

PCN# 20210607001

Potential for Processor Brownout at High Speed and Heavy Load:

MitySOM-335x Modules

Date: June 07, 2021

To: Purchasing Agents & Design Engineers

Dear Customer,

This is an initial announcement of a change to a product that is currently offered by Critical Link. The details of this change are on the following pages.

For questions regarding this notice, contact the Hardware Manager Bill Halpin (bill.halpin@critiallink.com).

Sincerely,

Critical Link, LLC

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Title: High Speed Processor Brownout

Contact: Bill Halpin

Phone: (315) 425-4045

EOL Date: 6/07/21

Overview

Changes to MitySOM-335x System on Modules are identified in the following sections.

1 Add Capacitance To “VDD_MPU”

1.1 Description of Change

The previous capacitance for the VDD_MPU processor voltage under the AM335x processor utilized four (4) 0.022uF capacitors and one (1) 0.01uF capacitor with a 10uF bulk capacitor midway between the Power Management IC (PMIC) and the processor. This change to the module replaces one of the 0.022uF capacitors under the processor, specifically C27, with a 10uF bulk capacitor.

1.2 Reason for Change

It was found that in some production lots of MitySOM-335x modules, specifically those running at 1GHz CPU clock frequencies, lot-to-lot variances combined with high instantaneous processor load could result in the AM335x processor browning out. This was determined to be due to specific high current demand software processes. Testing showed that reducing the CPU clock speed to 800MHz in these instances mitigates the occurrence of the brownout conditions.

Replacing C27 with the 10uF capacitor eliminates the occurrence of these brownouts when operating at 1GHz. This change provides additional margin for the VDD_MPU processor power input when operating at lower frequency CPU clock speeds. Due to the positive impact to the VDD_MPU voltage this change will be implemented on all variants of the MitySOM-335x, regardless of CPU clock frequency.

Note that the VDD_MPU voltage is designed to be scaled based upon the selected CPU clock frequency and the voltage is controlled by software registers set in the on-SoM PMIC. Please reference the Texas Instruments SPRS717 (Revision L March 2020) document, section 5.4 (Operating Performance Points(OPPs)), for specific voltage requirements.

1.3 Anticipated Impact on Form, Fit, Function (positive / negative)

The form of the modules is minimally impacted due to the increased height of the 10uF capacitor being used at location C27. The new capacitor has a maximum height of 0.90mm compared to the previous components height of 0.50mm. There are other existing components nearby that have the same maximum height of 0.90mm.

There is no change to the fit of the module.

There is no change to the function of the module and no associated software changes are necessary.

1.4 Anticipated Impact on Quality or Reliability (positive / negative)

There is no expected impact on quality.

Reliability during specific high current demand software processes is expected to be improved with this change.

2 Products Affected

Details regarding the full revision history can be located in the MitySOM-335x Revision History section on the Critical Link support site.

https://support.criticallink.com/redmine/projects/armc8-platforms/wiki/Module_Product_Change_Notifications

Table 1 Products Affected

Model Number	Starting PCA	Replacement PCA
3352-HX-X38-RC	80-000596RC-7	80-000596RC-8
3352-HX-X27-RC	80-000597RC-7	80-000597RC-8
3352-HX-X27-RI	80-000597RI-7	80-000597RI-8
3354-HX-X38-RC	80-000599RC-7	80-000599RC-8
3354-HX-X38-RI	80-000599RI-7	80-000599RI-8
3352-HX-XX7-RI	80-000601RI-7	80-000601RI-8
3352-HX-X47-RI	80-000695RI-7	80-000695RI-8
3354-HX-XX8-RC	80-000906RC-7	80-000906RC-8
3358-IX-X38-RI	80-000907RI-7	80-000907RI-8
3358-IX-X3A-RI	80-000927RI-7	80-000927RI-8
3352-HX-X4A-RC	80-001019RC-7	80-001019RC-8
3352-HX-X38-RC*	80-001041RC-7	80-001041RC-8
3352-HX-X38-RL	80-001088RL-7	80-001088RL-8
3354-IX-XXA-RC	80-001341RC-7	80-001341RC-8
3352-HX-X3A-RC	80-001471RC-7	80-001471RC-8
3352-HX-X3A-RC*	80-001472RC-7	80-001472RC-8

.*- Custom code

3 Document Revision History

Date	Version	Change Description
11-Jun-2021	1.0	Initial Version