



Public Products List

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PCI Title : Test site transfer from Amkor ATT3 to Amkor ATT6 for STBC02 and STBC03 devices in Flip Chip Package.

PCI Reference : AMS/21/13067

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

STBC02JR	STBC02AJR	STBC02BJR
STBC03JR		



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Process Change Information

Testing Plant Change: Amkor ATT3 → Amkor ATT6

AMS Analog Flip Chip devices on ETS-364 testers

STBC02 and STBC03 products

August, 2021

Introduction

- In agreement with Amkor (subcon) testing strategy, the ST AMS Analog testing capacity in Amkor Taiwan on Flip-Chip devices will be consolidated in the ATT6 (T6) site: testers currently located in ATT3 (T3) site will be relocated in ATT6 *(see next page for details)*
- T6 EWS plant is qualified by ST since September 2018
 - ST MCD production is running in T6 since Q3'18 (T2000 tester)
 - ST AMS IMG production is running in T6 since Q2'19 (UFLEX tester)
 - ST AMS Analog Divisions are progressively moving the testing on ETS-364 testers to T6 from January 2021.
 - This capacity extension does only concern the EWS Testing step; BUMPING & DPS remain unchanged
- Testing qualification is based on test comparison results on a correlation wafer from specific products or Test-Vehicles from same product family
- ST New Product Introduction projects will be directly qualified in T6

AMKOR T6 | LOCATION

Amkor T6 – Location



T3, Hukou Township, Hsinchu County



T6, Taoyuan City, Longtan District



- Over 130 probe testers has already moved into T6 from T3
- Almost all of test expertise and resources have moved to T6
- Continuous capacity increasement in T6 is on-going

Qualification Requirements and Buyoff Criteria

- Endurance & Repeatability Exercise
 - 1000x looped test on same dice
 - Acceptance criteria: No die killing, Yield $\geq 95\%$
- Site2Site Correlation exercise
 - 50x looped test on same dice
 - Acceptance criteria: No variation larger than measurement error
- Correlation Exercise
 - 1 correlation wafer (same wafer & probe card before/after relocation)
 - Yield and Bin to Bin difference (before/after) $< 3\%$
 - Mean of each parametric measurement (before/after) $< 5\%$ of spec range
 - STDV of each parametric measurement (before/after) $< 1\%$ of spec range

Risk assessment (1/2)

Description	Difference	Comment
BUMPING	No change	Flow is not changed
EWS	T6	It was T3 before
Plant Location	T6	All EWS will be managed upon production capacity requirements in T6 only
Test Cell ID (tester & prober)	No change	Test Cells identified for moving to T6 have been already qualified & used in production
Test Cell Configuration	No change	
Test HW (PRC / PIB)	No change	HW identified to be relocated to T6 has been already qualified & used in production
Product Codification	No change	No product codification change T6 is added as 2nd EWS test plant

Risk assessment (2/2)

Description	Amkor T3	Amkor T6	Comment
Test Floor Clean Room	72K ft2	88K ft2	Area Expansion
Particle Class	1K		No difference
Temperature	22°C +/- 2°C		No difference
Humidity	45 +/- 5% RH		No difference
HW System Management	ATMS (Amkor Tooling Management System) is the same for both plants		No difference
Production system	Same system on both plants (MES, AWMS, ERP, CAS, ATMS, PM, ECN, MRB, CAR, SWR)		No change
Production server	Both plants use the same servers that are located in T1		No change

Probe Card Room Equipment

Equipment List	ATT3	ATT6	Function
	Photo		
Barcode System			Establish barcode. Infrared sendors to read, all traceable parts placement
Measure Machine			Measure needle length / diameter / co-planarity
Sanding Machine			Automatic sanding tips co-planarity
Manual Adjustment			Adjustment needle
N2 Cabinet			Preserve probe card / PIB , Nitrogen cupboard wafer, by the oxidizing of preventive inoculation
Solder Tool			Component solder / de-solder

Risk assessment | Summary

ST classifies this change as a LOW RISK

- BUMPING & DPS remains unchanged
- EWS Test Cell configuration remains unchanged
- EWS Production System Environment in T6 is similar to T3 (Area expansion only)

Test site Transfer Qualification Report

STBC02 and STBC03 products in Flip-Chip30: Test site Transfer from Amkor ATT3 to Amkor ATT6

General Information

Product Lines	UQ5501
Product Description	DC-DC CONVERTERS
P/N	STBC02 and STBC03
Product Group	AMS (Analog MEMS & Sensor Group)
Product division	General Purpose Analog & RF Division
Package	POWER MANAGEMENT Flip-Chip30

Locations

EWS Test fab (current)	Amkor Taiwan (subcon) ATT3
EWS Test fab (new)	Amkor Taiwan (subcon) ATT6

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	September 2021	6	Shierly Yee	Angelo Ferrigno	Qualification activities on UQ55 are positive. Results are extended to all STBC02 and STBC03 Commercial Product options tested in Amkor subcon.

TEST SITE TRANSFER QUALIFICATION REPORT

A. Repeatability & Endurance

50 loop run and endurance 1000 loop run were performed. (Criteria $\geq 95\%$)
Summary Results = Pass

B. Yield Comparison

Yield comparison between ATT3 & ATT6. (Criteria: Delta yield $\leq 3\%$)

Lot# / Wfr#	Testing Plant		Delta
	ATT3	ATT6	
5026F88 - 22	94.12%	95.55%	1.43%

Summary Results = Pass

C. Bin Comparison:

Plant	ATT3		ATT6			
Diffusion ID	5026F88					
Wafer ID	22					
Test Program						
Revision						
Qty In	4697		4697			
Qty Out	4421		4488			
Yield	94.12%		95.55%			
Bin name	Total Count	Percentage	Total Count	Percentage		
Good	4421	94.06%	4488	95.55%	67	1.43%
Open/ Short	11	0.23%	13	0.28%	2	0.04%
Para	265	5.64%	196	4.17%	69	1.47%

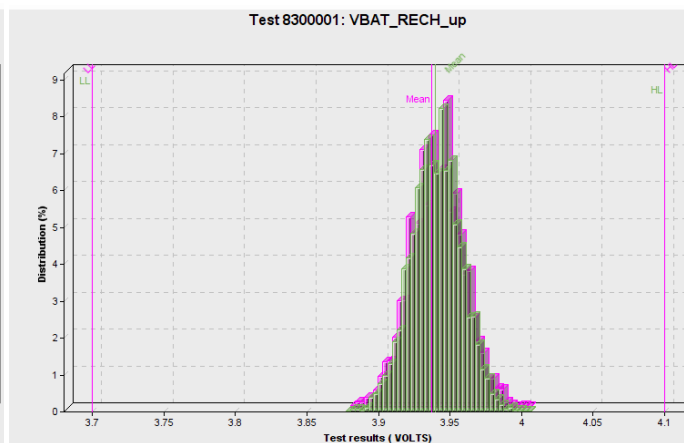
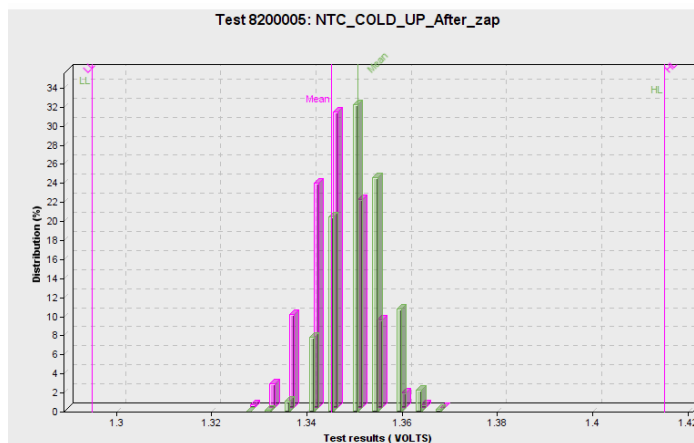
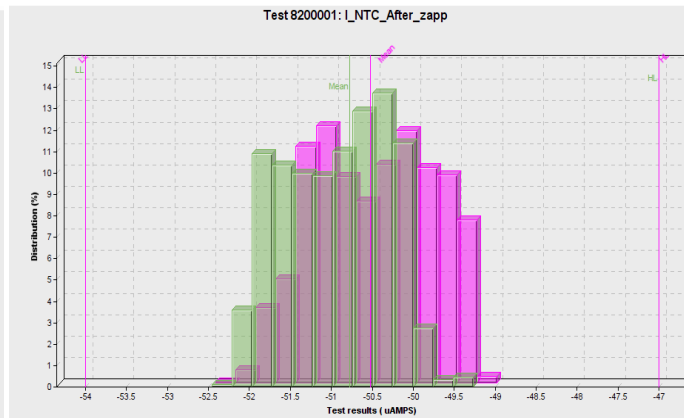
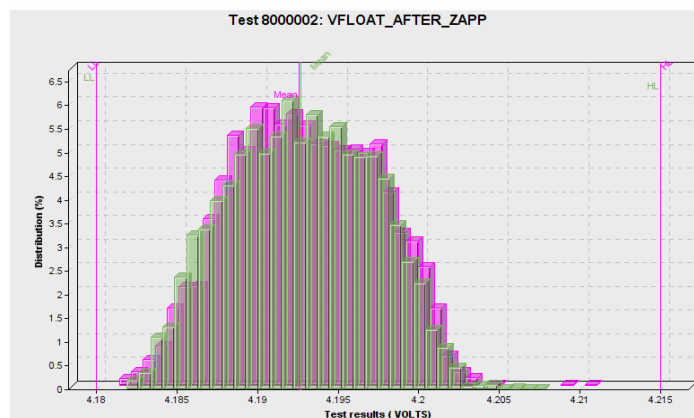
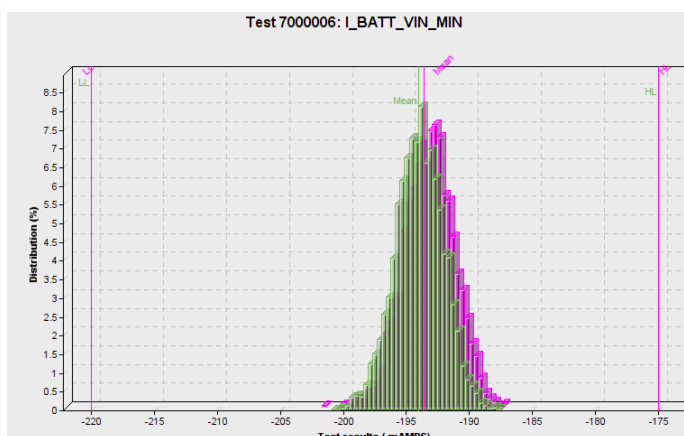
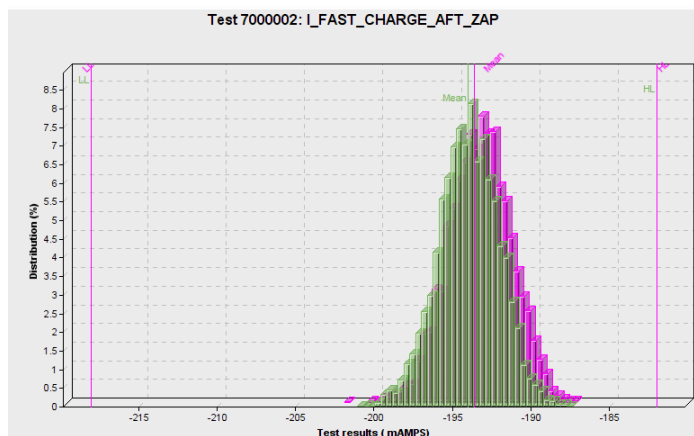
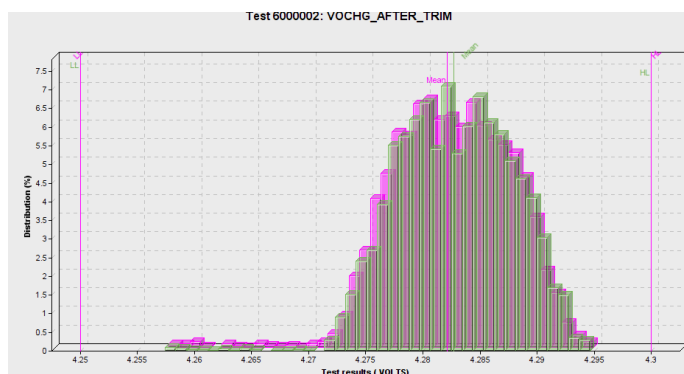
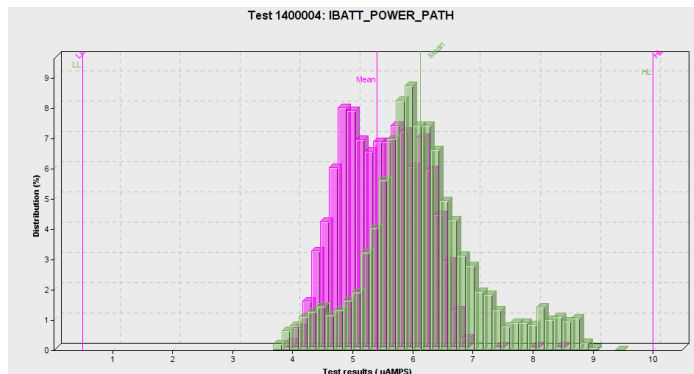
Summary Results = failed. T6 has better yield than T3.

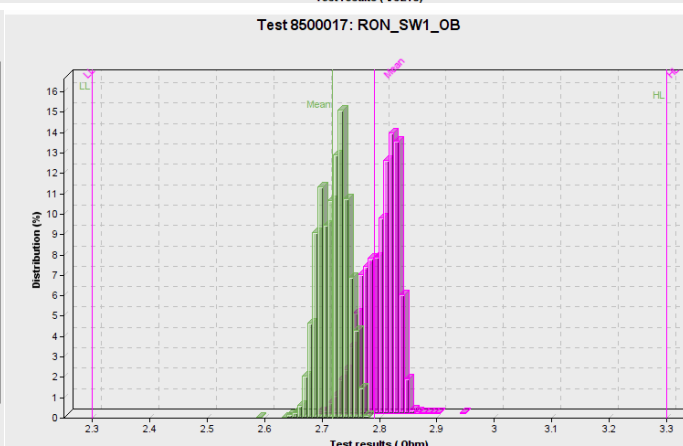
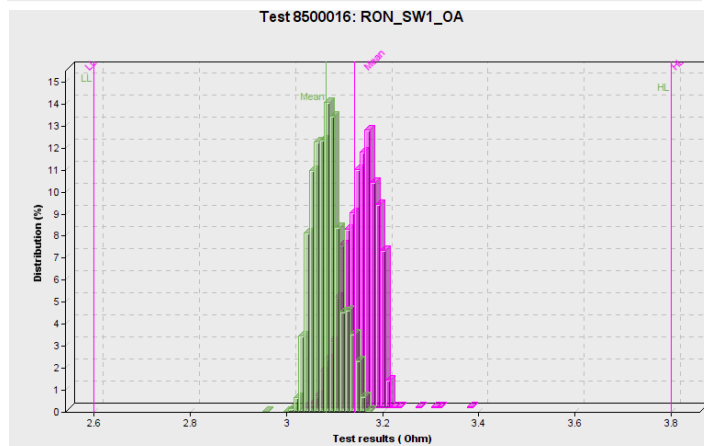
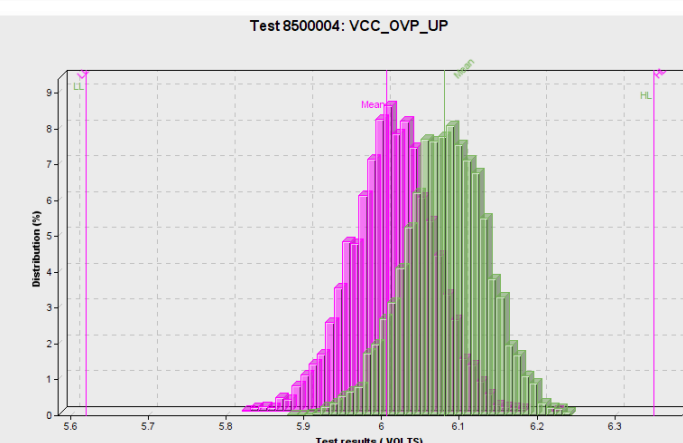
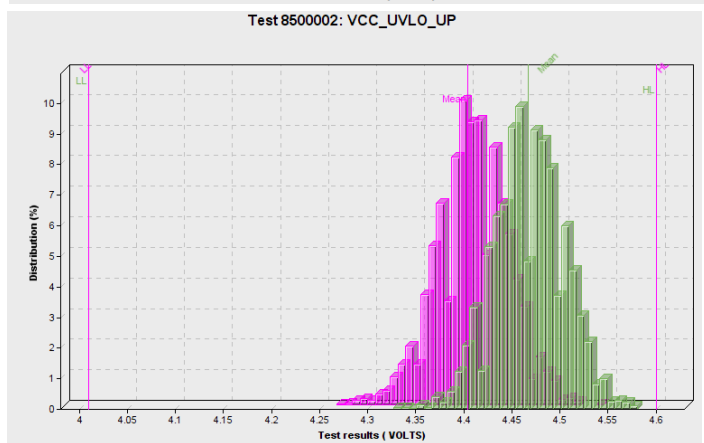
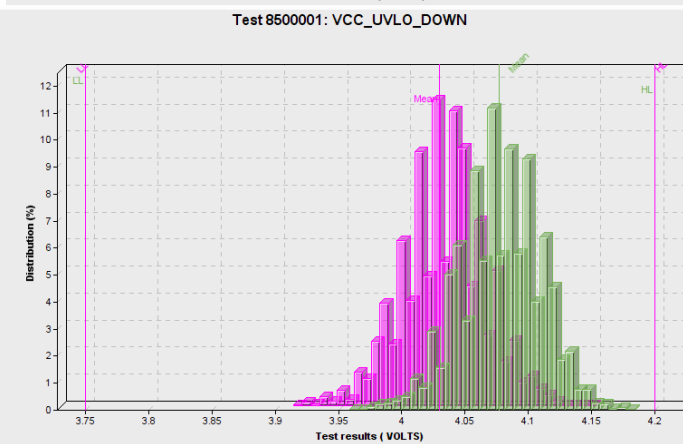
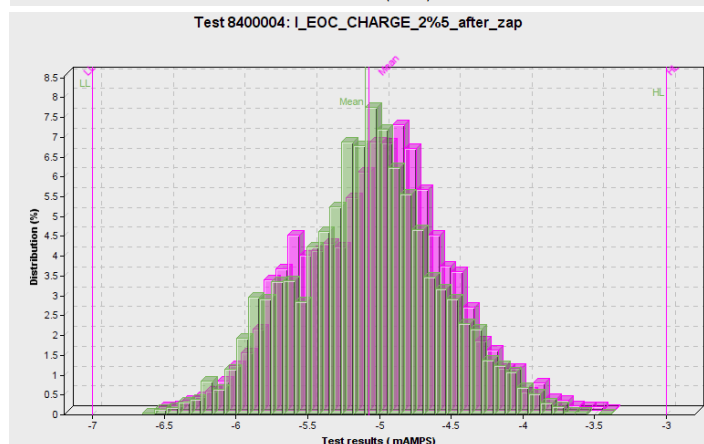
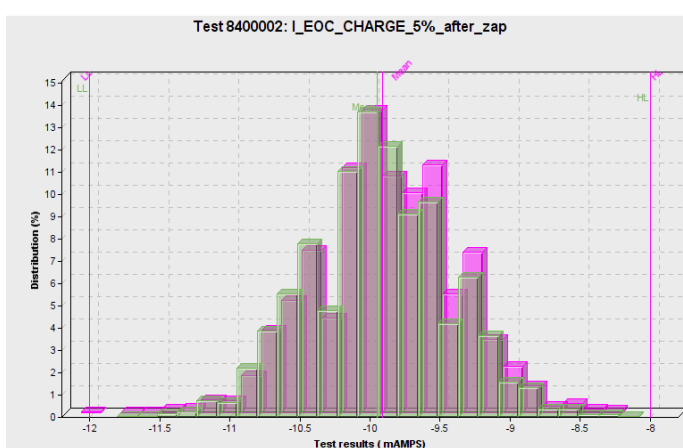
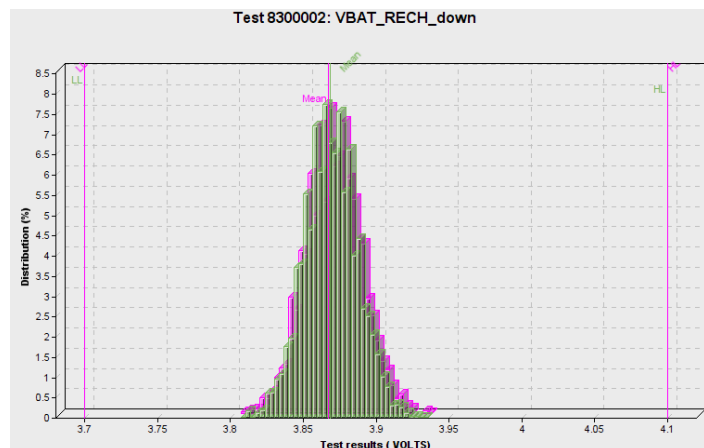
D. Correlation on the critical measures

Here a summary of critical measures on UQ55 line.

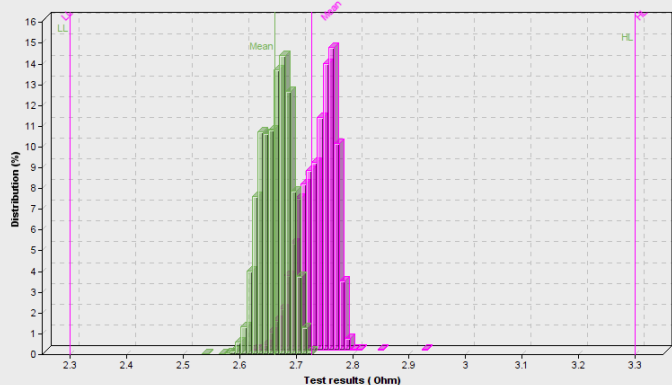
Data coming from present old facility (T3) is shown in green color and the data collected at new test facility (T6) is shown in pink color.

The data between the two test locations are consistent, confirming the goodness of the test setup. Results matches with qualification requirements.

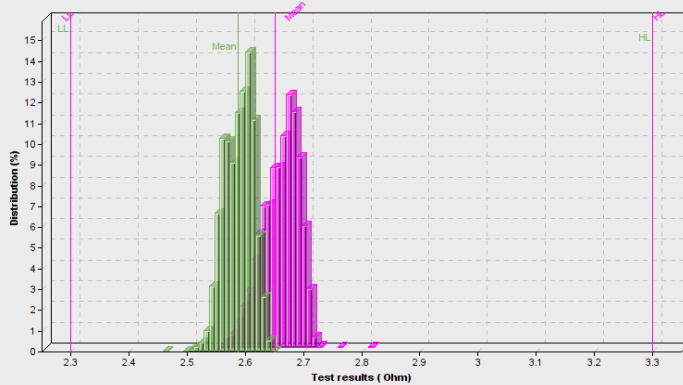




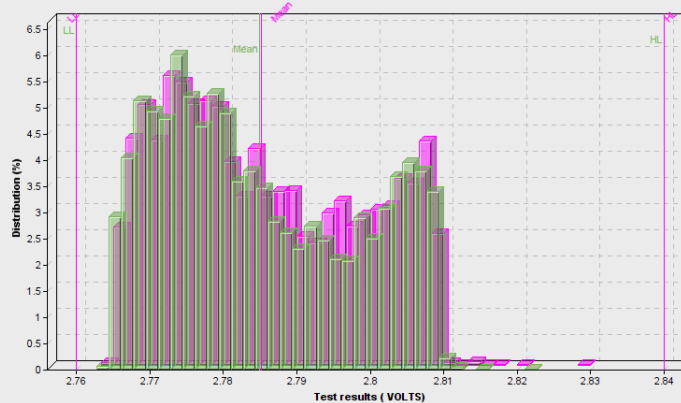
Test 8500018: RON_SW2_OA



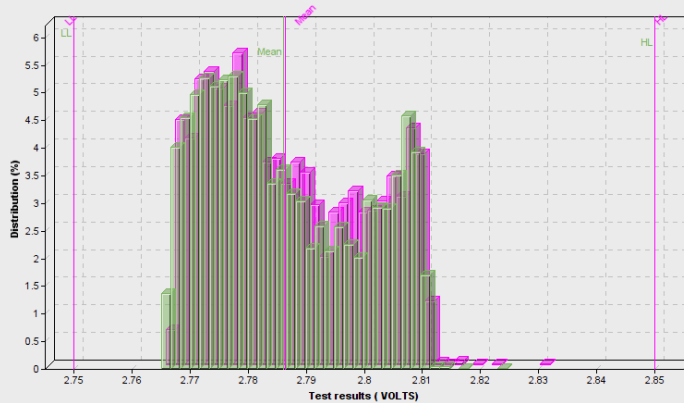
Test 8500019: RON_SW2_OB



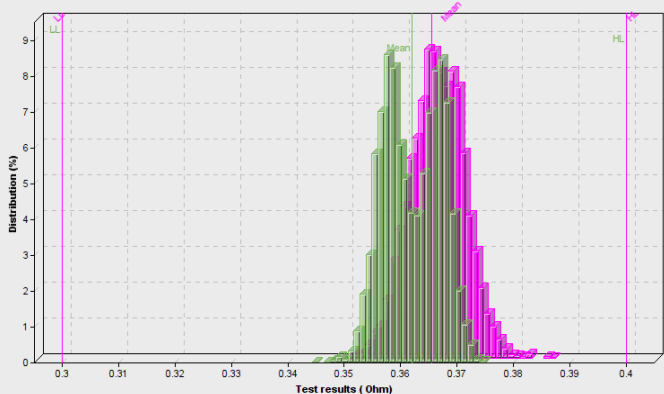
Test 8600002: BAT_OVD_AFTER_TRIM



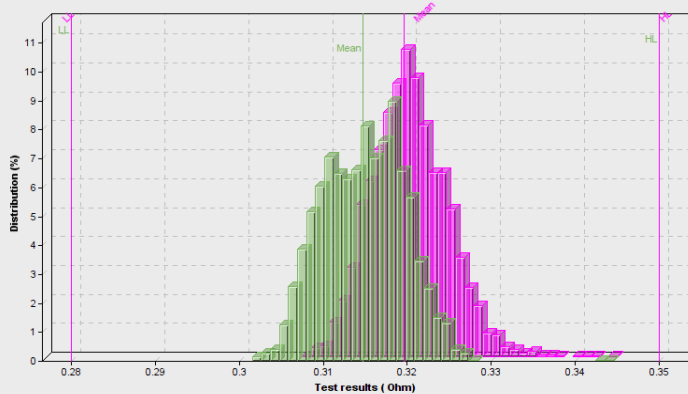
Test 8600003: BAT_OVD_UP



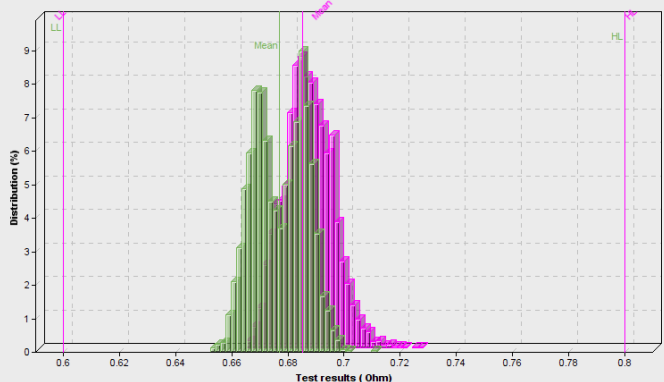
Test 8700001: RDS_ON_BS



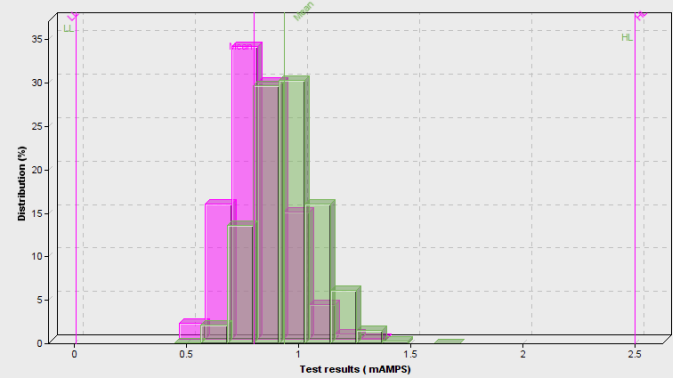
Test 8700002: RDS_ON_IS

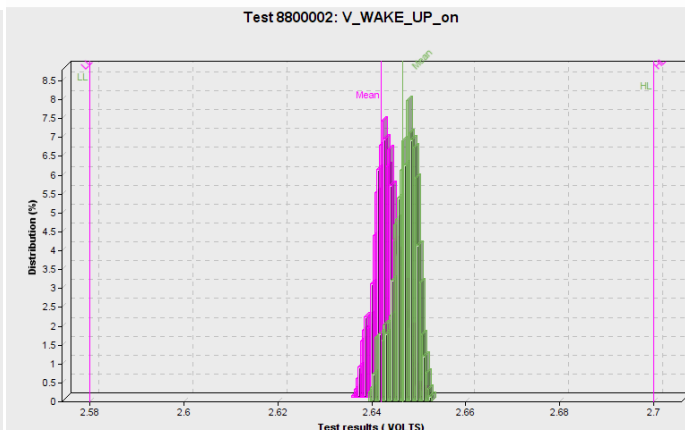
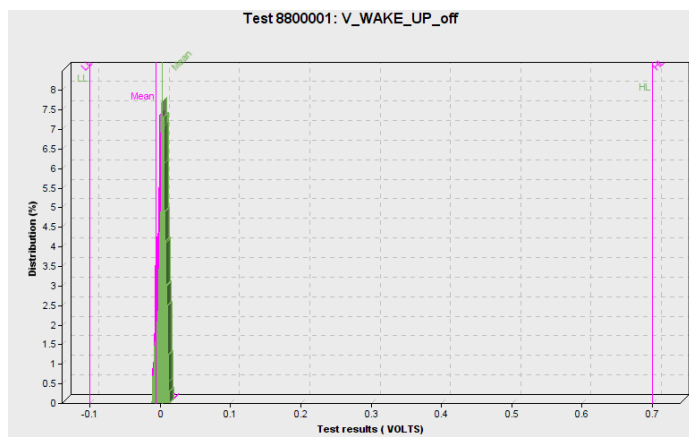


Test 8700003: RDS_ON_IB



Test 8700004: I_BATT_SINK





E. Overview of tester qualification result

- Yield is comparable.
- Repeatability and endurance test results are passed.
- Mean and Sigma study – all parameters are evaluated; miscorrelation have been reviewed and justified.
- ATT6 is consider qualified to test UQ55 Product line in all STBC02 and STBC03 Commercial Product options.