Product Unit

Infrared Data Communication

Interface Circuits

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Interfacing the 4000 Series to a UART16550

The 4000 series comprises the devices TFDT4500, TFDS4500, and TFDU4100. There are various possibilities to connect the IrDA front end transceiver e.g., TFDS4500 to the serial RS232 port – either as a built-in infrared port or as an external infrared adapter. In the built-in port (see figure 1), the interface providing the pulse shaping and stretching is performed by a circuit (TOIM3000) directly connected to the UART (16450-/16550 compatible).
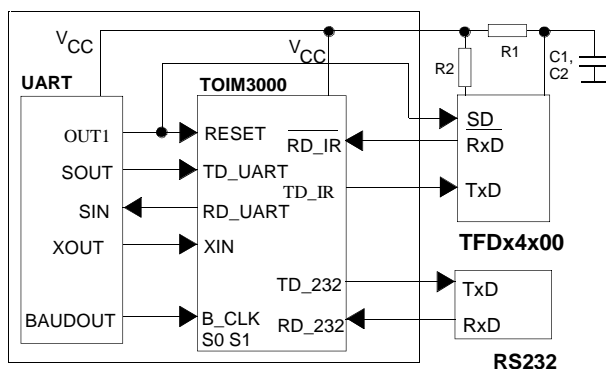

Figure 1. TOIM3000 – UART interface
(built-in infrared port)

Interfacing the 4000 Series to RS232 Externally

The second solution (see figure 2) is an IR adapter (so-called dongle) which connects the transceiver front end e.g., TFDS4500 to the RS232 port as

external component. The advantage is the external connectivity to a port with the drawback that the internal oscillator of the RS232 port cannot be used. The clock generator must also be added externally and is therefore integrated into the TOIM3232. The interface circuit TOIM3232 can be programmed by certain commands to the register of the interface circuit.
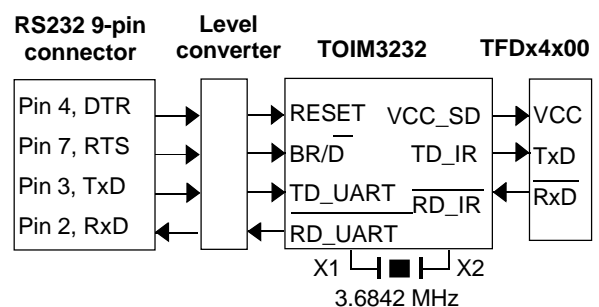

Figure 2. TOIM3232 – RS232 port interface
(external infrared adapter)

Interfacing the 4000 series by Super I/Oô Devices

Super I/O controllers, e.g., the National Semiconductor PC87334VLJ/ PC87334VJG and SMC (Standard Micro-systems Corporation) FDC37C665IR / FDC37C666IR can be directly interfaced to the devices of the 4000 series.

A capacitive coupling should be implemented in the TxD line as described in National Semiconductor's application note "Connecting a Serial Infrared (SIR) Analog Board to the PC87334VLJ".

Interfacing the 5000 and 6000 Series by PC87108/109/338 Infrared Controllers

The 5000 series comprises the devices TFDT5500, TFDS5500, and TFDU5100. The 6000 series comprises the devices TFDT6500x, TFDS6500x and TFDU6100x and TFDx6000.

NSCPC87108

The configuration shown in figure 3 is recommended to interface the TFDS6000 to the National Semiconductor PC87108VHG "Advanced UART and Infrared Controller".

- C_1 and C_2 should be placed as close as possible to the TFDS6000.

- The area which is grounded should be large enough to cover as much space as possible between the circuit paths leading to the TFDS6000. This is to provide EMI shielding to the internal optoelectronics.

NSCPC87338VLJ

The configuration shown in figure 4 is recommended to interface the TFDS6000 to the National Semiconductor PC87338VLJ.

- C_1 and C_2 should be placed as close as possible to the TFDS6000.

Winbond Controllers

Information on the Winbond controllers can be accessed via
http://www.winbond.com.tw/produ/perso5.htm

- The area which is grounded should be large enough to cover as much space as possible between the circuit paths leading to the TFDS6000. This is to provide EMI shielding to the internal optoelectronics.

A catalog overview can be found in find in
http://www.national.com/catalog/PersonalComputing.html, a documentation of the PC87109 controller in
http://www.national.com/pf/PC/PC87109.html.

Interfacing the 5000 and 6000 Series by SMSC Infrared Controllers

Standard Microsystems Corporation SMC has announced a variety of new Super- and Ultra I/Os™. Typical representatives of the new controllers are the FDC37C669FR and the FDC37C93XFR. Application notes describing how to use the Vishay Telefunken TFDx6x00x with regard to these circuits are available from SMSC (see appendix for addresses).

For more product information, see:
http://www.smsc.com/main/datasheet.html and
http://www.smsc.com/main/catalog/pcio.html.
Many application hints can be found in the document "SMSC IrCC (Infrared Communications Controller) Hardware Design Guide"
http://www.smsc.com/main/appnotes/an76.html.

Application examples
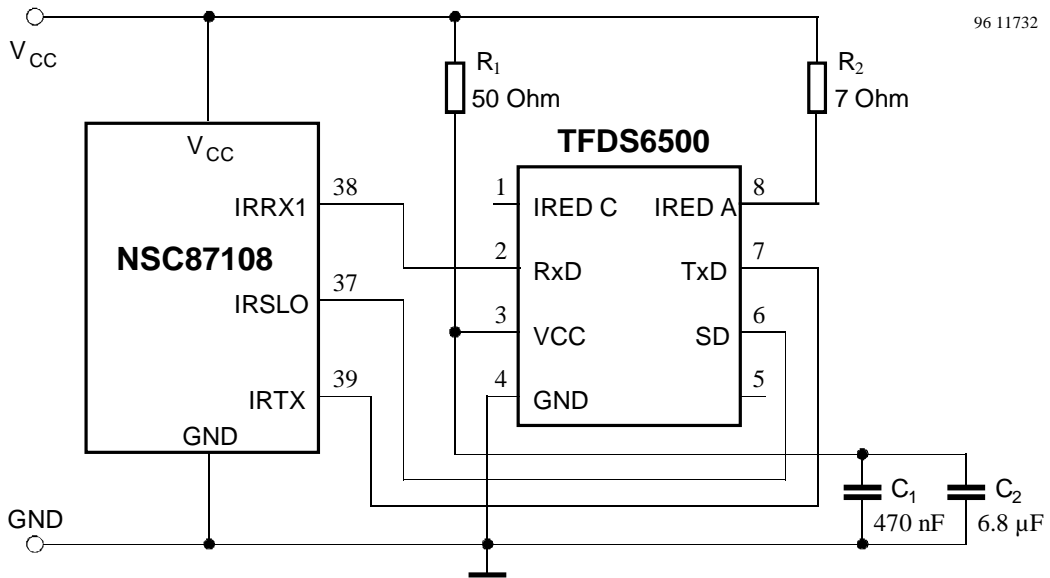

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Figure 3.   Application Example using NSC87108
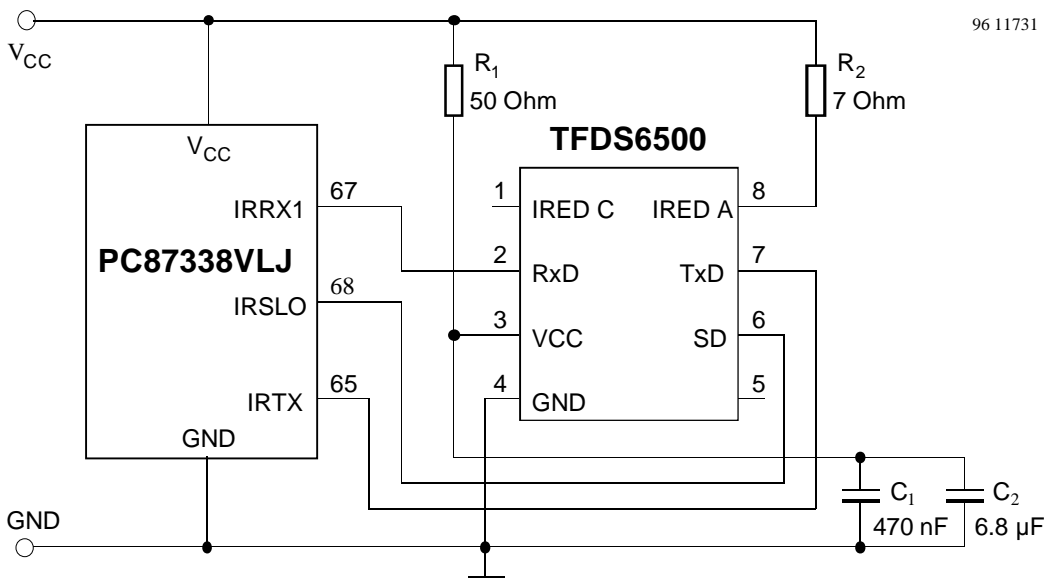

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Figure 4.   Application example for TFDS6500 with NSC87338VLJ I/O

List of Controllers Supporting IR

(Remark: This list is not complete, there are other suppliers as IBM, ITC, VLSI, or Phoenix)

NSC

- IR Communication Controller
  - PC87108   SIR   FIR
  - PC87109   SIR
  - PC87338   SIR   FIR
  - PC87306   SIR
  - PC97338   SIR   FIR

SMSC

- Enhanced Super I/Os
  - FDC37M612 SIR   FIR
  - FDC37C67   SIR   FIR
  - FDC37B77   SIR
  - FDC37B78   SIR

- NoteBook I/Os
  - FDC37N958FR   SIR   FIR
  - FDC37N769   SIR   FIR

- Ultra I/Os
  - FDC37C93   SIR
  - FDC37C93xAPM SIR
  - FDC37C93xFR   SIR   FIR

- Super I/Os
  - 37C665IR   SIR
  - 37C666IR   SIR
  - 37C669   SIR
  - 37C669FR   SIR   FIR

- PC I/O's
  - CAM35C44   SIR   FIR
  - (Package 48 pin TQFP)
  - IR Communication Controller Chip.

Texas Instruments

TIR2000   SIR   FIR
High-Speed Serial Infrared Controller.

Vishay Telefunken

TOIM3000   SIR to UART
TOIM3232   SIR dongle to UART

WINBOND

W83877F   SIR
W83877AF   SIR   FIR
W83877TF   SIR   FIR
W83877ATF   SIR   FIR
W83977F/AF   SIR
W83977TF   SIR
W83977ATF   SIR   FIR