

2 SIZES LED OR EL BACKLIGHT

Not for new designs !!



Display size

6x9 = 56 x 43 (See picture)

6x8 = 34 x 25

TECHNICAL DATA

- CONTROLLER INCLUDED ST7565
- SUPPLY VOLTAGE VDD = 2.7 .. 3.3V
- LOW POWER, IDEAL FOR HANDHELD APPLICATIONS 70µA @ 3V
- SINGLE VOLTAGE SUPPLY: NEGATIVE PRODUCE ON CHIP
- INTEGRATED TEMPERATURE COMPENSATION
- DIGITAL CONTRAST ADJUSTMENT
- ONBOARD DISPLAY RAM
- INPUT SERIAL (SI, SCL, A0) OR PARALLEL (DB0 .. DB7)
- Z80 OR 6800 MODE
- 0.5mm FCC CABLE WITH CONNECTOR
- EL BACKLIGHT OR LED BACKLIGHT
- OPERATING TEMPERATURE -20 .. + 70 °C

ACCESSORIES

EL INVERTER

EA PSEL-6

ORDERING INFORMATION

MINI GRAPHIC 128x64, ST7565, FCC CABLE, WHITE LED

EA W127W-6X9HLW

MINI GRAPHIC 128x64, ST7565 WITH WHITE EL BACKLIGHT

EA W127W-6X9HEW

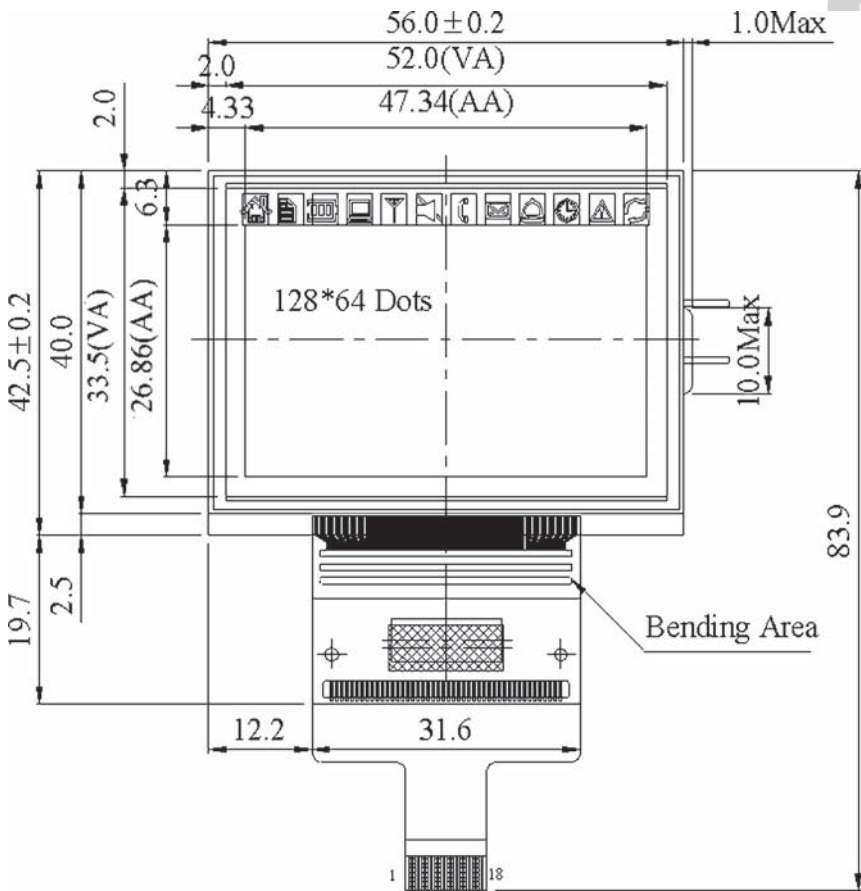
MICRO GRAPHIC 128x64, ST7565 WITH WHITE EL BACKLIGHT

EA W127W-6X8HEW

ZIFF CONNECTOR FOR FCC CABLE

EA WF050-18S

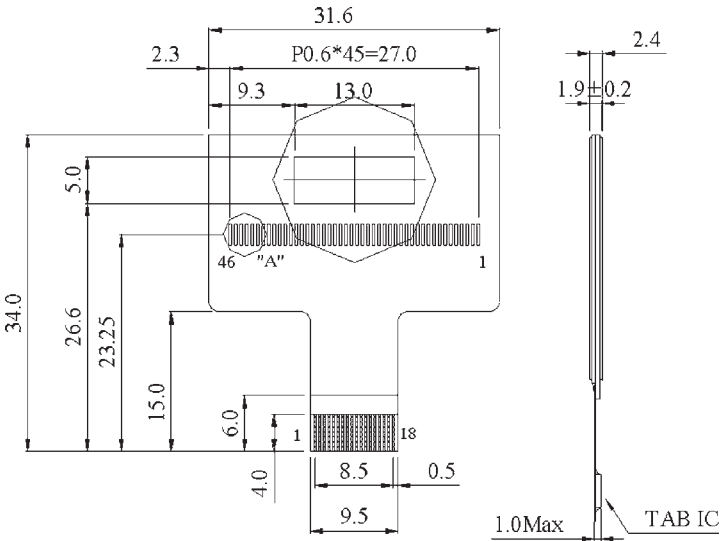
EA W127W-6X9HEW (FSTN, BLACK&WHITE, EL-Backlight WHITE)with FFC Cable for ZIF Connector



Optical characteristics FSTN						
Item	Symbol	Condition	min	typ	max	Unit
View ing angle	θ	CR=3	30	-	60	°
	ϕ	CR=3	-45	-	45	°
Contrast ratio	CR		-	5	-	
Response time	T rise	20°C	-	150	200	ms
	T fall	20°C	-	150	200	ms

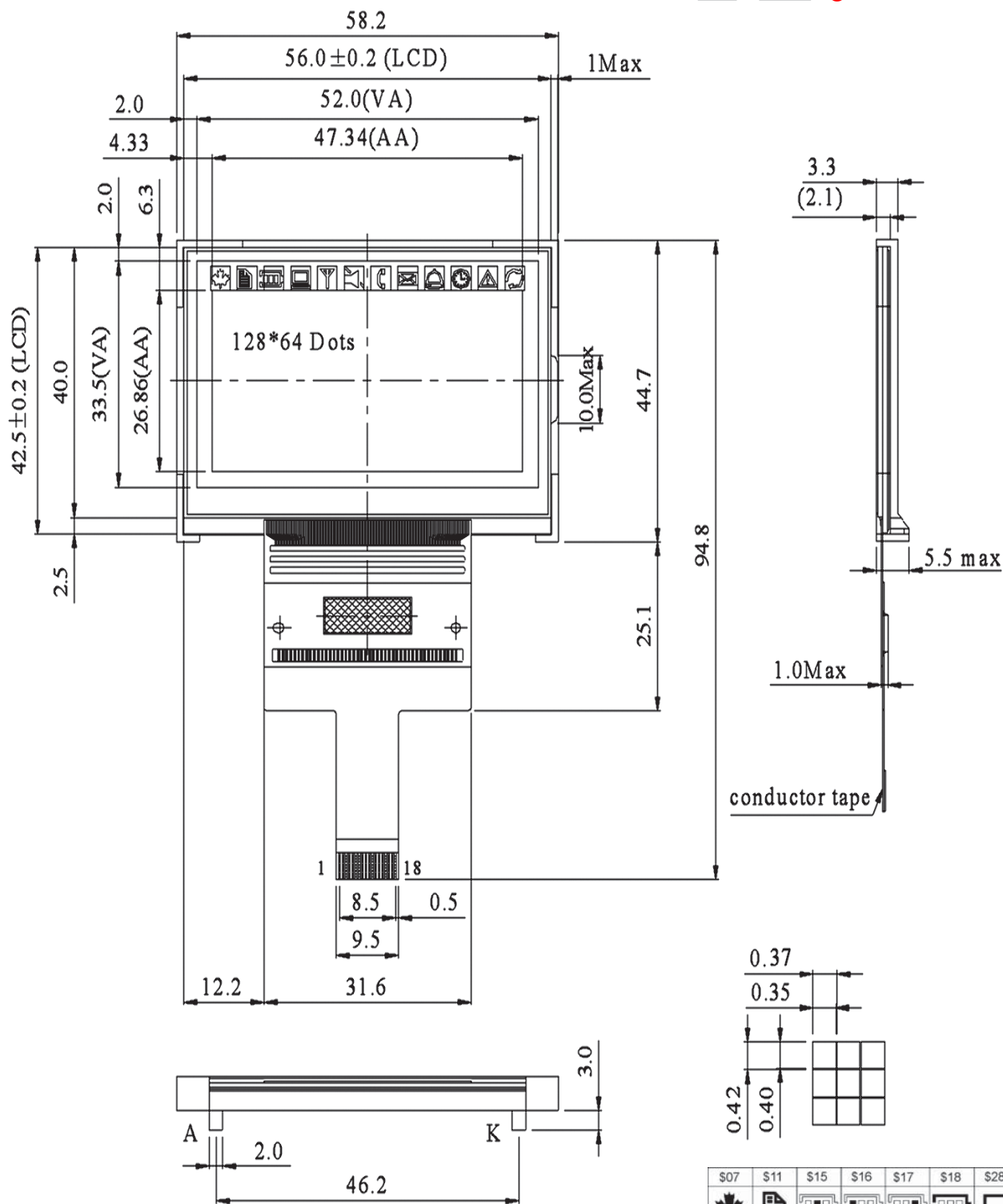
\$07	\$11	\$15	\$16	\$17	\$18	\$28	\$33
\$39	\$3C	\$41	\$49	\$44	\$4F	\$6A	
\$75	\$7F						

Not for new designs !!



EA W127W-6X9HLW (FSTN, BLACK&WHITE, WHITE LED-Backlight) with FFC
Cable for ZIF Connector

Not for new designs !!



Optical characteristics FSTN						
Item	Symbol	Condition	min	typ	max	Unit
Viewing angle	θ	CR=3	30	-	60	°
	ϕ	CR=3	-45	-	45	°
Contrast ratio	CR	-	-	5	-	-
Response time	T rise	20°C	-	150	200	ms
	T fall	20°C	-	150	200	ms

$V_{F_{LED}} = \text{typ. } 3.5V$, $I_{LED} = \text{max. } 45mA @ 25^{\circ}C$, consider derating for temperatures $> 25^{\circ}C$. Life time max. 50,000 hours

CONNECTION WITH THE ZIF-CONNECTOR

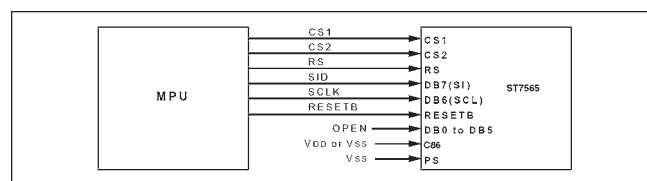
The connection is via a 18-pin FFC Kabel with 0,5mm pitch. Pin 17 (C86) selects 6800- or the Z80-Interface mode. Pin 18 (P/S) select Parallel- or Serial control.

Pinout															
Pin	Symbol	I/O	Description												
1	VDD		Power supply pin for logic												
2	VSS		Ground pin, connected to 0V												
3	CS1	I	Chip select input pins Data/Instruction I/O is enabled only when CS1 is "L" and CS2 is "H" When chip select is non-active, DB0 TO DB7 may be high impedance												
4	CS2	I	Chip select input pins Data/Instruction I/O is enabled only when CS1 is "L" and CS2 is "H" When chip select is non-active, DB0 TO DB7 may be high impedance												
5	RES	I	Reset input pin When RESETB is "L", initialization is executed												
6	A0	I	Register select input pin A0 = "H": D0 to D7 are display data A0 = "L": D0 to D7 are control data												
7	WR R/W	I	When connected to Z80-family MPU: Write enable input pin. The data on D0~D7 are latched at the rising edge of the WR When connected to 68-family MPU: R/W = "H": read, R/W = "L": write												
8	RD E	I	When connected to Z80-family MPU: Read enable clock input pin. When /RD is "L", D0~D7 are in an output status When connected to 68-family MPU: R/W = "H": When E is "H", D0~D7 are in an output status R/W = "L": The data on D0~D7 are latched at the falling edge of the E signal												
9	D0	I/O	8-bit bi-directional data bus that is connected to the standard 8-bit microprocessor data bus. When chip select is not active, D0~D7 may be high impedance. When the serial interface selected (P/S="L"): D0~D5 are high impedance D6: serial input clock (SCL) D7: serial input data (SI)												
10	D1														
11	D2														
12	D3														
13	D4														
14	D5														
15	D6														
16	D7														
17	C86	I	Microprocessor interface selects pin C86 = "H": 6800-series MPU interface C86 = "L": Z80-series MPU interface												
18	P/S	I	Parallel/Serial data input select pin <table border="1"> <tr> <th>Interface</th><th>Data</th><th>Read/Write</th><th>Serial clock</th></tr> <tr> <td>P/S = "H": Parallel</td><td>D0~D7</td><td>E_RD, RW_WR</td><td>-</td></tr> <tr> <td>P/S = "L": Serial</td><td>SI(D7)</td><td>Write only</td><td>SCL(D6)</td></tr> </table> In serial mode it is impossible to read data from the on-chip RAM. D0~D5 are high impedance and E_RD and RW_WR must be fixed to either "H" or "L"	Interface	Data	Read/Write	Serial clock	P/S = "H": Parallel	D0~D7	E_RD, RW_WR	-	P/S = "L": Serial	SI(D7)	Write only	SCL(D6)
Interface	Data	Read/Write	Serial clock												
P/S = "H": Parallel	D0~D7	E_RD, RW_WR	-												
P/S = "L": Serial	SI(D7)	Write only	SCL(D6)												

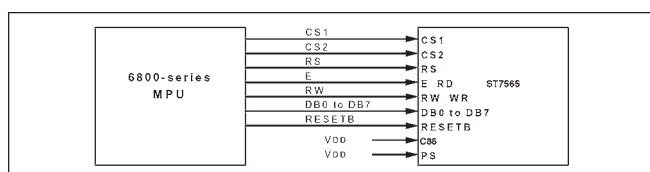
APPLIKATION EXAMPLE

For Timing specifications and programming details refer to the ST7565 LCD driver user manual:

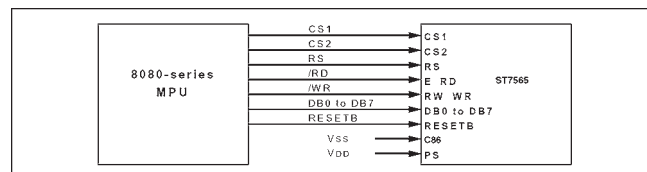
<http://www lcd-module.de/eng/pdf/zubehoer/st7565.pdf>



Serial Mode



6800-er Interface



Z80 Interface

ONBOARD KONTROLLER ST7565

Command	Command Code											Function
	A0	/RD	/WR	D7	D6	D5	D4	D3	D2	D1	D0	
(1) Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0	LCD display ON/OFF 0: OFF, 1: ON
(2) Display start line set	0	1	0	0	1	Display start address					Sets the display RAM display start line address	
(3) Page address set	0	1	0	1	0	1	1	Page address				Sets the display RAM page address
(4) Column address set upper bit	0	1	0	0	0	0	1	Most significant column address				Sets the most significant 4 bits of the display RAM column address.
Column address set lower bit	0	1	0	0	0	0	0	Least significant column address				Sets the least significant 4 bits of the display RAM column address.
(5) Status read	0	0	1	Status				0	0	0	0	Reads the status data
(6) Display data write	1	1	0	Write data								Writes to the display RAM
(7) Display data read	1	0	1	Read data								Reads from the display RAM
(8) ADC select	0	1	0	1	0	1	0	0	0	0	0	Sets the display RAM address SEG output correspondence 0: normal, 1: reverse
(9) Display normal/reverse	0	1	0	1	0	1	0	0	1	1	0	Sets the LCD display normal/reverse 0: normal, 1: reverse
(10) Display all points ON/OFF	0	1	0	1	0	1	0	0	1	0	0	Display all points 0: normal display 1: all points ON
(11) LCD bias set	0	1	0	1	0	1	0	0	0	1	0	Sets the LCD drive voltage bias ratio 0: 1/9 bias, 1: 1/7 bias (ST7565)
(12) Read/modify/write	0	1	0	1	1	1	0	0	0	0	0	Column address increment At write: +1 At read: 0
(13) End	0	1	0	1	1	1	0	1	1	1	0	Clear read/modify/write
(14) Reset	0	1	0	1	1	1	0	0	0	1	0	Internal reset
(15) Common output mode select	0	1	0	1	1	0	0	0	*	*	*	Select COM output scan direction 0: normal direction 1: reverse direction
(16) Power control set	0	1	0	0	0	1	0	1	Operating mode			Select internal power supply operating mode
(17) Vo voltage regulator internal resistor ratio set	0	1	0	0	0	1	0	0	Resistor ratio			Select internal resistor ratio(Rb/Ra) mode
(18) Electronic volume mode set	0	1	0	1	0	0	0	0	0	0	1	Set the Vo output voltage electronic volume register
Electronic volume register set				0	0	Electronic volume value						
(19) Static indicator ON/OFF	0	1	0	1	0	1	0	1	1	0	0	0: OFF, 1: ON
Static indicator register set				0	0	0	0	0	0	0	0	
(20) Booster ratio set	0	1	0	1	1	1	1	1	0	0	0	select booster ratio 00: 2x,3x,4x 01: 5x 11: 6x
(21) Power saver												Display OFF and display all points ON compound command
(22) NOP	0	1	0	1	1	1	0	0	0	1	1	Command for non-operation
(23) Test	0	1	0	1	1	1	1	*	*	*	*	Command for IC test. Do not use this command

Display Data RAM

Page Address P3,P2,P1,P0	Data	RAM address																Line Address (HEX)	Com Output
0,0,0,0	DB0																	00	COM1
	DB1																	01	COM2
	DB2																	02	COM3
	DB3																	03	COM4
	DB4																	04	COM5
	DB5																	05	COM6
	DB6																	06	COM7
	DB7																	07	COM8
}																		}	}
0,1,1,1	DB0																	38	COM57
	DB1																	39	COM58
	DB2																	3A	COM59
	DB3																	3B	COM60
	DB4																	3C	COM61
	DB5																	3D	COM62
	DB6																	3E	COM63
	DB7																	3F	COM64
0,1,1,1	DB0																	40	COM65
Column Address	ADC=0	03	83	81	80	7F	7E	7D	7C	7B	7A	~	~	~	~	~	~	~	~
Segment Output	ADC=1	0	1	2	3	4	5	6	7	8	9	~	~	~	~	~	~	~	~
		12	11	10	09	08	07	06	05	04	03	~	~	~	~	~	~	~	~

For detailed specification see the ST7565 user manual.
<http://www.lcd-module.de/eng/pdf/zubehoer/st7565.pdf>

INITIALISATION EXAMPLE

```

;-----
; Konstanten fuer Display Kommandos ST7665
;-----
DISPOFF      .EQU      10101110b ; (1) Wert fuer Display OFF
DISPON       .EQU      10101111b ; (1) Wert fuer Display ON
DISPSTART    .EQU      01000000b ; (2) Basiswert fuer Display Start Line
PAGEADR      .EQU      10110000b ; (3) Basiswert fuer Page Address Set
COLADRL      .EQU      00000000b ; (4) Basiswert fuer LSB Column Address Set
COLADRH      .EQU      00010000b ; (4) Basiswert fuer MSB Column Address Set
ADCSELECT    .EQU      10100000b ; (8)
REVERSEDISP  .EQU      10100110b ; (9)
DISPALLON    .EQU      10100100b ; (10)
LCDBIAS      .EQU      10100010b ; (11)
SETMODIFYRD  .EQU      11100000b ; (12)
RESMODIFYRD  .EQU      11101110b ; (13)
RESET        .EQU      11100010b ; (14)
COMMODE      .EQU      11001000b ; (15)
POWERCTRL    .EQU      00101000b ; (16)
VOLTAGEREG   .EQU      00100000b ; (17)
VOLUMESET    .EQU      10000001b ; (18)
STATICINDI   .EQU      10101100b ; (19)

#define COLOFF
#ifndef COLOFF
COLADROFF    .EQU      4          ; Offset der Spaltenadresse fuer Displayinhalt
DSPRAMOFF    .EQU      0          ; Spaltenadresse fuer Display-RAM zur freien
Benutzung
#else
COLADROFF    .EQU      0          ; Offset der Spaltenadresse fuer Displayinhalt
DSPRAMOFF    .EQU      128        ; Spaltenadresse fuer Display-RAM zur freien
Benutzung
#endif

;-----
; Makros fuer Displayausgaben
;-----
#define DISPBEF CLR RS ; Befehlsmodus fuer Display
#define DISPDAT SETB RS ; Datenmodus fuer Display
#define DISPOUTA MOVX @R0,A
#define DISPINA MOVX A,@R0
#define DISPBFOUTA LCALL DSPBEFOUT ; Befehl zum Display ausgeben
#define DISPDATOUT LCALL DSPDATOUT ; Daten zum Display ausgeben
#define DISPDATIN LCALL DSPDATIN ; Daten vom Display lesen
#define COLADR LCALL SETCOLOFF

;-----
; Das Display initialisieren
;-----
DISPINIT:
    CLR      DRES ; Display Reset
    NOP
    SETB     DRES

    MOV      A,#50
    LCALL    WARTEMS

    MOV      A,#DISPSTART
    DISPBFOUTA

    MOV      A,#DISPON
    DISPBFOUTA

    MOV      A,#DISPALLON
    DISPBFOUTA

    MOV      A,#COMMODE
    DISPBFOUTA

    MOV      A,#ADCSELECT+1
    DISPBFOUTA

    MOV      A,#VOLUMESET ; Kontrast einstellen
    DISPBFOUTA
    MOV      A,#33 ; 0..63
    DISPBFOUTA

    MOV      A,#LCDBIAS+1
    DISPBFOUTA

    MOV      A,#POWERCTRL+111b
    DISPBFOUTA

    MOV      A,#VOLTAGEREG+100b
    DISPBFOUTA

    RET

;-----
; Befehl im A zum Display ausgeben
;-----
DSPBEFOUT:    DISPBEF
              DISPOUTA
              RET

;-----
; Daten im A zum Display ausgeben
;-----
DISPDATOUT:   DISPDAT
              DISPOUTA
              RET

;-----
; Ein Byte vom Display in den A lesen
;-----
DISPDATIN:    DISPDAT
              DISPINA ; ersmal ein Dummy-Read
              DISPINA ; Daten lesen
              RET

```

ACCESORIES

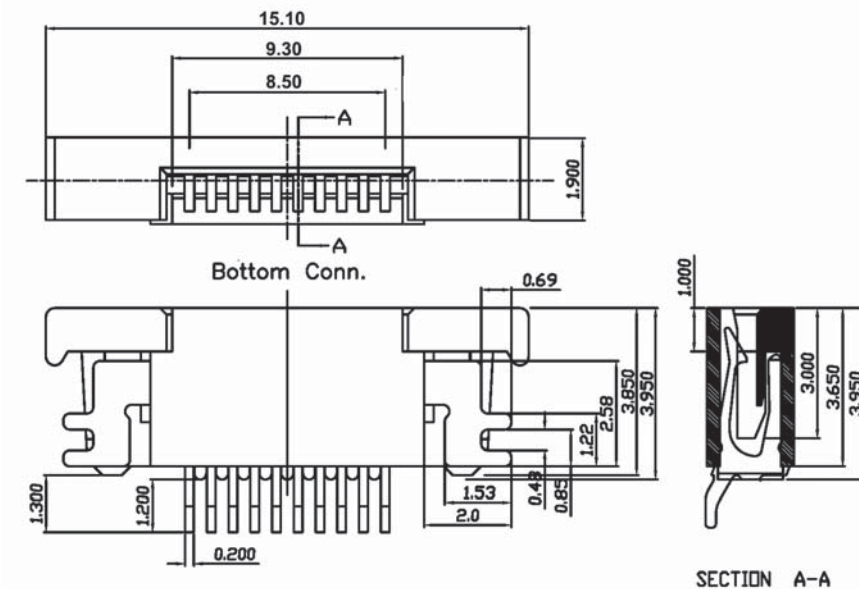
ZIFF CONNECTOR 0.5mm

Specifications:

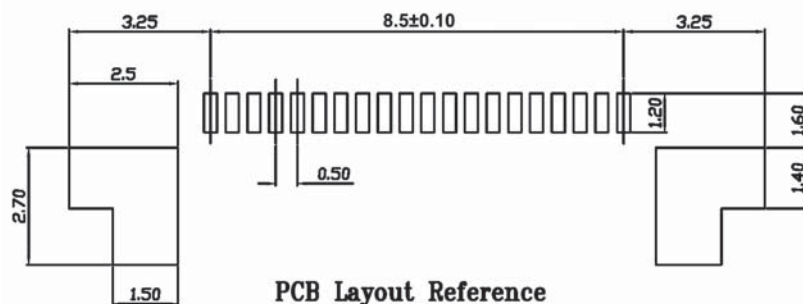
Current rating:0.5 Amps
Voltage Rating:50V DC
Dielectric Withstanding:AC 500V
Operating Temperature:-25°C ~ +85°C
Contact resistance:20mohm max.
Insulation resistance:50Mohm min.

Materials:

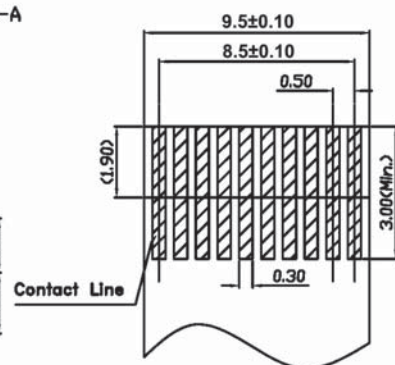
Insulator:Nylon 6T
Actuator:PPS
Contact material:Phosphor Bronze
Leg:Phosphor Bronze
Plating:100u" Tin/Lead over
45u" min. Nickel



SECTION A-A



PCB Layout Reference



Thickness: 0.30±0.05
FPC Dimension Reference

alle Masse in mm

PARTNUMBER

ZIFF-CONNECTOR FOR EA W127W-6X9 / W127W-6X8,
BOTTOM CONTACT

EA WF050-18S

**ELECTRONIC
ASSEMBLY**

making things easy