

Common OCD pinouts

NOTE: Macraigor Systems accepts NO responsibility for the accuracy of the following information. We strongly recommend that you use the OCD header specified by the semiconductor manufacturer. Please refer to the manufacturer's proper data book or reference design for information. *The pinouts given below may show a subset of the signals specified by the manufacturer.*

General Notes:

- Unless otherwise indicated, all headers are male dual-row Berg style connectors on 0.1 centers.
- We do not specify the use of pull ups or pull downs on any signals although they may be needed. Check with the chip manufacturer.
- TVcc pins should be the I/O ring voltage and that signal is used to determine the electrical characteristics of the other signals. If you must current limit this line, allow the probe at least 1 mA.
- Unless otherwise indicated, RESET \bar is an open collector signal from the probe to the target. It should directly drive the target processor and not drive power on reset circuits or the like.
- Some target boards may use a non-standard connector or a connector that we identify for a different target.
- Place the header as close to the processor as possible, use short traces of approximately equal length on all clock and data signals.

Pin Specifications:

Pins are identified by number and type.

- o = output from target processor to OCD interface
- i = input to target processor from OCD interface
- p = power pin
- oc = open collector driven from OCD interface, either floating or actively held low
- nc = not connected, ie: not driven nor read by OCD interface
- k = key, pin is typically missing from the target board

“COP” pinout

Motorola PowerPC 6xx, 7xx, 8xxx

IBM 4xx

LSI SerialICE 2

TDO	o	1	2	i	QACK
TDI	i	3	4	i	TRST\
HALTED	o	5	6	p	TVcc
TCK	i	7	8	nc	
TMS	i	9	10	nc	
SRESET	i	11	12	p	GND
HRESET	oc	13	14	nc	
CKSTP_OUT	o	15	16	p	GND

“BDM” – Background Debug Mode

There are actually several BDM pinouts.

Motorola MPC8xx, MPC5xx

NOTE: It is vital that pins 1 and 6 properly reflect the status of the target processor immediately following RESET. Some processors have configurable pins (MPC8xx, etc.) that are specified by a reset configuration word at the time of reset. These pins must be set properly and must ALWAYS reflect the status of the processor correctly. Check the ‘hardware reset configuration word’ in the Motorola User’s manual.

FRZ or VFSL0	o	1	2	o	SRESET
GND	p	3	4	i	DSCK
GND	p	5	6	o	FRZ or VFSL1
RESET\	oc	7	8	i	DSDI
TVcc	p	9	10	o	DSDO

Motorola CPU32 (*this version is obsolete and not recommended*)

GND	p	1	2	i	DSCK
GND	p	3	4	o	FRZ
RESET\	oc	5	6	i	DSDI
TVcc	p	7	8	o	DSDO

Motorola CPU16, CPU32

Note: Most probes are powered via TVcc, hence don't current limit.

DS	o	1	2	o	BERR
GND	p	3	4	i	DSCK
GND	p	5	6	o	FRZ
RESET\	oc	7	8	i	DSDI
TVcc	p	9	10	o	DSDO

“OnCE” – On Chip Emulation

Motorola DSP, M•CORE, Tensilica, AMD AM32

TDI	i	1	2	p	GND
TDO	o	3	4	p	GND
TCK	i	5	6	p	GND
	nc	7	8	nc	
RESET\	oc	9	10	i	TMS
TVcc	p	11	12	p	GND
	nc	13	14	i	TRST\

(note: RESET\ not supported for the AM32)

ARM

There are two standard ARM pinouts, and older 14 pin specification and a newer 20 pin specification.

TVcc	p	1	2	p	GND
TRST\	i	3	4	p	GND
TDI	i	5	6	p	GND
TMS	i	7	8	p	GND
TCK	i	9	10	p	GND
TDO	o	11	12	oc	RESET\
TVcc	p	13	14	p	GND

OR

TVcc	p	1	2		nc
TRST\	i	3	4	p	GND
TDI	i	5	6	p	GND
TMS	i	7	8	p	GND
TCK	i	9	10	p	GND
	nc	11	12	p	GND
TDO	o	13	14	p	GND
RESET/	oc	15	16	p	GND
	nc	17	18	p	GND
	nc	19	20	p	GND

MIPS – EJTAG 2.5

There are many MIPS OCD headers in use. This is the one specified by MTI for EJTAG 2.5

TRST\	i	1	2	p	GND
TDI	i	3	4	p	GND
TDO	o	5	6	p	GND
TMS	i	7	8	p	GND
TCK	i	9	10	p	GND
RESET\	oc	11	12	k	key
DINT	i	13	14	p	TVcc

Toshiba's variant:

TRST\	i	1	2	p	GND
TDI	i	3	4	p	GND
TDO	o	5	6	p	GND
TMS	i	7	8	p	GND
TCK	i	9	10	nc	
TVcc	p	11	12	nc	
RESET\	oc	13	14	nc	
	nc	15	16	nc	
	nc	17	18	nc	
	nc	19	20	nc	

AMD – Athlon

These are the pins that Macraigor uses on the Athlon header.

TVcc	p	1	2	i	TCK
	nc	3	4	i	TMS
	nc	5	6	nc	
	nc	7	8	i	TDI
	nc	9	10	i	TRST\
GND	p	11	12	o	TDO
DBREQ	i	13	14	o	DBRDY
RESET\	oc	15	16	i	PLL_TEST