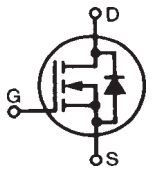
IXYS

Polar™ HiperFET™ Power MOSFET

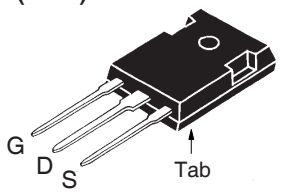
IXFH170N10P
IXFK170N10P

V_{DSS} = 100V
I_{D25} = 170A
$R_{DS(on)}$ ≤ 9mΩ
t_{rr} ≤ 150ns

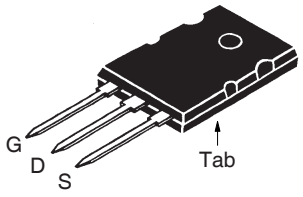
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier



TO-247 (IXFH)



TO-264 (IXFK)



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	100	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	100	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	T_C = 25°C	170	A
$I_{L(RMS)}$	External Lead Current Limit	160	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	350	A
I_A	T_C = 25°C	60	A
E_{AS}	T_C = 25°C	2	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 175°C$	10	V/ns
P_D	T_C = 25°C	715	W
T_J		-55 to +175	°C
T_{JM}		+175	°C
T_{stg}		-55 to +175	°C
T_L	1.6mm (0.063in) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-264	10	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	100			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4mA	2.5		5.0	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			25	μA
	T_J = 150°C			500	μA
$R_{DS(on)}$	V_{GS} = 10V, $I_D = 0.5 \bullet I_{D25}$, Note 1			9	mΩ
	V_{GS} = 15V, I_D = 350A		7		mΩ

Features

- International Standard Packages
- Fast Intrinsic Rectifier
- Avalanche Rated
- Low $R_{DS(ON)}$ and Q_G
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

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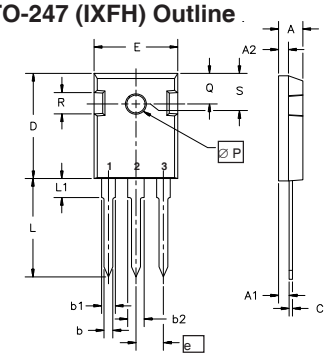
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	50	72		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		6000		pF
C_{oss}			2340		pF
C_{rss}			730		pF
$t_{d(on)}$	**Resistive Switching Times**		35		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 60A		50		ns
$t_{d(off)}$	R_G = 3.3Ω (External)		90		ns
t_f			33		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		198		nC
Q_{gs}			39		nC
Q_{gd}			107		nC
R_{thJC}				0.21	°C/W
R_{thCS}	(TO-247)		0.21		°C/W
	(TO-264)		0.15		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			170	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			350	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 25A, -di/dt = 100A/µs,			150	ns
I_{RM}	V_R = 50V, V_{GS} = 0V		8.0		A
Q_{RM}			0.6		µC

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

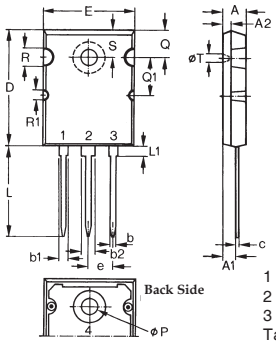
TO-247 (IXFH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

TO-264 AA (IXFK) Outline



1 = Gate
2 = Drain
3 = Source
Tab = Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

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 4,850,072 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 = 25ºC

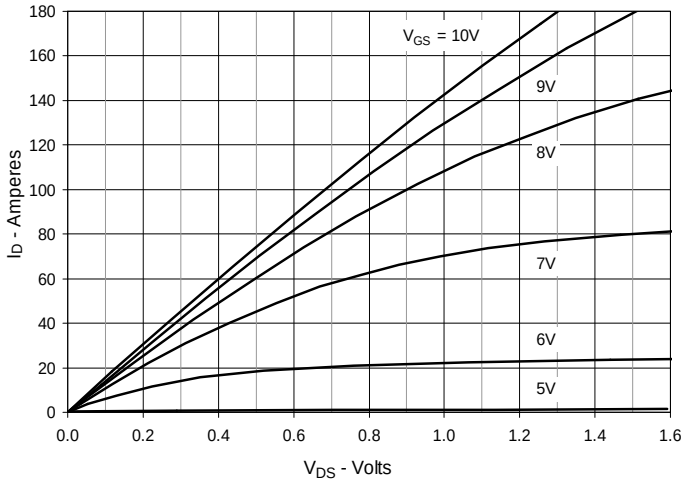


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

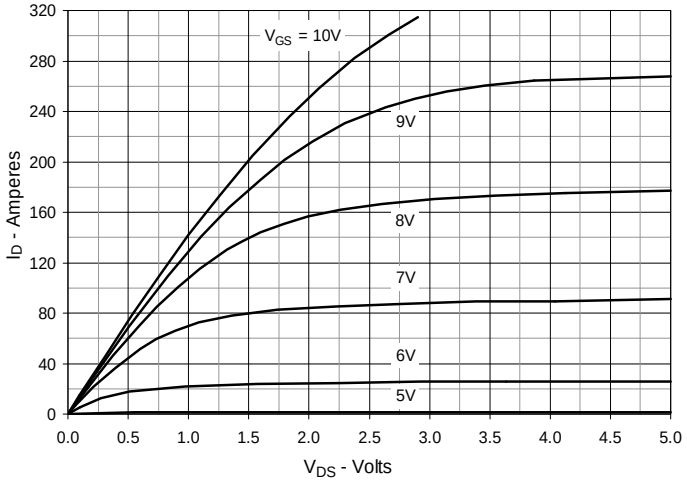


Fig. 3. Output Characteristics @ T_J = 150ºC

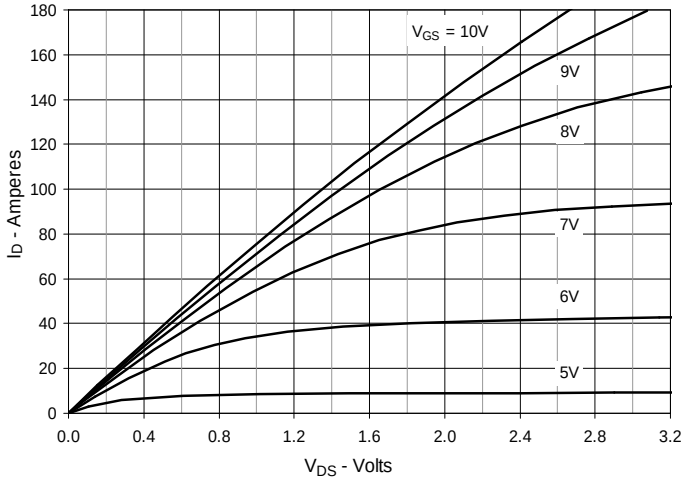


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 85A Value vs. Junction Temperature

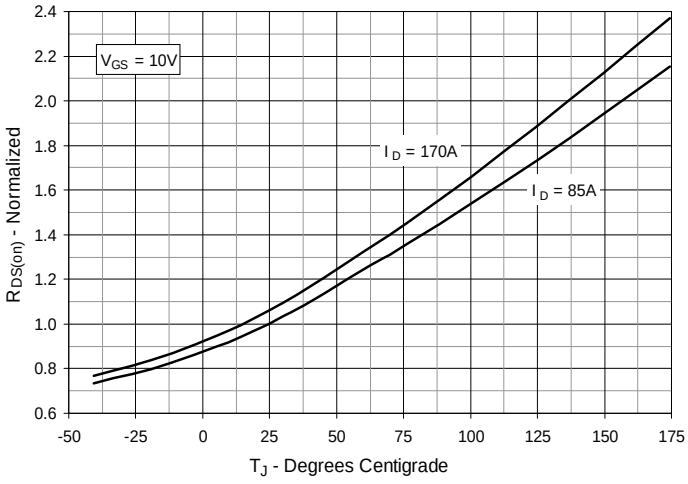


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 85A Value vs. Drain Current

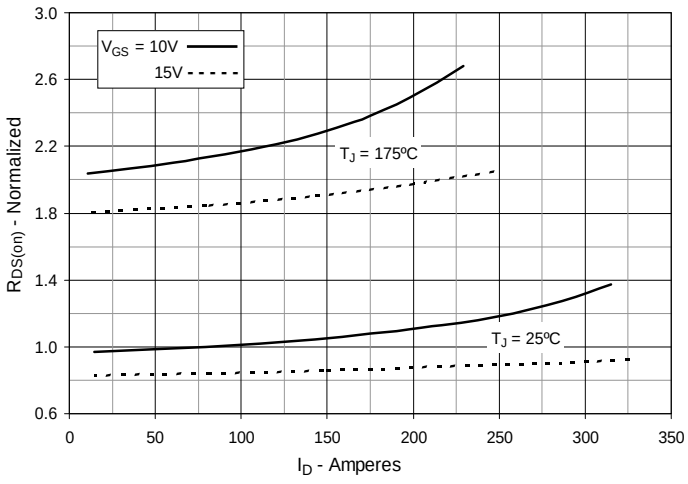
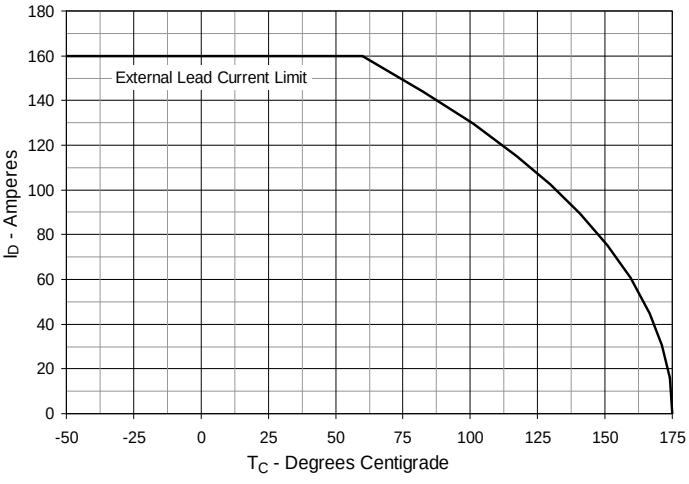


Fig. 6. Maximum Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

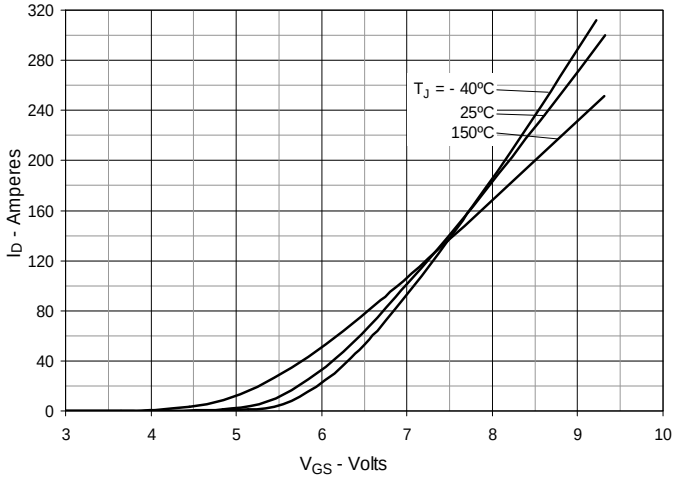


Fig. 8. Transconductance

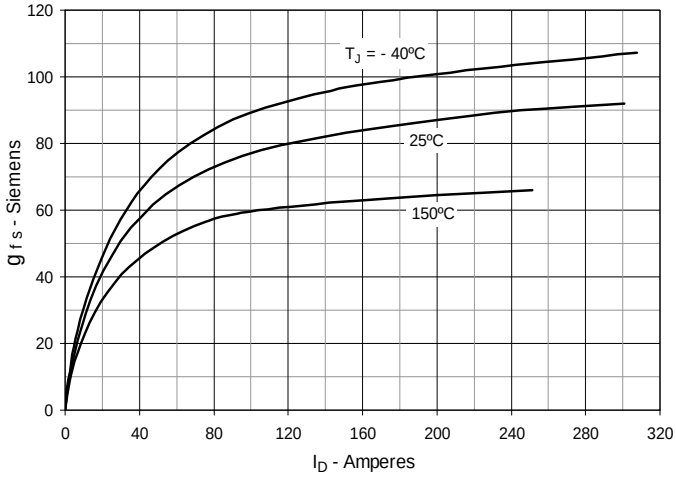


Fig. 9. Forward Voltage Drop of Intrinsic Diode

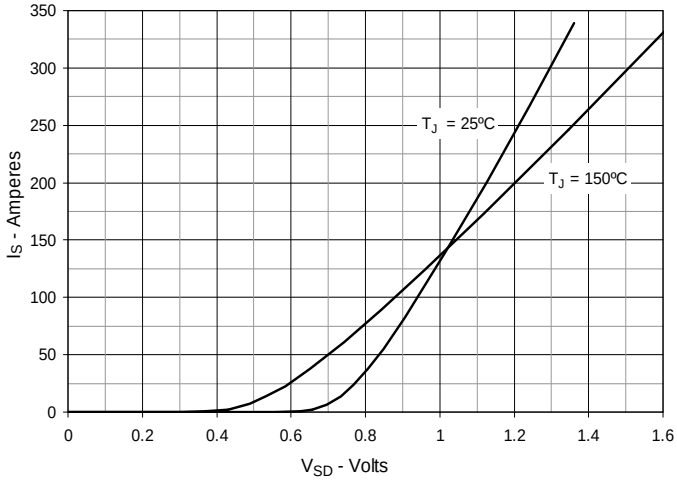


Fig. 10. Gate Charge

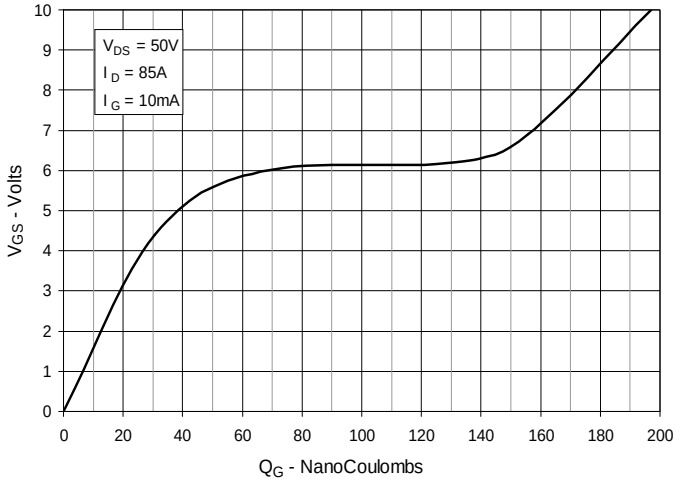


Fig. 11. Capacitance

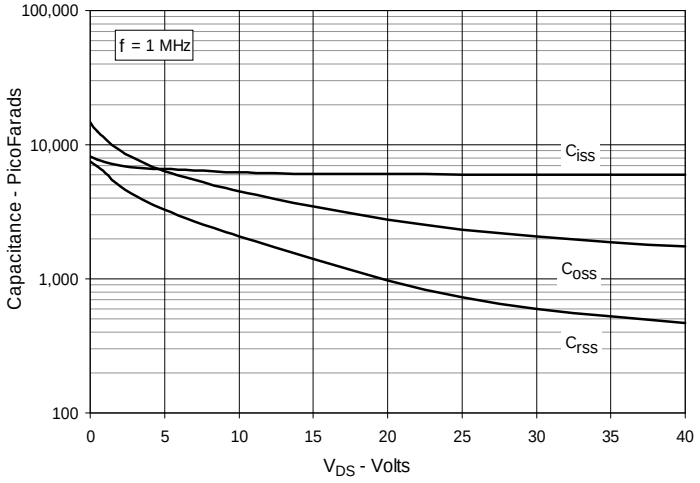
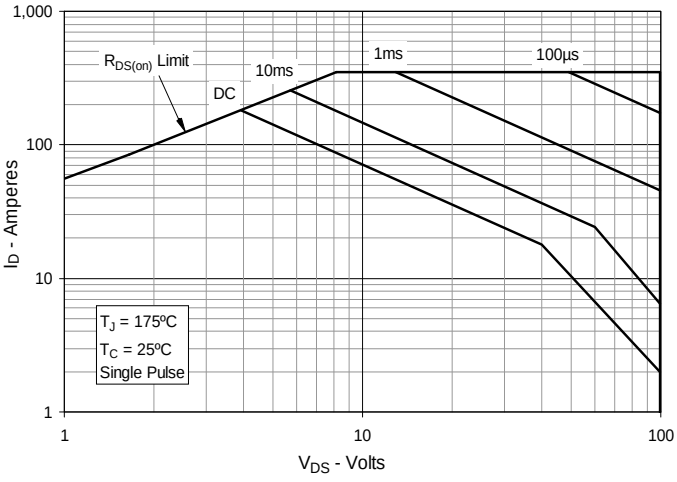
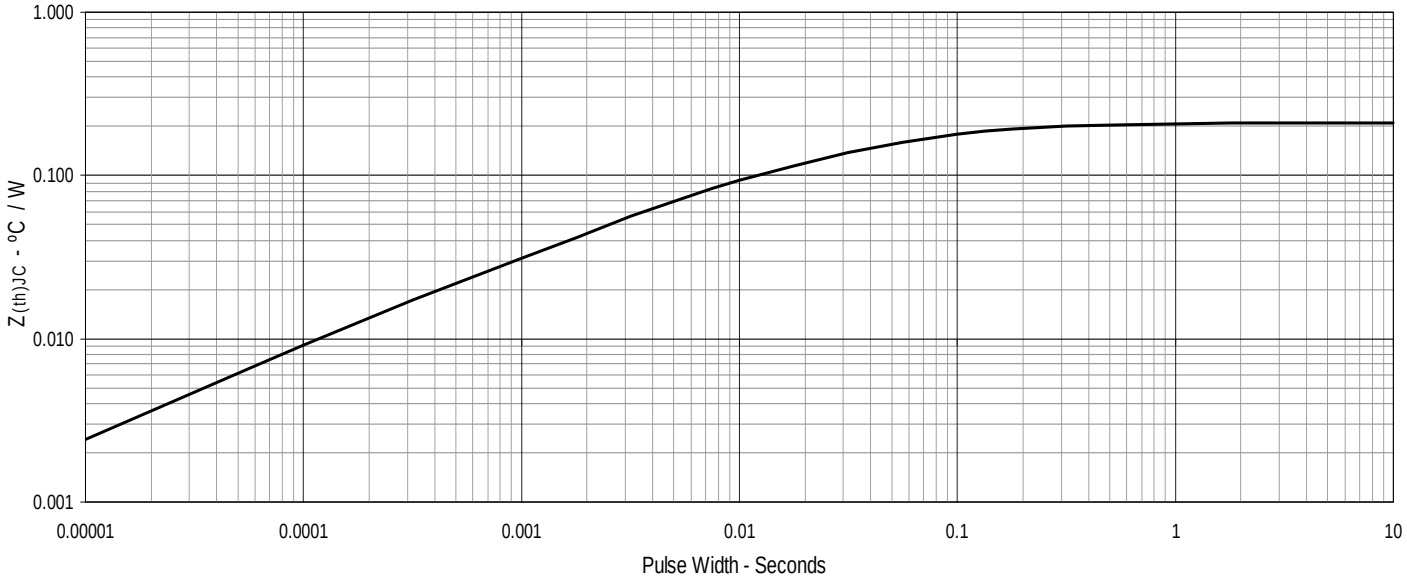


Fig. 12. Forward-Bias Safe Operating Area



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Fig. 13. Maximum Transient Thermal Impedance



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