BROADCOM®

HEDS-9820 and HEDS-9830
Evaluation Board

User Guide
Version 1.0

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HEDS-9820 and HEDS-9830 Evaluation Board User Guide

1 Top and Bottom Views

Figure 1: Bottom Side of the PCB
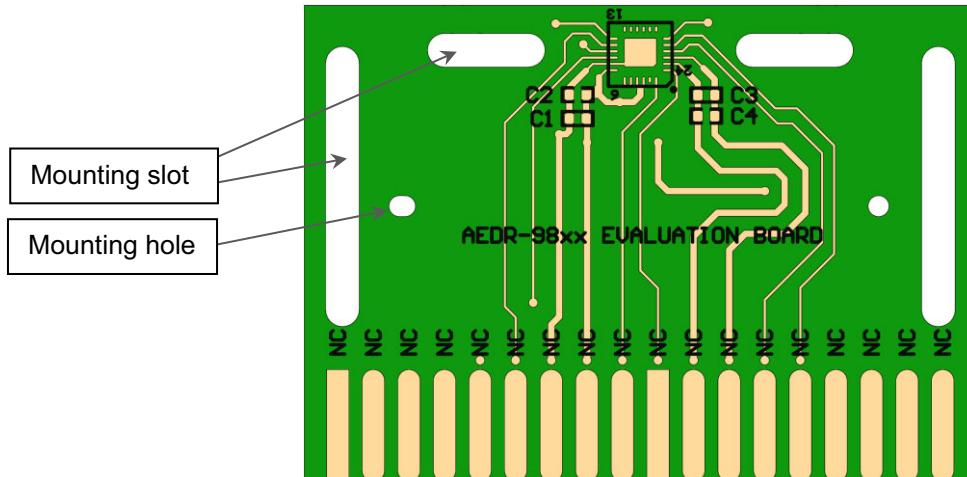
Figure 2: Top Side of the PCB (Left 318 LPI and Right 225 LPI)
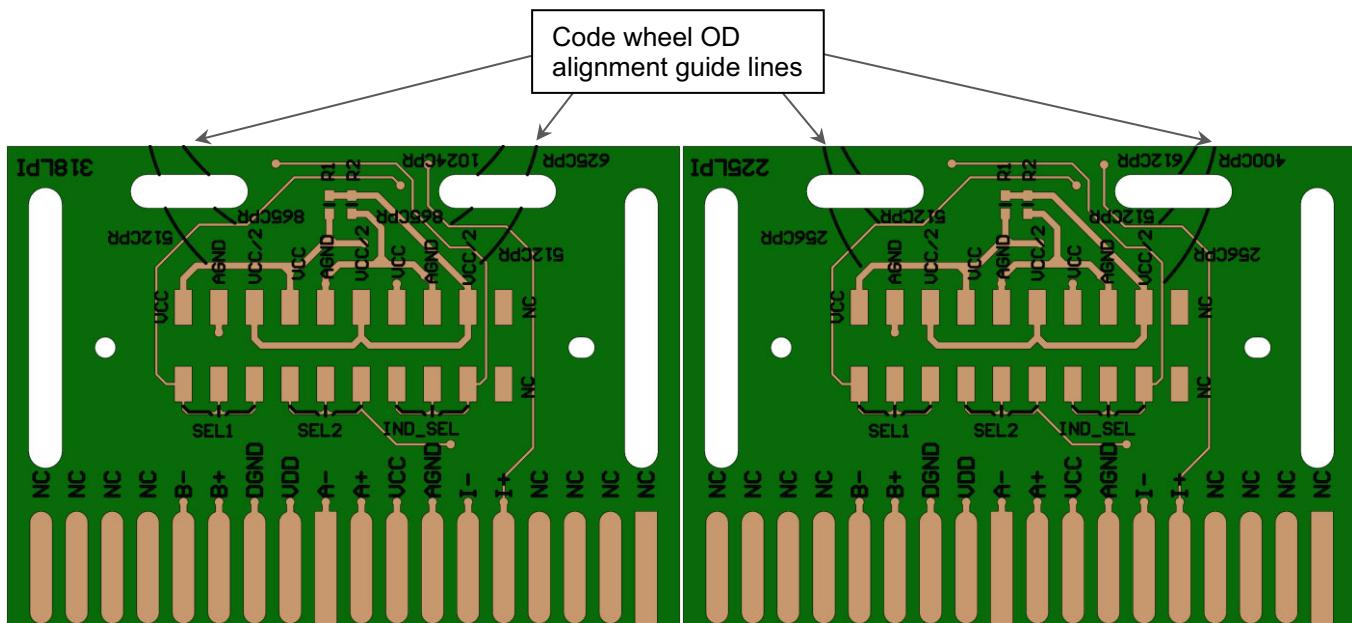
NOTE: Remove the protective kapton tape covering the encoder ASIC before use.

The silk screen-printed guide line on the PCB provides a visual alignment of the code wheel edge (outer diameter) for each of the different Rop (CPR) tracks. A sample diagram showing the position when encoder is aligned to 625 CPR track is shown in Figure 3.

Figure 3: Bottom Side of the PCB
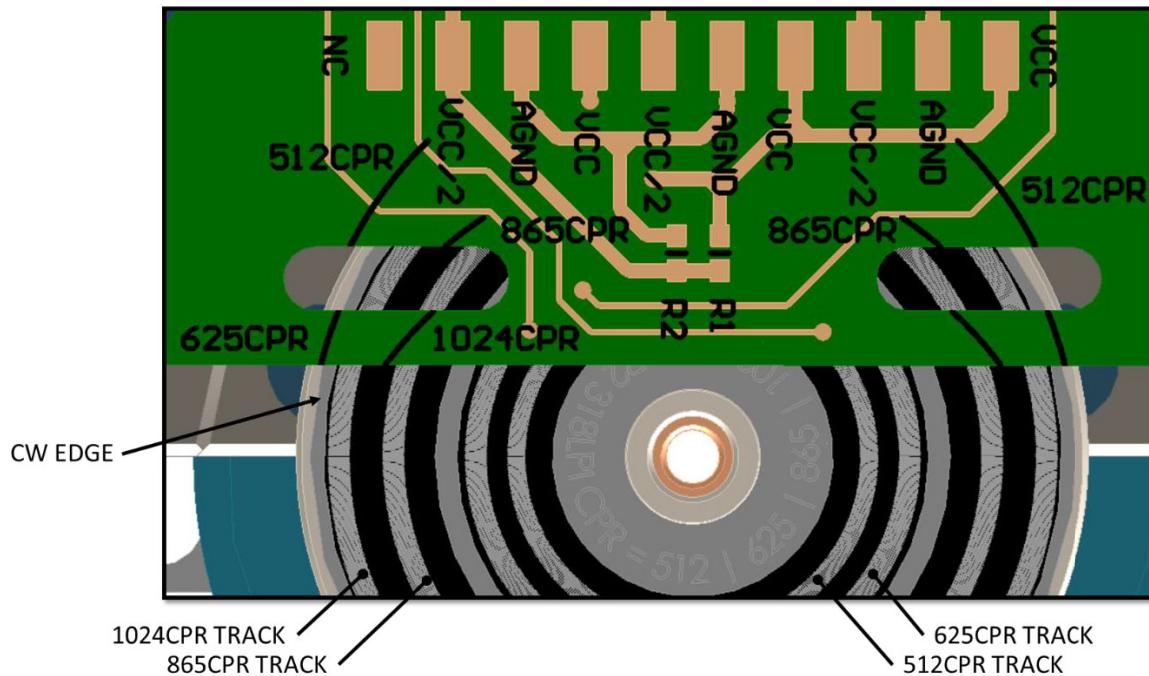
Figure 4: Sample Evaluation Board Mounting with Reference to the Code Wheel
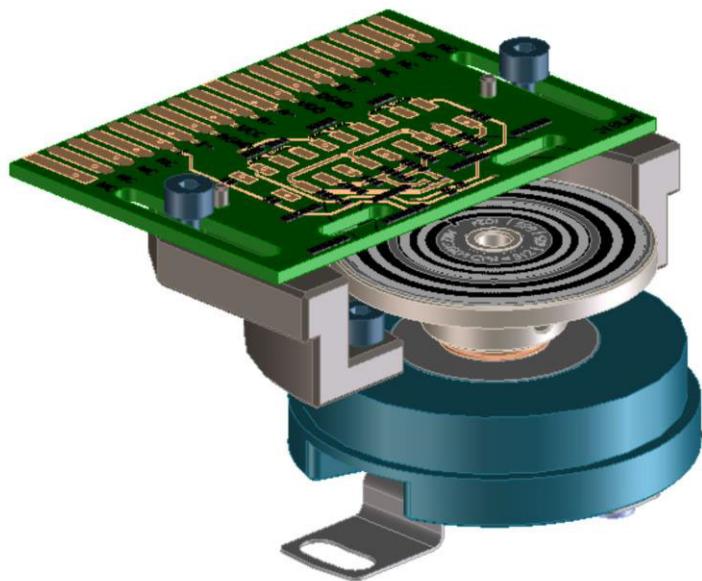
2 Select Options

2.1 Selection Table

Table 1: Selection Table for 318 LPI AEDR-9830 Variant

| SEL1	SEL2	INDEX SEL	Interpolation Factor	Index	Maximum Output Frequency	CPR at ROP 7.95 mm	CPR at ROP 11 mm
Open	Open	Low	1X	Gated 90°	200 kHz	625	865
		High		Gated 180°			
		Open		Ungated raw			
Open	Low	Low	2X	Gated 90°	400 kHz	1250	1730
		High		Gated 180°			
		Open		Gated 360°			
High	High	Low	4X	Gated 90°	800 kHz	2500	3460
		High		Gated 180°			
		Open		Gated 360°			
Low	Low	Low	8X	Gated 90°	1.6 MHz	5000	6920
		High		Gated 180°			
		Open		Gated 360°			
High	Low	Low	16X	Gated 90°	2.0 MHz	10,000	13,840
		High		Gated 180°			
		Open		Gated 360°			
Open	High	N/A	Analog (500 mVpp)	Analog	200 kHz	N/A	N/A
Low	High	N/A	Analog 1 Vpp	Ungated Digital			
High / Low	Open	N/A	Analog 1 Vpp	Analog			

Table 2: Selection Table for 225 LPI AEDR-9820 Variant

SEL1	SEL2	INDEX SEL	Interpolation Factor	Index	Maximum Output Frequency	CPR at ROP 4.6 mm	CPR at ROP 11 mm
Open	Open	Low	1X	Gated 90°	200 kHz	256	612
		High		Gated 180°			
		Open		Ungated raw			
Open	Low	Low	2X	Gated 90°	400 kHz	512	1224
		High		Gated 180°g			
		Open		Gated 360°			
High	High	Low	4X	Gated 90°	800 kHz	1024	2448
		High		Gated 180°			
		Open		Gated 360°			
Low	Low	Low	8X	Gated 90°	1.6 MHz	2048	4896
		High		Gated 180°			
		Open		Gated 360°g			

Table 2:   Selection Table for 225 LPI AEDR-9820 Variant (Continued)

SEL1	SEL2	INDEX SEL	Interpolation Factor	Index	Maximum Output Frequency	CPR at ROP 4.6 mm	CPR at ROP 11 mm
High	Low	Low	16X	Gated 90°	2.0 MHz	4096	9792
		High		Gated 180°			
		Open		Gated 360°			
Open	High	N/A	Analog (500mVpp)	Analog	200 kHz	N/A	N/A
Low	High	N/A	Analog 1Vpp	Ungated Digital			
High / Low	Open	N/A	Analog 1Vpp	Analog			

3 Board Schematic & Pin Assignment

Figure 5: Evaluation Board Schematic
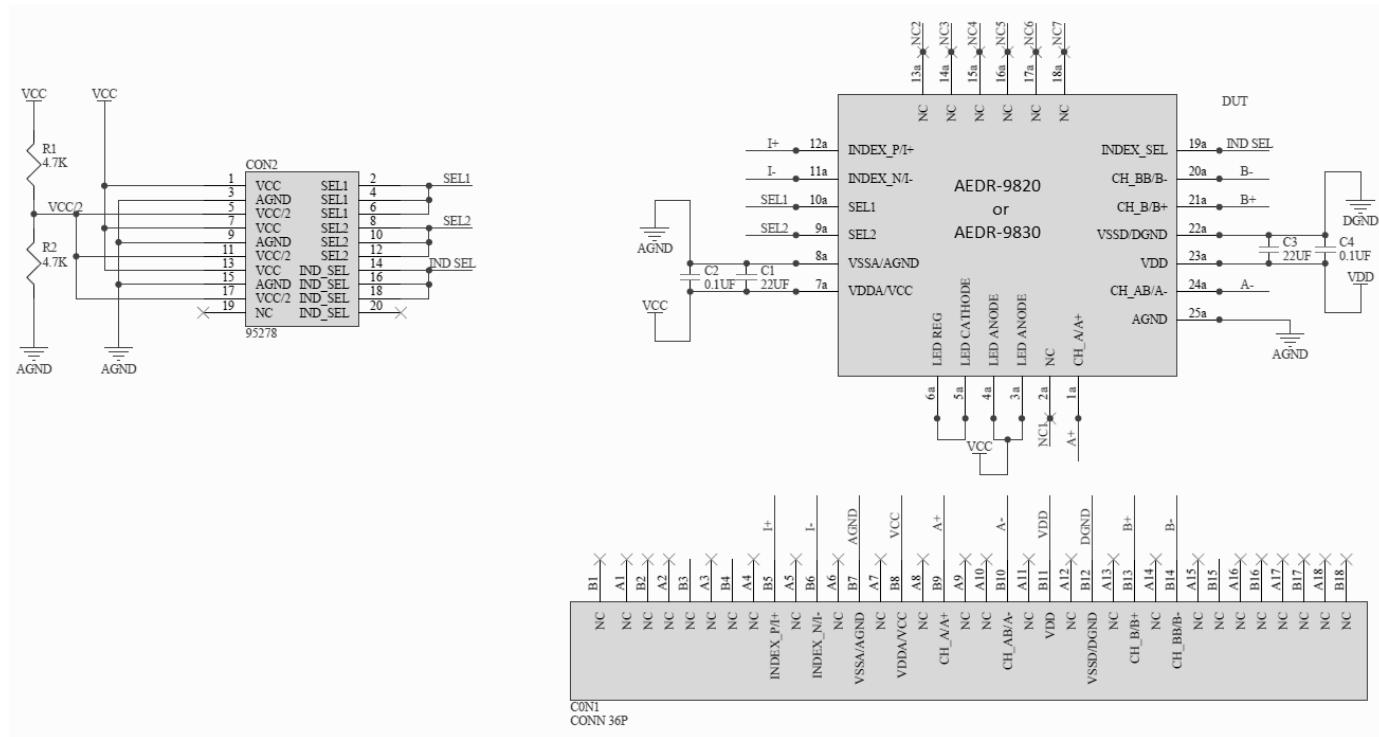
3.1 Connector Assignment

Table 3: Connector 1 Pin Assignments

Connector 1 (Top Side)	Label	Connector 1 (Top Side)	Label
1	NC	10	CH_AB/A-
2	NC	11	VDD
3	NC	12	VSSD/DGND
4	NC	13	CH_B/B+
5	INDEX_P/I+	14	CH_BB/B-
6	INDEX_P/I-	15	NC
7	VSSA/AGND	16	NC
8	VDDA/VCC	17	NC
9	CH_A/A+	18	NC

The finger design of Connector 1 is matched to either one of the following card edge connectors:

- EDAC, CONN EDGE DUAL FMALE 36POS 0.100, P/N# 395-036-520-202

  or

- SULLINS, CONN EDGE DUAL FMALE 36POS 0.100, P/N# EBC18DREH

The use of the previously mentioned card edge connectors is not needed if the required connections can be made using manual soldering to the relevant card edge fingers.

Table 4: Connector 2 Pin Assignments

Connector 1 (Top Side)	Label	State
1	SEL1	VCC
2		AGND
3		OPEN
4	SEL2	VCC
5		AGND
6		OPEN
7	INDEX_SEL	VCC
8		AGND
9		OPEN
10	NC	—

NOTE: See Table 1 (AEDR-9830 318 LPI) or Table 2 (AEDR-9820 225 LPI) for the various selection options available by changing the respective jumper position.

4 Code Wheel Drawing

For the AEDR-9830 evaluation board sample, the matching code wheel sample drawing is shown in Figure 6.

Figure 6: 318 LPI 4-Track (CPR) Code Wheel Drawing
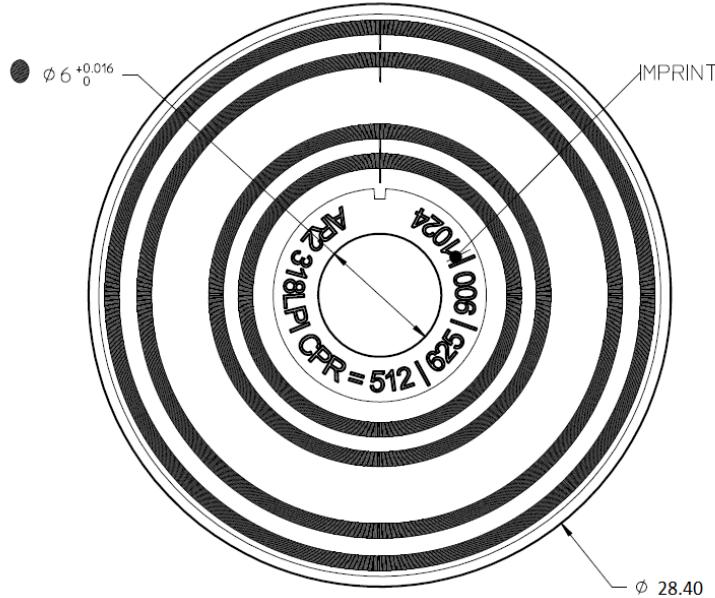
Table 1 : Data Track/Window

| Signal Channel	Track	Window Width	CPR	Rop (mm)
INC	1	180°/512	512	6.5087
INDEX	1	180°/512	512	5.8835
INC	2	180°/625	625	7.9452
INDEX	2	180°/625	625	7.3200
INC	3	180°/865	865	11.4411
INDEX	3	180°/865	865	10.8161
INC	4	180°/1024	1024	13.0175
INDEX	4	180°/1024	1024	12.3925

For the AEDR-9820 evaluation board sample, the matching code wheel sample drawing is shown in Figure 7.

Figure 7: 225 LPI 4-Track (CPR) Code Wheel Drawing
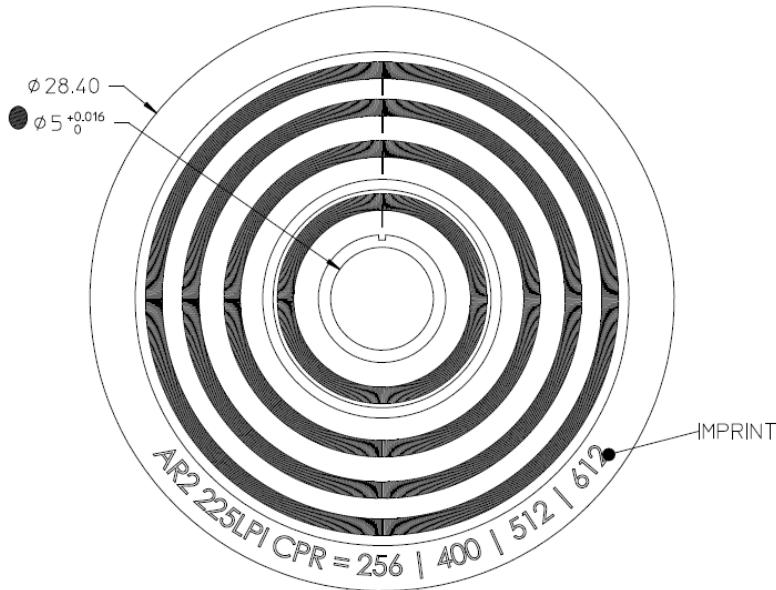
Table 1 : Data Track/Window

Signal Channel	Track	Window Width	CPR	Rop (mm)
INC	1	180°/256	256	4.5995
INDEX	1	180°/256	256	3.9743
INC	2	180°/400	400	7.1867
INDEX	2	180°/400	400	6.5615
INC	3	180°/512	512	9.1990
INDEX	3	180°/512	512	8.5738
INC	4	180°/612	612	10.9957
INDEX	4	180°/612	612	10.3705

For a detailed drawing of the sample code wheel, request it from your regional Field Applications Engineer.

Revision History

Version 1.0, July 15, 2020

- Initial release of the document.