ST62 MCU FAMILY GENERAL PURPOSE

DATABOOK

5th EDITION

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ST62 COST OPTIMISED ENTRY LEVEL MICROCONTROLLERS

SGS-THOMSON offers a comprehensive range of MCU cores, ranging from entry level to sophisticated high performance 32 bit RISC devices. Each core is available in a wide range of salestypes, featuring different combinations of standard and application specific peripherals.

- The ST6 family: low to mid-range 8-bit embedded control
- The ST7 family: application specific mid-range 8-bit industry standard core.
- The ST9 family: 8/16-bit core with register file based architecture for real-time tasks.
- The ST10 family: full 16-bit fast core for critical real-time applications.
- The ST20 family: high-end 32-bit high performance RISC modular core.

A growing number of applications require high performance digital processing at costs severely constrained by the consumer market. Indeed, even the most cost sensitive industries are increasingly adopting ST MCUs to achieve the lowest system costs while benefiting from significant product enhancements. This entry level market segment is well addressed by SGS-THOMSON's ST62 family of microcontrollers.

ST62 Family Overview

The ST62 family has been developed specifically for low to mid-range embedded control applications subject to the dual constraints of high noise immunity and low overall system cost. The product range has been expanded by the addition of ultra low cost entry level devices so as to encompass even the lowest cost applications. The ST62 family addresses the customer's needs by offering low-cost evaluation Starter Kits, a graphical development tool known as the ST6-Realizer which is as powerful as it is easy to use, clear and accurate product documentation, and application aware product support. The ST62 family offers optimal system cost in a wide range of consumer, automotive and industrial applications because:

- The extensive family of available ST62 devices is based on a common CPU core surrounded by a comprehensive range of peripherals, allowing the designer to select ONLY those features which are strictly required in the application.
- The ST62 family is much appreciated for its legendary noise immunity. This is vitally important in most control situations, and ensures the lowest possible system cost by reducing to the bare minimum the requirement for external protection.
- SGS-THOMSON's wealth of application know-how ensures that each peripheral is efficiently application oriented, thus achieving optimum integration and functionality.
- SGS-THOMSON's commitment to Service ensures expert application aware technical support which draws on consolidated know-how in a wide range of application sectors, ranging from appliances to industrial, from intelligent battery charging to car body, from motor control to user interfaces.

All ST62 family devices are available in One-Time-Programmable OTP versions giving the user the greatest possible code flexibility by allowing last minute programming of parts. Indeed parts may even be programmed after assembly for maximum flexibility and convenience.

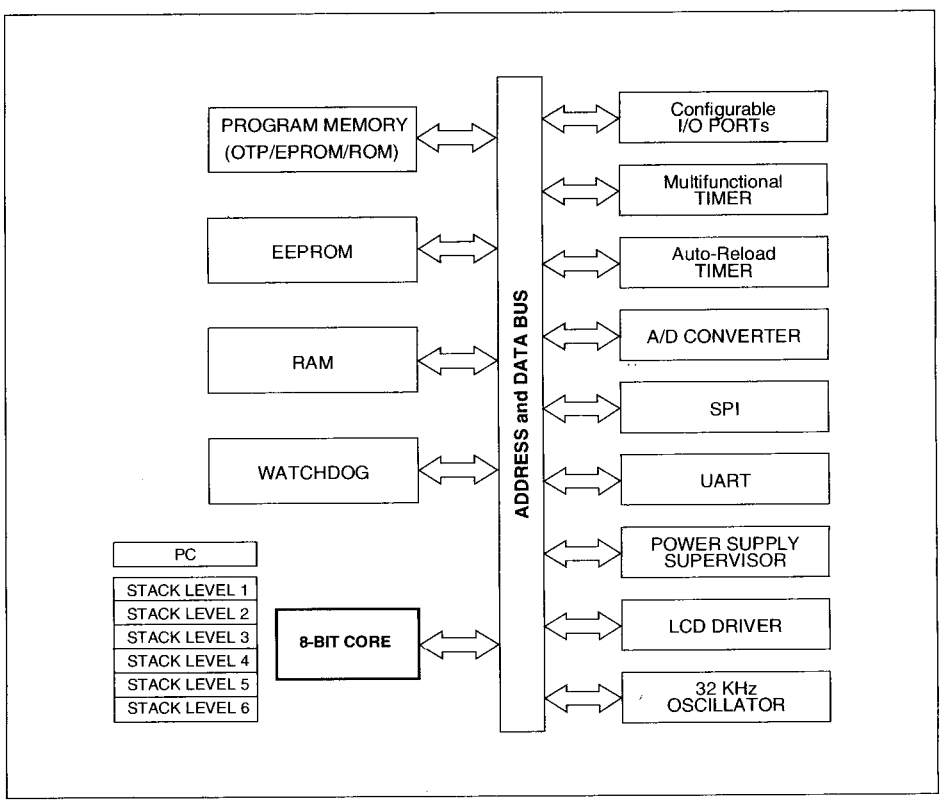
INTRODUCTION

The ST62 family has been well established since 1992 with large corporate key customers in application fields ranging from appliances to automotive, during which time it has acquired a legendary reputation for its excellent noise immunity and reliability.

CPU Core Architecture

The industry standard 8-bit parallel accumulator architecture features 6 internal registers, three pairs of flags available to the programmer, and a popular byte efficient instruction set. The CPU Core of ST62xx devices is independent of the I/O or Memory configuration. As such, it may be thought of as an independent central processor communicating with on-chip I/O, Memory and Peripherals via internal address, data, and control busses. Peripheral resources are handled via tailored interrupt structures and dedicated external registers.The core is linked to the on-chip peripherals via the serial data bus and indirectly, for interrupt purposes, through the control registers.

ST6 Architectural Block Diagram



Serial Peripheral Interface (SPI)

The SPI is an optimized synchronous serial interface with programmable transmission modes and master/slave capabilities supporting a wide range of industry standard SPI specifications. The SPI is controlled by simple user software to perform serial data exchange with low-cost external memory or serially controlled peripherals. The SPI may also be used to implement asynchronous serial communications, such as simple RS232 links, with limited processor overhead.

Universal Asynchronous Receiver/Transmitter

A dedicated UART peripheral is available for asynchronous serial communications with minimum software and processor overhead.

LCD Driver

The LCD driver peripheral comprises LCD control logic, a programmable prescaler, dedicated LCD RAM, as well as dedicated segment and common output pins.

EEPROM

EEPROM user data memory is available for non-volatile storage. The EEPROM features byte and parallel programming modes to minimise programming time and power consumption, which is especially interesting in battery powered applications. The EEPROM memory may be reprogrammed a great number of times while retaining data integrity.

ST62 Product Range

Device	Program Memory	RAM x 8	EEPROM x 8	I/Os (of which High Current***)	ADC channels	Timer (8-bit)	Auto-Reload Timer	Serial Interface	Package
ST6200	1K	64	-	9 (3)	4	1	-	-	DIP16/SO16
ST6201	2K	64	-	9 (3)	4	1	-	-	DIP16/SO16
ST6203	1K	64	-	9 (3)	-	1	-	-	DIP16/SO16
ST6208	1K	64	-	12 (4)	-	1	-	-	DIP20/SO20
ST6209	1K	64	-	12 (4)	4	1	-	-	DIP20/SO20
ST6210	2K	64	-	12 (4)	8	1	-		DIP20/SO20
ST6215	2K	64	-	20 (4)	16	1	-		DIP28/SO28
ST6220	4K	64	-	12 (4)	8	1	-		DIP20/SO20
ST6225	4K	64	-	20 (4)	16	1	-		DIP28/SO28
ST6230 *)	8K	192	128	20 (4)	16	1	1x16-bit	SPI + UART	DIP28/SO28
ST6232 *)	8K	192	128	30 (9)	21	1	1x16-bit	SPI + UART	QFP52 /SDIP42
ST6240 **)	8K	216	128	16 (4)	12	2	-	SPI	QFP80
ST6242 **)	8K	152	-	10 (4)	6	1	-	SPI	QFP64
ST6245 **)	4K	140	64	11 (4)	7	2	-	SPI	QFP52
ST6253	2K	64	-	13 (6)	7	1	1x8-bit	-	DIP20/SO20
ST6260	4K	128	128	13 (6)	7	1	1x8-bit	SPI	DIP20/SO20
ST6263	2K	64	64	13 (6)	7	1	1x8-bit	-	DIP20/SO20
ST6265	4K	128	128	21 (8)	13	1	1x8-bit	SPI	DIP28/SO28
ST6280 **)	8K	320	128	22 (10)	12	2	1x16-bit	SPI + UART *)	QFP100
ST6285 **)	8K	288		12 (4)	8	1	-	SPI + UART *)	QFP80

Abbreviations and Notes:

ADC = Analog to Digital Converter
SPI = Serial Peripheral Interface
UART = Universal Asynchronous Receiver/Transmitter
WDG = Watchdog

*) Contact your nearest sales office

**) Refer to 'ST62 LCD Driver ST624x/ST628x Databook' (DBST624XFST/2)

***) High Current I/O pins can drive LEDs or TRIACS directly

2 DEVELOPMENT & SUPPORT

Full Hardware and Software Development Support

A full range of development tools is available, including Starter Kits, In-Circuit Emulators, OTP/EPROM programming boards and Gang programmers for each device. Software development tools include a Windows Assembly Language development suite, as well as a graphical development tool known as the ST6-Realizer and a Fuzzy Logic development tool known as the *fuzzy*TECH™ ST6 Explorer Edition.

Hardware Development Tools

Device	EPROM Programmer			Emulator		Starter Kit
	Single Eprom	Complete Gang	Gang Adaptator	Complete	Dedication Board	
ST620x ST621X ST622x	ST62E1X-EPB/110 ST62E1X-EPB/220	ST62E10-GP/SO ST62E10-GP/DIP ST62E15-GP/SO ST62E15-GP/DIP	ST62E10-GPA/SO ST62E10-GPA/DIP ST62E15-GPA/SO ST62E15-GPA/DIP	ST626X-EMU2	ST626X-DBE	ST622X-KIT
ST623X*)	ST62E3X-EPB/110 ST62E3X-EPB/220	ST62E30-GP/DIP ST62E32-GP/DIP ST62E30-GP/SO	ST62E30-GPA/DIP ST62E32-GPA/DIP ST62E30-GPA/SO	ST623X-EMU2	ST623X-DBE	
ST624X	ST62E4X-EPB/110 ST62E4X-EPB/220	ST62E40-GP/QFP ST62E42-GP/QFP ST62E45-GP/QFP	ST62E40-GPA/QFP ST62E42-GPA/QFP ST62E45-GPA/QFP	ST624X-EMU2 ST6240-EMU2 ST6242-EMU2 ST6245-EMU2	ST624X-DBE	ST6240-KIT
ST626X	ST62E6X-EPB/110 ST62E6X-EPB/220	ST62E60-GP/SO ST62E60-GP/DIP ST62E65-GP/SO ST62E65-GP/DIP	ST62E60-GPA/SO ST62E60-GPA/DIP ST62E65-GPA/SO ST62E65-GPA/DIP	ST626X-EMU2	ST626X-DBE	ST626x-KIT
ST628X	ST62E8X-EPB/110 ST62E8X-EPB/220	ST62E80-GP/QFP	ST62E80-GPA/QFP	ST628X-EMU2	ST628X-DBE	

Notes:
- All Emulators include Probe except for ST624x, ST628x and ST623x (ST6240, ST6242, ST6245-P/QFP, ST6280, ST6285-P/QFP).
- All Emulators & Kits are provided with a complete Software package (e.g. Macro-Assembler, Linker, Debugger, Simulator).
- Gang Adaptator enables to change Package without replacing Complete Gang

*). Contact your nearest sales office

Software Development Tools

A full range of development software tooling is available for the ST6 family of Microcontrollers. This currently comprises three principal product groups:

the available products are listed below, together with the relevant upgrade versions.

Device	Salestype	Description
ST62	ST6-REALIZER	Graphical Schematic based Development
	ST6-FUZZY/PC	Fuzzy Logic Compiler
	ST6-SW/PC	Macro-assembler, Linker & simulator

(*) These software suites are supplied as standard issue with the ST6 Emulator.

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