

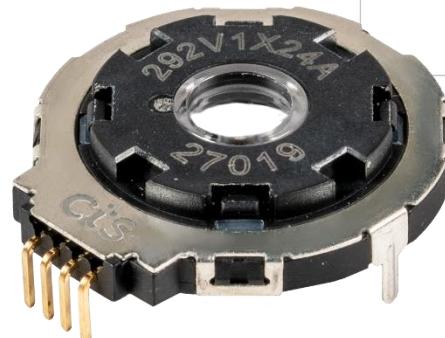
# Series 292

## 20mm Optical Ring Encoder

- Compact Ø20mm size package
- 3 million cycles rotational life (1 million cycles with detent)
- 24 PPR resolution
- Wide operating temperature range (-10°C to +85°C)
- 5.0 VDC and 3.3 VDC power options
- Integrated Schmitt trigger and pull-up resistor

### Applications

- Medical diagnostic equipment
- Industrial automation controls
- Automotive HVAC controls
- Infotainment controls
- Professional audio and lighting equipment



### Description

The Series 292 optical ring encoder provides a reliable and durable solution to applications that require extended rotational life where traditional mechanical contacting designs fall short. The hollow shaft design allows the engineer to integrate an additional push switch or LED in the center of the unit. Power options allow for use in standard or energy efficient circuits. The integrated Schmitt trigger and pull up resistor reduces the number of components required when adding an encoder to a circuit. The reduced number of components translates into cost savings and reduction in required PCB space.

### Ordering Information

Series	Terminal Type	Output Combination	Voltage
292	V1	X24	A
	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">Code</div> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">Spec.</div> </div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">V1</div> <div>.050" pitch pin rear facing</div> </div>	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">Code</div> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">Output Combination</div> </div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">X00</div> <div>24 PPR No detents</div> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">X24</div> <div>24 PPR 24 detents</div> </div>	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">Code</div> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">Spec.</div> </div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">A</div> <div>5.0 VDC</div> <div style="border-bottom: 1px solid black; padding: 0 10px; margin-right: 10px;">B</div> <div>3.3 VDC</div> </div>

## Electrical Specifications

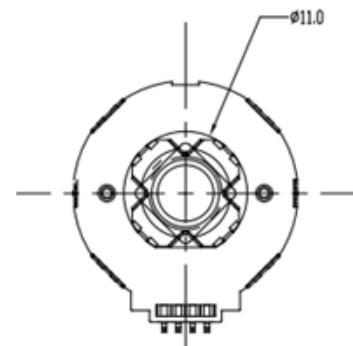
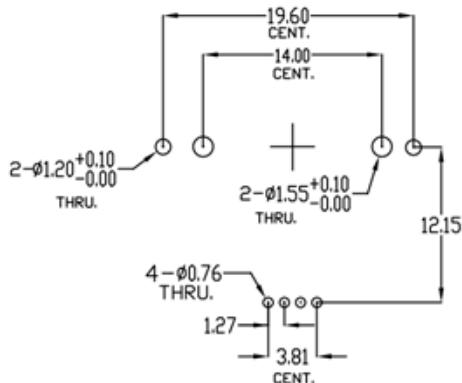
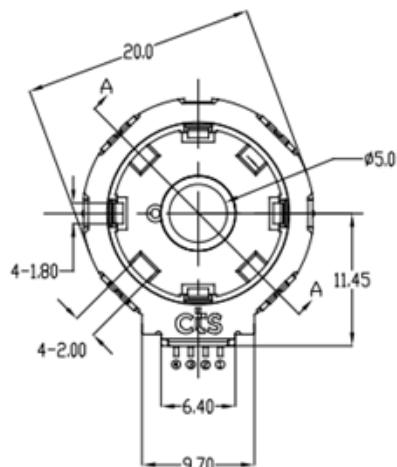
Encoder Function					
Parameter	Conditions & Remarks	Min	Nominal	Max	Unit
Input Voltage		4.95	5.0	5.50	VDC
		2.97	3.3	3.63	
Supply Current	5.0 VDC 3.3 VDC			30	mA
				20	mA
Dielectric Strength	For 1 minute			50	VDC
Insulation Resistance	At 50 VDC			10	MegΩ
Output Code	2-Bit Quadrature Channel A leads Channel B by 90°±45° during clockwise rotation				
Sink Current	5.0 VDC 3.3 VDC	2.0mA	1.0mA		
Power Consumption	5.0 VDC 3.3 VDC			150	mW
				80	mW
Logic Output	Logic High Logic Low	3.8		0.8	VDC
Resolution	24				Pulses per Revolution

## Mechanical and Environmental

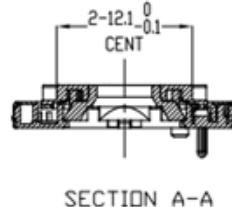
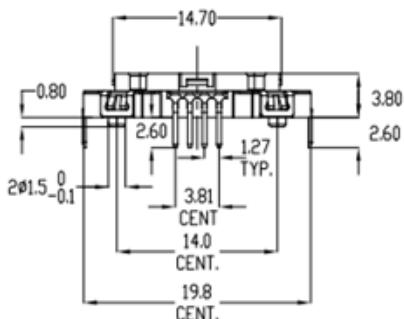
Wave Soldering	Maximum temperature of 260°C for 5 seconds
Operating Temperature:	-10°C to +85°C
Storage Temperature:	-10°C to +100°C
Rotational Life	3 million cycles (no detent @ 30 RPM) 1 million cycles (with detent @ 30 RPM) 500k cycles (with detent @30 RPM and 300 to 350 gf of side load)
Rotational Torque	
Non-detent	10 gf-cm max.
Detent	78 ± 30 gf-cm
Detent Position	Every 15° ± 3° of mechanical rotation
Travel	360° endless
Operational Speed	120 RPM max.
RoHS	Fully compliant to RoHS3 directive
IP Rating	IP 50
Marking	CTS logo, part number, date code
Packaging	Standard anti-static tray packaging
Weight	1.2g

All testing is performed at room ambient conditions except as noted. Users should verify device actual performance in their specific applications  
RoHS3 Directive 2015/863 Amendments of Annex II on March 31,2015  
Custom and value-added options available on request. Please contact your sales representative for additional information.

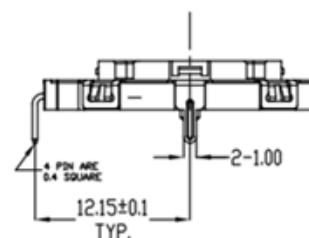
## Mechanical Specifications



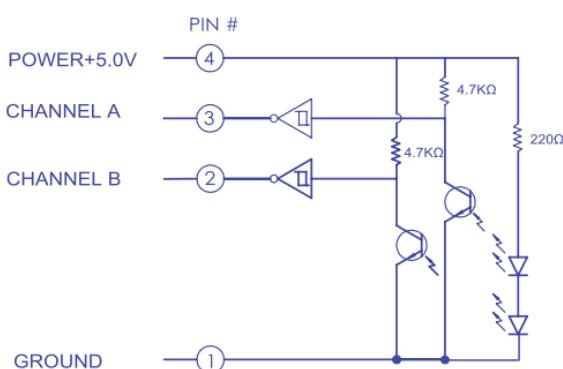
RECOMMENDED PCB LAYOUT  
(TOP VIEW)



GENERAL TOLERANCE:  $\pm 0.010$  inch  
 $\pm 0.25$  mm



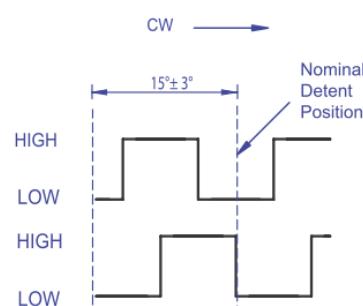
## Electric Circuit And Waveform



Schmitt trigger and pull-up resistor ( $4.7\text{k}\Omega$ ) are integrated into the optical encoder eliminating the necessity to use external pull-up resistors for the application circuit.

## Standard Quadrature 2-Bit Code

24 PPR/ 24 DETENTS



Channel A leads channel B in the CW direction, and lags in the CCW direction.

## Knob Reference Design

UNLESS OTHERWISE SPECIFIED  
GEN. TOL.  $\pm 0.05$  mm

