

## Rectifier Diodes

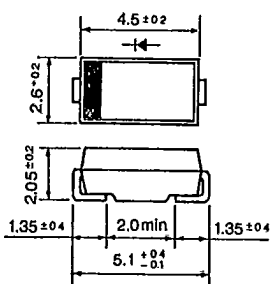
■  $V_{RM}: 100 \sim 1500V$  ■  $I_o: 0.5 \sim 3.0A$ 

## SFPM/AM/EM/RM/RO

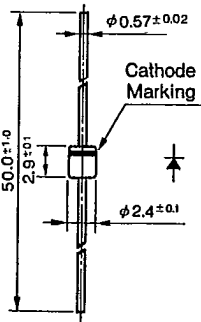
| Rating/<br>Characteristics |      | Absolute Maximum Ratings |                        |                                        |                         |                        |                          | Electrical Characteristics (Ta = 25°C) |                                         |                                                    |                           | 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>(μA)                             | I <sub>R(H)</sub><br>(μA) | Outline<br>Drawing | Weight(g) | Taping | Note             |  |  |  |  |   |     |     |  |  |
| Type No.                   |      |                          | ( ) =<br>with Fin      | 50Hz Half Sine<br>Wave<br>Single Pulse |                         |                        | max                      | I <sub>F</sub><br>(A)                  | V <sub>R</sub> = V <sub>RM</sub><br>max | V <sub>R</sub> = V <sub>RM</sub><br>Ta = 100°C max |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| SFPM-52                    | 250  | 200                      | 0.9                    | 30                                     | - 40 ~ + 150            |                        | 1.0                      |                                        |                                         |                                                    |                           | ①                  | 0.072     |        | Surface<br>Mount |  |  |  |  |   |     |     |  |  |
| SFPM-54                    | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| SFPM-62                    | 250  | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| SFPM-64                    | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| AM01Z                      | 250  | 200                      | 1.0                    | 35                                     | - 40 ~ + 140            |                        | 0.98                     | 1.0                                    | 10                                      | 50                                                 |                           | ②                  | 0.13      |        |                  |  |  |  |  |   |     |     |  |  |
| AM01                       | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| AM01A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM01Z                      | 250  | 200                      |                        | 45                                     |                         |                        |                          |                                        |                                         |                                                    |                           | 0.97               |           |        |                  |  |  |  |  | ③ | 0.2 |     |  |  |
| EM01                       | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM01A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 1Y                      | 150  | 100                      |                        | 1.2                                    |                         |                        | 80                       |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   | ④   | 0.3 |  |  |
| EM 1Z                      | 250  | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 1                       | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 1A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 1B                      | 850  | 800                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 1C                      | 1050 | 1000                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 2                       | 450  | 400                      | 1.0                    | 50                                     | - 40 ~ + 130            |                        | 0.95                     | 1.0                                    | 5                                       |                                                    |                           | ⑤                  | 0.44      |        |                  |  |  |  |  |   |     |     |  |  |
| EM 2A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| EM 2B                      | 850  | 800                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1Z                      | 250  | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1                       | 450  | 400                      | 0.8                    | 40                                     |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1B                      | 850  | 800                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1C                      | 1050 | 1000                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1D                      | 1250 | 1200                     | 0.6                    | 25                                     |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1E                      | 1450 | 1400                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 1F                      | 1550 | 1500                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 11A                     | —    | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 11B                     | —    | 800                      | 1.2                    | 100                                    | - 40 ~ + 140            |                        | 0.92                     |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 11C                     | —    | 1000                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 10Z                     | —    | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 10                      | —    | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 10A                     | —    | 600                      | 1.5                    | 150                                    |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 10B                     | —    | 800                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 2Z                      | 250  | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 2                       | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 2A                      | 650  | 600                      | 1.2                    | 100                                    | - 40 ~ + 130            |                        | 0.91                     |                                        |                                         |                                                    |                           | ⑥                  | 0.6       |        |                  |  |  |  |  |   |     |     |  |  |
| RM 2B                      | 850  | 800                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 2C                      | 1050 | 1000                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 3                       | 400  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4Y                      | 150  | 100                      | 2.5                    | 150                                    |                         |                        |                          | 2.5                                    | 10                                      | 100 (150°C)                                        |                           | ⑧                  | 1.0       |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4Z                      | 250  | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4                       | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4B                      | 850  | 800                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4C                      | 1050 | 1000                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RM 4AM                     | 650  | 600                      | 1.8(3.0)               | 350                                    |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RO 2Z                      | 250  | 200                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RO 2                       | 450  | 400                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RO 2A                      | 650  | 600                      |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |
| RO 2B                      | 850  | 800                      | 1.2                    | 80                                     | - 40 ~ + 130            |                        | 0.92                     | 1.5                                    |                                         |                                                    |                           | ⑨                  | 0.61      | ○      |                  |  |  |  |  |   |     |     |  |  |
| RO 2C                      | 1050 | 1000                     |                        |                                        |                         |                        |                          |                                        |                                         |                                                    |                           |                    |           |        |                  |  |  |  |  |   |     |     |  |  |

○ : Available

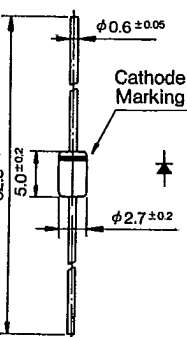
Outline Drawing ①



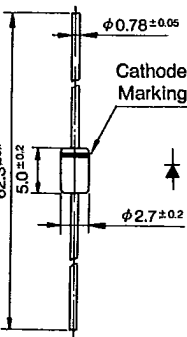
Outline Drawing ②



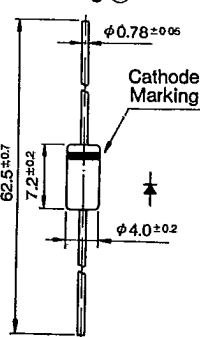
Outline Drawing ③



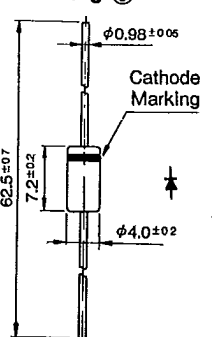
Outline Drawing ④



Outline Drawing ⑤



Outline Drawing ⑥



①~⑧. Plastic Molded : UL94V-O or Equivalent

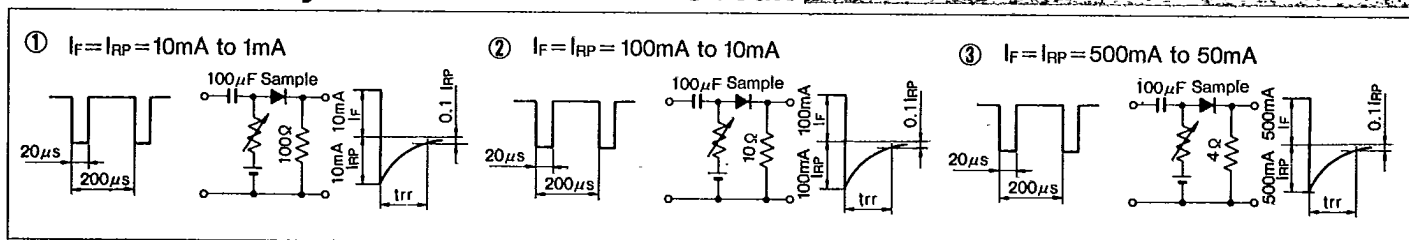


# Symbols/trr Measurement Circuit

## 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               | $I_t^2$       | $I_t^2$ 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

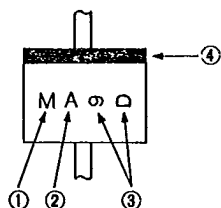
| Designation                                | Dimension (in mm)                                                                                                                                                                                                                                                                   | Packaging Dimension and Marking | Quantity                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------|
| <b>V</b><br><br>Add Suffix [V] to Type No. | <b>Tape Carrier Method</b> <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> | <b>Reel</b>                     | 1,800 pcs per reel                                                               |
| <b>V</b><br><br>Add Suffix [V] to type No. | <b>Axial Taping</b>                                                                                                                                                                                                                                                                 | <b>Reel</b>                     | 5,000 pcs per reel (2.7 $\phi$ body)<br><br>3,000 pcs per reel (4.0 $\phi$ body) |

## Taping Specifications

| Designation                                     | Dimension (in mm)                              | Packaging Dimension and Marking | Quantity                                                                             |
|-------------------------------------------------|------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
| <b>V1</b><br><br>Add Suffix [V1]<br>to Type No. | Axial Taping<br>                               | Ammunition Pack<br>             | 2,000 pcs per<br>box (2.7 $\phi$ body)<br><br>1,000 pcs per<br>box (4.0 $\phi$ body) |
| <b>VO</b><br><br>Add Suffix [VO]<br>to Type No. | Axial Taping<br>                               | Ammunition Pack<br>             | 2,000 pcs per<br>box (2.7 $\phi$ body)<br>(2.4 $\phi$ body)                          |
| <b>V3</b><br><br>Add Suffix [V3]<br>to Type No. | Axial Taping<br>                               | Reel<br>                        | 1,500 pcs per<br>reel (5.2 $\phi$ body)                                              |
| <b>V4</b><br><br>Add Suffix [V4]<br>to Type No. | Axial Taping<br>                               | Ammunition Pack<br>             | 1,000 pcs per<br>box (5.2 $\phi$ body)                                               |
| <b>W</b><br><br>Add Suffix [W]<br>to Type No.   | Radial Taping<br>                              | Ammunition Pack<br>             | 4,000 pcs per<br>box (2.7 $\phi$ body)<br>(0.6 $\phi$ lead)                          |
| <b>WS</b><br><br>Add Suffix [WS]<br>to Type No. | Radial Taping<br>(Applicable to AO Series)<br> | Ammunition Pack<br>             | 2,500 pcs per<br>box (2.4 $\phi$ body)                                               |
| <b>WK</b><br><br>Add Suffix [WK]<br>to Type No. | Radial Taping<br>(Applicable to AO Series)<br> |                                 |                                                                                      |

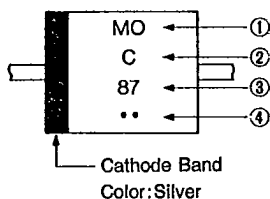
# Marking Guide

## 1 Small TMD



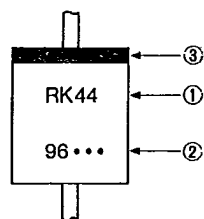
- ① Type Designation (in abbreviation)  
AM01 is abbreviated as M.
- ② Class Designation  
Z: 200V, No Letter: 400V, A: 600V
- ③ A: Year (Last Number of AD Year)  
B: Month (Jan. to Sept. are represented by numbers 1 to 9 respectively, and Oct., Nov., and Dec. are abbreviated as O, N and D respectively)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

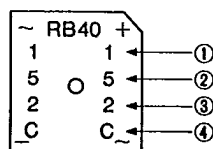
## 3 R Type TMD



- 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

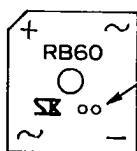
## 4 RB40/60

(RB40 Series)



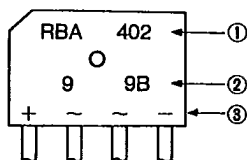
- ① Peak Reverse Voltage Designation  
1, 2, 4, 6, C  
Production Period
- ② Year (Last Number of AD Year)
- ③ Month (1~9, O, N, D)
- ④ Divided in 3 ten day terms  
A: 1st 10days, B: 2nd 10days  
C: 3rd 10days  
Color Designation: Silver

(RB60 Series)



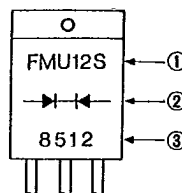
Dot Designation RB601 Violet  
RB602 No Color  
RB604 Blue  
RB606 White

## 5 RBV/RBA



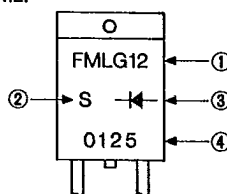
- ① Type Designation
- ② Lot Number  
1st : Year (Last Number of AD Year)  
2nd: Month (1~9, O, N, D)  
3rd : Divided 1~3 ten day Terms  
A: 1st 10 days B: 2nd 10 days  
C: 3rd 10 days
- ③ In-Put Designation

## 6 TO220 Type (FM or CT Type)



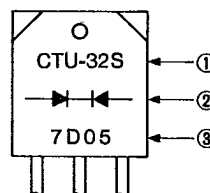
- ① Type Designation  
Show FMU-12S as FMU12S.
- ② Polarity: Rectifier Symbols
- ③ Lot Number (Laser Marking)  
1st : Year (Last Number of AD Year)  
2nd : Month (0~9, O, N, D)  
3rd, 4th: Day

## 7 TO220 Type (FM or CT Type, single chip)



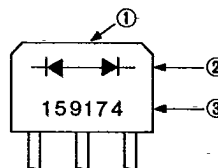
- ① Type Designation: Omit Last Letter  
Show FML-G12S as FMLG12.
- ② Last Letter of Type Designation
- ③ Polarity: Rectifier Symbols
- ④ Lot Number (Laser Marking)  
1st : Year (Last Number of AD Year)  
2nd : Month (0~9, O, N, D)  
3rd, 4th: Day

## 8 TO3P Type (FM or CT Type)



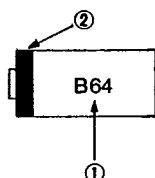
- ① Type shown in full designation  
However, CTB-34/34S/34M are marked as CTB-34, CTU-G3DR is marked as CTUG3DR.
- ② Polarity: Rectifier Symbols
- ③ Lot Number:  
1) M, U, G and L Types  
First Number : Last Digit of AD Year  
Second Number : Month  
Third and Fourth Numbers: Day  
Fifth Number : None  
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