



LM780 Module Integration Notes

Document Version: 1.2

Version History

Version	Date	Description
v1.0	07/06/2010	First Version
v1.1	22/10/2012	1. Add information about pin connections 2. Add information about Reset Circuit
v1.2	13/03/2013	1. Update PIO information for Ring Indicator, Carrier Detect and other functions

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1 General Guidelines -Module Positioning

LM780 module includes on-board antenna and RF tracks on the PCB board which necessitates the customer board/end product hardware designer to follow recommended guidelines during placement of LM780 modules in customer product.

The below guidelines must be considered for positioning LM780 module:

- Components should be at least 5mm away from the module, this will help to maximise the range achievable
- There should be no planes directly underneath the module
- The number of PCB traces underneath the module should be kept to a minimum
- All unused pins can be left disconnected
- Do not use ultrasonic cleaning as this can cause damage to the solder connections

2 Pin Connections

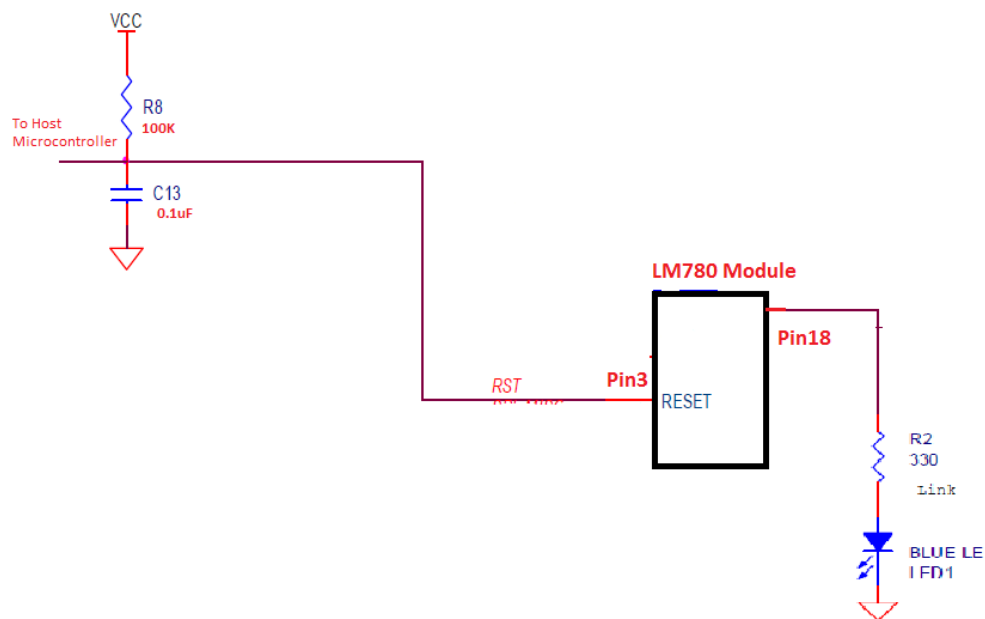
The following table shows the minimum number of pin connections and their functions to make the module usable

Functionality	LM780 Module Pin	Host Processor Signal	Remarks
Link Indication	18 (PIO 1)	Connect to LED if required	Connection status indication as shown in the Reset and LED circuit below. Blinking in slave mode, waiting for connection. In connected mode LED is solid ON
Factory Restore Button	22 (PIO 3)	Connect to button if required	Input signal. Used to restore factory setting if active high >3 sec
RF Output	NA	NA	Not required since Antenna is Onboard
3V3 (Vdd)	24	Host Power Supply (3.3V)	
GND (Vss)	23	Common Ground	
RESET	3	Pull up or connect to Host	Active Low. Refer to Reset and LED circuit below
UART_CTS	9	Host UART RTS	Short to UART_RTS(pin 10) if host doesn't support RTS/CTS flow control
UART_RTS	10	Host UART CTS	Short to UART_CTS(pin 9) if host doesn't support RTS/CTS flow control

UART_Tx	6	Host UART Rx	
UART_Rx	8	Host UART Tx	
SPI_MISO	16		Solder pad on main PCB
SPI_MOSI	17		Solder pad on main PCB
SPI_CSB	19		Solder pad on main PCB
SPI_CLK	1		Solder pad on main PCB
RI	20 (PIO 2)	Ring Indication	This pin works similar to a modem Ring Indication. Firmware pulls this PIO high by default but when there is an incoming connection request, this pin is pulled low and again high when the connection is accepted or rejected. Please note this PIO is only used when RICD setting is enabled i.e. AT+RICD?\r=RICD+ and when module is in slave mode
DCD	15 (PIO 6)	Data Carrier Detect	This pin works similar to Data Carrier Detect (DCD) of a modem. The firmware informs the host using this pin whether a Bluetooth connection is present or not. Firmware keeps this pin high by default but pulls it low when Bluetooth connection is present. Please note this PIO is only used when RICD setting is enabled i.e. AT+RICD?\r=RICD+
DTR	14 (PIO 7)	Data Terminal Ready	This feature is only present in firmware v6.18 onwards. It emulates the RS232 DTR pin depending on the modem signal setting (AT+MODEM command). If the modem signal setting is set to remote handshake, this signal is propagated to remote Bluetooth device depending on the status of Bluetooth connection. See AT+MODEM command description in AT Command Manual for more information.
DSR	21 (PIO 8)	Data Set Ready	This feature is only present in firmware v6.18 onwards. It emulates the RS232 DSR pin depending on the modem signal setting (AT+MODEM command). This pin should be connected to the host DTR. If the modem signal setting is set to remote handshake, this signal is propagated to remote Bluetooth device. So the remote

			device will know the status of local host's DTR pin. See AT+MODEM command description in AT Command Manual for more information.
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The Reset and LED Circuit of the LM780 module is shown below. A push button can be included in the reset circuit to pull the Reset PIN3 low to reset the module.



Reset and LED Circuit