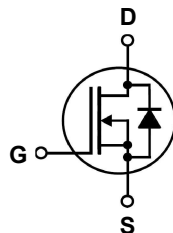


# Depletion Mode MOSFET

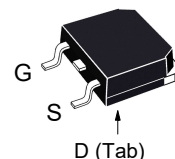
## IXTT16N20D2 IXTH16N20D2

$V_{DSX} = 200V$   
 $I_{D(on)} \geq 16A$   
 $R_{DS(on)} \leq 80m\Omega$

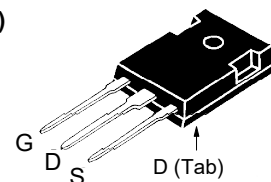
N-Channel



TO-268  
(IXTT)



TO-247  
(IXTH)



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

Symbol	Test Conditions	Maximum Ratings	
$V_{DSX}$	$T_J = 25^\circ C$ to $150^\circ C$	200	V
$V_{DGX}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$	200	V
$V_{GSX}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$P_D$	$T_C = 25^\circ C$	695	W
$T_J$		- 55 ... +150	$^\circ C$
$T_{JM}$		150	$^\circ C$
$T_{stg}$		- 55 ... +150	$^\circ C$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ C$
$T_{SOLD}$	Plastic Body for 10s	260	$^\circ C$
Weight	TO-268	4	g
	TO-247	6	g

### Features

- Normally ON Mode
- International Standard Packages
- Molding Epoxies Meet UL94V-0 Flammability Classification

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- Audio Amplifiers
- Start-up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

Symbol	Test Conditions ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSX}$	$V_{GS} = -5V$ , $I_D = 250\mu A$	200		V
$V_{GS(off)}$	$V_{DS} = 25V$ , $I_D = 4mA$	- 2.0		V
$I_{GSX}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 100$ nA
$I_{DSX(off)}$	$V_{DS} = V_{DSX}$ , $V_{GS} = -5V$ $T_J = 125^\circ C$			5 $\mu A$ 100 $\mu A$
$R_{DS(on)}$	$V_{GS} = 0V$ , $I_D = 8A$ , Note 1			80 m $\Omega$
$I_{D(on)}$	$V_{GS} = 0V$ , $V_{DS} = 25V$ , Note 1	16		A

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 20\text{V}, I_D = 8\text{A}$ , Note 1	7	12	S
$C_{iss}$	$V_{GS} = -10\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		5500	pF
$C_{oss}$			1360	pF
$C_{rss}$			607	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = \pm 5\text{V}, V_{DS} = 100\text{V}, I_D = 8\text{A}$ $R_G = 3.3\Omega$ (External)		46	ns
$t_r$			130	ns
$t_{d(off)}$			270	ns
$t_f$			135	ns
$Q_{g(on)}$	$V_{GS} = \pm 5\text{V}, V_{DS} = 100\text{V}, I_D = 8\text{A}$		208	nC
$Q_{gs}$			28	nC
$Q_{gd}$			110	nC
$R_{thJC}$	TO-247			0.18 $^\circ\text{C/W}$
$R_{thCS}$			0.21	$^\circ\text{C/W}$

**Safe-Operating-Area Specification**

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 200\text{V}, I_D = 2.1\text{A}, T_C = 75^\circ\text{C}, t_p = 5\text{s}$	420		W

**Source-Drain Diode**

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{SD}$	$I_F = 16\text{A}, V_{GS} = -10\text{V}$ , Note 1		0.8	1.3 V
$t_{rr}$	$I_F = 8\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = -10\text{V}$		265	ns
$I_{RM}$			14.3	A
$Q_{RM}$			1.9	$\mu\text{C}$

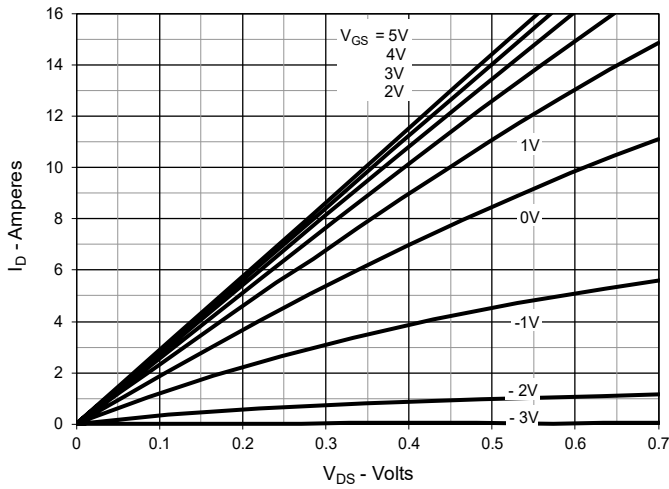
Note 1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

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

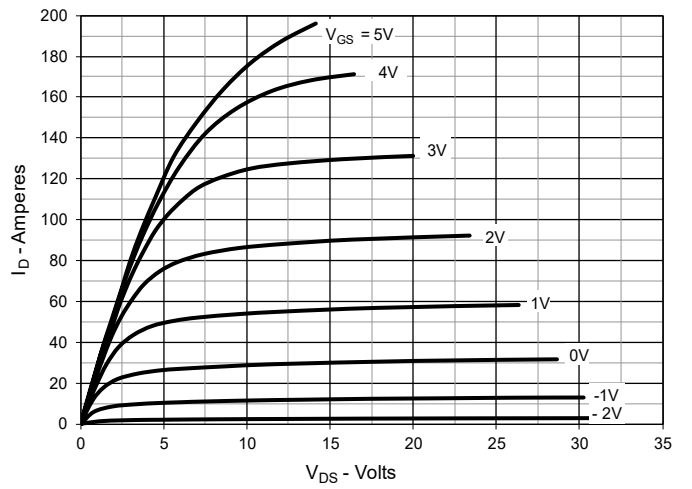
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

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	

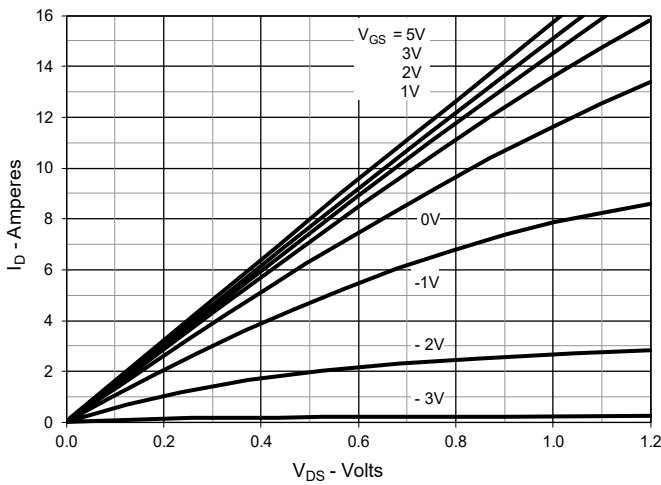
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



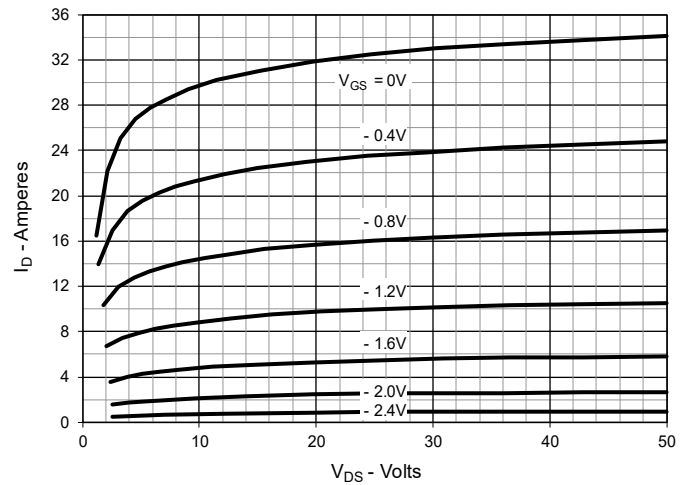
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



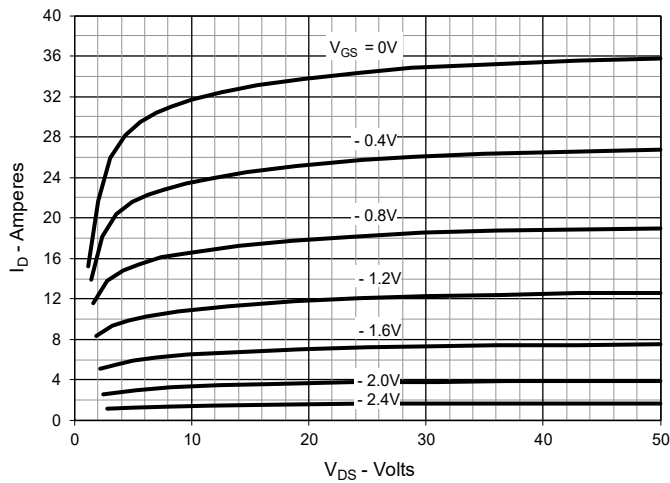
**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$**



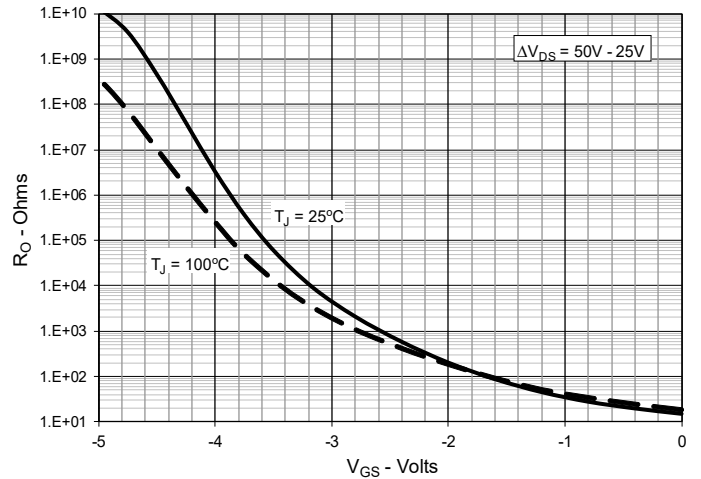
**Fig. 4. Drain Current @  $T_J = 25^\circ\text{C}$**



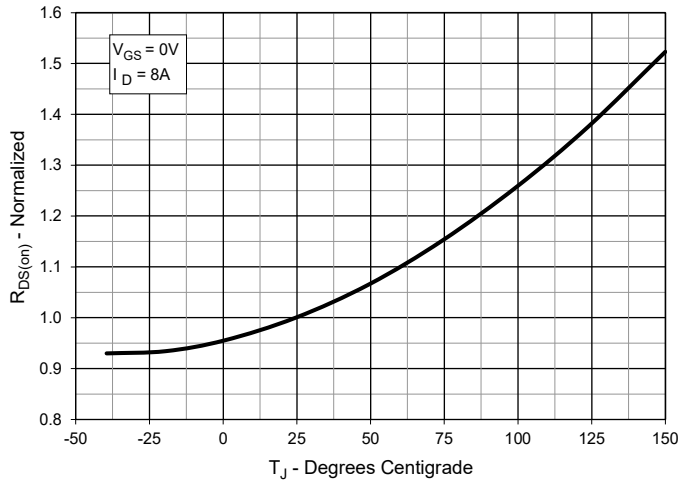
**Fig. 5. Drain Current @  $T_J = 100^\circ\text{C}$**



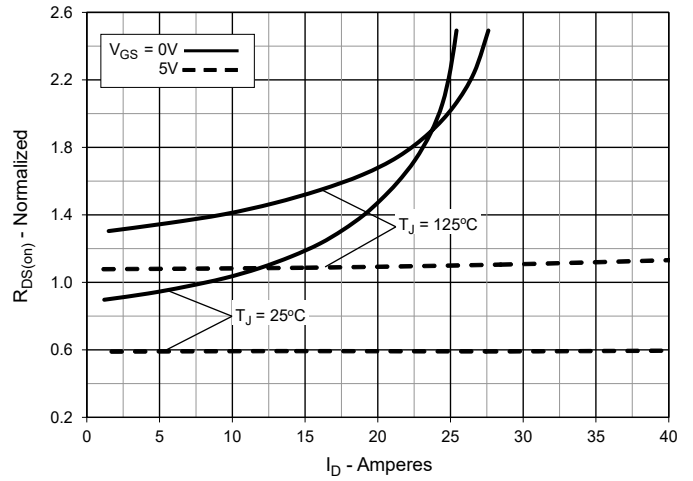
**Fig. 6. Dynamic Resistance vs. Gate Voltage**



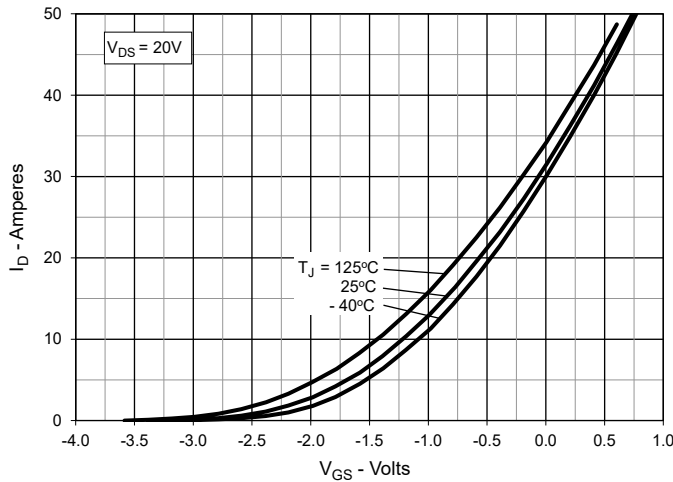
**Fig. 7. Normalized  $R_{DS(on)}$  vs. Junction Temperature**



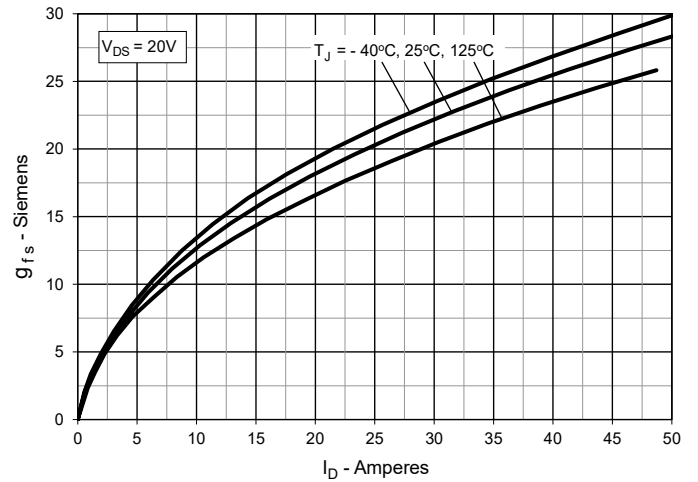
**Fig. 8.  $R_{DS(on)}$  Normalized to  $I_D = 8A$  Value vs. Drain Current**



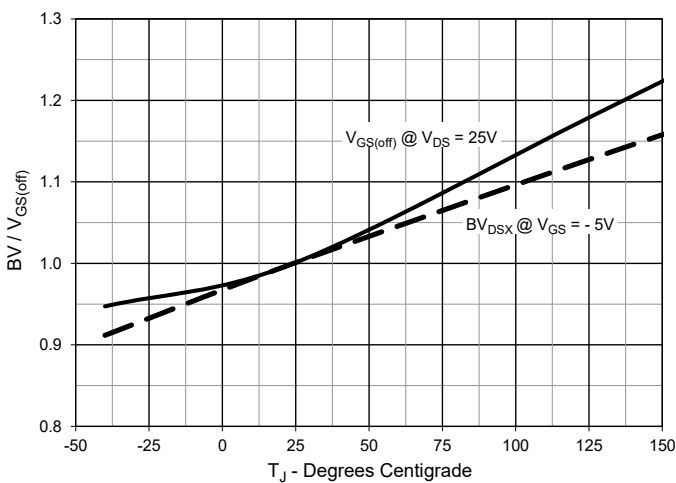
**Fig. 9. Input Admittance**



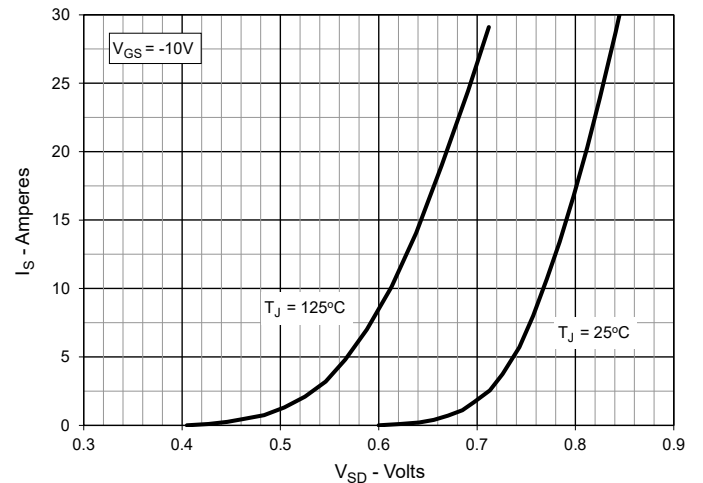
**Fig. 10. Transconductance**



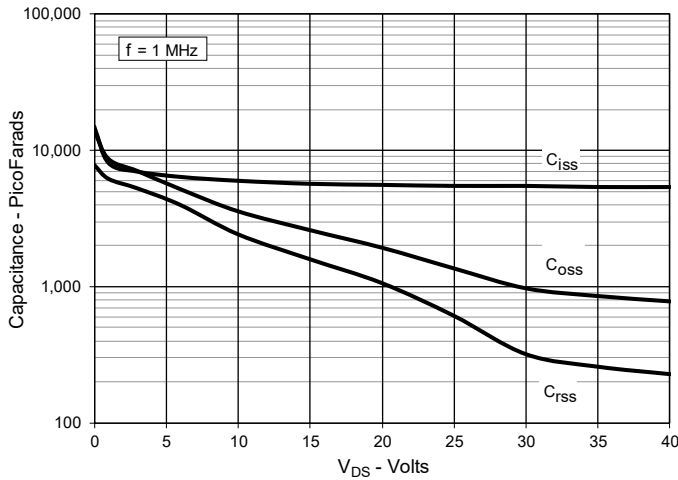
**Fig. 11. Normalized Breakdown and Threshold Voltages vs. Junction Temperature**



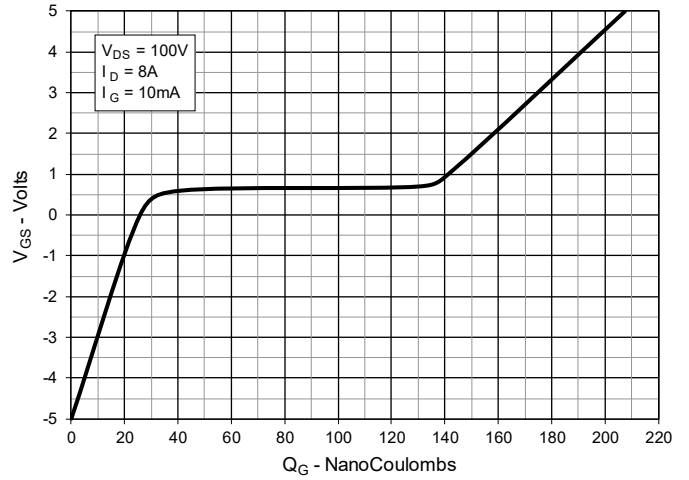
**Fig. 12. Forward Voltage Drop of Intrinsic Diode**



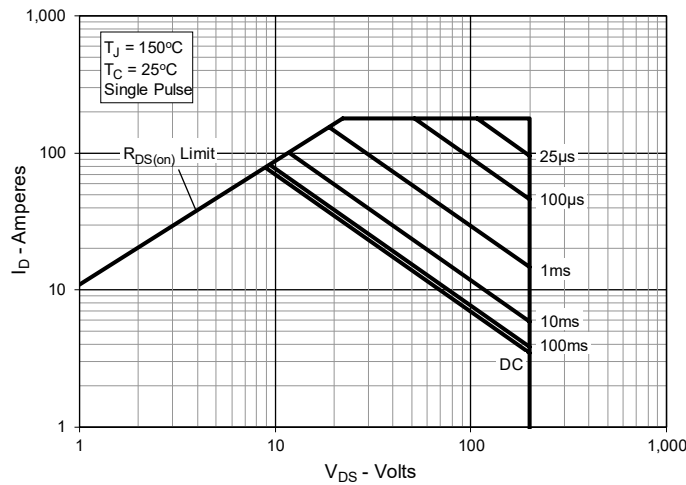
**Fig. 13. Capacitance**



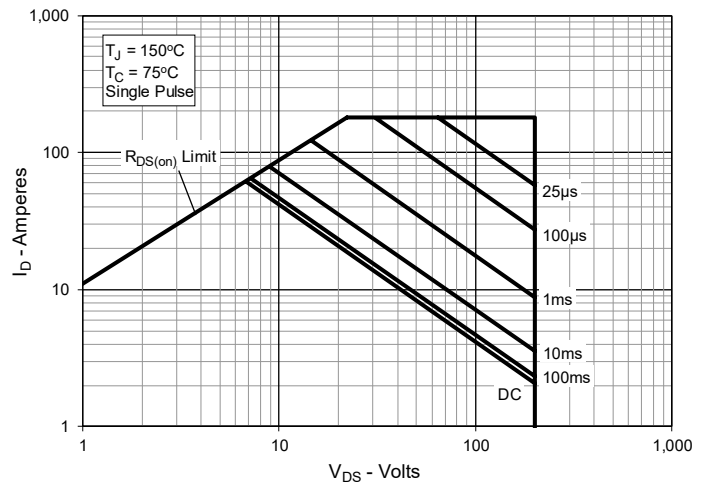
**Fig. 14. Gate Charge**



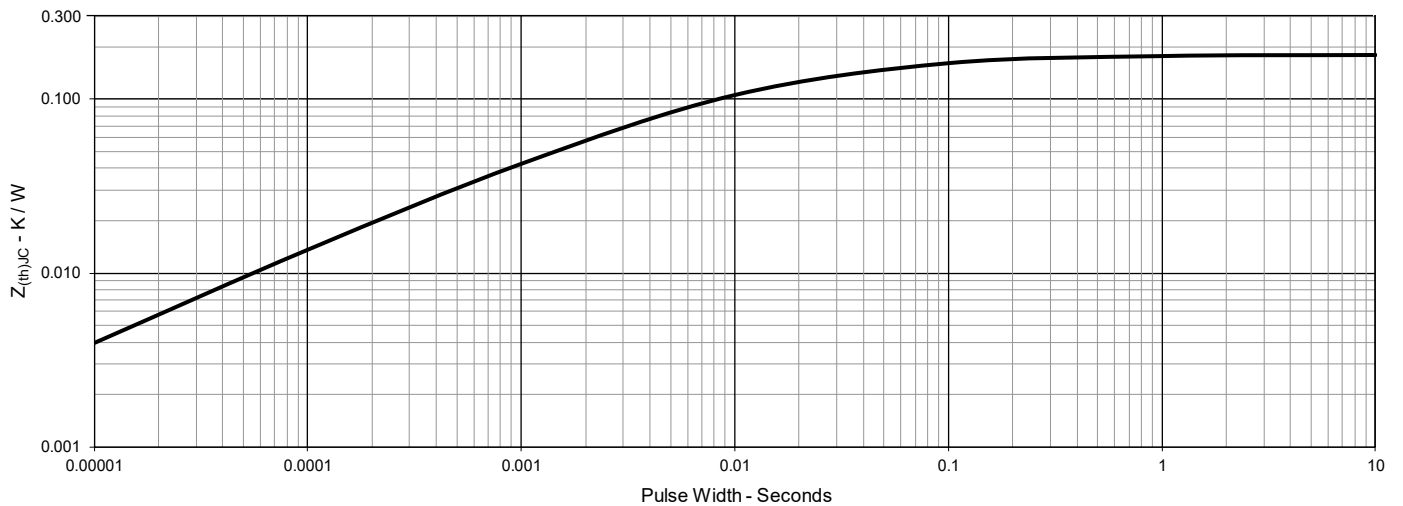
**Fig. 15. Forward-Bias Safe Operating Area  
@ T\_C = 25°C**



**Fig. 16. Forward-Bias Safe Operating Area  
@ T\_C = 75°C**



**Fig. 17. Maximum Transient Thermal Impedance**







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