DRD6990M28

Rectifier Diode

Replaces DS5869-2.0 Jan 2010 – Datasheet DS2904SM28

DS6228-1 February 2018 (LN35173)

FEATURES

- Double Side Cooling
- High Surge Capability

APPLICATIONS

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

VOLTAGE RATINGS

Part and Ordering Number	Repetitive Peak Voltages V_{DRM} and V_{DRM} V	Conditions
DRD6990M28 DRD6990M26 DRD6990M24	2800 2600 2400	T_{vj} = -40°C to 160°C, I_{RRM} = 200mA, V_{RRM} t_p = 10ms, V_{RSM} =V_{RRM} + 100V respectively

Lower voltage grades available.

ORDERING INFORMATION

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

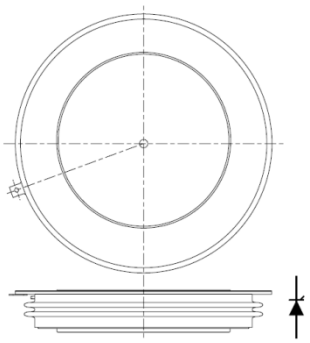
For example:

DRD6990M26 for a 2600V device

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}	**2800V**
$I_{F(AV)}$	**8790A**
I_{FSM}	**95000A**



(See Package Details for further information)

Fig. 1 Package outline M

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	8790	A
$I_{F(RMS)}$	RMS value	-	13800	A
I_F	Continuous (direct) on-state current	-	12777	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	5765	A
$I_{F(RMS)}$	RMS value	-	9056	A
I_F	Continuous (direct) on-state current	-	7698	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	6992	A
$I_{F(RMS)}$	RMS value	-	10984	A
I_F	Continuous (direct) on-state current	-	9942	A
Single Side Cooled (Anode side)				
$I_{F(AV)}$	Mean forward current	Half wave resistive load	4507	A
$I_{F(RMS)}$	RMS value	-	7079	A
I_F	Continuous (direct) on-state current	-	5857	A

SURGE RATINGS

Symbol	Parameter	Test Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	76.0	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM} - ¼ sine	28.9	MA^2s
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine, T_{case} = 150°C	95.0	kA
I^2t	I^2t for fusing	V_R = 0	45.1	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	-	0.00558	°C/W
		Single side cooled	Anode DC	-	0.01115	°C/W
			Cathode DC	-	0.01115	°C/W
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 54kN	Double side	-	0.00113	°C/W
		(with mounting compound)	Single side	-	0.00226	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	170	°C
		Reverse (blocking)		-	160	°C
T_{stg}	Storage temperature range			-55	160	°C
F_m	Clamping force			75	91	kN

CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
V_{FM}	Forward voltage	At 3000A peak, T_{case} = 25°C	-	0.97	V
I_{RM}	Peak reverse current	At V_{DRM}, T_{case} = 160°C	-	200	mA
Q_S	Total stored charge	I_F = 2000A, dI_{RR}/dt =3A/µs T_{case} = 150°C, V_R >300V	-	3900	µC
I_{rr}	Peak reverse recovery current		-	115	A
V_{TO}	Low Level Threshold voltage	At 150°C, 1000A to 3200A	-	0.6364	V
	High Level Threshold voltage	At 150°C, 3200A to 8000A	-	0.6909	V
r_T	Low Level Slope resistance	At 150°C, 1000A to 3200A	-	0.056	mΩ
	High Level Slope resistance	At 150°C, 3200A to 8000A	-	0.0389	mΩ

CURVES

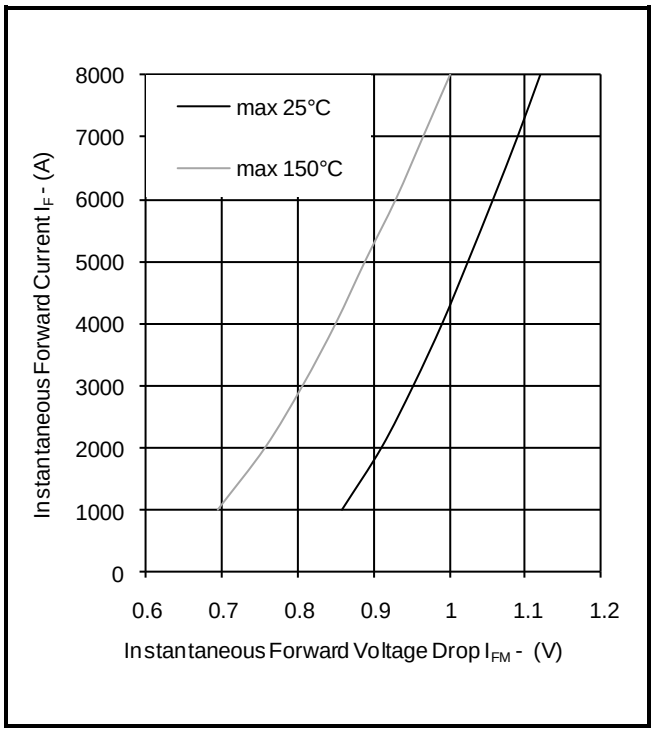


Fig.2 Maximum & minimum on-state characteristics

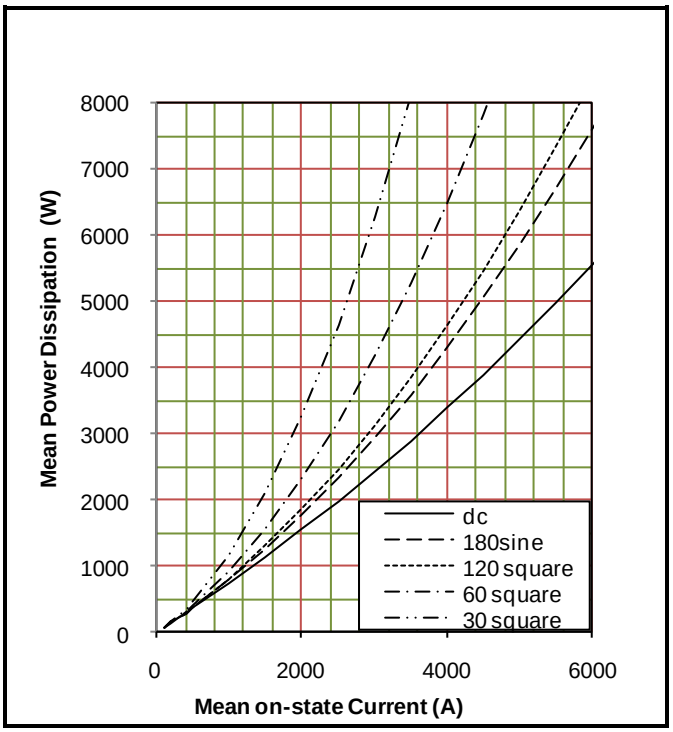


Fig.3 Dissipation curves

V_{TM} EQUATION

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

Where A = 0.419759
B = 0.029383
C = 0.000023
D = 0.001492

these values are valid for T_j = 150°C for I_T 1000A to 8000A

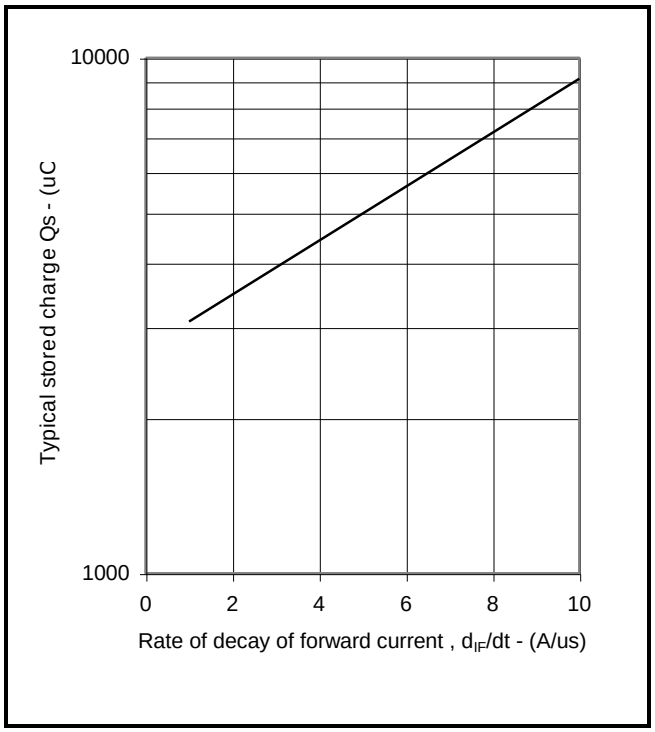


Fig.4 Total stored charge

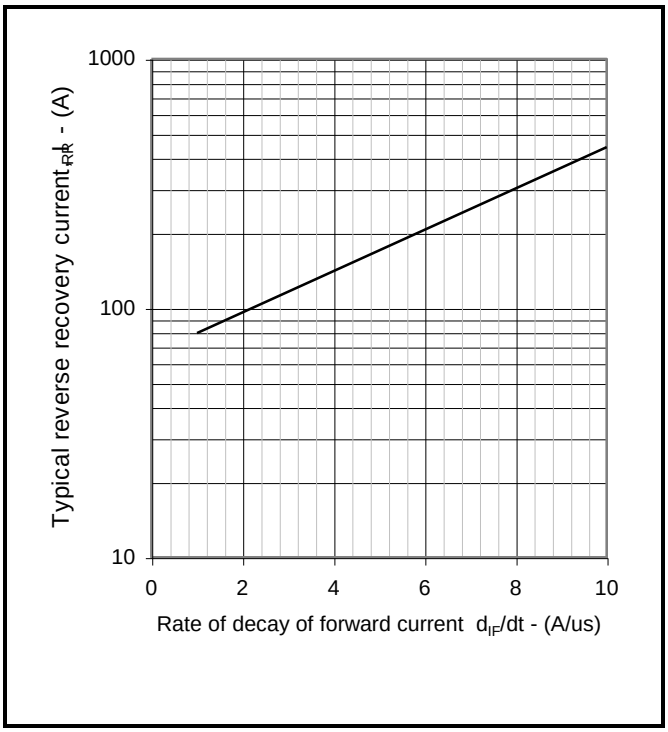


Fig.5 Maximum reverse recovery current

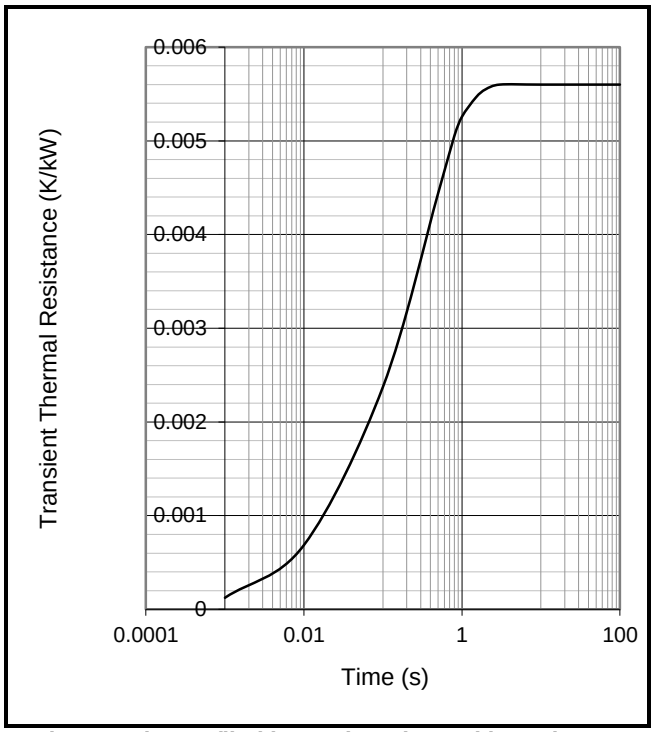


Fig.6 Maximum (limit) transient thermal impedance-junction to case

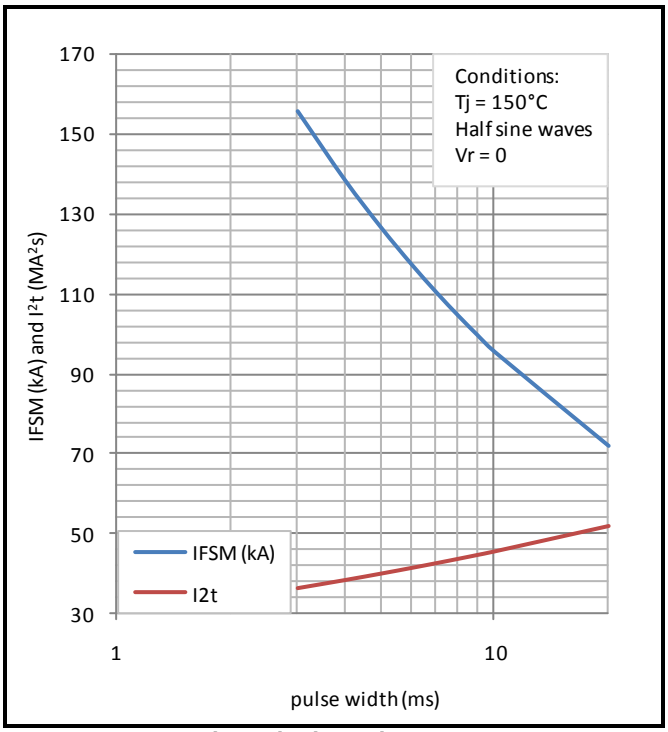


Fig.7 Single cycle surge

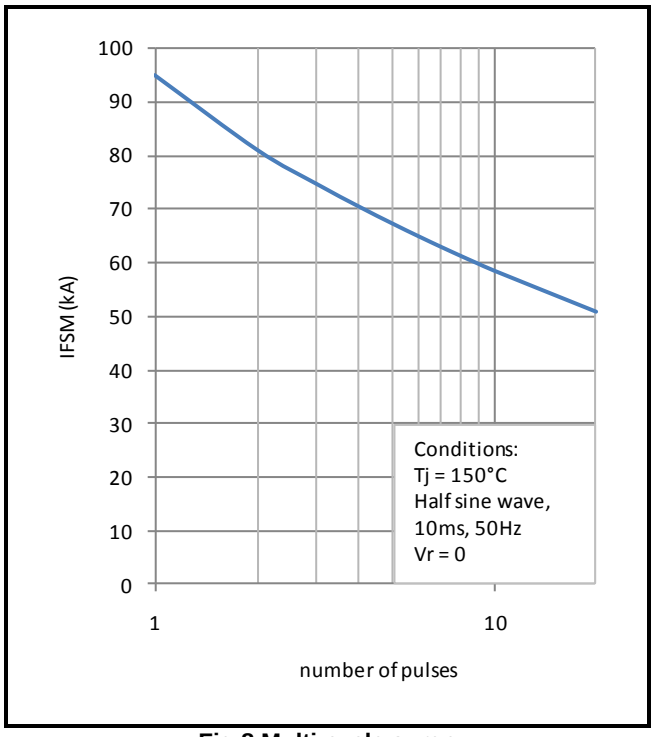


Fig.8 Multi-cycle surge

PACKAGE DETAILS

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

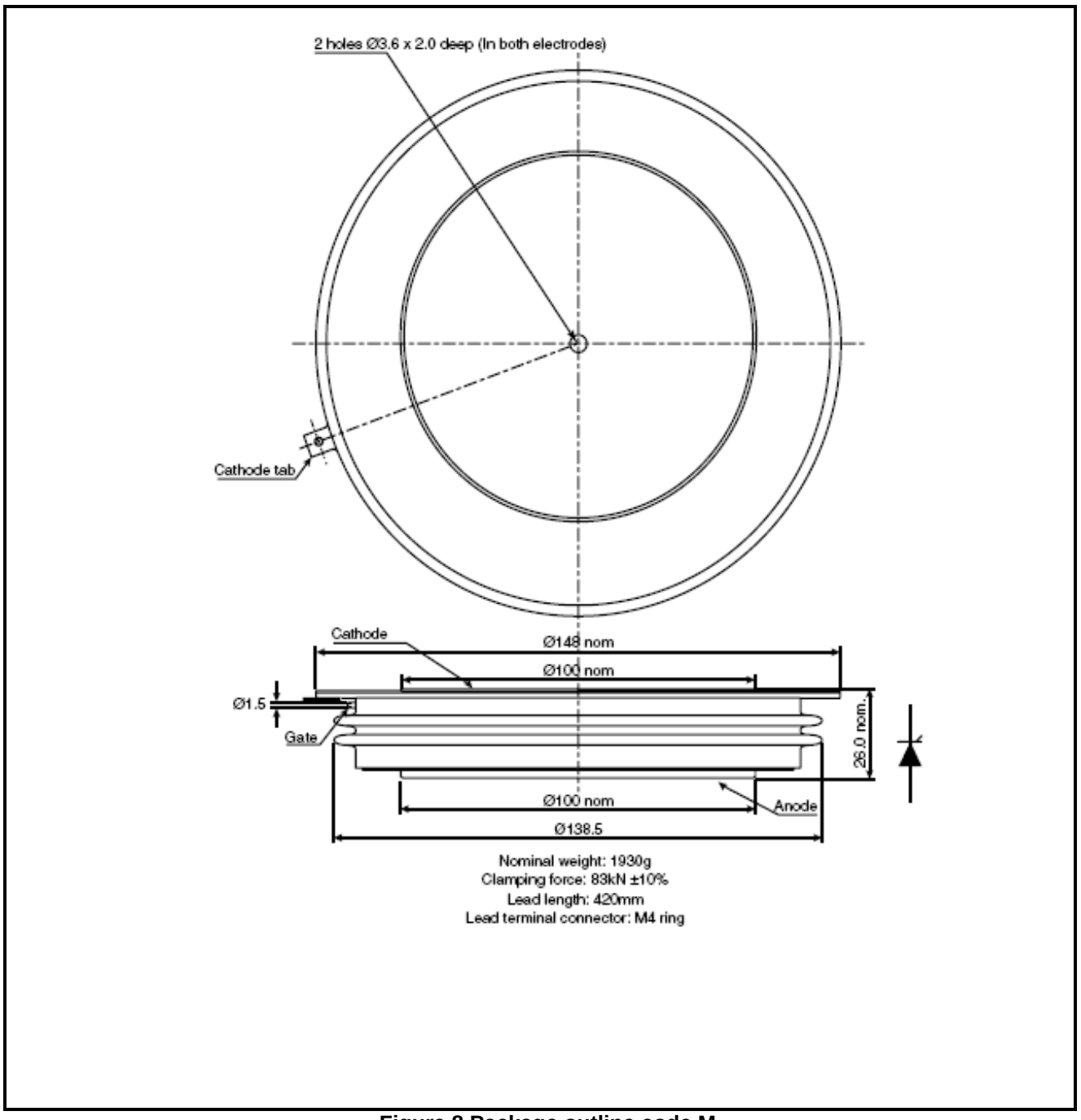


Figure 8 Package outline code M

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

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