



ams AG
Tobelbader Strasse 30
8141 Premstaetten
Austria

T +43 3136 500-0
F +43 3136 525-01
sensor@ams.com
www.ams.com

Premstätten, March 10, 2021

Process Change Notification PCN42- 2020

FAB process change TM2703 and TE2703

I. Description and Purpose:

The purpose of this PCN is to notify the customer regarding an upcoming process change for the TM2703 and TE2703 family of device. The current Inter metal dielectric (IMD) process for the TM2703 (UMC fab 8AB) and TE2703 (UMC fab 8E) devices use FOX process and the proposed change will include the change of the IMD process from FOX to SOG process (additional process details included in sec 3). The reason for this proposed change is that UMC is discontinuing the use of FOX material in their process. Both UMC fabs 8AB and 8E are qualified fabs for these products.

The SOG IMD process is a mature process at UMC and is currently used in mass production in other AMS products manufactured in UMC and AMS has shipped several millions of these products. The SOG IMD process qualification for Fab8E has been completed and passed.

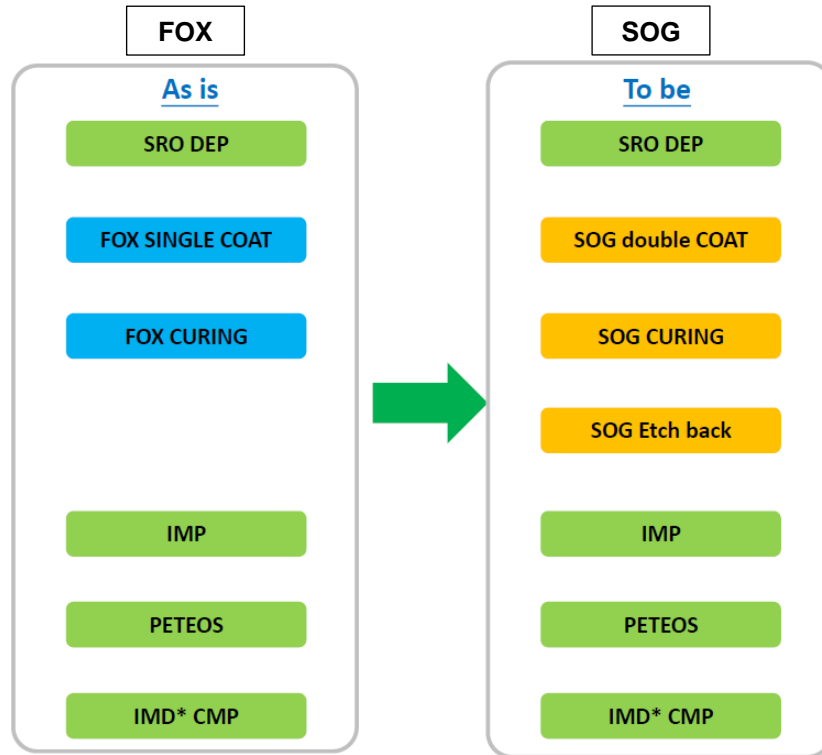
II. Scope and Limitation

This PCN document applies to TM2703 and TE2703 family of devices, which includes following products:

PN	Ordering Code	Description
300170017	TSL25723FN	TSL25723FN ODFN6 LF T&RDP
300170029	TSL25721FN	TSL25721FN ODFN6 LF T&RDP
300170003	TMD27723	TMD27723 MOD8 LF T&RDP
300170021	TMD27721	TMD27721 MOD8 LF T&RDP
300170009	TSL27721FN	TSL27721FN ODFN6 LF T&RDP
300170011	TMD26723	TMD26723 MOD8 LF T&RDP
300170025	TMD26721	TMD26721 MOD8 LF T&RDP
300170008	TSL26721FN	TSL26721FN ODFN6 LF T&RDP
300170047	AF-TE2703C	AF-TE2703C / TM2703C UW

III. Process flow, Process Qualification and Product Qualification Plan:

The below table shows a process flow comparison of the IMD process.



• FOX no need to the etch back due to the cage structure

Process qualification data completed for the 0.35 um SOG process

■ Reliability data at 8E 0.35um SOG process -- Pass

Item	Pattern	SPEC	1st lot	2nd lot	3rd lot
EM	M1	Lifetime > 10yrs	Pass	Pass	Pass
	M2	Lifetime > 10yrs	Pass	Pass	Pass
	TM	Lifetime > 10yrs	Pass	Pass	Pass
	Via1	Lifetime > 10yrs	Pass	Pass	Pass
	TVia1	Lifetime > 10yrs	Pass	Pass	Pass

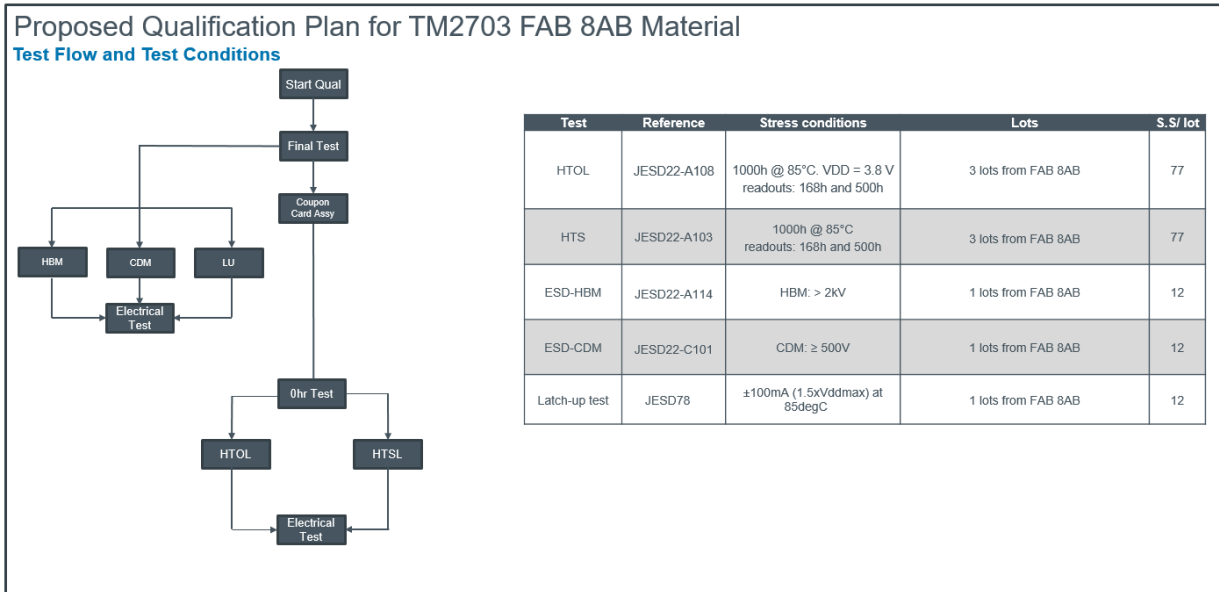
■ Reliability data at 8AB 0.35um SOG process -- Pass

Test Item	Pattern	SPEC	1st lot	2nd lot	3rd lot
EM	M1	Lifetime > 10yrs	PASS	PASS	PASS
	M2	Lifetime > 10yrs	PASS	PASS	PASS
	TM	Lifetime > 10yrs	PASS	PASS	PASS
	Via1	Lifetime > 10yrs	PASS	PASS	PASS
	TVia1	Lifetime > 10yrs	PASS	PASS	PASS



Qualification Plan for TM2703 and TE2703 materials with SOG process (TSL25723FN)

The TSL25723FN device will be qualified using the TM2703 for the process technology qualification.



Qualification Timeline

Production materials available (TM2703) – Samples ready for shipment

Production materials available (TE2703) – CW 22, 2021

Qualification completion– Completed

IV. Key Milestones

Process Technology Qualification	Completed
Product Qualification	Completed



Please be advised that unless we received your written refusal concerning this PCN in writing within 30 days, the PCN shall be deemed accepted.

If you do have further questions, please do not hesitate to contact me.

Best Regards,

A handwritten signature in black ink, appearing to read 'Maximino de Leon', written over a horizontal line.

Maximino de Leon

ams AG

Director, Key Customer Quality



TSL25723

PCN42-2020

Qualification Report

Prepared By: David Mauriello
Product Quality Engineer

Approved By: Blaine Anderson
Product Quality Engineering Manager

Date: February 22, 2021



Revision History

Revision	Date	Description
A	January 15, 2021	Report
B	February 22, 2021	Added ESD and Latch-Up Test Results



Table of Contents

I.	Introduction	8
II.	Objective	8
III.	Summary of Results	8
IV.	General Product Information	8
V.	Qualification Test Flow	9
VI.	Test Conditions and Standards	10
VII.	Detailed Qualification Test Results.....	11
VIII.	Conclusion	12



I. Introduction

The TSL2572 device family provides ambient light sensing (ALS) that approximates human eye response to light intensity under a variety of lighting conditions and through a variety of attenuation materials. Accurate ALS measurements are the result of the AMS patented dual-diode technology and the UV rejection filter incorporated in the package. In addition, the operating range is extended to 60,000 lux in sunlight when the low-gain mode is used. While useful for general purpose light sensing, the TSL2572 device is particularly useful for display management to provide optimum viewing in diverse lighting conditions while extending battery life. The TSL2572 device family is ideally suited for use in mobile handsets, TVs, tablets, monitors, and portable media players where the display backlight may account for 50% to 70% of the system power consumption.

II. Objective

To produce objective evidence that the TSL25723 wafer fab process change per PCN 42-2020 produced at the UMC wafer fab passes qualification testing.

III. Summary of Results

All units passed electrical and optical test after the different reliability stress tests. The qualification results indicate that the product either meets or exceeds customer's application requirements.

IV. General Product Information

Device:	TSL25723
Function:	ALS Sensor
Process Technology:	UMC 0.3 micron
Package:	DFN
Assembly Sites:	Hana AYT (Thailand)
Test Site:	HANA AYT (Thailand)
Wafer Fab Sites:	UMC (Taiwan)

V. Qualification Test Flow

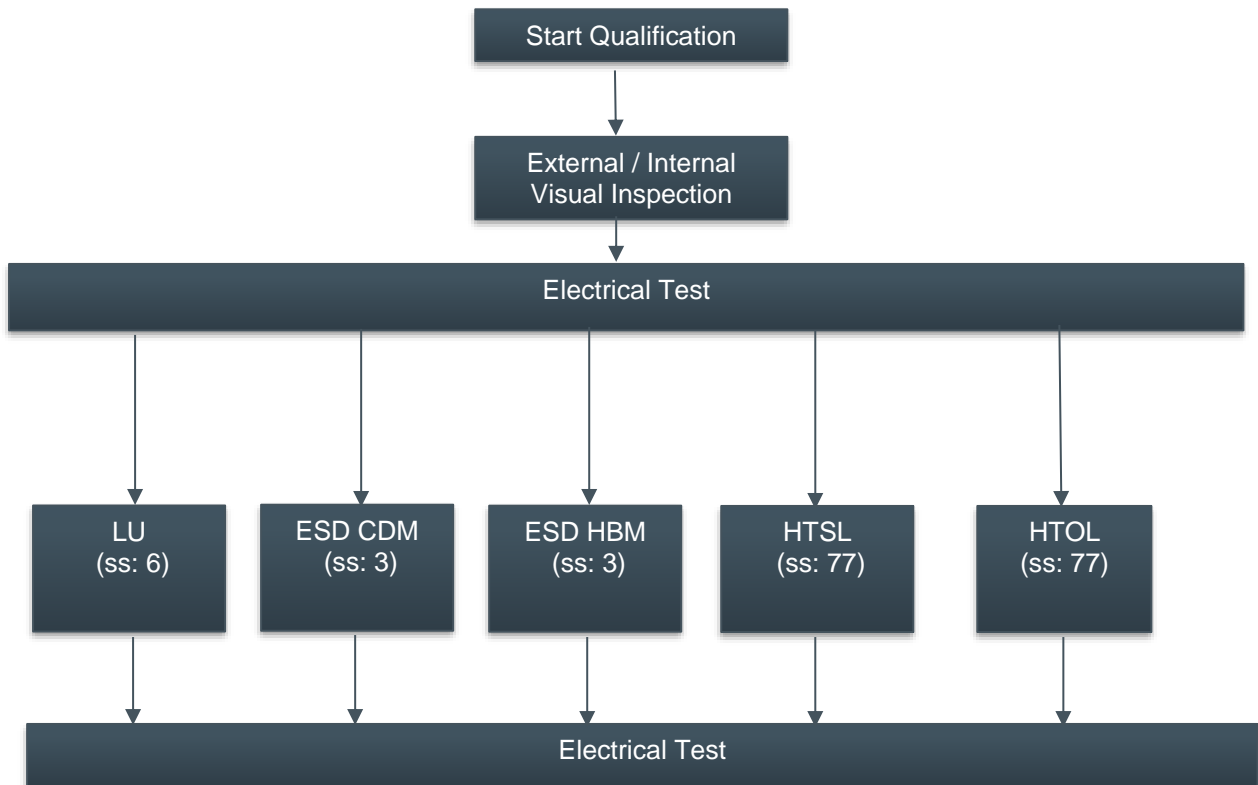


Figure 1. Qualification Test Flow, with full electrical test coverage.



VI. Test Conditions and Standards

Table 1: Reliability Test Conditions

TEST	STANDARD	TEST CONDITIONS	SAMPLE SIZE/LOTS
Start Qualification		Samples having passed the final outgoing quality control	204 samples/3 lots
External / Internal Visual Inspection		Per Visual Inspection Criteria	204 samples/3 lots
Electrical Test		Full Electrical Test according device specification at room temperature	204 samples/3 lots
High Temperature Operating Life (HTOL)	JESD22-A108	85°C, dynamic, 3.8V, readouts at 168hrs, 500hrs, 1000hrs	77 samples/3 lots
High Temperature Storage Life (HTSL)	JESD22-A103	85°C, readout at 168hrs, 500hrs 1000hrs	77 samples/3 lots
ESD HBM	JS-001-2017	2000V	3 Samples/1 lot
ESD CDM	JS-002-2014	500V	3 Samples/1 lot
Latch-Up	JESD78E	Class II (70°C) +/-100mA	6 Samples/1 lot



VII. Detailed Qualification Test Results

Table 1. HTOL Results

Stress:	HTOL	
Condition:	3.8V , 85°C Dynamic	
Test Readouts:	168, 500 & 1000 Hours	
Sample Size:	77 pcs/lot	
Test Results:	Pass	Fail
Lot 1: G74995.3-05	77	0
Lot 2: G74995.3-06	77	0
Lot 3: G74995.3-07	77	0

Table 2 HTSL Results

Stress:	HTSL	
Condition:	85°C	
Test Readouts:	168, 500 & 1000 Hours	
Sample Size:	77 pcs/lot	
Test Results:	Pass	Fail
Lot 1: G74995.3-05	77	0
Lot 2: G74995.3-06	77	0
Lot 3: G74995.3-07	77	0

Table 4. ESD HBM Results

Lot ID	ESD HBM 2000V
Lot 1: G74995.3-05	0/3

Table 5. ESD CDM Results

Lot ID	ESD CDM 500V
Lot 1: G74995.3-05	0/3



Table 6. Latch-up Results

Lot ID	Latch-Up
Lot 1: G74995.3-05	0/6

VIII. Conclusion

The TSL25723 product passed all qualification testing with no failures.