

High Efficiency Standard Rectifier

$$V_{RRM} = 2 \times 800 \text{ V}$$

$$I_{FAV} = 5 \text{ A}$$

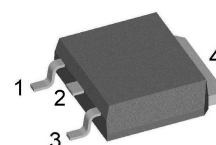
$$V_F = 1.12 \text{ V}$$

Phase leg

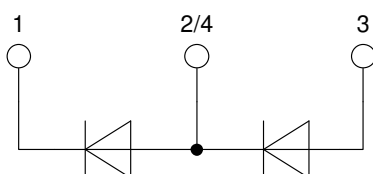
Part number

DLA5P800UC

Marking on Product: M5RLUP



Backside: anode/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-252 (DPak)

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

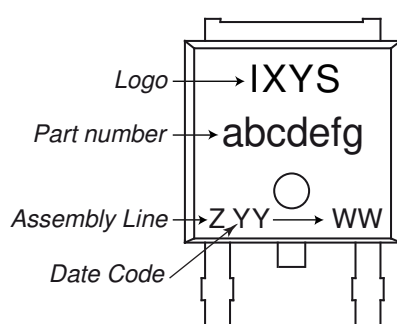
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				900	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				800	V
I_R	reverse current	$V_R = 800\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			5	μA
		$V_R = 800\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			0.05	mA
V_F	forward voltage drop	$I_F = 5\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.18	V
		$I_F = 10\text{ A}$				1.38	V
		$I_F = 5\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.12	V
		$I_F = 10\text{ A}$				1.41	V
I_{FAV}	average forward current	$T_C = 155^{\circ}\text{C}$ 180° sine	$T_{VJ} = 175^{\circ}\text{C}$			5	A
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}\text{C}$			0.82	V
r_F	slope resistance					58	m Ω
R_{thJC}	thermal resistance junction to case					2.5	K/W
R_{thCH}	thermal resistance case to heatsink				0.5		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			60	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			70	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			76	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			60	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			64	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			25	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			24	A ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			18	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			17	A ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		1		pF

Package TO-252 (DPak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			20	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		150	°C
Weight				0.3		g
F_c	mounting force with clip		20		60	N

Product Marking



Part description

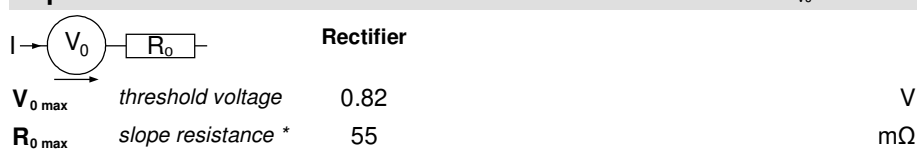
D = Diode
 L = Low Voltage Standard Rectifier
 A = (up to 1200V)
 5 = Current Rating [A]
 P = Phase leg
 800 = Reverse Voltage [V]
 UC = TO-252AA (DPak)

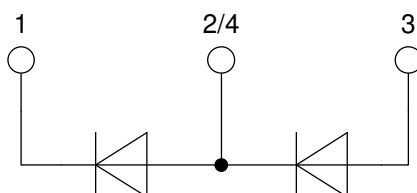
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DLA5P800UC-TRL	M5RLUP	Tape & Reel	2500	511574
Alternative	DLA5P800UC-TUB	M5RLUP	Tube	70	523442

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175\text{ °C}$



Outlines TO-252 (DPak)


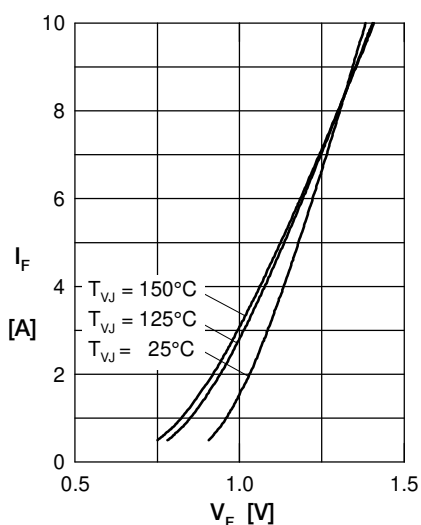
Rectifier


Fig. 1 Forward current versus voltage drop

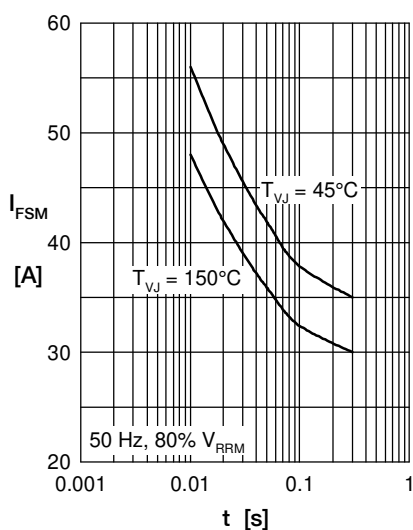


Fig. 2 Surge overload current

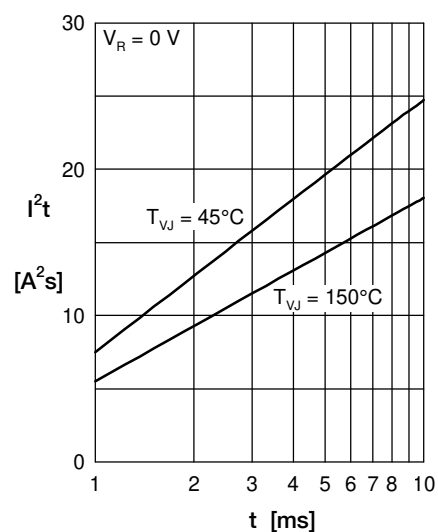
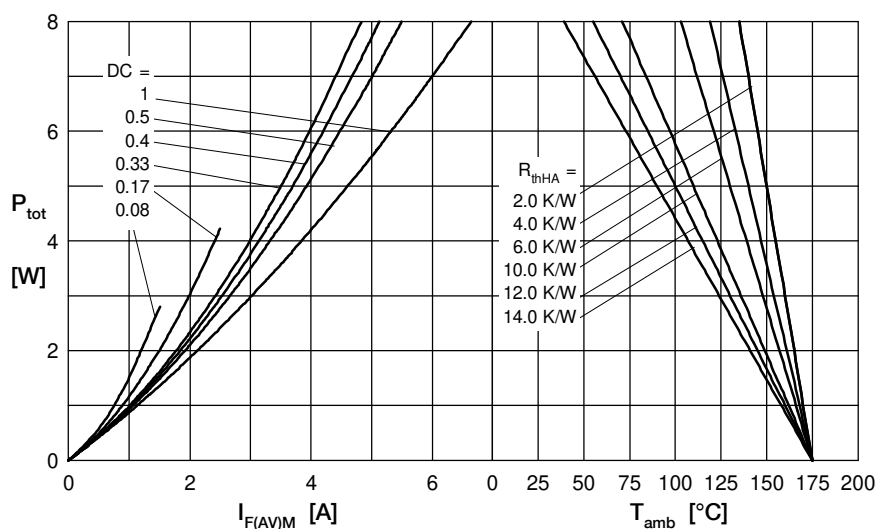

 Fig. 3 I^2t versus time


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

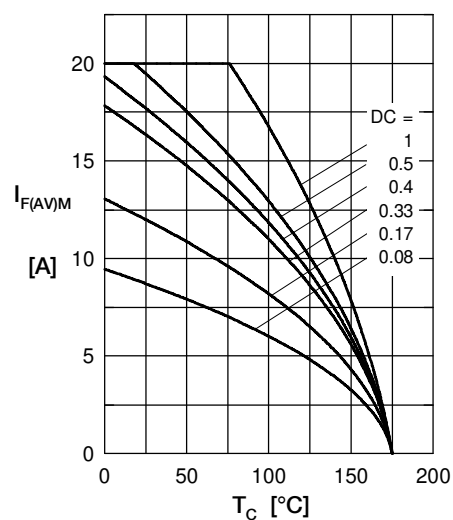


Fig. 5 Max. forward current vs. case temperature

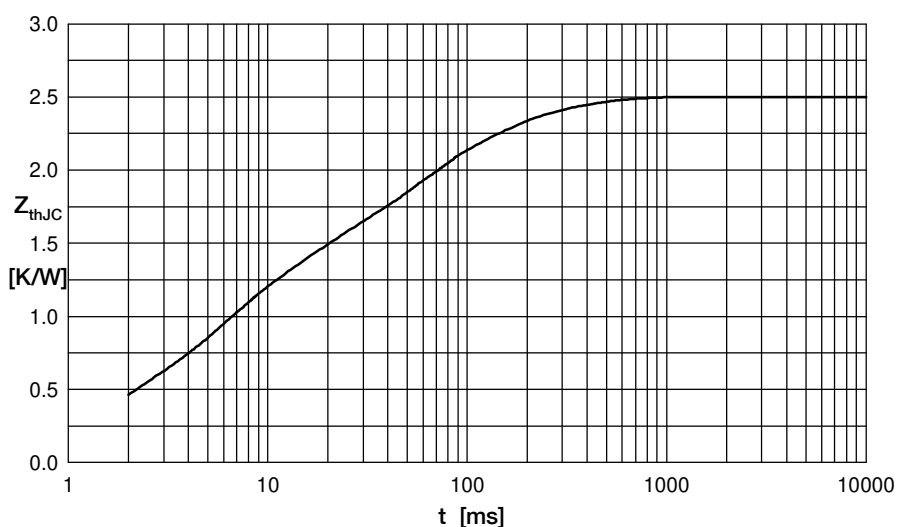


Fig. 6 Transient thermal impedance junction to case

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	1.1	0.005
2	0.06	0.0003
3	0.2	0.045
4	0.4	0.2
5	0.74	0.05