

PCN# 20170130000

Allow Processor Power Down

Date: Jan 30, 2017
To: Purchasing Agents

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 Production Manager, Bill Halpin (bill.halpin@criticallink.com).

Sincerely,

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PCN Number: 20170130000
PCN Date: Jan 30, 2017
Title: Allow Processor Power Down
Contact: Bill Halpin
Phone: (315) 425-4045
Ship Date: May 2017

Overview

One change to the MitySOM-335x modules is identified in the following section.

Change 1 – Allow Processor Power Down

Description of Change

Portable applications generally desire the ability to power-down and save battery power. The original MitySOM design targeted always-on use cases, and did not have a functional power-down feature. The power on reset was configured such that the unit automatically powered back up when the AM335x RTC is configured to power down the Power Management Integrated Circuit (PMIC).

To correct this, the power on reset is pulled high (inactive) for as long as power is applied, so that the AM335x RTC remains active, even during power-down. The unit will stay at a low power state after power-down until a power button is pressed, which is connected to PWR_ON (PMIC PWRON, Pin 33, Module Pin 32) and EXT_WAKEUP (AM335x EXT_WAKEUP, Module Pin 180). Note that there is still some minimal circuitry active when powered down.

To use this newly supported feature, the PWR_ON (PMIC PWRON, Pin 33, Module Pin 32) and EXT_WAKEUP (AM335x EXT_WAKEUP, Module Pin 180) will need to be connected to a power button and the kernel will need to be updated to configure the AM335x RTC to power down (See Figure 1 for an example circuit). Note that EXT_WAKEUP is on a 1.8V power domain; the voltage divider is shown in Figure 1. Please contact Critical Link if designing a system using this feature.

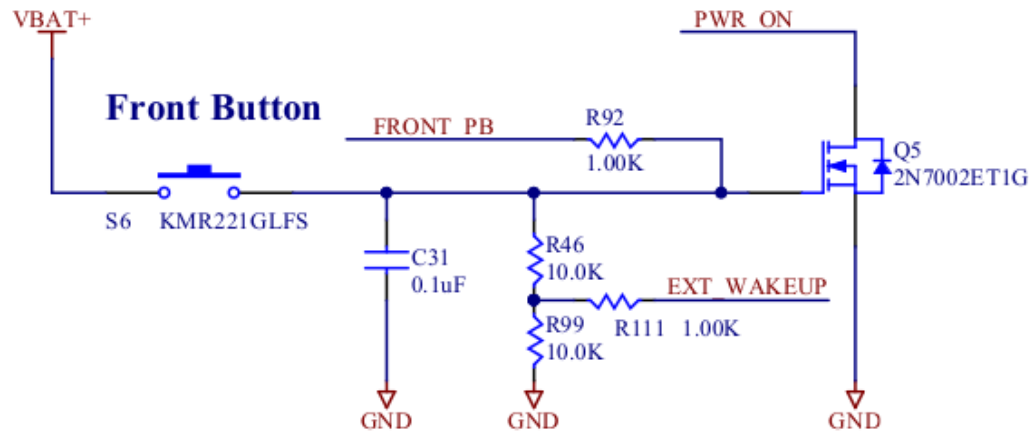


Figure 1: Example schematic for connecting a power button

If the AM335x RTC is not configured to power down, as is with existing kernel releases to date, the MitySOM will operate exactly as previous revisions have.

Reason for Change

The PMIC_PWR_EN signal from the processor is connected to the PWRHOLD signal in the PMIC (TPS65910). This signal is used to tell the PMIC that the processor is running and to maintain power. If the AM335x RTC is enabled and configured to power down the PMIC, then after a Linux shutdown the AM335x RTC Alarm 2 register is configured to pull low (inactive) the PMIC_PWR_EN signal to allow the system to shut down. However the PMIC_PWR_EN signal only goes low (inactive) for ~62uS before going high again, causing the system to power back up. It was discovered that the AM335x RTC reset was going low (active) at the same time that the PMIC_PWR_EN signal was going back high. The AM335x RTC reset should instead be tied to what powers it, which in this case, is U11 pin 5 (VRTC_1P8).

Without this change, excess power consumption when linux is shutdown could have adverse effects on battery-powered applications.

NOTE: There are two RTCs on the module, the AM335x RTC and the PMIC RTC. This modification only affects the AM335x RTC, which does not affect time keeping functionality. The module's time keeping is maintained with the PMIC RTC.

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

Power down mode is now supported in this hardware revision. Note that this feature will need to be enabled in the Linux kernel. No change to form or fit.

Anticipated Impact on Quality or Reliability (positive / negative)

No impact to Quality or Reliability is anticipated.

Products Affected:

Table 1 lists all affected products. Details regarding the full printed circuit assembly (PCA) 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	Current PCA	Replacement PCA
3352-IX-X3A-RC	80-000660RC-3	80-000660RC-4
3352-HX-X27-RC	80-000597RC-3	80-000597RC-4
3352-HX-X27-RI	80-000597RI-3	80-000597RI-4
3352-HX-X38-RC	80-000596RC-3	80-000596RC-4
3352-HX-XX7-RC	80-000601RC-3	80-000601RC-4
3352-HX-XX7-RI	80-000601RI-3	80-000601RI-4
3354-HX-X38-RC	80-000599RC-3	80-000599RC-4
3354-HX-X38-RI	80-000599RI-3	80-000599RI-4
3354-HX-XX8-RC	80-000906RC-3	80-000906RC-4
3354-IX-X38-RC	80-000659RC-3	80-000659RC-4
3354-IX-X38-RI	80-000659RI-3	80-000659RI-4
3354-IX-X3A-RC	80-000638RC-3	80-000638RC-4
3354-IX-X3A-RI	80-000638RI-3	80-000638RI-4
3354-HX-XX8-RC	80-000906RC-3	80-000906RC-4
3358-IX-X38-RI	80-000907RI-3	80-000907RI-4
3358-IX-X3A-RI	80-000927RI-3	80-000927RI-4