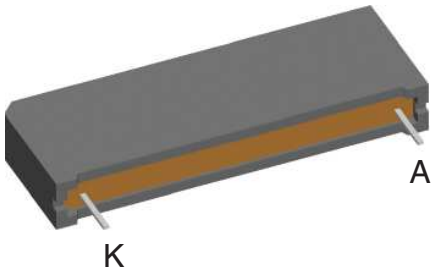
Breakover Diode Modules
(BOD1)

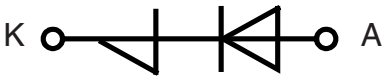
V_{BO} = 1200 - 4200 V
I_{AVM} = 0.2 - 1.25 A

Number of BODs	Types
2	IXBOD1-12R(D) ... IXBOD1-19R(D)
3	IXBOD1-20R(D) ... IXBOD1-32R(D)
4	IXBOD1-34R ... IXBOD1-42R



Version R

Version RD



Features / Advantages:
- Fast turn on
- Low temperature dependence
- Low leakage current

Applications:
- High voltage circuit protection
- Transient voltage protection
- Trigger device
- Power pulse generators
- Lightning and arcing protection
- Energy discharge circuits
- Battery overvoltage protection
- Solar array protection

Package: BOD-Package
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Reduced weight

IXBOD1 several values				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
I_D	*drain current*	$V_D = 0.8 \cdot V_{BO}$	$T_{VJ} = 125°C$			100	µA
I_{BO}	*breakover current*		$T_{VJ} = 25°C$			15	mA
I_H	*holding current*		$T_{VJ} = 25°C$			30	mA
V_H	*holding voltage*		$T_{VJ} = 25°C$	4		8	V
$(di/dt)_C$	*maximum pulsed source current*	$V_D = V_{BO}$; $I_T = 80$ A; f = 50 Hz	$T_{VJ} = 125°C$			200	A/µs
t_q	*turn-off time*	$V_D = 0.67 \cdot V_{BO}$; $V_R = 0$ V; $I_T = 80$A $dv/dt_{(lin.)} = 200$ V/µs; di/dt = -10 A/µs	$T_{VJ} = 125°C$		150		µs
K_T	*temperature coefficient of V_{BO}*					$2 \cdot 10^{-3}$	K^{-1}
K_P	*coefficient for energy per pulse E_P*	(material constant)				700	K/Ws

IXBOD1 - 12R... - 19R (2 Elements)				Ratings			
Symbol	**Definitions**	**Conditions**		**min.**	**typ.**	**max.**	
V_{BO}	*breakover voltage*	V_{BO} (T_{VJ}) = $V_{BO, 25°C}$ [1 + K_T (T_{VJ} - 25°C)]					
		IXBOD 1 -12R		1150	1200	1250	V
		IXBOD 1 -13R		1250	1300	1350	V
		IXBOD 1 -14R		1350	1400	1450	V
		IXBOD 1 -15R		1450	1500	1550	V
		IXBOD 1 -16R		1550	1600	1650	V
		IXBOD 1 -17R		1650	1700	1750	V
		IXBOD 1 -18R		1750	1800	1850	V
		IXBOD 1 -19R		1850	1900	1950	V
I_{RMS}	*RMS current*	f = 50 Hz pins soldered to printed circuit (conductor 0.035x2mm)	$T_{amb} = 50°C$			2.0	A
I_{FAVM}	*maximum average forward current*					1.25	A
I_{SM}	*maximum pulsed source current*	$t_p = 0.1$ ms; non repetitive	$T_{amb} = 50°C$			200	A
I^2t	*I^2t value for fusing*	$t_p = 0.1$ ms	$T_{amb} = 50°C$			2	A^2s
V_T	*forward voltage drop*	$I_T = 5$ A	$T_{VJ} = 125°C$			3.4	V
V_{T0} r_T	*threshold voltage* *slope resistance*	for power-loss calculation only				2.2 0.24	V Ω

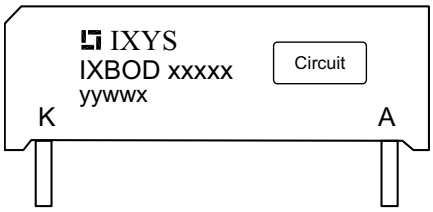
IXBOD1 - 12RD... - 19RD (2 Elements)			Ratings			
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	
V_{BO}	*breakover voltage*	V_{BO} (T_{VJ}) = $V_{BO, 25°C}$ [1 + K_T (T_{VJ} - 25°C)]				
		IXBOD 1 -12RD	1150	1200	1250	V
		IXBOD 1 -13RD	1250	1300	1350	V
		IXBOD 1 -14RD	1350	1400	1450	V
		IXBOD 1 -15RD	1450	1500	1550	V
		IXBOD 1 -16RD	1550	1600	1650	V
		IXBOD 1 -17RD	1650	1700	1750	V
		IXBOD 1 -18RD	1750	1800	1850	V
		IXBOD 1 -19RD	1850	1900	1950	V
I_{RMS}	*RMS current*	f = 50 Hz T_{amb} = 50°C pins soldered to printed circuit (conductor 0.035x2mm)			0.3	A
I_{FAVM}	*maximum average forward current*				0.2	A
I_{SM}	*maximum pulsed source current*	t_p = 0.1 ms; non repetitive T_{amb} = 50°C			50	A
I^2t	*I^2t value for fusing*	t_p = 0.1 ms T_{amb} = 50°C			0.125	A^2s
V_T	*forward voltage drop*	I_T = 5 A T_{VJ} = 125°C			27	V
V_{T0} r_T	*threshold voltage* *slope resistance*	for power-loss calculation only			17.5 3	V Ω

IXBOD1 - 20R... - 32R (3 Elements)			Ratings			
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	
V_{BO}	*breakover voltage*	V_{BO} (T_{VJ}) = $V_{BO, 25°C}$ [1 + K_T (T_{VJ} - 25°C)]				
		IXBOD 1 -20R	1950	2000	2050	V
		IXBOD 1 -21R	2050	2100	2150	V
		IXBOD 1 -22R	2150	2200	2250	V
		IXBOD 1 -23R	2250	2300	2350	V
		IXBOD 1 -24R	2350	2400	2450	V
		IXBOD 1 -25R	2450	2500	2550	V
		IXBOD 1 -26R	2500	2600	2700	V
		IXBOD 1 -28R	2700	2800	2900	V
		IXBOD 1 -30R	2900	3000	3100	V
		IXBOD 1 -32R	3100	3200	3300	V
I_{RMS}	*RMS current*	f = 50 Hz T_{amb} = 50°C pins soldered to printed circuit (conductor 0.035x2mm)			1.4	A
I_{FAVM}	*maximum average forward current*				0.9	A
I_{SM}	*maximum pulsed source current*	t_p = 0.1 ms; non repetitive T_{amb} = 50°C			200	A
I^2t	*I^2t value for fusing*	t_p = 0.1 ms T_{amb} = 50°C			2	A^2s
V_T	*forward voltage drop*	I_T = 5 A T_{VJ} = 125°C			5.1	V
V_{T0} r_T	*threshold voltage* *slope resistance*	for power-loss calculation only			3.3 0.36	V Ω

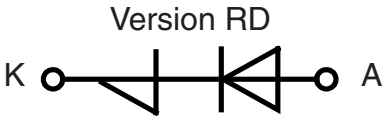
IXBOD1 - 20RD... - 32RD (3 Elements)			Ratings			
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	
V_{BO}	*breakover voltage*	V_{BO} (T_{VJ}) = $V_{BO, 25°C}$ [1 + K_T (T_{VJ} - 25°C)]				
		IXBOD 1 -20RD	1950	2000	2050	V
		IXBOD 1 -21RD	2050	2100	2150	V
		IXBOD 1 -22RD	2150	2200	2250	V
		IXBOD 1 -23RD	2250	2300	2350	V
		IXBOD 1 -24RD	2350	2400	2450	V
		IXBOD 1 -25RD	2450	2500	2550	V
		IXBOD 1 -26RD	2500	2600	2700	V
		IXBOD 1 -28RD	2700	2800	2900	V
		IXBOD 1 -30RD	2900	3000	3100	V
		IXBOD 1 -32RD	3100	3200	3300	V
I_{RMS}	*RMS current*	f = 50 Hz T_{amb} = 50°C pins soldered to printed circuit (conductor 0.035x2mm)			0.3	A
I_{FAVM}	*maximum average forward current*				0.2	A
I_{SM}	*maximum pulsed source current*	t_p = 0.1 ms; non repetitive T_{amb} = 50°C			50	A
I^2t	*I^2t value for fusing*	t_p = 0.1 ms T_{amb} = 50°C			0.125	A^2s
V_T	*forward voltage drop*	I_T = 5 A T_{VJ} = 125°C			27	V
V_{T0} r_T	*threshold voltage* *slope resistance*	for power-loss calculation only			17.5 3	V Ω

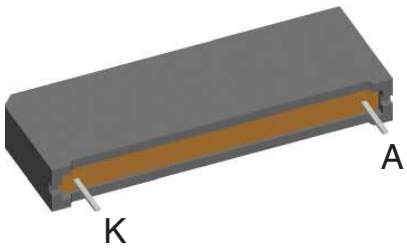
IXBOD1 - 34... - 42R (4 Elements)			Ratings			
Symbol	**Definitions**	**Conditions**	**min.**	**typ.**	**max.**	
V_{BO}	*breakover voltage*	V_{BO} (T_{VJ}) = $V_{BO, 25°C}$ [1 + K_T (T_{VJ} - 25°C)]				
		IXBOD 1 -34R	3300	3400	3500	V
		IXBOD 1 -36R	3500	3600	3700	V
		IXBOD 1 -38R	3700	3800	4000	V
		IXBOD 1 -40R	3900	4000	4100	V
		IXBOD 1 -42R	4100	4200	4300	V
I_{RMS}	*RMS current*	f = 50 Hz T_{amb} = 50°C pins soldered to printed circuit (conductor 0.035x2mm)			1.1	A
I_{FAVM}	*maximum average forward current*				0.7	A
I_{SM}	*maximum pulsed source current*	t_p = 0.1 ms; non repetitive T_{amb} = 50°C			200	A
I^2t	*I^2t value for fusing*	t_p = 0.1 ms T_{amb} = 50°C			2	A^2s
V_T	*forward voltage drop*	I_T = 5 A T_{VJ} = 125°C			6.8	V
V_{T0} r_T	*threshold voltage* *slope resistance*	for power-loss calculation only			4.4 0.48	V Ω

Package FP-Case			Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.	
T_{amb}	*ambient temperature (cooling medium)*		-40		125	°C
T_{stg}	*storage temperature*		-40		125	°C
T_{VJM}	*maximum virtual junction temperature*		-40		125	°C
R_{thJA}	*thermal resistance junction to ambient*	natural convection			20	K/W
		with air speed 2 m/s			16	K/W
Weight				14		g

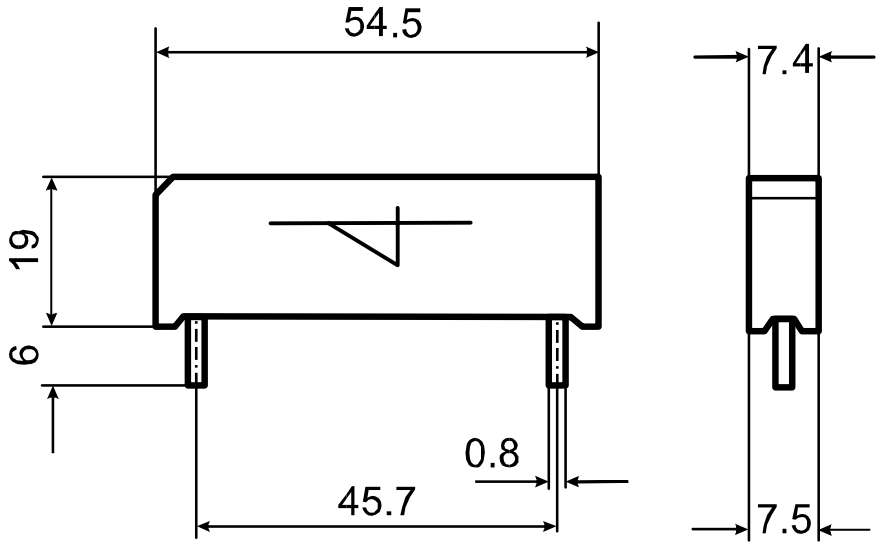


Outlines FP-case





Dimensions in mm (1 mm = 0.0394“)



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	IXBOD 1 -12R	IXBOD 1 -12R	Box	20	468649
Standard	IXBOD 1 -12RD	IXBOD 1 -12RD	Box	20	472948
Standard	IXBOD 1 -13R	IXBOD 1 -13R	Box	20	468657
Standard	IXBOD 1 -13RD	IXBOD 1 -13RD	Box	20	472956
Standard	IXBOD 1 -14R	IXBOD 1 -14R	Box	20	468665
Standard	IXBOD 1 -14RD	IXBOD 1 -14RD	Box	20	472964
Standard	IXBOD 1 -15R	IXBOD 1 -15R	Box	20	468673
Standard	IXBOD 1 -15RD	IXBOD 1 -15RD	Box	20	472972
Standard	IXBOD 1 -16R	IXBOD 1 -16R	Box	20	468681
Standard	IXBOD 1 -16RD	IXBOD 1 -16RD	Box	20	472794
Standard	IXBOD 1 -17R	IXBOD 1 -17R	Box	20	468703
Standard	IXBOD 1 -17RD	IXBOD 1 -17RD	Box	20	472980
Standard	IXBOD 1 -18R	IXBOD 1 -18R	Box	20	468711
Standard	IXBOD 1 -18RD	IXBOD 1 -18RD	Box	20	472999
Standard	IXBOD 1 -19R	IXBOD 1 -19R	Box	20	468738
Standard	IXBOD 1 -19RD	IXBOD 1 -19RD	Box	20	473006
Standard	IXBOD 1 -20R	IXBOD 1 -20R	Box	20	468746
Standard	IXBOD 1 -20RD	IXBOD 1 -20RD	Box	20	473014
Standard	IXBOD 1 -21R	IXBOD 1 -21R	Box	20	468754
Standard	IXBOD 1 -21RD	IXBOD 1 -21RD	Box	20	473022
Standard	IXBOD 1 -22R	IXBOD 1 -22R	Box	20	468762
Standard	IXBOD 1 -22RD	IXBOD 1 -22RD	Box	20	473030
Standard	IXBOD 1 -23R	IXBOD 1 -23R	Box	20	468770
Standard	IXBOD 1 -23RD	IXBOD 1 -23RD	Box	20	472786
Standard	IXBOD 1 -24R	IXBOD 1 -24R	Box	20	468789
Standard	IXBOD 1 -24RD	IXBOD 1 -24RD	Box	20	473049
Standard	IXBOD 1 -25R	IXBOD 1 -25R	Box	20	468797
Standard	IXBOD 1 -25RD	IXBOD 1 -25RD	Box	20	473057
Standard	IXBOD 1 -26R	IXBOD 1 -26R	Box	20	468800
Standard	IXBOD 1 -26RD	IXBOD 1 -26RD	Box	20	473065
Standard	IXBOD 1 -28R	IXBOD 1 -28R	Box	20	468819
Standard	IXBOD 1 -28RD	IXBOD 1 -28RD	Box	20	473073
Standard	IXBOD 1 -30R	IXBOD 1 -30R	Box	20	468827
Standard	IXBOD 1 -30RD	IXBOD 1 -30RD	Box	20	473081
Standard	IXBOD 1 -32R	IXBOD 1 -32R	Box	20	468835
Standard	IXBOD 1 -32RD	IXBOD 1 -32RD	Box	20	473103
Standard	IXBOD 1 -34R	IXBOD 1 -34R	Box	20	468843
Standard	IXBOD 1 -36R	IXBOD 1 -36R	Box	20	468851
Standard	IXBOD 1 -38R	IXBOD 1 -38R	Box	20	468878
Standard	IXBOD 1 -40R	IXBOD 1 -40R	Box	20	468886
Standard	IXBOD 1 -42R	IXBOD 1 -42R	Box	20	468894

Curves

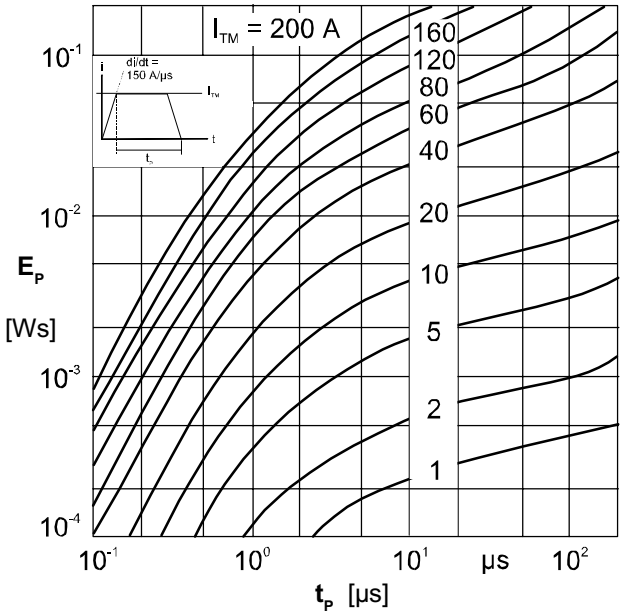


Fig. 1 Energy per pulse for single BOD element for trapezoidal wave current. E_P must be multiplied by number of elements for total energy

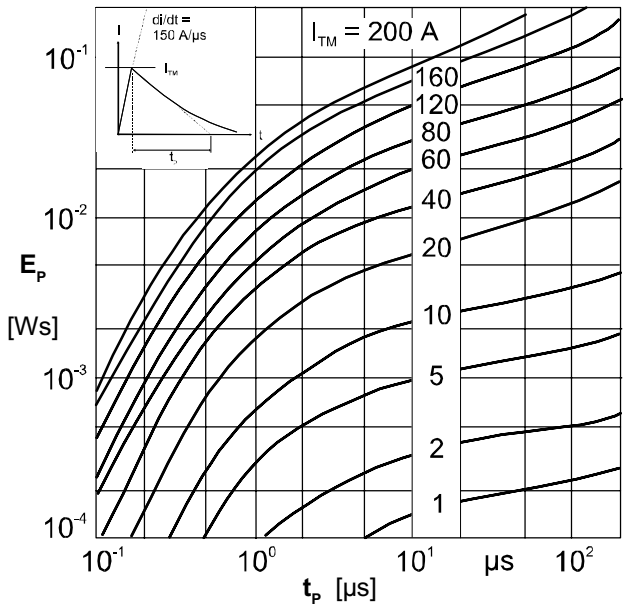


Fig. 2 Energy per pulse for single BOD element for exponentially decaying current pulse. E_P must be multiplied by number of elements for total energy

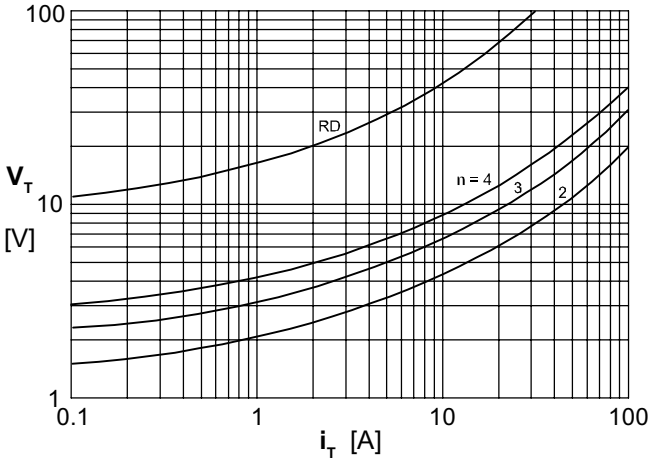


Fig. 3 On-state voltage at T_{VJ} = 125°C

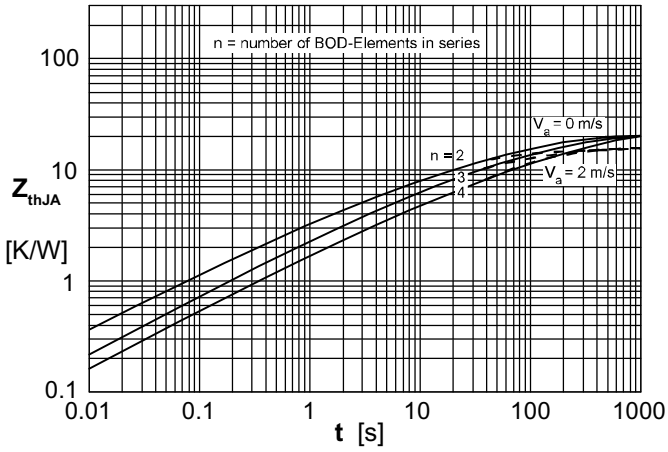


Fig. 4 Transient thermal resistance