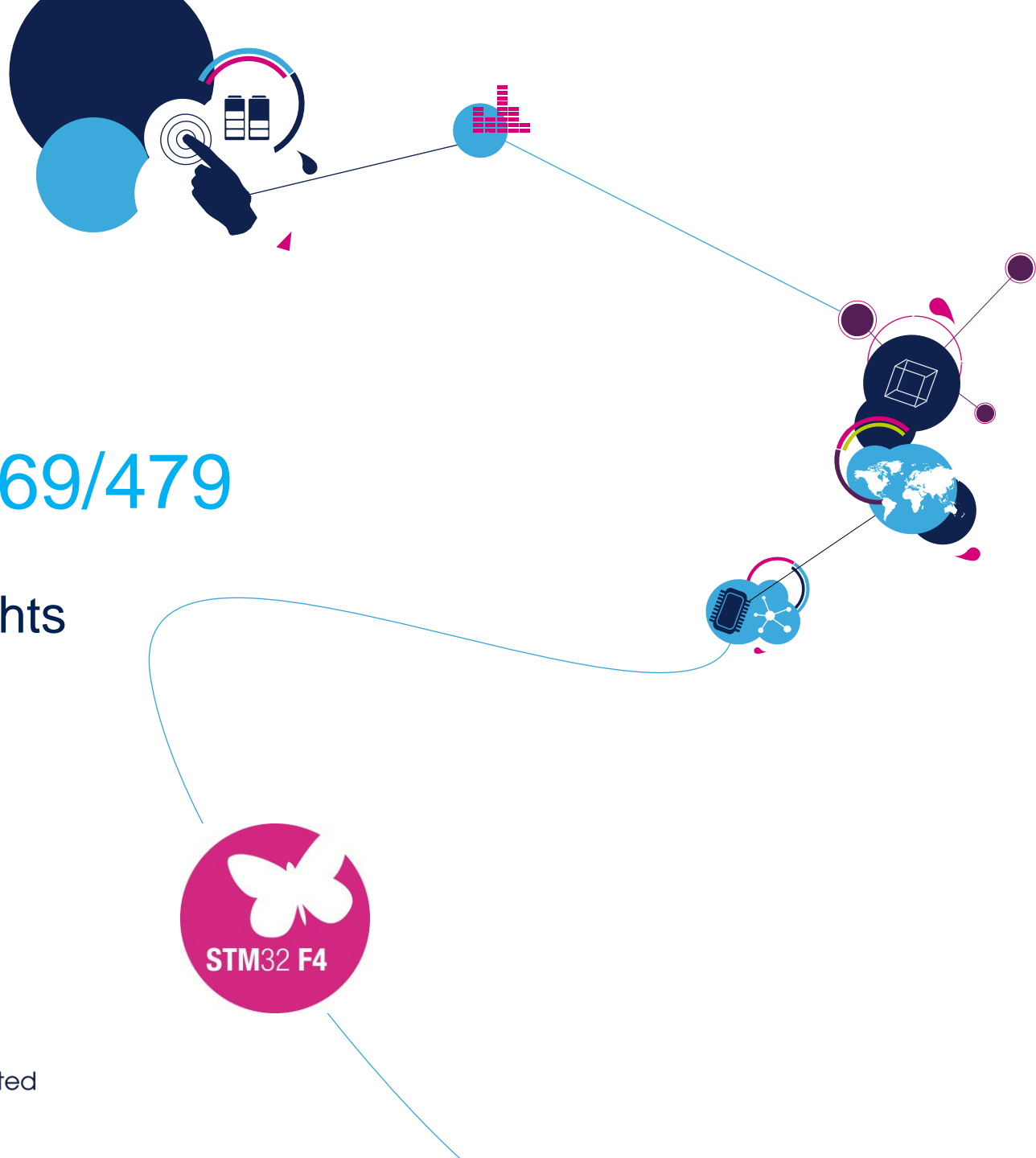


STM32F469/479

Product highlights



F469/479 Highlights 1/2

2

- **High Performance**

- Cortex-M4 with DSP and FPU
- **ART Accelerator™** allowing zero wait state execution from Flash
 - Achieving **225 DMIPS** and **608 CoreMark** scores

- **Advanced Graphics**

- **Chrom-ART Accelerator™**
 - Offloading the CPU from repetitive graphics operations
 - Efficient data copy, transparency effects and pixel format conversion
- **Embedded display controllers**
 - **MIPI® DSI controller**
 - High-speed differential serial interface
 - Up to 720p 30Hz resolution
 - Interfacing display modules w/ or w/o on-panel display controller or frame buffer
 - 2 D-PHY data lanes with up to 500Mbps for each line
 - **TFT LCD controller**
 - 24-bit parallel RGB interface
 - Up to XGA resolution
 - 2 display layers with dedicated FIFOs
 - Color look-up table with up to 256 24-bit colors per display layer

F469/479 Highlights 2/2

3

- **Extended memory resources**

- Up to 2 MBytes internal Flash
- 384 KB internal RAM including 64KB CCM

- **External memory interfaces**

- Flexible Memory Controller (FMC)
 - 90 MHz I/F with memory remap capability for higher performance
 - SRAM,PSRAM,SDRAM/LPDDR SDRAM, Flash NOR/NAND support
 - Intel 8080 and Motorola 6800 LCD parallel interfaces for cost-effective graphical interfaces using LDC with embedded controllers
- Dual Quad SPI interface (QSPI)
 - SPI NOR Flash (1-bit), quad SPI (4-bit), or dual-Quad (8-bit) SPI NOR Flash support
 - Memory Mapped mode supporting up to 256 Mbytes external SPI NOR flash
 - Up to 90 Mbytes/s in SDR mode and up to 120Mbytes/s in DDR mode

- **Upgraded USB features**

- Added dedicated USB power rails
- Additional support of Link Power Mode (LPM)
 - low power state with short entry and exit times

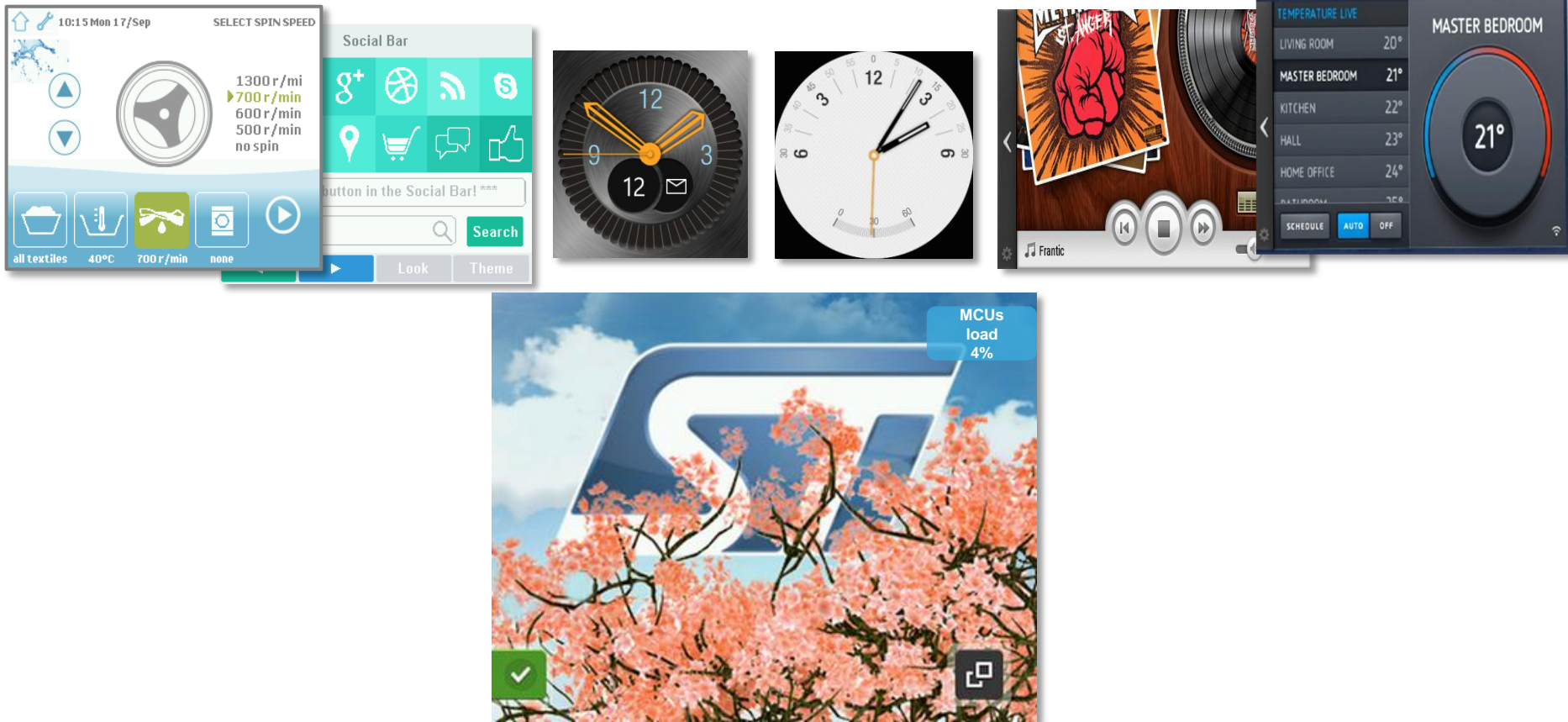
F469/479 Feature Benefits 1/3

4

- **Chrom-ART Accelerator™**
 - **BETTER** Graphics with **LESS** CPU load
 - **Enabling** both advanced GUI and real-time processing with a single MCU
 - High-quality rendering
 - Smooth transitions
 - Motion fluidity

F469/479 Feature Benefits 2/3

5



Motion and transparency effects
with up to **94% LESS CPU** resources

F469/479 Feature Benefits 3/3

6

- **MIPI® DSI controller**

- Advanced animations and graphical user interfaces
- Aligned with mobile industry standards
 - Opening the door to next-generation displays with higher pixel density
- Only 2 pins for each lane are requested to interface with the display panels
 - Availability in small packages => BOM cost saving
- Lower power consumption and less electromagnetic interference

- **TFT LCD controller**

- Advanced animations and graphical user interfaces
- Drives displays without embedded controllers → BOM cost saving

Application examples - 1/2

7



**Smart
Watch**



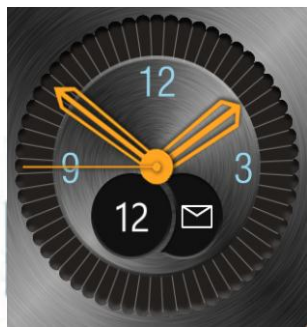
**Control
Panel**



**Medical
Devices**



**Industrial/
Home
Automation**



STM32F469 - 2/2

Application example

8

No more DSI bridge needed

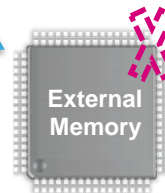
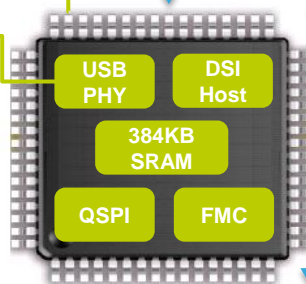
Saved cost: ~0.8\$

Saved size: ~4.5x4.5 mm



1.8 V

3.3 V



Sensors

No more external USB PHY needed

Saved cost (including crystal): ~0.5\$

Saved size: ~3.5x3.5 mm

Potentially, no more external RAM needed

Depending on display resolution

Saved cost: ~0.6-0.7\$

Saved size: ~8x13 mm

A choice of advanced graphical libraries taking full advantage of **Chrom-ART Accelerator™**



STM32F469/479 block diagram

10

- Packages

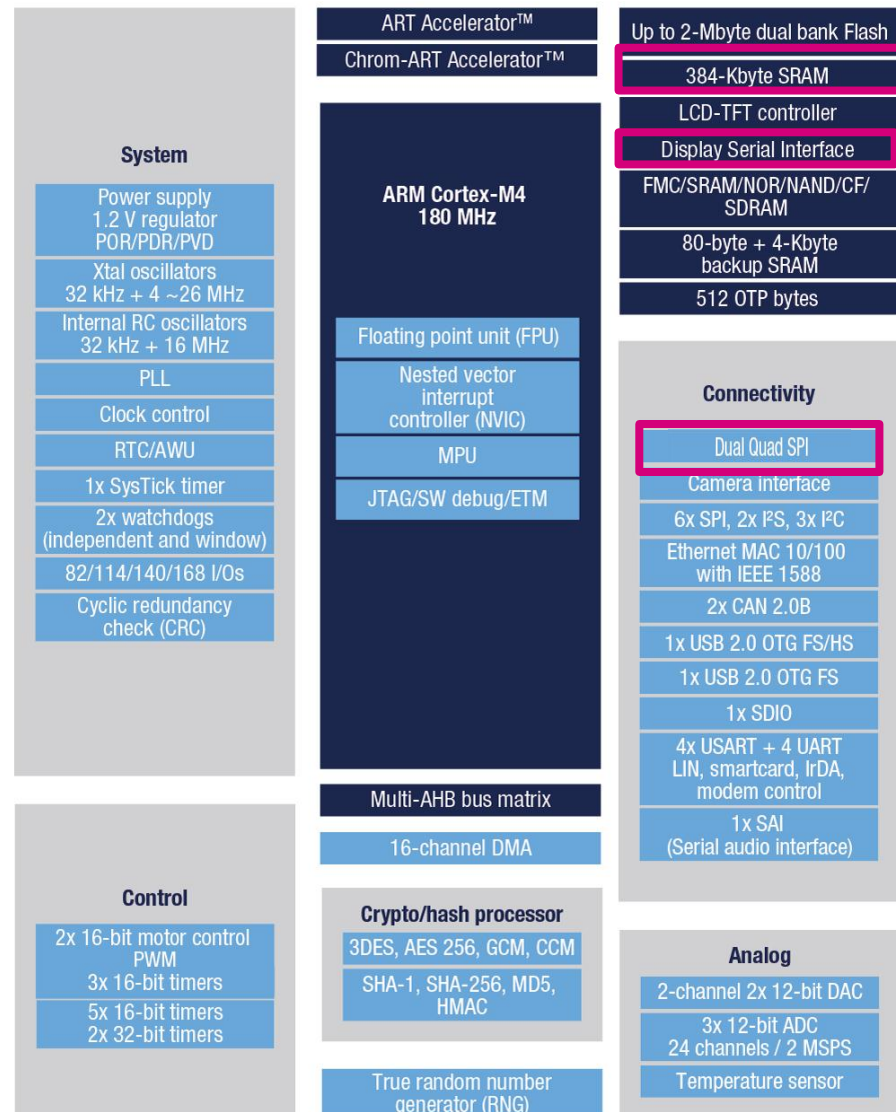
- WLCSP168
- BGA169
- LQFP208
- BGA216
- LQFP176

- Memory sizes

- 2 MB Flash, 384 KB RAM
- 1 MB Flash, 384 KB RAM
- 512 KB Flash, 384 KB RAM

- Cryptography

- STM32F479 embeds a HW Crypto processor



STM32F469/F479 lines

11



Legend: With crypto Without crypto

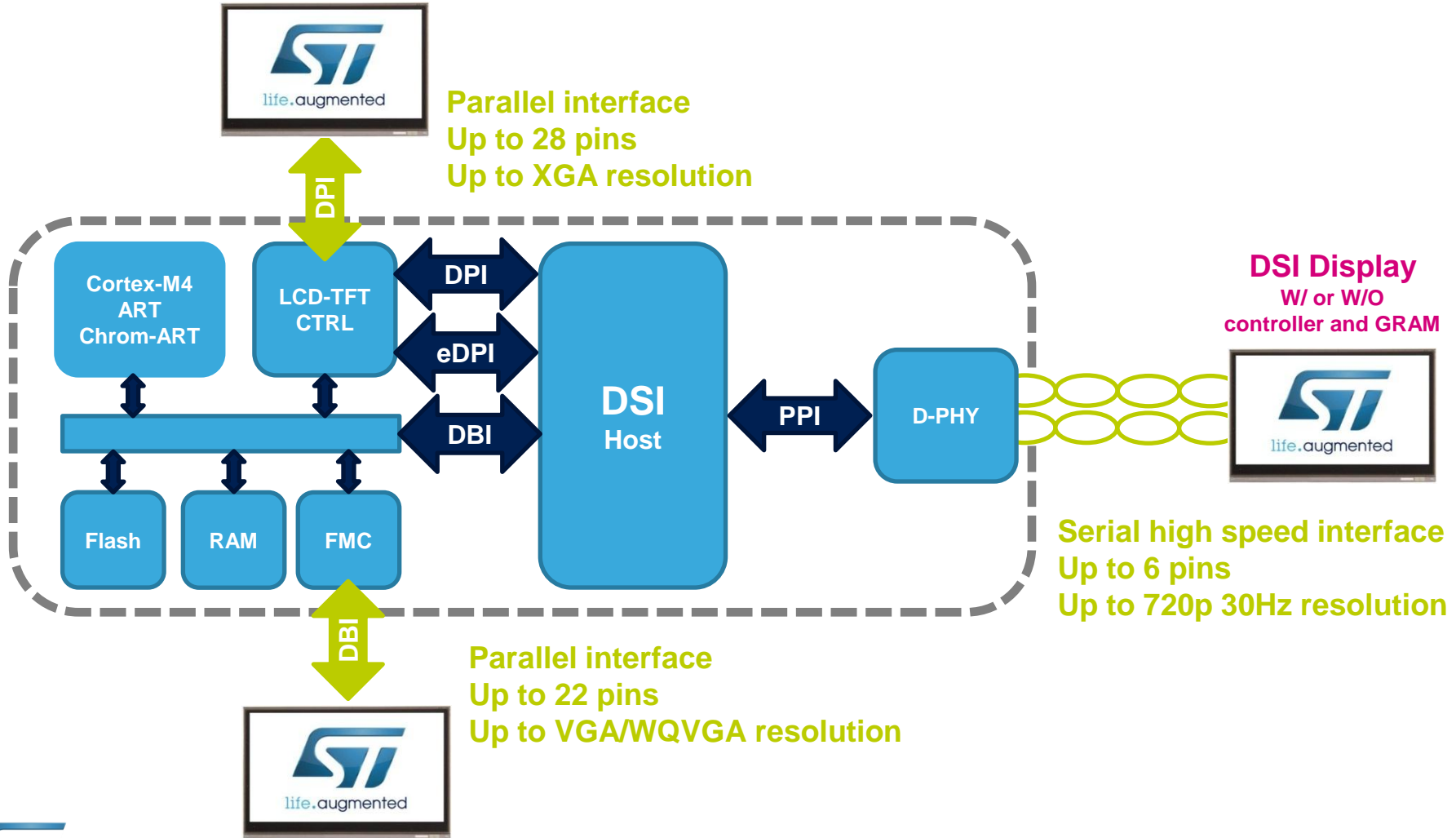
Display interfaces with STM32F469/479

12

Parallel interface LCD Display Without controller and GRAM



Parallel interface
Up to 28 pins
Up to XGA resolution



- DBI (Display Bus Interface)
 - From interconnect to DSI through APB
 - 20 MHz, for config with DCS (Display Command Set) based commands
- DPI (Display Pixel Interface)
 - For display with or without embedded RAM
 - From TFT controller to DSI
 - Video mode
 - Streaming of data and synchronisation at refresh rate
 - 2 types of streaming (burst or not burst)
 - 2 types of synchronisation (pulse or event)
- eDPI
 - Requires display with embedded RAM
 - Exclusive with DPI mode
 - From TFT controller to DSI
 - High-speed DBI
 - Update of display embedded RAM only when new image to display

Extended Memory Resources

14

- Up to 2 MBytes internal Flash
- 384 KB internal RAM including 64KB CCM-SRAM
 - Enables advanced data processing, high integration, and higher graphic resolutions

		resolution→						
BUFFER SIZES (Kbytes) ↘		CGA (320x200)	QVGA (320x240)	WQVGA (480x272)	VGA (640x480)	WVGA (800x480)	SVGA (800x600)	XGA (1024x768)
bpp ↓	1 (2 colors)	7.8	9.4	15.9	37.5	46.9	58.6	96.0
	2 (4 colors)	15.6	18.8	31.9	75.0	93.8	117.2	192.0
	4(16 colors)	31.3	37.5	63.8	150.0	187.5	234.4	384.0
	8 (256 colors)	62.5	75.0	127.5	300.0	375.0	468.8	768.0
	16 (high color)	125.0	150.0	255.0	600.0	750.0	937.5	1536.0
	24 (true color)	187.5	225.0	382.5	900.0	1125.0	1406.3	2304.0
	32 (deep color)	250.0	300.0	510.0	1200.0	1500.0	1875.0	3072.0



Double buffer



Single buffer



External memory needed

Quad SPI interface (QSPI)

15

- NOR flash interface requiring a limited number of pins (5 pins in single QSPI mode and 9 pins in dual mode QSPI)
 - Fast and cost effective NOR flash extension available from the lowest pin count MCU packages → lower BOM cost
- Dual quad SPI mode
 - Allowing to double up the throughput by accessing 2 external QSPI flash memories in parallel
- Possibility to have the QSPI Flash memory internally mapped
 - Allowing to access the QSPI external Flash as an internal flash and so avoiding all memory access overhead
- Non exclusive with the FMC
 - Allowing to simplify an application using both external Flash and external RAM

Upgraded USB connectivity

16

- Added dedicated power rails supplying the 2 USB peripherals
 - Enables USB connectivity even when the MCU is supplied at 1.8V
 - Link Power Mode (LPM)
 - Compliant with USB IF specification
 - Allowing a finer power management enabling significant power savings

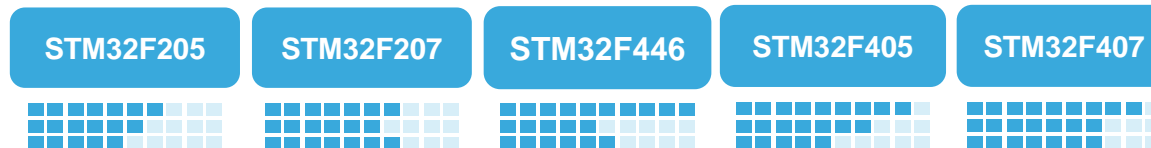
High-performance MCU with Extended SDRAM, Quad SPI and MIPI DSI interface

Advanced



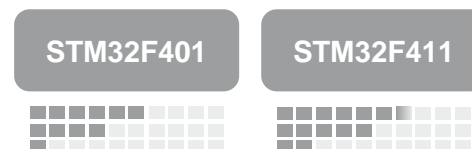
Enhanced Graphic
High memory density
Security

Foundation



Extended Connectivity
& Features
Security

Access



Dynamic efficiency
Entry pricing



F469/479 Production Schedule

18

Evaluation board samples are available

2015

JAN

FEB

MAR

APR

MAY

JUN

JUL

AUG

SEP

OCT

NOV

DEC

2016

JAN

FEB

MAR

APR

First samples are available

Mass Production