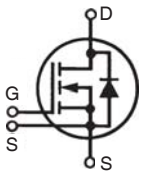
IXYS

X-Class HiPerFET™ Power MOSFET

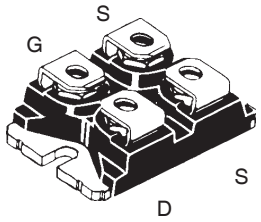
IXFN52N100X

V_{DSS} = 1000V
I_{D25} = 44A
$R_{DS(on)}$ ≤ 125mΩ

N-Channel Enhancement Mode
Avalanche Rated



miniBLOC, SOT-227
E153432



G = Gate D = Drain
S = Source

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		1000	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		1000	V
V_{GSS}	Continuous		± 30	V
V_{GSM}	Transient		± 40	V
I_{D25}	T_C = 25°C		44	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		100	A
I_A	T_C = 25°C		10	A
E_{AS}	T_C = 25°C		3	J
P_D	T_C = 25°C		830	W
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$		50	V/ns
T_J			-55 ... +150	°C
T_{JM}			150	°C
T_{stg}			-55 ... +150	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 minute	2500	V~
	$I_{ISOL} \le$ 1mA	t = 1 second	3000	V~
M_d	Mounting Torque		1.5/13	Nm/lb.in
	Terminal Connection Torque		1.3/11.5	Nm/lb.in
Weight			30	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	1000			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4mA	3.5		6.0	V
I_{GSS}	V_{GS} = ± 30V, V_{DS} = 0V			± 100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS}= 0V			50	μA
	T_J = 125°C			5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 26A, Note 1			125	mΩ

Features

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- Isolation Voltage 2500 V~
- Low Q_G
- Avalanche Rated
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

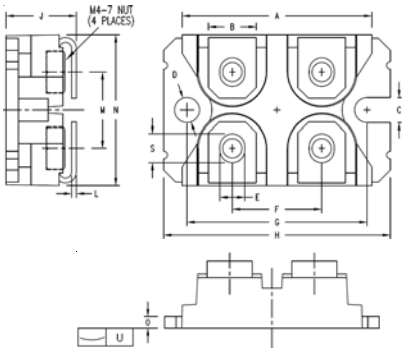
Applications

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

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Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max
g_{fs}	V_{DS} = 20V, I_D = 26A, Note 1	23	37	S
R_{Gi}	Gate Input Resistance		0.5	Ω
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		6725	pF
C_{oss}			1620	pF
C_{rss}			123	pF
	Effective Output Capacitance			
$C_{o(er)}$	Energy related: V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		220	pF
$C_{o(tr)}$	Time related: V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		1070	pF
$t_{d(on)}$	**Resistive Switching Times**		34	ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 26A		13	ns
$t_{d(off)}$	R_G = 1Ω (External)		107	ns
t_f			9	ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 26A		245	nC
Q_{gs}			53	nC
Q_{gd}			125	nC
R_{thJC}				0.15 °C/W
R_{thCS}			0.10	°C/W

SOT-227B miniBLOC (IXFN)



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.224	1.260	31.10	32.00
B	.303	.327	7.70	8.30
C	.161	.173	4.10	4.40
D	.161	.173	4.10	4.40
E	.161	.173	4.10	4.40
F	.587	.598	14.90	15.20
G	1.181	1.201	30.00	30.50
H	1.488	1.508	37.80	38.30
J	.461	.484	11.70	12.30
L	.030	.033	0.75	0.85
M	.492	.512	12.50	13.00
N	.984	1.004	25.00	25.50
O	.075	.087	1.90	2.20
S	.181	.193	4.60	4.90
U	.000	.005	0.00	0.13

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			52	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			208	A
V_{SD}	I_F = I_S , V_{GS} = 0V, Note 1			1.4	V
t_{rr}	I_F = 26A, -di/dt = 100A/μs		260		ns
Q_{RM}	V_R = 100V, V_{GS} = 0V		2.7		μC
I_{RM}			20.8		A

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

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IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25°C

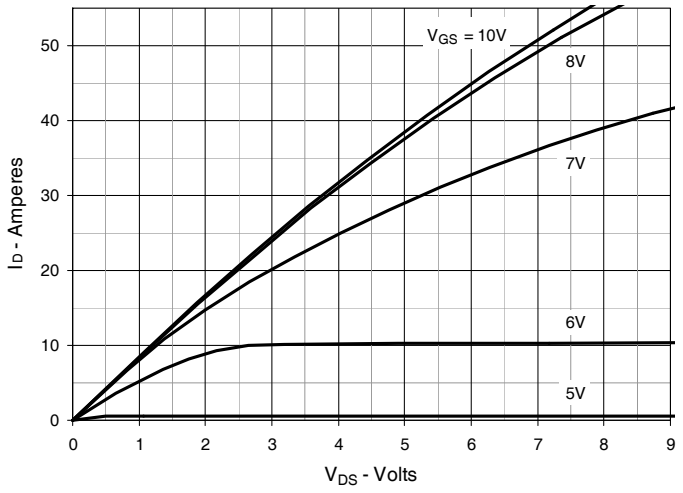


Fig. 2. Extended Output Characteristics @ T_J = 25°C

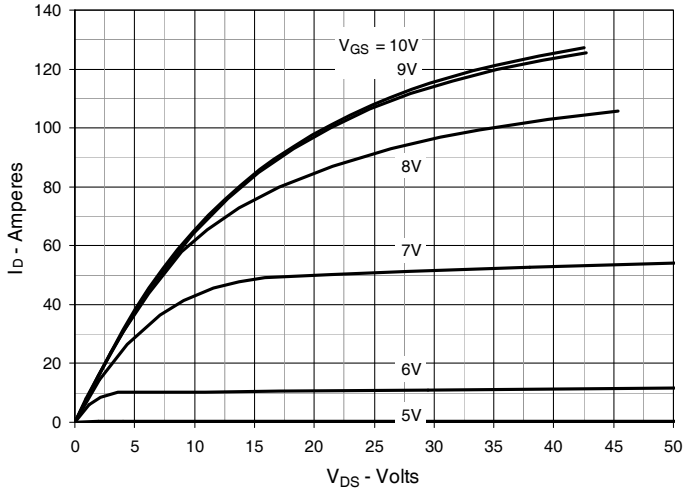


Fig. 3. Output Characteristics @ T_J = 125°C

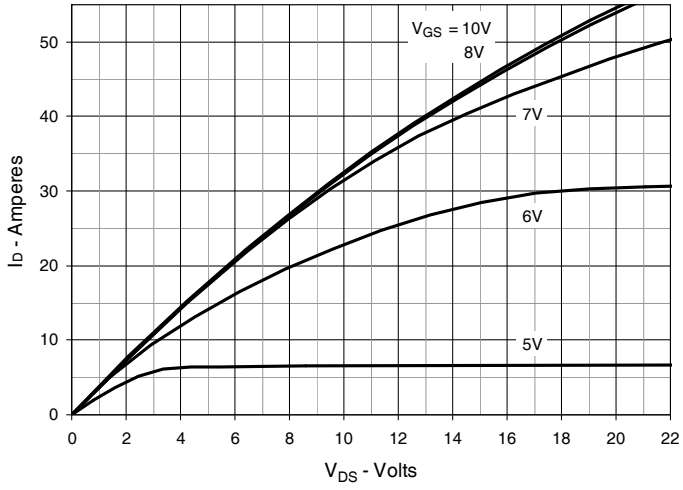


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 26A Value vs. Junction Temperature

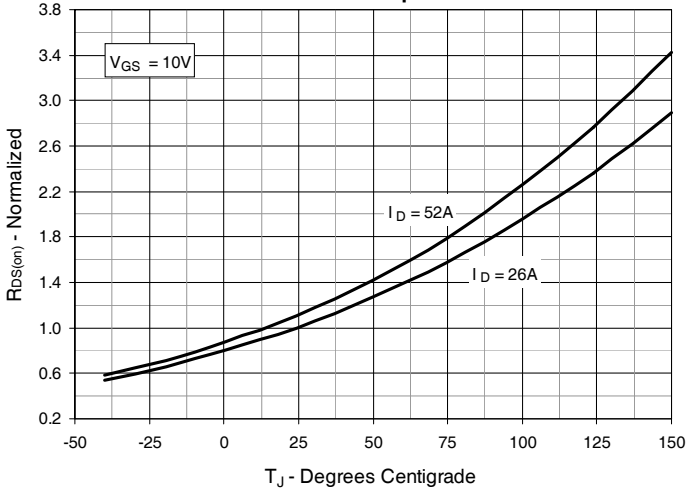


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 26A Value vs. Drain Current

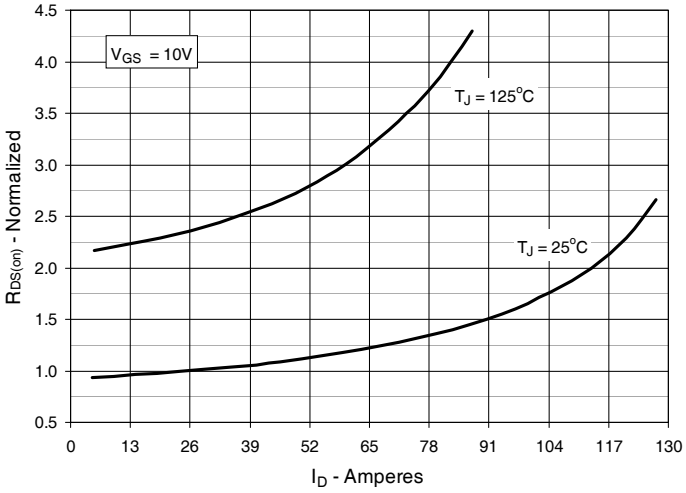
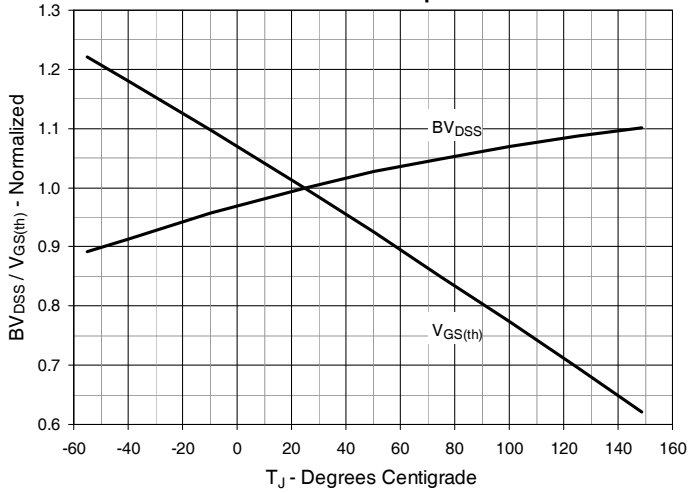


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature



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Fig. 7. Maximum Drain Current vs. Case Temperature

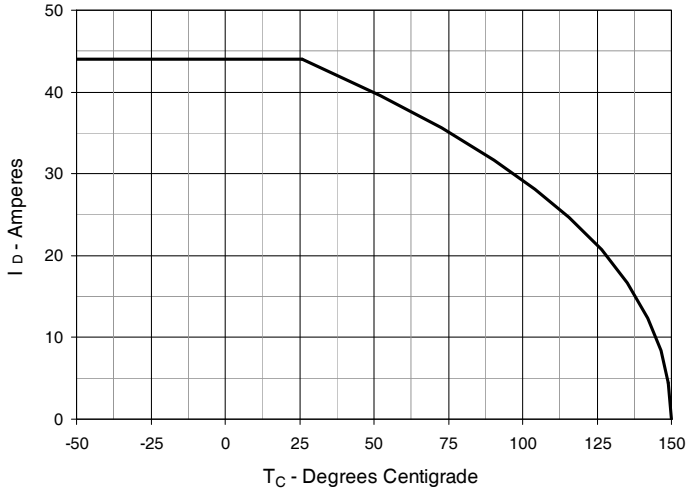


Fig. 8. Input Admittance

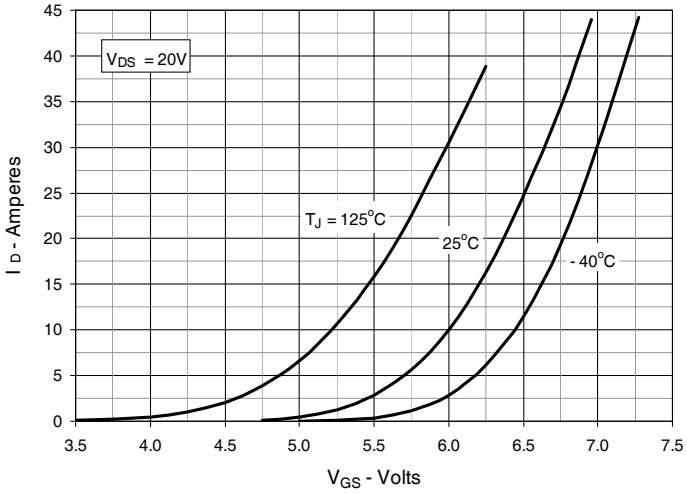


Fig. 9. Transconductance

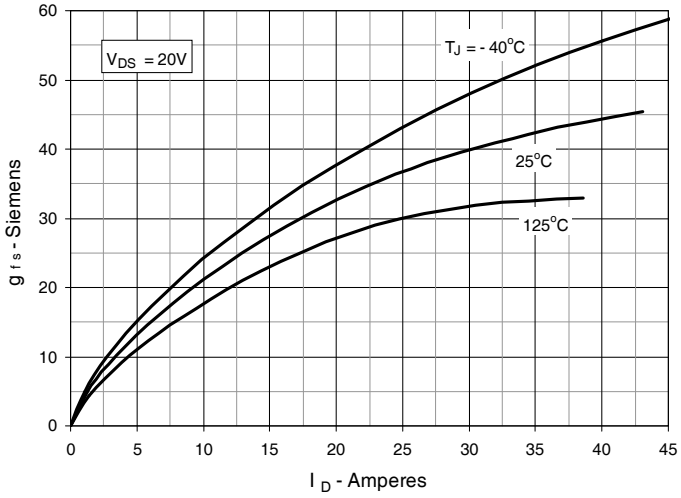


Fig. 10. Forward Voltage Drop of Intrinsic Diode

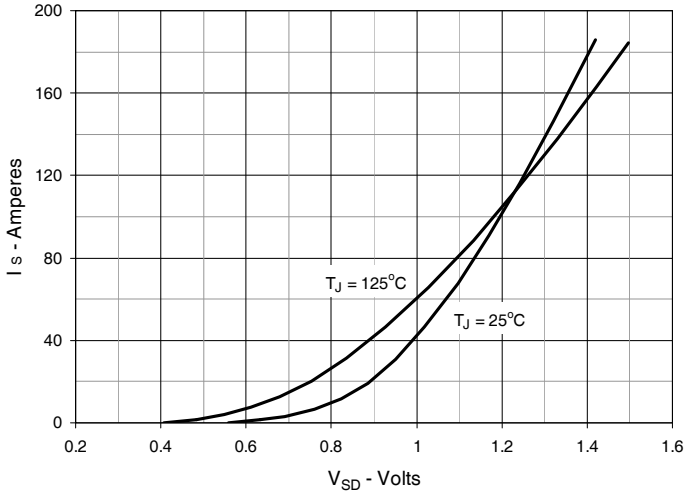


Fig. 11. Gate Charge

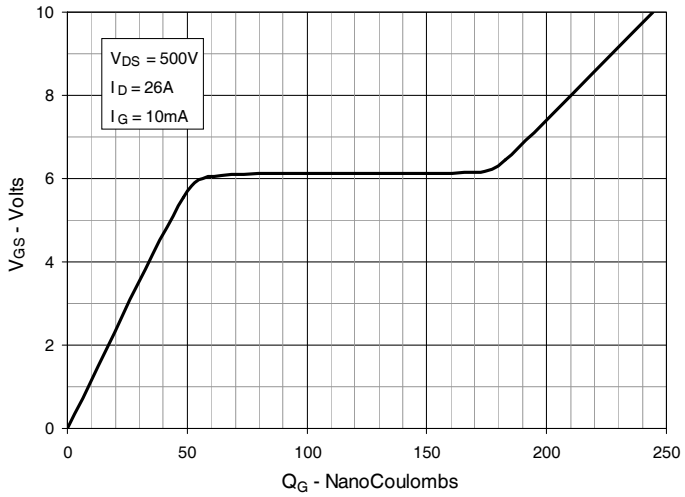
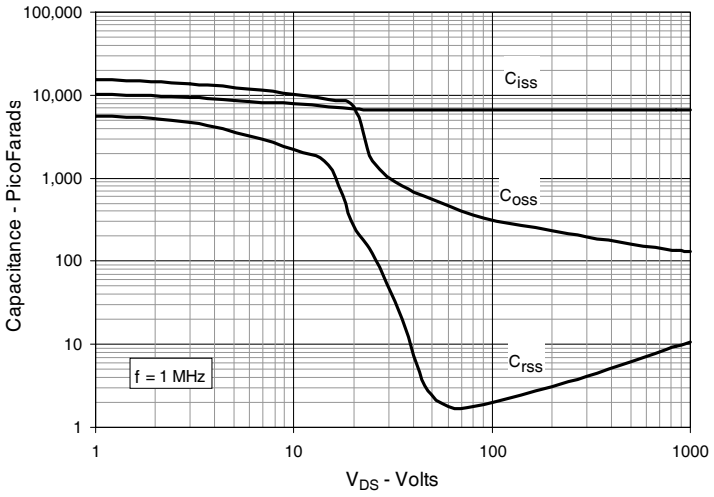


Fig. 12. Capacitance



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Fig. 13. Output Capacitance Stored Energy

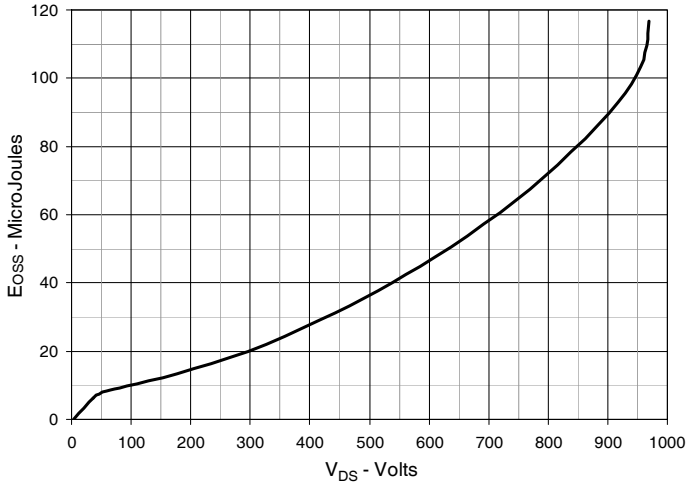


Fig. 14. Forward-Bias Safe Operating Area

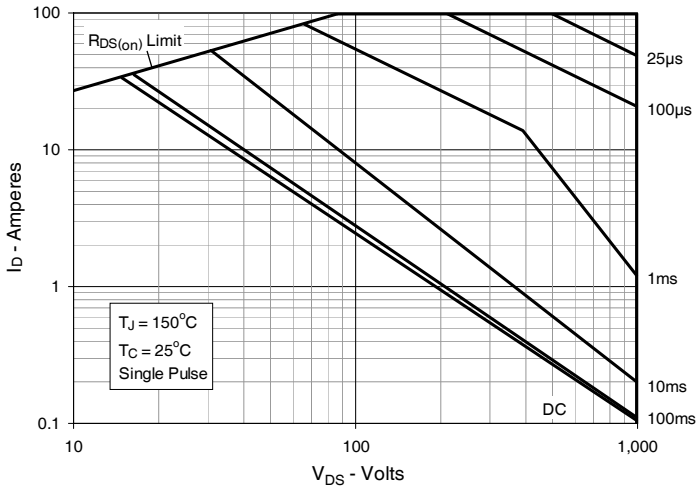
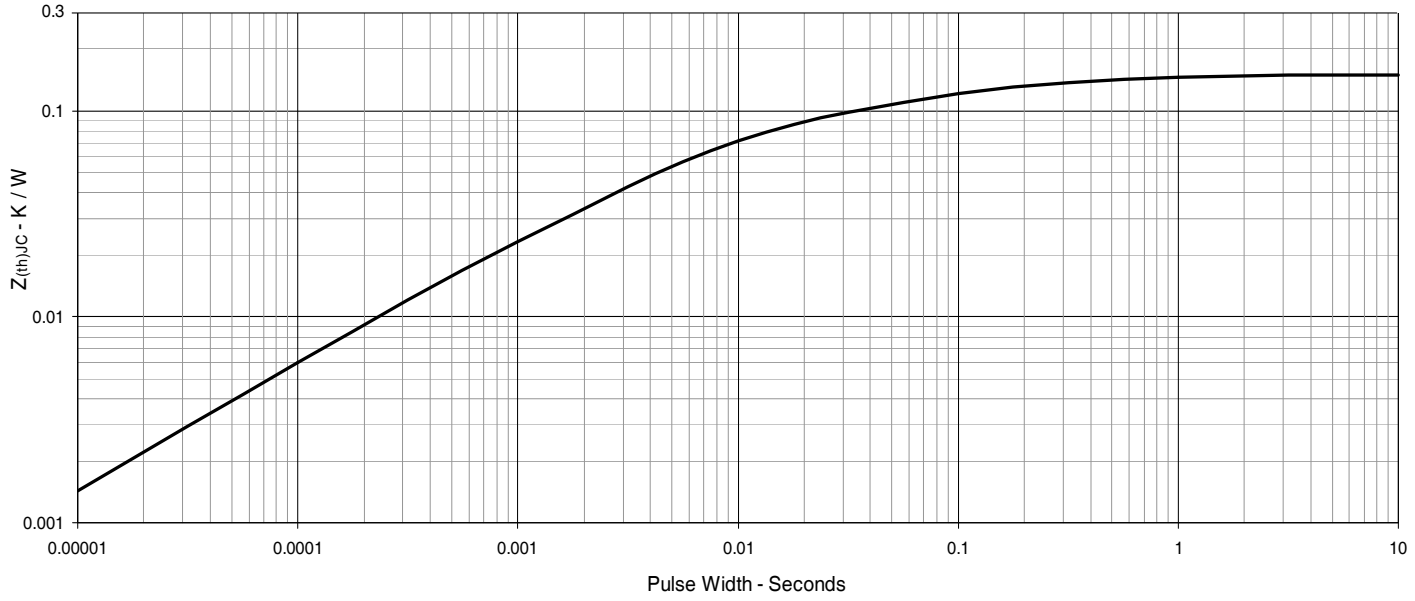


Fig. 15. Maximum Transient Thermal Impedance



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