

Standard Rectifier

$$V_{RRM} = 1600V$$

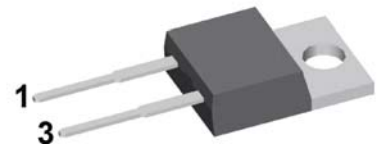
$$I_{FAV} = 10A$$

$$V_F = 1.21V$$

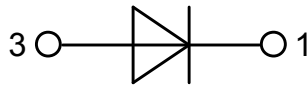
Single Diode

Part number

DMA10I1600PA



Backside: cathode



Features / Advantages:

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

Applications:

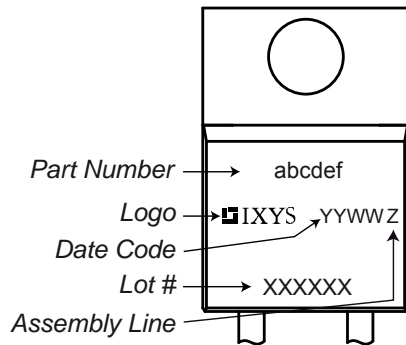
- Diode for main rectification
- For single and three phase bridge configurations

Package: TO-220

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

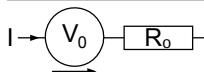
Rectifier				Ratings		
Symbol	Definition	Conditions	min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1600	V
I_R	reverse current, drain current	$V_R = 1600 V$	$T_{VJ} = 25^{\circ}C$		10	μA
		$V_R = 1600 V$	$T_{VJ} = 150^{\circ}C$		0.2	mA
V_F	forward voltage drop	$I_F = 10 A$	$T_{VJ} = 25^{\circ}C$		1.26	V
					1.53	V
		$I_F = 20 A$	$T_{VJ} = 150^{\circ}C$		1.21	V
					1.57	V
I_{FAV}	average forward current	$T_C = 150^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		10	A
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.82	V
r_F	slope resistance				37	m Ω
R_{thJC}	thermal resistance junction to case				1.5	K/W
R_{thCH}	thermal resistance case to heatsink			0.50		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		100	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		120	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		130	A
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		100	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		110	A
I^2t	value for fusing	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		72	A ² s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		70	A ² s
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		50	A ² s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		50	A ² s
C_J	junction capacitance	$V_R = 400 V \quad f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		4	pF

Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			25	A
T_{stg}	storage temperature		-55		150	°C
T_{VJ}	virtual junction temperature		-55		175	°C
Weight				2		g
M_D	mounting torque		0.4		0.6	Nm
F_C	mounting force with clip		20		60	N

Product Marking

Part number

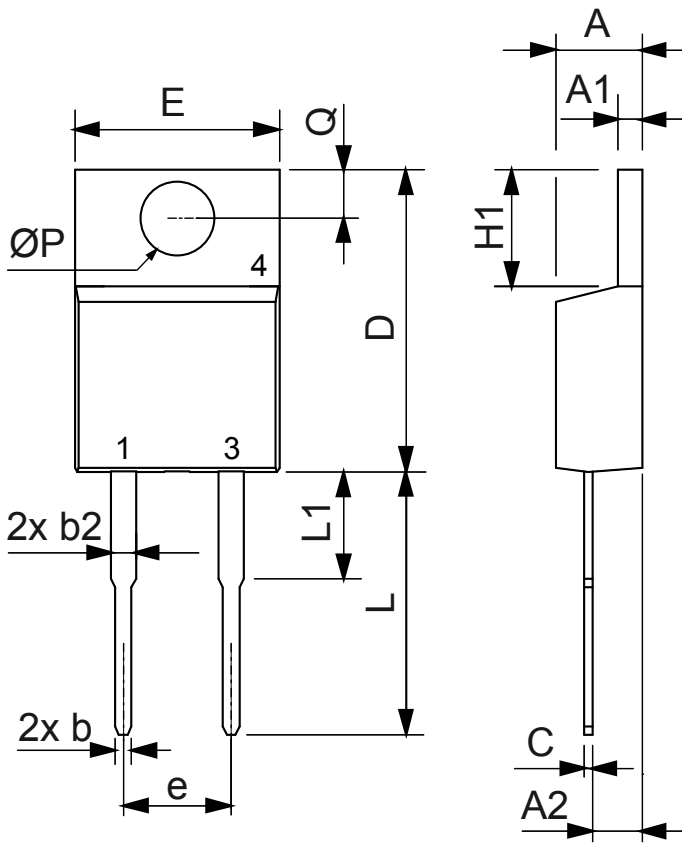
D = Diode
 M = Standard Rectifier
 A = (up to 1800V)
 10 = Current Rating [A]
 I = Single Diode
 1600 = Reverse Voltage [V]
 PA = TO-220AC (2)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA10I1600PA	DMA10I1600PA	Tube	50	508780

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

Rectifier

$V_{0\max}$	threshold voltage	0.82	V
$R_{0\max}$	slope resistance *	34	mΩ

Outlines TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08	BSC	0.200	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
$\varnothing P$	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125



Rectifier

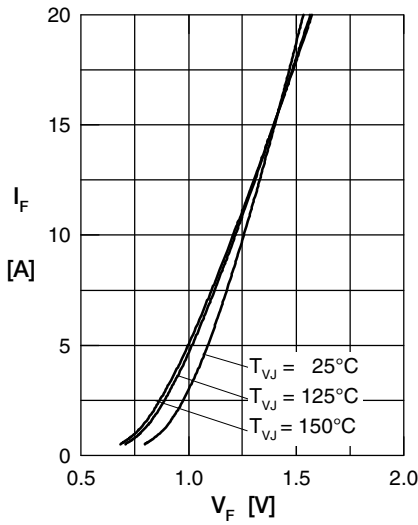


Fig. 1 Forward current versus voltage drop per diode

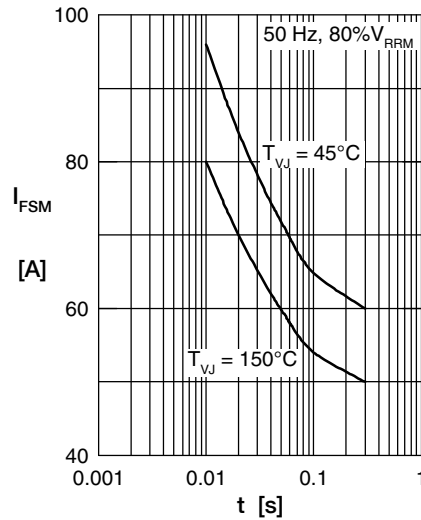


Fig. 2 Surge overload current

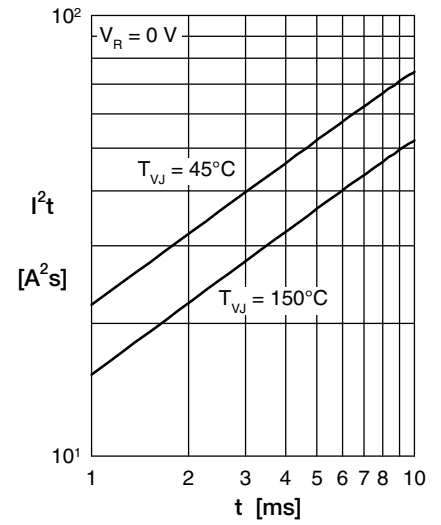


Fig. 3 I^2t versus time per diode

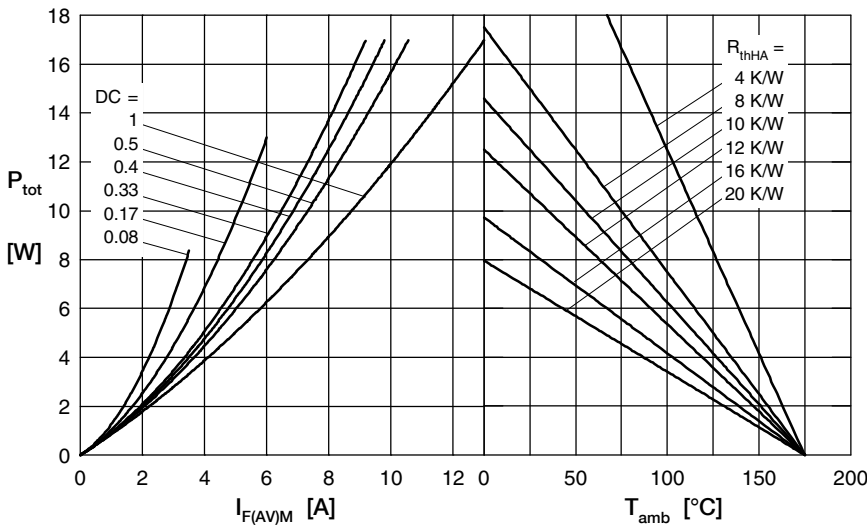


Fig. 4 Power dissipation vs. direct output current and ambient temperature

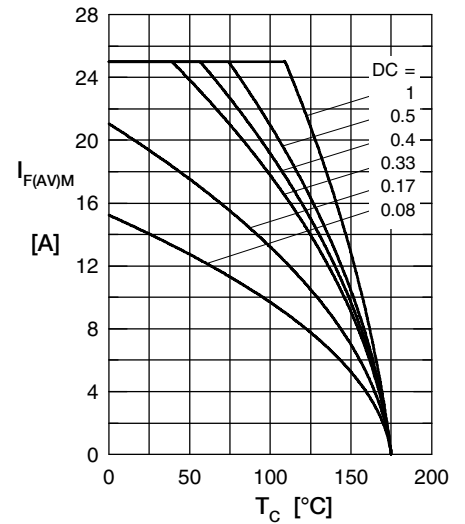


Fig. 5 Max. forward current vs. case temperature

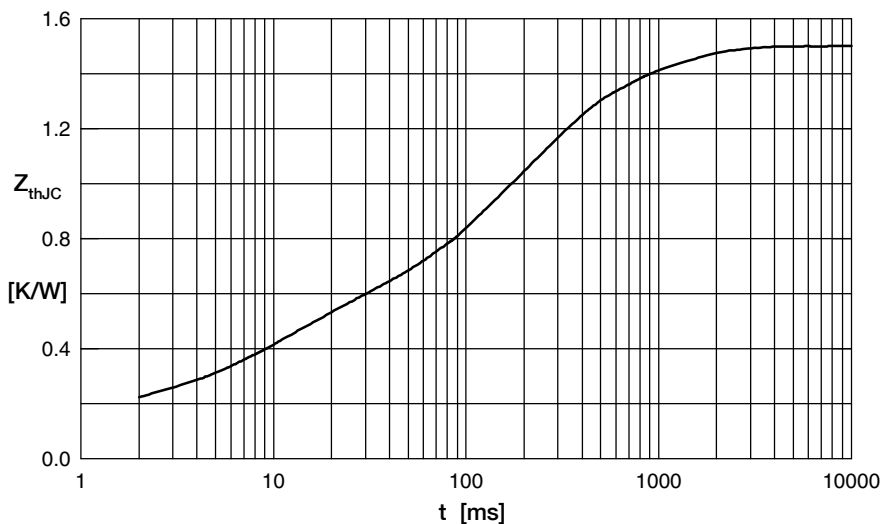


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.155	0.0005
2	0.332	0.0095
3	0.713	0.17
4	0.3	0.8
5	0.00001	0.00001