DRD2960Y40

Rectifier Diode

DS5983-2 June 2013 (LN30617)

FEATURES

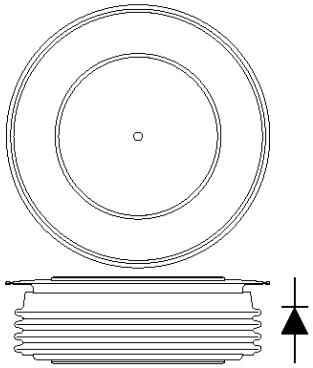
- Double Side Cooling
- High Surge Capability

APPLICATIONS

- Rectification
- Free-wheel Diode
- DC Motor Control
- Power Supplies
- Welding
- Battery Chargers

KEY PARAMETERS

V_{RRM}	**4000V**
$I_{F(AV)}$	**2956A**
I_{FSM}	**62500A**



Outline type code: Y

(See Package Details for further information)

Fig. 1 Package outlines

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{RRM} V	Conditions
DRD2960Y40	4000	$V_{RSM} = V_{RRM}+100V$
DRD2960Y39	3900	
DRD2960Y38	3800	
DRD2960Y37	3700	
DRD2960Y36	3600	
DRD2960Y35	3500	

Lower voltage grades available.

ORDERING INFORMATION

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

For example:

DRD2960Y37 for a 3700V device in a Y outline

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

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	3830	A
$I_{F(RMS)}$	RMS value	-	6016	A
I_F	Continuous (direct) on-state current	-	5597	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	2525	A
$I_{F(RMS)}$	RMS value	-	3966	A
I_F	Continuous (direct) on-state current	-	3421	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	2956	A
$I_{F(RMS)}$	RMS value	-	4643	A
I_F	Continuous (direct) on-state current	-	4218	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	1913	A
$I_{F(RMS)}$	RMS value	-	3005	A
I_F	Continuous (direct) on-state current	-	2514	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	50.0	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	12.5	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	62.5	kA
I^2t	I^2t for fusing	V_R = 0	19.6	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)		-	160	°C
		Reverse (blocking)		-	150	°C
T_{stg}	Storage temperature range			-55	150	°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	-	1.15	V
I_{RM}	Peak reverse current	At V_{DRM}, T_{case} = 150°C	-	250	mA
Q_S	Total stored charge	I_F = 2000A, dI_{RR}/dt =3A/µs	-	5000	µC
I_{rr}	Peak reverse recovery current	T_{case} = 150°C, V_R =100V	-	150	A
V_{TO}	Threshold voltage	At T_{vj} = 150°C	-	0.75	V
r_T	Slope resistance	At T_{vj} = 150°C	-	0.118	mΩ

CURVES

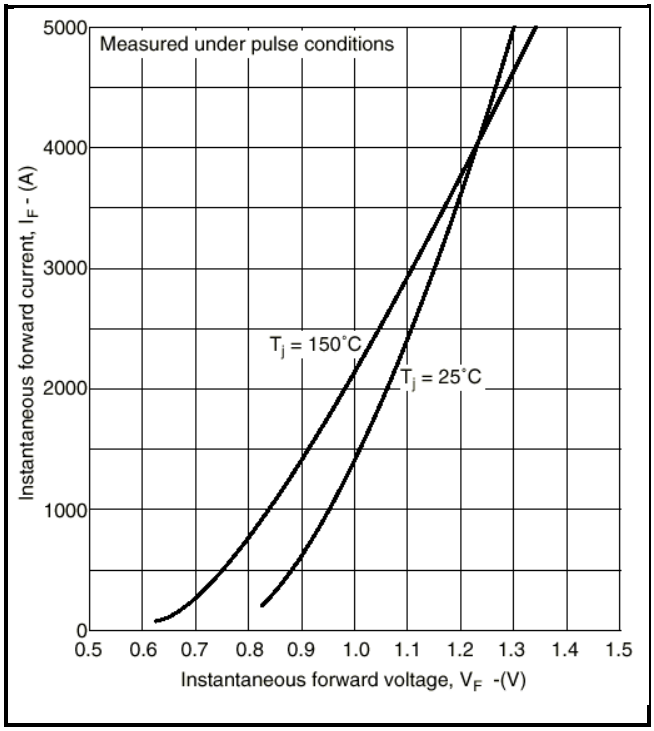


Fig.2 Maximum (limit) on-state characteristics

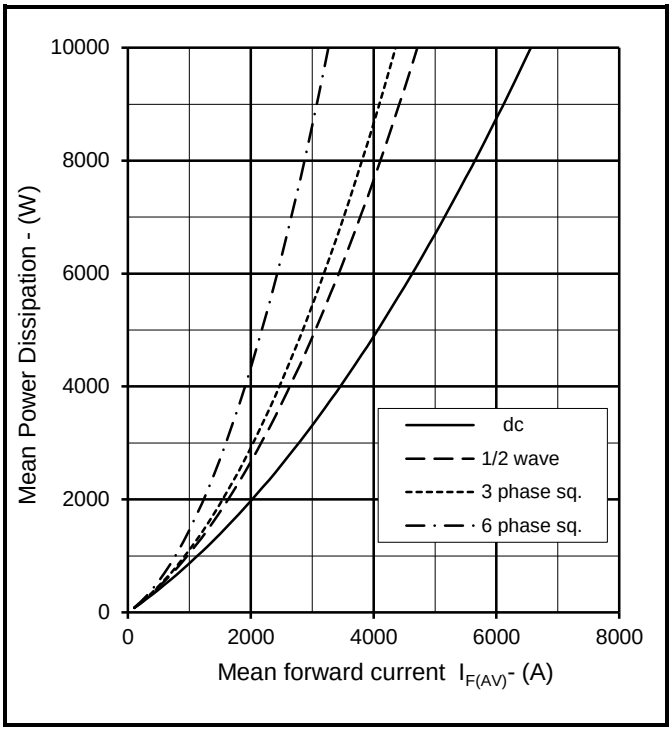


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = - 0.15357
B = 0.177571
C = 0.000179
D = - 0.01294

these values are valid for T_j = 150°C for I_F 500A to 5000A

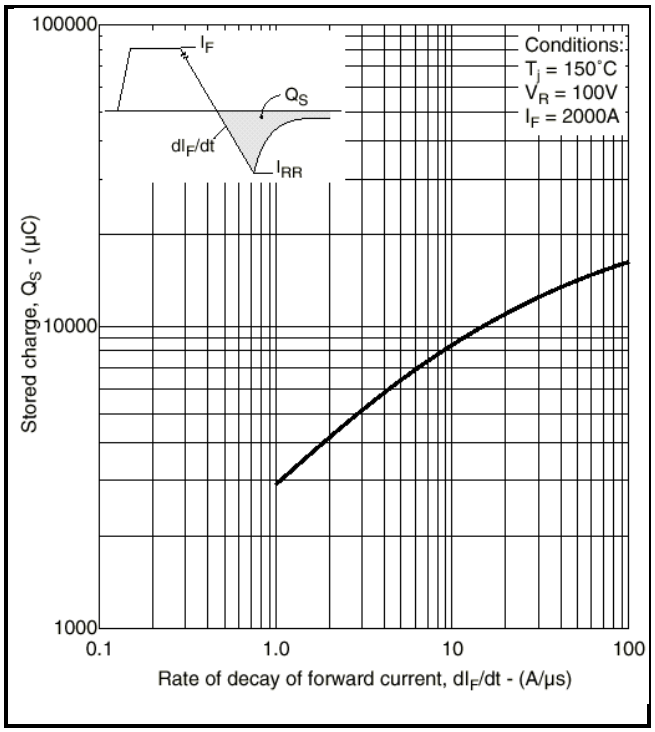


Fig.4 Total stored charge

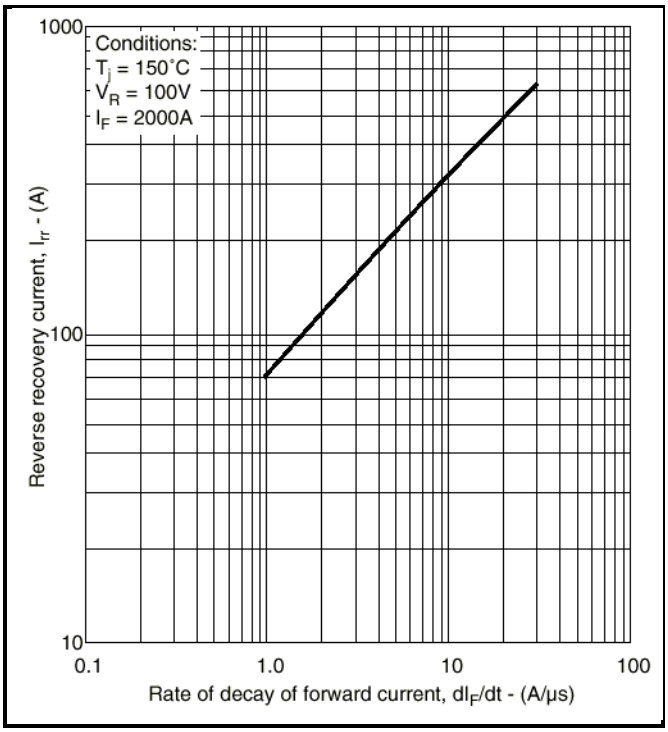


Fig.5 Maximum reverse recovery current

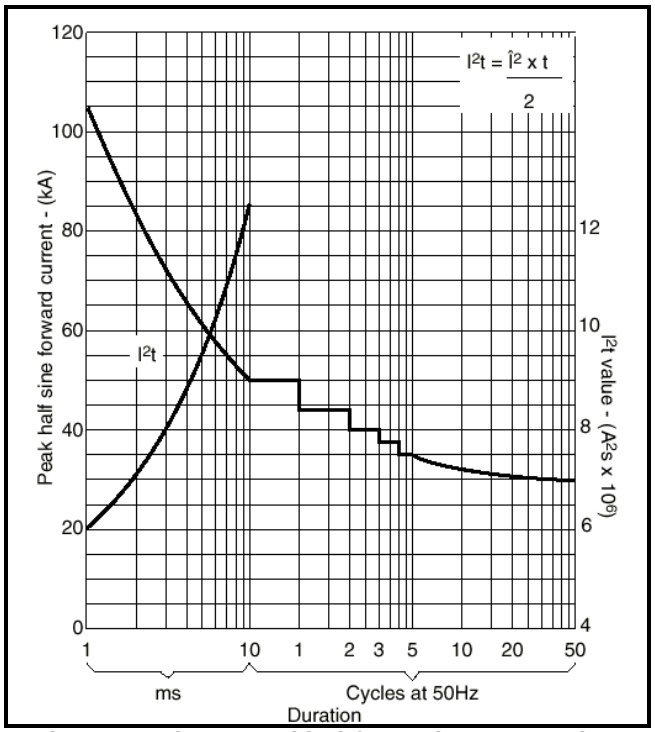


Fig.6 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} at T_{case} 150°C)

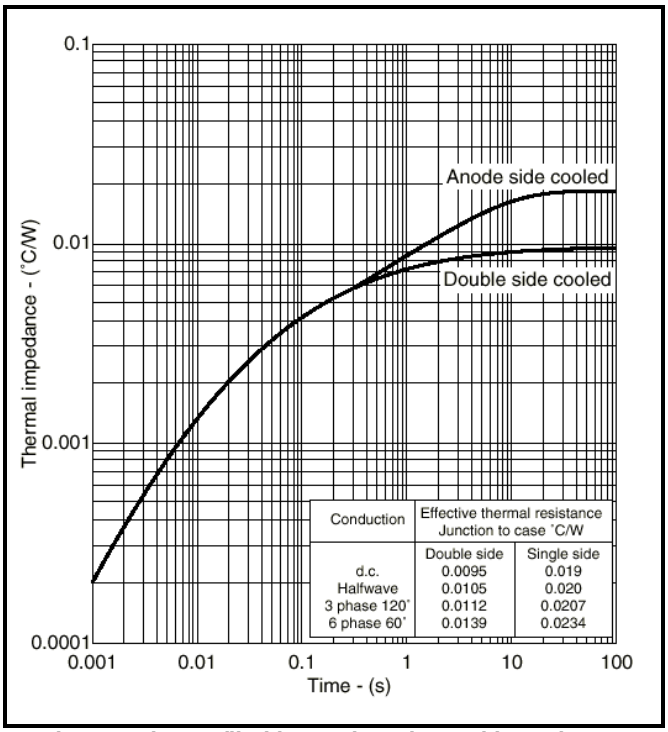
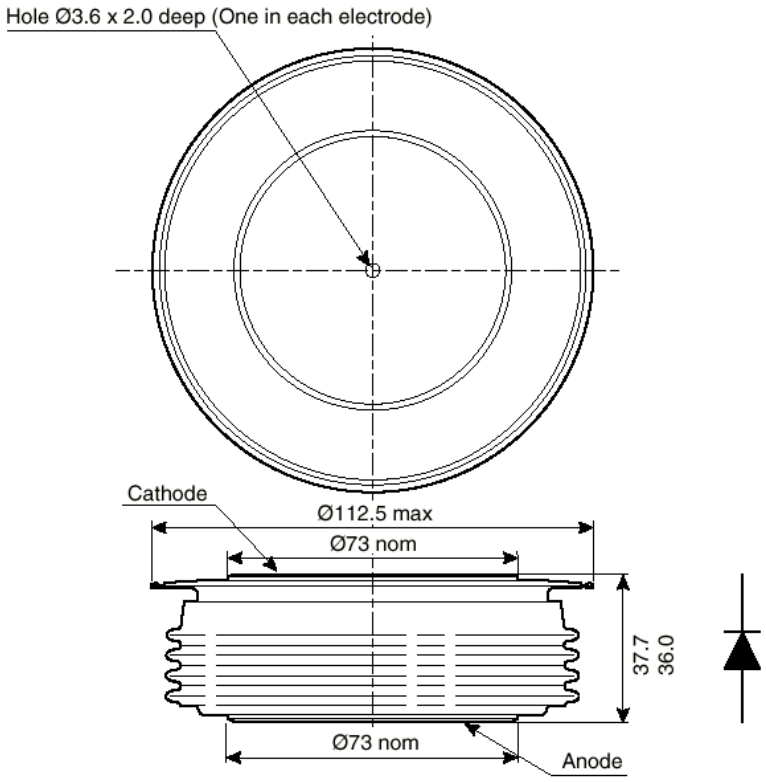


Fig.7 Maximum (limit) transient thermal impedance-junction to case

PACKAGE DETAILS

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



Normal weight: 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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