



PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000740

Date: DEC-09-2021

P1/1

Semtech Corporation, 200 Flynn Road, Camarillo CA 93012

Change Details

Part Number(s) Affected: GN7355AINE3 GN7355AINTE3Z	Customer Part Number(s) Affected: <input checked="" type="checkbox"/> N/A
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Description, Purpose and Effect of Change:

The current GN7355A test facility, Giga Solutions, will no longer support the current tester configuration, and no alternative configuration will support the tests required by the GN7355A.

As a result, the GN7355A test will be transferred to KYEC and run on an HP93k PS1600 configuration. All of the GN7355A's tests are supported by this, and there is no change in test coverage.

Change Classification	<input type="checkbox"/> Major <input checked="" type="checkbox"/> Minor	Impact to Form, Fit, Function	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Impact to Data Sheet	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	New Revision or Date	<input checked="" type="checkbox"/> N/A

Impact to Performance, Characteristics or Reliability:

There has been no change to the device's performance, characteristics or reliability.

Implementation Date	JAN-09-2022	Work Week	02
Last Time Ship (LTS) <small>Of unchanged product</small>	N/A	Affecting Lot No. / Serial No. (SN)	2421 (Date Code)
Sample Availability	AUG-31-2021	Qualification Report Availability	NOV-17-2021

Supporting Documents for Change Validation/Attachments:

- Please see the following pages.

Issuing Authority

Semtech Business Unit:	Signal Integrity Product Group (SIP)		
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FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: <http://www.semtech.com/contact/index.html#support>

Process Changes

Process Change Summary

The GN7355A is currently tested at Giga Solutions on an HP93K test system using an HX card for at-speed signals. Giga Solution is no longer able to support this tester configuration and does not have tester configurations capable of at-speed test up to the 10Gbps required for the GN7355A. This change will require qualification of a new test platform. Future testing will be testing on a Verigy 93k PS1600 test platform at KYEC. This report details the qualification procedure and correlation analysis performed to qualify the new test facility and test platform.

Please note that equivalent Semtech devices have been already testing on the 93K PS1600 platform at KYEC for multiple years with no concerns.

	Current	Future
Test Location	Giga Solutions	KYEC
Test Platform	V93k with HX card	V93K PS1600

Affected Products

Final Product
GN7355AINE3 GN7355AINTE3Z

Qualification Procedure

Procedure

Qualification of the V93k PS1600 test platform at KYEC consisted of 3 main components:

- 1) Correlation testing
- 2) Gauge R&R (GR&R) testing
- 3) Large volume trial lot testing

Correlation testing was completed by testing a large number of devices on the reference tester (V93k with HX card) and then testing these same units on the new tester (V93K PS1600). The correlation units consisted of 490 units. These units consisted of both passing units and reject units. The test data was then compared to ensure tester to tester correlation using the metrics detailed in section 3. Gauge R&R testing

was performed in order to verify stability of the new test solution. Finally, a large volume trial lot was tested at KYEC to ensure that the final test program was adequate for mass production testing.

Qualification Devices

The sample size for correlation of test results on the new platform at KYEC is summarized in the following table.

Function	Quantity	Comment
Yield Correlation	490 units	450 passing units, 40 reject units
Bin Correlation	490 units	450 passing units, 40 reject units
Repeatability / GR&R	12 units from 1 foundry lot	10 units from 1 foundry lot

Analysis

The correlation exercise consisted of a GR&R experiment and analysis to examine repeatability and tester platform variation. Results for all parametric tests were examined. For yield and bin correlation, a larger sample of 490 devices were run.

Yield Comparison

Overall yields were compared between the Reference Test System and the New Test System . Correlation is achieved if yields are within 2%.

Results

The correlation units tested had comparable yield on the Verigy 93k at Giga and V93k PS1600 at KYEC. Yield on the new tester was within 1% of the previous system.

Bin Correlation

The correlation units were tested on both test platforms and a bin movement table was created to identify if parts were binned identically on both test systems.

Results

It was found that all parts were binned equivalently on both test solutions.

Gauge R&R

GR&R analysis is a statistical method of systematically comparing the repeatability and reproducibility variances between two measurement systems. This is accomplished by using ANOVA (Analysis of Variance) to calculate the percentages of the repeatability and reproducibility variance components to the pass windows as defined by the test program limits. The goal of GR&R is to demonstrate that the new system will match or exceed the current benchmark, production test system performance on all critical parameters. The GRR maximum allowed for the total tolerance is 30%, this includes combined reproducibility and repeatability. 30% is an agreed industry standard.

For this qualification, the GR&R experiment was conducted with the following control factors:

- 10 Known good samples
- 2 Test platforms

- 1 Loadboard per platform
- 1 Test site per Loadboard
- 2 insertions
- 10 loops for repeatability

Results

The comparison of the V93k HX and V93k PS1600 GRR showed no discrepancies between test results

Test category	GR&R Total Tolerance Acceptance Criteria	GR&R Test Platform Compare	GR&R Repeatability	Bin Compare	Yield Compare
Continuity / ESD	<30%	Pass	Pass	Pass	Pass
Termination Resistance	<30%	Pass	Pass	Pass	Pass
Leakage	<30%	Pass	Pass	Pass	Pass
Swing	<30%	Pass	Pass	Pass	Pass
Icc/Power	<30%	Pass	Pass	Pass	Pass
CPA	<30%	Pass	Pass	Pass	Pass
Voltages Levels	<30%	Pass	Pass	Pass	Pass
Jitter	<30%	Pass	Pass	Pass	Pass
LOS	<30%	Pass	Pass	Pass	Pass
ADC	<30%	Pass	Pass	Pass	Pass

Large Volume Trial Test Run

A final trial lot test run of 800 fresh units was completed at KYEC using the final V93k test program. Review of this data showed that yields and failure Pareto were as expected.

Conclusion

The KYEC V93k PS1600 test platform provides equivalent test coverage to the Giga V93k HX test platform.

The KYEC V93k PS1600 test platform is deemed qualified for production testing of the GN7355A product.