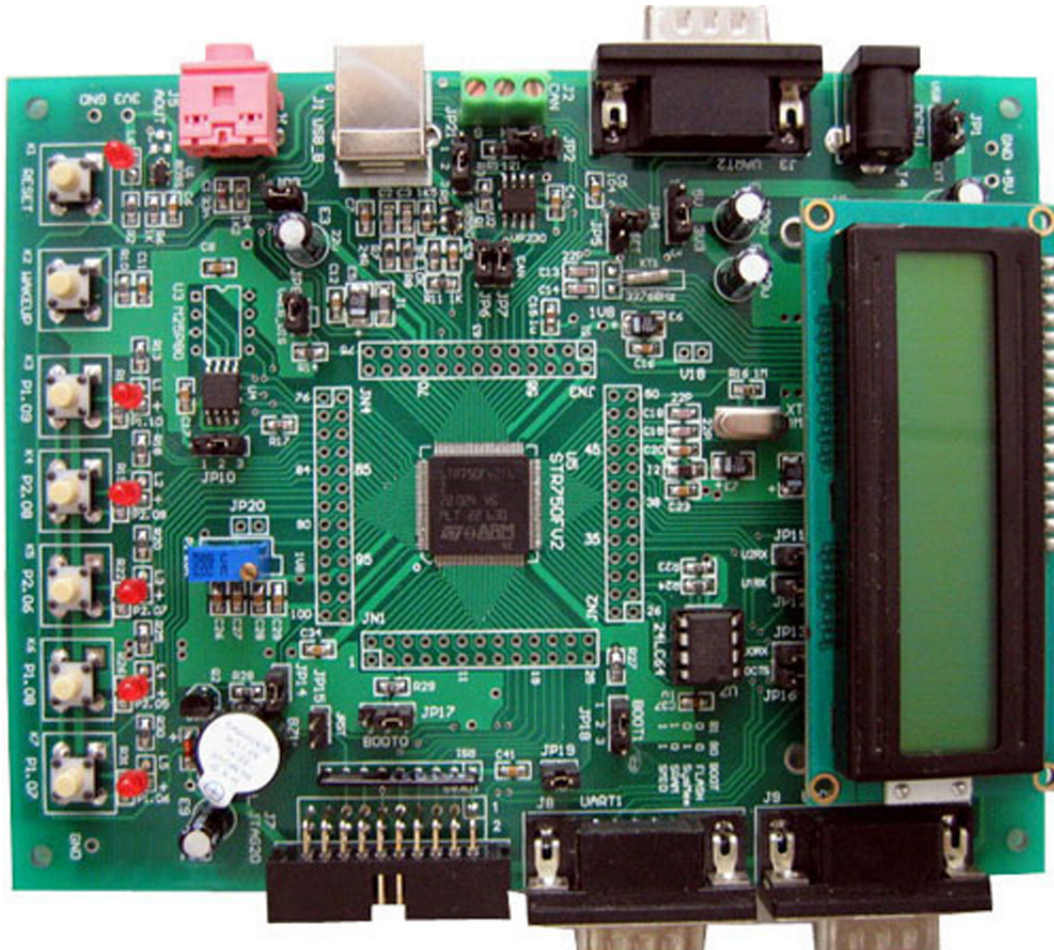# Embest STDV750F Evaluation Board

- Evaluation Board for STMicroelectronic's STR750FV2T6 ARM7TDMI-S Microcontroller (STR750 series)
- RS232, USB device, CAN, LCD, Audio, I2C, Jtag, uCos, ...
- Plenty of software examples, all in source code

Embest STDV750F Evaluation Board

Description

The STR750FV2T6 is among STR750F family, which is a new series of super-integrated, single-chip 32-bit ARM7-based MCUs from **STMicroelectronics**. Based on an ARM7TDMI-S core, the device has embedded 256KB of Flash plus an additional 16K bank of Read-While-Write Flash for EEPROM emulation. It can be used with either a 3.3V or a 5V power supply and is able to offer high performance with 54MIPS at 60MHz and low power consumption down to 10µA in standby mode that makes it ideal for battery-operated applications. It includes up to eight communication peripherals including USB and CAN, as well as a 4-channel DMA controller that significantly reduces CPU loading and a fast 10-bit ADC. The added innovative features to STR750 series have greatly extended the original rich peripherals of STR7 series.

Embest STDV750F^{TM} Evaluation Board is a complete development platform for STR750FV2T6 devices. The board expands all features of the microcontroller via a number of header connectors to support USB 2.0, CAN

2.0, 3 UART channels, LCD hardware and the full processor interfaces including JTAG. Plenty of software examples are provided with this board providing the designer with the ability to both understands hardware operation and enables rapid evaluation of the microcontroller's peripherals and other features.

Hardware Specification

- Dimensions: 150x116mm
- Working temperature: -40°C ~ 85°C
- Processor: STR750FV2T6 ARM7TDMI-S 32-bit RISC CPU running up to 60MHz with embedded 272kByte (256k+16k+32k) FLASH memory and 16kByte SRAM memory
- Power input: +5.0V/1A
- USB2.0 full speed interface (Device)
- CAN2.0 communication interface with CAN driver-chip
- 3 HiSpeed UARTs (HS-UART)
- 2 SSP interfaces (one is connected to flash chip which is able to plug in and out for replacement)
- 1 Serial Memory Interface - SMI (can be used for boot)
- II-C interface (EEPROM chip is able to plug in and out for replacement)
- 16x2 Character LCD
- 6 LED indicator light: one for power and five are general used
- 16 channel ADC and 1 on-board regulator (ADC experiment)
- 1 buzzer (PWM experiment)
- 1 Reset button
- 1 WAKE-UP button
- 5 general used keys (two can be used for external interrupts: K3 and K7)
- ICP (In-circuit Programming) and IAP (In-Application Programming) functions
- A standard 20-pin Debug-JTAG connector

Interfaces and Jumpers Introduction
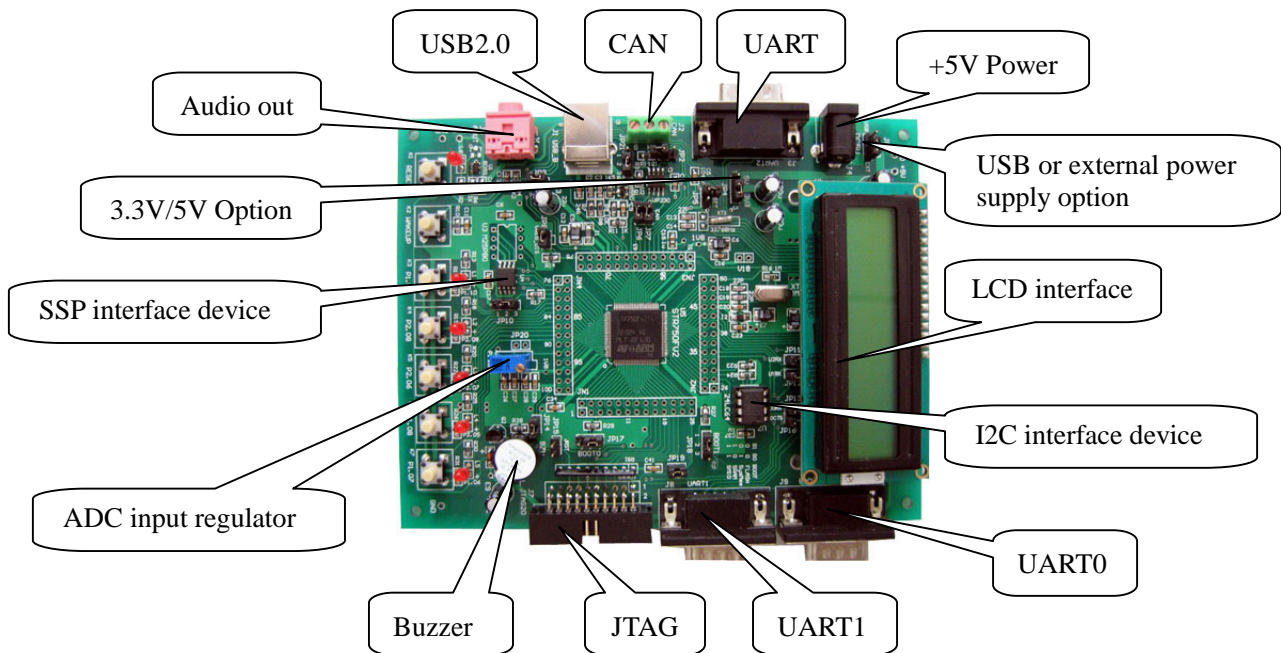
Interfaces: List below the introduction of the main interfaces

Interface	Name	Description
J1	USB_B	USB (Device) interface
J2	CAN	CAN interface
J3	UART2	UART2 interface
J4	DC5V	External 5V power input interface
J5	Audio	Audio input interface
J6	LCD1602	LCD interface
J7	JTAG20	Jtag interface
J8	UART1	UART1 interface
J9	UART0	UART0 interface

Jumpers: List below the functions and settings of the main interfaces

Jumper	Description	Setting	Setting explanation
JP1	Power supply option	Connect 1, 2	Power supplied by USB
		Connect 2, 3	Power supplied by external power
JP2	CAN Matched Resistance	Short-circuit	Enable 120 CAN matched resistance
		Disconnect	Disable CAN matched resistance
JP3	Audio output switch	Short-circuit	Enable Audio output
		Disconnect	Disable Audio output
JP4	3.3V/5V option	Connect 1, 2	CPU use 5V power supply
		Connect 2, 3	CPU use 3.3V power supply

| JP5 | Reset source option | Disconnect | Support RESET key reset but do not support NRSTOUT output reset |
		Short-circuit	Support both RESET key reset and NRSTOUT output reset
JP6	CAN output switch	Disconnect	CAN output closed
		Short-circuit	CAN output open
JP7	CAN receive switch	Disconnect	CAN receive closed
		Short-circuit	CAN receive open
JP8	Voltage adjust Enable	Disconnect	Voltage adjust invalid
		Short-circuit	Voltage adjust valid
JP9	SPI device chip selection	Connect 1, 2	SPI device chip selection input pull-up resistor
		Connect 2, 3	SPI device chip selection input pull-down resistor
JP10	UART2 receive switch	Disconnect	UART2 receive closed
		Short-circuit	UART2 receive open
JP11	UART1 receive switch	Disconnect	UART1 receive closed
		Short-circuit	UART2 receive open
JP12	UART0 receive switch	Disconnect	UART0 receive closed
		Short-circuit	UART0 receive open
JP13	Buzzer Enable	Short-circuit	Connected to enable buzzer to work
		Disconnect	Disable buzzer
JP14	JTAG TAP reset Enable	Disconnect	JTAG TAP does not reset when system resets
		Short-circuit	JTAG TAP reset when system resets
JP15	UART0 CTS transmitting switch	Disconnect	UART0 CTS transmitting closed
		Short-circuit	UART0 CTS transmitting open
JP16	BOOT0	Connect 1, 2	BOOT0 sets to be high level
		Connect 2, 3	BOOT0 sets to be low level
JP17	BOOT1	Connect 1, 2	BOOT1 sets to be high level
		Connect 2, 3	BOOT1 sets to be low level
JP18	Jtag return clock Enable	Disconnect	Jtag return clock invalid
		Short-circuit	Jtag return clock valid
JP19	ADC channel switch	Short-circuit	ADC channel open
		Disconnection	ADC channel closed
JP20	CAN speed selection	Connect 1, 2	Connect to GND directly, low speed mode (BAUD<250K)
		Connect 2, 3	Connect to GND through resistor, high speed mode (BAUD<1M)

BOOT MODE SETTING

BOOT1 B1	BOOT0 B0	Mode (start address)	Explanation
0	0	Flash (0x20000000)	Internal flash (BANK0: 256K) boot

0	1	System memory (0x2010C000)	System boot from bootloader in system memory
1	0	RAM (0x40000000)	Internal RAM (16K) boot (reserved)
1	1	External memory	System boot from external memory (with speed limitation)

ADDRESS ALLOT
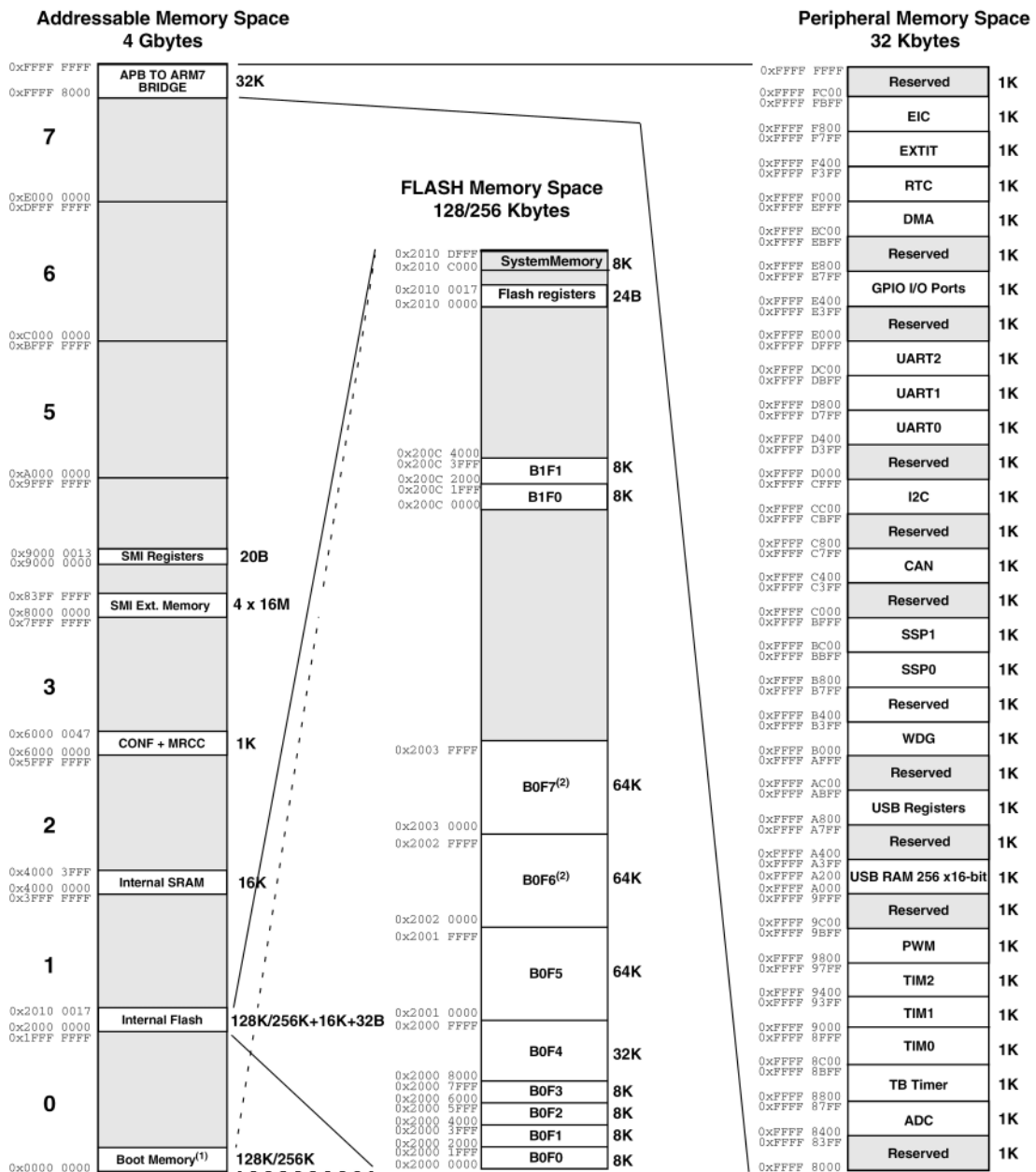
(1) In internal Flash Boot Mode, internal FLASH is aliased at 0x0000 0000h
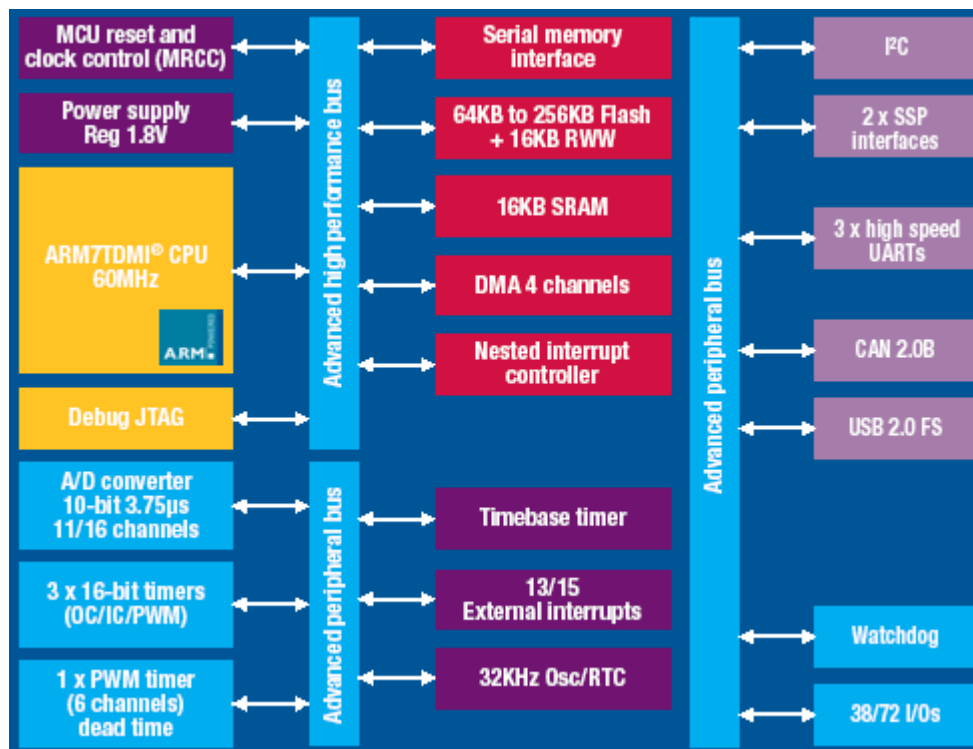(2) Only available in STR750Fx2

☐ Reserved

The 4GB address space of STR750FV2 is divided into several parts as above diagram. BANK0 of the Internal Flash is 256K.

Note: STR750FV2 provides four boot modes; please refer to **BOOT MODE SETTING**.

STR750F Series Microcontroller Function Block Diagram

STR750F Series Device Summary

Part number	Program memory type	Prog. (bytes)	RAM (bytes)	A/D inputs	Timer functions 12 or 16-bit (IC/OC/PWM)	Others	Serial interface	I/Os (high current)	Supply voltage	Special features
	Flash									
STR750FV0	●	64K	16K	16x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART/CAN/USB	72(9)	3.0 to 3.6V or 4.5 to 5.5V (without USB)	4xDMA, AWU, SMI, on-chip RC oscillator, motor control oriented PWM, -40 to 105°C (optional)
STR755FV0	●	64K	16K	16x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART	72(9)		
STR750FV1	●	128K	16K	16x10-bit	5x16-bit (6/6/12)	WDG, RTC	2xSSP/I²C/3xHS-UART/CAN/USB	72(9)		
STR755FV1	●	128K	16K	16x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART	72(9)		
STR750FV2	●	256K	16K	16x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART/CAN/USB	72(9)		
STR755FV2	●	256K	16K	16x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART	72(9)		
STR751FR0	●	64K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART/USB	38(7)	3.0 to 3.6V	
STR752FR0	●	64K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART/CAN	38(7)	3.0 to 3.6V or	
STR755FR0	●	64K	16K	11x10-bit	5x16-bit (5/5/11)	WDG, RTC	2xSSP/I²C/3xHS-UART	38(7)	4.5 to 5.5V	
STR751FR1	●	128K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART/USB	38(7)	3.0 to 3.6V	
STR752FR1	●	128K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART/CAN	38(7)	3.0 to 3.6V or	
STR755FR1	●	128K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/3xHS-UART	38(7)	4.5 to 5.5V	
STR751FR2	●	256K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/2xHS-UART/USB	38(7)	3.0 to 3.6V	
STR752FR2	●	256K	16K	11x10-bit	5x16-bit (6/6/12)	WDG, RTC	2xSSP/I²C/2xHS-UART/CAN	38(7)	3.0 to 3.6V or	
STR755FR2	●	256K	16K	11x10-bit		WDG, RTC	2xSSP/I²C/2xHS-UART	38(7)	4.5 to 5.5V	

Software Examples

Embest Provides plenty of software examples for this STDV750F evaluation board, all in source code. Each program has two versions to correspond respectively with ADS and Embest environments. Separately saved under the "ADS" and "Embest" sub-directories. The structure of the directories is as below:

Directory	Content	Run environment
STR750 Demo	All source codes under ADS environment	
|- ADC	ADC test program	
|- CAN	CAN test program	
|- COMMON	Common file including driver modules of main peripheral equipments	
| |- library	STR75x library function	
| |- startup	STR75x startup file	
| |- LED.c/.h	LED control program	
| |- Key.c/.h	Key control program	
| |_ LCD.c/.h	LCD display program module	
|- EXTIT	External interrupt test program	
|- I2C	I2C test program	
|- LED	LED test program	
|- MRCC	Low-power mode test program	
|- RTC	RTC test program	
|- SMI	SMI interface communication test program	
| |- SMI1	SMI interface chip burning test program	RAM
| |_ SMI2	Execution program which supports SMI interface	SMI Flash
|- TB	Timebase test program	
|- TIM	Timer test program	
|- UART	UART test program	
|- uCOS-II	uCOS-II test program	
|- USB	USB mouser test program	
|_ WDG	Watch dog test program	
EmbestIDE	Programs source code under EmbestIDE environment (structure of sub-directories similar to that under ADS environment)	

Order Information

Order No.	EBD7
Item	Embest STDV750F Evaluation Board
CD-ROM	• software examples • user manual • circuit schematic drawing • Datasheet • STR7xx Documents for development
Development Tools	• Embest IDE for ARM (IDE, editor, GNU ARM Compiler and Linker, debugger) demo version. With a Jtag cable connecting evaluation board to host PC via parallel port.
Others	• Serial cable • DC5V/1000mA Power Adapter • USB cable • 16x2 LCD
Option Tools	Embest IDE for ARM Development Tools Suite I or II, include: • IDE, editor, GNU ARM Compiler and Linker, debugger, full registered version • Embest PowerICE or Embest UnetICE • Embest Flash Programmer

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