Dynamic D3000 Series D3230 Connector

1. Introduction

1.1 Testing was performed on the DYNAMIC D-3000 SERIES CONNECTOR to determine if it meets the requirements of Product Specification, 108-5349 Rev.J8.

1.2 Scope

This report covers the electrical, mechanical and environmental performance requirements of the D-3000 series connector.

The qualification testing for connector was performed from 23-mar-1991 to 27-AUG-1991.

The qualification testing for the crimping terminal ”2L”, was performed from 25-OCT-1995 to 30-OCT-1995.

The qualification testing for voltage upgrade to 800V was performed from 15-APR-2023 to 7-MAY-2023.

1.3 Conclusion

The D-3000 series D3230 connector meets the electrical, mechanical and environmental performance requirements of Product Specification, 108-5349 Rev.J8.

1.4 Product Description

This product has been designed for use with power distribution panels, control panels, computer, PCs, NCs, Servo drivers and motors input and output for the inverters, switching power supplies and others.

(Features)

-The connectors consists of a pair of connectors for the cable and board.

-For sizes of connectors are available: “2L” (for AWG14 to 16), “L” (for AWG16 to 20), “M” (for AWG 20 to 24), “S” (for AWG 24 to 28).

-Three types of plating are available for the terminals: Tin plating, 0.38um gold plating And 0.76um gold plating. Noted that the gold plating is provided only on the contact surface.

The following connectors are also available to satisfy other application requirements:

D- 3100: 3.81㎜ X 5.08mm (Pitches for the pins and rows)

D- 3200: 5.08mm X 7.62mm (Pitches for the pins and rows)

D- 3400: 3.81mm X 5.08mm (For rows)

D- 3500: 5.08mm X 5.08mm (Pitches for the pins and rows)

1.5 Test Sample

1.5.1. Sample were taken randomly from current production.

The following sample were used:

Part Number	Description
1-178293-2	1-178293-2 D - 3100 3P “H“ HDR ASS ' Y (Au 0.38 µm)
1-178293-5	1-178293-5 D - 3100 3P “H“ HDR ASS ' Y (TIN LEAD)
1-178137-5	1-178137-5 D - 3100 6P “H“ HDR ASS ' Y (TIN LEAD)
1-178138-2	1-178138-2 D - 3200 3P “H“ HDR ASS ' Y (Au 0.38µm)
1-178138-5	1-178138-5 D - 3200 3P “H“ HDR ASS ' Y (TIN LEAD)
3-178141-2	3-178141-2 D - 3100 6P “V“ HDR ASS ' Y (Au 0.38µm)
3-178141-5	3-178141-5 D - 3100 6P “V“ HDR ASS ' Y (TIN LEAD)
7-178136-2	7-178136-2 D - 3200 3P “V“ HDR ASS ' Y (Au 0.38µm)
178216-5	178216-5 D - 3400 12P “H“ HDR ASS ' Y (TIN LEAD)
178307-2	178307-2 D - 3100 16P “H“ HDR ASS ' Y (Au 0.38 µm)
178307-5	178307-5 D - 3100 16P “H“ HDR ASS ' Y (TIN LEAD)
1-178288-3	1-178288-3 D - 3100 3P Rec. HSG
3-178127-6	3-178127-6 D - 3100 6P Rec. HSG
1-178128-3	1-178128-3 D - 3200 3P Rec. HSG
7-178128-3	7-178128-3 D - 3200 3P Rec. HSG
178289-7	178289-7 D - 3100 16P Rec. HSG
178214-1	178214-1 D - 3400 12P Rec. HSG
175194-2	175194-2 “S“ Size Rec. Contact (Au 0.38 µm)
175195-2	175195-2 “M“ Size Rec. Contact (Au 0.38 µm)
175196-2	175196-2 “L“ Size Rec. Contact (Au 0.38 µm)
1-175196-5	1-175196-5 “L“ Size Rec. Contact (Pre-tin)
1-917484-2	1-917484-2 “2L“ Size Rec. Contact (Au 0.38 µm)
917485-2	917485-2 “2L“ Size Rec. Contact (Au 0.38 µm)
178289-3	178289-3 D - 3100 6P Rec. HSG
178289-5	178289-5 D - 3100 10P Rec. HSG
178289-8	178289-8 D - 3100 20P Rec. HSG
1-177648-3	1-177648-3 D - 3100 3P TAB .HSG
178964-3	178964-3 D - 3100 6P TAB .HSG
178964-5	178964-5 D - 3100 10P TAB .HSG
178964-8	178964-8 D - 3100 20P TAB .HSG

1.5.2. Product Qualification Test Sequence

Test Examination	試験グループ/Test Group												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	試験順序/Test Sequence (a)												
Examination of Product	1	1	1	1	1	1	1	1	1	1	1	1	1
Termination Resistance (Low Level)	2,8	2,5	2,6	2,4	2,4	2,4	2,4	2,4					2,4
Dielectric withstanding Voltage			4, 8										
Insulation Resistance			3,7										
Temperature Rising					3								
Contact Retention Force									3				
Crimp Tensile Strength										2			
Physical Shock		4											
Connector Mating Force	3,6												
Connector Unmating Force	4,7												
Contact Insertion Force									2				
Vibration		3											
Durability	5												
Housing Locking Strength											3		
Solderability											2		
Resistance to Soldering Heat												2	
Contact Insertion Force													
Thermal Shock						3							
Humidity-Temperature Cycling			5										
Humidity (Steady State)				3									
Industrial SO_2 Gas							3						
Temperature Life								3					
Salt Spray													3

Numbers indicate sequence in which the tests are performed.

1.5.3. Test Result

Number	3.0.1
Test Items	Examination of Product
Test group	All the groups
Spec Requirements Per 108-5349	Inspect for any damage that can impact proper connector performance.
Result	Requirements specified on the product drawing
Judgement	Acceptable

Electrical performance	
Number	3.0.2
Test Items	Termination Resistance (Low Level)
Test group	1~8
Spec Requirements Per 108-5349	5 mΩ Max. (Initial) 10 mΩ Max. (Final)
Result	5 mΩ Max. (Initial) 10 mΩ Max. (Final) Shown in Fig.4
Judgement	Acceptable

Number	3.0.3	
Test Items	Insulation Resistance	
Test Group	3	
Spec Requirements per 108-5349	1000 MΩ Min. (Initial) 100 MΩ Min. (Final)	
Result	1000 MΩ Min. (Initial) 100 MΩ Min. (Final)	
Judgement	Acceptable	
Number	3.0.4	
Test Items	Dielectric withstanding voltage	
Test Group	3	
Spec Requirements per 108-5349	For one minute at the following voltage Leakage current of 0.5 mA or less	
	3.81mm pitch	1.5kv AC
	5.08mm pitch	2.6kv AC
Result	Dielectric withstanding voltage: acceptable Leakage current of 0.5 mA or less	
Judgement	Acceptable	
Number	3.0.5	
Test Items	Temperature rise	
Test Group	5	
Spec Requirements per 108-5349	30℃ or less Connector: D3100 6P “H” Wire: AWG 16 Current: 10A	
Result	30℃ or less 10 mΩ or less Shown in Fig.4	
Judgement	Acceptable	

Physical performance	
Number	3.0.6
Test Items	Vibration
Test Group	2
Spec Requirements per 108-5349	No momentary discontinuity exceeding 1us shall be permissible when the vibration of 10 to 500 Hz at 98m/s2 and amplitude of 1.52 mm is applied for 15 min.
Result	No momentary discontinuity 10 mΩ or less
Judgement	Acceptable
Number	3.0.7
Test Items	Shock
Test Group	2
Spec Requirements per 108-5349	490m/s^2 along three axes of X, Y and Z No momentary discontinuity exceeding 1us shall be permissible during the round trip vibrations along the three axes
Result	No momentary discontinuity 10 mΩ or less
Judgement	Acceptable
Number	3.0.8
Test Items	Connector insertion force (high pressure contact)
Test Group	1
Spec Requirements per 108-5349	4.9N or less per contact
Result	4.9N or less
Judgement	Acceptable
Number	3.0.9
Test Items	Connector unmating force (high pressure contact)
Test Group	1
Spec Requirements per 108-5349	Tin plating type: 0.49N or greater per contact Gold plating type: 0.29N or greater per contact
Result	0.49N or greater 0.36N or greater (gold plated contact)
Judgement	Acceptable
Number	3.1.0
Test Items	Contact mating force
Test Group	9
Spec Requirements per 108-5349	9.8N or less
Result	9.8N or less
Judgement	Acceptable

Number	3.1.1	
Test Items	Contact retention force (Housing lancer retention force)	
Test Group	9	
Spec Requirements per 108-5349	49N or greater	
Result	49N or greater	
Judgement	Acceptable	
Number	3.1.2	
Test Items	Durability	
Test Group	1	
Spec Requirements per 108-5349	10 mΩ or less Mating and unmating cycles: 100cycles (Tin plated type) 500cycles (Gold plated type)	
Result	10 mΩ or less	
Judgement	Acceptable	
Number	3.1.3	
Test Items	Housing lock strength	
Test Group	11	
Spec Requirements per 108-5349	Series	Unit: N
	D-3100S (single row) D-3200S (Single row)	98N or greater
	D-3100D (Dual rows) D-3200D (Dual rows)	147N or greater
	D-3400F (Four rows)	196N or greater
	D-3500 (Dual rows)	39.2N or greater
Result	Measurement result: D-3100S, D-3200S: 176.4-196N D-3100D, D-3200D: 245-343N D-3400F: 294-372.4N D-3500: 93.1-102.9N	
Judgement	Acceptable	
Environmental performance		
Number	3.1.4	
Test Items	Solderability	
Test Group	11	
Spec Requirements per 108-5349	The solder shall be wetted by a minimum of 95% at 230±5ºC for 5s	
Result	The solder was wetted by 95% or greater	
Judgement	Acceptable	

Number	3.1.5
Test Items	Resistance to soldering heat
Test Group	12
Spec Requirements per 108-5349	No defect shall be permissible after exposing the sample to 230±5ºC for 10 seconds. (To be mounted on the board)
Result	No damage such as deformation shall be permissible
Judgement	Acceptable
Number	3.1.6
Test Items	Thermal shock
Test Group	6
Spec Requirements per 108-5349	The resistance shall be 10mΩ or less after exposing the sample to -55°C to +85°C for 25 cycles.
Result	10mΩ or less
Judgement	Acceptable
Number	3.1.7
Test Items	Temperature and humidity cycle
Test Group	3
Spec Requirements per 108-5349	The resistance shall be 10mΩ or less after exposing the sample to +25°C to +65°C and 95% R.H for 10 cycles.
Result	10mΩ or less
Judgement	Acceptable
Number	3.1.8
Test Items	Humidity resistance (steady state)
Test Group	4
Spec Requirements per 108-5349	The resistance shall be 10mΩ or less after exposing the sample to 96 hours at 90% to 95% R.H
Result	10mΩ or less
Judgement	Acceptable
Number	3.1.9
Test Items	High temperature life
Test Group	8
Spec Requirements per 108-5349	The resistance shall be 10mΩ or less after exposing the sample to +105ºC for 250hours
Result	10mΩ or less
Judgement	Acceptable
Number	3.2.0
Test Items	SO_2 gas
Test Group	7
Spec Requirements per 108-5349	The resistance shall be 10mΩ or less after 96hours at 10ppm
Result	10mΩ or less
Judgement	Acceptable

Number	3.2.1
Test Items	Salt spray
Test Group	13
Spec Requirements per 108-5349	The resistance shall be 10mΩ or less after exposing the sample to +35ºC for 96hours at saltwater concentration of
Result	10mΩ or less
Judgement	Acceptable

$$m\Omega = \frac{V - V_W}{A}$$

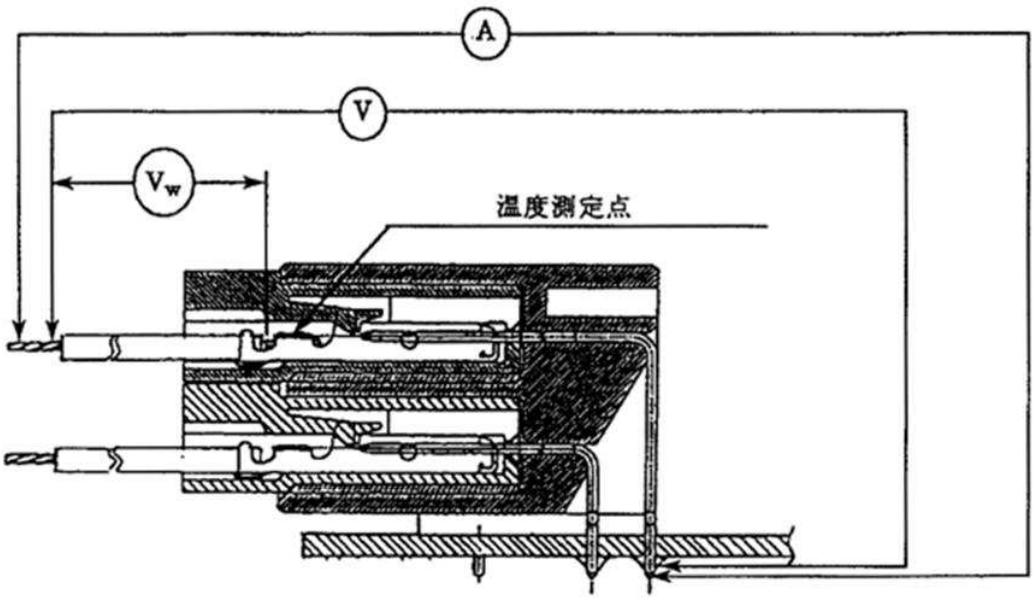


Fig.4

1.5.4. List of Test results

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
3	Insulation resistance 1 min at 500VDC after subjecting the sample to 40ºC and 90 to 95% R.H for 96hours	12P (H) D-3400	Initial	$0.441X10^{13}\Omega$-$10^{13}\Omega$ or greater	Acceptable	$10^{9}\Omega$ or greater
			After Humidity	$0.202X10^{12}\Omega$-$10^{13}\Omega$ or greater	Acceptable	$10^{8}\Omega$ or greater
		16P (H) D-3100	Initial	$10^{13}\Omega$ or greater	Acceptable	$10^{9}\Omega$ or greater
			After Humidity	$10^{9}\Omega$ or greater	Acceptable	$10^{8}\Omega$ or greater
	Dielectric withstanding voltage 1min at 1500 VDC (3.81pitch) 1min at 2600 VDC (5.08pitch)	12P (H) D-3400	Initial	OK	Acceptable	1min at 1500V AC
			After Humidity	OK	Acceptable	1min at 1500V AC
			Breakdown voltage	2000V-2500V	Acceptable	Real breakdown voltage
		16P (H) D-3100	Initial	OK	Acceptable	1min at 1500V AC
			After Humidity	OK	Acceptable	1min at 1500V AC
			Breakdown voltage	2000V-5500V	Acceptable	Real breakdown voltage
		Au 6P (H) D-3200	Initial	OK	Acceptable	1min at 2600V AC
			After Humidity	OK	Acceptable	1min at 2600V AC
			Breakdown voltage	3600V	Acceptable	Real breakdown voltage
		12P (H) D-3500	Initial	OK	Acceptable	1min at 2600V AC
			After Humidity	OK	Acceptable	1min at 2600V AC
			Breakdown voltage	3600V	Acceptable	Real breakdown voltage

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
2	Vibration and shock Vibration of 10 to 500Hz Shock of 11ms at 490m/s^2	Au 6P (H) D-3100	After vibration and shock	No physical damage was noted	Accept	
		Tin 6P (V) D-3100	After vibration and shock	No physical damage was noted	Accept	
	Vibration and shock Vibration of 10 to 500Hz Shock of 11ms at 490m/s^2	Au 6P (H)	After vibration and shock	No physical damage was noted	Accept	
		Tin 6P (H)	After vibration and shock	No physical damage was noted	Accept	
		Tin 12P (H)	After vibration and shock	No physical damage was noted	Accept	
		Au 16P (H)	After vibration and shock	No physical damage was noted	Accept	
	Low level contact resistance After vibration and shock	Au 6P (V)	Initial	0.36mΩ-0.79mΩ	Accept	5 mΩ or less
			After vibration and shock	0.33mΩ-0.58mΩ	Accept	10 mΩ or less
		Tin 6P (V)	Initial	0.71mΩ-0.94mΩ	Accept	5 mΩ or less
			After vibration and shock	0.95mΩ-2.06mΩ	Accept	10 mΩ or less
		Au 6P (H)	Initial	0.54mΩ-1.09mΩ	Accept	5 mΩ or less
			After vibration and shock	0.58mΩ-1.13mΩ	Accept	10 mΩ or less
		Tin 6P (H)	Initial	0.93mΩ-1.51mΩ	Accept	5 mΩ or less
			After vibration and shock	1.04mΩ-2.11mΩ	Accept	10 mΩ or less
		Tin 12P (H)	Initial	0.98mΩ-2.24mΩ	Accept	5 mΩ or less
			After vibration and shock	1.11mΩ-2.73mΩ	Accept	10 mΩ or less
		Au 16P (H)	Initial	0.48mΩ-1.61mΩ	Accept	5 mΩ or less
			After vibration and shock	1.54mΩ-1.01mΩ	Accept	10 mΩ or less

6P (H) (V): D3100 Series
12P (H): D-3400 Series
16P (H): D-3100 Series

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
1	Connector mating and unmating force	Tin 12P (H)	Initial ON	27.82-30.61 N	Accept	58.8N or less
			OFF	28.58-33.35 N	Accept	5.88N or greater
			50 ON	36.9-65.12 N		
			OFF	53.25-69.04 N		
			100 ON	58.63-67.16 N		
			OFF	64.3-79.14 N		
		Au 16P (H)	Initial ON	27.93-30.87 N	Accept	78.4N or less
			OFF	24.01-24.5 N	Accept	4.7N or greater
			500 ON	46-56.84 N		
			OFF	44.1-55.88 N		

6P (H) (V): D3100 Series
12P (H): D-3400 Series
16P (H): D-3100 Series

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
3	Appearance After Temperature and humidity cycle MIL-STD-202 106 10cylces	Tin 6P (V)	After temperature and humidity	No physical damage was noted	Accept	
		Au 16P (H)	After temperature and humidity	No physical damage was noted	Accept	
	Low level contact resistance after temperature and humidity cycle	Tin 6P (V)	Initial	0.77mΩ-0.97mΩ	Accept	5 mΩ or less
			After 10cylces	0.85mΩ-1.05mΩ	Accept	10 mΩ or less
		Au 16P (H)	Initial	1.07mΩ-1.58mΩ	Accept	5 mΩ or less
			After 10cylces	1.02mΩ-1.61mΩ	Accept	10 mΩ or less
4	Appearance After Humidity (Steady state) 40ºC 90-95% R.H 96hours	Tin 6P (V)	After humidity	No physical damage was noted	Accept	58.8N or less
		Au 16P (H)	After humidity	No physical damage was noted	Accept	78.4N or less
	Low level contact resistance after humidity	Tin 6P (V)	Initial	0.72mΩ-0.96mΩ	Accept	5 mΩ or less
			After humidity	0.88mΩ-1.14mΩ	Accept	10 mΩ or less
		Au 16P (H)	Initial	1.03mΩ-1.55mΩ	Accept	5 mΩ or less
			After humidity	1.04mΩ-1.54mΩ	Accept	10 mΩ or less

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
6	Appearance after Thermal shock 50cycles -55ºC 30 min +85ºC 30 min	Tin 6P (V)	After thermal shock	No physical damage was noted	Accept	
		Au 16P (H)	After thermal shock	No physical damage was noted	Accept	
	Low level contact resistance after SO2 exposing	Tin 6P (V)	Initial	0.73mΩ-1.16mΩ	Accept	5 mΩ or less
			After thermal	0.91mΩ-1.27mΩ	Accept	10 mΩ or less
		Au 16P (H)	Initial	1.07mΩ-1.48mΩ	Accept	5 mΩ or less
			After thermal	1.04mΩ-1.47mΩ	Accept	10 mΩ or less

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
8	Appearance after High temperature life 105ºC 250hours	Tin 6P (V)	After temp. life	No physical damage was noted	Accept	
		Au 6P (V)	After temp. life	No physical damage was noted	Accept	
		Au 16P (H)	After temp. life	No physical damage was noted	Accept	
	Low level contact resistance after High temperature life	Tin 6P (V)	Initial	0.77mΩ-0.95mΩ	Accept	5 mΩ or less
			After 96hours	0.81mΩ-0.96mΩ	Accept	10 mΩ or less
			After 250hours	0.92mΩ-1.33mΩ	Accept	10 mΩ or less
		Au 6P (V)	Initial	0.88mΩ-1.08mΩ	Accept	5 mΩ or less
			After 96hours	0.87mΩ-1.22mΩ	Accept	10 mΩ or less
			After 250hours	0.86mΩ-1.22mΩ	Accept	10 mΩ or less
		Au 16P (H)	Initial	0.97mΩ-1.65mΩ	Accept	5 mΩ or less
			After 96hours	1.01mΩ-1.53mΩ	Accept	10 mΩ or less
			After 250hours	1.09mΩ-1.82mΩ	Accept	10 mΩ or less

Test group	Type of test	Test item	Result		Spec
			Measurement	Judgement	
11	Solderability	Au 6P (H)	After solder was wetted by 95% or more	Accept	The solder shall be wetted by 95% or more on a freshly solder surface
		Tin 6P (H)	After solder was wetted by 95% or more	Accept	The solder shall be wetted by 95% or more on a freshly solder surface
9	Housing lancer retention force	3P REC HSG	73.5-88.2 N	Accept	49N or greater
		6P REC HSG	63.7-98 N	Accept	49N or greater
		12P REC HSG	68.6-73.5 N	Accept	49N or greater
		16P REC HSG	63.7-73.5 N	Accept	49N or greater
11	Housing locking strength	3P REC HSG	176.4-196 N	Accept	98N or greater
		6P REC HSG	343-372-4 N	Accept	147N or greater
		12P REC HSG	294-372-4 N	Accept	196N or greater
		16P REC HSG	245-343 N	Accept	147N or greater
9	Contact mating force	3P REC HSG	3.185-3.92 N	Accept	9.8N or less
		6P REC HSG	2.205-8.85 N	Accept	9.8N or less
		12P REC HSG	1.47-2.205 N	Accept	9.8N or less
		16P REC HSG	1.125-2.45 N	Accept	9.8N or less

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
10	Crimping tensile strength	Rec. Cont. “S” size	AWG #28	21-25 N	Accept	11.76N or greater
			AWG #26	31.36-36.26 N	Accept	19.6N or greater
			AWG #24	49-61.25 N	Accept	29.4N or greater
		Rec. Cont. “M” size	AWG #24	58.8-63.7 N	Accept	29.4N or greater
			AWG #22	88.2-98 N	Accept	44.1N or greater
			AWG #20	132.3-142.1 N	Accept	73.5N or greater
		Rec. Cont. “L” size	AWG #20	125.4-142.1 N	Accept	73.5N or greater
			AWG #18	225.4-235.2 N	Accept	117.6N or greater
			AWG #16	279.3-313.6 N	Accept	186.2N or greater
		Rec. Cont. “2L” size	AWG #16	268.52-299.9 N	Accept	186.2N or greater
			AWG #14	347.9-382-2 N	Accept	186.2N or greater

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #16	TIN 3P (H)	4A	3.7ºC-16ºC		
			8A	37.1ºC-11.2ºC		
			12A	16.9ºC-23.4ºC		
			16A	30.8ºC-41.1ºC		
			18A	48.2ºC-59.9ºC		
		TIN 3P (V)	4A	1.5ºC-2.6ºC		
			8A	6.7ºC-9.3ºC		
			12A	15.2ºC-19.2ºC		
			16A	28.1ºC-33.8ºC		
			20A	43.4ºC-53.1ºC		
		TIN 6P (H)	4A	2.8ºC-4.1ºC		
			8A	12.1ºC-14.6ºC		
			12A	25.8ºC-30.9ºC		
			16A	46.4ºC-53.5ºC		
			20A	70.6ºC-81.1ºC		
		TIN 6P (V)	4A	2.4ºC-3.5ºC		
			8A	9.2ºC-12.2ºC		
			12A	17.8ºC-24.5ºC		
			16A	33.9ºC-43.7ºC		
			20A	52.3ºC-65.9ºC		
		TIN 12P (H)	4A	4.3ºC-6.1ºC		
			8A	16.1ºC-20.7ºC		
			12A	32.8ºC-45.0ºC		
			16A	58.4ºC-78.7ºC		
			20A	12.9ºC-91.2ºC		
		Au 16P (H)	4A	4.6ºC-5.9ºC		
			8A	18.6ºC-21.2ºC		
			12A	39.2ºC-44.1ºC		
			16A	68.7ºC-77.0ºC		
			20A	97.7ºC-113.4ºC		

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #18	TIN 3P (H)	4A	2.1ºC-3.9ºC		
			8A	10.3ºC-14.1ºC		
			12A	21.5º-26.8ºC		
			16A	38.4ºC-47.4ºC		
		TIN 3P (V)	4A	2.2ºC-2.8ºC		
			8A	10.3ºC-13.1ºC		
			12A	20.7ºC-24.4ºC		
			16A	34.4ºC-41.6ºC		
		TIN 6P (H)	4A	3.9ºC-5.9ºC		
			8A	15.7ºC-19.2ºC		
			12A	33.1ºC-37.4ºC		
			16A	57.3ºC-66.3ºC		
		TIN 6P (V)	4A	2.6ºC-4.7ºC		
			8A	12.2ºC-15.5ºC		
			12A	25.9ºC-32.1ºC		
			16A	48.3ºC-56.4ºC		
		TIN 12P (H)	4A	4.7ºC-6.9ºC		
			8A	18.8ºC-26.1ºC		
			12A	39.6ºC-54.7ºC		
			16A	74.2ºC-100.9ºC		
		Au 16P (H)	4A	6.3ºC-7.8ºC		
			8A	21.5ºC-26.7ºC		
			12A	48.4ºC-57.5ºC		
			16A	88.2ºC-104.4ºC		

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #20	TIN 3P (H)	3A	2.7ºC-4.5ºC		
			6A	8.8ºC-11.8ºC		
			9A	19.6º-25.1ºC		
			12A	33.7ºC-44.0ºC		
		TIN 3P (V)	3A	3.0ºC-3.9ºC		
			6A	7.4ºC-11.3ºC		
			9A	16.1ºC-22.7ºC		
			12A	29.2ºC-39.5ºC		
		TIN 6P (H)	3A	3.0ºC-3.9ºC		
			6A	13.0ºC-15.8ºC		
			9A	28.4ºC-33.9ºC		
			12A	48.7ºC-57.7ºC		
		TIN 6P (V)	3A	2.9ºC-4.4ºC		
			6A	10.4ºC-13.7ºC		
			9A	23.1ºC-30.1ºC		
			12A	38.9ºC-52.0ºC		
		TIN 12P (H)	3A	5.3ºC-6.1ºC		
			6A	17.8ºC-21.8ºC		
			9A	35.7ºC-45.2ºC		
			12A	62.6ºC-77.4ºC		
		Au 16P (H)	3A	5.6ºC-6.4ºC		
			6A	19.7ºC-22.7ºC		
			9A	40.0ºC-47.4ºC		
			12A	70.6ºC-83.3ºC		

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #22	TIN 3P (H)	3A	2.9ºC-4.3ºC		
			6A	12.8ºC-15.2ºC		
			9A	28.7º-34.0ºC		
			12A	52.9ºC-61.5ºC		
		TIN 3P (V)	3A	3.4ºC-3.9ºC		
			6A	12.0ºC-15.1ºC		
			9A	26.1ºC-31.4ºC		
			12A	46.6ºC-56.6ºC		
		TIN 6P (H)	3A	5.2ºC-6.4ºC		
			6A	17.9ºC-22.7ºC		
			9A	41.5ºC-52.3ºC		
			12A	75.4ºC-89.8ºC		
		TIN 6P (V)	3A	4.9ºC-5.9ºC		
			6A	17.4ºC-20.1ºC		
			9A	38.1ºC-43.5ºC		
			12A	64.3ºC-75.0ºC		
		TIN 12P (H)	3A	7.0ºC-8.7ºC		
			6A	25.5ºC-32.2ºC		
			9A	55.5ºC-68.5ºC		
			12A	99.8ºC-122.6ºC		
		Au 16P (H)	3A	7.5ºC-8.6ºC		
			6A	24.9ºC-29.0ºC		
			9A	51.9ºC-60.2ºC		
			12A	99.1ºC-111.7ºC		

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #24	TIN 3P (H)	3A	5.1ºC-6.1ºC		
			6A	17.4ºC-21.8ºC		
			9A	38.1º-26.7ºC		
			12A	-		
		TIN 3P (V)	3A	4.1ºC-4.6ºC		
			6A	15.3ºC-18.8ºC		
			9A	32.3ºC-40.6ºC		
			12A	-		
		TIN 6P (H)	3A	7.6ºC-8.9ºC		
			6A	27.9ºC-33.1ºC		
			9A	60.1ºC-71.2ºC		
			12A	-		
		TIN 6P (V)	3A	6.3ºC-7.9ºC		
			6A	22.5ºC-28.1ºC		
			9A	51.6ºC-61.3ºC		
			12A	-		
		TIN 12P (H)	3A	9.4ºC-11.6ºC		
			6A	36.2ºC-45.4ºC		
			9A	77.1ºC-98.6ºC		
			12A	-		
		Au 16P (H)	3A	9.4ºC-11.6ºC		
			6A	39.1ºC-45.6ºC		
			9A	86.9ºC-96.4ºC		
			12A	-		

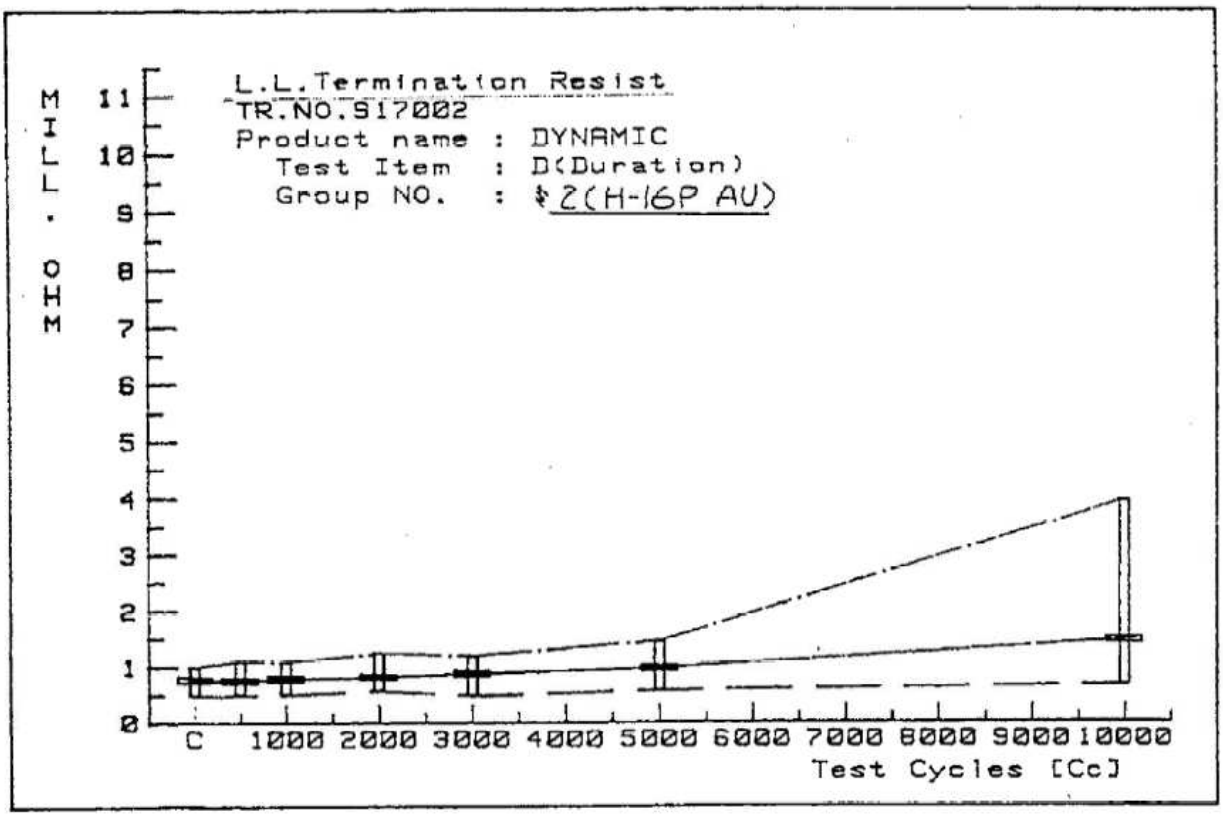
Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #26	TIN 3P (H)	3A	7.1ºC-8.6ºC		
			6A	27.0ºC-32.0ºC		
			9A	59.9º-75.2ºC		
		TIN 3P (V)	3A	6.6ºC-8.2ºC		
			6A	21.5ºC-27.5ºC		
			9A	48.2ºC-59.0ºC		
		TIN 6P (H)	3A	10.0ºC-11.7ºC		
			6A	37.6ºC-43.5ºC		
			9A	82.0ºC-95.4ºC		
		TIN 6P (V)	3A	8.5ºC-11.1ºC		
			6A	28.4ºC-35.7ºC		
			9A	65.8ºC-79.8ºC		
		TIN 12P (H)	3A	13.0ºC-16.2ºC		
			6A	46.6ºC-57.6ºC		
			9A	104.2ºC-133.0ºC		
		Au 16P (H)	3A	13.6ºC-17.0ºC		
			6A	48.6ºC-57.8ºC		
			9A	112.7ºC-137.9ºC		

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #28	TIN 3P (H)	4A	15.9ºC-18.7ºC		
			6A	35.9ºC-44.3ºC		
			8A	61.7º-75.9ºC		
		TIN 3P (V)	4A	14.1ºC-17.3ºC		
			6A	30.4ºC-38.3ºC		
			8A	53.1ºC-69.3ºC		
		TIN 6P (H)	4A	18.9ºC-24.5ºC		
			6A	43.5ºC-55.8ºC		
			8A	83.1ºC-97.2ºC		
		TIN 6P (V)	4A	20.8ºC-24.8ºC		
			6A	46.1ºC-54.6ºC		
			8A	78.8ºC-100.2ºC		
		TIN 12P (H)	4A	29.0ºC-34.5ºC		
			6A	66.3ºC-81.2ºC		
			8A	116.5ºC-159.8ºC		
		Au 16P (H)	4A	35.3ºC-39.6ºC		
			6A	85.9ºC-95.8ºC		

Test group	Type of test	Test item		Result		Spec
				Measurement	Judgement	
5	Temperature rising AWG #14	1P	10A	7.4ºC		
			15A	16.8ºC		
			20A	29.9ºC		
		3P	10A	12.1ºC		
			15A	26.8ºC		
			20A	45.5ºC		
		6P	10A	15.2ºC-15.7ºC		
			15A	29.6ºC-33.5ºC		
			20A	50.0ºC-57.0ºC		
		10P	10A	14.7ºC-16.1ºC		
			15A	31.7ºC-36.1ºC		
			20A	53.5ºC-60.8ºC		
		20P	10A	18.1ºC-18.7ºC		
			15A	36.9ºC-38.5ºC		
			20A	62.8ºC-65.2ºC		

試験グループ1 Test group 1: Low level termination resistance

ローレベル総合抵抗(グループ1繰返し挿抜) Group 1: Repeated mating and unmating

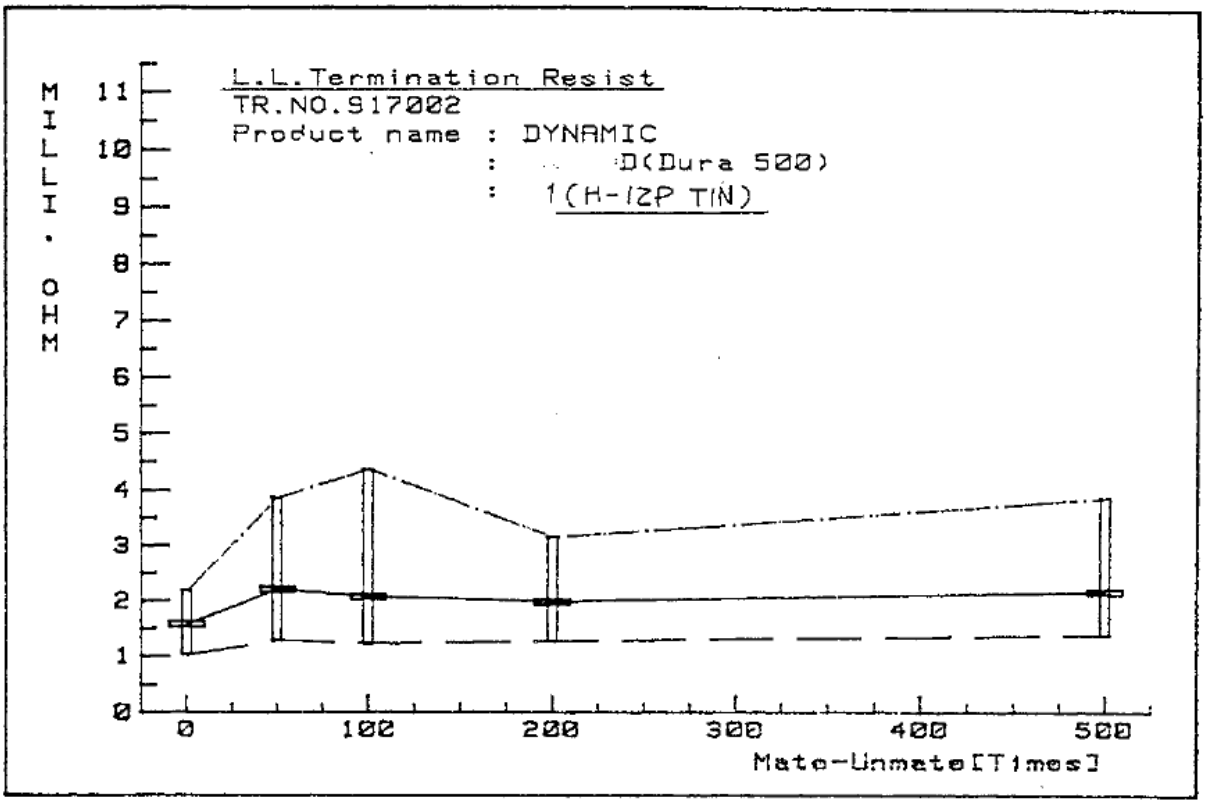


試験グループ1

ローレベル総合抵抗(繰返し挿抜)

Test group 1:

Low level termination resistance (mating and unmating)

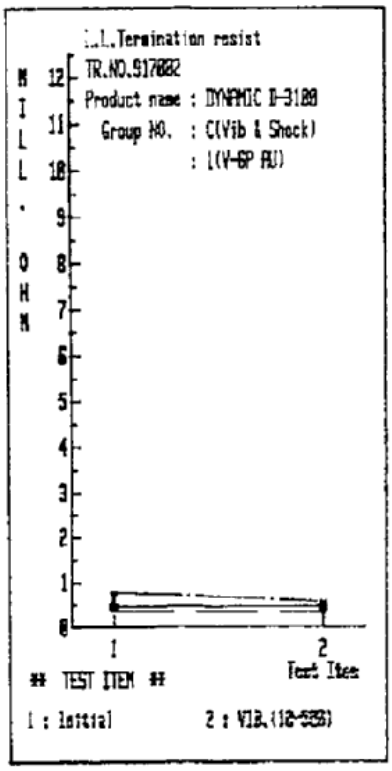


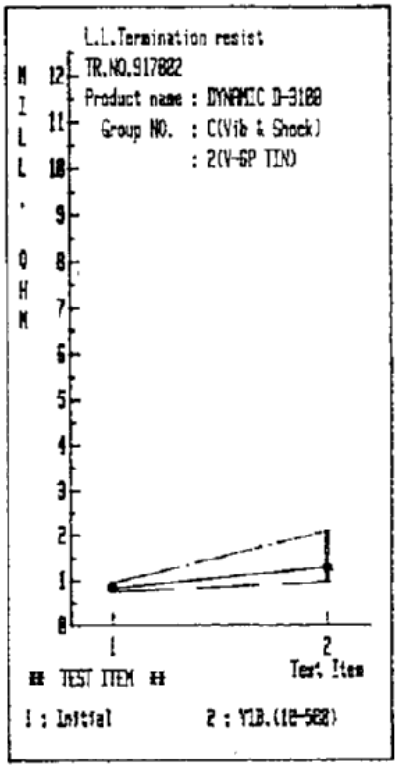
試験グループ 2

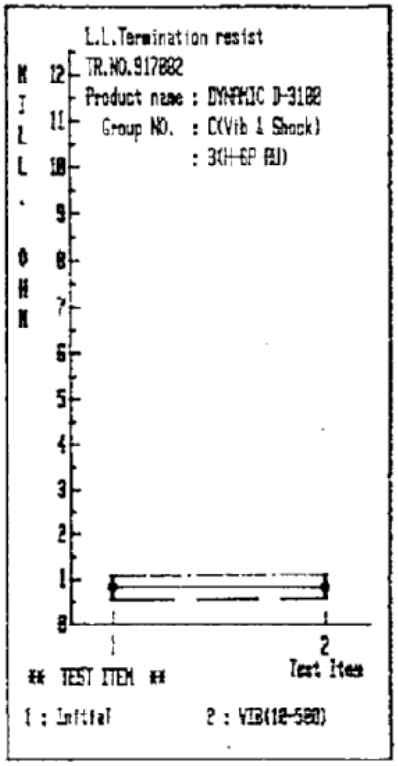
ローレベル総合抵抗(振動・衝撃)

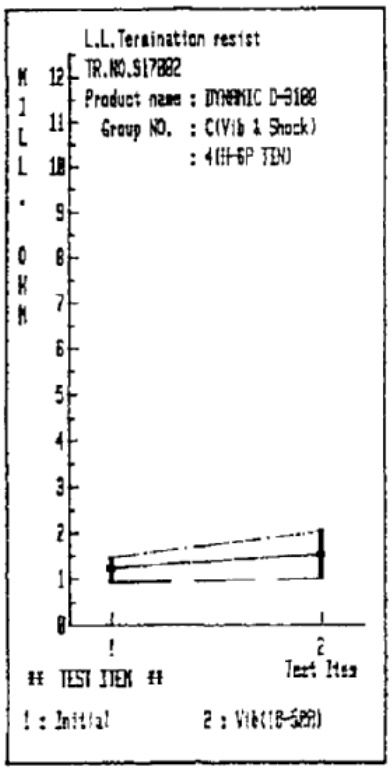
Test group 2:

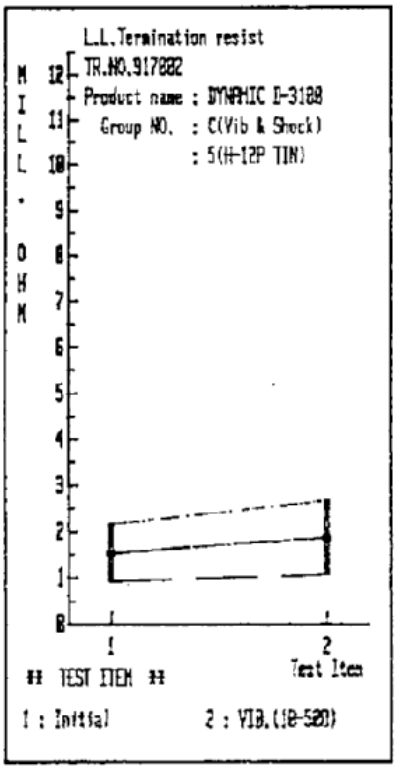
Low level termination resistance (Vibration and shock)

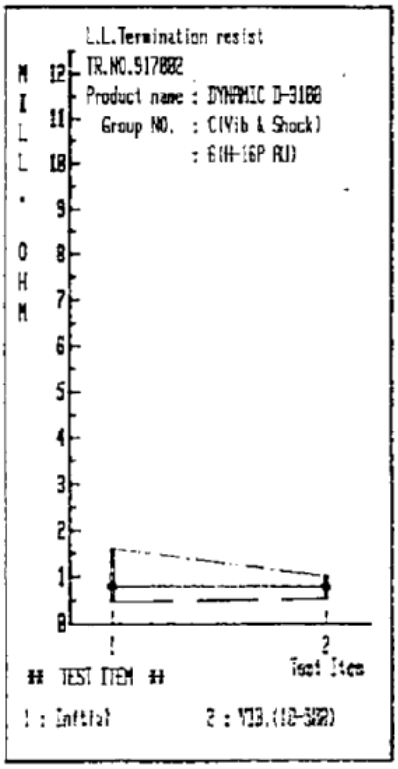






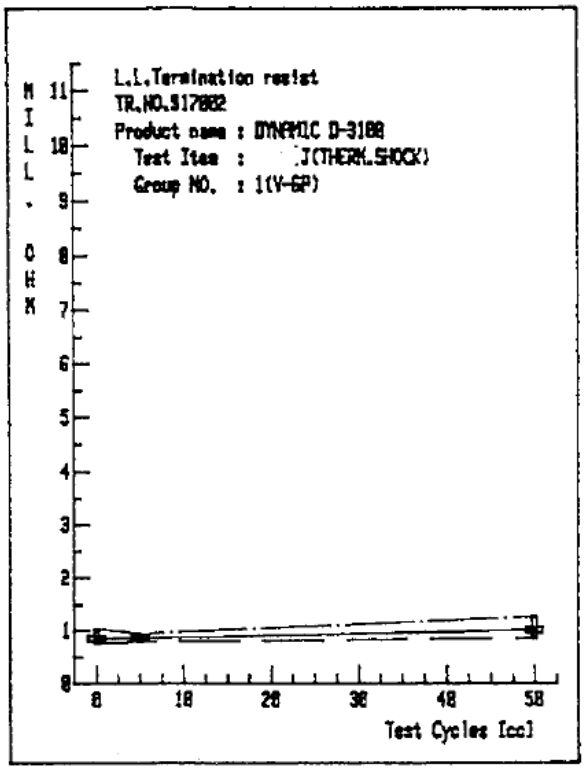






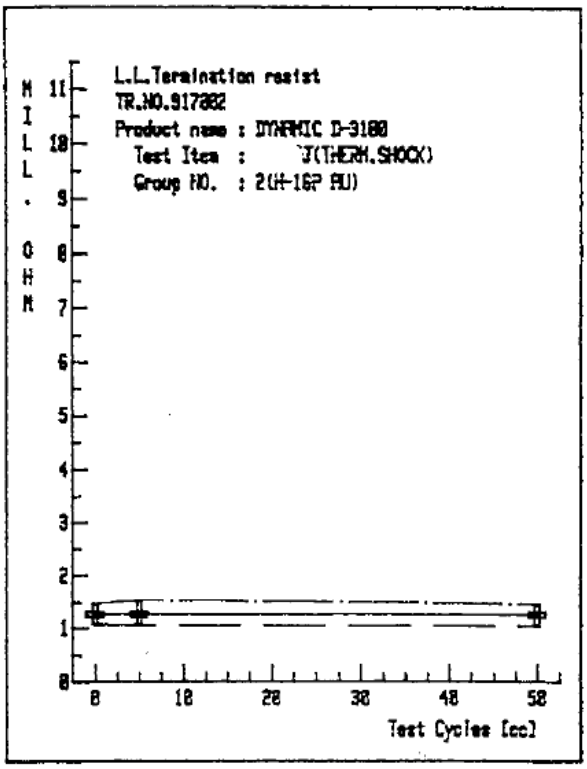
試験グループ6

ローレベル総合抵抗(熱衝撃)



Test group 6:

Low level termination resistance (thermal shock)

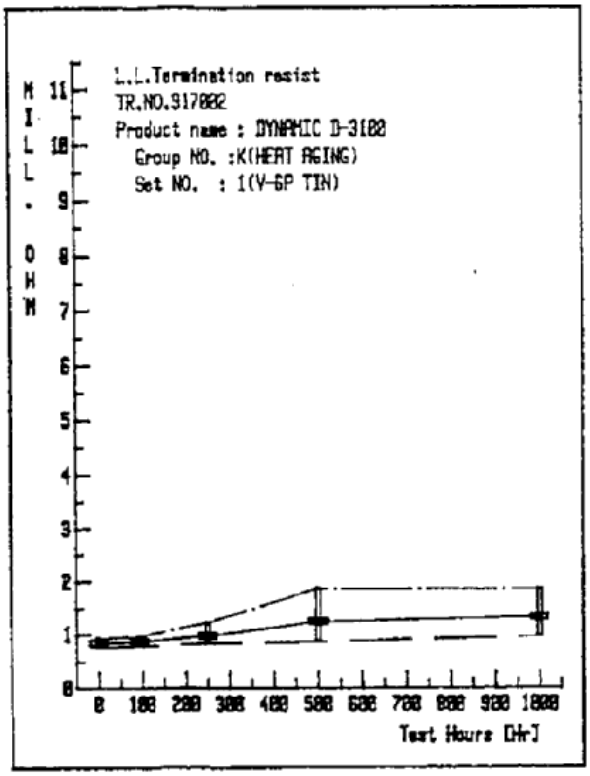


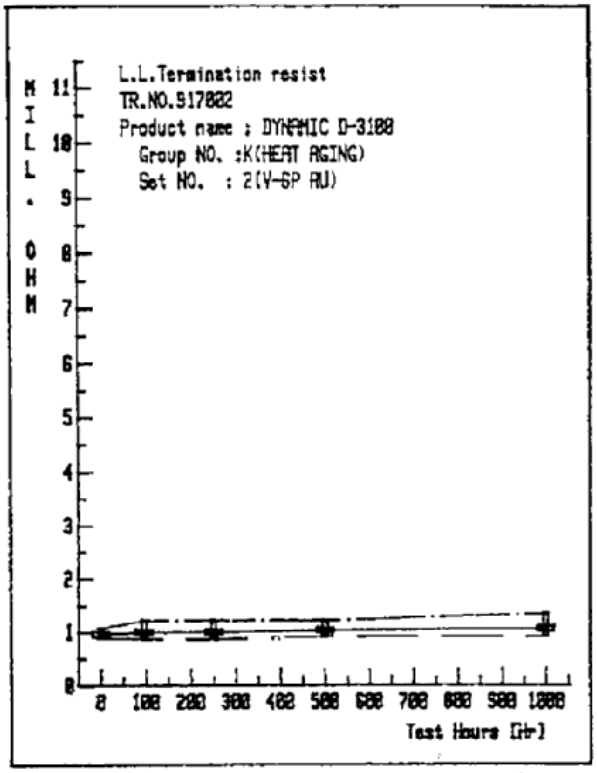
試験グループ8

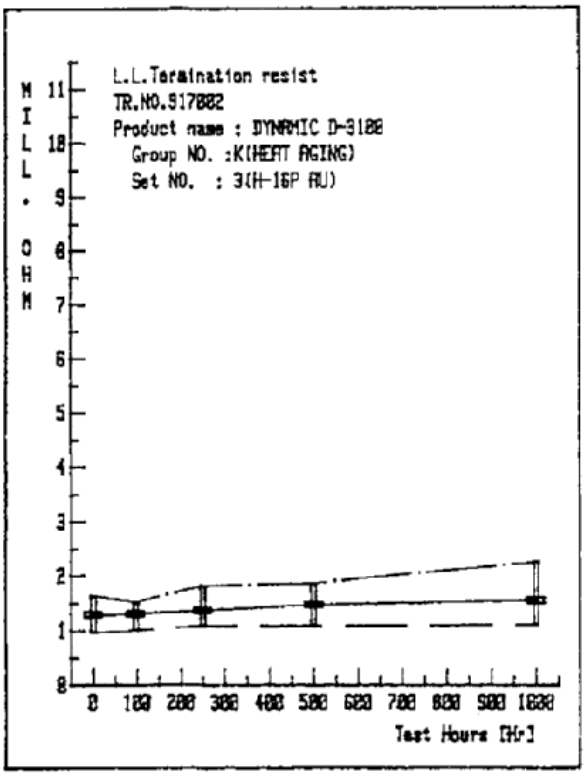
コーレベル総合抵抗(高温寿命)

Test group 8:

Low level termination resistance (high temperature life)

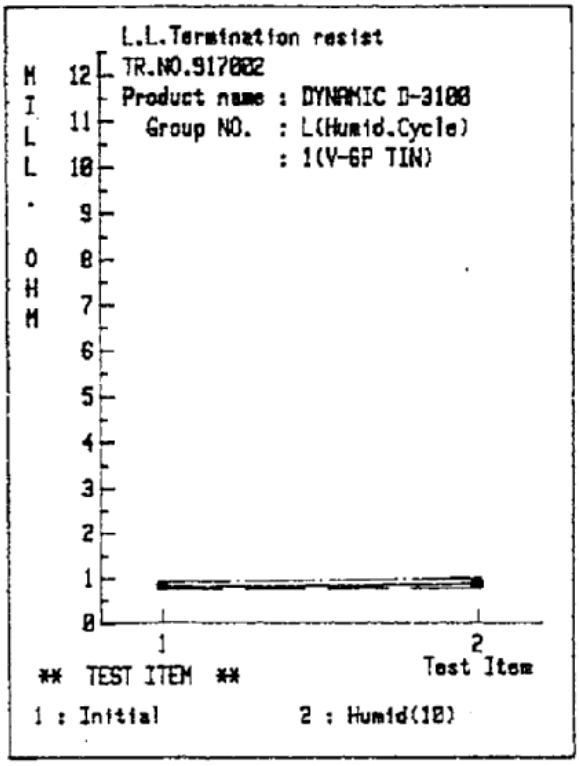


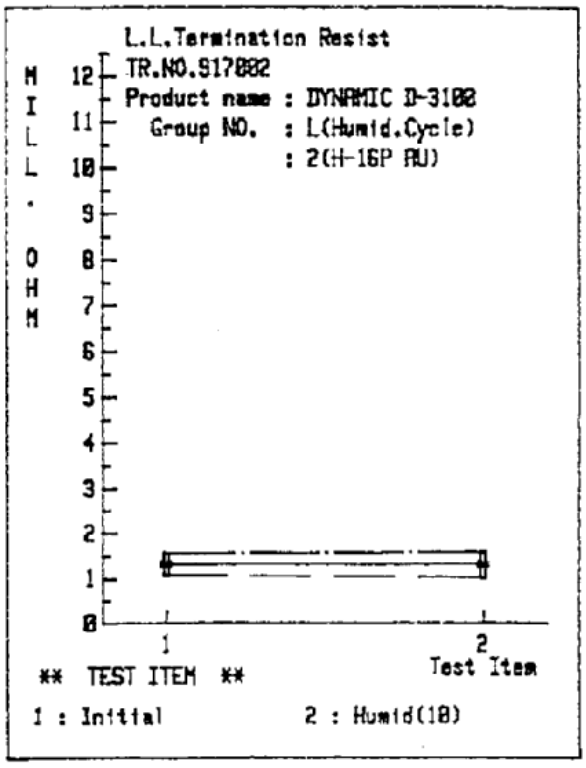


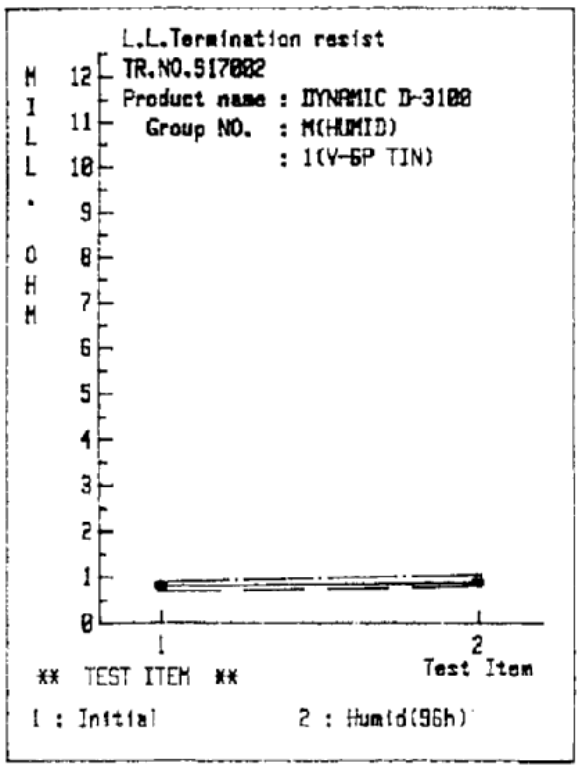


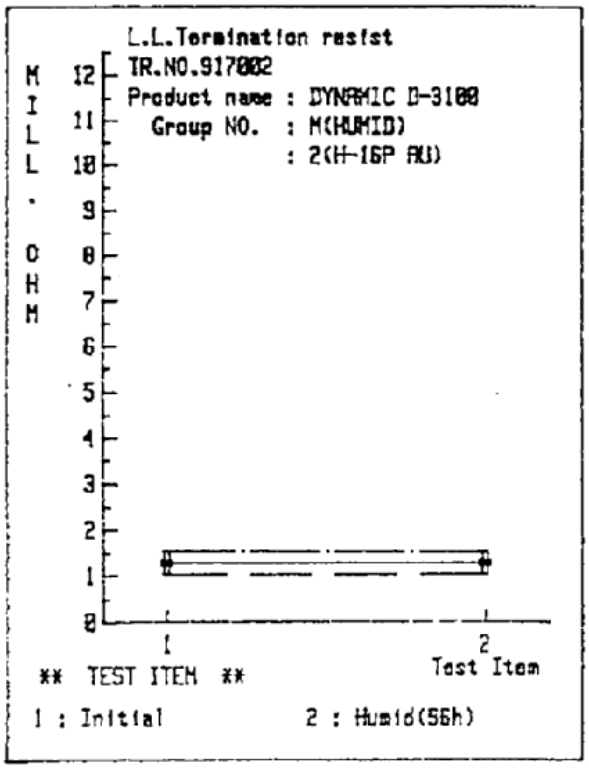
試験グループ 3　試験グループ 4
ローレベル総合抵抗(:耐湿サイクリング:耐湿コンスタント)

Test groups 3 and 4:
Low level termination resistance (humidity resistance, steady state)







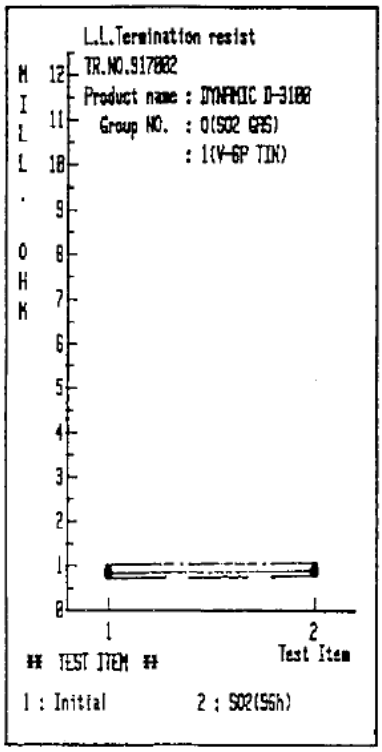


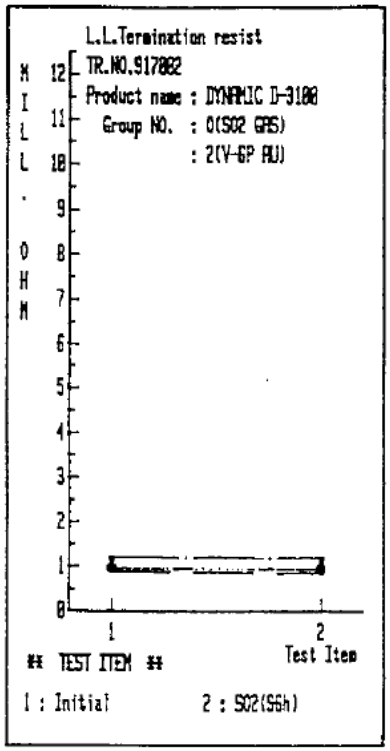
試験グループ7

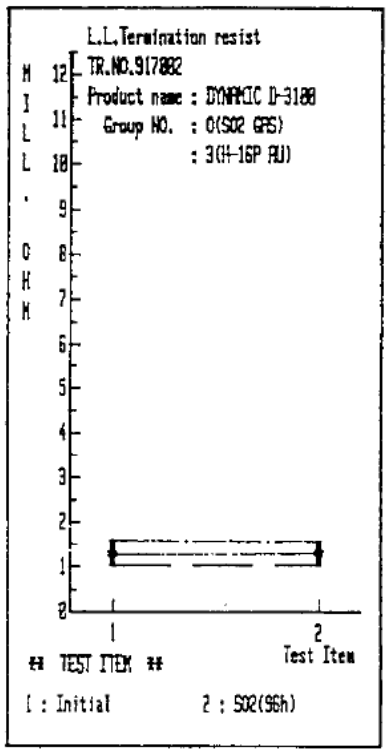
ローレベル総合抵抗(SO_2ガス)

Test group 7:

Low level termination resistance (SO_2 gas)

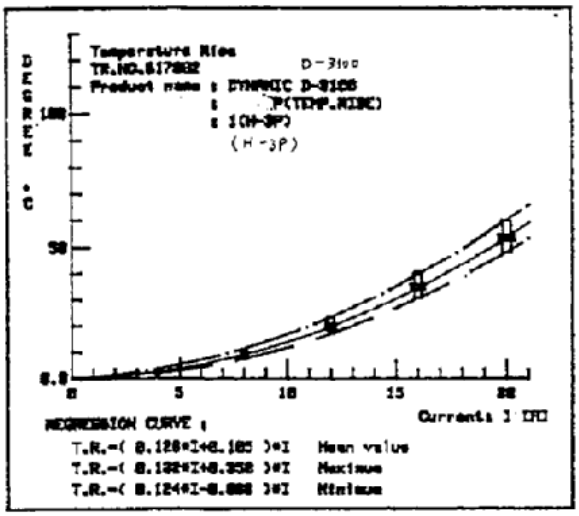


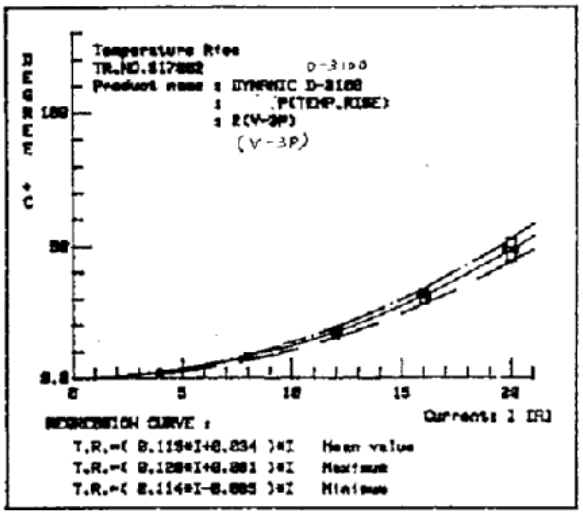


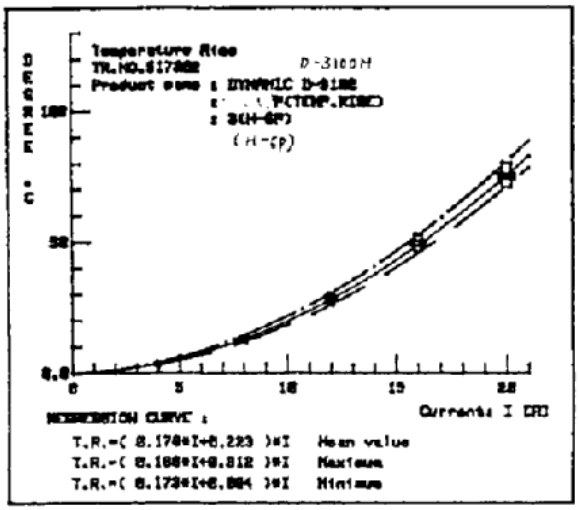


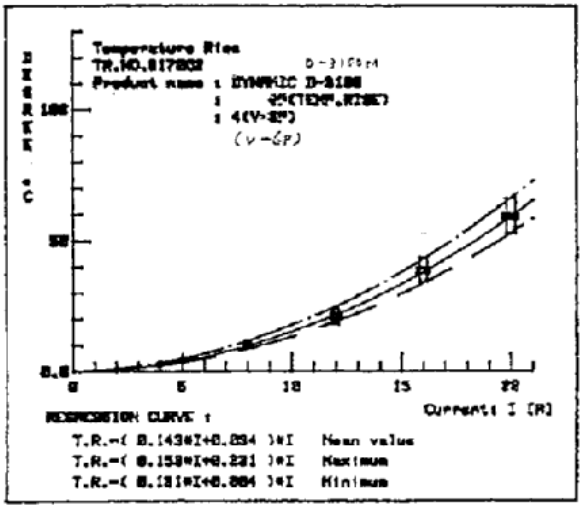
試験グループ5
温度上昇(AWG＃16)
HDR 3P～12P　すずめっき
16P 金めっき
REC 3P～12P　すずめっき
16P 金めっき

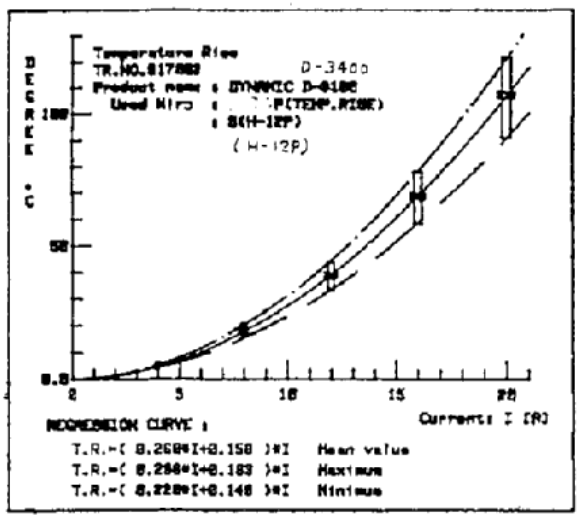
Test group 5:
Temperature rising (AWG #16)
HDR 3P～12P Tin plating
16P Gold plating
REC 3P～12P Tin plating
16P Gold plating

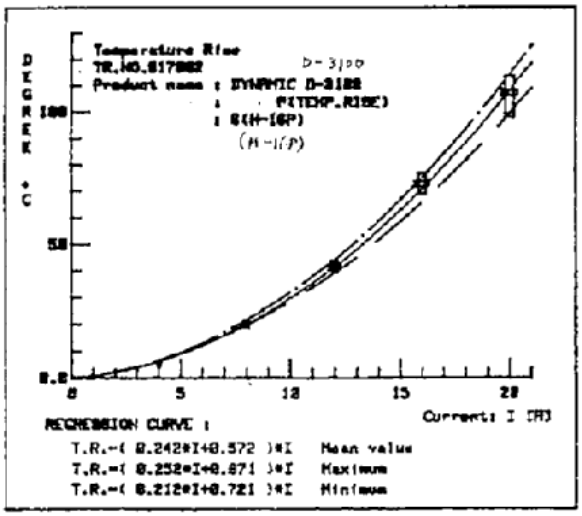








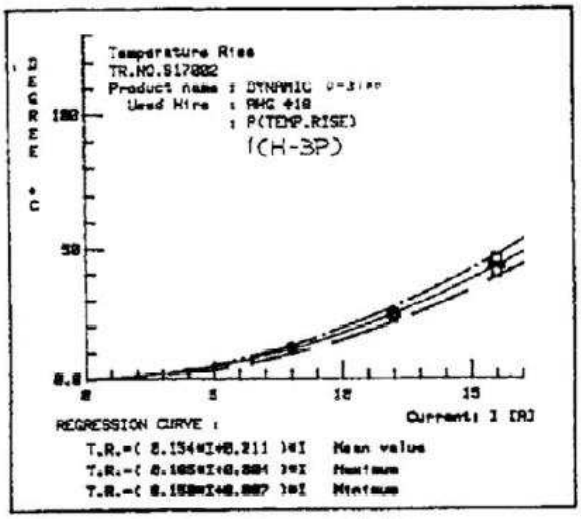


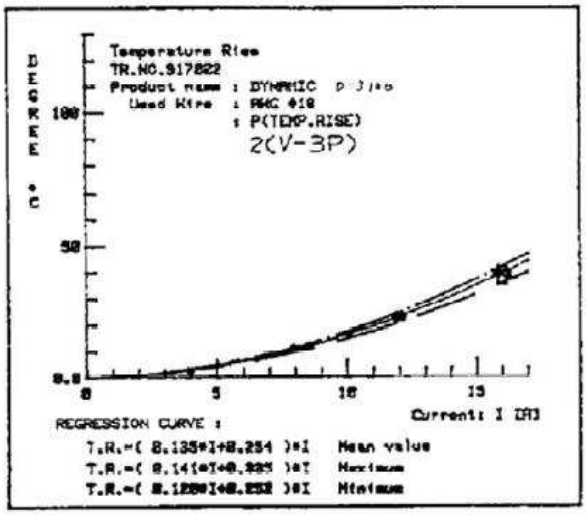


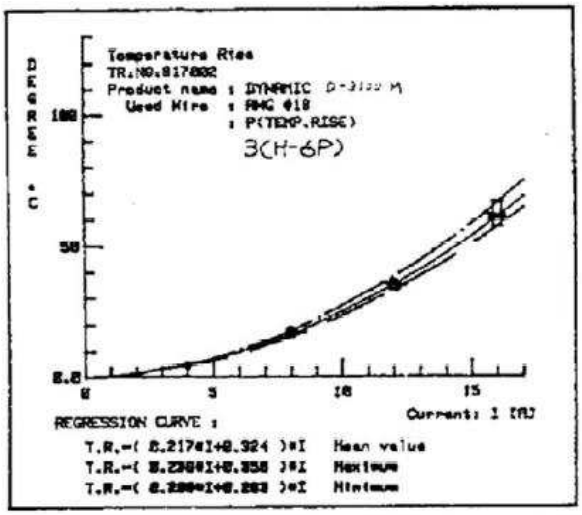
試験グループ5
温度上昇(AWG＃18)
HDR 3P～12P すずめっき
16P 金めっき
REC 3P～12P すずめっき
16P 金めっき

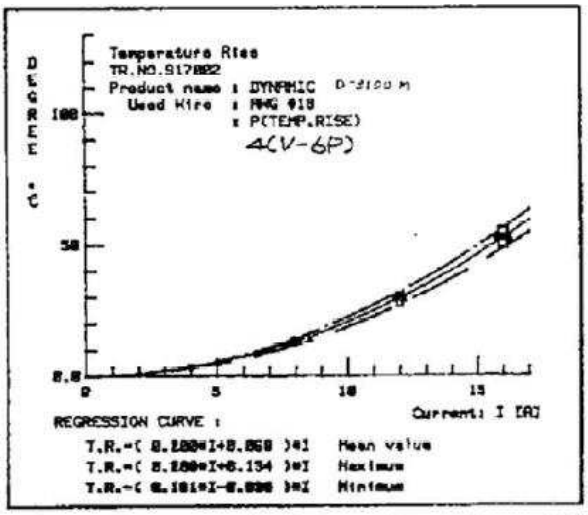
Test group 5:
Temperature rising (AWG #18)

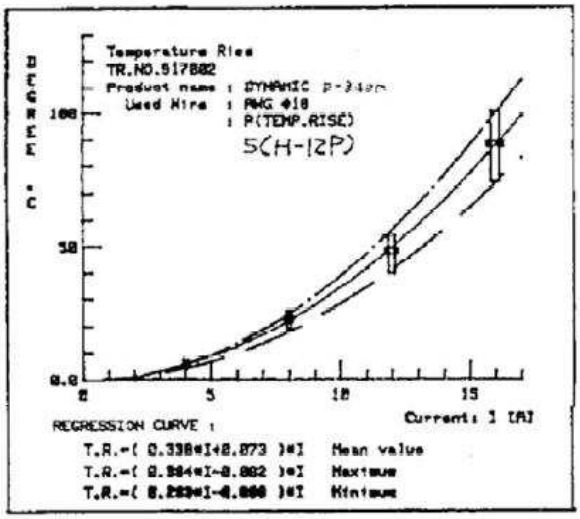
HDR	3P～12P	Tin plating
	16P	Gold plating
REC	3P～12P	Tin plating
	16P	Gold plating

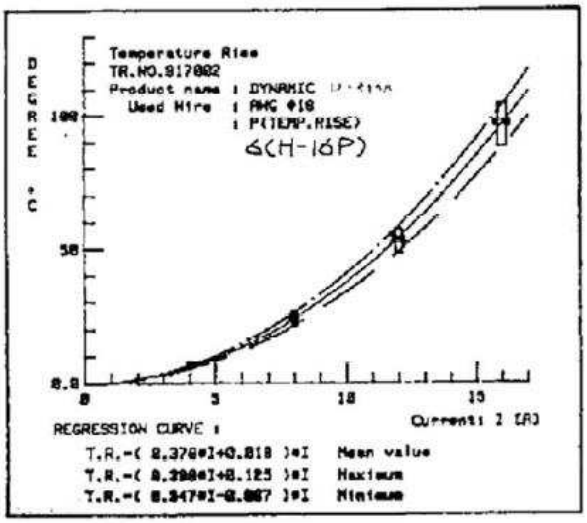








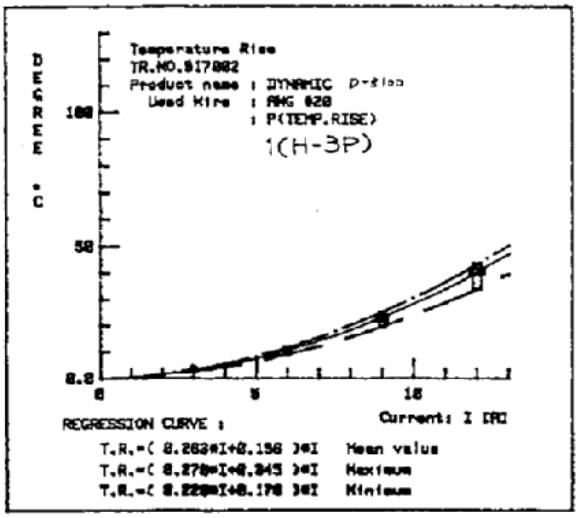


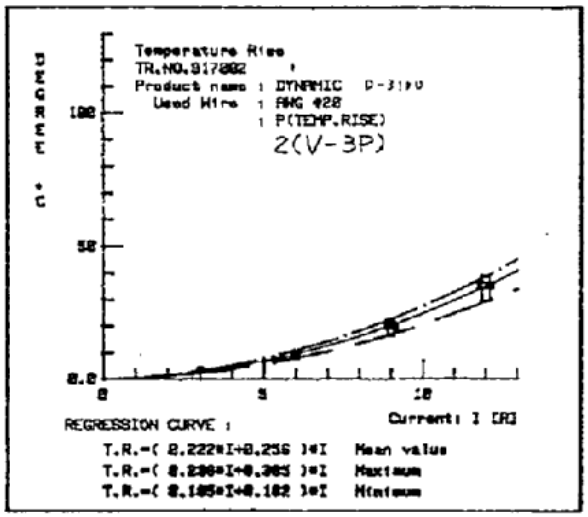


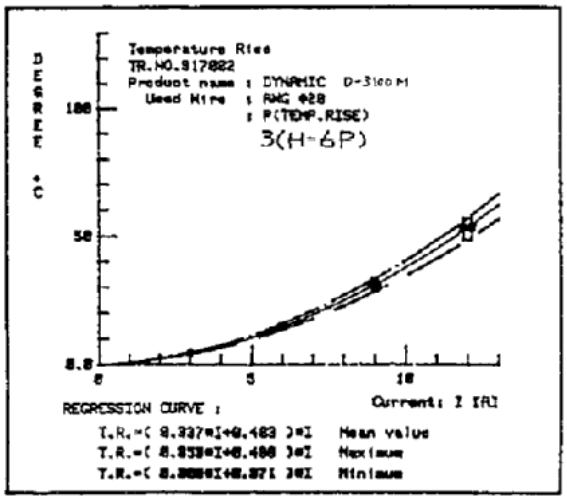
試験グループ5
温度上昇(AWG＃20)
HDR 3P～12P すずめっき
16P 金めっき
REC 3P～12P すずめっき
16P 金めっき

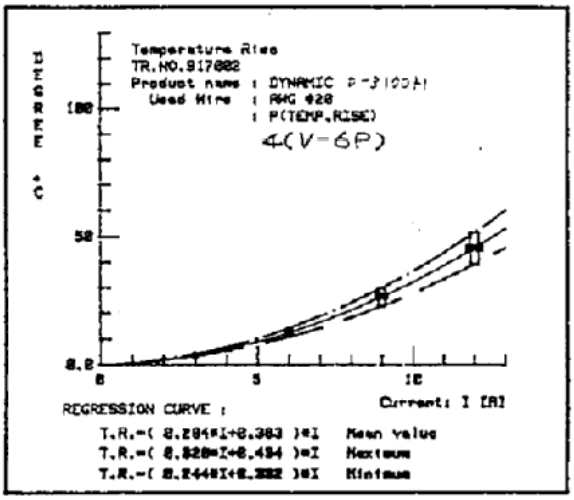
Test group 5:
Temperature rising (AWG #20)

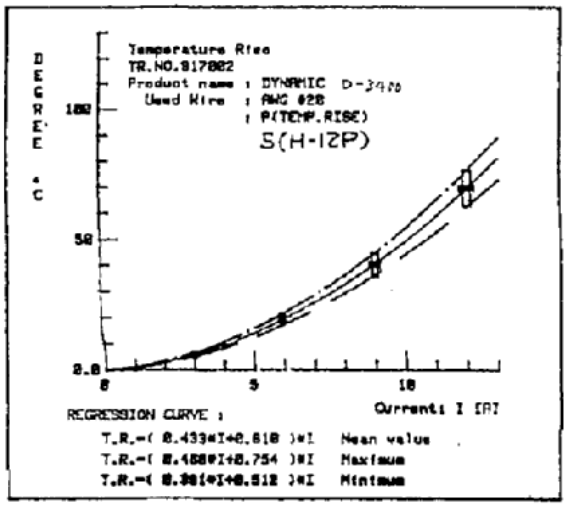
HDR	3P～12P	Tin plating
	16P	Gold plating
REC	3P～12P	Tin plating
	16P	Gold plating

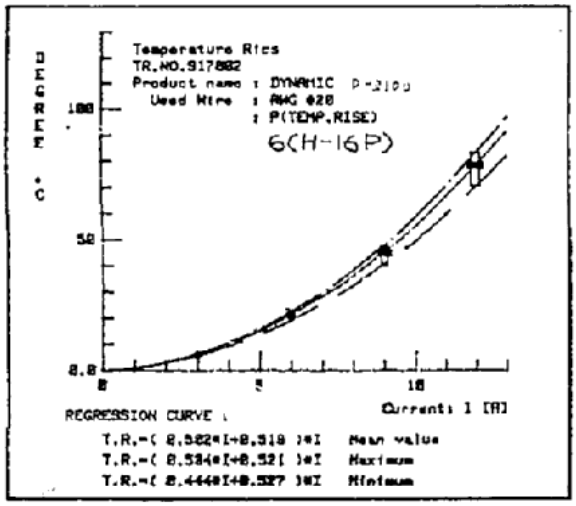






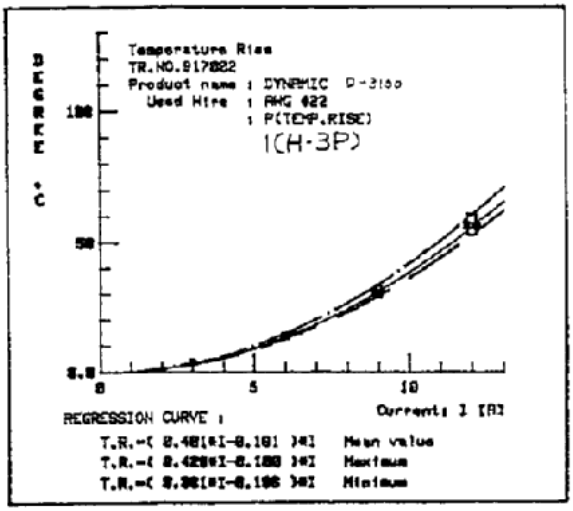


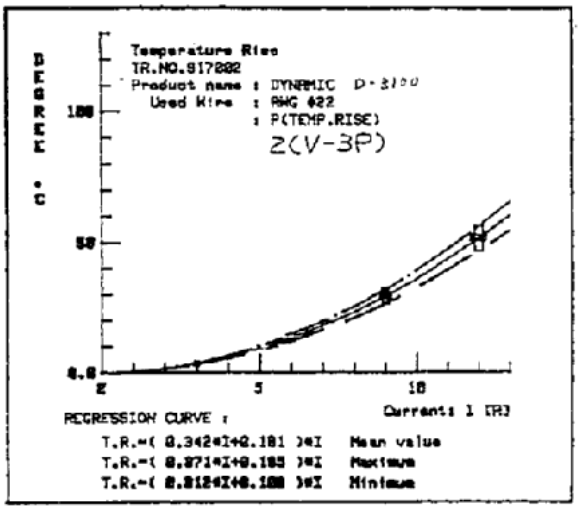


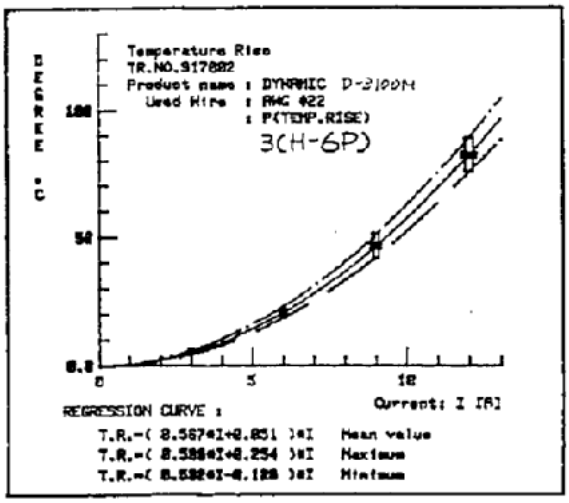


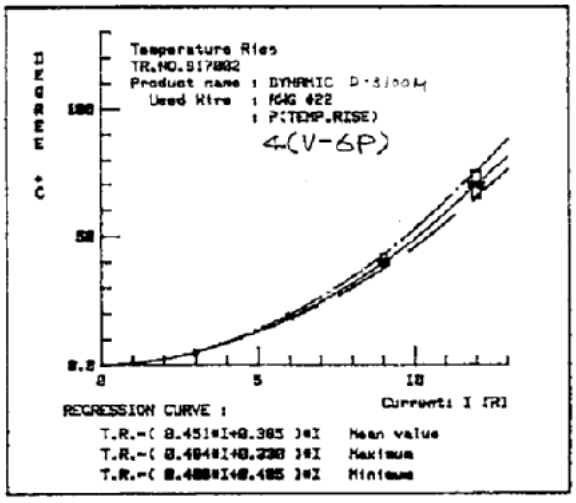
試験グループ5
温度上昇(AWG＃22)
HDR 3P～12P　すずめっき
16P 金めっき
REC 金めっき

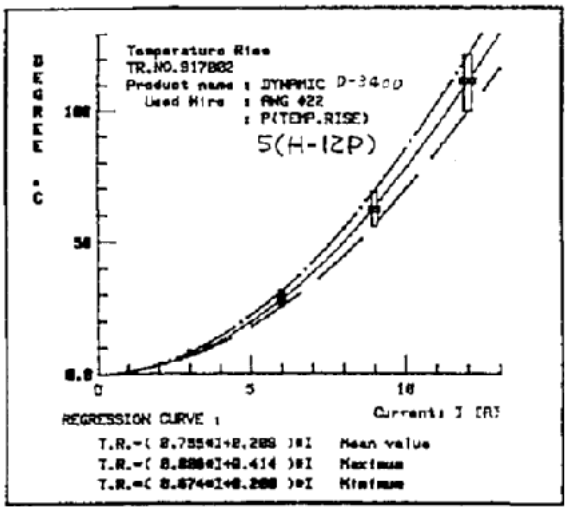
Test group 5:
Temperature rising (AWG #22)
HDR 3P～12P Tin plating
16P Gold plating
REC Gold plating

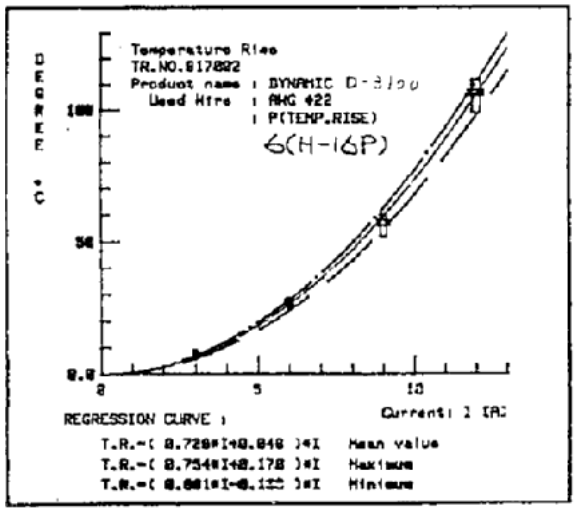






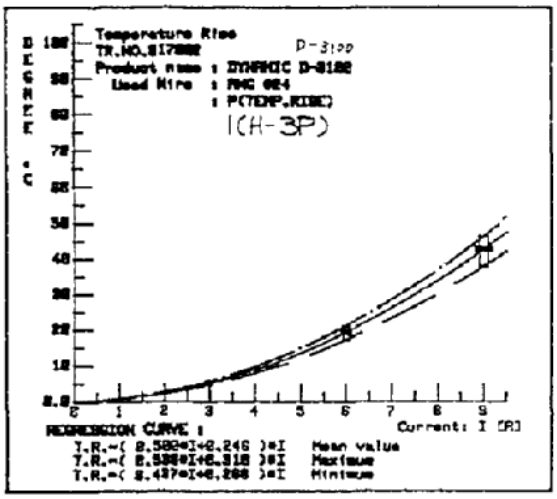


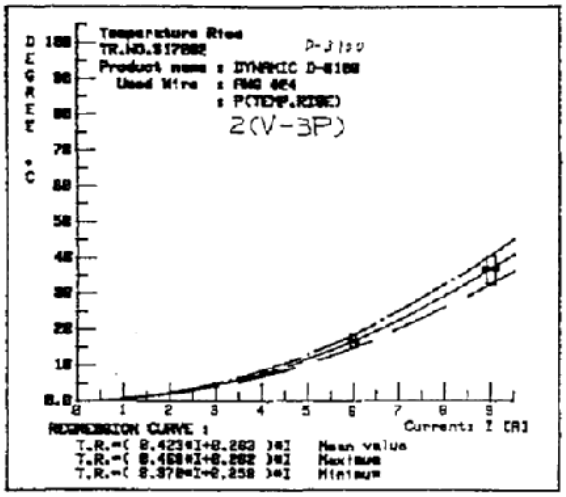


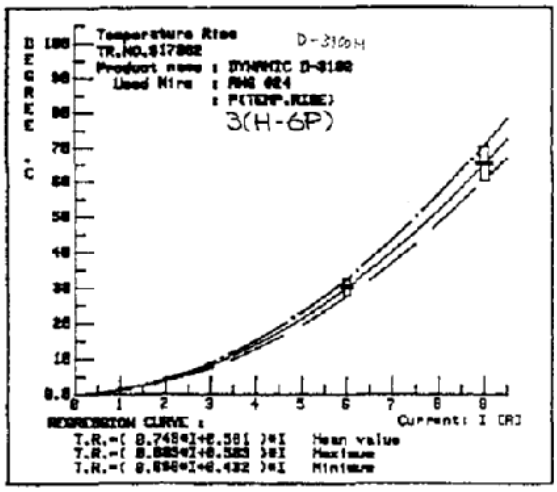


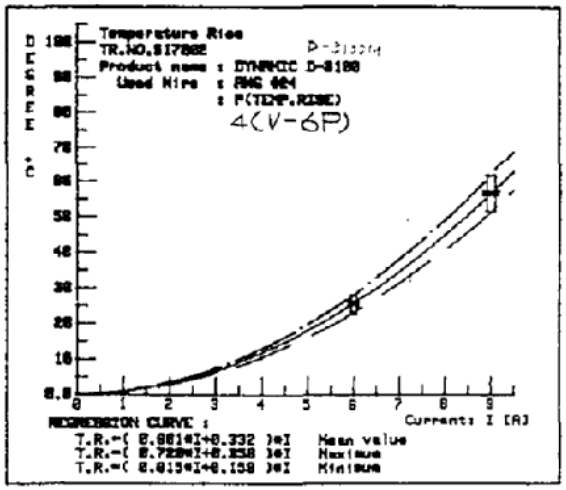
試験グループ5
温度上昇(AWG＃24)
HDR 3P～12P　すずめっき
16P 金めっき
REC 金めっき

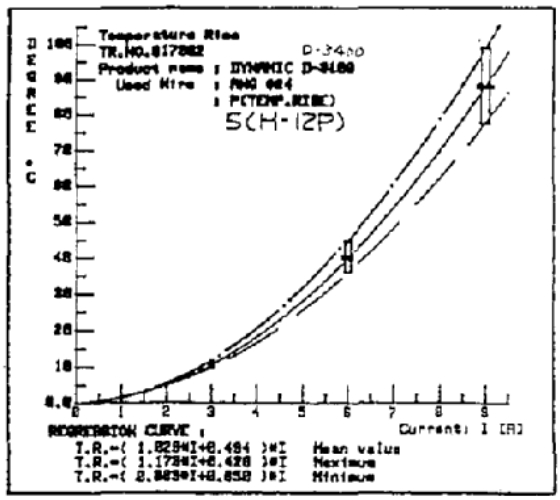
Test Group 5
Temperature rising (AWG #24)
HDR 3P～12P Tin plating
16P Gold plating
REC Gold plating

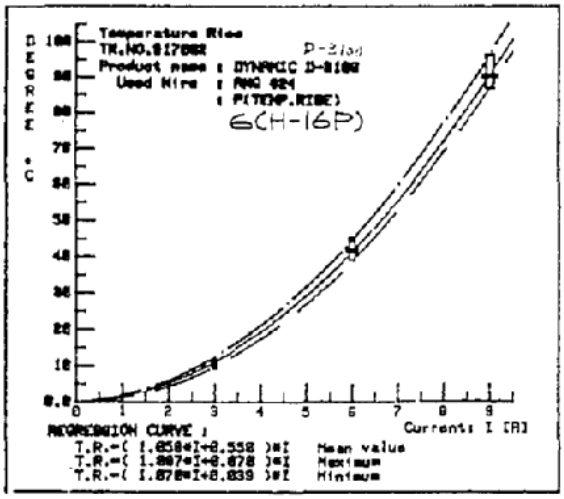






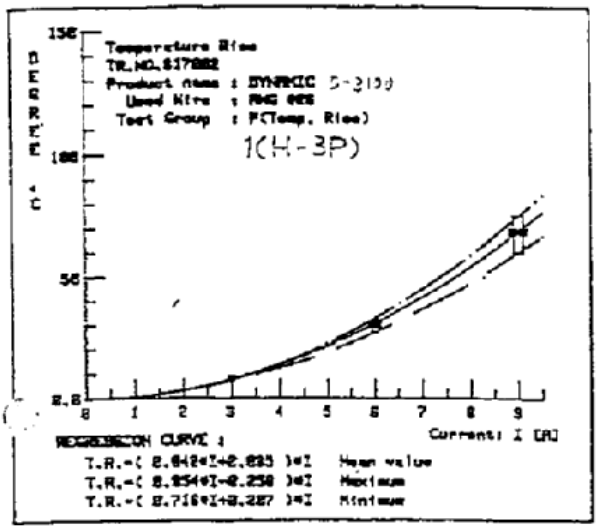


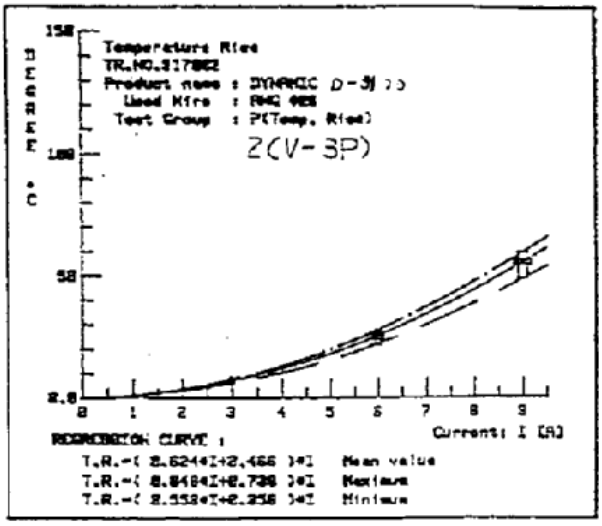


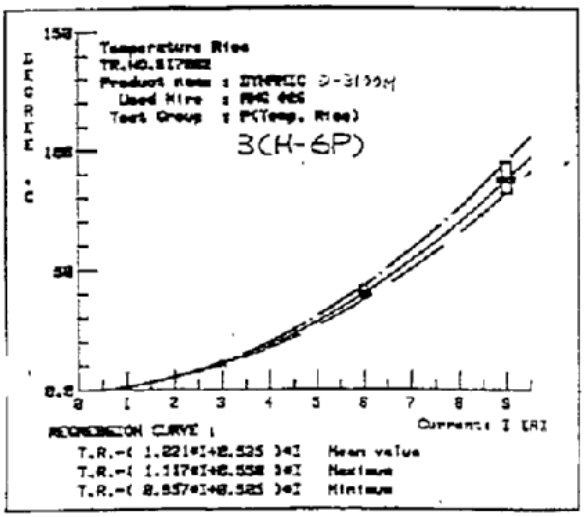


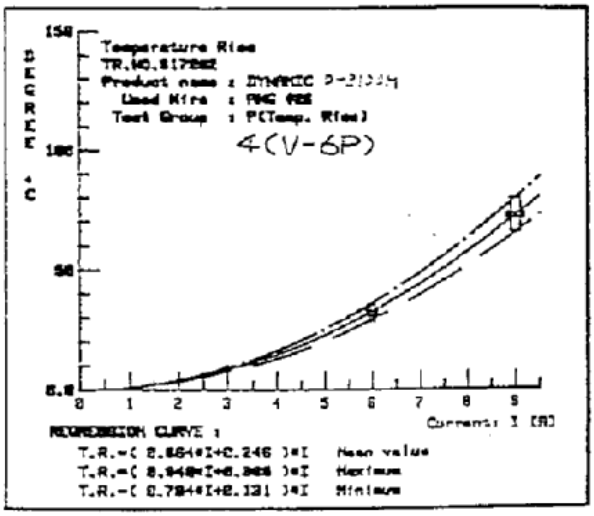
試験グループ5
温度上昇(AWG＃26)
HDR 3P～12P すずめっき
16P 金めっき
REC 金めっき

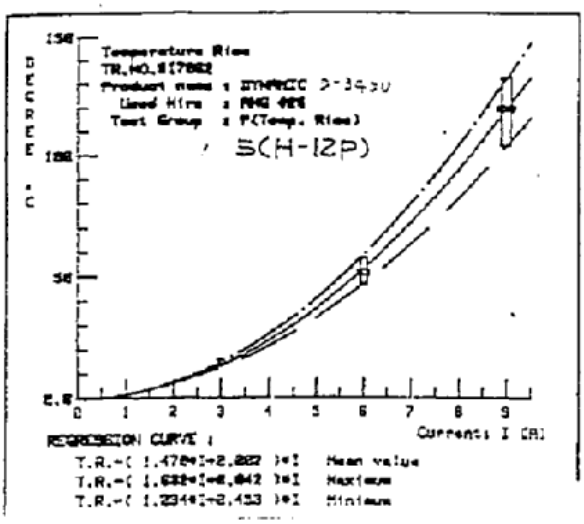
Test group 5:
Temperature rising (AWG #26)
HDR 3P～12P Tin plating
16P Gold plating
REC Gold plating

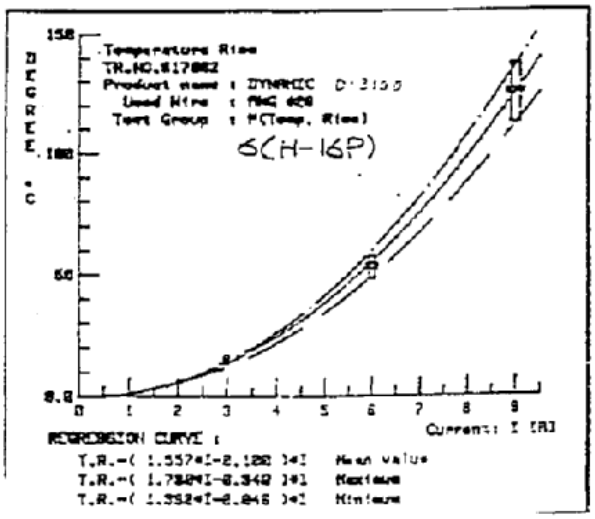






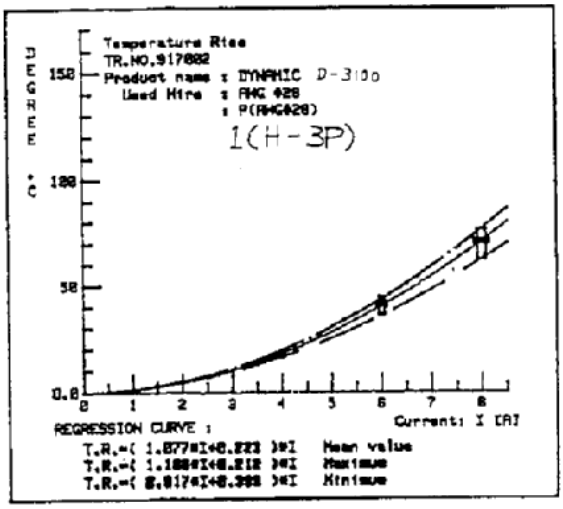


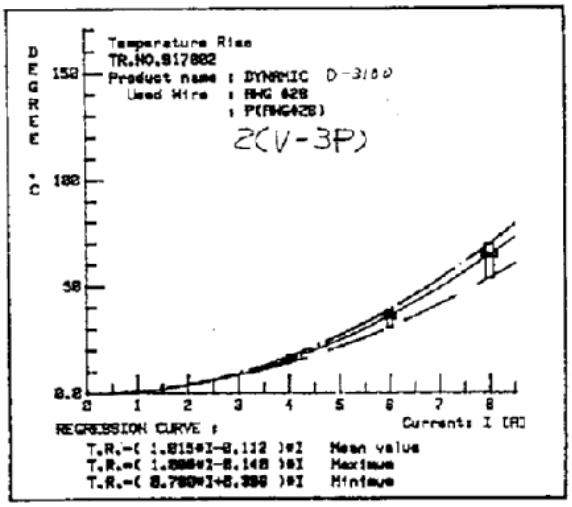


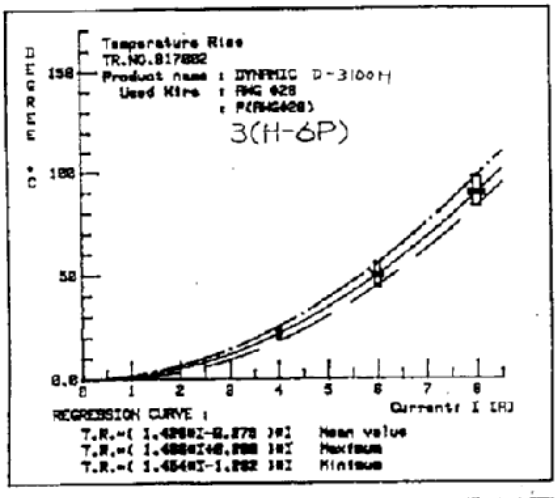


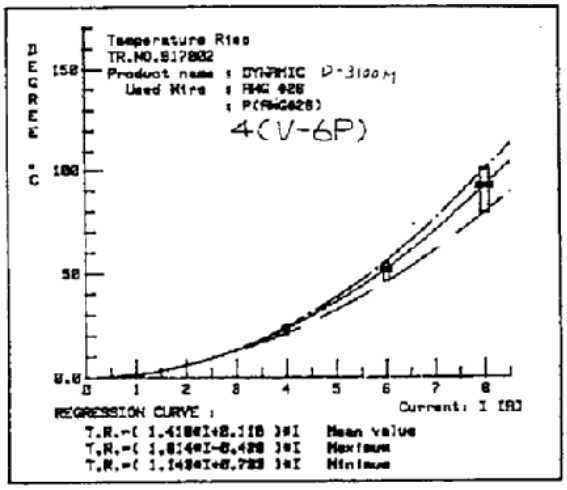
試験グループ5
温度上昇(AWG＃28)
HDR 3P～12P すずめっき
16P 金めっき
REC 金めっき

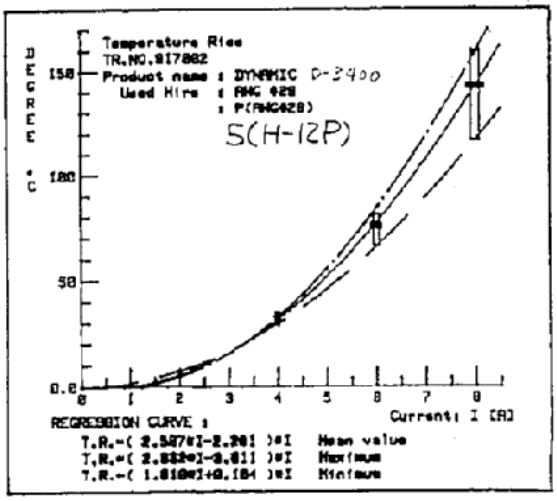
Test group 5:
Temperature rising (AWG #28)
HDR 3P～12P Tin plating
16P Gold plating
REC Gold plating

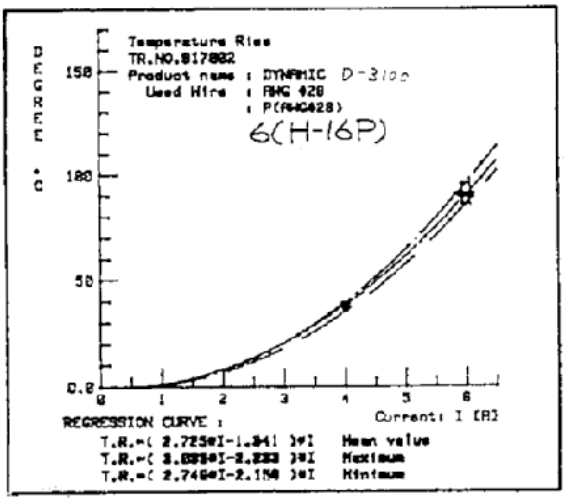






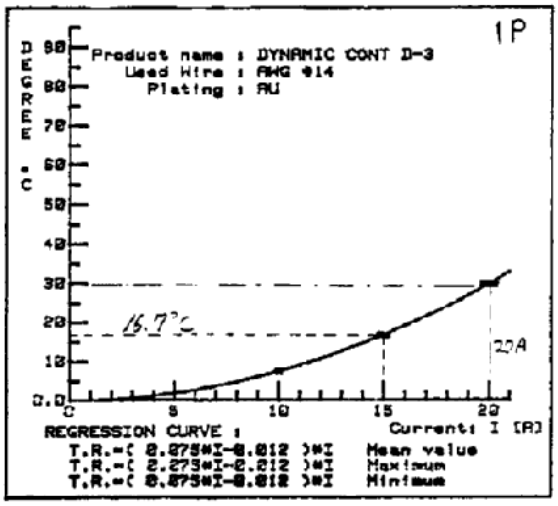


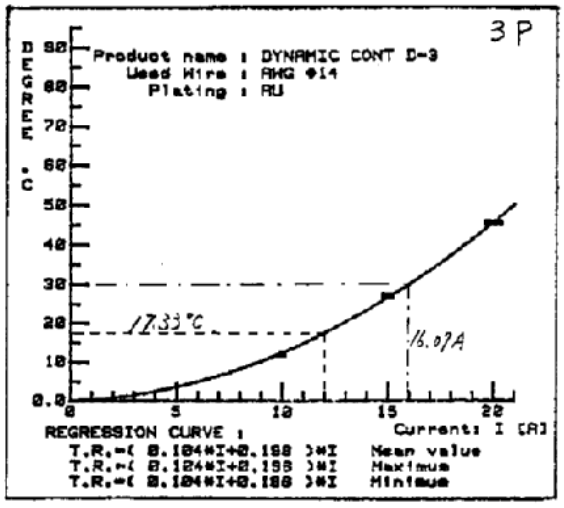


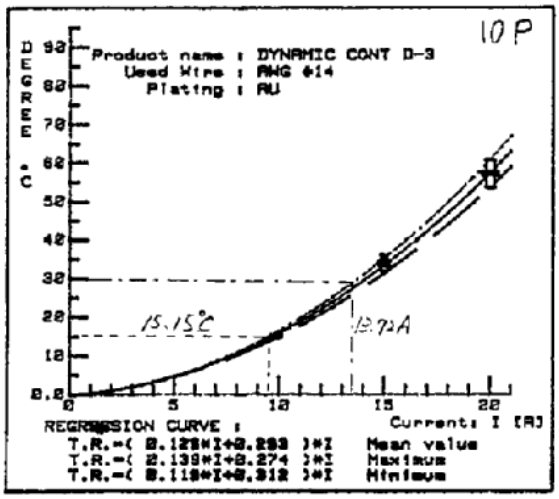


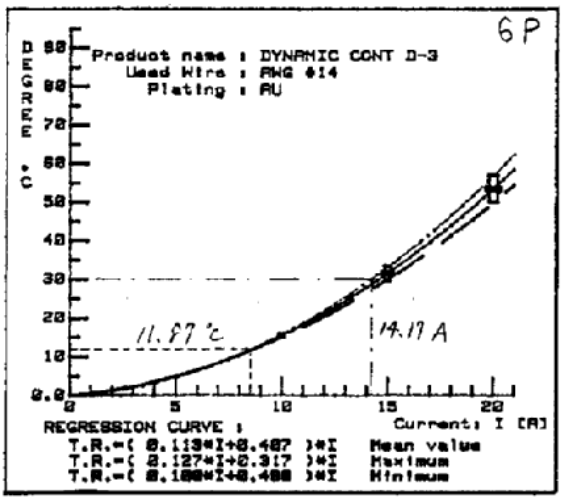
試験グループ5
温度上昇(AWG＃14)
0.37μ金めっき

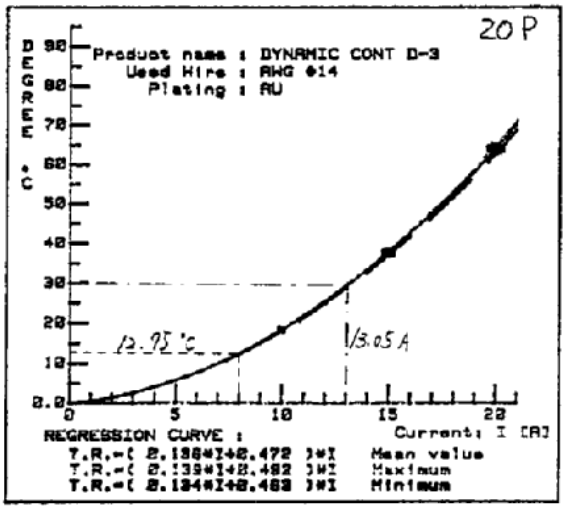
Test group 5:
Temperature rising (AWG #14)
0.37μ Gold plating











Wire: AWG #14 **Unit: A**

Position	Measurement	Spec	Judgement
1	20	15	Accept
3	16.07	12	Accept
6	14.17	9.5	Accept
10	13.72	8.5	Accept
20	13.06	8	Accept