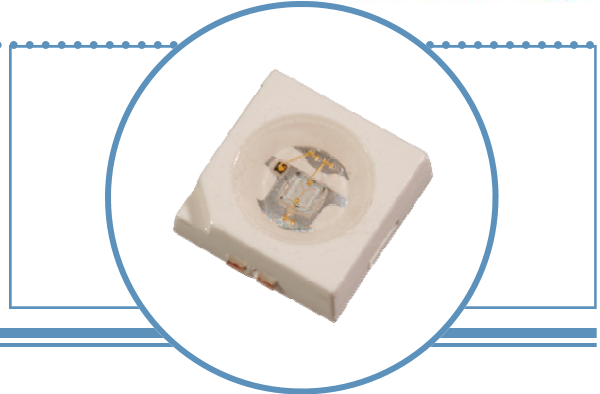


Mini half-watt SMD 3.5mm (120° Viewing Angle)

OVS5MxBCR4 Series

- Compact Package Outline of 3.5 x 3.5 x 1.2 mm
- Robust energy-efficient design with long operating life
- Low thermal resistance
- Exceptional spatial uniformity
- Compatible to IR reflow soldering
- High Lumens output



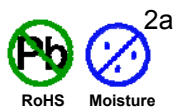
The **mini-half watt** is an energy-efficient packaged LED source that offers high luminance, and a long operating lifespan. This device offers a 120° viewing angle and an ultra-low profile (1.2 mm) making it highly suitable for conventional lighting and specialized applications.

Applications

- Automotive exterior and interior lighting
- Architectural indoor and outdoor lighting
- General lighting
- Display Backlighting
- Electronic signs and signals

| Part Number | Viewing Angle | Emitted Color | Typ. Luminous Flux (lm) | Forward Voltage V_F | Power Dissipation @ 150 mA | Lens Color |
|-------------|---------------|---------------|-------------------------|-----------------------|----------------------------|-------------|
| OVS5MWBCR4 | 120 | White | 30 | 3.4 | 0.51 W | Water Clear |
| OVS5MWWBCR4 | | Warm White | 23 | 3.6 | 0.54 W | |
| OVS5MBBCR4 | | Blue | 6 | 3.4 | 0.51 W | |
| OVS5MGBCR4 | | Green | 22 | 3.4 | 0.51 W | |

| Part Number | Viewing Angle | Emitted Color | Typ. Luminous Intensity (mcd) | Forward Voltage V_F | Power Dissipation @ 150 mA | Lens Color |
|-------------|---------------|---------------|-------------------------------|-----------------------|----------------------------|-------------|
| OVS5MRBCR4 | 120 | Red | 7150 | 2.2 | 0.33 W | Water Clear |
| OVS5MABCR4 | | Amber | 7150 | 2.2 | 0.33 W | |
| OVS5MYBCR4 | | Yellow | 7150 | 2.2 | 0.33 W | |



DO NOT LOOK DIRECTLY AT LED WITH UNSHIELDED EYES OR DAMAGE TO RETINA MAY OCCUR.

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Mini half-watt SMD 3.5mm OVS5MxBCR4

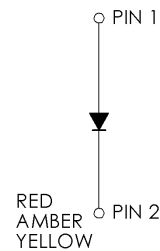
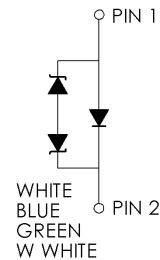
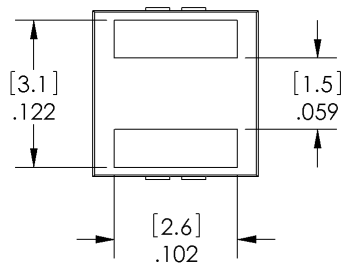
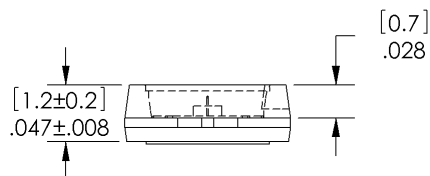
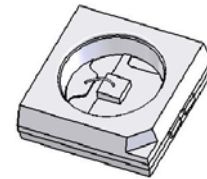
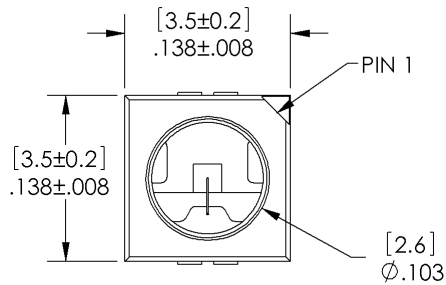


Absolute Maximum Ratings $T_A = 25^\circ\text{C}$

| | Red, Amber, Yellow | Green, Blue | White | Warm White |
|--|--------------------|-------------------------------|-------|------------|
| DC Forward Current | 200 mA | 180 mA | | |
| Peak Pulsed Forward Current ¹ | 1000 mA | 350 mA | | |
| Reverse Voltage | 12V @ 10 uA | Not designed for reverse bias | | |
| Junction Temperature ² | 125°C | | | |
| Power Dissipation | 750mW | | | |
| Storage and Operating Temperature | -40° ~ +100 ° C | | | |
| ESD (JEDEC-JESD22-A114F) | Class 2 | | | |
| MSL (IPC / JEDEC J-STD-020C) | 2a / 672 Hrs | | | |

Notes:

1. Pulse width $t_p \leq 10\mu\text{s}$, Duty cycle = 0.1
2. Thermal Resistance = 5 C/W



| | |
|-------|---------|
| PIN 1 | ANODE |
| PIN 2 | CATHODE |

DIMENSIONS ARE IN INCHES [MM].

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Optical and Electrical Characteristics - Red, Amber, Yellow ($I_F = 140 \text{ mA}$, $T_A = 25^\circ \text{ C}$)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | |
|-----------------|------------------------|--------|------|------|---------------|-----|
| V_F | Forward Voltage | 1.9 | 2.2 | 2.65 | V | |
| Φ | Luminous Intensity | Red | 4500 | 7150 | 9000 | mcd |
| | | Amber | | | | |
| | | Yellow | | | | |
| λ_D | Dominant Wavelength | Red | 620 | 625 | 630 | nm |
| | | Amber | 610 | 615 | 621 | |
| | | Yellow | 585 | 590 | 594 | |
| I_R | Reverse Current @ 12 V | ---- | 10 | ---- | μA | |
| $2\Theta_{1/2}$ | 50% Power Angle | ---- | 120 | ---- | deg | |

Optical and Electrical Characteristics - Blue, Green ($I_F = 150 \text{ mA}$, $T_A = 25^\circ \text{ C}$)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | |
|-----------------|---------------------|-------|------|------|-------|----|
| V_F | Forward Voltage | 3.0 | 3.4 | 3.9 | V | |
| Φ | Luminous Flux | Blue | 4.9 | 6.0 | 8.2 | lm |
| | | Green | 18.1 | 22.0 | 30.6 | |
| λ_D | Dominant Wavelength | Blue | 460 | 465 | 470 | nm |
| | | Green | 520 | 525 | 535 | |
| $2\Theta_{1/2}$ | 50% Power Angle | ---- | 120 | ---- | deg | |

Optical and Electrical Characteristics - White, Warm White ($I_F = 150 \text{ mA}$, $T_A = 25^\circ \text{ C}$)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | |
|-----------------|-----------------|------------|------|------|-------|----|
| V_F | Forward Voltage | White | 3.0 | 3.4 | 4.1 | V |
| | | Warm White | | 3.6 | | |
| Φ | Luminous Flux | White | 23.5 | 30.6 | 39.8 | lm |
| | | Warm White | 18.1 | 23.5 | 30.6 | |
| $2\Theta_{1/2}$ | 50% Power Angle | ---- | 120 | ---- | deg | |

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Standard Bins

LEDs are sorted to luminous intensity (I_v) or luminous flux (Φ) and dominant wavelength (nm) bins shown. Each reel consists of a single intensity bin and a single color bin. Orders are filled using all intensity and color bins listed in the following tables. Optek will not accept orders for single intensity bins or single color bins.

Luminous Flux (Φ) @ 150mA (lm)

| Blue: OVS5MBBCR4 | | |
|-------------------|----------|----------|
| IV Code | Min (lm) | Max (lm) |
| H2 | 4.9 | 5.5 |
| H3 | 5.5 | 6.3 |
| J2 | 6.3 | 7.1 |
| J3 | 7.1 | 8.2 |
| Green: OVS5MGBCR4 | | |
| IV Code | Min (lm) | Max (lm) |
| N2 | 18.1 | 20.6 |
| N3 | 20.6 | 23.5 |
| P2 | 23.5 | 26.8 |
| P3 | 26.8 | 30.6 |

Dominant Wavelength (nm)

| Blue: OVS5MBBCR4 | | |
|-------------------|----------|----------|
| nm Code | Min (nm) | Max (nm) |
| A | 460 | 465 |
| B | 465 | 470 |
| Green: OVS5MGBCR4 | | |
| nm Code | Min (nm) | Max (nm) |
| A | 520 | 525 |
| B | 525 | 530 |
| C | 530 | 535 |

Luminous Intensity (I_v) @ 140mA

| Amber: OVS5MABCR4 | | |
|--------------------|-----------|-----------|
| IV Code | Min (mcd) | Max (mcd) |
| Z1 | 4500 | 5600 |
| Z2 | 5600 | 7150 |
| AA | 7150 | 9000 |
| Red: OVS5MRBCR4 | | |
| IV Code | Min (mcd) | Max (mcd) |
| Z1 | 4500 | 5600 |
| Z2 | 5600 | 7150 |
| AA | 7150 | 9000 |
| Yellow: OVS5MYBCR4 | | |
| IV Code | Min (mcd) | Max (mcd) |
| Z1 | 4500 | 5600 |
| Z2 | 5600 | 7150 |
| AA | 7150 | 9000 |

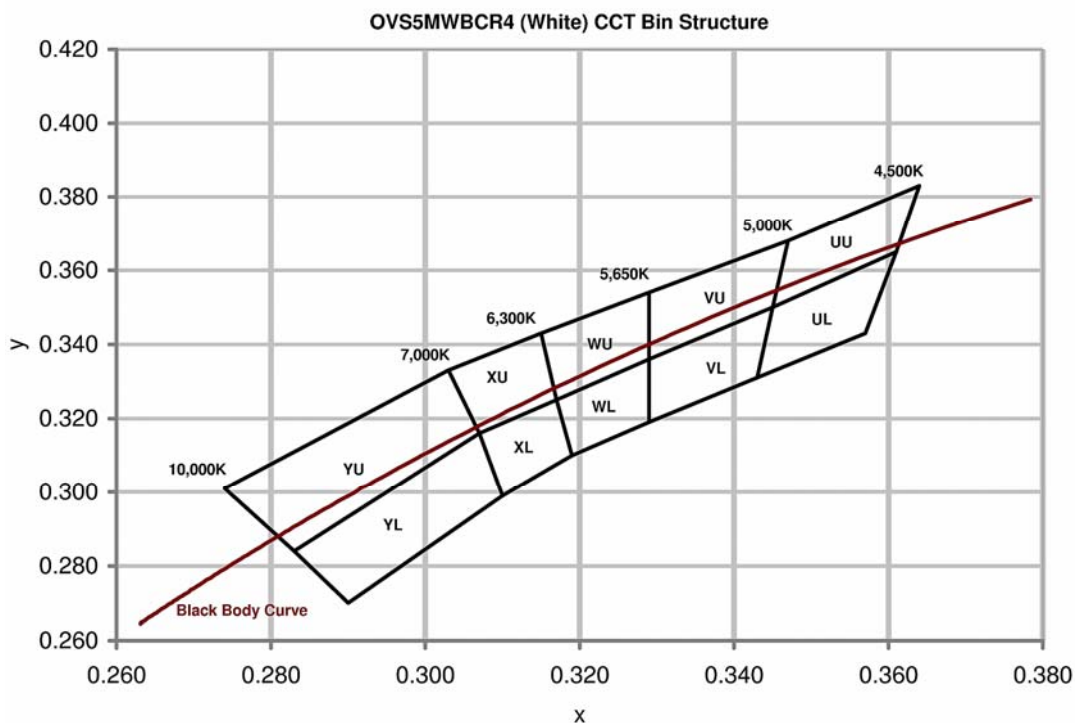
Dominant Wavelength (nm)

| Amber: OVS5MABCR4 | | |
|--------------------|----------|----------|
| nm Code | Min (nm) | Max (nm) |
| W | 610 | 615 |
| X | 615 | 621 |
| Red: OVS5MRBCR4 | | |
| nm Code | Min (nm) | Max (nm) |
| Full | 620 | 630 |
| Yellow: OVS5MYBCR4 | | |
| nm Code | Min (nm) | Max (nm) |
| X | 585 | 588 |
| Y | 588 | 591 |
| Z | 591 | 594 |

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Standard Bins ($I_F = 150\text{mA}$)

LEDs are sorted to luminous flux (Φ) and chromaticity coordinates (x, y) bins shown. Each reel consists of a single intensity bin and a single chromaticity bin. Orders are filled using all intensity and chromaticity bins listed in the following table. Optek will not accept orders for single intensity bins or single chromaticity bins.



Chromaticity Coordinates (x, y)

| Rank | YU | | | | YL | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cx | 0.274 | 0.283 | 0.307 | 0.303 | 0.283 | 0.290 | 0.310 | 0.307 |
| Cy | 0.301 | 0.284 | 0.316 | 0.333 | 0.284 | 0.270 | 0.299 | 0.316 |
| Rank | XU | | | | XL | | | |
| Cx | 0.303 | 0.307 | 0.317 | 0.315 | 0.307 | 0.310 | 0.319 | 0.317 |
| Cy | 0.333 | 0.316 | 0.325 | 0.343 | 0.316 | 0.299 | 0.310 | 0.325 |
| Rank | WU | | | | WL | | | |
| Cx | 0.315 | 0.317 | 0.329 | 0.329 | 0.317 | 0.319 | 0.329 | 0.329 |
| Cy | 0.343 | 0.325 | 0.336 | 0.354 | 0.325 | 0.310 | 0.319 | 0.336 |
| Rank | VU | | | | VL | | | |
| Cx | 0.329 | 0.329 | 0.345 | 0.347 | 0.329 | 0.329 | 0.343 | 0.345 |
| Cy | 0.354 | 0.336 | 0.350 | 0.368 | 0.336 | 0.319 | 0.331 | 0.350 |
| Rank | UU | | | | UL | | | |
| Cx | 0.347 | 0.345 | 0.361 | 0.364 | 0.345 | 0.343 | 0.357 | 0.361 |
| Cy | 0.368 | 0.350 | 0.365 | 0.383 | 0.350 | 0.331 | 0.343 | 0.365 |

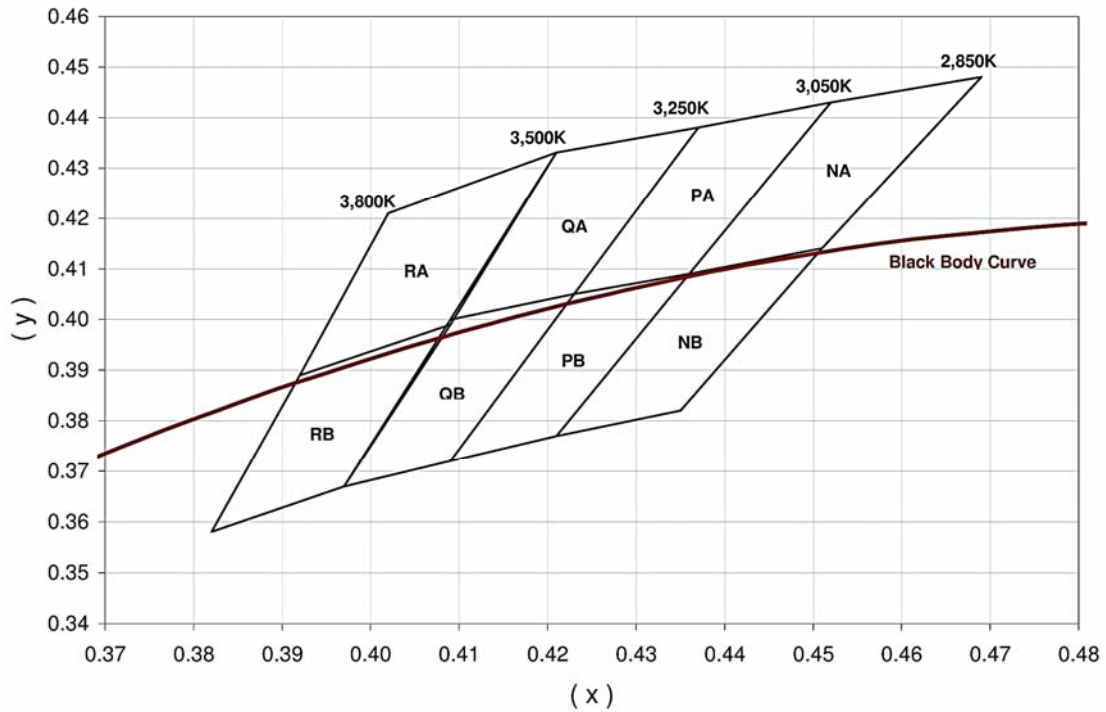
| Φ | Luminous Flux (lm) | |
|--------|--------------------|------|
| Bin | Min | Max |
| P2 | 23.5 | 26.8 |
| P3 | 26.8 | 30.6 |
| Q2 | 30.6 | 34.8 |
| Q3 | 34.8 | 39.8 |

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Standard Bins ($I_F = 150\text{mA}$)

LEDs are sorted to luminous flux (Φ) and chromaticity coordinates (x, y) bins shown. Each reel consists of a single intensity bin and a single chromaticity bin. Orders are filled using all intensity and chromaticity bins listed in the following table. Optek will not accept orders for single intensity bins or single chromaticity bins.

OVS5MWWBCR4 (Warm White) CCT Bin Structure



Chromaticity Coordinates (x, y)

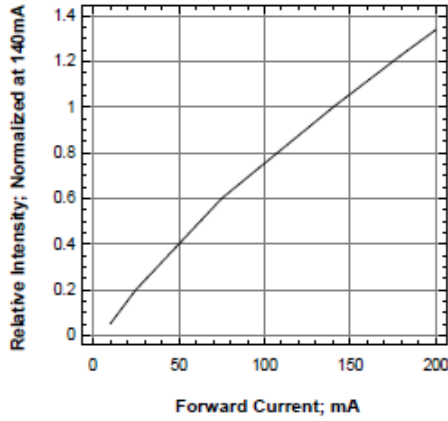
| Rank | RA | | | | RB | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cx | 0.402 | 0.392 | 0.409 | 0.421 | 0.392 | 0.382 | 0.397 | 0.409 |
| Cy | 0.421 | 0.389 | 0.399 | 0.433 | 0.389 | 0.358 | 0.367 | 0.399 |
| Rank | QA | | | | QB | | | |
| Cx | 0.421 | 0.409 | 0.423 | 0.437 | 0.409 | 0.397 | 0.409 | 0.423 |
| Cy | 0.433 | 0.400 | 0.405 | 0.438 | 0.400 | 0.367 | 0.372 | 0.405 |
| Rank | PA | | | | PB | | | |
| Cx | 0.437 | 0.423 | 0.436 | 0.452 | 0.423 | 0.409 | 0.421 | 0.436 |
| Cy | 0.438 | 0.405 | 0.409 | 0.443 | 0.405 | 0.372 | 0.377 | 0.409 |
| Rank | NA | | | | NB | | | |
| Cx | 0.452 | 0.436 | 0.451 | 0.469 | 0.436 | 0.421 | 0.435 | 0.451 |
| Cy | 0.443 | 0.409 | 0.414 | 0.448 | 0.409 | 0.377 | 0.382 | 0.414 |

| Φ | Luminous Flux (lm) | |
|--------|--------------------|------|
| Bin | Min | Max |
| N2 | 18.1 | 20.6 |
| N3 | 20.6 | 23.5 |
| P2 | 23.5 | 26.8 |
| P3 | 26.8 | 30.6 |

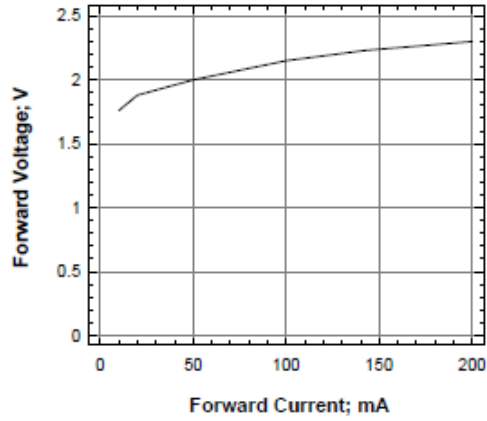
OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

OVS5MABCR4 (Amber), OVS5MRBCR4 (Red) and OVS5MYBCR4 (Yellow)

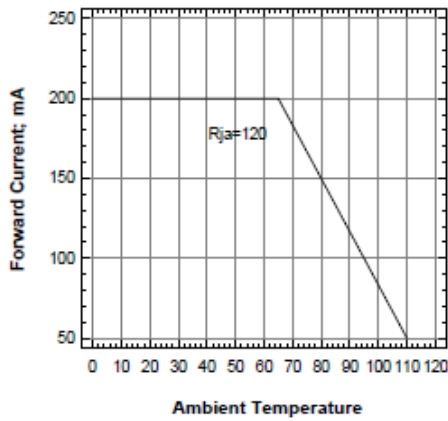
Relative Intensity Vs Forward Current



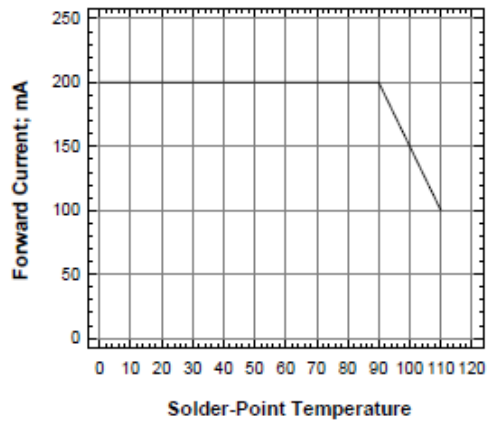
Forward Voltage Vs Forward Current



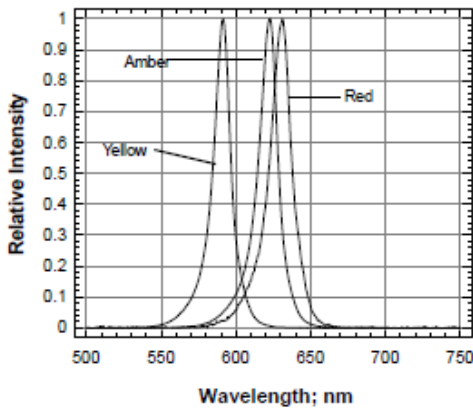
Maximum Current Vs Ambient Temperature



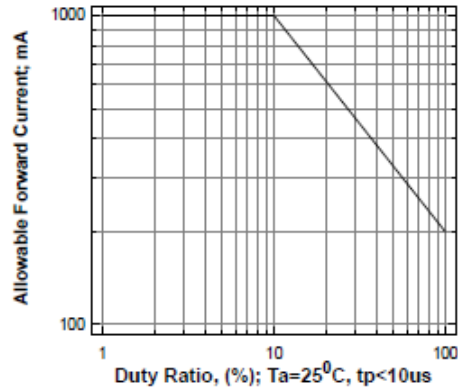
Maximum Current vs Solder-Point Temperature



Relative Intensity Vs Wavelength

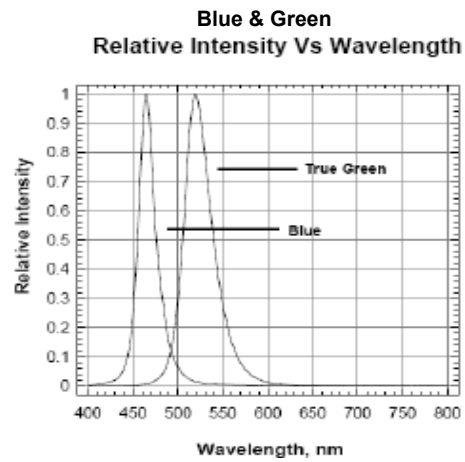
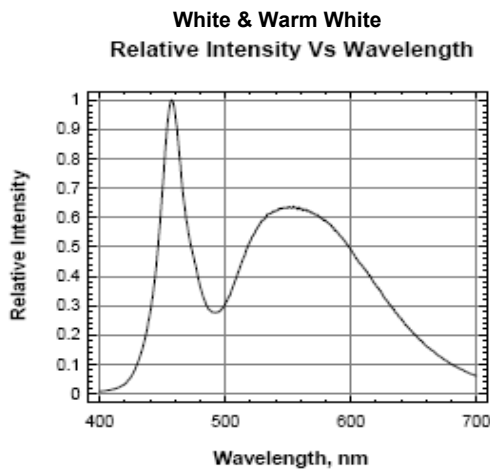
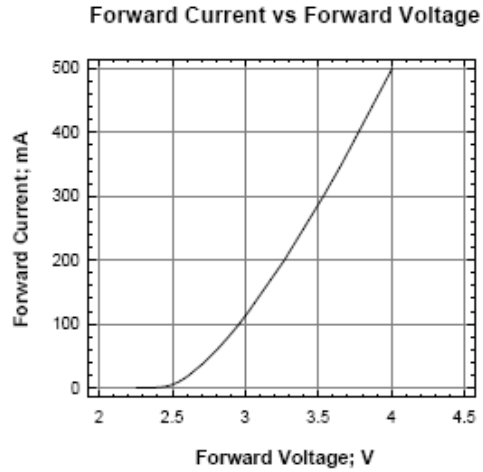
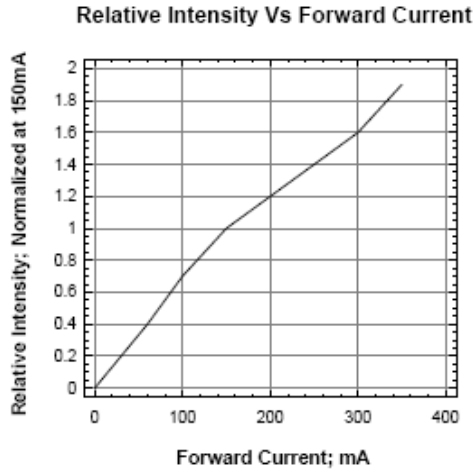


Allowable Forward Current Vs Duty Ratio

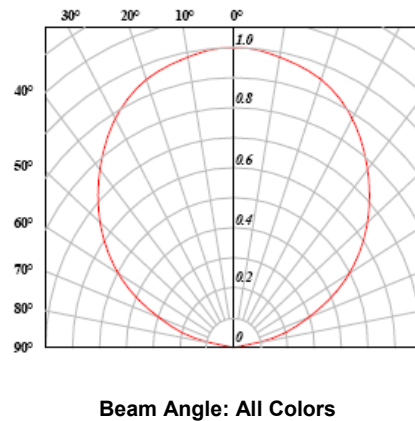
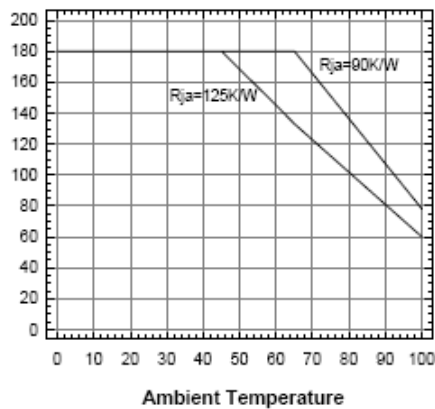


OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

OVS5MBCR4 (Blue), OVS5MGBCR4 (Green), OVS5MWBCR4 (White) and OVS5MWWBCR4 (Warm White)



Forward Current Vs Ambient Temperature

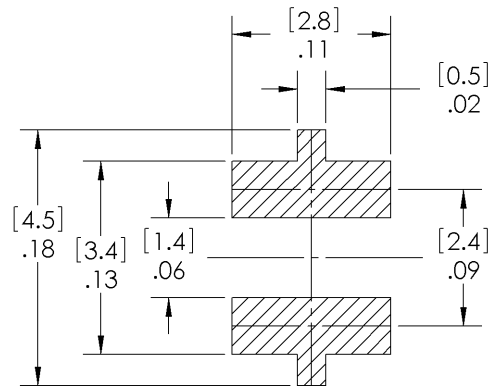


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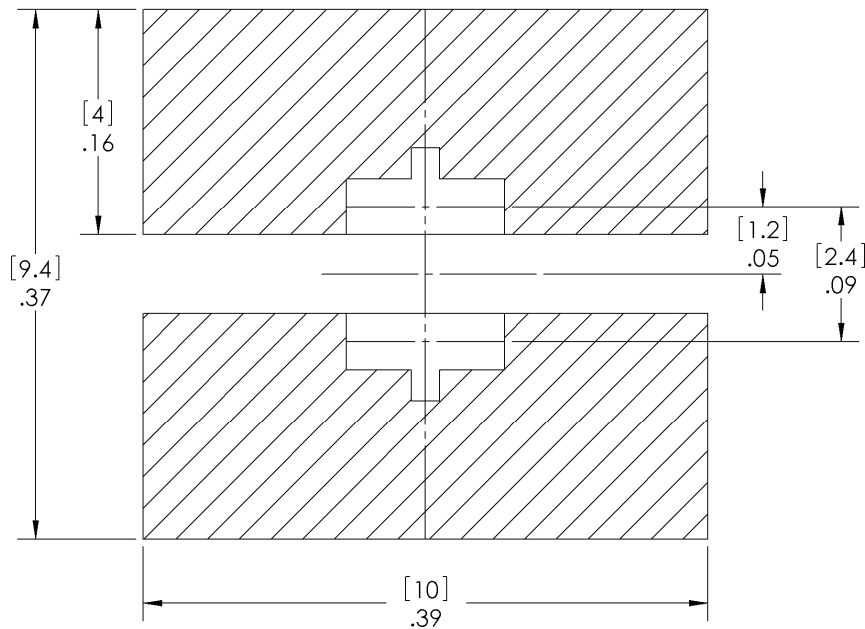
Mini half-watt SMD 3.5mm OVS5MxBCR4

Solder Pad Design

Note: Metal core circuit board (MCPCB) is highly recommended for high density applications. FR-4 board is recommended for other applications



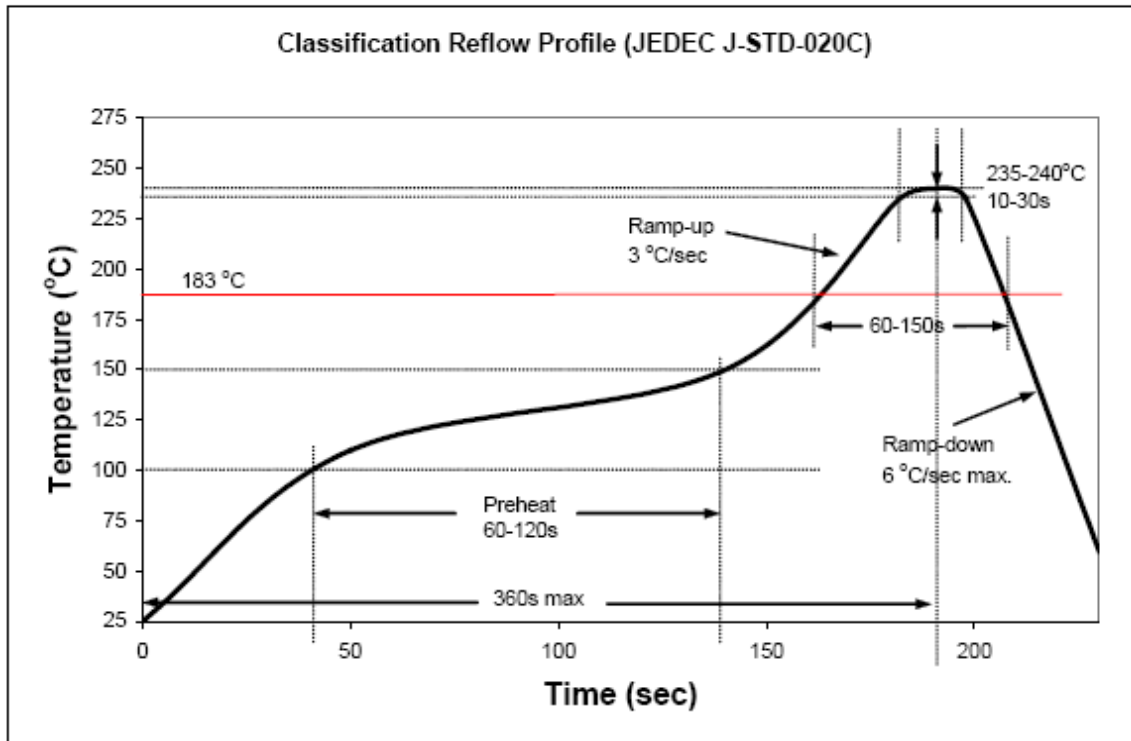
Solder Paste Pattern



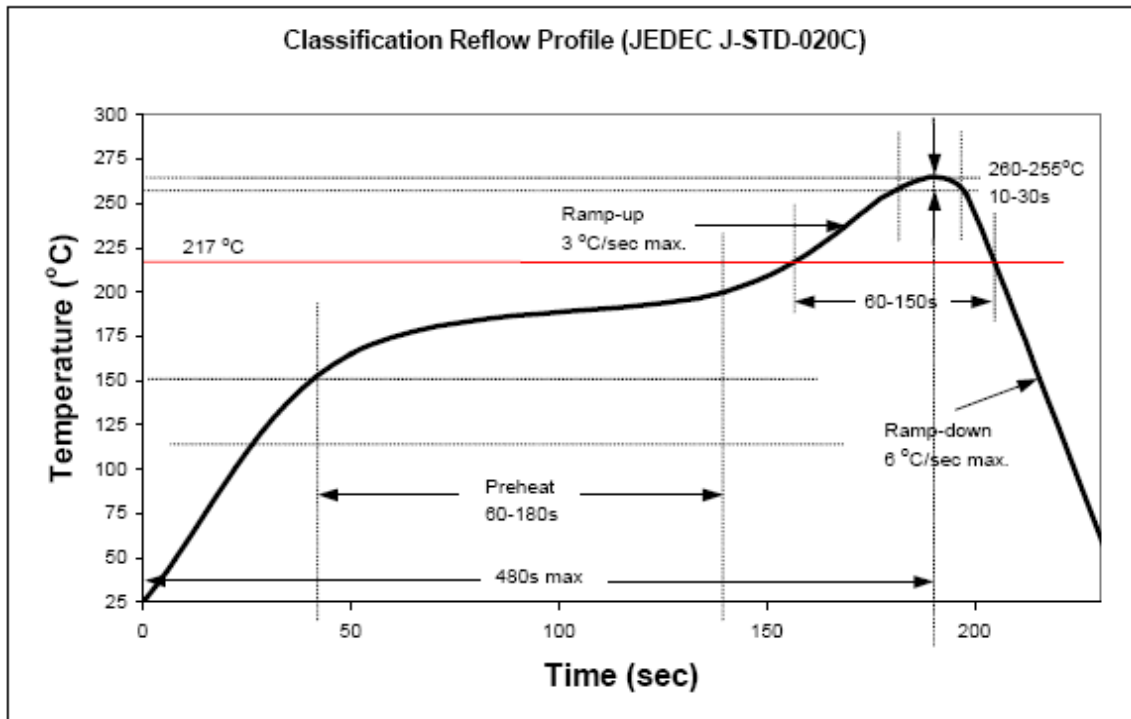
Copper Pattern

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Recommended Sn-Pb IR-Reflow Soldering Profile.



Recommended Pb Free IR-Reflow Soldering Profile.



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

