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Test Report Summary

HT06405

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 the 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

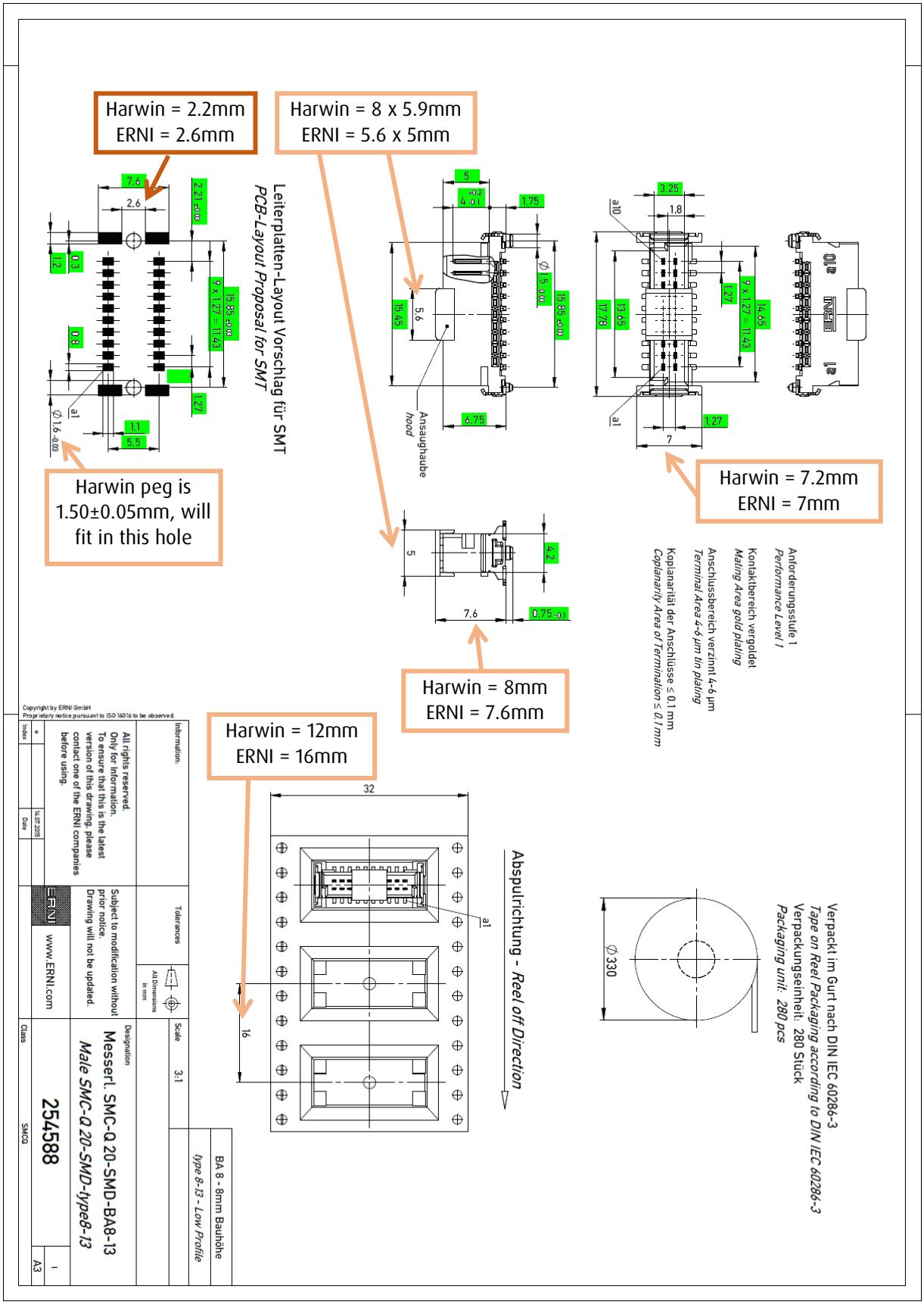
2.1. Dimensional Comparison

2.1.1. Male Vertical SMT

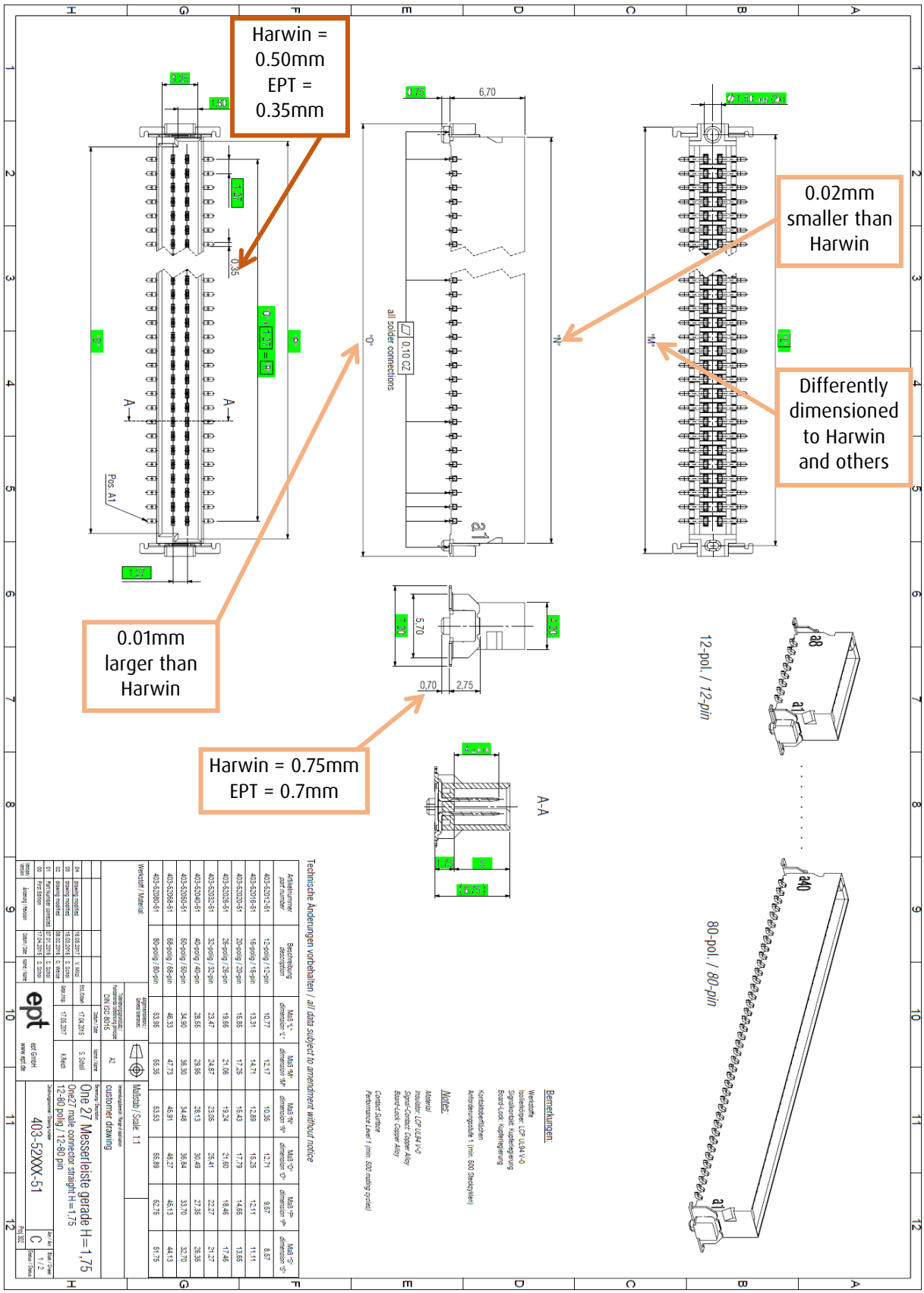
On the following pages, the drawings for the three competitor's ranges of Male Vertical SMT connectors are compared to equivalent dimensions from the Archer Kontrol range (specifically, the M55-700 connectors). Each drawing has been marked up with notations where differences were located.

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).

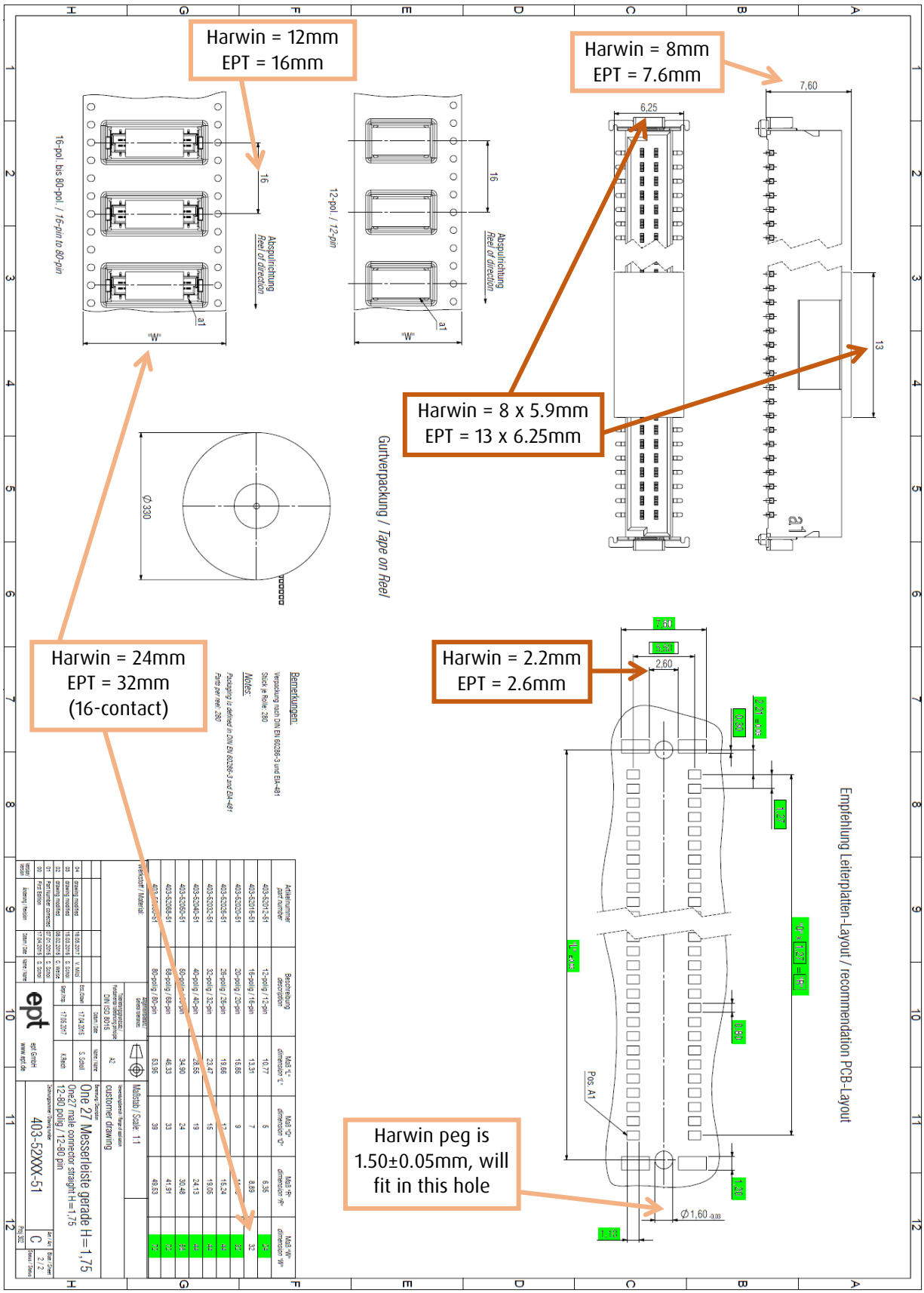
Comparison 1 – ERNI 254588 (drawing downloaded June 2018):



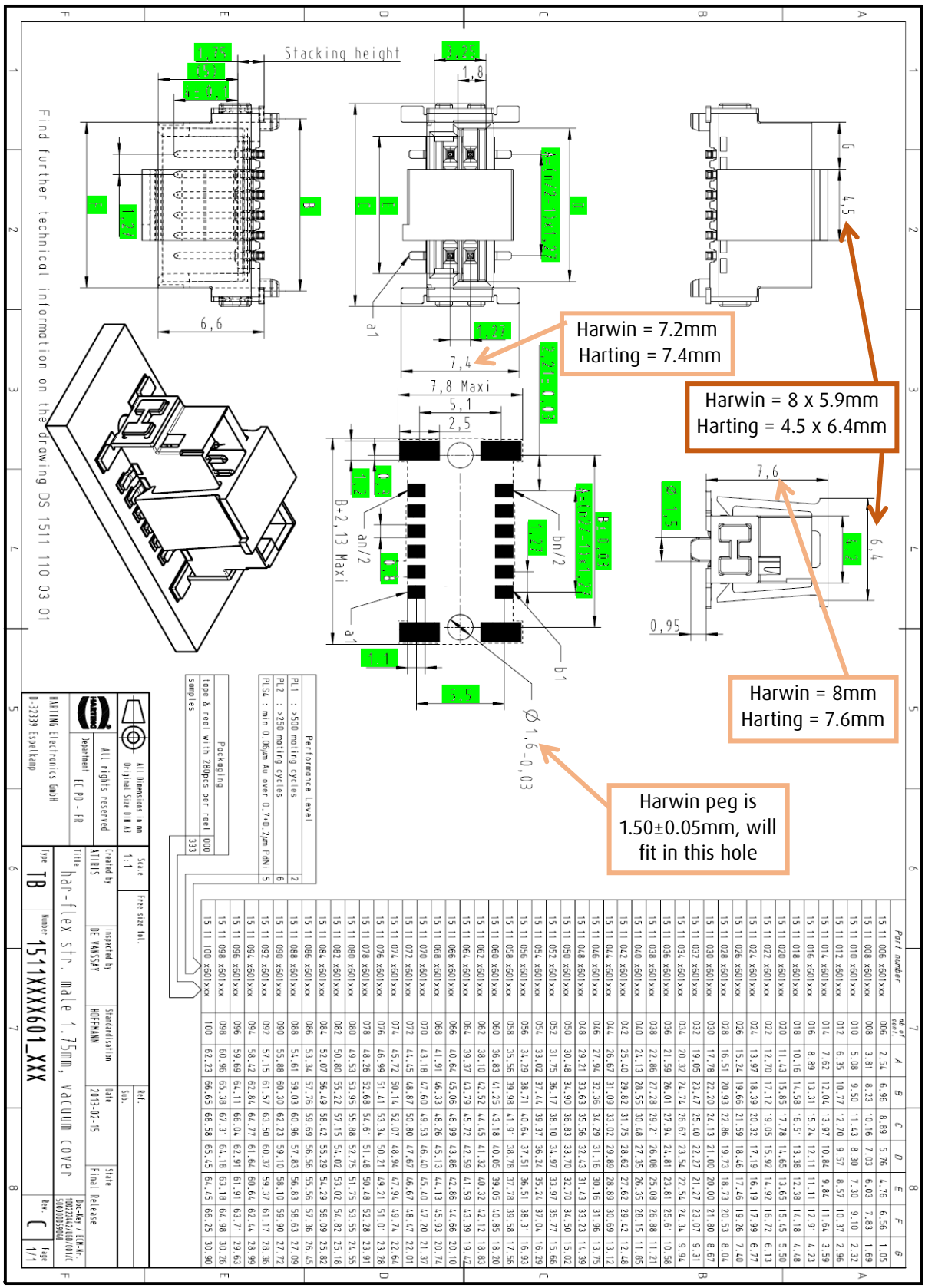
Comparison 2 – EPT 403-52xxx-51 (drawing downloaded June 2018)



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

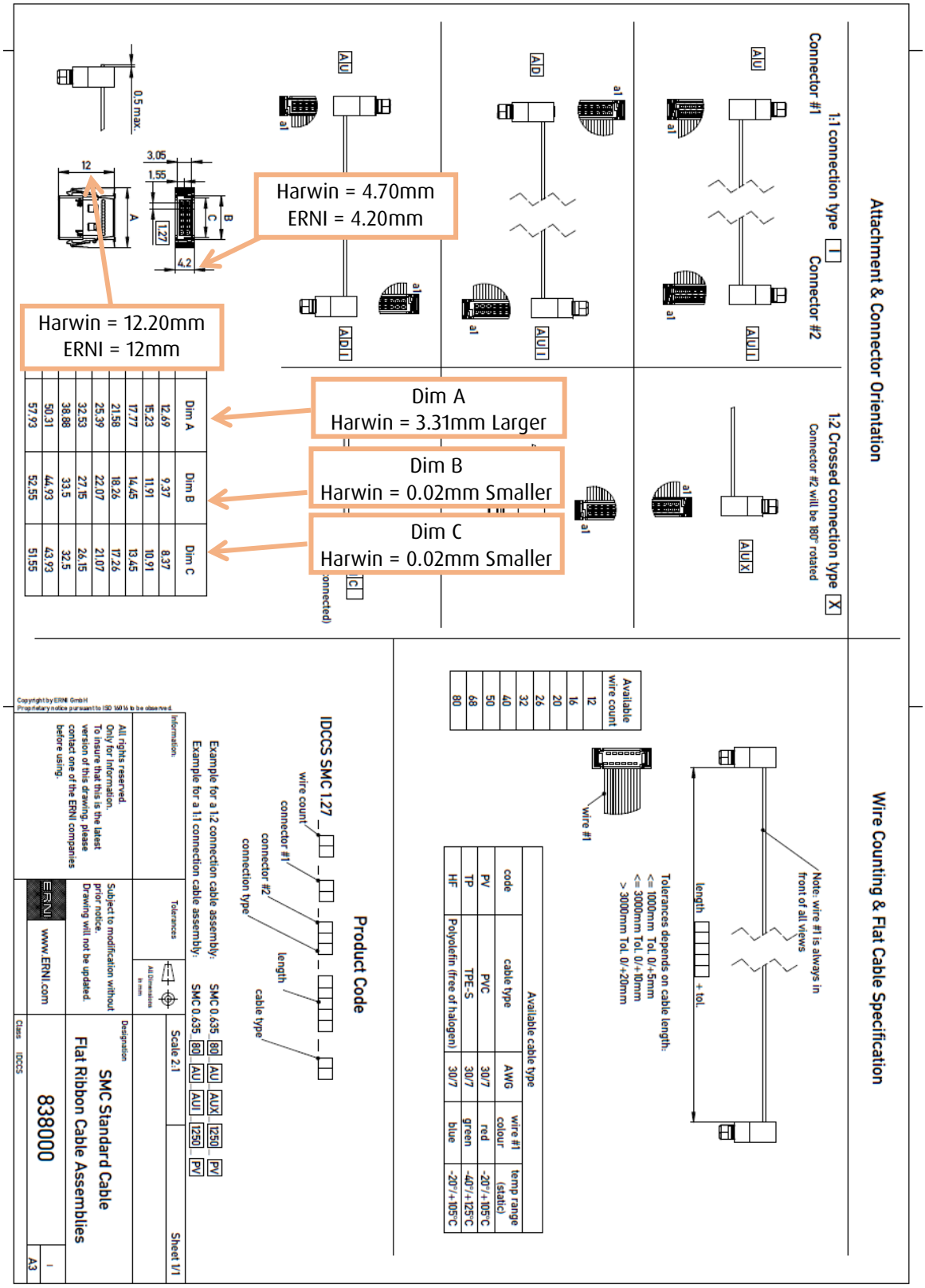


Comparison 3 – Harting har-flex 1511xxxx601 (drawing downloaded June 2018)

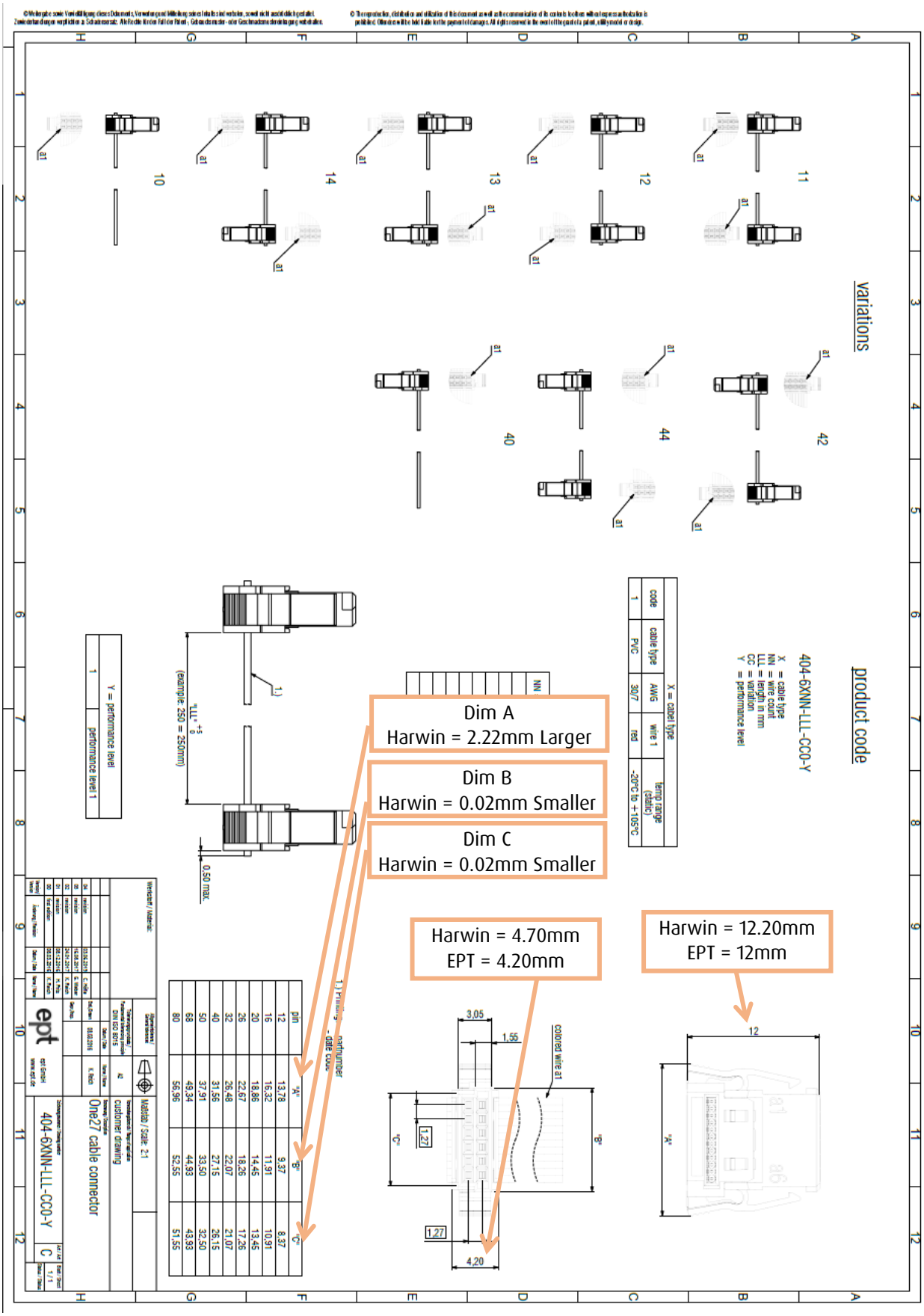


2.1.2. Female IDC Cable Assemblies

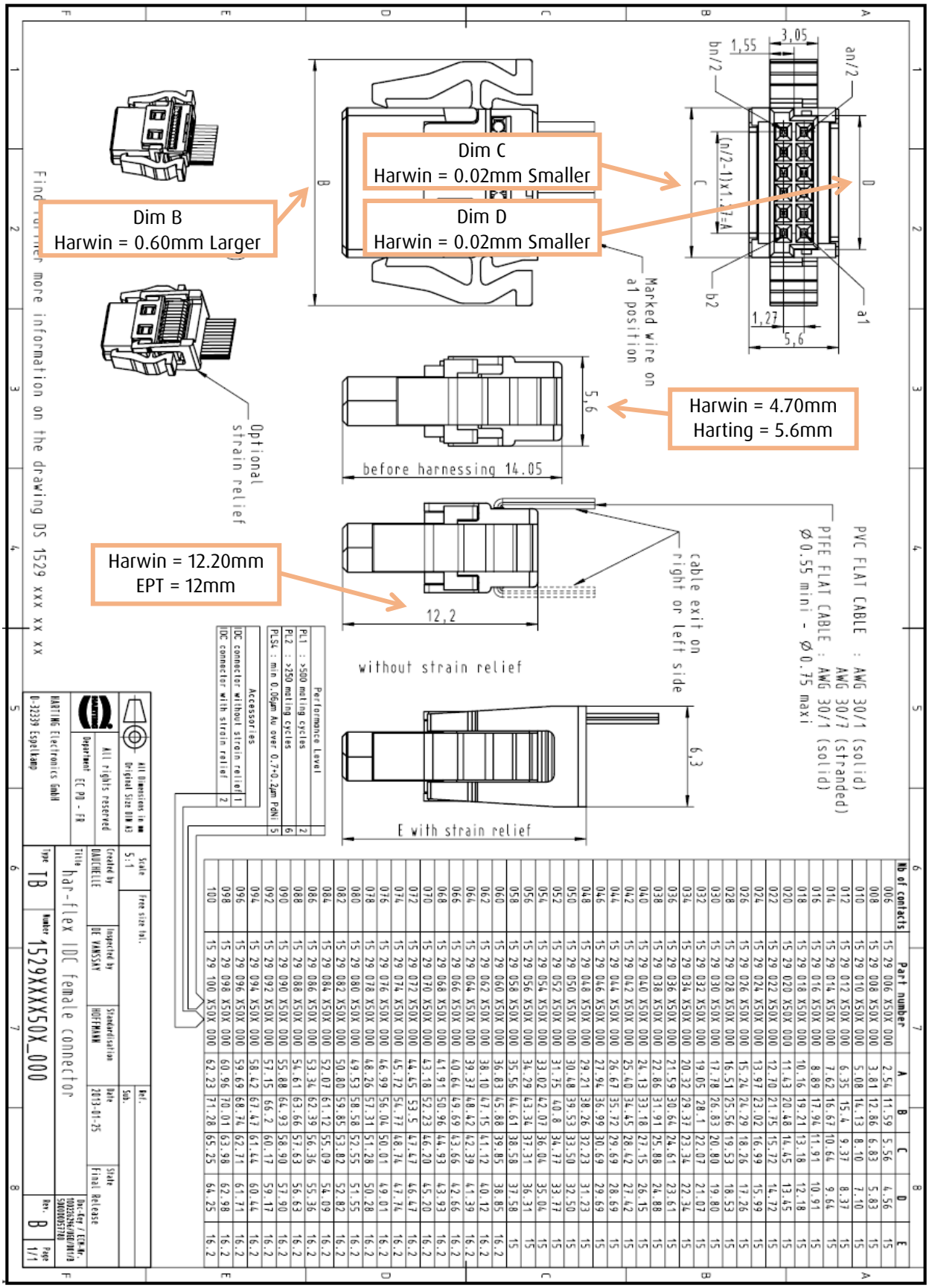
Comparison 1 – ERNI 838000 (drawing downloaded JANUARY 2021) (sheet 1)



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)



Nb of contacts	Part number	A	B	C	D	E
006	15 29 006 X50X 000	2.54	11.59	5.56	4.56	15
008	15 29 008 X50X 000	3.81	12.86	6.83	5.83	15
010	15 29 010 X50X 000	5.08	14.13	8.10	7.10	15
012	15 29 012 X50X 000	6.35	15.4	9.37	8.37	15
014	15 29 014 X50X 000	7.62	16.67	10.64	9.64	15
016	15 29 016 X50X 000	8.89	17.94	11.91	10.91	15
018	15 29 018 X50X 000	10.16	19.21	13.18	12.18	15
020	15 29 020 X50X 000	11.43	20.48	14.45	13.45	15
022	15 29 022 X50X 000	12.70	21.75	15.72	14.72	15
024	15 29 024 X50X 000	13.97	23.02	16.99	15.99	15
026	15 29 026 X50X 000	15.24	24.29	18.26	17.26	15
028	15 29 028 X50X 000	16.51	25.56	19.53	18.53	15
030	15 29 030 X50X 000	17.78	26.83	20.80	19.80	15
032	15 29 032 X50X 000	19.05	28.1	22.07	21.07	15
034	15 29 034 X50X 000	20.32	29.37	23.34	22.34	15
036	15 29 036 X50X 000	21.59	30.64	24.61	23.61	15
038	15 29 038 X50X 000	22.86	31.91	25.88	24.88	15
040	15 29 040 X50X 000	24.13	33.18	27.15	26.15	15
042	15 29 042 X50X 000	25.40	34.45	28.42	27.42	15
044	15 29 044 X50X 000	26.67	35.72	29.69	28.69	15
046	15 29 046 X50X 000	27.94	36.99	30.69	29.69	15
048	15 29 048 X50X 000	29.21	38.26	32.23	31.23	15
050	15 29 050 X50X 000	30.48	39.53	33.50	32.50	15
052	15 29 052 X50X 000	31.75	40.8	34.77	33.77	15
054	15 29 054 X50X 000	33.02	42.07	36.04	35.04	15
056	15 29 056 X50X 000	34.29	43.34	37.31	36.31	15
058	15 29 058 X50X 000	35.56	44.61	38.58	37.58	15
060	15 29 060 X50X 000	36.83	45.88	39.85	38.85	16.2
062	15 29 062 X50X 000	38.10	47.15	41.12	40.12	16.2
064	15 29 064 X50X 000	39.37	48.42	42.39	41.39	16.2
066	15 29 066 X50X 000	40.64	49.69	43.66	42.66	16.2
068	15 29 068 X50X 000	41.91	50.96	44.93	43.93	16.2
070	15 29 070 X50X 000	43.18	52.23	46.20	45.20	16.2
072	15 29 072 X50X 000	44.45	53.5	47.47	46.47	16.2
074	15 29 074 X50X 000	45.72	54.77	48.74	47.74	16.2
076	15 29 076 X50X 000	46.99	56.04	50.01	49.01	16.2
078	15 29 078 X50X 000	48.26	57.31	51.28	50.28	16.2
080	15 29 080 X50X 000	49.53	58.58	52.55	51.55	16.2
082	15 29 082 X50X 000	50.80	59.85	53.82	52.82	16.2
084	15 29 084 X50X 000	52.07	61.12	55.09	54.09	16.2
086	15 29 086 X50X 000	53.34	62.39	56.36	55.36	16.2
088	15 29 088 X50X 000	54.61	63.66	57.63	56.63	16.2
090	15 29 090 X50X 000	55.88	64.93	58.90	57.90	16.2
092	15 29 092 X50X 000	57.15	66.2	60.17	59.17	16.2
094	15 29 094 X50X 000	58.42	67.47	61.44	60.44	16.2
096	15 29 096 X50X 000	59.69	68.74	62.71	61.71	16.2
098	15 29 098 X50X 000	60.96	70.01	63.98	62.98	16.2
100	15 29 100 X50X 000	62.23	71.28	65.25	64.25	16.2

2.2. Electrical and Mechanical Specification Comparison

2.2.1. 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	Harwin	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 min	10GΩ min
Operating Voltage	100V AC	-	-	100V
Dielectric Withstand Voltage	500V AC			
Durability (No. 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 2,000Hz, 1.52mm, 196m/s² (20G), duration 12h	10Hz to 2,000Hz, 20G	10Hz to 2,000Hz, 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

2.2.2. 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	Harwin	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	$<10^4$MΩ	10GΩ max	<10GΩ
Operating Voltage	100V AC	-	-	-
Dielectric Withstand Voltage	500V AC			
Durability (No. 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/s² (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 the 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.