Reliability Test Report

Product Name: CS485XX

Report Version: V1.3

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1. Overview

Reliability testing of microelectronic products is a risk mitigation process designed to ensure the service life of device in customer applications. Semiconductor wafer manufacturing process and package-level reliability can be assessed in a variety of ways and may include accelerated environmental test conditions. Chipanalog evaluates manufacturability of the device to verify a robust silicon and assembly flow to ensure continuity of supply to customers. Chipanalog qualifies new devices, significant changes, and product families based on JEDEC JESD47. CS485XX series chips are packaged with the same wafer. The differences between part numbers are the package and bonding diagram. The data shown is representative of the material sets, processes, and manufacturing sites used by the device family.

2. Part Number List

Package Type	**Part Number**
SOIC8-NB(S)	CS485S/CS48505S/CS48520S/CS48505AS/CS48520AS/CS48520BS
MSOP8(M)	CS485M/CS48505M/CS48520M
DFN8(D)	CS48505D/CS48520D

Note: JEDEC specification is designed to also qualify a family of similar components utilizing the same fabrication process, design rules, and similar circuits. The family qualification may also be applied to a package family where the construction is the same and only the size and number of leads differs.

3. Product Information

3.1. Wafer Information

Wafer	EUROPA
Fab Process	18BCD

3.2. Package Information

Assembly site	JCET/SiMAT/Shaohua	JCET	SiMAT
FT site	JCET/SiMAT/Shaohua	JCET	SiMAT
Package	SOIC8-NB	MSOP8	DFN8
Lead frame	Cu	Cu	Cu
Bond wire	20um AuPdCu	20um AuPdCu	20um AuPdCu
MSL level	MSL3	MSL3	MSL3

4. Reliability Qualification Plan

4.1. Device Qualification Test Requirements

Stress	Ref.	Abbv.	Conditions	Duration /Accept
Electrical Parameter Assessment	JESD86	ED	Per Datasheet	Per Datasheet
High Temperature Operating Life	JESD22-A108, JESD85	HTOL	$T_J \geq 125°C$ $V_{CC} \geq V_{CCmax}$	1000 hrs/0 Fail
Human Body Model ESD	JS-001	ESD-HBM	$T_A = 25°C$	Classification
Charged Device Model ESD	JS-002	ESD-CDM	$T_A = 25°C$	Classification
Latch-Up	JESD78	LU	Class I or Class II	Classification

4.2. Nonhermetic Package Qualification Test Requirements

Stress	Ref.	Abbv.	Conditions	Duration /Accept
MSL Preconditioning	JESD22-A113	PC	Per appropriate MSL level per J-STD-020	Electrical Test (optional)
High Temperature Storage	JESD22-A103 & A113	HTSL	150°C, 1000 hrs	1000 hrs/0 Fail
Temperature Humidity Bias	JESD22-A101	THB	85°C, 85% RH, V_{CCmax}	1000 hrs/0 Fail
Highly Accelerated Temperature and Humidity Stress	JESD22-A110	HAST	130°C/110°C, 85% RH, 33.3/17.7 psia, V_{cc}= 5.5V	96/264 hrs/0 Fail
Temperature Cycling	JESD22-A104	TC	-65°C to 150°C	500 cycles/0 Fail
Unbiased Temperature/Humidity	JESD22-A102	AC	121°C, 100% RH, 29.7psia	96 hrs/0 Fail
Unbiased Temperature/Humidity	JESD22-A118	UHAST	130°C/110°C, 85% RH, 33.3/17.7 psia	96/264 hrs/0 Fail
Bond Pull Strength	JESD22-B120	BPS	Characterization, Pre Encapsulation	Ppk≥1.66 or Cpk≥1.33
Bond Shear	JESD22-B116	BS	Characterization, Pre Encapsulation	Ppk≥1.66 or Cpk≥1.33
Solderability	M2003 JESD22-B102	SD	Characterization	95% coverage

Note: Either HAST or THB may be chosen. If THB or HAST is run, then UHAST need not be run. Autoclave is not recommended as a qualification test; Unbiased or biased HAST is the recommended stress and is required for organic substrates instead of Autoclave.

5. Reliability Test Results

5.1. Device Reliability Test Results

Stress	Condition	Duration	Sample Size	Result	Classification
ED	Per Datasheet	/	10*3 lot	Pass	/
HTOL	TA = 125°C, V_{cc}= 5.5V	1000 hrs	77*3 lot	Pass	/
ESD-HBM	T_A = 25°C	/	3*1 lot	Pass	Class 3A
ESD-CDM	T_A = 25°C	/	3*1 lot	Pass	Class C3
LU	T_A = 25°C	/	3*1 lot	Pass	Class IA

5.2. Package Reliability Test Results

Package Type: SOIC8-NB-JCET				
Stress	**Condition**	**Duration**	**Sample size**	**Results**
PC	MSL 3	/	231*3 lot	Pass
HTSL	T_A = 150°C	1000 hrs	77*3 lot	Pass
HAST	130°C, 85% RH, 33.3psia, V_{cc}= 5.5V	96 hrs	77*3 lot	Pass
TC	-65°C to 150°C	500 cycles	77*3 lot	Pass
AC	121°C, 100% RH, 29.7psia	96 hrs	77*3 lot	Pass
BPS	JESD22-B120	/	30 bonds/5 ea.	Pass
BS	JESD22-B116	/	30 bonds/5 ea.	Pass
SD	Steam aging, 245°C dipping	5s	22 leads*3 lot	Pass
Package Type: SOIC8-NB-SiMAT				
Stress	**Condition**	**Duration**	**Sample size**	**Results**
PC	MSL 3	/	231*3 lot	Pass
HTSL	T_A = 150°C	1000 hrs	77*3 lot	Pass
HAST	130°C, 85% RH, 33.3psia, V_{cc}= 5.5V	96 hrs	77*3 lot	Pass
TC	-65°C to 150°C	500 cycles	77*3 lot	Pass
AC	121°C, 100% RH, 29.7psia	96 hrs	77*3 lot	Pass
BPS	JESD22-B120	/	30 bonds/5 ea.	Pass
BS	JESD22-B116	/	30 bonds/5 ea.	Pass
SD	Steam aging, 245°C dipping	5s	22 leads*3 lot	Pass
Package Type: SOIC8-NB-Shaohua				
Stress	**Condition**	**Duration**	**Sample size**	**Results**
PC	MSL 3	/	231*3 lot	Pass
HTSL	T_A = 150°C	1000 hrs	77*3 lot	Pass
HAST	130°C, 85% RH, 33.3psia, V_{cc}= 5.5V	96 hrs	77*3 lot	Pass
TC	-65°C to 150°C	500 cycles	77*3 lot	Pass

uHAST	130°C, 85% RH, 33.3psia	96 hrs	77*3 lot	Pass
BPS	JESD22-B120	/	30 bonds/5 ea.	Pass
BS	JESD22-B116	/	30 bonds/5 ea.	Pass
SD	Steam aging, 245°C dipping	5s	22 leads*3 lot	Pass
Package Type: MSOP8-JCET				
Stress	**Condition**	**Duration**	**Sample size**	**Results**
PC	MSL 3	/	231*3 lot	Pass
HTSL	T_A = 150°C	1000 hrs	77*3 lot	Pass
HAST	130°C, 85% RH, 33.3psia, V_{cc}= 5.5V	96 hrs	77*3 lot	Pass
TC	-65°C to 150°C	500 cycles	77*3 lot	Pass
AC	121°C, 100% RH, 29.7psia	96 hrs	77*3 lot	Pass
BPS	JESD22-B120	/	30 bonds/5 ea.	Pass
BS	JESD22-B116	/	30 bonds/5 ea.	Pass
SD	Steam aging, 245°C dipping	5s	22 leads*3 lot	Pass
Package Type: DFN8-SiMAT				
Stress	**Condition**	**Duration**	**Sample size**	**Results**
PC	MSL 3	/	231*3 lot	Pass
HTSL	T_A = 150°C	1000 hrs	77*3 lot	Pass
HAST	130°C, 85% RH, 33.3psia, V_{cc}= 5.5V	96 hrs	77*3 lot	Pass
TC	-65°C to 150°C	500 cycles	77*3 lot	Pass
AC	121°C, 100% RH, 29.7psia	96 hrs	77*3 lot	Pass
BPS	JESD22-B120	/	30 bonds/5 ea.	Pass
BS	JESD22-B116	/	30 bonds/5 ea.	Pass
SD	Steam aging, 245°C dipping	5s	22 leads*3 lot	Pass

6. Conclusion

CS485XX series chips are qualified according to JEDEC standards.

Disclaimer

This information is provided to assist customers in design and development. It could change for technology innovation without notice.

The devices are shipped after passing final test. Customers are responsible to conduct sufficient engineering and additional qualification testing to determine whether a device is suitable for use in their applications.

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Revision History

Revision	Change Log	Date
V1.0	Initial release	Aug, 2022
V1.1	Add pressure condition of HAST and AC test	Oct, 2023
V1.2	Add new qualified PN CS48520BS	Oct, 2024
V1.3	Add 3lots Shaohua reliability test result of SOP8 package	2025.6.25