

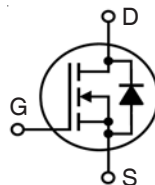
X3-Class HiPerFET™ Power MOSFET

IXFJ80N25X3

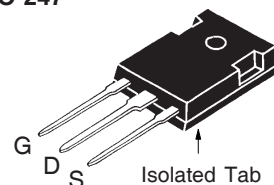
$$\begin{aligned} V_{DSS} &= 250V \\ I_{D25} &= 44A \\ R_{DS(on)} &\leq 18m\Omega \end{aligned}$$

(Electrically Isolated Tab)

N-Channel Enhancement Mode
Avalanche Rated



ISO TO-247™



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	250	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C , $R_{GS} = 1M\Omega$	250	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	44	A
I_{DM}	$T_C = 25^\circ\text{C}$, Pulse Width Limited by T_{JM}	220	A
I_A	$T_C = 25^\circ\text{C}$	40	A
E_{AS}	$T_C = 25^\circ\text{C}$	1.2	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$	50	V/ns
P_D	$T_C = 25^\circ\text{C}$	104	W
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 Torque	1.13 / 10	Nm/lb.in
V_{ISOL}	50/60 Hz, RM, $t = 1\text{min}$	2500	V~
Weight		5	g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu\text{A}$	250		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1.5\text{mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ\text{C}$			5 μA 350 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 40A$, Note 1			18 m Ω

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- 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

Symbol	Test Conditions (T _J = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
g_{fs}	V _{DS} = 10V, I _D = 40A, Note 1	38	64	S
R_{Gi}	Gate Input Resistance		1.6	Ω
C_{iss}	} V _{GS} = 0V, V _{DS} = 25V, f = 1MHz		5430	pF
C_{oss}			890	pF
C_{rss}			1.6	pF
Effective Output Capacitance				
C_{o(er)}	Energy related	} V _{GS} = 0V V _{DS} = 0.8 • V _{DSS}	320	pF
C_{o(tr)}	Time related		1410	pF
t_{d(on)}	} Resistive Switching Times V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 40A R _G = 5Ω (External)		30	ns
t_r			17	ns
t_{d(off)}			65	ns
t_f			8	ns
Q_{g(on)}	} V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 40A		83	nC
Q_{gs}			27	nC
Q_{gd}			24	nC
R_{thJC}				1.20 °C/W
R_{thCS}			0.30	°C/W

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
I_S	$V_{GS} = 0\text{V}$			80 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			320 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1			1.4 V
t_{rr}	$I_F = 40\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$		120	ns
Q_{RM}			600	nC
I_{RM}			10	A

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

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	

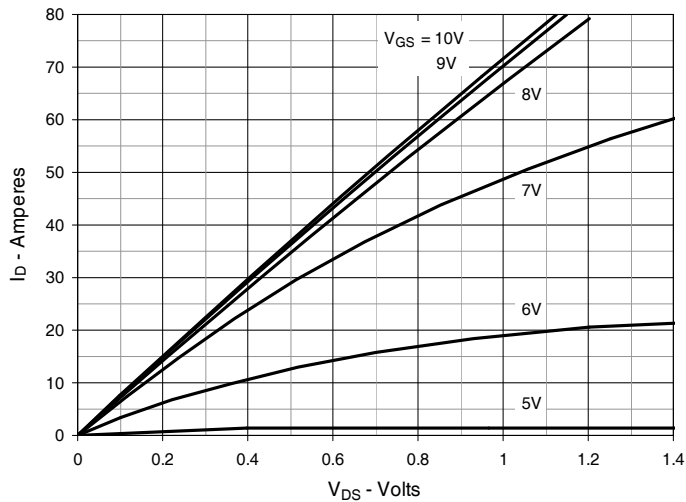
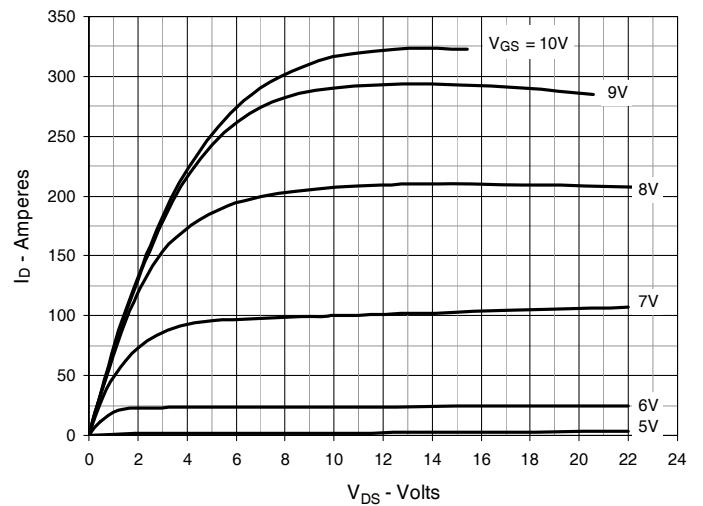
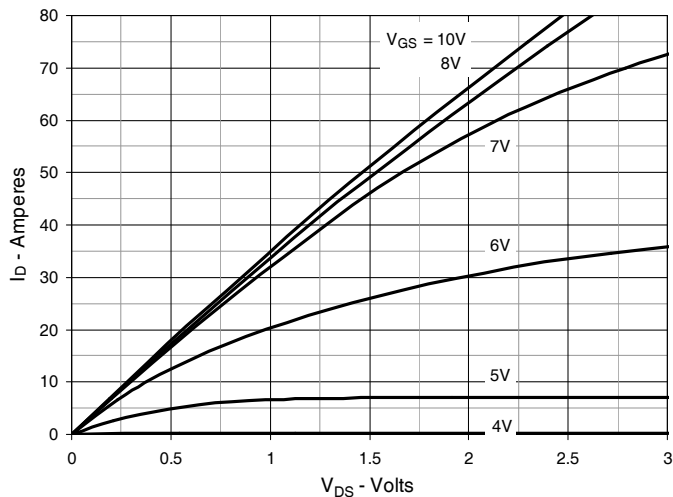
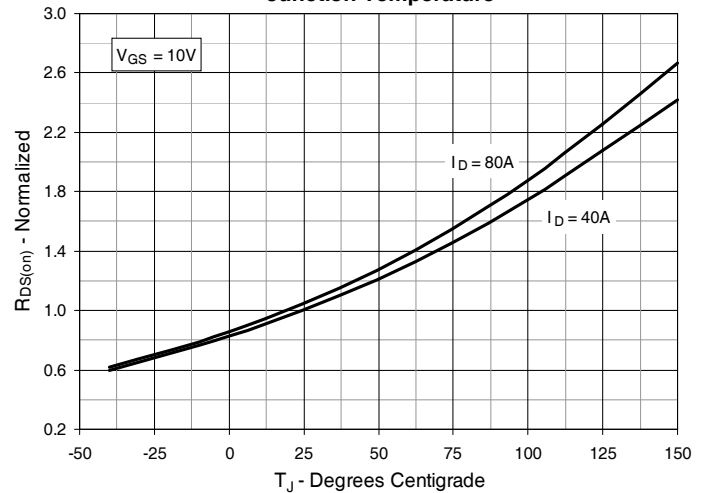
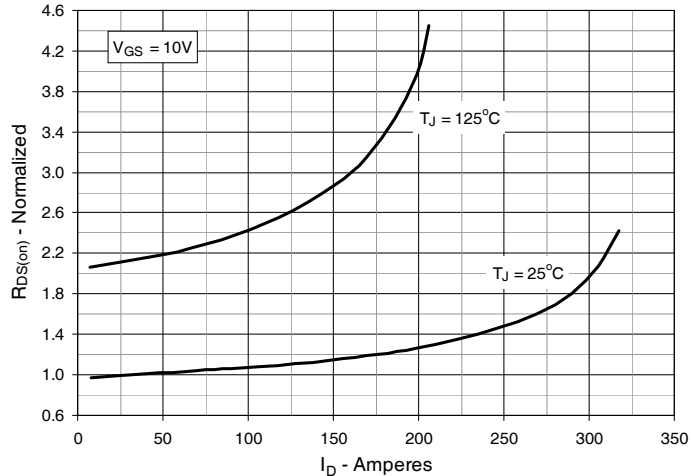
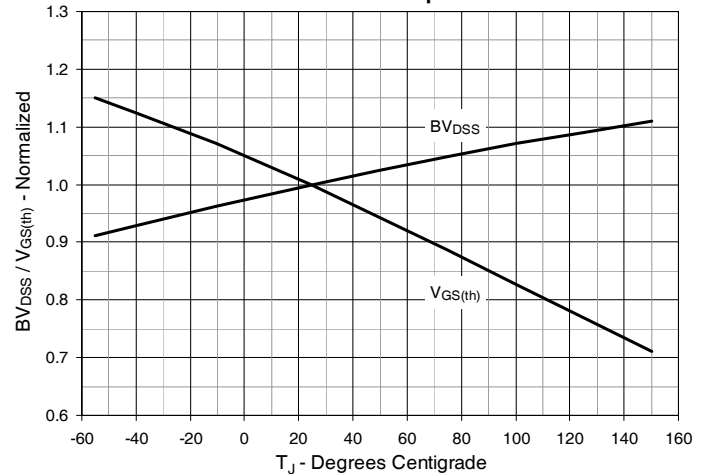
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

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 $I_D = 40\text{A}$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 40\text{A}$ Value vs. Drain Current

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


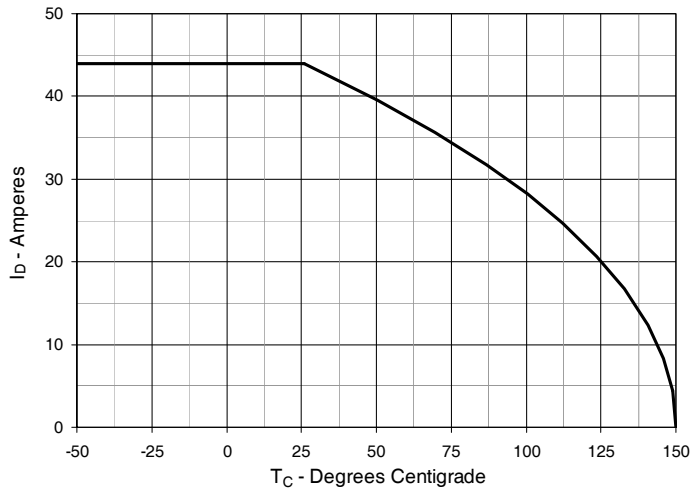
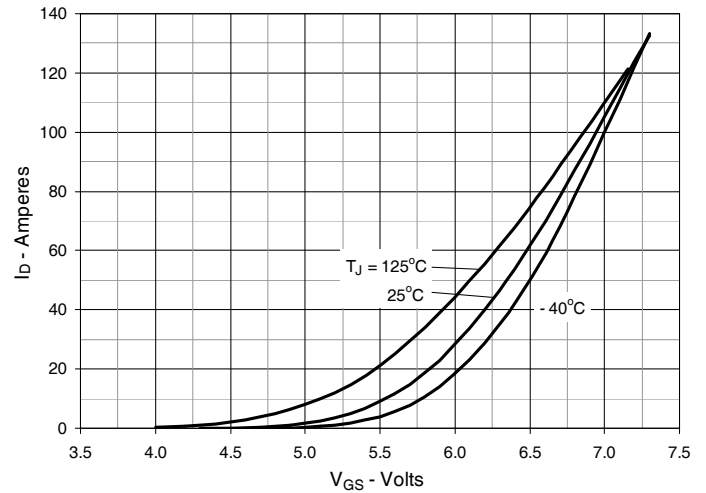
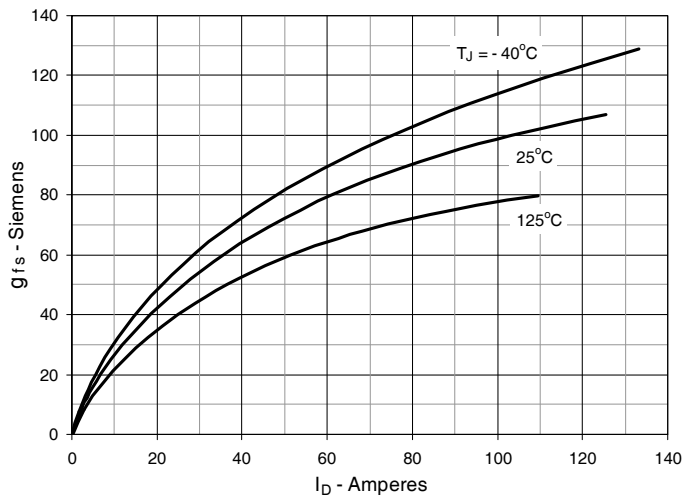
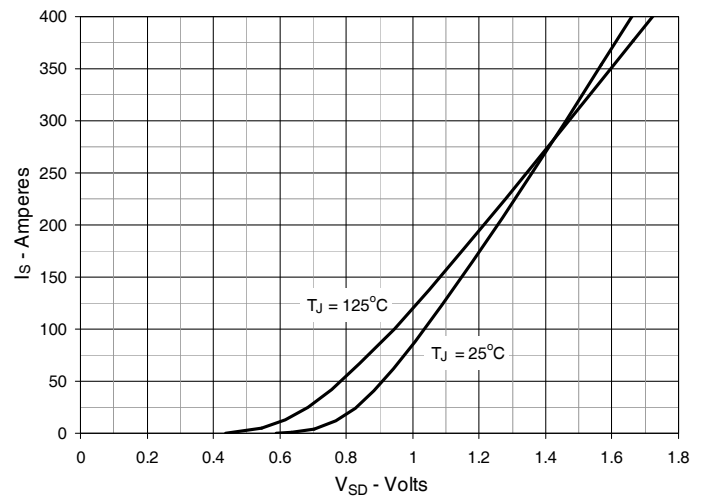
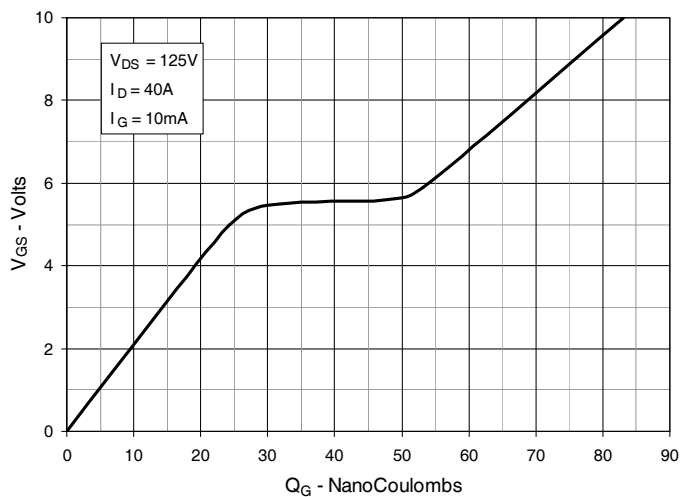
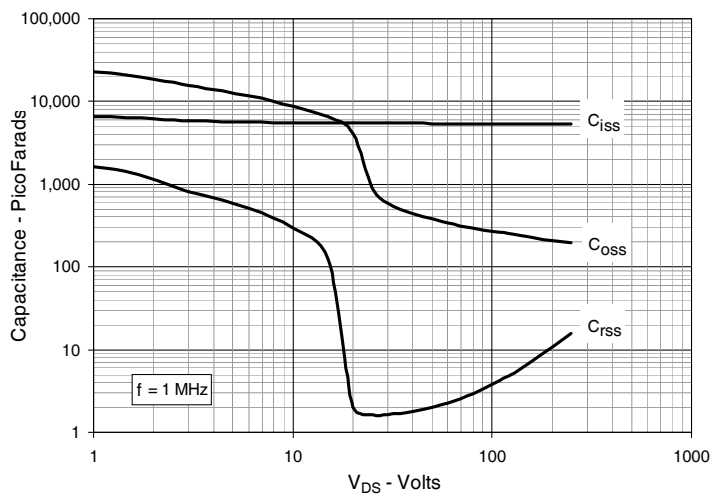
Fig. 7. Maximum Drain Current vs. Case Temperature

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

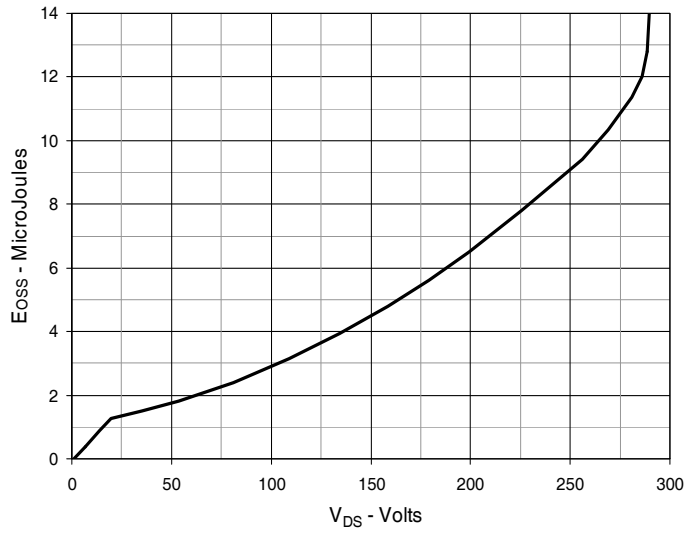


Fig. 14. Forward-Bias Safe Operating Area

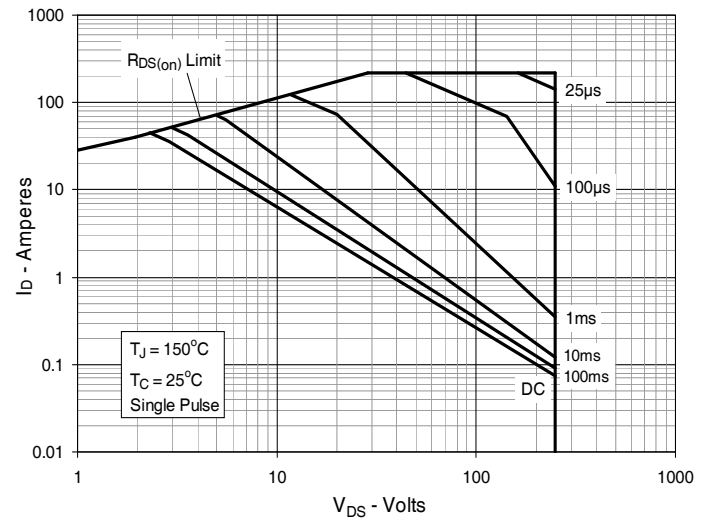
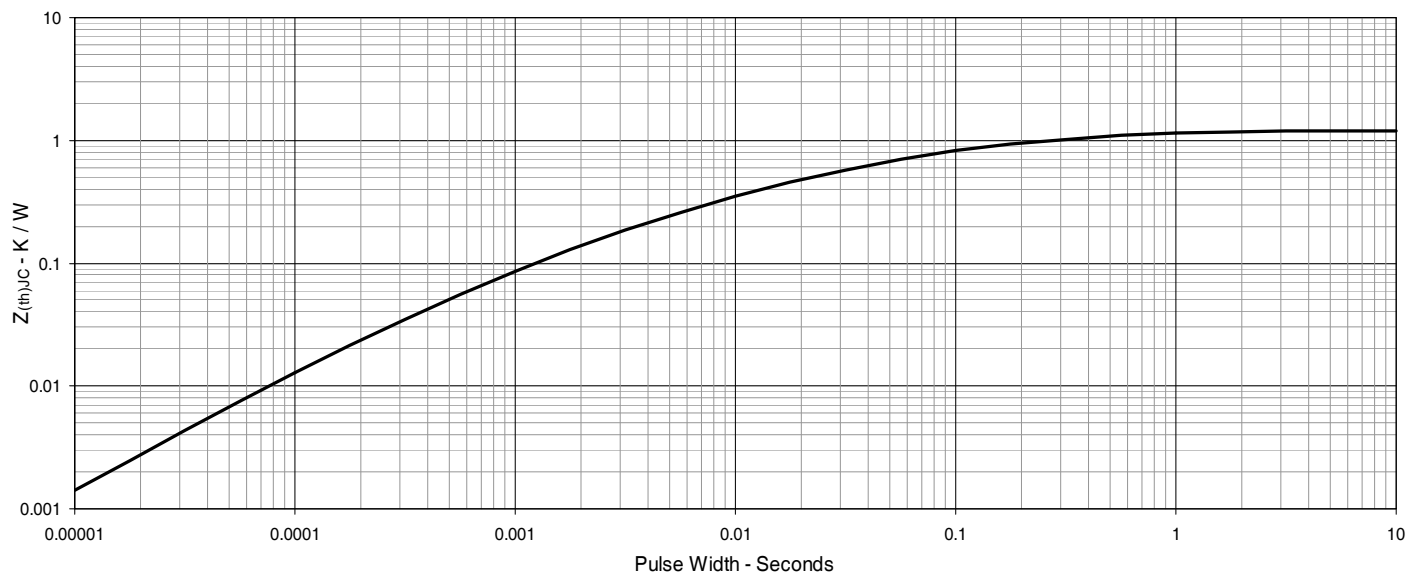
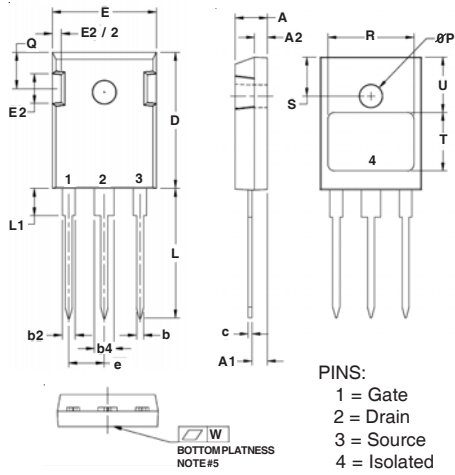


Fig. 15. Maximum Transient Thermal Impedance



ISO TO-247 (IXFJ) 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



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