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Embedded - Microcontrollers - Application Specific: Tailored Solutions for Precision and Performance

Embedded - Microcontrollers - Application Specific represents a category of microcontrollers designed with unique features and capabilities tailored to specific application needs. Unlike general-purpose microcontrollers, application-specific microcontrollers are optimized for particular tasks, offering enhanced performance, efficiency, and functionality to meet the demands of specialized applications.

What Are Embedded - Microcontrollers - Application Specific?

Application-specific microcontrollers are engineered to

Details	
Product Status	Obsolete
Applications	GPS Baseband Controller
Core Processor	ARM7®
Program Memory Type	FLASH (256kB)
Controller Series	VESPUCCI
RAM Size	64K x 8
Interface	I²C, SPI Serial, CAN, USB, UART
Number of I/O	48
Voltage - Supply	1.8V
Operating Temperature	-40°C ~ 85°C
Mounting Type	Surface Mount
Package / Case	64-LQFP
Supplier Device Package	64-TQFP
Purchase URL	https://www.e-xfl.com/product-detail/stmicroelectronics/e-sta2051

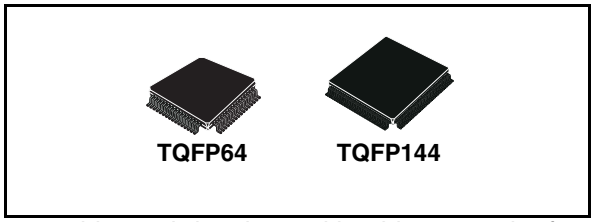
STA2051

32-bit single chip baseband controller for GPS and telematic applications

Data Brief

Features

- Suitable for automotive applications
- ARM7TDMI 16/32 bit RISC CPU based host microcontroller.
- Complete embedded memory system:
  - Flash 256 KB + 16 KB (100K erasing/programming cycles)
  - RAM 64 KB
- External memory interface provides glueless support for up to four banks of external SRAM, Flash, ROM.
- 12 channel GPS correlation DSP:
  - no TCXO required
  - RTCA-SC159 / WAAS / EGNOS support
- GPS performance
  - accuracy: stand alone <30m; differential <1m; surveying <1cm
  - time to first fix: autonomous start 90s; cold start 45s; warm start 7s; obscuration 1s.
- CMOS M8T (0.18 µm) technology.
- -40°C to 85°C operating temperature range.
- Packaged in TQFP 64-pin or 144-pin
- Power supply:
  - 2.7V to 3.6V operating supply range for input/output periphery
  - 3V to 3. V operating supply range for A/ D Converter reference
  - 1.8V operating supply range for core supply provided either by internal voltage regulator with external stabilization capacitor, or by external supply for higher power efficiency.
- 0-66MHz internal clock frequency managed by a reset and clock control unit; the unitisable to provide low power modes (Wait, Slow, Stop, Standby) and to generate the internal clock from the external reference through integrated PLL.
- 48 programmable general purpose I/O, each pin programmable independently as digital input or digital output; 40 (30 in TQFP64) are multiplexed with peripheral functions; 16 can generate an interrupt on input level/transition
- Real time clock module with 3 2 kHz low power oscillator and separate power supply to continue running during stand-by mode.



- 16-bit watchdog timer with 8 bits prescaler for system reliability and integrity.
- CAN module compliant with the CAN specification V2.0 part B (active). The bit rate can be programmed up to 1 MBaud.
- Four16-bit programmable timers with 7 bit prescaler, up to two input capture/output compare, one pulse counter function, one PWM channel with selectable frequency each.
- 4 channels 12-bit sigma-delta analog to digital converter, single channel or multi channel conversion modes, single-shotor continuous conversion modes, sample rate1KHz (4 KHz when single channel), conversion range 0-2.5V.
- Three serial communication interfaces (UART) allow full duplex, asynchronous, communications with external devices, independently programmable TX and RX baud rates up to 625K baud.
- One UART adapted to suit smart card interface needs, for asynchronous SC as defined by ISO 7816-3; it includes SC clock generation..
- Two serial peripheral interfaces (SPI) allow full duplex, synchronous communications with external devices, master or slave operation, max baud rate: 8Mb/s. One SPI may be used as multimedia card interface.
- Two I^2C interfaces provide multi-master and slave functions, support normal and fast I^2C mode (400 kHz), 7/10 bit addressing modes. One I^2C interface is multiplexed with one SPI, so either 2xSPI+1xI^2C or 1xSPI+2xI^2C may be used at a time.
- USB unit V1.1 compliant, software configurable end point setting, USB Suspend/Resume support. (TQFP144 only)
- High Level Data Link Controller (HDLC) unit supports full duplex operating mode, NRZ, NRZI, FM0 and MANCHESTER modes, internal 8bit Baud Rate Generator.

1 System block and pin connection diagrams

Figure 1. System block diagram

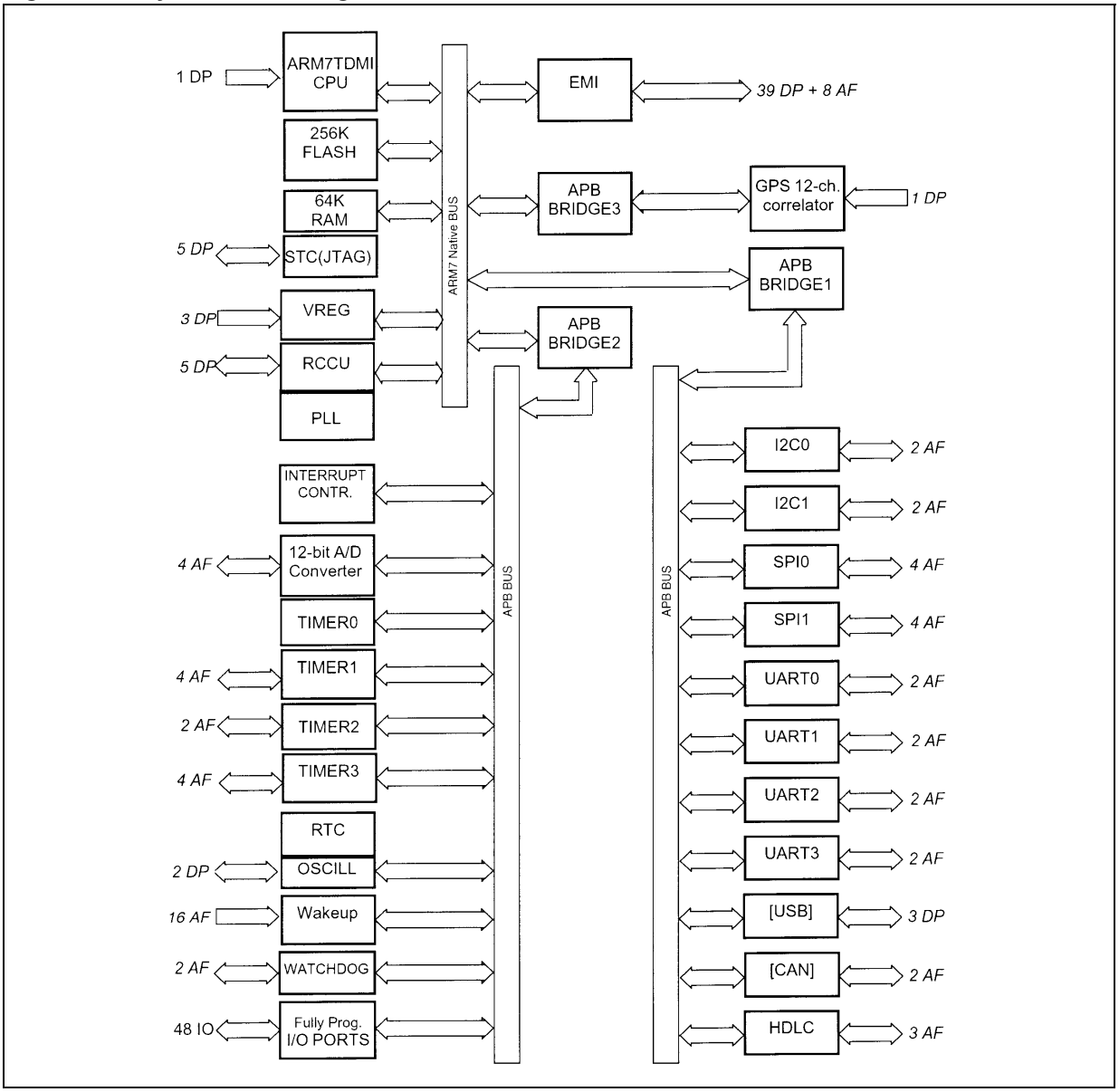


Figure 2. TQFP144 pin connection diagram (top view)

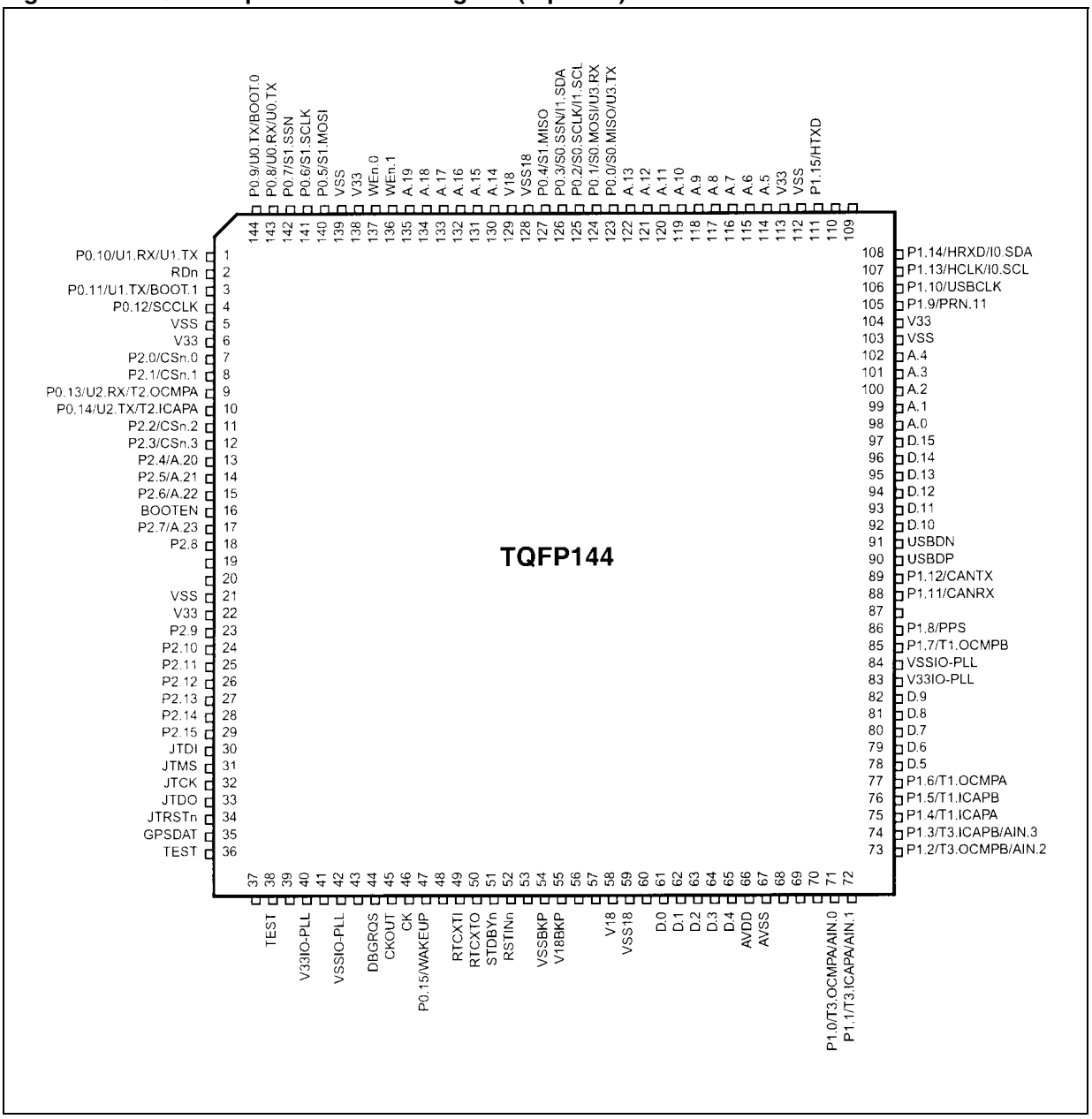
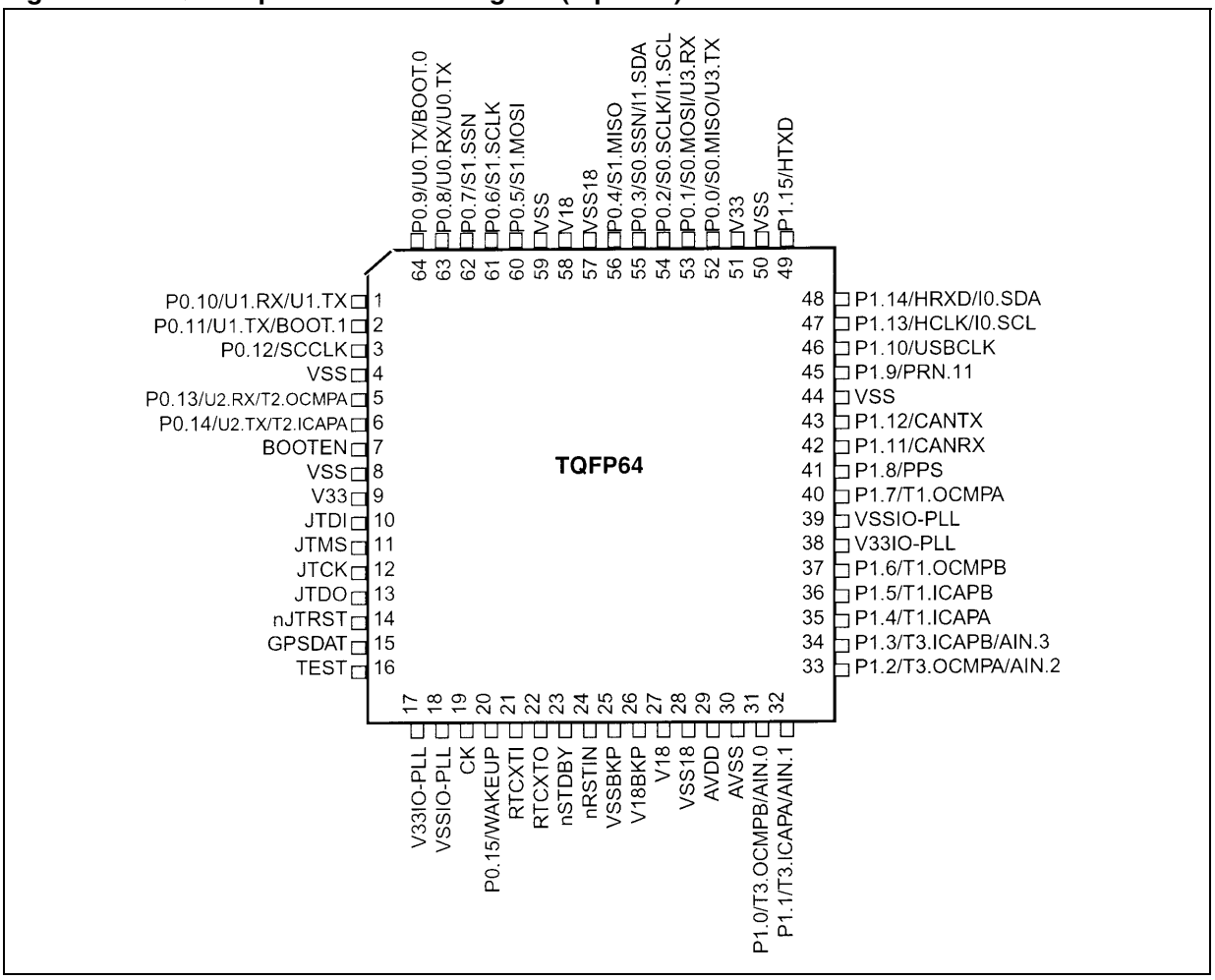


Figure 3. LQFP64 pin connection diagram (top view)



2 Ordering information

Table 1. Device summary

Order code	Package	Packing
STA2051	TQFP64	Tray
STA2051TR	TQFP64	Tape and reel
STA2051E	TQFP144	Tray
STA2051ETR	TQFP144	Tape and reel
E-STA2051	TQFP64	Tray
E-STA2051TR	TQFP64	Tape and reel

3 Revision history

Table 2. Document revision history

Date	Revision	Changes
24-Sep-1994	1	Initial release.
25-Jan-2004	2	Added a new feature (first bullet).
05-Dec-2008	3	Reformatted document. Updated *Section 2: Ordering information*.

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