

# Ultra Fast Recovery Diodes

$V_{RM}: 100 \sim 600V$

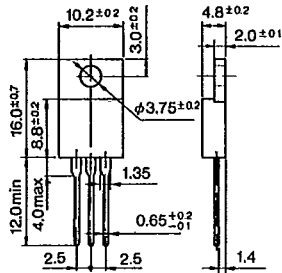
$I_o: 5 \sim 20A$

## CTL/RBV/RBA

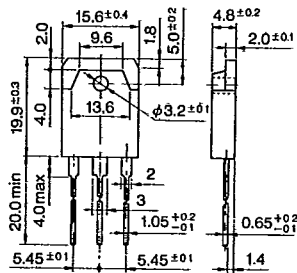
| Rating/<br>Characteristics | Absolute Maximum Ratings |                        |                       |                                     |                        | Electrical Characteristics (Ta = 25°C) |                       |                        |  |   | Others                                  |                    |           |        |                                     |
|----------------------------|--------------------------|------------------------|-----------------------|-------------------------------------|------------------------|--|-----------------------|------------------------|--|---|---|--------------------|-----------|--------|-------------------------------------|
|                            | V <sub>RSM</sub><br>(V)  | V <sub>RM</sub><br>(V) | I <sub>o</sub><br>(A) | I <sub>FSM</sub><br>(A)             | T <sub>J</sub><br>(°C) | T <sub>stg</sub><br>(°C)               | V <sub>F</sub><br>(V) | I <sub>R</sub><br>(mA) | I <sub>R(H)</sub><br>(mA)                          | trr<br>(μs)   | I <sub>F</sub> /I <sub>RP</sub><br>(mA) | Outline<br>Drawing | Weight(g) | Taping | Note                                |
| Type No.                   | per chip                 |                        | With<br>Fin           | 50Hz Half Sine Wave<br>Single Pulse |                        |  | Max.<br>per chip      | I <sub>F</sub><br>(A)  | V <sub>R</sub> = V <sub>RM</sub><br>max (per chip) | V <sub>R</sub> = V <sub>RM</sub> , T <sub>J</sub> = 140°C<br>max (per chip) |   |                    |           |        |                                     |
| CTL-12S                    | 200                      | 200                    | 5.0                   | 35                                  | -40 ~ +140             |  | 0.98                  | 2.5                    | 0.1  | 1.5   | 0.04                                    | 100/100            | ②⑧        | 2.6    | For High Frequency<br>Rectification |
| CTL-21S                    | 100                      | 100                    | 10                    | 65                                  |                        |  |                       |                        |  |   |   |                    |           |        |                                     |
| CTL-22S                    | 200                      | 200                    | 20                    | 150                                 |                        |  |                       |                        |  |   |   |                    |           |        |                                     |
| CTL-31S                    | 100                      | 100                    |                       |                                     |                        |  |                       |                        |  |   |   |                    |           |        |                                     |
| CTL-32S                    | 200                      | 200                    |                       |                                     |                        |  |                       |                        |  |   |   |                    |           |        |                                     |
| RBV-406H                   | 600                      | 600                    | 4.0                   | 120                                 | -40 ~ +150             |  | 1.0                   | 2.0                    | 0.01   | 0.1 (Ta = 100°C)  | 5.0                                     | ①⑩                 | 4.05      |        |                                     |
| RBA-402L                   | 200                      | 200                    |                       | 80                                  |                        |  |                       |                        |  |   |   |                    |           |        |                                     |
| RBV-602L                   | 200                      | 200                    | 6.0                   | 100                                 |                        |  |                       |                        |  |   |   |                    |           |        |                                     |
|                            |                          |                        |                       |                                     |                        |  | 1.0                   | 3.0                    | 0.25   | 1.0   | 0.05                                    | 100/100            | ①⑦        | 6.45   |                                     |

Thermal Resistance R<sub>th(j-c)</sub> max : 3.0°C/W (CTL-1, CTL-2)  
1.5°C/W (OTL-3)

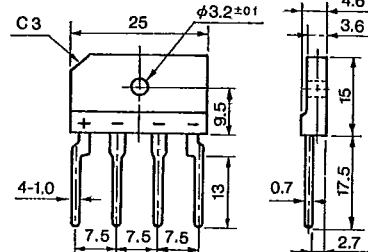
Outline Drawing ②⑧



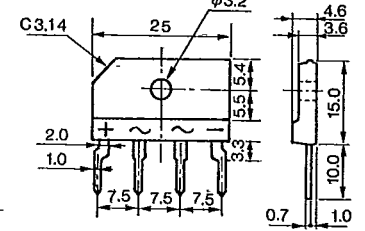
Outline Drawing ②⑨



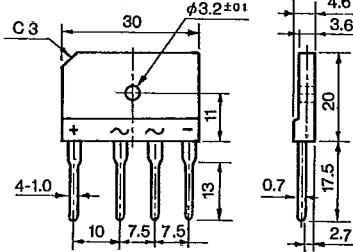
Outline Drawing ①⑩



Outline Drawing ①⑦



Outline Drawing ①②



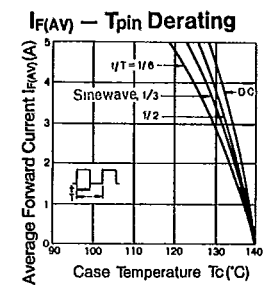
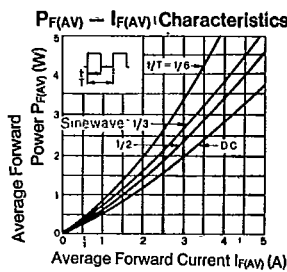
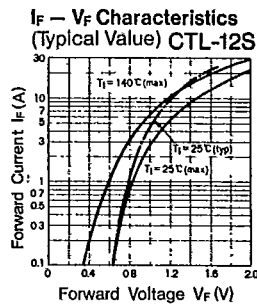
Center Tap Internal Connection:

S Type

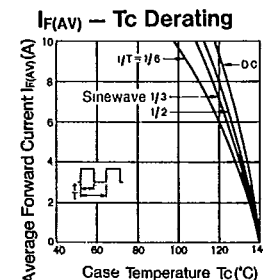
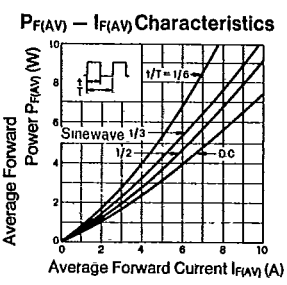
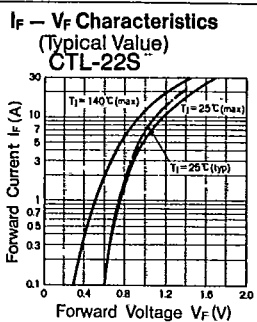


②⑧ ~ ①② Plastic Moulded, Flammability :  
UL94V-0 or Equivalent

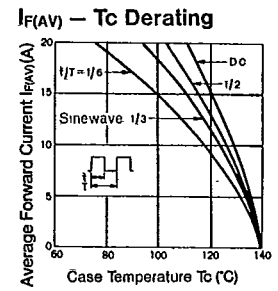
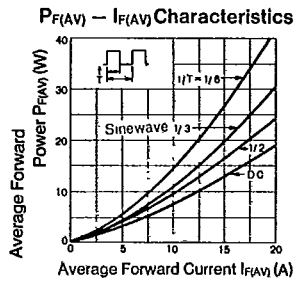
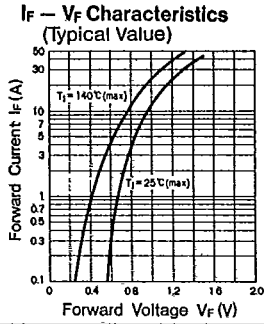
CTL-12S



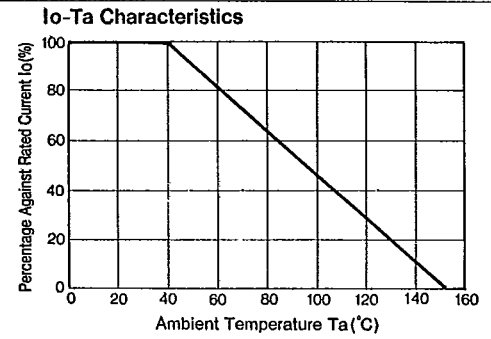
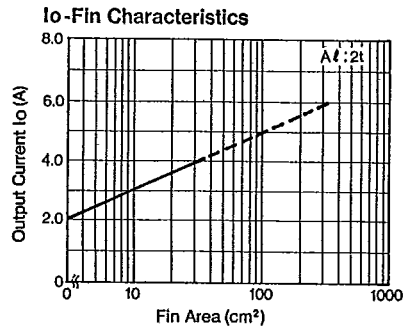
CTL-2 Series



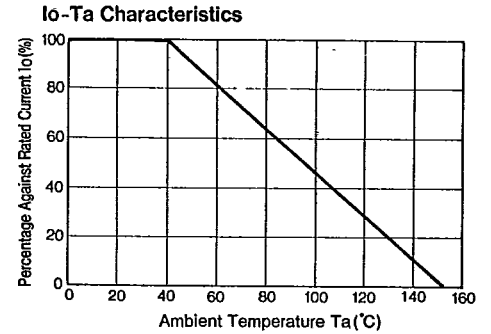
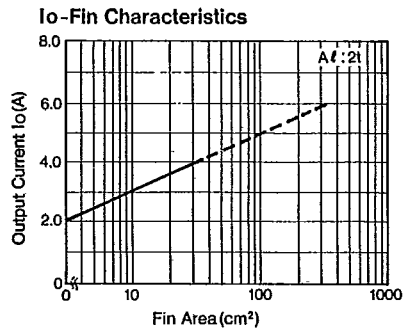
CTL-3 Series



RBV-406H



RBA-402L

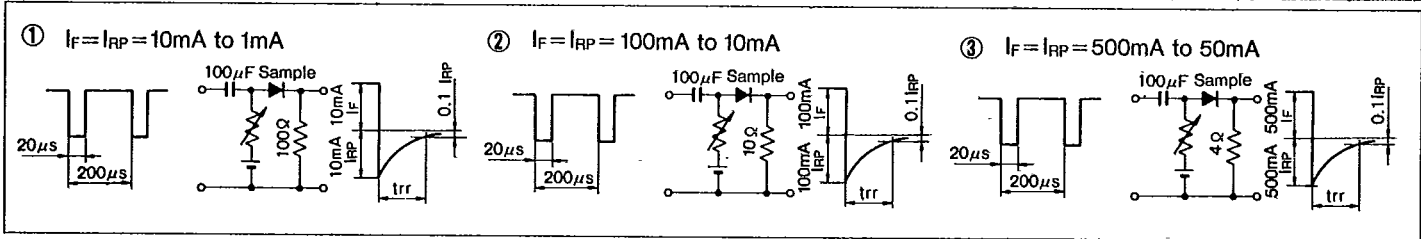


# Symbols/trr Measurement Circuit

## Symbols

|             |                                   |            |                                    |               |  |
|-------------|-----------------------------------|------------|------------------------------------|---------------|--|
| $V_{RSM}$   | Peak Reverse Surge Voltage        | $I_{RSM}$  | Peak Reverse Surge Current         | $T_{stg}$     | Storage Temperature                          |
| $V_{RM}$    | Peak Reverse Voltage              | $I_R$      | Reverse Current                    | $t_{rr}$      | Reverse Recovery Time                        |
| $V_{P-P}$   | Reverse Voltage (Peak to Peak)    | $I_{RP}$   | Peak Reverse Current               | $C_t$         | Total Capacitance Between Terminals          |
| $V_R$       | Reverse Voltage                   | $I_{R(H)}$ | Reverse Current (High Temperature) | $R_{th(j-c)}$ | Thermal Resistance, Junction to Case         |
| $V_F$       | Forward Voltage                   | $I_Z$      | Avalanche Current                  | $r_z$         | Temperature Coefficient of Breakdown Voltage |
| $V_B$       | Breakdown Voltage                 | $I_{ZSM}$  | Allowable Avalanche Current        | $R_z$         | Equivalent Resistance of Breakdown Region    |
| $I_o$       | Average Rectified Forward Current | $T_a$      | Ambient Temperature                | $P_{F(AV)}$   | Average Forward Power Dissipation            |
| $I_F$       | Forward Current                   | $T_j$      | Junction Temperature               | $I^2_t$       | $I^2_t$ limiting Value                       |
| $I_{F(AV)}$ | Average Forward Current           | $T_{opr}$  | Operating Ambient Temperature      |               |  |
| $I_{FSM}$   | Peak Forward Surge Current        | $T_c$      | Case Temperature                   |               |  |

## Reverse Recovery Time Measurement Circuit



## Taping Specifications

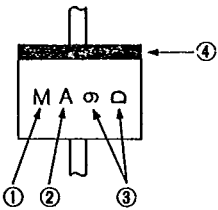
Excluding High Voltage Diodes

| Designation                            | Dimension (in mm)  | Packaging Dimension and Marking                                     | Quantity   |
|--|--|---|--|
| <b>V</b><br>Add Suffix [V] to Type No. | <p><b>Tape Carrier Method</b></p> <p>(1) Right side of taping direction is cathode.<br/>                 (2) Place electrode side down when casing.<br/>                 (3) Provide leader tape of 150~200mm at beginning of tape.<br/>                 (4) Provide space of more than 10 pitches each for beginning and end of tape.</p> | <p><b>Reel</b></p> <p>Marking of Type No., Lot No. and Quantity</p> | 1,800 pcs per reel   |
| <b>V</b><br>Add Suffix [V] to type No. | <p><b>Axial Taping</b></p>   | <p><b>Reel</b></p> <p>Markings of Type No. Lot No. and Quantity</p> | 5,000 pcs per reel (2.7φ body)<br><br>3,000 pcs per reel (4.0φ body) |



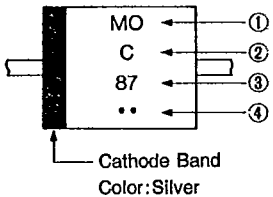
# Marking Guide

## 1 Small TMD



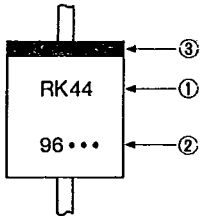
- ① Type Designation (in abbreviation)  
AM01 is abbreviated as M.
- ② Class Designation  
Z: 200V, No Letter: 400V, A: 600V
- ③ A: Year (Last Number of AD Year)  
B: Month (Jan. to Sept. are represented by numbers 1 to 9 respectively, and Oct., Nov., and Dec. are abbreviated as O, N and D respectively)
- ④ Cathode Band: Successive Band, however AU02 Type is Non-Successive Band.

## 2 E/EO Type TMD



- ① Type Designation (in abbreviation)  
EM01 is abbreviated as MO, EM2 is abbreviated as M2.
- ② Class Designation  
Z: 200V, No Letter: 400V, A: 600V  
B: 800 V, C: 1000V, F: 1500V  
However, EU02A to be marked 2A, and EU2YX to be marked Y.
- ③ Abbreviations Representing Production Period  
A: Year (Last Number of AD Year)  
B: Month (1~9, O, N, D)
- ④ Production Period Divided in 3 ten day terms  
• : 1st 10days •• : 2nd 10days ••• : 3rd 10days

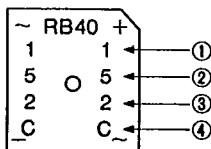
## 3 R Type TMD



- ① Type Designation: Mark in 2 sets
- ② Production Period: Mark in 4 sets  
A: Year (Last Number of AD Year)  
B: Month (1~9, O, N, D)
- ③ Production Period Divided in 3 ten day terms  
• : 1st 10days •• : 2nd 10days ••• : 3rd 10days
- ④ Cathode Band Color: Silver: For Power Supply  
Yellow: For Middle Speed  
Red : For High Speed and Ultra-High Speed

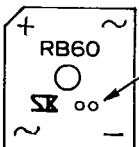
## 4 RB40/60

(RB40 Series)



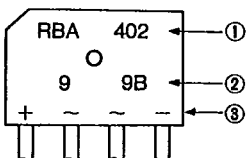
- ① Peak Reverse Voltage Designation  
1, 2, 4, 6, C  
Production Period
- ② Year (Last Number of AD Year)
- ③ Month (1~9, O, N, D)
- ④ Divided in 3 ten day terms  
A: 1st 10days, B: 2nd 10days  
C: 3rd 10days  
Color Designation: Silver

(RB60 Series)



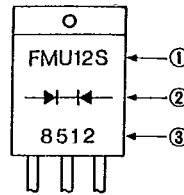
Dot Designation RB601 Violet  
RB602 No Color  
RB604 Blue  
RB606 White

## 5 RBV/RBA



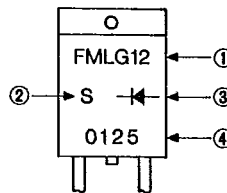
- ① Type Designation
- ② Lot Number  
1st : Year (Last Number of AD Year)  
2nd: Month (1~9, O, N, D)  
3rd : Divided 1~3 ten day Terms  
A: 1st 10 days B: 2nd 10 days  
C: 3rd 10 days
- ③ In-Put Designation

## 6 T0220 Type (FM or CT Type)



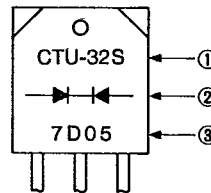
- ① Type Designation  
Show FMU-12S as FMU12S.
- ② Polarity: Rectifier Symbols
- ③ Lot Number (Laser Marking)  
1st : Year (Last Number of AD Year)  
2nd : Month (0~9, O, N, D)  
3rd, 4th: Day

## 7 T0220 Type (FM or CT Type, single chip)



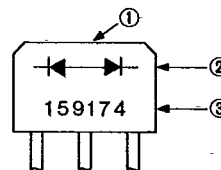
- ① Type Designation: Omit Last Letter  
Show FML-G12S as FMLG12.
- ② Last Letter of Type Designation
- ③ Polarity: Rectifier Symbols
- ④ Lot Number (Laser Marking)  
1st : Year (Last Number of AD Year)  
2nd : Month (0~9, O, N, D)  
3rd, 4th: Day

## 8 T03P Type (FM or CT Type)



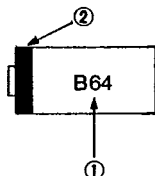
- ① Type shown in full designation  
However, CTB-34/34S/34M are marked as CTB-34, CTU-G3DR is marked as CTUG3DR.
- ② Polarity: Rectifier Symbols
- ③ Lot Number:  
1) M, U, G and L Types  
First Number : Last Digit of AD Year  
Second Number : Month  
Third and Fourth Numbers: Day  
Fifth Number : None  
2) For types CTB-34/34S/34M, the fifth letter shows type designation. If no fifth number, the type is CTB-33 or CTB-34.
- 3) Marking Color: Silver

## 9 MI-10/15 Type



- ① MI-10/15 is die-stamped on the top of the case.
- ② Rectifier Symbols
- ③ Lot Number:  
First Number : Peak Reverse Voltage:  
(Letter) 0=50V, 1=100V, 2=200V,  
4=400V, 6=600V, C=1000V  
Second Number : Last Digit of AD Year  
Third Number : Month  
Fourth and Fifth Numbers: Day  
Sixth Number : Production number and  
U: Voltage Doubler Type

## 10 SFP Type



- ① Type Designation:  
SFPB-64 is abbreviated at B64,
- ② Cathode Band