DRA170E44

Avalanche Diode

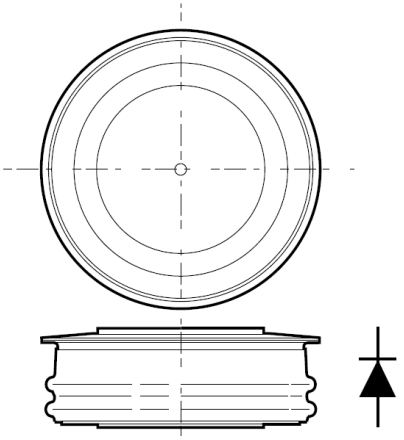
DS5977 – 2 May 2011 (LN28438)

FEATURES

- Double Side Cooling
- High Surge Capability
- Avalanche Capability

KEY PARAMETERS

V_{RRM}	4400V
$I_{F(AV)}$	170A
I_{FSM}	1500A



Outline type code: E

(See Package Details for further information)

Fig. 1 Package outline

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{RRM} V	Conditions
DRA170E44	4400	$V_{RSM} = V_{RRM}+100V$

ORDERING INFORMATION

When ordering, select the required part number shown in the Voltage Ratings selection table.

For example:

DRA170E44 for a 4400V device

CURRENT RATINGS

T_{case} = 75°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	219	A
$I_{F(RMS)}$	RMS value	-	344	A
I_F	Continuous (direct) on-state current	-	333	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	132	A
$I_{F(RMS)}$	RMS value	-	207	A
I_F	Continuous (direct) on-state current	-	181	A

T_{case} = 100°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	170	A
$I_{F(RMS)}$	RMS value	-	267	A
I_F	Continuous (direct) on-state current	-	254	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	100	A
$I_{F(RMS)}$	RMS value	-	157	A
I_F	Continuous (direct) on-state current	-	134	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	1.5	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	11.25	kA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	1.8	kA
I^2t	I^2t for fusing	V_R = 0	16.2	kA^2s

THERMAL AND MECHANICAL RATINGS

Symbol	Parameter	Test Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance – junction to case	Double side cooled	DC	-	0.115	°C/W
		Single side cooled	Anode DC	-	0.27	°C/W
			Cathode DC	-	0.27	°C/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 3kN	Double side	-	0.02	°C/W
		(with mounting compound)	Single side	-	0.04	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	165	°C
		Reverse (blocking)		-	150	°C
T_{stg}	Storage temperature range			-55	150	°C
F_m	Clamping force			2.5	3.8	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 300A peak, T_{case} = 25°C	-	2.1	V
P_{RSM}	Non-repetitive peak avalanche power	10µs avalanche, T_{vj} = 150°C	-	10	kW
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 150 ºC	-	20	mA
		At 50% V_{RRM}, T_{case} = 150 ºC	1*	10*	A
V_{TO}	Threshold voltage	At T_{vj} = 150°C	-	1.12	V
r_T	Slope resistance	At T_{vj} = 150°C	-	3.75	mΩ

*This selection for series sharing only upon request

CURVES

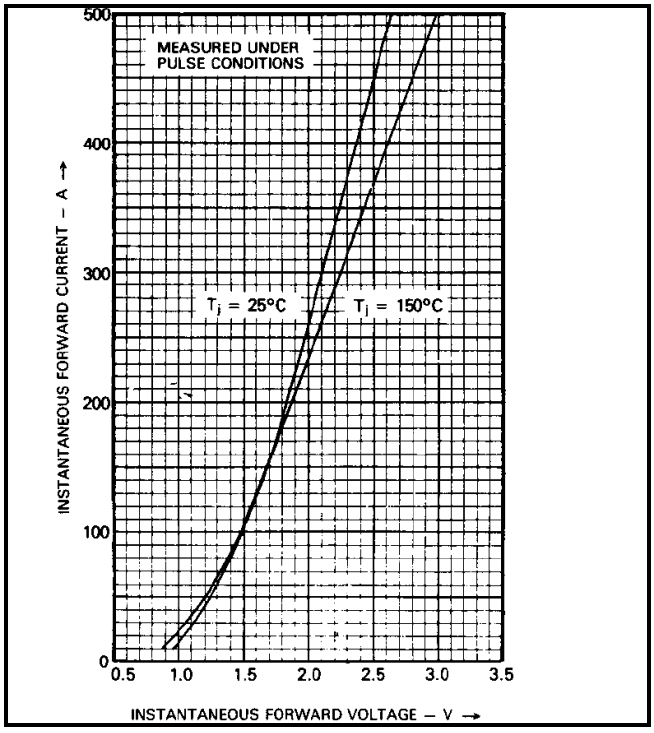


Fig.2 Maximum (limit) on-state characteristics

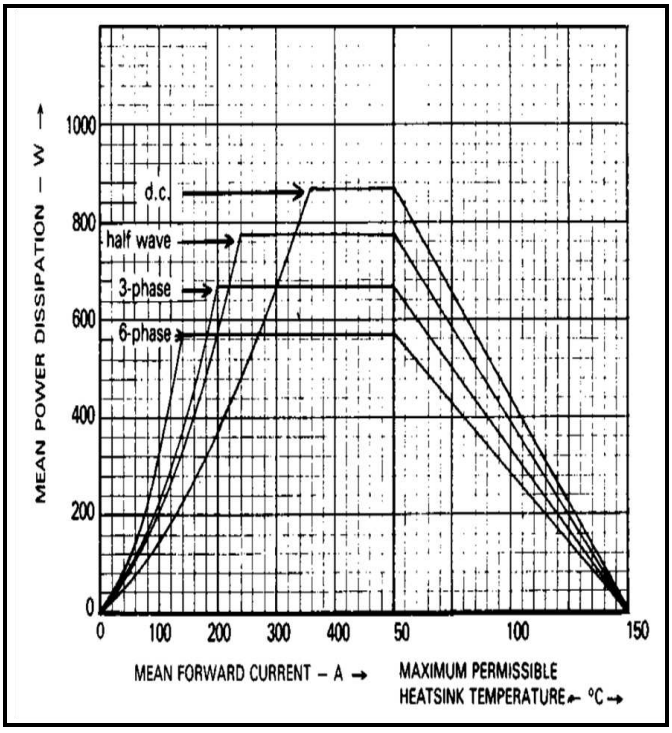


Fig.3 Dissipation curves (double side cooled)

V_{TM} EQUATION

$V_{TM} = A + B\ln(I_T) + C.I_T + D.\sqrt{I_T}$

Where A = 0.576648
B = 0.116697
C = 0.003044
D = 0.007655

these values are valid for T_j = 150°C for I_F 10A to 500A

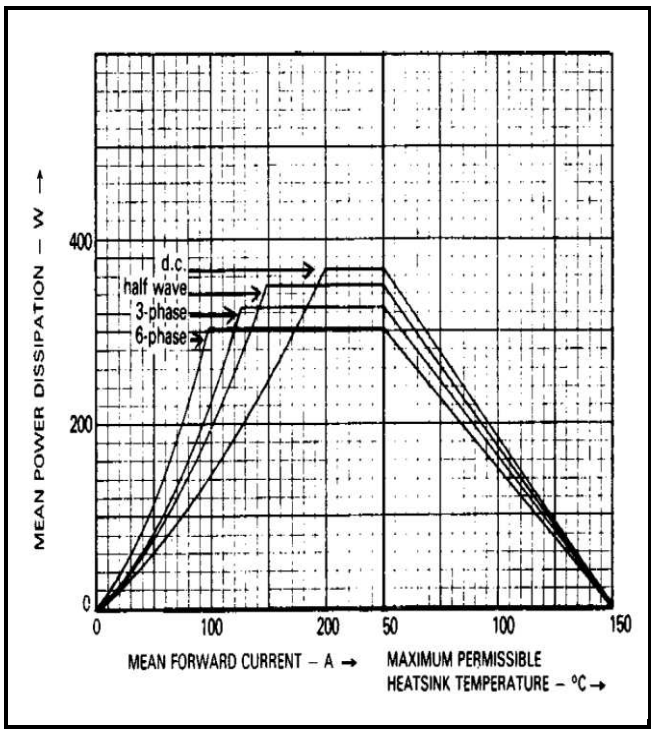


Fig.4 Dissipation curvew – single side cooled

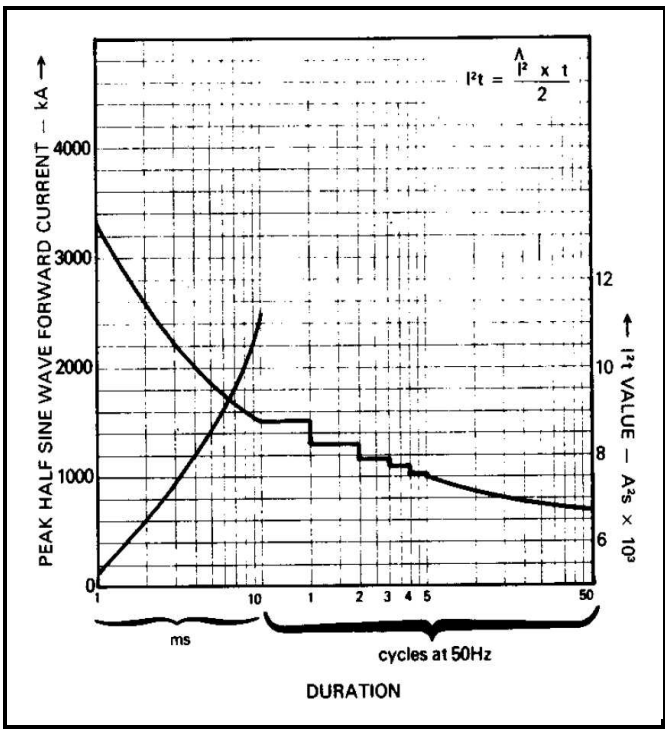


Fig.5 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at T_{case} 150°C)

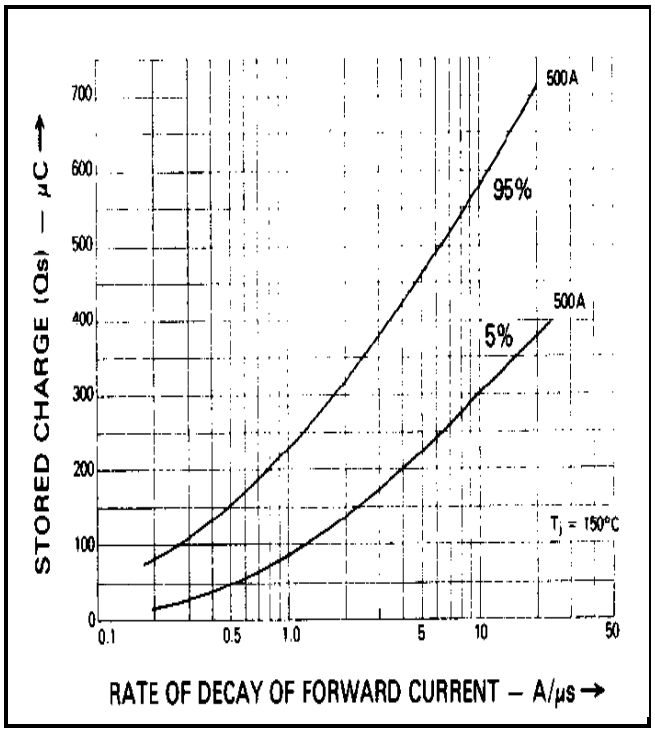


Fig.6 Stored charge

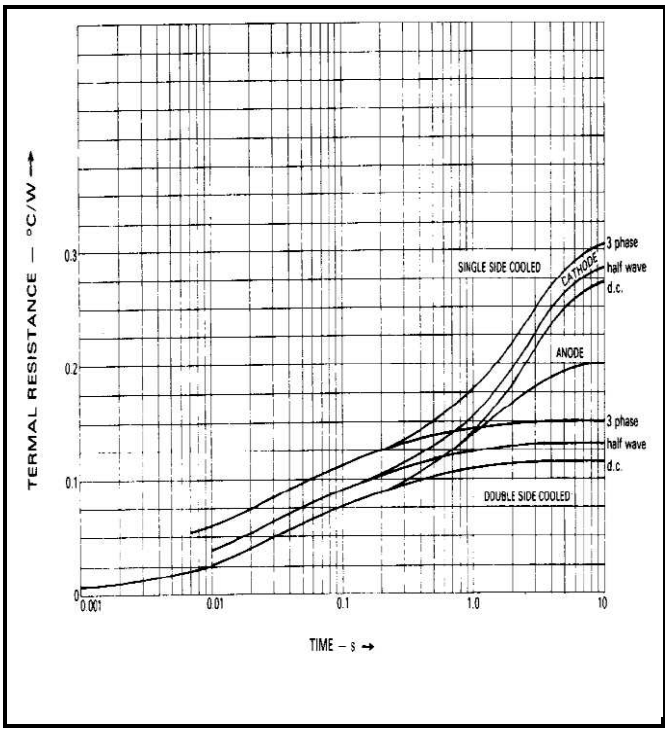
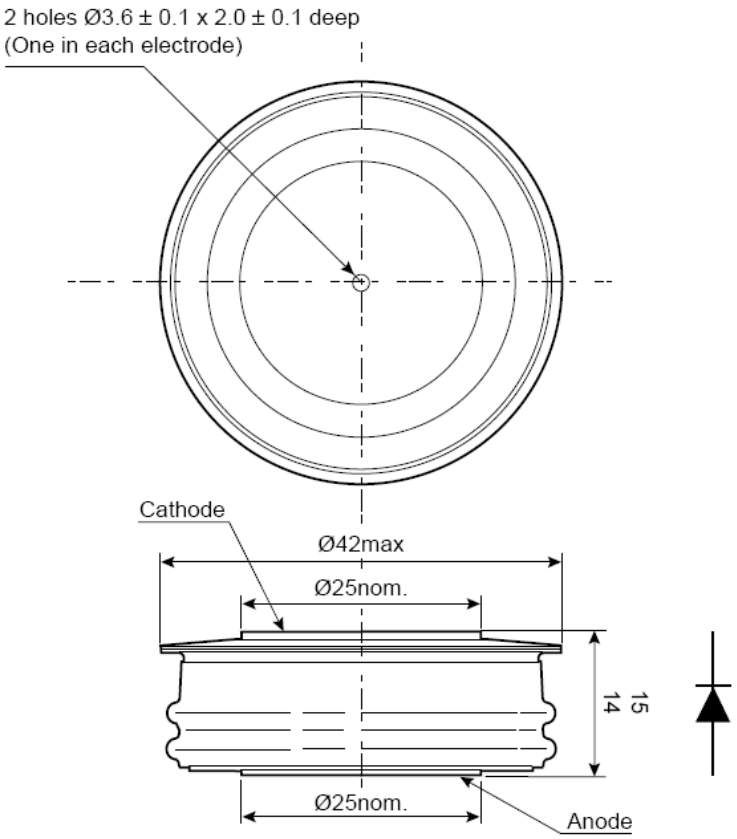


Fig.7 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

For further package information, please contact Customer Services. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Normal weight: 65g
Clamping force: 3.1kN±20%

Package outline type code:E

Note:
Some packages may be supplied with gate and or tags.

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