

# MBR60L45CTG, MBR60L45WTG

## SWITCHMODE™ Power Rectifier 45 V, 60 A

### Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- 60 A Total (30 A Per Diode Leg)
- Guard-Ring for Stress Protection

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight (Approximately): 1.9 Grams (TO-220)  
4.3 Grams (TO-247)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Max. for 10 Seconds
- Shipped 50 Units Per Plastic Tube for TO-220  
and 30 Units Per Plastic Tube for TO-247
- This is a Pb-Free Device

### MAXIMUM RATINGS

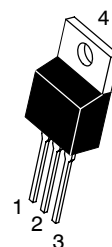
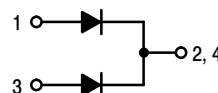
Please See the Table on the Following Page



ON Semiconductor®

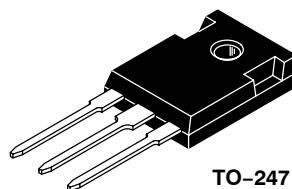
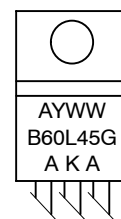
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIERS 60 AMPERES, 45 VOLTS

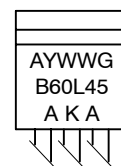


TO-220  
CASE 221A  
PLASTIC

### MARKING DIAGRAMS



TO-247  
CASE 340L  
PLASTIC



B60L45 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
AKA = Polarity Designator  
G = Pb-Free Device

### ORDERING INFORMATION

| Device      | Package             | Shipping      |
|-------------|---------------------|---------------|
| MBR60L45CTG | TO-220<br>(Pb-Free) | 50 Units/Rail |
| MBR60L45WTG | TO-247<br>(Pb-Free) | 30 Units/Rail |

# MBR60L45CTG, MBR60L45WTG

## MAXIMUM RATINGS (Per Diode Leg)

| Rating                                                                                                                                                        | Symbol                          | Value           | Unit               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------|--------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                                                                        | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 45              | V                  |
| Average Rectified Forward Current<br>(Rated $V_R$ ) $T_C = 145^{\circ}\text{C}$ for MBR60L45CTG<br>(Rated $V_R$ ) $T_C = 165^{\circ}\text{C}$ for MBR60L45WTG | $I_{F(AV)}$                     | 30              | A                  |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz)                                                                                        | $I_{FRM}$                       | 60              | A                  |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz)                                                    | $I_{FSM}$                       | 200             | A                  |
| Operating Junction Temperature (Note 1)                                                                                                                       | $T_J$                           | -65 to +175     | $^{\circ}\text{C}$ |
| Storage Temperature                                                                                                                                           | $T_{stg}$                       | -65 to +175     | $^{\circ}\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )                                                                                                                         | $dv/dt$                         | 10,000          | V/ $\mu\text{s}$   |
| ESD Ratings: Machine Model = C<br>Human Body Model = 3B                                                                                                       |                                 | > 400<br>> 8000 | V                  |

## THERMAL CHARACTERISTICS

|                                                                                                    |                                    |             |                      |
|----------------------------------------------------------------------------------------------------|------------------------------------|-------------|----------------------|
| Maximum Thermal Resistance<br>(MBR60L45CTG) - Junction-to-Case<br>(MBR60L45WTG) - Junction-to-Case | $R_{\theta JC}$<br>$R_{\theta JC}$ | 1.9<br>0.59 | $^{\circ}\text{C/W}$ |
|----------------------------------------------------------------------------------------------------|------------------------------------|-------------|----------------------|

## ELECTRICAL CHARACTERISTICS (Per Diode Leg)

|                                                                                                                                                                                                                                                                                  |       |                              |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|----|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $I_F = 30\text{ A}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $I_F = 30\text{ A}$ , $T_C = 125^{\circ}\text{C}$ )<br>( $I_F = 60\text{ A}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $I_F = 60\text{ A}$ , $T_C = 125^{\circ}\text{C}$ ) | $V_F$ | 0.55<br>0.53<br>0.73<br>0.76 | V  |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated DC Voltage, $T_C = 25^{\circ}\text{C}$ )<br>(Rated DC Voltage, $T_C = 125^{\circ}\text{C}$ )                                                                                                                            | $I_R$ | 1.2<br>275                   | mA |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .
2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# MBR60L45CTG, MBR60L45WTG

## TYPICAL CHARACTERISTICS

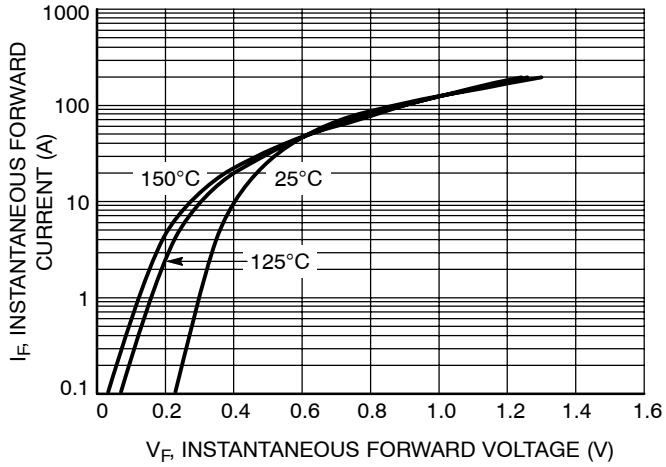


Figure 1. Typical Forward Voltage

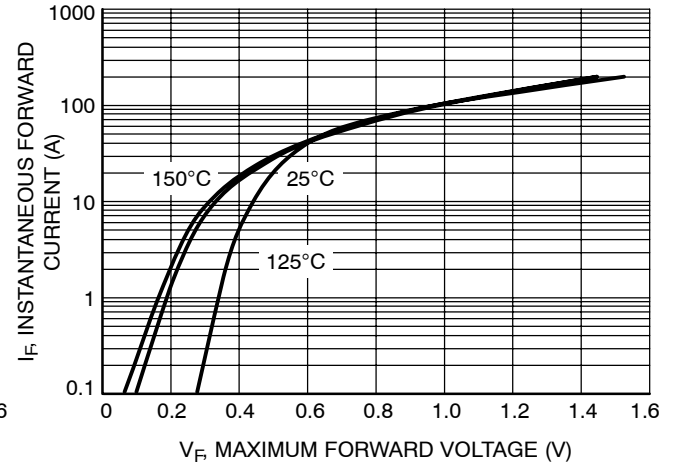


Figure 2. Maximum Forward Voltage

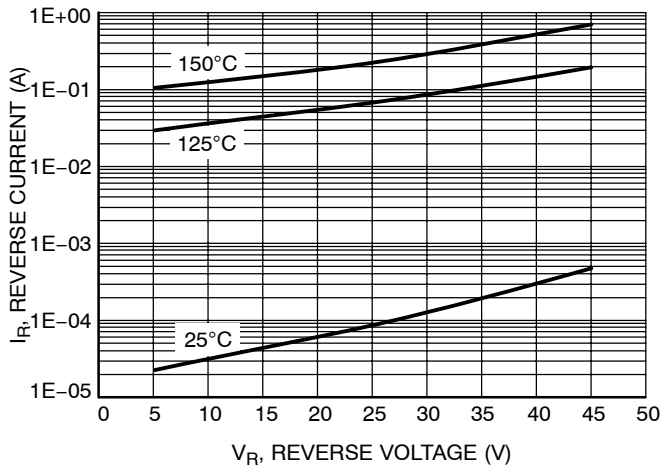


Figure 3. Typical Reverse Current

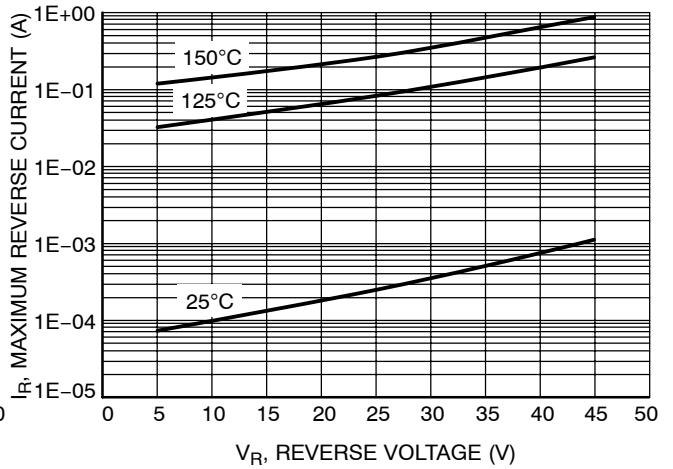


Figure 4. Maximum Reverse Current

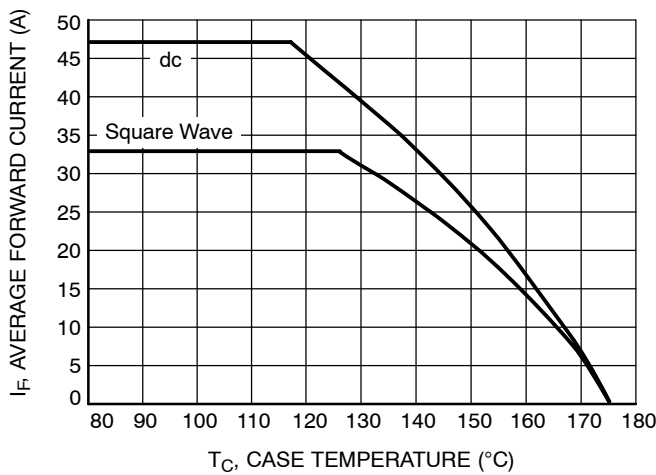


Figure 5. Current Derating for MBR60L45CTG

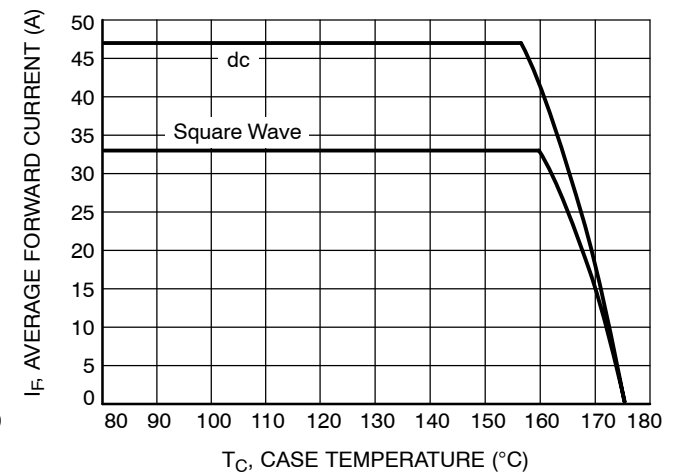


Figure 6. Current Derating for MBR60L45WTG

# MBR60L45CTG, MBR60L45WTG

## TYPICAL CHARACTERISTICS

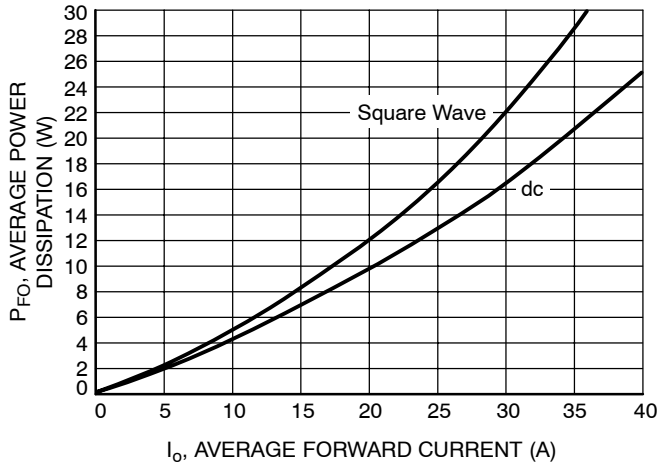


Figure 7. Forward Power Dissipation

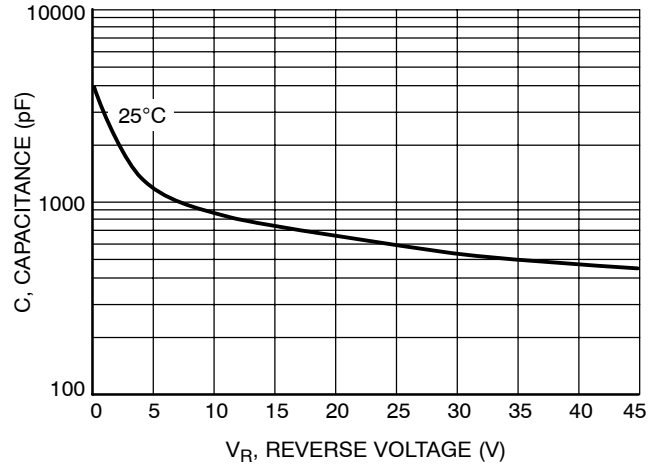


Figure 8. Capacitance

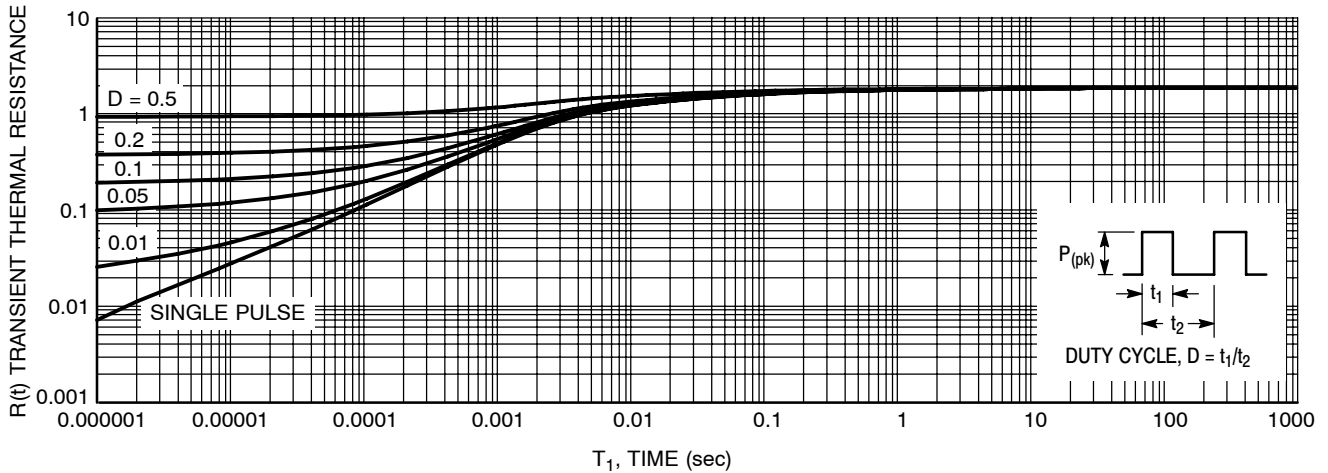


Figure 9. Thermal Response  
Junction-to-Case for MBR60L45CTG

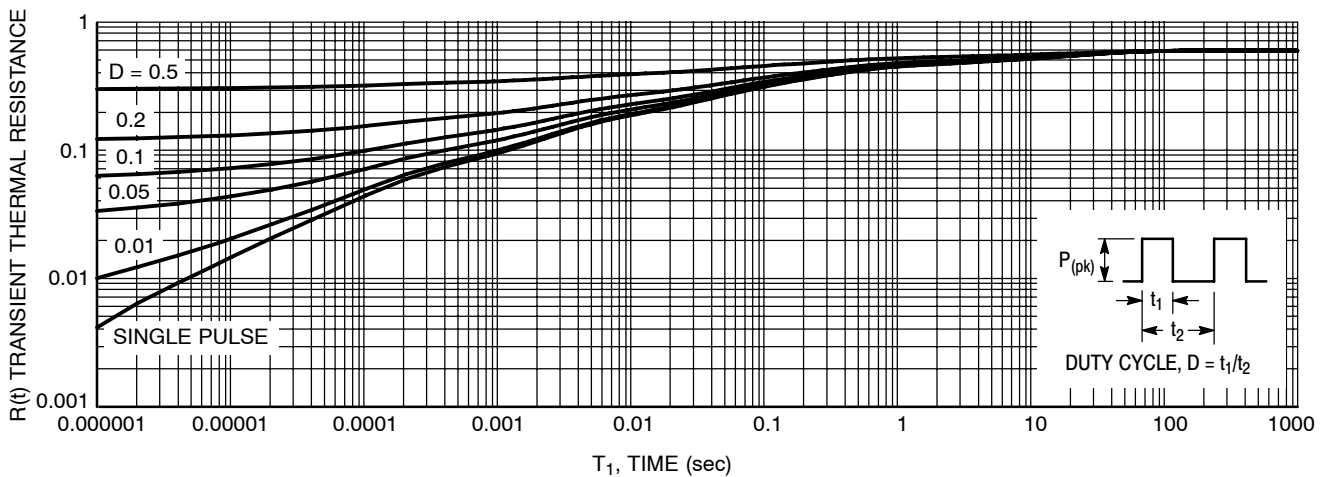
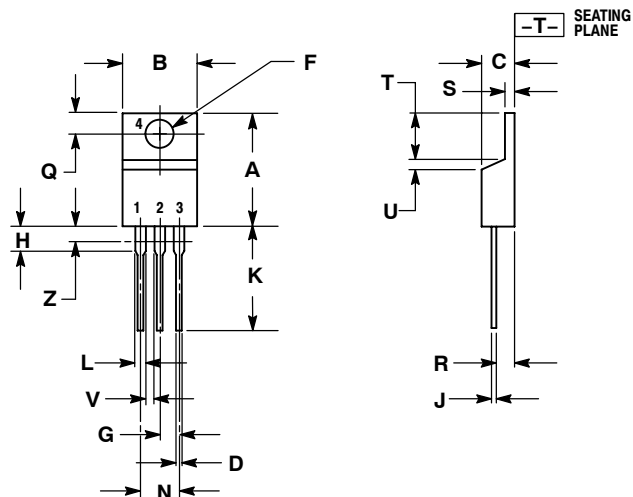


Figure 10. Thermal Response  
Junction-to-Case for MBR60L45WTG

# MBR60L45CTG, MBR60L45WTG

## PACKAGE DIMENSIONS

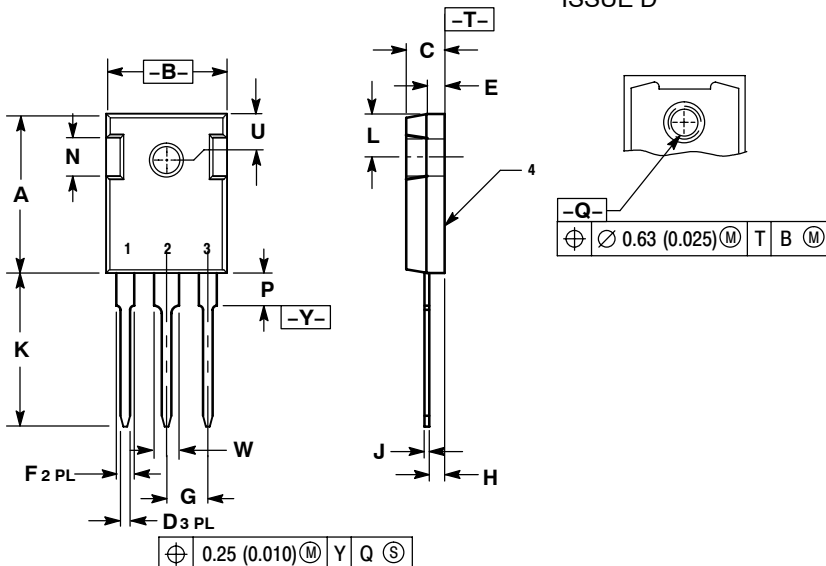
### TO-220 CASE 221A-09 ISSUE AD



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.570  | 0.620 | 14.48       | 15.75 |
| B   | 0.380  | 0.405 | 9.66        | 10.28 |
| C   | 0.160  | 0.190 | 4.07        | 4.82  |
| D   | 0.025  | 0.035 | 0.64        | 0.88  |
| F   | 0.142  | 0.147 | 3.61        | 3.73  |
| G   | 0.095  | 0.105 | 2.42        | 2.66  |
| H   | 0.110  | 0.155 | 2.80        | 3.93  |
| J   | 0.018  | 0.025 | 0.46        | 0.64  |
| K   | 0.500  | 0.562 | 12.70       | 14.27 |
| L   | 0.045  | 0.060 | 1.15        | 1.52  |
| N   | 0.190  | 0.210 | 4.83        | 5.33  |
| Q   | 0.100  | 0.120 | 2.54        | 3.04  |
| R   | 0.080  | 0.110 | 2.04        | 2.79  |
| S   | 0.045  | 0.055 | 1.15        | 1.39  |
| T   | 0.235  | 0.255 | 5.97        | 6.47  |
| U   | 0.000  | 0.050 | 0.00        | 1.27  |
| V   | 0.045  | ---   | 1.15        | ---   |
| Z   | ---    | 0.080 | ---         | 2.04  |

### TO-247 CASE 340L-02 ISSUE D



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.

| DIM | MILLIMETERS        |       | INCHES |       |
|-----|--------------------|-------|--------|-------|
|     | MIN                | MAX   | MIN    | MAX   |
| A   | 20.32              | 21.08 | 0.800  | 0.830 |
| B   | 15.75              | 16.26 | 0.620  | 0.640 |
| C   | 4.70               | 5.30  | 0.185  | 0.209 |
| D   | 1.00               | 1.40  | 0.040  | 0.055 |
| E   | 2.20               | 2.60  | 0.087  | 0.102 |
| F   | 1.65               | 2.13  | 0.065  | 0.084 |
| G   | 5.45 BSC 0.215 BSC |       |        |       |
| H   | 1.50               | 2.49  | 0.059  | 0.098 |
| J   | 0.40               | 0.80  | 0.016  | 0.031 |
| K   | 20.06              | 20.83 | 0.790  | 0.820 |
| L   | 5.40               | 6.20  | 0.212  | 0.244 |
| N   | 4.32               | 5.49  | 0.170  | 0.216 |
| P   | ---                | 4.50  | ---    | 0.177 |
| Q   | 3.55               | 3.65  | 0.140  | 0.144 |
| U   | 6.15 BSC 0.242 BSC |       |        |       |
| W   | 2.87               | 3.12  | 0.113  | 0.123 |

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