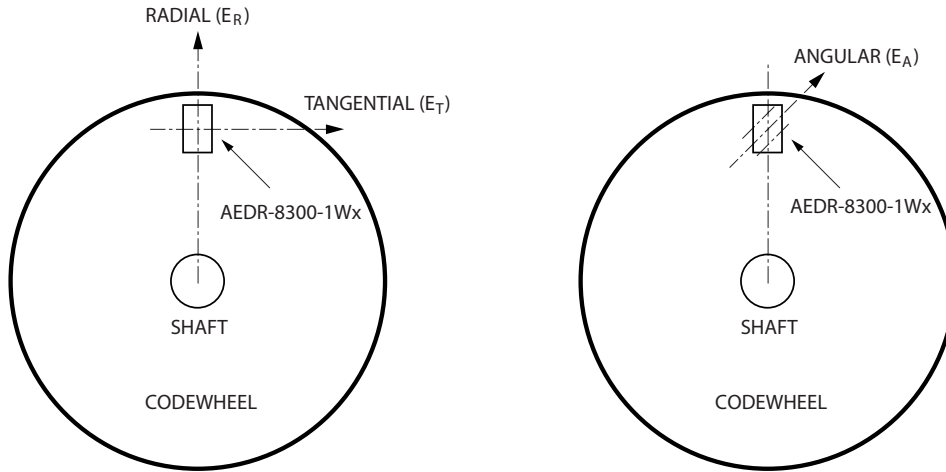
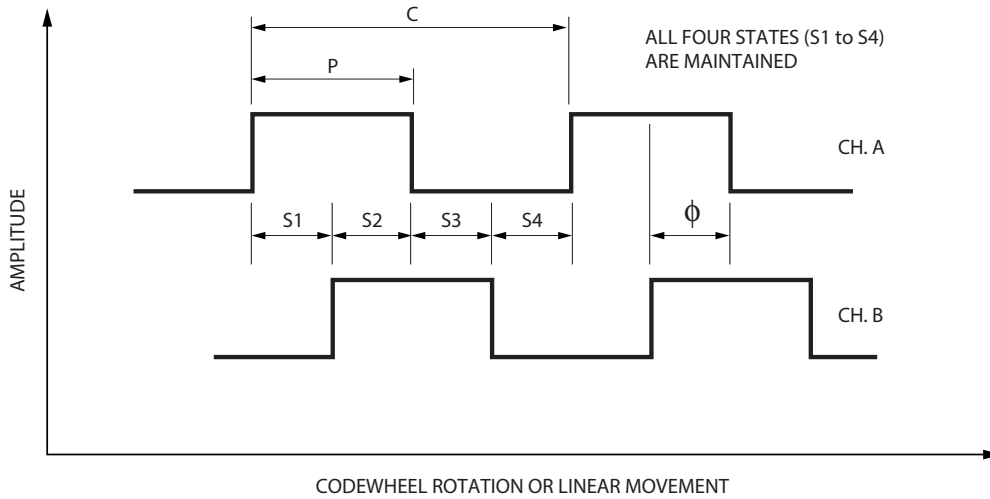


## Output waveform



## Absolute Maximum Ratings

Storage Temperature, $T_S$	-40° C to 85° C
Operating Temperature, $T_A$	-20° C to 85° C
Supply Voltage, $V_{CC}$	-0.5 V to 7 V
Output Voltage, $V_O$	-0.5 V to $V_{CC}$
Output Current per Channel, $I_{OUT}$	-1.0 mA to 8 mA
ESD	Human Body Model JESD22-A114-A Class 2
	Machine Model JESD22-A115-A Class B

### Notes:

- Exposure to extreme light intensity (such as from flashbulbs or spotlights) may cause permanent damage to the device.
- CAUTION: It is advised that normal static precautions should be taken when handling the encoder in order to avoid damage and/or degradation induced by ESD.
- Proper operation of the encoder cannot be guaranteed if the maximum ratings are exceeded.

## Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes
Temperature	T <sub>A</sub>	-20	25	85	°C	
Supply Voltage	V <sub>CC</sub>	3.0	3.3 / 5.0	5.5	V	Ripple < 100 mVp-p
LED Current	I <sub>LED</sub>	13	15	18	mA	See Note 1
Load Capacitance	C <sub>L</sub>			100	pF	2.7 kΩ Pull-Up
Count Frequency <sup>2</sup>	F	0.3		60	kHz	See Note 3
Radial Misalignment	E <sub>R</sub>			±0.38 (±0.015)	mm (in.)	
Tangential Misalignment	E <sub>T</sub>			±0.38 (±0.015)	mm (in.)	
Angular Misalignment	E <sub>A</sub>		0	±1.5	deg.	
Codewheel/strip tilt	C <sub>T</sub>		0	1	deg.	
Codewheel/strip Gap	G	1.0 (0.04)	2.0 (0.08)	2.5 (0.10)	mm (in.)	

Notes:

- LED Current Limiting Resistor:  
For V<sub>CC</sub> = 5.0 V, recommended series resistor = 220 Ω (±10 %)  
For V<sub>CC</sub> = 3.3 V, recommended series resistor = 110 Ω (± 10 %)
- Count frequency = velocity (rpm) x N / 60.
- Data collected based on Avago production characterization.

## Encoding Characteristics

Encoding characteristics over the recommended operating condition and mounting conditions.

Parameter	Symbol	Typical	Maximum	Unit
Pulse Width Error (Ch.A, Ch.B)	ΔP	16	75	°e
Phase Error	Δφ	10	60	°e

Note:

- Typical values represent the encoder performance at typical mounting alignment, whereas the maximum values represent the encoder performance across the range of recommended mounting tolerance.

## Electrical Characteristics

Characteristics over recommended operating conditions at 25° C.

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Detector Supply Current	I <sub>CC</sub>		4.8	6.0	mA	V <sub>CC</sub> = 5 V
			3.9	4.1		V <sub>CC</sub> = 3.3 V
High Level Output Voltage	V <sub>OH</sub>	2.4			V	I <sub>OH</sub> = -0.2 mA
Low Level Output Voltage	V <sub>OL</sub>			0.4	V	I <sub>OL</sub> = 8.0 mA
Rise Time	t <sub>r</sub>		500		ns	C <sub>L</sub> = 25 pF
Fall Time	t <sub>f</sub>		100		ns	R <sub>L</sub> = 2.7 kΩ