

10 mm Seven Segment Displays

Color	Type	Circuitry
Red	TDSR315.	Common anode
	TDSR316.	Common cathode
High efficiency red	TDSO315.	Common anode
	TDSO316.	Common cathode
Yellow	TDSY315.	Common anode
	TDSY316.	Common cathode
Green	TDSG315.	Common anode
	TDSG316.	Common cathode

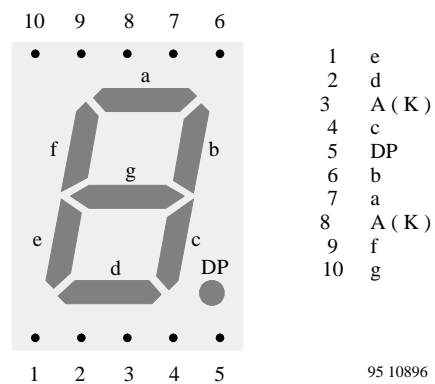
Description

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 meters 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 appearance.

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

Applications

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

TDS.31..

Absolute Maximum Ratings

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

TDSR315./TDSR316., TDSO315./TDSO316., TDSY315./TDSY316., TDSG315./TDSG316., /

Parameter	Test Conditions	Type	Symbol	Value	Unit
Reverse voltage per segment or DP			V_R	6	V
DC forward current per segment or DP		TDSR315./316.	I_F	30	mA
		TDSO315./316.	I_F	20	mA
		TDSY315./316.	I_F	20	mA
		TDSG315./316.	I_F	20	mA
Surge forward current per segment or DP	$t_p \leq 10 \mu\text{s}$ (non repetitive)	TDSR315./316.	I_{FSM}	0.5	A
		TDSO315./316.	I_{FSM}	0.15	A
		TDSY315./316.	I_{FSM}	0.15	A
		TDSG315./316.	I_{FSM}	0.15	A
Power dissipation	$T_{amb} \leq 45^{\circ}\text{C}$		P_V	480	mW
Junction temperature			T_j	100	$^{\circ}\text{C}$
Operating temperature range			T_{amb}	-40 to +85	$^{\circ}\text{C}$
Storage temperature range			T_{stg}	-40 to +85	$^{\circ}\text{C}$
Soldering temperature	$t \leq 3 \text{ sec}$, 2mm below seating plane		T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance LED junction/ambient			R_{thJA}	140	K/W

Optical and Electrical Characteristics

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

Red (TDSR315., TDSR316.)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) ¹⁾	$I_F = 10 \text{ mA}$	TDSR3150/3160	I_V	180			μcd
	$I_F = 10 \text{ mA}$	TDSR3151/3161	I_V	280		1400	μcd
Dominant wavelength	$I_F = 10 \text{ mA}$		λ_d		655		nm
Peak wavelength	$I_F = 10 \text{ mA}$		λ_p		660		nm
Angle of half intensity	$I_F = 10 \text{ mA}$		φ		± 50		deg
Forward voltage per segment or DP	$I_F = 20 \text{ mA}$		V_F		1.6	2	V
Reverse voltage per segment or DP	$I_R = 10 \mu\text{A}$		V_R	6	15		V

¹⁾ $I_{V_{min}}$ and I_V groups are mean values of segments a to g

High efficiency red (TDSO315. , TDSO316.)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) ¹⁾	I _F = 10 mA	TDSO3150/3160	I _V	450			μcd
	I _F = 10 mA	TDSO3151/3161	I _V	1800		9000	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 (TDSY315. , TDSY316.)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) ¹⁾	I _F = 10 mA	TDSY3150/3160	I _V	450			μcd
	I _F = 10 mA	TDSY3151/3161	I _V	1100		5600	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

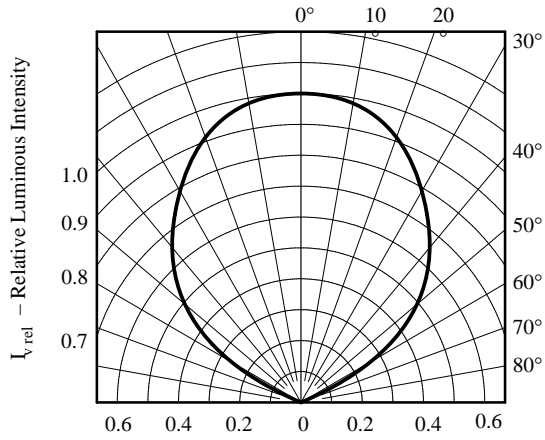
¹⁾ I_{Vmin} and I_V groups are mean values of segments a to g

Green (TDSG315. , TDSG316.)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity per segment (digit average) ¹⁾	I _F = 10 mA	TDSG3150/3160	I _V	450			μcd
	I _F = 10 mA	TDSG3151/3161	I _V	1800		9000	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

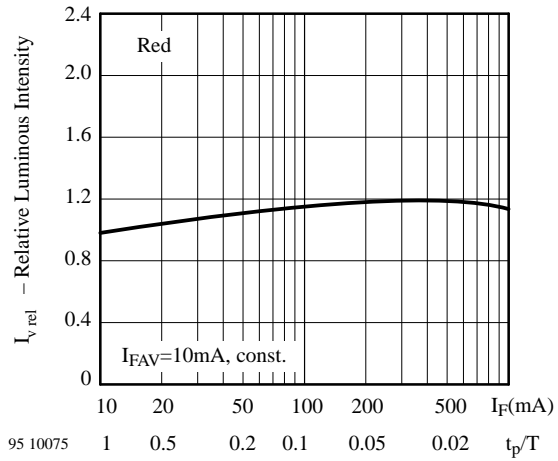
¹⁾ I_{Vmin} and I_V groups are mean values of segments a to g

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



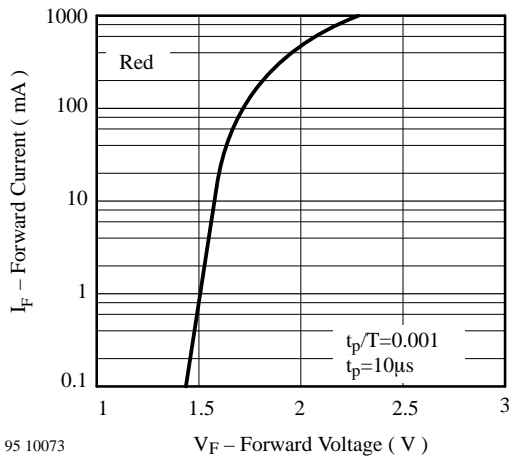
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Figure 1. Rel. Luminous Intensity vs. Angular Displacement



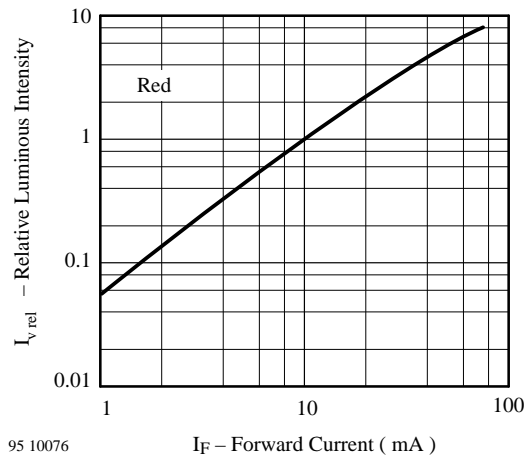
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Figure 4. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle



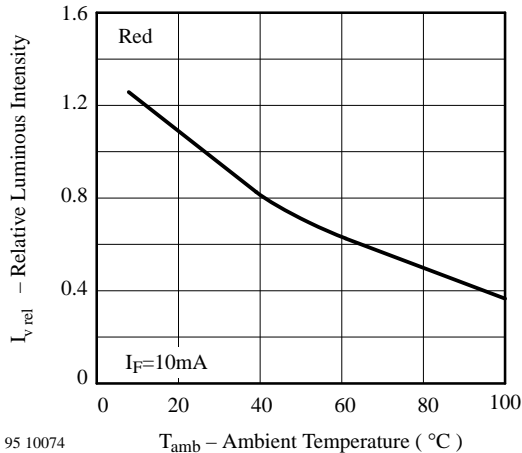
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Figure 2. Forward Current vs. Forward Voltage



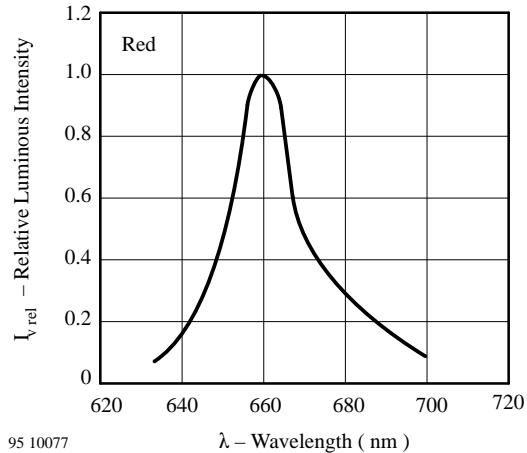
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Figure 5. Relative Luminous Intensity vs. Forward Current



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Figure 3. Rel. Luminous Intensity vs. Ambient Temperature



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Figure 6. Relative Luminous Intensity vs. Wavelength

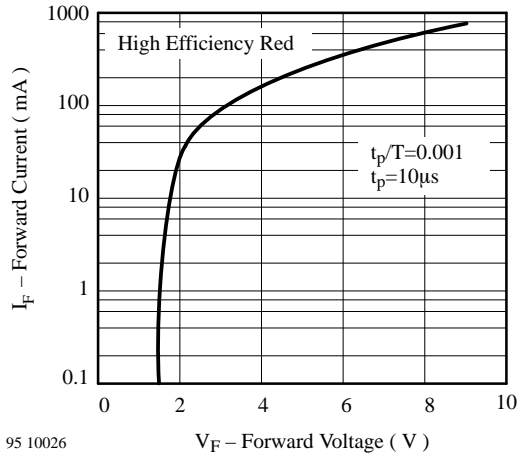


Figure 7. Forward Current vs. Forward Voltage

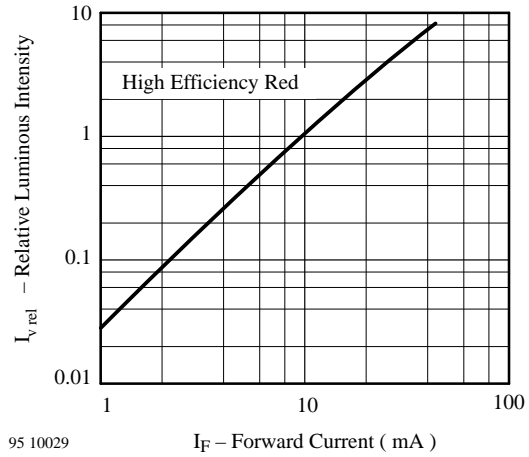


Figure 10. Relative Luminous Intensity vs. Forward Current

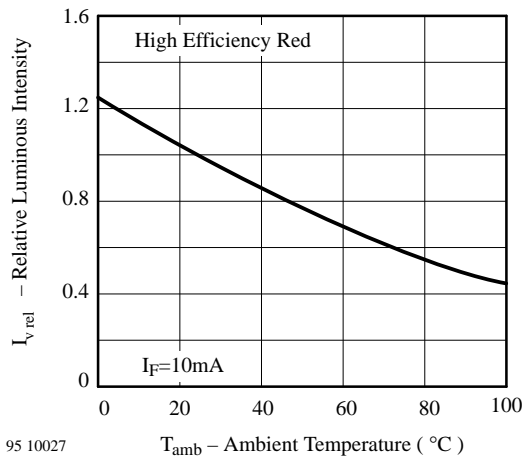


Figure 8. Rel. Luminous Intensity vs. Ambient Temperature

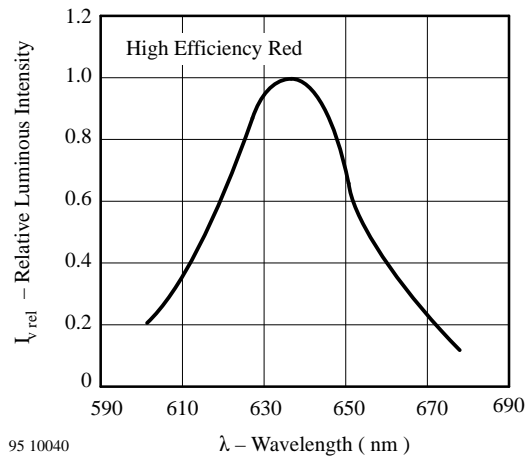


Figure 11. Relative Luminous Intensity vs. Wavelength

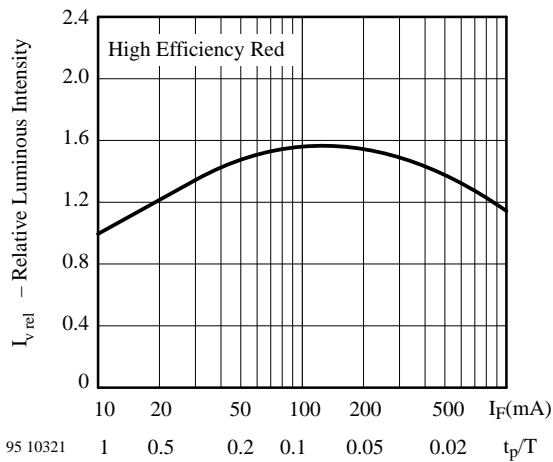


Figure 9. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

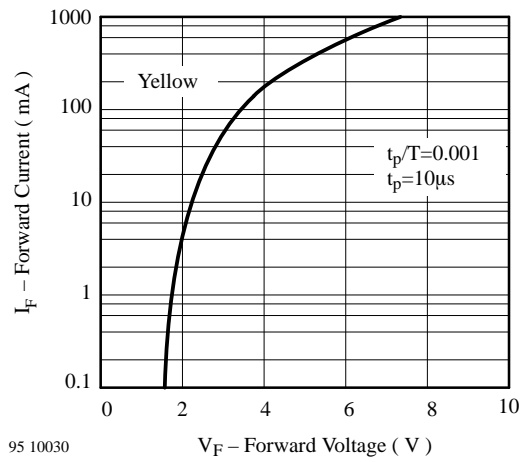
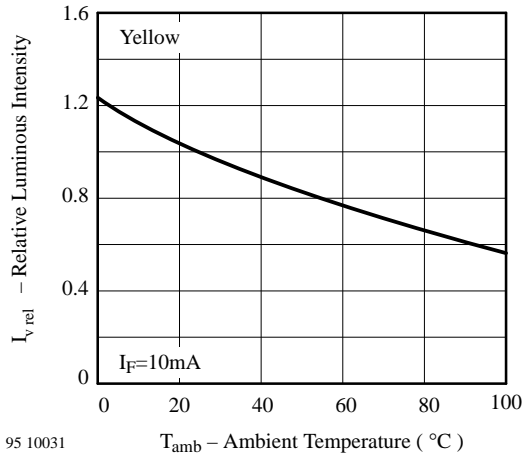
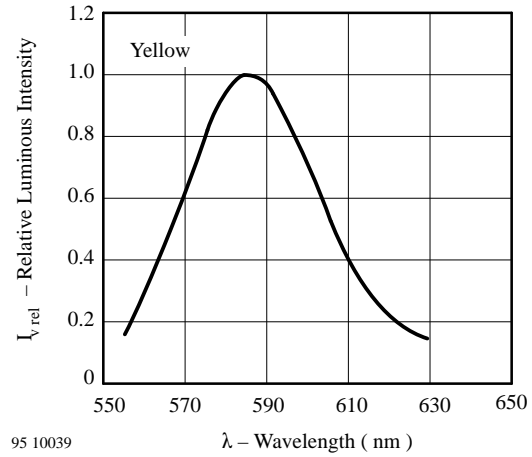


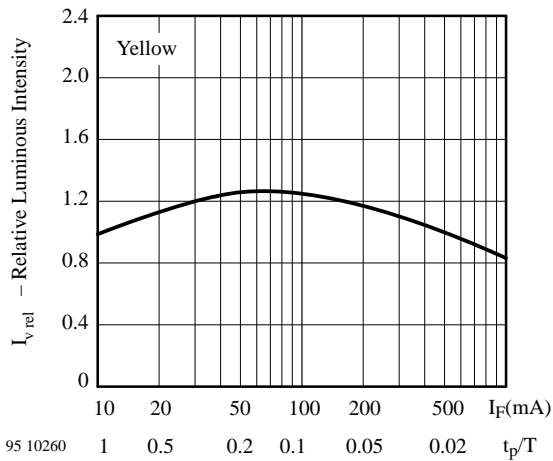
Figure 12. Forward Current vs. Forward Voltage



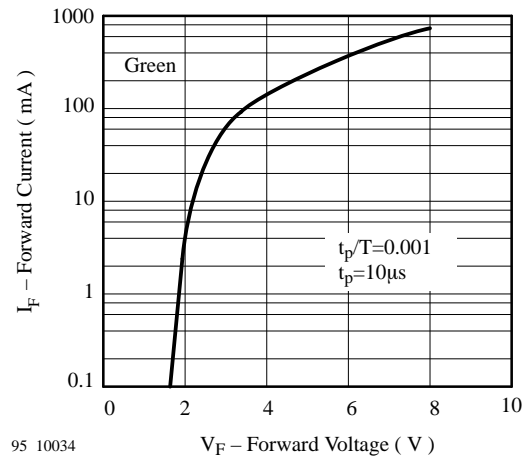
95 10031 **Figure 13. Rel. Luminous Intensity vs. Ambient Temperature**



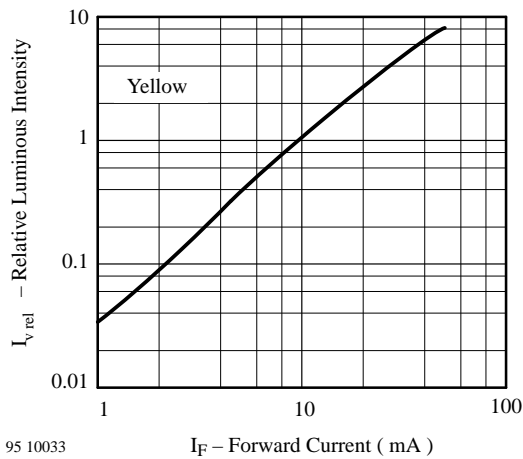
95 10039 **Figure 16. Relative Luminous Intensity vs. Wavelength**



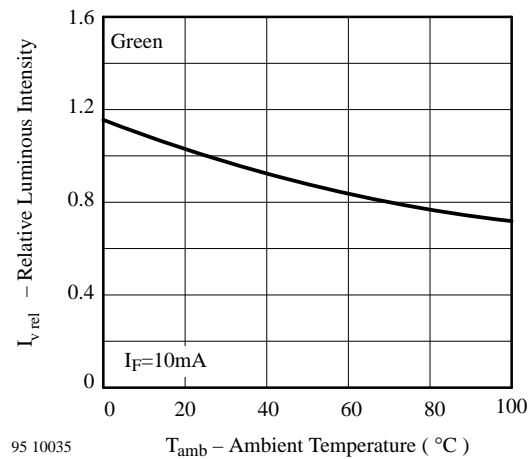
95 10260 **Figure 14. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle**



95 10034 **Figure 17. Forward Current vs. Forward Voltage**



95 10033 **Figure 15. Relative Luminous Intensity vs. Forward Current**



95 10035 **Figure 18. Rel. Luminous Intensity vs. Ambient Temperature**

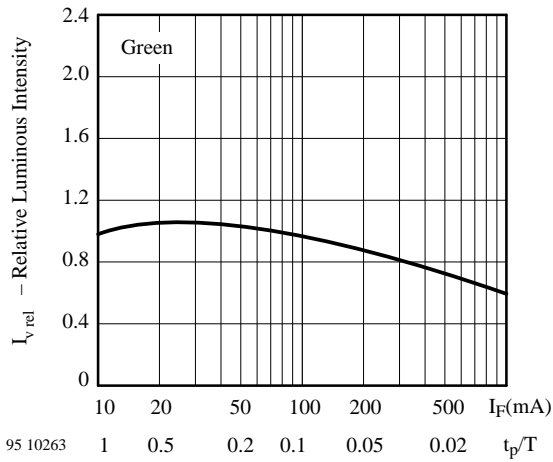


Figure 19. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

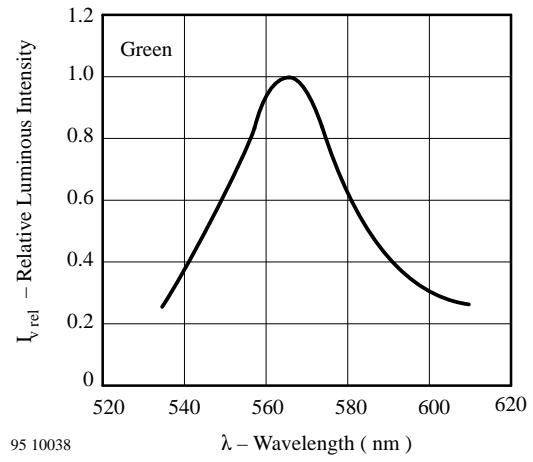


Figure 21. Relative Luminous Intensity vs. Wavelength

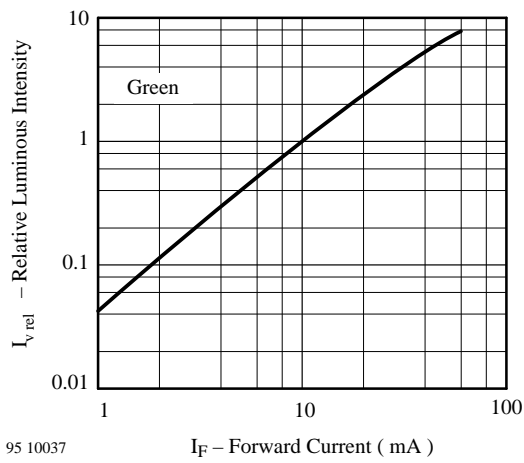


Figure 20. Relative Luminous Intensity vs. Forward Current

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.

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 TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC 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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