

Appendix I

GLM Results for the Accelerated Live, Vibration, Mechanical Shock, and Branch Water Tests

Table I.1 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HCLV PTH	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	7.133	-0.030	-0.040	-0.032	-0.044	-0.012
Benzimidazole Immersion Ag Immersion Au/Pd		0.092				
Parylene Silicone Urethane					0.139	-0.098
Flux			0.089			
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene		-0.161		-0.176		
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone		-0.278				
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane			0.288			
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux	-0.071			0.142		
Parylene*Flux Silicone*Flux Urethane*Flux		-0.099 0.161	-0.141		0.095	0.168
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux				-0.216 0.24		
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux			-0.41			
Model R ²	2.9%	16.6%	10.7%	14.4%	10.8%	4.7%
Standard Deviation	0.135	0.185	0.200	0.177	0.178	0.194

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.2 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HCLV SMT	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	7.289	-0.091	-0.068	-0.031	-0.051	-0.043
Benzimidazole Immersion Ag Immersion Au/Pd	-0.036	0.060				
Parylene Silicone Urethane		0.063				0.041
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene		-0.124				
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone						
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane			0.140	0.083		
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux			0.064 0.103		0.091	
Parylene*Flux Silicone*Flux Urethane*Flux						
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux					-0.192	
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux		0.147				
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux	-0.081		-0.167			
Model R ²	6.2%	6.5%	10.8%	2.6%	7.9%	2.5%
Standard Deviation	0.078	0.141	0.121	0.125	0.113	0.113

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.3 Significant Coefficients for the GLM Analyses by Test Time
(all units are in terms of \log_{10})

Electrical Response: HVLC PTH	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	0.7005	0.7003	0.7002	0.7002	1.34	0.7003
Benzimidazole					1.01	
Immersion Ag						
Immersion Au/Pd					0.46	
Parylene						
Silicone						
Urethane						
Flux					-0.47	
Benzi*Parylene					-1.40	
Imm Ag*Parylene						
Imm Au/Pd*Parylene					-0.71	
Benzi*Silicone					-0.80	
Imm Ag*Silicone					0.96	
Imm Au/Pd*Silicone						
Benzi*Urethane					-1.09	
Imm Ag* Urethane					0.63	
Imm Au/Pd* Urethane						
Benzi*Flux						
Imm Ag*Flux						
Imm Au/Pd*Flux						
Parylene*Flux	0.0003	0.0004	0.0004	0.0004		0.0004
Silicone*Flux					0.79	
Urethane*Flux						
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux					-1.46	
Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux					1.11	
Imm Ag*Urethane*Flux						
Imm Au/Pd*Urethane*Flux						
Model R ²	2.5%	6.3%	5.3%	6.8%	27.9%	5.2%
Standard Deviation	0.001	0.0005	0.0005	0.0005	0.79	0.0005

*All GLM analyses including Pre-Test were based on logarithms. Logs were used to ameliorate the influence of extreme measurements on the GLM during the BW and SF tests.

Table I.4 Significant Coefficients for the GLM Analyses by Test Time
(all units are in terms of \log_{10})

Electrical Response: HVLC SMT	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	0.6989	0.6988	0.6988	0.6974	2.418	0.688
Benzimidazole Immersion Ag Immersion Au/Pd						-0.241
Parylene Silicone Urethane					-1.71	
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene						0.254
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone	-0.004	-0.004	-0.004	-0.026	-0.80	0.312
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane						0.256
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux					-0.73	
Parylene*Flux Silicone*Flux Urethane*Flux	-0.003	-0.003	-0.003			
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux	0.0060	0.0059	0.0060	0.0244	-1.56	
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux						
Model R ²	5.9%	5.8%	5.8%	9.1%	45.3%	8.8%
Standard Deviation	0.0039	0.0039	0.0039	0.0148	0.873	0.207

*All GLM analyses including Pre-Test were based on logarithms. Logs were used to ameliorate the influence of extreme measurements on the GLM during the BW and SF tests.

Table I.5 Significant Coefficients for the GLM Analyses by Test Time
 (units in the first column are *ns*, all others are percentages)

Electrical Response: HSD PTH	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	17.01	0.342	0.533	1.521	36.61	1.570
Benzimidazole Immersion Ag Immersion Au/Pd						
Parylene Silicone Urethane						
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene		3.3	-1.77			2.5
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone						
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane						
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux					1.54	-3.3
Parylene*Flux Silicone*Flux Urethane*Flux						
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux		-4.1				
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux						5.2
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux	-0.34			2.71		5.1
Model R ²	3.5%	5.9%	3.4%	5.8%	2.8%	10.1%
Standard Deviation	0.308	2.42	2.36	1.99	2.85	2.40

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.6 Significant Coefficients for the GLM Analyses by Test Time
 (units in the first column are *ns*, all others are percentages)

Electrical Response: HSD SMT	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	9.135	1.07	-1.5	-13.5	59.3	-13.4
Benzimidazole				-21.1		-8.3
Immersion Ag			-12.3			
Immersion Au/Pd		-2.06				
Parylene				18.9		9.1
Silicone	0.057					
Urethane						
Flux				15.0	9.9	14.6
Benzi*Parylene						
Imm Ag*Parylene			14.9			
Imm Au/Pd*Parylene						
Benzi*Silicone			-22.3			
Imm Ag*Silicone			14.8			
Imm Au/Pd*Silicone						
Benzi*Urethane				39		
Imm Ag* Urethane						
Imm Au/Pd* Urethane		2.60				
Benzi*Flux				17.9		
Imm Ag*Flux						
Imm Au/Pd*Flux		2.70				
Parylene*Flux				-14.8		
Silicone*Flux						
Urethane*Flux						
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux			24.5			
Imm Ag*Silicone*Flux						
Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux				-60		
Imm Ag*Urethane*Flux						
Imm Au/Pd*Urethane*Flux						
Model R ²	1.6%	8.0%	13.7%	28.3%	9.0%	19.7%
Standard Deviation	0.198	3.08	13.7	17.3	15.8	18.3

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.7 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF PTH 50 MHz	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	-0.249	-0.024	-0.021	-0.008	0.032	-0.010
Benzimidazole Immersion Ag	-0.014					
Immersion Au/Pd			0.024	0.021	-0.108	0.020
Parylene Silicone Urethane	-0.013					
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene		0.037				
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone					0.170	
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane	0.018				0.129	
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux					0.153	
Parylene*Flux Silicone*Flux Urethane*Flux				-0.010		
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux					-0.167	
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux					-0.174	
Model R ²	12.7%	1.4%	10.9%	20.7%	10.4%	10.3%
Standard Deviation	0.023	0.076	0.030	0.019	0.098	0.026

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.8 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF PTH f(-3dB)	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	252.0	-4.98	-5.86	-4.75	-3.85	-4.98
Benzimidazole Immersion Ag Immersion Au/Pd	2.40					
Parylene Silicone Urethane	-2.94	-2.03	-3.26 -1.99	-3.85 -2.70	-2.69	-3.91 -2.74
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene						-3.20
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone						
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane						
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux						
Parylene*Flux Silicone*Flux Urethane*Flux				-2.60		
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux			5.10	5.00	6.50	5.40
Model R ²	10.7%	2.6%	10.0%	12.0%	10.7%	13.8%
Standard Deviation	4.79	5.37	4.81	4.80	5.00	4.72

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.9 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF PTH f(-40dB)	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	439.5	-1.22	-2.64	-3.10	-1.41	-2.96
Benzimidazole Immersion Ag Immersion Au/Pd	3.45	2.10	3.27	3.03	2.90	2.97
Parylene Silicone Urethane			-1.88		-2.70	-2.12
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene						
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone						
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane						
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux						
Parylene*Flux Silicone*Flux Urethane*Flux						
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux					5.70	
Model R ²	8.5%	2.6%	10.2%	7.0%	9.7%	9.8%
Standard Deviation	4.93	5.61	4.86	4.82	6.16	4.86

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.10 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF SMT 50 MHz	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	-0.248	0.005	-0.006	-0.002	0.019	-0.002
Benzimidazole				0.015		
Immersion Ag	-0.014					
Immersion Au/Pd	0.016	0.0254		0.025		0.021
Parylene						
Silicone						
Urethane	-0.016					
Flux				0.010		
Benzi*Parylene	0.016					
Imm Ag*Parylene						
Imm Au/Pd*Parylene						
Benzi*Silicone						
Imm Ag*Silicone						
Imm Au/Pd*Silicone						
Benzi*Urethane						
Imm Ag* Urethane						
Imm Au/Pd* Urethane			0.039			
Benzi*Flux				-0.016		
Imm Ag*Flux						
Imm Au/Pd*Flux			-0.034			
Parylene*Flux	-0.010					
Silicone*Flux						
Urethane*Flux						
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux			0.083			
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux						
Imm Au/Pd*Silicone*Flux			0.065			
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux			-0.048	-0.019		
Imm Au/Pd*Urethane*Flux	0.024	-0.053			-0.069	
Model R ²	34.4%	7.0%	17.3%	29.0%	1.0%	21.6%
Standard Deviation	0.020	0.0441	0.036	0.019	0.123	0.017

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.11 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF SMT f(-3dB)	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	277.4	8.74	-2.02	-0.53	-1.37	-0.38
Benzimidazole Immersion Ag Immersion Au/Pd	0.78	0.98	1.29	1.12	2.25	1.19
Parylene Silicone Urethane	-0.80 -1.26	-1.27 -1.06		-1.61 -1.35		-1.48 -1.61
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene				-1.29		-1.50
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone	-0.98			1.13		
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane						
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux				-0.94		-1.00
Parylene*Flux Silicone*Flux Urethane*Flux		-3.04				
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux		3.30 2.70 2.60				
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux	2.00			2.27		2.35
Model R ²	27.5%	22.7%	3.0%	33.8%	5.7%	35.1%
Standard Deviation	1.31	1.61	3.23	1.21	4.02	1.27

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.12 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF SMT f(-40dB)	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	659.2	-6.8	-9.7	-1.0	10.1	-5.6
Benzimidazole	-7.1	-6.9		-7.7		-6.1
Immersion Ag			7.2			
Immersion Au/Pd	-6.9			-12.6	-9.0	
Parylene			11.4			
Silicone				-4.7		
Urethane	-6.3					
Flux						3.7
Benzi*Parylene			-10.4			
Imm Ag*Parylene			-12.3			
Imm Au/Pd*Parylene	-8.6	-11.8	-17.3			-12.0
Benzi*Silicone						
Imm Ag*Silicone						
Imm Au/Pd*Silicone	-9.3	-14.8	-9.3			-15.1
Benzi*Urethane	9.8					
Imm Ag* Urethane	14.6					6.7
Imm Au/Pd* Urethane		-15.2				-12.8
Benzi*Flux						
Imm Ag*Flux						
Imm Au/Pd*Flux						
Parylene*Flux	5.2					
Silicone*Flux						
Urethane*Flux						
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux	-10.9					
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux	-10.1					
Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux						
Imm Au/Pd*Urethane*Flux						
Model R ²	36.9%	23.2%	21.4%	31.7%	5.7%	36.0%
Standard Deviation	8.6	10.1	9.9	8.5	15.7	8.2

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.13 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF TLC 50 MHz Forward	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	-39.74	1.90	0.35	0.94	0.33	3.26
Benzimidazole	2.31			-0.62		-2.13
Immersion Ag	0.81					-2.50
Immersion Au/Pd	3.43	-2.87	-0.82		-2.04	-3.31
Parylene		-2.03				-2.57
Silicone	-4.33	-2.00			2.73	
Urethane	-2.47	-1.56				-3.52
Flux		-1.78				
Benzi*Parylene						
Imm Ag*Parylene	-2.69	1.60				3.80
Imm Au/Pd*Parylene	-1.60	3.50				3.40
Benzi*Silicone						
Imm Ag*Silicone						
Imm Au/Pd*Silicone		4.10				
Benzi*Urethane						4.80
Imm Ag* Urethane						3.60
Imm Au/Pd* Urethane		2.40				4.40
Benzi*Flux						-1.97
Imm Ag*Flux						
Imm Au/Pd*Flux		3.50			3.30	
Parylene*Flux		1.94				
Silicone*Flux		2.00			-3.60	
Urethane*Flux		1.70				
Benzi*Parylene*Flux						5.40
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux		-4.30				
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux						
Imm Au/Pd*Silicone*Flux		-4.70	2.58			
Benzi*Urethane*Flux		-2.01				
Imm Ag*Urethane*Flux	-1.50					
Imm Au/Pd*Urethane*Flux		-3.40				
Model R ²	71.0%	23.9%	5.2%	1.7%	8.2%	18.8%
Standard Deviation	1.44	1.47	2.06	2.06	3.88	2.61

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.14 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF TLC 500 MHz Forward	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	-18.32	0.10	-0.34	0.37	-0.63	0.48
Benzimidazole	-0.54					
Immersion Ag						
Immersion Au/Pd	-0.96		-0.85			
Parylene	-0.79				-1.05	
Silicone	-2.84					
Urethane	-1.83					
Flux						
Benzi*Parylene		1.04				
Imm Ag*Parylene						
Imm Au/Pd*Parylene	0.77	-1.00				-1.20
Benzi*Silicone						
Imm Ag*Silicone				-0.38		
Imm Au/Pd*Silicone						
Benzi*Urethane			-2.20			
Imm Ag* Urethane						
Imm Au/Pd* Urethane						
Benzi*Flux						
Imm Ag*Flux						
Imm Au/Pd*Flux						
Parylene*Flux						
Silicone*Flux						
Urethane*Flux						
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux		1.13				1.33
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux						
Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux		0.85	3.10			
Imm Ag*Urethane*Flux						
Imm Au/Pd*Urethane*Flux						
Model R ²	75.5%	13.4%	5.9%	1.7%	3.7%	4.4%
Standard Deviation	0.68	0.89	2.20	0.71	2.33	1.00

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.15 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF TLC 1 GHz Forward	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	-13.22	0.51	-0.11	0.47	-0.64	0.77
Benzimidazole Immersion Ag Immersion Au/Pd						
Parylene	-0.55					-0.24
Silicone	-2.72					
Urethane	-1.28					
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene				0.61		
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone	0.71					
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane			-2.51			
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux						
Parylene*Flux Silicone*Flux Urethane*Flux						
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux					1.70	
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux		1.25	3.10			
Model R ²	60.9%	3.7%	4.8%	2.8%	1.5%	0.7%
Standard Deviation	0.81	1.12	2.03	0.87	2.35	1.25

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.16 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF TLC Rev Null Freq	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	647.2	4.8	1.1	3.6	-6.7	1.8
Benzimidazole			2.1			
Immersion Ag						
Immersion Au/Pd	-4.6			-2.1		
Parylene	-3.6			-1.9		
Silicone	-15.6			-2.6	14.3	6.8
Urethane	-10.7			-3.5	11.1	
Flux						
Benzi*Parylene						
Imm Ag*Parylene						
Imm Au/Pd*Parylene						
Benzi*Silicone	4.3					
Imm Ag*Silicone						
Imm Au/Pd*Silicone				3.4		
Benzi*Urethane						
Imm Ag* Urethane						
Imm Au/Pd* Urethane				3.3		
Benzi*Flux		2.3		2.6		
Imm Ag*Flux						
Imm Au/Pd*Flux						
Parylene*Flux						
Silicone*Flux						-6.2
Urethane*Flux						
Benzi*Parylene*Flux					14.6	
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux						12.0
Imm Ag*Silicone*Flux						
Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux						
Imm Au/Pd*Urethane*Flux						
Model R ²	65.1%	3.1%	4.2%	15.5%	19.5%	11.3%
Standard Deviation	4.6	4.4	4.2	3.6	13.4	8.5

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.17 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: HF TLC Rev Null Resp	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	-41.26	0.26	0.44	2.15	1.64	1.32
Benzimidazole Immersion Ag Immersion Au/Pd						
Parylene Silicone Urethane	-9.6					2.2
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene	-6.4		-2.2			
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone	-7.3 -9.6				8.6	
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane	5.8	4.4			13.3	
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux						
Parylene*Flux Silicone*Flux Urethane*Flux	-4.4	4.1		5.5	8.2	
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux	12.2 7.6	8.6				
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux	-5.9 7.7	-8.8 -8.5		-6.8 -6.6 -6.3	-27.9	
Model R ²	44.4%	20.2%	1.9%	5.8%	14.7%	1.9%
Standard Deviation	5.53	4.26	3.72	4.19	9.64	6.95

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.18 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: 10-Mil Pads	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	11.88	12.83	12.62	12.50	8.82	12.69
Benzimidazole				0.33	-0.78	
Immersion Ag	0.71	0.38	0.96	0.77	-1.11	
Immersion Au/Pd	0.62	0.77	0.77	0.67		
Parylene	1.76	1.08	0.88	1.29	1.79	
Silicone						
Urethane	0.87			0.33		
Flux	1.71	0.913	0.285	0.869		0.42
Benzi*Parylene				-0.56		
Imm Ag*Parylene	-0.45	-0.41	-0.91	-0.93		
Imm Au/Pd*Parylene	-0.65	-0.62	-0.62	-0.71		
Benzi*Silicone			-0.40	-0.45		
Imm Ag*Silicone	-1.12	-1.01	-1.36	-1.32	2.28	
Imm Au/Pd*Silicone	-0.71	-1.28	-1.31	-1.04		
Benzi*Urethane						
Imm Ag* Urethane	-0.54	-0.39	-1.05	-0.66		
Imm Au/Pd* Urethane	-0.58	-0.55	-0.91	-0.64		
Benzi*Flux						
Imm Ag*Flux	-0.38					
Imm Au/Pd*Flux		-0.36				-0.91
Parylene*Flux	-1.76	-0.79		-0.63	1.32	
Silicone*Flux			0.71			
Urethane*Flux	-1.64	-0.74		-0.89		
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux	0.88	0.64		0.58		
Imm Au/Pd*Silicone*Flux		0.61				
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux					1.83	
Imm Au/Pd*Urethane*Flux						
Model R ²	77.8%	72.0%	61.7%	68.6%	30.4%	5.8%
Standard Deviation	0.41	0.37	0.44	0.41	1.80	1.20

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.19 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: PGA A	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	11.25	12.20	12.02	12.04	6.95	12.14
Benzimidazole			0.31			
Immersion Ag	0.68		0.50	-1.91		
Immersion Au/Pd			0.48			
Parylene	1.87	1.30	1.14	1.38	3.28	0.45
Silicone	0.57					
Urethane	0.50				1.94	-0.32
Flux	1.94	1.60	1.173	1.20		0.89
Benzi*Parylene						
Imm Ag*Parylene				2.12		
Imm Au/Pd*Parylene						
Benzi*Silicone			-0.47			-0.53
Imm Ag*Silicone	-0.84		-0.58	1.77		-0.65
Imm Au/Pd*Silicone			-0.48			-0.36
Benzi*Urethane			-0.46			
Imm Ag* Urethane	-0.66		-0.67	1.76		
Imm Au/Pd* Urethane			-0.65			
Benzi*Flux					1.35	
Imm Ag*Flux				2.34		
Imm Au/Pd*Flux					2.10	
Parylene*Flux	-2.68	-1.55	-1.29	-1.10		-1.00
Silicone*Flux	-0.64	-0.75			2.48	
Urethane*Flux	-1.92	-1.87	-1.28	-1.39		-0.86
Benzi*Parylene*Flux	1.11					
Imm Ag*Parylene*Flux				-2.7		
Imm Au/Pd*Parylene*Flux	0.99				-2.8	
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux				-2.40	-2.9	
Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux				-2.19		
Imm Au/Pd*Urethane*Flux						
Model R ²	72.5%	39.2%	73.9%	41.8%	34.0%	50.0%
Standard Deviation	0.52	0.89	0.45	1.02	2.25	0.47

Table I.20 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: PGA B	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	10.93	12.21	12.18	12.08	6.78	11.72
Benzimidazole				0.319		
Immersion Ag	0.63			0.311		
Immersion Au/Pd				0.263		
Parylene	1.99	1.45	1.37	1.20	1.35	0.61
Silicone	0.56					
Urethane	0.53	-0.59	-0.67	-0.74	2.58	
Flux	2.13	1.40	1.34	1.092		1.35
Benzi*Parylene						
Imm Ag*Parylene						
Imm Au/Pd*Parylene	0.48					
Benzi*Silicone	-0.38	-0.33	-0.58	-0.90		
Imm Ag*Silicone	-0.98	-0.47	-0.64	-0.96		
Imm Au/Pd*Silicone		-0.56	-0.44	-0.69		
Benzi*Urethane						
Imm Ag* Urethane	-0.62					
Imm Au/Pd* Urethane						
Benzi*Flux						
Imm Ag*Flux						
Imm Au/Pd*Flux					1.44	
Parylene*Flux	-2.58	-1.46	-1.52	-1.17		-1.39
Silicone*Flux	-0.77	-0.46	-0.34			-0.65
Urethane*Flux	-2.07	-1.36	-1.28	-1.04		-1.44
Benzi*Parylene*Flux	0.77					
Imm Ag*Parylene*Flux						
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux						
Imm Ag*Silicone*Flux						
Imm Au/Pd*Silicone*Flux		0.64				
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux						
Imm Au/Pd*Urethane*Flux						
Model R ²	78.5%	82.9%	82.0%	81.7%	21.4%	45.9%
Standard Deviation	0.49	0.40	0.41	0.40	2.28	0.52

Table I.21 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: Gull Wing	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	11.48	13.01	13.10	12.64	4.48	9.87
Benzimidazole	1.07					
Immersion Ag			-0.74			-0.94
Immersion Au/Pd	0.93					
Parylene	1.47	0.29		0.72	2.85	2.32
Silicone		-1.14	-1.34	-0.85		1.66
Urethane	0.49	-0.96	-0.99			1.60
Flux						
Benzi*Parylene	-1.24					
Imm Ag*Parylene			0.64			
Imm Au/Pd*Parylene	-0.81					
Benzi*Silicone	-1.07					
Imm Ag*Silicone			0.73			
Imm Au/Pd*Silicone	-1.07			-1.53		-1.89
Benzi*Urethane	-1.23				1.53	
Imm Ag* Urethane			0.73			-2.15
Imm Au/Pd* Urethane	-0.76					-1.22
Benzi*Flux						
Imm Ag*Flux	0.92					
Imm Au/Pd*Flux					1.12	
Parylene*Flux						
Silicone*Flux						
Urethane*Flux	-0.54			-0.62		
Benzi*Parylene*Flux						
Imm Ag*Parylene*Flux	-1.53				1.81	
Imm Au/Pd*Parylene*Flux						
Benzi*Silicone*Flux					2.37	
Imm Ag*Silicone*Flux	-0.90					
Imm Au/Pd*Silicone*Flux				1.45		
Benzi*Urethane*Flux						
Imm Ag*Urethane*Flux	-0.88				1.97	2.44
Imm Au/Pd*Urethane*Flux						
Model R ²	56.0%	52.0%	47.9%	39.9%	42.3%	34.6%
Standard Deviation	0.57	0.59	0.61	0.88	1.67	1.53

Table I.22 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: Stranded Wire 1	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	0.7005	-0.0008	-0.0006	-0.0016	-0.0022	-0.0016
Benzimidazole Immersion Ag Immersion Au/Pd				0.0019	0.0028	
Parylene Silicone Urethane					0.0033	0.0025
Flux						
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene						
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone						
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane					-0.0045	
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux					0.0028	0.0031
Parylene*Flux Silicone*Flux Urethane*Flux	0.0002					
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux						0.0054
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux						
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux		-0.0038	-0.0030		-0.0077	-0.0050 -0.0057
Model R ²	2.5%	2.4%	1.1%	2.6%	9.3%	12.4%
Standard Deviation	0.001	0.0043	0.0051	0.0052	0.0048	0.0044

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.

Table I.23 Significant Coefficients for the GLM Analyses by Test Time

Electrical Response: Stranded Wire 2	Accelerated Life, Vibration, and Mechanical Shock				Branch Water	
	Pre-Test	AL 1800 Cycles	Vibration	Mech. Shock	BW Vertical	BW Post Vertical
Constant	21.99	0.0040	0.0014	0.0021	0.0019	0.0016
Benzimidazole Immersion Ag Immersion Au/Pd	1.36					
Parylene Silicone Urethane						
Flux	-0.79					
Benzi*Parylene Imm Ag*Parylene Imm Au/Pd*Parylene						
Benzi*Silicone Imm Ag*Silicone Imm Au/Pd*Silicone						
Benzi*Urethane Imm Ag* Urethane Imm Au/Pd* Urethane			0.0040			
Benzi*Flux Imm Ag*Flux Imm Au/Pd*Flux						
Parylene*Flux Silicone*Flux Urethane*Flux						0.0030
Benzi*Parylene*Flux Imm Ag*Parylene*Flux Imm Au/Pd*Parylene*Flux				0.0059		
Benzi*Silicone*Flux Imm Ag*Silicone*Flux Imm Au/Pd*Silicone*Flux	-3.8				-0.003	0.0094
Benzi*Urethane*Flux Imm Ag*Urethane*Flux Imm Au/Pd*Urethane*Flux		0.0086	-0.0080			
Model R ²	16.3%	3.1%	6.9%	5.7%	1.2%	8.9%
Standard Deviation	2.42	0.0084	0.0037	0.0042	0.0047	0.0060

*The Pre-Test column contains estimated coefficients for the raw Pre-Test measurements. The remaining columns contain the estimated coefficients for the deltas defined in Section 6.3.