

# MBR30L45CTG, MBRF30L45CTG

## SWITCHMODE™ Power Rectifier 45 V, 30 A

### Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 150°C Operating Junction Temperature
- 30 A Total (15 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
- 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
- This is a Pb-Free Device\*

### MAXIMUM RATINGS

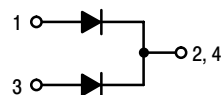
Please See the Table on the Following Page



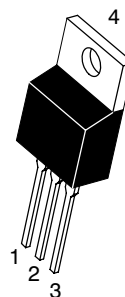
ON Semiconductor®

<http://onsemi.com>

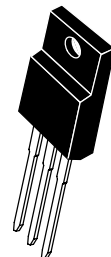
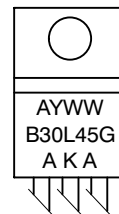
## DUAL SCHOTTKY BARRIER RECTIFIERS 30 AMPERES, 45 VOLTS



### MARKING DIAGRAMS



TO-220  
CASE 221A  
PLASTIC



TO-220  
CASE 221D  
STYLE 3



B30L45 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
AKA = Polarity Designator  
G = Pb-Free Device

### ORDERING INFORMATION

| Device       | Package               | Shipping      |
|--------------|-----------------------|---------------|
| MBR30L45CTG  | TO-220<br>(Pb-Free)   | 50 Units/Rail |
| MBRF30L45CTG | TO-220FP<br>(Pb-Free) | 50 Units/Rail |

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MBR30L45CTG, MBRF30L45CTG

## 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 $V_R$ ) $T_C = 137^\circ\text{C}$                              | $I_{F(AV)}$                     | 15              | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz)                                     | $I_{FRM}$                       | 30              | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 190             | A                |
| Operating Junction Temperature (Note 1)  | $T_J$                           | -55 to +150     | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$                       | -55 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>(MBR30L45CTG) | Junction-to-Case    | $R_{\theta JC}$ | 1.9 | $^\circ\text{C/W}$ |
|   | Junction-to-Ambient | $R_{\theta JA}$ | 45  |                    |
| (MBRF30L45CTG)                              | Junction-to-Case    | $R_{\theta JC}$ | 2.2 |                    |

## ELECTRICAL CHARACTERISTICS (Per Diode Leg)

|  |       |                              |    |
|--|-------|------------------------------|----|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $I_F = 15\text{ A}$ , $T_C = 25^\circ\text{C}$ )<br>( $I_F = 15\text{ A}$ , $T_C = 125^\circ\text{C}$ )<br>( $I_F = 30\text{ A}$ , $T_C = 25^\circ\text{C}$ )<br>( $I_F = 30\text{ A}$ , $T_C = 125^\circ\text{C}$ ) | $V_F$ | 0.50<br>0.44<br>0.61<br>0.60 | V  |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated DC Voltage, $T_C = 25^\circ\text{C}$ )<br>(Rated DC Voltage, $T_C = 125^\circ\text{C}$ )  | $i_R$ | 0.65<br>250                  | 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.

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

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## TYPICAL CHARACTERISTICS

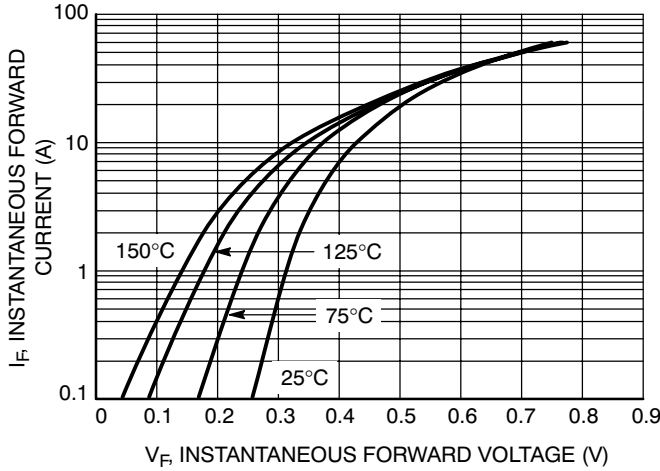


Figure 1. Typical Forward Voltage

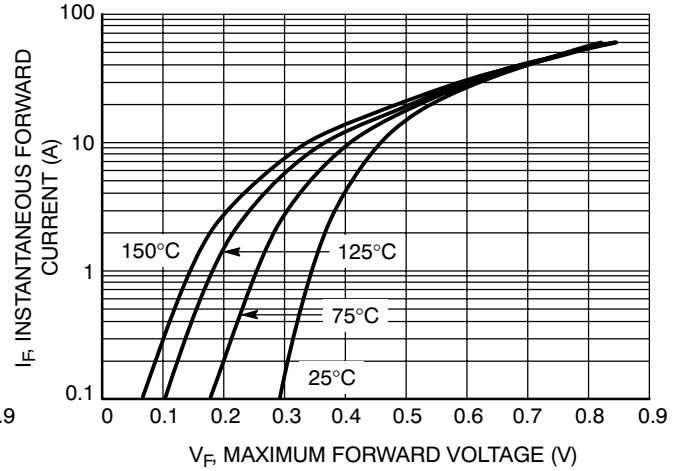


Figure 2. Maximum Forward Voltage

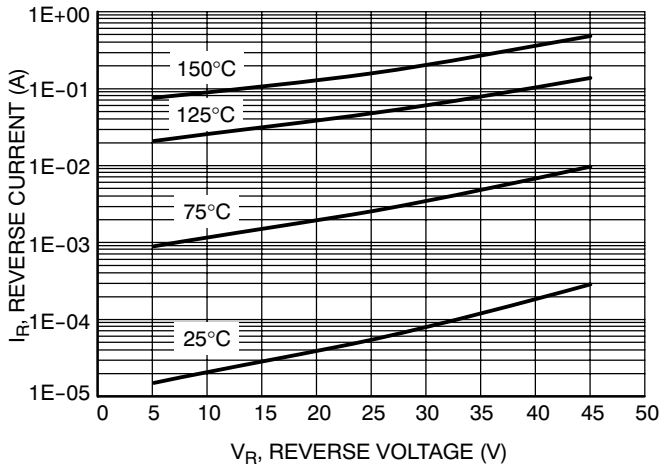


Figure 3. Typical Reverse Current

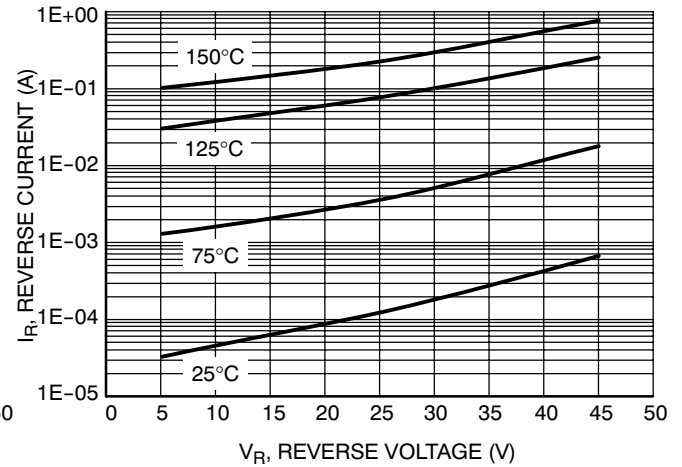


Figure 4. Maximum Reverse Current

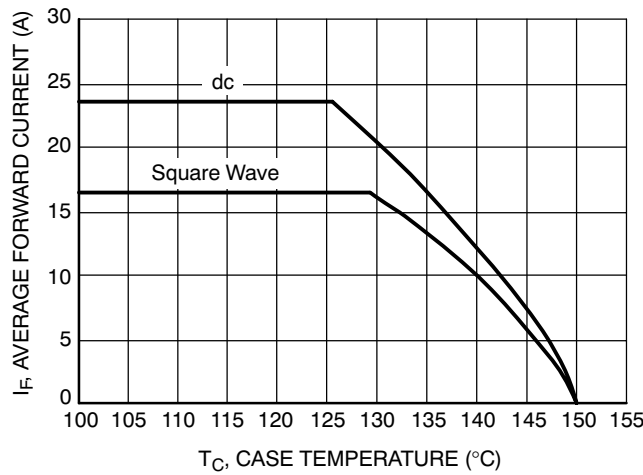


Figure 5. Current Derating

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## TYPICAL CHARACTERISTICS

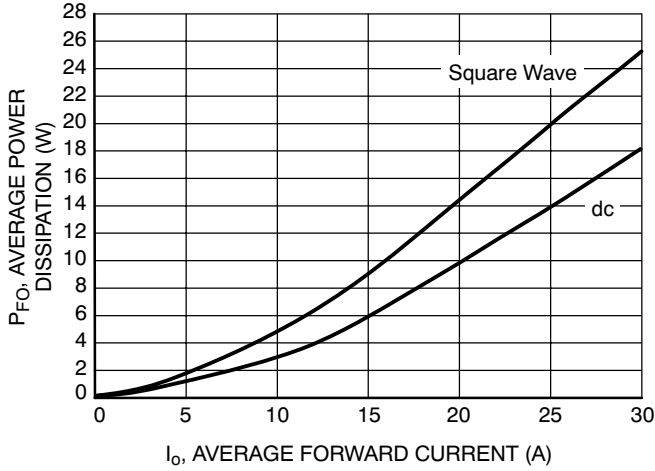


Figure 6. Forward Power Dissipation

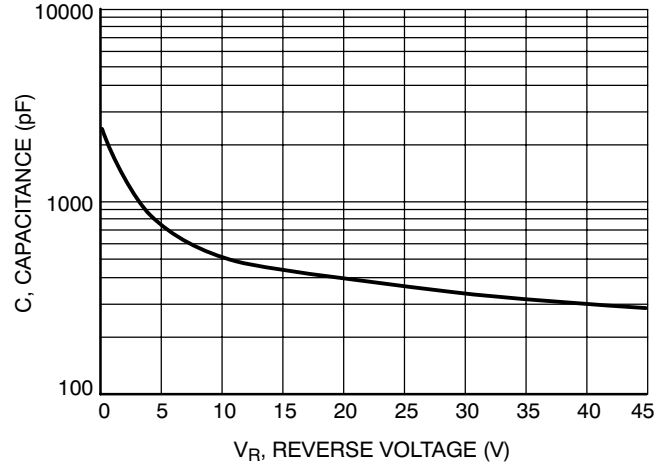


Figure 7. Typical Capacitance

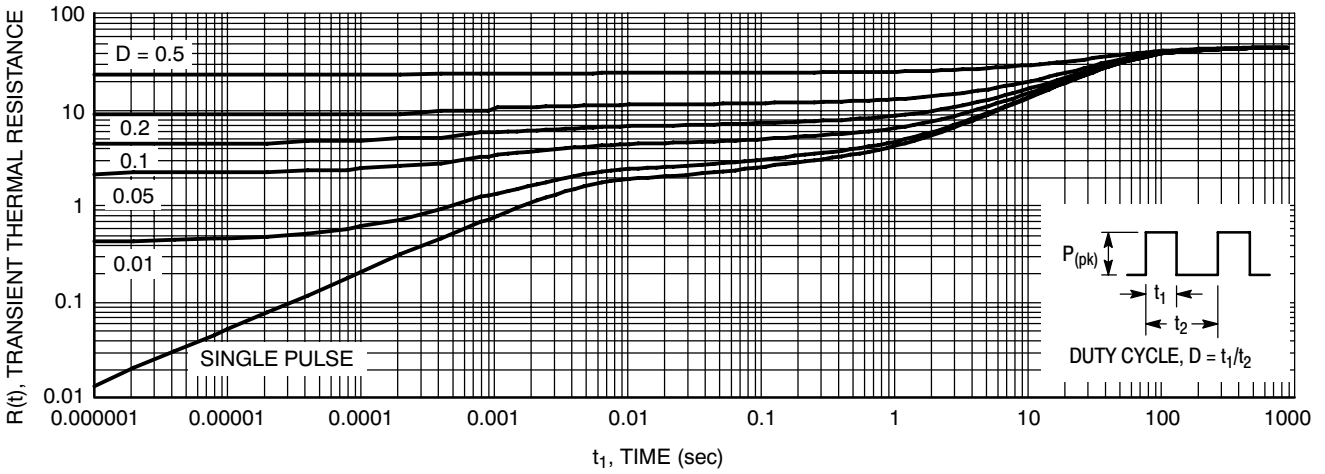


Figure 8. Thermal Response Junction-to-Ambient for MBR30L45CTG

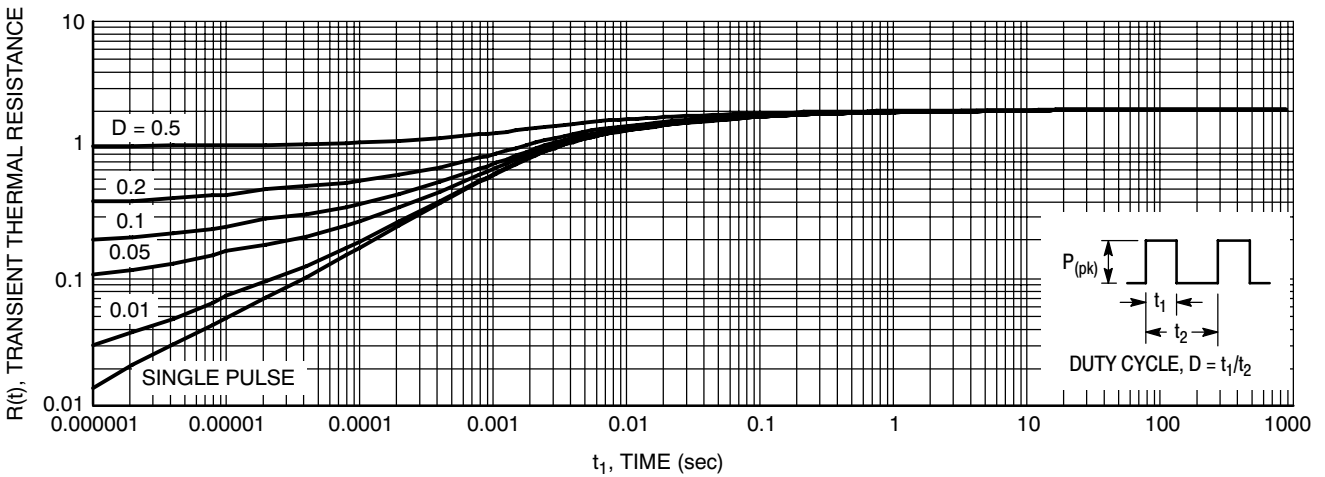


Figure 9. Thermal Response Junction-to-Case for MBR30L45CTG

# MBR30L45CTG, MBRF30L45CTG

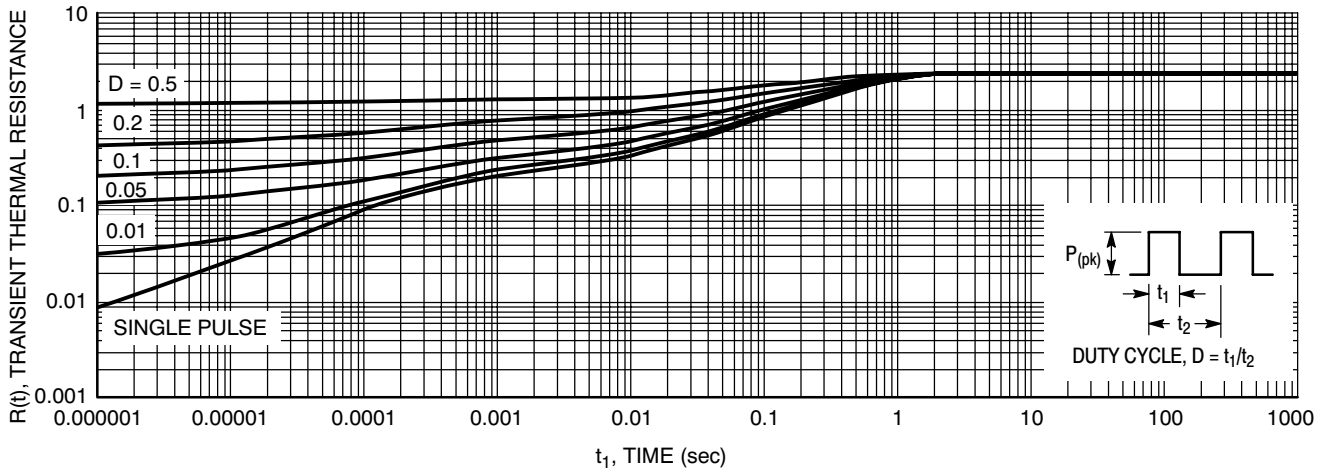
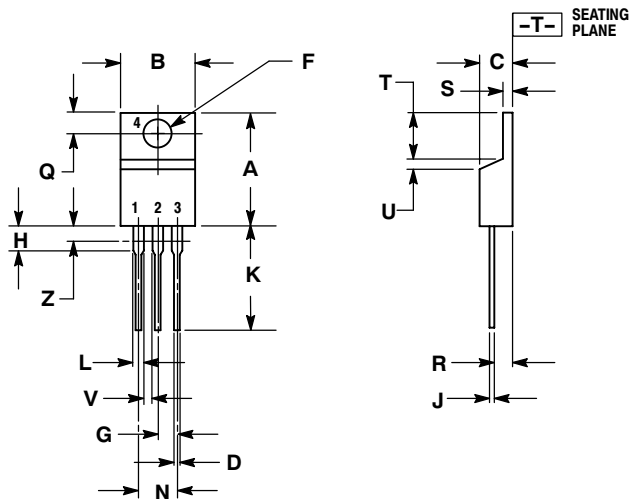


Figure 10. Thermal Response Junction-to-Case for MBRF30L45CTG

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## PACKAGE DIMENSIONS

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

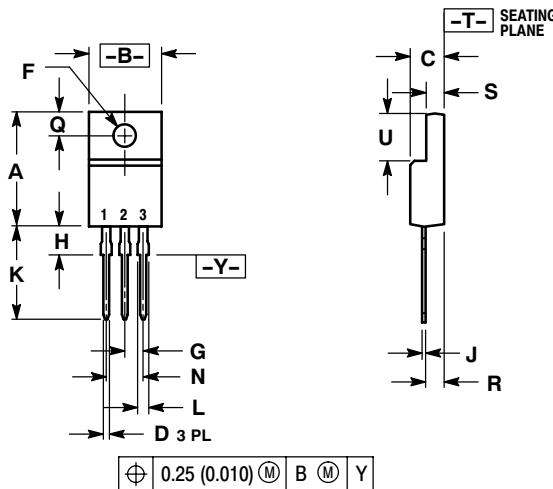


NOTES:

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-220 FULLPAK CASE 221D-03 ISSUE H



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D-01 THRU 221D-02 OBSOLETE, NEW STANDARD 221D-03.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.625     | 0.635 | 15.88       | 16.12 |
| B   | 0.408     | 0.418 | 10.37       | 10.63 |
| C   | 0.180     | 0.190 | 4.57        | 4.83  |
| D   | 0.026     | 0.031 | 0.65        | 0.78  |
| F   | 0.116     | 0.119 | 2.95        | 3.02  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.125     | 0.135 | 3.18        | 3.43  |
| J   | 0.018     | 0.025 | 0.45        | 0.63  |
| K   | 0.530     | 0.540 | 13.47       | 13.73 |
| L   | 0.048     | 0.053 | 1.23        | 1.36  |
| N   | 0.200 BSC |       | 5.08 BSC    |       |
| Q   | 0.124     | 0.128 | 3.15        | 3.25  |
| R   | 0.099     | 0.103 | 2.51        | 2.62  |
| S   | 0.101     | 0.113 | 2.57        | 2.87  |
| U   | 0.238     | 0.258 | 6.06        | 6.56  |

STYLE 3:

1. ANODE
2. CATHODE
3. ANODE

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