

ISH® WIRE TO WIRE

Test Report

Product Specification no. PSS-0033

2	T26080	September 30, 2026	M.Yoneda	K.Tsusu	T.Takeda
1	T26074	August 28, 2026	M.Yoneda	K.Tsusu	T.Takeda
0	RS0942	June 14, 2023	Y. Nishimura	J. Mukunoki	J. Tateishi
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate performance of ISH Connector.

2. Specimen

Items shown in Table 1 were evaluated.

Table 1. Test samples

Pole	TYPE		PARTS No.				Test result
	LOCK	KEY-CODING	MALE HOUSING	MALE TERMINAL	FEMALE HOUSING	FEMALE TERMINAL	
3P	Normal	-	V0112-91003-01	VT010-01	V0113-91003-01	VT009-01 VT009-02	Initial : Sheet 3 Durability test : Sheet 4~6

3. Test condition

In compliance with Product Specification 【PSS-0033】

4. Result

All test items were satisfied.

- For detail of the test results see of Table1.
- For resistance monitoring during durability test, see Graphs 1 and 2.
- For the number of pins listed for both VT009-01 and VT009-02, the results for VT009-01 are presented as the representative results, except for the following items:
 - Connector mating Force
 - Connector unmating Force

Table 2. List of results: Initial properties (3P)

	Item Number	Measurement item		Requirements	Set	n	Unit	Data				Judgement
								Avg.	Max.	Min.	s	
Initial Characteristics	1	Terminal appearance		No detrimental deformation	5	5	-	No detrimental deformation				✓
	2	Terminal outer dimension		Satisfy drawing dimension	5	5	-	Satisfies drawing dimension				✓
	3	Housing appearance		No detrimental deformation	5	5	-	No detrimental deformation				✓
	4	Housing outer dimension		Satisfy drawing dimension	5	5	-	Satisfies drawing dimension				✓
	5	Feeling (insertion/removal)		No discomfort	5	5	-	No discomfort				✓
	6	Connector mating force	VT009-01	24.5N MAX.	5	5	N	13.56	14.2	12.8	0.54	✓
			VT009-02	24.5N MAX.	5	5	N	13.78	15.4	12.6	1.28	✓
	7	Connector unmating force	VT009-01	15N MAX.	5	5	N	8.82	9.1	8.3	0.31	✓
			VT009-02	15N MAX.	5	5	N	10.54	11.6	9.4	0.81	✓
	8	Connector retention force	Direction 1	90N MIN.	5	5	N	106.18	107.8	103.9	1.55	✓
			Direction 2		5	5	N	156.46	157.4	155.6	0.77	✓
			Direction 3		5	5	N	155.26	178.1	136.1	17.26	✓
			Direction 4		5	5	N	148.46	173.0	114.4	22.5	✓
	9	Unlocking force		50N MAX.	5	5	N	18.52	22.7	17.1	2.35	✓
	10	Insulation resistance		100MΩ MIN.	5	5	-	1,000MΩ MIN.				✓
	11	Withstanding voltage		No insulation breakdown or erosion	5	5	-	No insulation breakdown				✓
	12	Temperature rise	Single pin	ΔT=50°C MIN.	5	5	°C	25.02	27.2	21.5	2.19	✓
			All pin	ΔT=50°C MIN.	5	5	°C	27.90	31.9	24.6	2.89	✓
	13	Leak current		1mA MAX.	5	5	-	1μA MAX.				✓
	14	Audible click		60dB MIN.	5	5	db	66.42	67.5	63.9	1.44	✓
	15	Terminal crimp strength	MALE	70N MIN.	5	5	N	80.58	82.8	77.8	1.92	✓
			FEMALE		5	5	N	79.24	80.8	77.9	1.27	✓
	16	Terminal insertion force		0.5N~3.0N	5	5	N	1.628	1.87	1.40	0.174	✓ ✓
	17	Terminal removal force		0.5N~3.0N	5	5	N	1.455	1.71	1.17	0.161	✓ ✓
	18	Terminal contact force		3N MIN.	5	5	N	3.58	3.73	3.33	0.15	✓
	19	Voltage drop		10mV/A MAX.	5	15	mV/A	1.355	2.09	1.09	0.271	✓
	20	Dry circuit resistance		10mΩ MAX.	5	15	mΩ	1.951	2.88	1.20	0.551	✓
	21	MALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	65.57	69.8	60.1	3.31	✓
			Without secondary lock	20N MIN.	2	6	N	47.68	52.8	44.0	3.95	✓
	22	FEMALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	83.88	85.4	80.7	1.71	✓
			Without secondary lock	20N MIN.	2	6	N	43.12	45.2	40.8	1.41	✓
	23	Terminal to housing insertion force	MALE	10N MAX.	2	6	N	2.40	2.8	2.0	0.30	✓
			FEMALE	10N MAX.	2	6	N	1.91	2.2	1.6	0.17	✓
	24	Retainer insertion/removal force	MALE Insertion force	29.4N MAX.	5	5	N	17.34	18.1	16.4	0.63	✓
			MALE Removal force	5.5N MIN.	5	5	N	22.64	26.8	17.5	4.08	✓
			EMALE Insertion force	29.4N MAX.	5	5	N	17.34	18.1	16.4	0.63	✓
			EMALE Removal force	14.7N MIN.	5	5	N	22.64	26.8	17.5	4.08	✓
	25	Housing lock strength without terminals		49N MIN.	5	5	N	98.86	102.6	94.5	3.72	✓
	26	Sn whisker		125μm MAX.	5	5	-	No whisker				✓
	27	Connector clip insertion force		50N MAX.	5	5	N	41.48	42.8	39.5	1.2	✓
	28	Connector clip retention force	F1	90N MAX.	5	5	N	168.71	171.2	166.6	1.69	✓
			F2		5	5	N	189.18	191.6	188	1.42	✓
			F3		5	5	N	96.98	100.7	95.1	2.24	✓
			F1'		5	5	N	96.26	97.2	95.7	0.58	✓
			F2'		5	5	N	110.86	119.1	100.8	6.89	✓
			F3'		5	5	N	109.14	111.9	106.2	2.2	✓

Table 3. List of results: Properties after endurance tests – I (3P)

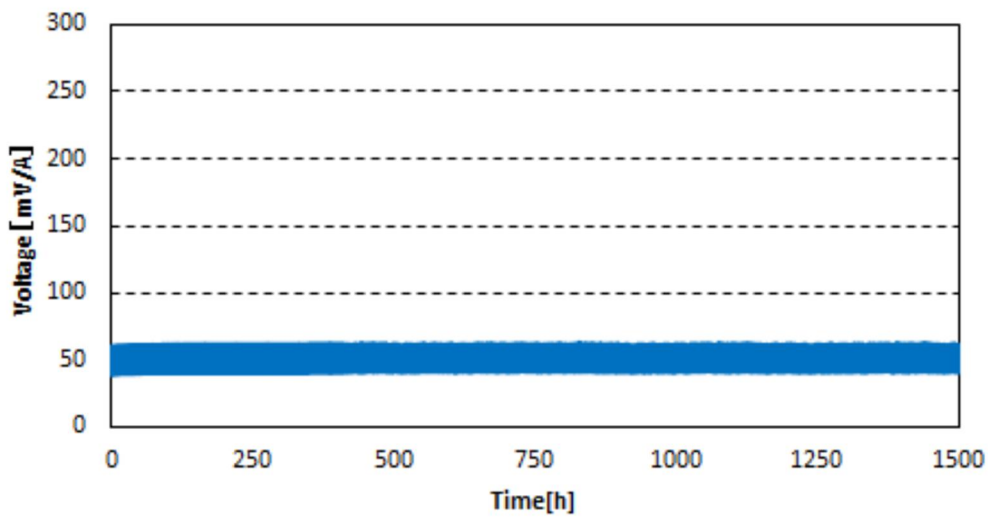
Item Number	Measurement item			Requirements	Set	n	Unit	Data				Judgement
								Avg.	Max.	Min.	s	
1	Repeated insertion/removal	Connector mating force	After 5 repeat	24.5N MAX.	5	5	N	8.03	8.8	7.4	0.58	✓
			After test	24.5N MAX.	5	5	N	6.17	7.0	5.3	0.61	✓
		Connector unmating force	After 5 repeat	15N MAX.	5	5	N	5.07	5.2	4.8	0.17	✓
			After test	15N MAX.	5	5	N	4.85	4.9	4.7	0.08	✓
		Voltage drop	Initial	10mV/A MAX.	5	15	mV/A	1.941	2.32	1.10	0.355	✓
			After test	20mV/A MAX.	5	15	mV/A	2.323	2.72	1.45	0.352	✓
2	Resistance to forced-mating	Connector mating force		24.5N MAX.	5	5	N	6.79	7.1	6.5	0.26	✓
		Connector unmating force		15N MAX.	5	5	N	5.89	6.2	5.6	0.27	✓
		Voltage drop	Initial	10mV/A MAX.	5	15	mV/A	2.039	2.31	1.55	0.415	✓
			After test	20mV/A MAX.	5	15	mV/A	2.095	2.51	1.53	0.290	✓
3	High temperature aging	Housing appearance		No detrimental deformation	5	5	-	No detrimental deformation				✓
		Feeling (insertion/removal)		No discomfort	5	5	-	No discomfort				✓
		Connector retention force	Direction 1	90N MIN.	5	5	N	102.74	104.6	101.2	1.27	✓
		Terminal crimp strength	MALE	70N MIN.	5	5	N	80.30	81.8	77.4	1.23	✓
			FEMALE	70N MIN.	5	5	N	78.90	80.3	76.2	1.40	✓
		Dry circuit resistance	Initial	10mΩ MAX.	5	15	mΩ	2.940	3.42	2.14	0.382	✓
			After test	20mΩ MAX.	5	15	mΩ	3.187	4.32	2.20	0.487	✓
		MALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	61.87	64.4	59.2	2.15	✓
			Without secondary lock	20N MIN.	2	6	N	44.82	46.5	43.3	1.21	✓
		FEMALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	82.73	84.4	80.9	1.14	✓
			Without secondary lock	20N MIN.	2	6	N	47.68	50.3	44.7	1.84	✓
		Housing lock strength without terminals		49N MIN.	5	5	N	100.90	110.2	96.9	5.37	✓
		Connector clip retention force	F1	90N MAX.	5	5	N	187.93	193.6	179.5	5.47	✓
			F2		5	5	N	147.68	149.7	144.2	2.32	✓
			F3		5	5	N	108.48	112.5	98.3	5.77	✓
			F1'		5	5	N	103.09	108.7	102.3	0.50	✓
			F2'		5	5	N	145.51	148.3	142.6	2.10	✓
			F3'		5	5	N	102.42	104.9	98.4	2.94	✓
4	Low temperature aging	Housing appearance		No detrimental deformation	5	5	-	No detrimental deformation				✓
		Feeling (insertion/removal)		No discomfort	5	5	-	No discomfort				✓
		Dry circuit resistance	Initial	10mΩ MAX.	5	15	mΩ	2.660	2.85	2.37	0.146	✓
			After test	20mΩ MAX.	5	15	mΩ	2.960	4.01	2.53	0.380	✓
		MALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	72.60	74.3	70.7	1.48	✓
			Without secondary lock	20N MIN.	2	6	N	45.41	46.0	44.8	0.40	✓
		FEMALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	82.98	84.2	79.4	1.83	✓
			Without secondary lock	20N MIN.	2	6	N	47.67	50.3	44.7	1.83	✓
		Housing lock strength without terminals		49N MIN.	5	5	N	98.84	99.8	97.8	0.73	✓
		Connector clip retention force	F1	90N MAX.	5	5	N	179.26	210.9	167.3	18.06	✓
			F2		5	5	N	158.06	177.8	140.3	14.87	✓
			F3		5	5	N	104.76	105.9	103.4	0.92	✓
			F1'		5	5	N	98.35	101.0	95.7	1.97	✓
			F2'		5	5	N	130.72	135.0	128.1	2.60	✓
F3'	5		5		N	105.16	106.4	104.1	0.88	✓		
5	Thermal shock	Housing appearance		No detrimental deformation	5	5	-	No detrimental deformation				✓
		Feeling (insertion/removal)		No discomfort	5	5	-	No discomfort				✓
		Connector retention force	Direction 1	90N MIN.	5	5	N	97.84	98.9	96.8	0.87	✓
		Terminal crimp strength	MALE	70N MIN.	5	5	N	76.70	80.4	73.4	2.10	✓
			FEMALE	70N MIN.	5	5	N	75.32	79.6	71.6	2.33	✓
		Dry circuit resistance	Initial	10mΩ MAX.	5	5	mΩ	2.750	2.90	2.54	0.112	✓
			After test	20mΩ MAX.	5	15	mΩ	3.204	4.37	2.45	0.646	✓
		MALE Terminal retention force	With secondary lock	49N MIN.	5	15	N	70.12	78.0	62.7	6.58	✓
			Without secondary lock	20N MIN.	2	6	N	48.78	50.3	48.2	0.74	✓
		FEMALE Terminal retention force	With secondary lock	49N MIN.	2	6	N	83.24	84.5	82.7	0.71	✓
			Without secondary lock	20N MIN.	2	6	N	46.58	51.8	41.1	3.50	✓
		Connector clip retention force	F1	90N MAX.	2	6	N	199.41	206.5	179.6	11.28	✓
			F2		5	5	N	164.28	178.3	154.0	9.61	✓
			F3		5	5	N	110.93	117.3	99.3	6.82	✓
			F1'		5	5	N	104.31	105.0	103.6	0.60	✓
			F2'		5	5	N	142.09	144.3	137.8	2.55	✓
			F3'		5	5	N	109.05	113.3	103.5	3.83	✓

Table 4. List of results: Properties after endurance tests – II (3P)

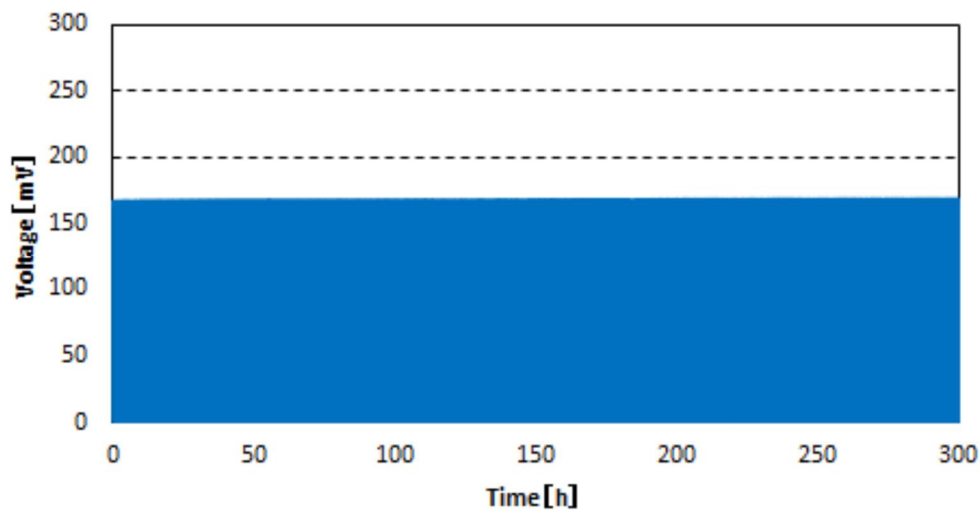
Item Number	Measurement item		Requirements	Set	n	Unit	Data				Judgement
							Avg.	Max.	Min.	s	
6	Temperature /humidity cycle	Housing appearance	No detrimental deformation	5	5	-	No detrimental deformation				✓
		Feeling (insertion/removal)	No discomfort	5	5	-	No discomfort				✓
		Insulation resistance	100MΩ MIN.	5	5	-	1,000MΩ MIN.				✓
		Withstanding voltage	No insulation breakdown or erosion	5	5	-	No insulation breakdown				✓
		Leak current	1mA MAX.	5	5	-	1μA MAX.				✓
		Dry circuit resistance	Initial	5	15	mΩ	1.897	2.35	1.37	0.307	✓
			After test	5	15	mΩ	2.247	2.85	1.56	0.349	✓
		MALE Terminal retention force	With secondary lock	2	6	N	65.75	72.4	61.6	3.94	✓
			Without secondary lock	2	6	N	44.88	46.5	43.2	1.35	✓
		FEMALE Terminal retention force	With secondary lock	2	6	N	85.33	85.6	84.5	0.42	✓
			Without secondary lock	2	6	N	46.58	49.7	43.8	2.50	✓
		Connector clip retention force	F1	5	5	N	190.17	199.7	177.0	10.75	✓
			F2	5	5	N	146.20	158.2	123.6	14.95	✓
			F3	5	5	N	99.97	104.4	95.4	3.19	✓
			F1'	5	5	N	101.78	102.0	101.4	0.22	✓
			F2'	5	5	N	143.07	145.0	141.6	1.26	✓
			F3'	5	5	N	108.09	111.1	102.8	3.29	✓
7	Resistance to humidity	Housing appearance	No detrimental deformation	5	5	-	No detrimental deformation				✓
		Connector retention force	Direction 1	5	5	N	113.90	116.0	113.0	1.24	✓
		Insulation resistance	100MΩ MIN.	5	5	-	1,000MΩ MIN.				✓
		Withstanding voltage	No insulation breakdown or erosion	5	5	-	No insulation breakdown				✓
		Leak current	1mA MAX.	5	5	-	1μA MAX.				✓
		Dry circuit resistance	Initial	5	15	mΩ	2.332	2.72	2.00	0.249	✓
			After test	5	15	mΩ	2.335	2.96	1.61	0.395	✓
		MALE Terminal retention force	With secondary lock	2	6	N	65.21	71.80	58.30	4.800	✓
			Without secondary lock	2	6	N	46.39	48.8	43.3	1.53	✓
		FEMALE Terminal retention force	With secondary lock	2	6	N	84.36	84.9	83.2	0.56	✓
			Without secondary lock	2	6	N	47.05	50.3	44.5	1.96	✓
		Connector clip retention force	F1	5	5	N	200.27	203.0	194.1	3.68	✓
			F2	5	5	N	156.12	160.8	145.8	6.00	✓
			F3	5	5	N	100.91	105.3	97.0	3.34	✓
			F1'	5	5	N	101.21	101.7	100.6	0.46	✓
			F2'	5	5	N	143.83	145.4	140.5	1.97	✓
			F3'	5	5	N	105.29	110.3	99.7	5.04	✓
8	Resistance to abrasion	Housing appearance	No detrimental deformation	5	5	-	No detrimental deformation				✓
		Feeling (insertion/removal)	No discomfort	5	5	-	No discomfort				✓
		Voltage drop	Initial	5	15	mV/A	2.562	2.98	1.84	0.260	✓
			After test	5	15	mV/A	2.850	3.25	2.58	0.189	✓
9	Corrosion gas	Terminal appearance	No detrimental deformation	5	5	-	No detrimental deformation				✓
		Housing appearance	No detrimental deformation	5	5	-	No discomfort				✓
		Terminal crimp strength	MALE	5	5	N	82.99	83.5	82.4	0.39	✓
			FEMALE	5	5	N	80.57	82.1	78.3	1.98	✓
		Voltage drop	Initial	5	5	mV/A	2.038	2.19	1.91	0.075	✓
			After test	5	15	mV/A	2.849	3.41	2.22	0.376	✓
10	Condensation	Terminal appearance	No detrimental deformation	5	15	-	No detrimental deformation				✓
		Housing appearance	No detrimental deformation	5	5	-	No detrimental deformation				✓
		Insulation resistance	100MΩ MIN.	5	5	-	1,000MΩ MIN.				✓
		Withstanding voltage	No insulation breakdown or erosion	5	5	-	No insulation breakdown				✓
		Leak current	1mA MAX.	5	5	-	1μA MAX.				✓
		Dry circuit resistance	Initial	5	5	mΩ	2.582	3.24	1.95	0.470	✓
			After test	5	15	mΩ	2.733	4.41	1.42	0.891	✓

Table 5. List of results: Properties after endurance tests –III (3P)

Item Number	Measurement item		Requirements	Set	n	Unit	Data				Judgement		
							Avg.	Max.	Min.	s			
11	Dump heat cycle	Housing appearance		No detrimental deformation		5	5	-	No detrimental deformation				✓
		Leak current		1mA MAX.		5	5	-	1μA MAX.				✓
		Insulation resistance	250h	100MΩ MIN.		5	5	-	1,000MΩ MIN.				✓
			500h	100MΩ MIN.		5	5	-	1,000MΩ MIN.				✓
			750h	100MΩ MIN.		5	5	-	1,000MΩ MIN.				✓
			1000h	100MΩ MIN.		5	5	-	1,000MΩ MIN.				✓
12	Current cycle	Migration		No migration		5	5	-	No migration				✓
		Temperature rise		ΔT=50℃ MAX.		5	5	℃	34.12	37.5	32.5	2.09	✓
		Voltage drop	Initial	10mV/A MAX.		5	5	mV/A	2.341	2.58	2.17	0.109	✓
			After test	20mV/A MAX.		5	15	mV/A	2.357	3.46	1.84	0.423	✓
13	Shock	Voltage drop	Initial	10mV/A MAX.		5	15	mV/A	1.595	1.91	1.27	0.210	✓
			After test	20mV/A MAX.		5	15	mV/A	1.676	2.00	1.43	0.163	✓
		Microcut		1μsMIN.7ΩMAX.		5	5	-	No microcut				✓
		14	Vibration	Temperature rise		ΔT=50℃ MAX.		5	5	℃	33.92	37.7	31.1
Voltage drop	Initial			10mV/A MAX.		5	5	mV/A	2.518	2.88	2.23	0.176	✓
	After test			20mV/A MAX.		5	15	mV/A	2.831	3.68	2.39	0.367	✓
Dry circuit resistance	Initial			10mΩ MAX.		5	15	mΩ	2.571	2.74	1.80	0.232	✓
	After test			20mΩ MAX.		5	15	mΩ	2.581	3.30	1.90	0.446	✓
Microcut				No exceed 1μs and 7Ω		5	5	-	No microcut				✓
15	Vibration with temperature change	Terminal appearance		No detrimental deformation		5	5	-	No detrimental deformation				✓
		Housing appearance		No detrimental deformation		5	5	-	No detrimental deformation				✓
		Terminal contact force		3N MIN.		5	5	N	3.380	3.44	3.32	0.044	✓
		Voltage drop	Initial	10mV/A MAX.		5	5	mV/A	2.469	2.68	2.20	0.101	✓
			After test	20mV/A MAX.		5	15	mV/A	5.110	8.20	3.46	1.034	✓
		Dry circuit resistance	Initial	10mΩ MAX.		5	15	mΩ	2.667	2.83	2.43	0.085	✓
			After test	20mΩ MAX.		5	15	mΩ	4.672	6.56	3.26	0.836	✓
		Microcut		No exceed 1μs and 7Ω		5	5	-	No microcut				✓



Graph 1 . Thermal shock Resistance Monitor



Graph 2. Vibration with temperature change Resistance Monitor