

Description

CambridgeIC's resonant inductive position sensing technology allows linear or rotary sensors to be built using conventional PCB fabrication processes. Sensors detect inductively coupled targets without contact.

20mm Transponder Coils are wound ferrite cored inductors for surface mounting to a PCB. They form the inductive component of the resonant circuit inside a target, and allow targets to be built using PCB fabrication and assembly processes too.

The 20mm Transponder Coil is also available with capacitance connected across its SMD pads, for use as a resonator assembly.

Features

- 2 alignment Pins for accurate registration on a PCB
- 4 large solder terminals for secure fixing to a PCB
- High Q-factor for strong signals and high resolution
- Stable inductance
- Magnetic geometry optimised for inductive sensing

Performance

- Operating Temperature Range -40°C to +125°C

Applications

- Inductively coupled resonant circuits
- Through hole contactless rotary position sensors
- End shaft contactless rotary position sensors
- Contactless linear position sensors

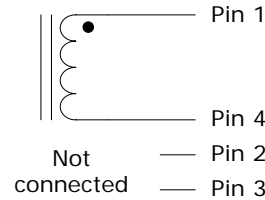


Figure 1 Electrical connections, 012-1704

Product identification	
Part no.	Description
012-1704	20mm Transponder Coil
013-1024	Resonator Assembly, 187.5kHz

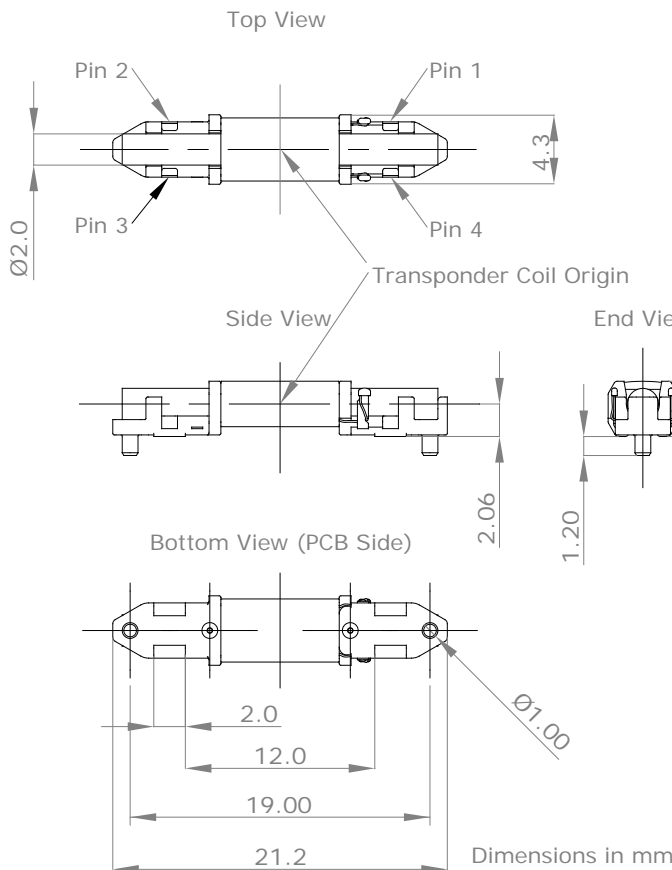


Figure 2 Dimensions, part 012-1704

1 Specifications, Transponder Coil

1.1 Electrical

Table 1 Electrical specifications, transponder coil

Item	Value
Nominal Inductance, free space	935 μ H
Inductance tolerance at 20°C	\pm 2%
Max Change in inductance across Operating Temperature Range relative to value at 20°C	\pm 2%
Minimum self resonant frequency	1MHz
Typical DC series resistance, 20°C	5.3 Ω

1.2 Environmental

Table 2 Environmental specifications, transponder coil

Item	Value
Maximum Operating Temperature	+125°C
Minimum Operating Temperature	-40°C
Maximum Storage Temperature	+125°C

1.3 Physical

Table 3 Physical specifications, transponder coil

Item	Value
Mass	0.7g

2 PCB Footprint, Transponder Coil

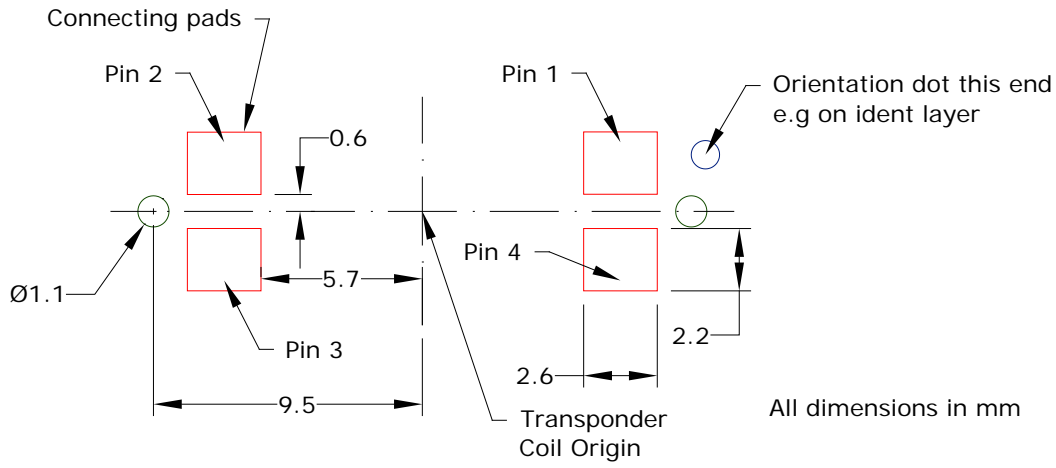


Figure 3 Recommended PCB footprint, top view

3 Resonator Assemblies

The 20mm Transponder coil is available with SMD capacitor(s) soldered across pins 1 and 4 to form a resonator assembly. The part is available with different nominal resonant frequencies to suit different metal environments.

3.1 Mechanical

One or more capacitors are soldered across pins 1 and 4 as illustrated in Figure 4.

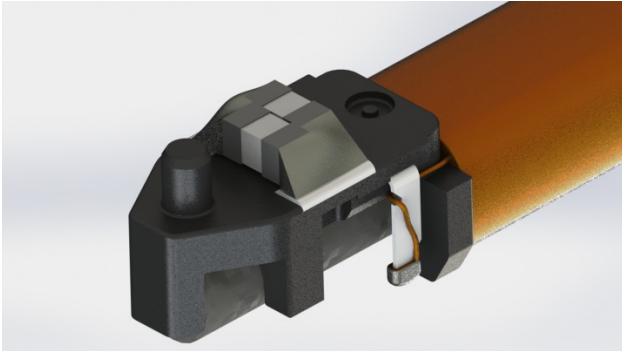


Figure 4 Location of added capacitance

Figure 5 illustrates the increase in physical envelope of the part in the area of the added capacitors, to allow for the capacitors and their soldering.

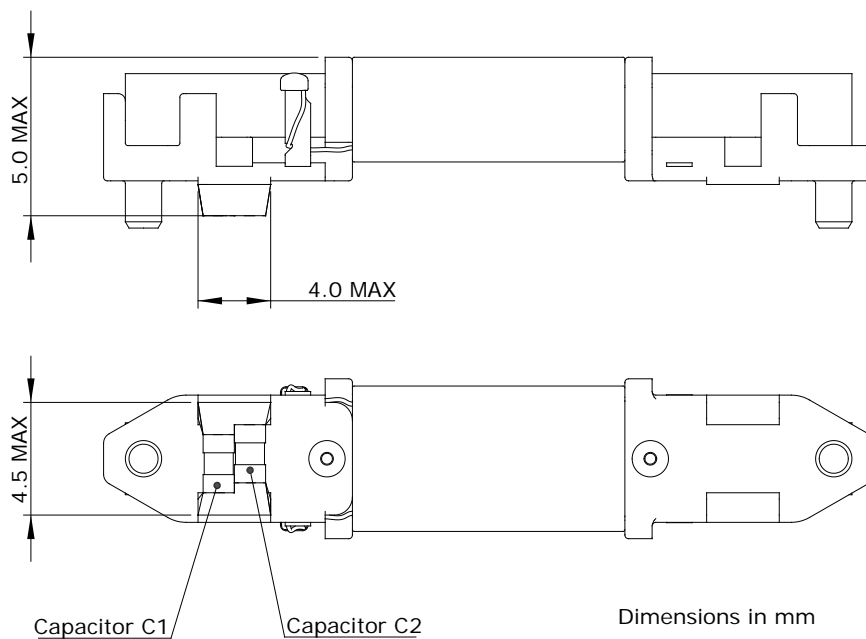


Figure 5 Dimensions, part 013-1024

3.2 Electrical

Table 4 Electrical specifications, resonator assemblies

Part No	013-1024
Item	
Resonator nominal frequency, free space, 20°C	187.5kHz
Tolerance at 20°C	±3.5%
Max change in resonant frequency across Resonator Assembly Operating Temperature Range	±2%
Min Resonator Q-factor, free space, 20°C	100

3.3 Environmental

Table 5 Environmental specifications, resonator assemblies

Item	Value
Minimum Resonator Assembly Operating Temperature	-40°C
Maximum Resonator Assembly Operating Temperature	+85°C
Maximum Resonator Assembly Storage Temperature	+125°C

4 Document History

Revision	Date	Description
0001	11 January 2016	First draft
0002	29 January 2016	Added Resonator Assembly 013-1024
0003	24 February 2016	Confirmed nominal inductance at 935 μ H Updated drawing to include height tolerance

5 Contact Information

Cambridge Integrated Circuits Ltd
21 Sedley Taylor Road
Cambridge
CB2 8PW
UK

Tel: +44 (0) 1223 413500

info@cambridgeic.com

6 Legal

This document is © 2014-2016 Cambridge Integrated Circuits Ltd (CambridgeIC). It may not be reproduced, in whole or part, either in written or electronic form, without the consent of CambridgeIC. This document is subject to change without notice. It, and the products described in it ("Products"), are supplied on an as-is basis, and no warranty as to their suitability for any particular purpose is either made or implied. CambridgeIC will not accept any claim for damages as a result of the failure of the Products. The Products are not intended for use in medical applications, or other applications where their failure might reasonably be expected to result in personal injury. The publication of this document does not imply any license to use patents or other intellectual property rights.