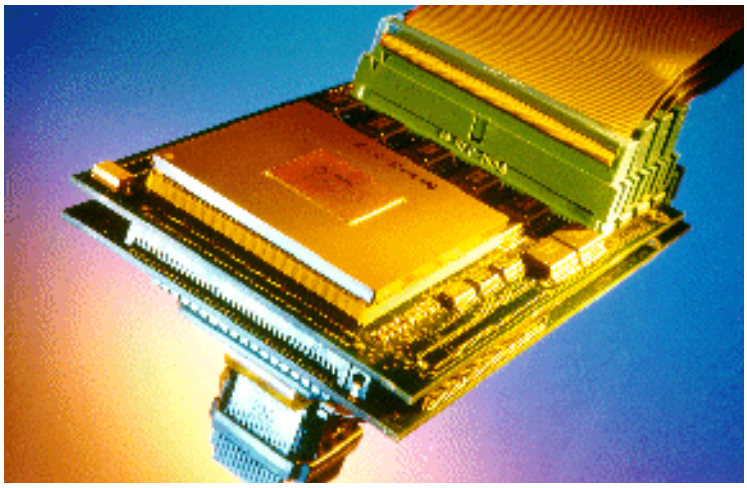
ICE-166



In-Circuit Emulator for C166/ST10 - Out of Production

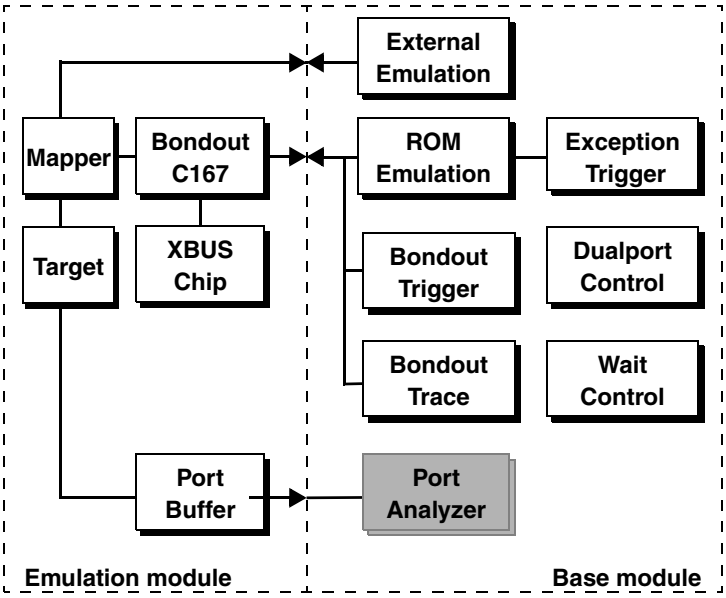
C161CI
C161CS
C161JI
C161K
C161O
C161PI
C161RI
C161S
C161SI
C161V
C161XX
C163
C163-16F
C163-24D
C164CH
C164CI
C164CL
C165
C167
C167C
C167CR
C167CS
C167CW
C167SR
PMB2705_GOLD_1.5
PMB2705_GOLD_2.1
PMB2705_GOLD_3.3
PMB2706GOLD
PMB2800HIGOLD
PMB2800HIGOLDV4
SAB80C166
SAB83C166
SAB88C166
ST10F163
ST10F166

- Full support for standard, VECON and GOLD
- Full support for KEIL, TASKING and GNU compilers
- Bondout and non-Bondout Probes
- 25 MHz no-wait-state operation
- Dual-port access for ROM and external bus
- Trace on internal and local variables
- Selective trace on registers, peripherals and local variables
- Trigger on internal register access, bit, byte, and word variables
- Mixed trace on external and BONDOUT busses
- Clip-Over, Solder-On and YAMAICHI adapters
- Support of all derivatives, also non-public versions

The ICE-166 emulator module support bondout and non-bondout derivatives of the C166 family. All features of the BONDOUT chips are supported, trigger and selective trace is possible on internal addresses and data, on registers and on peripheral accesses. 160 extra trace channels are used to trace all BONDOUT signals. The ROM and FLASH memory is emulated by an extra emulation system with separate breakpoints and execution flags for code coverage. The emulator can simulate bootstrap sequences and FLASH operation.

Features

Basics of Operation



The TRACE32-ICE166 supports all features provided by the bondout chip. The bondout chip has 4 bus systems:

- External bus
- ROM emulation bus
- XPER bus
- Bondout trace bus

The ***ROM emulation bus*** emulates together with the 256K emulation RAM on the base module the on-chip ROM or FLASH memory. In addition the emulator supports 256K breakpoints and 256K flag memory on ROM emulation. The flag memory is useful for code coverage and software analysis.

The ***XPER bus*** is needed for the emulation of CAN and VECON derivatives. Since the bondout chip does not contain any peripherals, there is a socket on the emulation module to add the specific CAN or VECON derivative. For the operation, the core of the derivative is disabled and the bondout CPU uses the XPER bus to emulate the peripherals.

The ***Bondout trace bus*** provides all signals for tracing on internal operations. Since most of the transfers are made between the internal RAM, registers and internal peripherals, these busses are a big help for analyzing the application´s behaviour.

Operating Modes

The Emulator can work in stand-alone mode with internal clock or in active mode with internal or the target clock. On power-down of the target system the emulator tristates its output buffers and isolates its internal emulation circuits.

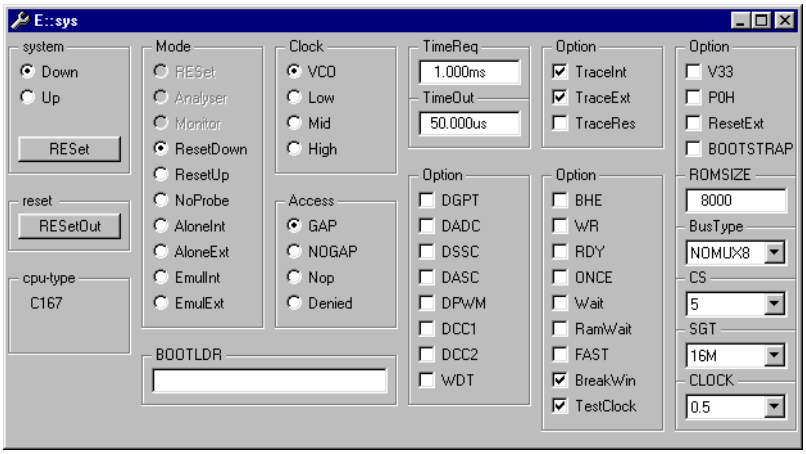
The operation modes are as follows:

- ❏ Reset Down
- ❏ Reset Up
- ❏ Alone Internal
- ❏ Alone External
- ❏ Emulation Internal
- ❏ Emulation External

Clock

- ❏ Operation with external or internal Clock
- ❏ 1..35 MHz internal clock

Dual-Port Access



All TRACE32 memories are dual-ported. The dual-port access makes it possible to display and modify the contents of the overlay memory, to set or delete breakpoints or use the flag memory while the application is running in real-time.

The dual-port access on the ROM bus (on-chip ROM and FLASH emulation) is always possible. Their are no limitations on breakpoint and flag usage.

The external bus has 3 modes for dual-port access

- ❏ GAP
- ❏ NoGAP
- ❏ NOP (BONDOUT only)

The ***GAP modes*** need extra time, as the dual-port cycle is inserted between the bus cycles generated by the CPU. This means that the max. speed of

operation is not possible in this mode, or extra wait states are needed for correct operation.

In the ***NOP mode*** the bus unit is stopped for a short time to allow dual-port cycles without any time limitations. This mode will be possible with future bondout steps. The current bondout CPUs have bugs in this mode.

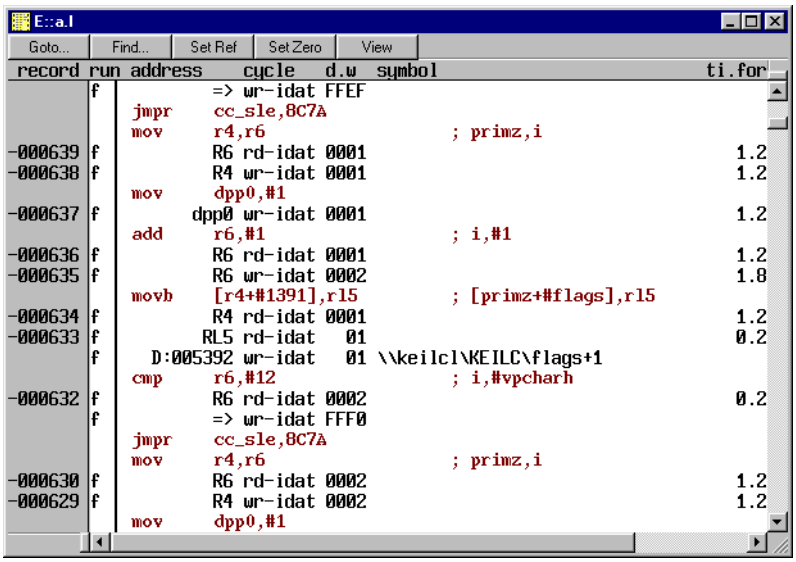
ROM Emulation

The ROM emulation circuits build a separate emulator system to emulate all on-chip FLASH or ROM based applications.

- ❏ 256K ROM emulation memory
  - FLASH and ROM emulation
  - Bootstrap loader support
- ❏ 256K Breakpoint memory on ROM area
  - Program breakpoints
  - ROM data breakpoints
  - Trace points on execution
- ❏ 256K Flag Memory
  - Additional flag memory for ROM
  - Separate flags for OPFETCH and ROMDATA

Bondout Trace

128 additional trace channels are supported by TRACE32-ICE166 to trace all signals delivered by the bondout busses.The trace can display internal operations like register to internal memory, peripheral to registers, etc. Stack operations cannot be displayed because there is no information on the bus.



Trace Channels

The bondout trace samples the 128 channels for BONDOUT busses. These channels provide the following information:

- ❏ Instruction execution address

- ❏ Operand read address
- ❏ Operand write address
- ❏ Operand data
- ❏ Control lines
- ❏ Instruction code

Trace Operation

The trace can work on the external bus, the internal bus or on both busses (mixed trace) to sample:

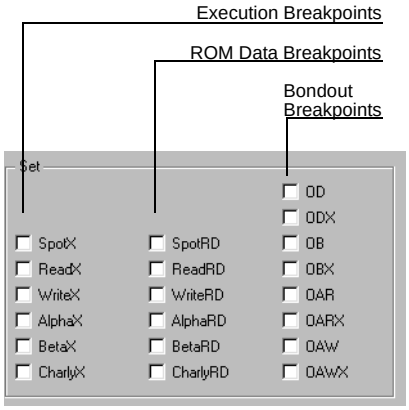
- ❏ Internal CPU cycles (BONDOUT only)
- ❏ External bus cycles
- ❏ Mixed trace (BONDOUT only)

Code Sequencer

The code sequencer samples the code flow of the CPU and generates in real-time internal control signals, which qualify the signals on the bondout busses. This signals are used for the bondout triggering.

Bondout Trigger System

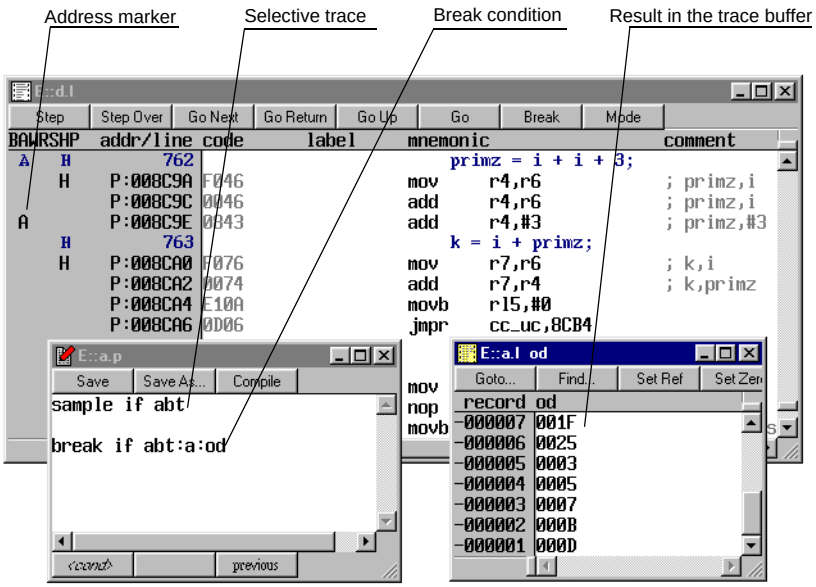
The bondout trigger system works on the code flow and the other bondout signals to qualify states for internal trigger accesses. Trigger points can be set on operation results, on 24 bit addresses or on short and bit addressing operations. Future software will support also triggering on register access. All trigger points can be qualified by program segments like functions, program lines, etc.



The following trigger points are available:

- 2 operand data breakpoints (Results of operation)
- 2 operand address read breakpoints on 24 bit adressing mode
- 2 operand read read breakpoint on 24 bit address mode
- 2 address write breakpoints on short address mode
- 2 address read breakpoints on short address mode
- 2 address write breakpoints on bit address mode
- 2 address read breakpoints on bit address mode
- 2 address write breakpoints on register address mode
- 2 address read breakpoints on register address mode

Every breakpoint can be used to break emulation or as a source signal for the trigger sequencer of the analyzer.

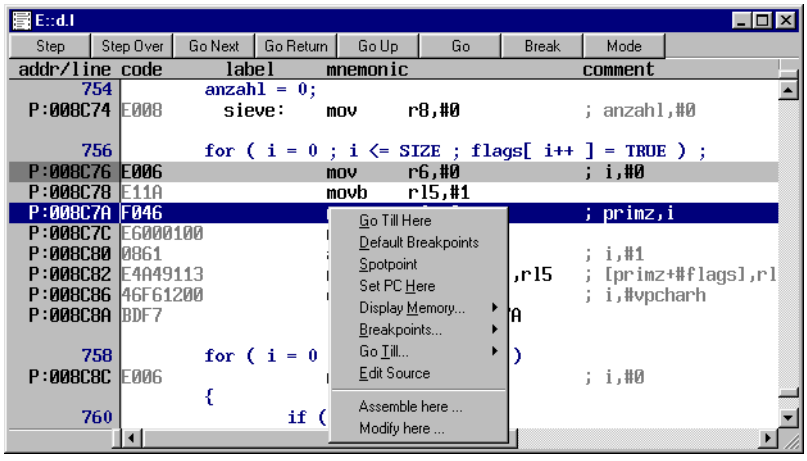


Execution Breakpoints

The emulator supports execution breakpoints on the ROM and external area. All breakpoints are 'break-before-make' breakpoints. Emulation is stopped before execution.

- ❏ 256K ROM execution breakpoints
- ❏ Up to 16M breakpoints on external bus

HLL Debugging



Full support in real-time for:

- ❏ ROM and external busses
- ❏ Break-before-line operation
- ❏ HLL single step in real-time

- ❏ Trigger and trace on local variables
- ❏ Trigger on bit variables

Multitask Debugging

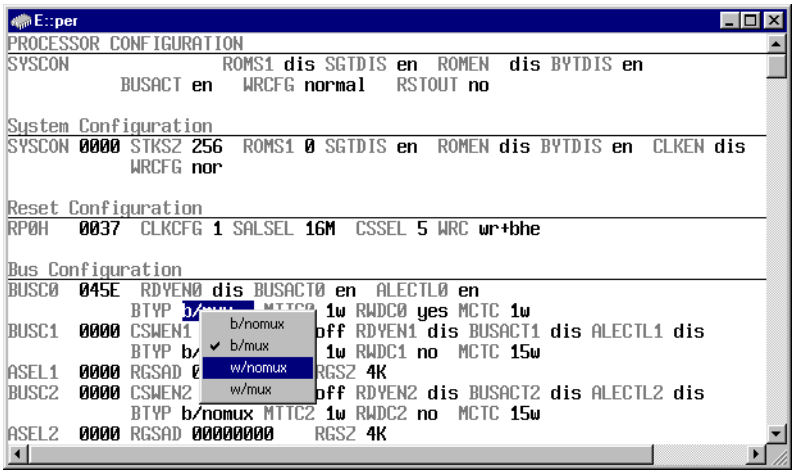
- ❏ 1 foreground task
- ❏ 1 background task

Wait System

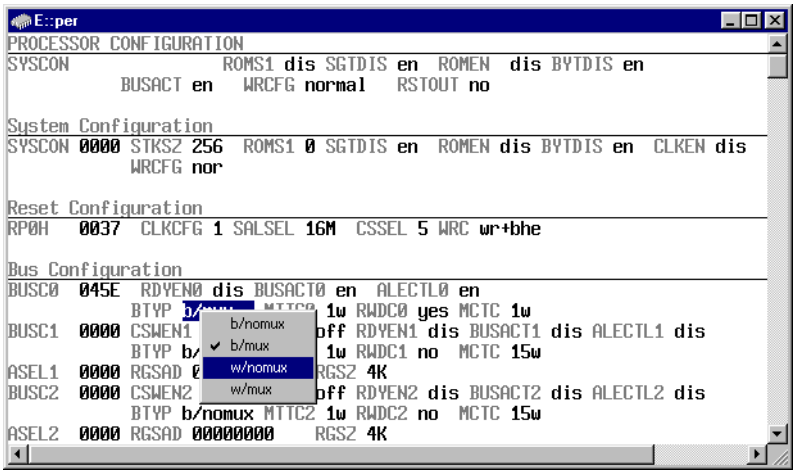
- ❏ Additional wait cycles (1-15) may be specified
- ❏ Up to 250 wait cycles (4K blocks global and bytewise)

Voltage and Clock Monitors

- On-Line Display for SYSCON and BUSCON



Exception Control



The TRACE32 exception controller allows to permanently activate an exception, to enable or disable specific exceptions, to trigger on specific exceptions or to stimulate an exception.

- Static exception setting
  - RSTIN
- Target exception control
  - RSTIN
  - NMI

- Exception trigger
  - RSTOUT
  - RSTIN
  - PWRDOWN
  - IDLE
  - TRAP
  - PEC

Port Analyzer

On the emulation base there is an extra slot for the TRACE32 Port Analyzer. The following additional signals can be traced:

- Port 2
- Port 3
- Port 4
- Port 6
- Port 7
- Port 8
- READY

On-Circuit Emulation

- Support for Clip-Over adapters

Emulation Modules

Non-Bondout Modules

- Module 166
  - Support for 80C166
  - ROMless emulation only
  - Adaption for ET100R and ET100
  - Adapter for QF49 available
  -
- Module 167
  - ROMless emulation only
  - Adaption for ET144 and ET100R

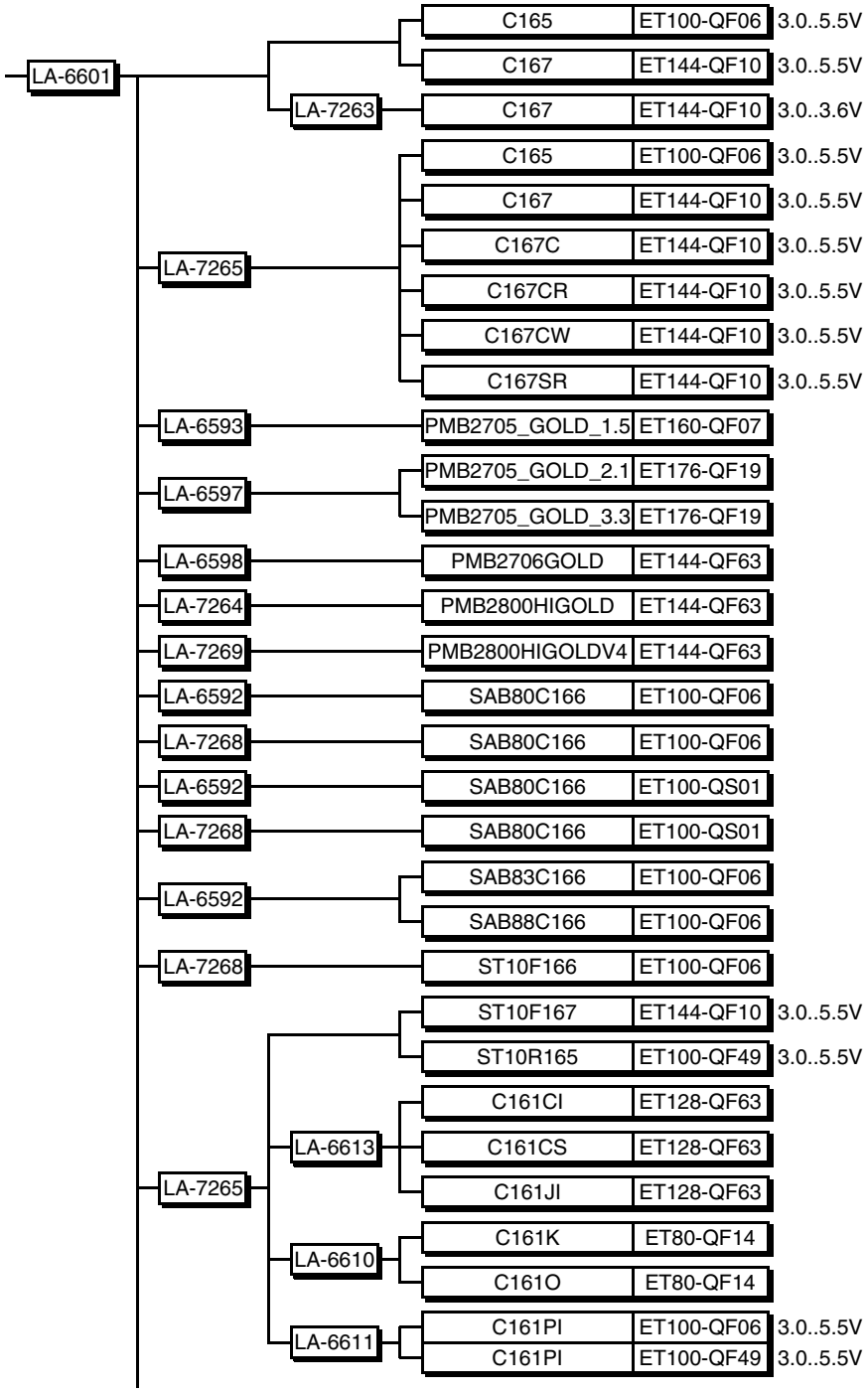
Bondout Modules

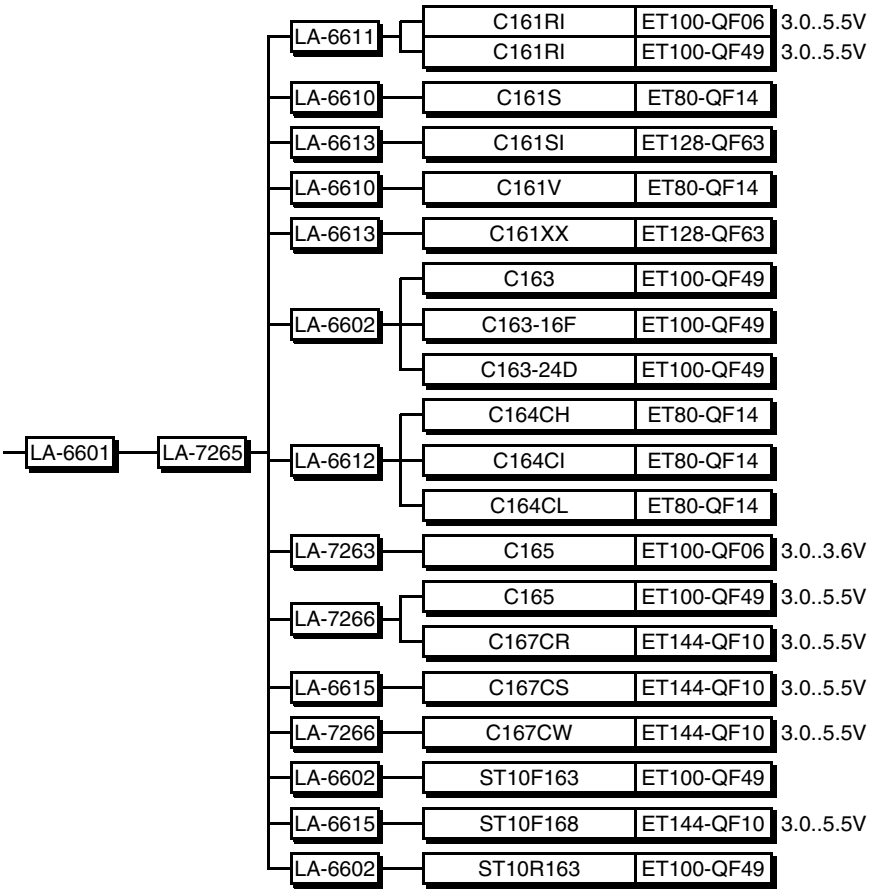
- Module 166 bondout
  - ROM and ROMless emulation
  - Adaption for ET-100 and ET100R
  - Adaption for QF49 available
  -
- Module 167 bondout
  - Support for C167 and C165
  - Adaption for ET100R and ET144
  -
- VECON
  - Support for VECON

GOLD Support

- Module 166 GOLD-uC PMB 2705
  - Adaption for ET-160
- Module 166 GOLD-uC PMB 2706
  - Adaption for ET-144

Modules Overview




LA-6601
LA-7265
LA-6611
C161RI
ET100-QF06
3.0..5.5V
C161RI
ET100-QF49
3.0..5.5V
LA-6610
C161S
ET80-QF14
LA-6613
C161SI
ET128-QF63
LA-6610
C161V
ET80-QF14
LA-6613
C161XX
ET128-QF63
LA-6602
C163
ET100-QF49
C163-16F
ET100-QF49
C163-24D
ET100-QF49
LA-6612
C164CH
ET80-QF14
C164CI
ET80-QF14
C164CL
ET80-QF14
LA-7263
C165
ET100-QF06
3.0..3.6V
LA-7266
C165
ET100-QF49
3.0..5.5V
C167CR
ET144-QF10
3.0..5.5V
LA-6615
C167CS
ET144-QF10
3.0..5.5V
LA-7266
C167CW
ET144-QF10
3.0..5.5V
LA-6602
ST10F163
ET100-QF49
LA-6615
ST10F168
ET144-QF10
3.0..5.5V
LA-6602
ST10R163
ET100-QF49

Debug Interfaces

TRACE32-PowerView supports most compilers, realtime operation systems and debuggers.

New integrations are mostly done on customers request. If your compiler or RTOS is not supported now, please ask us !

Compiler Support

Language	Compiler	Company	Option	Comment
C	C166	ARM Germany GmbH	EOMF-166	
C	XC16X/ST10	Cosmic Software	ELF/ DWARF	
C	GNU-GCC166	HighTec EDV-Systeme GmbH	DBX	
C	C166	TASKING	IEEE	
C++	GNU-CPP166	HighTec EDV-Systeme GmbH	DBX	
C++	CP166	TASKING	IEEE	

RTOS Support

Name	Company	Comment
ARTX-166	ARM Germany GmbH	
CMX-RTX	CMX Systems Inc.	
Elektrobit tresos	Elektrobit Automotive GmbH	via ORTI
Erika	Evidence	via ORTI
Nucleus PLUS	Mentor Graphics Corporation	
osCAN	Vector Informatik	via ORTI
OSE Basic	Enea OSE Systems	(OS166)
OSE Epsilon	Enea OSE Systems	(OS166), 3.x
OSEK	-	via ORTI

Name	Company	Comment
ProOSEK	Elektrobit Automotive GmbH	via ORTI
PXROS	HighTec EDV-Systeme GmbH	
RTX166/-tiny	ARM Germany GmbH	
RTXC 3.2	Quadros Systems Inc.	
RTXC Quadros	Quadros Systems Inc.	
Rubus OS	Articus Systems AB	
SDT-Cmicro	IBM Corp.	
uC/OS-II	Micrium Inc.	2.0 to 2.92

Debugger Support

CPU	Debugger	Company	Host
ALL	X-TOOLS / X32	blue river software GmbH	Windows
ALL	CODEWRIGHT	Borland Software Corporation	Windows
ALL	CODE CONFIDENCE TOOLS	Code Confidence Ltd	Windows
ALL	CODE CONFIDENCE TOOLS	Code Confidence Ltd	Linux
ALL	EASYCODE	EASYCODE GmbH	Windows
ALL	ECLIPSE	Eclipse Foundation, Inc	Windows
ALL	RHAPSODY IN MICROC	IBM Corp.	Windows
ALL	RHAPSODY IN C++	IBM Corp.	Windows
ALL	LDRA TOOL SUITE	LDRA Technology, Inc.	Windows
ALL	ATTOL TOOLS	MicroMax Inc.	Windows
ALL	VISUAL BASIC INTERFACE	Microsoft Corporation	Windows

CPU	Debugger	Company	Host
ALL	LABVIEW	NATIONAL INSTRUMENTS Corporation	Windows
ALL	CODE::BLOCKS	Open Source	-
ALL	C++TEST	Parasoft	Windows
ALL	RAPITIME	Rapita Systems Ltd.	Windows
ALL	DA-C	RistanCASE	Windows
ALL	SIMULINK	The MathWorks Inc.	Windows
ALL	WINDOWS CE PLATF. BUILDER	Windows	Windows
C166	SDT CMICRO	IBM Corp.	Windows

Operation Voltage and Frequency

The maximum operation frequency of TRACE32-ICE depends on:

- ❏ The max. frequency of the CPU
- ❏ The access time of the overlay memory (15ns or 35ns)
- ❏ The mapper mode (**S**low or **F**ast)
- ❏ The number of waitstates (WO = 0 waitstates W1 = 1 waitstate)
- ❏ The dual-port access mode

Denied Access

Module	CPU	F-W0-15	F-W0-35	S-W0-15	S-W0-35	S-W1-15	S-W1-35	DRAM
LA-7265	C161CI	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7265	C161CS	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7265	C161JI	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7265	C161K	16.0+	16.0+	16.0+	15.8	16.0+	16.0+	
LA-7265	C161O	16.0+	16.0+	16.0+	15.8	16.0+	16.0+	
LA-7265	C161PI	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C161RI	16.0+	16.0+	16.0+	15.8	16.0+	16.0+	
LA-7265	C161S	16.0+	16.0+	16.0+	15.8	16.0+	16.0+	
LA-7265	C161SI	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7265	C161V	16.0+	16.0+	16.0+	15.8	16.0+	16.0+	
LA-7265	C161XX	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7265	C163	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C163-16F	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C163-24D	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C164CH	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C164CI	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C164CL	25.0	18.8	20.0	15.8	25.0+	25.0+	
-	C165	20.0+	18.8	20.0	15.8	20.0+	20.0+	
-	C167	20.0	15.8	16.7	13.6	25.0+	22.7	
LA-7265	C167	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C167C	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C167CR	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C167CS	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C167CW	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	C167SR	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-6593	PMB2705_GOLD_1.5	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-6597	PMB2705_GOLD_2.1	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-6597	PMB2705_GOLD_3.3	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-6598	PMB2706GOLD	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7264	PMB2800HIGOLD	26.0	19.3	20.6	16.2	26.0+	26.0+	

Module	CPU	F-W0-15	F-W0-35	S-W0-15	S-W0-35	S-W1-15	S-W1-35	DRAM
LA-7269	PMB2800HIGOLDV 4	26.0	19.3	20.6	16.2	26.0+	26.0+	
LA-7268	SAB80C166	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-6592	SAB83C166	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-6592	SAB88C166	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	ST10F163	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7268	ST10F166	20.0+	18.8	20.0	15.8	20.0+	20.0+	
LA-7265	ST10F167	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	ST10F168	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	ST10R163	25.0	18.8	20.0	15.8	25.0+	25.0+	
LA-7265	ST10R165	25.0	18.8	20.0	15.8	25.0+	25.0+	

Gap Access

Module	CPU	F-W0-15	F-W0-35	S-W0-15	S-W0-35	S-W1-15	S-W1-35	DRAM
LA-7265	C161K	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C161O	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C161RI	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C161S	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C161V	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C163	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C163-16F	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C164CI	10.0	8.8	9.1	8.1	15.2	15.2	
LA- 0	C165	10.0	8.8	9.1	8.1	15.2	15.2	
LA- 0	C167	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C167C	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C167CR	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C167CW	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	C167SR	10.0	8.8	9.1	8.1	15.2	15.2	
LA-6593	PMB2705_GOLD_1.5	10.0	8.8	9.1	8.1	15.2	15.2	
LA-6597	PMB2705_GOLD_2.1	10.0	8.8	9.1	8.1	15.2	15.2	
LA-6597	PMB2705_GOLD_3.3	10.0	8.8	9.1	8.1	15.2	15.2	
LA-6598	PMB2706GOLD	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7264	PMB2800HIGOLD	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7268	SAB80C166	10.0	8.8	9.1	8.1	15.2	15.2	
LA-6592	SAB83C166	10.0	8.8	9.1	8.1	15.2	15.2	
LA-6592	SAB88C166	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7268	ST10F166	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	ST10F167	10.0	8.8	9.1	8.1	15.2	15.2	
LA-7265	ST10R165	10.0	8.8	9.1	8.1	15.2	15.2	

Operation Voltage

This list contains information on probes available for other voltage ranges. Probes not noted here supply an operation voltage range from 4.5V to 5.5V.

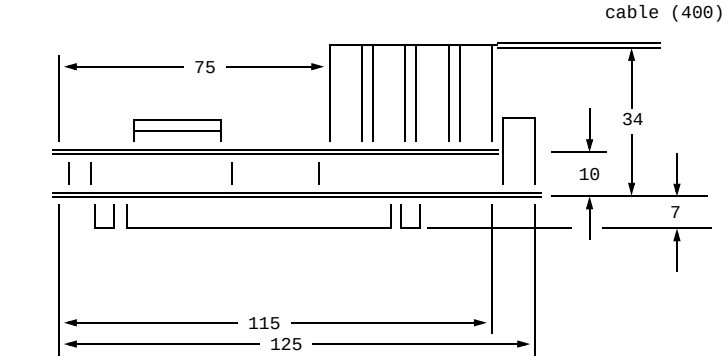
CPU	Module	Adapter	Voltage Range
C161PI	LA-7265	LA-6611	3.0 .. 5.5 V
C161RI	LA-7265	LA-6611	3.0 .. 5.5 V
C165	-	-	3.0 .. 5.5 V
C165	LA-7265	-	3.0 .. 5.5 V
C165	LA-7265	LA-7263	3.0 .. 3.6 V
C165	LA-7265	LA-7266	3.0 .. 5.5 V
C167	-	-	3.0 .. 5.5 V
C167	-	LA-7263	3.0 .. 3.6 V
C167	LA-7265	-	3.0 .. 5.5 V
C167C	LA-7265	-	3.0 .. 5.5 V
C167CR	LA-7265	-	3.0 .. 5.5 V
C167CR	LA-7265	LA-7266	3.0 .. 5.5 V
C167CS	LA-7265	LA-6615	3.0 .. 5.5 V
C167CW	LA-7265	-	3.0 .. 5.5 V
C167CW	LA-7265	LA-7266	3.0 .. 5.5 V
C167SR	LA-7265	-	3.0 .. 5.5 V
ST10F167	LA-7265	-	3.0 .. 5.5 V
ST10F168	LA-7265	LA-6615	3.0 .. 5.5 V
ST10R165	LA-7265	-	3.0 .. 5.5 V

Dimensions

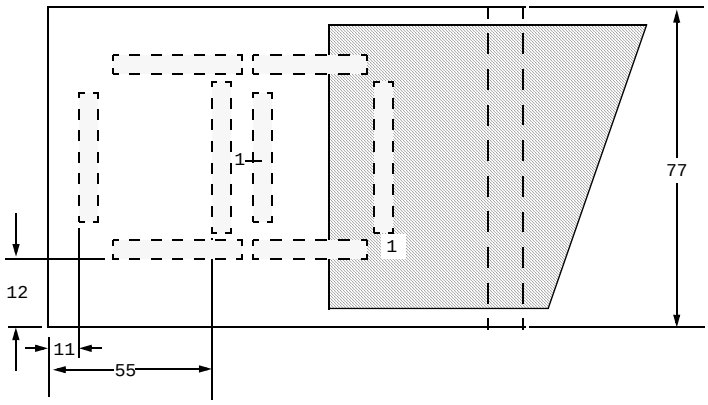
Module Dimensions

Dimension

LA-6592 M-166



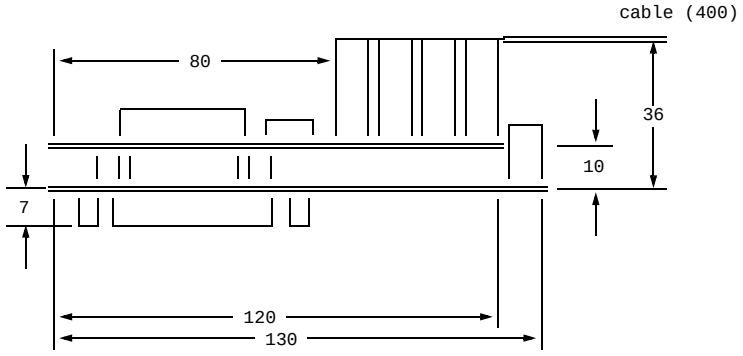
SIDE VIEW



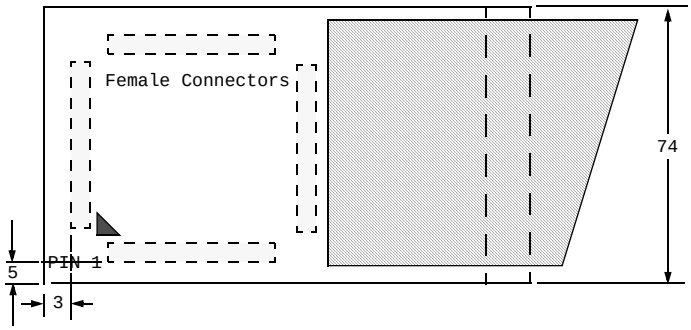
TOP VIEW (all dimensions in mm)

Dimension

LA-6593 M-166-GOLD-V1.5



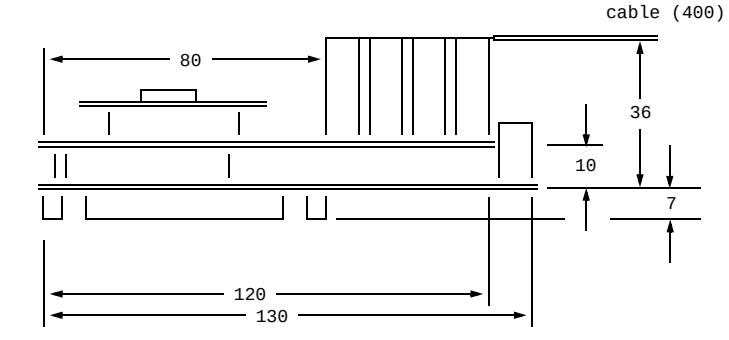
SIDE VIEW



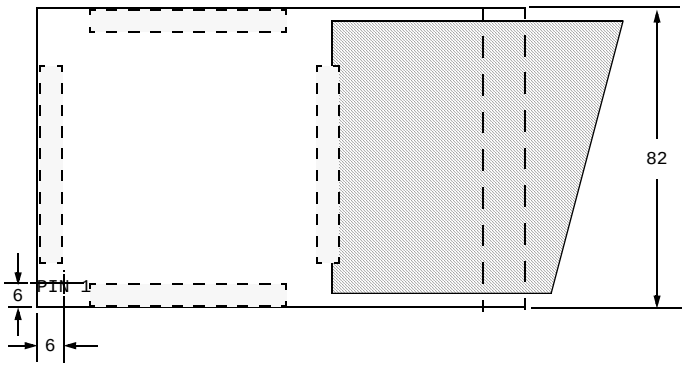
TOP VIEW (all dimensions in mm)

Dimension

LA-6597 M-166-GOLD-V2.1



SIDE VIEW

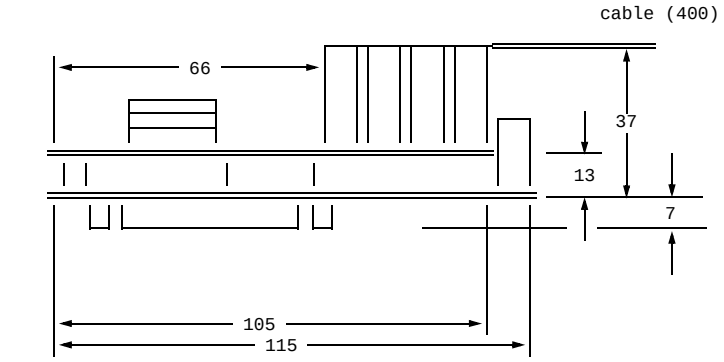


TOP VIEW (all dimensions in mm)

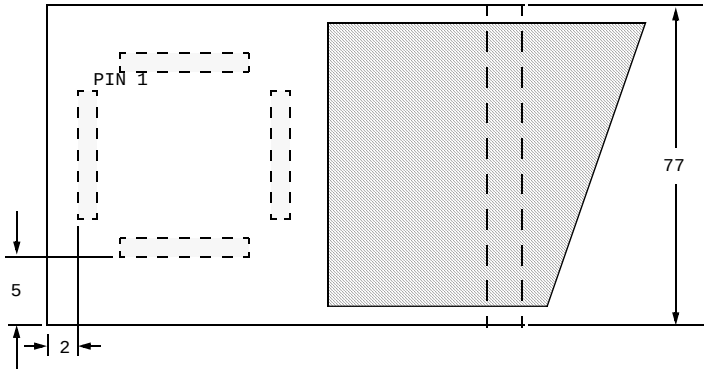
LA-6598 M-166-GOLD-2706

Dimension

LA-7264 M-166-GOLD-2800



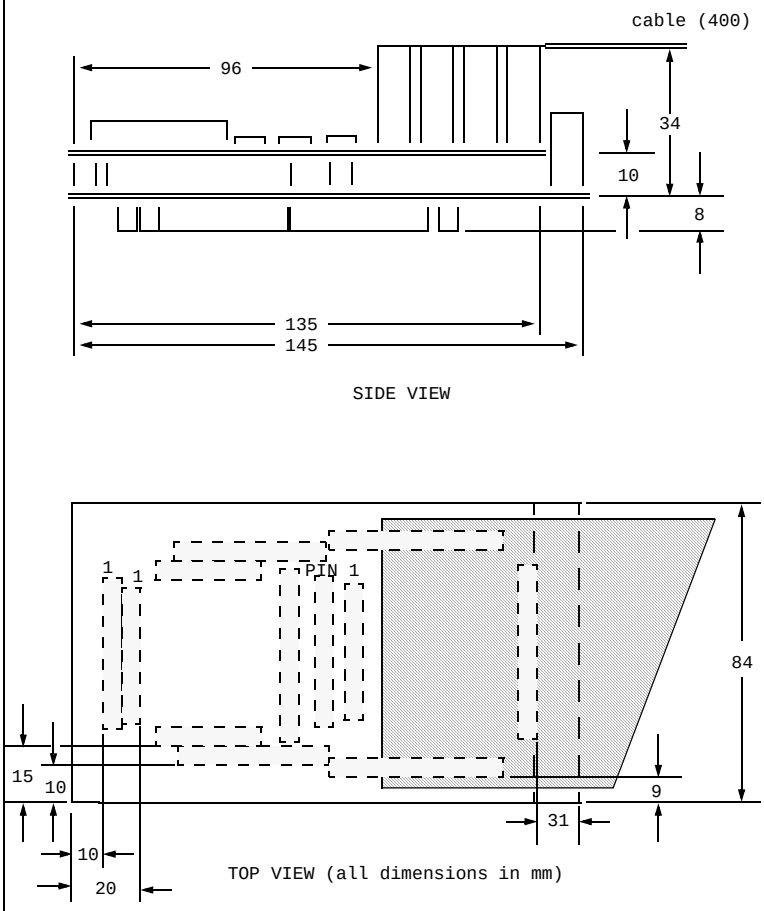
SIDE VIEW



TOP VIEW (all dimensions in mm)

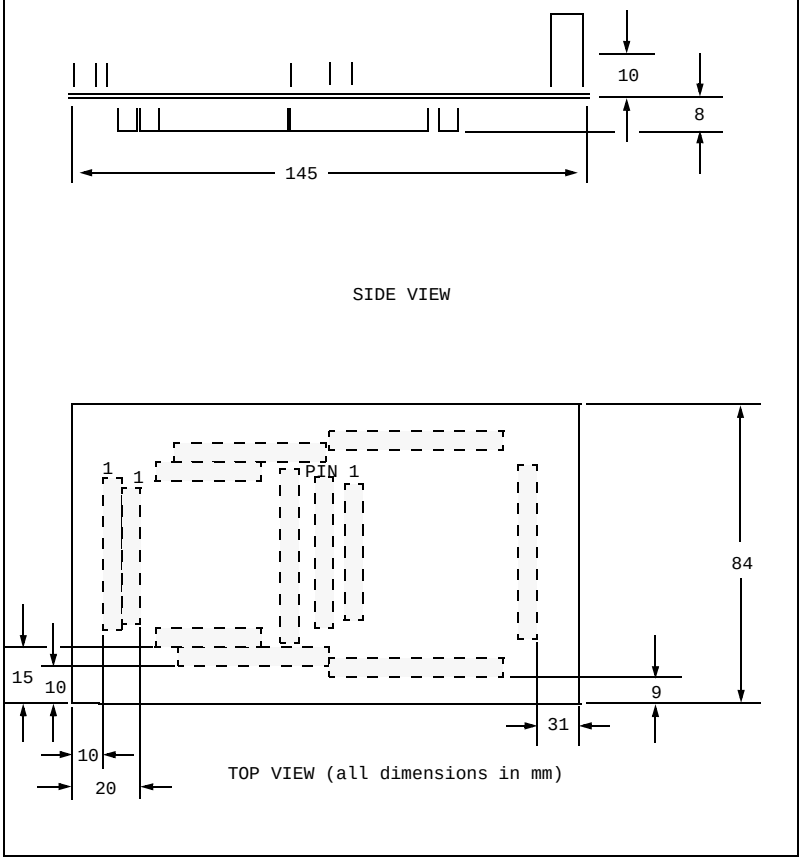
Dimension

LA-7265 M-167E2-B



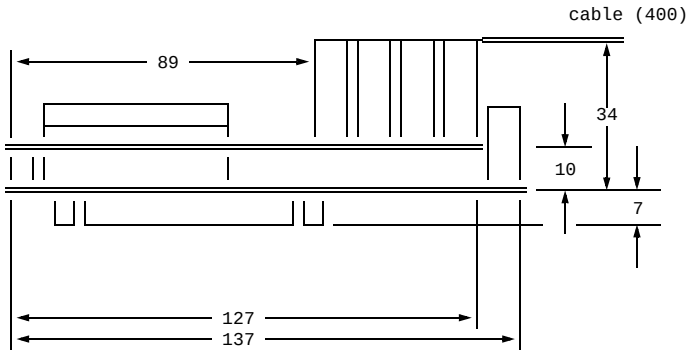
Dimension

LA-7266 A-167E2

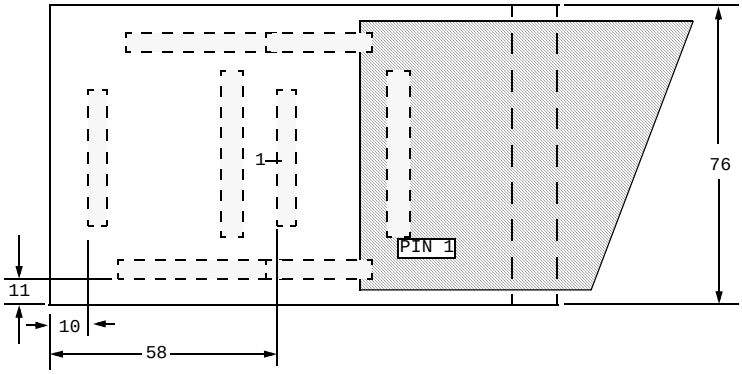


Dimension

LA-7268 M-166-B



SIDE VIEW

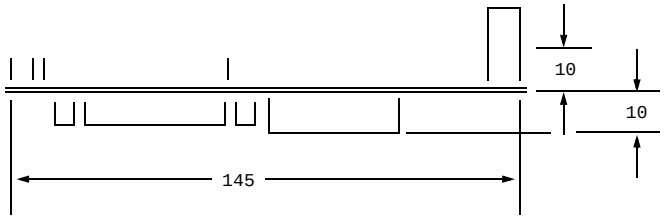


TOP VIEW (all dimensions in mm)

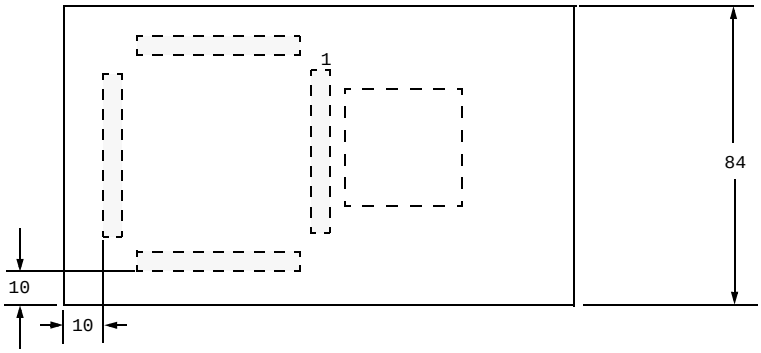
LA-7263 A-167-B-3.3-V

Dimension

LA-6596 A-165-VECON
LA-6603 A-165-VECON-3.3V



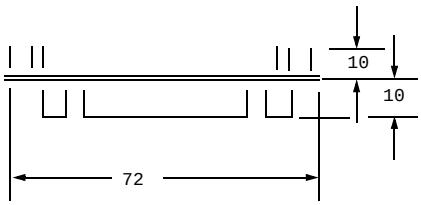
SIDE VIEW



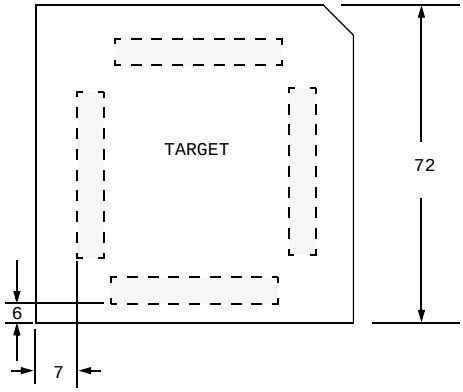
TOP VIEW (all dimensions in mm)

Dimension

LA-1201 ET160-VECON160



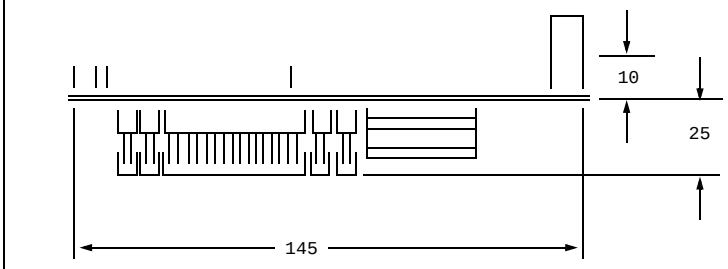
SIDE VIEW



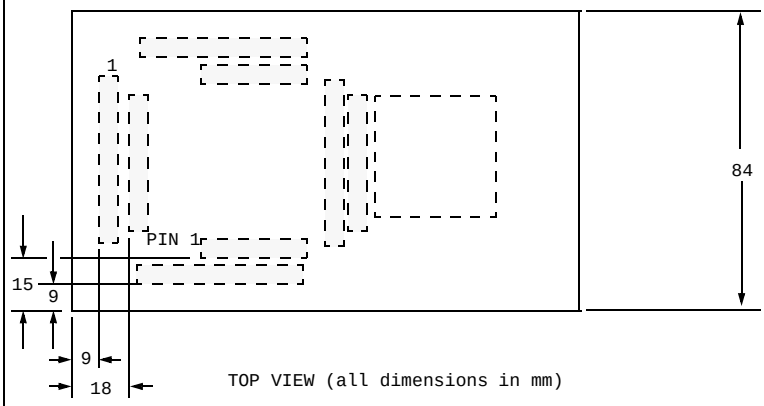
TOP VIEW (all dimensions in mm)

Dimension

LA-6602 A-C163
LA-6604 A-C163-3.3V



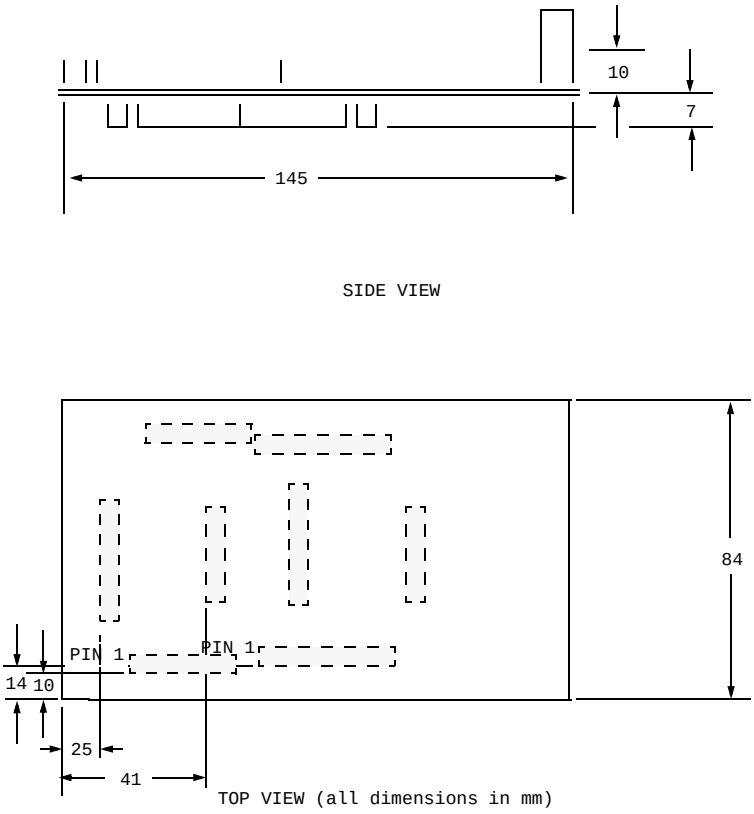
SIDE VIEW



TOP VIEW (all dimensions in mm)

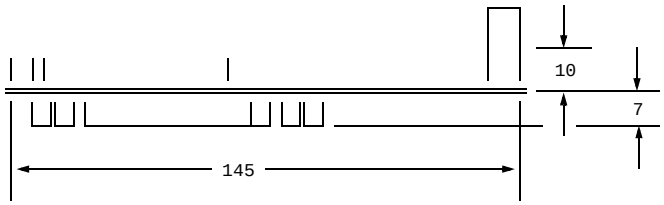
Dimension

LA-6610 A-C161V

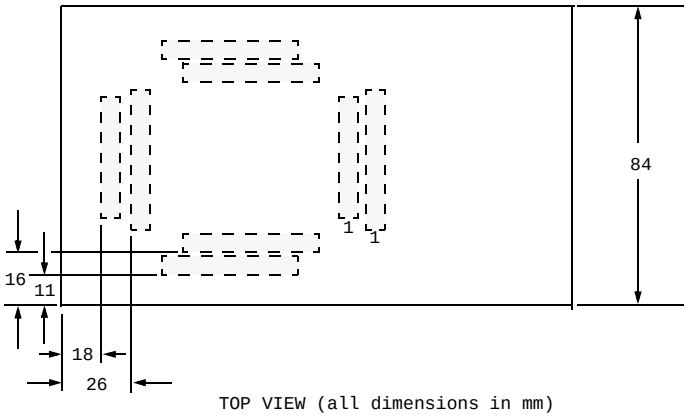


Dimension

LA-6611 A-C161RI



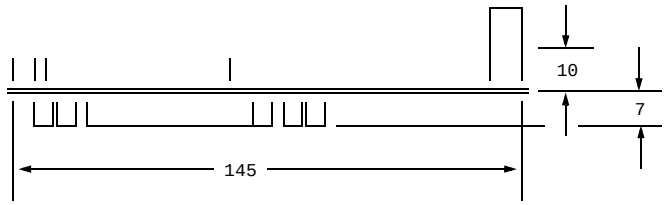
SIDE VIEW



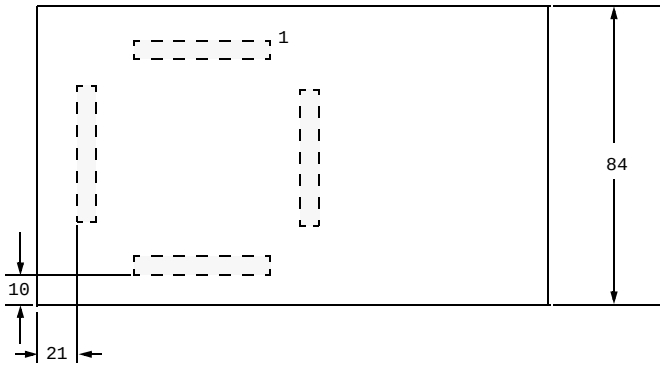
TOP VIEW (all dimensions in mm)

Dimension

LA-6612 A-C164CI



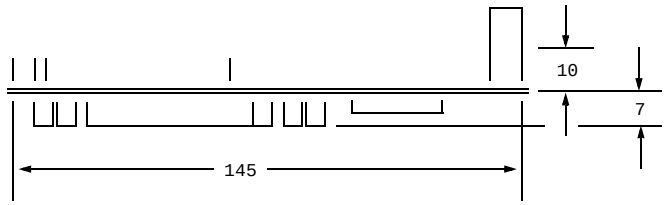
SIDE VIEW



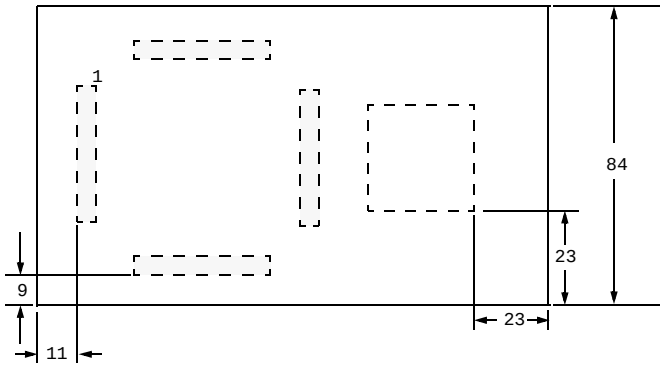
TOP VIEW (all dimensions in mm)

Dimension

LA-6613 A-C161CI



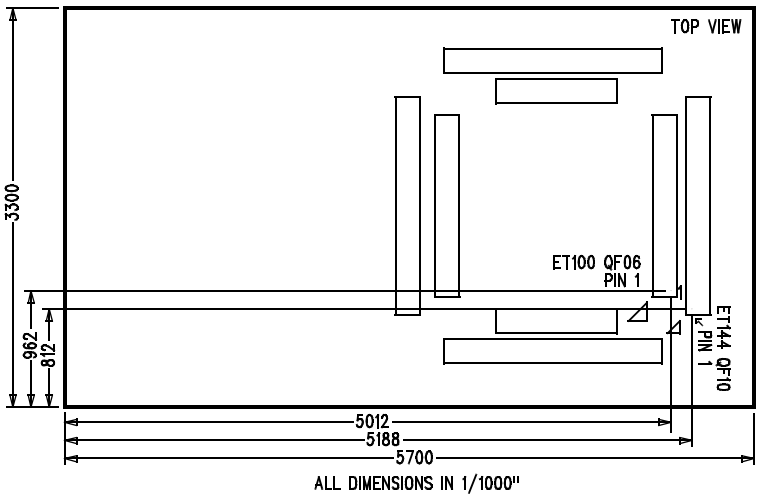
SIDE VIEW



TOP VIEW (all dimensions in mm)

Dimension

LA-6615 A-C167E2CS

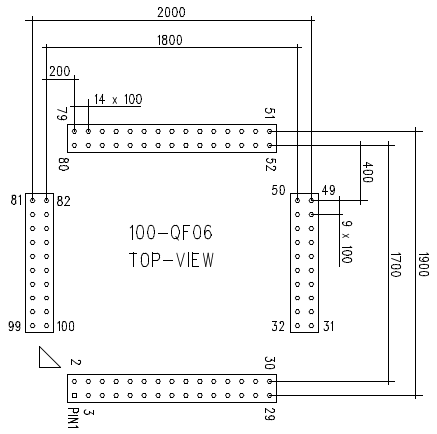
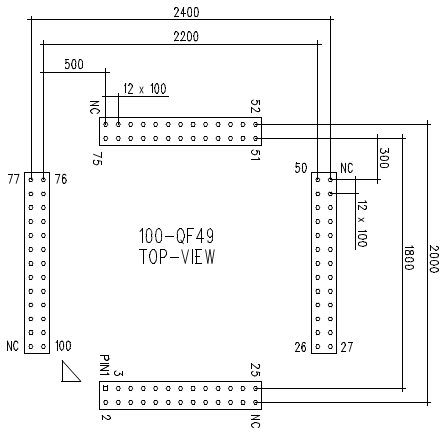


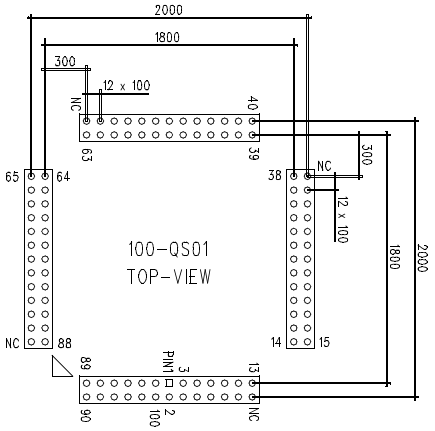
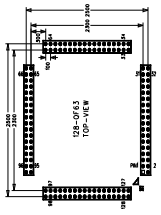
Connectors

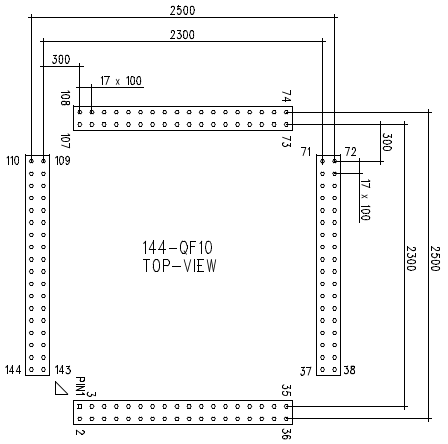
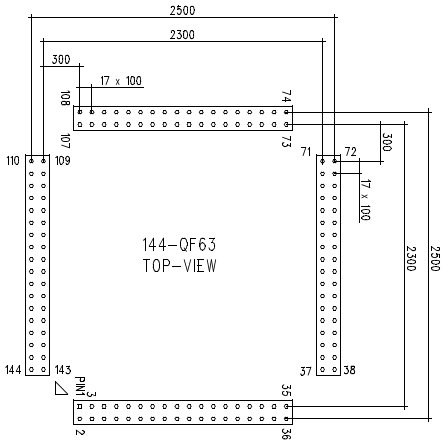
On each emulation module there are half-size connectors to:

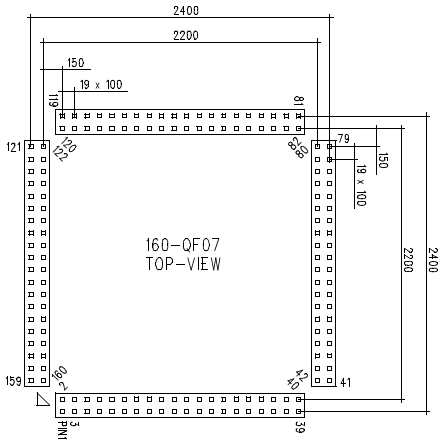
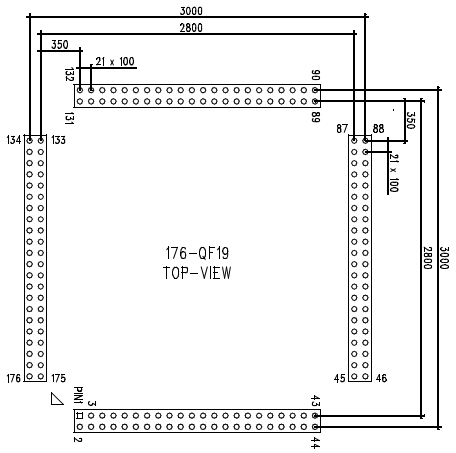
- ❏ Connect the emulation module directly to the target by providing the corresponding connectors also on the target hardware
- ❏ Connect a standard adapter from Emulation Technology, YAMAICHI, AMP, TOKYO ELETECH etc.

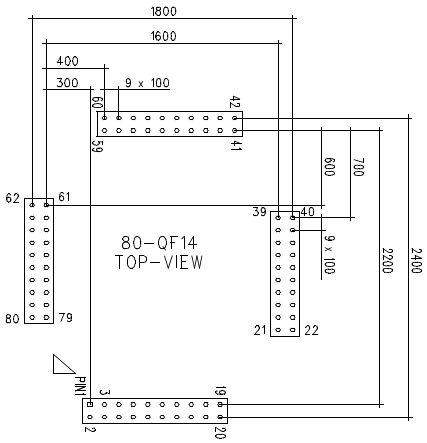
The following table lists the physical dimensions of these connectors.

CPU	Dimension
C161PI C161RI C165 C165 C165 SAB80C166 SAB80C166 SAB83C166 SAB88C166 ST10F166	**ET100-QF06** 
C161PI C161RI C163 C163-16F C163-24D C165 ST10F163 ST10R163 ST10R165	**ET100-QF49** 

CPU	Dimension
SAB80C166 SAB80C166	**ET100-QS01** 
C161CI C161CS C161JI C161SI C161XX	**ET128-QF63** 

CPU	Dimension
C167 C167 C167 C167C C167CR C167CR C167CS C167CW C167CW C167SR ST10F167 ST10F168	**ET144-QF10** 
PMB2706GOLD PMB2800HIGOLD PMB2800HIGOLD V4	**ET144-QF63** 

CPU	Dimension
PMB2705_GOLD_1.5	**ET160-QF07** 
PMB2705_GOLD_2.1 PMB2705_GOLD_3.3	**ET176-QF19** 

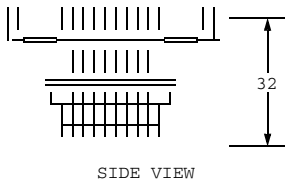
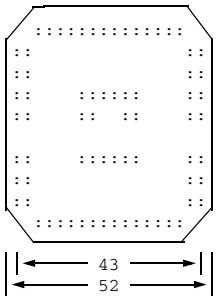
CPU	Dimension
C161K C161O C161S C161V C164CH C164CI C164CL	**ET80-QF14** 

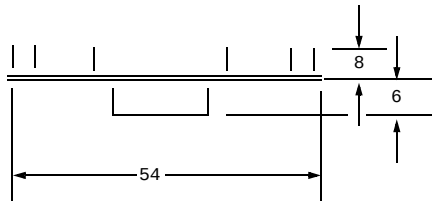
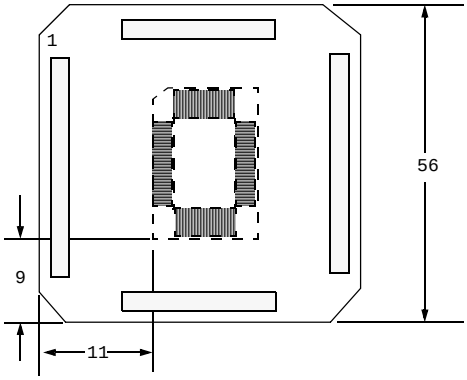
Adapter

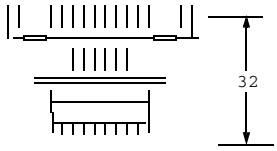
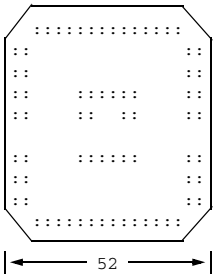
The adapters connect in different ways

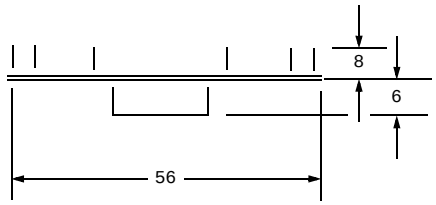
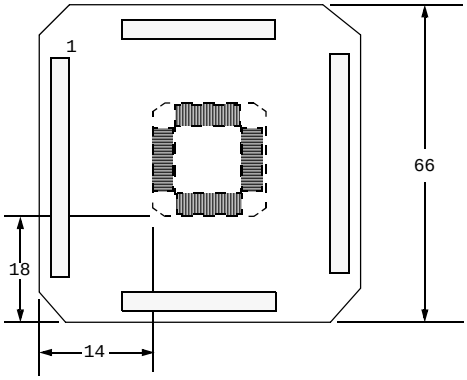
- ❏ With Clip-Over Adapters the CPU can stay on the target board.
- ❏ With Solder-ON adapters the CPU must be removed
- ❏ YAMAICHI and AMP adapters fit to the CPU socket

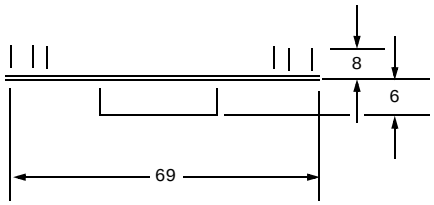
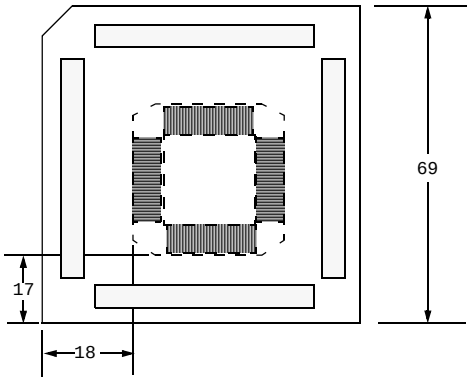
The following table lists the physical dimensions of these adapters.

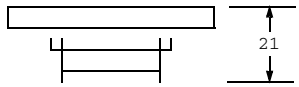
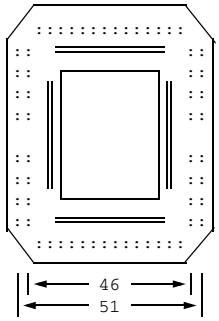
Socket CPU	Adapter
ET100-QF06 C161PI C161RI C165 SAB80C166 SAB83C166 SAB88C166 ST10F166	**ET-1030 ET100-SET-QF06** **Surface Mountable Adapter for ET100 to QF06**  SIDE VIEW  TOP VIEW (all dimensions in mm)

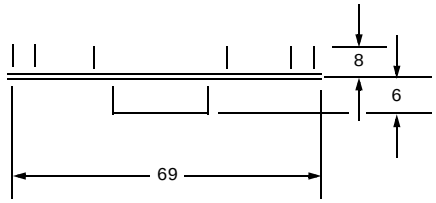
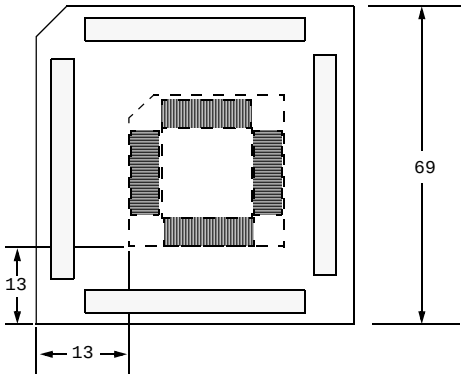
Socket CPU	Adapter
ET100-QF06 C161PI C161RI C165 SAB80C166 SAB83C166 SAB88C166 ST10F166	**YA-1031 ET100-EYA-QF06** **Emul. Adapter for YAMAICHI socket ET100-QF06**  SIDE VIEW  TOP VIEW (all dimensions in mm)

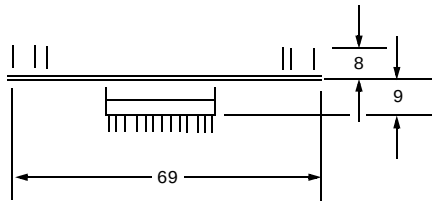
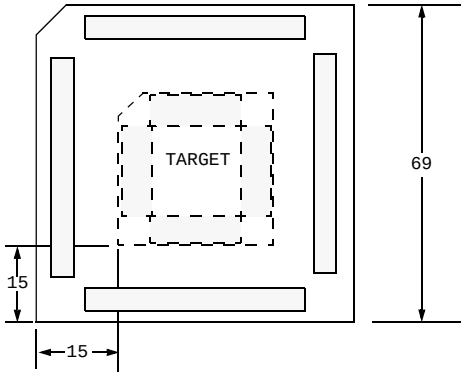
Socket CPU	Adapter
ET100-QF06 C161PI C161RI C165	**ET-1032 ET100-CET-QF06** **Clip-Over Adapter for ET100-QF06**  SIDE VIEW  TOP VIEW (all dimensions in mm)

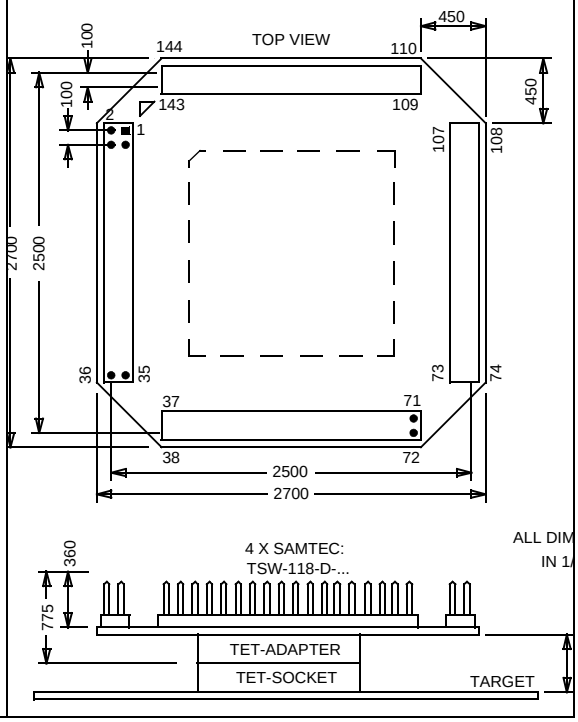
Socket CPU	Adapter
ET100-QF49 C161PI C161RI C163 C163-16F C163-24D C165 ST10F163 ST10R163 ST10R165	**YA-1091 ET100-EYA-QF49** **Emul. Adapter for YAMAICHI socket ET100-QF49**  SIDE VIEW  TOP VIEW (all dimensions in mm)

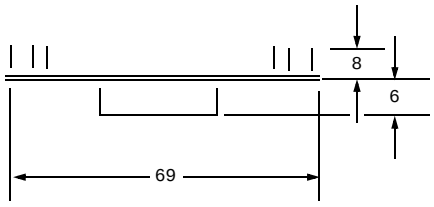
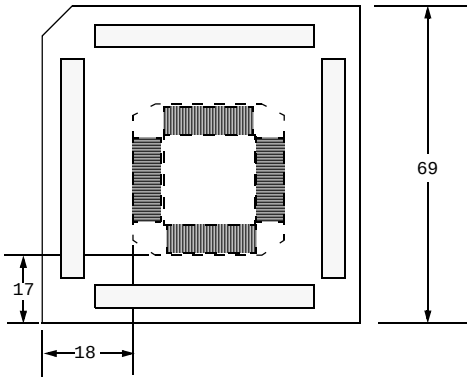
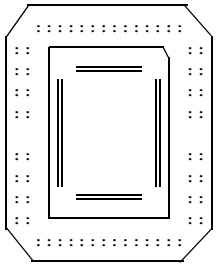
Socket CPU	Adapter
ET128-QF63 C161CI C161CS C161JI C161SI C161XX	**YA-1112 ET128-EYA-QF63** **Emul. Adapter for YAMAICHI socket ET128-QF63**  SIDE VIEW  TOP VIEW (all dimensions in mm)

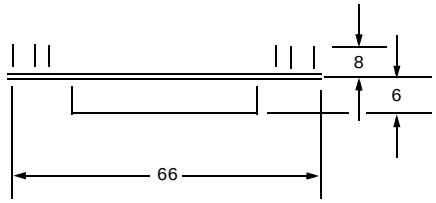
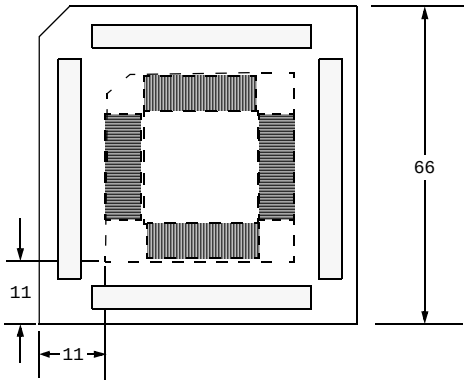
Socket CPU	Adapter
ET144-QF10 C167 C167C C167CR C167CS C167CW C167SR ST10F167 ST10F168	**ET-1090 ET144-SET-QF10** **Surface Mountable Adapter for ET144-QF10**  SIDE VIEW  TOP VIEW (all dimensions in mm)

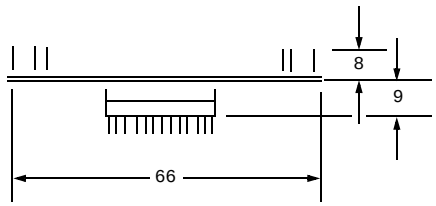
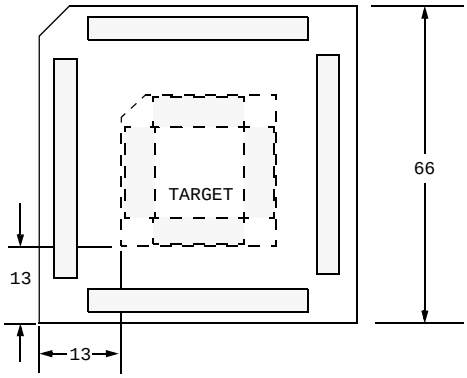
Socket CPU	Adapter
ET144-QF10 C167 C167C C167CR C167CS C167CW C167SR ST10F167 ST10F168	**YA-1094 ET144-EYA-QF10** **Emul. Adapter for YAMAICHI socket ET144-QF10**  SIDE VIEW  TOP VIEW (all dimensions in mm)

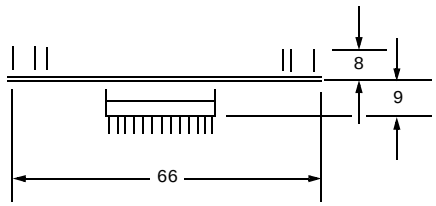
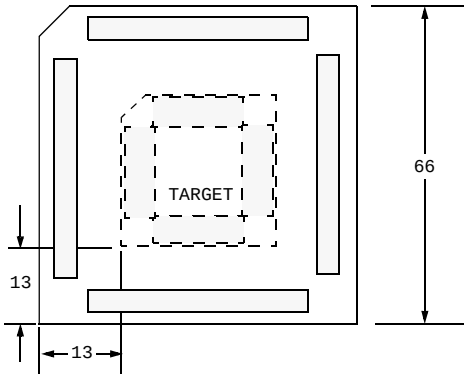
Socket CPU	Adapter
ET144-QF10 C167 C167C C167CR C167CS C167CW C167SR ST10F167 ST10F168	**LA-1096 ET144-FP144** **Adapter ET144 to Footprint AMP Sockets**  SIDE VIEW  TOP VIEW (all dimensions in mm)

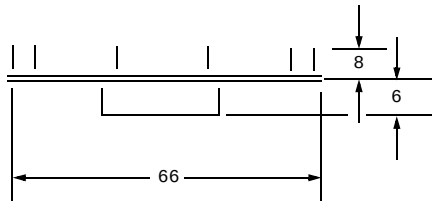
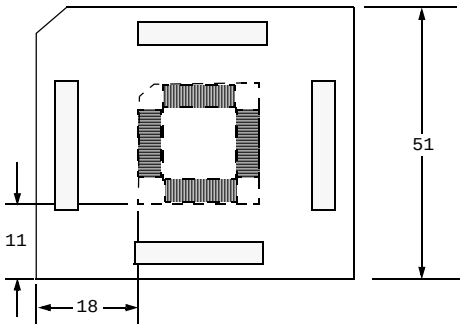
Socket CPU	Adapter
ET144-QF10 C167 C167C C167CR C167CS C167CW C167SR ST10F167 ST10F168	**TO-1300 ET144-ETO-QF10** **Emul. Adapter for T0 socket ET144-QF10** 

Socket CPU	Adapter
ET144-QF63 PMB2706GOLD PMB2800HIGOLD PMB2800HIGOLDV4	**YA-1111 ET144-EYA-QF63** **Emul. Adapter for YAMAICHI socket ET144-QF63**  SIDE VIEW  TOP VIEW (all dimensions in mm)
ET160-QF07 PMB2705_GOLD_1.5	**ET-1060 ET160-SET-QF07** **Surface Mountable Adapter for ET160-QF07**  TOP VIEW (all dimensions in mm)

Socket CPU	Adapter
ET160-QF07 PMB2705_GOLD_1.5	**YA-1061 ET160-EYA-QF07** **Emul. Adapter for YAMAICHI socket ET160-QF07**  SIDE VIEW  TOP VIEW (all dimensions in mm)

Socket CPU	Adapter
ET160-QF07 PMB2705_GOLD _1.5	**LA-1063 ET160-FP160-R** **Adapter for Footprint AMP/3M sockets**  SIDE VIEW  TOP VIEW (all dimensions in mm)

Socket CPU	Adapter
ET160-QF07 PMB2705_GOLD _1.5	**LA-1064 ET160-FP160-L** **Adapter for Footprint AMP/3M sockets**  SIDE VIEW  TOP VIEW (all dimensions in mm)

Socket CPU	Adapter
ET80-QF14 C161K C161O C161S C161V C164CH C164CI C164CL	**YA-1131 ET80-EYA-QF14** **Emul. Adapter for YAMAICHI socket ET080-QF14**  SIDE VIEW  TOP VIEW (all dimensions in mm)

Available Tool Chain

TRACE32 provides a complete set of development tools for this family. This includes:

- ❏ The In-Circuit Emulator TRACE32-ICE
- ❏ The high speed RISC Emulator TRACE32-FIRE
- ❏ The BDM/JTAG/ONCE etc. based In-Circuit Debugger TRACE32-ICD
- ❏ The ROM Monitor based In-Circuit Debugger TRACE32-ICD
- ❏ The ICD Trace, a trace externsion to the BDM/JTAG debuggers or ROM monitors
- ❏ Evaluation boards, which can be used until the target hardware is available.
- ❏ The Instruction Set Simulator (SIM), a software tool for code test without any hardware

The following list give an overview which development tools are available for the specific derivatives of this family.

CPU	ICE	FIRE	ICD DEBUG	ICD MONITOR	ICD TRACE	POWER INTEGRATOR	INSTRUCTION SIMULATOR
C161CI	YES	YES		YES			YES
C161CS	YES			YES			YES
C161JI	YES			YES			YES
C161K	YES	YES		YES	YES		YES
C161O	YES	YES		YES	YES		YES
C161PI	YES	YES		YES			YES
C161RI	YES	YES		YES			YES
C161S	YES	YES		YES	YES		YES
C161SI	YES	YES		YES			YES
C161V	YES	YES		YES	YES		YES
C161XX	YES	YES		YES			YES
C163	YES	YES		YES			YES
C163-16F	YES	YES		YES			YES
C163-24D	YES	YES		YES			YES
C164CH	YES			YES			YES
C164CI	YES	YES		YES			YES
C164CL	YES	YES		YES			YES
C165	YES	YES		YES	YES		YES
C167	YES	YES		YES	YES		YES
C167C	YES	YES		YES	YES		YES
C167CR	YES	YES		YES	YES		YES
C167CS	YES	YES		YES	YES		YES
C167CW	YES	YES		YES	YES		YES
C167SR	YES	YES		YES	YES		YES
PMB2705_GOLD_1.5	YES			YES			YES
PMB2705_GOLD_2.1	YES			YES			YES

CPU	ICE	FIRE	ICD DEBUG	ICD MONITOR	ICD TRACE	POWER INTEGRATOR	INSTRUCTION SIMULATOR
PMB2705_GOLD_3.3	YES			YES			YES
PMB2706GOLD	YES			YES			YES
PMB2800HIGOLD	YES			YES			YES
PMB2800HIGOLDV4	YES			YES			YES
SAB80C166	YES			YES			YES
SAB83C166	YES			YES			YES
SAB88C166	YES			YES			YES
ST10F163	YES	YES		YES			YES
ST10F166	YES			YES			YES
ST10F167	YES	YES		YES			YES
ST10F168	YES	YES		YES			YES
ST10R163	YES	YES		YES			YES
ST10R165	YES	YES		YES			YES

Order Information

Module Description

OrderNo Code	Text
LA-6601 ICE-166/256K	**ICE-166 Base Module 256K** Base module for 80C166/C167/ST10 family, 128 add. trace channels for bondout busses 256K memory for ROM emulation up to 30 MHz, separate break and flag system for ROM area, trigger and break features for all bondout busses
LA-6592 M-166	**Module 80C166** supports 80C166 with original CPU target adapter for ET100-QF06
LA-6597 M-166-GOLD-V2.1	**Module PMB2705 GOLD Version 2.1/3.3** supports PMB 2705 GOLD Version 2.1 with original CPU target adapter for ET176
LA-6598 M-166-GOLD-2706	**Module PMB2706 GOLD** supports GOLD-uC PMB 2706 at 26 MHz, 3 Volt needs target adapter for ET144
LA-7264 M-166-GOLD-2800	**Module PMB2800 HIGOLD** supports HIGOLD PMB 2800 at 26 MHz, 3 Volt needs target adapter for ET144
LA-7269 M-166-GOLD-2800V4	**Module PMB2800 HIGOLD V4** supports HIGOLD PMB 2800 V4 at 26 MHz, 2.5 Volt needs target adapter for ET144
LA-6593 M-166-GOLD-V1.5	**Module PMB2705 GOLD Version 1.5** supports PMB 2705 GOLD with original CPU target adapter for ET160-QF07
LA-7265 M-167E2-B	**Module 80C167E2 Bondout** supports C167/C165/C164/C163/C161 with bondout CPU, 25 MHz, needs adapter A-16x
LA-7266 A-167E2	**Adapter C165/C167** supports C167/C165 with bondout CPU, 25 MHz, target connector to ET144-QF10, ET100-QF06 and ET100-QF49, on-circuit emulation.
LA-7268 M-166-B	**Module 80C166 Bondout** supports 80C166 with bondout CPU, 20 MHz, target adapter ET100-QF01 and ET100R-QF06
LA-7263 A-167-B-3.3-V	**Adapter SABC167/C165 3.3 V** supports C167/C165 3.3 V with bondout CPU, 25 MHz, socket for 144 pin X-BUS peripherals, target connector to ET144-QF10 and ET100-QF06, on-circuit emulation
LA-6596 A-165-VECON	**Adapter C165 VeCon** supports 'VeCon' emulation in conjunction with module 167 bondout, adaption ET160 and VECON

OrderNo Code	Text
LA-6615 A-C167E2CS	**Adapter C165/C167CS/F168** supports C167/C165 with bondout CPU, 25 MHz, target connector to ET144-QF10, ET100-QF06 and ET100-QF49, on-circuit emulation. Socket for XPER device, supports C167CS and ST10F168
LA-6603 A-165-VECON-3.3V	**Adapter C165 VeCon 3.3V** supports 'VeCon' emulation in conjunction with module 167 bondout 3.3V, adaption ET160 and VECON
LA-1201 ET160-VECON160	**ET160 to VECON160 Converter** adaption for connector definition in VECON manual
LA-6602 A-C163	**Adapter C163** supports C163 with module 167 bondout, 25 MHz, socket for 100 pin X-BUS peripherals, target connector to ET100-QF49, on-circuit emulation
LA-6604 A-C163-3.3V	**Adapter C163 3.3V** supports C163 emulation in conjunction with module 167 bondout 3.3V 25 MHz, socket for 100 pin X-BUS peripherals, target connector to ET100F, on-circuit emulation
LA-6612 A-C164CI	**Adapter C164CI** supports C164CI with module 167 bondout 20 MHz, target connector to ET80-QF14 on-circuit emulation
LA-6616 A-C164CR	**Adapter C164CR** supports C164CR with module 167 bondout, 25 MHz, target connector to ET100-QF49, on-circuit emulation
LA-6610 A-C161V	**Adapter C161V** supports C161S, C161V, C161K and C161O with with module 167 bondout, 16 MHz target connector to ET80-QF14 on-circuit emulation
LA-6611 A-C161RI	**Adapter C161RI** supports C161RI, C161PI with module 167 bondout, 16 MHz target connector to ET100-QF49 and ET100-QF06 on-circuit emulation
LA-6613 A-C161CI	**Adapter C161SI/CI/CS** supports C161SI/CI/CS with module 167E2-B, 16/12 MHz Operation target connector to ET128(ET144-QF63) on-circuit emulation
LA-6599 ET100R-EYA-QF49	**Adapter ET100R-06 to YAMAICHI socket QF49** Emulation Adapter for 80C165 in QF49 for YAMAICHI socket YAMAICHI part number: IC-149-100-025-S5 without locator pin IC-149-100-125-S5 with locator pin

Detailed Order Information

Order No.	Code	Text
LA-6601	ICE-166/256K	ICE-166 Base Module 256K
LA-6592	M-166	Module 80C166
LA-6597	M-166-GOLD-V2.1	Module PMB2705 GOLD Version 2.1/3.3
LA-6598	M-166-GOLD-2706	Module PMB2706 GOLD
LA-7264	M-166-GOLD-2800	Module PMB2800 HIGOLD
LA-7269	M-166-GOLD-2800V4	Module PMB2800 HIGOLD V4
LA-6593	M-166-GOLD-V1.5	Module PMB2705 GOLD Version 1.5
LA-7265	M-167E2-B	Module 80C167E2 Bondout
LA-7266	A-167E2	Adapter C165/C167
LA-7268	M-166-B	Module 80C166 Bondout
LA-7263	A-167-B-3.3-V	Adapter SABC167/C165 3.3 V
LA-6596	A-165-VECON	Adapter C165 VeCon
LA-6615	A-C167E2CS	Adapter C165/C167CS/F168
LA-6603	A-165-VECON-3.3V	Adapter C165 VeCon 3.3V
LA-1201	ET160-VECON160	ET160 to VECON160 Converter
LA-6602	A-C163	Adapter C163
LA-6604	A-C163-3.3V	Adapter C163 3.3V
LA-6612	A-C164CI	Adapter C164CI
LA-6616	A-C164CR	Adapter C164CR
LA-6610	A-C161V	Adapter C161V
LA-6611	A-C161RI	Adapter C161RI
LA-6613	A-C161CI	Adapter C161SI/CI/CS
LA-6599	ET100R-EYA-QF49	Adapter ET100R-06 to YAMAICHI socket QF49
Additional Options		
AM-1055	ET100-AMP100	Adapter for AMP QFP100 Socket
ET-1032	ET100-CET-QF06	Clip-Over Adapter for ET100-QF06
TO-1260	ET100-ETO-QF06	Emul. Adapter for TO socket ET100-QF06
TO-1250	ET100-ETO-QF49	Emul. Adapter for T0 socket ET100-QF49
TO-1255	ET100-ETO-SE	Emul. Adapter for T0 socket ET100-SE 0.4mm
YA-1051	ET100-EYA-QF01	Emul. Adapter for YAMAICHI socket ET100-QF01
YA-1031	ET100-EYA-QF06	Emul. Adapter for YAMAICHI socket ET100-QF06

Order No.	Code	Text
YA-1091	ET100-EYA-QF49	Emul. Adapter for YAMAICHI socket ET100-QF49
LA-1054	ET100-FP100-L	Adapter for ET100 to Footprint AMP/3M Sockets
LA-1053	ET100-FP100-R	Adapter for ET100 to Footprint AMP/3M Sockets
ET-1050	ET100-SET-QF01	Surface Mountable Adapter for ET100 to QF01
ET-1030	ET100-SET-QF06	Surface Mountable Adapter for ET100 to QF06
ET-1092	ET100-SET-QF49	Surface Mountable Adapter for ET100-QF49
TO-1261	ET100-STO-QF06	Emul. Adapter TO-surface mount. ET100-QF06
TO-1251	ET100-STO-QF49	Emul. Adapter TO-surface mount. ET100-QF49
YA-1112	ET128-EYA-QF63	Emul. Adapter for YAMAICHI socket ET128-QF63
ET-1095	ET144-CET-QF10	Clip Over Adapter for ET144-QF10
TO-1300	ET144-ETO-QF10	Emul. Adapter for T0 socket ET144-QF10
TO-1310	ET144-ETO-QF63	Emul. Adapter for T0 socket ET144-QF63
YA-1094	ET144-EYA-QF10	Emul. Adapter for YAMAICHI socket ET144-QF10
YA-1111	ET144-EYA-QF63	Emul. Adapter for YAMAICHI socket ET144-QF63
LA-1096	ET144-FP144	Adapter ET144 to Footprint AMP Sockets
ET-1090	ET144-SET-QF10	Surface Mountable Adapter for ET144-QF10
ET-1110	ET144-SET-QF63	Surface Mountable Adapter for ET144-QF63
TO-1301	ET144-STO-QF10	Emul. Adapter TO-surface mount. ET144-QF10
TO-1311	ET144-STO-QF63	Emul. Adapter TO-surface mount. ET144-QF63
TO-1320	ET160-ETO-QF07	Emul. Adapter for T0 socket ET160-QF07
YA-1061	ET160-EYA-QF07	Emul. Adapter for YAMAICHI socket ET160-QF07
LA-1064	ET160-FP160-L	Adapter for Footprint AMP/3M sockets
LA-1063	ET160-FP160-R	Adapter for Footprint AMP/3M sockets
ET-1060	ET160-SET-QF07	Surface Mountable Adapter for ET160-QF07
TO-1321	ET160-STO-QF07	Emul. Adapter TO-surface mount. ET160-QF07
ET-1132	ET80-CET-QF14	Clip Over Adapter for QF14
TO-1275	ET80-ETO-QF14	Emul. Adapter for T0 socket ET080-QF14
YA-1131	ET80-EYA-QF14	Emul. Adapter for YAMAICHI socket ET080-QF14
ET-1130	ET80-SET-QF14	Surface Mountable Adapter for ET80-QF14
TO-1276	ET80-STO-QF14	Emul. Adapter TO-surface mount. ET080-QF14
LA-7512	MON-166	ROM Monitor for C166/ST10 on ESI
LA-7755	OCDS-C166CBC	OCDS Debugger for C166CBC (ICD)
LA-6450	PA64	Port Analyzer
LA-8803	SIM-166	TRACE32 Instruction Set Simulator for C166/ST

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