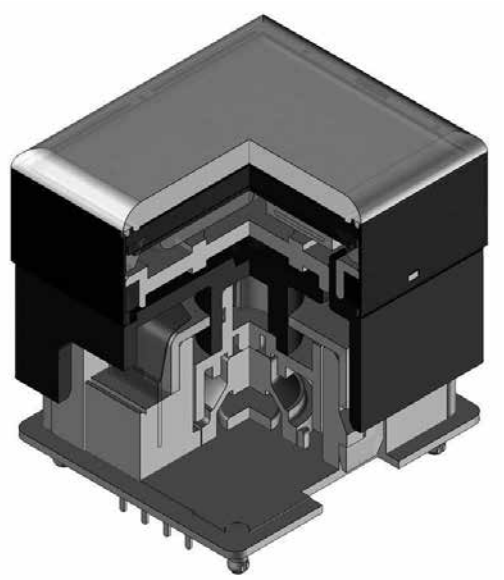
DISTINCTIVE CHARACTERISTICS

- High definition, contrast and resolution of 96RGB x 64 pixels in compact screen and minimal frame
- Range of 65,536 colors in 16 bit mode
- Operating life of 50,000 hours minimum
- Maximum use of display lens with ultra-thin frame provides full screen capacity
- Multiple units easily combine to form one screen, offering flexibility in size and layout
- Smooth, silent operation with short stroke of 0.07″ lends to tactile feedback unparalleled to touch panels
- Operated by commands and data supplied via serial communications (SPI)
- Incorporates bitmap display function
- Low energy consumption
- Dust tight construction
- Snap-in standoff for easy, secure mounting and alignment; aids in prevention of dislodging during wave soldering



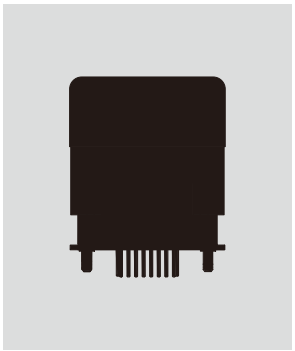
Viewing area: 21.28mm x 18.74mm (horizontal x vertical)

High reliability and long life of one million actuations minimum

Highly reliable gold plated twin contacts

Epoxy sealed straight PC terminals

Actual Size



SWITCH PART NUMBER & DESCRIPTION

ATTENTION ELECTROSTATIC SENSITIVE DEVICES

Part Number	Switch Description	OLED	Pixel Format
ISF15ACP4	SPST, Momentary ON Gold Contacts Straight PC Terminals	Color OLED Display Module 65,536 Colors	96RGB x 64 Pixels Horizontal x Vertical

SWITCH SPECIFICATIONS

Circuit	SPST normally open
Contact Position	Leave actuator: ① – ② OFF Push actuator: ① – ② ON
Electrical Capacity (Resistive Load)	100mA @ 12V DC (resistive circuit)
Contact Resistance	200 milliohms maximum @ 20mV 10mA
Insulation Resistance	100 megohms minimum @ 100V DC
Dielectric Strength	125V AC for 1 minute minimum
Mechanical Endurance	1,000,000 operations minimum
Electrical Endurance	1,000,000 operations minimum
Operating Force	1.7N ± 0.5N
Total Travel	1.8mm (0.07")

OLED SPECIFICATIONS

Characteristics of Display

Display Device	Color OLED display module
Display Mode	Passive matrix
Viewing Area	21.28mm x 18.74mm (horizontal x vertical)
Pixel Format	96RGB x 64 pixels (horizontal x vertical)
Pixel Size	0.222mm x 0.293mm (horizontal x vertical)
Interface	Serial (SPI) interface
Number of Colors	65,536 Colors (16bit: R 5bit/G 6bit/B 5bit) or 256 Colors (8bit: R 2bit/G 3bit/B 3bit)
Operating Temperature Range	–20°C ~ +70°C (–4°F ~ +158°F)
Storage Temperature Range	–30°C ~ +80°C (–22°F ~ +176°F)
Operating Life (Display)	50,000 hours @ 100cd/m² (based on 40% pixels ON; Ta = 77°F)

Absolute Maximum Ratings

Items	Symbols	Ratings
Supply Voltage for Logic/Interface	V_{DD}	–0.3V to +4.0V
Supply Voltage for Drive	V_{CC}	–0.0V to +19.0V
Input Voltage	V_I	–0.3V to V_{DD} +0.3V

Current Consumption

(Temperature at 25°C, V_{DD} = 2.8V, V_{CC} = 15.0V)

Items	Symbols	Min	Typical	Max
All-Pixels-On Mode *Drive System Power Current	I_{CC1}	—	11.0mA	13.2mA
All-Pixels-On Mode *Logic/IF System Power Current	I_{DD1}	—	0.17mA	0.20mA
Sleep Mode **Drive System Power Current	I_{CC2}	—	—	10μA
Sleep Mode **Logic/IF System Power Current	I_{DD2}	—	—	10μA

* All pixels shall be turned on with the maximum level gray scale
** All pixels shall be turned off (while chip is operating)

Recommended Operating Conditions

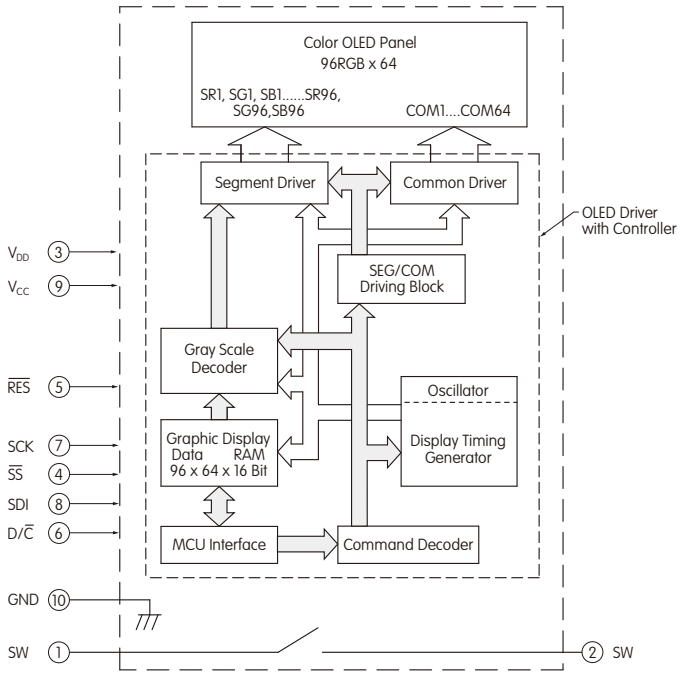
Items	Symbols	Minimum	Typical	Maximum
Supply Voltage for Logic/Interface	V_{DD}	2.4V	2.8V	3.5V
Supply Voltage for Drive	V_{CC}	14.0V	15.0V	16.0V
Input High Level Voltage	V_{IH}	0.8 x V_{DD}	—	—
Input Low Level Voltage	V_{IL}	—	—	0.2 x V_{DD}

Optical Characteristics (Temperature at 25°C, Initial Value: 87 x 0F)

Items		Min	Typical	Max	Unit	Remarks
Luminosity		80	105	130	cd/m²	White (All pixels on)
White Color Coordinate	(x)	0.26	0.30	0.34	—	
	(y)	0.31	0.36	0.41	—	
Red Color Coordinate	(x)	0.62	0.66	0.70	—	
	(y)	0.30	0.34	0.38	—	
Green Color Coordinate	(x)	0.24	0.29	0.33	—	
	(y)	0.59	0.63	0.67	—	
Blue Color Coordinate	(x)	0.10	0.15	0.19	—	
	(y)	0.10	0.17	0.23	—	
Contrast Ratio		100	—	—	—	

BLOCK DIAGRAM & PIN CONFIGURATIONS

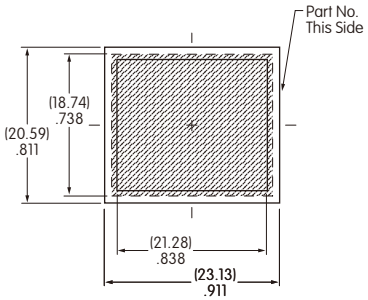
ISF15ACP4

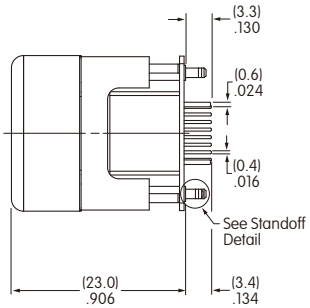


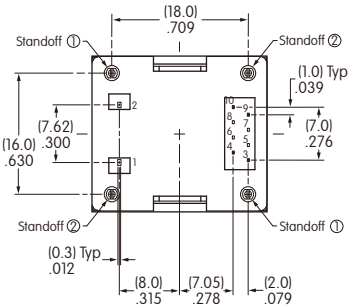
Pin No.	Symbol	Name	Function
1	**SW**	Terminal of Switch	Normally open
2	**SW**	Terminal of Switch	Normally open
3	**V_{DD}**	Power	Power source for logic circuit
4	**$\overline{SS}$**	Slave Select	Slave select for SPI. This line is active low.
5	**$\overline{RES}$**	Reset	Reset signal input. When pin is low, initialization of chip is executed.
6	**D/$\overline{C}$**	Data/Command	Data/Command Control. When pin is pulled low, data will be interpreted as Command; when pulled high, data will be interpreted as Data.
7	**SCK**	Serial Clock	Clock line for SPI that synchronizes command and data
8	**SDI**	Serial Data In	Data input line for SPI
9	**V_{CC}**	Power	Power source for drive circuit
10	**GND**	Ground	Connect to Ground

TYPICAL SWITCH DIMENSIONS

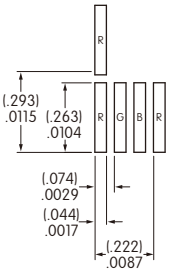
Terminal numbers are not on the switch.



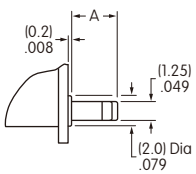




Pixel Detail



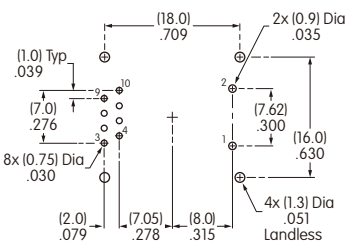
Standoff Detail



Dimension A

Standoff 1 = (2.7) .106 Standoff 2 = (2.3) .091

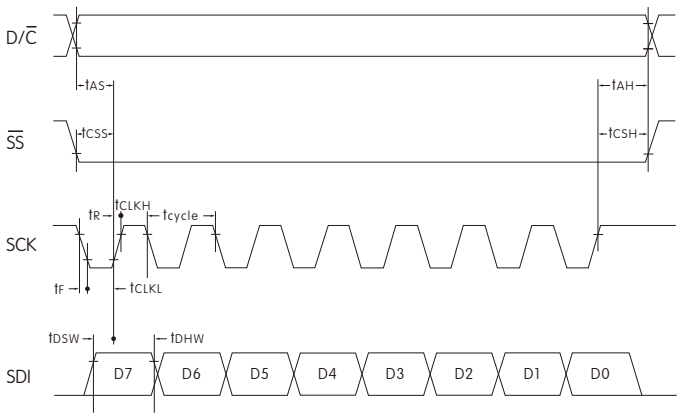
Footprint



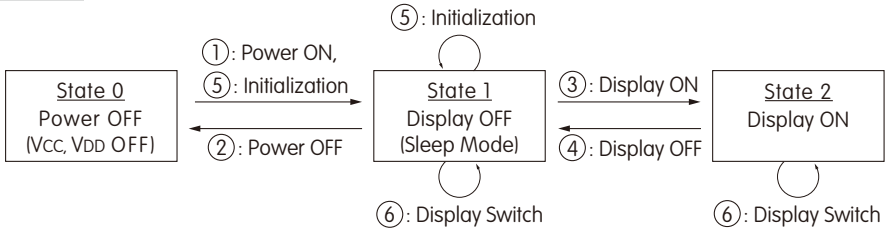
TIMING SPECIFICATIONS

AC Characteristics (Temperature at 25°C), V_{DD} = 2.4V ~ 3.5V)

Items	Symbols	Minimum	Typical	Maximum
Clock Cycle Time	tcycle	150ns	—	—
D/C̄ Setup Time	tAS	40ns	—	—
D/C̄ Hold Time	tAH	40ns	—	—
S̄S̄ Setup Time	tCSS	75ns	—	—
S̄S̄ Hold Time	tCSH	60ns	—	—
Write Data Setup Time	tDSW	40ns	—	—
Write Data Hold Time	tDHW	40ns	—	—
SCK Low Time	tCLKL	75ns	—	—
SCK High Time	tCLKH	75ns	—	—
SCK Rise Time	tR	—	—	15ns
SCK Fall Time	tF	—	—	15ns



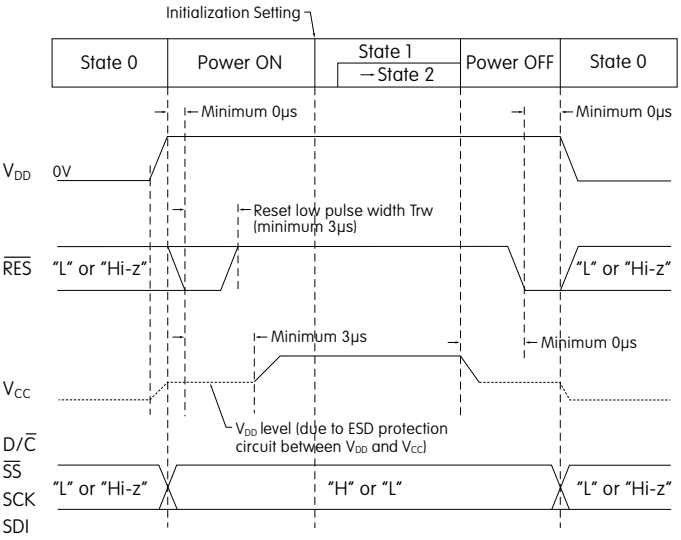
STATE TRANSITION



State Number	State	Display	Sleep	V_{CC}	V_{DD}	Changing the Display
0	Power OFF	OFF	—	OFF	OFF	Disable
1	Display OFF	OFF	ON	ON	ON	Enable
2	Display ON	ON	OFF	ON	ON	Enable

State Transition	Transition	Index
①	Power ON	Refer to "Power ON/OFF Sequence"
②	Power OFF	
③	Display ON	
④	Display OFF	
⑤	Initialization	Initialize Setting of Command/Data
⑥	Image Rewriting	Send Display Data
	Display Settings	Dimmer, Scroll, etc.

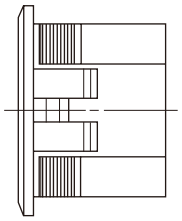
Power ON/OFF Sequence

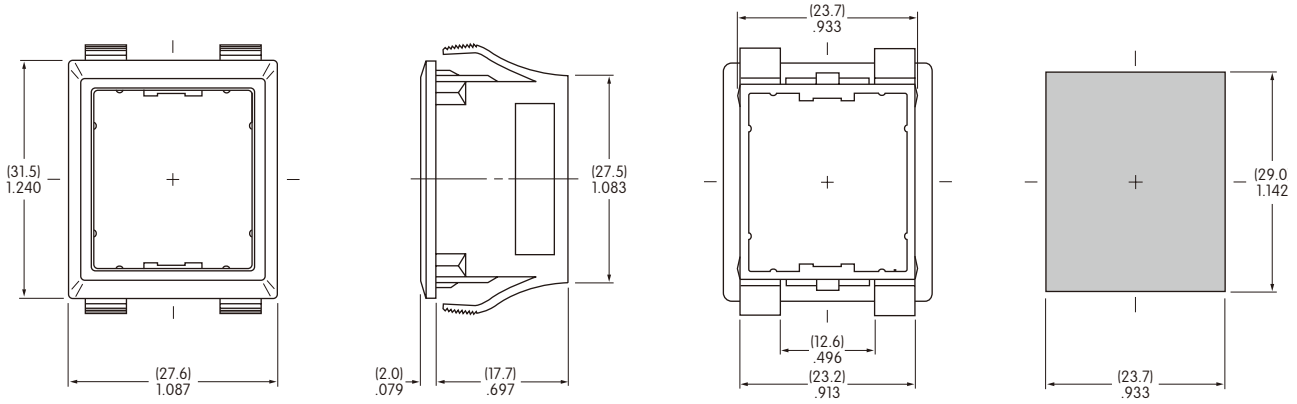


OPTIONAL ACCESSORIES

AT548 Panel Mount Housing

Material: Polyamide





Compatible Part Numbers for AT548

Wide View LCD 36 x 24
IS15BAFP4CF
IS15BBFP4RGB

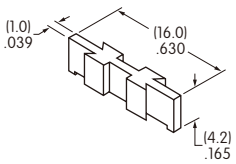
The Panel Mount Housing is available for the LCD 36 x 24 Pushbutton only.

Panel Thickness Range:
(1.5 ~ 4.0mm) .059 ~ .157"

Panel mount housing allows the LCD 36 x 24 Pushbutton to be snapped into a panel cutout for quick, secure mounting. It gives flexibility in locating the devices anywhere on the panel. It also allows using the LCD 36 x 24 Pushbutton on an existing panel.

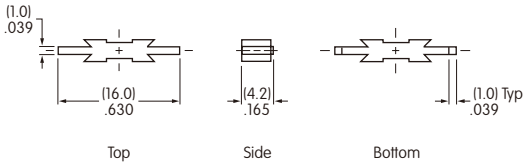
AT542 Coupler

Material: PBT



Compatible Part Numbers for AT542

Wide View LCD 36 x 24
IS15BAFP4CF
IS15BBFP4RGB



This coupler is for connecting the LCD 36 x 24 Pushbutton into precise, tight groupings that maintain an even distance from PCB to top of the actuator.

The Coupler is available for the LCD 36 x 24 Pushbutton only.

OPTIONAL ACCESSORIES

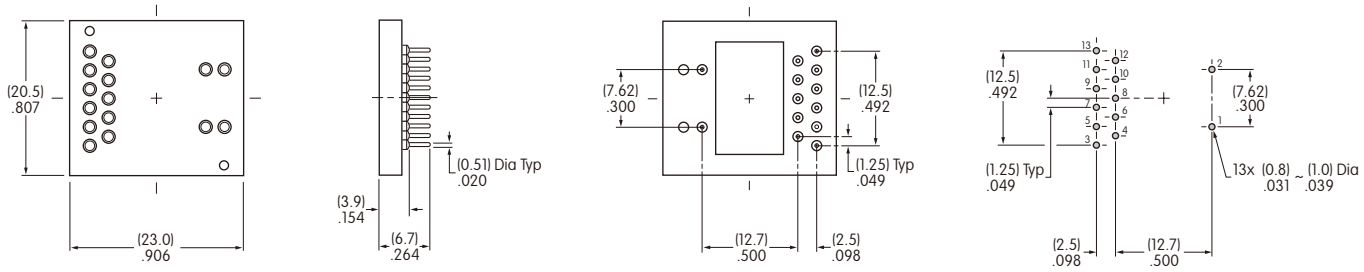
AT9704-02YC Socket for Single and Bicolor LCD 36 x 24 Pushbutton

Materials:

Base - Glass Fiber Reinforced PBT
Terminals - Brass/Beryllium Copper

Compatible Part Number for AT9704-02YC
Wide View LCD 36 x 24
IS15BAFP4CF

- The socket permits the SmartSwitch to be plugged in after automated processing.
- Use of the socket enables easy field replacement of the device.



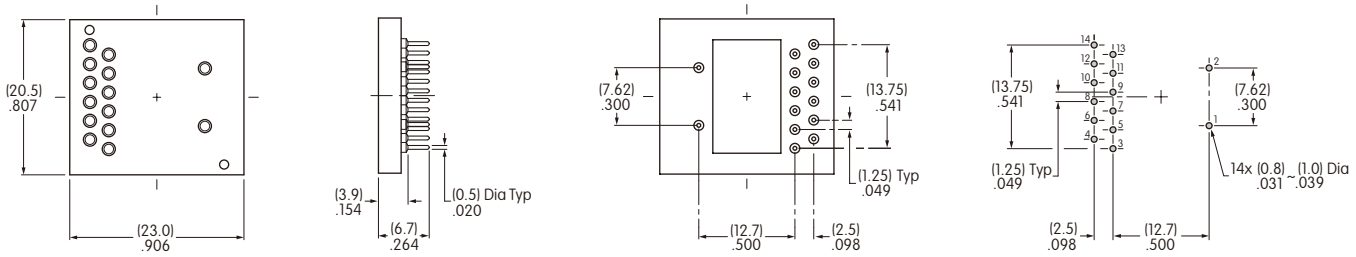
AT9704-065E Socket for RGB LCD 36 x 24 Pushbutton

Materials:

Base - Glass Fiber Reinforced PBT
Terminals - Brass/Beryllium Copper

Compatible Part Number for AT9704-065E
Wide View RGB LCD 36 x 24
IS15BBFP4RGB

- The socket permits the RGB SmartSwitch to be plugged in after automated processing.
- Use of the socket enables easy field replacement of the device.



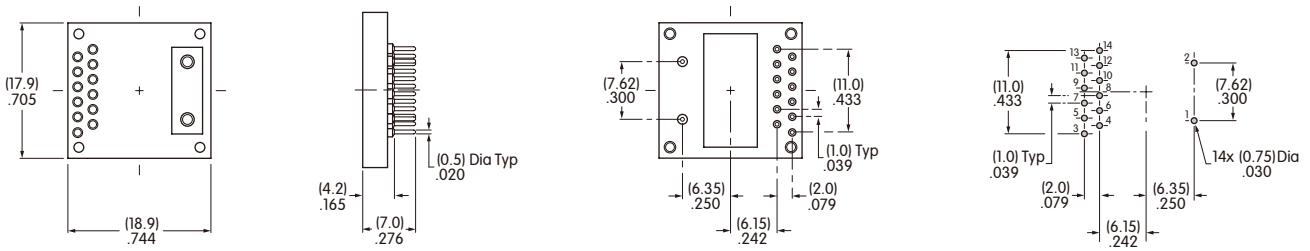
AT9704-065F Socket for Compact Pushbutton (All Models)

Materials:

Base - Glass Fiber Reinforced PBT
Terminals - Brass/Beryllium Copper

Compatible Part Numbers for AT9704-065F
Wide View/Short Travel LCD 64 x 32
IS15EBFP4RGB-134E
Wide View LCD 64 x 32 Compact
IS15ESBFP4RGB
Wide View LCD 36 x 24
IS15BAFP4CF
Wide View LCD 36 x 24 Compact
IS15BSBFP4RGB

- The socket permits the Compact SmartSwitch to be plugged in after automated processing.
- Use of the socket enables easy field replacement of the device.



Note: AT9704-065F Socket may be used with the LCD 64 x 32 SmartSwitch by removing pins 3, 4, 11, 12, 13 and 14.

OPTIONAL ACCESSORIES

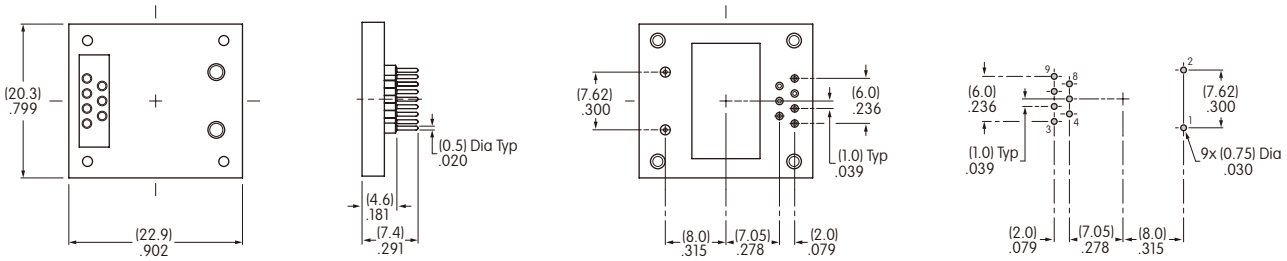
AT9704-085K Socket for LCD 64 x 32 Pushbutton

Materials:

Base - Glass Fiber Reinforced PBT
Terminals - Brass/Beryllium Copper

Compatible Part Number for AT9704-085K
Wide View LCD 64 x 32
IS15EBFP4RGB

- The socket permits the SmartSwitch to be plugged in after automated processing.
- Use of the socket enables easy field replacement of the device.



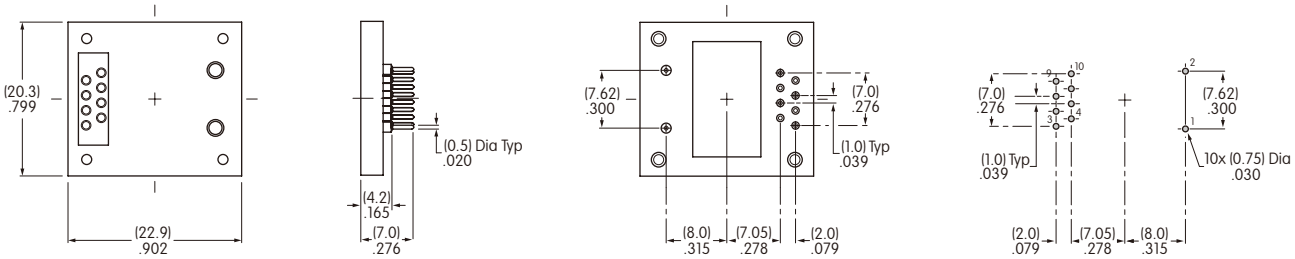
AT9704-085L Socket for OLED Pushbutton

Materials:

Base - Glass Fiber Reinforced PBT
Terminals - Brass/Beryllium Copper

Compatible Part Numbers for AT9704-085L	
OLED Pushbutton	Frameless OLED
ISC15ANP4	ISF15ACP4

- The socket permits the OLED SmartSwitch to be plugged in after automated processing.
- Use of the socket enables easy field replacement of the device.



AT9704-085M Socket for OLED Display

Materials:

Base - Glass Fiber Reinforced PBT
Terminals - Brass/Beryllium Copper

Compatible Part Number for AT9704-085M
OLED Display
ISC01P

- The socket permits the OLED SmartDisplay to be plugged in after automated processing.
- Use of the socket enables easy field replacement of the device.