ActiveGT POD Renesas RL78

Ordering code	IC30771

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ActiveGT POD General Notes

ActiveGT PODs can be used connected to the iC3000 Emulator through the PRO/GT interface iCARD.

A green LED is lit when the ActiveGT POD is powered on.

PIN1 location on every component is also marked on the circuit board with a square block (PIN 1 pin is soldered a square block, other pins have a round pin).

AUX Inputs

The POD has a special interface for an additional ActivePRO/GT AUX card (IC30338), which provides 16 AUX auxiliary inputs. Signals connected to these inputs are either sampled with the trace cycle or on the signal edge change. Inputs are divided into two identical blocks with 8 inputs each. Every block has an adjustable input threshold from 0 to 3V. Inputs are 5V tolerant. For more information see the hardware reference for the ActivePRO/GT AUX Card.

Trigger Output

A trigger output, signaling trace trigger event, is available on the hardware via a coax SMA connector. For instance, an external logic analyzer can be connected to this connector. Trace trigger event is indicated as a negative edge on the coax SMA connector. The signal returns to a high level (3,3V) on the next trace activation.

Temperature range

All iSYSTEM devices, unless explicitly otherwise noted, are specified to operate at room temperatures (specifically, between 10°C/50°F and 40°C/105°F).

Final Target Application Test

After the application is being more or less debugged and final application test is performed, it is recommended to remove all breakpoints and to close all debug windows (memory, SFR, watch...) to eliminate any possible influence of the emulator on the CPU execution. There were cases where the target application has been behaving differently with the target CPU inserted or the POD connected. If the debugger is configured to update some debug windows in real-time, the user may not be aware of that the CPU execution may be slightly disturbed. However, when the monitor access type is configured to update debug windows while the CPU is running, the CPU execution is disturbed significantly, depending on the necessary number of memory accesses to update opened debug windows.

There are cases when internal peripheral device requires read access of the particular register during the device configuration. The user has had SFR window opened and the necessary read access was actually performed by the debugger and not by the application as it would be correct. Therefore, the application was working fine with the emulator, but a standalone application didn't work correctly, as the peripheral device was not configured properly.
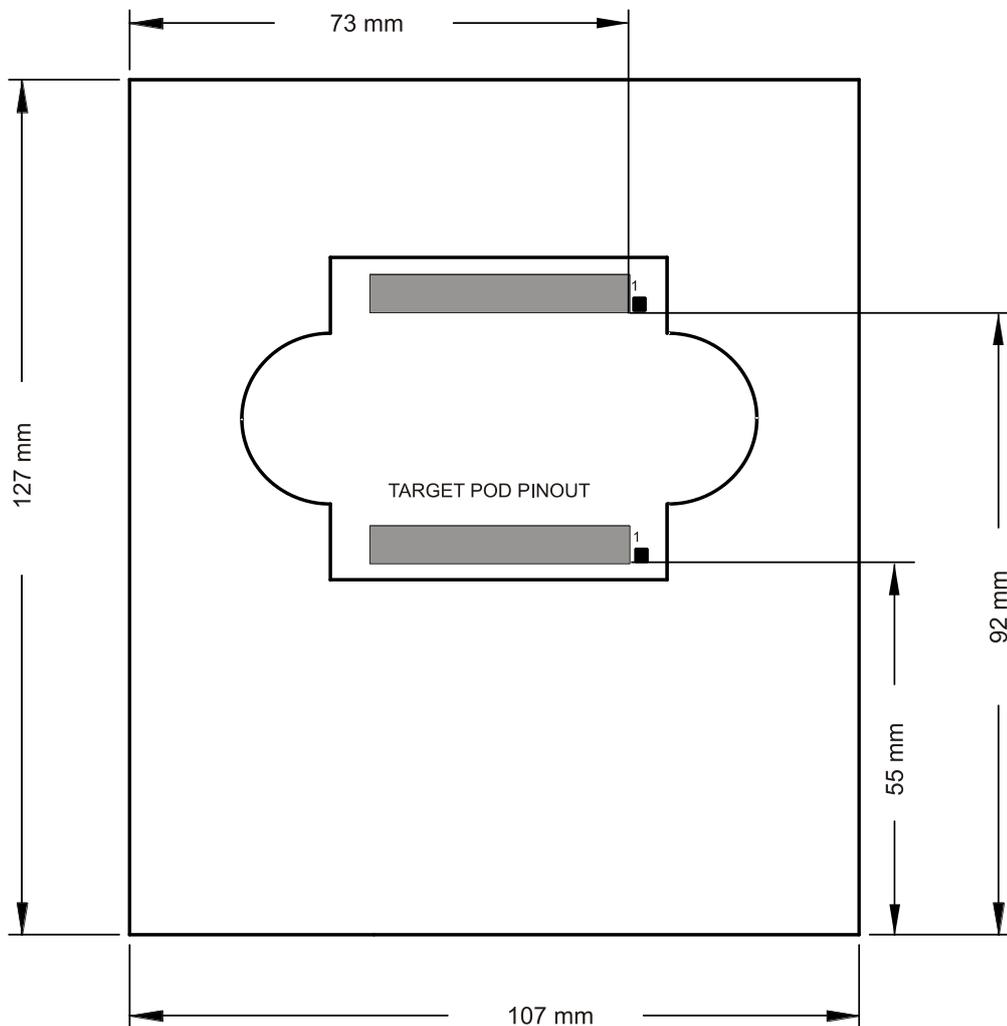
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Max POD ECLK Speed (MHz)	**20MHz**
Trace Depth	**64M Frames**
Time Stamp Resolution	**less than 25ns**
Time Reach	**Unlimited**

Supported MCUs
RL78/F13
RL78/F14

For the latest list of emulated CPUs please contact your local sales representative.

Renesas RL78 F13/F14 bottom POD view

Electrical Characteristics

Signals connecting the in-circuit emulator and the target system operate, in terms of function, as if an actual device was connected. The characteristics however may be different from those of the actual device.

To be on the safe side, try to withdraw from the electrical limits of the original microcontroller.

IO ports

All ports are protected via 47Ω serial resistor. All ports are implemented using Renesas uPD7886 level shifters. Pull-ups, which original microcontroller ports feature, are implemented inside the uPD7886. These pull-ups have following characteristics: min 10kΩ, typically 30kΩ, max 100kΩ. There is a 10kΩ pullup on target reset line.

Ports with AD inputs:

Depending on the port configuration, analog switch PI5A4684 connects target pin either to uPD7886 (IO operation) with active 1M pull-down or to OPA4354.

Note: All target port connections are Renesas design. When a detailed electrical characteristics of the in-circuit emulator are required, contact iSYSTEM, which will provide you the necessary Renesas contact.

Jumper Settings

All jumpers on the POD are reserved for factory use and should not be moved.

Emulation notes

The emulation device being used on the POD needs a special initialization. With this initialization the 'SFR mapping' is performed which selects emulated peripherals. This initialization is done by the emulator, therefore be sure that the correct target CPU is selected in winIDEA.

When using AUX card (IC30338) in conjunction with the RL78 F13/F14 Active GT POD, only 4 digital inputs are supported by AUX card, which otherwise features 16 digital inputs. This is due to the RL78 F13/F14 emulation device, which has a separate execution and data bus to be recorded by the analyzer.

Real-Time Watches

Read real-time access is supported using a shadow memory covering addresses below 0xFE00. Special Function Registers address range is not real-time accessible due to the restriction of the emulation device.

Target Adapters

A user can choose between iSYSTEM adapters or alternative Renesas adapters when connecting the POD to the target.

In order to use Renesas adapters, the IA100PODRL78F14 converter must be connected to the POD first, providing three connectors TCN1, TCN2 and TCN3, which is an equivalent output connection to the Renesas RL78 IECUBE emulation system. Renesas Emulation Probe part or optional Check Pin Adapter gets connected to these three connectors. Note that the IA100PODRL78F14 converter doesn't come along the POD and must be ordered separately from iSYSTEM.

When using Renesas target adaptation, target connection consists of the following obligatory parts:
Emulation probe + Exchange adapter + ICE connector + Target connector

Ordering codes in brackets in the below table are old codes.

	Target Device				
	30-pin SSOP (RL78/F13, RL78/F14)	48-pin LQFP (RL78/F13, RL78/F14)	64-pin LQFP (RL78/F13, RL78/F14)	80-pin LQFP (RL78/F13, RL78/F14)	100-pin LQFP (RL78/F14)
Emulation Probe	QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T	QB-144-EP-02S
Exchange adapter	QB-30SP-EA-04T	QB-48FB-EA-05T	QB-64FB-EA-04T (QB-64GB-EA-09T)	QB-80FB-EA-04T (QB-80GK-EA-10T)	QB-100FB-EA-02T (QB-100GC-EA-09T)
ICE connector	QB-30SP-YQ-01T (QB-30MC-YQ-01T)	QB-48FB-YQ-01T (QB-48GA-YQ-01T)	QB-64FB-YQ-01T (QB-64GB-YQ-01T)	QB-80FB-YQ-01T (QB-80GK-YQ-01T)	QB-100FB-YQ-01T (QB-100GC-YQ-01T)
Target connector	QB-30SP-NQ-01T (QB-30MC-NQ-01T)	QB-48FB-NQ-01T (QB-48GA-NQ-01T)	QB-64FB-NQ-01T (QB-64GB-NQ-01T)	QB-80FB-NQ-01T (QB-80GK-NQ-01T)	QB-100FB-NQ-01T (QB-100GC-NQ-01T)

Required Renesas adaptation parts for different RL78/F13 and RL78/F14 target packages

Refer to Renesas documentation for more details on their target adaptation.
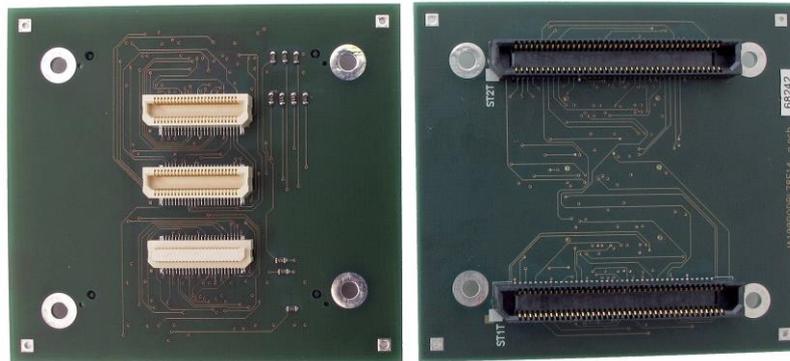
IA100PODRL78F14 converter, top view on the left and bottom view on the right
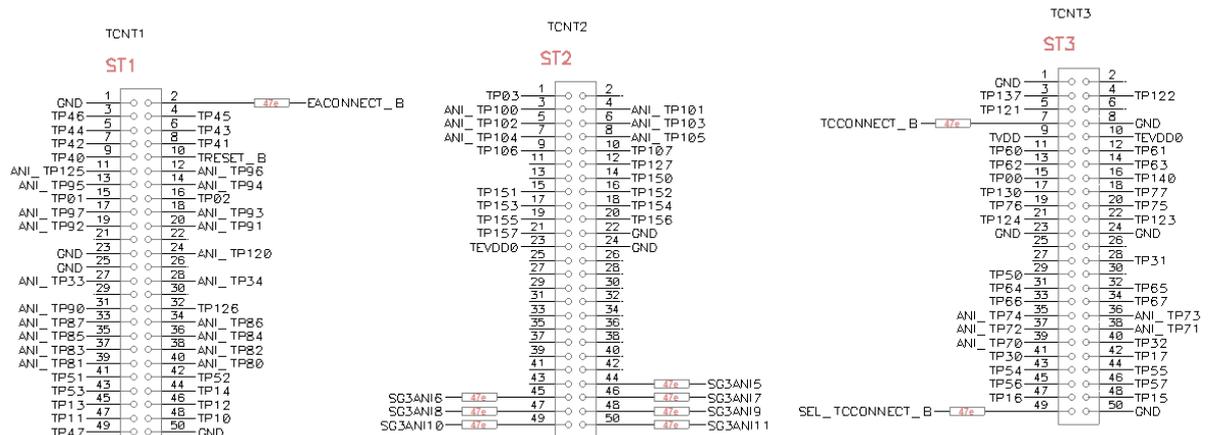
IA100PODRL78F14, top pinout

IA100PODRL78F14 *converter board assembled in the POD*

When using iSYSTEM adapters, the IA80RL78F14-WIRE in conjunction with the IA80ATQ-SOLDER is required when connecting the POD to the target based on the QFP80 target microcontroller. For the QFP64 target microcontroller the IA64RL78F14-WIRE in conjunction with the IA64ATQ-SOLDER is required. For the QFP48 target microcontroller the IA48RL78F13-WIRE in conjunction with the IA48TQ-SOLDER is required. Refer to iSYSTEM adapter documentation for more details. Other pincounts can be supported on request.