

Replacing the M41T00S and DS1340 RTC with the ISL12008

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Introduction

Intersil has recently introduced the ISL12008 Real Time Clock (RTC) devices. The device is pin-to-pin and software compatible to the STMicro M41T00S and Maxim DS1340 RTCs. The ISL12008 has extra features, and these features include:

- Alarm
- Battery InterSeal and ReSeal™
- Power Failure Detection

The features are detailed in the data sheets. This Technical Brief provides information for an engineer wishing to use the ISL12008 to replace the M41T00S or DS1340 in their system.

Replacing the M41T00S with the ISL12008

The ISL12008 can drop into an M41T00S socket with no hardware and software changes required.

There is one difference that may affect microcode or software. The M41T00S has 8 register addresses (00h to 07h). When communicating to the device, the upper

5 register address bits are “don’t care” bits (XXXXXA2A1A0). For example, register address 09h (00001001b) is same as 01h (00000001b), or 1Ah (00011010b) is same as 02h (00000010b). When the register address is set to 09h, the M41T00S will write or read the data from 01h; the Minute register. Since the ISL12008 has 32 register addresses, when writing to register address 09h, the date will be written to register address 09h.

Replacing the DS1340 with the ISL12008

The ISL12008 can drop into an DS1340 8 lead SOIC socket with no hardware and software changes required.

The only difference between the DS1340 and the ISL12008 is the DS1340 has battery charging function, which the ISL12008 does not provide.

Please note the DS1340 offers three subsets that operate at difference voltage levels. These voltage levels are: 1.8V, 3V and 3.3V. The ISL12008 can replace the 3V and 3.3V options, but not the 1.8V option.

TABLE 1. REPLACING THE M41T00S AND DS1340 WITH ISL12008

FUNCTION	M41T00S	DS1340	ISL12008	AFFECTS SOFTWARE?
Supply Voltage	2.7V to 5.5V	DS1340 - 3: 2.7V to 3.3V DS1340 - 3.3: 2.97V to 5.5V	2.7V to 5.5V	NO
Battery Voltage	2.0V to 3.5V	DS1340 - 3: 1.3V to 3.7V DS1340 - 3.3: 1.37V to 5.5V	1.8V to 5.5V	NO
Battery Switchover Voltage	$V_{BAT} < 2.6V$: V_{BAT} $V_{BAT} > 2.6V$: 2.6V	DS1340 - 3: $V_{BAT} < 2.6V$: V_{BAT} $V_{BAT} > 2.6V$: 2.6V DS1340 - 3.3: $V_{BAT} < 2.88V$: V_{BAT} $V_{BAT} > 2.88V$: 2.88V	$V_{BAT} < 2.6V$: V_{BAT} $V_{BAT} > 2.6V$: 2.6V	NO
Battery Current	600nA, $V_{BAT} = 3.0V$	800nA, $V_{BAT} = 3.0V$	800nA, $V_{BAT} = 3.0V$	NO
OF Bit Location	Register 1, Bit 7	Register 9, Bit 7	Registers 1 and 9, Bit 7	NO

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