

### 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	2800	$T_{vj} = -40^{\circ}\text{C}$ to $160^{\circ}\text{C}$ , $I_{RRM} = 200\text{mA}$ , $V_{RRM} t_p = 10\text{ms}$ , $V_{RSM} = V_{RRM} + 100\text{V}$ respectively
DRD6990M26	2600	
DRD6990M24	2400	

Lower voltage grades available.

### ORDERING INFORMATION

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

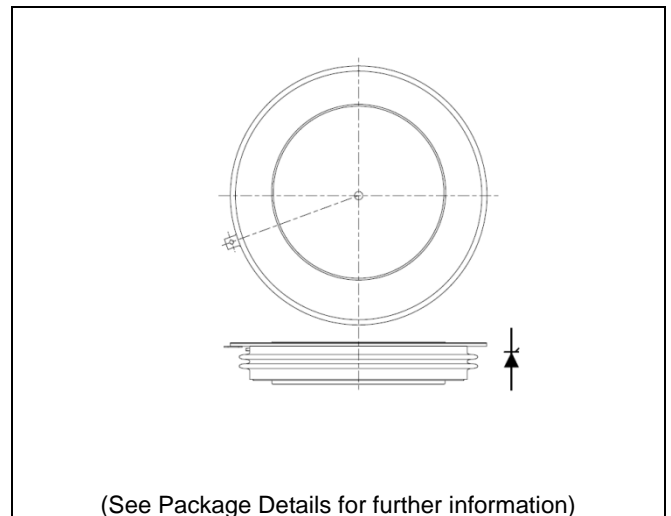
For example:

**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

$V_{RRM}$	<b>2800V</b>
$I_{F(AV)}$	<b>8790A</b>
$I_{FSM}$	<b>95000A</b>



(See Package Details for further information)

**Fig. 1 Package outline M**

**CURRENT RATINGS**
**T<sub>case</sub> = 75°C unless stated otherwise**

Symbol	Parameter	Test Conditions	Max.	Units
<b>Double Side Cooled</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	8790	A
I <sub>F(RMS)</sub>	RMS value	-	13800	A
I <sub>F</sub>	Continuous (direct) on-state current	-	12777	A
<b>Single Side Cooled (Anode side)</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	5765	A
I <sub>F(RMS)</sub>	RMS value	-	9056	A
I <sub>F</sub>	Continuous (direct) on-state current	-	7698	A

**T<sub>case</sub> = 100°C unless stated otherwise**

Symbol	Parameter	Test Conditions	Max.	Units
<b>Double Side Cooled</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	6992	A
I <sub>F(RMS)</sub>	RMS value	-	10984	A
I <sub>F</sub>	Continuous (direct) on-state current	-	9942	A
<b>Single Side Cooled (Anode side)</b>				
I <sub>F(AV)</sub>	Mean forward current	Half wave resistive load	4507	A
I <sub>F(RMS)</sub>	RMS value	-	7079	A
I <sub>F</sub>	Continuous (direct) on-state current	-	5857	A

**SURGE RATINGS**

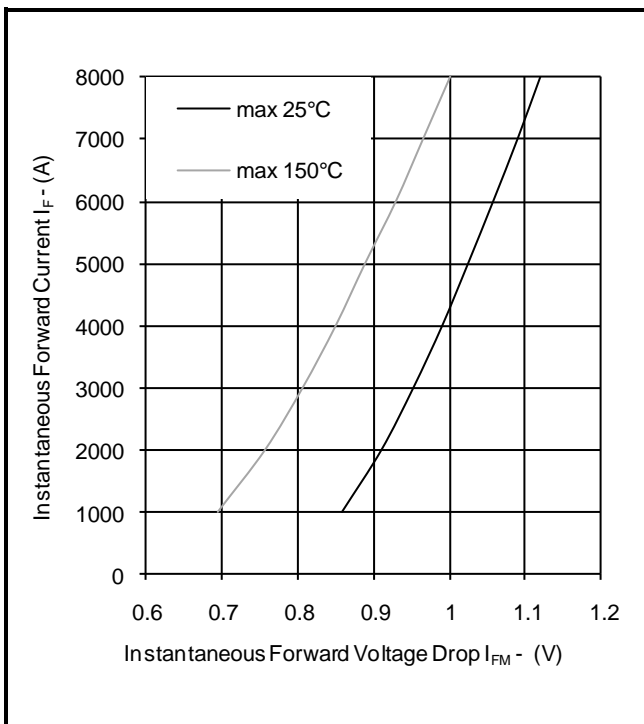
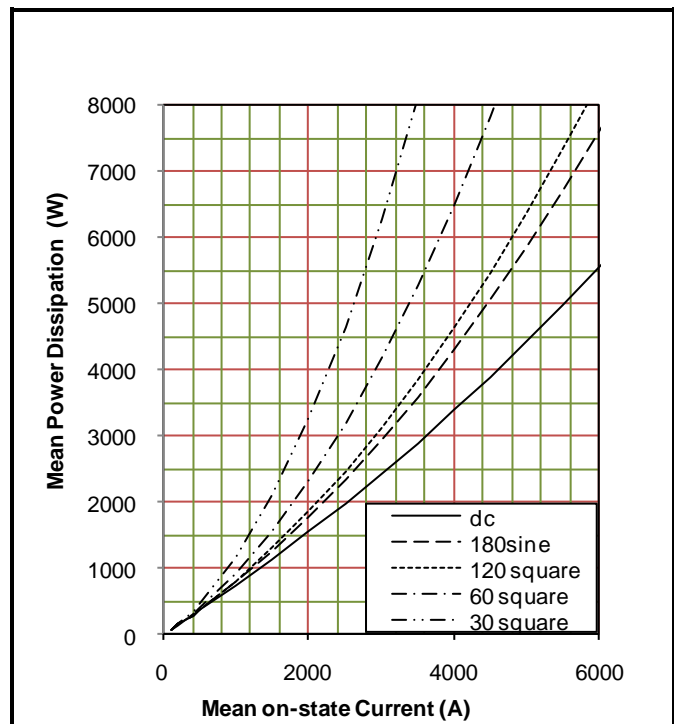
Symbol	Parameter	Test Conditions	Max.	Units
$I_{FSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 50\% V_{RRM} - \frac{1}{4}$ sine	76.0	kA
$I^2t$	$I^2t$ for fusing		28.9	$MA^2s$
$I_{FSM}$	Surge (non-repetitive) on-state current	10ms half sine, $T_{case} = 150^{\circ}C$ $V_R = 0$	95.0	kA
$I^2t$	$I^2t$ for fusing		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	$^{\circ}C/W$
		Single side cooled	Anode DC	-	0.01115	$^{\circ}C/W$
			Cathode DC	-	0.01115	$^{\circ}C/W$
$R_{th(c-h)}$	Thermal resistance – case to heatsink	Clamping force 54kN (with mounting compound)	Double side	-	0.00113	$^{\circ}C/W$
			Single side	-	0.00226	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	On-state (conducting)		-	170	$^{\circ}C$
		Reverse (blocking)		-	160	$^{\circ}C$
$T_{stg}$	Storage temperature range			-55	160	$^{\circ}C$
$F_m$	Clamping force			75	91	kN

**CHARACTERISTICS**

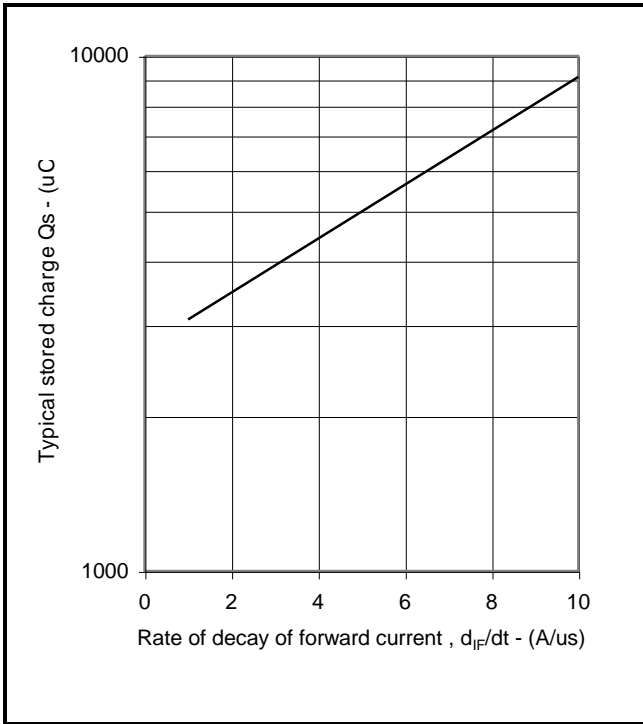
Symbol	Parameter	Test Conditions	Min.	Max.	Units
$V_{FM}$	Forward voltage	At 3000A peak, $T_{case} = 25^{\circ}C$	-	0.97	V
$I_{RM}$	Peak reverse current	At $V_{DRM}$ , $T_{case} = 160^{\circ}C$	-	200	mA
$Q_S$	Total stored charge	$I_F = 2000A$ , $dI_{RR}/dt = 3A/\mu s$ $T_{case} = 150^{\circ}C$ , $V_R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

**CURVES**

**Fig.2 Maximum & minimum on-state characteristics**

**Fig.3 Dissipation curves**
 **$V_{TM}$  EQUATION**

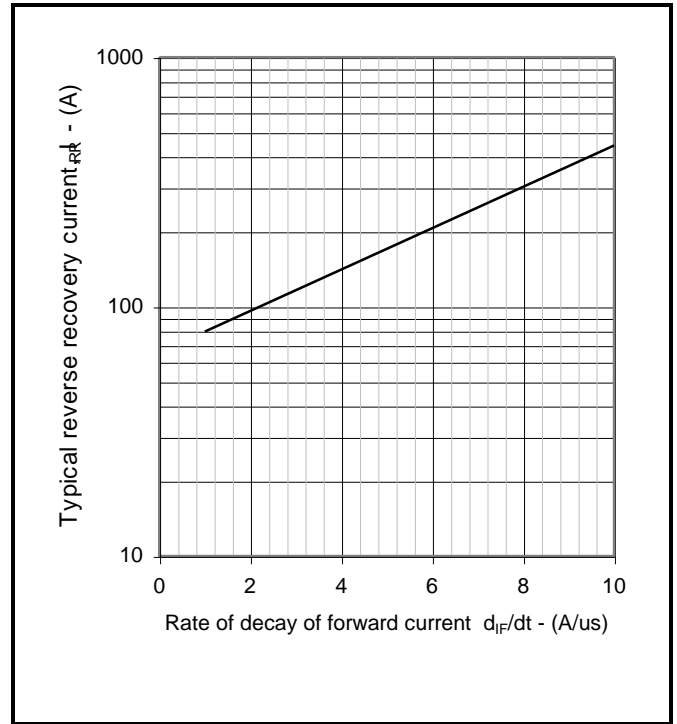
$$V_{TM} = A + B \ln(I_T) + C \cdot I_T + D \cdot \sqrt{I_T}$$

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

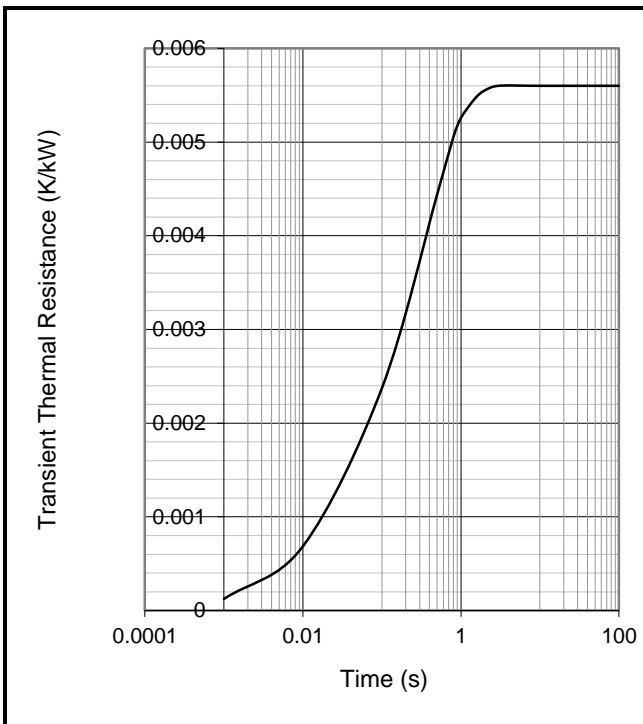
these values are valid for  $T_j = 150^{\circ}C$  for  $I_T$  1000A to 8000A



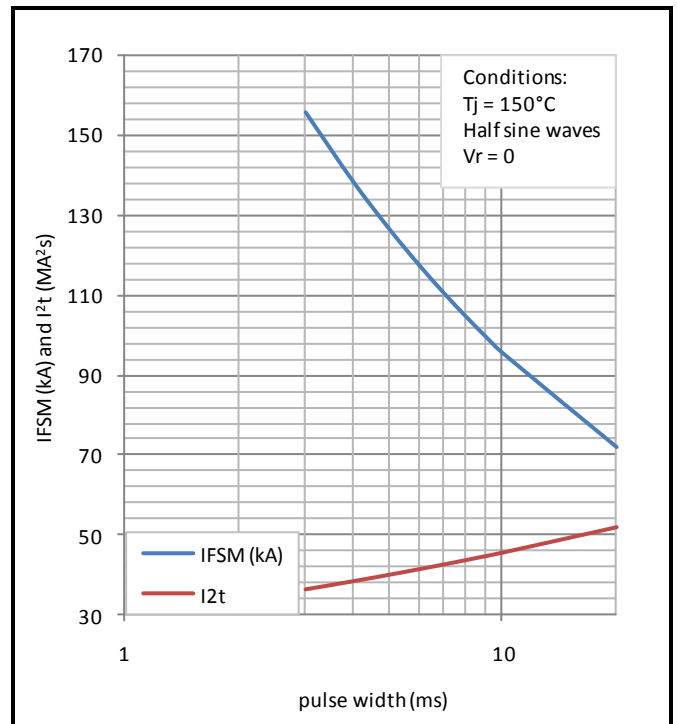
**Fig.4 Total stored charge**



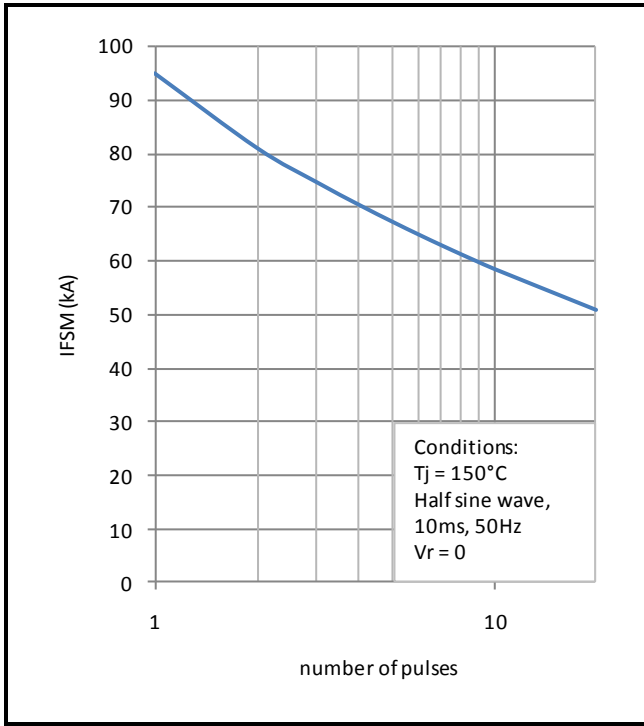
**Fig.5 Maximum reverse recovery current**



**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.

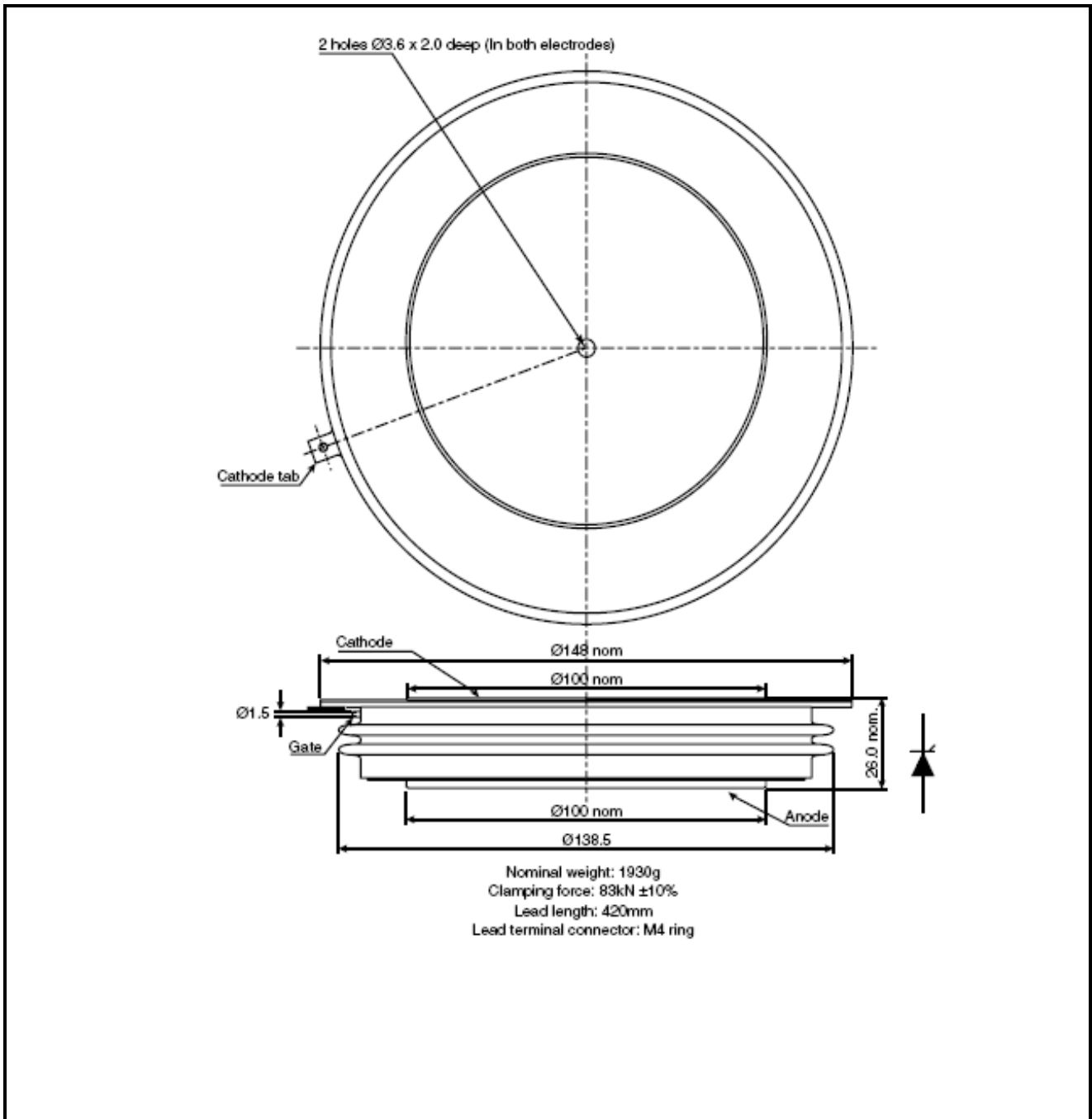


Figure 8 Package outline code M

**Note:**

Some packages may be supplied with gate and or tags.

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<b>Preliminary Information:</b>	The product design is complete and final characterisation for volume production is in progress. The datasheet represents the product as it is now understood but details may change.
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