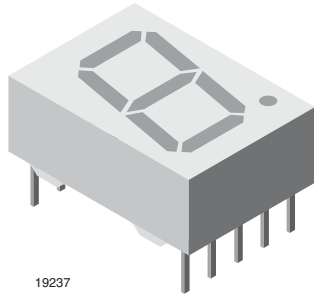




# High Intensity Red Low Current Seven Segment Display



19237

## DESCRIPTION

This series defines a new standard for low current displays. It is a single digit 7-segment LED display utilizing AlInGaP technology in color red.

The supreme light intensity allows applications under direct sunlight or “black front” designs by using tinted filter glass in front of the display.

Typical 1500  $\mu\text{cd}$  at 1 mA is best in class performance for applications with very limited power supply. The maximum forward current of 10 mA is allowed for an ambient temperature range of - 40 °C to + 85 °C without current derating.

Crosstalk between segments is possible at drive currents above 5 mA per segment. Therefore it is recommend to apply more than 5 mA only under direct sunlight or with tinted filter glass.

## FEATURES

- 1500  $\mu\text{cd}$  typical at 1 mA
- Very low power consumption
- Wide viewing angle
- Grey package surface
- Light intensity categorized at  $I_F = 1 \text{ mA}$
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS COMPLIANT

## APPLICATIONS

- Battery driven instruments
- Telecom devices
- Home appliances
- Instrumentation
- POS terminals

## PRODUCT GROUP AND PACKAGE DATA

- Product group: display
- Package: 13 mm
- Product series: low current
- Angle of half intensity:  $\pm 50^\circ$

PARTS TABLE			
PART	COLOR	LUMINOUS INTENSITY AT 1 mA	CIRCUITRY
TDSR1350	Red	$I_V = (280 \text{ to } 3600) \mu\text{cd}$	Common anode
TDSR1360	Red	$I_V = (280 \text{ to } 3600) \mu\text{cd}$	Common cathode
TDSR1360-IK	Red	$I_V = (1100 \text{ to } 3600) \mu\text{cd}$	Common cathode

ABSOLUTE MAXIMUM RATINGS ( $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified) TDSR1350, TDSR1360				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage per segment		$V_R$	5	V
DC forward current per segment		$I_F$	10	mA
Peak forward current per segment	$t_p \leq 10 \mu\text{s}$ , duty cycle 1/10	$I_{FM}$	50	mA
Power dissipation	$T_{\text{amb}} \leq 85 \text{ }^\circ\text{C}$	$P_V$	185	mW
Junction temperature		$T_j$	105	$^\circ\text{C}$
Operating temperature range		$T_{\text{amb}}$	- 40 to + 85	$^\circ\text{C}$
Storage temperature range		$T_{\text{stg}}$	- 40 to + 85	$^\circ\text{C}$
Soldering temperature	$t \leq 3 \text{ s}$ , 2 mm below seating plane	$T_{\text{sd}}$	260	$^\circ\text{C}$
Thermal resistance LED junction/ambient		$R_{\text{thJA}}$	100	K/W

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSR1350, TDSR1360, RED**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average)	$I_F = 1\text{ mA}$	TDSR1350	$I_V$	280	-	3600	$\mu\text{cd}$
		TDSR1360		280	-	3600	
		TDSR1350-IK		1100	-	3600	
Dominant wavelength	$I_F = 1\text{ mA}$	TDSR1350, TDSR1360	$\lambda_d$	-	640	-	nm
Peak wavelength	$I_F = 1\text{ mA}$		$\lambda_p$	-	650	-	nm
Angle of half intensity	$I_F = 1\text{ mA}$		$\phi$	-	$\pm 50$	-	deg
Forward voltage per segment or DP	$I_F = 1\text{ mA}$		$V_F$	-	1.8	2.4	V
Reverse voltage per segment or DP	$V_R = 6\text{ V}$		$I_R$	-	10	-	$\mu\text{A}$

**LUMINOUS INTENSITY CLASSIFICATION**

GROUP STANDARD	LIGHT INTENSITY ( $\mu\text{cd}$ )	
	MIN.	MAX.
F	280	560
G	450	900
H	700	1400
I	1100	2200
K	1800	3600

**Notes**

- 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.

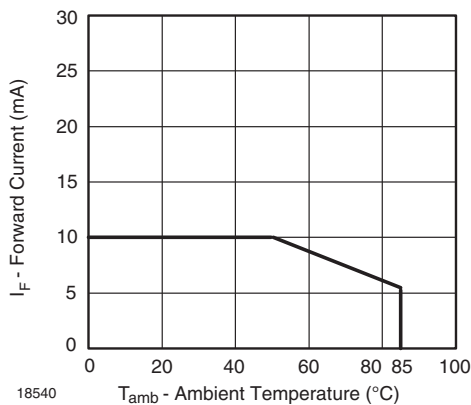
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

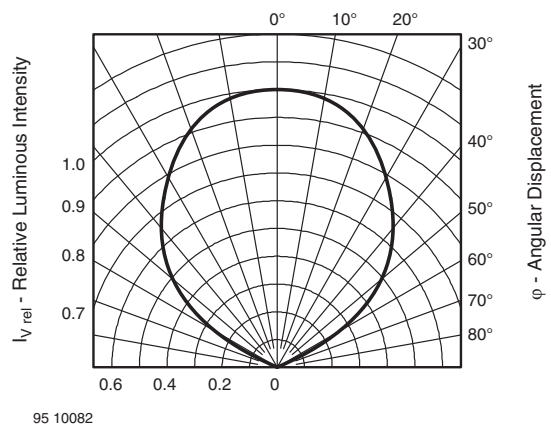


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

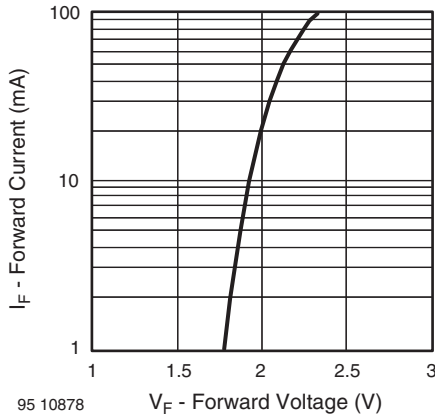


Fig. 3 - Forward Current vs. Forward Voltage

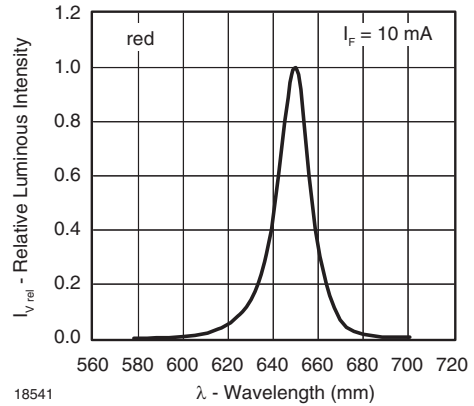


Fig. 6 - Rel. Luminous Intensity vs. Ambient Temperature

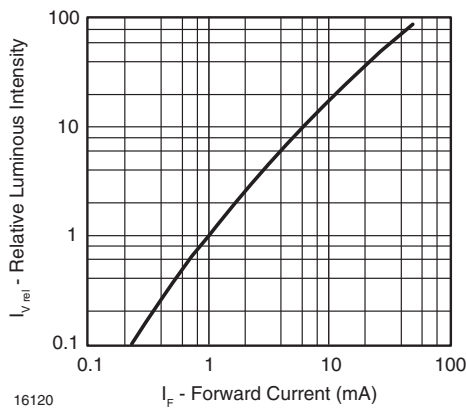


Fig. 4 - Relative Luminous Intensity vs. Forward Current

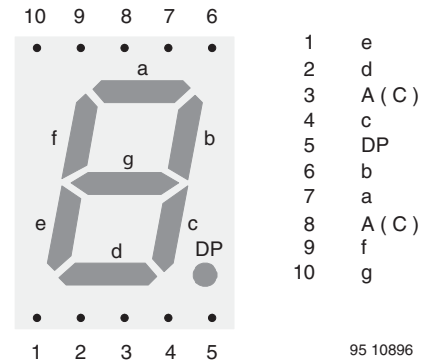


Fig. 7 - TDSR1350, TDSR1360

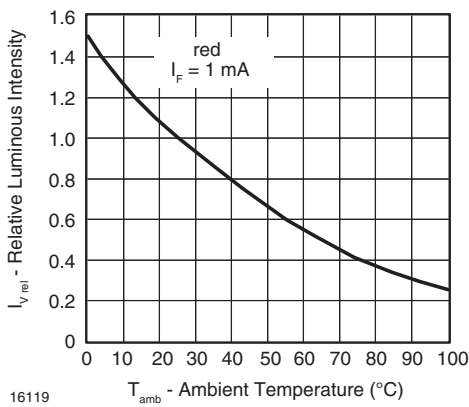
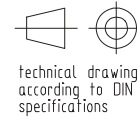
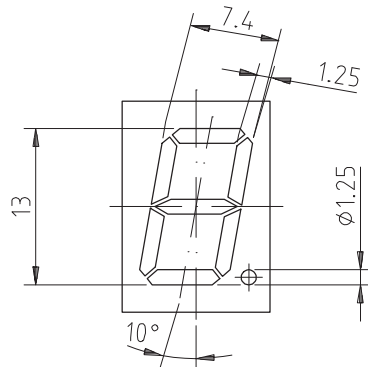
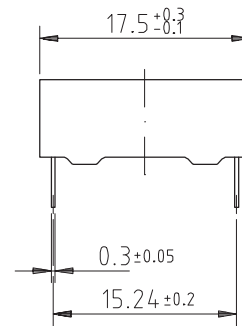
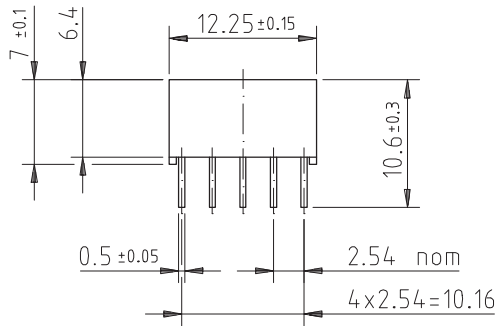


Fig. 5 - Rel. Luminous Intensity vs. Ambient Temperature



## PACKAGE DIMENSIONS FOR TDSR13.. in millimeters



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95 11344



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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.