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MIGRATING FROM THE XR16C2850 TO THE XR16L2751

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1.0 INTRODUCTION

This application note describes the changes necessary and what to consider when migrating from the XR16C2850 to the XR16L2751.

1.1 HARDWARE DIFFERENCES

- The XR16C2850 and XR16L2751 are both available in the 48-pin TQFP package. The XR16C2850 is also available in the 40-pin PDIP and 44-pin PLCC packages but the XR16L2751 is not.
- The XR16C2850 can operate at 3.3 or 5 V only. The XR16L2751 can operate from 2.25 V up to 5.5 V. Also, the XR16L2751 is 5 V tolerant while operating at 3.3 V.
- The maximum crystal oscillator frequency for the XR16C2850 is 8 MHz at 3.3 V while it is a maximum of 20 MHz for the XR16L2751. The crystal oscillator frequency at 5 V and external clock frequencies are the same and the XR16L2751 has the additional specifications for operating at 2.5 V.
- IER Bit-4 enables the sleep mode for both the XR16C2850 and XR16L2751. But if the PWRSERVE pin (pin 12) of the XR16L2751 is tied to VCC, then the XR16L2751 will be in PowerSave Mode where, in addition to sleep mode, the data bus interface is isolated further reducing power consumption. Please see datasheet for complete details. This pin is not available in the XR16C2850.
- The XR16C2850 can only operate in the Intel Bus Interface. But the XR16L2751 can operate in either the Intel or Motorola Bus Interface. If the 16/68# pin (pin 24) is tied to VCC, the XR16L2751 is in the Intel Bus Interface and if the 16/68# pin is tied to GND, the XR16L2751 will be operating in the Motorola Bus Interface.
- In the 48-pin TQFP package, there are 2 pins that are different between the XR16C2850 and the XR16L2751. The following table lists the pin differences and the hardware changes necessary to replace the XR16C2850 with the XR16L2751.

TABLE 1: PIN DIFFERENCES BETWEEN THE XR16C2850 AND XR16L2751

48-TQFP PIN NUMBER	XR16C2850 PIN NAME	XR16L2751 PIN NAME	HARDWARE CHANGE REQUIRED	COMMENTS
12	N.C.	PWRSERVE	Yes	PWRSERVE pin on the XR16L2751 is an input and therefore should be connected GND or VCC
24	CLK8/16	16/68#	Yes	Needs to be connected to VCC to select the Intel Bus Interface. CLK8/16 pin functionality can be selected via EMSR bit-7.

1.2 FIRMWARE DIFFERENCES

The internal registers of the XR16C2850 and XR16L2751 are identical except for a few registers:

- FIFO Control Register (FCR)
 - Bit-0 enables the FIFO for both the XR16C2850 and XR16L2751, but the FIFO sizes are different. The TX and RX FIFOs are 128 bytes deep for the XR16C2850 and are 64 bytes deep for the XR16L2751.

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- Enhanced Mode Select Register (EMSR)
 - Bit-7 is not used in the XR16C2850 but it is used in the XR16L2751 to select the 16X or 8X sampling rate. Bit-7 is asserted for 16X sampling (default) and de-asserted for 8X sampling.
 - Bit-6 is not used in the XR16C2850 but it is used in the XR16L2751 to select whether the LSR Interrupt is generated immediately when there is a data error in the FIFO or delayed until the data byte with an error is being read out of the FIFO.
 - Bit-3 is not used in the XR16C2850 but it is used in the XR16L2751 to invert the polarity of the RS485 half-duplex direction control output signal (RTS#) if necessary.
 - Device Identification (DVID) register has a value of 0x12 for the XR16C2850 and 0x0A for the XR16L2751.

1.3 REPLACING THE XR16C2850 WITH THE XR16L2751

You cannot directly replace the XR16C2850 with the XR16L2751 unless pin 12 was connected to VCC or GND and pin 24 was connected to VCC in the original design.

The PowerSave feature is well suited for low power and batter operated systems. It isolates the data bus to further reduce current drain during sleep mode. Sleep current can be as low as 30 uA. Please refer to the XR16L2751 datasheet for complete details.

If using the 8X data sampling rate for the XR16C2850, the software will need to be updated for the XR16L2751 since this functionality can only be controlled by a register bit rather than as a hardware pin like that of the XR16C2850. Also, the XR16L2751 has a few additional features such as selecting the LSR interrupt mode and inverting the RS485 polarity that may require some software changes.

In a nutshell, the XR16C2850 and XR16L2751 are very similar devices but with different FIFO sizes and there are a few additional features in the XR16L2751.

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