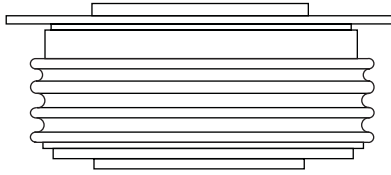


Fast Recovery Diodes (Hockey PUK Version), 560 A



DO-200AB (B-PUK)

FEATURES

- High power FAST recovery diode series
- 6.0 μ s recovery time
- High voltage ratings up to 4500 V
- High current capability
- Optimized turn-on and turn-off characteristics
- Low forward recovery
- Fast and soft reverse recovery
- Press PUK encapsulation
- Case style conform to JEDEC DO-200AB (B-PUK)
- Maximum junction temperature 125 °C
- Lead (Pb)-free


**RoHS
COMPLIANT**
PRODUCT SUMMARY

| | |
|-------------|-------|
| $I_{F(AV)}$ | 560 A |
|-------------|-------|

TYPICAL APPLICATIONS

- Snubber diode for GTO
- High voltage freewheeling diode
- Fast recovery rectifier applications

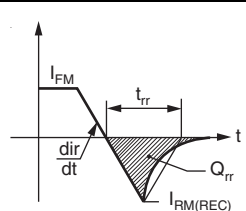
MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER | TEST CONDITIONS | VALUES | UNITS |
|--------------|-----------------|--------------|-------------------|
| $I_{F(AV)}$ | | 560 | A |
| | T_{hs} | 55 | °C |
| $I_{F(RMS)}$ | | 1120 | A |
| | T_{hs} | 25 | °C |
| I_{FSM} | 50 Hz | 12 000 | A |
| | 60 Hz | 12 570 | |
| I^2t | 50 Hz | 721 | kA ² s |
| | 60 Hz | 658 | |
| V_{RRM} | Range | 3000 to 4500 | V |
| t_{rr} | | 6.0 | μ s |
| | T_J | 125 | °C |
| T_J | | - 40 to 125 | |

ELECTRICAL SPECIFICATIONS
VOLTAGE RATINGS

| TYPE NUMBER | VOLTAGE CODE | V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I_{RRM} MAXIMUM AT $T_J = 125$ °C mA |
|--------------|--------------|----------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------|
| SD553C..S50L | 30 | 3000 | 3100 | 75 |
| | 36 | 3600 | 3700 | |
| | 40 | 4000 | 4100 | |
| | 45 | 4500 | 4600 | |

| FORWARD CONDUCTION | | | | | | |
|---------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------|---------------------------|-----------|--------------------|-------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS | |
| Maximum average forward current at heatsink temperature | $I_{F(AV)}$ | 180° conduction, half sine wave Double side (single side) cooled | | 560 (210) | A | |
| | | | | 55 (85) | °C | |
| Maximum RMS forward current | $I_{F(RMS)}$ | 25 °C heatsink temperature double side cooled | | 1120 | A | |
| Maximum peak, one-cycle forward, non-repetitive surge current | I_{FSM} | t = 10 ms | No voltage reappplied | 12 000 | | |
| | | t = 8.3 ms | | 12 570 | | |
| | | t = 10 ms | 50 % V_{RRM} reappplied | 10 100 | | |
| | | t = 8.3 ms | | 10 570 | | |
| Maximum I^2t for fusing | I^2t | t = 10 ms | No voltage reappplied | 721 | | kA ² s |
| | | t = 8.3 ms | | 658 | | |
| | | t = 10 ms | 50 % V_{RRM} reappplied | 510 | | |
| | | t = 8.3 ms | | 466 | | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reappplied | | 7210 | kA ² √s | |
| Low level value of threshold voltage | $V_{F(TO)1}$ | $(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 1.77 | V | |
| High level value of threshold voltage | $V_{F(TO)2}$ | $(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 1.95 | | |
| Low level value of forward slope resistance | r_{f1} | $(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 0.98 | mΩ | |
| High level value of forward slope resistance | r_{f2} | $(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum | | 0.89 | | |
| Maximum forward voltage drop | V_{FM} | $I_{pk} = 1500$ A, $T_J = 125$ °C, $t_p = 10$ ms sinusoidal wave | | 3.24 | V | |

| RECOVERY CHARACTERISTICS | | | | | | | | |
|--------------------------|---------------------------------|---------------------------|--------------|-----------|----------------------------------|---------------|--------------|---------------------------------------------------------------------------------------|
| CODE | MAXIMUM VALUE AT $T_J = 25$ °C | TEST CONDITIONS | | | TYPICAL VALUES AT $T_J = 125$ °C | | |  |
| | t_{rr} AT 25 % I_{RRM} (μs) | I_{pk} SQUARE PULSE (A) | di/dt (A/μs) | V_r (V) | t_{rr} AT 25 % I_{RRM} (μs) | Q_{rr} (μC) | I_{rr} (A) | |
| S50 | 5.0 | 1000 | 100 | - 50 | 6.0 | 900 | 250 | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | |
|--------------------------------------------------|--------------|---------------------------------|------------------|--------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum junction operating temperature range | T_J | | - 40 to 125 | °C |
| Maximum storage temperature range | T_{Stg} | | - 40 to 150 | |
| Maximum thermal resistance, junction to heatsink | R_{thJ-hs} | DC operation single side cooled | 0.073 | K/W |
| | | DC operation double side cooled | 0.031 | |
| Mounting force, ± 10 % | | | 14 700 (1500) | N (kg) |
| Approximate weight | | | 255 | g |
| Case style | | Conforms to JEDEC | DO-200AB (B-PUK) | |



| ΔR_{thJ-hs} CONDUCTION | | | | | | |
|--------------------------------------------------|-----------------------|-------------|------------------------|-------------|-----------------------------------------|-------|
| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | | RECTANGULAR CONDUCTION | | TEST CONDITIONS | UNITS |
| | SINGLE SIDE | DOUBLE SIDE | SINGLE SIDE | DOUBLE SIDE | | |
| 180° | 0.009 | 0.009 | 0.006 | 0.006 | T _J = T _J maximum | K/W |
| 120° | 0.011 | 0.011 | 0.011 | 0.011 | | |
| 90° | 0.014 | 0.014 | 0.015 | 0.015 | | |
| 60° | 0.020 | 0.020 | 0.021 | 0.021 | | |
| 30° | 0.036 | 0.036 | 0.036 | 0.036 | | |

Note

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

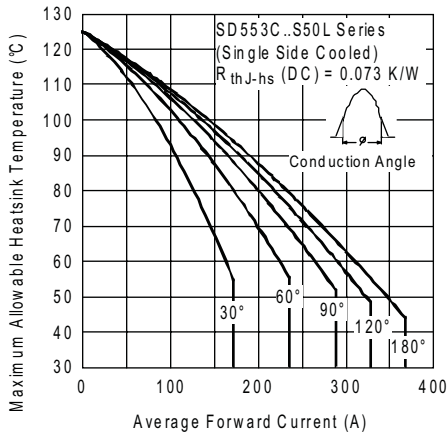


Fig. 1 - Current Ratings Characteristics

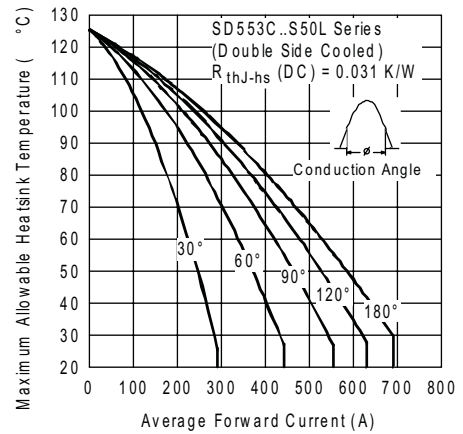


Fig. 3 - Current Ratings Characteristics

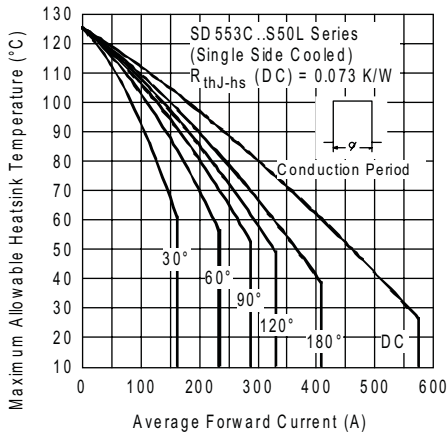


Fig. 2 - Current Ratings Characteristics

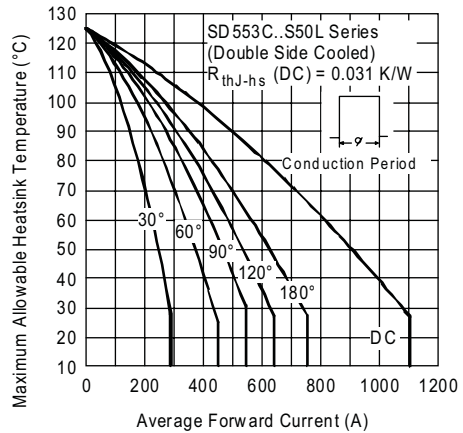


Fig. 4 - Current Ratings Characteristics

SD553C..S50L Series



Vishay High Power Products Fast Recovery Diodes
(Hockey PUK Version), 560 A

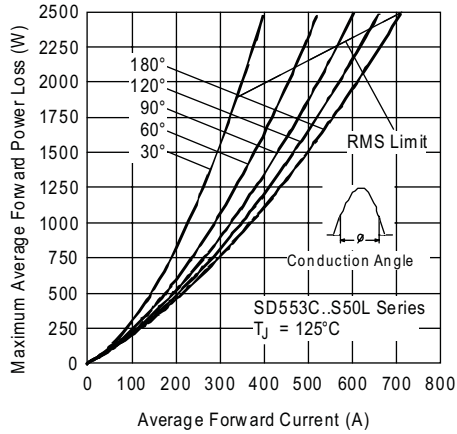


Fig. 5 - Forward Power Loss Characteristics

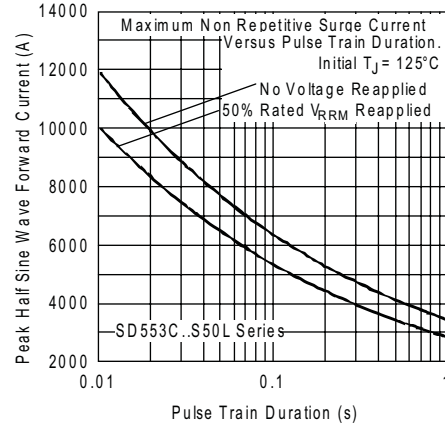


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

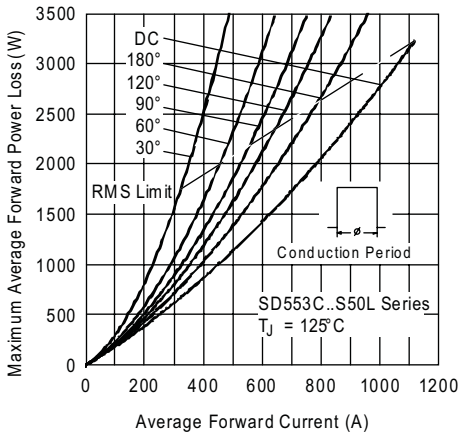


Fig. 6 - Forward Power Loss Characteristics

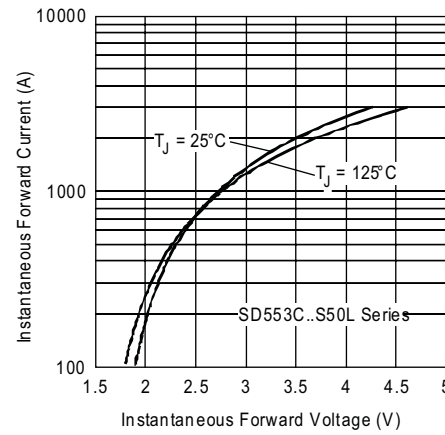


Fig. 9 - Forward Voltage Drop Characteristics

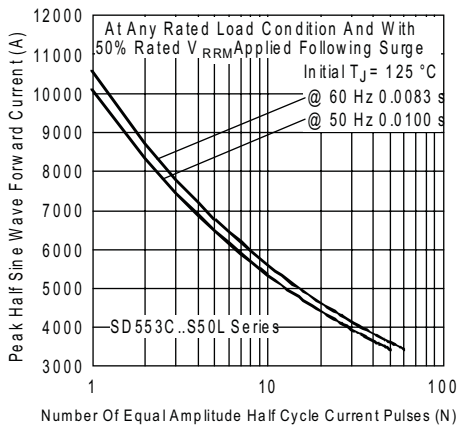


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

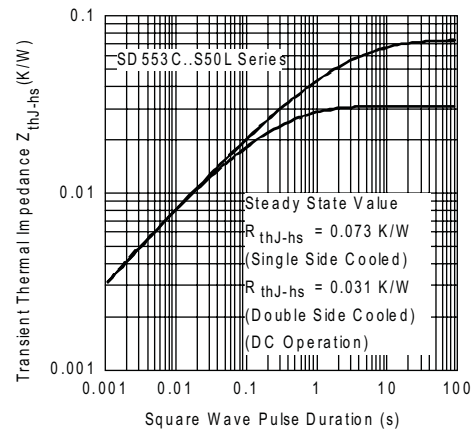


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristic

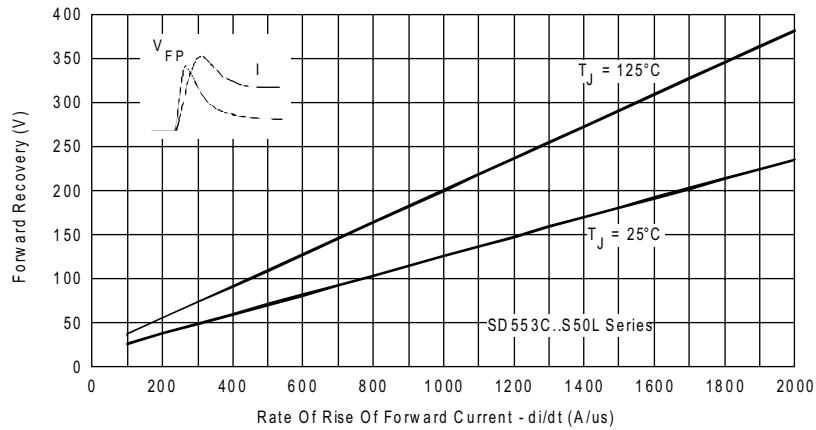


Fig. 11 - Typical Forward Recovery Characteristics

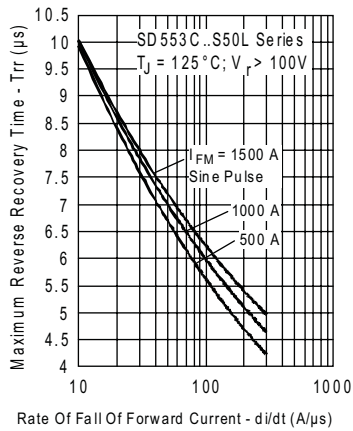


Fig. 12 - Recovery Time Characteristics

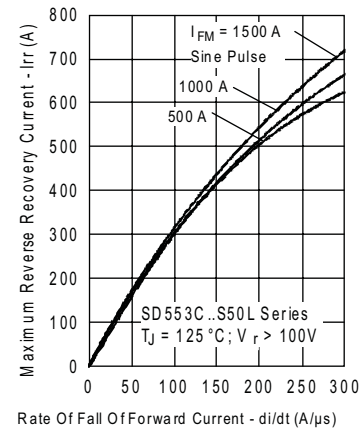


Fig. 14 - Recovery Current Characteristics

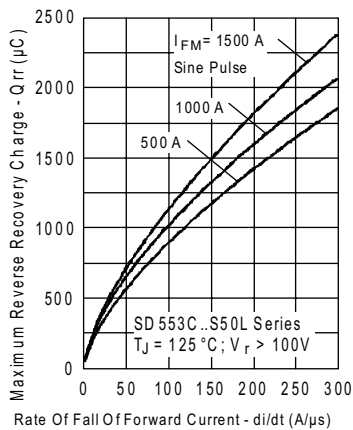


Fig. 13 - Recovery Charge Characteristics

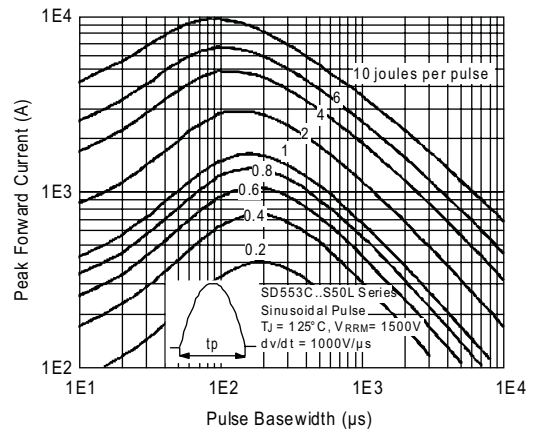


Fig. 15 - Maximum Total Energy Loss Per Pulse Characteristics

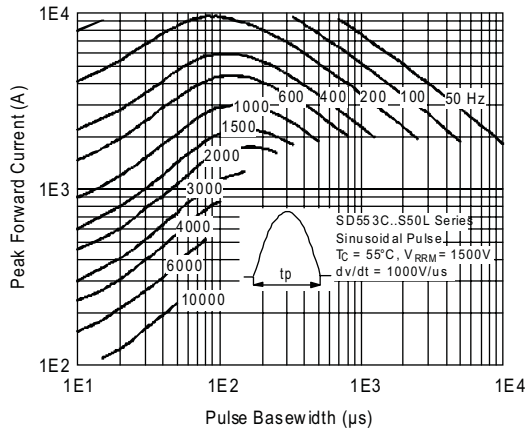


Fig. 16 - Frequency Characteristics

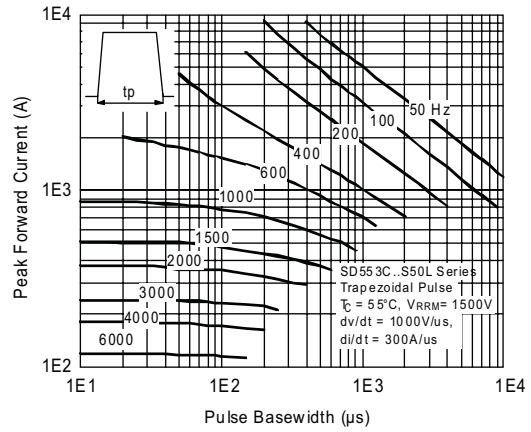


Fig. 18 - Frequency Characteristics

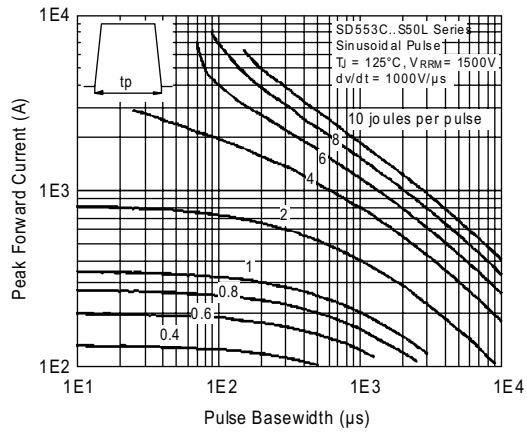


Fig. 17 - Maximum Total Energy Loss Per Pulse Characteristics

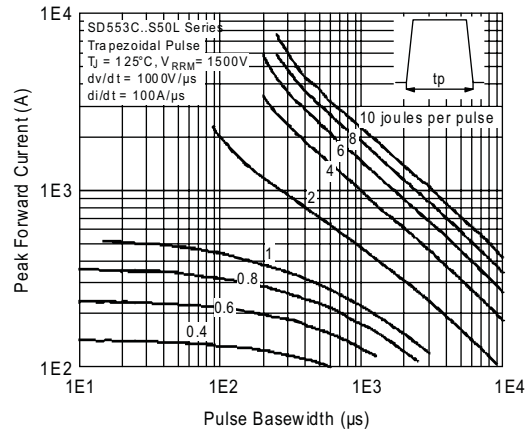


Fig. 19 - Maximum Total Energy Loss Per Pulse Characteristics

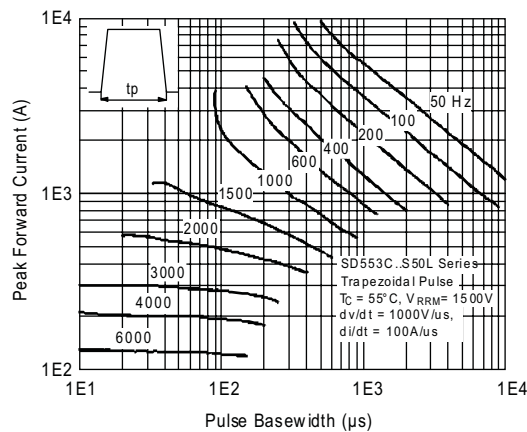


Fig. 20 - Frequency Characteristics



ORDERING INFORMATION TABLE

| | | | | | | | |
|-------------|----|----|---|---|----|-----|---|
| Device code | SD | 55 | 3 | C | 45 | S50 | L |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

- 1** - Diode
- 2** - Essential part number
- 3** - 3 = Fast recovery
- 4** - C = Ceramic PUK
- 5** - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)
- 6** - t_{rr} code
- 7** - L = PUK case DO-200AB (B-PUK)

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|-------------------------------------------------------------------------------|
| Dimensions | http://www.vishay.com/doc?95246 |



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