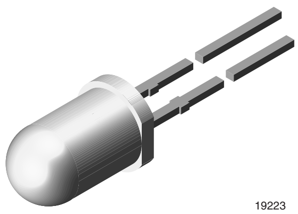
High Intensity LED, ∅ 5 mm Untinted Non-Diffused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FEATURES

- Untinted non diffused lens
- Choice of four colors
- TLH.5101 and TLH.5102 with reduced light matching factor
- TLH.5100 for cost effective design
- Medium viewing angle
- Lead (Pb)-free device

DESCRIPTION

The TLH.51.. series is a clear, non diffused 5 mm LED for outdoor application.

These clear lamps utilize the highly developed technologies like AlInGaP and GaP.

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

The subtypes TLH.5101 and TLH.5102 with their very stable light output are especially recommended for applications where a homogeneous appearance is required.

APPLICATIONS

- Outdoor LED panels
- Central high mounted stop lights (CHMSL) for motor vehicles
- Instrumentation and front panel indicators
- Light guide design
- Traffic signals

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity: ± 9°

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
TLHK5100	Red, I_V > 320 mcd	AllnGaP on GaAs
TLHE5100	Yellow, I_V > 750 mcd	AllnGaP on GaAs
TLHG5100	Green, I_V > 240 mcd	GaP on GaP
TLHG5101	Green, I_V > 240 mcd	GaP on GaP
TLHG5102	Green, I_V > 240 mcd	GaP on GaP
TLHP5100	Pure green, I_V > 66 mcd	GaP on GaP
TLHP5101	Pure green, I_V > 66 mcd	GaP on GaP
TLHP5102	Pure green, I_V > 66 mcd	GaP on GaP

ABSOLUTE MAXIMUM RATINGS[1)] TLHK51.. , TLHE51.. , TLHG51.. , TLHP51..				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage		V_R	6	V
DC Forward current	$T_{amb} \leq 65$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	1	A
Power dissipation	$T_{amb} \leq 65$ °C	P_V	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 55 to + 100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ ambient		R_{thJA}	350	K/W

Note:
1) T_{amb} = 25 °C, unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS[1)] TLHK51.., RED							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Luminous intensity [2)]	I_F = 20 mA	TLHK5100	I_V	320			mcd
Dominant wavelength	I_F = 10 mA		λ_d	626	630	639	nm
Peak wavelength	I_F = 10 mA		λ_p		643		nm
Angle of half intensity	I_F = 10 mA		φ		± 9		deg
Forward voltage	I_F = 20 mA		V_F		1.9	2.6	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

Note:
1) T_{amb} = 25 °C, unless otherwise specified
2) In one packing unit $I_{Vmin}/I_{Vmax} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS[1)] TLHE51.., YELLOW							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Luminous intensity [2)]	I_F = 20 mA	TLHE5100	I_V	750			mcd
Dominant wavelength	I_F = 10 mA		λ_d	581	588	594	nm
Peak wavelength	I_F = 10 mA		λ_p		590		nm
Angle of half intensity	I_F = 10 mA		φ		± 9		deg
Forward voltage	I_F = 20 mA		V_F		2	2.6	V
Reverse voltage	I_R = 10 µA		V_R	5			V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

Note:
1) T_{amb} = 25 °C, unless otherwise specified
2) In one packing unit $I_{Vmin}/I_{Vmax} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS[1] TLHG51.., GREEN							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Luminous intensity [2]	I_F = 20 mA	TLHG5100	I_V	240			mcd
		TLHG5101	I_V	240		480	mcd
		TLHG5102	I_V	240		640	mcd
Dominant wavelength	I_F = 10 mA		λ_d	562		575	nm
Peak wavelength	I_F = 10 mA		λ_p		565		nm
Angle of half intensity	I_F = 10 mA		φ		± 9		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Note:
[1] T_{amb} = 25 °C, unless otherwise specified
[2] In one packing unit $I_{Vmin}/I_{Vmax} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS[1] TLHP51.., PURE GREEN							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN**	**TYP.**	**MAX**	**UNIT**
Luminous intensity [2]	I_F = 20 mA	TLHP5100	I_V	66			mcd
		TLHP5101	I_V	66		132	mcd
		TLHP5102	I_V	66		200	mcd
Dominant wavelength	I_F = 10 mA		λ_d	555		565	nm
Peak wavelength	I_F = 10 mA		λ_p		555		nm
Angle of half intensity	I_F = 10 mA		φ		± 9		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Note:
[1] T_{amb} = 25 °C, unless otherwise specified
[2] In one packing unit $I_{Vmin}/I_{Vmax} \leq 0.5$

TYPICAL CHARACTERISTICS

T_{amb} = 25 °C, unless otherwise specified

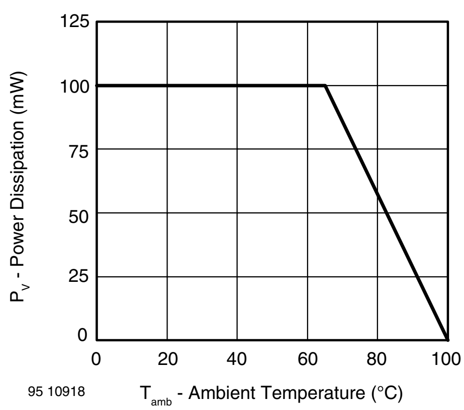


Figure 1. Power Dissipation vs. Ambient Temperature

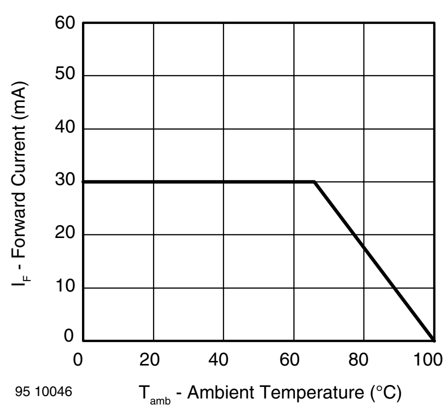


Figure 2. Forward Current vs. Ambient Temperature

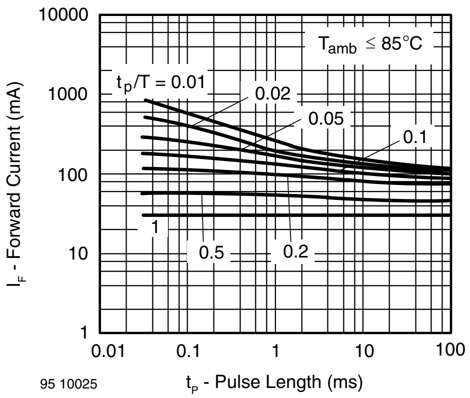


Figure 3. Forward Current vs. Pulse Length

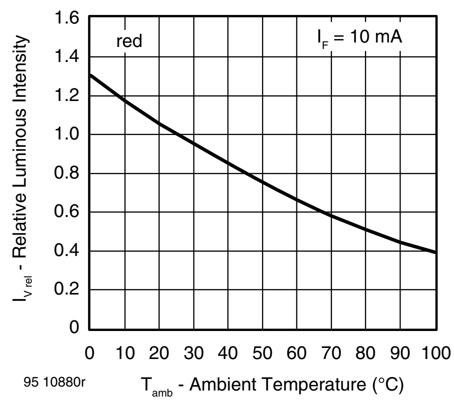


Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

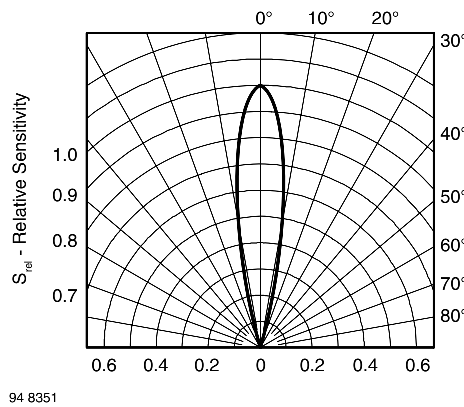


Figure 4. Relative Radiant Sensitivity vs. Angular Displacement

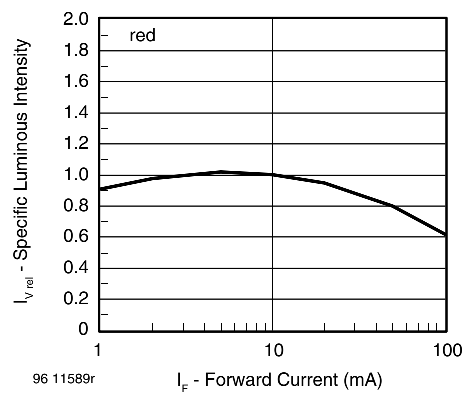


Figure 7. Specific Luminous Intensity vs. Forward Current

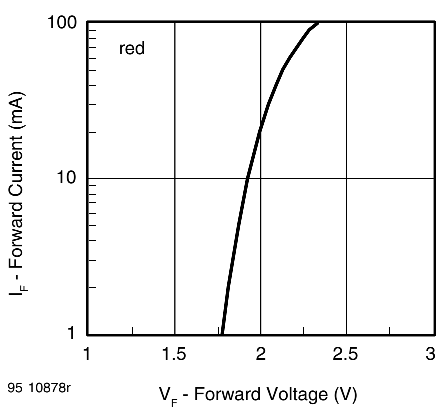


Figure 5. Forward Current vs. Forward Voltage

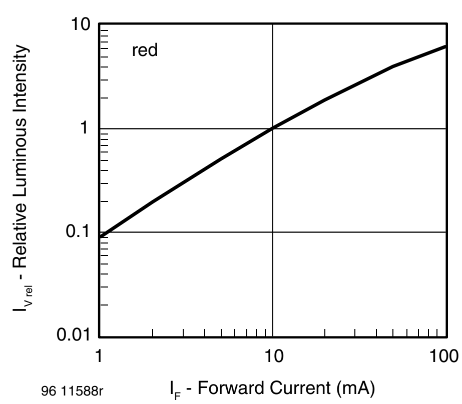


Figure 8. Relative Luminous Intensity vs. Forward Current

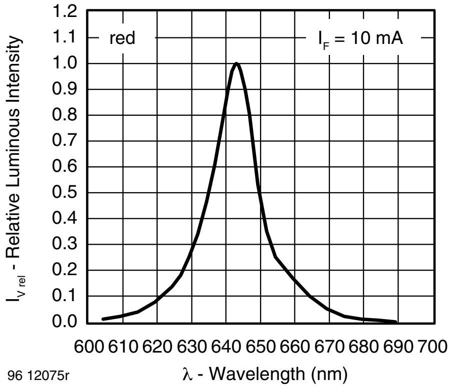


Figure 9. Relative Intensity vs. Wavelength

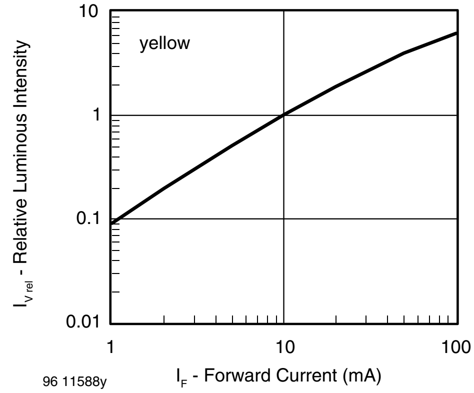


Figure 12. Relative Luminous Intensity vs. Forward Current

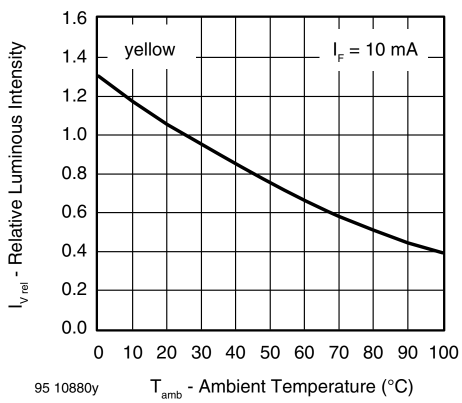


Figure 10. Rel. Luminous Intensity vs. Ambient Temperature

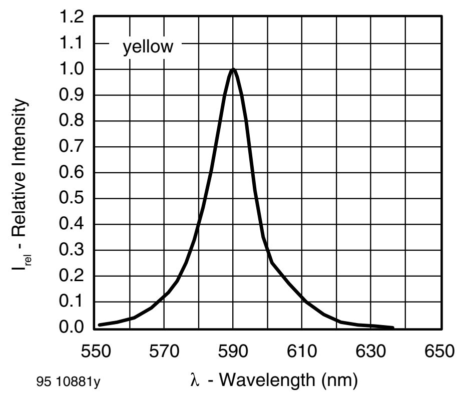


Figure 13. Relative Intensity vs. Wavelength

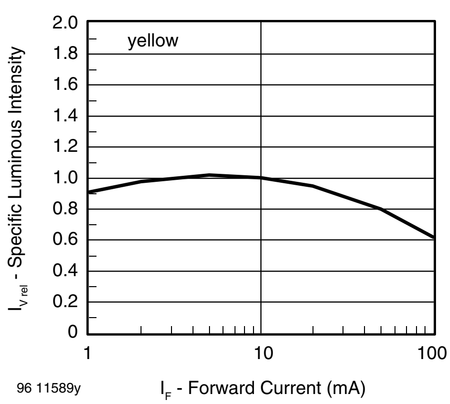


Figure 11. Specific Luminous Intensity vs. Forward Current

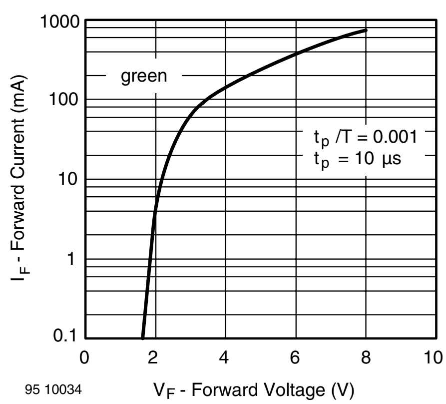


Figure 14. Forward Current vs. Forward Voltage

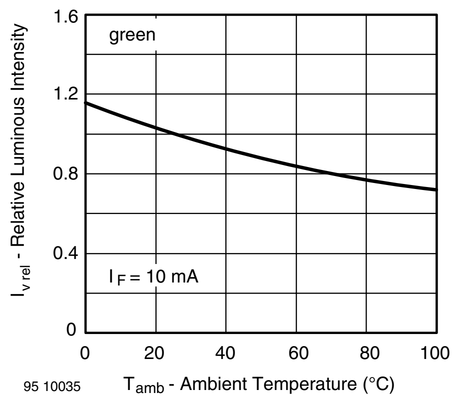


Figure 15. Rel. Luminous Intensity vs. Ambient Temperature

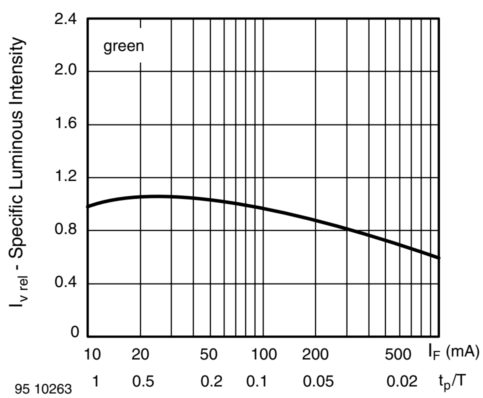


Figure 16. Specific Luminous Intensity vs. Forward Current

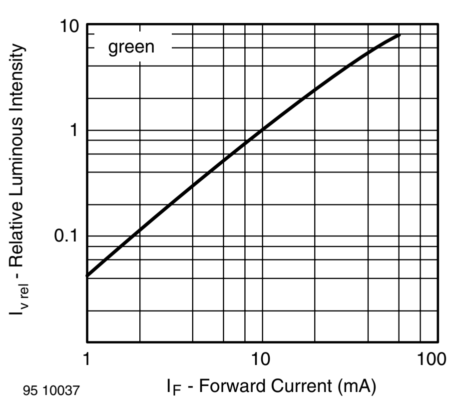


Figure 17. Relative Luminous Intensity vs. Forward Current

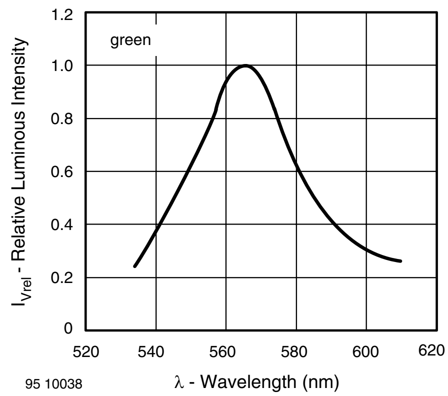


Figure 18. Relative Intensity vs. Wavelength

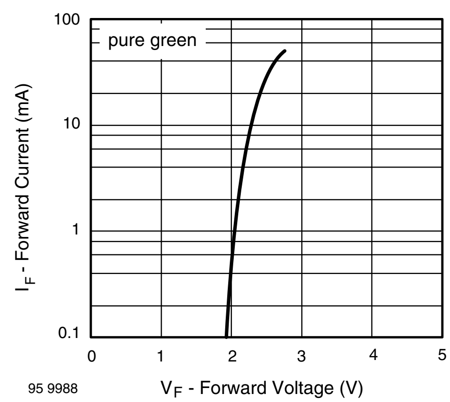


Figure 19. Forward Current vs. Forward Voltage

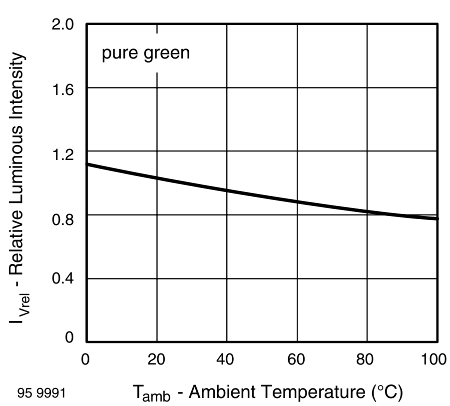


Figure 20. Rel. Luminous Intensity vs. Ambient Temperature

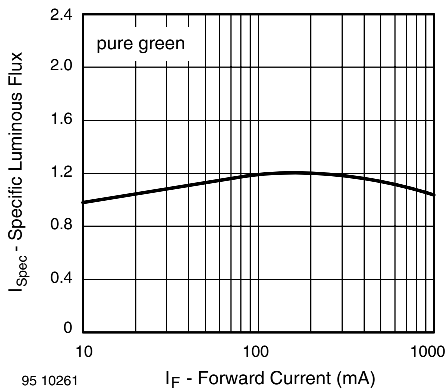


Figure 21. Specific Luminous Intensity vs. Forward Current

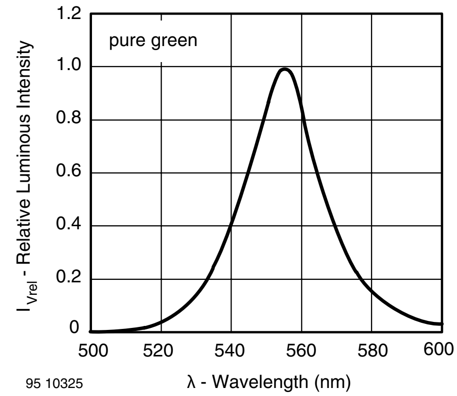


Figure 23. Relative Intensity vs. Wavelength

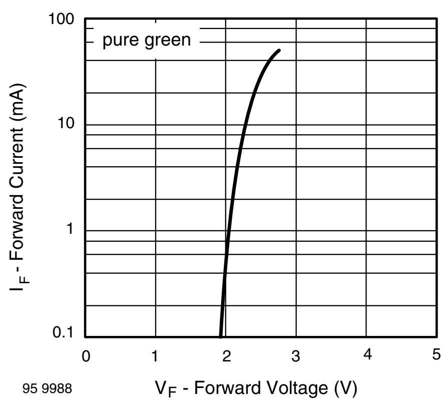
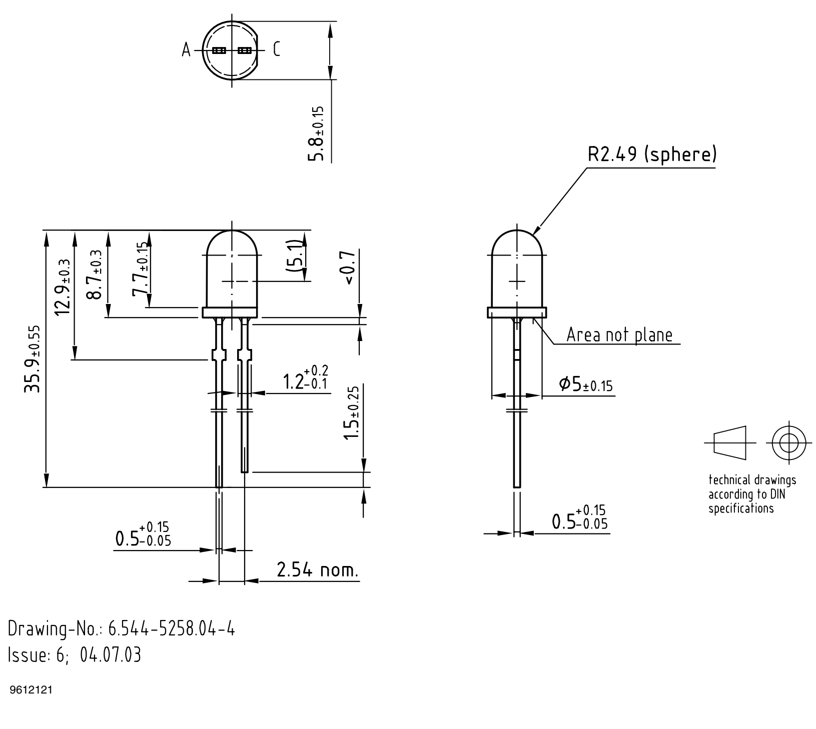


Figure 22. Relative Luminous Intensity vs. Forward Current

PACKAGE DIMENSIONS in millimeters



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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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