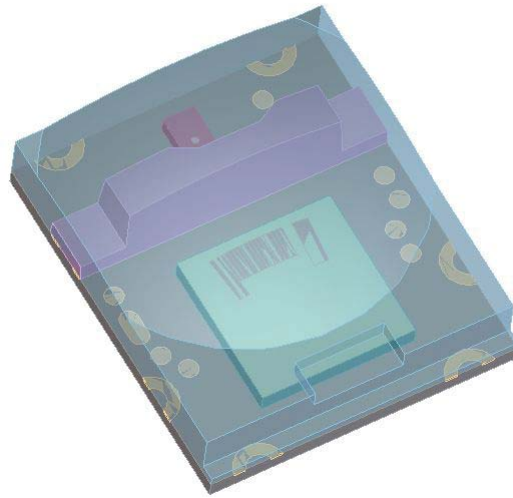
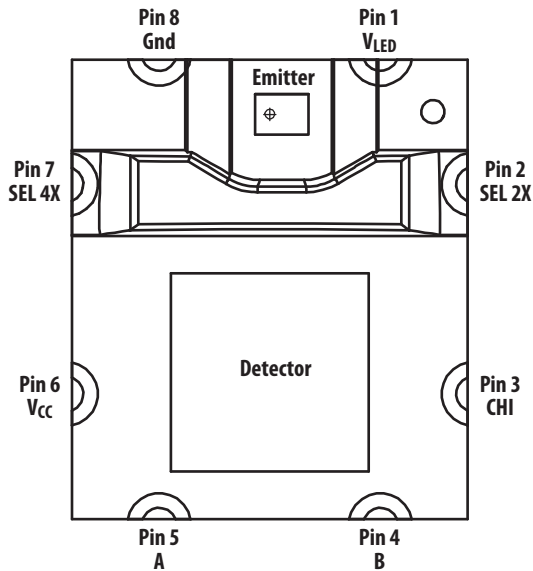


Encoder Pin-Out



Pin configuration (Top view)

Encoder's Built-in Interpolation

Pin (Interpolation)		Interpolation Factor	CPR @ (R _{OP} = 11.38 mm)	Count Frequency
SEL 4X	SEL 2X			
L	L	1X	828	55 KHz
L	H	2X	1656	110 KHz
H	L	4X	3312	220 KHz
H	H	Factory use		

H = HIGH Logic Level L = LOW Logic Level

The interpolation factor above may be used in conjunction with the below formulae to cater the needs for various rotation speed (RPM) and count.

$$\text{RPM} = (\text{Count Frequency} \times 60) / \text{CPR}$$

The CPR (@ 1X interpolation) is based on the following formulae which is directly dependent on R_{OP}

$$\text{CPR} = \text{LPI} \times 2\pi \times \text{R}_{\text{OP}} \text{ (inch) or}$$

$$\text{CPR} = \text{LPmm} \times 2\pi \times \text{R}_{\text{OP}} \text{ (mm)}$$

Encoding Characteristics (Codewheel of Rop @11.38 mm)

Encoding characteristics over the recommended operating condition and mounting conditions.

Parameter	Symbol	Typical			Unit
		1 X	2 X	4 X	
Interpolation factor		1 X	2 X	4 X	
Cycle Error	ΔC	18	22	36	°e
Pulse Width Error	ΔP	15	20	30	°e
Phase Error	$\Delta \phi$	9	15	18	°e
State Error	ΔS	10	15	25	°e
Index Pulse Width (Gated 90°)	P_O	90	90	90	°e
Index Pulse Width (Gated 180°)	P_O	180	180	180	°e
Index Pulse Width (Gated 360°)	P_O	Not Available	360	360	°e

Notes:

1. 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.
2. For optimal performance, please refer to alignment method as described in Application Note 5500 (document AV02-2789EN)

Electrical Characteristics

Characteristics over recommended operating conditions at 25° C.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
High Level Output Voltage	V_{OH}	2.4			V	$I_{OH} = -1.5 \text{ mA}$
Low Level Output Voltage	V_{OL}			0.4	V	$I_{OH} = +1.5 \text{ mA}$
Output current per channel, I_{out}	I_O	-	-	1.5	mA	
Rise Time	t_r		<100		ns	CL = 25pF RL = 2.7k Ω
Fall Time	t_f		<100		ns	

LED Current Limiting Resistor

A resistor to limit the current to the LED is required. The recommended value is 180 Ω ($\pm 1\%$) and the resistor should be placed in series between the 5 V supply and pin VLED of the encoder. This will result in an LED current of approximately 15 mA for optimal encoder performance.

