

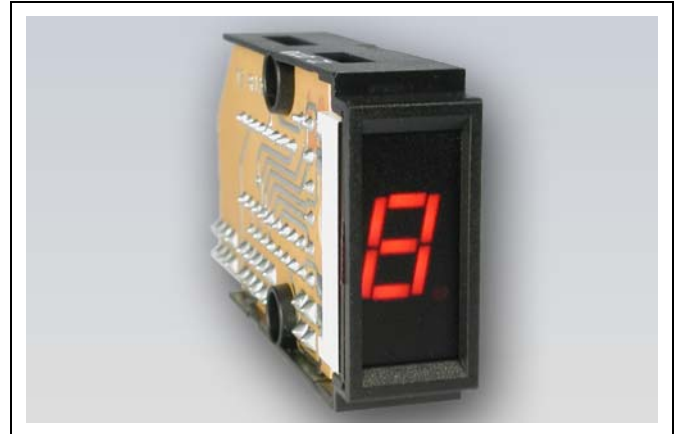
Data Sheet

LED-Display, Type TZ

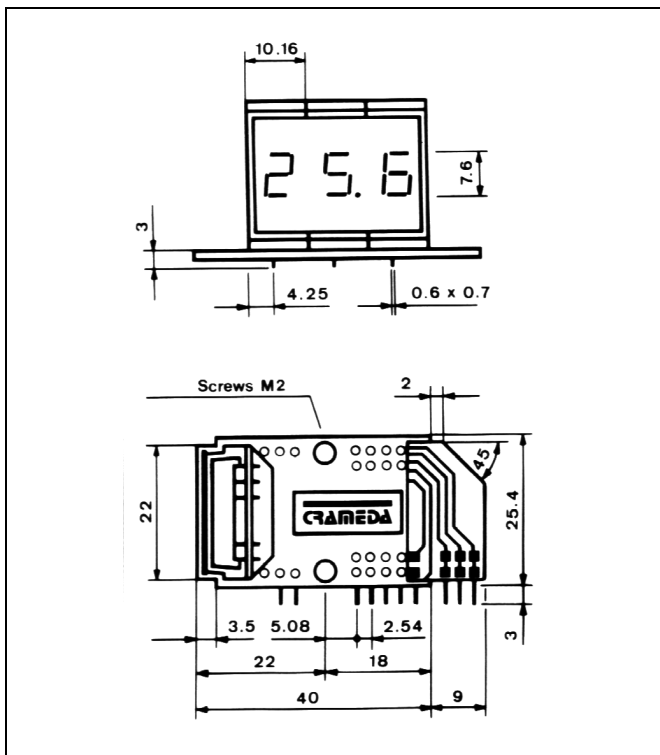
The TZ LED display is designed for vertical mounting on PCB. TZ displays can be combined with T-System components for vertical mounting on PCB's.

The installation depth is 49 mm, the width per decade is 10.16 mm.

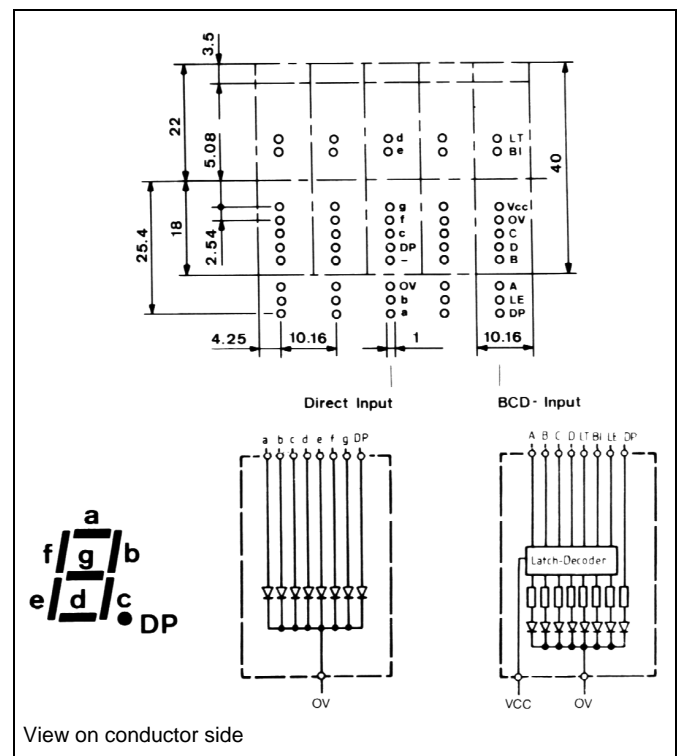
Technical data is identical with TK LED-displays.



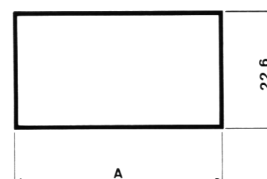
Dimensions



Hole and Connection pattern



Panel Cut-out



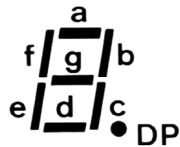
No. of decades	Dim. A
1 decade	10.5
2 decades	20.7
3 decades	30.9
4 decades	41.1
etc.	

Technical Data

Colour of display	bright red
Character height	7.6 mm
Max. number of modules	4
Ambient temperature	0° . . . +50°C

Modules with direct input

Forward voltage of LED's with I_{Nenn}	typ. 1.7 V
Recommended operating current per LED	12–15 mA DC
Inverse voltage	max. 5 V
Segment configuration	



Modules with BCD-input and memory

Logic C-MOS
non-used inputs have to be put on a defined level

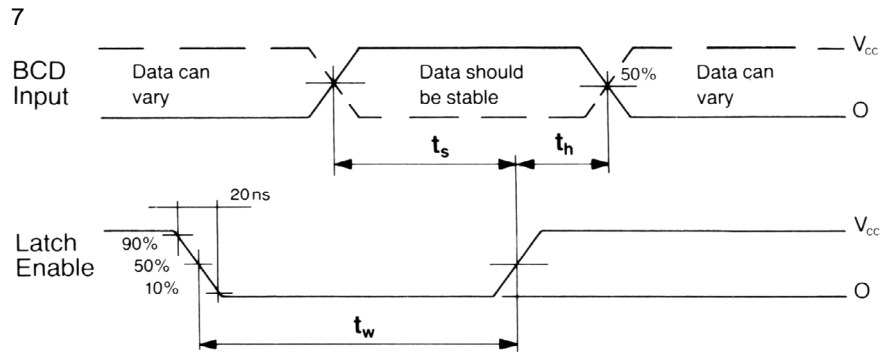
Truth table of the decoder

LE	\overline{BI}	\overline{LT}	D	C	B	A	a	b	c	d	e	f	g	Display
X	X	0	X	X	X	X	1	1	1	1	1	1	1	8
X	0	1	X	X	X	X	0	0	0	0	0	0	0	Blank
0	1	1	0	0	0	0	1	1	1	1	1	1	0	0
0	1	1	0	0	0	1	0	1	1	0	0	0	0	1
0	1	1	0	0	1	0	1	1	0	1	1	0	1	2
0	1	1	0	0	1	1	1	1	1	0	0	1	1	3
0	1	1	0	1	0	0	0	1	1	0	0	1	1	4
0	1	1	0	1	0	1	1	0	1	1	0	1	1	5
0	1	1	0	1	1	0	0	0	1	1	1	1	1	6
0	1	1	0	1	1	1	1	1	1	0	0	0	0	7
0	1	1	1	0	0	0	1	1	1	1	1	1	1	8
0	1	1	1	0	0	1	1	1	0	0	1	1	1	9
0	1	1	1	0	1	0	0	0	0	0	0	0	0	Blank
0	1	1	1	0	1	1	0	0	0	0	0	0	0	Blank
0	1	1	1	1	0	0	0	0	0	0	0	0	0	Blank
0	1	1	1	1	0	1	0	0	0	0	0	0	0	Blank
0	1	1	1	1	1	1	0	0	0	0	0	0	0	Blank
1	1	1	X	X	X	X	*	*	*	*	*	*	*	*

* "LE" on "1". The display freezes on the last value

Description of Decoder-Functions

- LT** Lamp Test: If this input is set to "0", the character 8 will appear on all display modules. This instruction is used to check the proper function of the segments and has highest priority.
- BI** Blinking input: If this input is set to "0", the display will extinguish. Brightness control can be achieved by a clock with variable pulse.
- LE** Latch enable: Every module has its own input. This instruction will freeze the display and suppress further response to changes of the BCD input. It can be used for multiplexer control



	V_{CC}	t
Length of setting time t_s	5 V	min. 150 ns
	12 V	min. 70 ns
	15 V	min. 40 ns
Length of holding time t_h	5 V	typ. 75 ns
	12 V	typ. 35 ns
	15 V	typ. 20 ns
Length of memory instruction t_w	5 V	min. 400 ns
	12 V	min. 160 ns
	15 V	min. 100 ns

DP Decimal point: For each module the decimal point must be controlled externally. The current limiting resistor R_v must be calculated for a current of max. 10 mA

$$R_v \text{ min.} = \frac{V_{CC} - 1.7 \text{ V}}{0.01 \text{ A}}$$

Supply voltage V_{CC}
 + 5 V \pm 5% "1" DP ON, "0" DP OFF
 + 12 V \pm 10% Supply current I_{CC}
 + 15 V \pm 10% typ. 80 mA per module

Input voltage U_{in} max. $V_{CC} + 0,5 \text{ V}$
 U_{in} "0" with $V_{CC} = 5 \text{ V}$ max. 1,5 V
 $= 12 \text{ V}$ max. 3,6 V
 $= 15 \text{ V}$ max. 4,5 V
 U_{in} "1" with $V_{CC} = 5 \text{ V}$ min. 3,5 V
 $= 12 \text{ V}$ min. 8,4 V
 $= 15 \text{ V}$ min. 10,5 V

Input current I_{in} typ. 10 pA Input capacity C_{in} typ. 5 pF

Order Number Configuration

Type ①	Number of decades ②	Power supply ③
TZ	<p>1 decade 2 decades 3 decades 4 decades</p>	01 5 V/C-MOS 2
		02 12 V/C-MOS 5
		03 15 V/C-MOS 6
		04 Module without logic 0
		etc.

④ Colour of housing black

Ordering Key 0

①	②	③	④
T	Z		0

- ① Type
- ② Number of decades
- ③ Power supply
- ④ Housing black

Specifications are subject to change without notice.