

Replaces July 2000 version, DS5107-3.3

DS5107-4.0 October 2001

FEATURES

- Double Side Cooling
- High Surge Capability
- Avalanche Capability

APPLICATIONS

- Freewheel Diode
- Rectification

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
DSZ412SE44	4400	$V_{RSM} = V_{RRM} + 100V$

Lower voltage grades available

ORDERING INFORMATION

Order as:

DSZ412SE44

Note: Please use the complete part number when ordering and quote this number in any future correspondence relating to your order.

KEY PARAMETERS

V_{RRM} **4400V**

$I_{F(AV)}$ **219A**

I_{FSM} **1500A**

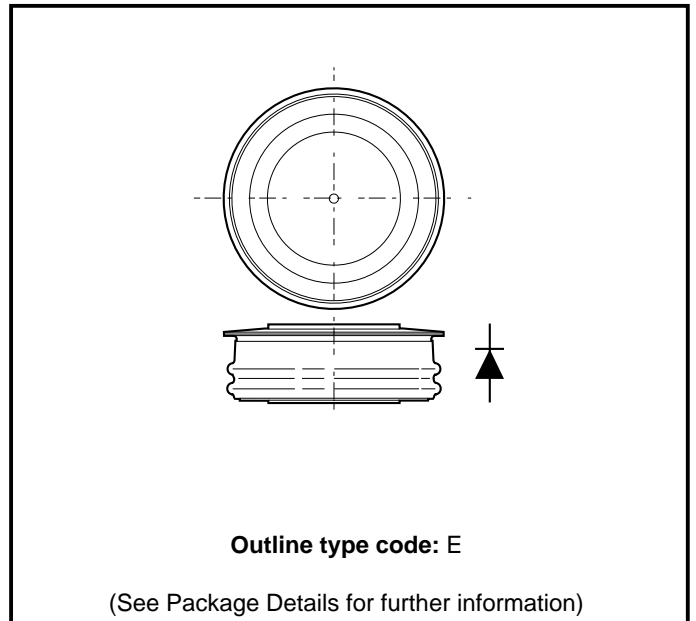


Fig. 1 Package outline

CURRENT RATINGS

$T_{case} = 75^{\circ}\text{C}$ unless otherwise stated

Symbol	Parameter	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) forward 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) forward current	-	181	A

CURRENT RATINGS

$T_{Heatsink} = 55^{\circ}\text{C}$ unless otherwise stated

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{Heatsink} = 55^{\circ}\text{C}$	230	A
$I_{F(RMS)}$	RMS value	$T_{Heatsink} = 55^{\circ}\text{C}$	360	A
I_F	Continuous (direct) forward current	$T_{Heatsink} = 55^{\circ}\text{C}$	345	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load, $T_{Heatsink} = 55^{\circ}\text{C}$	140	A
$I_{F(RMS)}$	RMS value	$T_{Heatsink} = 55^{\circ}\text{C}$	220	A
I_F	Continuous (direct) forward current	$T_{Heatsink} = 55^{\circ}\text{C}$	195	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FRM}	Repetitive peak forward current	Half sine $\phi = 30^\circ$; $T_{Heatsink} = 55^\circ\text{C}$	1990	A
I^2t	I^2t for fusing	10ms; $T_j = 150^\circ\text{C}$	11250	A ² s
		3ms; $T_j = 150^\circ\text{C}$	7250	A ² s
I_{FSM}	Surge (non-repetitive) forward current	With 50% V_{RRM} , $T_j = 150^\circ\text{C}$	1500	A
P_{RSM}	Non-repetitive peak avalanche power	10 μ s avalanche, $T_j = 150^\circ\text{C}$	10	kW

THERMAL RATINGS AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units	
$R_{th(j-h)}$	Thermal resistance - junction to heatsink	Double side cooled Clamping force 3.0kN with mounting compound	dc	-	0.115	$^\circ\text{C/W}$
			Half-wave	-	0.129	$^\circ\text{C/W}$
			3 phase	-	0.150	$^\circ\text{C/W}$
$R_{th(j-h)}$	Thermal resistance - junction to heatsink	Single side cooled Clamping force 3.0kN with mounting compound	dc	-	0.270	$^\circ\text{C/W}$
			Half-wave	-	0.284	$^\circ\text{C/W}$
			3 phase	-	0.305	$^\circ\text{C/W}$
T_{vj}	Virtual junction temperature	Forward (conducting)	-	165	$^\circ\text{C}$	
		Reverse (blocking)	-	150	$^\circ\text{C}$	
T_{stg}	Storage temperature range		-55	150	$^\circ\text{C}$	
f	Frequency		10	400	Hz	
-	Clamping force		2.5	3.8	kN	

CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 300A peak, $T_{case} = 25^{\circ}C$	-	2.1	V
I_{RM}	Peak reverse current	At V_{RRM} , $T_{case} = 150^{\circ}C$	-	20	mA
		At 50 % V_{RRM} , $T_{case} = 150^{\circ}C$	1*	10*	mA
V_{TO}	Threshold voltage	At $T_{vj} = 150^{\circ}C$	-	1.12	V
r_T	Slope resistance	At $T_{vj} = 150^{\circ}C$	-	3.75	m Ω

*This selection for series sharing only upon request.

CURVES

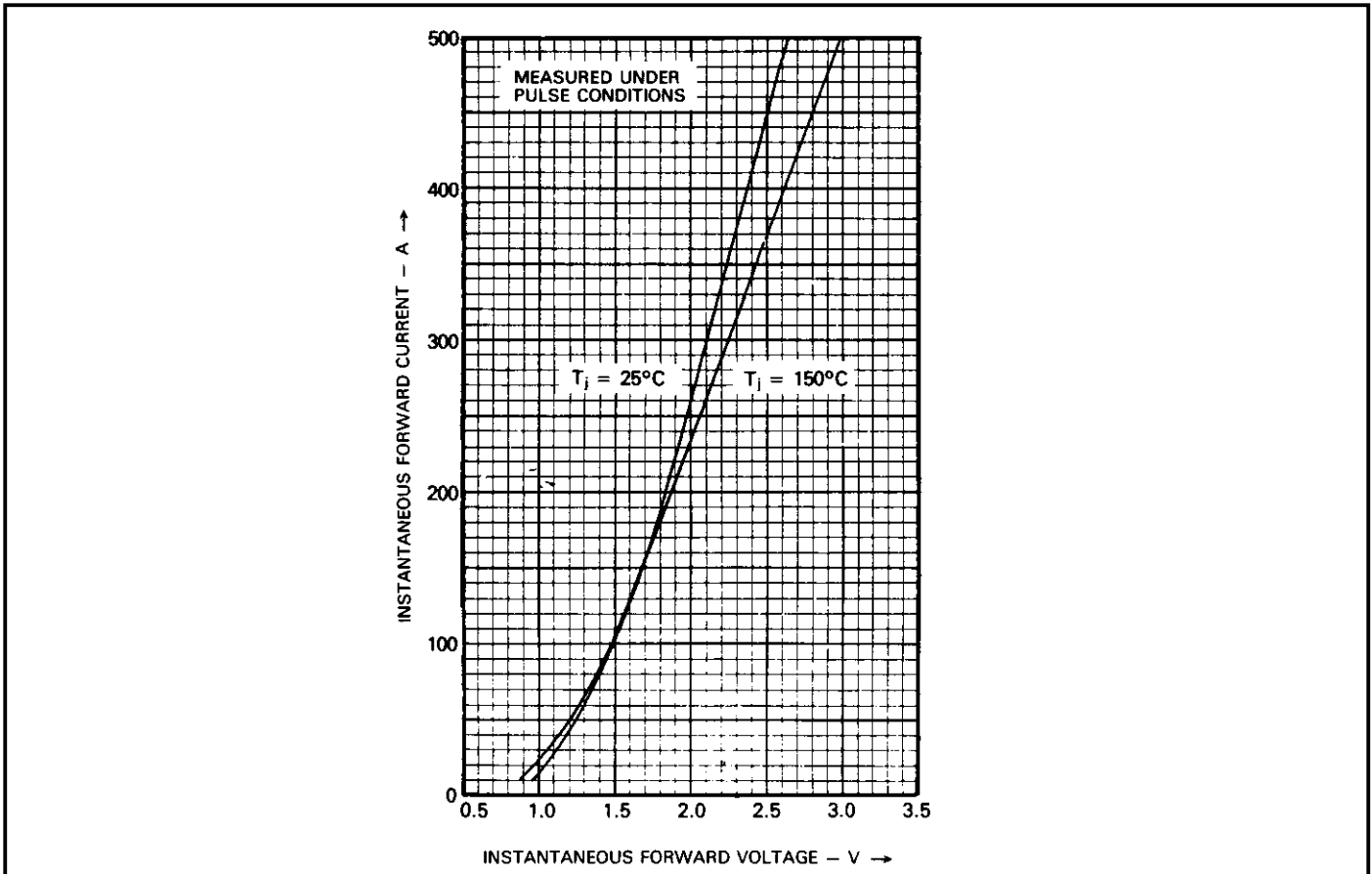


Fig.2 Maximum (limit) forward characteristics

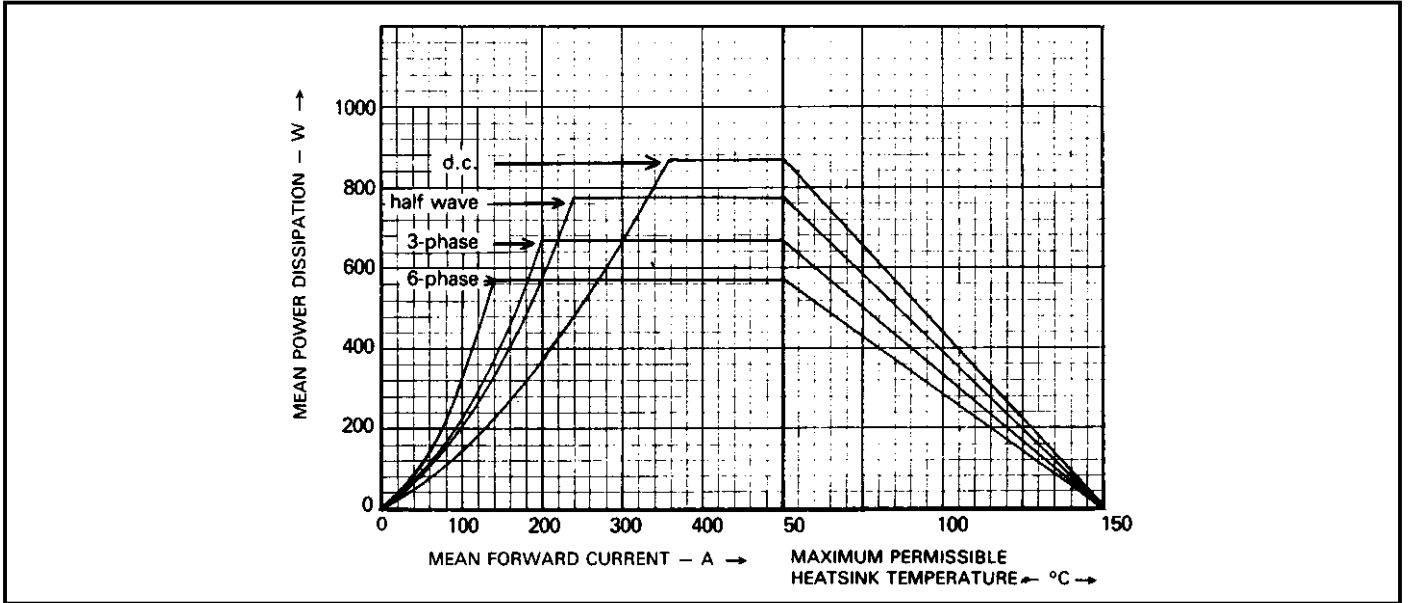


Fig.3 Dissipation curves - double side cooled

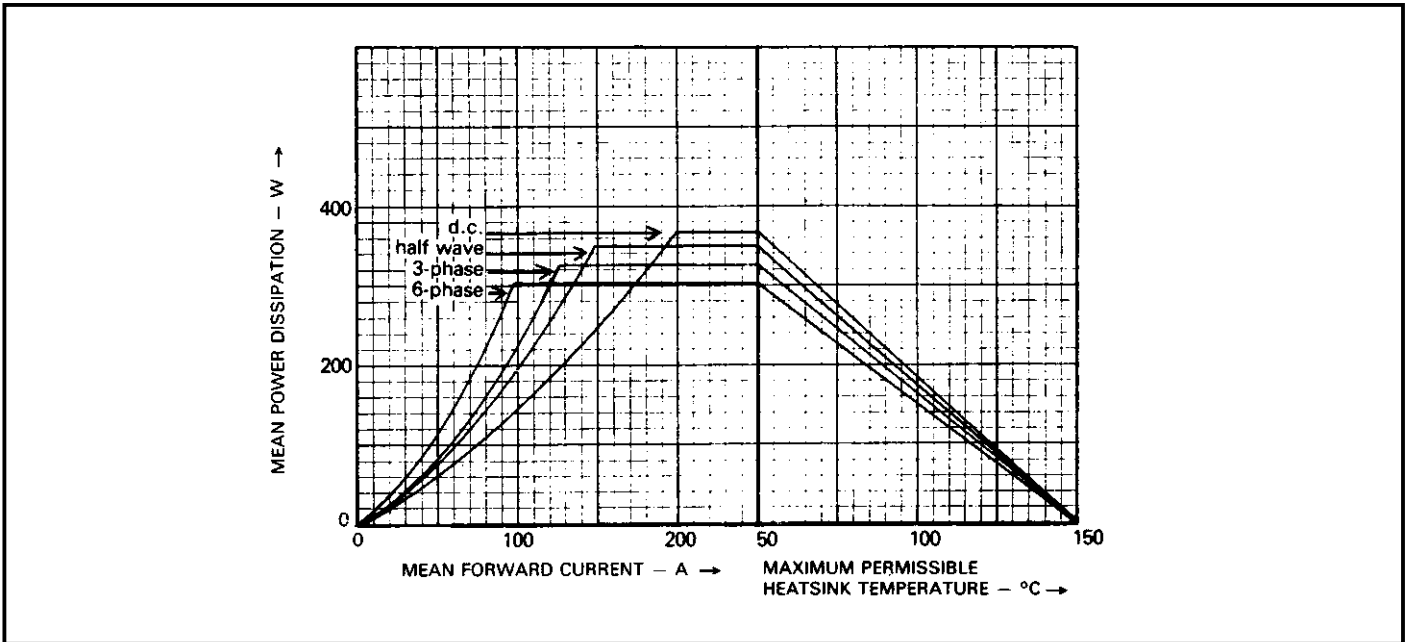


Fig.4 Dissipation curves - single side cooled

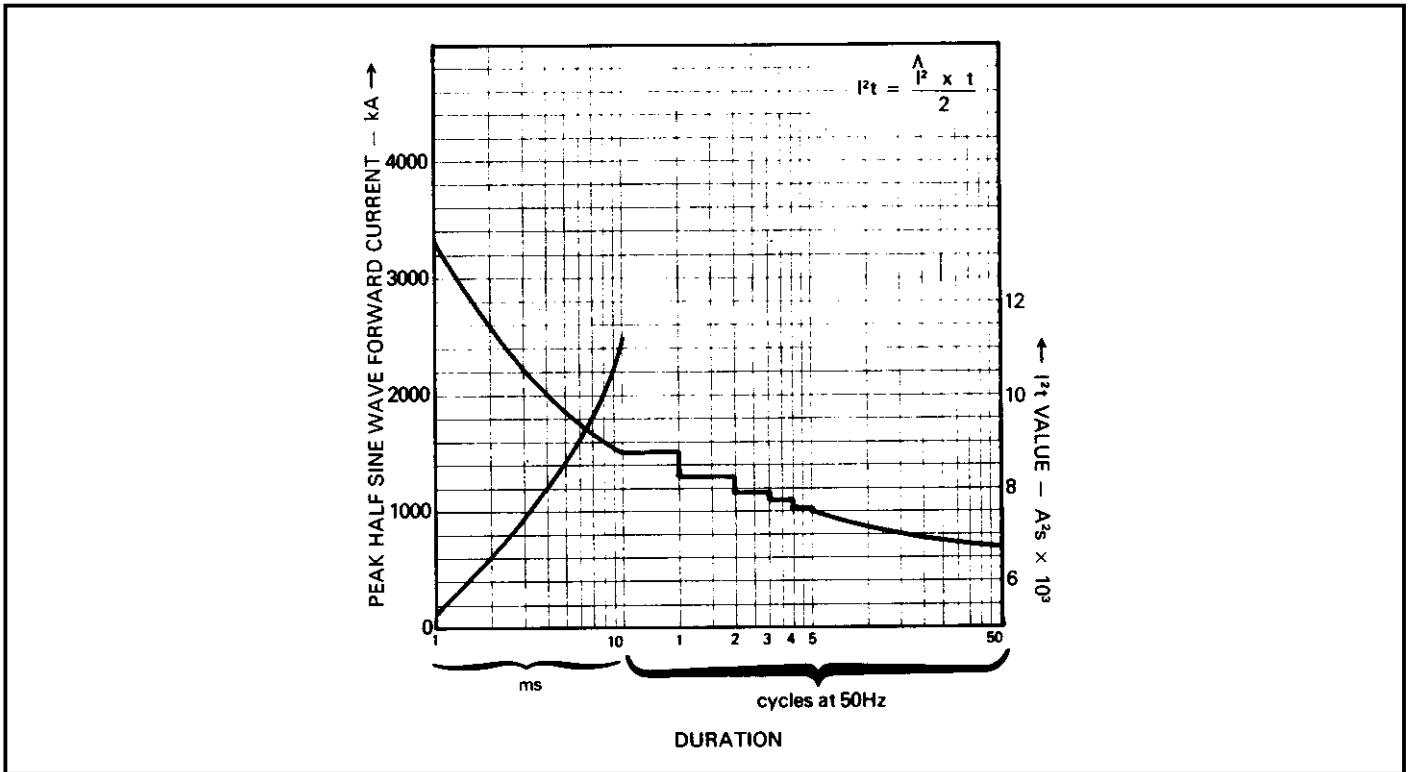


Fig.5 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} , $T_{case} = 150^{\circ}C$)

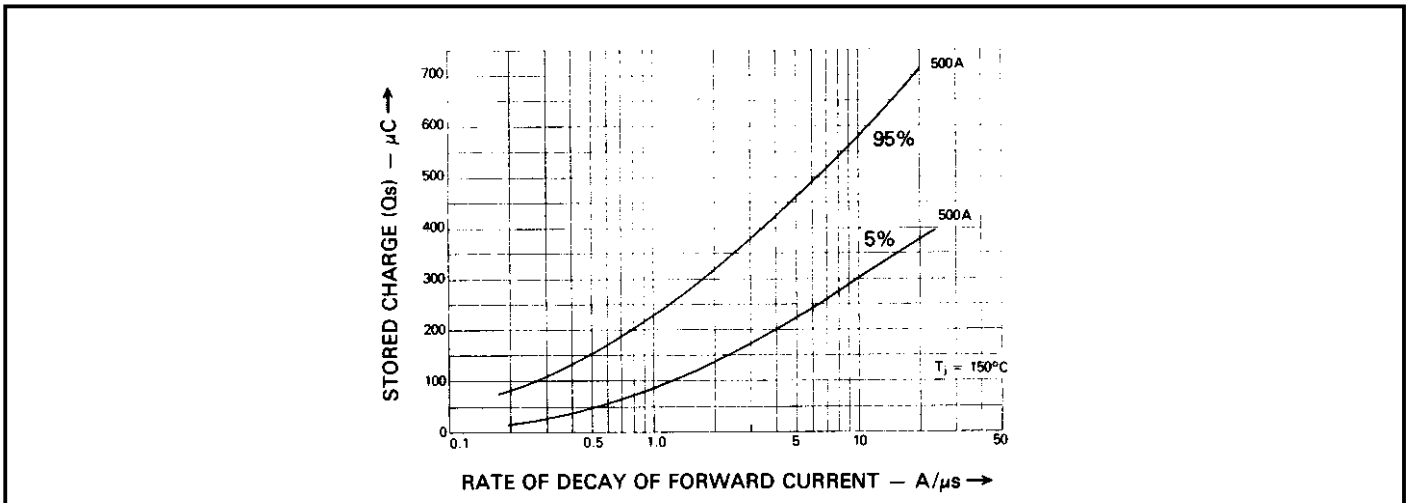


Fig.6 Stored charge

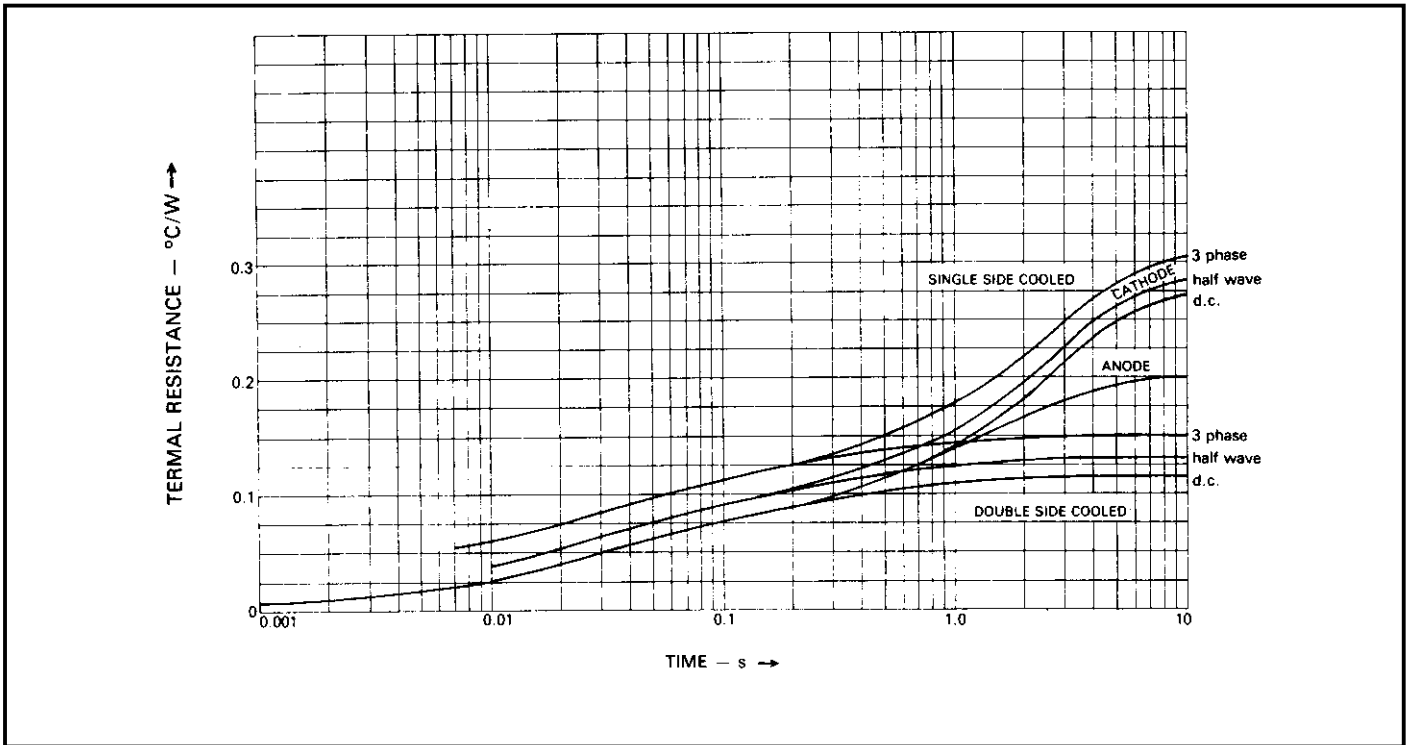
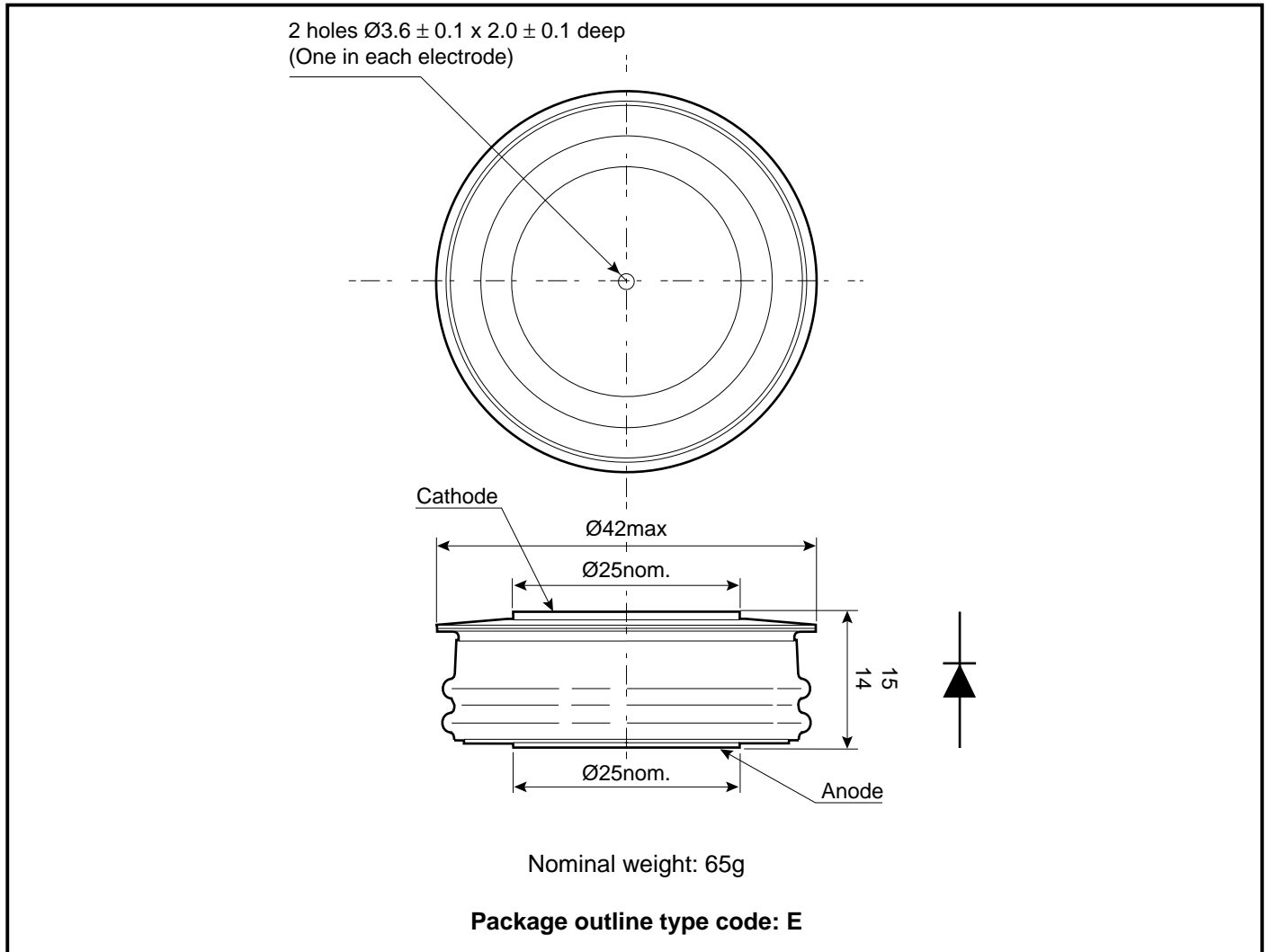


Fig.7 Maximum (limit) transient thermal impedance

PACKAGE DETAILS

For further package information, please visit our website or contact your nearest Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Note:

1. Package maybe supplied with pins and/or tags.

POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group offers high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the latest CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete Solution (PACs).

HEATSINKS

The Power Assembly group has its own proprietary range of extruded aluminium heatsinks which have been designed to optimise the performance of Dynex semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest sales representative or Customer Services.

Stresses above those listed in this data sheet may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed.



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