

Description

These targets function with a number of different resonant inductive sensors from CambridgeIC, including 10mm wide Linear Sensors. Sensors measure the relative position of the target without mechanical or electrical contact.

11mm E-Core Targets have a resonant circuit inside, comprising a wound E-Core ferrite with coil ends connected to a capacitor mounted on a miniature PCB. These form a high Q resonant circuit that is inductively coupled to the sensor.

11mm E-Core Targets are available in product variants with the capacitor PCB to the rear or to the side of the ferrite.

Product variants with different nominal frequencies are also available, to suit different metal environments.

Applications

- 10mm wide Type 1 Linear Sensors up to 300mm
- 10mm wide Type 2 and Type 6 sensors to 500mm

Product identification	
Part no.	Description
013-1020	11mm E-Core Target with Rear PCB
013-1023	11mm E-Core Target with Rear PCB -3% Freq
013-1027	11mm E-Core Target with Side PCB -1.5% Freq

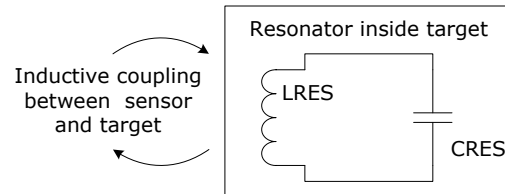


Figure 1 Equivalent circuit

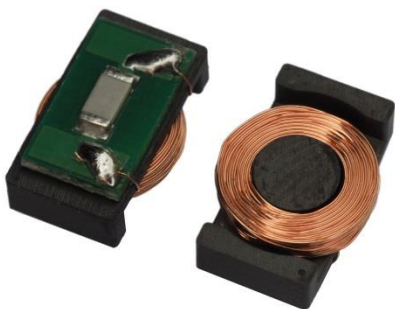


Figure 2 11mm E-Core Target with Rear PCB

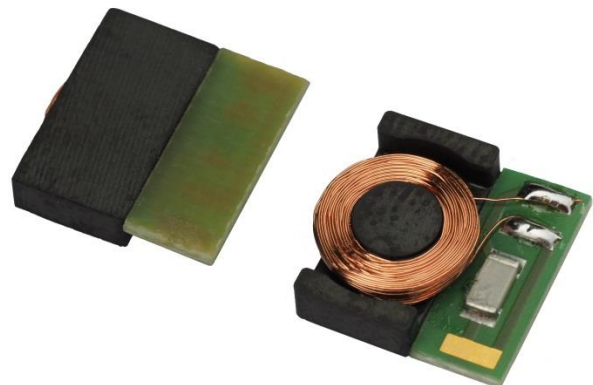


Figure 3 11mm E-Core Target with Side PCB

1 Mechanical

1.1 Rear PCB Version

Figure 4 illustrates the 11mm E-Core Target with Rear PCB, and includes key dimensions. This style, with the PCB to the rear of the ferrite, minimises plan view area (top left of Figure 4).

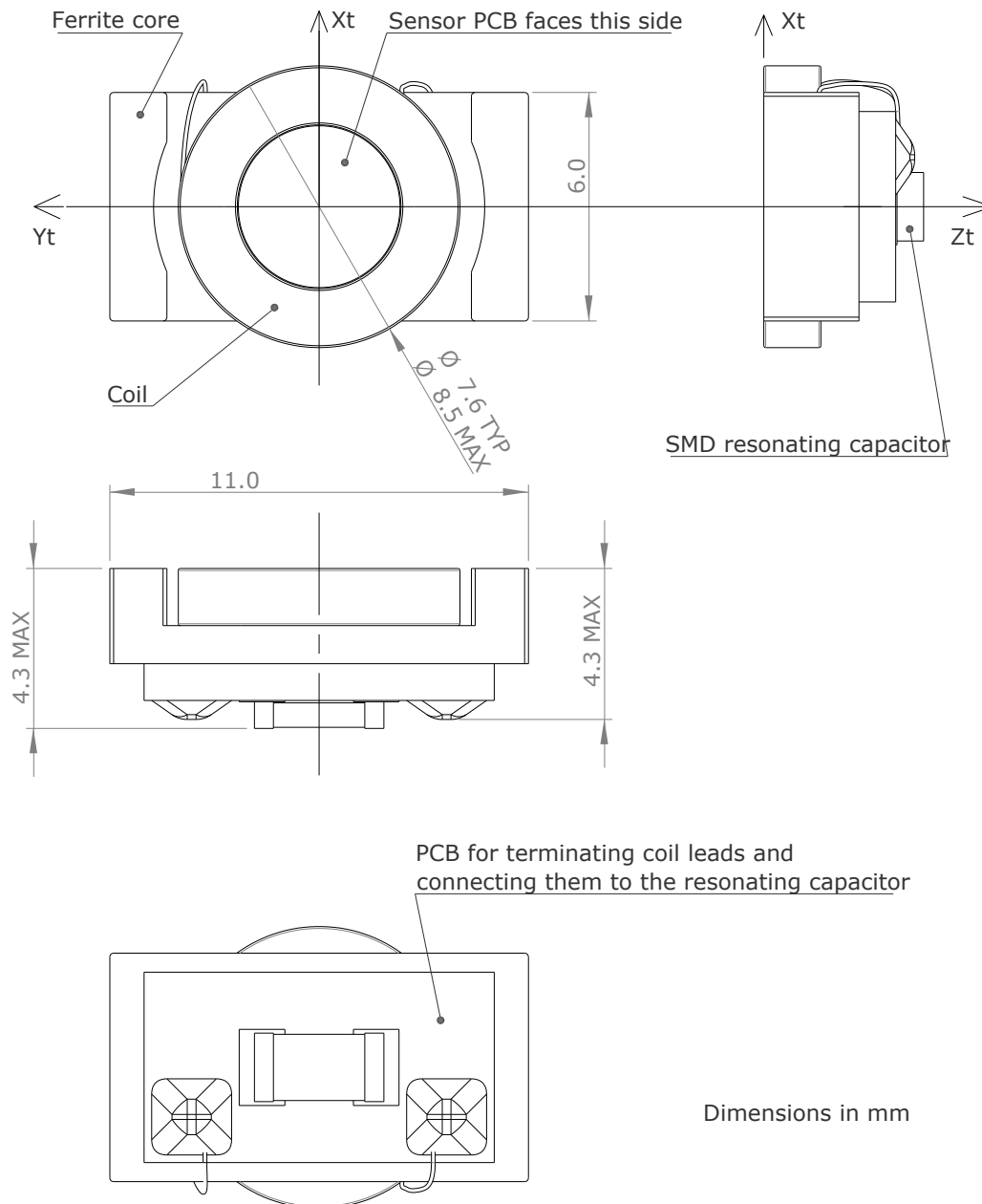


Figure 4 Mechanical drawing of 11mm E-Core Target with Rear PCB

The part's Xt Direction runs bottom to top as drawn, and is in the sensor's measuring direction. The part's Zt Direction runs through the thickness of the part, perpendicular to the sensor PCB and in the direction of measurement of the Gap to the sensor PCB. The part's Yt Direction runs perpendicular to Xt and Zt Directions.

1.2 Side PCB Version

Figure 4 illustrates the 11mm E-Core Target with Side PCB, and includes key dimensions. This style, with the PCB to the rear of the ferrite, minimises thickness.

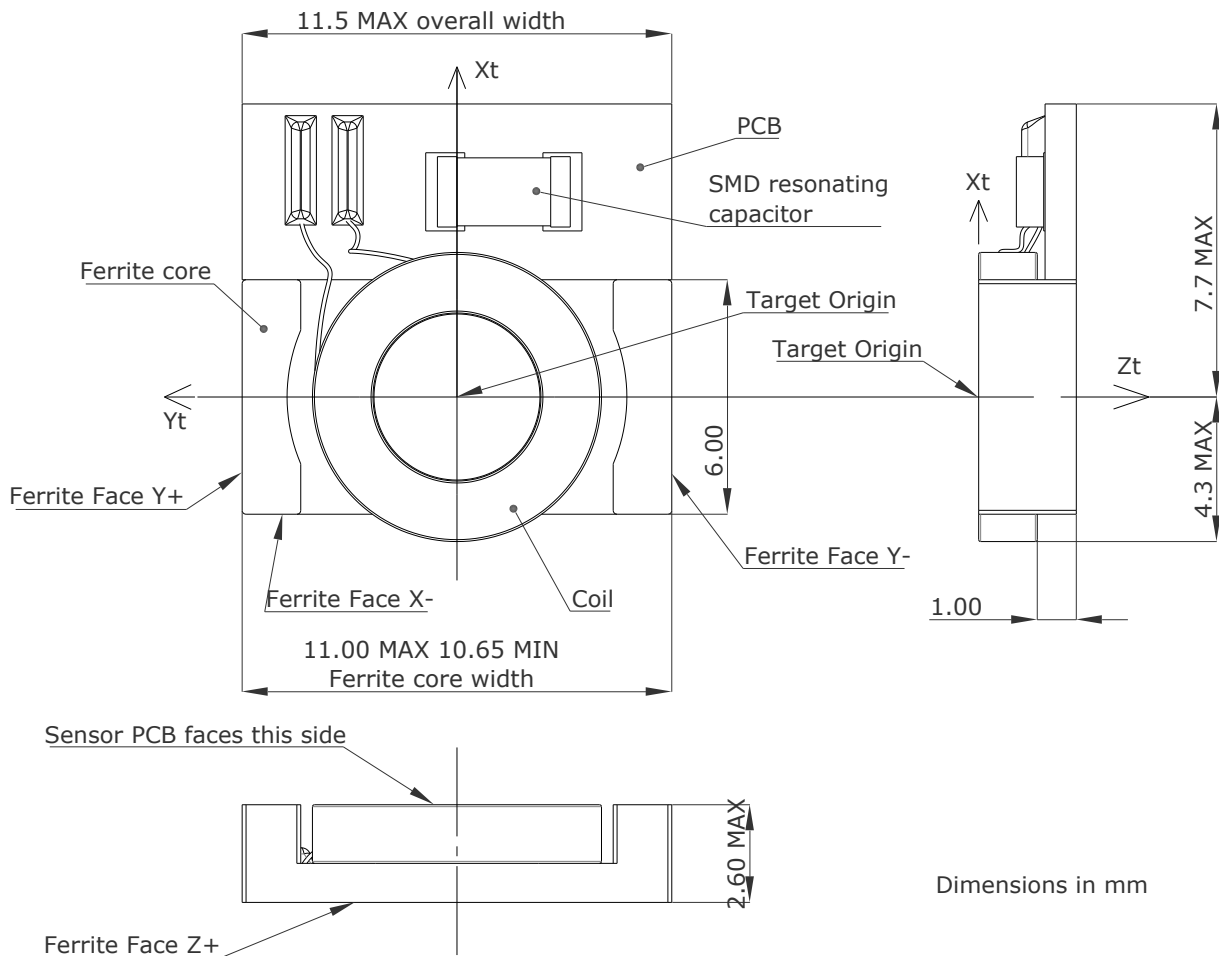


Figure 5 Mechanical drawing of 11mm E-Core Target with Side PCB

This style is also easier to mount and align than the Side PCB version, because the rear of the ferrite ("Ferrite face Z+" in Figure 5) is planar and because the overall thickness of the part is better controlled.

As before, the part's Xt Direction runs bottom to top as drawn, and is in the sensor's measuring direction. The part's Zt Direction runs through the thickness of the part, perpendicular to the sensor PCB and in the direction of measurement of the Gap to the sensor PCB. The part's Yt Direction runs perpendicular to Xt and Zt Directions.

Sensors measure the position of the centre of the ferrite ("Target Origin"). For minimum sensor Position Offset Error, it is recommended that mounting features should align the part in the Xt Direction using the Ferrite X- Face. For best lateral alignment with the sensor, it is recommended to align the part in the Yt Direction using the Ferrite Y+ and/or Ferrite Y- Face.

The coil and PCB must not be used for alignment because their dimensional tolerances are not as tight as the ferrite. Adequate clearance should be allowed for the coil and PCB MAX dimensions in the design of the mounting.

The part includes an adhesive bond between ferrite and capacitor PCB allowing shipping, handling and assembly. However this bond is not intended to survive mechanical shock and vibration in a final product without further support. Adhesive is recommended for attachment, for example epoxy, spanning both ferrite and the capacitor PCB.

2 Specifications

2.1 Electrical

Table 1 Electrical specifications

Part No	013-1020	013-1023	013-1027
Resonator frequency, free space	187.5kHz	182.0kHz	184.6kHz
Tolerance at 20°C	±4%	±4%	±3%
Max change in resonant frequency across Operating Temperature Range relative to value at 20°C	±1%	±1%	±1%

Parts with lower nominal frequency suit applications where the part is used with a sensor that has aluminium very close behind. The aluminium will increase the resonant frequency relative to its free space value. The resulting design must be checked to ensure the resonant frequency is within the appropriate tuning limits of the CTU chip used for processing. Please contact CambridgeIC for details.

2.2 Environmental

Table 2 Environmental Specifications

Item	Value
Maximum Operating Temperature	+85°C
Minimum Operating Temperature	-40°C

2.3 Physical

Table 3 Physical specifications

Item	Value
Mass, typical	0.8g

3 RoHS Compliance

CambridgeIC certifies, to the best of its knowledge and understanding that part numbers 013-1020, 013-1023 and 013-1027 are in compliance with EU RoHS directives 2011/65/EU and 2015/863, China RoHS and Korea RoHS.

4 Document History

Revision	Date	Description
0001	15 October 2014	First draft, basic information
0002	16 September 2015	Added part 013-1023 to available products (different nominal frequency)
0003	29 November 2016	Figure 4 now created from SolidWorks model
0004	30 November 2016	The maximum height dimension of figure 4 applies to revision _0002 onwards
0005	30 November 2016	Added max coil dimension
0006	26 June 2017	Added Side PCB version
0007	6 December 2017	Added RoHS statement
0008	7 June 2024	Updated RoHS statement to include RoHS 3

5 Contact Information

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6 Legal

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