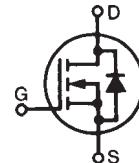


**LinearL2™**  
**Power MOSFET**  
**w/ Extended FBSOA**

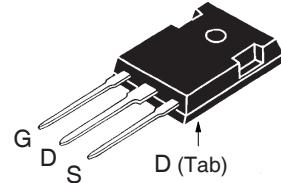
**IXTH58N25L2**

**V<sub>DSS</sub>** = 250V  
**I<sub>D25</sub>** = 58A  
**R<sub>DS(on)</sub>** ≤ 64mΩ



N-Channel Enhancement Mode

TO-247 (IXTH)



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

Symbol	Test Conditions	Maximum Ratings		
V <sub>DSS</sub>	T <sub>J</sub> = 25°C to 150°C	250		V
V <sub>DGR</sub>	T <sub>J</sub> = 25°C to 150°C, R <sub>GS</sub> = 1MΩ	250		V
V <sub>GSS</sub>	Continuous	± 20		V
V <sub>GSM</sub>	Transient	± 30		V
I <sub>D25</sub>	T <sub>C</sub> = 25°C	58	A	
I <sub>DM</sub>	T <sub>C</sub> = 25°C, Pulse Width Limited by T <sub>JM</sub>	180	A	
I <sub>A</sub>	T <sub>C</sub> = 25°C	29	A	
E <sub>AS</sub>	T <sub>C</sub> = 25°C	2.5	J	
P <sub>D</sub>	T <sub>C</sub> = 25°C	540		W
T <sub>J</sub>		-55 ... +150		°C
T <sub>JM</sub>		150		°C
T <sub>stg</sub>		-55 ... +150		°C
T <sub>L</sub>	Maximum Lead Temperature for Soldering	300		°C
T <sub>SOLD</sub>	Plastic Body for 10s	260		°C
M <sub>d</sub>	Mounting Torque	1.13 / 10	Nm/lb.in	
Weight		6		g

**Features**

- Designed for Linear Operation
- International Standard Package
- Avalanche Rated
- Guaranteed FBSOA at 75°C

**Advantages**

- Easy to Mount
- Space Savings
- High Power Density

Symbol	Test Conditions (T <sub>J</sub> = 25°C Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	250		V
V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.5		4.5 V
I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100 nA
I <sub>DSS</sub>	V <sub>DS</sub> = V <sub>DSS</sub> , V <sub>GS</sub> = 0V T <sub>J</sub> = 125°C			10 μA 250 μA
R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.5 • I <sub>D25</sub> , Note 1			64 mΩ

**Applications**

- Solid State Circuit Breakers
- Soft Start Controls
- Linear Amplifiers
- Programmable Loads
- Current Regulators

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 10\text{V}$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1	14	23	32 S
$C_{iss}$ $C_{oss}$ $C_{rss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$	9200		pF
		1060		pF
		340		pF
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$ $R_G = 2\Omega$ (External)	33		ns
		90		ns
		144		ns
		54		ns
$Q_{g(on)}$ $Q_{gs}$ $Q_{gd}$	$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$	330		nc
		50		nc
		175		nc
$R_{thJC}$			0.23 $^\circ\text{C}/\text{W}$	
$R_{thCS}$		0.21		$^\circ\text{C}/\text{W}$

### Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 250\text{V}$ , $I_D = 1.3\text{A}$ , $T_c = 75^\circ\text{C}$ , $T_p = 2\text{s}$	326		W

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
$I_s$	$V_{GS} = 0\text{V}$		58	A
$I_{SM}$	Repetitive, pulse Width Limited by $T_{JM}$		232	A
$V_{SD}$	$I_F = I_s$ , $V_{GS} = 0\text{V}$ , Note 1		1.4	V
$t_r$ $Q_{RM}$ $I_{RM}$	$I_F = 29\text{A}$ , $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$	400		ns
		6		$\mu\text{C}$
		30		A

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

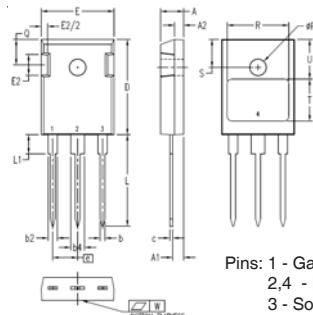
### ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

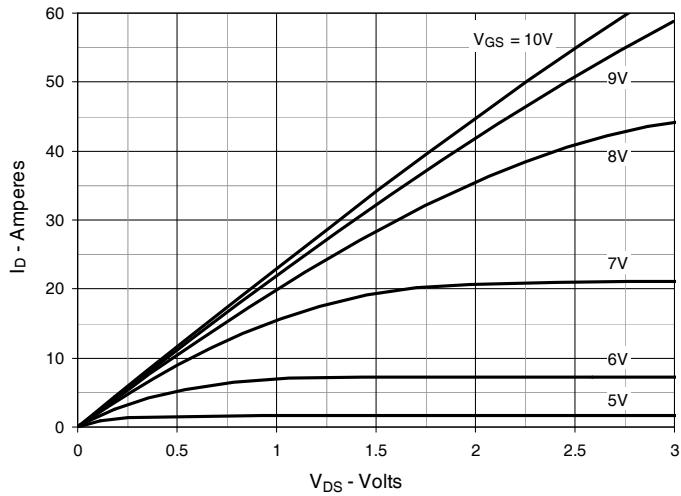
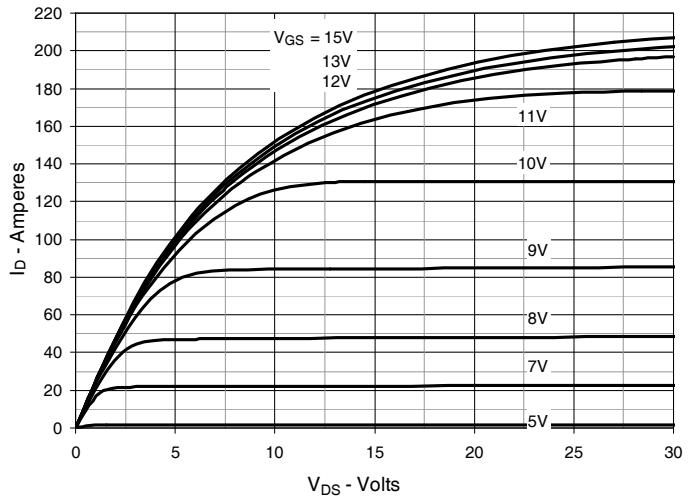
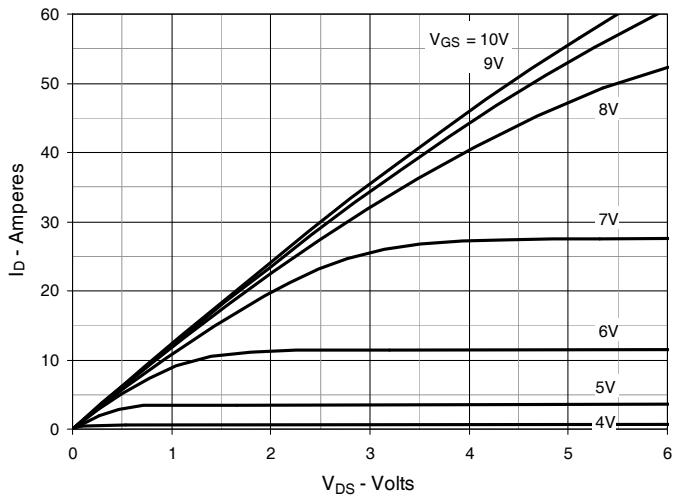
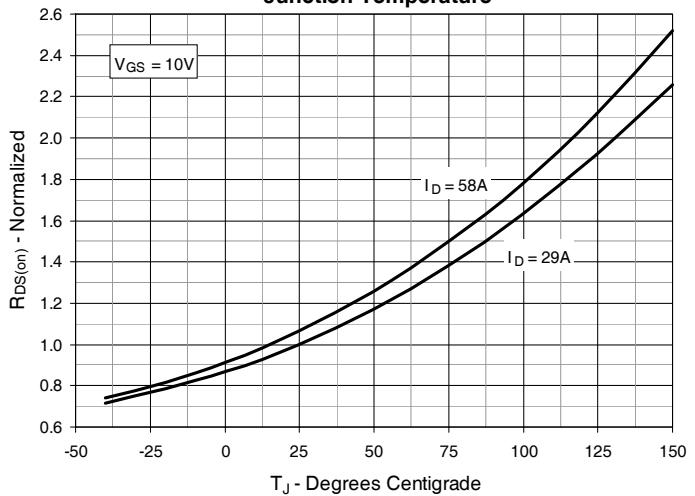
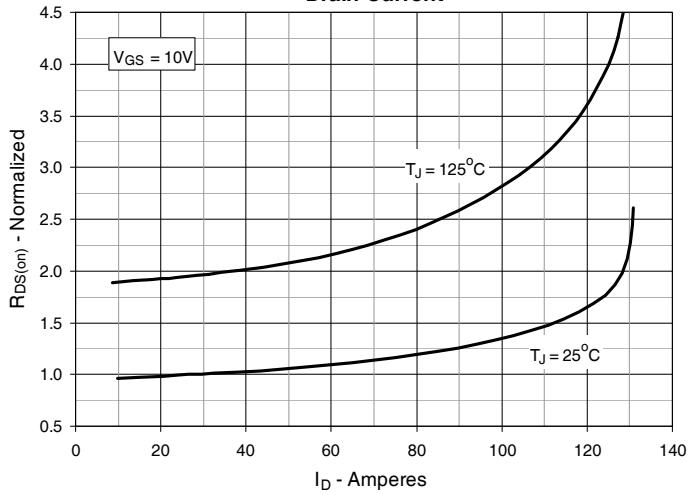
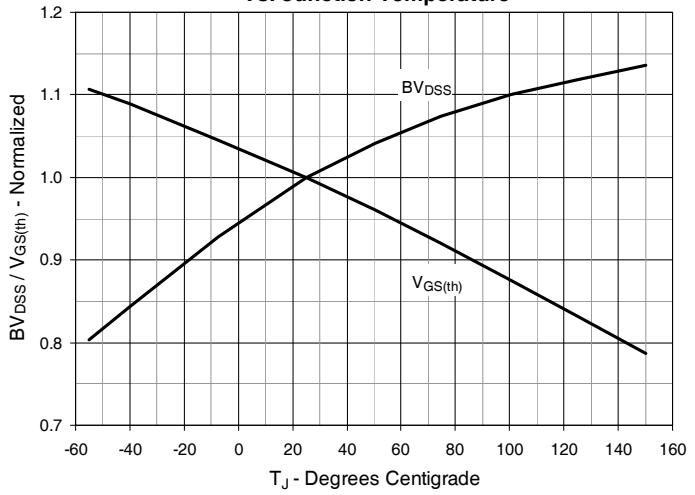
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IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 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

### TO-247 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.087	.100	2.21	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b2	.075	.085	1.91	2.16
b4	.115	.126	2.92	3.20
c	.023	.033	0.58	0.84
D	.820	.840	20.83	21.34
E	.620	.635	15.75	16.13
E2	.175	.195	4.44	4.95
e	.215 BSC		5.45 BSC	
L	.780	.810	19.81	20.57
L1	.160	.177	4.06	4.50
Q	.220	.240	5.59	6.10
R	.520	.540	13.21	13.72
S	.242 BSC		6.15 BSC	
T	.355	.375	9.02	9.53
U	.345	.370	8.76	9.40
ØP	.140	.144	3.55	3.66
W	.000	.004	0.00	0.10

**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  $I_D = 29\text{A}$  Value vs. Junction Temperature****Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 29\text{A}$  Value vs. Drain Current****Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature**

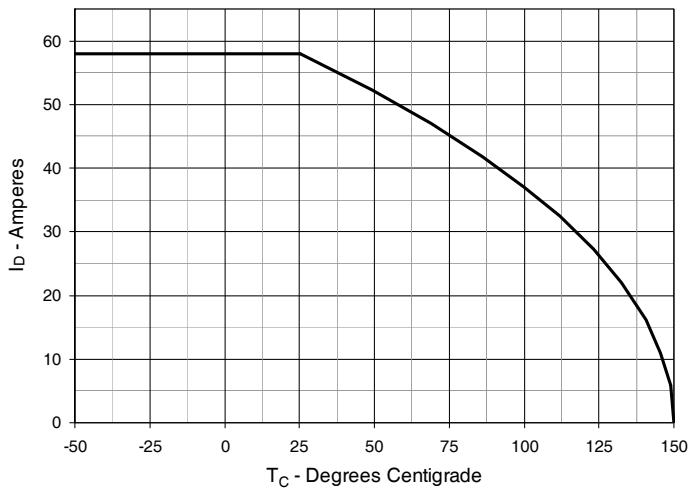
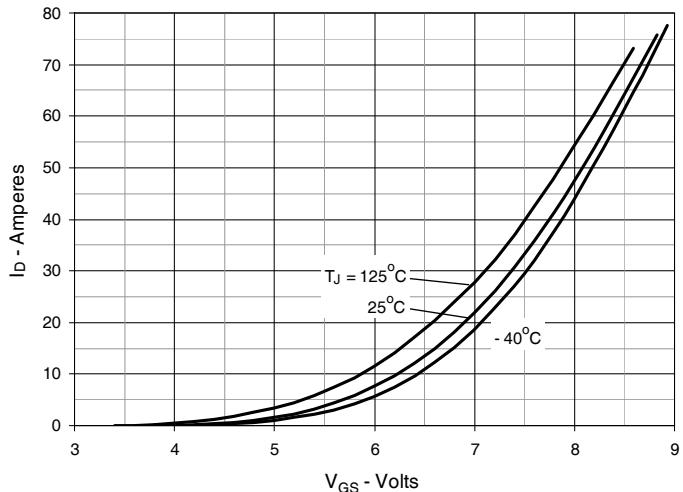
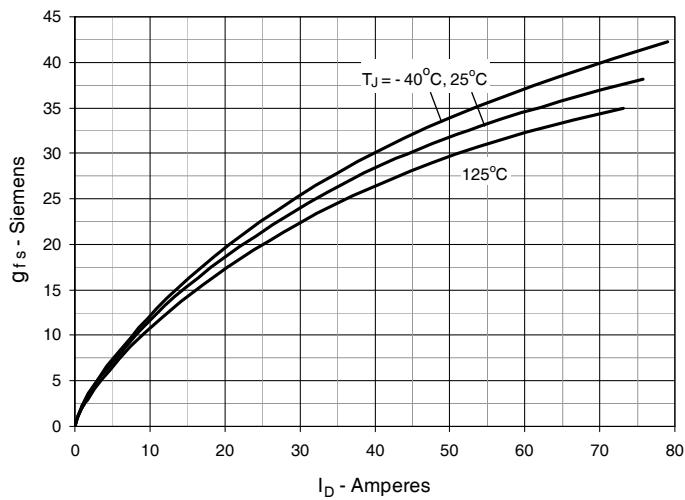
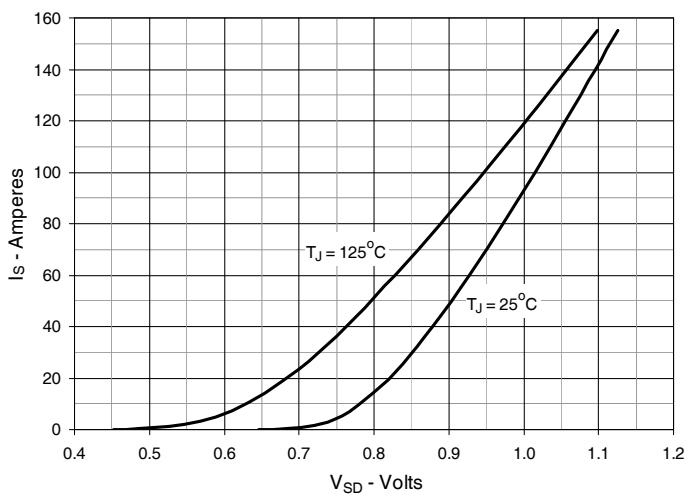
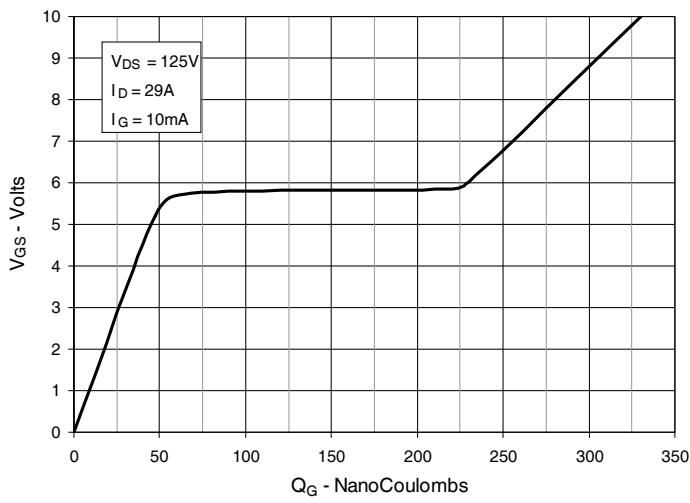
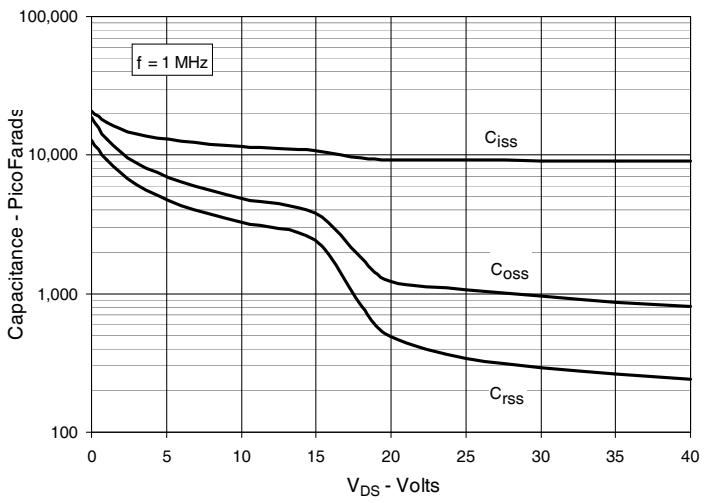
**Fig. 7. Maximum Drain Current vs. Case Temperature****Fig. 8. Input Admittance****Fig. 9. Transconductance****Fig. 10. Forward Voltage Drop of Intrinsic Diode****Fig. 11. Gate Charge****Fig. 12. Capacitance**

Fig. 13. Forward-Bias Safe Operating Area

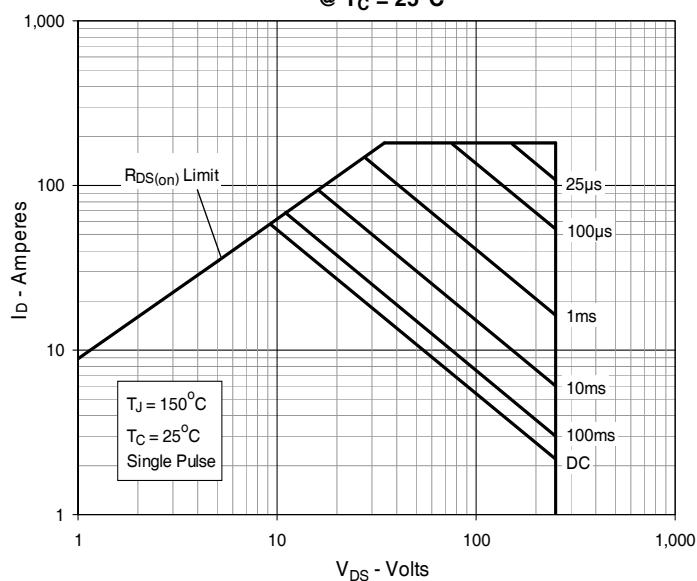
@  $T_C = 25^\circ\text{C}$ 

Fig. 14. Forward-Bias Safe Operating Area

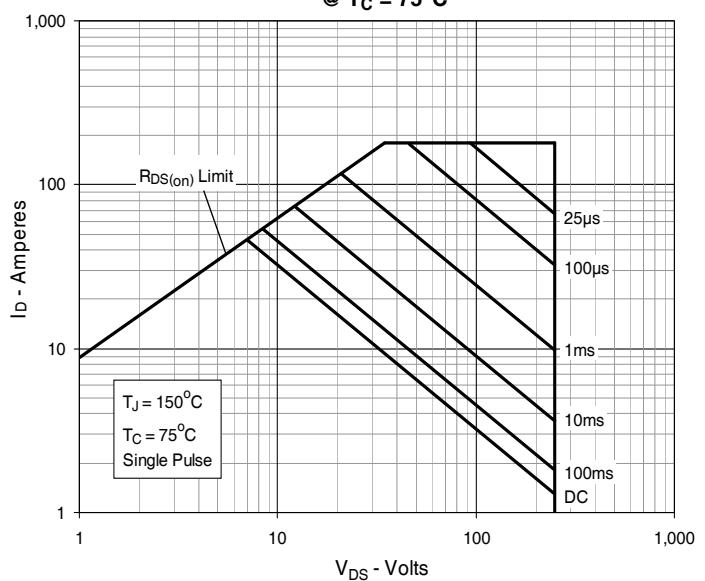
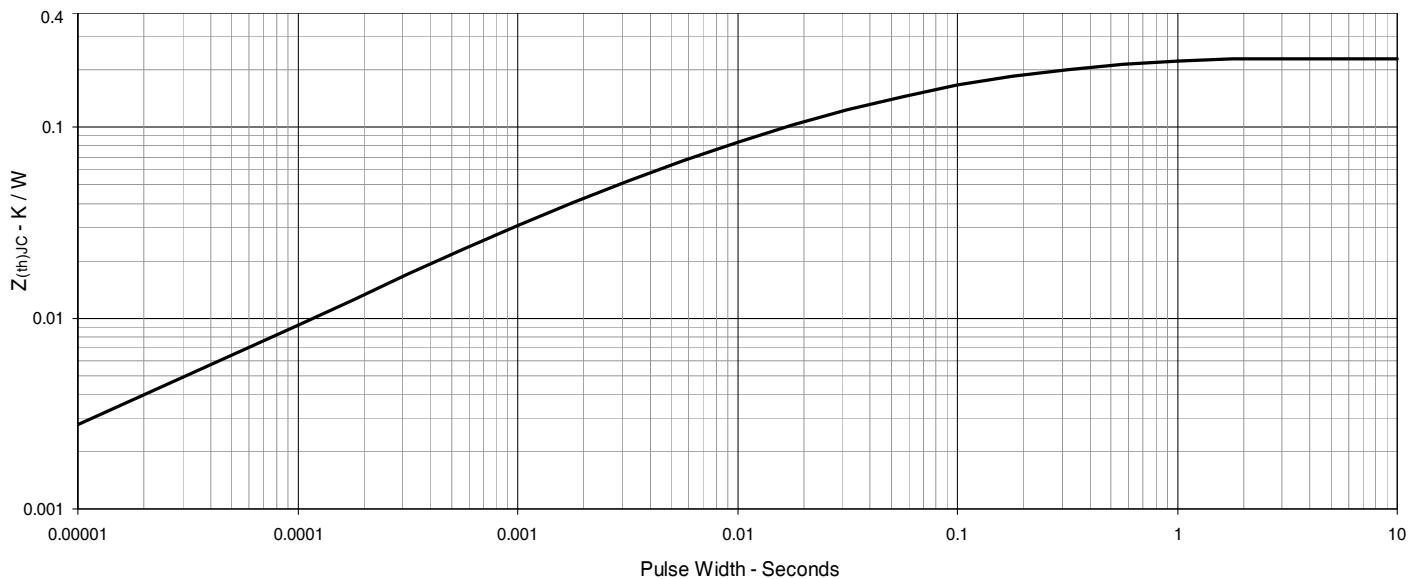
@  $T_C = 75^\circ\text{C}$ 

Fig. 15. Maximum Transient Thermal Impedance





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