

## 40V, 20A POWER SCHOTTKY RECTIFIER

### Features

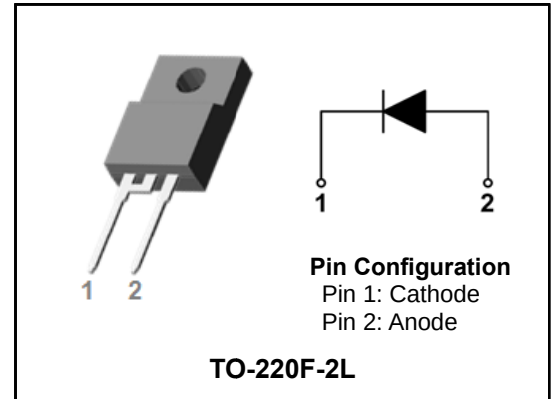
- Low forward voltage drop
- Low power loss and High efficiency
- Low leakage current
- High surge capability
- Full lead (Pb)-free and RoHS compliant device

### Applications

- High efficiency SMPS
- Output rectification
- High frequency switching
- Freewheeling
- DC-DC converter systems

### Description

The SDB2040PH is suited for Switch Mode Power Supply and high frequency DC to DC converters. This device is especially intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



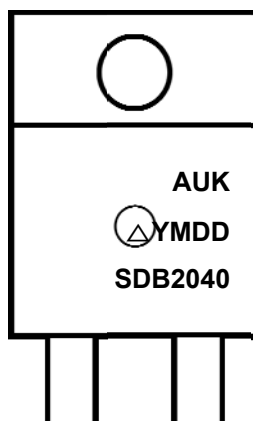
### Product Characteristics

|                   |              |
|-------------------|--------------|
| $I_{F(AV)}$       | <b>20A</b>   |
| $V_{RRM}$         | <b>40V</b>   |
| $V_{FM}$ at 125°C | <b>0.52V</b> |
| $I_{FSM}$         | <b>210A</b>  |

### Ordering Information

| Device    | Marking Code | Package    | Packaging |
|-----------|--------------|------------|-----------|
| SDB2040PH | SDB2040      | TO-220F-2L | Tube      |

### Marking Information



AUK = Manufacture Logo

△ = Control Code of Manufacture

YMDD = Date Code Marking

- Y = Year Code

- M = Monthly Code

- DD = Daily Code

SDB2040 = Specific Device Code

## Absolute Maximum Ratings (Limiting Values)

| Characteristic                                                                                            | Symbol                          | Value           | Unit |
|-----------------------------------------------------------------------------------------------------------|---------------------------------|-----------------|------|
| Maximum repetitive reverse voltage<br>Maximum working peak reverse voltage<br>Maximum DC blocking voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 40              | V    |
| Maximum average forward rectified current                                                                 | $I_{F(AV)}$                     | 20              | A    |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load per diode               | $I_{FSM}$                       | 210             | A    |
| Storage temperature range                                                                                 | $T_{stg}$                       | -55°C to +150°C | °C   |
| Maximum operating junction temperature                                                                    | $T_J$                           | 150             | °C   |

## Thermal Characteristics

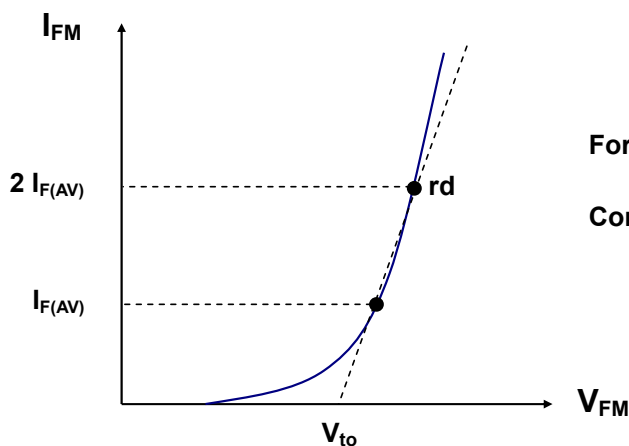
| Characteristic                              | Symbol        | Value | Unit |
|---------------------------------------------|---------------|-------|------|
| Maximum thermal resistance junction to case | $R_{th(j-c)}$ | 4.5   | °C/W |

## Electrical Characteristics

| Characteristic            | Symbol         | Test Condition  |                    | Min. | Typ. | Max. | Unit |
|---------------------------|----------------|-----------------|--------------------|------|------|------|------|
| Peak forward voltage drop | $V_{FM}^{(1)}$ | $I_{FM} = 20A$  | $T_J=25^{\circ}C$  | -    | -    | 0.58 | V    |
|                           |                |                 | $T_J=125^{\circ}C$ | -    | 0.49 | 0.52 | V    |
| Reverse leakage current   | $I_{RM}^{(1)}$ | $V_R = V_{RRM}$ | $T_J=25^{\circ}C$  | -    | -    | 1.5  | mA   |
|                           |                |                 | $T_J=125^{\circ}C$ | -    | -    | 200  | mA   |

Note: (1) Pulse test:  $t_p \leq 380 \mu s$ , Duty cycle  $\leq 2\%$

To evaluate the conduction losses use the following equation (Fig 4.):  $P_F = 0.31 \times I_{F(AV)} + 0.01 I_{F(RMS)}^2$



Forward Voltage :  $V_{FM} = V_{to} + rd I_{FM}$

Conduction Loss :  $P_F = V_{to} I_{F(AV)} + rd I_{F(RMS)}^2$

## Rating and Characteristic Curves

Fig. 1) Typical Forward Characteristics

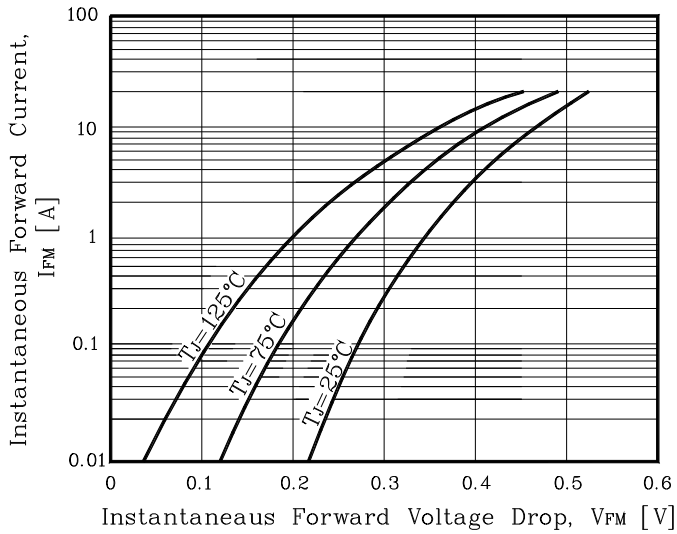


Fig. 2) Typical Reverse Characteristics

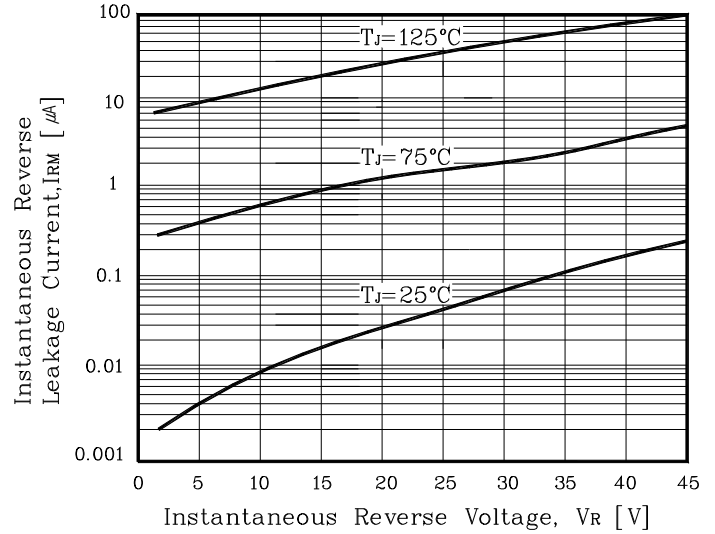


Fig. 3) Maximum Forward Derivative Curve

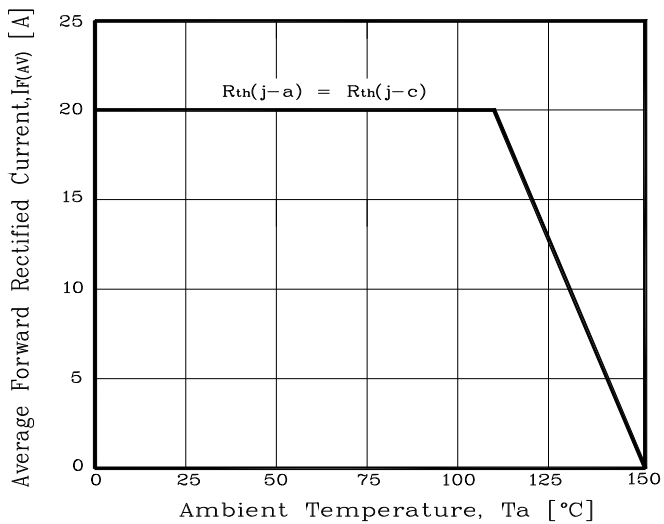


Fig. 4) Forward Power Dissipation

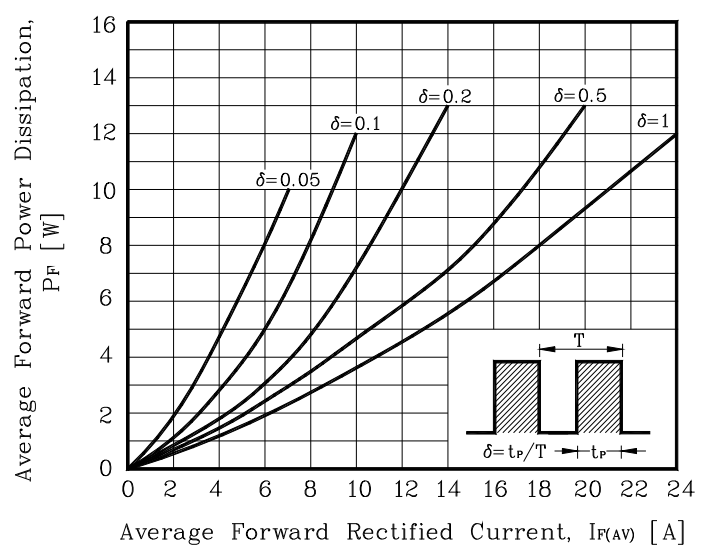


Fig. 5) Maximum Non-Repetitive Peak Forward Surae Current

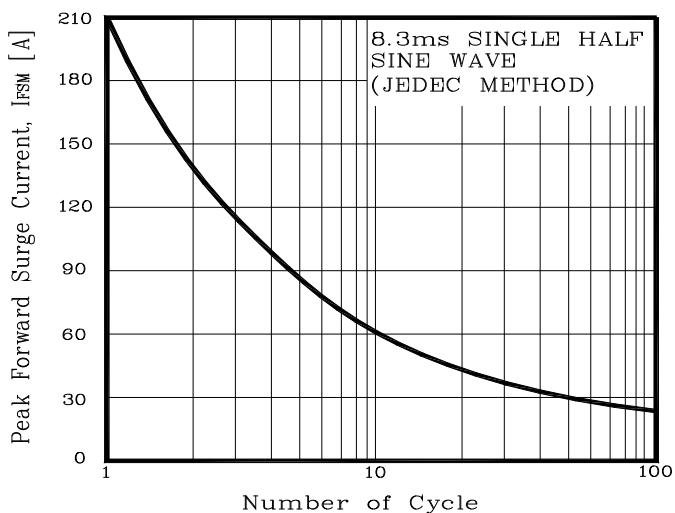
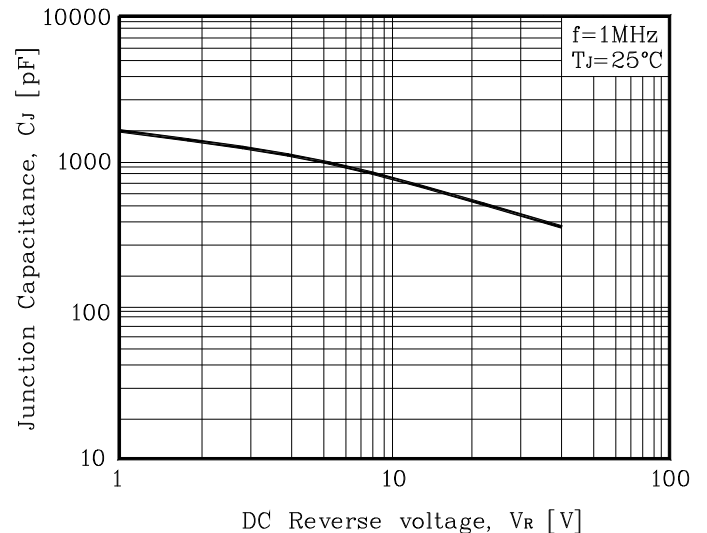
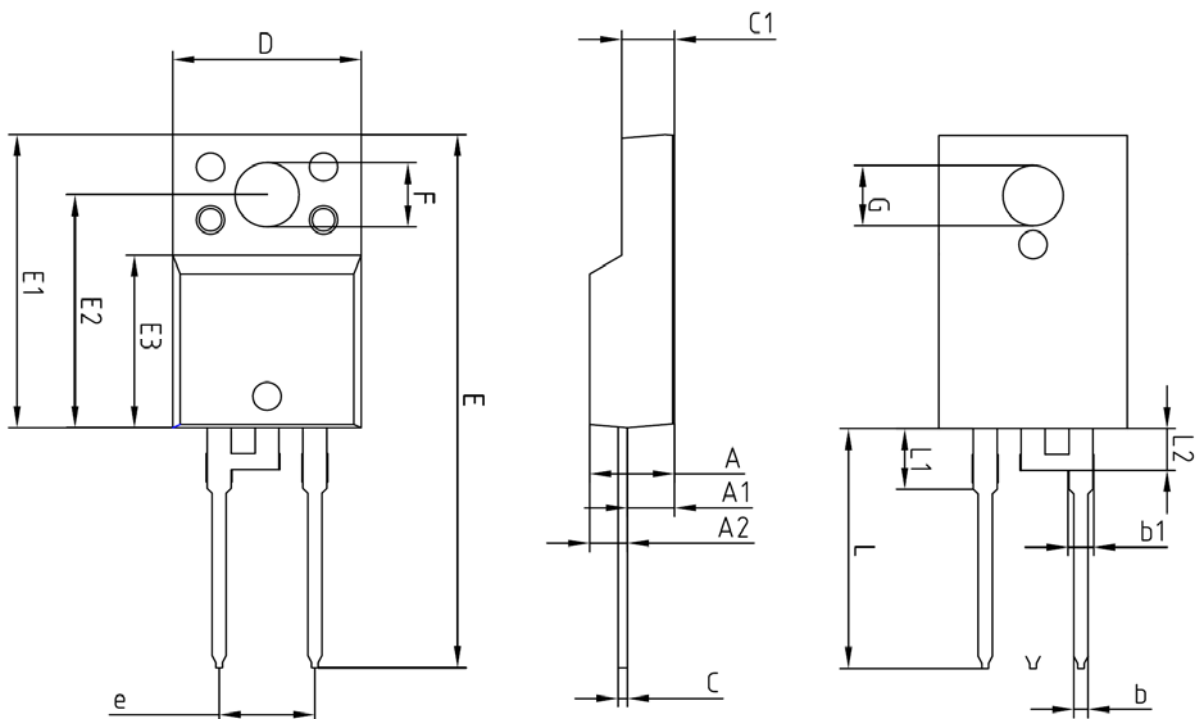


Fig. 6) Typical Junction Capacitance



## Package Outline Dimension



| SYMBOL | MILLIMETERS |         |         | NOTE |
|--------|-------------|---------|---------|------|
|        | MINIMUM     | NOMINAL | MAXIMUM |      |
| A      | —           | —       | 4.60    |      |
| A1     | 2.45        | 2.50    | 2.55    |      |
| A2     | 1.95        | 2.00    | 2.05    |      |
| b      | 0.65        | 0.75    | 0.85    |      |
| b1     | 1.07        | 1.27    | 1.47    |      |
| C      | 0.40        | 0.50    | 0.60    |      |
| C1     | 2.70        | 2.80    | 2.90    |      |
| D      | 9.90        | 10.00   | 10.10   |      |
| E      | 28.00       | —       | 28.60   |      |
| E1     | 15.50       | 15.60   | 15.70   |      |
| E2     | 12.30       | 12.40   | 12.50   |      |
| E3     | 9.15        | 9.20    | 9.25    |      |
| F      | 3.30        | 3.40    | 3.50    |      |
| G      | 3.10        | 3.20    | 3.30    |      |
| e      | 5.08 BSC    |         |         |      |
| L      | 12.40       | —       | 13.00   |      |
| L1     | 3.46 BSC    |         |         |      |
| L2     | 2.21 BSC    |         |         |      |

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