



UPSD3254A, UPSD3254BV UPSD3253B, UPSD3253BV

Flash Programmable System Devices with 8032 Microcontroller Core

DATA BRIEFING

FEATURES SUMMARY

- The uPSD325X devices combine a Flash PSD architecture with an 8032 microcontroller core.
The uPSD325X devices of Flash PSDs feature dual banks of Flash memory, SRAM, general purpose I/O and programmable logic, supervisory functions and access via USB, I²C, ADC, DDC and PWM channels, and an on-board 8032 microcontroller core, with two UARTs, three 16-bit Timer/Counters and two External Interrupts. As with other Flash PSD families, the uPSD325X devices are also in-system programmable (ISP) via a JTAG ISP interface.
- Large 32KByte SRAM with battery back-up option
- Dual bank Flash memories
 - 128KByte or 256KByte main Flash memory
 - 32KByte secondary Flash memory
- Content Security
 - Block access to Flash memory
- Programmable Decode PLD for flexible address mapping of all memories within 8032 space.
- High-speed clock standard 8032 core (12-cycle)
- USB Interface (some devices only)
- I²C interface for peripheral connections
- 5 Pulse Width Modulator (PWM) channels
- Analog-to-Digital Converter (ADC)
- Standalone Display Data Channel (DDC)
- Six I/O ports with up to 46 I/O pins
- 3000 gate PLD with 16 macrocells
- ▼ Supervisor functions with Watchdog Timer
 - In-System Programming (ISP) via JTAG
 - Zero-Power Technology
- Single Supply Voltage
 - 4.5 to 5.5V
 - 3.0 to 3.6V

Figure 1. 52-lead, Thin, Quad, Flat Package

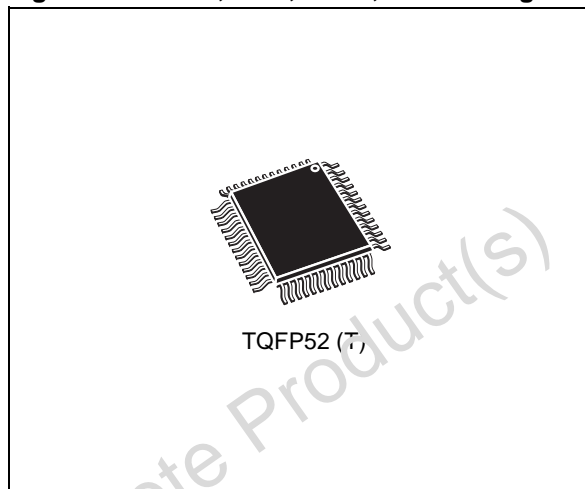
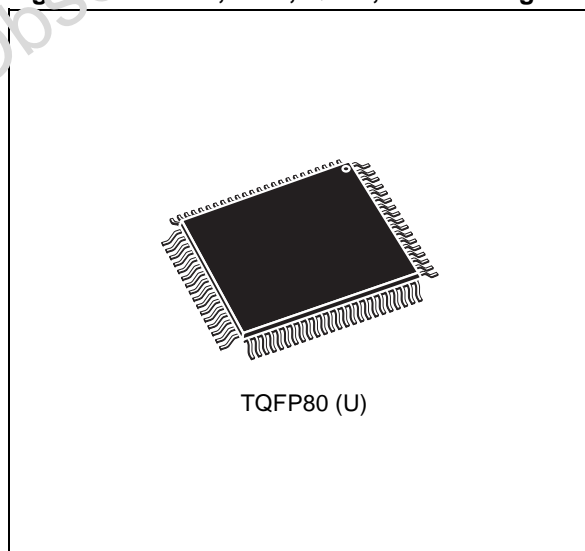


Figure 2. 80-lead, Thin, Quad, Flat Package



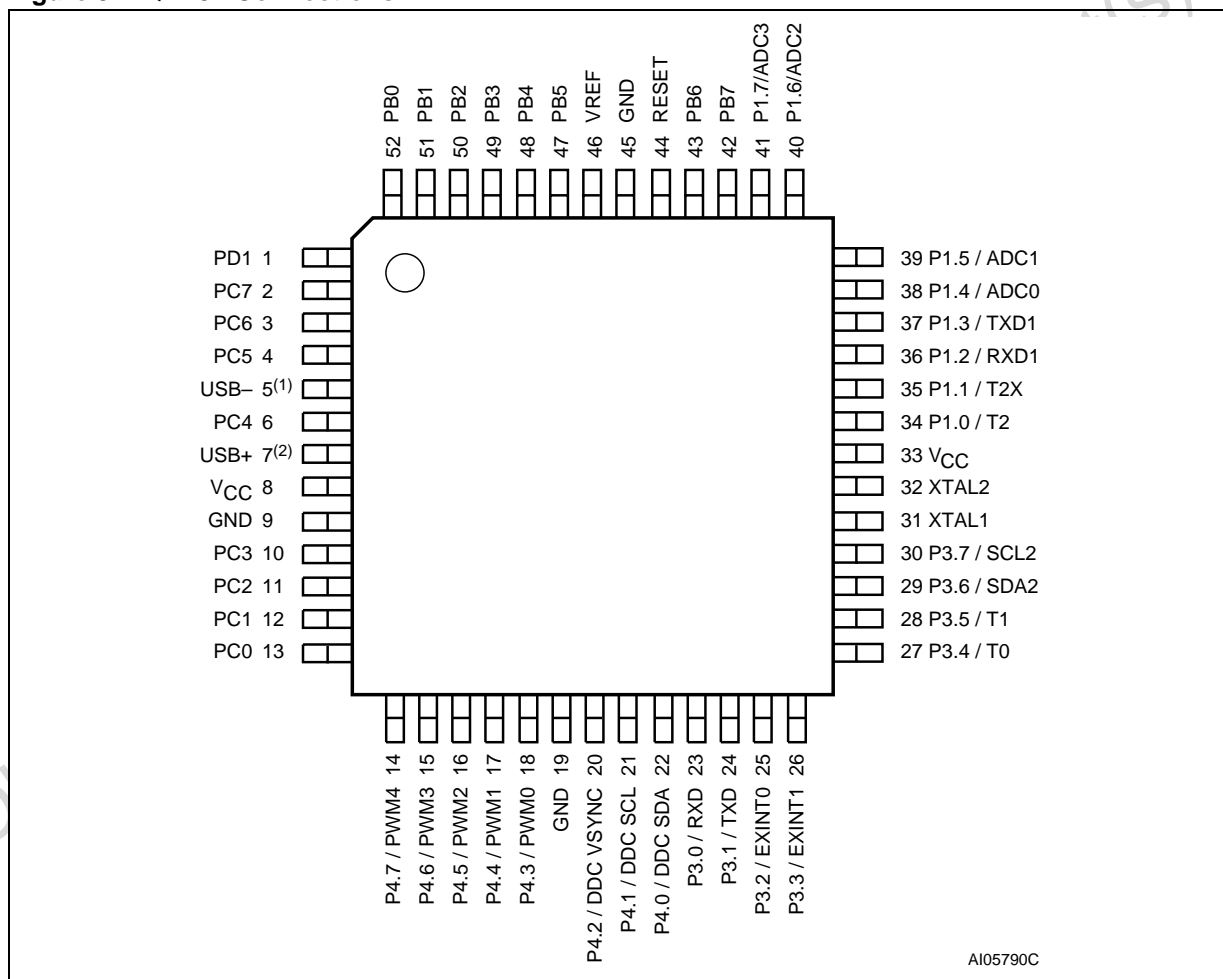
SUMMARY DESCRIPTION

- Dual bank Flash memories
 - Concurrent operation, read from memory while erasing and writing the other. In-Application Programming (IAP) for remote updates
 - Large 128KByte or 256KByte main Flash memory for application code, operating systems, or bit maps for graphic user interfaces
 - Large 32KByte secondary Flash memory divided in small sectors. Eliminate external EEPROM with software EEPROM emulation
 - Secondary Flash memory is large enough for sophisticated communication protocol (USB) during IAP while continuing critical system tasks
- Large SRAM with battery back-up option
 - 32KByte SRAM for RTOS, high-level languages, communication buffers, and stacks
- Programmable Decode PLD for flexible address mapping of all memories
 - Place individual Flash and SRAM sectors on any address boundary
 - Built-in page register breaks restrictive 8032 limit of 64KByte address space
 - Special register swaps Flash memory segments between 8032 “program” space and “data” space for efficient In-Application Programming
- High-speed clock standard 8032 core (12-cycle)
 - 40MHz operation at 5V, 24MHz at 3.3V
 - 2 UARTs with independent baud rate, three 16-bit Timer/Counters and two External Interrupts
- USB Interface (some devices only)
 - Supports USB 1.1 Slow Mode (1.5Mbit/s)
 - Control endpoint 0 and interrupt endpoints 1 and 2
- I²C interface for peripheral connections
 - Capable of master or slave operation
- 5 Pulse Width Modulator (PWM) channels
 - Four 8-bit PWM units
 - One 8-bit PWM unit with programmable period
- 4-channel, 8-bit Analog-to-Digital Converter (ADC) with analog supply voltage (V_{REF})
- Standalone Display Data Channel (DDC)
 - For use in monitor, projector, and TV applications
 - Compliant with VESA standards DDC1 and DDC2B
 - Eliminate external DDC PROM
- Six I/O ports with up to 46 I/O pins
 - Multifunction I/O: GPIO, DDC, I²C, PWM, PLD I/O, supervisor, and JTAG
 - Eliminates need for external latches and logic
- 3000 gate PLD with 16 macrocells
 - Create glue logic, state machines, delays, etc.
 - Eliminate external PALs, PLDs, and 74HCxx
 - Simple PSDsoft Express software...Free
- Supervisor functions
 - Generates reset upon low voltage or watchdog time-out. Eliminate external supervisor device
 - RESET Input pin; Reset output via PLD
- In-System Programming (ISP) via JTAG
 - Program entire chip in 10 - 25 seconds with no involvement of 8032
 - Allows efficient manufacturing, easy product testing, and Just-In-Time inventory
 - Eliminate sockets and pre-programmed parts
 - Program with FlashLINK™ cable and any PC
- Content Security
 - Programmable Security Bit blocks access of device programmers and readers
- Zero-Power Technology
 - Memories and PLD automatically reach standby current between input changes
- Packages
 - 52-pin TQFP
 - 80-pin TQFP: allows access to 8032 address/data/control signals for connecting to external peripherals

Table 1. uPSD325X Devices Product Matrix

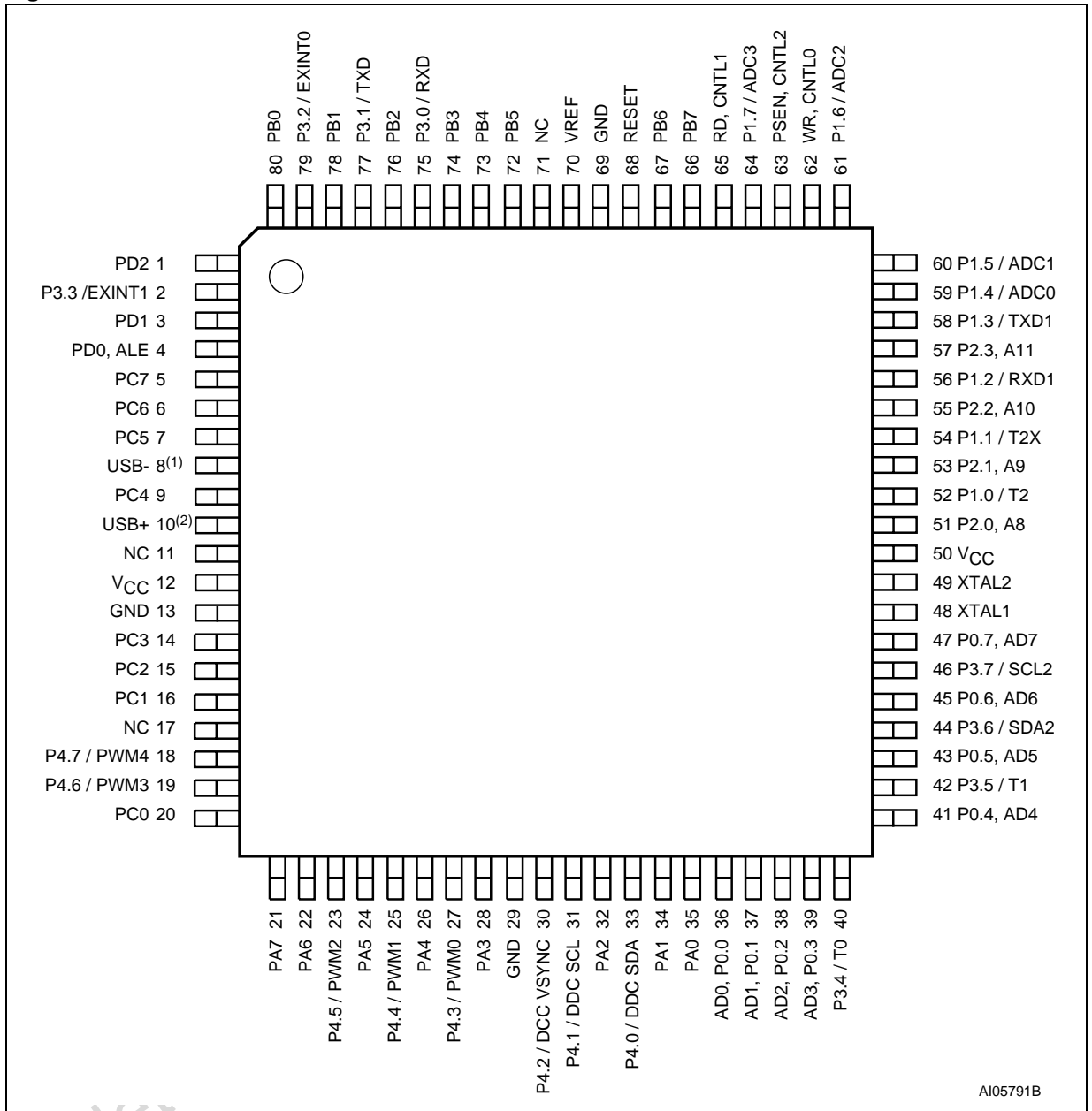
Part No.	Main Flash (bit)	Sec. Flash (bit)	SRAM (bit)	Macro -Cells	I/O Pins	PWM Ch.	Timer / Ctr	UART Ch.	I ² C	ADC Ch.	DDC	USB	V _{CC}	MHz	Pins
uPSD 3254 A-40	2M	256K	256K	16	37 or 46	5	3	2	1	4	yes	yes	5V	40	52 or 80
uPSD 3254 BV-24	2M	256K	256K	16	46	5	3	2	1	4	yes		3V	24	80
uPSD 3253 B-40	1M	256K	256K	16	37	5	3	2	1	4	yes		5V	40	52
uPSD 3253 BV-24	1M	256K	256K	16	37	5	3	2	1	4	yes		3V	24	52

Figure 3. TQFP52 Connections



Note: 1. Pull-up resistor required on pin 5 (2kΩ for 3V devices, 7.5kΩ for 5V devices) for all 52-pin devices, with or without USB function.
 2. Pin 7 is Not Connected (NC) for device with no USB function.

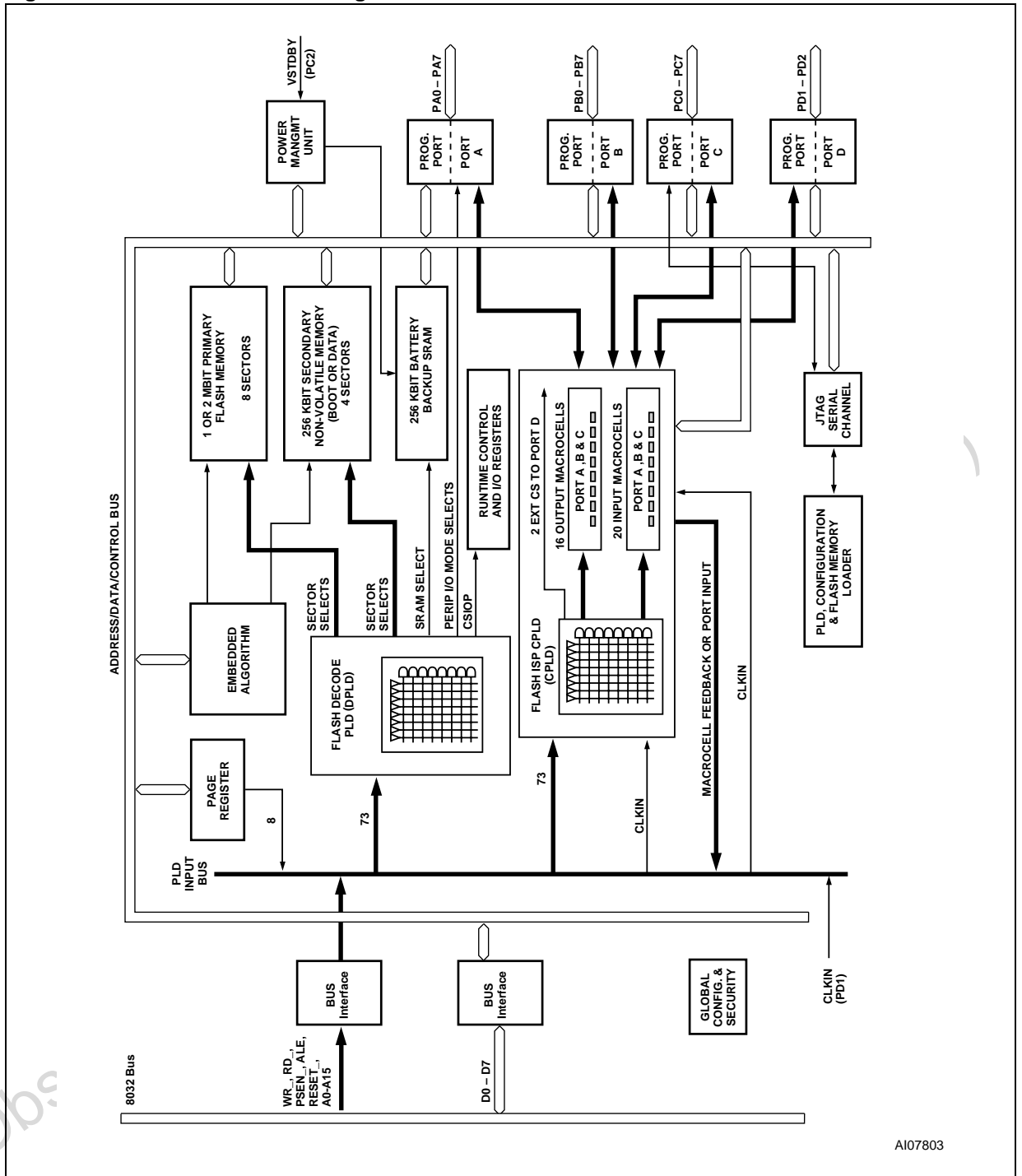
Figure 4. TQFP80 Connections



Note: NC = Not Connected

1. Pull-up resistor required on pin 8 (2kΩ for 3V devices, 7.5kΩ for 5V devices) for all 82-pin devices, with or without USB function.
2. Pin 10 is Not Connected (NC) for device with no USB function.

Figure 5. PSD MODULE Block Diagram



AI07803

PART NUMBERING

Table 2. Ordering Information Scheme

Example:	uPSD	3	2	5	4	B	V	-	24	U	6	T
Device Type												
uPSD = Microcontroller PSD												
Family												
3 = 8032 core												
PLD Size												
2 = 16 Macrocells												
SRAM Size												
5 = 256Kbit												
Main Flash Memory Size												
3 = 1Mbit 4 = 2Mbit												
IP Mix												
A = USB, I ² C, PWM, DDC, ADC, (2) UARTs Supervisor (Reset Out, Reset In, LVD, WD)												
B = I ² C, PWM, DDC, ADC, (2) UARTs Supervisor (Reset Out, Reset In, LVD, WD)												
Operating Voltage												
blank = V _{CC} = 4.5 to 5.5V V = V _{CC} = 3.0 to 3.6V												
Speed												
-24 = 24MHz -40 = 40MHz												
Package												
T = 52-pin TQFP U = 80-pin TQFP												
Temperature Range												
1 = 0 to 70°C 6 = -40 to 85°C												
Shipping Option												
Tape & Reel Packing = T												

For a list of available options (e.g., Speed, Package) or for further information on any aspect of this device, please contact the ST Sales Office nearest to you.

