

## **AP-10**

Part No. Plug: 3531-\*\*01-00T, 3539-\*\*01-00\*

Receptacle: 3532-\*\*01-00T

# Test Report

Product Specification no.PRS-2616

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2	T23047	November 30,2023	K. Mizobuchi	S. Kamada	Y. Hashimoto		
1	T22059	March 15, 2022	K. Tanaka	-	Y. Hashimoto		
Rev.	ECN	Date	Prepared by	Checked by	Approved by		
Confidentia	al C		I-PEX Inc.		QKE-DFFDE07-07 REV.10		

### AP-10 Test Report

#### 1. Purpose

To evaluate the performance of AP-10Connector in accordance with PRS-2616.

#### 2. Specimen

(1) AP-10 PLUG (Part No. 3531-\*\*01-00T, 3539-\*\*01-00\*)

(2) AP-10 RECEPTACLE (Part No. 3532-\*\*01-00T)

#### 3. Test Sequence

All the evaluations were performed in accordance with Table 1.Test Sequence.

#### 4. Result

See Table 3-1 to 3-3, Graph 1 to 14. For the details of the testing conditions and requirements, see PRS-2616. The "n" in the tables show the number of measurement points.

#### 5. Conclusion

All the specimens met the requirements of PRS-2616.

Table 1 Test Sequence and Sample Quantity

T . T	Group													
Test Item		В	С	D	Е	F	G	Н	J	K	L	М	N	Р
Contact Resistance			1,3	1,3		1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3
Temperature rising		1												
Mating Force/Unmating Force	1,4													
Durability	3													
Vibration			2											
Shock				2										
Electrode fastness test					1									
High Temperature Life						2								
High Temperature Life (Energization)							2							
Low Temperature Life								2						
Low Temperature Life (Energization)									2					
High Temperature and humidity										2				
High Temperature and humidity (Energization)											2			
Temperature cycling												2		
Temperature and humidity cycling													2	
SO <sub>2</sub> Gas														2
Specimen Quantity.	5 pcs													

<sup>\*</sup>Numbers indicate sequence in which tests are performed.

Table 2 Test Sequence and Sample Quantity

Test Item	Group						
lest item	Q	R	S	Т			
Solder ability	1						
Soldering Heat Resistance (Reflow)		1					
Soldering Heat Resistance (Soldering iron)			1				
Solder junction life				1			
Specimen Quantity	5 pcs	5 pcs	5 pcs	5 pcs			

<sup>\*</sup>Numbers indicate sequence in which tests are performed.

Table 3-1 /Test Result

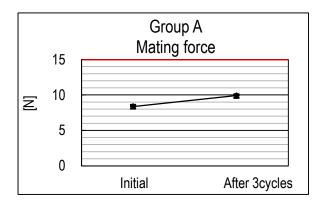
Pass criteria   Pass				<u>Table 3-1</u>	/Test Re	<u>esult</u>				
Mating force	Group	Test i	tems							
Initial   After Acycles   15N MAX.   5   N   9.93   10.1   9.6   Pass   After Acycles   Initial			Measurements	Pass criteria	n	Unit	AVE.	MAX.	MIN.	Judgement
After 3 cycles	Α	Matin	ng force							
After 3cycles   15N MAX.   5 N   6.08   6.5   5.6   Pass		Initial		1FN MAY	Г	N.	8.38	8.6	8.1	Pass
Initial   15N MAX.   5			After 3cycles	TON MAX.	3	l IN	9.93	10.1	9.6	Pass
After 3cycles   15N MAX.   5		Unma	ating force							
After 3cycles   ImΩ MAX.   S   ImΩ   Im			Initial	1EN MAY		N.	6.08	6.5	5.6	Pass
Initial After 3cycles			After 3cycles	TON MAX.	5	l IN	9.45	10.2	8.5	Pass
After 3 cycles		Conta	act resistance	<u> </u>		•	*		•	•
After 3 cycles			Initial	1 O MAY	-	0	0.3927	0.395	0.389	Pass
Initial			After 3cycles	IMIZ MAX.	5	l mzz	0.3777	0.380	0.374	Pass
Initial	Б	T				•	•	•	•	•
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Ь	remp		4T4 F%C MANY		T %	2 2 4 0	2.60	1 2 00	D
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			Initial	⊿115℃ MAX.	5	τ.	3.340	3.60	2.90	Pass
Initial	С	Vibra	tion							
After testing		Conta	act resistance							
After testing			Initial	4 0 14 14	_		0.3880	0.400	0.377	Pass
During test No discontinuity greater than 1μs. Appearance  After testing No abnormality 5 - No abnormality Pass    No abnormality   S   No abnormality   Pass			After testing	lmΩ MAX.	5	mΩ	0.3822	0.395	0.376	Pass
During test   greater than 1µs.   5   -   No discontinity   Pass		Electi	rical discontinuity	•				·		
Appearance   After testing   No abnormality   5   -   No abnormality   Pass			During tost	No discontinuity	Г		No discont	tinity		Dage
After testing			During test	greater than 1µs.	5		NO discorn	LITTICY		Pass
D   Contact resistance		Appe	arance	•			•			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			After testing	No abnormality	5	-	No abnorr	nality		Pass
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	D	Shock	·							
$ \begin{array}{ c c c c c }\hline Initial & 1m\OmegaMAX. & 5 & m\Omega & 0.3956 & 0.408 & 0.384 & Pass \\ \hline After testing & 1m\OmegaMAX. & 5 & m\Omega & 0.3896 & 0.412 & 0.376 & Pass \\ \hline Electrical discontinuity & & & & & & & & \\ \hline During test & No discontinuity & 5 & - & No discontinity & Pass \\ \hline Appearance & & & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline E & Electorode fastness test & & & & \\ \hline Appearance & & & & & \\ \hline Appearance & & & & & \\ \hline Pass criteria: No abnormality adversely affecting the performance shall not occur. & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline F & High Temperature Life & & & & \\ \hline Contact resistance & & & & \\ \hline Initial & & & & & \\ \hline Appearance & & & & & \\ \hline Appearance & & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline G & High Temperature Life (Energization ) & & & & \\ \hline Contact resistance & & & & & \\ \hline Initial & & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline G & High Temperature Life (Energization ) & & & & \\ \hline Contact resistance & & & & & \\ \hline Initial & & & & & \\ \hline Initial & & & & & \\ \hline After testing & & & & & \\ \hline After testing & & & & & \\ \hline Appearance & & & & & \\ \hline \end{tabular} \begin{tabular}{ll} \hline Pass & & & \\ \hline Appearance & & & & \\ \hline \end{tabular} \begin{tabular}{ll} \hline Pass & & & \\ \hline \end{tabular} \begin{tabular}{ll} \hline Pass & \\ \hline \end{tabular} t$										
$ \begin{array}{ c c c c c }\hline After testing & 1m\Omega  MAX. & 5 & m\Omega \\\hline After testing & No discontinuity \\\hline During test & No discontinuity \\\hline During test & No abnormality & 5 & - No discontinity \\\hline Appearance & & & \\\hline After testing & No abnormality & 5 & - No abnormality \\\hline Electorode fastness test \\\hline Appearance & & \\\hline Pass criteria: No abnormality adversely affecting the performance shall not occur. \\\hline After testing & No abnormality & 5 & - No abnormality \\\hline After testing & No abnormality & 5 & - No abnormality \\\hline Pass \\\hline F & High Temperature Life \\\hline Contact resistance & \\\hline Initial & & & & & & & & & & & & & & & & & & &$		Conta					n 3056	0.408	0.384	Pacc
				1mΩ MAX.	5	mΩ				
$ \begin{array}{ c c c c c c } \hline During test & No discontinuity greater than 1 \mus. & 5 & - & No discontinity & Pass \\ \hline Appearance & & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline Electorode fastness test & & & \\ \hline Appearance & & & & \\ \hline Pass criteria: No abnormality adversely affecting the performance shall not occur. & After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline F & High Temperature Life & & & \\ \hline Contact resistance & & & & \\ \hline Initial & & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & 0.499 & Pass \\ \hline Appearance & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline G & High Temperature Life (Energization ) & & & \\ \hline Contact resistance & & & & \\ \hline Initial & & & & \\ \hline After testing & No abnormality & 5 & - & No abnormality & Pass \\ \hline Appearance & & & & \\ \hline After testing & & & & \\ \hline After testing & & & & \\ \hline Appearance & & & \\ \hline Appearance & & & \\ \hline Appearance & & & \\ \hline During test & No abnormality & 5 & - & No abnormality & Pass \\ \hline Appearance & & & & \\ \hline Appearance & & & \\ \hline During test & No abnormality & 5 & - & No abnormality & Pass \\ \hline Appearance & & & & \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & No abnormality & Pass \\ \hline Appearance & & & \\ \hline During test & Pass \\ \hline Appearance & & & \\ \hline During test & Pass \\ \hline During test & Pa$		Flecti					0.3090	0.412	0.370	F 0 3 3
During test   greater than 1μs.   S   -   No discontinity   Pass		Licco		No discontinuity						
Appearance			During test		5	-	No discont	tinity		Pass
		Appe	arance	' '		1				1
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$				No abnormality	5	_	No abnorr	nality		Pass
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$				,		1		•		
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Е	Electo	orode fastness test							
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$		Appe	arance							
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$			Pass criteria: No al	onormality adversely	affectin	g the pe	rformance	shall no	t occur.	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			After testing	No abnormality	5	<u> </u>	No abnorr	nality		Pass
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$							-	· · · · · · · · · · · · · · · · · · ·		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	F		•							
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Conta				1	T			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			Initial	1mΩ MAX.	5	mΩ	0.4144	0.434	0.399	Pass
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			After testing				0.4762	0.515	0.453	Pass
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Appe	arance							
			After testing	No abnormality	5	-	No abnorr	nality		Pass
	-	High	Tomporature Life (En	orgization )						
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	G			cigization j						
After testing $1m\Omega$ MAX. $5m\Omega$ 0.4550 0.493 0.429 Pass Appearance		Conta		<del> </del>		1	0.4120	0.440	0.201	Daga
Appearance				1mΩ MAX.	5	mΩ		***************************************		
			_				0.4550	0.493	0.429	Pass
After testing No abnormality 5 - No abnormality Pass		Appe	arance	1						
			After testing	No abnormality	5	-	No abnorr	nality		Pass

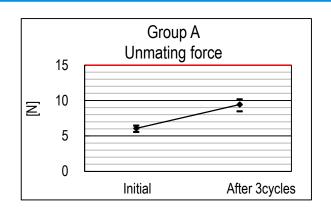
### Table 3-2 Test Result

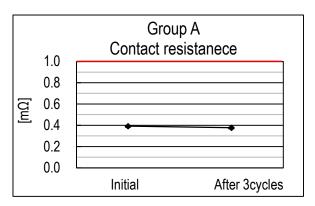
			Tuble 0 2	. 1001110	<u>Juit</u>				
Group	Test items								
	Measurem	nents	Pass criteria	n	Unit	AVE.	MAX.	MIN.	Judgement
Н	Low Temperat	ure Life							
	Contact resista	ance							
	Initial		1mΩ MAX.	5	mΩ	0.4120	0.420	0.400	Pass
	After tes	sting	THISZ MAX.	,	11122	0.4070	0.414	0.395	Pass
	Appearance								
	After tes	sting	No abnormality	5	-	No abnorr	mality		Pass
J	Low Temperat	ure Life (Ene	rgization )						
	Contact resista	ance							
	Initial		1mΩ MAX.	5	mΩ	0.4020	0.420	0.390	Pass
	After tes	sting	THISE PIAK.		11132	0.3897	0.396	0.378	Pass
	Appearance					_			
	After tes	sting	No abnormality	5	-	No abnorr	mality		Pass
K	High Temperat	ture and hum	idity						
	Contact resista	ance	-						
	Initial		40.144.)/	5		0.4048	0.417	0.391	Pass
	After tes	sting	1mΩ MAX.	5	mΩ	0.3900	0.406	0.371	Pass
	Appearance		•			•		•	
	After tes	sting	No abnormality	5	-	No abnorr	nality		Pass
L	High Temperat	ture and hum	idity (Energization)						
	Contact resista	ance							
	Initial		1mΩ MAX.	5	mΩ	0.4203	0.437	0.407	Pass
	After tes	sting	TIIISZ MAX.	3	11122	0.4091	0.432	0.391	Pass
	Appearance								
	After tes	sting	No abnormality	5	-	No abnorr	nality		Pass
М	Temperature o	cycling							
	Contact resista	ance							
	Initial		1mO MAV	_	m0	0.4136	0.432	0.398	Pass
	After tes	sting	1mΩ MAX.	5	mΩ	0.4176	0.457	0.400	Pass
	Appearance								
	After tes	sting	No abnormality	5	-	No abnorr	nality		Pass

#### Table 3-3 Test Result

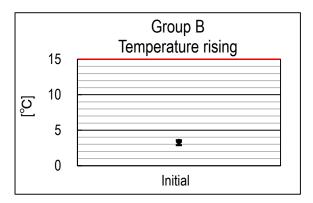
Group	Test i	items										
- · P		Measurements	Pass criteria	n	Unit	AVE.	MAX.	MIN.	Judgemen			
N	Temr	perature and humid			· · · · ·	7						
	Contact resistance											
		Initial	<u> </u>	_		0.4155	0.434	0.400	Pass			
		After testing	1mΩ MAX.	5	mΩ	0.4000	0.426	0.389	Pass			
	Appe	arance	<b>'</b>	I.			1					
		After testing	No abnormality	5	-	No abnorr	nality		Pass			
Р	SO2 (	Gas										
	Conta	act resistance										
		Initial	1 m O M A V	_		0.4172	0.420	0.407	Pass			
		After testing	1mΩ MAX.	5	mΩ	0.3904	0.403	0.381	Pass			
	Appe	arance										
		Initial	No abnormality	- 5	_	No abnorr	Pass					
		After testing	No abnormality		_	No abnorr	Pass					
Q	Solde	er ability										
	Appe	arance										
		Pass criteria: No	abnormality adversely	affecting	g the pe	rformance	shall no	t occur.				
		After testing	No abnormality	5	-	No abnorr	nality		Pass			
R	Solde	ering Heat Resistand	ce(Reflow)									
		Pass criteria: No	abnormality adversely	affecting	the pe	rformance	shall no	t occur.				
		After testing	No abnormality	5	-	No abnorr	nality		Pass			
S	Solde	ering Heat Resistand	ce(Soldering iron)									
		Pass criteria: No	abnormality adversely	affecting	the pe	rformance	shall no	t occur.				
		After testing	No abnormality	5	-	No abnorr	nality		Pass			
Т	Solde	er junction life										
		Pass criteria: Ele	ctrical continuity is cor	nfirmed a	fter the	test,and						
			abnormality adversely			=	shall no	ot occur.				
		After testing No abnormality 5 - No abnormality										



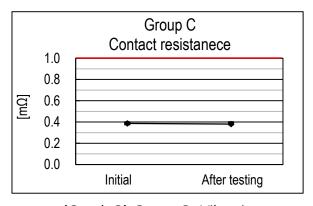




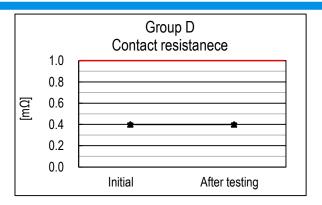
(Graph 1) Group A: Durability



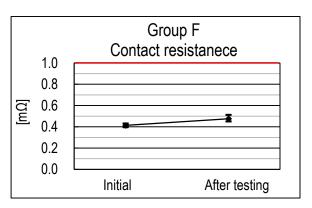
(Graph 2) Group B: Temperature rising



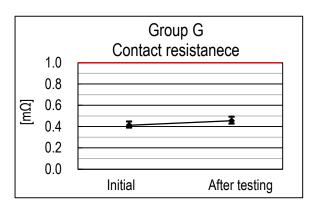
(Graph 3) Group C: Vibration



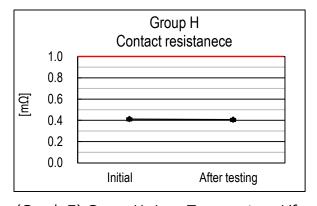
(Graph 4) Group D: Shock



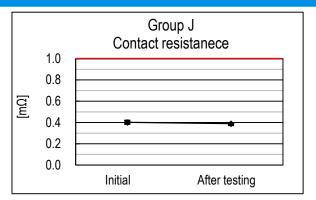
(Graph 5) Group F: High Temperature Life



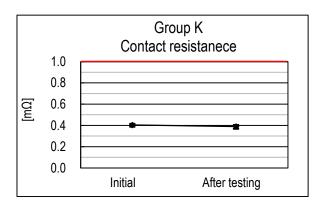
(Graph 6) Group F: High Temperature Life (Energization)



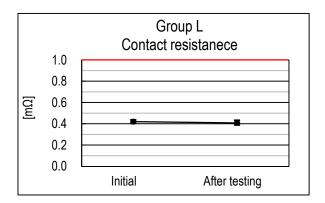
(Graph 7) Group H: Low Temperature Life



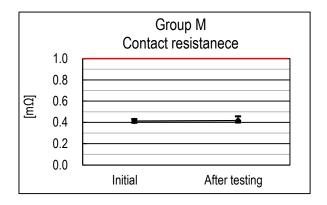
(Graph 8) Group J: Low Temperature Life (Energization)



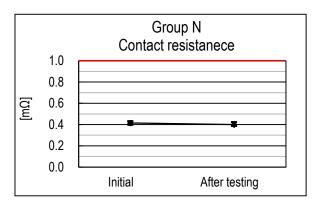
(Graph 9) Group K: High Temperature and humidity



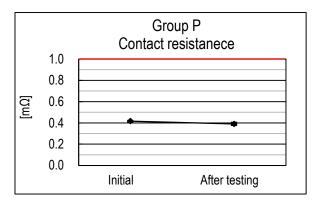
(Graph 10) Group L: Higt Temperature and humidity (Energization)



(Graph 11) Group M: Temperature cycling



(Graph 12) Group N: Temperature and humidity cycling



(Graph 13) Group P: SO<sub>2</sub> Gas