4	.039	.059	1.00	1.50

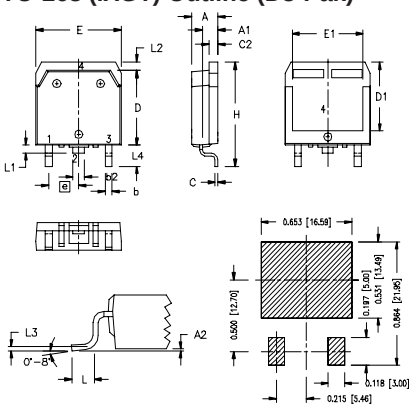
TO-247 (IXGH) Outline



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

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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
∅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 (IXGT) Outline (D3-Pak)



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

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 by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ 25ºC

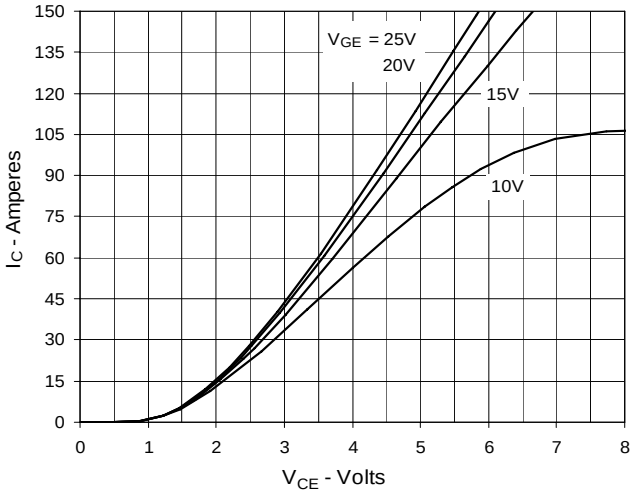

Fig. 2. Extended Output Characteristics @ 25ºC

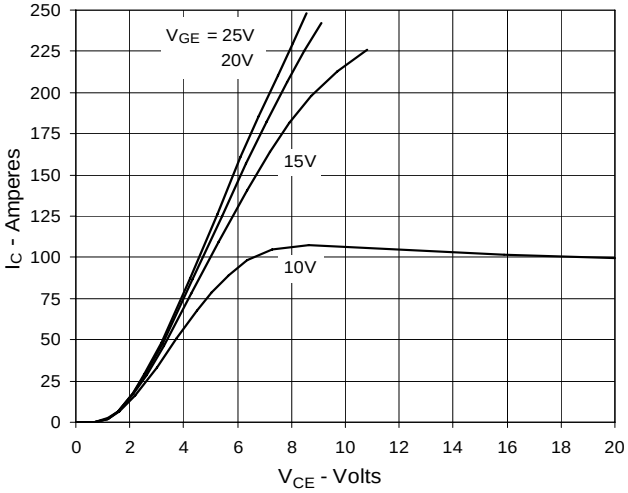

Fig. 3. Output Characteristics @ 125ºC

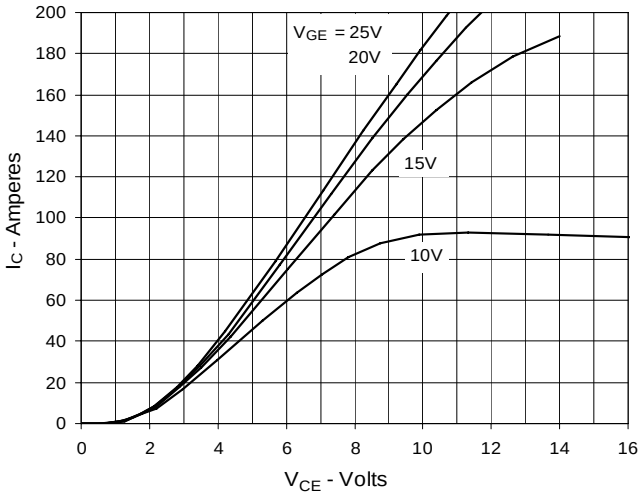

Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

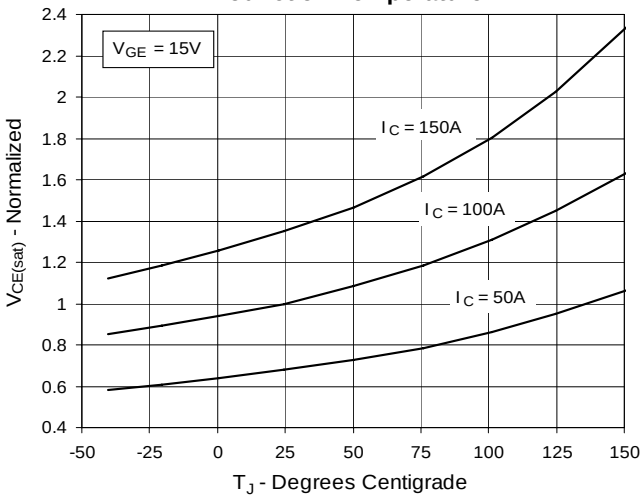

Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

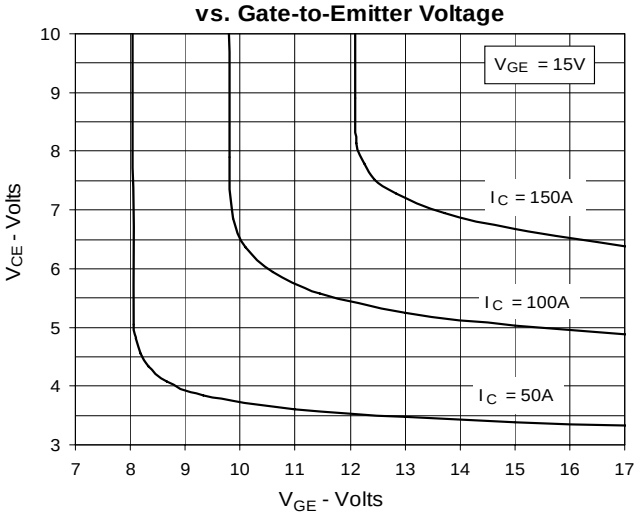

Fig. 6. Input Admittance

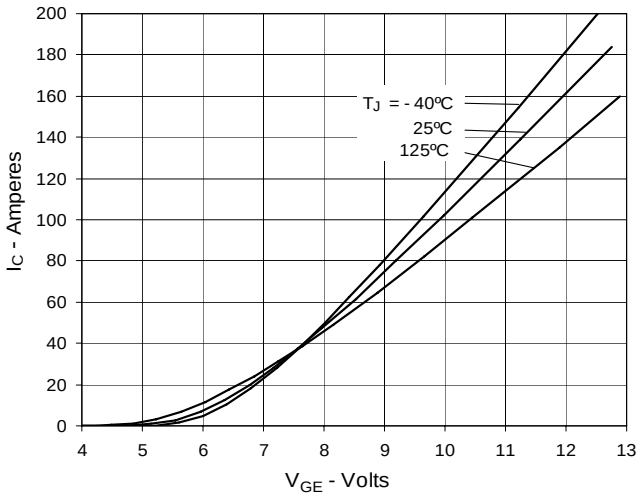

Fig. 7. Transconductance

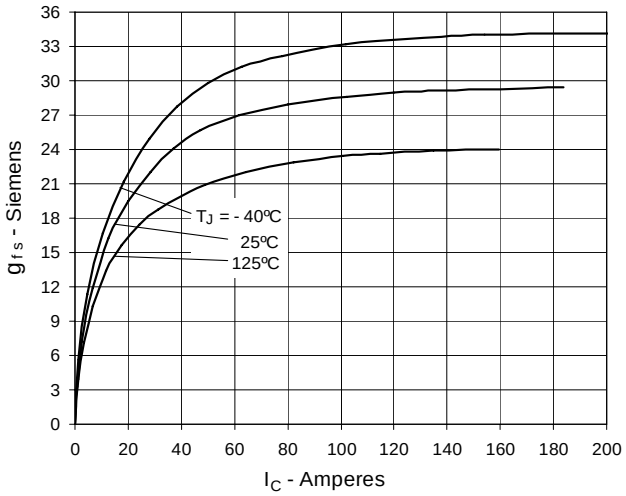

Fig. 8. Resistive Turn-on Rise Time vs. Junction Temperature

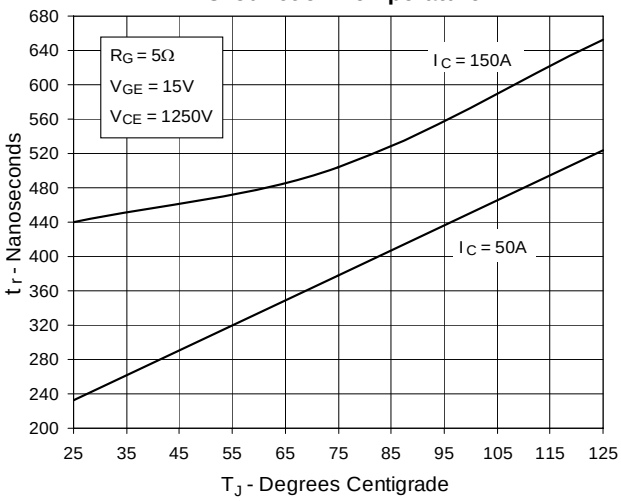

Fig. 9. Resistive Turn-on Rise Time vs. Collector Current

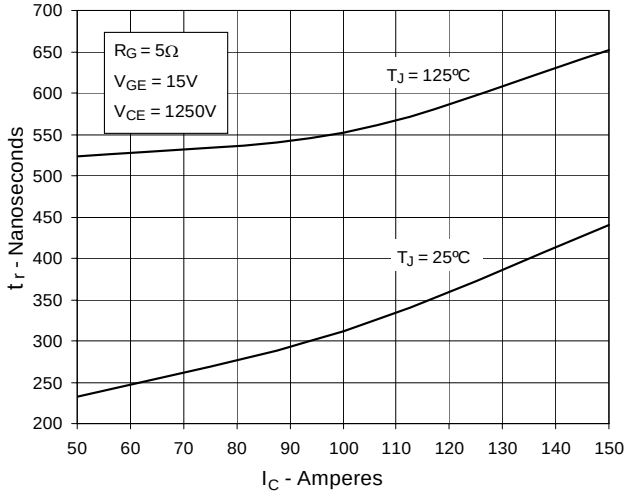

Fig. 10. Resistive Turn-on Switching Times vs. Gate Resistance

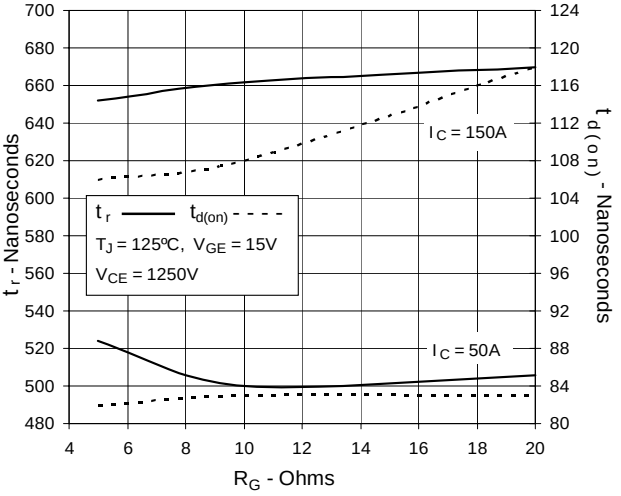

Fig. 11. Resistive Turn-off Switching Times vs. Junction Temperature

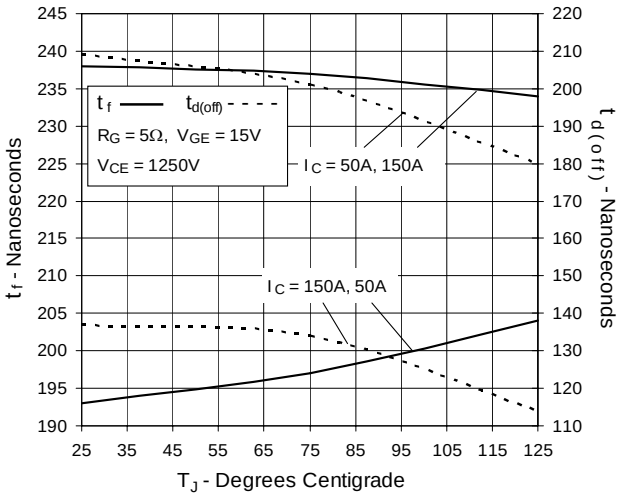

Fig. 12. Resistive Turn-off Switching Times vs. Collector Current

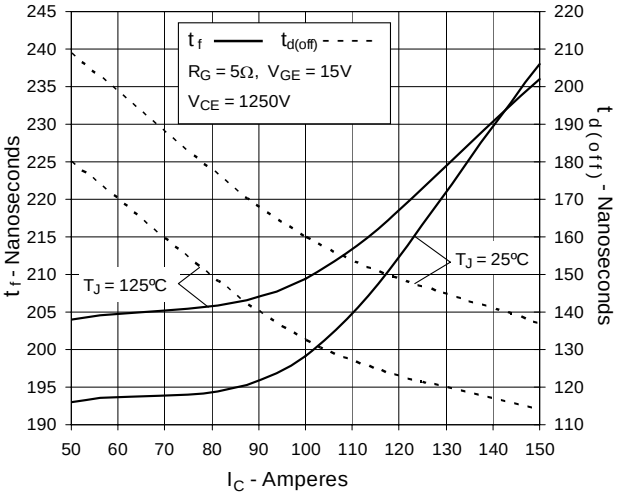

Fig. 13. Resistive Turn-off Switching Times vs. Gate Resistance

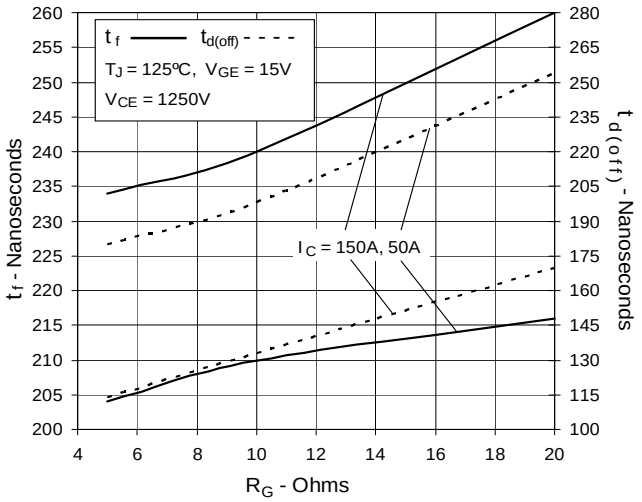

Fig. 14. Gate Charge

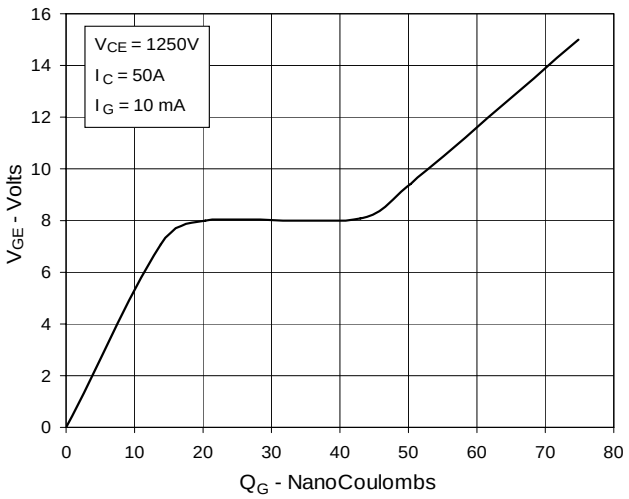

Fig. 15. Reverse-Bias Safe Operating Area

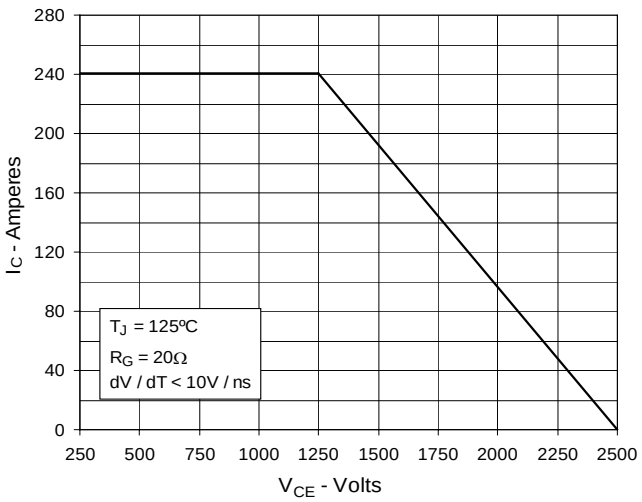

Fig. 16. Capacitance

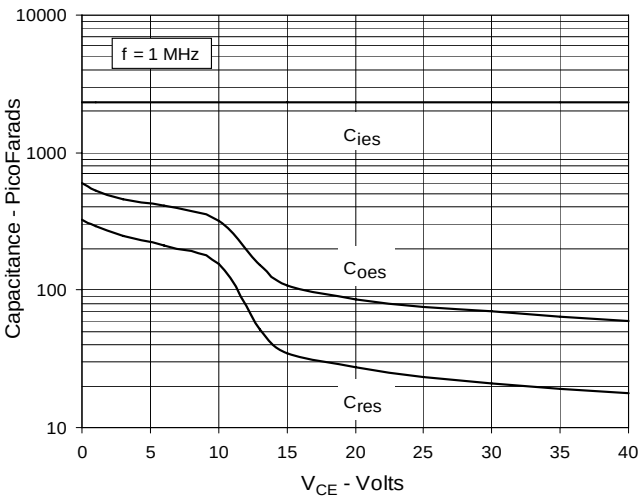

Fig. 17. Maximum Transient Thermal Impedance