

T-1 3/4 Sub-Miniature LED Replacement Lamp



Direct incandescent replacement LED lamp that delivers improved illumination, durability and long life. The T-1 3/4 Sub-Miniature LED lamps are drop in replacements for the less efficient filament lamps, typically used within pushbutton switches and indicators.



Key Features

- T-1 3/4 sub-miniature LED lamp (light bulb)
- Voltage: 2-28 VDC
- Base: bi-pin, bayonet, flange, groove, screw, wedge
- Available in six LED single colors: red, amber, green, orange, blue, white
- Available in one bi-color: red/green
- Low power consumption
- Mounts directly into industry standard sockets
- Single chip based LED
- Direct incandescent replacement
- Low power consumption - uses up to 90% less energy than an incandescent lamp
- Low heat generation, LEDs operate significantly cooler than traditional lamps
- Designed for quick installation and reduces overall cost due to less-frequent replacements
- Fast on/off cycling, shock resistance, and long operating life
- Compliant with RoHS and REACH

| 1 Model ^[1] | |
|------------------------|---------|
| BP202 ^[5] | Bi-Pin |
| MB200 | Bayonet |
| MF200 ^[6] | Flange |
| MG200 | Groove |
| MS200 | Screw |
| WB201 | Wedge |

TO ORDER, FOLLOW THE EXAMPLE:

Select one **BOLD** component from each SHADED column in the tables below.

| 1 Model | 2 LED | 3 Voltage |
|---------|-------|-----------|
| WB201 | -BCG | 12H |

→Part Number **WB201-BCG12H**

| 2 MEDIUM INTENSITY - TINTED ENCAPSULATION | | | | | |
|---|-------|----------|-------------------------|---------------|--------------------------|
| LED | Color | λpk (nm) | Iv ^[2] (mcd) | Viewing Angle | V/C Table ^[3] |
| -BCR | RED | 635 | 120 | 35 | I |
| -BCA | AMB | 583 | 100 | 35 | I |
| -BCG | GRN | 565 | 80 | 24 | I |

| Voltage/Current | |
|--------------------|------------|
| Design Vf/If | Max Vf/If |
| V/C Table I | |
| 5V/22mA | 5.5V/28mA |
| 6V/21mA | 7V/27mA |
| 12V/20mA | 14V/25mA |
| 15V/24mA | 16.5V/28mA |
| 24V/17mA | 26V/20mA |
| 28V/16.5mA | 30V/18mA |

| 3 Voltage ^[4] | |
|--------------------------|--|
| 2 | |
| 5H | |
| 6H | |
| 12H | |
| 15H | |
| 24H | |
| 28H | |
| 120 | |

| HIGH INTENSITY- WATERCLEAR ENCAPSULATION | | | | | |
|--|-------|----------|-------------------------|---------------|--------------------------|
| LED | Color | λpk (nm) | Iv ^[2] (mcd) | Viewing Angle | V/C Table ^[3] |
| -NWR | RED | 634 | 2800 | 30 | I |
| -NWO | ORG | 605 | 2000 | 30 | I |
| -NWA | AMB | 592 | 2800 | 30 | I |
| -NWG | GRN | 520 | 2400 | 45 | II |
| -NWB | BLU | 465 | 700 | 45 | II |
| -NWW | CWHT | | 2500 | 50 | II |
| -NWL | WWHT | | 1800 | 50 | II |
| -NKR | RED | 634 | 3600 | 15 | I |
| -NKO | ORG | 605 | 8000 | 15 | I |
| -NKA | AMB | 592 | 3600 | 15 | I |
| -NKG | GRN | 520 | 10000 | 15 | II |
| -NKB | BLU | 465 | 3000 | 15 | II |
| -NKW | CWHT | | 9200 | 20 | II |
| -NKL | WWHT | | 9200 | 15 | II |

| Voltage/Current | |
|---------------------|------------|
| Design Vf/If | Max Vf/If |
| V/C Table II | |
| 5V/15mA | 5.5V/23mA |
| 6V/15mA | 7V/25mA |
| 12V/15mA | 14V/20mA |
| 15V/15mA | 16.5V/18mA |
| 24V/15mA | 26V/18mA |
| 28V/15mA | 30V/17mA |

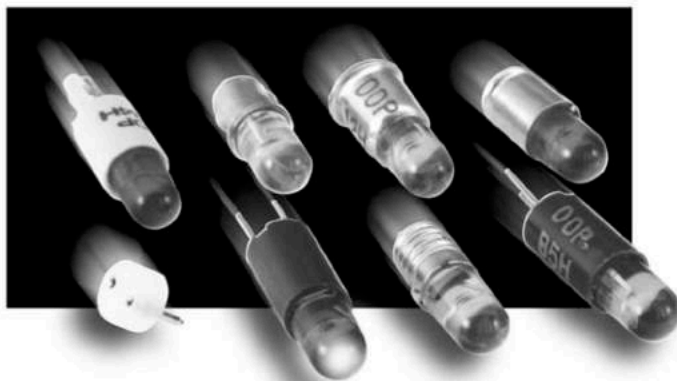
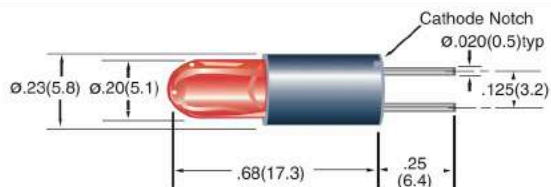
| WIDE ANGLE/FLAT-TOPPED-WATERCLEAR ENCAPSULATION | | | | | |
|---|-------|----------|-------------------------|---------------|--------------------------|
| LED | Color | λpk (nm) | Iv ^[2] (mcd) | Viewing Angle | V/C Table ^[3] |
| -NFR | RED | 634 | 780 | 75 | I |
| -NFA | AMB | 592 | 600 | 75 | I |
| -NFG | GRN | 520 | 780 | 75 | II |
| -NFB | BLU | 465 | 168 | 75 | II |
| -NFW | WHT | | 280 | 75 | II |

| SPECIALTY LEDs | | | | | | |
|---------------------|---------|----------|-------------------------|---------------|--------------------------|-----------------------|
| LED | Color | λpk (nm) | Iv ^[2] (mcd) | Viewing Angle | V/C Table ^[3] | Description |
| -RLP ^[7] | RED | 635 | 2.3 | 50 | [3] | Low Power |
| -ALP ^[7] | AMB | 583 | 2.1 | 50 | [3] | Low Power |
| -GLP ^[7] | GRN | 565 | 2.3 | 50 | [3] | Low Power |
| -LRG ^[8] | RED/GRN | 660/565 | 90/40 | 60 | I | Bi-Color, Red Cathode |

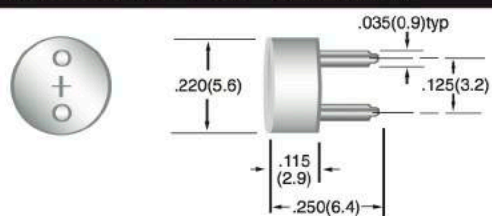
[1] All Models are center anode (note cathode notch for BP202, BP203 and WB201). Insert C after Model for center cathode (e.g. MF200C).
 [2] Iv = typical luminous intensity @ If = 20mA (Ta=25°C). Low Power LEDs = 2mA.
 [3] See Voltage/Current table for design specifications. Design current for low power LEDs = 2mA.
 [4] Ta = 25°C. Voltage 2 indicates external resistor required. Voltages 5H through 28H are VDC. For AC operation, insert D after Voltage (e.g. 24HD). D indicates built-in rectifier: not required for 5H.

[5] Optional Socket available. See Model BPS-1 (pg. 72).
 [6] Optional Socket available. See Model MFS1-B (pg. 74).
 [7] Omit "H" Voltage designation (e.g. MG200-RLP12).
 [8] Cathode energized negative and anode positive lights red. Cathode energized positive and anode negative lights green.

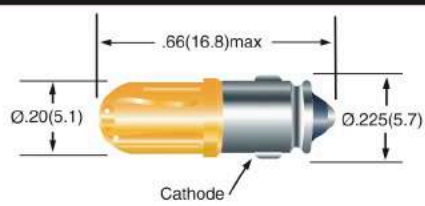
BP202



BPS-1 (Socket for BP202 Lamp)

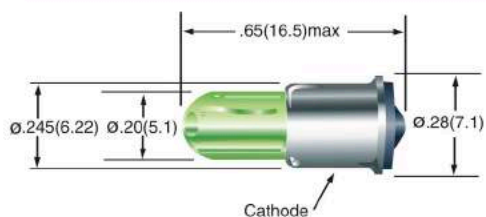


MB200



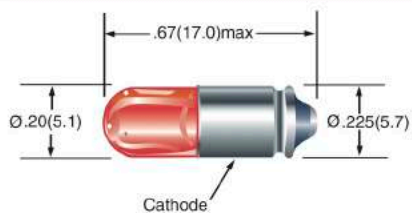
Available with Center Cathode

MF200



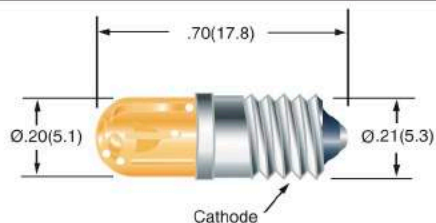
Available with Center Cathode

MG200



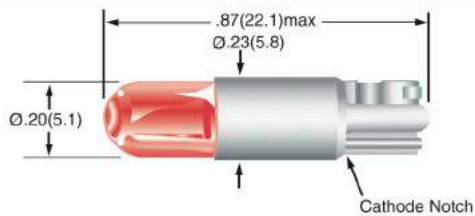
Available with Center Cathode

MS200



Available with Center Cathode

WB201

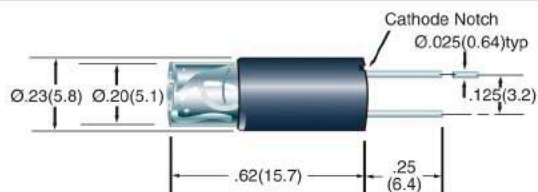


All dimensions are in inches (mm)

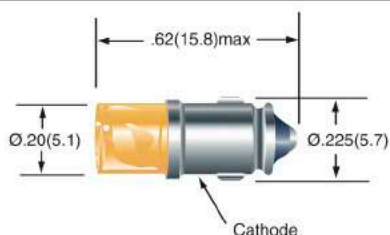
Tolerances: .xx"(.x) ±.025"(.63) / .xxx"(.xx)±.010"(.25)
Specifications are subject to change without notice.

Wide Angle LED Lamps

BP202, NFX Series (75°)

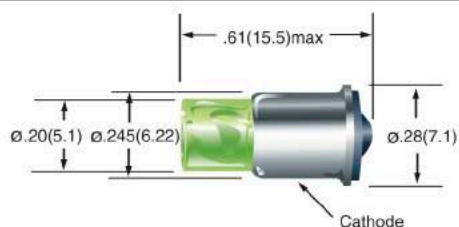


MB200, NFX Series (75°)



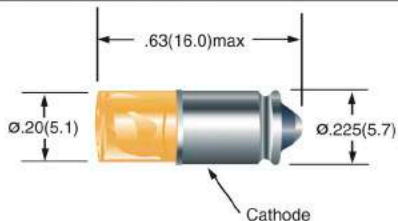
Available with Center Cathode

MF200, NFX Series (75°)



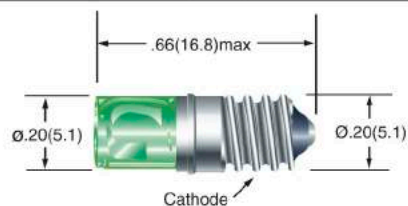
Available with Center Cathode

MG200, NFX Series (75°)



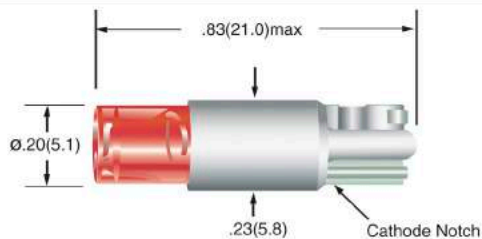
Available with Center Cathode

MS200, NFX Series (75°)



Available with Center Cathode

WB201, NFX Series (75°)



All dimensions are in inches (mm)

Tolerances: .xx"(x) ±.025"(.63) / .xxx"(xx)±.010"(.25)
Specifications are subject to change without notice.

| Series | LED | Voltage | Operating Temp (°C) | Storage Temp (°C) |
|--------------------------------|-----|---------|---------------------|-------------------|
| T-1 3/4 Sub-miniature LED lamp | NFR | - | -30 to +60 | -40 to +100 |
| | NFA | - | -30 to +60 | -40 to +100 |
| | NFG | - | -30 to +60 | -40 to +100 |
| | NFW | - | -30 to +60 | -40 to +100 |
| | NFB | - | -30 to +60 | -40 to +100 |
| | NWR | 24H | -40 to +100 | -40 to +100 |
| | NWR | 28H | -40 to +100 | -40 to +120 |
| | NWW | 24H | -30 to +85 | -40 to +100 |
| | NWW | 28H | -30 to +80 | -40 to +100 |
| | NWG | 24H | -30 to +85 | -40 to +100 |
| | NWG | 28H | -20 to +80 | -30 to +100 |
| | NWA | 24H | -40 to +100 | -40 to +100 |
| | NWA | 28H | -40 to +100 | -40 to +120 |
| | NWB | 24H | -30 to +85 | -40 to +100 |
| | NWB | 28H | -20 to +80 | -30 to +100 |
| | BCG | - | -20 to +100 | -55 to +100 |
| | BCR | - | -55 to +100 | -55 to +100 |
| | BCA | - | -55 to +100 | -55 to +100 |

***MF200-NFA120**: Operating voltage: 120VAC, Max Voltage: 130VAC, Forward current: 3.4~3.6mA,
Max current: 4.0mA

* For operating temperature of a specific part number contact VCC

| Incandescent Lamp # | Design Voltage | Base Description | VCC Model # | Suggested VCC Part Number |
|---------------------|----------------|----------------------|-------------|---------------------------|
| 2314 | 28 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX28H |
| 2324 | 28 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX28H |
| 2335 | 14 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX15H |
| 2337 | 6.3VAC | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 3149 | 5 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX5H |
| 7001 | 24 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX24H |
| 7003 | 24 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX24H |
| 7327 | 28 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX28H |
| 7328 | 6 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 7330 | 14 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX15H |
| 7349 | 6.3VAC | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 7361 | 5 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX5H |
| 7371 | 12 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX12H |
| 7373 | 14 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX15H |
| 7376 | 28 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX28H |
| 7377 | 6.3VAC | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 7380 | 6.3VAC | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 7381 | 6.3VAC | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 7382 | 14 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX15H |
| 7387 | 28 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX28H |
| 7876 | 28 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX28H |
| 7945 | 6 | Sub-Miniature Bi-Pin | BP202 | BP202-NFX6H |
| 327 | 28 | Sub-Miniature Flange | MF200 | MF200-NFX28H |
| 328 | 6 | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 330 | 14 | Sub-Miniature Flange | MF200 | MF200-NFX15H |
| 345 | 6 | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 349 | 6.3VAC | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 350 | 6.3VAC | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 370 | 18 | Sub-Miniature Flange | MF200 | MF200-NFX24H |
| 376 | 28 | Sub-Miniature Flange | MF200 | MF200-NFX28H |
| 377 | 6.3VAC | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 380 | 6.3VAC | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 381 | 6.3VAC | Sub-Miniature Flange | MF200 | MF200-NFX6H |
| 382 | 14 | Sub-Miniature Flange | MF200 | MF200-NFX15H |
| 385 | 28 | Sub-Miniature Flange | MF200 | MF200-NFX28H |
| 387 | 28 | Sub-Miniature Flange | MF200 | MF200-NFX28H |
| 394 | 12 | Sub-Miniature Flange | MF200 | MF200-NFX12H |
| 459 | 22 | Sub-Miniature Flange | MF200 | MF200-NFX24H |
| 7332 | 5 | Sub-Miniature Flange | MF200 | MF200-NFX5H |
| 7333 | 5 | Sub-Miniature Flange | MF200 | MF200-NFX5H |
| 7335 | 5 | Sub-Miniature Flange | MF200 | MF200-NFX5H |
| 7341 | 28 | Sub-Miniature Flange | MF200 | MF200-NFX28H |
| 8918 | 14 | Sub-Miniature Flange | MF200 | MF200-NFX15H |

| Incandescent Lamp # | Design Voltage | Base Description | VCC Model # | Suggested VCC Part Number |
|---------------------|----------------|----------------------|-------------|---------------------------|
| 334 | 28 | Sub-Miniature Groove | MG200 | MG200-NFX28H |
| 336 | 14 | Sub-Miniature Groove | MG200 | MG200-NFX15H |
| 337 | 6 | Sub-Miniature Groove | MG200 | MG200-NFX6H |
| 379 | 6.3VAC | Sub-Miniature Groove | MG200 | MG200-NFX6H |
| 386 | 14 | Sub-Miniature Groove | MG200 | MG200-NFX15H |
| 388 | 28 | Sub-Miniature Groove | MG200 | MG200-NFX28H |
| 398 | 6.3VAC | Sub-Miniature Groove | MG200 | MG200-NFX6H |
| 335 | 28 | Sub-Miniature Screw | MS200 | MS200-NFX28H |
| 342 | 6 | Sub-Miniature Screw | MS200 | MS200-NFX6H |
| 369 | 28 | Sub-Miniature Screw | MS200 | MS200-NFX28H |
| 373 | 14 | Sub-Miniature Screw | MS200 | MS200-NFX15H |
| 378 | 6.3VAC | Sub-Miniature Screw | MS200 | MS200-NFX6H |
| 383 | 14 | Sub-Miniature Screw | MS200 | MS200-NFX15H |
| 399 | 28 | Sub-Miniature Screw | MS200 | MS200-NFX28H |
| 17 | 28 | Sub-Miniature Groove | WB201 | WB201-NFX28H |
| 18 | 14 | Sub-Miniature Screw | WB201 | WB201-NFX15H |
| 37 | 14 | Sub-Miniature Screw | WB201 | WB201-NFX15H |
| 56 | 5 | Sub-Miniature Screw | WB201 | WB201-NFX5H |
| 73 | 14 | Sub-Miniature Screw | WB201 | WB201-NFX15H |
| 74 | 14 | Sub-Miniature Screw | WB201 | WB201-NFX15H |
| 79 | 6 | Sub-Miniature Screw | WB201 | WB201-NFX6H |
| 84 | 6.3VAC | Sub-Miniature Screw | WB201 | WB201-NFX6H |
| 85 | 28 | Sub-Miniature Screw | WB201 | WB201-NFX28H |
| 86 | 6.3VAC | Sub-Miniature Screw | WB201 | WB201-NFX6H |

Note: The X in the part number represent the LED color (Ex. WB201-NFA6H is with an Amber LED)