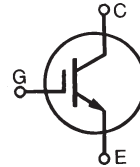


HiPerFAST™ IGBT IXGR 120N60B

ISOPLUS247™

(Electrically Isolated Back Surface)

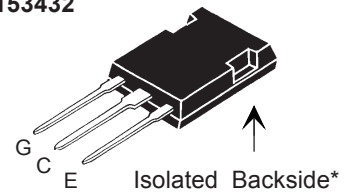
$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 156 \text{ A} \\ V_{CE(sat)} &= 2.1 \text{ V} \end{aligned}$$



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	156	A
I_{C110}	$T_C = 110^\circ\text{C}$	102	A
$I_{L(RMS)}$	External lead limit	76	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	300	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 2.4 \Omega$ Clamped inductive load	$I_{CM} = 200$ @ $0.8 V_{CES}$	A
P_C	$T_C = 25^\circ\text{C}$	520	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	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS, $t = 1 \text{ minute leads-to-tab}$	2500	V
Weight		5	g

ISOPLUS 247

 E153432



G = Gate, C = Collector
E = Emitter

* Patent pending

Features

- DCB Isolated mounting tab
- Meets TO-247AD package Outline
- High current handling capability
- Latest generation HDMOS™ process
- MOS Gate turn-on - drive simplicity

Applications

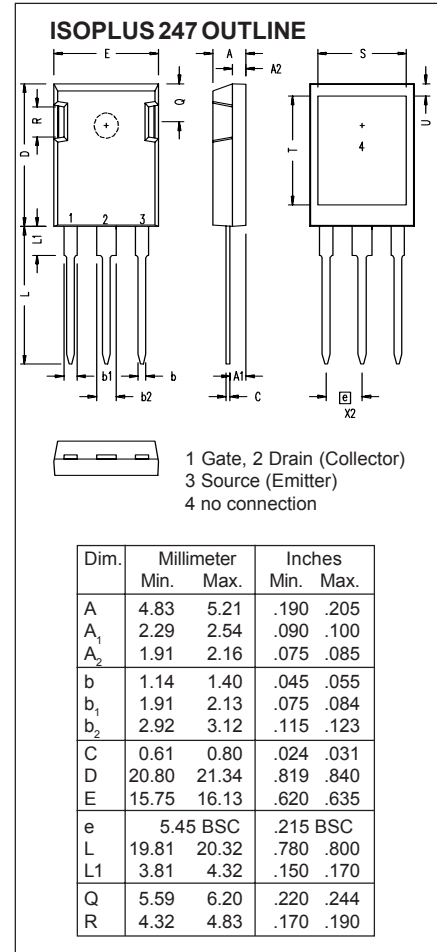
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

Advantages

- Easy assembly
- High power density
- Very fast switching speeds for high frequency applications

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 1 \text{ mA}, V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_C = 1 \text{ mA}, V_{CE} = V_{GE}$	2.5		5.5 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$			200 μA 2 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 400 \text{ nA}$
$V_{CE(sat)}$	$I_C = 100 \text{ A}, V_{GE} = 15 \text{ V (see note 1)}$			2.1 V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = 60\text{A}$; $V_{CE} = 10\text{V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	50	75	S
C_{ies}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$	11000	680	pF
C_{oes}				pF
C_{res}				190 pF
Q_g	$I_C = 100\text{A}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 V_{CES}$	350	72	nC
Q_{ge}				nC
Q_{gc}				131 nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 100\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}$, $R_G = R_{off} = 2.4\text{ }\Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G	200	360	ns
t_{ri}				ns
E_{on}				2.4 mJ
$t_{d(off)}$				ns
t_{fi}				ns
E_{off}				5.5 9.6 mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 100\text{A}$, $V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}$, $R_G = R_{off} = 2.4\text{ }\Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G	290	250	ns
t_{ri}				ns
E_{on}				4.8 mJ
$t_{d(off)}$				ns
t_{fi}				ns
E_{off}				8.7 mJ
R_{thJC}			0.3	K/W
R_{thCK}		0.15		K/W



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	6,404,065 B1	6,683,344	6,727,585
	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
	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

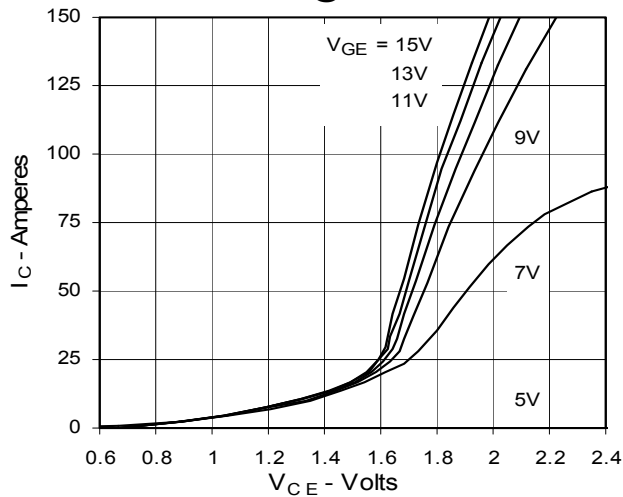


Fig. 2. Extended Output Characteristics
@ 25 °C

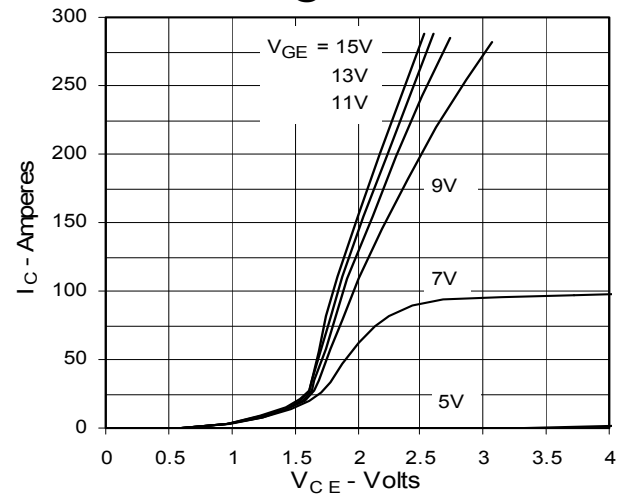


Fig. 3. Output Characteristics
@ 125 °C

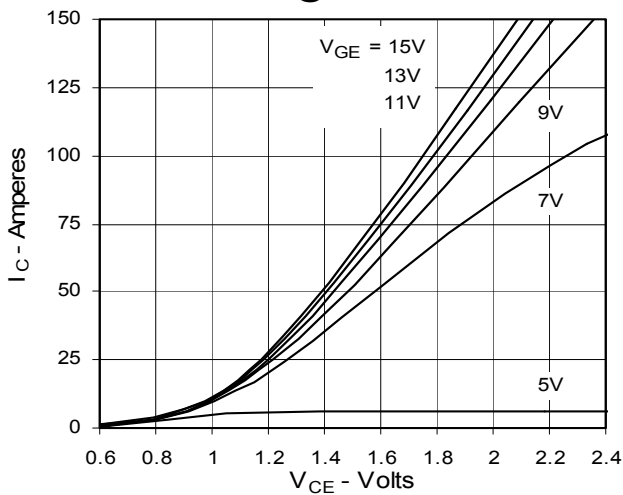


Fig. 4. Dependence of VCE(sat) on Temperature

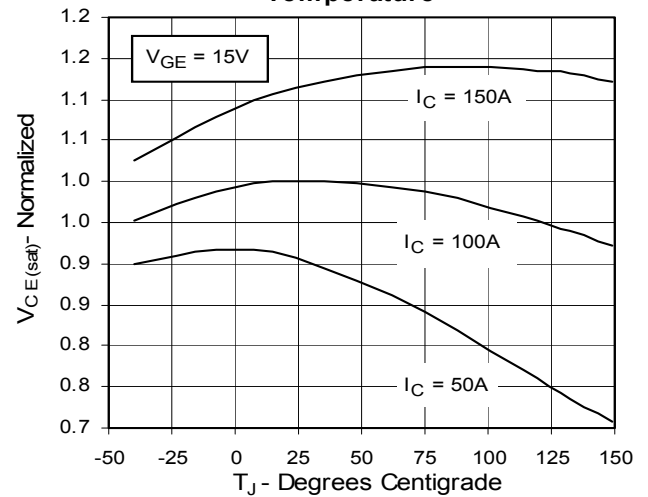


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

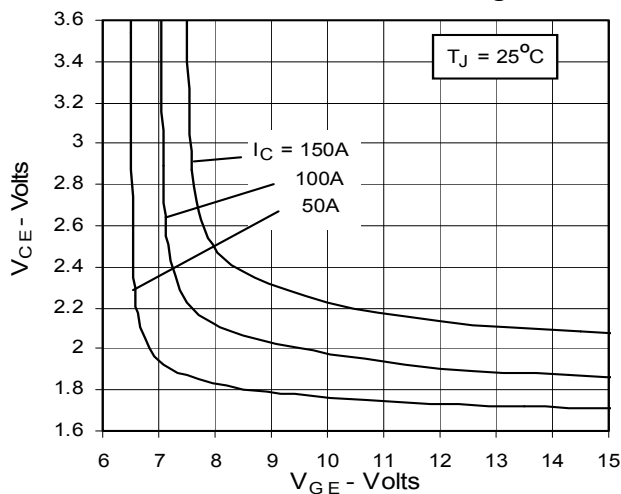


Fig. 6. Input Admittance

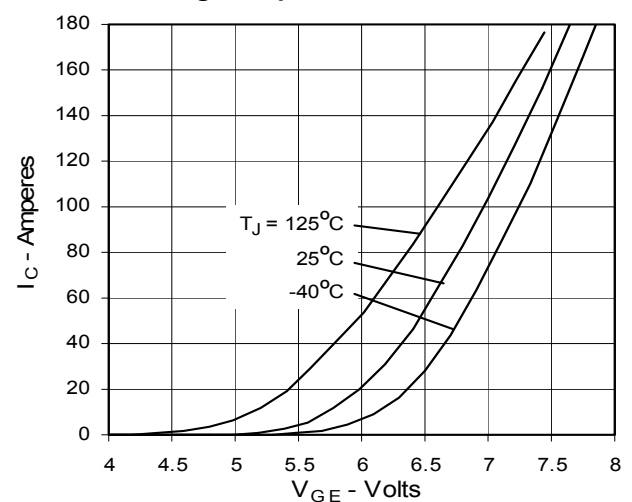


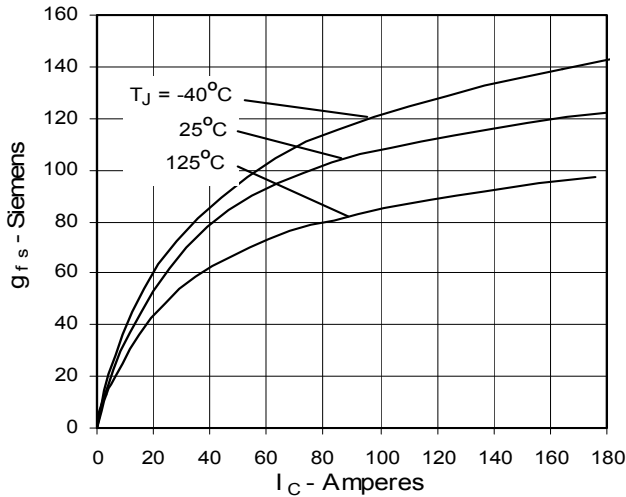
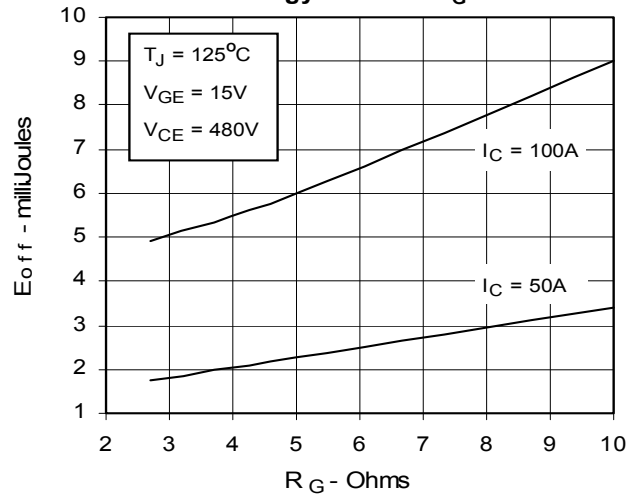
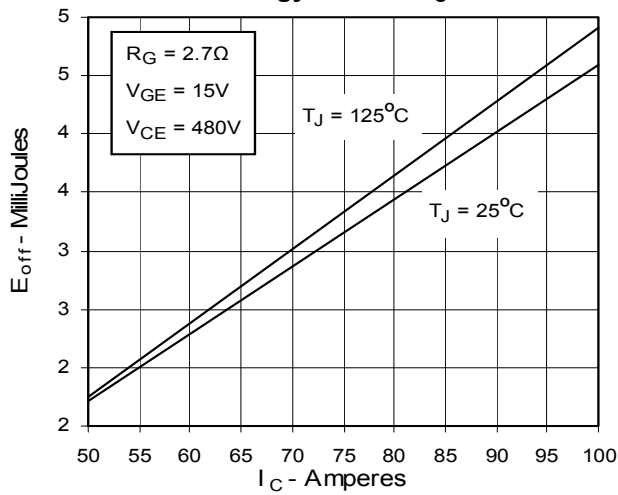
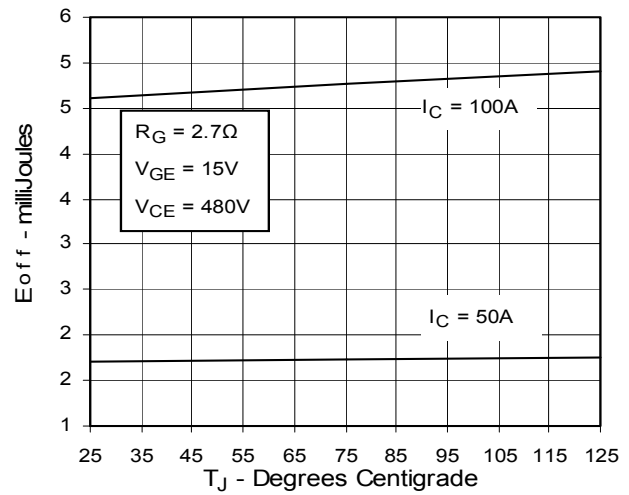
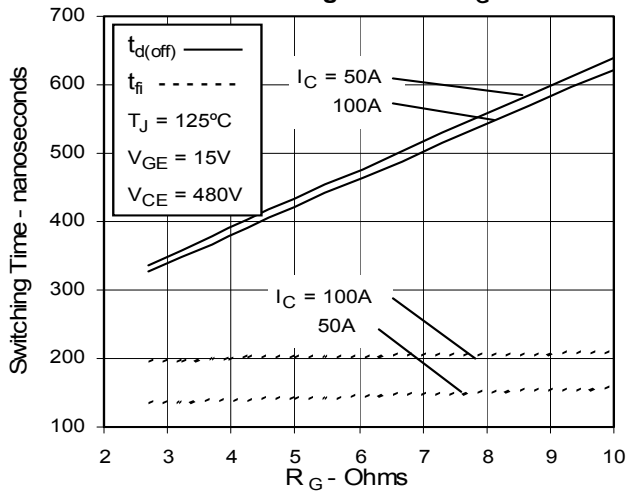
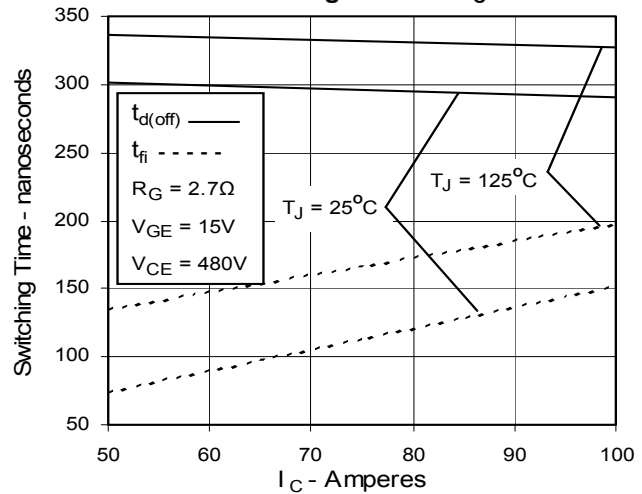
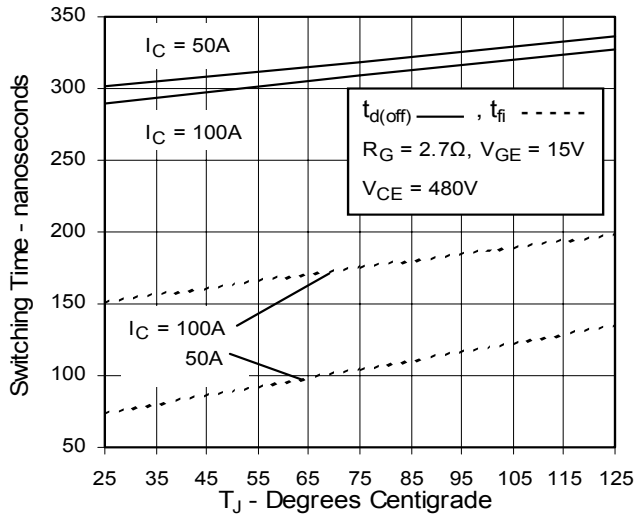
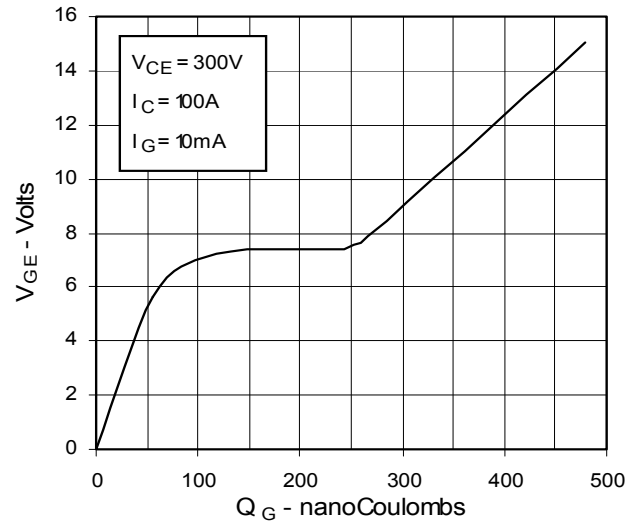
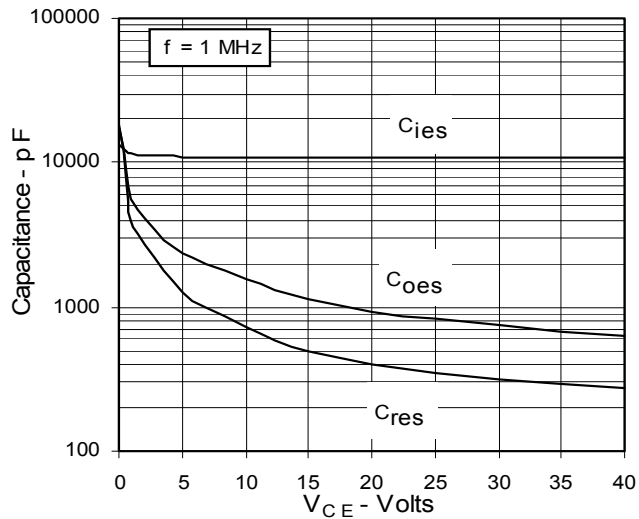
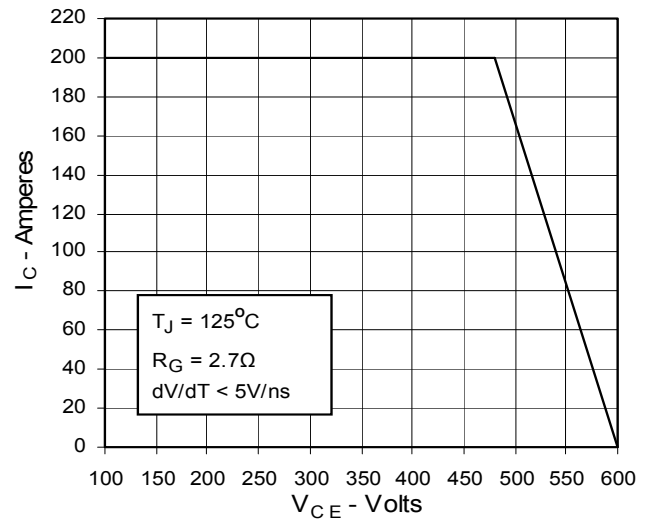
Fig. 7. Transconductance

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 Energy Loss on Temperature

Fig. 11. Dependence of Turn-off Switching Time on R_G

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


Fig. 13. Dependence of Turn-off Switching Time on Temperature

Fig. 14. Gate Charge

Fig. 15. Capacitance

Fig. 16. Reverse-Bias Safe Operating Area

Fig. 17. Maximum Transient Thermal Resistance
