High Efficiency Standard Rectifier

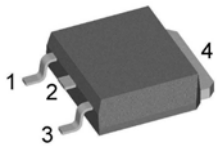
V_{RRM} = 2x 800V
I_{FAV} = 5A
V_F = 1.12V

Phase leg

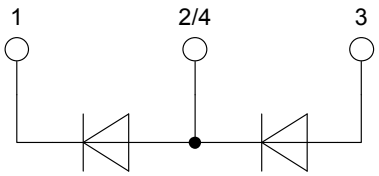
Part number

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

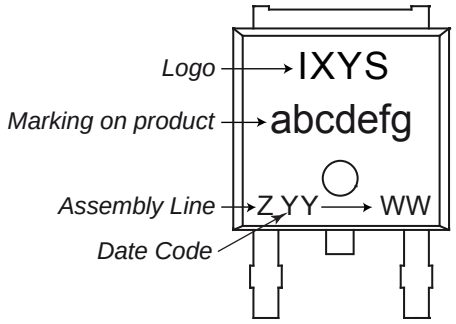
Package: TO-252 (DPak)

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

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			900	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			800	V
I_R	*reverse current, drain current*	V_R = 800 V	T_{VJ} = 25°C			5	µA
		V_R = 800 V	T_{VJ} = 150°C			0.05	mA
V_F	*forward voltage drop*	I_F = 5 A	T_{VJ} = 25°C			1.18	V
		I_F = 10 A				1.38	V
		I_F = 5 A	T_{VJ} = 150 °C			1.12	V
		I_F = 10 A				1.41	V
I_{FAV}	*average forward current*	T_C = 155°C	T_{VJ} = 175°C			5	A
		180° sine					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.82	V
r_F	*slope resistance* }					58	mΩ
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°C			60	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			70	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			76	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			60	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			64	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			25	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			24	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			18	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			17	A²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		1		pF

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

Product Marking



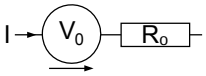
Part number

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

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DLA5P800UC	M5RLUP	Tape & Reel	2500	511574

Equivalent Circuits for Simulation

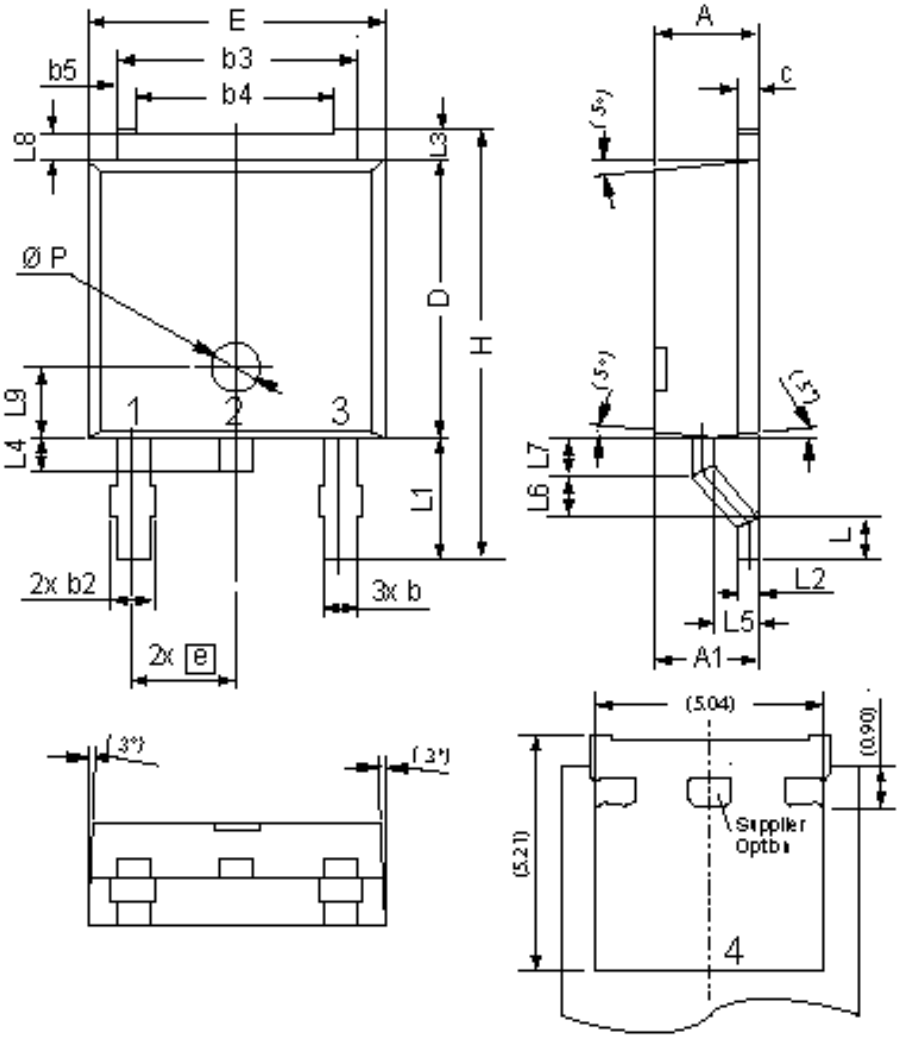
** on die level* T_{VJ} = 175°C



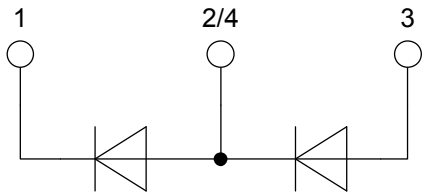
Rectifier

$V_{0\,max}$	*threshold voltage*	0.82	V
$R_{0\,max}$	*slope resistance **	55	mΩ

Outlines TO-252 (DPak)



Dim.	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
b	0.66	0.86	0.026	0.034
b2	-	0.96	-	0.038
b3	5.04	5.64	0.198	0.222
b4	4.34 BSC		0.171 BSC	
b5	0.50 BSC		0.020 BSC	
c	0.40	0.86	0.016	0.034
D	5.90	6.30	0.232	0.248
E	6.40	6.80	0.252	0.268
e	2.10	2.50	0.083	0.098
H	9.20	10.10	0.362	0.398
L	0.55	1.28	0.022	0.050
L1	2.50	2.90	0.098	0.114
L2	0.40	0.60	0.016	0.024
L3	0.50	0.90	0.020	0.035
L4	0.60	1.00	0.024	0.039
L5	0.82	1.22	0.032	0.048
L6	0.79	0.99	0.031	0.039
L7	0.81	1.01	0.032	0.040
L8	0.40	0.80	0.016	0.031
L9	1.50 BSC		0.059 BSC	
Ø P	1.00 BSC		0.039 BSC	



Rectifier

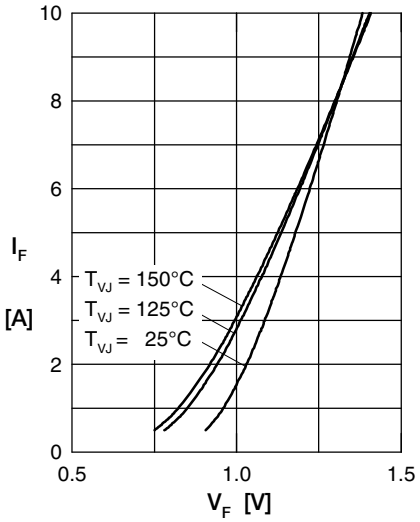


Fig. 1 Forward current versus voltage drop

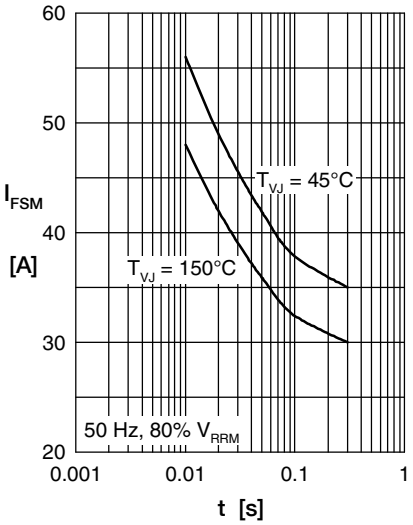


Fig. 2 Surge overload current

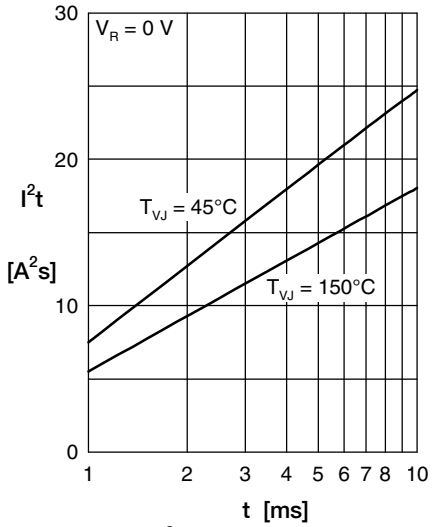


Fig. 3 I^2t versus time

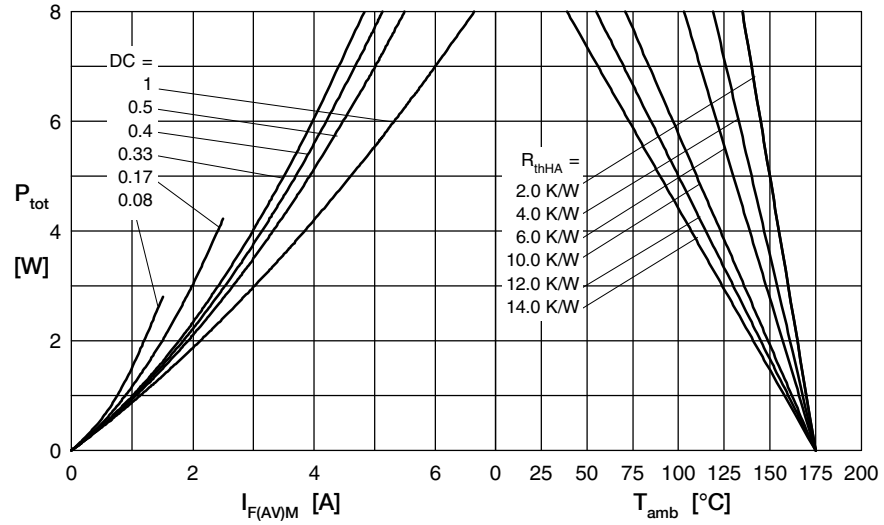


Fig. 4 Power dissipation versus direct output current and ambient temperature

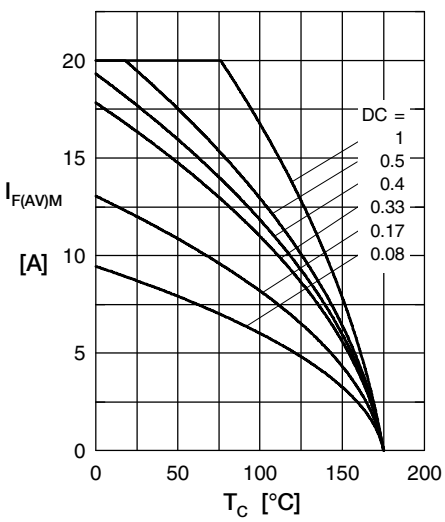


Fig. 5 Max. forward current vs. case temperature

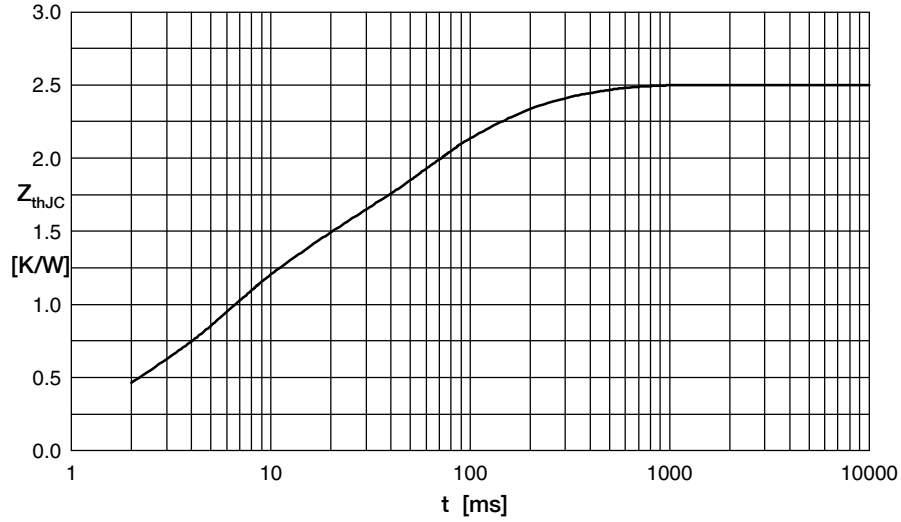


Fig. 6 Transient thermal impedance junction to case

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