

# Hall-Effect Digital Current Sensor

The Hall-Effect Digital Current Sensors manufactured by Engineered Components Company provide a method for sensing the magnetic field associated with a current-carrying conductor, and providing an isolated digital output voltage that corresponds to the current. Supply voltage ( $V_{cc}$ ) can range between 5 and 24 volts DC.

With zero current, the digital output is driven to a "high" level, which is approximately equal to  $V_{cc}$ . When the current rises above an "operate current" level ( $I_{OP}$ ), the digital output is driven to a "low" level, which is approximately equal to 0.2 volts DC. When the current falls below a "release current" level ( $I_{REL}$ ), the digital output is driven back to a "high" level (see Figure 1).

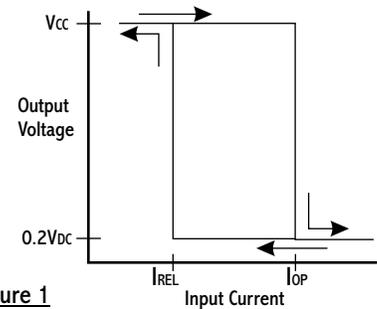


Figure 1

Product Selection Table

PART NUMBER	$I_{OP}$ (amps)	$I_{REL}$ (amps)	$I_{MAX}$ (amps)	W	L	H	A
VHEDCS-.10	.100+/-0.010	.065 TYP.	1.00	.400	.900	.975	.034
VHEDCS-.20	.200+/-0.020	.130 TYP.	1.00	.400	.900	.975	.034
VHEDCS-.30	.300+/-0.030	.200 TYP.	2.50	.400	.900	.975	.034
VHEDCS-.40	.400+/-0.040	.260 TYP.	2.50	.400	.900	.975	.034
VHEDCS-.50	.500+/-0.050	.325 TYP.	5.00	.400	.900	.975	.034
VHEDCS-.75	.750+/-0.075	.550 TYP.	5.00	.400	.900	.975	.034
VHEDCS-1.0	1.00+/-0.100	.730 TYP.	8.00	.500	.950	1.000	.043
VHEDCS-2.0	2.00+/-0.200	1.75 TYP.	8.00	.500	.950	1.000	.043
VHEDCS-3.0	3.00+/-0.300	2.60 TYP.	10.0	.500	.950	1.025	.054
VHEDCS-4.0	4.00+/-0.400	3.50 TYP.	10.0	.500	.950	1.025	.054
VHEDCS-5.0	5.00+/-0.500	4.35 TYP.	10.0	.500	.950	1.025	.054
VHEDCS-46	46.0 TYP. (SINGLE TURN)	40.0 TYP. (SINGLE TURN)	N/A	.350	.900	.950	8-32 UNC-2A

## OPERATING SPECIFICATIONS

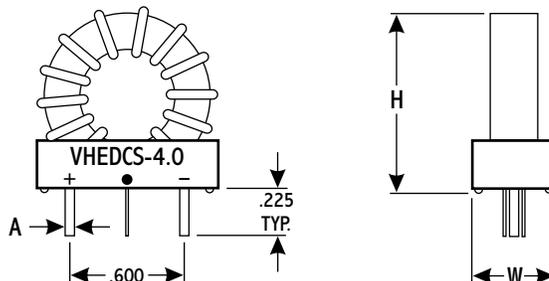
Operating Temp.....-40 to +125 °C  
 Supply Voltage.....5.0 to 24 Vdc  
 Supply Current.....4.4 mA typ.  
   9 mA max.  
 Output Current.....25 mA max.  
 Vout (on).....0.2 Vdc typ.  
 Vout (off).....Vcc typ.  
 Output rise time.....0.04 us typ.  
 Output fall time.....18.0 us typ.  
 NOTE: rise and fall times measured with  
 load of R=820 ohms and C=20pF  
 Input to Output isolation can  
 withstand 500 Vdc @ 50 uA

RoHS compliant (no lead solder) is designated by adding an "NL" suffix to the part number. Special modules can often be manufactured to provide for customer specific applications.

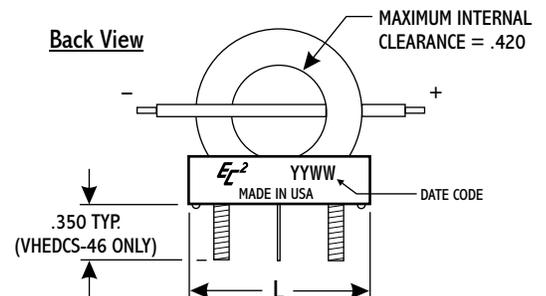
The current to be sensed is applied to the sensor coil leads marked with a "+" and a "-" on the front of the case. The VHEDCS-46 is provided with two 8-32 thread brass mounting studs in place of the sensor coil leads. On this module, the customer can pass a current carrying wire through the center of the toroid core to function as a single turn coil. This single turn coil produces the trip currents shown for the VHEDCS-46. Multiple turns can be passed through the center of the core to produce lower trip currents on this model. The three leads in the center of the module are the hall-effect sensor leads. A dot on the front of the case marks the output voltage lead. The center lead is the common lead and the far lead is the  $V_{cc}$  supply voltage lead (see Figure 2).

The Toroid and Sensor are secured in the housing with an epoxy resin. The housing material is a Liquid Crystal Polymer, off-white in color. Marking is applied by silkscreen using blue epoxy paint. Copper leads are tin-lead plated.

Front View



Back View



Bottom View

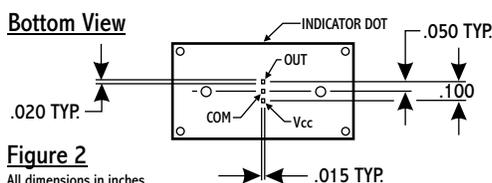


Figure 2

All dimensions in inches

NOTE: The front view drawing is showing the VHEDCS-4.0 with the current sensing coil pre-wound on the toroid. The back view drawing is showing a VHEDCS-46 with a single turn coil (supplied by the customer) passing through the center of the toroid.



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