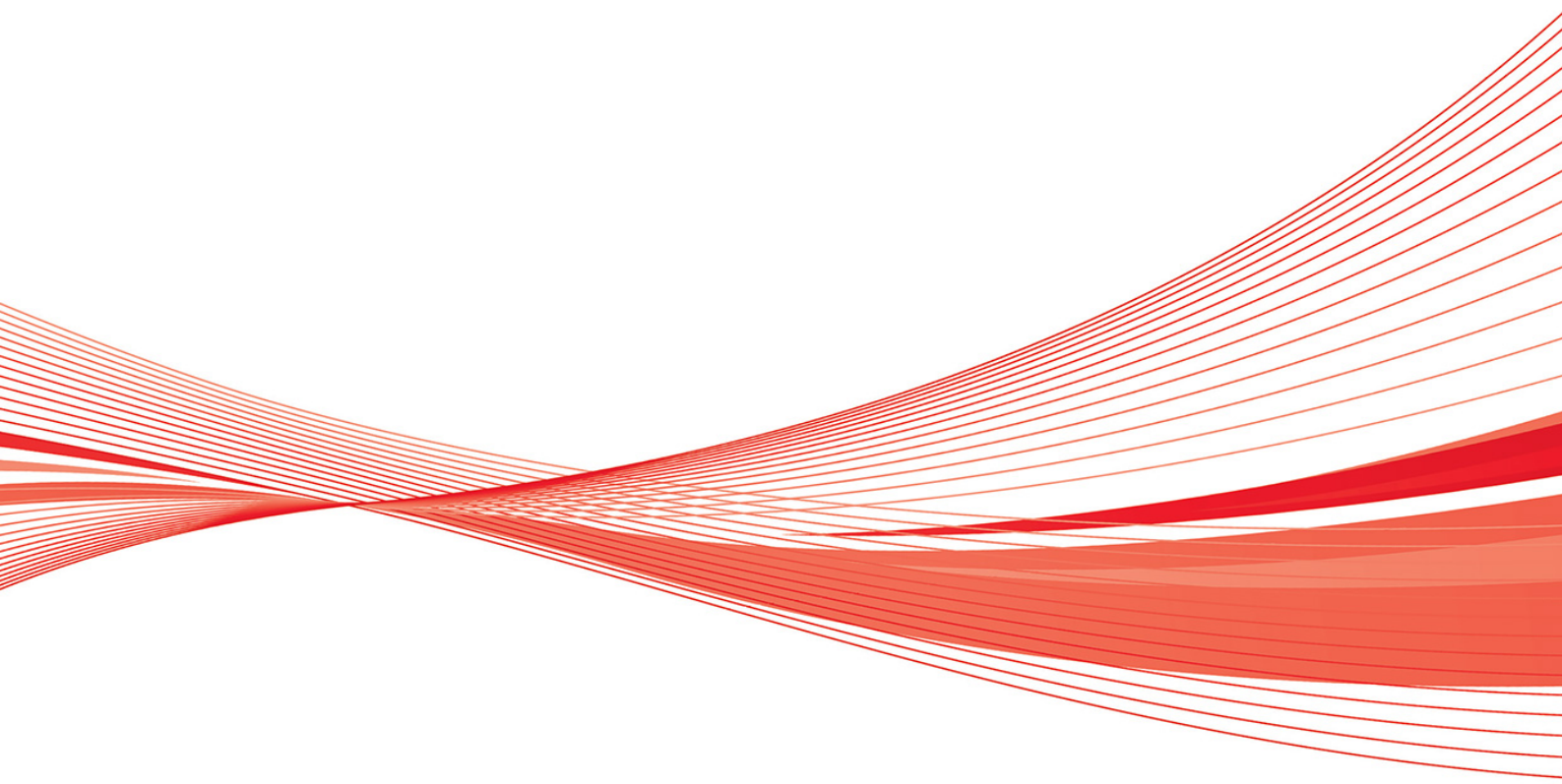
HARWiN

Harwin Test Report Summary

HT06404

Comparison Report with Competitor product for Archer Kontrol (M55 Series)

ARCHER KONTROL



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1. Introduction.

1.1. Description and Purpose.

The following data has been taken from Harwin Test Report 1695 and from comparison of applicable technical drawings, datasheets and component specifications of competitor product. As these comparisons were carried out on competitor-published data in Q3 2017 (Male Vertical SMT) Q1 2021 (Female IDC Cable Assemblies), and with competitor product purchased during Q3 2017 (Board Mount), the reports are only valid for the information gathered at that time, the items tested, and on the day of the test/for the batch tested.

This report summarises this data to compare with equivalent connectors available from other manufacturers, namely:

- ERNI – SMC series
- EPT – One27 series (performance level 1)
- Harting – Har-Flex series (performance level 1)

1.2. Conclusion.

For all tested comparisons, the results suggest that Archer Kontrol (M55 Series) was comparable to these three competitor products, subject to the customer's own application, connector choices and environment.

However, certain results lead us to recommend that, in all cases, customers mate Harwin with Harwin product. Harwin plc and subsidiaries cannot be held liable for any changes to any competitor product, nor any issues that may arise from mating Harwin product to a non-Harwin product.

2. Test Method, Requirements and Results.

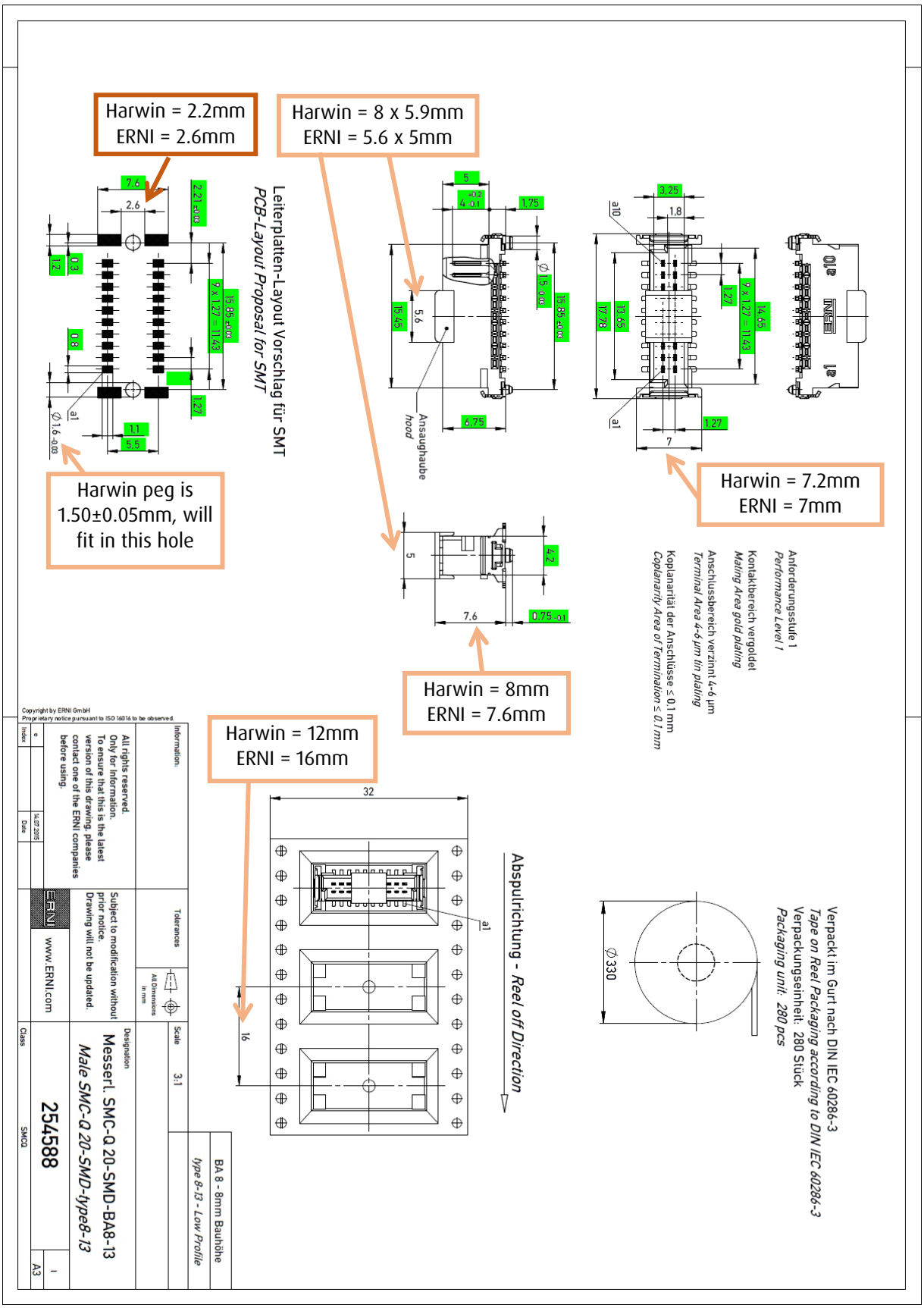
2.1. Dimensional Comparison.

Male Vertical SMT

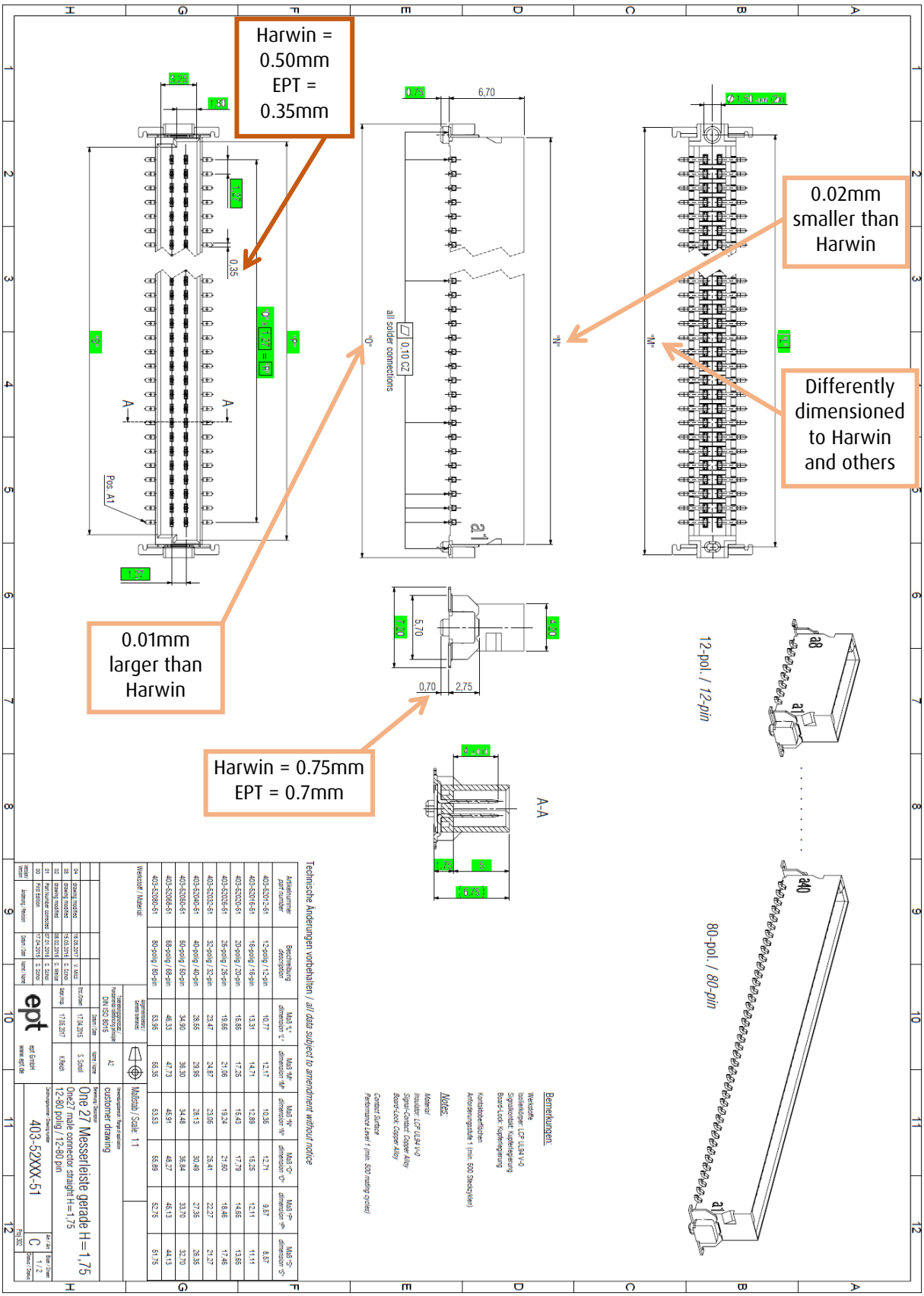
On the following pages, the drawings for the three competitor's ranges of Male Vertical SMT connectors are compared to equivalent dimensions from the Archer Kontrol range (specifically, the M55-700 connectors). Each drawing has been marked up with notations where differences were located.

None of the differences were felt to cause any major impact on equivalence for fit, form or function (subject to the customer's application and environment).

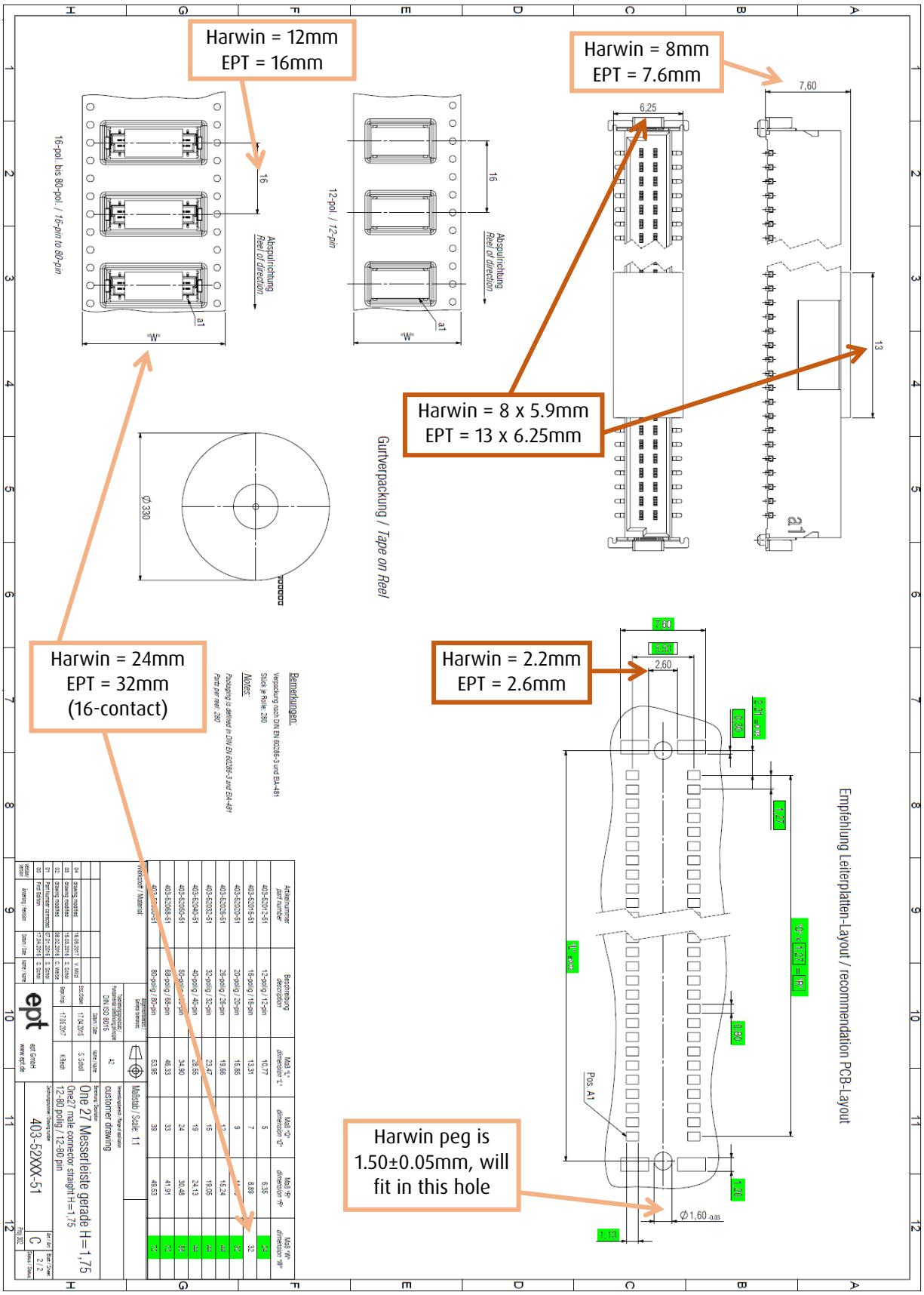
Comparison 1 – ERNI 254588 (drawing downloaded June 2018):



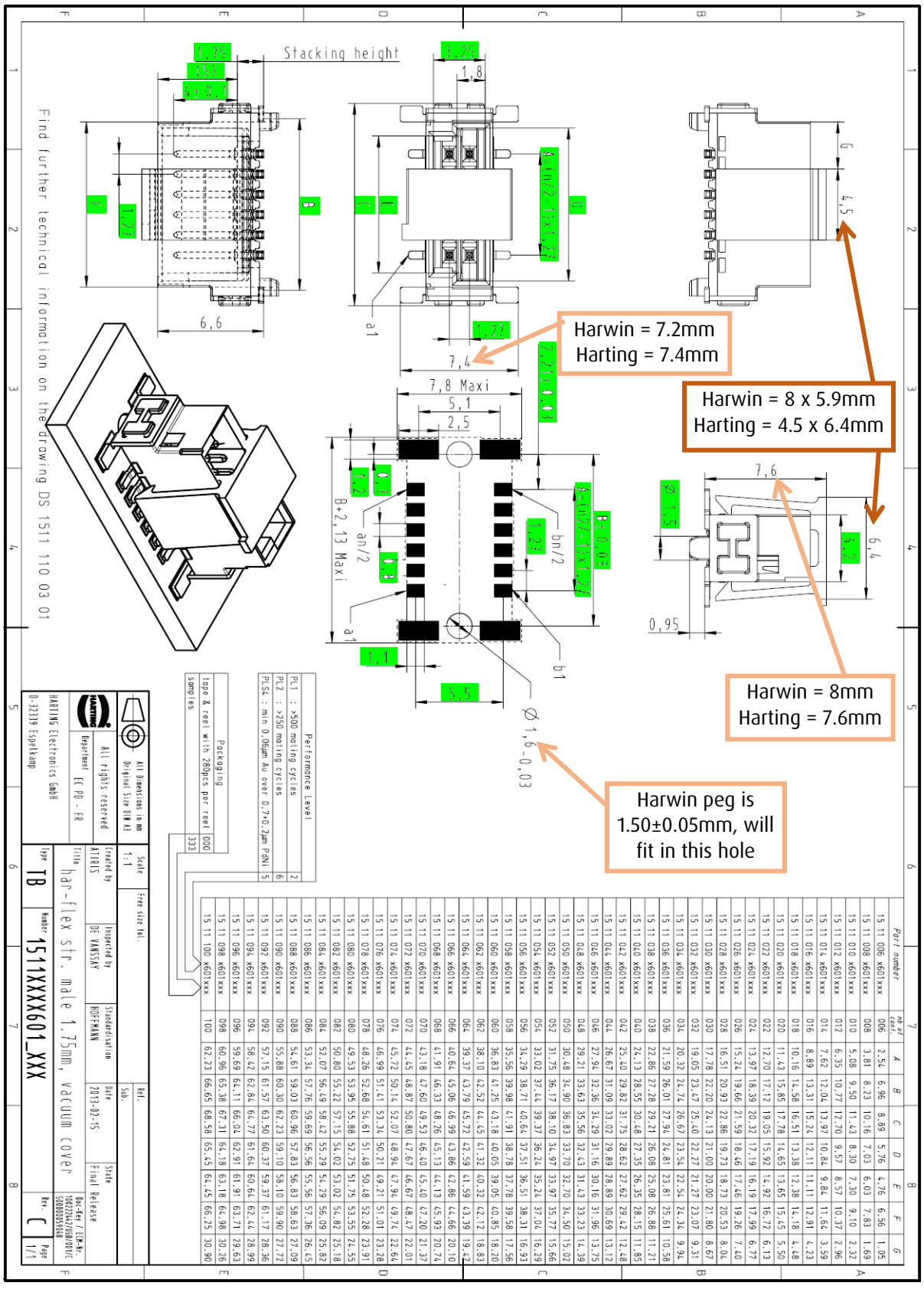
Comparison 2 – EPT 403-52xxx-51 (drawing downloaded June 2018)



Comparison 2 – EPT 403-52xxx-51 (drawing downloaded June 2018) (sheet 2)

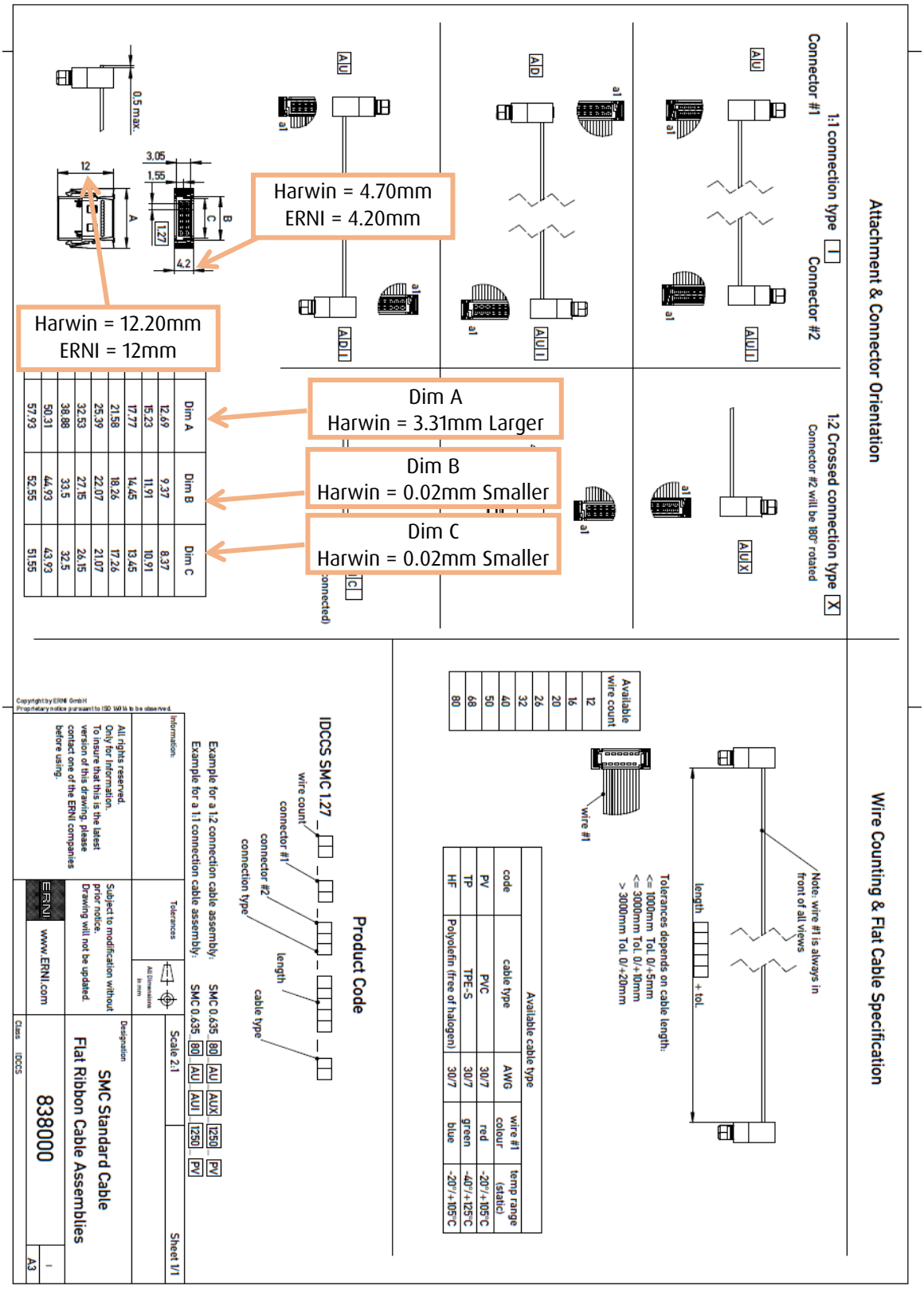


Comparison 3 – Harting har-flex 1511xxxx601 (drawing downloaded June 2018)

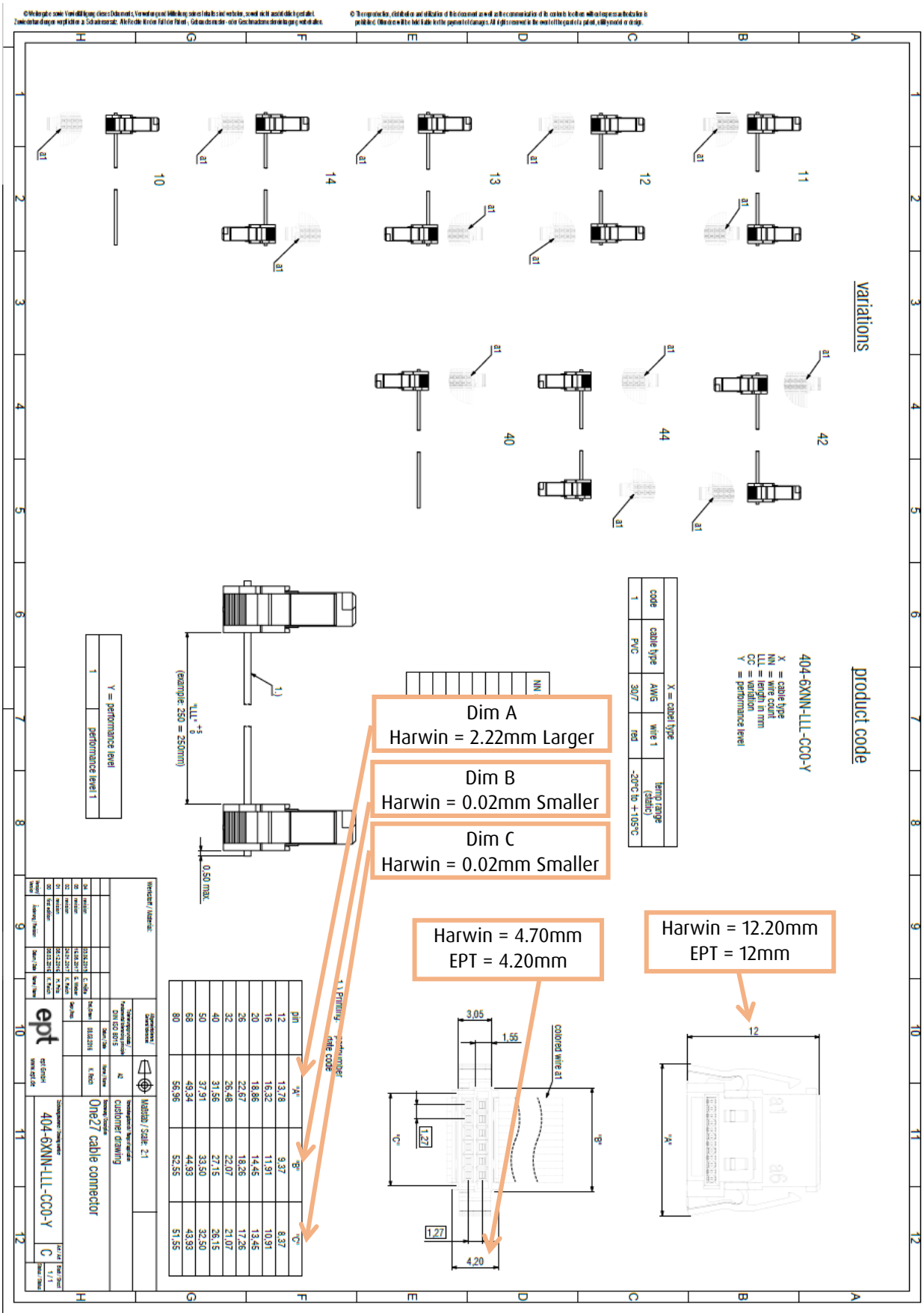


Female IDC Cable Assemblies

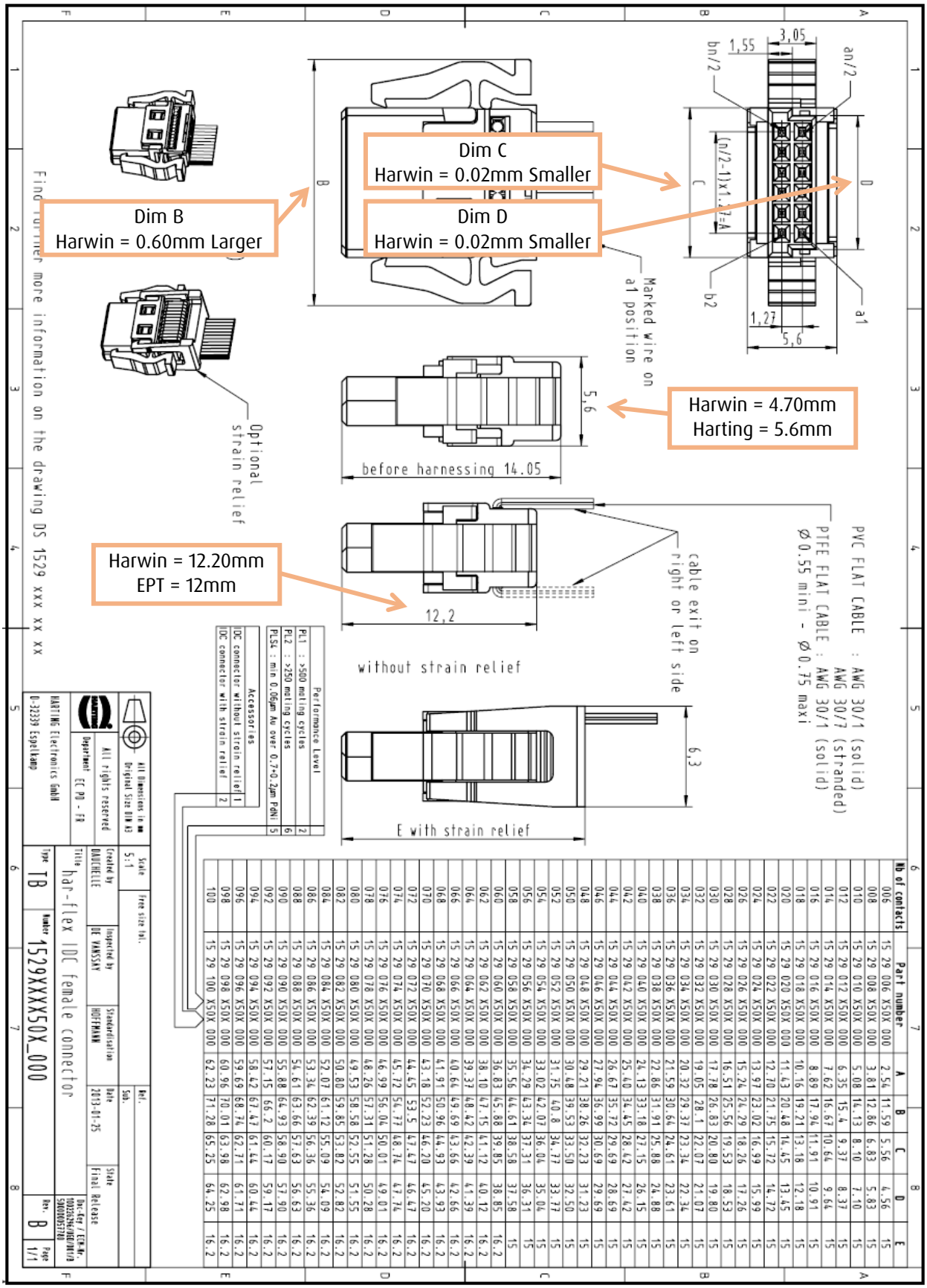
Comparison 1 – ERNI 838000 (drawing downloaded JANUARY 2021) (sheet 1)



Comparison 2 – EPT 404-6XNN-LLL-CC0-Y (drawing downloaded JANUARY 2021) (sheet 1)



Comparison 3 – Harting 1529xxxx50x_000 (drawing downloaded JANUARY 2021) (sheet 1)



2.2. Electrical and Mechanical Specification Comparison.

Male Vertical SMT

The following table is a comparison of the component specification performance levels between Archer Kontrol and the three other product ranges. The table is incomplete in some cases where information proved difficult to find publicly. The information was gathered in Q3 2017.

The table shows that the ranges show only minor differences, none of which are expected to cause issues in fit, form function, or mating compatibility.

Specification	Hawin	ERNI	EPT	Harting
Current rating	1.2A per contact	1.7A per contact (12 pins)	1.4A max at 20°C (50 pins)	1.2A to 0.7A (as connector size increases)
Contact resistance	25mΩ max			
Insulation resistance	10GΩ min	10,000MΩ min	10GΩ max	10GΩ min
Operating voltage	100V AC			100V
Dielectric withstand voltage	500V AC			
Durability (Number of mating cycles)	500			
Insertion force	0.8N max	0.5N max	0.5N max	0.5N approx.
Withdrawal force	0.2N min	0.5N max	0.1N min (0.5N max)	0.5N approx.
Operating temperature	-55°C to +125°C			
Vibration Sensitivity	10Hz to 2000Hz, 1.52mm, 196m/s^2 (20G), duration 12h	10Hz to 2000Hz, 20G	10Hz to 200Hz, 20G	
Vertical stacking heights (fully mated)	8.00 to 18.50mm	8.00 to 18.50mm	8.00 to 12.30mm	8.00 to 12.30mm

Female IDC Cable Assemblies

The following table is a comparison of the component specification performance levels between Archer Kontrol and the three other product ranges. The table is incomplete in some cases where information proved difficult to find publicly. The information was gathered in Q1 2021.

The table shows that the ranges show only minor differences, none of which are expected to cause issues in fit, form function, or mating compatibility.

Specification	Hawin	ERNI	EPT	Harting
Current rating	0.5A per contact	1.7A per contact (12 pins)	1.4A max at 20°C (50 pins)	-
Contact resistance	<25 mΩ	<10mΩ	<10mΩ	<25 mΩ
Insulation resistance	10GΩ min	<10^4MΩ	10GΩ max	<10GΩ
Operating voltage	100V AC	-	-	-
Dielectric withstand voltage	500V AC			
Durability (Number of mating cycles)	500			
Insertion force	0.8N max	0.5N max	0.5N max	0.5N approx.
Withdrawal force	0.2N min	0.5N max	0.1N min (0.5N max)	0.5N approx.
Operating temperature	-20°C to +105°C	-55°C to +125°C	-30°C to +105°C	-55°C to +125°C
Vibration Sensitivity	10Hz to 2000Hz, 1.52mm, 196m/s^2 (20G), duration 12h	10Hz to 2000Hz, 20G	10Hz to 200Hz, 20G	-

2.3. Plating Finish Comparison.

The plating finishes are compared as follows:

- Harwin – 0.025µm Gold over 2.03µm Nickel on contact area, 2.54µm Tin over 1.27µm Nickel on SMT tails.
- ERNI – Gold over Nickel on contact area, 4-6µm Tin over Nickel on SMT tails. Thicknesses of Gold and Nickel not specified.
- EPT – Gold over Palladium Nickel over Nickel on contact area, Tin on tails. No thicknesses specified.
- Harting – Gold over Palladium Nickel on contact area, Tin on SMT tails. No thicknesses specified.

2.4. Mating Compatibility.

A small selection of Harwin connectors were mated to a selection of the competitor products. In each case, the following checks were carried out:

- Insertion and Withdrawal force – the following table shows figures for total connector, with per contact figure in brackets.
- Contact resistance at pin 1 (to meet 25mΩ max).

None of these figures exceed the specification limits that Harwin states in the Component Specification.

Harwin Part Number	Competitor	Competitor Part Number	Fit?	Insertion force (N)	Withdrawal force (N)	Contact resistance (mΩ)
M55-7001242R (Male)	ERNI	154805	Yes	3.9 (0.33)	2.75 (0.23)	9
	EPT	404-52012-51	Yes	3.5 (0.29)	2.9 (0.24)	13
	Harting	15210122601000	Yes	5.7 (0.48)	5.1 (0.43)	11
M55-7012642R (Male)	ERNI	154806	Yes	6.6 (0.25)	5.7 (0.22)	11
	EPT	404-52026-51	Yes	5.8 (0.22)	4.8 (0.18)	15
	Harting	15210262601000	Yes	6.65 (0.26)	5.6 (0.22)	12
M55-6001242R (Female)	ERNI	244836	Yes	8.4 (0.7)	3.7 (0.31)	13
	EPT	403-52012-51	Yes	5.3 (0.44)	4.9 (0.41)	12
	Harting	15110122601000	Yes	5.6 (0.47)	8.3 (0.69)	10
M55-6022642R (Female)	ERNI	244837	Yes	7.7 (0.3)	7.8 (0.3)	9
	EPT	403-52026-51	Yes	8.75 (0.34)	9.2 (0.35)	15
	Harting	15110262601000	Yes	8.3 (0.32)	6.2 (0.24)	11
M55-6108042R (Female)	ERNI	244840	Yes	58.7 (0.73)	25.2 (0.32)	13
	EPT	403-52080-51	Yes	33.9 (0.42)	32 (0.4)	16
	Harting	15110802601000	Yes	41.5 (0.52)	36 (0.45)	15

These results lead us to conclude that to ensure full performance to the required specification, customers should preferably mate Harwin to Harwin connectors.