

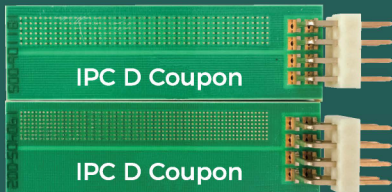
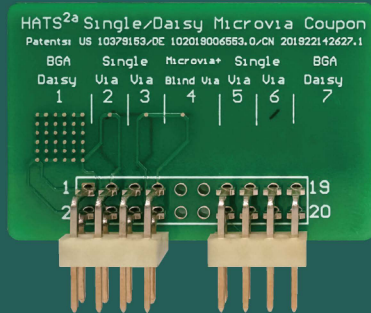


Reliability Assessment
Solutions for Electronics



HATS^{2TM} Via Structure Reliability & Robustness Test System

Assessing the Reliability, Robustness and Component Attachment Process Survivability of PCB/Substrate Via Structures



System Introduction

- Testing of IPC-2221B Type "D", HATS^{2TM} Single Via Coupons*, Substrate & Custom Coupons of up to 7 Test Nets
- 72 IPC "D" or 36 HATS^{2TM} Single Via*/Custom Coupon Test Chamber Capacity
- Air-to-Air Thermal Shock Compliant with IPC-TM-650 Method 2.6.7.2C
- Rapid Temperature Cycles or Custom Profiles Between -65°C to +265°C
- Reduced Thermal Shock Cycle Times by 60% to 80% (~1000 Cycles per Week)
- Convection Reflow Assembly Simulation Compliant with IPC-TM-650 Method 2.6.27B with In-Situ Resistance Monitoring
- Built-in Reflow Profiler Allows any Reflow Cycles to be Simulated Automatically
- Robustness Testing of Unlimited Consecutive Reflow Cycles or Any Cycle from -65°C to 265°C
- HATSTM & HATS^{2TM} Test Services Available around the World
- Detailed Graphical Test Report Including Box Plots

www.HATS-Tester.com

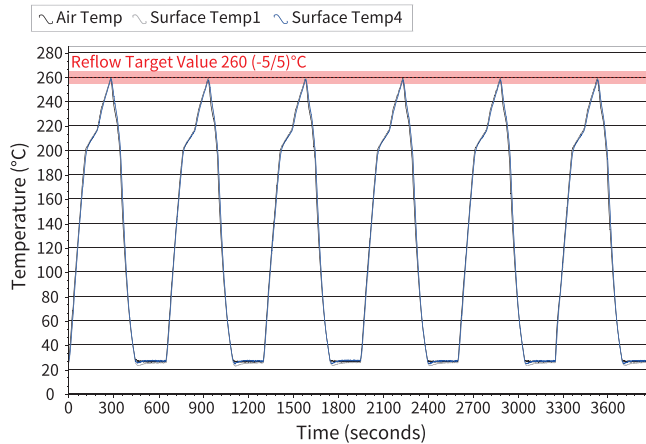


* U.S. Patent 10,379,153. German Patent 10 2019 006 553.0. Japanese Patent 7,291,045. Chinese Patent ZL 201922142627.1. Worldwide Patents Pending

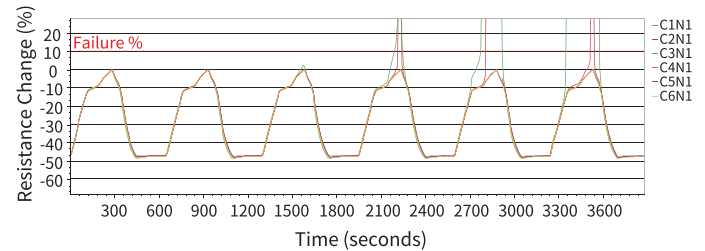


HATS²™ Reflow Simulation Profile and Data Summary

Reflow Simulation Temperature Profile Cycle 1-6



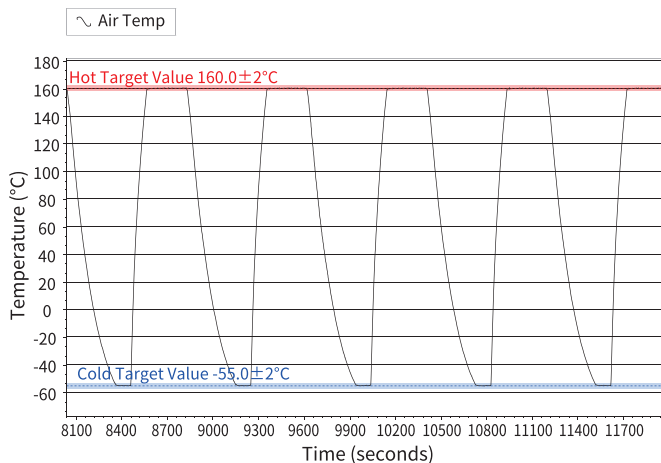
Reflow Simulation - Net 1 Resistance Change



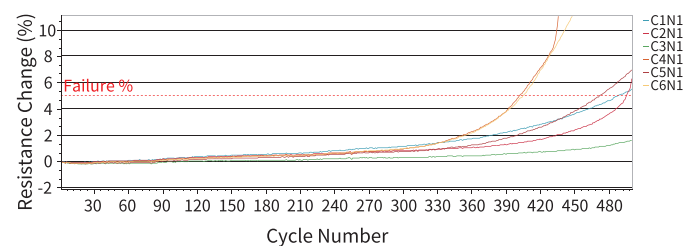
Coupon Number	1	2	3	4	5	6
Reference Resistance (Ohms)	1.10444	1.16478	1.12687	1.15913	1.18200	1.16489
Maximum Resistance% Change(Cycle#)	0.00(0)	71.70(4)	77.48(4)	0.00(0)	0.00(0)	0.00(0)
Cycle Failed 10% Limit	>6	4	4	>6	>6	>6

HATS²™ Thermal Cycling Profile and Data Summary

5 Cycle Sample of Profile Temperatures



Thermal Cycling - Net 1 Resistance Change



Coupon Number	1	2	3	4	5	6
Reference Resistance (Ohms)	0.75998	0.75971	0.74893	0.77014	0.76167	0.75782
Maximum Resistance% Change(Cycle#)	5.49(500)	6.31(500)	1.60(500)	2496.93(486)	6.94(500)	34.28(500)
Cycle Failed 5% Limit	489	496	>500	403	472	405