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JTAG-Booster for
AMD ÉlanSC520

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Table of Contents

1. General

The program JTAGEL5 uses the JTAG port of the AMD ÉlanSC520 embedded microprocessor in conjunction with the small JTAG-BOOSTER:

- to program data into flash memory
- to verify and read the contents of a flash memory
- to make a memory dump
- to access a I2C Device
- to test CPU signals

All functions are done without any piece of software running in the target. No firmware or BIOS must be written. Bootstrap software may be downloaded to initially unprogrammed memories.

For latest documentation please refer to the file README.TXT on the distribution disk.

1.1. System Requirements

To successfully run this tool the following requirements must be met:

- MSDOS, WIN3.x, WIN9x or WinNT
  (WinNT is supported with an additional support-kit)

- Intel 80386 or higher

- 205 kByte of free DOS memory

- no extended memory

- Parallel Port

1.2.Connecting your PC to the target system

The JTAG-Booster can be plugged into standard parallel ports (LPT1-3) with a DB25-Connector.

LPT1-3
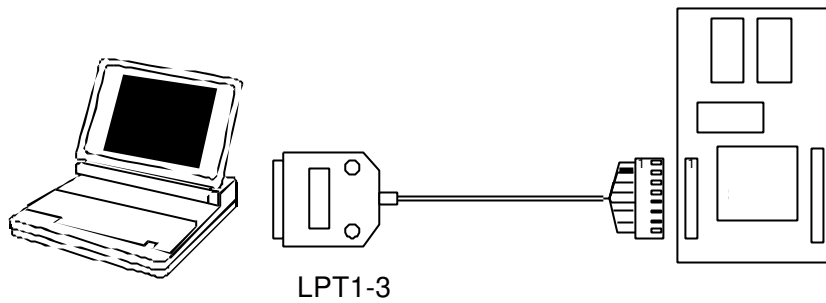
The target end of the cable has the following reference:

1	2*	3	4	5	6	7	8
TCK	GND	TMS	TRST#	NC	TDI	TDO	+3.3V

*PIN 2 can be detected by the white thick cable.

To connect your design to the JTAG-BOOSTER you need a single row berg connector with a spacing of 2.54mm on your PCB. The names refer to the target: Pin 7 is the target's TDO pin and is connected to the JTAG-Booster's TDI pin.

A 3.3V version of the JTAG-Booster is delivered for the AMD ElanSC520. Do not connect the 3.3V JTAG-Booster to a 5V power supply. The JTAG-Booster may be damaged.

Before you start the program, the JTAG-BOOSTER must be plugged to a parallel interface of your PC and to the 8 pin JTAG connector on the target.

The utility is started with the general command line format:

JTAGEL5 /function [filename] [/option_1] ... [/option_n].

Note that the function must be the first argument followed (if needed) by the filename.

If you want to cancel execution of JTAGEL5, press CTRL-Break-Key.

On any error the program aborts with an MSDOS error level of one.

1.3.First Example

In the following simple example it is assumed that the JTAG-Booster is connected to LPT1 of your PC and target power is on.

Typing

> JTAGEL5 /P MYAPP.BIN /VERIFY

at the DOS prompt results in the following output:

> JTAGEL5 --- JTAG utility for AMD ÉlanSC520
> Copyright © FS FORTH-SYSTEME GmbH, Breisach
> Version 3.0 of mm/dd/yyyy

(1)	Configuration loaded from file JTAGEL5.INI
(2)	Target: FS FORTH-SYSTEME, EVA520
(3)	Using LPT at I/O-address 0378h
(4)	JTAG Adapter detected

(5)	More than 9 devices detected in JTAG chain or TDI pin stuck at low level

> Device 0: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 1: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 2: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 3: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 4: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 5: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 6: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 7: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1
> Device 8: IDCODE=10EFF003 AMD ÉlanSC520, Revision 1

(6)	Sum of instruction register bits	: 4
(7)	CPU position	: 0
(8)	Instruction register offset	: 0

(9)	AMD 29F040 detected
(10)	Erasing Flash-EPROM Block #:6 7

> Programming File MYAPP.BIN
> 131072 Bytes programmed
> Programming ok

Erase Time   :   1.1 sec
Programming Time :   121.2 sec

(1)   The initialization file JTAGEL5.INI was found in the current directory.

(2)   The target identification line of the initialization file is printed here.

(3)   The resulting I/O-address of the parallel port is printed here.

(4)   A JTAG-Booster is found on the parallel port

(5)   The JTAG chain is analyzed. There may be several parts in the JTAG chain.
       The chain is analyzed and all parts except the AMD ÉlanSC520 are
       switched to bypass mode.
       Please note: The current revision of the AMD ÉlanSC520 has a silicon bug
       with the JTAG identification register. As a result of that bug, the contents of
       the identification register is shifted out infinitely. If there are other devices in
       the JTAG chain, the AMD ÉlanSC520 must be the first part in the chain
       (nearest to TDI). Otherwise the JTAG-Booster does not work.

(6)   The length of all instruction registers in the JTAG chain are added.

(7)   The position of the AMD ÉlanSC520 in the JTAG chain is checked.

(8)   The position of the JTAG instruction register of the AMD ÉlanSC520 is
       checked

(9)   One Flash-EPROM AMD 29F040 selected with chip select BOOTCS# is
       found.

(10)   In this example two blocks must be erased.

1.4.Trouble Shooting

Avoid long distances between your Host-PC and the target. If you are using standard parallel extension cable, the JTAG-BOOSTER may not work. Don't use Dongles between the parallel port and the JTAG-BOOSTER.

Switch off all special modes of your printer port (EPP, ECP, ...) in the BIOS setup. Only standard parallel port (SPP) mode is allowed.

On very fast PCs there could be verify errors. To avoid this, watch for the ´IO recovery time´-switch in the BIOS Setup which must be turned on. Otherwise try to slow down your PC by setting the turbo switch off.

When using older flash devices (nearly maximum erase cycles reached), we propose to use the /VERIFY option. This is also true for the relatively slow 3 Volt only flash devices.

Some newer fast flash devices need a setup time between address/data and the write strobe signal. If programming of this devices fails, try with the option /WRSETUP again.

If there are problems with autodetection of the flash devices use the /DEVICE= option. To speed up autodetection specify the option /16BIT or /8BIT.

Don't use hardware protected flash memories.

The used chip selects must be defined as output and inactive in the initialization file (see chapter 1.6 "Initialization file JTAGEL5.INI"). Also the address bits must be defined as output.

1.5.Error Messages

- **80386 or greater required**
  The JTAG-BOOSTER does not work on a 8088/8086 or a 80286 platform.

- **Adapter not connected or target power fail**
  The JTAG-Booster wasn't found. Please check connection to parallel port and connection to target. Check target power. Check your BIOS-Setup.

- **Can't open x:\yyy\zzz\JTAGEL5.OVL**
  The overlay file JTAGEL5.OVL must be in the same directory as JTAGEL5.EXE.

- **Configuration file XYZ not found.**
  The file specified with the option /INI= wasn't found.

- **Device offset out of range**
  The value specified with the option /OFFSET= is greater than the size of the detected flash device.

- **Disk full**
  Writing a output file was aborted as a result of missing disk space.

- **Error creating file:**
  The output file could not be opened. Please check free disk space or write protection.

- **Error:** *Pin-Name* **is an output only pin**
  The specified pin cannot be sampled. Check the command line. Check the initialization file.

- **Error:** *Pin-Name* **is an input only pin**
  The specified pin cannot be activated. Check the command line. Check the initialization file.

- **Error:** *Pin-Name* **may not be read back**
  The specified pin can be switched to tristate, but cannot be read back. Check the command line.

- **illegal function:**
  The first parameter of the command line must be a valid function. See chapter 2 "JTAGEL5 Parameter Description" for a list of supported functions.

- **illegal number:**
  The specified number couldn't be interpret as a valid number. Check the relevant number base.

- **illegal option:**
  See chapter 2 "JTAGEL5 Parameter Description" for a list of supported options.

- **illegal Pin Type:**
  The name specified with the option /PIN= must be one of the list of chapter 1.6 "Initialization file JTAGEL5.INI"

- **illegal Flash Type:**
  The name specified with the option /DEVICE= must be one of the list of chapter 1.7 "Supported flash devices".

- **Input file not found:**
  The specified file cannot be found

- **Input file is empty:**
  Files with zero length are not accepted

- **" " is undefined**
  Please check the syntax in your configuration file. (See chapter 1.6 "Initialization file JTAGEL5.INI").

- **LPTx not installed**
  The LPT port specified with /LPTx cannot be found. Please check the LPT port or specify a installed LPT port. Check your BIOS setup.

- **missing filename**
  Most functions need a filename as second parameter.

- **missing option /I2CCLK=**
  Some functions need the option /I2CCLK= to be defined.

- **missing option /I2CDAT=**
  Some functions need the option /I2CDAT= or the options /I2CDATO= and /I2CDATI= to be defined.

- **missing option /LENGTH=**
  Some functions need the option /LENGTH= to be defined.

- **missing option /PIN=**
  Some functions need the option /PIN= to be defined.

- **More than 9 devices in the JTAG chain or TDI pin stuck at low level**
  The JTAG chain is limited to 9 parts. Check target power. Check the target's TDO pin.

- **No devices found in JTAG chain or TDI pin stuck at high level**
  A stream of 32 high bits was detected on the pin TDI. TDI may stuck at high level. Check the connection to your target. Check the target power. Check the target's TDO pin.

- **Option /CPUPOS= out of range**
  The number specified with the option /CPUPOS= must be less or equal to the number of parts minus 1.

- **Option /IROFFS= out of range**
  Please specify a smaller value

- **Part at specified position is not a AMD ÉlanSC520**
  The option /CPUPOS= points to a part not a AMD ÉlanSC520

- **Pins specified with /I2CCLK= and /I2CDAT= must have different control cells**
  The pin specified with the option /I2CDAT= must be able to be switched to high impedance while the pin specified with option /I2CCLK= is an active output. See chapter 1.6 "Initialization file JTAGEL5.INI".

- **Pins specified with /I2CCLK= and /I2CDATI= must have different control cells**
  The pin specified with the option /I2CDATI= must be able to be switched to high impedance while the pin specified with option /I2CCLK= is an active output. See chapter 1.6 "Initialization file JTAGEL5.INI".

- **Pins specified with /I2CDATO= and /I2CDATI= must have different control cells**
  The pin specified with the option /I2CDATI= must be able to be switched to high impedance while the pin specified with option /I2CDATO= is an active output. See chapter 1.6 "Initialization file JTAGEL5.INI".

- **Specify only one of that options:**
  Some options are exclusive (i.e. /8BIT and /16BIT). Don't mix them.

- **There are unknown parts in the JTAG chain. Please use the option /IROFFS= to specify the instr. reg. offset of the CPU.**
  If there are unknown parts in the JTAG chain, the program isn't able to determine the logical position of the CPU's instruction register.

- **There is no AMD ÉlanSC520 in the JTAG chain**
  No AMD ÉlanSC520 was found in the JTAG chain. Check the target power. Try with option /DRIVER=4 again.

- **Value of option /FILE-OFFSET out of range**
  The value of the option /FILE-OFFSET= points behind end of file.

- **wrong driver #**
  The value specified with the option /DRIVER= is out of range.

- **wrong Identifier (xxxx)**
  No valid identifier found. Check the specified chip select signal and the bus width. Try with the option /DEVICE= .

1.6.Initialization file JTAGEL5.INI

This file is used to set the CPU signals for input/output. In case of output signal an additional parameter is used to set the default level to high or low. This file can be used to adapt your own AMD ÉlanSC520 design to the JTAG-BOOSTER. The Target-Entry is used to identify your design which is displayed with most commands.

When the JTAGEL5 software is started it scans the current directory for an existing initialization file named JTAGEL5.INI. If no entry is found the default values are used. You may also specify the initialization file with the option /INI= . If the specified file isn't found, the program aborts with an error message.

The CPU pins can also be used with the functions /BLINK (chapter 2.9), /PIN? (chapter 2.10) and /SAMPLE (chapter 2.11) to test the signals on your design.

Example of JTAGEL5.INI:

// Description file for AMD ÉlanSC520
Target: FS FORTH-SYSTEME, EVA520
// All chip select signals are set to output and inactive.
// All signals should be defined. Undefined signals are set to their defaults.
// Pin names are defined in upper case.
// Low active signals are signed with a trailing #.

// Group A: All pins in this group must be set to the same direction
//   This pins are tristateable outputs and may not be read back
BA1   Out,Lo   // SDRAM, bank address
BA0   Out,Lo   // SDRAM, kank address
MA12   Out,Lo   // SDRAM, address
MA11   Out,Lo   //
MA10   Out,Lo   //
MA9   Out,Lo   //
MA8   Out,Lo   //
MA7   Out,Lo   //
MA6   Out,Lo   //
MA5   Out,Lo   //
MA4   Out,Lo   //
MA3   Out,Lo   //
MA2   Out,Lo   //

```
MA1             Out,Lo  //
MA0             Out,Lo  //

// Group B: All pins in this group must be set to the same direction
//        This pins are bidirectional
MD31            Inp     // SDRAM data bus
MD30            Inp     //
MD29            Inp     //
MD28            Inp     //
MD27            Inp     //
MD26            Inp     //
MD25            Inp     //
MD24            Inp     //
MD23            Inp     //
MD22            Inp     //
MD21            Inp     //
MD20            Inp     //
MD19            Inp     //
MD18            Inp     //
MD17            Inp     //
MD16            Inp     //
MD15            Inp     //
MD14            Inp     //
MD13            Inp     //
MD12            Inp     //
MD11            Inp     //
MD10            Inp     //
MD9             Inp     //
MD8             Inp     //
MD7             Inp     //
MD6             Inp     //
MD5             Inp     //
MD4             Inp     //
MD3             Inp     //
MD2             Inp     //
MD1             Inp     //
MD0             Inp     //
MECC6           Inp     // SDRAM, memory error correction code
MECC5           Inp     //
MECC4           Inp     //
MECC3           Inp     //
```

```
MECC2          Inp       //
MECC1          Inp       //
MECC0          Inp       //


// Group C: All pins in this group must be set to the same direction
//         This pins are tristateable outputs but may not be read back
SCS3#          Out,Hi    // SDRAM, chip select
SCS2#          Out,Hi    //
SCS1#          Out,Hi    //
SCS0#          Out,Hi    //


// Group D: All pins in this group must be set to the same direction
//         This pins are tristateable outputs but may not be read back
SRASB#         Out,Hi    // SDRAM, row address strobe
SRASA#         Out,Hi    //


// Group E: All pins in this group must be set to the same direction
//         This pins are tristateable outputs but may not be read back
SCASB#         Out,Hi    // SDRAM, column address strobe
SCASA#         Out,Hi    //


// Group F: All pins in this group must be set to the same direction
//         This pins are tristateable outputs but may not be read back
SWEB#          Out,Hi    // SDRAM, memory write enables
SWEA#          Out,Hi    //


// Group G: All pins in this group must be set to the same direction
//         This pins are tristateable outputs but may not be read back
SDQM3          Out,Lo    // SDRAM, data ubput/output mask
SDQM2          Out,Lo    //
SDQM1          Out,Lo    //
SDQM0          Out,Lo    //


// Group H: All pins in this group must be set to the same direction
//         This pins are bidirectional
AD31           Inp       // PCI, address/data bus
AD30           Inp       //
AD29           Inp       //
AD28           Inp       //
AD27           Inp       //
AD26           Inp       //
```

```
AD25            Inp     //
AD24            Inp     //
AD23            Inp     //
AD22            Inp     //
AD21            Inp     //
AD20            Inp     //
AD19            Inp     //
AD18            Inp     //
AD17            Inp     //
AD16            Inp     //
AD15            Inp     //
AD14            Inp     //
AD13            Inp     //
AD12            Inp     //
AD11            Inp     //
AD10            Inp     //
AD9             Inp     //
AD8             Inp     //
AD7             Inp     //
AD6             Inp     //
AD5             Inp     //
AD4             Inp     //
AD3             Inp     //
AD2             Inp     //
AD1             Inp     //
AD0             Inp     //

// Group I: All pins in this group must be set to the same direction
//          This pins are bidirectional
CBE3#           Out,Hi  // PCI, command or byte enable
CBE2#           Out,Hi  //
CBE1#           Out,Hi  //
CBE0#           Out,Hi  //

// Group J: All pins in this group must be set to the same direction
//          Pins GPA14..0 are tristateable outputs but may not be read back
//          Pins GPA25..15 are bidirectional
//          For Flash programming this pins must be set to output
GPA25           Out,Lo  // = DEBUG_ENTER config switch
GPA24           Out,Lo  // = INST_TRCE config switch
GPA23           Out,Lo  // = AMDEBUG_DIS config switch
```

```
GPA22          Out,Lo    // = RSTLD7 config switch
GPA21          Out,Lo    // = RSTLD6 config switch
GPA20          Out,Lo    // = RSTLD5 config switch
GPA19          Out,Lo    // = RSTLD4 config switch
GPA18          Out,Lo    // = RSTLD3 config switch
GPA17          Out,Lo    // = RSTLD2 config switch
GPA16          Out,Lo    // = RSTLD1 config switch
GPA15          Out,Lo    // = RSTLD0 config switch
GPA14          Out,Lo    //
GPA13          Out,Lo    //
GPA12          Out,Lo    //
GPA11          Out,Lo    //
GPA10          Out,Lo    //
GPA9           Out,Lo    //
GPA8           Out,Lo    //
GPA7           Out,Lo    //
GPA6           Out,Lo    //
GPA5           Out,Lo    //
GPA4           Out,Lo    //
GPA3           Out,Lo    //
GPA2           Out,Lo    //
GPA1           Out,Lo    //
GPA0           Out,Lo    //

// Group K: All pins in this group must be set to the same direction
//        This pins are bidirectional
GPD15          Inp       //
GPD14          Inp       //
GPD13          Inp       //
GPD12          Inp       //
GPD11          Inp       //
GPD10          Inp       //
GPD9           Inp       //
GPD8           Inp       //

// Group L: All pins in this group must be set to the same direction
//        This pins are bidirectional
GPD7           Inp       //
GPD6           Inp       //
GPD5           Inp       //
GPD4           Inp       //
```

```
GPD3            Inp         //
GPD2            Inp         //
GPD1            Inp         //
GPD0            Inp         //
```

// The direction of each following pin can be set independent of the others,
// but this pins can not be read back.
```
CLKMEMOUT  Out,Lo// SDRAM, clock output
BOOTCS#         Out,Hi//
ROMRD#          Out,Hi//
FLASHWR#        Out,Hi//
ROMBUFOE#   Out,Hi//
ROMCS1#         Out,Hi//
ROMCS2#         Out,Hi      //
CLKPCIOUT       Out,Lo      // PCI, clock input
RST#            Out,Hi      // PCI, reset
GNT4#           Out,Hi      //
GNT3#           Out,Hi      //
GNT2#           Out,H       i//
GNT1#           Out,Hi      //
GNT0#           Out,Hi      //
GPRESET         Out,Lo      // some people connect GPRESET to the Boot-Flash!!
GPIORD#         Out,Hi      //
GPIOWR#         Out,Hi      //
GPMEMRD#        Out,Hi      //
GPMEMWR#        Out,Hi      //
SOUT1           Out,Lo      //
RTS1#           Out,Lo      //
DTR1#           Out,Lo      //
SOUT2           Out,Lo      //
RTS2#           Out,Lo      //
DTR2#           Out,Lo      //
SSI_CLK         Out,Hi      //
SSI_DO          Out,Hi      //
CMDACK          Out,Lo      //
STOP/TX         Out,Lo      //
TRIG/TRACE      Out,Lo      //
```

// The following pins are complete bidirectional pins.
// The direction of each pin can be set independent of the other pins.
// Each pin can be used as input.

```
PAR             Inp         //
PERR#           Inp         //
FRAME#          Inp         //
TRDY#           Inp         //
IRDY#           Inp         //
STOP#           Inp         //
DEVSEL#         Inp         //
PIO27           Inp         // = GPCS0#
PIO26           Inp         // = PMEMCS16#
PIO25           Inp         // = GPIOCS16#
PIO24           Out,Hi      // = GPDBUFOE#
PIO23           Inp         // = GPIRQ0
PIO22           Inp         // = GPIRQ1
PIO21           Inp         // = GPIRQ2
PIO20           Inp         // = GPIRQ3
PIO19           Inp         // = GPIRQ4
PIO18           Inp         // = GPIRQ5
PIO17           Inp         // = GPIRQ6
PIO16           Inp         // = GPIRQ7
PIO15           Inp         // = GPIRQ8
PIO14           Inp         // = GPIRQ9
PIO13           Inp         // = GPIRQ10
PIO12           Out,Hi      // = GPDACK0#
PIO11           Out,Hi      // = GPDACK1#
PIO10           Out,Hi      // = GPDACK2#
PIO9            Out,Hi      // = GPDACK3#
PIO8            Inp         // = GPDRQ0
PIO7            Inp         // = GPDRQ1
PIO6            Inp         // = GPDRQ2
PIO5            Inp         // = GPDRQ3
PIO4            Out,Lo      // = GPTC
PIO3            Out,Lo      // = GPAEN
PIO2            Inp         // = GPRDY
PIO1            Out,Hi      // = GPBHE#
PIO0            Out,Lo      // = CPALE
PIO28           Inp         // = CTS2#
PIO29           Inp         // = DSR2#
PIO30           Inp         // = DCD2
PIO31           Inp         // = RIN2#
CLKTIMER        Inp         //
DC              Out,Lo      //
```

```
DATASTRB     Out,Lo    //
CPUACT       Out,Lo    //
PITOUT2      Out,Lo    //
PITGATE2     Inp       //
TMRIN1       Inp       //
TMRIN0       Inp       //
TMROUT1      Out,Lo    //
TMROUT0      Out,Lo    //

// The following pins are input only.
// Setting to output of one of these pins results in an error.
// Declaration of the direction of these pins is optional.
CLKMEMIN     Inp       //
SERR#        Inp       //
CLKPCIIN     Inp       //
INTD#        Inp       //
INTC#        Inp       //
INTB#        Inp       //
INTA#        Inp       //
REQ4#        Inp       //
REQ3#        Inp       //
REQ2#        Inp       //
REQ1#        Inp       //
REQ0#        Inp       //
SIN1         Inp       //
CTS1#        Inp       //
DSR1#        Inp       //
DCD1#        Inp       //
RIN1#        Inp       //
SIN2         Inp       //
SSI_DI       Inp       //
PWRGOOD      Inp       //
PRGRESET     Inp       //
BR/TC        Inp       //
```

This example is equal to the default initialization which is used when no initialization file could be found in the current directory and no initialization file is specified with the option /INI=.

Changes to the structure of the file could result in errors. Remarks can be added by using //.

1.7.Supported flash devices

The following types could be used with the /DEVICE= option:

```
  AM29F010          : AMD 29F010
  AM29F010*2        : Dual AMD 29F010
* AM29LV010         : AMD 29LV010              (3.3V)
* AM29LV010*2       : Dual AMD 29LV010         (3.3V)
* AM29F100BW        : AMD 29F100B              (word mode)
* AM29F100BB        : AMD 29F100B              (byte mode)
* AM29F100TW        : AMD 29F100T              (word mode)
* AM29F100TB        : AMD 29F100T              (byte mode)
* AM29F200BW        : AMD 29F200B              (word mode)
* AM29F200BB        : AMD 29F200B              (byte mode)
* AM29F200TW        : AMD 29F200T              (word mode)
* AM29F200TB        : AMD 29F200T              (byte mode)
* AM29LV200BW       : AMD 29F200B              (3.3V, word mode)
* AM29LV200BB       : AMD 29F200B              (3.3V, byte mode)
* AM29LV200TW       : AMD 29F200T              (3.3V, word mode)
* AM29LV200TB       : AMD 29F200T              (3.3V, byte mode)
  AM29F040          : AMD 29F040
  AM29F040*2        : Dual AMD 29F040
* AM29F400BW        : AMD 29F400B              (word mode)
* AM29F400BB        : AMD 29F400B              (byte mode)
  AM29F400TW        : AMD 29F400T              (word mode)
  AM29F400TB        : AMD 29F400T              (byte mode)
* AM29LV400BW       : AMD 29LV400B             (3.3V, word mode)
* AM29LV400BB       : AMD 29LV400B             (3.3V, byte mode)
* AM29LV400TW       : AMD 29LV400T             (3.3V, word mode)
* AM29LV400TB       : AMD 29LV400T             (3.3V, byte mode)
* AM29LV004B        : AMD 29LV004B             (3.3V)
* AM29LV004T        : AMD 29LV004T             (3.3V)
  AM29F080          : AMD 29F080
* AM29F080*2        : Dual AMD 29F080
* AM29LV081         : AMD 29LV081              (3.3V)
* AM29LV081*2       : Dual 29LV081             (3.3V)
* AM29F800BW        : AMD 29F800B              (word mode)
* AM29F800BB        : AMD 29F800B              (byte mode)
  AM29F800TW        : AMD 29F800T              (word mode)
* AM29F800TB        : AMD 29F800T              (byte mode)
* AM29LV800BW       : AMD 29LV800B             (3.3V, word mode)
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*  AM29LV800BB          : AMD 29LV800B           (3.3V, byte mode)
   AM29LV800TW          : AMD 29LV800T           (3.3V, word mode)
*  AM29LV800TB          : AMD 29LV800T           (3.3V, byte mode)
*  AM29LV008T           : AMD 29LV008T           (3.3V)
*  AM29LV008B           : AMD 29LV008B           (3.3V)
   AM29F016             : AMD 29F016
   AM29F016*2           : Dual AMD 29F016
*  AM29F017             : AMD 29F017
   AM29F017*2           : Dual AMD 29F017
   AM29LV017*2          : Dual AMD 29LV017        (3.3V)
*  AM29F160BW           : AMD 29F160B            (word mode)
*  AM29F160BB           : AMD 29F160B            (byte mode)
*  AM29F160TW           : AMD 29F160T            (word mode)
*  AM29F160TB           : AMD 29F160T            (byte mode)
*  AM29F160BB*2         : Dual AMD 29F160B       (byte mode)
*  AM29F160TB*2         : Dual AMD 29F160T       (byte mode)
   AM29LV160BW          : AMD 29LV160B           (3.3V, word mode)
*  AM29LV160BB          : AMD 29LV160B           (3.3V, byte mode)
*  AM29LV160TW          : AMD 29LV160T           (3.3V, word mode)
*  AM29LV160TB          : AMD 29LV160T           (3.3V, byte mode)
   AM29LV160BB*2        : Dual AMD 29LV160B      (3.3V, byte mode)
*  AM29LV160TB*2        : Dual AMD 29LV160T      (3.3V, byte mode)
   AM29F032             : AMD 29F032
   AM29F032*2           : Dual AMD 29F032
*  AM29LV033            : AMD 29LV033            (3.3V)
*  AM29LV033*2          : Dual AMD 29F033        (3.3V)
*  AM29LV640            : AMD 29LV160            (3.3V, word mode)

*  I28F001T             : Intel 28F001T
*  I28F001T*2           : Dual Intel 28F001T
*  I28F001B             : Intel 28F001B
*  I28F200BW            : Intel 28F200B          (word mode)
*  I28F200BB            : Intel 28F200B          (byte mode)
*  I28F200TW            : Intel 28F200T          (word mode)
*  I28F200TB            : Intel 28F200T          (byte mode)
*  I28F002B             : Intel 28F002B
*  I28F002T             : Intel 28F002T
*  I28F400BW            : Intel 28F400B          (word mode)
*  I28F400BB            : Intel 28F400B          (byte mode)
   I28F400TW            : Intel 28F400T          (word mode)
   I28F400TB            : Intel 28F400T          (byte mode)
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 * I28F004B            : Intel 28F004B
 * I28F004T            : Intel 28F004T
 * I28F400B3B          : Intel 28F400B3B          Boot Block Smart3 Bottom
 * I28F400B3T          : Intel 28F400B3T          Boot Block Smart3 Top
 * I28F004S5           : Intel 28F004             FlashFile Smart3/5
 * I28F800BW           : Intel 28F800B            (word mode)
 * I28F800BB           : Intel 28F800B            (byte mode)
   I28F800TW           : Intel 28F800T            (word mode)
 * I28F800TB           : Intel 28F800T            (byte mode)
 * I28F800B3B          : Intel 28F800B3B          Boot Block Smart3 Bottom
 * I28F800B3T          : Intel 28F800B3T          Boot Block Smart3 Top
 * I28F008B            : Intel 28F008B
 * I28F008T            : Intel 28F008T
   I28F008SA           : Intel 28F008             FlashFile 12V
   I28F008SA*2         : Dual Intel 28F008        FlashFile 12V
   I28F008S5           : Intel 28F008             FlashFile Smart3/5
   I28F008S5*2         : Dual Intel 28F008        FlashFile Smart3/5
   I28F016W            : Intel 28F016             FlashFile (word mode)
 * I28F016B            : Intel 28F016             FlashFile (byte mode)
 * I28F016S5           : Intel 28F016             FlashFile Smart3/5
 * I28F160B3B          : Intel 28F160             Boot Block Smart3 Bottom
 * I28F160B3T          : Intel 28F160             Boot Block Smart3 Top
 * I28F160S5W          : Intel 28F160             FlashFile Smart5 (word mode)
 * I28F160S5B          : Intel 28F160             FlashFile Smart5 (byte mode)
   I28F320S5W          : Intel 28F320             FlashFile Smart3/5 (word mode)
 * I28F320S5B          : Intel 28F320             FlashFile Smart3/5 (byte mode)
 * I28F320J5W          : Intel 28F320             StrataFlash (word mode)
 * I28F320J5B          : Intel 28F320             StrataFlash (byte mode)
 * I28F320J3W          : Intel 28F320             StrataFlash (3.3V, word mode)
 * I28F320J3B          : Intel 28F320             StrataFlash (3.3V, byte mode)
 * I28F640J5W          : Intel 28F640             StrataFlash (word mode)
 * I28F640J5B          : Intel 28F640             StrataFlash (byte mode)
 * I28F640J3W          : Intel 28F640             StrataFlash (3.3V, word mode)
 * I28F640J3B          : Intel 28F640             StrataFlash (3.3V, byte mode)
 * I28F128J3W          : Intel 28F128             StrataFlash (3.3V, word mode)
 * I28F128J3B          : Intel 28F128             StrataFlash (3.3V, byte mode)

 * MBM29F200BW         : Fujitsu 29F200B          (word mode)
 * MBM29F200BB         : Fujitsu 29F200B          (byte mode)
 * MBM29F200TW         : Fujitsu 29F200T          (word mode)
 * MBM29F200TB         : Fujitsu 29F200T          (byte mode)
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* MBM29LV200BW    : Fujitsu 29LV200B        (3.3V, word mode)
* MBM29LV200BB    : Fujitsu 29LV200B        (3.3V, byte mode)
* MBM29LV200TW    : Fujitsu 29LV200T        (3.3V, word mode)
* MBM29LV200TB    : Fujitsu 29LV200T        (3.3V, byte mode)
* MBM29F002B      : Fujitsu 29F002B
* MBM29F002SB     : Fujitsu 29F002SB        (TSOP40)
* MBM29LV002B     : Fujitsu 29LV002B        (3.3V)
* MBM29F002T      : Fujitsu 29F002T
* MBM29F002ST     : Fujitsu 29F002ST        (TSOP40)
* MBM29LV002T     : Fujitsu 29LV002T        (3.3V)
* MBM29F040       : Fujitsu 29F040
* MBM29F400BW     : Fujitsu 29F400B         (word mode)
* MBM29F400BB     : Fujitsu 29F400B         (byte mode)
* MBM29F400TW     : Fujitsu 29F400T         (word mode)
* MBM29F400TB     : Fujitsu 29F400T         (byte mode)
* MBM29LV400BW    : Fujitsu 29LV400B        (3.3V, word mode)
* MBM29LV400BB    : Fujitsu 29LV400B        (3.3V, byte mode)
* MBM29LV400TW    : Fujitsu 29LV400T        (3.3V, word mode)
* MBM29LV400TB    : Fujitsu 29LV400T        (3.3V, byte mode)
* MBM29LV004B     : Fujitsu 29LV004B        (3.3V)
* MBM29LV004T     : Fujitsu 29LV004T        (3.3V)
* MBM29F080       : Fujitsu 29F080
* MBM29LV080      : Fujitsu 29LV080         (3.3V)
* MBM29F800BW     : Fujitsu 29F800B         (word mode)
* MBM29F800BB     : Fujitsu 29F800B         (byte mode)
* MBM29F800TW     : Fujitsu 29F800T         (word mode)
* MBM29F800TB     : Fujitsu 29F800T         (byte mode)
* MBM29LV800BW    : Fujitsu 29LV800B        (3.3V, word mode)
* MBM29LV800BB    : Fujitsu 29LV800B        (3.3V, byte mode)
* MBM29LV800TW    : Fujitsu 29LV800T        (3.3V, word mode)
* MBM29LV800TB    : Fujitsu 29LV800T        (3.3V, byte mode)
* MBM29LV008B     : Fujitsu 29LV008B        (3.3V)
* MBM29LV008T     : Fujitsu 29LV008T        (3.3V)
* MBM29F016       : Fujitsu 29F016
* MBM29F016*2     : Dual Fujitsu 29F016
* MBM29F017       : Fujitsu 29F017
* MBM29F017*2     : Dual Fujitsu 29F017
* MBM29F160BW     : Fujitsu 29LV160B        (word mode)
* MBM29F160BB     : Fujitsu 29LV160B        (byte mode)
* MBM29F160TW     : Fujitsu 29LV160T        (word mode)
* MBM29F160TB     : Fujitsu 29LV160T        (byte mode)
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