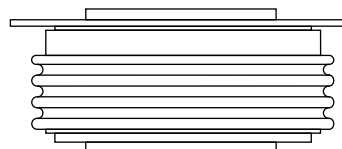


## Standard Recovery Diodes (Hockey PUK Version), 3270A

### FEATURES

- Wide current range
- High voltage ratings up to 2200V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style DO-220AC(K-PUK),  
Nell's D-type Capsule
- Lead (Pb)-free



DO-220AC(K-PUK)  
(Nell's D-type Capsule)

### TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

### PRODUCT SUMMARY

|             |       |
|-------------|-------|
| $I_{F(AV)}$ | 3270A |
|-------------|-------|

### MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER    | TEST CONDITIONS | VALUES      | UNIT              |
|--------------|-----------------|-------------|-------------------|
| $I_{F(AV)}$  |                 | 3270        | A                 |
|              | $T_{hs}$        | 55          | °C                |
| $I_{F(RMS)}$ |                 | 5950        | A                 |
|              | $T_{hs}$        | 25          | °C                |
| $I_{FSM}$    | 50 HZ           | 31000       | A                 |
|              | 60 HZ           | 32460       |                   |
| $I^2t$       | 50 HZ           | 4805        | kA <sup>2</sup> s |
|              | 60 HZ           | 4375        |                   |
| $V_{RRM}$    |                 | 800 to 2200 | V                 |
| $T_J$        | Typical         | -40 to 180  | °C                |

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

| TYPE NUMBER | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ , MAXIMUM AT $T_J = T_J$ MAXIMUM<br>mA |
|-------------|--------------|----------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|
| D3270D      | 08           | 800                                                      | 900                                                          | 75                                               |
|             | 12           | 1200                                                     | 1300                                                         |                                                  |
|             | 16           | 1600                                                     | 1700                                                         |                                                  |
|             | 20           | 2000                                                     | 2100                                                         |                                                  |
|             | 22           | 2200                                                     | 2300                                                         |                                                  |

| FORWARD CONDUCTION                                      |                     |                                                                                                         |                                |                                                                          |            |                    |
|---------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------|------------|--------------------|
| PARAMETER                                               | SYMBOL              | TEST CONDITIONS                                                                                         |                                |                                                                          | VALUES     | UNIT               |
| Maximum average forward current at heatsink temperature | I <sub>F(AV)</sub>  | 180° conduction, half sine wave<br>Double side (single side) cooled                                     |                                |                                                                          | 3270(1640) | A                  |
|                                                         |                     |                                                                                                         |                                |                                                                          | 55(85)     | °C                 |
| Maximum RMS forward current                             | I <sub>F(RMS)</sub> | 25°C heatsink temperature double side cooled                                                            |                                |                                                                          | 5950       | A                  |
| Maximum peak, one cycle non-reptitive surge current     | I <sub>FSM</sub>    | t = 10ms                                                                                                | No voltage reapplied           | Sinusoidal half wave,<br>initial T <sub>J</sub> = T <sub>J</sub> maximum | 31000      | A                  |
|                                                         |                     | t = 8.3ms                                                                                               |                                |                                                                          | 32460      |                    |
|                                                         |                     | t = 10ms                                                                                                | 100%V <sub>RRM</sub> reapplied |                                                                          | 26040      |                    |
|                                                         |                     | t = 8.3ms                                                                                               |                                |                                                                          | 27270      |                    |
| Maximum I <sup>2</sup> t for fusing                     | I <sup>2</sup> t    | t = 10ms                                                                                                | No voltage reapplied           |                                                                          | 4805       | kA <sup>2</sup> s  |
|                                                         |                     | t = 8.3ms                                                                                               |                                |                                                                          | 4375       |                    |
|                                                         |                     | t = 10ms                                                                                                | 100%V <sub>RRM</sub> reapplied |                                                                          | 3390       |                    |
|                                                         |                     | t = 8.3ms                                                                                               |                                |                                                                          | 3090       |                    |
| Maximum I <sup>2</sup> √t for fusing                    | I <sup>2</sup> √t   | t = 0.1 to 10 ms, no voltage reapplied                                                                  |                                |                                                                          | 48050      | kA <sup>2</sup> √s |
| Maximum value of threshold voltage                      | V <sub>F(TO)</sub>  | I <sub>FM</sub> =9800A , T <sub>J</sub> =T <sub>J</sub> maximum                                         |                                |                                                                          | 0.83       | V                  |
| Maximum value of forward slope resistance               | r <sub>t</sub>      | I <sub>FM</sub> =9800A , T <sub>J</sub> =T <sub>J</sub> maximum                                         |                                |                                                                          | 0.16       | mΩ                 |
| Maximum forward voltage drop                            | V <sub>FM</sub>     | I <sub>pk</sub> = 6400A, T <sub>J</sub> =T <sub>J</sub> maximum, t <sub>p</sub> = 10 ms sinusoidal wave |                                |                                                                          | 1.50       | V                  |

| THERMAL AND MECHANICAL SPECIFICATIONS            |              |                                         |  |                 |           |
|--------------------------------------------------|--------------|-----------------------------------------|--|-----------------|-----------|
| PARAMETER                                        | SYMBOL       | TEST CONDITIONS                         |  | VALUES          | UNIT      |
| Maximum junction operating temperature range     | $T_J$        |                                         |  | -40 to 180      | °C        |
| Maximum storage temperature range                | $T_{stg}$    |                                         |  | -55 to 200      |           |
| Maximum thermal resistance, junction to heatsink | $R_{thJ-hs}$ | DC operation single side cooled         |  | 0.042           | K/W       |
|                                                  |              | DC operation double side cooled         |  | 0.020           |           |
| Mounting force, ±10%                             |              |                                         |  | 22250<br>(2250) | N<br>(kg) |
| Approximate weight                               |              |                                         |  | 425             | g         |
| Case style                                       |              | TO-200AC (K-PUK), Nell's D-type Capsule |  |                 |           |

| △ R <sub>thJC</sub> CONDUCTION |                       |             |                        |             |                                         |       |
|--------------------------------|-----------------------|-------------|------------------------|-------------|-----------------------------------------|-------|
| CONDUCTION ANGEL               | SINUSOIDAL CONDUCTION |             | RECTANGULAR CONDUCTION |             | TEST CONDUCTIONS                        | UNITS |
|                                | SINGLE SIDE           | DOUBLE SIDE | SINGLE SIDE            | DOUBLE SIDE | T <sub>J</sub> = T <sub>J</sub> maximum | K/W   |
| 180°                           | 0.002                 | 0.002       | 0.001                  | 0.001       |                                         |       |
| 120°                           | 0.002                 | 0.002       | 0.002                  | 0.002       |                                         |       |
| 90°                            | 0.003                 | 0.003       | 0.003                  | 0.003       |                                         |       |
| 60°                            | 0.004                 | 0.004       | 0.004                  | 0.004       |                                         |       |
| 30°                            | 0.007                 | 0.007       | 0.007                  | 0.007       |                                         |       |

### Note

- The table above shows the increment of thermal resistance  $R_{thJ-hs}$  when devices operate at different conduction angles than DC

## Nell High Power Products

**Fig.1 Current ratings characteristics**

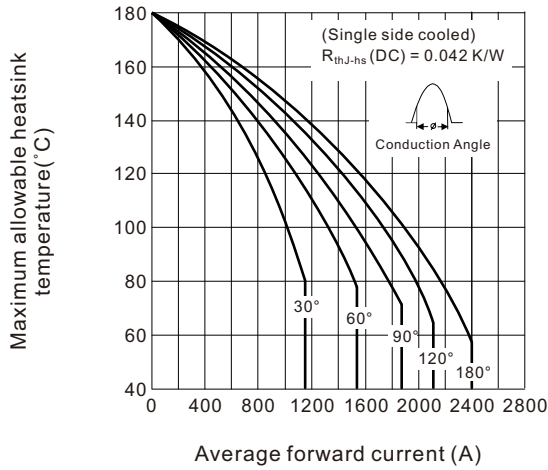


**Fig.2 Current ratings characteristics**

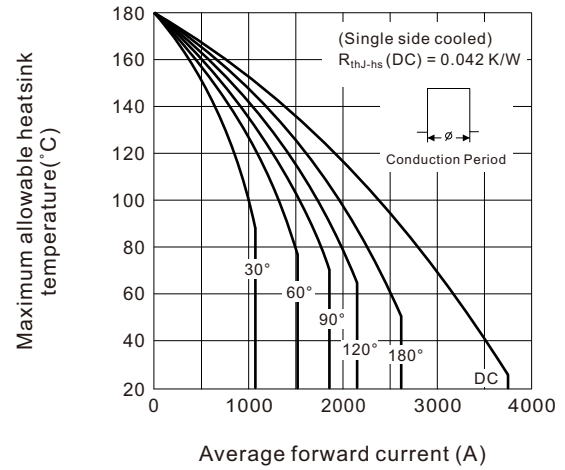


**Fig.3 Current ratings characteristics**

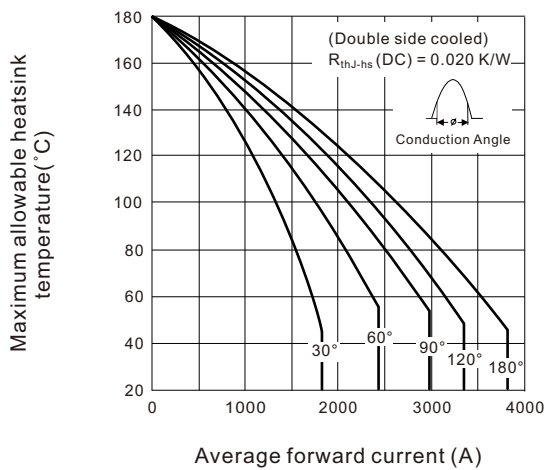


**Fig.4 Current ratings characteristics**

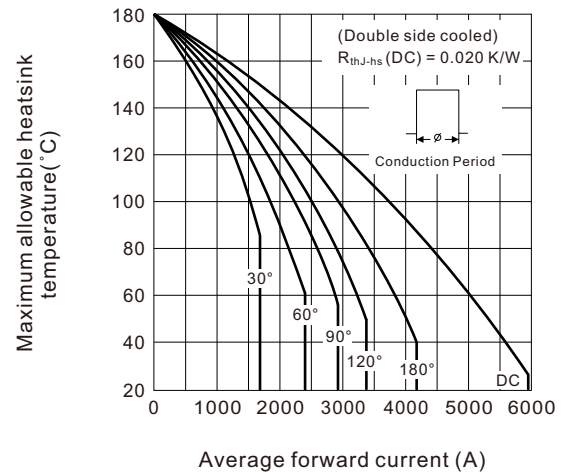


**Fig.5 Forward power loss characteristics**

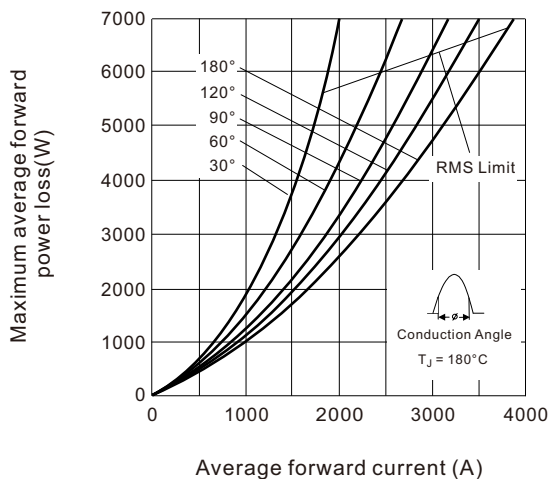


**Fig.6 Forward power loss characteristics**

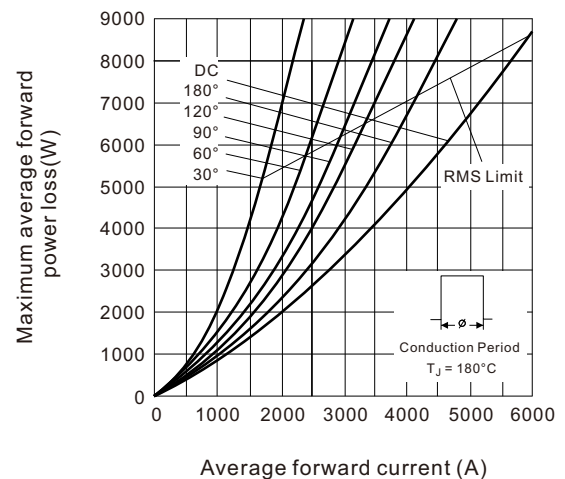


**Fig.7 Maximum non-repetitive surge current single and double side cooled**

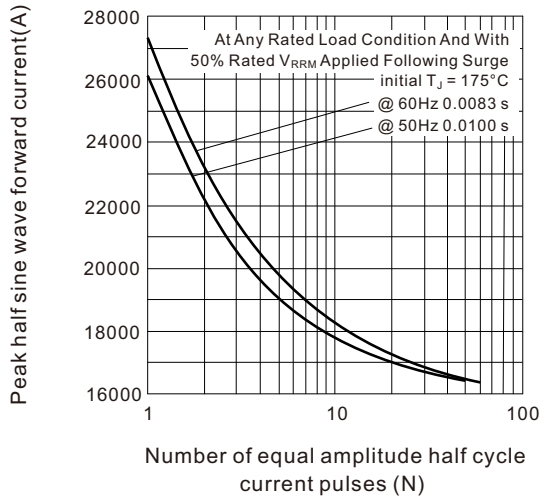


**Fig.8 Maximum non-repetitive surge current single and double side cooled**

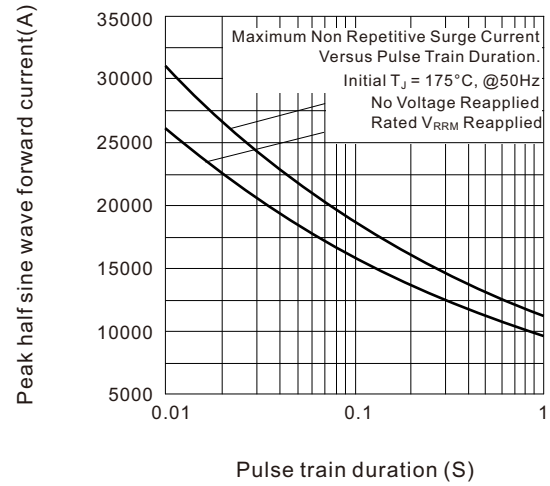


**Fig.9 Forward voltage drop characteristics**

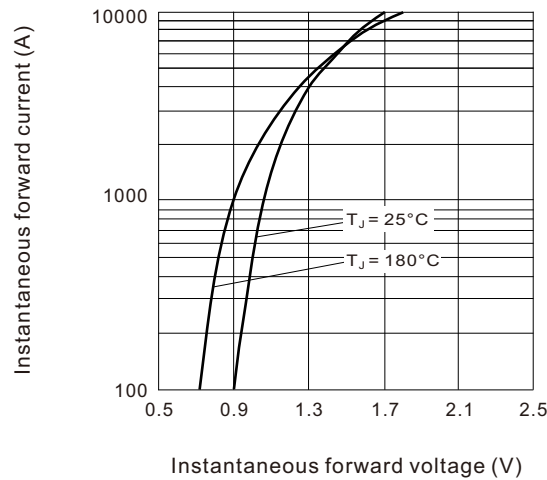
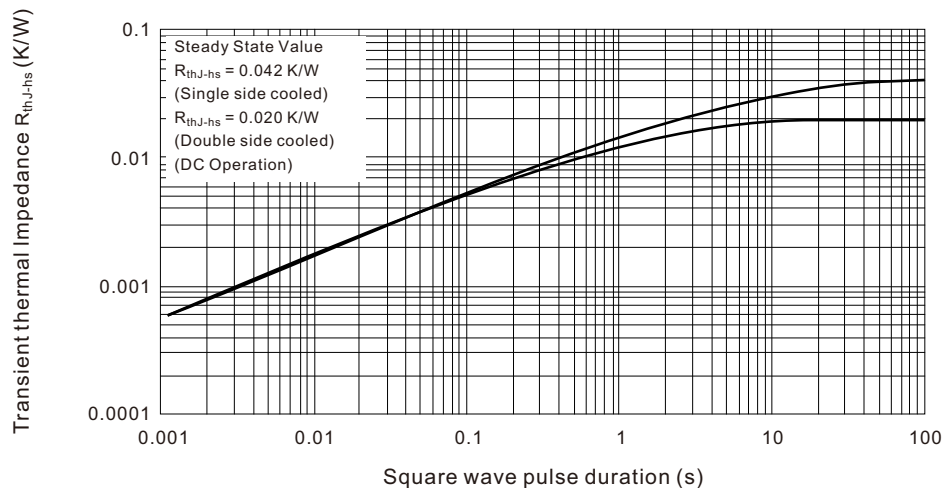


**Fig.10 Thermal Impedance  $R_{thJ-hs}$  characteristics**

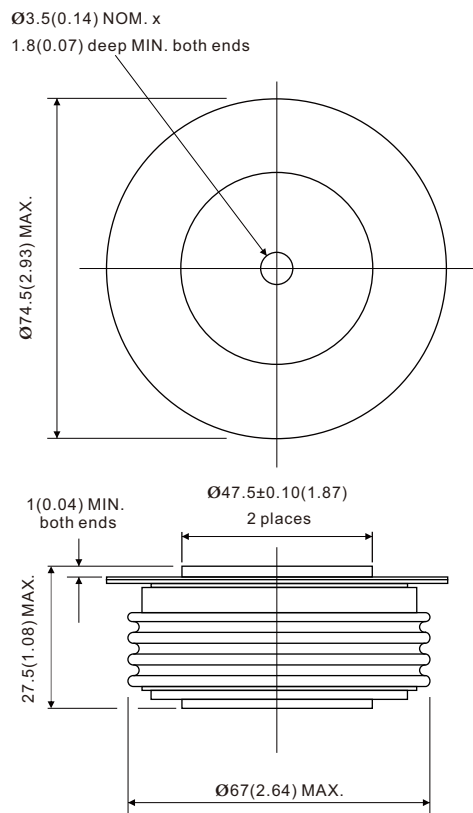


## ORDERING INFORMATION TABLE

|             |          |             |          |           |
|-------------|----------|-------------|----------|-----------|
| Device code | <b>D</b> | <b>3270</b> | <b>D</b> | <b>20</b> |
|             | ①        | ②           | ③        | ④         |

- ① - "D" for standard recovery diode
- ② - Maximum average forward current, "3270" for 3270A
- ③ - Case style : "D" for Nell's D-type Capsule, DO-200AC (K-PUK)
- ④ - Voltage code, code x 100 =  $V_{RRM}$

### DO-220AC (K-PUK), Nell's D-type Capsule



All dimensions in millimeters (inches)

