DYNEX SEMICONDUCTOR

PT85QWx45

Pulse Power Thyristor Switch

Preliminary Information

DS5334-1.2 April 2000

APPLICATIONS

- Pulse Power
- Crowbars
- Ignitron Replacement

KEY PARAMETERS

V_{DRM}	4500V
$I_{T(AV)}$	1670A
I_{TSM}	37000A
dI/dt	22000A/µs

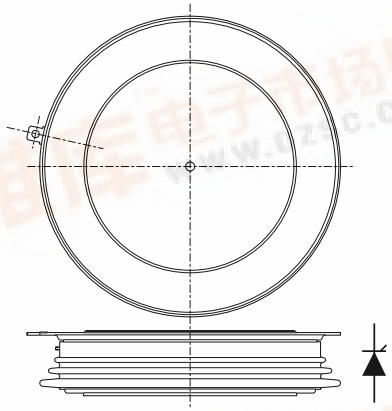
FEATURES

- Double Side Cooling
- Fast Turn-on
- Low Turn-on Losses

VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages V_{DRM}/V_{RRM} V	Conditions
PT85QWx45	4500/16	T_{vj} = 0˚ to 125˚C, $I_{DRM} = I_{RRM}$ = 50mA, V_{DRM}, V_{RRM} t_p = 10ms

Lower voltage grades available.



Outline type code: W.
See Package Details for further information.

Fig.1 Package outline

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, T_{case} = 80ºC	1670	A
$I_{T(RMS)}$	RMS value	T_{case} = 80ºC	2625	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; T_{case} = 125°C	29.6	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - 1/4 sine	4.38 x 10^6	A^2s
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; T_{case} = 125°C	37.0	kA
I^2t	I^2t for fusing	V_R = 0	6.85 x 10^6	A^2s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.01	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 40kN with mounting compound	Double side	-	0.001	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	135	°C
		Reverse (blocking)		-	125	°C
T_{stg}	Storage temperature range			–55	125	°C
-	Clamping force			36.0	44.0	kN

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions		Typ.	Max.	Units
I_{RRM}/I_{DRM}	Peak reverse and off-state current	At V_{RRM}/V_{DRM}, T_{case} = 125°C		-	250	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To 67% V_{DRM} T_j = 125°C. $R_{gk} \leq 1.5\Omega$		-	200	V/µs
dI/dt	Rate of rise of on-state current	From 67% V_{DRM} to 90kA Gate source 130A t_r = 1.5µs, T_j = 25°C	Non-repetitive	-	22000	A/µs
$V_{T(TO)}$	Threshold voltage	At T_{vj} = 125°C		-	1.45	V
r_T	On-state slope resistance	At T_{vj} = 125°C		-	0.3	mΩ

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{GT}	Gate trigger voltage	V_{DRM} = 5V, T_{case} = 25°C	1.0	4.0	V
I_{GT}	Gate trigger current	V_{DRM} = 5V, T_{case} = 25°C	-	1.5	A

ORDERING INFORMATION

PT Pulse Power Thyristor
85Q Device type
W Package outline type code
x lead length (see table, right)
45 Voltage x100

Lead length (x)		
O	No lead	
C	8"	200mm
D	10"	250mm
E	12"	300mm
F	16"	400mm
G	18"	450mm
H	20"	500mm
J	24"	600mm
K	30"	750mm
L	40"	1000mm

CURVES

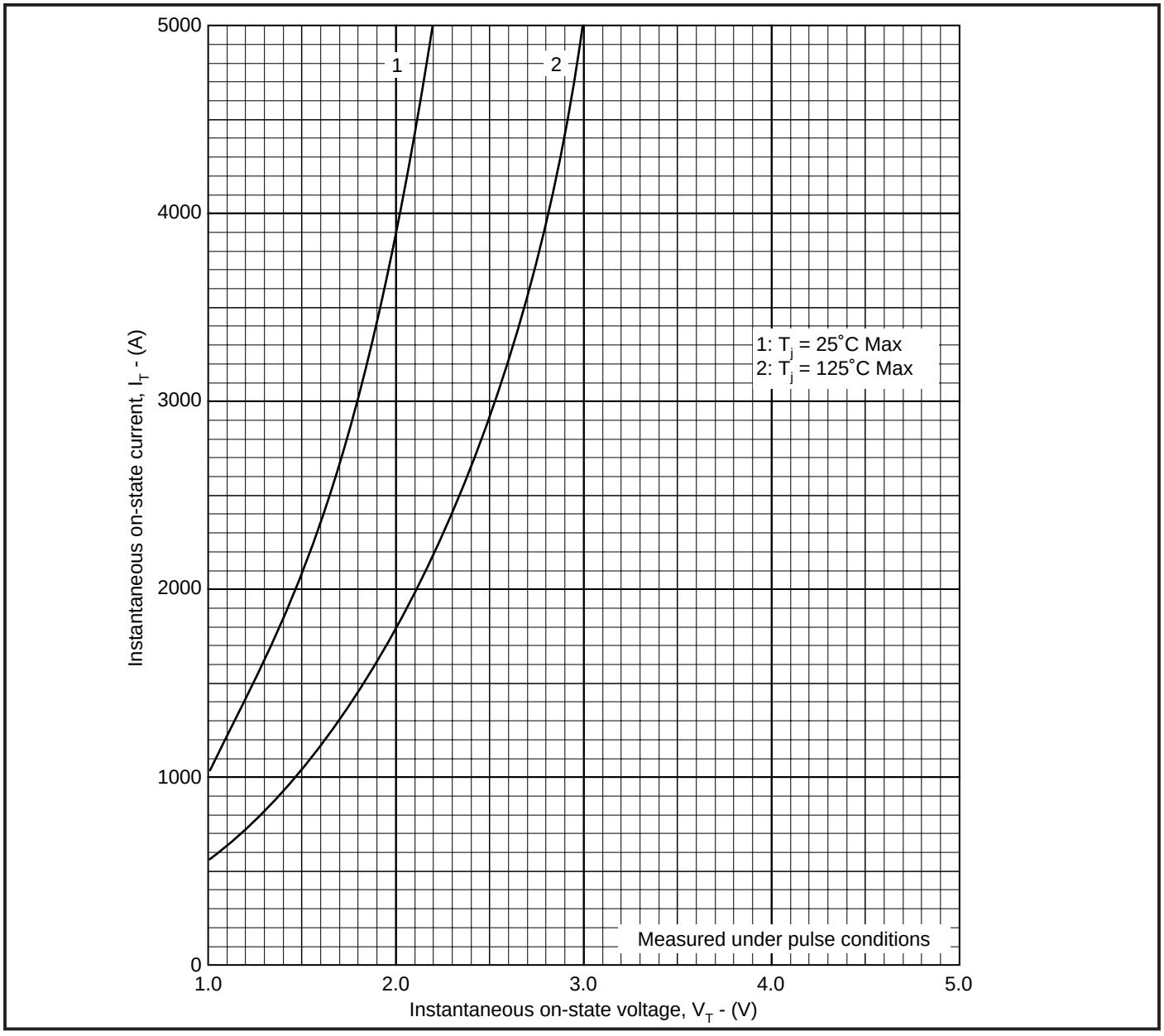


Fig.2 Maximum (limit) on-state characteristics

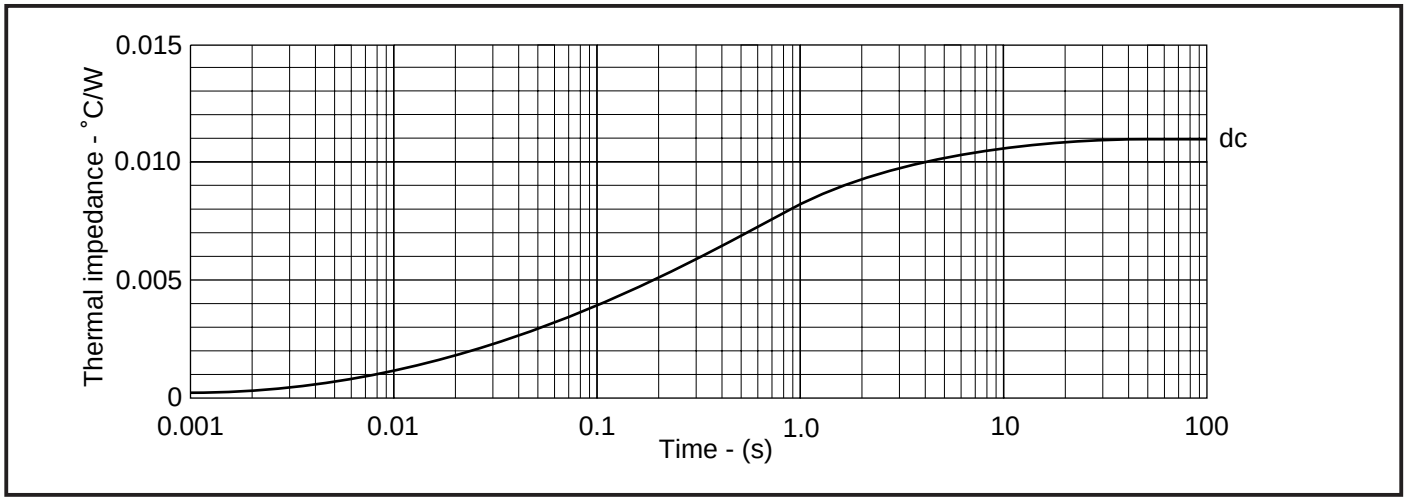
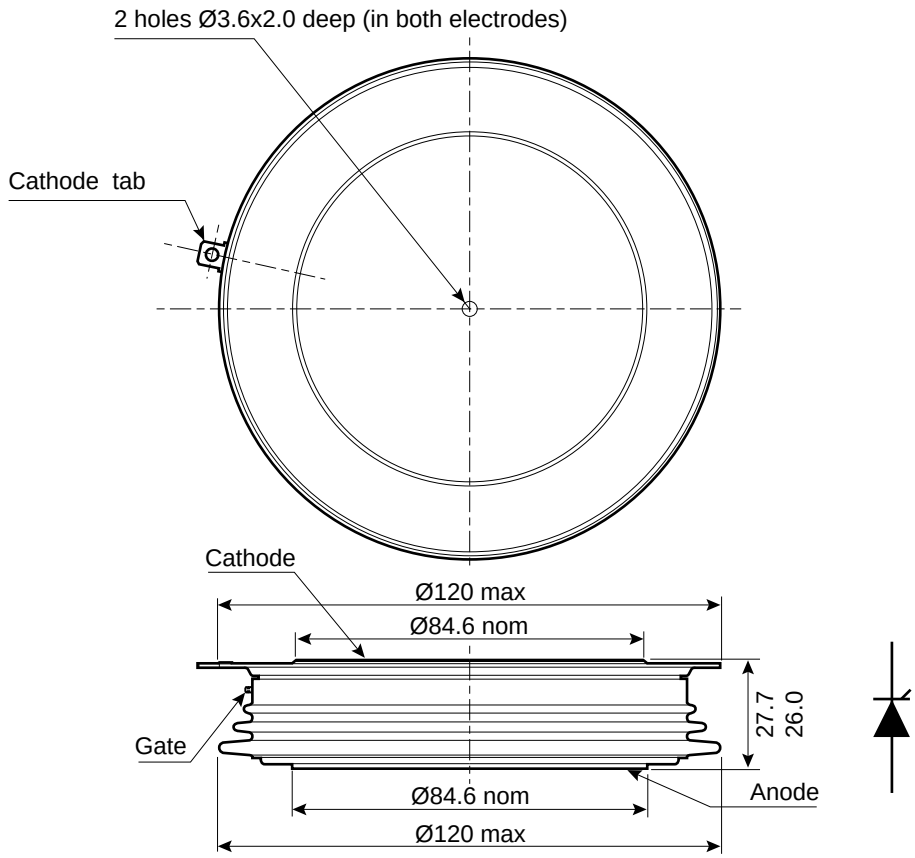


Fig.3 Maximum (limit) transient thermal impedance - junction to case

PACKAGE DETAILS

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Nominal weight: 2600g
Clamping force: 40kN ±10%

Package outine type code: W

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.

DYNEX SEMICONDUCTOR

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Dynex Semiconductor annotate datasheets in the top right hard corner of the front page, to indicate product status. The annotations are as follows:-

Target Information: This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started.

Preliminary Information: The product is in design and development. The datasheet represents the product as it is understood but details may change.

Advance Information: The product design is complete and final characterisation for volume production is well in hand.

No Annotation: The product parameters are fixed and the product is available to datasheet specification.