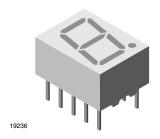


## **High Intensity Red Low Current 7-Segment Display**



### **DESCRIPTION**

This series defines a new standard for low current displays. It is a single digit 7-segment LED display utilizing AllnGaP 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 µcd 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.

Due to the design of 10 mm displays, a certain amount of cross-talk between segments is unavoidable. This light leakage becomes more noticeable as the brightness of the operated segments increases. However, higher environmental illumination, or a partially transparent cover, may reduce this effect. Therefore, it's important to consider this phenomenon during design-in and to validate suitability for the particular application and all its operation modes.

#### **FEATURES**

- 1500 µcd typical at 1 mA
- Very low power consumption
- · Wide viewing angle
- · Grey package surface
- Light intensity categorized at I<sub>F</sub> = 1 mA
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

# Pb-free



# ROHS

#### **APPLICATIONS**

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

#### PRODUCT GROUP AND PACKAGE DATA

Product group: display

• Package: 10 mm

Product series: low current
Angle of half intensity: ± 50°

PARTS TABLE															
PART	COLOR	LUMINOUS INTENSITY (µcd)			at I <sub>F</sub>	WAVELENGTH (nm)		at I <sub>F</sub>	FORWARD VOLTAGE (V)			at I <sub>F</sub>	CIRCUITRY		
		MIN.	TYP.	MAX.	(mA)	MIN.	TYP.	MAX.	(mA)	MIN.	TYP.	MAX.	(mA)		
TDSR1050	Red	280	-	3600	1	-	640	-	1	-	1.8	2.4	1	Common anode	
TDSR1050-IK	Red	1100	-	3600	1	-	640	-	1	-	1.8	2.4	1	Common anode	
TDSR1060	Red	280	-	3600	1	-	640	-	1	-	1.8	2.4	1	Common cathode	

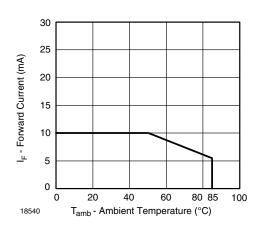
ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) TDSR1050, TDSR1050-IK, TDSR1060							
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT			
Reverse voltage per segment		$V_R$	5	V			
DC forward current per segment		I <sub>F</sub>	10	mA			
Peak forward current per segment	t <sub>p</sub> ≤ 10 μs, duty cycle 1/10	I <sub>FM</sub>	50	mA			
Power dissipation	T <sub>amb</sub> ≤ 85 °C	P <sub>V</sub>	185	mW			
Junction temperature		Tj	105	°C			
Operating temperature range		T <sub>amb</sub>	-40 to +85	°C			
Storage temperature range		T <sub>stg</sub>	-40 to +85	°C			
Soldering temperature	$t \le 3$ s, 2 mm below seating plane	T <sub>sd</sub>	260	°C			
Thermal resistance LED junction to ambient	R <sub>thJA</sub>	100	K/W				

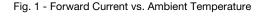
OPTICAL AND ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25$ °C, unless otherwise specified) TDSR1050, TDSR1050-IK, TDSR1060, RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
	I <sub>F</sub> = 1 mA	TDSR1050	I <sub>V</sub>	280	-	3600	μcd
Luminous intensity per segment (digit average)		TDSR1050-IK		1100	-	3600	
average,		TDSR1060		280	-	3600	
Dominant wavelength	I <sub>F</sub> = 1 mA		$\lambda_{d}$	-	640	-	nm
Peak wavelength	I <sub>F</sub> = 1 mA	TDSR1050,	λρ	-	650	-	nm
Angle of half intensity	I <sub>F</sub> = 1 mA	TDSR1050-IK,	φ	-	± 50	-	0
Forward voltage per segment or DP	I <sub>F</sub> = 1 mA	TDSR1060	V <sub>F</sub>	-	1.8	2.4	V
Reverse voltage per segment or DP	V <sub>R</sub> = 6 V		I <sub>R</sub>	-	10	-	μΑ

LUMINOUS INTENSITY CLASSIFICATION						
GROUP	LIGHT INTENSITY (μcd)					
STANDARD	MIN.	MAX.				
F	280	560				
G	450	900				
Н	700	1400				
1	1100	2200				
К	1800	3600				
L	2800	5600				

#### Note

### TYPICAL CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)





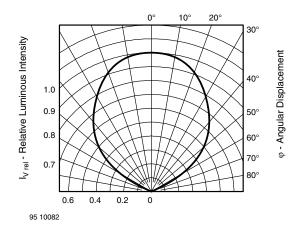


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

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.

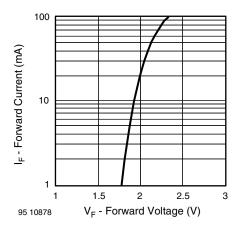


Fig. 3 - Forward Current vs. Forward Voltage

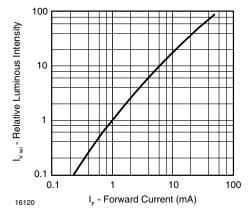


Fig. 4 - Relative Luminous Intensity vs. Forward Current

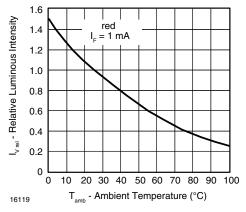


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

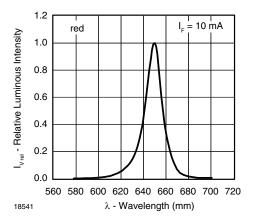


Fig. 6 - Relative Luminous Intensity vs. Ambient Temperature

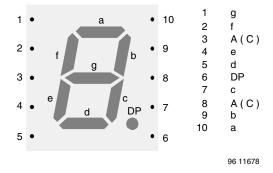
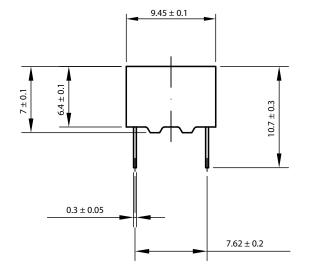
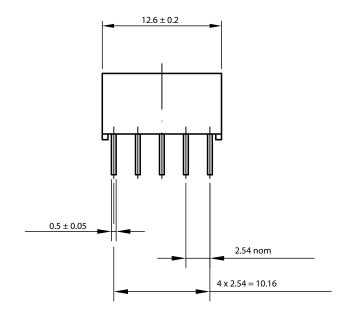


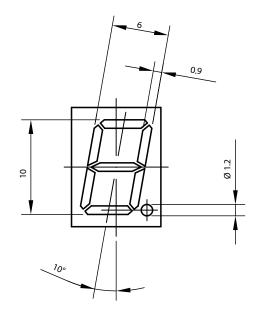
Fig. 7 - TDSR10..

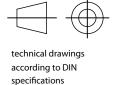


### PACKAGE DIMENSIONS FOR TDSR10.. in millimeters









Drawing-No.: 6.544-5093.01-4 Issue: 2; 23.03.2012 95 11343



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