IXYS

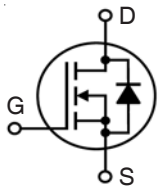
X3-Class HiPerFET™ Power MOSFET

IXFJ80N25X3

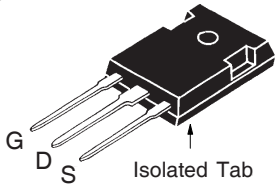
V_{DSS} = 250V
I_{D25} = 44A
$R_{DS(on)}$ ≤ 18mΩ

(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°C to 150°C	250	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	250	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	44	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	220	A
I_A	T_C = 25°C	40	A
E_{AS}	T_C = 25°C	1.2	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	50	V/ns
P_D	T_C = 25°C	104	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
F_C	Mounting Torque	1.13 / 10	Nm/lb.in
V_{ISOL}	50/60 Hz, RM, t = 1min	2500	V~
Weight		5	g

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

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

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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 = 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; V_{GS} = 0V, V_{DS} = 0.8 • V_{DSS}		1410		pF
$t_{d(on)}$	**Resistive Switching Times**		30		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 40A		17		ns
$t_{d(off)}$	R_G = 5Ω (External)		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°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
I_S	V_{GS} = 0V			80	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			320	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.4	V
t_{rr}	I_F = 40A, -di/dt = 100A/μs		120		ns
Q_{RM}	V_R = 100V		600		nC
I_{RM}			10		A

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 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 4,860,072 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

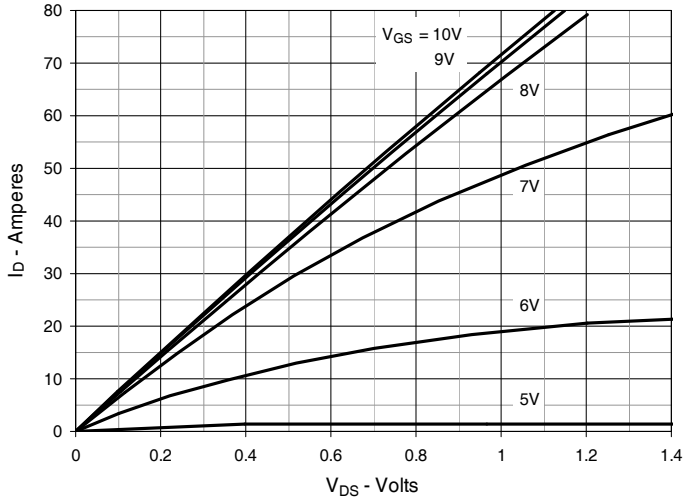


Fig. 2. Extended Output Characteristics @ T_J = 25°C

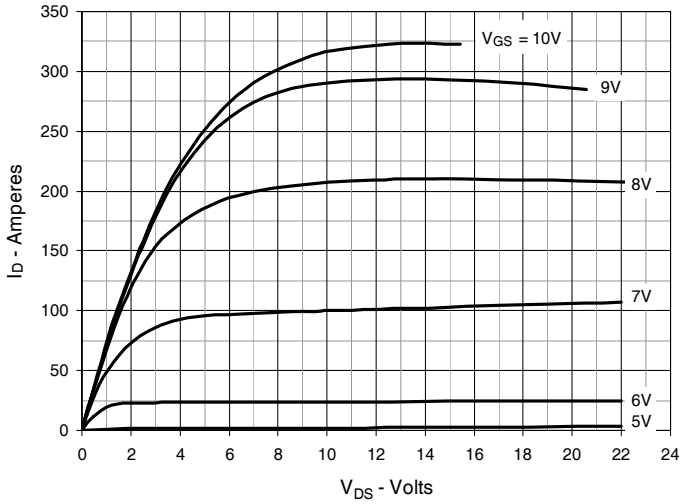


Fig. 3. Output Characteristics @ T_J = 125°C

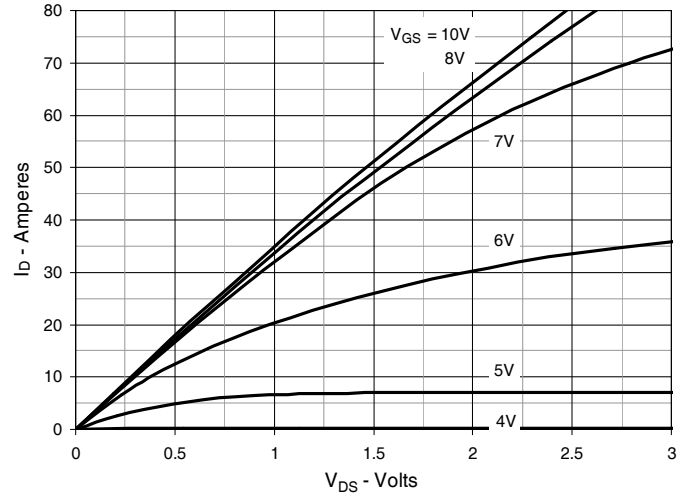


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Junction Temperature

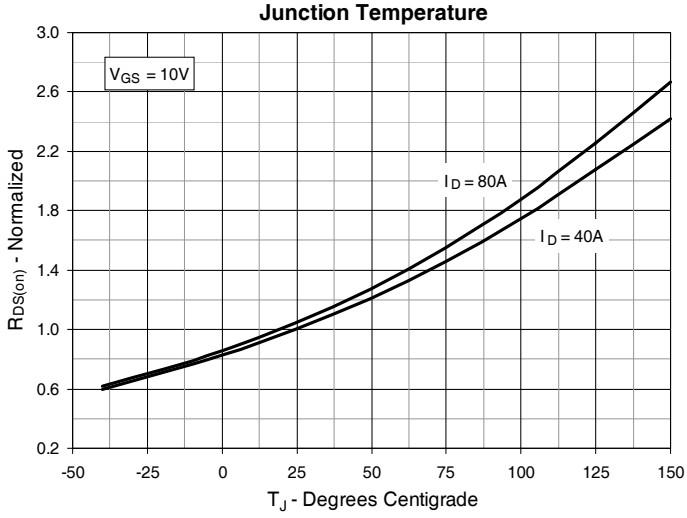


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Drain Current

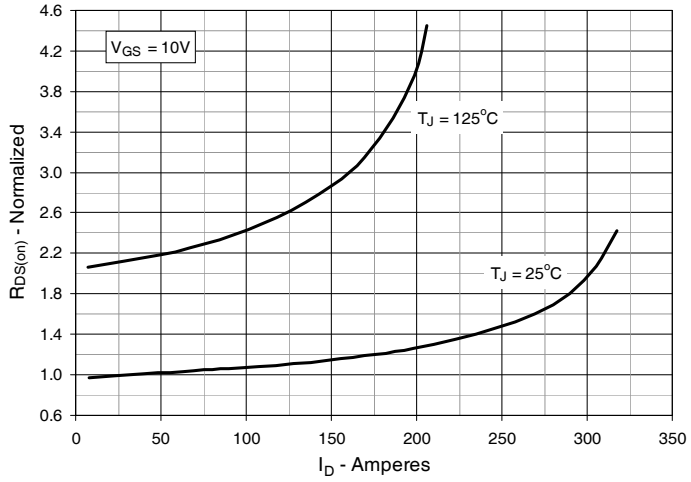
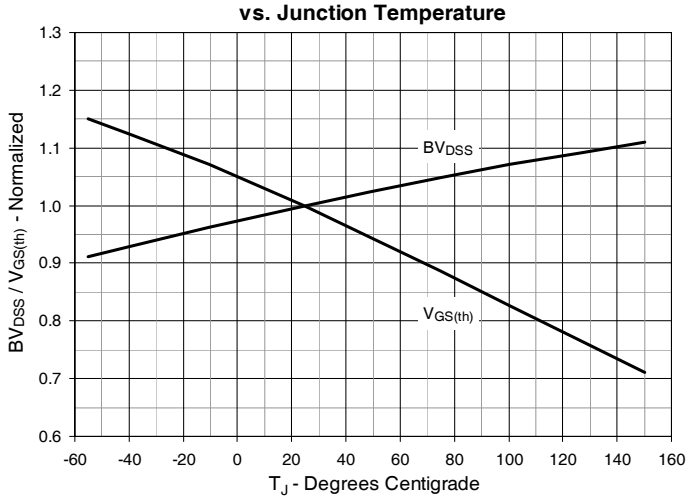


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature



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Fig. 7. Maximum Drain Current vs. Case Temperature

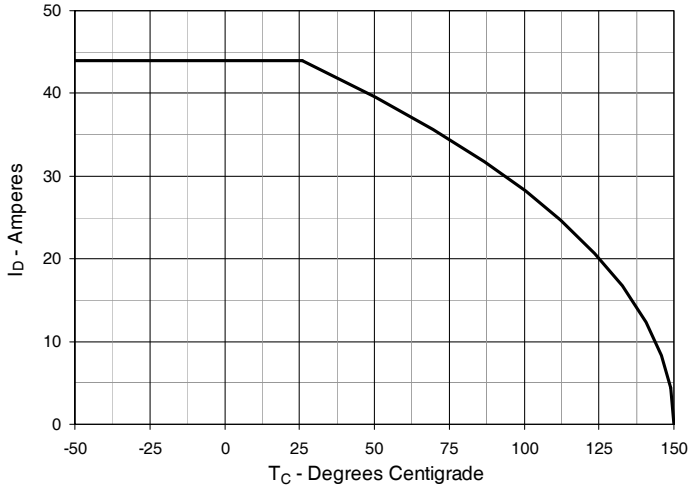


Fig. 8. Input Admittance

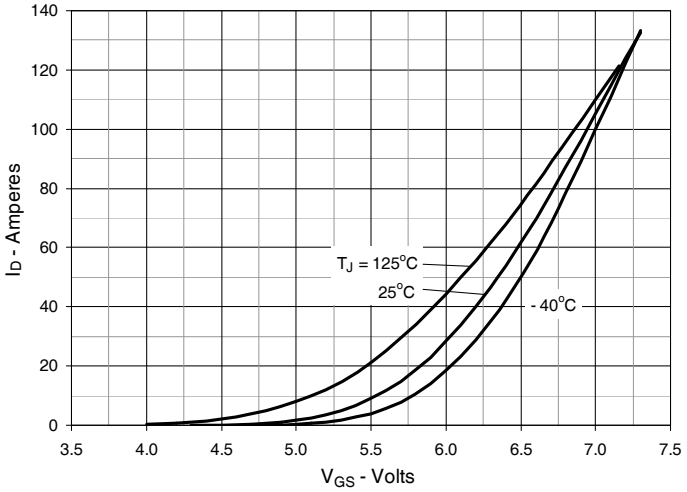


Fig. 9. Transconductance

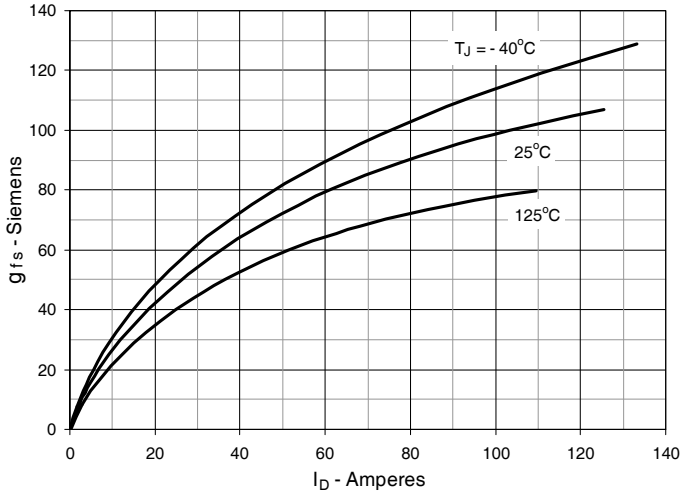


Fig. 10. Forward Voltage Drop of Intrinsic Diode

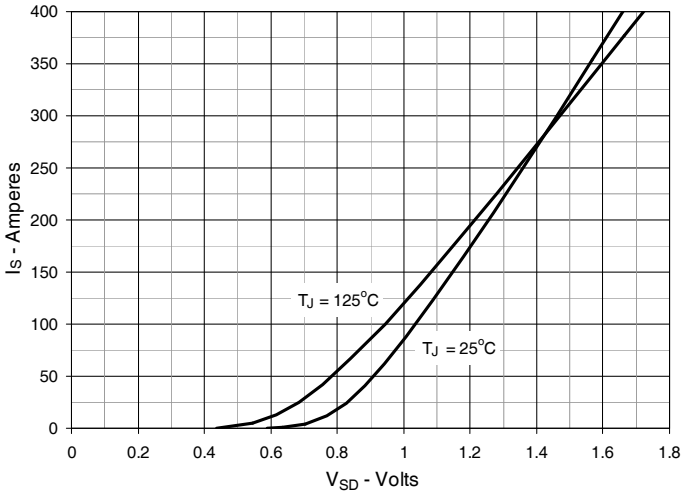


Fig. 11. Gate Charge

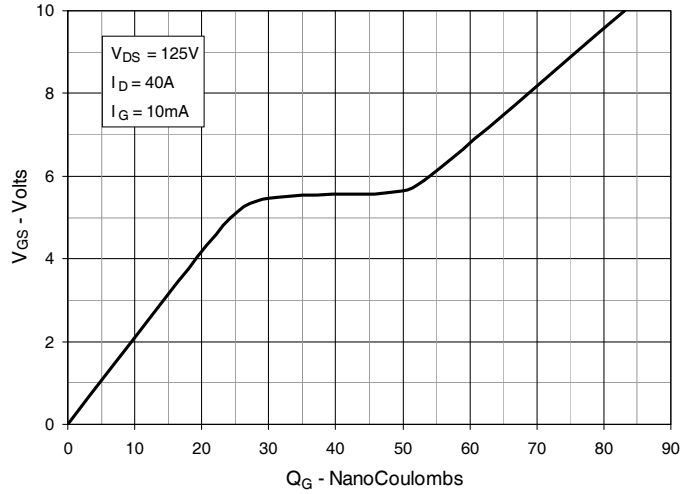
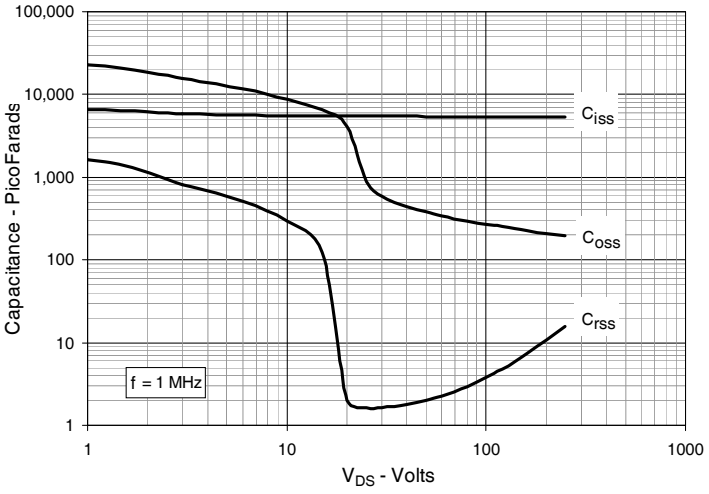


Fig. 12. Capacitance



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Fig. 13. Output Capacitance Stored Energy

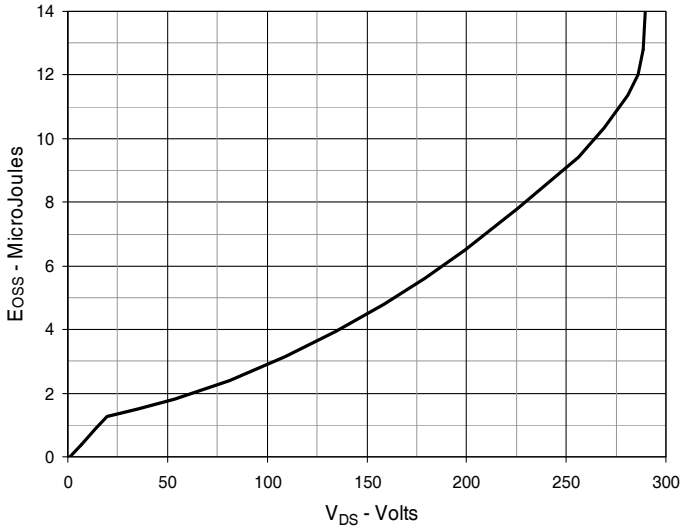


Fig. 14. Forward-Bias Safe Operating Area

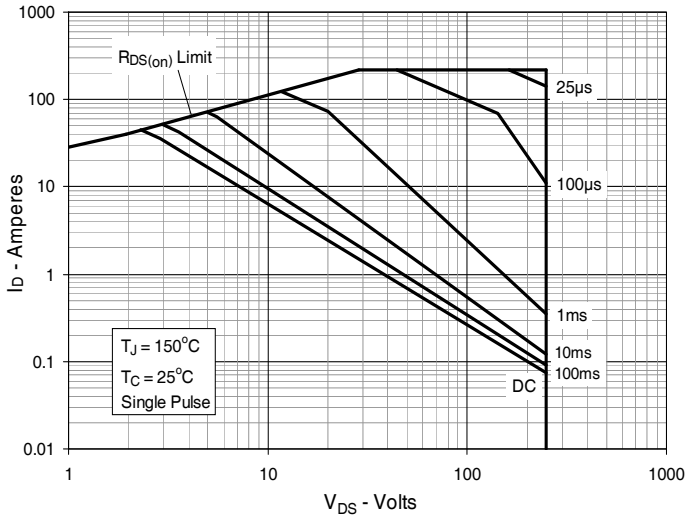
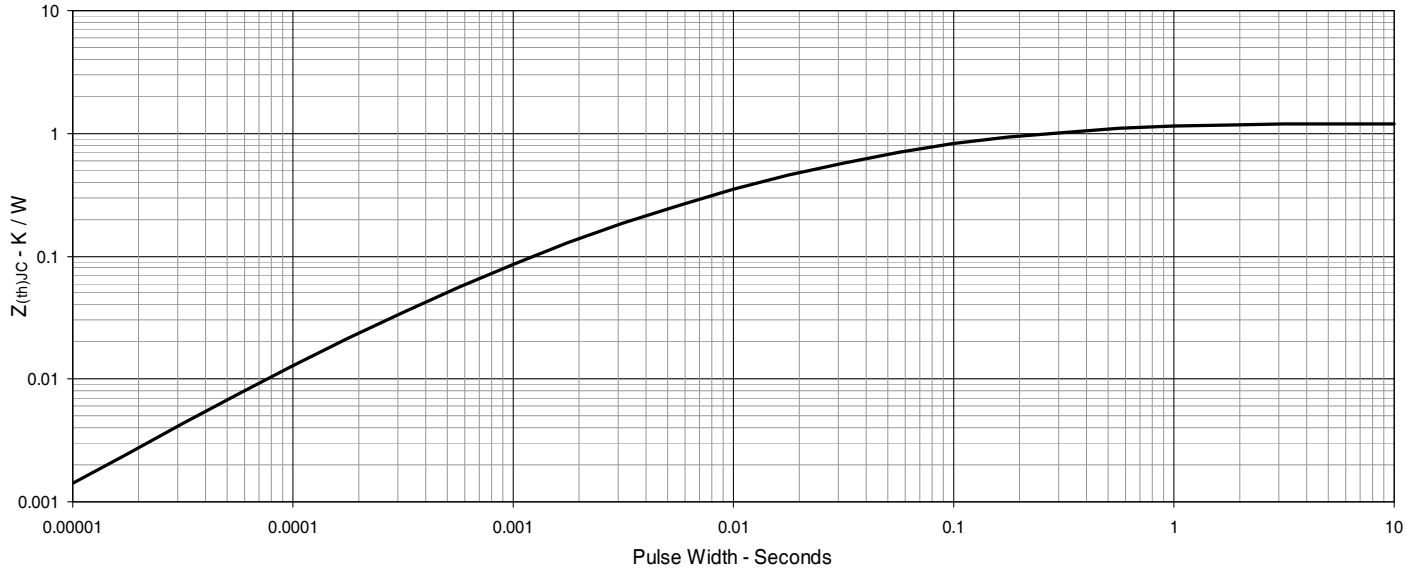
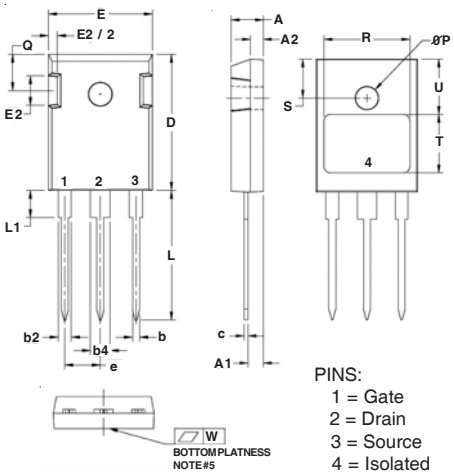


Fig. 15. Maximum Transient Thermal Impedance



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ISO TO-247 (IXFJ) OUTLINE



PINS:
1 = Gate
2 = Drain
3 = Source
4 = Isolated

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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