DRD5460Y20

Rectifier Diode

Replaces DS4171-6.0 February 2003 – Datasheet DS2102SY-DS2102SV

DS6231-1 February 2018 (LN35176)

FEATURES

- Double Side Cooling
- High Surge Capability

KEY PARAMETERS

V_{RRM}	**2000V**
$I_{F(AV)}$	**6654A**
I_{FSM}	**100kA**

VOLTAGE RATINGS

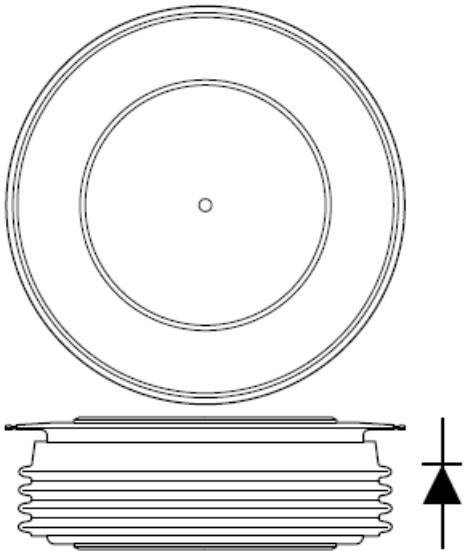
Part and Ordering Number	Repetitive Peak Voltages V_{RRM} V	Conditions
DRD5460Y20 DRD5460Y18 DRD5460Y16	2000 1800 1600	$V_{RSM} = V_{RRM}+100V$

ORDERING INFORMATION

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

For example:

DRD5460Y18 for a 1800V device



Outline type code: Y

See Package Details for further information.

Fig. 1 Package outline

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	6654	A
$I_{F(RMS)}$	RMS value	-	10452	A
I_F	Continuous (direct) on-state current	-	9275	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	4227	A
$I_{F(RMS)}$	RMS value	-	6640	A
I_F	Continuous (direct) on-state current	-	5403	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	5460	A
$I_{F(RMS)}$	RMS value	-	8575	A
I_F	Continuous (direct) on-state current	-	7450	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	3410	A
$I_{F(RMS)}$	RMS value	-	5356	A
I_F	Continuous (direct) on-state current	-	4620	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 175°C	80.0	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	32	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 175°C	100	kA
I^2t	I^2t for fusing	V_R = 0	50	MA^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	-	0.0095	°C/W
		Single side cooled	Anode DC	-	0.019	°C/W
			Cathode DC	-	0.019	°C/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 43kN	Double side	-	0.002	°C/W
		(with mounting compound)	Single side	-	0.004	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	185	°C
		Reverse (blocking)		-	175	°C
T_{stg}	Storage temperature range			-55	175	°C
F_m	Clamping force			38.0	47.0	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 3000A peak, T_{case} = 25°C	-	1.0	V
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 175°C	-	100	mA
Q_S	Total stored charge	I_F = 2000A, dI_{RR}/dt =3A/µs	-	2600	µC
I_{rr}	Peak reverse recovery current	T_{case} = 175°C, V_R =100V	-	120	A
V_{TO}	Threshold voltage	At T_{vj} = 175°C	-	0.75	V
r_T	Slope resistance	At T_{vj} = 175°C	-	0.0415	mΩ

CURVES

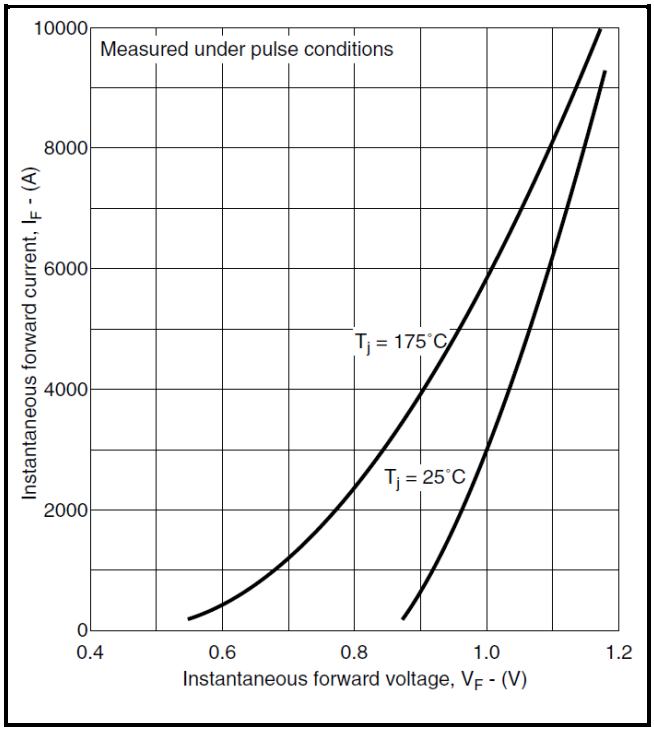


Fig.2 Maximum & minimum on-state characteristics

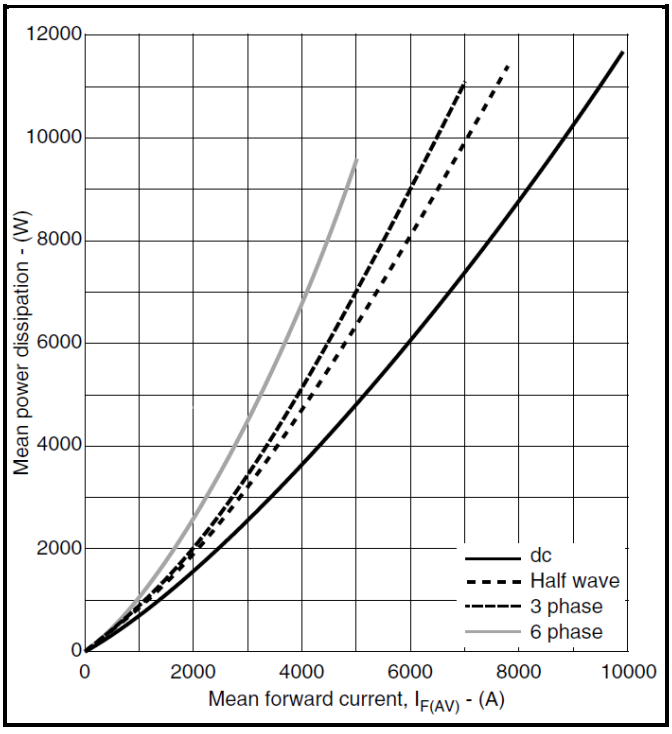


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = 0.402091
B = 0.011718
C = 6.48 x 10^{-5}
D = 0.005977

these values are valid for T_j = 175°C for I_F 500A to 10000A

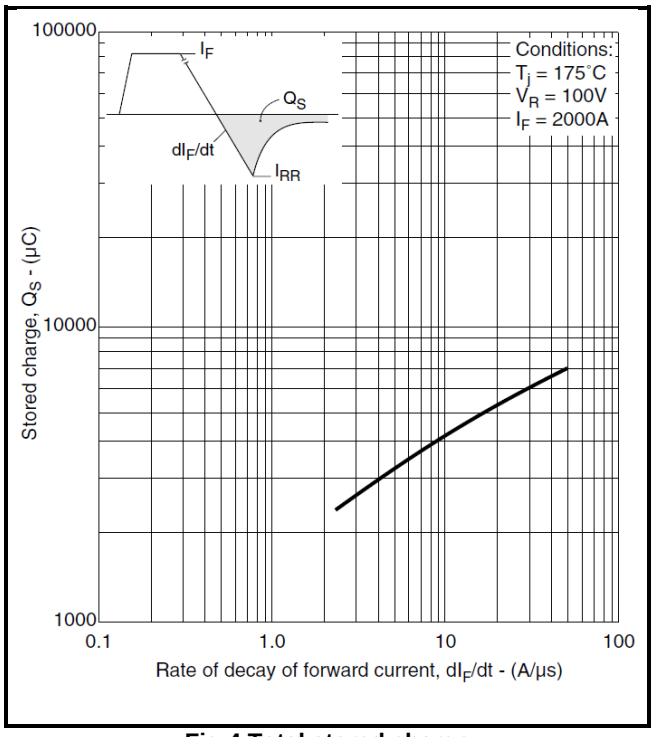


Fig.4 Total stored charge

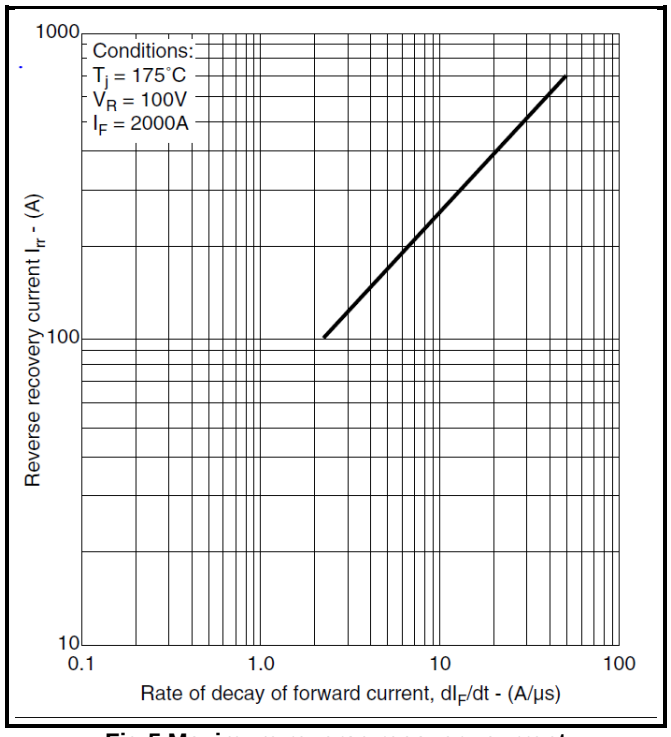


Fig.5 Maximum reverse recovery current

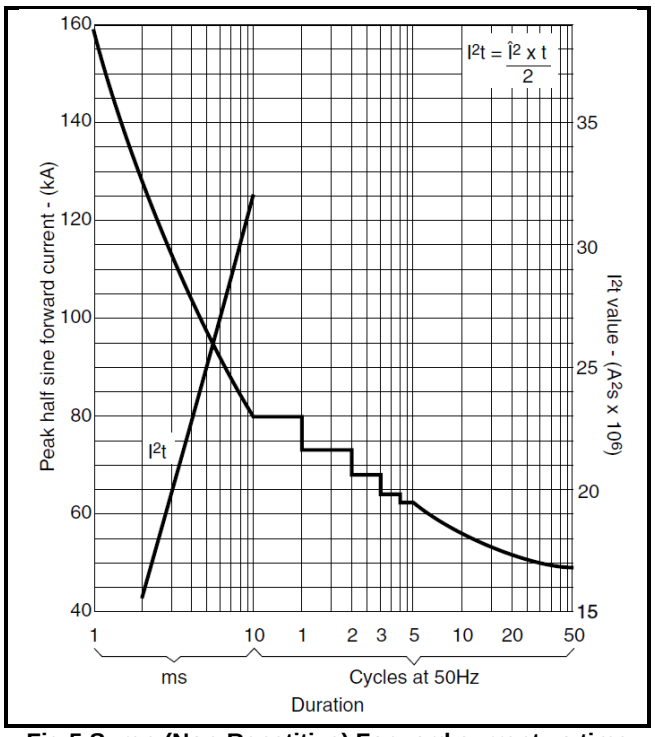


Fig.5 Surge (Non-Repetitive) Forward current vs time

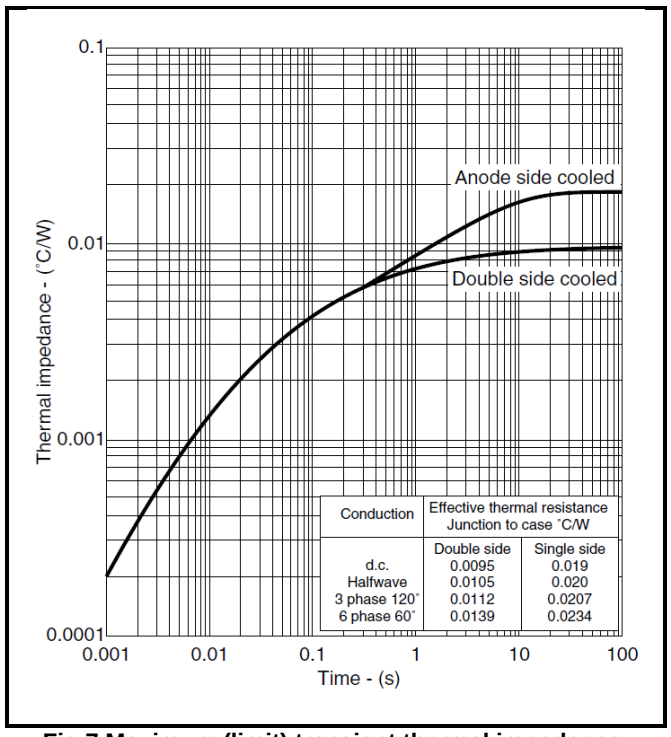
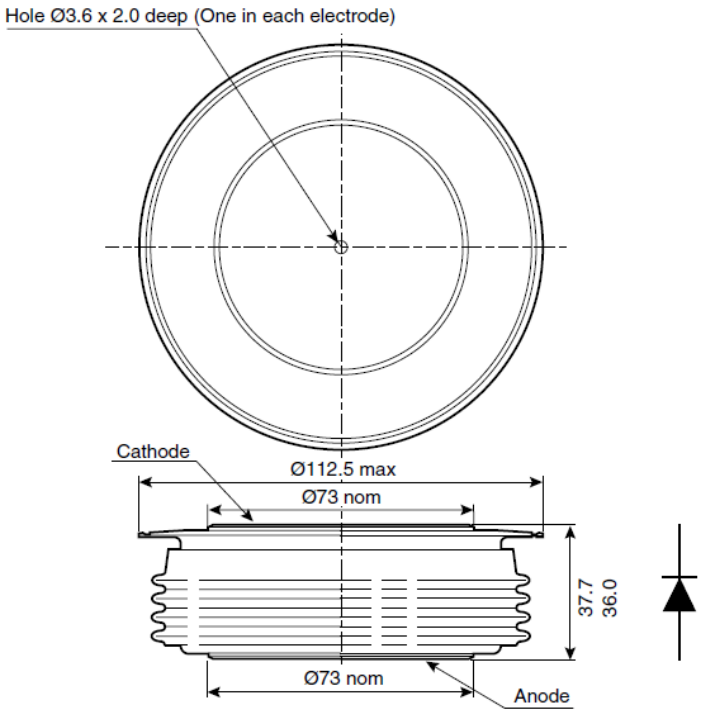


Fig.7 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



Nominal weight: 1600g
Clamping force: 43kN ±10%

Package outline type code: Y

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

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