

Standard Rectifier

$$V_{RRM} = 1800V$$

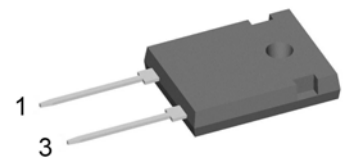
$$I_{FAV} = 30A$$

$$V_F = 1.22V$$

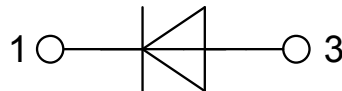
Single Diode

Part number

DMA30E1800HA



Backside: anode



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:

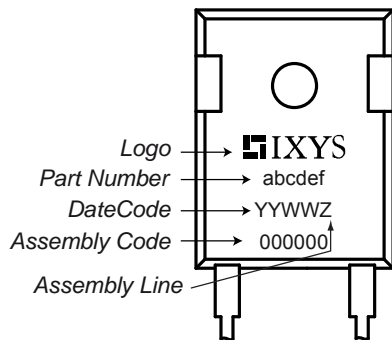
- Diode for main rectification
- For single and three phase bridge configurations

Package: TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

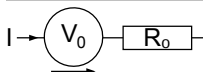
Rectifier				Ratings		
Symbol	Definition	Conditions	min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1900	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1800	V
I_R	reverse current, drain current	$V_R = 1800 V$	$T_{VJ} = 25^{\circ}C$		40	μA
		$V_R = 1800 V$	$T_{VJ} = 150^{\circ}C$		1.5	mA
V_F	forward voltage drop	$I_F = 30 A$	$T_{VJ} = 25^{\circ}C$		1.25	V
		$I_F = 60 A$			1.50	V
		$I_F = 30 A$	$T_{VJ} = 150^{\circ}C$		1.22	V
		$I_F = 60 A$			1.59	V
I_{FAV}	average forward current	$T_C = 140^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		30	A
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.83	V
r_F	slope resistance				12.8	m Ω
R_{thJC}	thermal resistance junction to case				0.7	K/W
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		210	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		370	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		400	A
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		315	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		340	A
I^2t	value for fusing	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		685	A ² s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		665	A ² s
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		495	A ² s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		480	A ² s
C_J	junction capacitance	$V_R = 400 V \quad f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		10	pF

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{stg}	storage temperature		-55		150	°C
T_{VJ}	virtual junction temperature		-55		175	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking

Part number

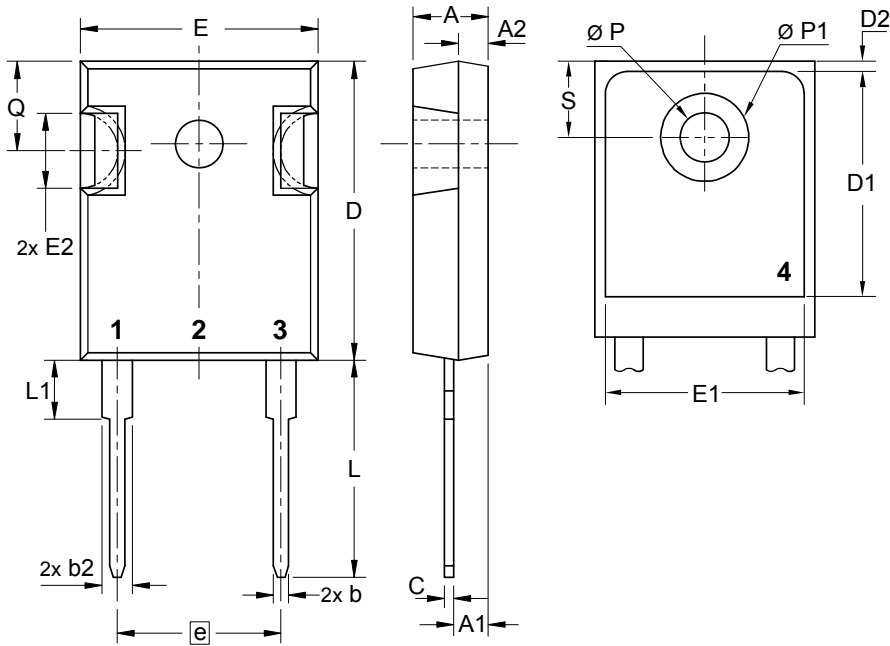
D = Diode
 M = Standard Rectifier
 A = (up to 1800V)
 30 = Current Rating [A]
 E = Single Diode
 1800 = Reverse Voltage [V]
 HA = TO-247AD (2)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA30E1800HA	DMA30E1800HA	Tube	30	455156

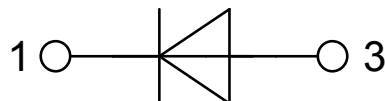
Equivalent Circuits for Simulation
** on die level*
 $T_{VJ} = 175^{\circ}\text{C}$

Rectifier

$V_{0\max}$	threshold voltage	0.83	V
$R_{0\max}$	slope resistance *	10.2	mΩ

Outlines TO-247



Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.430 BSC		10.92 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



Rectifier

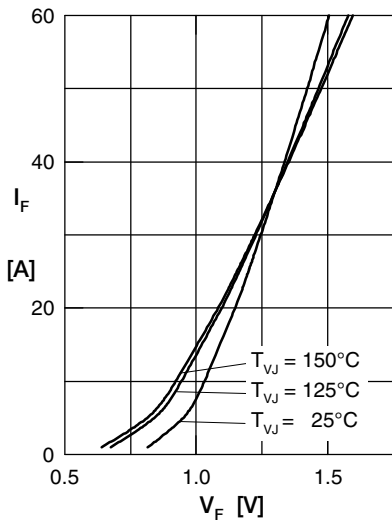


Fig. 1 Forward current versus voltage drop per diode

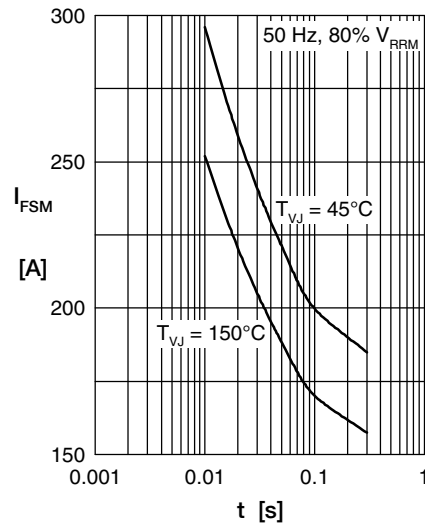


Fig. 2 Surge overload current

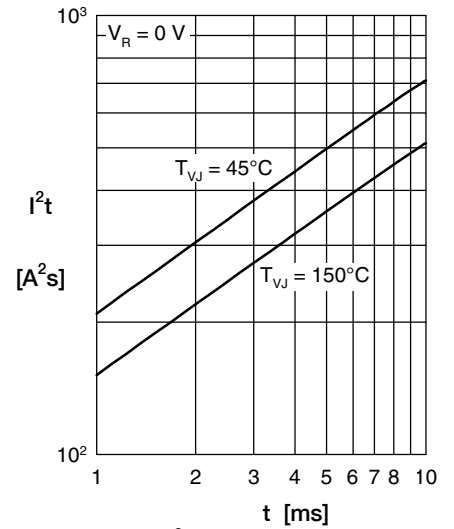


Fig. 3 I^2t versus time per diode

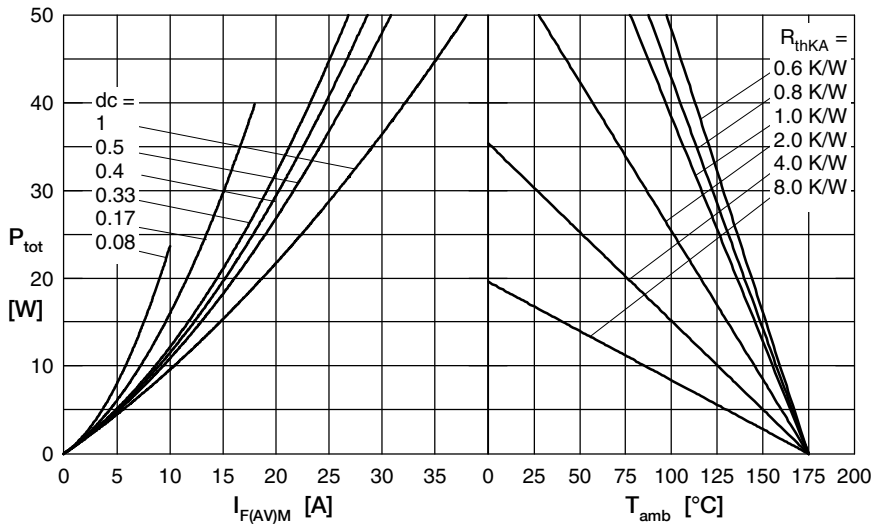


Fig. 4 Power dissipation versus direct output current and ambient temperature

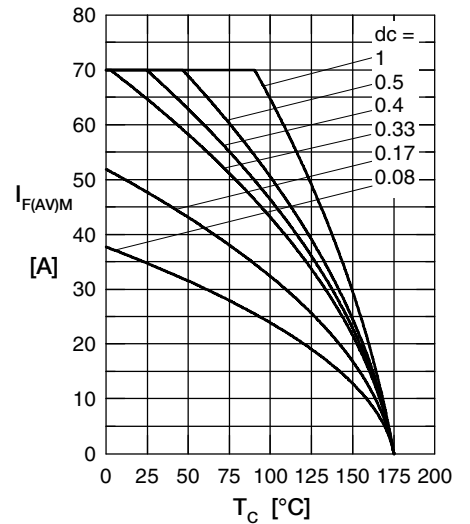


Fig. 5 Max. forward current versus case temperature

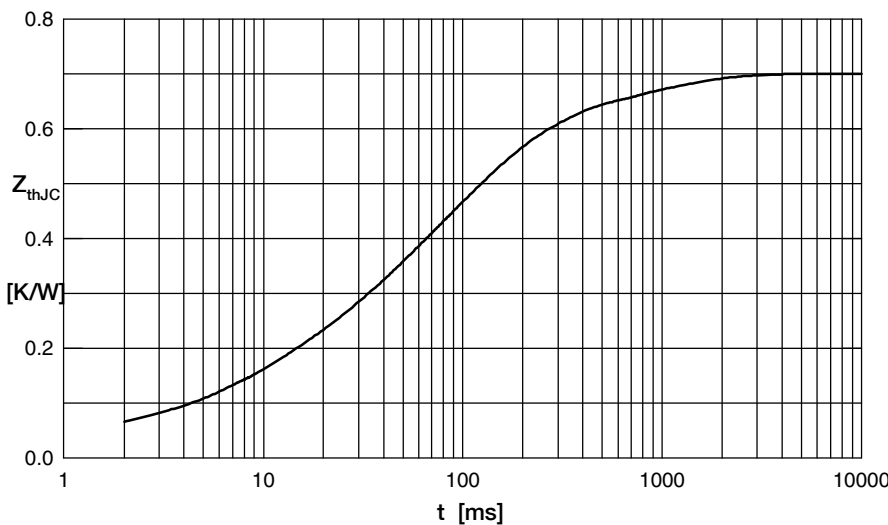


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.03	0.0003
2	0.072	0.0065
3	0.131	0.027
4	0.367	0.105
5	0.1	0.8