

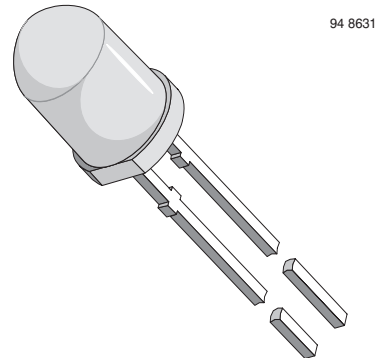
# High Intensity LED, Ø 5 mm 30 ° Untinted Non-Diffused

## Description

The TLC.52.. series is a clear, non diffused 5 mm LED for high end applications where supreme luminous intensity required.

These lamps with clear untinted plastic case utilize the highly developed ultrabright AlInGaP and InGaN technologies.

The lens and the viewing angle is optimized to achieve best performance of light output and visibility.



94 8631

## Features

- Untinted non diffused lens
- Utilizing ultrabright AlInGaP and InGaN technology
- High luminous intensity
- High operating temperature:  
T<sub>j</sub> (chip junction temperature)  
up to 125 °C for AlInGaP devices
- Luminous intensity and color categorized for each packing unit
- ESD-withstand voltage:  
2 kV acc. to MIL STD 883 D, Method 3015.7  
for AlInGaP, 1 kV for InGaN

## Applications

Interior and exterior lighting  
Outdoor LED panels  
Instrumentation and front panel indicators  
Central high mounted stop lights (CHMSL)  
for motor vehicles  
Replaces incandescent lamps  
Traffic signals  
Light guide design

## Parts Table

| Part      | Color, Luminous Intensity            | Angle of Half Intensity (±φ) | Technology      |
|-----------|--------------------------------------|------------------------------|-----------------|
| TLCR5200  | Red, I <sub>V</sub> > 1350 mcd       | 15                           | AlInGaP on GaAs |
| TLCY5200  | Yellow, I <sub>V</sub> > 1350 mcd    | 15                           | AlInGaP on GaAs |
| TLCTG5200 | True green, I <sub>V</sub> > 750 mcd | 15                           | InGaN on SiC    |
| TLCB5200  | Blue, I <sub>V</sub> > 240 mcd       | 15                           | InGaN on SiC    |

### Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

#### TLCR5200 , TLCY5200

| Parameter                           | Test condition                            | Symbol     | Value         | Unit               |
|-------------------------------------|-------------------------------------------|------------|---------------|--------------------|
| Reverse voltage                     |                                           | $V_R$      | 5             | V                  |
| DC forward current                  | $T_{amb} \leq 85\text{ }^{\circ}\text{C}$ | $I_F$      | 50            | mA                 |
| Surge forward current               | $t_p \leq 10\text{ }\mu\text{s}$          | $I_{FSM}$  | 1             | A                  |
| Power dissipation                   | $T_{amb} \leq 85\text{ }^{\circ}\text{C}$ | $P_V$      | 135           | mW                 |
| Junction temperature                |                                           | $T_j$      | 125           | $^{\circ}\text{C}$ |
| Operating temperature range         |                                           | $T_{amb}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Storage temperature range           |                                           | $T_{stg}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Soldering temperature               | $t \leq 5\text{ s}$ , 2 mm from body      | $T_{sd}$   | 260           | $^{\circ}\text{C}$ |
| Thermal resistance junction/ambient |                                           | $R_{thJA}$ | 300           | K/W                |

#### TLCTG5200 , TLCB5200

| Parameter                           | Test condition                            | Symbol     | Value         | Unit               |
|-------------------------------------|-------------------------------------------|------------|---------------|--------------------|
| Reverse voltage                     |                                           | $V_R$      | 5             | V                  |
| DC forward current                  | $T_{amb} \leq 60\text{ }^{\circ}\text{C}$ | $I_F$      | 30            | mA                 |
| Surge forward current               | $t_p \leq 10\text{ }\mu\text{s}$          | $I_{FSM}$  | 0.1           | A                  |
| Power dissipation                   | $T_{amb} \leq 60\text{ }^{\circ}\text{C}$ | $P_V$      | 135           | mW                 |
| Junction temperature                |                                           | $T_j$      | 100           | $^{\circ}\text{C}$ |
| Operating temperature range         |                                           | $T_{amb}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Storage temperature range           |                                           | $T_{stg}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Soldering temperature               | $t \leq 5\text{ s}$ , 2 mm from body      | $T_{sd}$   | 260           | $^{\circ}\text{C}$ |
| Thermal resistance junction/ambient |                                           | $R_{thJA}$ | 300           | K/W                |

### Optical and Electrical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

#### Red

##### TLCR5200

| Parameter                                       | Test condition                | Part     | Symbol           | Min  | Typ.     | Max | Unit |
|-------------------------------------------------|-------------------------------|----------|------------------|------|----------|-----|------|
| Luminous intensity <sup>1)</sup>                | $I_F = 50\text{ mA}$          | TLCR5200 | $I_V$            | 1350 | 4000     |     | mcd  |
| Dominant wavelength                             | $I_F = 50\text{ mA}$          |          | $\lambda_d$      | 611  | 616      | 622 | nm   |
| Peak wavelength                                 | $I_F = 50\text{ mA}$          |          | $\lambda_p$      |      | 622      |     | nm   |
| Spectral bandwidth at 50 % $I_{rel\text{ max}}$ | $I_F = 50\text{ mA}$          |          | $\Delta\lambda$  |      | 18       |     | nm   |
| Angle of half intensity                         | $I_F = 50\text{ mA}$          |          | $\phi$           |      | $\pm 15$ |     | deg  |
| Forward voltage                                 | $I_F = 50\text{ mA}$          |          | $V_F$            |      | 2.1      | 2.7 | V    |
| Reverse voltage                                 | $I_R = 10\text{ }\mu\text{A}$ |          | $V_R$            | 5    |          |     | V    |
| Temperature coefficient of $V_F$                | $I_F = 50\text{ mA}$          |          | $TC_{VF}$        |      | - 3.5    |     | mV/K |
| Temperature coefficient of $\lambda_d$          | $I_F = 50\text{ mA}$          |          | $TC_{\lambda d}$ |      | 0.05     |     | nm/K |

<sup>1)</sup> in one Packing Unit  $I_{VMax}/I_{VMin} \leq 2.0$

**Yellow****TLCY5200**

| Parameter                                        | Test condition         | Part     | Symbol           | Min  | Typ.     | Max | Unit |
|--------------------------------------------------|------------------------|----------|------------------|------|----------|-----|------|
| Luminous intensity <sup>1)</sup>                 | $I_F = 50 \text{ mA}$  | TLCY5200 | $I_V$            | 1350 | 4000     |     | mcd  |
| Dominant wavelength                              | $I_F = 50 \text{ mA}$  |          | $\lambda_d$      | 585  | 590      | 597 | nm   |
| Peak wavelength                                  | $I_F = 50 \text{ mA}$  |          | $\lambda_p$      |      | 593      |     | nm   |
| Spectral bandwidth at 50 % $I_{rel \text{ max}}$ | $I_F = 50 \text{ mA}$  |          | $\Delta\lambda$  |      | 17       |     | nm   |
| Angle of half intensity                          | $I_F = 50 \text{ mA}$  |          | $\varphi$        |      | $\pm 15$ |     | deg  |
| Forward voltage                                  | $I_F = 50 \text{ mA}$  |          | $V_F$            |      | 2.1      | 2.7 | V    |
| Reverse voltage                                  | $I_R = 10 \mu\text{A}$ |          | $V_R$            | 5    |          |     | V    |
| Temperature coefficient of $V_F$                 | $I_F = 50 \text{ mA}$  |          | $TC_{VF}$        |      | - 3.5    |     | mV/K |
| Temperature coefficient of $\lambda_d$           | $I_F = 50 \text{ mA}$  |          | $TC_{\lambda d}$ |      | 0.1      |     | nm/K |

<sup>1)</sup> in one Packing Unit  $I_{V\text{Max.}}/I_{V\text{Min.}} \leq 2.0$

**True green****TLCTG5200**

| Parameter                                        | Test condition         | Part      | Symbol           | Min | Typ.     | Max | Unit |
|--------------------------------------------------|------------------------|-----------|------------------|-----|----------|-----|------|
| Luminous intensity <sup>1)</sup>                 | $I_F = 30 \text{ mA}$  | TLCTG5200 | $I_V$            | 750 | 2000     |     | mcd  |
| Dominant wavelength                              | $I_F = 30 \text{ mA}$  |           | $\lambda_d$      | 515 | 525      | 535 | nm   |
| Peak wavelength                                  | $I_F = 30 \text{ mA}$  |           | $\lambda_p$      |     | 520      |     | nm   |
| Spectral bandwidth at 50 % $I_{rel \text{ max}}$ | $I_F = 30 \text{ mA}$  |           | $\Delta\lambda$  |     | 37       |     | nm   |
| Angle of half intensity                          | $I_F = 30 \text{ mA}$  |           | $\varphi$        |     | $\pm 15$ |     | deg  |
| Forward voltage                                  | $I_F = 30 \text{ mA}$  |           | $V_F$            |     | 3.9      | 4.5 | V    |
| Reverse voltage                                  | $I_R = 10 \mu\text{A}$ |           | $V_R$            | 5   |          |     | V    |
| Temperature coefficient of $V_F$                 | $I_F = 30 \text{ mA}$  |           | $TC_{VF}$        |     | - 4.5    |     | mV/K |
| Temperature coefficient of $\lambda_d$           | $I_F = 30 \text{ mA}$  |           | $TC_{\lambda d}$ |     | 0.02     |     | nm/K |

<sup>1)</sup> in one Packing Unit  $I_{V\text{Max.}}/I_{V\text{Min.}} \leq 2.0$

**Optical and Electrical Characteristics**

$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

**Blue****TLCB5200**

| Parameter                                        | Test condition         | Part     | Symbol           | Min | Typ.     | Max | Unit |
|--------------------------------------------------|------------------------|----------|------------------|-----|----------|-----|------|
| Luminous intensity <sup>1)</sup>                 | $I_F = 30 \text{ mA}$  | TLCB5200 | $I_V$            | 240 | 700      |     | mcd  |
| Dominant wavelength                              | $I_F = 30 \text{ mA}$  |          | $\lambda_d$      | 462 | 470      | 476 | nm   |
| Peak wavelength                                  | $I_F = 30 \text{ mA}$  |          | $\lambda_p$      |     | 464      |     | nm   |
| Spectral bandwidth at 50 % $I_{rel \text{ max}}$ | $I_F = 50 \text{ mA}$  |          | $\Delta\lambda$  |     | 25       |     | nm   |
| Angle of half intensity                          | $I_F = 30 \text{ mA}$  |          | $\varphi$        |     | $\pm 15$ |     | deg  |
| Forward voltage                                  | $I_F = 30 \text{ mA}$  |          | $V_F$            |     | 3.9      | 4.5 | V    |
| Reverse voltage                                  | $I_R = 10 \mu\text{A}$ |          | $V_R$            | 5   |          |     | V    |
| Temperature coefficient of $V_F$                 | $I_F = 30 \text{ mA}$  |          | $TC_{VF}$        |     | - 5.0    |     | mV/K |
| Temperature coefficient of $\lambda_d$           | $I_F = 30 \text{ mA}$  |          | $TC_{\lambda d}$ |     | 0.02     |     | nm/K |

<sup>1)</sup> in one Packing Unit  $I_{V\text{Max.}}/I_{V\text{Min.}} \leq 2.0$

## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

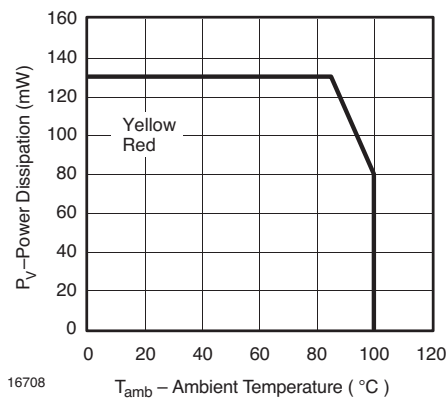


Figure 1. Power Dissipation vs. Ambient Temperature

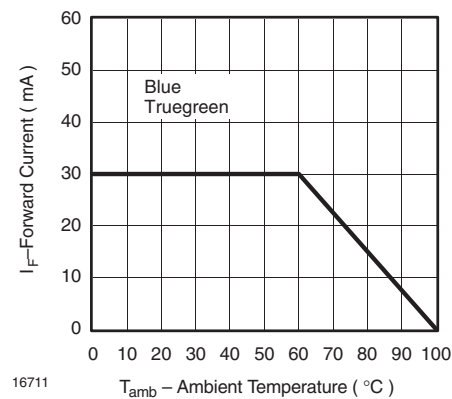


Figure 4. Forward Current vs. Ambient Temperature

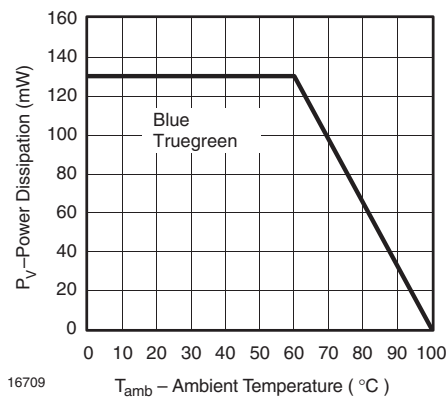


Figure 2. Power Dissipation vs. Ambient Temperature

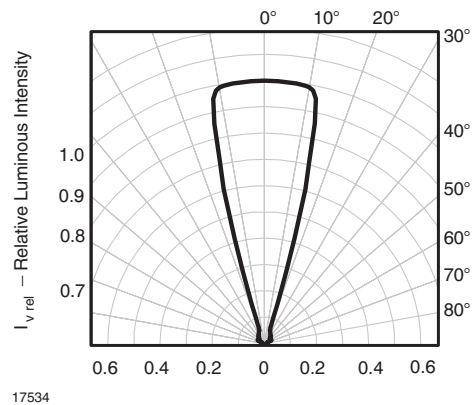


Figure 5. Rel. Luminous Intensity vs. Angular Displacement

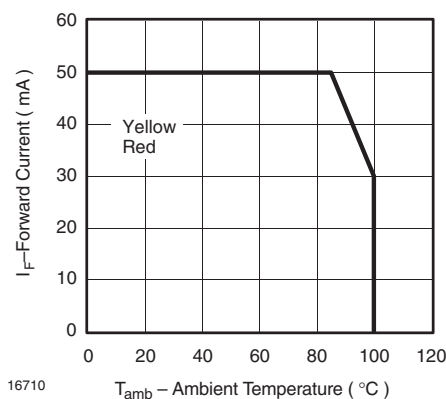


Figure 3. Forward Current vs. Ambient Temperature

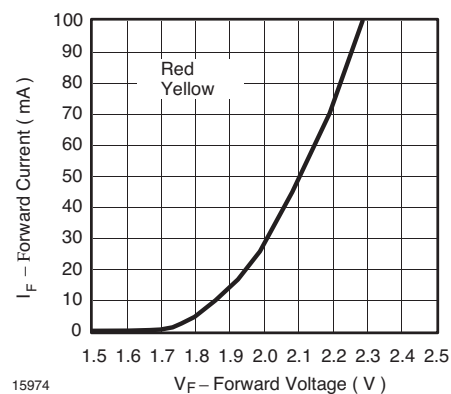


Figure 6. Forward Current vs. Forward Voltage

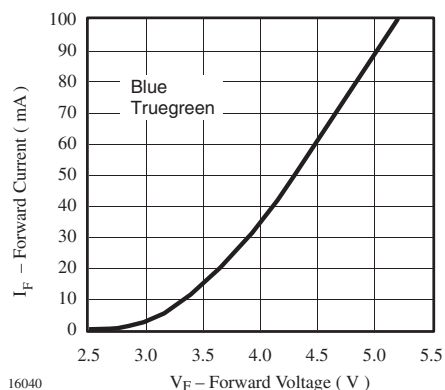


Figure 7. Forward Current vs. Forward Voltage

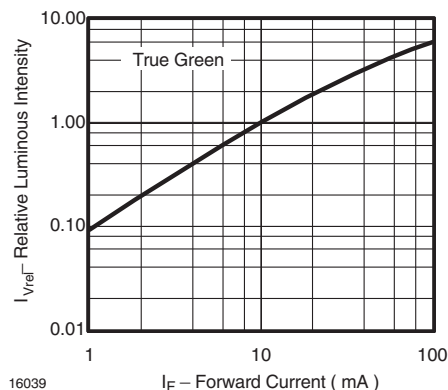


Figure 10. Relative Luminous Flux vs. Forward Current

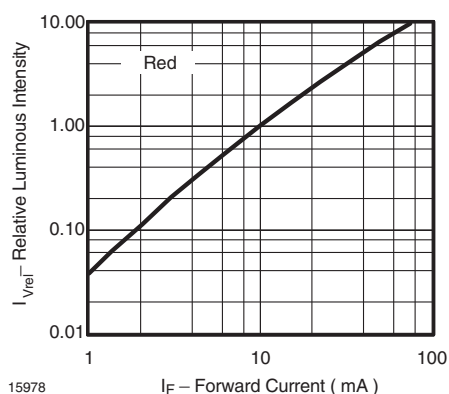


Figure 8. Relative Luminous Flux vs. Forward Current

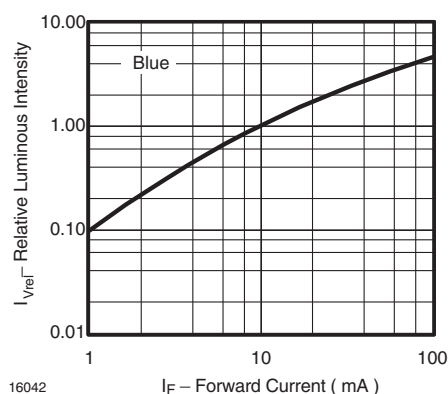


Figure 11. Relative Luminous Flux vs. Forward Current

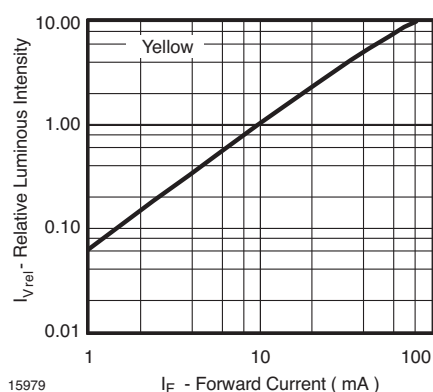


Figure 9. Relative Luminous Flux vs. Forward Current

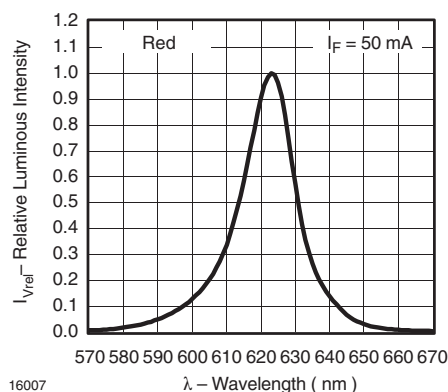


Figure 12. Relative Intensity vs. Wavelength

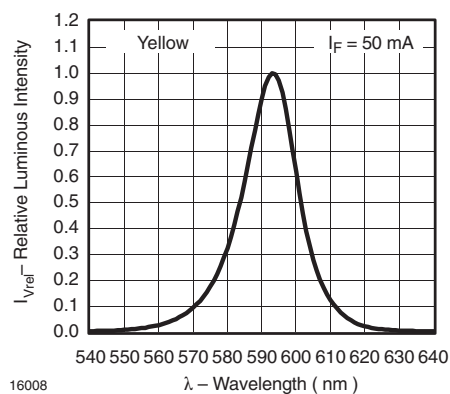


Figure 13. Relative Intensity vs. Wavelength

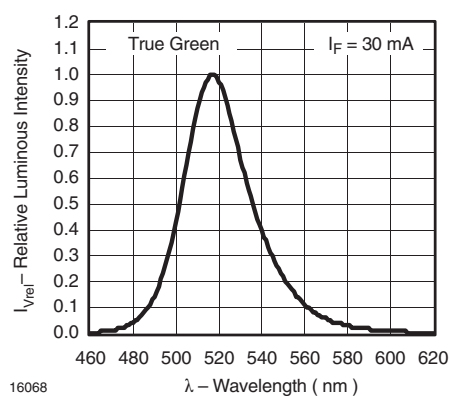


Figure 14. Relative Intensity vs. Wavelength

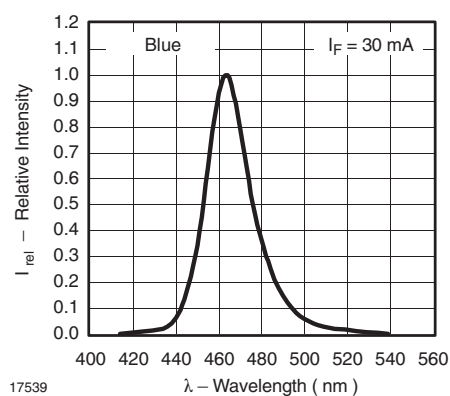
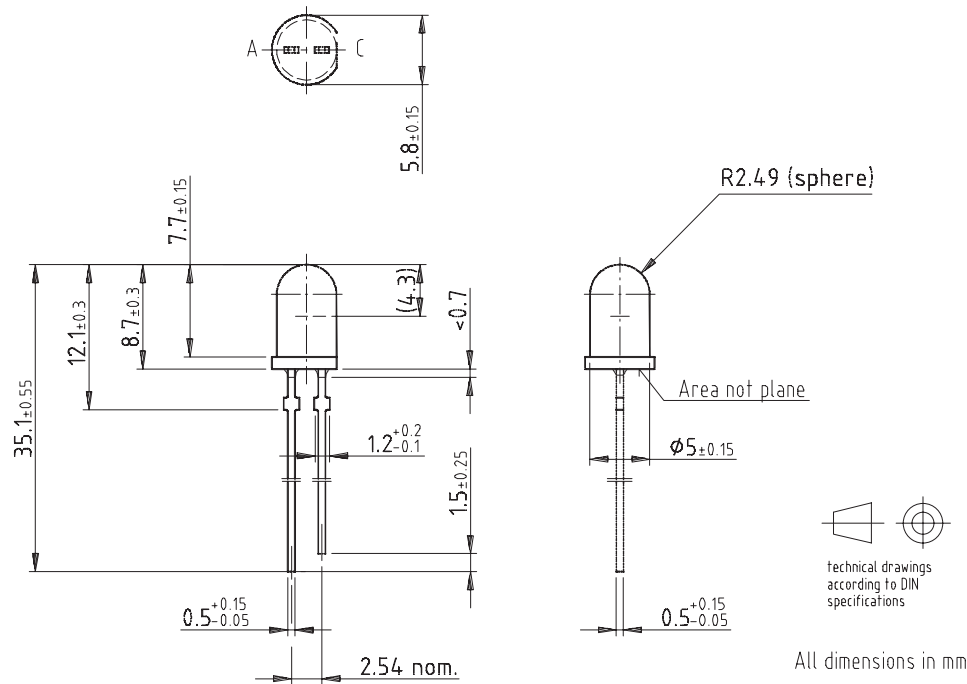


Figure 15. Relative Intensity vs. Wavelength

## Package Dimensions in mm



Drawing-No.: 6.544-5258.07-4  
Issue: 3; 06.02.03

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### Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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