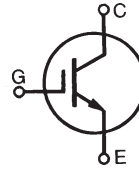


Polar™ IGBT

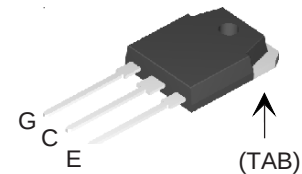
for PDP Applications

IXGQ90N27PB

$$\begin{aligned} V_{CES} &= 270 \text{ V} \\ I_{CP} &= 340 \text{ A} \\ V_{CE(sat)} &\leq 2.1 \text{ V} \end{aligned}$$



TO-3P



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

Features

- International standard package
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- MOS Gate turn-on
 - drive simplicity

Applications

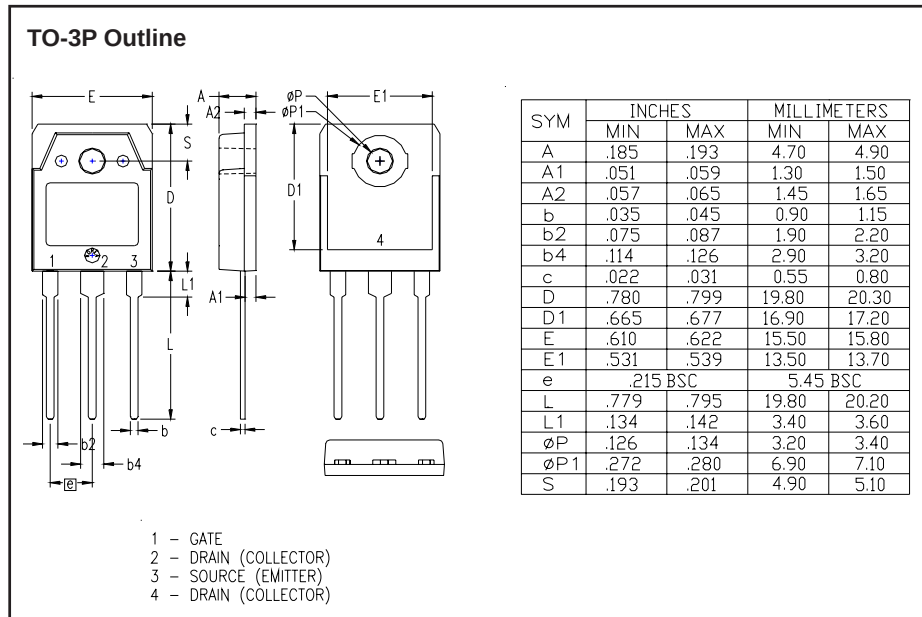
- PDP Screen Drivers

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	270	V
V_{GEM}		± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$, IGBT chip capability	90	A
I_{CPEAK}	$T_J \leq 150^\circ\text{C}$, $t_p \leq 1 \mu\text{s}$, $D \leq 1\%$	340	A
$I_{C(RMS)}$	Lead current limit	75	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_{VJ} = 150^\circ\text{C}$, $R_G = 20 \Omega$ Clamped inductive load, $V_{CE} < 270 \text{ V}$	$I_{CM} = 90$	A
P_C	$T_C = 25^\circ\text{C}$	150	W
T_J		$-55 \dots +150$	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		$-55 \dots +150$	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
T_{SOLD}	Maximum plastic body temperature for 10 S	260	$^\circ\text{C}$
M_d	Mounting torque	1.3/10	Nm/lb.in.
Weight		5.5	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{GE(th)}$	$I_C = 1 \text{ mA}$, $V_{CE} = V_{GE}$	3.0		5.5 V
I_{CES}	$V_{CE} = 270 \text{ V}$			1 μA
	$V_{GE} = 0 \text{ V}$, $T_J = 125^\circ\text{C}$			200 μA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$V_{GE} = 15 \text{ V}$, $I_C = 50 \text{ A}$	1.3		2.1 V
	Note 1, $T_J = 125^\circ\text{C}$	1.3		V
	$I_C = 100 \text{ A}$	1.67		V
	$T_J = 125^\circ\text{C}$	1.80		V

Symbol	Test Conditions	Characteristic Values		
	($T_J = 25^\circ\text{C}$ unless otherwise specified)	Min.	Typ.	Max.
g_{fs}	$I_C = 45\text{ A}$, $V_{CE} = 10\text{ V}$, Note 1	30	48	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		2750	pF
C_{oes}			180	pF
C_{res}			48	pF
Q_g	$I_C = 45\text{ A}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		79	nC
Q_{ge}			16	nC
Q_{gc}			29	nC
$t_{d(on)}$	Resistive load, $T_J = 25^\circ\text{C}$ $I_C = 50\text{ A}$, $V_{GE} = 15\text{ V}$ $V_{CE} = 200\text{ V}$, $R_G = 5\ \Omega$		21	ns
t_{ri}			43	ns
$t_{d(off)}$			82	ns
t_{fi}			170	350 ns
$t_{d(on)}$	Resistive load, $T_J = 125^\circ\text{C}$ $I_C = 50\text{ A}$, $V_{GE} = 15\text{ V}$ $V_{CE} = 200\text{ V}$, $R_G = 5\ \Omega$		21	ns
t_{ri}			68	ns
$t_{d(off)}$			88	ns
t_{fi}			340	ns
R_{thJC}				0.833 K/W
R_{thCS}		0.25		K/W

Note 1: Pulse test, $t < 300\ \mu\text{s}$, duty cycle $< 2\%$



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.

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

IXYS MOSFETs and IGBTs are covered by 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
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 6,710,405B2 6,759,692
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

Fig. 1. Output Characteristics
@ 25°C

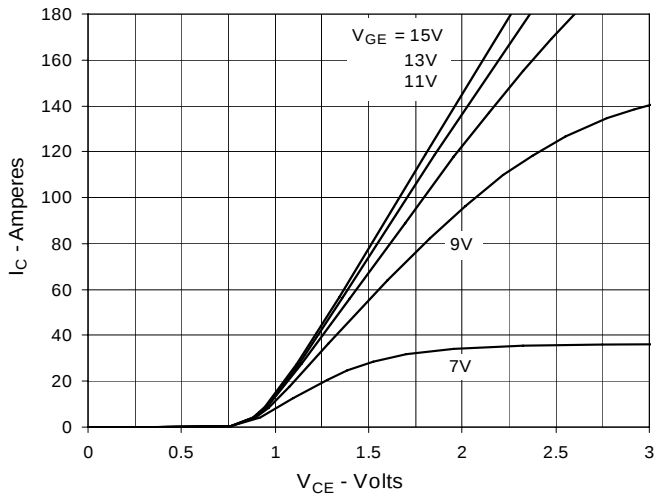


Fig. 2. Extended Output Characteristics
@ 25°C

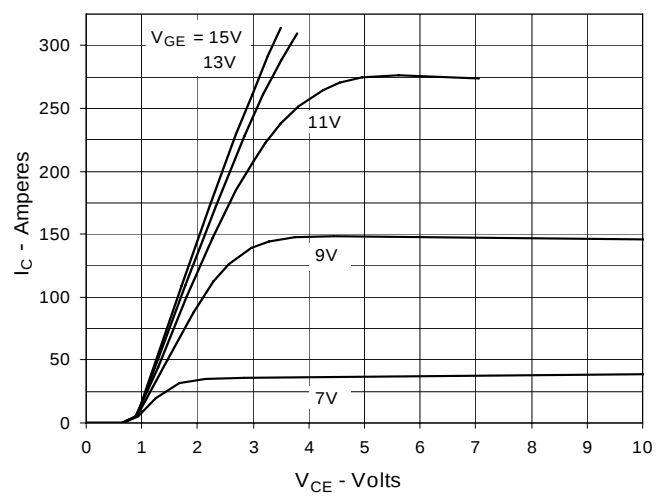


Fig. 3. Output Characteristics
@ 125°C

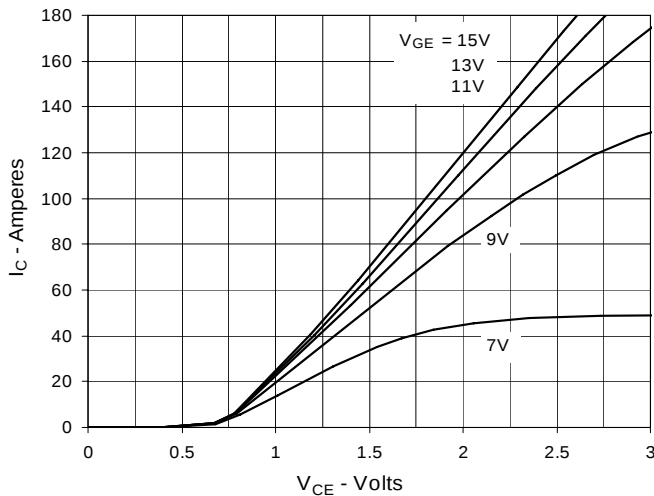


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

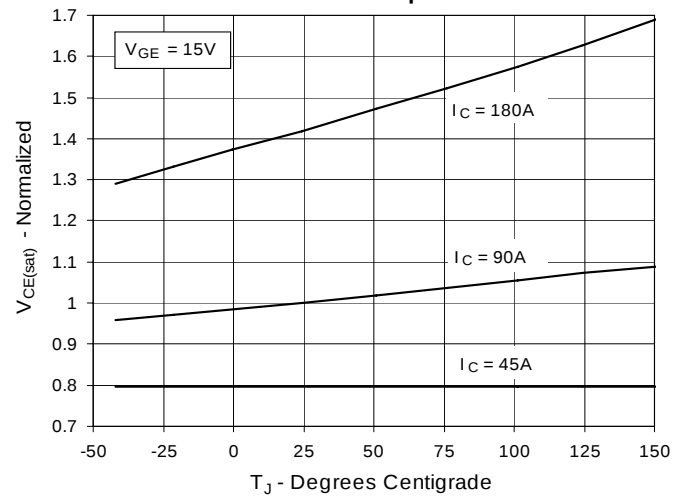


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

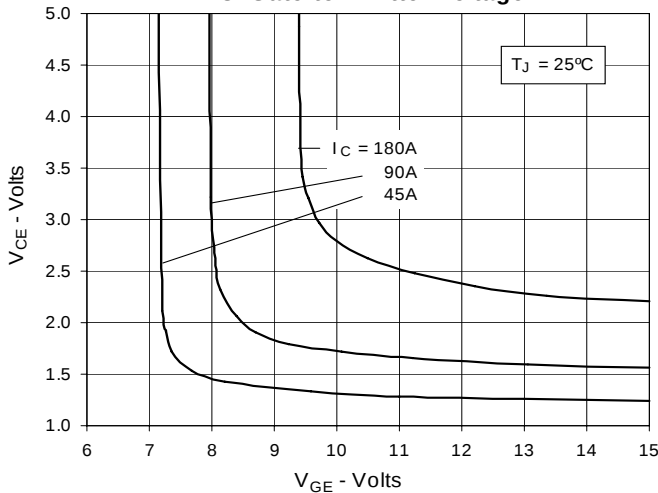


Fig. 6. Input Admittance

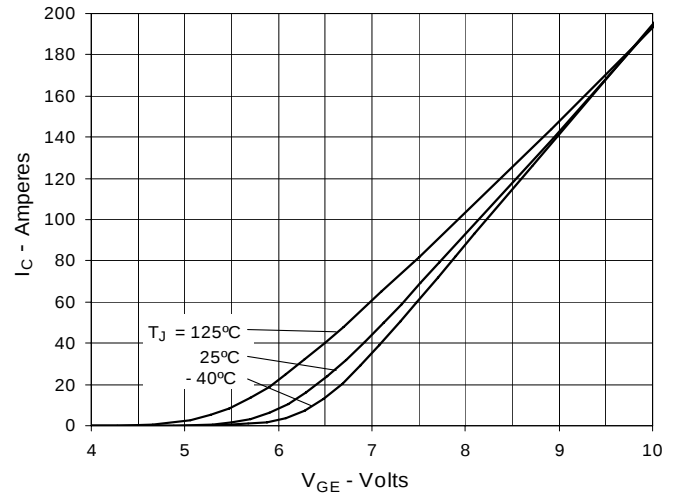


Fig. 7. Transconductance

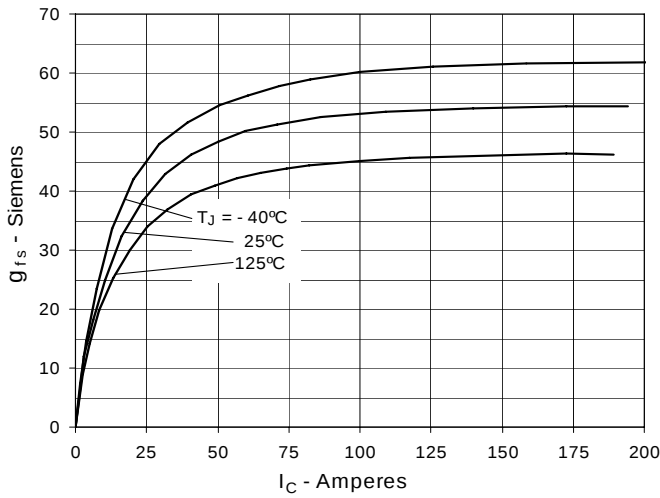


Fig. 8. Resistive Turn-On Rise Time vs. Junction Temperature

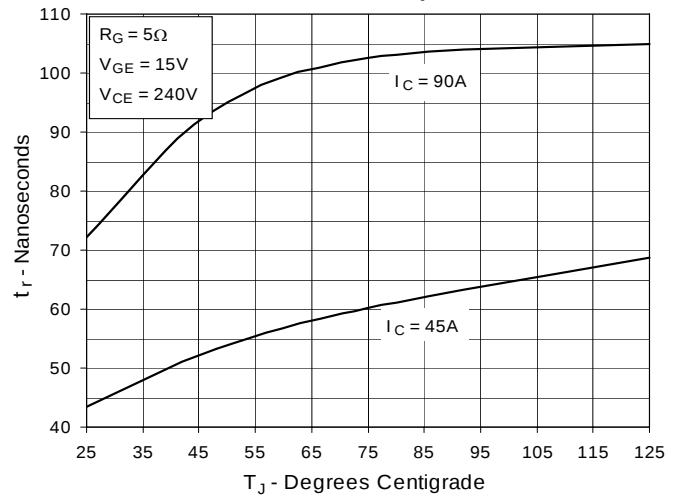


Fig. 9. Resistive Turn-On Rise Time vs. Collector Current

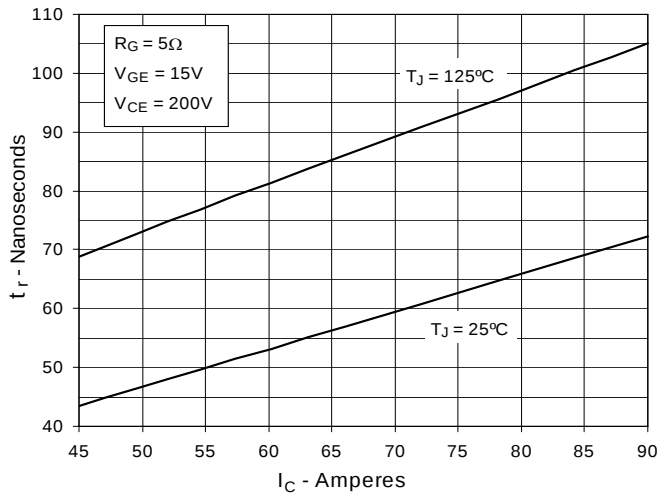


Fig. 10. Resistive Turn-On Switching Times vs. Gate Resistance

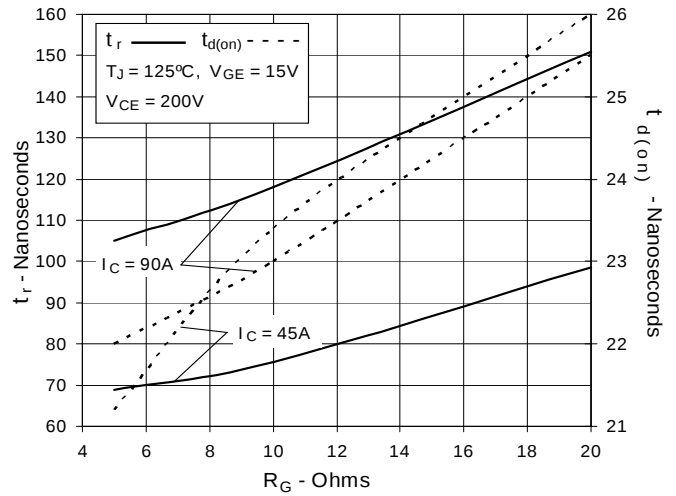


Fig. 11. Resistive Turn-Off Switching Times vs. Junction Temperature

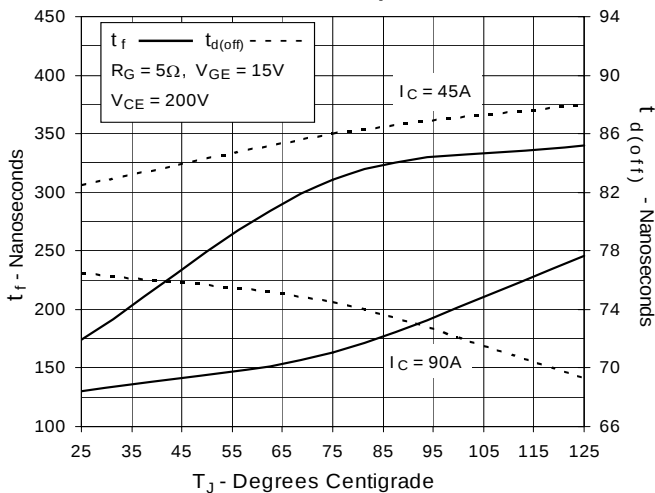


Fig. 12. Resistive Turn-Off Switching Times vs. Collector Current

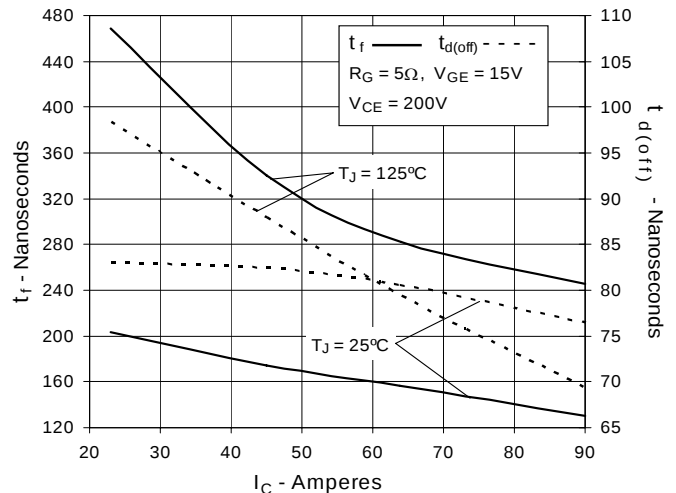


Fig. 13. Resistive Turn-Off Switching Times vs. Gate Resistance

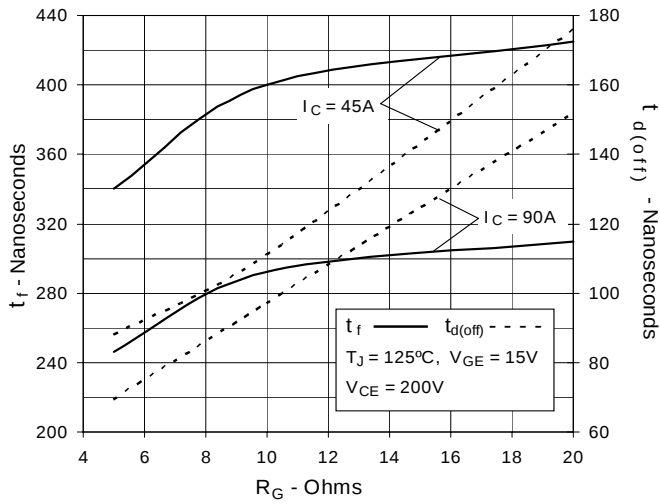


Fig. 14. Gate Charge

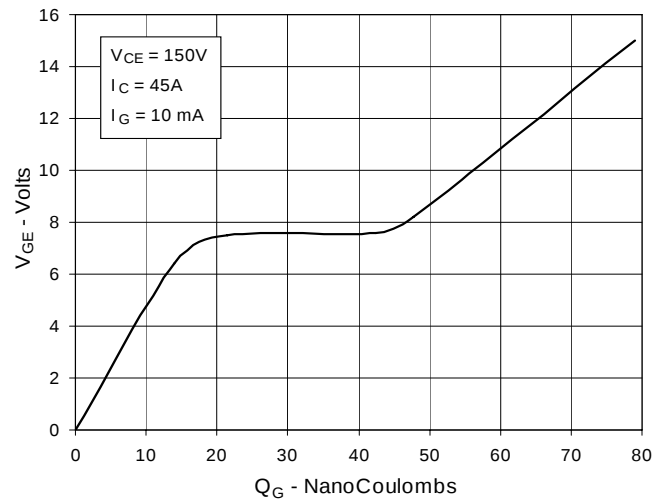


Fig. 15. Reverse-Bias Safe Operating Area

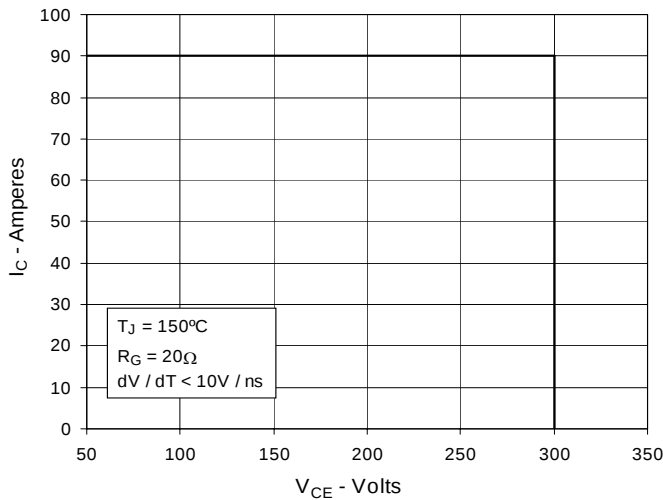


Fig. 16. Capacitance

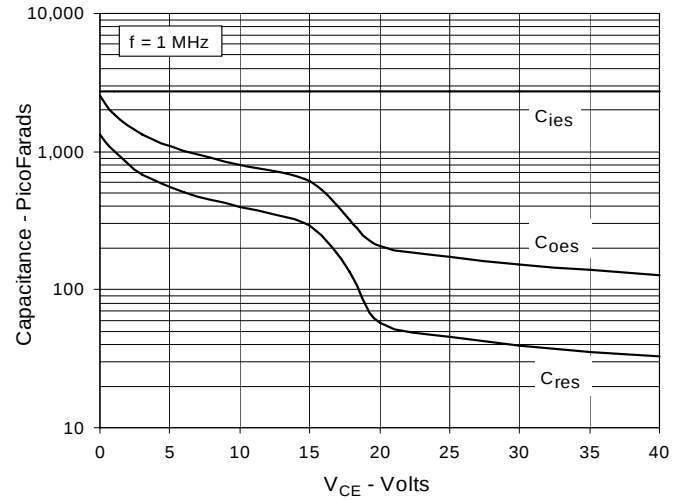


Fig. 17. Maximum Transient Thermal Resistance

