

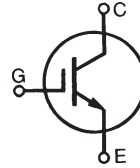
IGBT

Optimized for
switching up to 5KHz

IXGA 12N120A2
IXGP 12N120A2

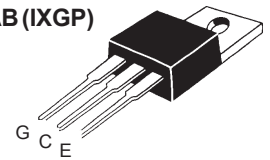
$V_{CES} = 1200\text{ V}$
 $I_{C25} = 24\text{ A}$
 $V_{CE(sat)} = 3.0\text{ V}$

Preliminary data sheet

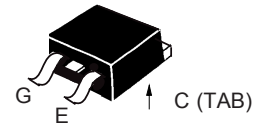


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1\text{ M}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	24	A
I_{C90}	$T_C = 90^\circ\text{C}$	12	A
I_{CM}	$T_C = 25^\circ\text{C}, 1\text{ ms}$	48	A
SSOA (RBSOA)	$V_{GE} = 15\text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 100\ \Omega$ Clamped inductive load	$I_{CM} = 24$ @ $0.8 V_{CES}$	A
P_C	$T_C = 25^\circ\text{C}$	75	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 with screw M3 Mounting torque with screw M3.5	0.45/4 Nm/lb.in. 0.55/5 Nm/lb.in.	
Weight	TO-220	4	g
	TO-263	2	g

TO-220AB (IXGP)



TO-263 AA (IXGA)



Features

- International standard packages
JEDEC TO-220AB and TO-263AA
- Low $V_{CE(sat)}$
- for minimum on-state conduction losses
- MOS Gate turn-on
- drive simplicity

Applications

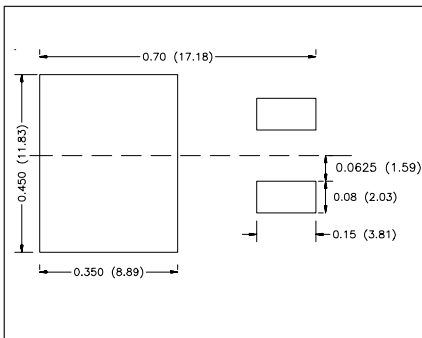
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies
- Capacitor discharge

Advantages

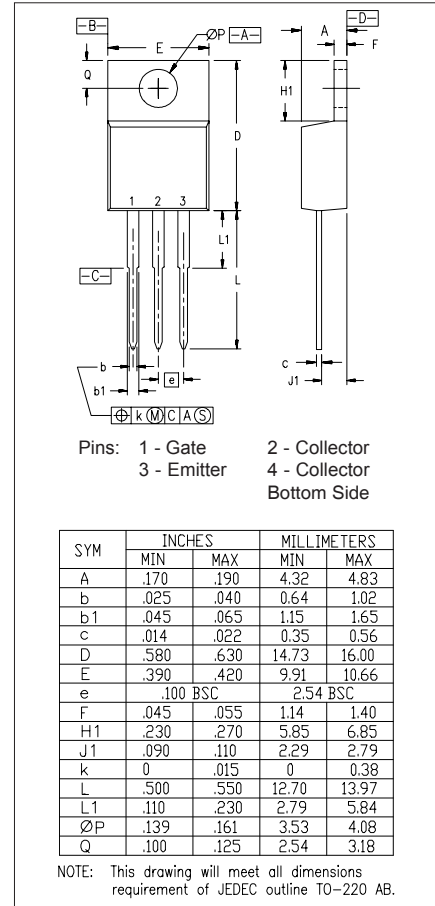
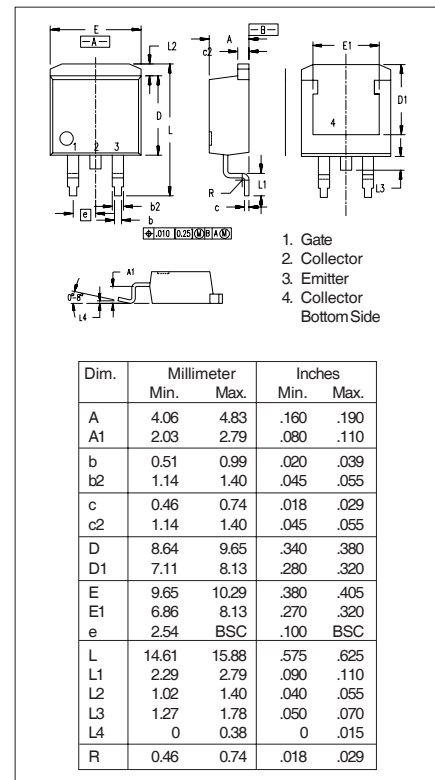
- Easy to mount with one screw
- Reduces assembly time and cost
- High power density

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250\ \mu\text{A}, V_{GE} = 0\text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 250\ \mu\text{A}, V_{CE} = V_{GE}$	2.5		V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0\text{ V}$	$T_J = 25^\circ\text{C}$		25 μA
		$T_J = 125^\circ\text{C}$		250 μA
I_{GES}	$V_{CE} = 0\text{ V}, V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15\text{ V}$	2.4	3.0	V

Symbol	Test Conditions	Characteristic Values			
		Min.	Typ.	Max.	
g_{fs}	$I_C = I_{C90}, V_{CE} = 10 V$ Pulse test, $t \leq 300 \mu s$, duty cycle $\leq 2 \%$	4.0	7.8	S	
$I_{C(on)}$	$V_{GE} = 10 V, V_{CE} = 10 V$		35	A	
C_{ies}	$V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz$		530	pF	
C_{oes}			30	pF	
C_{res}			4	pF	
Q_g	$I_C = I_{C90}, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}$		24	nC	
Q_{ge}			5.5	nC	
Q_{gc}			8.8	nC	
$t_{d(on)}$	Inductive load, $T_J = 25^\circ C$ $I_C = I_{C90}, V_{GE} = 15 V$ $V_{CE} = 960 V, R_G = R_{off} = 100 \Omega$ Remarks: Switching times may increase for $V_{CE} (Clamp) > 0.8 V_{CES}$, higher T_J or increased R_G		15	ns	
t_{ri}			30	ns	
$t_{d(off)}$			680	1000	ns
t_{fi}			650	1000	ns
E_{off}			5.4	9.0	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ C$ $I_C = I_{C90}, V_{GE} = 15 V$ $V_{CE} = 960 V, R_G = R_{off} = 100 \Omega$ Remarks: Switching times may increase for $V_{CE} (Clamp) > 0.8 V_{CES}$, higher T_J or increased R_G		15	ns	
t_{ri}			30	ns	
E_{on}			0.5	mJ	
$t_{d(off)}$			700	ns	
t_{fi}			1050	ns	
E_{off}		7.7	mJ		
R_{thJC}	TO-220			1.66	KW
R_{thCK}			0.5		KW



Min. Recommended Footprint
(Dimensions in inches and mm)

TO-220 AB Dimensions

TO-263 AA Outline


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:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123B1	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	

Fig. 1. Output Characteristics
@ 25 °C

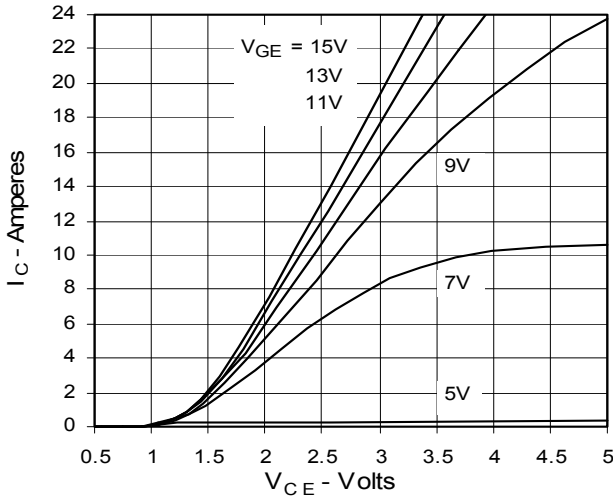


Fig. 2. Extended Output Characteristics
@ 25 °C

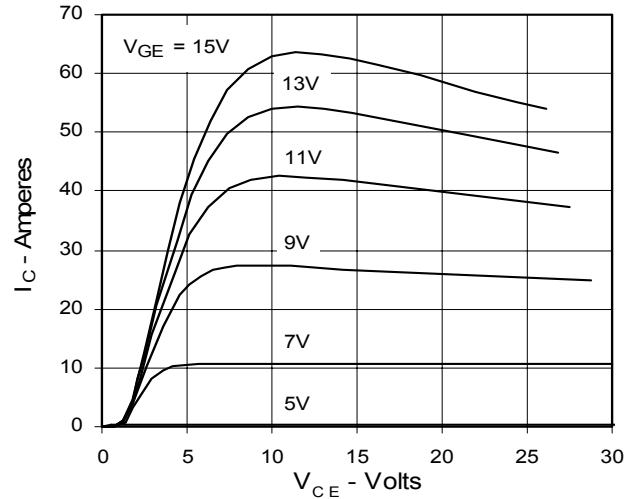


Fig. 3. Output Characteristics
@ 125 °C

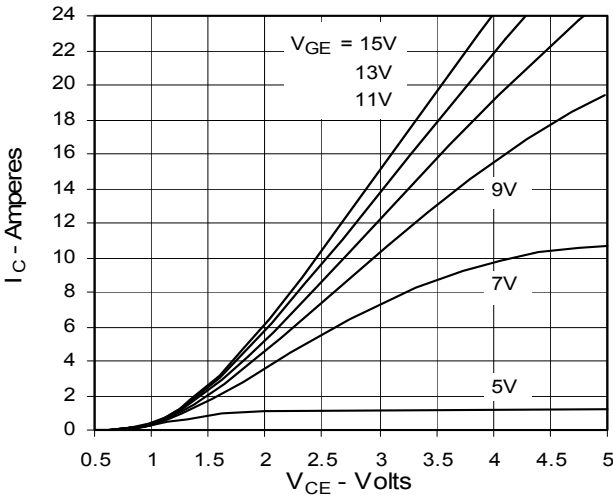


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

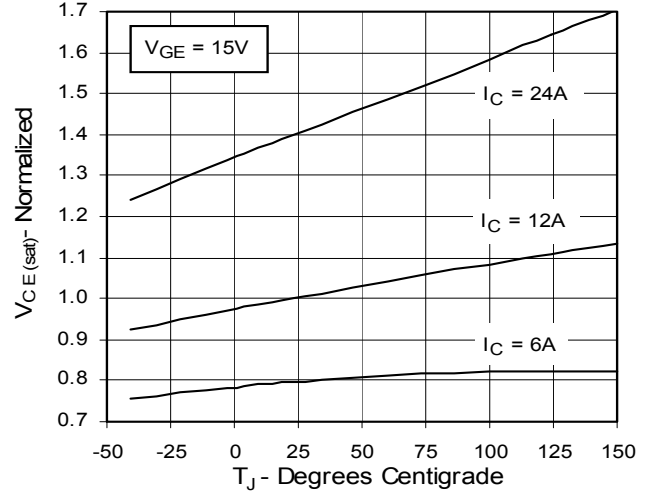


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

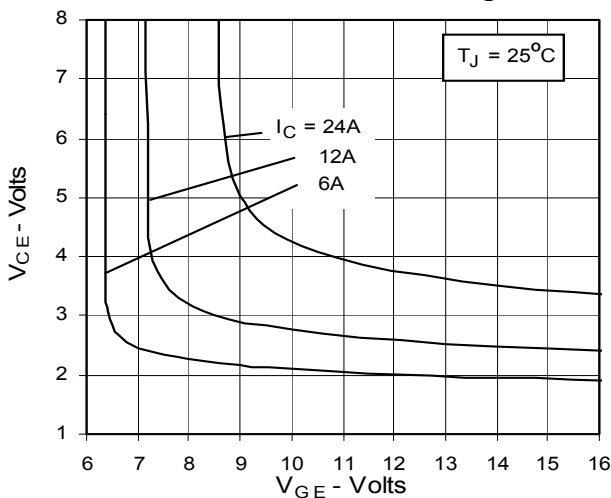


Fig. 6. Input Admittance

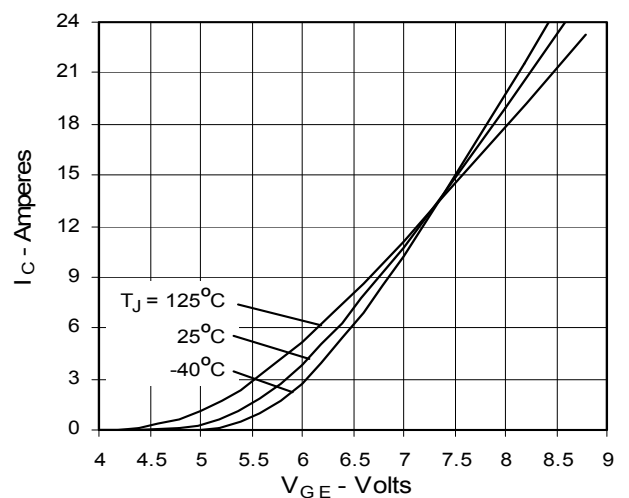


Fig. 7. Transconductance

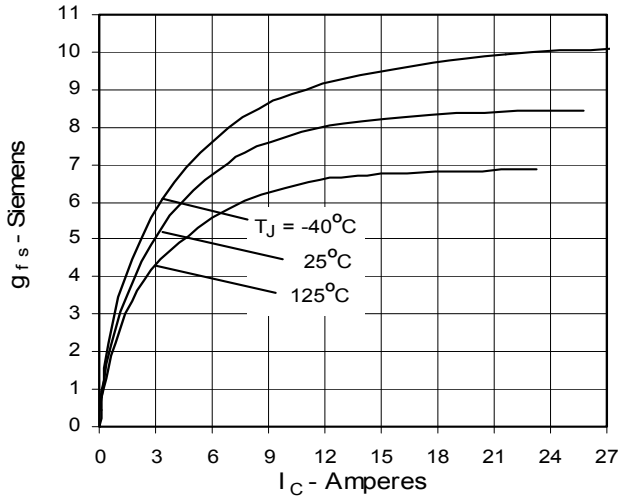


Fig. 8. Dependence of Turn-off Energy Loss on R_G

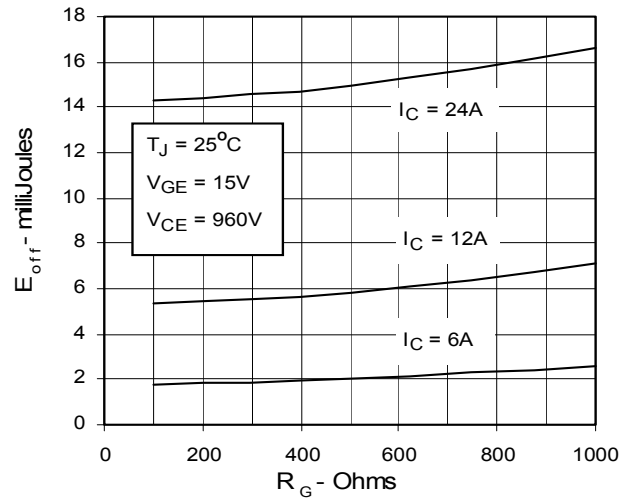


Fig. 9. Dependence of Turn-Off Energy Loss on I_C

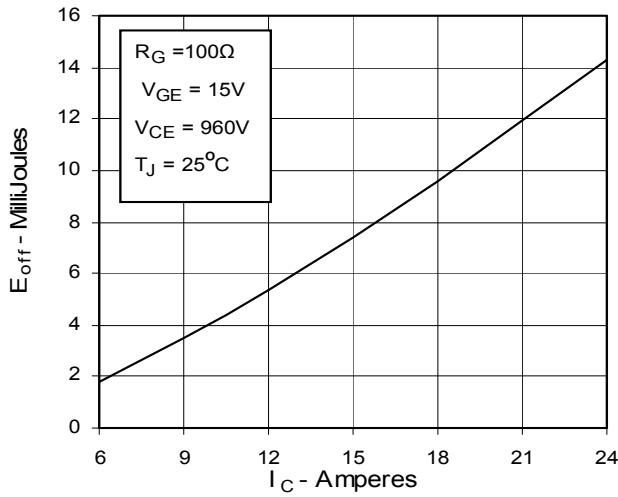


Fig. 10. Dependence of Turn-off Delay Time on R_G

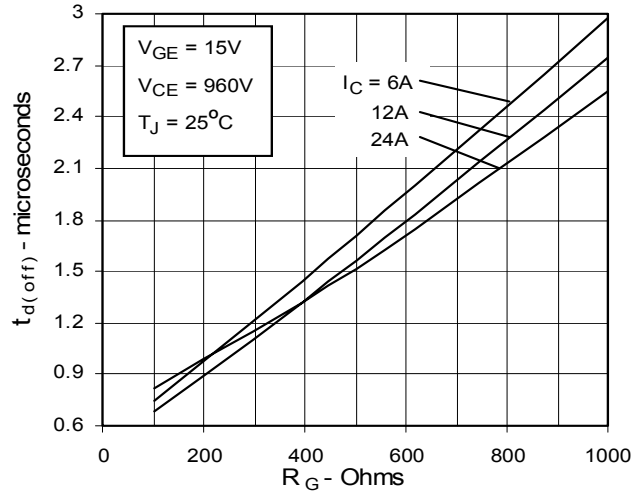


Fig. 11. Dependence of Turn-off Current Fall Time on R_G

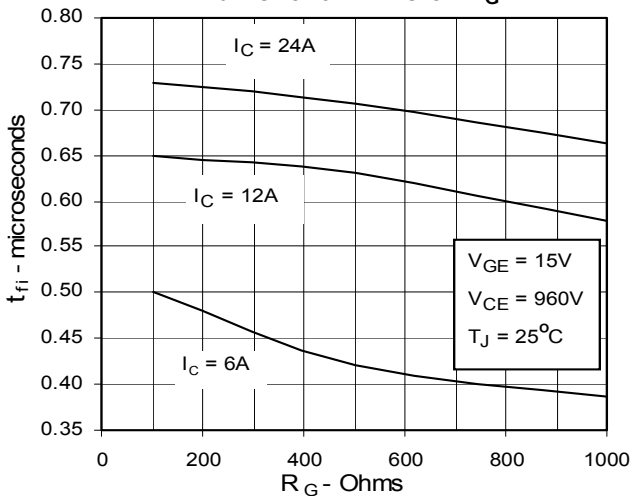


Fig. 12. Dependence of Turn-off Switching Time on I_C

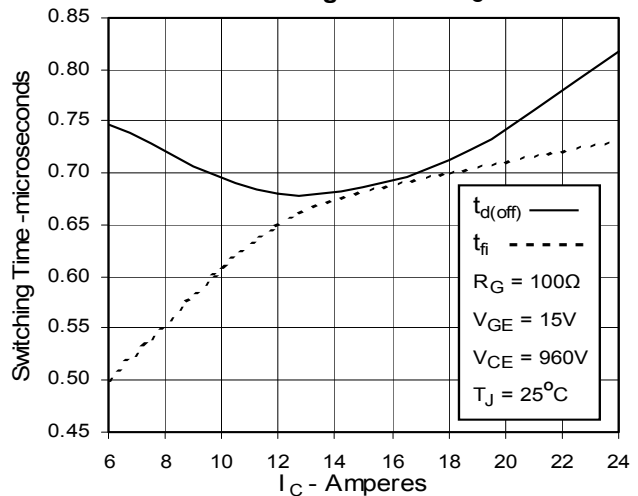


Fig. 13. Gate Charge

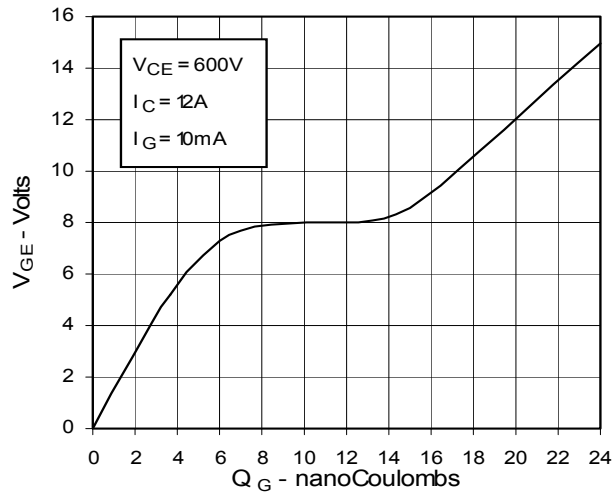


Fig. 14. Reverse-Bias Safe Operating Area

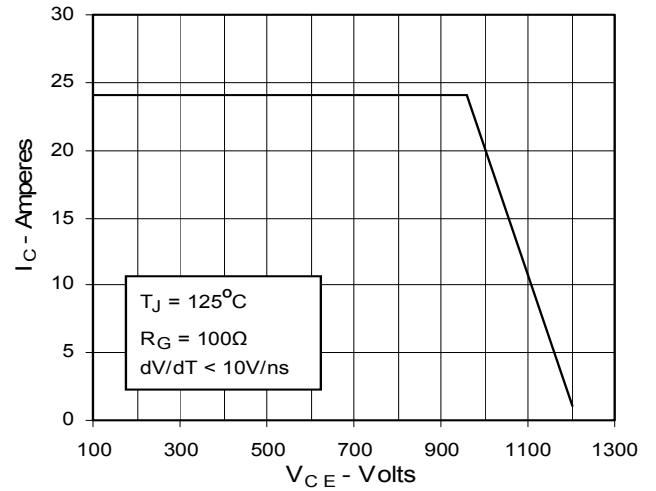


Fig. 15. Capacitance

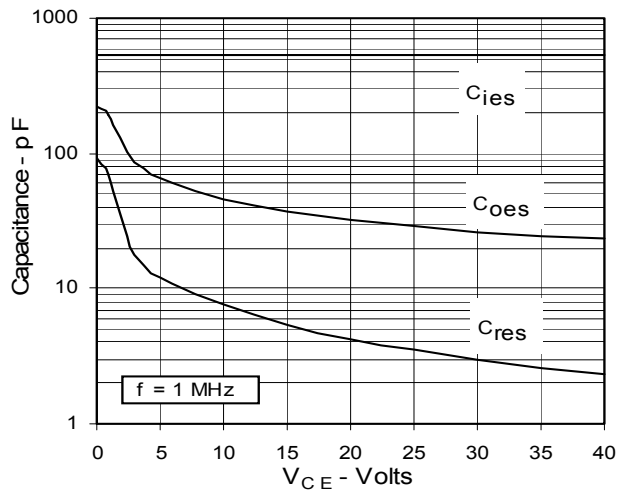


Fig. 17. Maximum Transient Thermal Resistance

