## FEATURES

- Double Side Cooling
- High Surge Capability


## APPLICATIONS

- High Power Drives
- High Voltage Power Supplies
- Static Switches


## VOLTAGE RATINGS

| Part and <br> Ordering <br> Number | Repetitive Peak <br> Voltages <br> V $_{\text {DRM }}^{\text {and }}$VRM <br> V | Conditions |
| :---: | :---: | :--- |
| DCR2830C18 | 1800 | $\mathrm{~T}_{\text {vi }}=-40^{\circ} \mathrm{C}$ to $125^{\circ} \mathrm{C}$, |
| DCR2830C16 | 1600 | $\mathrm{I}_{\text {DRM }}=\mathrm{I}_{\text {RRM }}=250 \mathrm{~mA}$, |
| DCR2830C14 | 1400 | $\mathrm{~V}_{\text {DRM }}, \mathrm{V}_{\text {RRM }} \mathrm{t}_{\mathrm{p}}=10 \mathrm{~ms}$, |
| DCR2830C12 | 1200 | $\mathrm{~V}_{\text {DSM }} \& \mathrm{~V}_{\text {RSM }}=$ |
|  |  | $\mathrm{V}_{\text {DRM }} \& \mathrm{~V}_{\text {RRM }}+100 \mathrm{~V}$ <br> respectively |
|  |  |  |

Lower voltage grades available.

## ORDERING INFORMATION

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

For example:

## DCR2830C18

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

## KEY PARAMETERS

| $\mathrm{V}_{\text {DRM }}$ | 1800 V |
| :--- | :--- |
| $\mathrm{I}_{\mathrm{T}(\mathrm{AV})}$ | 2830 A |
| $\mathrm{I}_{\text {TSM }}$ | 45000 A |
| $\mathrm{dV} / \mathrm{dt}^{*}$ | $1000 \mathrm{~V} / \mu \mathrm{s}$ |
| $\mathrm{dl} / \mathrm{dt}$ | $200 \mathrm{~A} / \mu \mathrm{s}$ |

* Higher dV/dt selections available


Fig. 1 Package outline

## CURRENT RATINGS

$\mathrm{T}_{\text {case }}=60^{\circ} \mathrm{C}$ unless stated otherwise

| Symbol | Parameter | Test Conditions | Max. | Units |  |  |  |  |  |
| :---: | :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Double Side Cooled |  |  |  |  |  |  | Half wave resistive load | 2830 | A |
| $\mathrm{I}_{T(\mathrm{AV})}$ | Mean on-state current | - | 4440 | A |  |  |  |  |  |
| $\mathrm{I}_{\mathrm{T}(\mathrm{RMS})}$ | RMS value | - | 4000 | A |  |  |  |  |  |
| $\mathrm{I}_{\mathrm{T}}$ | Continuous (direct) on-state current |  |  |  |  |  |  |  |  |

## SURGE RATINGS

| Symbol | Parameter | Test Conditions | Max. | Units |
| :---: | :--- | :---: | :---: | :---: |
| $I_{\text {TSM }}$ | Surge (non-repetitive) on-state current | 10 ms half sine, $T_{\text {case }}=125^{\circ} \mathrm{C}$ | 45.0 | kA |
| $\mathrm{I}^{2} \mathrm{t}$ | $\mathrm{I}^{2} \mathrm{t}$ for fusing | $\mathrm{V}_{R}=0$ | 10.10 | $\mathrm{MA}^{2} \mathrm{~s}$ |

THERMAL AND MECHANICAL RATINGS

| Symbol | Parameter | Test Conditions | Min. | Max. | Units |  |
| :---: | :--- | :--- | :--- | :---: | :---: | :---: |
| $R_{\text {th(j-c) }}$ | Thermal resistance - junction to case | Double side cooled | DC | - | 0.0125 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| $\mathrm{R}_{\mathrm{th}(\mathrm{c}-\mathrm{h})}$ | Thermal resistance - case to heatsink | Double side cooled | DC | - | 0.004 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| $\mathrm{T}_{\mathrm{vj}}$ | Virtual junction temperature | Blocking $\mathrm{V}_{\text {DRM }} / \mathrm{VRRM}$ |  | - | 125 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {stg }}$ | Storage temperature range |  | -40 | 140 | ${ }^{\circ} \mathrm{C}$ |  |
| $\mathrm{F}_{\mathrm{m}}$ | Clamping force |  | 40 | 50 | kN |  |

## DYNAMIC CHARACTERISTICS

| Symbol | Parameter | Test Conditions |  | Min. | Max. | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{I}_{\text {RRM }} / \mathrm{I}_{\text {DRM }}$ | Peak reverse and off-state current | At $\mathrm{V}_{\text {RRM }} / \mathrm{V}_{\text {DRM }}, \mathrm{T}_{\text {case }}=125^{\circ} \mathrm{C}$ |  | - | 250 | mA |
| dV/dt | Max. linear rate of rise of off-state voltage | To $67 \% \mathrm{~V}_{\text {DRM }}, \mathrm{T}_{\mathrm{j}}=125^{\circ} \mathrm{C}$, gate open |  | 1000 | - | V/us |
| dl/dt | Rate of rise of on-state current | From 67\% VDRM to 4000A Gate source 30V, 10 ,$\mathrm{t}_{\mathrm{r}}<0.5 \mu \mathrm{~s}, \mathrm{~T}_{\mathrm{j}}=125^{\circ} \mathrm{C}$ | Repetitive 50Hz | - | 200 | A/ $\mu \mathrm{s}$ |
|  |  |  | Non-repetitive | - | 1000 | A/ $\mu \mathrm{s}$ |
| $\mathrm{V}_{\mathrm{T}}$ | On-state voltage | $\mathrm{I}_{\mathrm{T}}=3000 \mathrm{~A}, \mathrm{~T}_{\text {case }}=125^{\circ} \mathrm{C}$ |  |  | 1.27 | V |
| $\mathrm{V}_{\mathrm{T} \text { (TO) }}$ | Threshold voltage | $\mathrm{T}_{\text {case }}=125^{\circ} \mathrm{C}$ |  | - | 0.91 | V |
| $\mathrm{r}_{\text {T }}$ | On-state slope resistance | $\mathrm{T}_{\text {case }}=125^{\circ} \mathrm{C}$ |  | - | 0.12 | $\mathrm{m} \Omega$ |
| $\mathrm{tg}_{\mathrm{gd}}$ | Delay time | $\begin{aligned} & \mathrm{V}_{\mathrm{D}}=67 \% \mathrm{~V}_{\mathrm{DRM}}, \text { gate source } 30 \mathrm{~V}, 10 \Omega \\ & \mathrm{t}_{\mathrm{r}}=0.5 \mu \mathrm{~s}, \mathrm{~T}_{\mathrm{j}}=25^{\circ} \mathrm{C} \end{aligned}$ |  | - | 3.0 | $\mu \mathrm{s}$ |
| $t_{\text {a }}$ | Turn-off time | $\begin{aligned} & T_{j}=125^{\circ} \mathrm{C}, V_{R}=100 \mathrm{~V}, \mathrm{dl} / \mathrm{dt}=10 \mathrm{~A} / \mu \mathrm{s}, \\ & d V_{D R} / \mathrm{dt}=20 \mathrm{~V} / \mu \mathrm{s} \text { linear to } 67 \% \mathrm{~V}_{\mathrm{DRM}} \end{aligned}$ |  | - | 300 | $\mu \mathrm{s}$ |
| Qs | Stored charge | $\begin{aligned} & I_{T}=4000 \mathrm{~A}, \mathrm{tp}=1000 \mathrm{us}, \mathrm{~T}_{\mathrm{j}}=125^{\circ} \mathrm{C}, \\ & \mathrm{~d} / \mathrm{dt}=10 \mathrm{~A} / \mu \mathrm{s}, \end{aligned}$ |  | - | 3000 | $\mu \mathrm{C}$ |
| $I_{\text {RR }}$ | Reverse recovery current |  |  | - | 165 | A |
| IL | Latching current | $\mathrm{T}_{\mathrm{j}}=25^{\circ} \mathrm{C}$, |  | - | 1 | A |
| $\mathrm{I}_{\mathrm{H}}$ | Holding current | $\mathrm{T}_{\mathrm{j}}=25^{\circ} \mathrm{C}$, |  | - | 200 | mA |

GATE TRIGGER CHARACTERISTICS AND RATINGS

| Symbol | Parameter | Test Conditions | Max. | Units |
| :---: | :--- | :--- | :---: | :---: |
| $\mathrm{V}_{\mathrm{GT}}$ | Gate trigger voltage | $\mathrm{V}_{\mathrm{DRM}}=5 \mathrm{~V}, \mathrm{~T}_{\text {case }}=25^{\circ} \mathrm{C}$ | 3 | V |
| $\mathrm{~V}_{\mathrm{GD}}$ | Gate non-trigger voltage | At $40 \% \mathrm{~V}_{\mathrm{DRM}}, \mathrm{T}_{\text {case }}=125^{\circ} \mathrm{C}$ | TBD | V |
| $\mathrm{I}_{\mathrm{GT}}$ | Gate trigger current | $\mathrm{V}_{\mathrm{DRM}}=5 \mathrm{~V}, \mathrm{~T}_{\text {case }}=25^{\circ} \mathrm{C}$ | 300 | mA |
| $\mathrm{I}_{\mathrm{GD}}$ | Gate non-trigger current | At $40 \% \mathrm{~V}_{\mathrm{DRM}}, \mathrm{T}_{\text {case }}=125^{\circ} \mathrm{C}$ | TBD | mA |

## CURVES



Fig. 2 Maximum \&minimum on-state characteristics


Fig. 3 Maximum (limit) transient thermal impedance - junction to case ( ${ }^{\circ} \mathrm{C} / \mathrm{W}$ )


Fig. 4 On-state power dissipation - sine wave


Fig. 6 Maximum permissible case temperature, double side cooled - rectangular wave


Fig. 5 Maximum permissible case temperature, double side cooled - sine wave


Fig. 7 On-state power dissipation - rectangular wave


Fig. 8 Multi-cycle surge current


Fig. 10 Stored charge vs di/dt


Fig. 9 Single-cycle $\mathbf{I}^{2}$ t


Fig. 11 Reverse recovery current vs di/dt

DCR2830C18


Fig. 12 Gate characteristics


Fig. 13 Gate characteristics

## PACKAGE DETAILS

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


Fig. 14 Package outline

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#### Abstract

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## HEADQUARTERS OPERATIONS

DYNEX SEMICONDUCTOR LIMITED
Doddington Road, Lincoln, Lincolnshire, LN6 3LF
United Kingdom.
Phone: +44 (0) 1522500500
Fax: +44 (0) 1522500550
Web: http://www.dynexsemi.com

## CUSTOMER SERVICE

Phone: +44 (0) 1522502753 / 502901
Fax: $\quad+44$ (0) 1522500020
e-mail: power_solutions@dynexsemi.com

