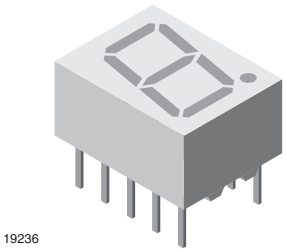
Standard 7-Segment Display 10 mm


19236

DESCRIPTION

The TDS.31.. series are 10 mm character seven segment LED displays in a very compact package.
The displays are designed for a viewing distance up to 6 m and available in four bright colors. The grey package surface and the evenly lighted untinted segments provide an optimum on-off contrast.
All displays are categorized in luminous intensity groups. That allows users to assemble displays with uniform appearence. Typical applications include instruments, panel meters, point-of-sale terminals and household equipment.

FEATURES

- Evenly lighted segments
- Grey package surface
- Untinted segments
- Luminous intensity categorized
- Yellow and green categorized for color
- Wide viewing angle
- Suitable for DC and high peak current
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free
e4
RoHS COMPLIANT

APPLICATIONS

- Panel meters
- Test- and measure- equipment
- Point-of-sale terminals
- Control units

PRODUCT GROUP AND PACKAGE DATA

- Product group: display
- Package: 10 mm
- Product series: standard
- Angle of half intensity: ± 50°

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY AT 10 mA	CIRCUITRY
TDSO3150	Orange red	I_V = 4500 µcd (typ.)	Common anode
TDSO3150-KL	Orange red	I_V = (1800 to 5600) µcd	Common anode
TDSO3150-L	Orange red	I_V = (2800 to 5600) µcd	Common anode
TDSO3160	Orange red	I_V = 4500 µcd (typ.)	Common cathode
TDSO3160-KL	Orange red	I_V = (1800 to 5600) µcd	Common cathode
TDSO3160-L	Orange red	I_V = (2800 to 5600) µcd	Common cathode
TDSY3150	Yellow	I_V = 3000 µcd (typ.)	Common anode
TDSY3150-K	Yellow	I_V = (1800 to 3600) µcd	Common anode
TDSY3160	Yellow	I_V = 3000 µcd (typ.)	Common cathode
TDSG3150	Green	I_V = 6500 µcd (typ.)	Common anode
TDSG3150-M	Green	I_V = (4500 to 9000) µcd	Common anode
TDSG3150-MN	Green	I_V = (4500 to 14 000) µcd	Common anode
TDSG3160	Green	I_V = 6500 µcd (typ.)	Common cathode
TDSG3160-M	Green	I_V = (4500 to 9000) µcd	Common cathode

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
TDSO3150, TDSO3160, TDSY3150, TDSY3160, TDSG3150, TDSG3160

PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
Reverse voltage per segment or DP			V_R	6	V
DC forward current per segment or DP		TDSO3150	I_F	20	mA
		TDSO3160		20	
		TDSY3150		20	
		TDSY3160		20	
		TDSG3150		20	
		TDSG3160		20	
DC forward current per segment or DP	$t_p \leq 10$ µs (non repetitive)	TDSO3150	I_{FSM}	0.15	A
		TDSO3160		0.15	
		TDSY3150		0.15	
		TDSY3160		0.15	
		TDSG3150		0.15	
		TDSG3160		0.15	
Power dissipation	$T_{amb} \leq 45$ °C	TDSO3150, TDSO3160, TDSY3150, TDSY3160, TDSG3150, TDSG3160	P_V	480	mW
Junction temperature			T_j	100	°C
Operating temperature range			T_{amb}	- 40 to + 85	°C
Storage temperature range			T_{stg}	- 40 to + 85	°C
Soldering temperature	t ≤ 3 s, 2 mm below seating plane		T_{sd}	260	°C
Thermal resistance LED junction/ambient			R_{thJA}	120	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TDSO3150, TDSO3160, ORANGE RED

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) (1)	I_F = 10 mA	TDSO3150	I_V	450	4500	-	µcd
		TDSO3150-KL		1800	-	5600	
		TDSO3150-L		2800	-	5600	
		TDSO3160		450	4500	-	
		TDSO3160-KL		1800	-	5600	
		TDSO3160-L		2800	-	5600	
Dominant wavelength	I_F = 10 mA	TDSO3150, TDSO3160	λ_d	612	-	625	nm
Peak wavelength	I_F = 10 mA		λ_p	-	630	-	nm
Angle of half intensity	I_F = 10 mA		φ	-	± 50	-	deg
Forward voltage per segment or DP	I_F = 20 mA		V_F	-	2	3	V
Reverse voltage per segment or DP	I_R = 10 µA		V_R	6	15	-	V

Note

(1) $I_{Vmin.}$ and I_V groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is ≥ 0.5, excluding decimal points and colon.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TDSY3150, TDSY3160, YELLOW

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) (1)	I_F = 10 mA	TDSY3150	I_V	450	3000	-	µcd
		TDSY3150-K		1800	-	3600	
		TDSY3160		450	3000	-	
Dominant wavelength	I_F = 10 mA	TDSY3150, TDSY3160	λ_d	581	-	594	nm
Peak wavelength	I_F = 10 mA		λ_p	-	585	-	nm
Angle of half intensity	I_F = 10 mA		φ	-	± 50	-	deg
Forward voltage per segment or DP	I_F = 20 mA		V_F	-	2.4	3	V
Reverse voltage per segment or DP	I_R = 10 µA		V_R	6	15	-	V

Note

(1) $I_{Vmin.}$ and I_V groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is ≥ 0.5, excluding decimal points and colon.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TDSG3150, TDSG3160, GREEN

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) (1)	I_F = 10 mA	TDSG3150	I_V	450	6800	-	µcd
		TDSG3150-M		4500	-	9000	
		TDSG3150-MN		4500	-	14 000	
		TDSG3160		450	6800	-	
		TDSG3160-M		4500	-	9000	
Dominant wavelength	I_F = 10 mA	TDSG3150, TDSG3160	λ_d	562	-	575	nm
Peak wavelength	I_F = 10 mA		λ_p	-	565	-	nm
Angle of half intensity	I_F = 10 mA		φ	-	± 50	-	deg
Forward voltage per segment or DP	I_F = 20 mA		V_F	-	2.4	3	V
Reverse voltage per segment or DP	I_R = 10 µA		V_R	6	15	-	V

Note

(1) $I_{Vmin.}$ and I_V groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is ≥ 0.5, excluding decimal points and colon.

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LIGHT INTENSITY (µcd)	
STANDARD	MIN.	MAX.
E	180	360
F	280	560
G	450	900
H	700	1400
I	1100	2200
K	1800	3600
L	2800	5600
M	4500	9000
N	7000	14 000

Note

The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped in one tube (there will be no mixing of two groups in one tube).
In order to ensure availability, single brightness groups will not be orderable.

COLOR CLASSIFICATION

GROUP	ORANGE RED		YELLOW		GREEN	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
1	598	601	581	584		
2	600	603	583	586	562	565
3	602	605	585	588	564	567
4	604	607	587	590	566	569
5	606	609	589	592	568	571
6	608	611	591	594	570	573
7					570	575

Note

Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm.

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

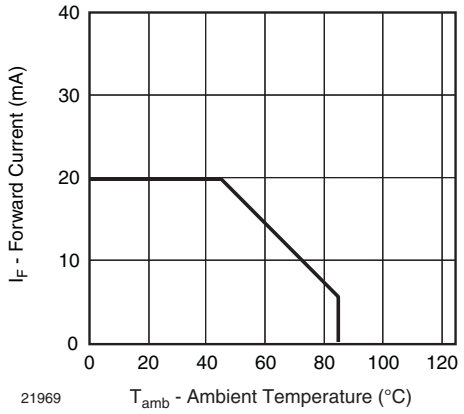


Fig. 1 - Forward Current vs. Ambient Temperature

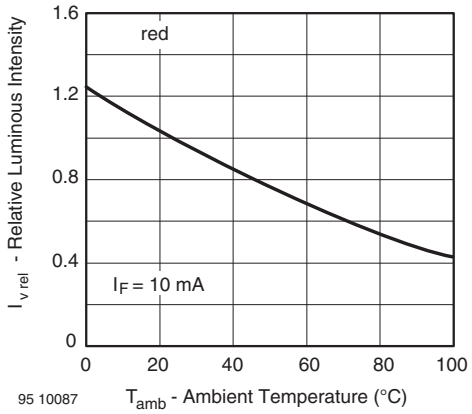


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

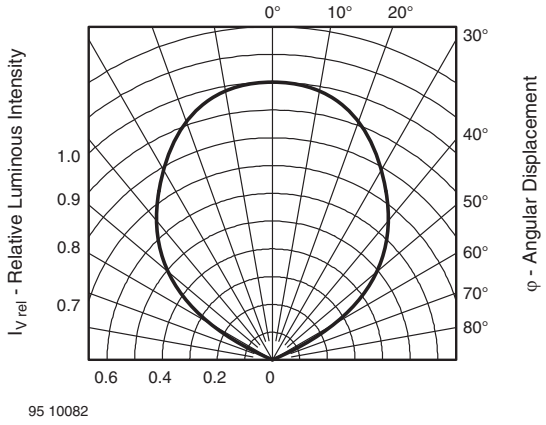


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

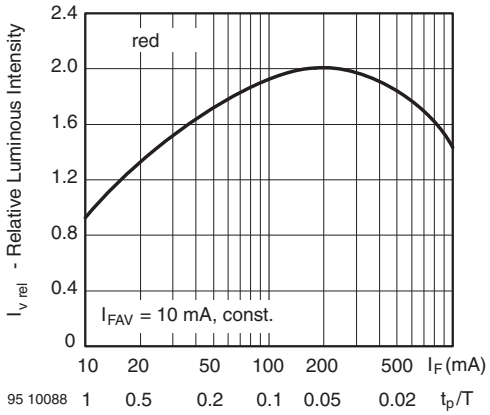


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

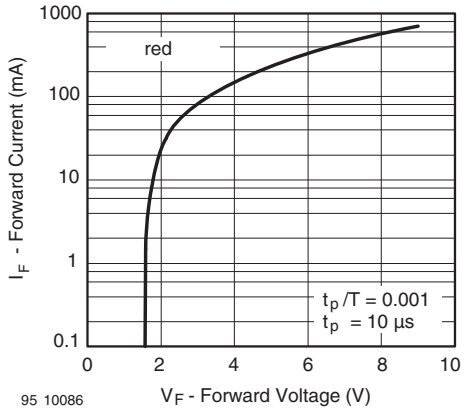


Fig. 3 - Forward Current vs. Forward Voltage

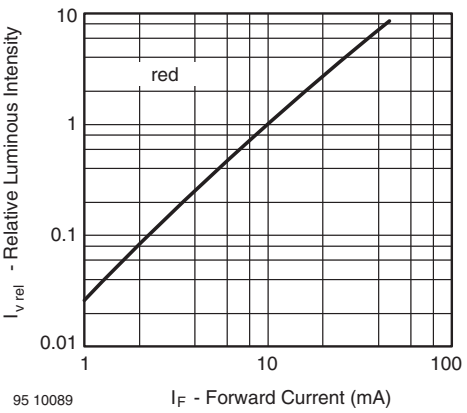


Fig. 6 - Relative Luminous Intensity vs. Forward Current

For technical questions, contact: LED@Vishay.com
Document Number: 83125
Rev. 1.6, 23-May-11

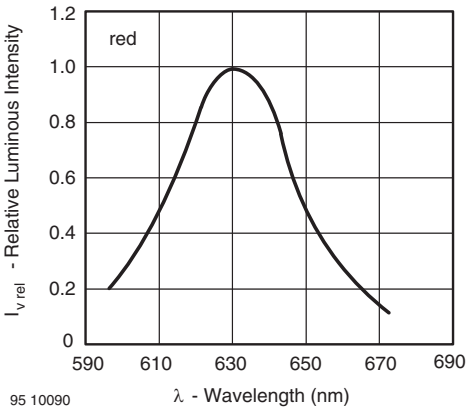


Fig. 7 - Relative Intensity vs. Wavelength

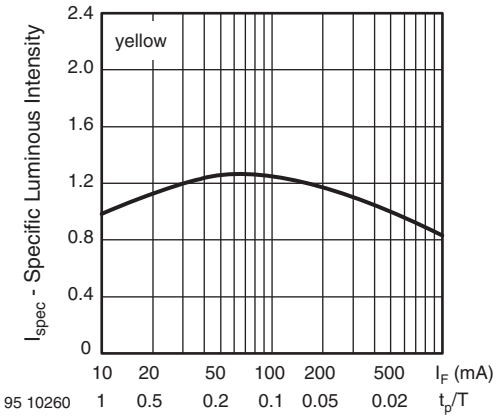


Fig. 10 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

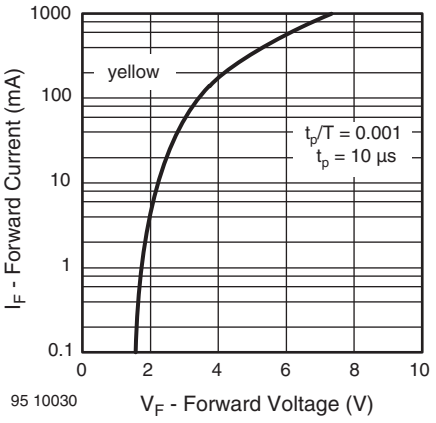


Fig. 8 - Forward Current vs. Forward Voltage

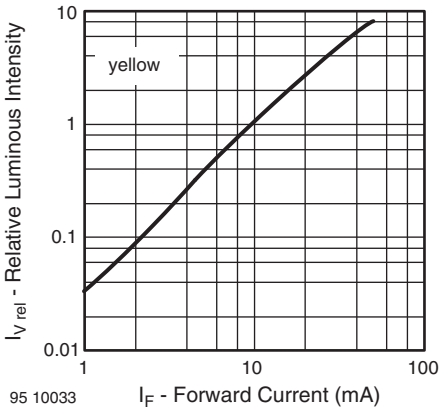


Fig. 11 - Relative Luminous Intensity vs. Forward Current

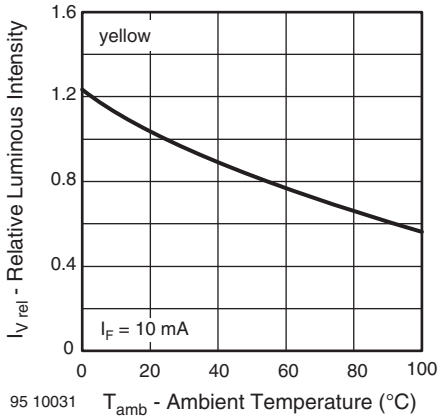


Fig. 9 - Rel. Luminous Intensity vs. Ambient Temperature

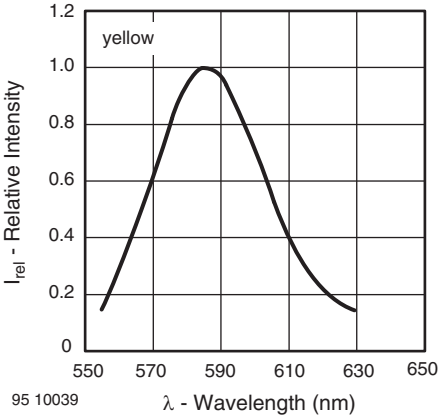


Fig. 12 - Relative Intensity vs. Wavelength

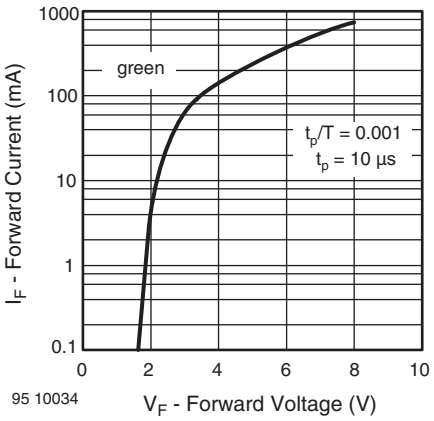


Fig. 13 - Forward Current vs. Forward Voltage

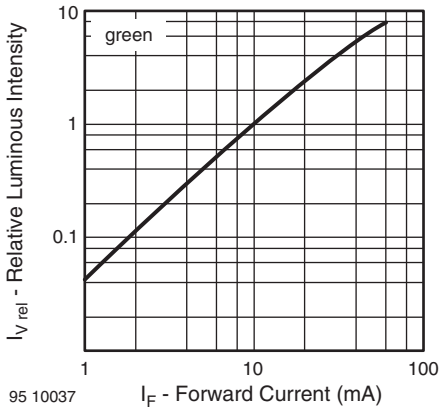


Fig. 16 - Relative Luminous Intensity vs. Forward Current

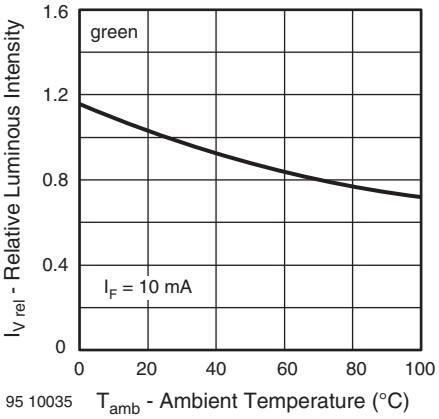


Fig. 14 - Rel. Luminous Intensity vs. Ambient Temperature

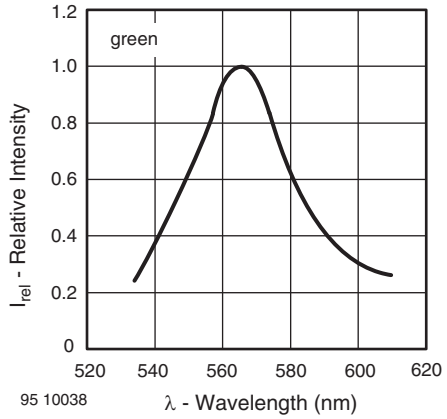


Fig. 17 - Relative Intensity vs. Wavelength

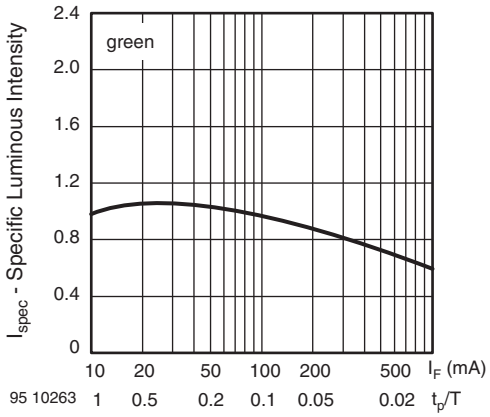


Fig. 15 - Specific Luminous Intensity vs. Forward Current

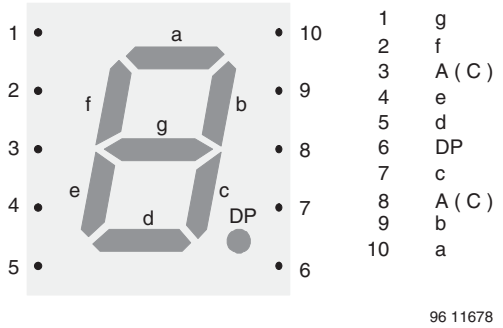
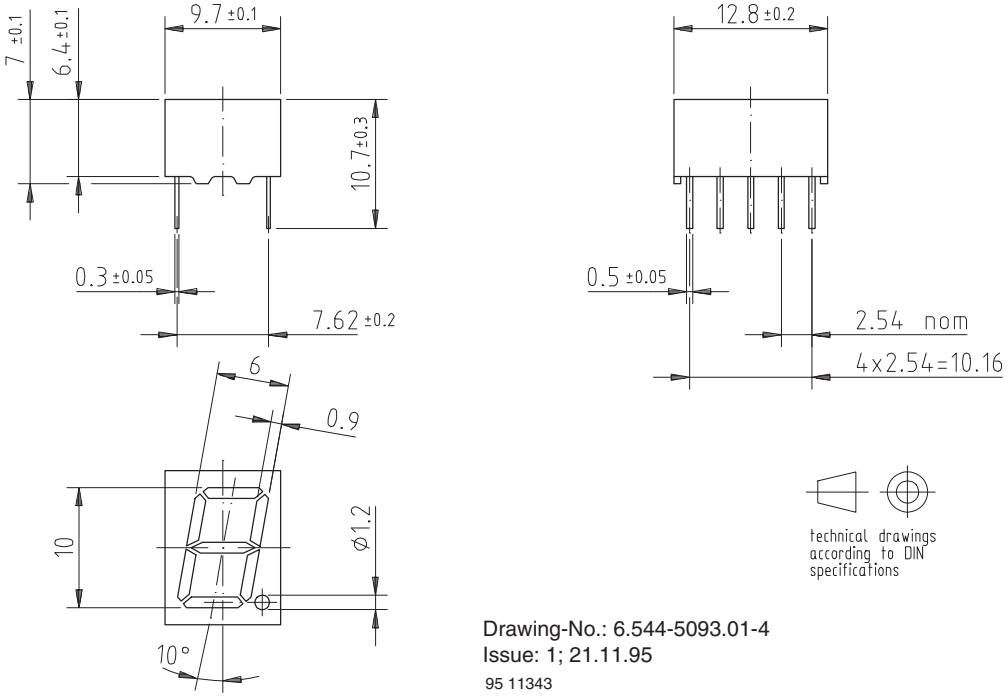


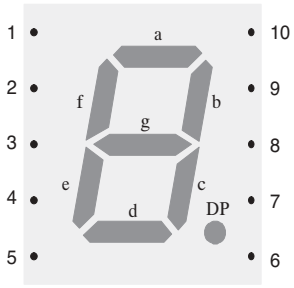
Fig. 18 - TDS.31..

PACKAGE DIMENSIONS FOR TDS.31.. in millimeters



Drawing-No.: 6.544-5093.01-4
Issue: 1; 21.11.95
95 11343

Pin Connections 10 mm



1	g
2	f
3	A (C)
4	e
5	d
6	DP
7	c
8	A (C)
9	b
10	a

96 11678

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 operatingsystems 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
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

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Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.