

# STPR2040CTW

**SUPER FAST  
GLASS PASSIVATED RECTIFIERS**

**REVERSE VOLTAGE – 400 Volts  
FORWARD CURRENT – 20 Amperes**

**FEATURES**

- High current capability
- Superfast switching time for high efficiency
- Low forward voltage drop and high current capability
- Low leakage current
- High surge capacity
- Qualification is according to AEC-Q101 Rev\_D
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

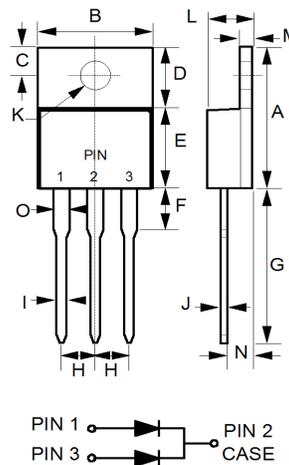
**APPLICATION**

- Switching-mode power supplies
- High frequency DC to DC converters

**MECHANICAL DATA**

- Package: JEDEC TO-220AB
- Package Material: “Green” molding compound, UL flammability classification 94V-0, “Halogen-free”.
- Lead free finish, RoHS compliant
- Weight: 1.927 grams (Approximate)
- Marking code: STPR2040CTW

**TO-220AB**



| TO-220AB                     |       |       |
|------------------------------|-------|-------|
| DIM                          | MIN   | MAX   |
| A                            | 14.40 | 15.20 |
| B                            | 9.65  | 10.67 |
| C                            | 2.54  | 3.43  |
| D                            | 5.84  | 6.86  |
| E                            | 8.26  | 9.28  |
| F                            | --    | 4.20  |
| G                            | 12.70 | 14.73 |
| H                            | 2.29  | 2.79  |
| I                            | 0.51  | 1.00  |
| J                            | 0.30  | 0.64  |
| K                            | 3.53Φ | 4.09Φ |
| L                            | 3.56  | 4.83  |
| M                            | 1.14  | 1.40  |
| N                            | 2.03  | 2.92  |
| O                            | 1.14  | 1.70  |
| All Dimensions in millimeter |       |       |

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25°C ambient temperature unless otherwise specified.

**ABSOLUTE RATINGS**

| PARAMETER  | SYMBOL         | VALUE      | UNIT |
|--|----------------|------------|------|
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 400        | V    |
| Maximum DC blocking voltage  | $V_{DC}$       | 400        | V    |
| Maximum Average rectified output current   | $I_{(AV)}$     | 20         | A    |
| Peak forward surge current 8.3ms single half sine-wave Superimposed on rated load. | $I_{FSM}$      | 125        | A    |
| Operating junction and Storage Temperature range                                   | $T_J, T_{STG}$ | -55 ~ +150 | °C   |

**STATIC ELECTRICAL CHARACTERISTICS**

| PARAMETER                             | TEST CONDITIONS | SYMBOL | TYP  | MAX  | UNIT |
|---------------------------------------|-----------------|--------|------|------|------|
| Forward voltage (Note 4)              | $I_F=10A$       | $V_F$  | --   | 1.30 | V    |
|                                       | $T_J=25°C$      |        | 0.88 | 1.20 |      |
|                                       | $T_J=125°C$     |        | --   | 1.50 |      |
| Leakage current                       | $I_F=20A$       | $I_R$  | 1.02 | 1.40 | uA   |
|                                       | $T_J=125°C$     |        | --   | 10   |      |
| Typical junction capacitance (Note 5) | $V_R=400V$      | $C_J$  | 2.47 | 500  | pF   |
|                                       | $T_J=25°C$      |        |      |      |      |
|                                       | $T_J=100°C$     |        |      |      |      |
|                                       |                 |        | 80   |      |      |

**DYNAMIC ELECTRICAL CHARACTERISTICS**

| PARAMETER             | TEST CONDITIONS                    | SYMBOL   | MAX | UNIT |
|-----------------------|------------------------------------|----------|-----|------|
| Reverse recovery time | $I_F=0.5A, I_R=1.0A, I_{RR}=0.25A$ | $T_{rr}$ | 35  | nS   |

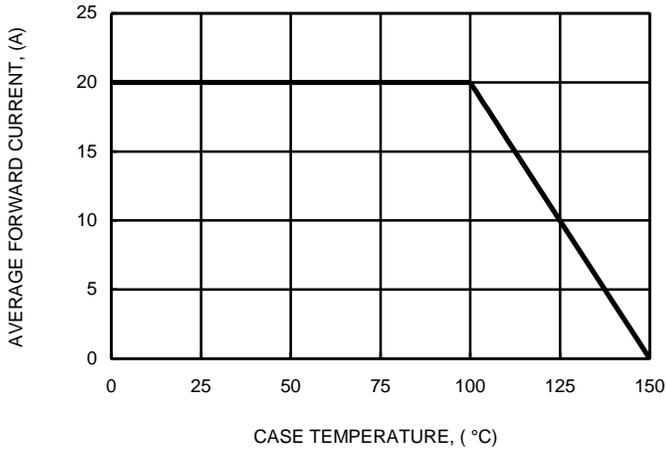
**THERMAL CHARACTERISTICS**

| PARAMETER                               | SYMBOL     | TYP | UNIT |
|---|------------|-----|------|
| Typical thermal resistance (Notes 6, 7) | $R_{thJC}$ | 2   | °C/W |
|   | $R_{thJA}$ | 1   |      |

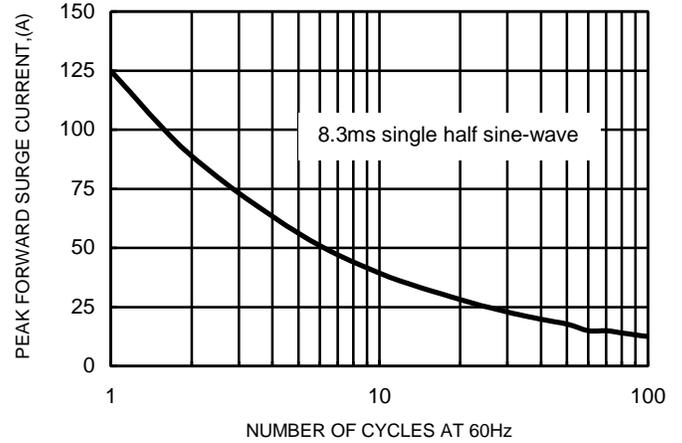
**Notes:**

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. 300us pulse width, 2% duty cycle.
5. Measured at 1.0MHz and applied voltage of 4.0V DC.
6. Thermal resistance test performed in accordance with JESD-51.
7. The unit mounted on copper 100mm x 100mm x 1.9 mm.

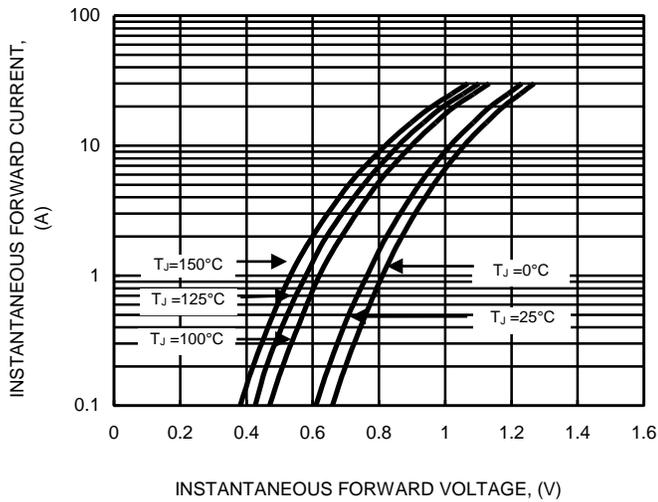
**FIG.1 FORWARD CURRENT DERATING CURVE**



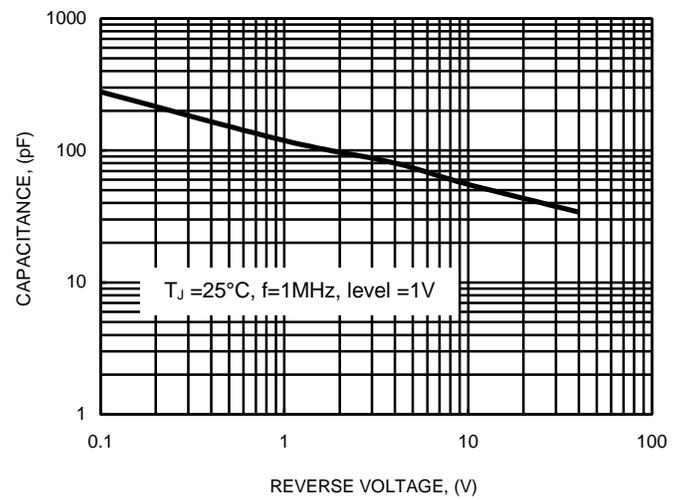
**FIG.2 MAXIMUM NON-REPETITIVE SURGE CURRENT**



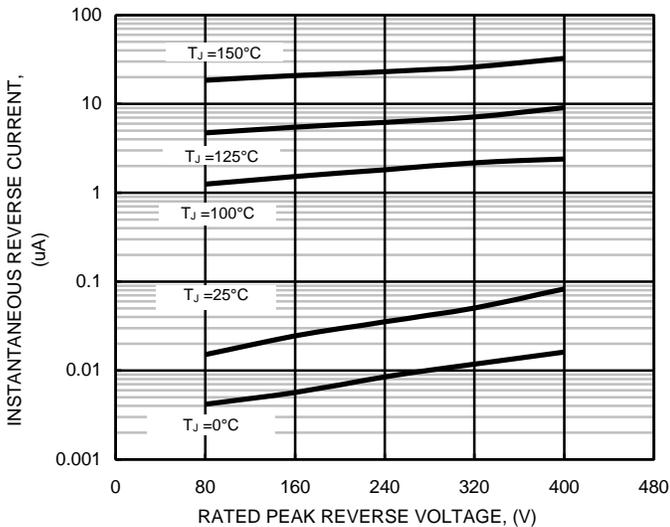
**FIG.3 TYPICAL FORWARD CHARACTERISTICS**



**FIG.4 TYPICAL JUNCTION CAPACITANCE**



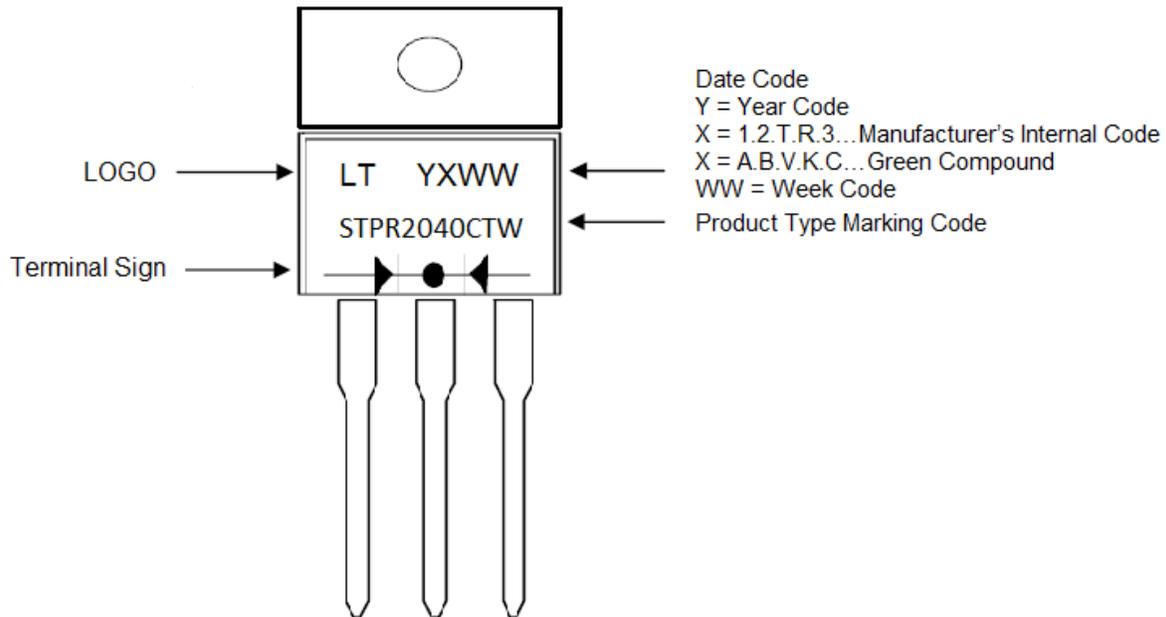
**FIG.5 TYPICAL REVERSE CHARACTERISTICS**



### Ordering Information :

| Part Number | Package  | Packing |         |
|-------------|----------|---------|---------|
|             |          | Qty.    | Carrier |
| STPR2040CTW | TO-220AB | 50 pcs  | Tube    |

### Marking Information :



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