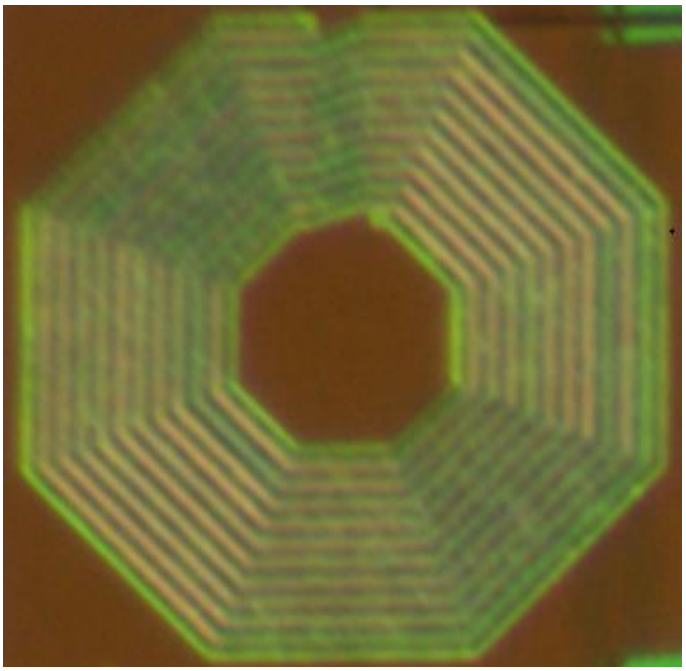
CC-203IP Super Inductor Revolutionary, High Quality Factor (Q), Adjustable, On-Chip Inductor



Applications:

Ultra-Low Noise, High Gain Amplifiers/LNAs
Compact on-chip LC Filters
High Q, LC Tank Circuits
RF and Audio Signal Chains

Features:

Ultra High Inductor Quality Factor (Q)
Customizable Inductance Range (1nh to 700nh)
Planar or Stacked Layer Construction
IP portable to any manufacturing process

CC-203IP General Description

The CC-203IP is a revolutionary, On-Chip, Ultra-High Quality Factor (Q) inductor which can be manufactured in a planar or stacked die configuration on any given manufacturing process. Utilizing on-die manufacturing techniques pioneered by CurrentRF, the super inductor Quality Factor (Q) increases from a 20% to over 100% range as compared to typical on-chip inductors, competing with the Quality Factors of off chip, wire wound inductors. The CC-203IP inductance ranges from 1nh to 700nh and can be customized to fit customer design requirements. Table 1 shows example Inductance Quality Factor (Q) parameters, and approximate Inductor planar dimensions. The Super Inductor dimensions will substantially reduce if a layer stacked inductor is manufactured using a TSV embedded IC manufacturing process.

Inductance	Type	Quality Factor (Q)	Test Frequency	Dimensions	Metal Resistance
2nh	planar	78	1Ghz	480um X 480um	on-chip Low
9.6nh	planar	90	1Ghz	960um X 960um	on-chip Low
20nh	planar	94	1Ghz	960um X 1920um	on-chip Low
41.6nh	planar	103	1Ghz	1920um X 1920um	on-chip Low
128nh	planar	109	1Ghz	3840um X 3840um	on-chip Low
691nh	planar	103	1Ghz	7680um X 7680um	on-chip Low

Table 1: Super Inductor Test Results

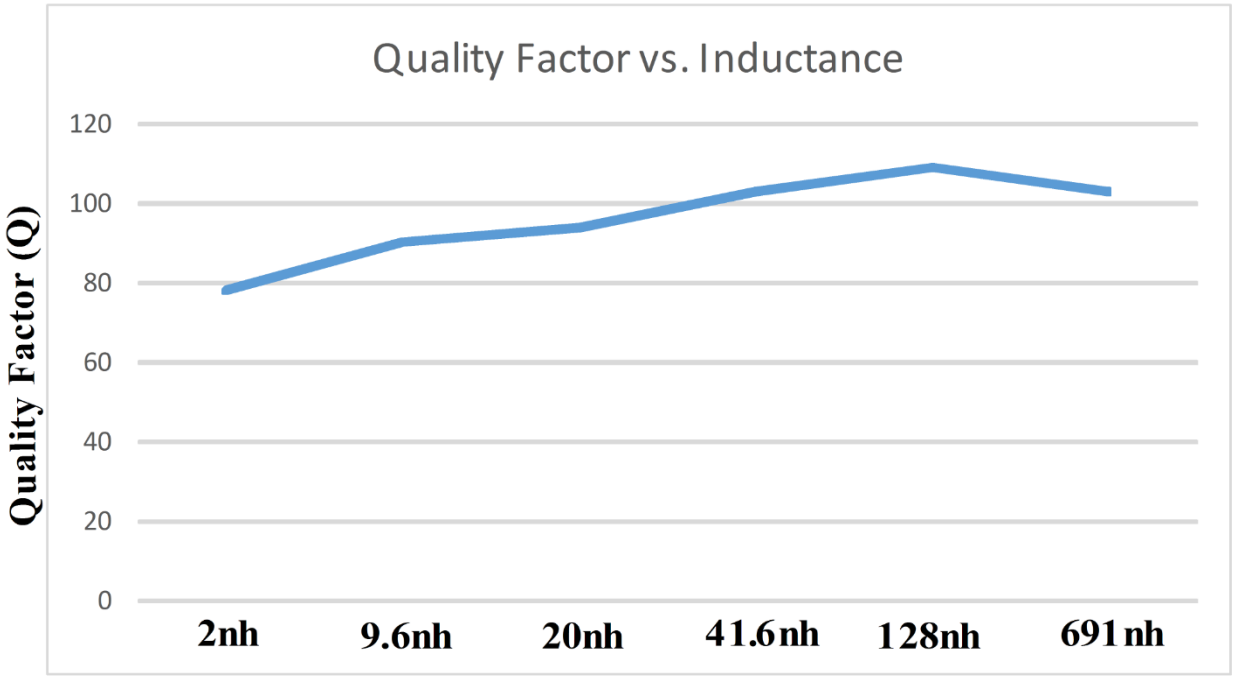


Figure 1: Super Inductor Quality Factor (Q) vs. Inductance

Figure 1 is a graphic display of how the Quality Factor (Q) of the CC-203IP Super Inductor vs the on-chip inductance of the block. With the CurrentRF Inductor design and manufacturing technique not only is there a factor of 10 increase in Q as compared to standard on-chip inductors, but as the inductance value increases, the Quality Factor (Q) generally increases. At approximately 700nh there is a marginal

decrease in Q. The Q reduction for this large inductor, however, is negligible, and competitive with off chip wire wound inductors.

Going Forward:

CurrentRF can produce the CC-203 Super Inductor as a custom block for IC designs. Using HFSS capabilities, we can produce an Super Inductor that will meet your design specifications.

Contact Information:

For additional information, evaluation boards/reference designs, IP product pricing or technical help, reach us at:

Current RF

8558 Maul Oak Drive

West Jordan, Utah 84081

http//:www.CurrentRF.com

(209)-914-2305

Michael.Hopkins@CurrentRF.com