No Post Program Conditioning on UT28F256QL and UT28F256LVQL 256k PROMs

Overview:
The UT28F256QL and UT28F256LVQL 256k PROMs (QL PROMs) are functionally equivalent replacement devices for the UT28F256 and UT28F256LV exhausted legacy PROM inventory. The QL PROM reliability has been demonstrated and is guaranteed without post program conditioning (PPC). These devices are a complete redesign of the legacy PROM devices and are built on a state-of-the-art 5V 0.35µm CMOS process using RadHard-by-Design techniques. The QL PROM along with the QuickLogic ViaLink™ non-volatile programming element have been designed, characterized and demonstrated to support a reliable QL PROM device post programming, with NO added conditioning. The QL PROM reliability results are highlighted in the attached low temperature (-55°C) operating lifetest (LTOL) and high temperature (+125°C) operating lifetest (HTOL) summaries. Over 20 million programmed ViaLink elements and over 20 million unprogrammed ViaLink elements were found to be reliable during this lifetest study. The LTOL and HTOL lifetest studies each contained 77 QL PROM devices balanced in their programming between 1's and 0's, the 1's being programmed ViaLink elements and the 0's being unprogrammed ViaLink elements. The duration of lifetest was 1000 hours for all devices operating at maximum operating power supply voltage of 5.5V. No failures were observed.

The QL PROM devices **will be damaged** if subjected to the legacy PROM post program conditioning (PPC). The PPC kit supplied with the legacy PROM operates with VDD at 7.0V, maximum VDD on the QL PROM is 6.0V. Also, the Program Enable pin toggles on the PPC kit, which will incorrectly stress the QL PROM. **DO NOT** perform PPC on the new QL PROM devices.

History:
The legacy PROMs (device types UT28F256 and UT28F256LV) were designed in the early 1990s and manufactured in the mid-1990s on a 1.2µm radiation-hardened CMOS process. Before the critical programming-to-use fuse current characteristics for reliably programming millions of fuses could be determined and understood, access to this 1.2µm CMOS process went away with the sale of Aeroflex's wafer fabrication facility. Aeroflex Colorado Springs was no longer able to re-design the programming path in the legacy PROM to provide more current through the fuse during programming. To compensate for one in a million weakly and unreliably programmed fuses occurring immediately after programming, Aeroflex developed a post program conditioning (PPC) procedure to strengthen weakly programmed fuses and expose any remaining devices with weakly programmed fuses. Aeroflex demonstrated high reliability of the legacy PROM with PPC through lifetest studies.

Summary:
The new UT28F256QL and UT28F256LVQL QL PROMs are designed with reliable ViaLink programming which requires no post program conditioning. These devices are built on a state-of-the-art 5V 0.35µm CMOS process using RadHard-by-Design techniques. The reliability of the programmed QL PROMs has been demonstrated though LTOL and HTOL lifetest studies.

Conversely, the UT28F256 and UT28F256LV legacy PROMs were found to have insufficient fuse programming current and required a post programming conditioning procedure to guarantee reliability. Extensive reliability studies were performed and demonstrated reliability of the programmed Legacy PROM with PPC.

The QL PROM devices **will be damaged** if subjected to the legacy PROM post program conditioning (PPC). **DO NOT** perform PPC on the new QL PROM devices.

Low Temperature Operating Lifetest
(LTOL)

JESD22-A108

DATE:03/21/05 **DEVICE:**WE62D **LOT:**QL0815LTOL **DATE CODE:**0510

QUALIFICATION PERIOD:WAFER LOT **GENERIC FAMILY:**256K QLPROM

CUSTOMER P/N:N/A **WAFER LOT:**D63791.02

TEST	CONDITION	RESULTS # FAIL / # TESTED	SEE NOTES
1000 hours LTOL (Low Temp Operating Lifetest)	-55°C	0 / 77	
End Point Electrical			1/, 2/

NOTES:

1/ Per applicable device specification.

2/ Parts tested at 3.3V and 5V.

_____ June 14, 2005

QA Representative Date

Technology Conformance Inspection
Group C Acceptance Test

MIL-PRF-38535

DATE:03/22/05 **DEVICE:**WE62D **LOT:**QL0815HTOL **DATE CODE:**0510

QUALIFICATION PERIOD:WAFER LOT **GENERIC FAMILY:**256K QLPROM

CUSTOMER P/N:N/A **WAFER LOT:**D63791.02

SUB GROUP	TEST	883 METHOD	RESULTS # FAIL/# TESTED	SEE NOTES
1	STEADY STATE LIFE	1005	0 / 77	1
	END-POINT ELECTRICAL			2

NOTES:

1.Test conditions to be specified. (1000 hours at 125°C)

2. Per applicable device specification

_____ June 14, 2005

QA REPRESENTATIVE **DATE**

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