



Keywords: DS2155,DS21458,migration,software migration,SCT,transceiver,quad

APPLICATION NOTE 3357

DS2155 To DS21458 Migration

Oct 14, 2004

Abstract: The DS21458 is a four-port T1/E1/J1 Single Chip Transceiver (SCT) that shares a common register set with the DS2155, a single port T1/E1/J1 SCT. The DS2155 and the DS21458 share common software architectures, and therefore migrating from the single port DS2155 to the four-port DS21458 is relatively simple. This document details the minor differences between the DS2155 and the DS21458.

Introduction

The DS21458 is a four-port T1/E1/J1 Single Chip Transceiver (SCT) that shares a common register set with the DS2155, a single port T1/E1/J1 SCT. The DS2155 and the DS21458 share common software architectures, and therefore migrating from the single port DS2155 to the four-port DS21458 is relatively simple. This document details the minor differences between the DS2155 and the DS21458.

Register Map

The DS21458 is comprised of four copies of the DS2155 register map, one for each port. The ports are selected via the two most significant address lines, A8 and A9. Though the memory maps are virtually identical, there are several small differences that exist between the DS2155 and the DS21458. These differences are summarized in Table 1 below.

Table 1. Register Map Differences

Register Name.Bit	Address	Bit Name	DS2155	DS21458	Comments
CCR1.3	70h	DICAI	X	--	Disable Idle Code Auto Increment - Selects/deselects the auto-increment feature for the transmit and receive idle code array address register, this function is not available in the DS21458
CCR1.7	70h	MCLKS	X	--	MCLK Select, allows the user to select either TSYSCCLK or MCLK as the master clock, this function is not available in the DS21458
CCR3.6	72h	INTDIS	X	--	Interrupt Disable, allows the user to disable all interrupts regardless of the Interrupt Mask Register settings, this function is not available in the DS21458.
CCR3.7	72h	TMSS	X	--	Transmit Multi-frame Sync Source, allows the users to select the framer or TSYNC pin as the source of the multi-frame sync, this feature is not available on

					the DS21458.
LBCR.7	4Ah	LTS	--	X	LIUC/TPD Pin Function Select, this pin selects the function of the LIUC/TPD pin and should always be set to a 1 in the DS21458. This bit does not exist in the DS2155 memory map.
PSA1	F1h	--	--	X	Pulse Shape Adjustment Register 1 - Allows the user to adjust the transmit pulse waveform, this register is not available on the DS2155.
PSA2	F2h	--	--	X	Pulse Shape Adjustment Register 2 - Allows the user to adjust the transmit pulse waveform, this register is not available on the DS2155.
IDR	0Fh	--	X	X	Device Identification Register - This read only register displays the Device ID and Chip Revision of the given device and the contents will depend on which part or revision is used.

Pin Changes

The pin names associated with the DS21458 are almost identical to those of the DS2155 with the obvious difference that some pin names have changed to allow for differentiation between the multiple ports on the DS21458. For instance, the single RSIG pin on the DS2155 has been changed to RSIG1, RSIG2, RSIG3 and RSIG4 for the four ports on the DS21458.

The DS2155 has a single MCLK pin, while the DS21458 has two MCLK pins called MCLK1 and MCLK2. These two pins can be driven from a common source on the DS21458.

The DS2155 has an XTALD pin to allow the option of using a quartz crystal applied across the MCLK and XTALD pins. The DS21458 does not support this and therefore has no XTALD pin.

The 8xCLK pin is also not available on the DS21458. This pin is an 8x clock output pin on the DS2155 but has been removed on the DS21458.

The DS21458 has two more address pins, A8 and A9 that do not exist on the DS2155. These address pins are used to select one of the four ports.

The DS2155 has four generic user output pins that do not exist on the DS21458. These pins are UOP0, UOP1, UOP2 and UOP3.

The LIUC pin, which is used to separate the Line Interface Unit (LIU) and the Framer on the DS2155, is called the Transmit Power Down (TPD) pin on the DS21458. The user has limited access to the clock and data signals between the framer and the LIU on the DS21458 and the LIUC pin is not required. The TPD functionality is only available on the DS2155 via the register bit TPD located in the LIC1 register. With the reduced access to signals between the LIU and the Framer, the following pins are not present on the DS21458: TPOSI, TNEGI, TCLKI, RPOSI, RNEGI and RCLKI.

ESIB Functionality

The Extended System Information Bus (ESIB) function of the DS2155 allows up to 8 individual DS2155s to share a common 8-bit CPU bus for reporting alarms and interrupt status as a group. These signals are externally tied together for multiple devices in order to accomplish this in the DS2155 architecture. On the DS21458 the ESIB signals are internally bussed and only a single set of signals are brought out

to enable the connection of another DS21458 onto the ESIB bus to make it an 8-port bus. Please see the DS21458 datasheet for detailed information regarding the ESIB bus functionality.

JTAG Functionality

The DS21458 JTAG chain consists of a single chain for all four ports. On the DS2155, the JTAG chain consists of a single port. Details for the JTAG chain can be found in the JTAG section of the DS21458 datasheet.

Conclusion

While there are some minor memory map differences between the DS2155 and the DS21458, migration from the single-port DS2155 to the four-port DS21458 is relatively straightforward. There are very few register bit changes and with the exception of the additional pins required to support the multi-port design of the DS21458, the pin functionality between the two parts is virtually identical as well. For more information, please consult the DS2155 and DS21458 datasheets, which can be found at: www.maximintegrated.com.

Related Parts		
DS21458	Quad T1/E1/J1 Transceivers	Free Samples
DS21458	Quad T1/E1/J1 Transceivers	Free Samples
DS2155	T1/E1/J1 Single-Chip Transceiver	Free Samples
DS2155	T1/E1/J1 Single-Chip Transceiver	Free Samples

More Information

For Technical Support: <http://www.maximintegrated.com/support>

For Samples: <http://www.maximintegrated.com/samples>

Other Questions and Comments: <http://www.maximintegrated.com/contact>

Application Note 3357: <http://www.maximintegrated.com/an3357>

APPLICATION NOTE 3357, AN3357, AN 3357, APP3357, Appnote3357, Appnote 3357

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