Standard Rectifier

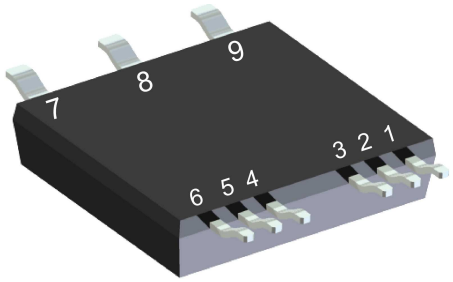
3~ Rectifier		
V_{RRM}	=	1800 V
I_{DAV}	=	90 A
I_{FSM}	=	350 A

ISOPLUS™
Surface Mount Power Device
3~ Rectifier Bridge

Part number

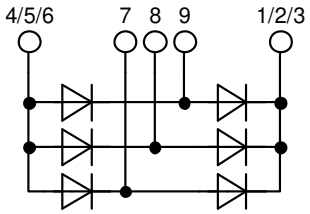
DMA90U1800LB

Marking on Product: DMA90U1800LB



Backside: isolated

E72873



Features / Advantages:

- Rectifier diode
- Isolated back surface
- Low coupling capacity between pins and heatsink
- Enlarged creepage towards heatsink
- Application friendly pinout
- Low inductive current path
- High reliability

Applications:

- Line rectifying 50/60 Hz
- Drives
- SMPS
- UPS

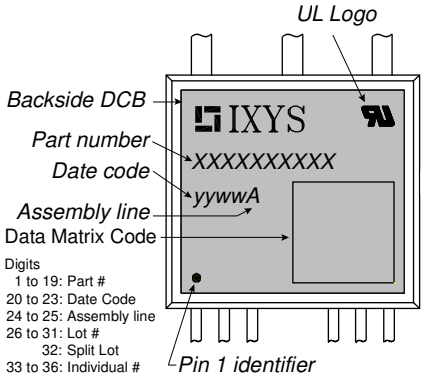
Package: SMPD

- Isolation Voltage: 3000 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

Rectifier

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1900	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1800	V
I_R	*reverse current*	V_R = 1800 V	T_{VJ} = 25°C			40	µA
		V_R = 1800 V	T_{VJ} = 150°C			1.5	mA
V_F	*forward voltage drop*	I_F = 30 A	T_{VJ} = 25°C			1.26	V
		I_F = 90 A				1.79	V
		I_F = 30 A	T_{VJ} = 150°C			1.20	V
		I_F = 90 A				1.93	V
I_{DAV}	*bridge output current*	T_C = 110°C	T_{VJ} = 175°C			90	A
		rectangular d = ⅓					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.81	V
r_F	*slope resistance* }					12.7	mΩ
R_{thJC}	*thermal resistance junction to case*					1.1	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.4		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			135	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			350	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			380	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			300	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			320	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			615	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			600	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			450	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			425	A²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		11		pF

Package SMPD				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-55		175	°C
T_{op}	*operation temperature*			-55		150	°C
T_{stg}	*storage temperature*			-55		150	°C
Weight					8.5		g
F_C	*mounting force with clip*			40		130	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	1.6			mm
$d_{Spb/Apb}$			*terminal to backside*	4.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3000			V
		t = 1 minute		2500			V



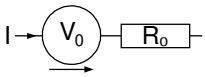
Part description

D = Diode
M = Standard Rectifier
A = (up to 1800V)
90 = Current Rating [A]
U = 3~ Rectifier Bridge
1800 = Reverse Voltage [V]
LB = SMPD-B

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA90U1800LB-TUB	DMA90U1800LB	Tube	20	517130
Alternative	DMA90U1800LB-TRR	DMA90U1800LB	Tape & Reel	200	524497

Equivalent Circuits for Simulation

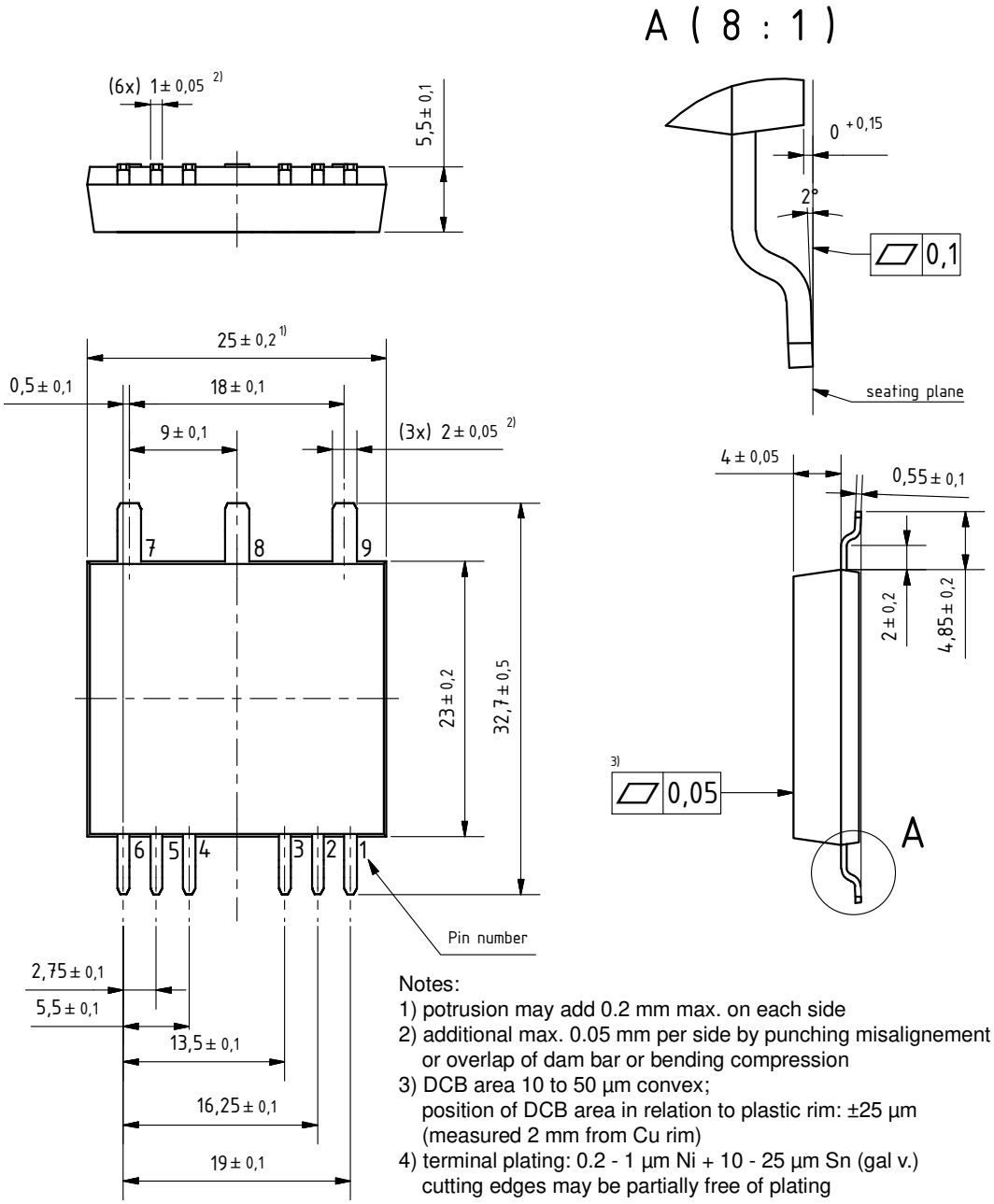
** on die level* T_{VJ} = 175 °C



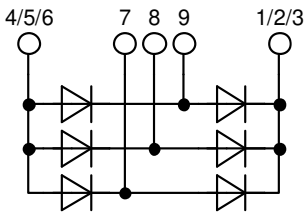
Rectifier

$V_{0\ max}$	*threshold voltage*	0.81	V
$R_{0\ max}$	*slope resistance **	10.1	mΩ

Outlines SMPD



Notes:
1) potrusion may add 0.2 mm max. on each side
2) additional max. 0.05 mm per side by punching misalignement or overlap of dam bar or bending compression
3) DCB area 10 to 50 µm convex;
position of DCB area in relation to plastic rim: ±25 µm (measured 2 mm from Cu rim)
4) terminal plating: 0.2 - 1 µm Ni + 10 - 25 µm Sn (gal v.)
cutting edges may be partially free of plating



Rectifier

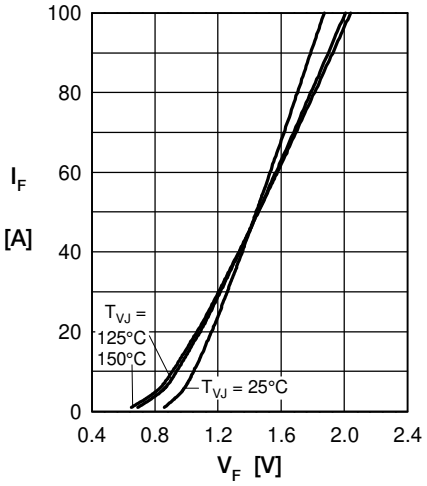


Fig. 1 Forward current vs. voltage drop per diode

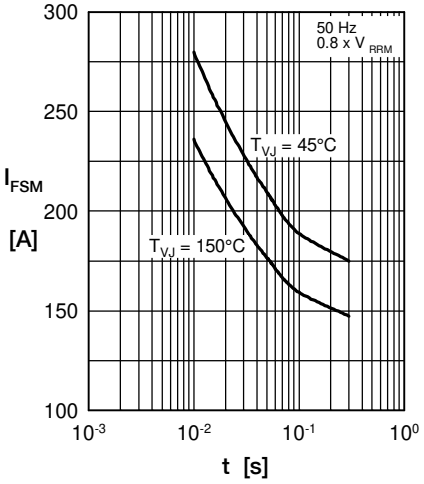


Fig. 2 Surge overload current vs. time per diode

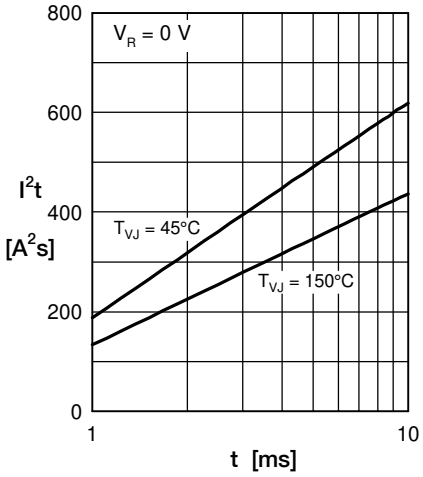


Fig. 3 I^2t vs. time per diode

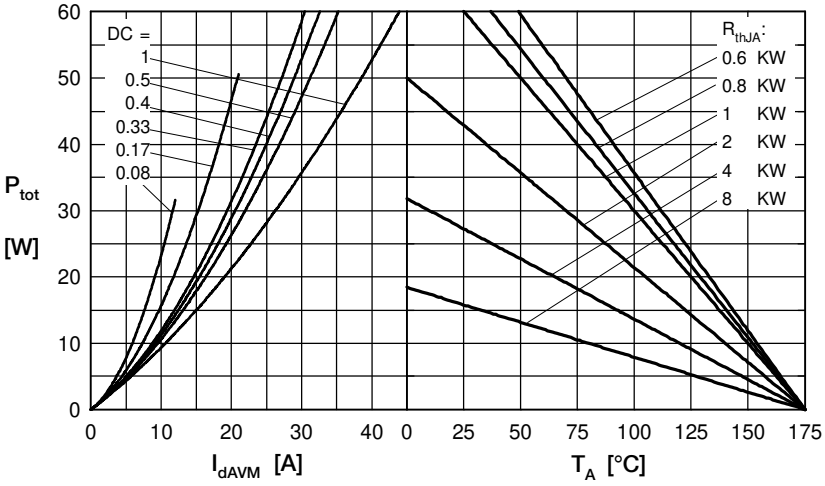


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

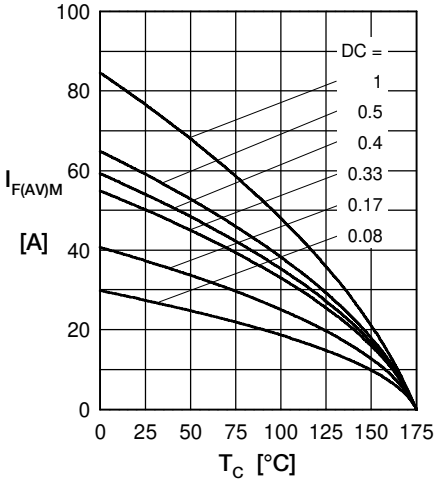


Fig. 5 Max. forward current vs. case temperature per diode

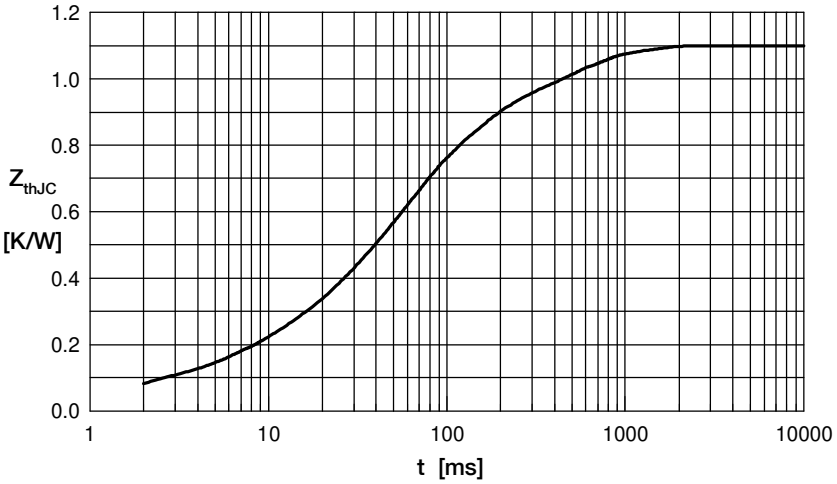


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.030	0.0003
2	0.072	0.0045
3	0.092	0.0530
4	0.606	0.0520
5	0.300	0.4000

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