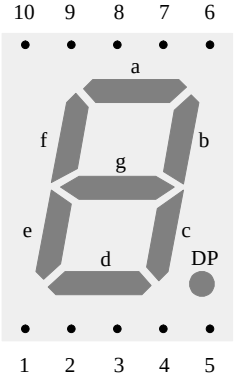
7 mm Seven Segment Displays

Color	Type	Circuitry
Red	TDSR115.	Common anode
	TDSR116.	Common cathode
High efficiency red	TDSO115.	Common anode
	TDSO116.	Common cathode
Yellow	TDSY115.	Common anode
	TDSY116.	Common cathode
Green	TDSG115.	Common anode
	TDSG116.	Common cathode

Description

The TDS.11.. series are 7 mm character seven segment LED displays in a very compact package.
The displays are designed for a viewing distance up to 3 meters and available in four bright colors. The grey package surface and the evently 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.



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

95 10896

Features

- Evently 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

Applications

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

Absolute Maximum Ratings

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

TDSR115. /TDSR116. , **TDSO115. /TDSO116.** , **TDSY115. /TDSY116.** , **TDSG115. /TDSG116.**

Parameter	Test Conditions	Type	Symbol	Value	Unit
Reverse voltage per segment or DP			V_R	6	V
DC forward current per segment or DP		TDSR115./116.	I_F	25	mA
		TDSO115./116.	I_F	17	mA
		TDSY115./116.	I_F	17	mA
		TDSG115./116.	I_F	17	mA
Surge forward current per segment or DP	$t_p \leq 10$ µs (non repetitive)	TDSR115./116.	I_{FSM}	0.5	A
		TDSO115./116.	I_{FSM}	0.15	A
		TDSY115./116.	I_{FSM}	0.15	A
		TDSG115./116.	I_{FSM}	0.15	A
Power dissipation	$T_{amb} \leq 45$˚C		P_V	400	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 sec, 2mm below seating plane		T_{sd}	260	˚C
Thermal resistance LED junction/ ambient			R_{thJA}	140	K/W

Optical and Electrical Characteristics

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

Red (**TDSR115.** , **TDSR116.**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) [1]	I_F = 10 mA	TDSR1150/1160	I_V	180			µcd
	I_F = 10 mA	TDSR1151/1161	I_V	280		1400	µcd
Dominant wavelength	I_F = 10 mA		λ_d		645		nm
Peak wavelength	I_F = 10 mA		λ_p		660		nm
Angle of half intensity	I_F = 10 mA		φ		±50		deg
Forward voltage per segment or DP	I_F = 20 mA		V_F		1.6	2	V
Reverse voltage per segment or DP	I_R = 10 µA		V_R	6	15		V
[1] I_{Vmin} and I_V groups are mean values of segments a to g							

High efficiency red (**TDSO115.** , **TDSO116.**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) 1)	I_F = 10 mA	TDSO1150/1160	I_V	450			µcd
	I_F = 10 mA	TDSO1151/1161	I_V	1100		5600	µcd
Dominant wavelength	I_F = 10 mA		λ_d		626		nm
Peak wavelength	I_F = 10 mA		λ_p		635		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 mA		V_R	6	15		V
1) I_{Vmin} and I_V groups are mean values of segments a to g							

Yellow (**TDSY115.** , **TDSY116.**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) 1)	I_F = 10 mA	TDSY1150/1160	I_V	450			µcd
	I_F = 10 mA	TDSY1151/1161	I_V	700		3600	µcd
Dominant wavelength	I_F = 10 mA		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 mA		V_R	6	15		V
1) I_{Vmin} and I_V groups are mean values of segments a to g							

Green (**TDSG115.** , **TDSG116.**)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) 1)	I_F = 10 mA	TDSG1150/1160	I_V	450			µcd
	I_F = 10 mA	TDSG1151/1161	I_V	1100		5600	µcd
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		±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
1) I_{Vmin} and I_V groups are mean values of segments a to g							

Typical Characteristics (T_{amb} = 25°C, unless otherwise specified)

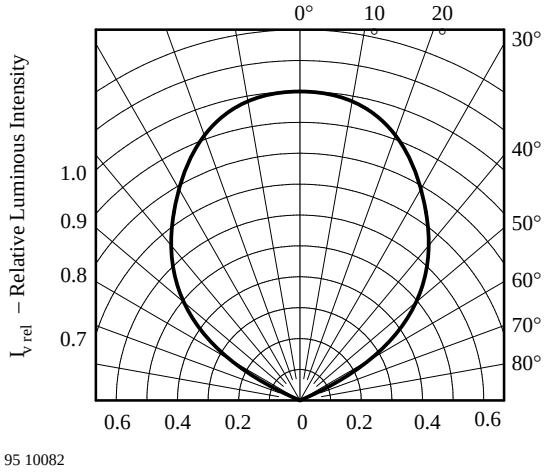


Figure 1. Rel. Luminous Intensity vs. Angular Displacement

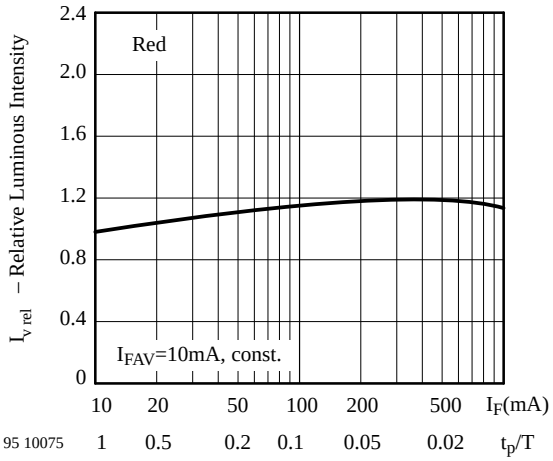


Figure 4. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

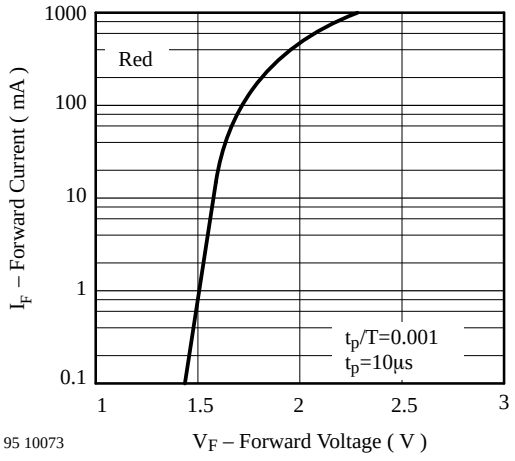


Figure 2. Forward Current vs. Forward Voltage

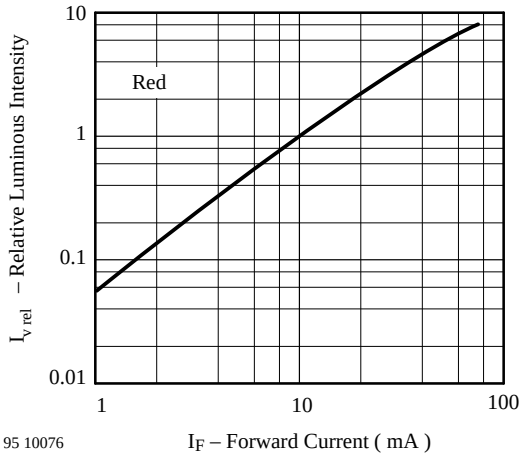


Figure 5. Relative Luminous Intensity vs. Forward Current

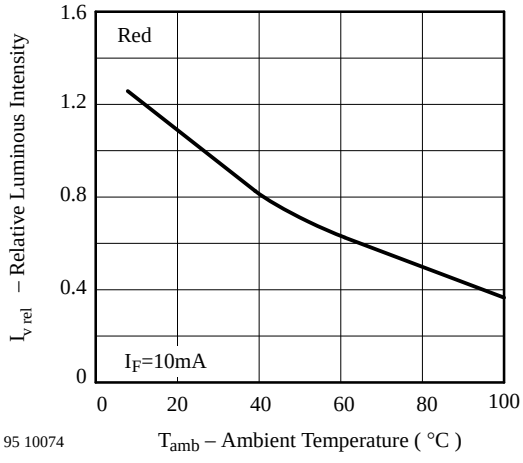


Figure 3. Rel. Luminous Intensity vs. Ambient Temperature

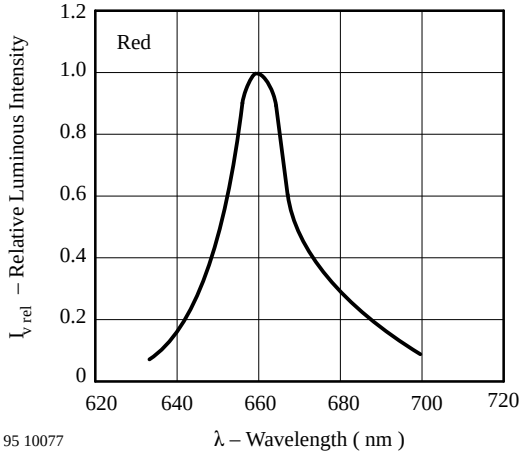


Figure 6. Relative Luminous Intensity vs. Wavelength

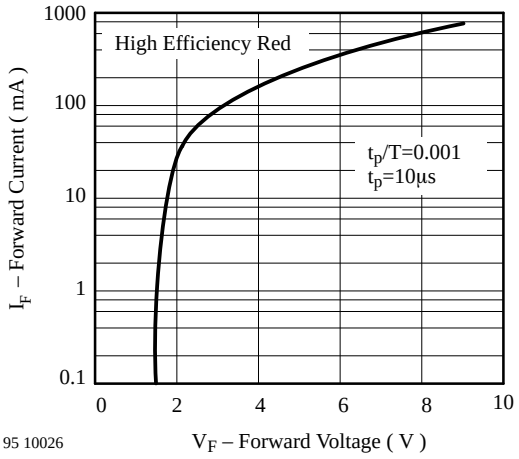


Figure 7. Forward Current vs. Forward Voltage

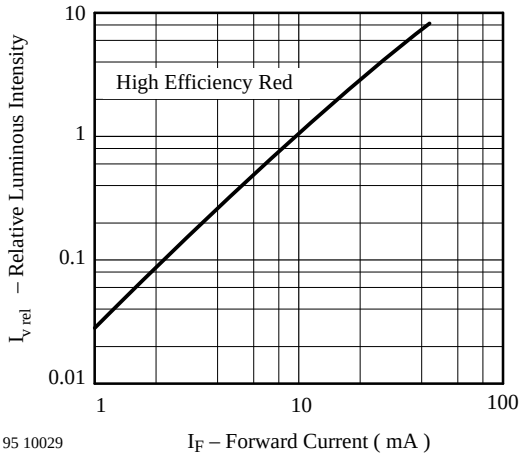


Figure 10. Relative Luminous Intensity vs. Forward Current

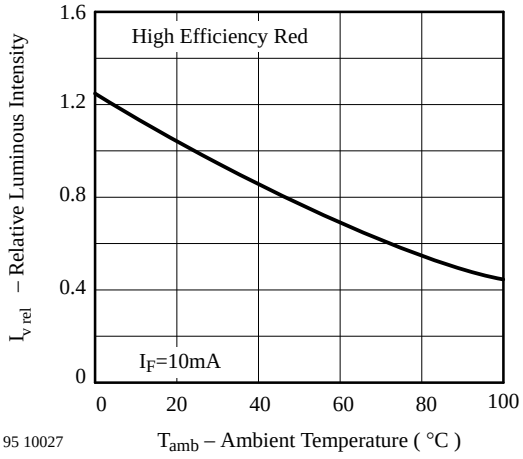


Figure 8. Rel. Luminous Intensity vs. Ambient Temperature

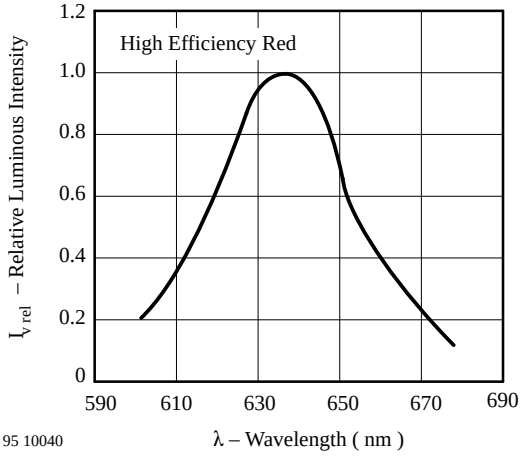


Figure 11. Relative Luminous Intensity vs. Wavelength

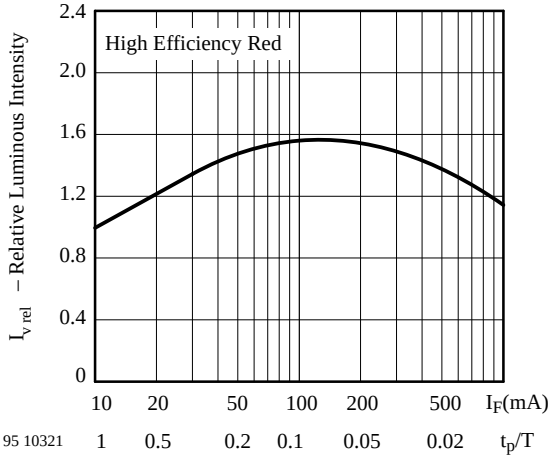


Figure 9. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

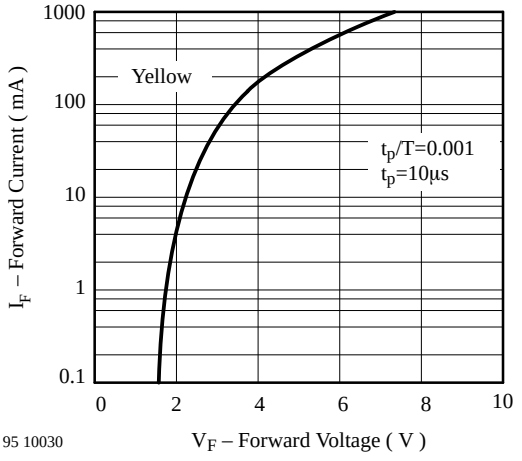


Figure 12. Forward Current vs. Forward Voltage

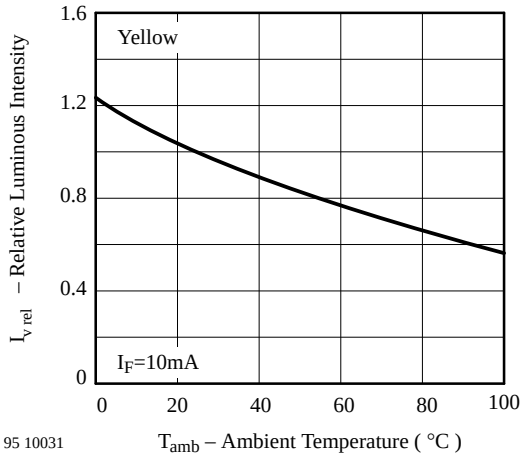


Figure 13. Rel. Luminous Intensity vs. Ambient Temperature

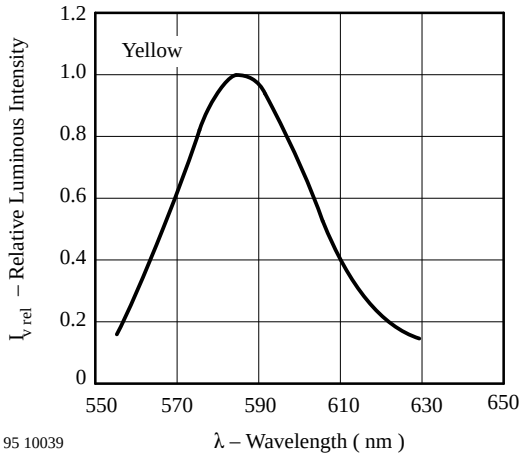


Figure 16. Relative Luminous Intensity vs. Wavelength

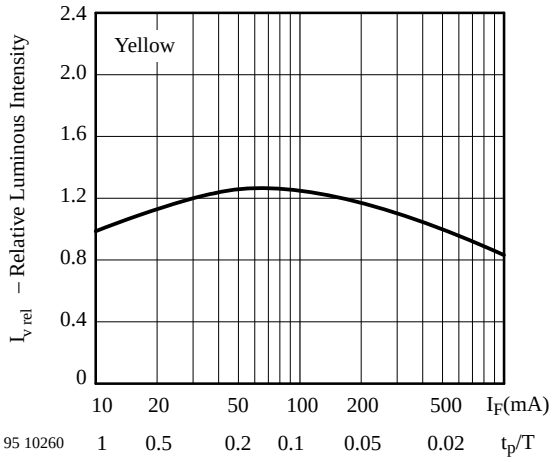


Figure 14. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

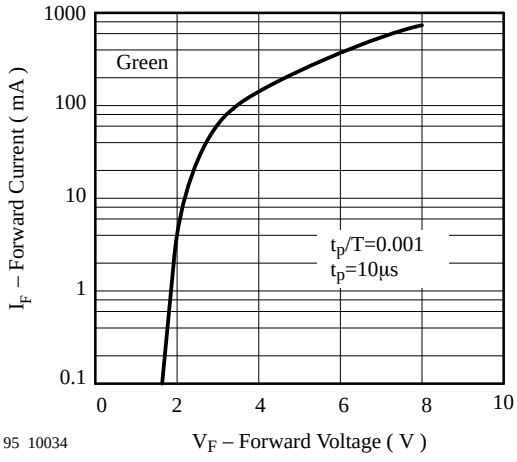


Figure 17. Forward Current vs. Forward Voltage

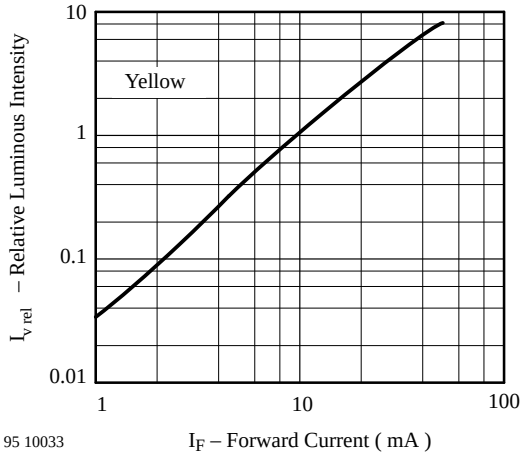


Figure 15. Relative Luminous Intensity vs. Forward Current

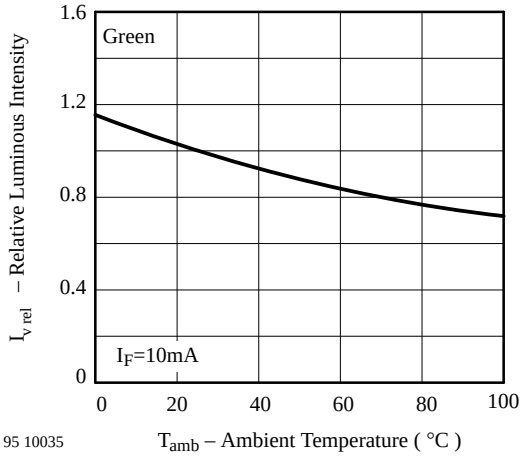


Figure 18. Rel. Luminous Intensity vs. Ambient Temperature

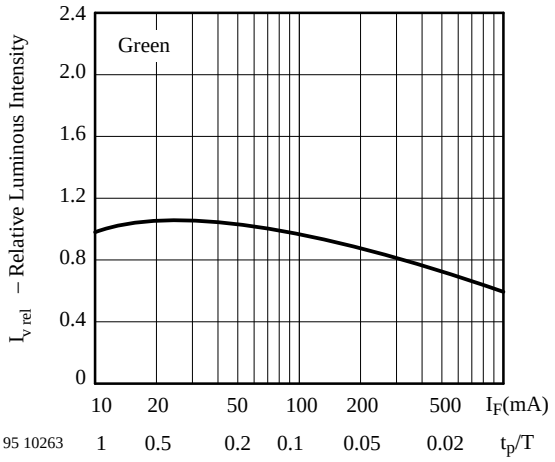


Figure 19. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

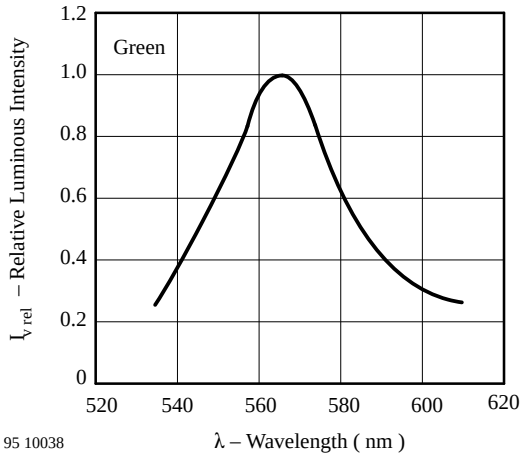


Figure 21. Relative Luminous Intensity vs. Wavelength

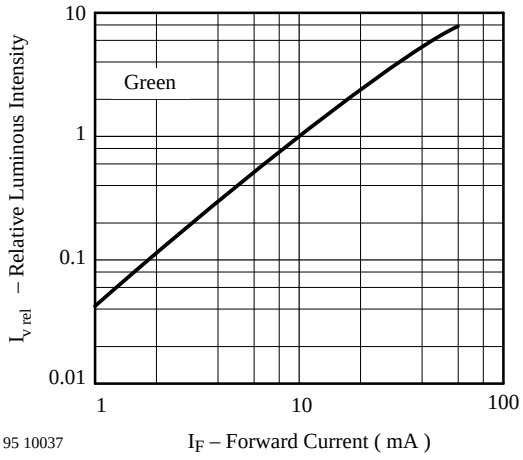


Figure 20. Relative Luminous Intensity vs. Forward Current

Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic 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.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division 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.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

TEMIC TELEFUNKEN microelectronic GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423