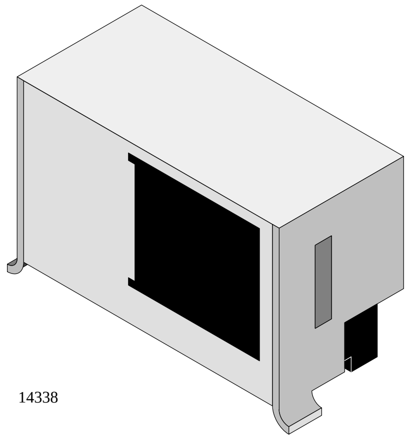
Photo Modules for PCM Remote Control Systems

Available types for different carrier frequencies

Type	fo	Type	fo
TFMN 5300	30 kHz	TFMN 5330	33 kHz
TFMN 5360	36 kHz	TFMN 5370	36.7 kHz
TFMN 5380	38 kHz	TFMN 5400	40 kHz
TFMN 5560	56 kHz		

Description

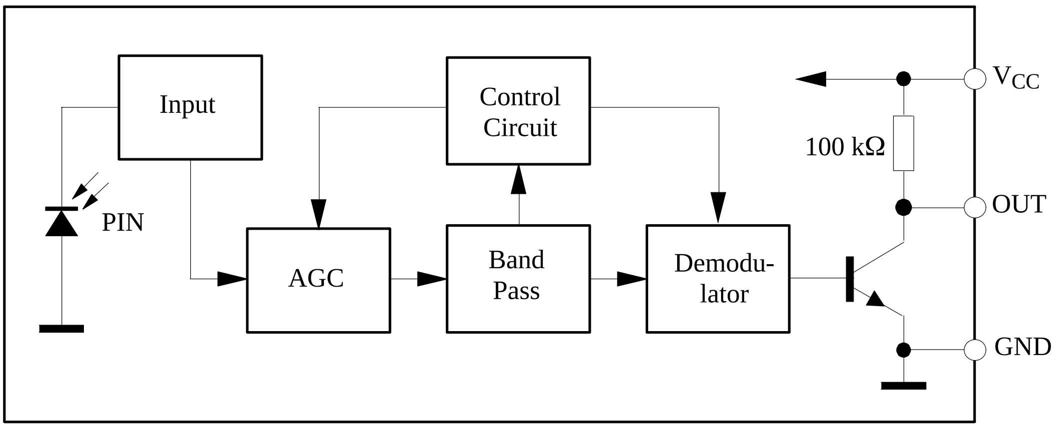
The TFMN5..0 – series are miniaturized receivers for infrared remote control systems. PIN diode and preamplifier are assembled on PC board, the epoxy package is designed as IR filter.
The demodulated output signal can directly be decoded by a microprocessor. The main benefit is the reliable function even in disturbed ambient and the protection against uncontrolled output pulses.


14338

Features

- Photo detector and preamplifier in one package
- Output active low
- Internal filter for PCM frequency
- High immunity against ambient light
- High shielding against electric field disturbance
- 5 Volt supply voltage, low power consumption
- TTL and CMOS compatibility
- Continuous transmission possible ($t_{pi}/T \leqq 0.4$)
- SMD

Block Diagram



15906

Absolute Maximum Ratings

T_{amb} = 25°C

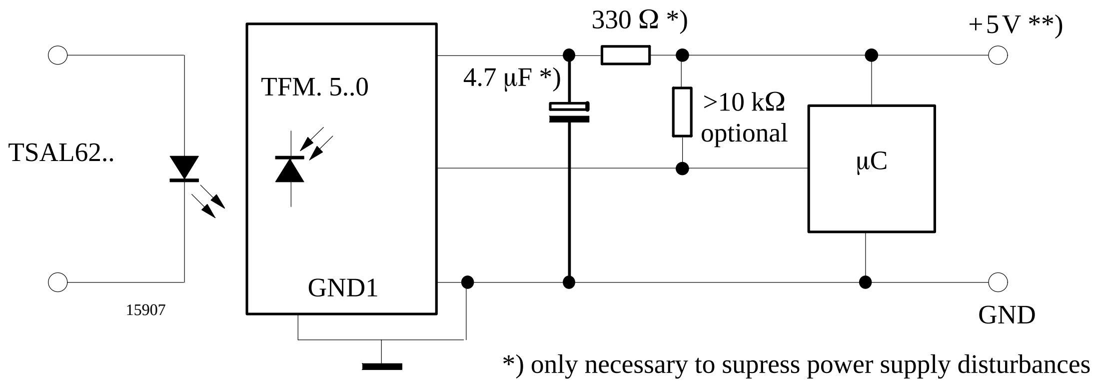
Parameter	Test Conditions	Symbol	Value	Unit
Supply Voltage	(Pin 2)	V_S	–0.3...6.0	V
Supply Current	(Pin 2)	I_S	5	mA
Output Voltage	(Pin 3)	V_O	–0.3...6.0	V
Output Current	(Pin 3)	I_O	5	mA
Junction Temperature		T_j	100	°C
Storage Temperature Range		T_{stg}	–40...+85	°C
Operating Temperature Range		T_{amb}	–25...+85	°C
Power Consumption	(T_{amb} ≦ 85 °C)	P_{tot}	50	mW
Soldering Temperature	t ≦ 10 s, 1 mm from case	T_{sd}	230	°C

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Supply Current (Pin 2)	V_S = 5 V, E_v = 0	I_{SD}	0.4	0.5	0.8	mA
	V_S = 5 V, E_v = 40 klx, sunlight	I_{SH}		1.0		mA
Transmission Distance	E_v = 0, test signal see fig.7, IR diode TSAL6200, I_F = 0.3 A	d		35		m
Output Voltage Low (Pin 3)	I_{OSL} = 0.5 mA, E_e = 0.7 mW/m², f = f_o, t_p/T = 0.4	V_{OSL}			250	mV
Irradiance (30 – 40 kHz)	Pulse width tolerance: $t_{po}=t_{pi}\pm160\mu s$, test signal (see fig.7)	$E_{e\ min}$		0.6		mW/m²
Irradiance (56 kHz)	Pulse width tolerance: $t_{po}=t_{pi}\pm160\mu s$, test signal (see fig.7)	$E_{e\ min}$		0.8		mW/m²
Irradiance		$E_{e\ max}$	20			W/m²
Directivity	Angle of half transmission distance	$\varphi_{1/2}$		±50		deg

Application Circuit



*) only necessary to supress power supply disturbances
**) tolerated supply voltage range : 4.5V<V_S<5.5V

Typical Characteristics (T$_{amb}$ = 25°C unless otherwise specified)

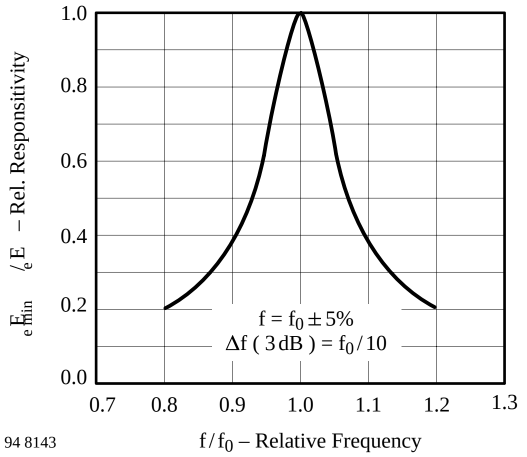


Figure 1. Frequency Dependence of Responsivity

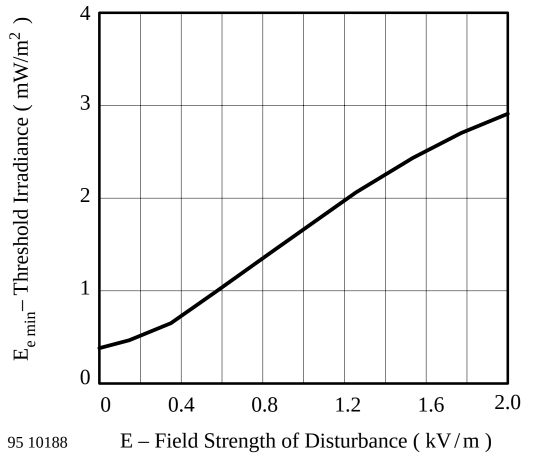


Figure 4. Sensitivity vs. Electric Field Disturbances

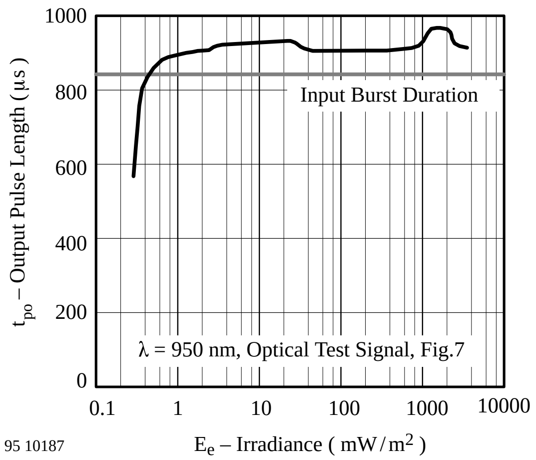


Figure 2. Sensitivity in Dark Ambient

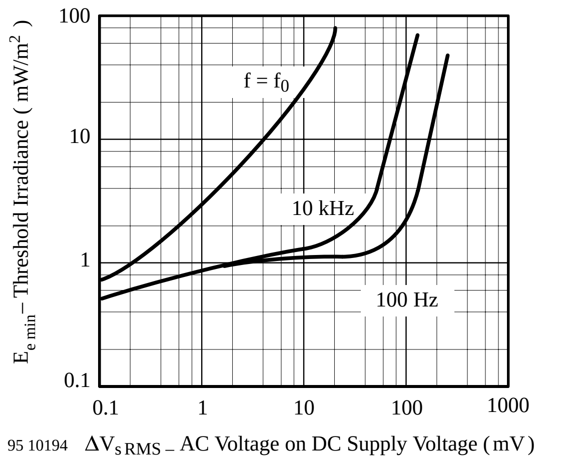


Figure 5. Sensitivity vs. Supply Voltage Disturbances

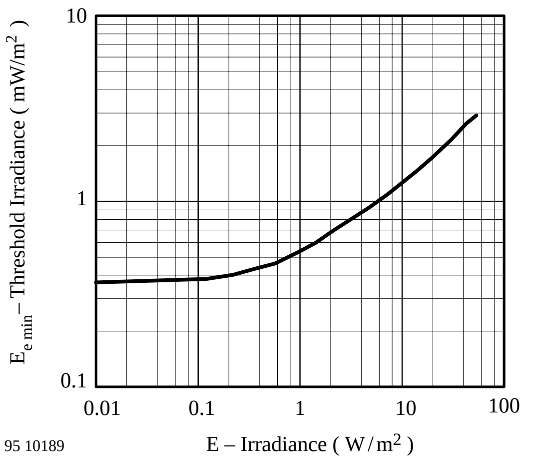


Figure 3. Sensitivity in Bright Ambient

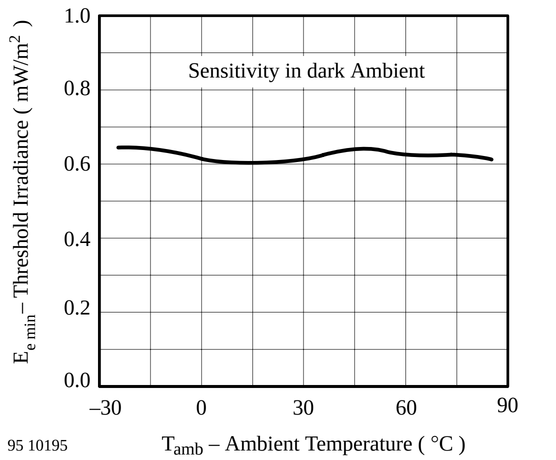


Figure 6. Sensitivity vs. Ambient Temperature

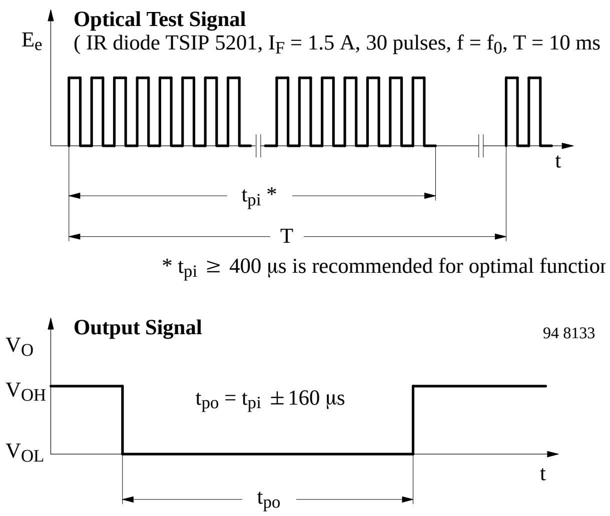


Figure 7. Output Function

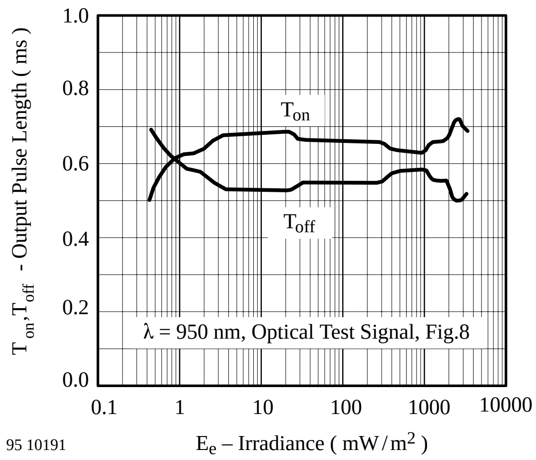


Figure 10. Output Pulse Diagram

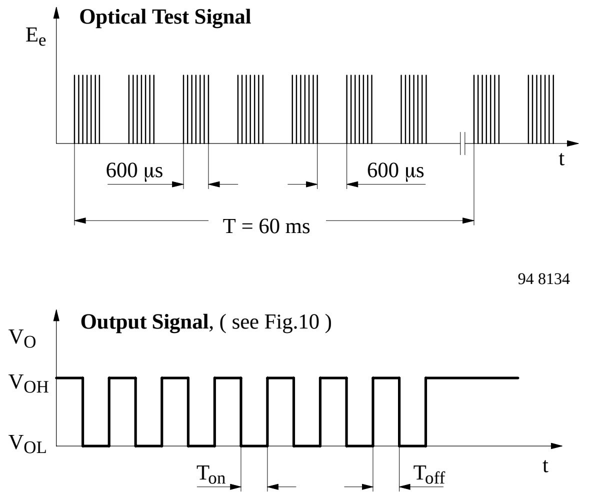


Figure 8. Output Function

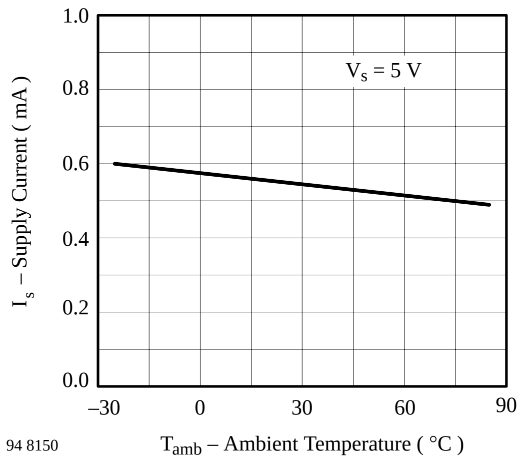


Figure 11. Supply Current vs. Ambient Temperature

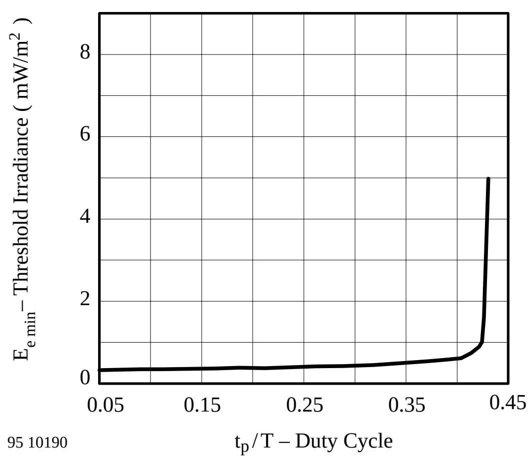


Figure 9. Sensitivity vs. Duty Cycle

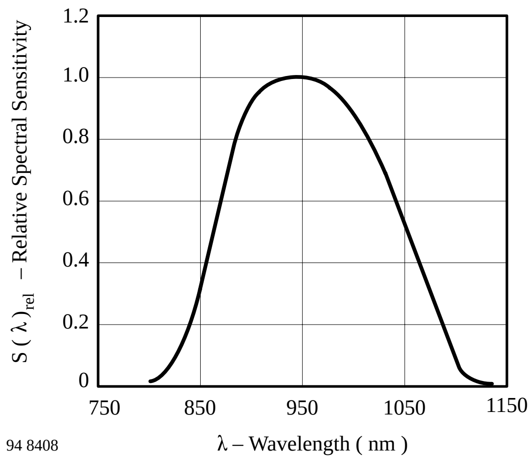


Figure 12. Relative Spectral Sensitivity vs. Wavelength

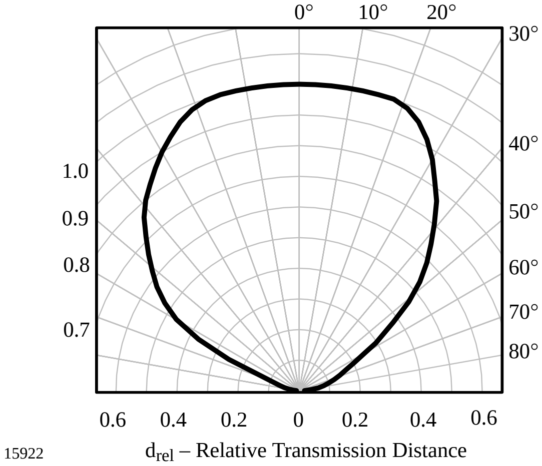


Figure 13. Vertical Directivity φ_y

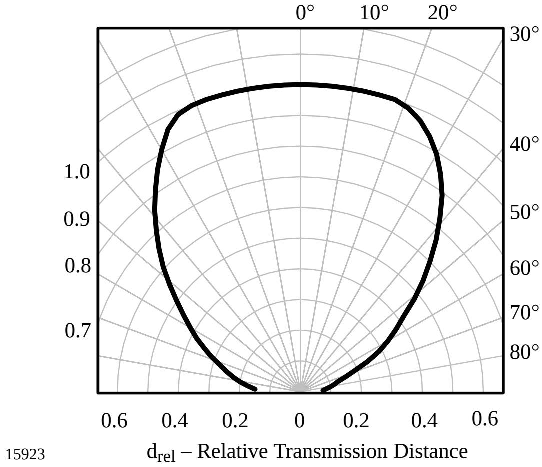
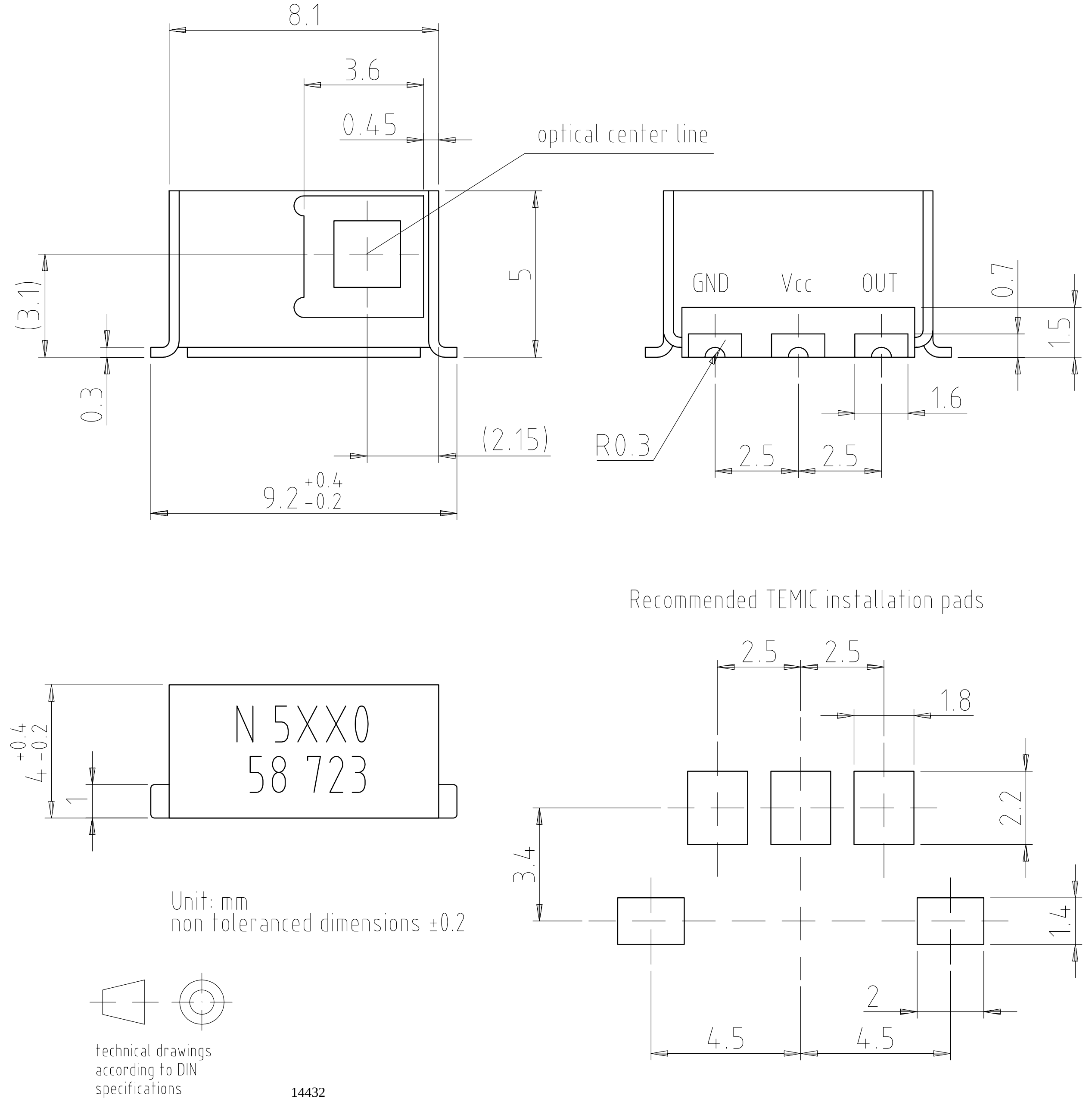


Figure 14. Horizontal Directivity φ_x

Dimensions in mm



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