IPS2xxx

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1. Introduction

The CRB (Customer Reference Board catalog) is a collection of plug-and-play sensor designs, which are simulated, optimized and tested. For downloading PCB documents (including BOM and PCB manufacturing data) and Measurement reports for each design, click on the relevant link in Table 1 and Table 2.

Important: all reference designs of this catalog are made for and tested with the IPS2200, but they are also compatible with the IPS2550.

Important: For manufacturing a specific sensor design, contact our Renesas sales support center (https://www.renesas.com/us/en/contact-us) to get a copy of the full version of the CRB, which includes links to request the Gerber files for each sensor design.

2. Rotary Coil Designs

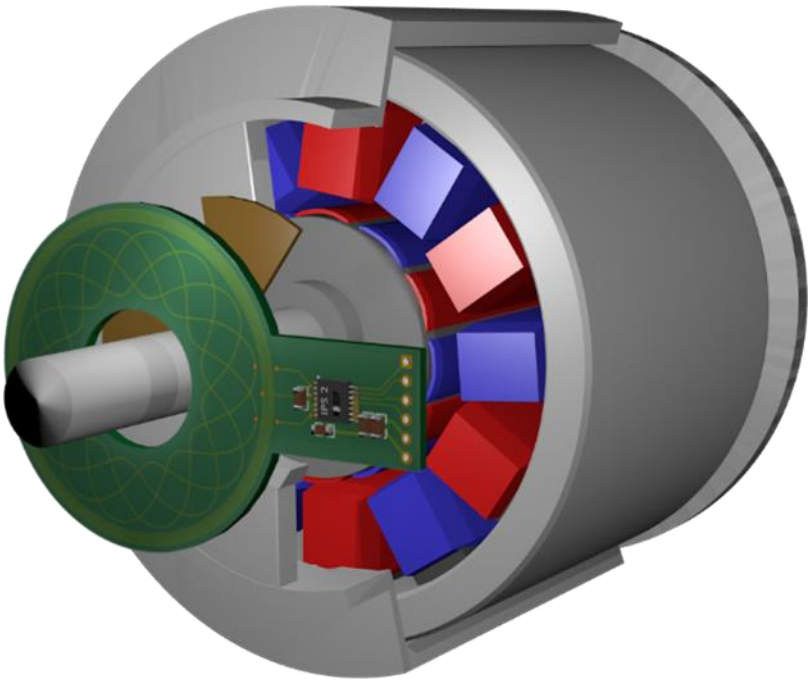

Figure 1. Example of a Through-Shaft Rotary Coil Design

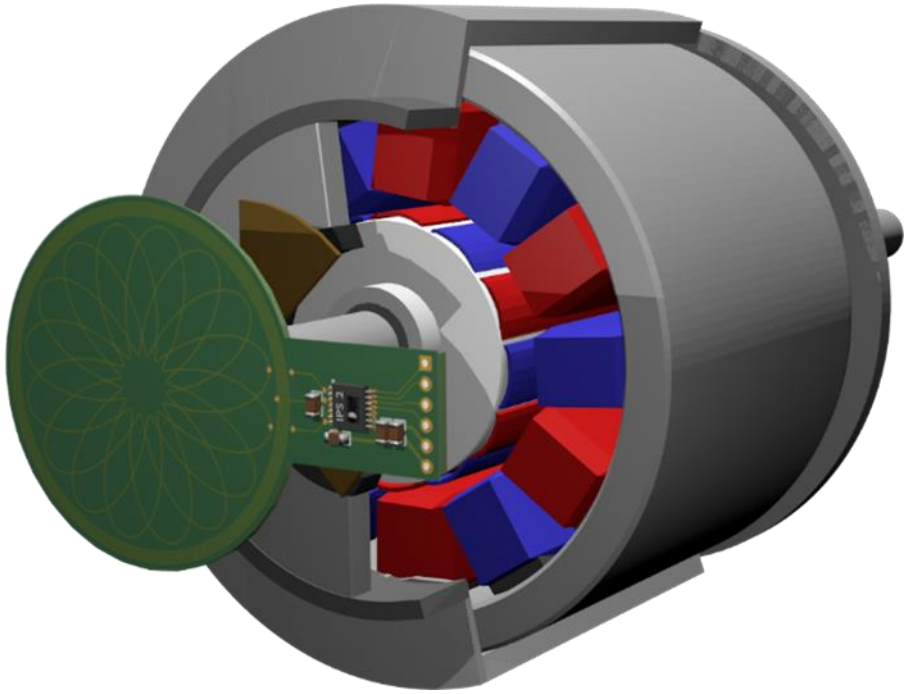

Figure 2. Example of an End-of-Shaft Rotary Coil Design

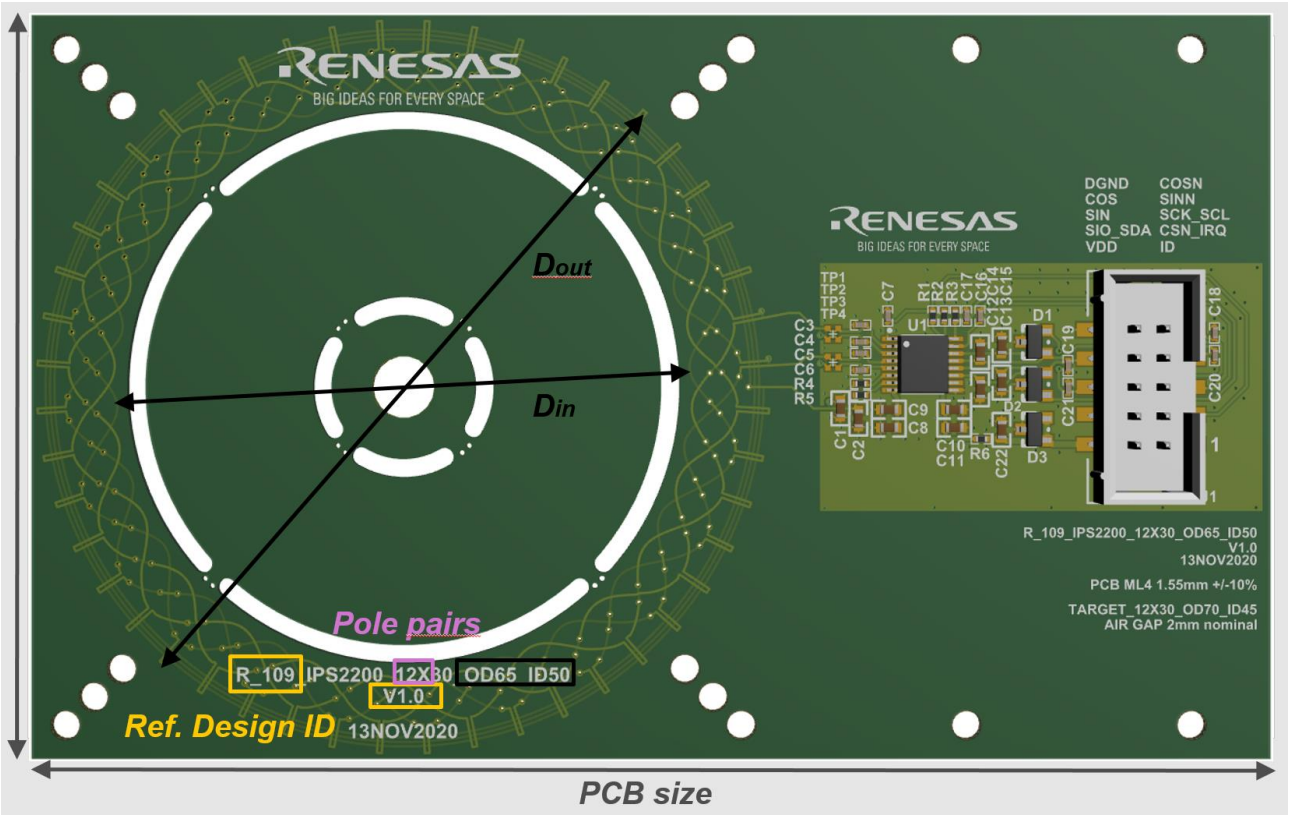

Figure 3 Example Rendered Image of a typical CRB Design

Table 1. Through-Shaft and End-of-Shaft Sensor Characteristics

Ref. Design ID	Single / Redundant	Number of Pole Pairs	PCB Size [mm]	Coil Size D_{out} / D_{in} [a] [mm]	Target Size D_{out} / D_{in} [mm]	Air Gap (Nominal) [mm]	Accuracy [b] (Nominal) [deg. mech.] / [deg. el.]	Links
R_66_V10	Single	1	64 x 40	19 / 6	24 / 6	1	±0.370 ±0.370	PCB Documentation Measurement Report
R_92_V10	Single	1	40 x 40	19 / 6	24 / 6	1	±0.491 ±0.491	PCB Documentation Measurement Report
R_67_V10	Single	2	64 x 40	19 / 6	24 / 6	1	±0.110 ±0.220	PCB Documentation Measurement Report
R_93_V10	Single	2	40 x 40	19 / 6	24 / 6	1	±0.112 ±0.223	PCB Documentation Measurement Report
R_68_V10	Single	3	64 x 40	19 / 6	24 / 6	1	±0.088 ±0.264	PCB Documentation Measurement Report
R_94_V10	Single	3	40 x 40	19 / 6	24 / 6	1	±0.129 ±0.388	PCB Documentation Measurement Report
R_69_V10	Single	4	64 x 40	19 / 6	24 / 6	1	±0.054 ±0.218	PCB Documentation Measurement Report
R_77_V20	Single	4	d=29mm round	22 / 8	24 / 6	1.5	±0.118 ±0.474	PCB Documentation Measurement Report
R_75_V10	Single	5	64 x 40	19 / 6	24 / 6	1	±0.053 ±0.264	PCB Documentation Measurement Report
R_95_V10	Single	5	40 x 40	19 / 6	24 / 6	1	±0.060 ±0.299	PCB Documentation Measurement Report
R_63_V10	Single	1	64 x 40	32 / 18	36 / 12	2	±0.339 ±0.339	PCB Documentation Measurement Report
R_64_V10	Single	2	64 x 40	32 / 18	36 / 12	2	±0.179 ±0.359	PCB Documentation Measurement Report
R_56_V10	Single	3	64 x 40	32 / 18	35 / 13	2	±0.077 ±0.23	PCB Documentation Measurement Report
R_53_V10	Single	4	64 x 40	32 / 18	35 / 13	2	±0.119 ±0.476	PCB Documentation Measurement Report
R_54_V10	Single	5	64 x 40	32 / 18	35 / 13	2	±0.063 ±0.317	PCB Documentation Measurement Report
R_58_V10	Single	6	64 x 40	32 / 18	35 / 13	1.5	±0.061 ±0.365	PCB Documentation Measurement Report
R_96_V10	Single	7	84 x 42	31 / 18	36 / 12	2	±0.038 ±0.270	PCB Documentation Measurement Report
R_59_V10	Single	8	64 x 40	32 / 18	35 / 13	1.5	±0.028 ±0.223	PCB Documentation Measurement Report
R_60_V10	Single	10	64 x 40	32 / 18	35 / 13	1.5	±0.021 ±0.212	PCB Documentation Measurement Report

Ref. Design ID	Single / Redundant	Number of Pole Pairs	PCB Size [mm]	Coil Size D_{out} / D_{in} [a] [mm]	Target Size D_{out} / D_{in} [mm]	Air Gap (Nominal) [mm]	Accuracy [b] (Nominal) [deg. mech.] / [deg. el.]	Links
R_84_V10	Single	13	91 x 80	35 / 20	36 / 18	2	±0.030 ±0.396	PCB Documentation Measurement Report
R_79_V10	Single	4	75 x 50	45 / 24	50 / 19	2	±0.053 ±0.213	PCB Documentation Measurement Report
R_102_V20	Single	5	84 x 40	38 / 22	42 / 18	2	±0.051 ±0.253	PCB Documentation Measurement Report
R_85_V10	Single	13	91 x 80	44 / 20	44 / 18	2	±0.032 ±0.416	PCB Documentation Measurement Report
R_99_V10	Single	1	110 x 66	65 / 50	70 / 45	3	±0.568 ±0.568	PCB Documentation Measurement Report
R_100_V10	Single	2	110 x 66	65 / 50	70 / 45	2	±0.104 ±0.208	PCB Documentation Measurement Report
R_76_V10	Single	3	94 x 70	65 / 50	70 / 45	3	±0.166 ±0.497	PCB Documentation Measurement Report
R_71_V10	Single	4	94 x 70	65 / 50	70 / 45	3	±0.096 ±0.383	PCB Documentation Measurement Report
R_08_V30	Single	4	94 x 70	60 / 38	66 / 32	5	±0.057 ±0.229	PCB Documentation Measurement Report
R_61_V12	Single	4	80 x 80	70 / 54	74 / 54	2	±0.106 ±0.423	PCB Documentation Measurement Report
R_87_V10	Single	5	112 x 66	60 / 24	60 / 22	3	±0.061 ±0.306	PCB Documentation Measurement Report
R_101_V10	Single	5	110 x 66	65 / 50	70 / 45	3	±0.065 ±0.327	PCB Documentation Measurement Report
R_107_V10	Single	6	110 x 66	65 / 50	70 / 45	3	±0.052 ±0.315	PCB Documentation Measurement Report
R_97_V10	Single	7	110 x 66	65 / 50	70 / 45	2	±0.045 ±0.316	PCB Documentation Measurement Report
R_108_V10	Single	8	110 x 66	65 / 50	70 / 45	2	±0.033 ±0.260	PCB Documentation Measurement Report
R_72_V10	Single	10	94 x 70	65 / 50	70 / 45	3	±0.022 ±0.224	PCB Documentation Measurement Report
R_109_V10	Single	12	110 x 66	65 / 50	70 / 45	2	±0.027 ±0.324	PCB Documentation Measurement Report
R_116_V10	Single	16	108 x 66	60 / 32	64 / 28	2.5	±0.028 ±0.446	PCB Documentation Measurement Report
R_90_V10	Single	32	108 x 66	60 / 32	64 / 28	1	±0.011 ±0.366	PCB Documentation Measurement Report
R_110_V10	Single	1	142 x 92	97 / 66	100 / 62	3	±0.310 ±0.310	PCB Documentation Measurement Report
R_111_V10	Single	2	142 x 92	97 / 66	100 / 62	3	±0.112 ±0.225	PCB Documentation Measurement Report

Ref. Design ID	Single / Redundant	Number of Pole Pairs	PCB Size [mm]	Coil Size D_{out} / D_{in} [a] [mm]	Target Size D_{out} / D_{in} [mm]	Air Gap (Nominal) [mm]	Accuracy [b] (Nominal) [deg. mech.] / [deg. el.]	Links
R_112_V10	Single	3	142 x 92	97 / 66	100 / 62	3	±0.077 ±0.230	PCB Documentation Measurement Report
R_73_V10	Single	4	120 x 120	97 / 66	100 / 62	3	±0.092 ±0.368	PCB Documentation Measurement Report
R_65_V10	Single	5	120 x 120	97 / 66	100 / 62	3	±0.066 ±0.329	PCB Documentation Measurement Report
R_113_V10	Single	6	142 x 92	97 / 66	100 / 62	3	±0.037 ±0.222	PCB Documentation Measurement Report
R_98_V10	Single	7	142 x 92	97 / 66	100 / 62	3	±0.035 ±0.246	PCB Documentation Measurement Report
R_114_V10	Single	8	142 x 92	97 / 66	100 / 62	3	±0.029 ±0.234	PCB Documentation Measurement Report
R_74_V10	Single	10	120 x 120	97 / 66	100 / 62	3	±0.031 ±0.313	PCB Documentation Measurement Report
R_115_V10	Single	12	142 x 98	97 / 66	100 / 62	3	±0.019 ±0.228	PCB Documentation Measurement Report

[a] D_{out} refers to the outer diameter, and D_{in} refers to the inner diameter.

[b] The typical accuracy is obtained as the maximum of the absolute full-scale error at the nominal air gap.

3. Arc Coil Designs

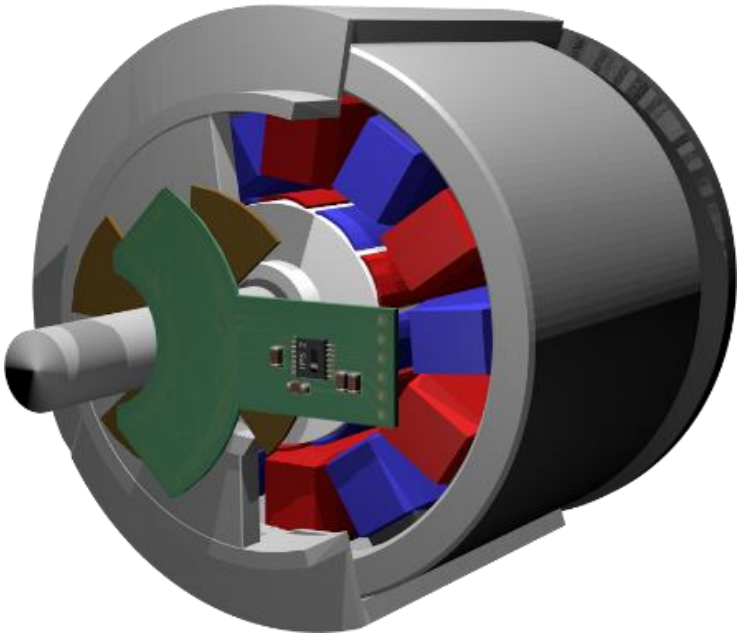

Figure 4. Example of a Side-Shaft Arc Coil Design

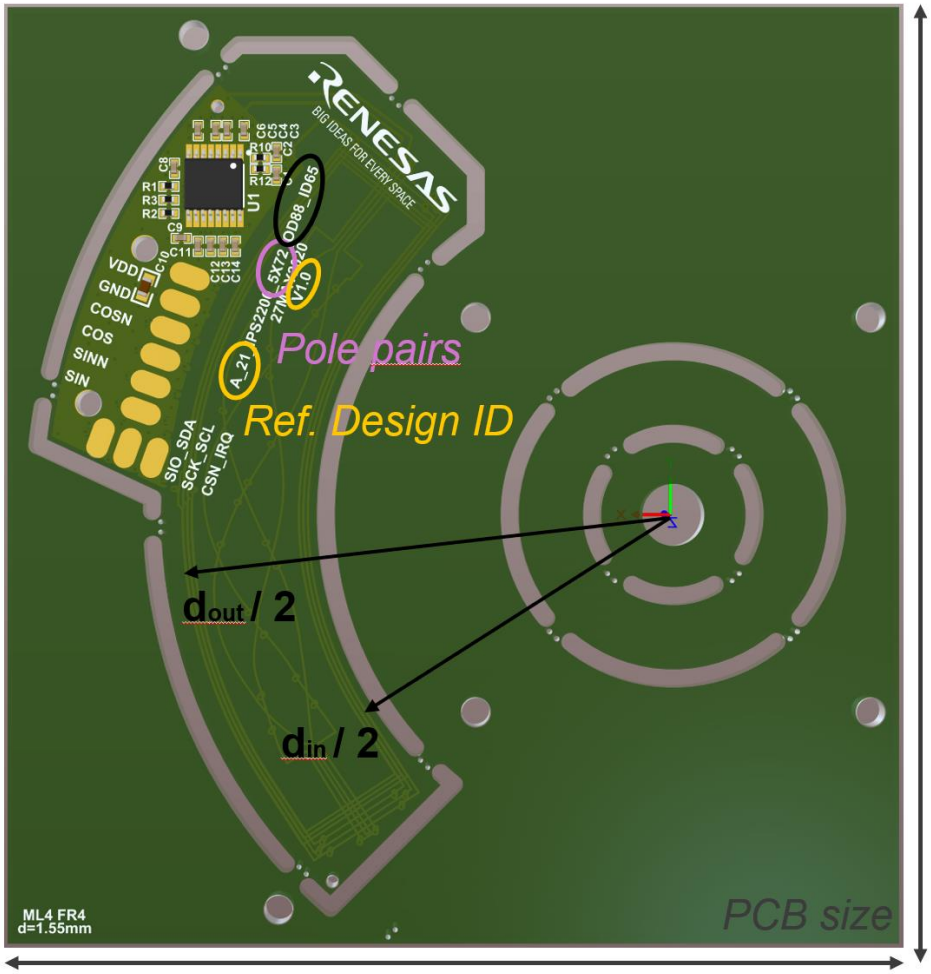

Figure 5. Example Rendered Image of a typical CRB Design

Table 2. Side-Shaft Sensor Characteristics

Ref. Design ID	Single / Redundant	Number of Pole Pairs	PCB Size [mm]	Coil Size D_{out} / D_{in} [a] [mm]	Target Size D_{out} / D_{in} [mm]	Air Gap (Nominal) [mm]	Accuracy [b] (Nominal) [deg. mech.] / [deg. el.]	Links
A_20_V11	Single	12	118 x 60	139 / 117	143 / 114	3.5	±0.059 ±0.709	PCB Documentation Measurement Report
A_21_V10	Single	5	83 x 79	88 / 65	92 / 61	3	±0.159 ±0.793	PCB Documentation Measurement Report

[a] D_{out} refers to the outer diameter, and D_{in} refers to the inner diameter.

[b] The typical accuracy is obtained as the maximum of the absolute full-scale error at the nominal air gap.

Revision History

Rev.	Date	Description	
		Page	Summary
1.0	Mar.25.20		Initial version.
1.1	June.24.20		Minor fix
2.0	Feb.23.21		New designs added

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