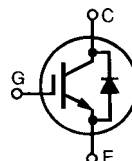


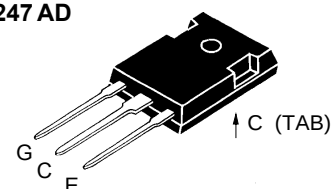
HiPerFAST™ IGBT IXGH 32N60BU1 with Diode

$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 60 \text{ A} \\ V_{CE(sat)} &= 2.3 \text{ V} \\ t_{fi} &= 80 \text{ ns} \end{aligned}$$



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	60	A
I_{C90}	$T_C = 90^\circ\text{C}$	32	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	120	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 33 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 64$ @ $0.8 V_{CES}$	A
P_C	$T_C = 25^\circ\text{C}$	200	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
Maximum Lead and Tab temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque, TO-247 AD	1.13/10	Nm/lb.in.
Weight		6	g

TO-247 AD



G = Gate, C = Collector,
E = Emitter, TAB = Collector

Features

- International standard packages
JEDEC TO-247 SMD
- High frequency IGBT and antiparallel
FRED in one package
- High current handling capability
- Newest generation HDMOS™ process
- MOS Gate turn-on
- drive simplicity

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode
power supplies

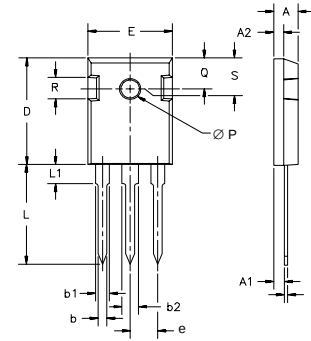
Advantages

- Space savings (two devices in one
package)
- High power density
- Very fast switching speeds for high
frequency applications

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 750 \mu\text{A}, V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	2.5		5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$			500 μA 8 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}, V_{GE} = 15 \text{ V}$			2.3 V

Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	I _C = I _{C90} ; V _{CE} = 10 V, Pulse test, t ≤ 300 μs, duty cycle ≤ 2 %	15	25	S
C_{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		2700	pF
C_{oes}			270	pF
C_{res}			50	pF
Q_G	I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.5 V _{CES}		110	nC
Q_{GE}			23	nC
Q_{GC}			40	nC
t_{d(on)}	Inductive load, T_J = 25°C I _C = I _{C90} , V _{GE} = 15 V, L = 100 μH, V _{CE} = 0.8 V _{CES} , R _G = R _{off} = 4.7 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G		25	ns
t_{ri}			20	ns
t_{d(off)}			100	ns
t_{fi}			80	ns
E_{off}			0.6	mJ
t_{d(on)}	Inductive load, T_J = 125°C I _C = I _{C90} , V _{GE} = 15 V, L = 100 μH V _{CE} = 0.8 V _{CES} , R _G = R _{off} = 4.7 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G		25	ns
t_{ri}			25	ns
E_{on}			1	mJ
t_{d(off)}			120	ns
t_{fi}			120	ns
E_{off}			1.2	mJ
R_{thJC}				0.62 K/W
R_{thCK}			0.25	K/W

TO-247 AD Outline



Dim.	Millimeter		Inches	
	Min.	Max.	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
L ₁		4.50		.177
ØP	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

Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
V_F	I _F = I _{C90} , V _{GE} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.6 V
I_{RM}	I _F = I _{C90} , V _{GE} = 0 V, -di _F /dt = 240 A/μs V _R = 360 V I _F = 1 A; -di _F /dt = 100 A/μs; V _R = 30 V		10	15 A
t_{rr}			150	ns
			35	50 ns
R_{thJC}				1 K/W

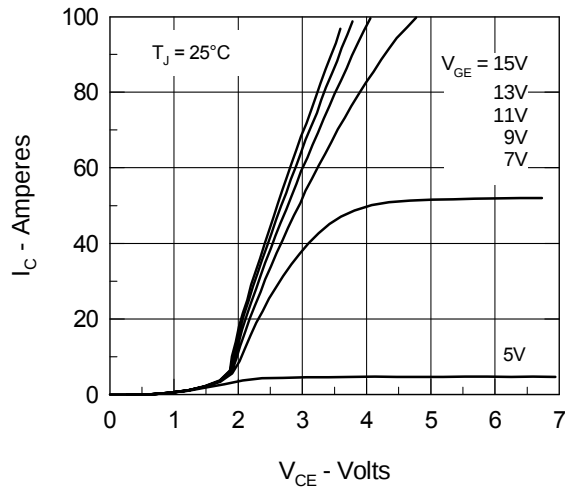


Fig. 1. Saturation Voltage Characteristics

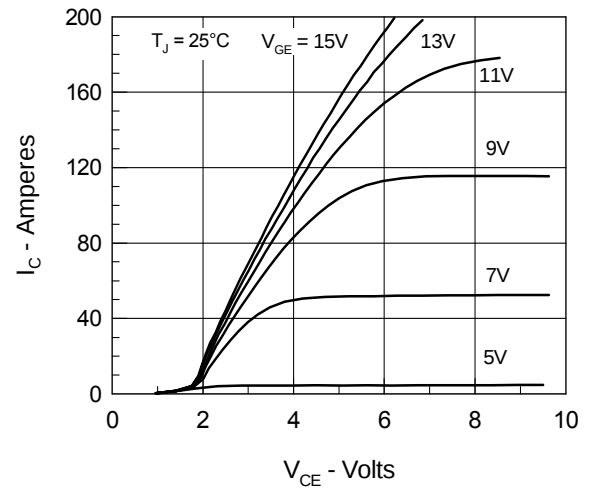


Fig. 2. Extended Output Characteristics

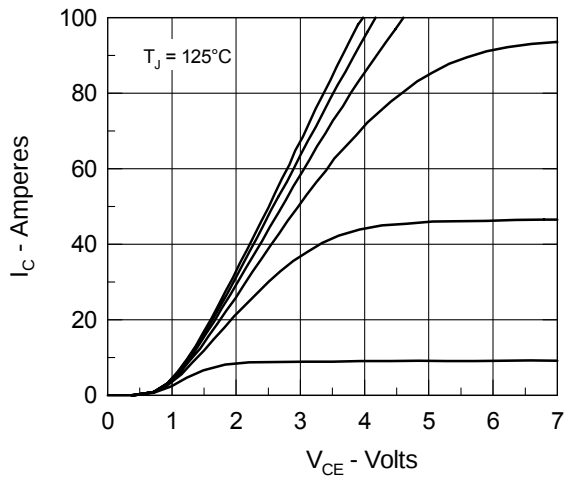


Fig. 3. Saturation Voltage Characteristics

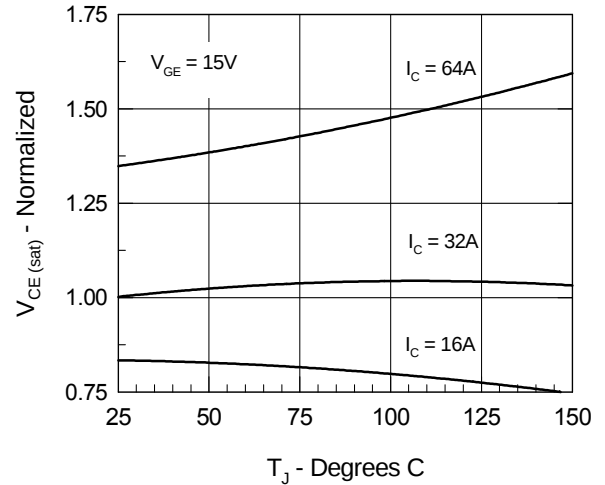
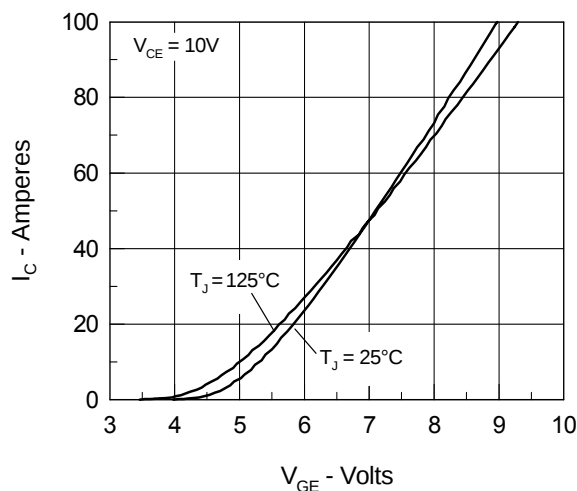
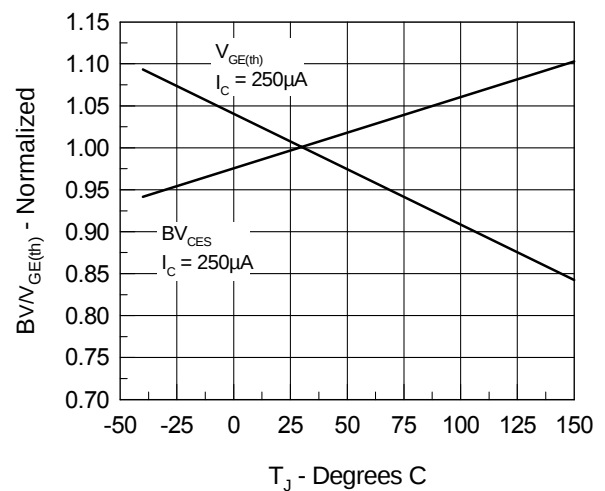

 Fig. 4. Temperature Dependence of $V_{CE(sat)}$


Fig. 5. Admittance Curves


 Fig. 6. Temperature Dependence of BV_{DSS} & $V_{GE(th)}$

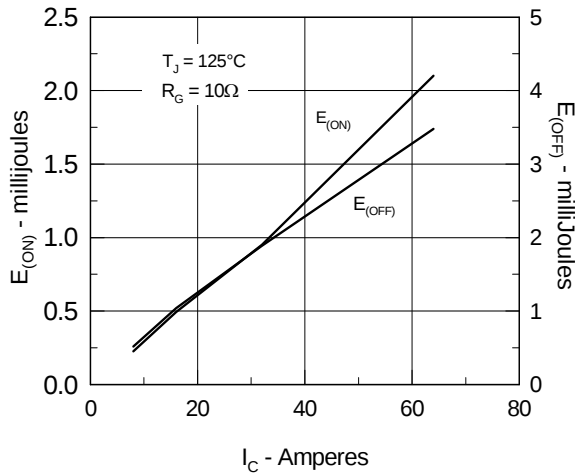


Fig. 7. Dependence of t_{fi} and E_{OFF} on I_C .

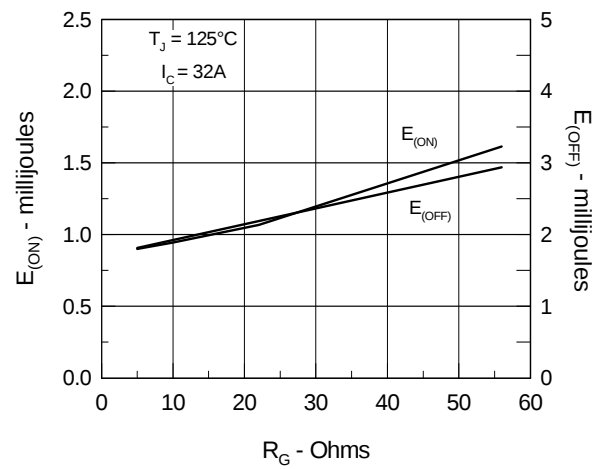


Fig. 8. Dependence of t_{fi} and E_{OFF} on R_G .

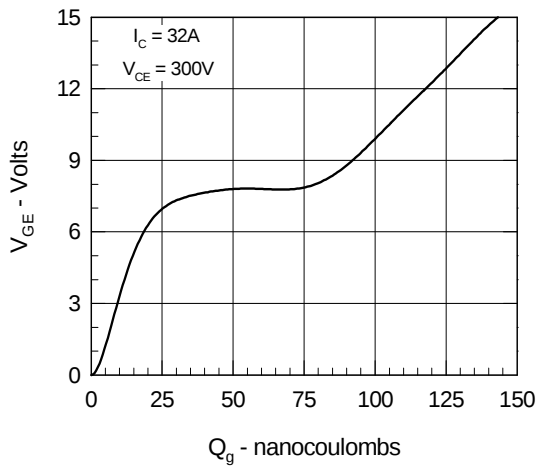


Fig. 9. Gate Charge

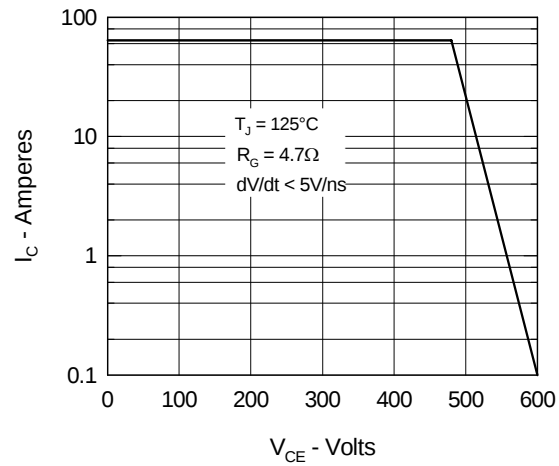


Fig. 10. Turn-off Safe Operating Area

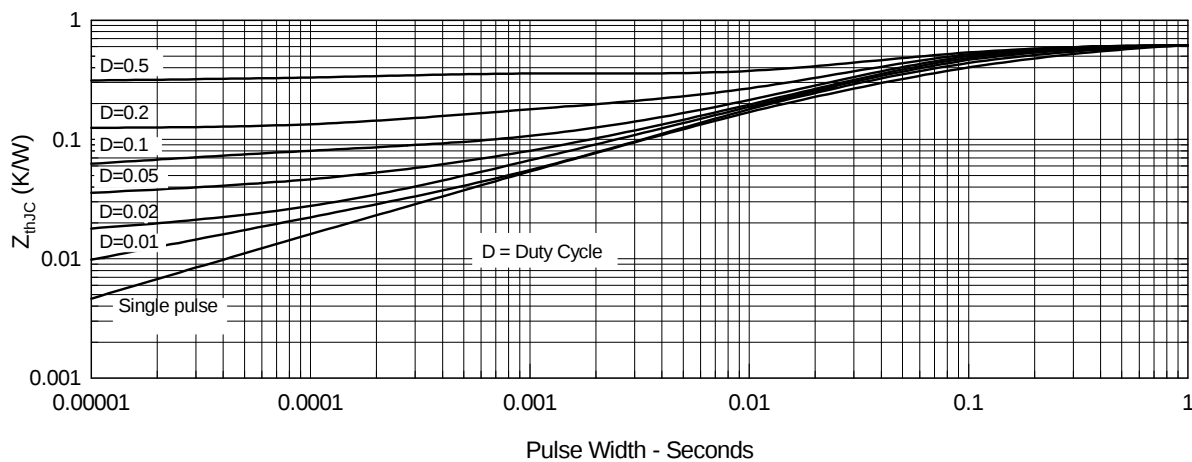


Fig. 11. Transient Thermal Resistance

Fig.12 Maximum Forward Voltage Drop

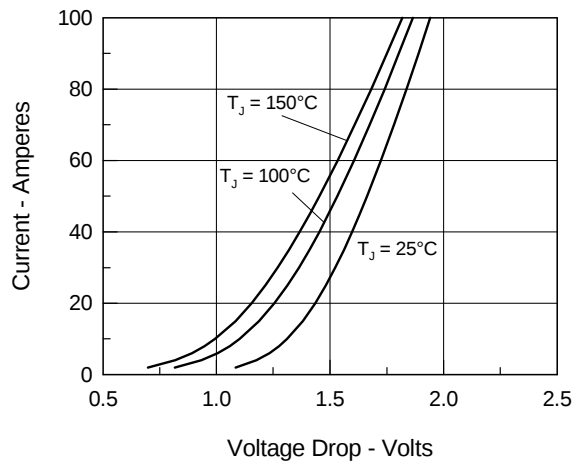


Fig.13 Peak Forward Voltage V_{FR} and Forward Recovery Time t_{fr}

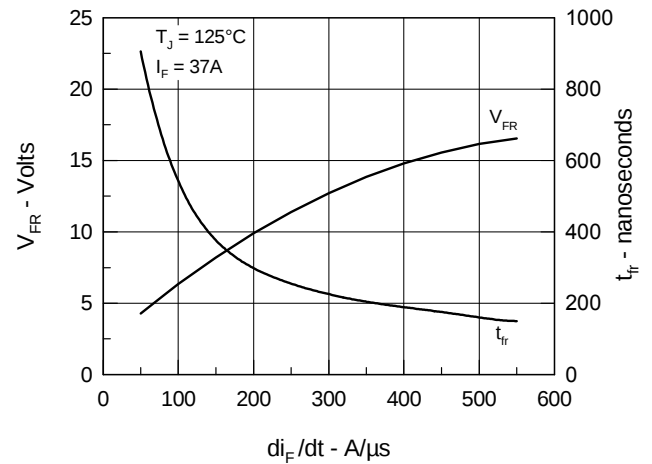


Fig.14 Junction Temperature Dependence off I_{RM} and Q_r

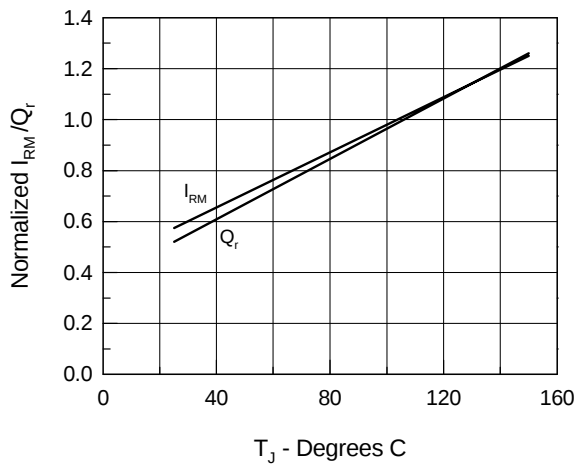


Fig.15 Reverse Recovery Charge

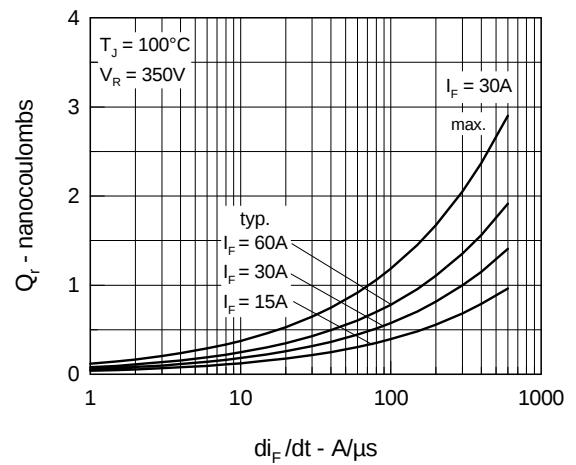


Fig.16 Peak Reverse Recovery Current

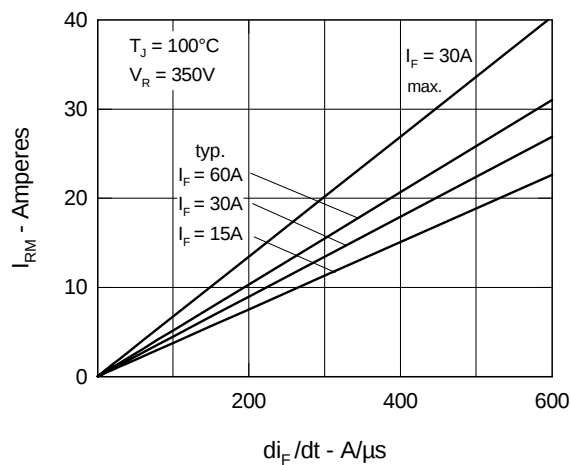


Fig.17 Reverse Recovery Time

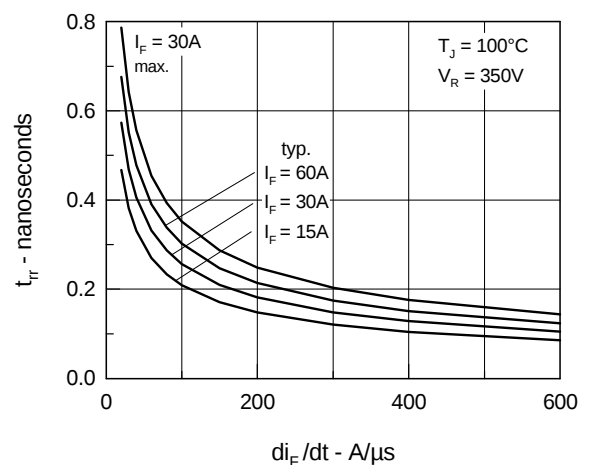
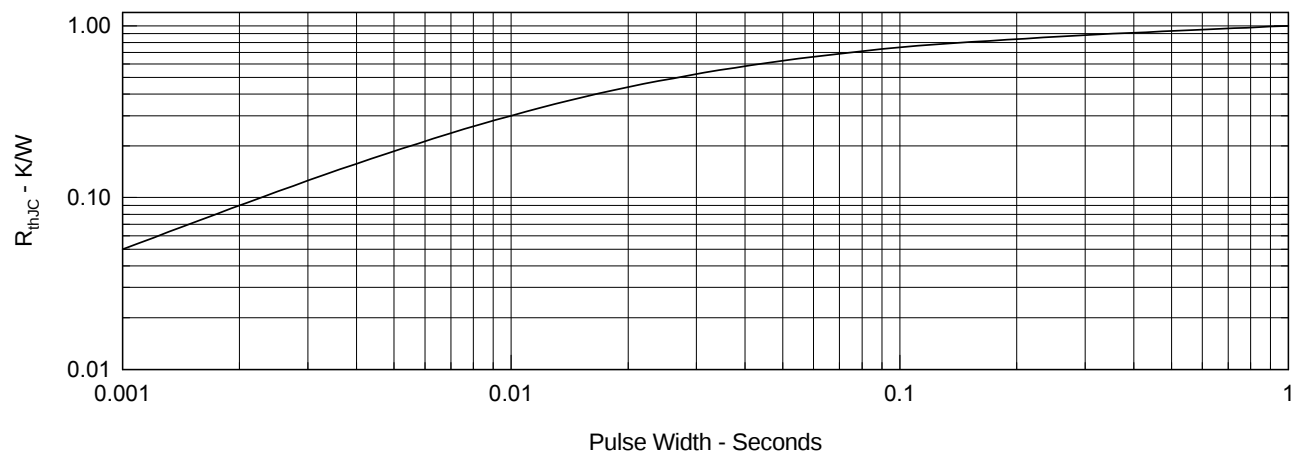


Fig.18 Diode Transient Thermal resistance junction to case



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	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1
4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	