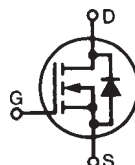


# X2-Class HiPerFET™ Power MOSFET

## IXFB150N65X2

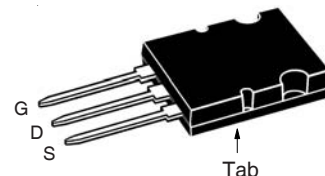
$$\begin{aligned} V_{DSS} &= 650V \\ I_{D25} &= 150A \\ R_{DS(on)} &\leq 17m\Omega \end{aligned}$$

N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode



Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	650	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1M\Omega$	650	V
$V_{GSS}$	Continuous	$\pm 30$	V
$V_{GSM}$	Transient	$\pm 40$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	150	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$	300	A
$I_A$	$T_C = 25^\circ\text{C}$	20	A
$E_{AS}$	$T_C = 25^\circ\text{C}$	4	J
$P_D$	$T_C = 25^\circ\text{C}$	1560	W
$dv/dt$	$I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$	50	V/ns
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ\text{C}$
$F_C$	Mounting Force	30..120 / 6.7..27	N/lb
Weight		10	g

### PLUS264™



G = Gate      D = Drain  
S = Source    Tab = Drain

### Features

- Low  $Q_G$
- Avalanche Rated
- Low Package Inductance

### Advantages

- High Power Density
- Easy to Mount
- Space Savings

### Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- PFC Circuits
- AC and DC Motor Drives
- Robotics and Servo Controls

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 3mA$	650		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8mA$	3.5		5.0 V
$I_{GSS}$	$V_{GS} = \pm 30V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			50 $\mu\text{A}$ 5 mA
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1			17 m $\Omega$

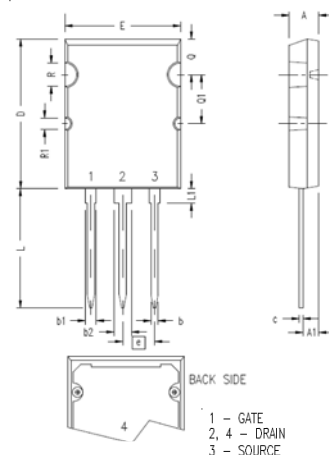
Symbol	Test Conditions (T <sub>J</sub> = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
<b>g<sub>fs</sub></b>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 60A, Note 1	56	88	S
<b>R<sub>Gi</sub></b>	Gate Input Resistance		0.57	Ω
<b>C<sub>iss</sub></b>	} V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz		21.0	nF
<b>C<sub>oss</sub></b>			12.5	nF
<b>C<sub>rss</sub></b>			42	pF
<b>Effective Output Capacitance</b>				
<b>C<sub>o(er)</sub></b>	Energy related } V <sub>GS</sub> = 0V		600	pF
<b>C<sub>o(tr)</sub></b>	Time related } V <sub>DS</sub> = 0.8 • V <sub>DSS</sub>		2800	pF
<b>t<sub>d(on)</sub></b>	<b>Resistive Switching Times</b> V <sub>GS</sub> = 10V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub> R <sub>G</sub> = 1Ω (External)		55	ns
<b>t<sub>r</sub></b>			30	ns
<b>t<sub>d(off)</sub></b>			100	ns
<b>t<sub>f</sub></b>			13	ns
<b>Q<sub>g(on)</sub></b>	} V <sub>GS</sub> = 10V, V <sub>DS</sub> = 0.5 • V <sub>DSS</sub> , I <sub>D</sub> = 0.5 • I <sub>D25</sub>		355	nC
<b>Q<sub>gs</sub></b>			130	nC
<b>Q<sub>gd</sub></b>			110	nC
<b>R<sub>thJC</sub></b>				0.08 °C/W
<b>R<sub>thCS</sub></b>			0.13	°C/W

## Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^{\circ}\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{V}$			150 A
$I_{SM}$	Repetitive, Pulse Width Limited by $T_{JM}$			600 A
$V_{SD}$	$I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1			1.4 V
$t_{rr}$	$I_F = 75\text{A}$ , $-di/dt = 300\text{A}/\mu\text{s}$ $V_R = 100\text{V}$ , $V_{GS} = 0\text{V}$		190	ns
$Q_{RM}$			4.6	$\mu\text{C}$
$I_{RM}$			48.4	A

Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

## PLUS264™ (IXFB) Outline

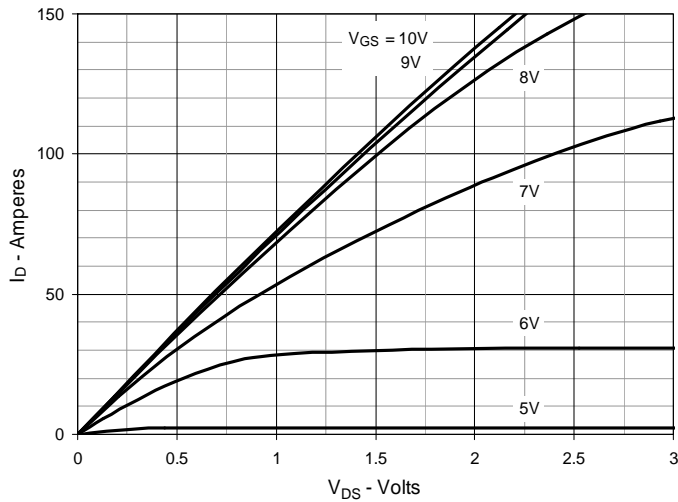
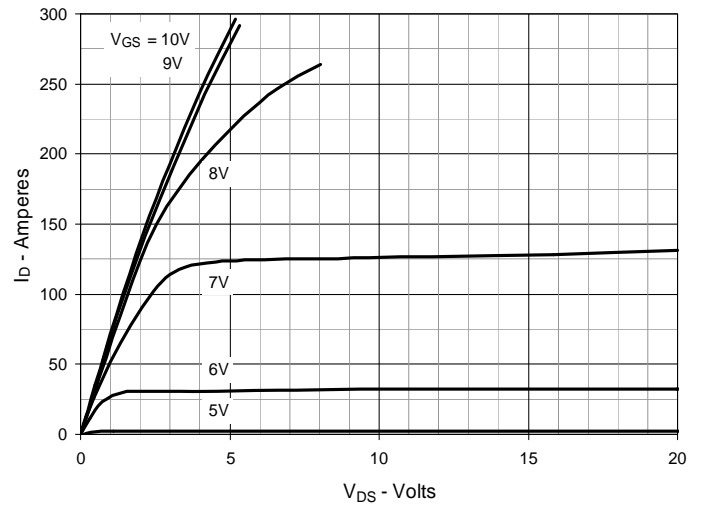
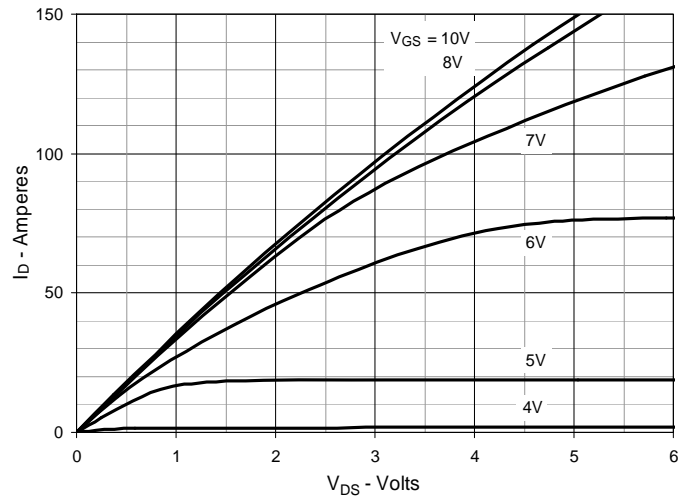
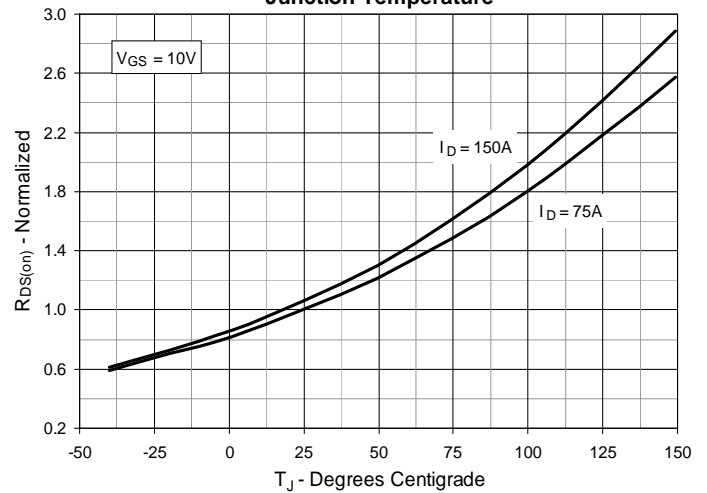
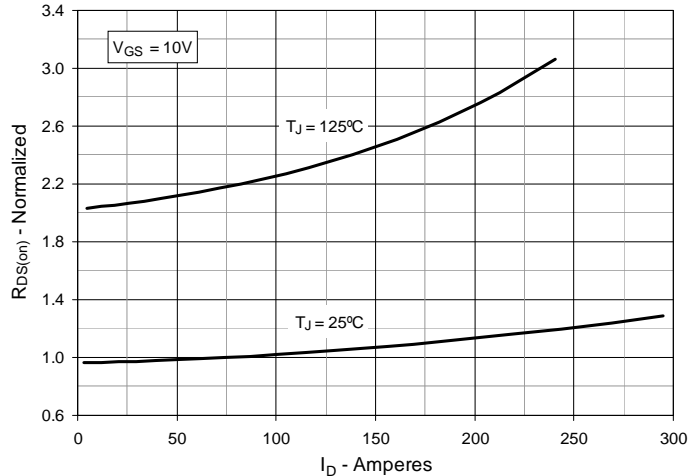
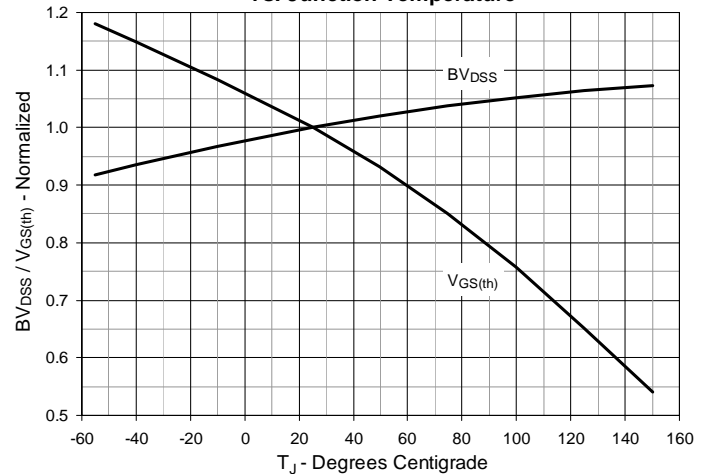


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215 BSC		5.46 BSC	
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36

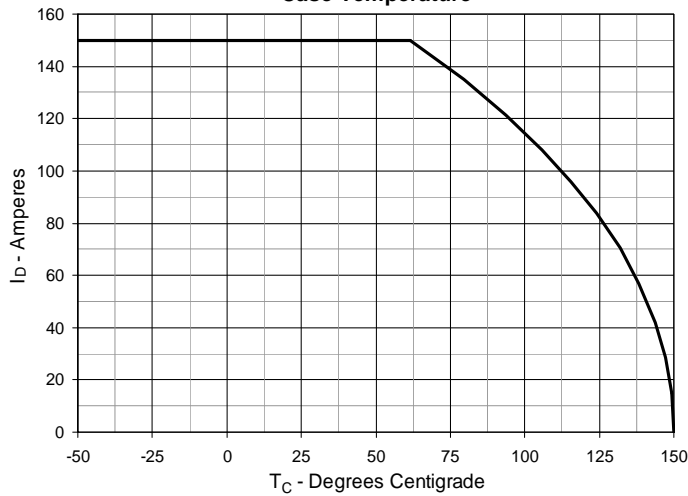
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

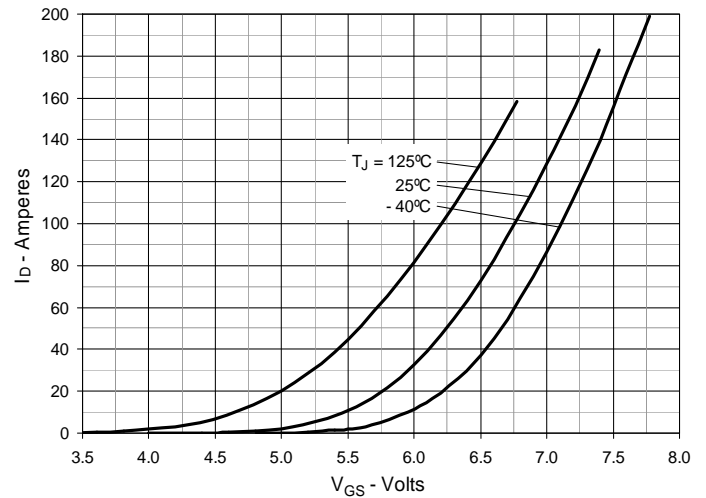
4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$** 

**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$** 

**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 75\text{A}$  Value vs. Junction Temperature**

**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 75\text{A}$  Value vs. Drain Current**

**Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature**


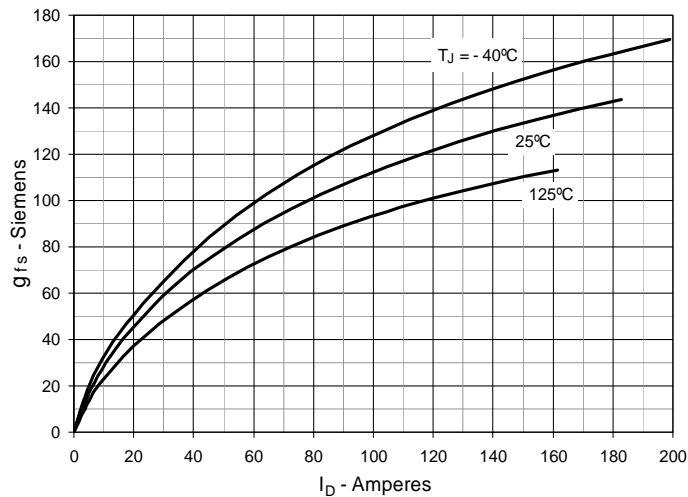
**Fig. 7. Maximum Drain Current vs. Case Temperature**



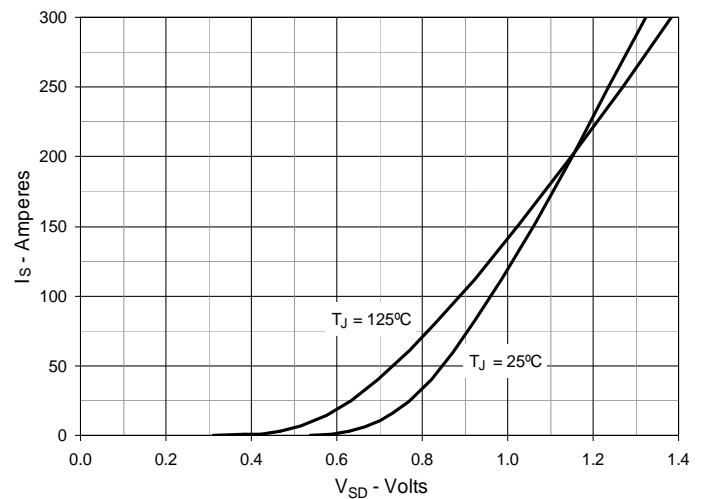
**Fig. 8. Input Admittance**



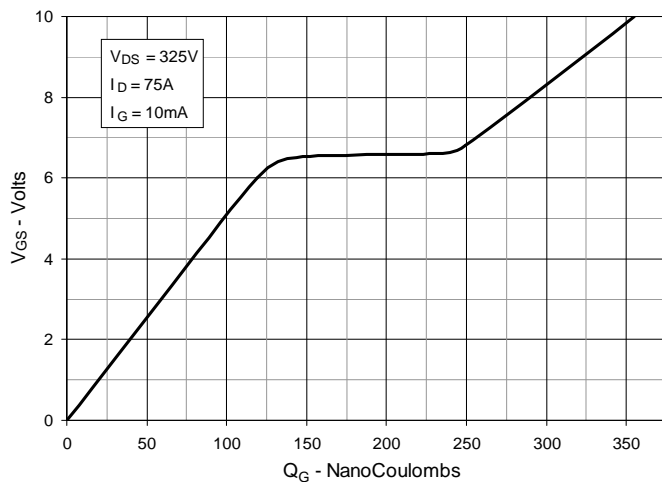
**Fig. 9. Transconductance**



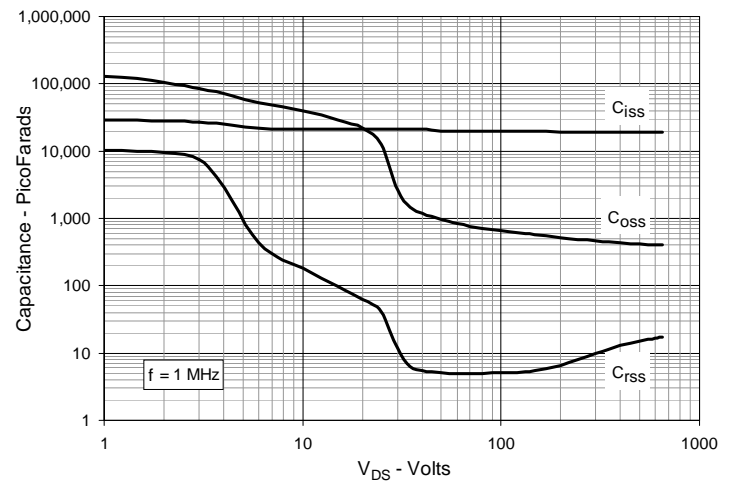
**Fig. 10. Forward Voltage Drop of Intrinsic Diode**



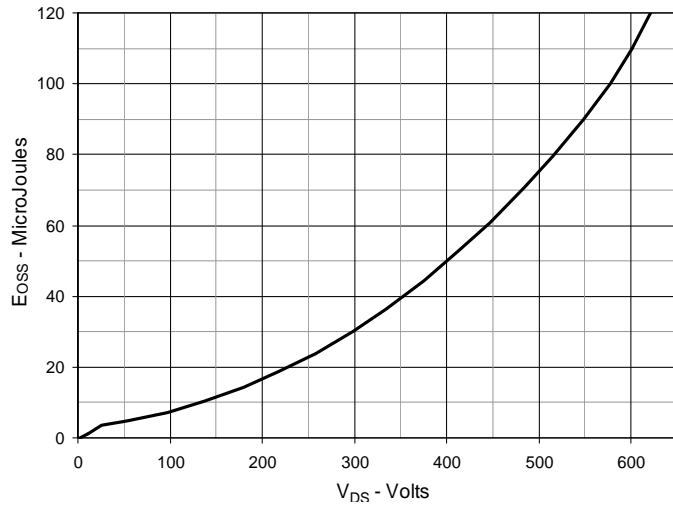
**Fig. 11. Gate Charge**



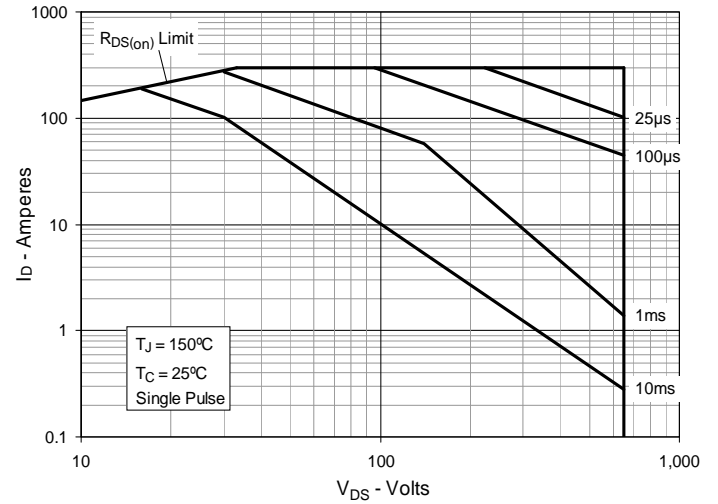
**Fig. 12. Capacitance**



**Fig. 13. Output Capacitance Stored Energy**



**Fig. 14. Forward-Bias Safe Operating Area**



**Fig. 15. Maximum Transient Thermal Impedance**

