



# QREP9901 QUALIFICATION REPORT

---

## Laser Marking for PLCC, TSOP, SO, PDIP and FDIP Packages

---

### INTRODUCTION

Laser marking will be used as an alternative manufacturing solution to the ink marking. This change will allow to improve the marking cycle time and therefore the service to the ST customers.

STMicroelectronics has performed a standard qualification for marking. No impact is forecasted at customer level.

Director of  
Memory Products Group  
Quality Control & Reliability

*Attilio PANCHIERI*

## QREP9901 - QUALIFICATION REPORT

The Laser Marking qualification criteria are:

- v) visibility (marking must be deep enough)
- q) quality (marking must not be so deep to approach wire loops)
- r) reliability (humidity penetration)

In order to qualify laser marking, trials have been set-up to verify conformity to all these concerns, with the following criteria:

- v) lighting = 600 lux, angle 45°, distance 45 cm.
- q) good control of marking depth w.r.t. clearance to wire loop.
- r) (Preconditioning+) Pressure Pot + Thermal Cycles

TSOP package is the thinnest, the most critical and therefore the most tested. Since the other packages are much thicker, **similarity to TSOP** has been used to qualify laser marking on the other packages. Clear visibility has been verified on all packages.

After completion of trials for all packages (see Table 1 collecting trials for MPG packages), STMicroelectronics is confident that Laser Marking process in Singapore meets all visibility, quality and reliability targets. It is therefore qualified for all MPG packages.

**Table 1. Matrix of Trials and Results for Laser Marking Qualification**

Package	Visibility Check <sup>(1)</sup>	Marking Depth/Wire Loop	Reliability Trials
<b>TSOP</b> PCN: NV7009	Test Vehicle: 32 lead		Test Vehicle: 28, 32, 40, 48 lead
	s/s = 4 units all OK	s/s = 8 points x 4 units min = 20 µm, max = 38 µm spec: depth < 50 µm	s/s = 76 units total MSL3 + IR reflow PPT at 240h: 0/76 TCT at 500#: 0/76
<b>SO</b> PCN: NV8003	Test Vehicle: 44 lead		Similarity (TSOP)
	s/s = 80 units all OK	s/s = 7 points x 20 units min = 20 µm, max = 35 µm spec: depth < 75µm	
<b>PLCC</b> PCN: NV6004	Test Vehicle: 32 lead		Similarity (TSOP)
	s/s = 4 units all OK	s/s = 8 points x 4 units min = 19 µm, max = 47 µm spec: depth < 75 µm	
<b>PDIP</b> PCN: NV8003	Test Vehicle: 600mils		Similarity (TSOP)
	s/ = 10 units all OK	s/s = 7 points x 10 units min = 30 µm, max = 51 µm spec: depth < 75 µm	
<b>FDIP</b> PCN: NV8006	Test Vehicle: 600mils		N/A
	s/s = 10 units all OK	s/s = 7 points x 10 units min = 17 µm, max = 30 µm spec: depth < 75 µm	

Note: 1. Visibility Spec: visually clear at distance = 30 cm, angle = 45°, with lighting = 600 lux.  
s/s = Sample size  
MSL3 = Moisture sensitivity level 3 preconditioning.

## QREP9901 - QUALIFICATION REPORT

---

If you have any questions or suggestion concerning the matters raised in this document please send them to the following electronic mail address:

*ask.memory@st.com* (for general enquiries)

Please remember to include your name, company, location, telephone number and fax number.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is registered trademark of STMicroelectronics  
© 1999 STMicroelectronics - All Rights Reserved

All other names are the property of their respective owners.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>

