IXYS

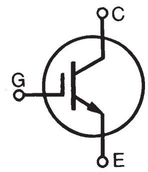
High Voltage IGBT

For Capacitor Discharge Applications

Preliminary Data Sheet

IXGH 25N160
IXGT 25N160

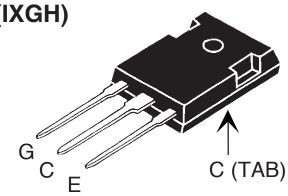
V_{CES} = 1600 V
I_{C25} = 75 A
$V_{CE(sat)}$ = 2.5 V



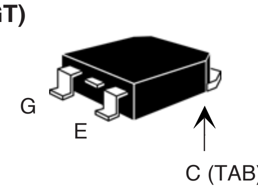
Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	75	A
I_{C110}	T_C = 110°C	25	A
I_{CM}	T_C = 25°C, V_{GE} = 20 V, 1 ms	200	A
SSOA (RBSOA)	V_{GE}= 15 V, T_{VJ} = 125°C, R_G = 20 Ω Clamped inductive load	I_{CM} = 100 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	300	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
Maximum Tab temperature for soldering SMD devices 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		1600			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} V_{GE} = 0 V	 T_J = 125°C			50 1	μA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±30 V				±100	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15 V				2.5	V
	I_C = 100 A, V_{GE} = 20 V				4.7	V

TO-247 (IXGH)



TO-268 (IXGT)



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
- International standard packages
  - JEDEC TO-268 and
  - JEDEC TO-247 AD
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

- Capacitor discharge
- Pulser circuits

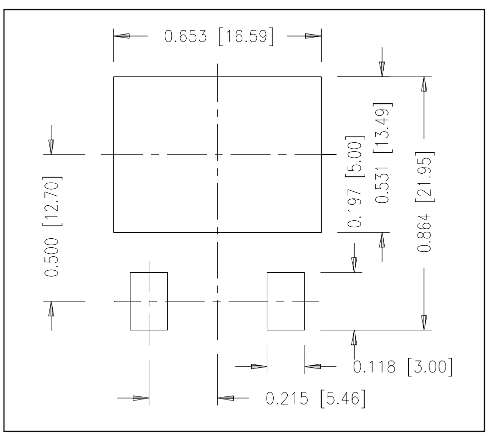
Advantages

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

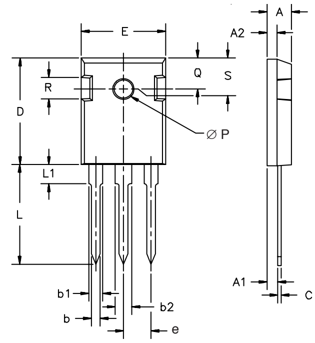
Symbol	Test Conditions	Characteristic Values (T$_J$ = 25°C unless otherwise specified) min.	typ.	max.	
g_{fs}	I_C = 50 A; V_{CE} = 10 V, Note 1	14	21		S
$I_{C(ON)}$	V_{GE} = 15V, V_{CE} = 10V, Note 1		200		A
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		2090		pF
C_{oes}			94		pF
C_{res}			34		pF
Q_g	I_C = 50 A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		84		nC
Q_{ge}			15		nC
Q_{gc}			37		nC
$t_{d(on)}$	**Resistive load**		47		ns
t_{ri}	I_C = 100 A, V_{GE} = 15 V, Note 1		236		ns
$t_{d(off)}$	V_{CE} = 1200 V, R_G = 10 Ω		86		ns
t_{fi}			440		ns
R_{thJC}				0.42	K/W
R_{thCK}	(TO-247)		0.25		K/W

Notes: 1. Pulse test, t < 300 µs, duty cycle < 2 %

TO-268: Minimum Recommended Footprint

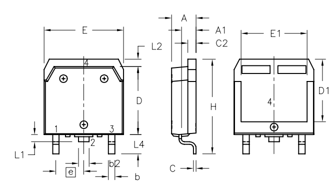


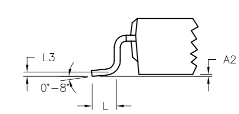
TO-247 AD Outline



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
∅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





Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E_1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

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 subjective pre-production design evaluation. Ixys reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ 25ºC

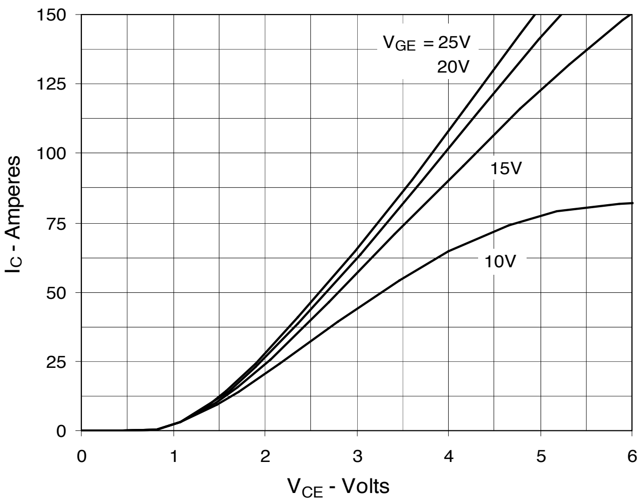


Fig. 2. Exteded Output Characteristics @ 25ºC

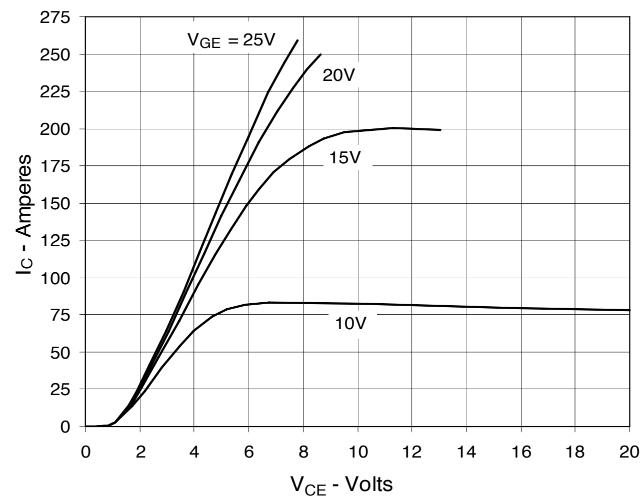


Fig. 3. Output Characteristics @ 125ºC

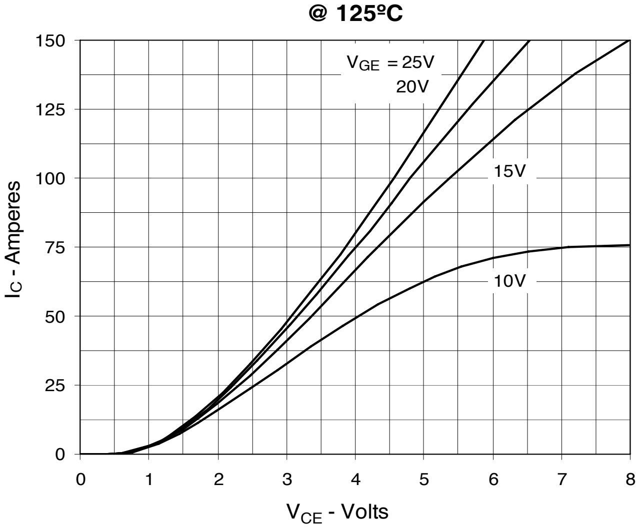


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

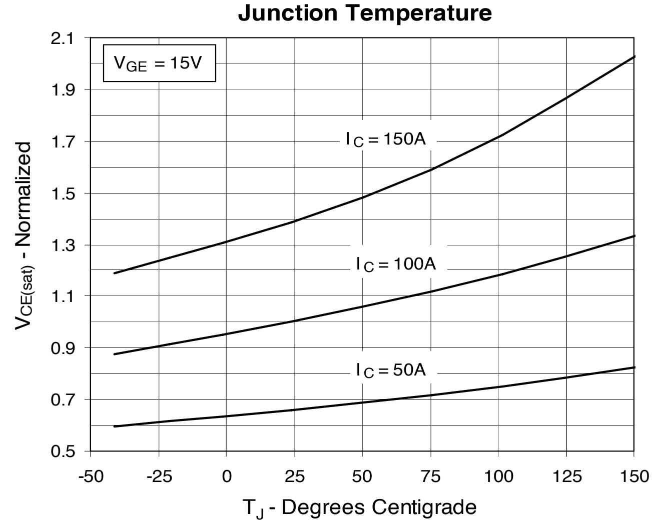


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

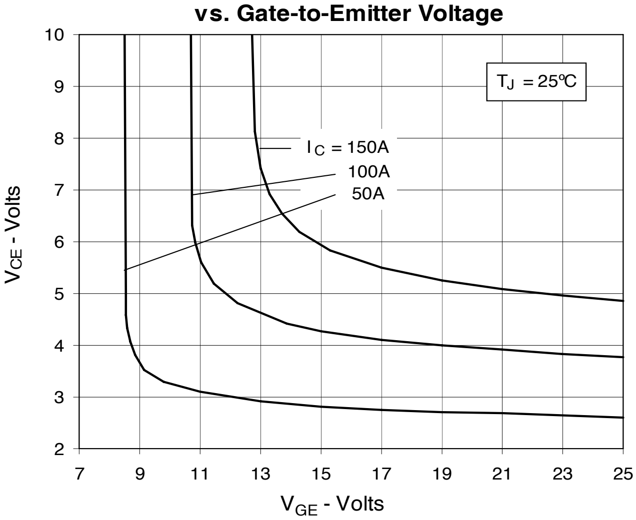


Fig. 6. Input Admittance

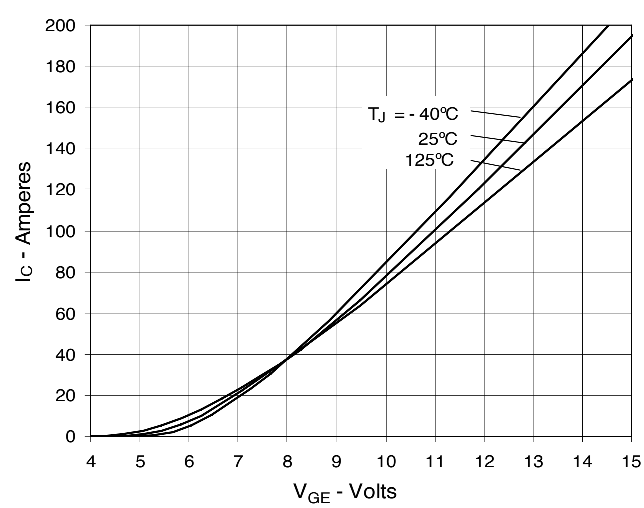


Fig. 7. Transconductance

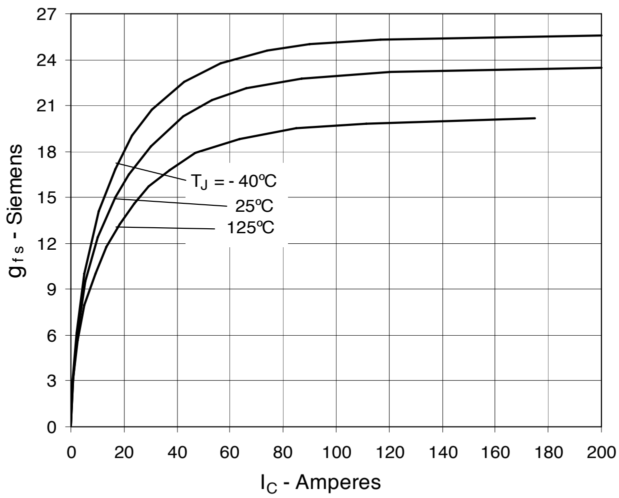


Fig. 8. Resistive Turn-On Rise Time vs. Junction Temperature

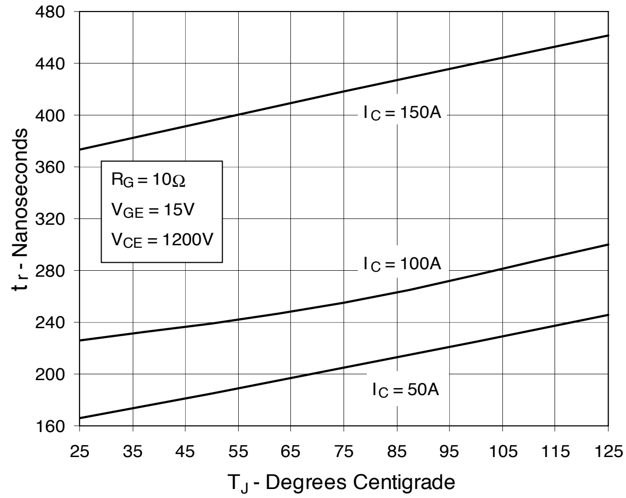


Fig. 9. Resistive Turn-On Rise Time vs. Collector Current

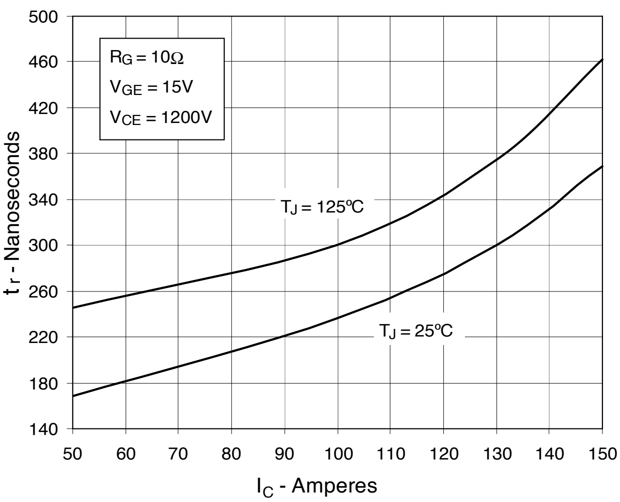


Fig. 10. Resistive Turn-On Switching Times vs. Gate Resistance

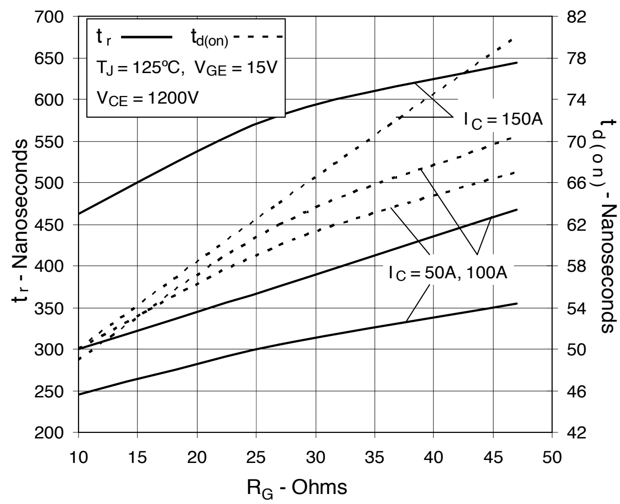


Fig. 11. Resistive Turn-Off Switching Times vs. Junction Temperature

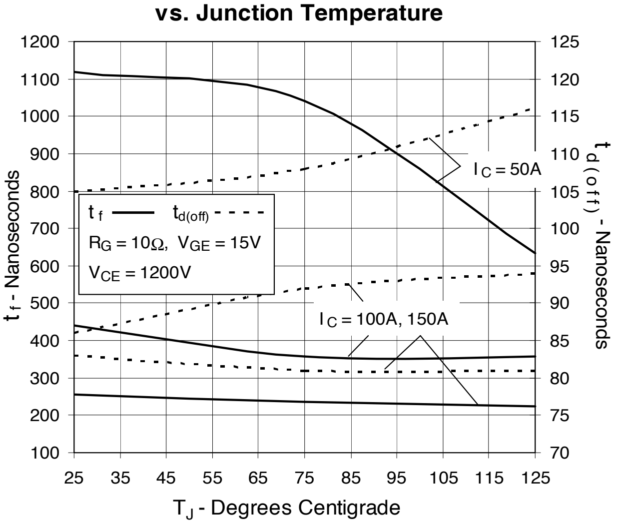


Fig. 12. Resistive Turn-Off Switching Times vs. Collector Current

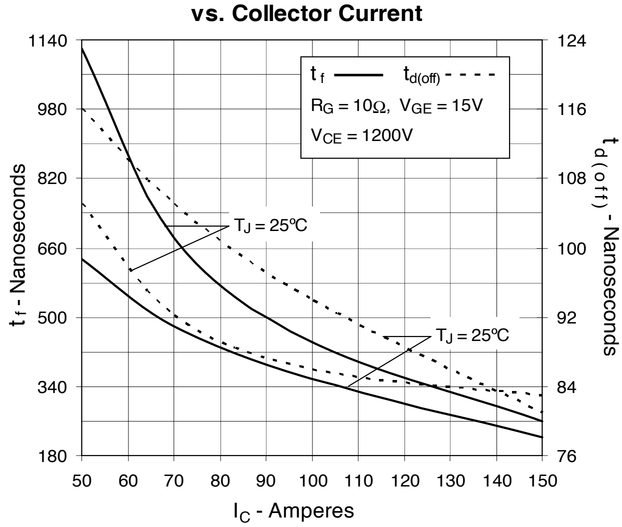


Fig. 13. Resistive Turn-Off Switching Times vs. Gate Resistance

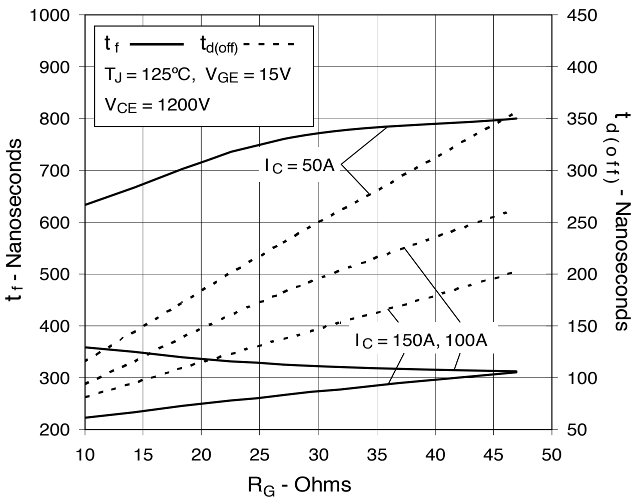


Fig. 14. Gate Charge

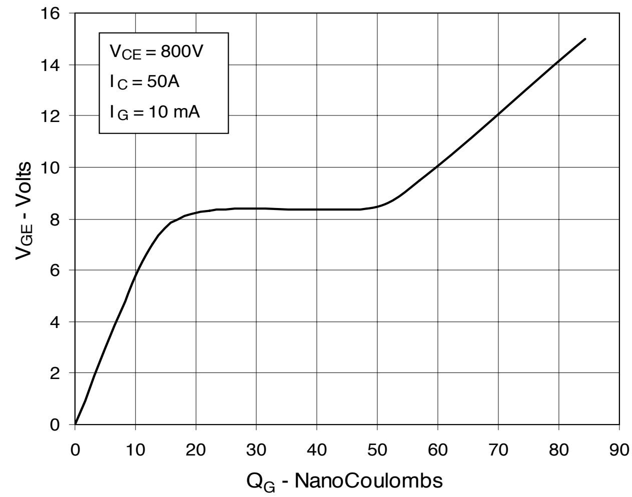


Fig. 15. Reverse-Bias Safe Operating Area

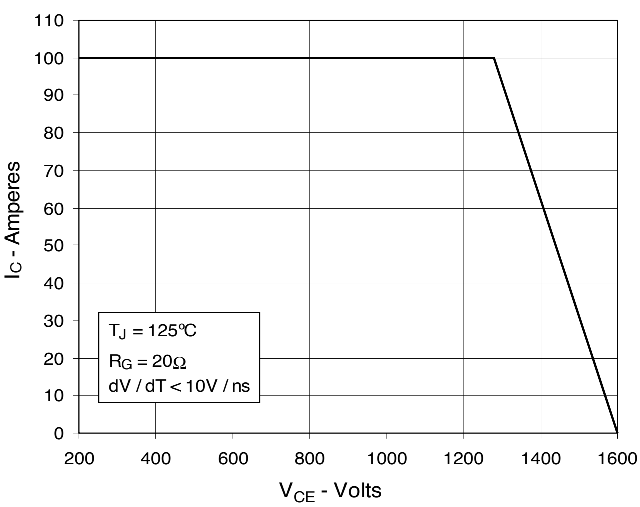


Fig. 16. Capacitance

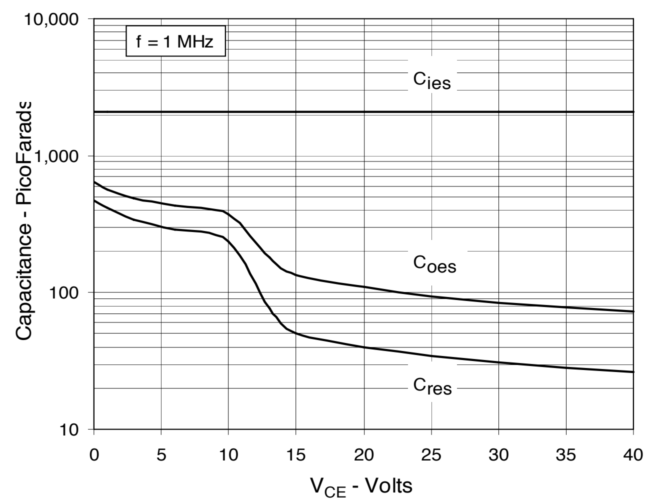


Fig. 17. Maximum Transient Thermal Resistance