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What is "Embedded - Microcontrollers"?

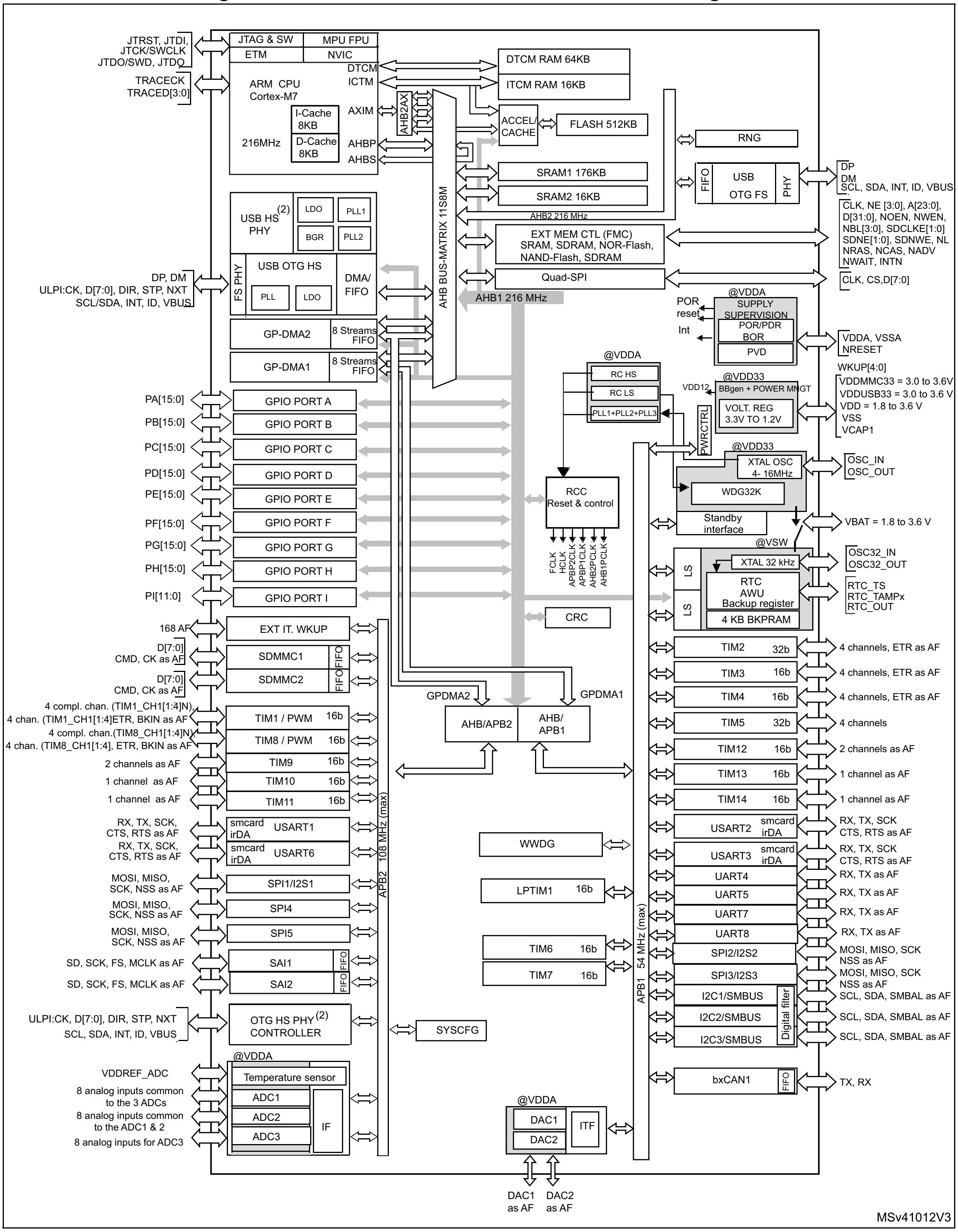
"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Active
Core Processor	ARM® Cortex®-M7
Core Size	32-Bit Single-Core
Speed	216MHz
Connectivity	CANbus, EBI/EMI, I²C, IrDA, LINbus, MMC/SD, QSPI, SAI, SPI, UART/USART, USB
Peripherals	Brown-out Detect/Reset, DMA, I²S, POR, PWM, WDT
Number of I/O	82
Program Memory Size	512KB (512K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	256K x 8
Voltage - Supply (Vcc/Vdd)	1.7V ~ 3.6V
Data Converters	A/D 16x12b; D/A 2x12b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	100-LQFP
Supplier Device Package	100-LQFP (14x14)
Purchase URL	https://www.e-xfl.com/product-detail/stmicroelectronics/stm32f722vet6

List of figures

Figure 5. STM32F722xx and STM32F723xx block diagram



1. The timers connected to APB2 are clocked from TIMxCLK up to 216 MHz, while the timers connected to APB1 are clocked from TIMxCLK either up to 108 MHz or 216 MHz depending on TIMPRE bit configuration in the RCC_DCKCFGR register.

2.13 Boot modes

At startup, the boot memory space is selected by the BOOT pin and BOOT_ADDx option bytes, allowing to program any boot memory address from 0x0000 0000 to 0x3FFF FFFF which includes:

- All Flash address space mapped on ITCM or AXIM interface
- All RAM address space: ITCM, DTCM RAMs and SRAMs mapped on AXIM interface
- The System memory bootloader

The boot loader is located in system memory. It is used to reprogram the Flash memory through a serial interface.

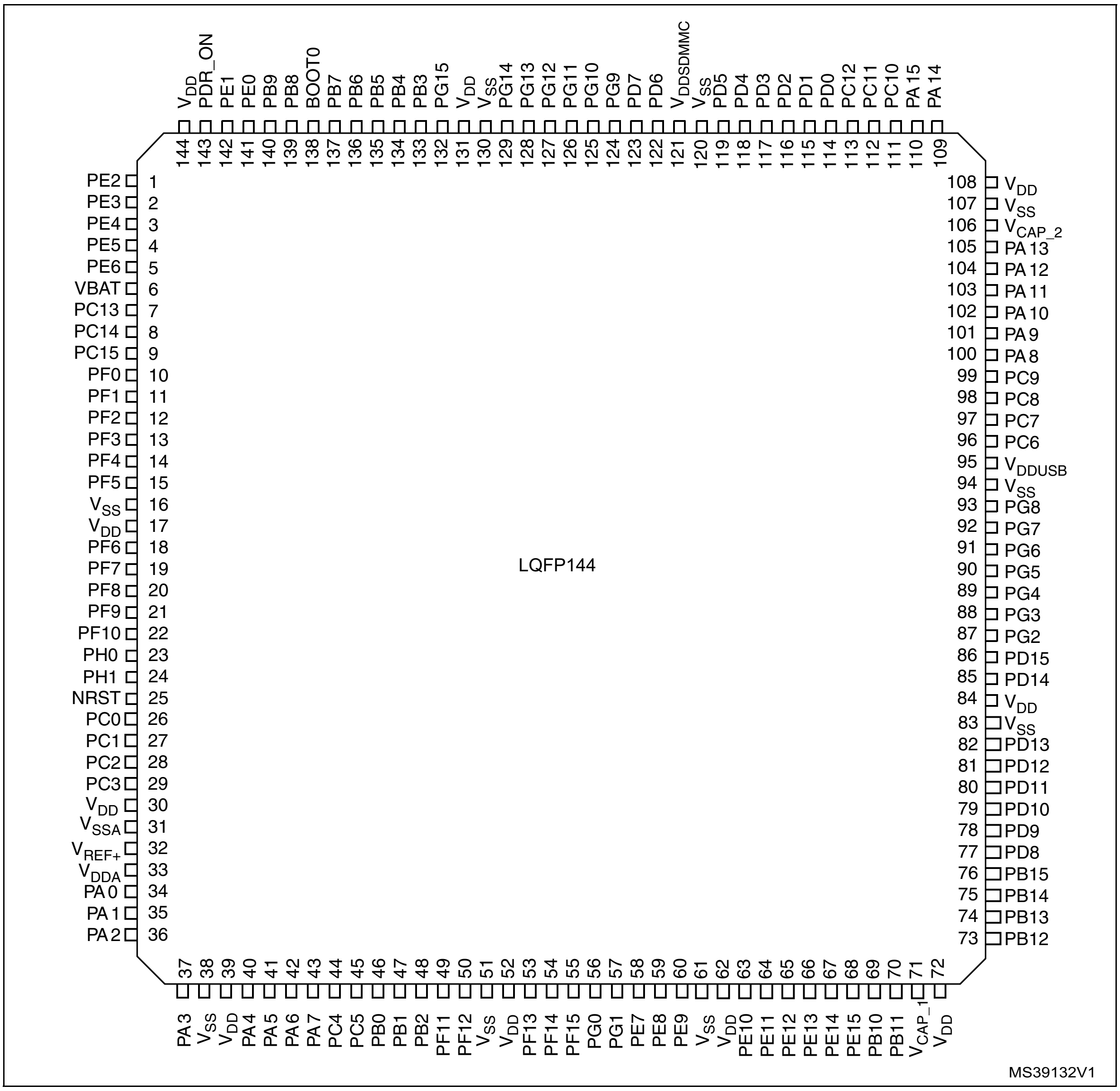
2.14 Power supply schemes

- V_{DD} = 1.7 to 3.6 V: external power supply for I/Os and the internal regulator (when enabled), provided externally through V_{DD} pins.
- V_{SSA}, V_{DDA} = 1.7 to 3.6 V: external analog power supplies for ADC, DAC, Reset blocks, RCs and PLL. V_{DDA} and V_{SSA} must be connected to V_{DD} and V_{SS}, respectively.
- V_{BAT} = 1.65 to 3.6 V: power supply for RTC, external clock 32 kHz oscillator and backup registers (through power switch) when V_{DD} is not present.

Note: The V_{DD}/V_{DDA} minimum value of 1.7 V is obtained when the internal reset is OFF (refer to Section 2.15.2: Internal reset OFF). Refer to Table 3: Voltage regulator configuration mode versus device operating mode to identify the packages supporting this option.

- The $V_{DDSDMMC}$ can be connected either to V_{DD} or an external independent power supply (1.8 to 3.6V) for the SDMMC2 pins (clock, command, and 4-bit data). For example, when the device is powered at 1.8V, an independent power supply 2.7V can be connected to $V_{DDSDMMC}$.When the $V_{DDSDMMC}$ is connected to a separated power supply, it is independent from V_{DD} or V_{DDA} but it must be the last supply to be provided and the first to disappear. The following conditions $V_{DDSDMMC}$ must be respected:
  - During the power-on phase ($V_{DD} < V_{DD\_MIN}$), $V_{DDSDMMC}$ should be always lower than V_{DD}
  - During the power-down phase ($V_{DD} < V_{DD\_MIN}$), $V_{DDSDMMC}$ should be always lower than V_{DD}
  - The $V_{DDSDMMC}$ rising and falling time rate specifications must be respected
  - In the operating mode phase, $V_{DDSDMMC}$ could be lower or higher than V_{DD}: All associated GPIOs powered by $V_{DDSDMMC}$ are operating between $V_{DDSDMMC\_MIN}$ and $V_{DDSDMMC\_MAX}$.
- The V_{DDUSB} can be connected either to V_{DD} or an external independent power supply (3.0 to 3.6V) for USB transceivers (refer to Figure 7 and Figure 8). For example, when the device is powered at 1.8V, an independent power supply 3.3V can be connected to the V_{DDUSB}. When the V_{DDUSB} is connected to a separated power supply, it is independent from V_{DD} or V_{DDA} but it must be the last supply to be provided and the first to disappear. The following conditions V_{DDUSB} must be respected:
  - During the power-on phase ($V_{DD} < V_{DD\_MIN}$), V_{DDUSB} should be always lower than V_{DD}
  - During the power-down phase ($V_{DD} < V_{DD\_MIN}$), V_{DDUSB} should be always lower than V_{DD}

Figure 17. STM32F722xx LQFP144 pinout



1. The above figure shows the package top view.

Table 10. STM32F722xx and STM32F723xx pin and ball definition (continued)

Pin Number										Pin name (function after reset)(1)	Pin type	I/O structure	Notes	Alternate functions	Additional functions
STM32F722xx					STM32F723xx										
LQFP64	LQFP100	LQFP144	UFBGA176	LQFP176	WLCSP100	UFBGA176	UFBGA144	LQFP144	LQFP176						
15	23	35	N2	41	J8	N2	K2	35	41	PA1	I/O	FT	(5)	TIM2_CH2, TIM5_CH2, USART2_RTS, UART4_RX, QUADSPI_BK1_IO3, SAI2_MCK_B, EVENTOUT	ADC1_IN1, ADC2_IN1, ADC3_IN1
16	24	36	P2	42	H8	P2	L2	36	42	PA2	I/O	FT	(5)	TIM2_CH3, TIM5_CH3, TIM9_CH1, USART2_TX, SAI2_SCK_B, EVENTOUT	ADC1_IN2, ADC2_IN2, ADC3_IN2, WKUP2
-	-	-	F4	43	-	F4	-	-	43	PH2	I/O	FT		LPTIM1_IN2, QUADSPI_BK2_IO0, SAI2_SCK_B, FMC_SDCKE0, EVENTOUT	-
-	-	-	G4	44	-	G4	-	-	44	PH3	I/O	FT	-	QUADSPI_BK2_IO1, SAI2_MCK_B, FMC_SDNE0, EVENTOUT	-
-	-	-	H4	45	-	H4	-	-	45	PH4	I/O	FTf	(4)	I2C2_SCL, OTG_HS_ULPI_NXT, EVENTOUT	-
-	-	-	J4	46	-	J4	-	-	46	PH5	I/O	FTf	-	I2C2_SDA, SPI5_NSS, FMC_SDNWE, EVENTOUT	-
17	25	37	R2	47	H7	R2	M2	37	47	PA3	I/O	FT	(4) (5)	TIM2_CH4, TIM5_CH4, TIM9_CH2, USART2_RX, OTG_HS_ULPI_D0, EVENTOUT	ADC1_IN3, ADC2_IN3, ADC3_IN3
18	26	38	-	-	K8	-	G4	38	-	VSS	S	-	-	-	-
-	-	-	L4	48	-	L4	H5	-	48	BYPASS_REG	I	FT	-	-	-

Table 10. STM32F722xx and STM32F723xx pin and ball definition (continued)

Pin Number										Pin name (function after reset)(1)	Pin type	I/O structure	Notes	Alternate functions	Additional functions
STM32F722xx					STM32F723xx										
LQFP64	LQFP100	LQFP144	UFBGA176	LQFP176	WLCSP100	UFBGA176	UFBGA144	LQFP144	LQFP176						
-	58	80	N14	99	F3	N14	H9	82	101	PD11	I/O	FT	-	USART3_CTS, QUADSPI_BK1_IO0, SAI2_SD_A, FMC_A16/FMC_CLE, EVENTOUT	-
-	59	81	N13	100	F2	N13	L10	83	102	PD12	I/O	FT	-	TIM4_CH1, LPTIM1_IN1, USART3_RTS, QUADSPI_BK1_IO1, SAI2_FS_A, FMC_A17/FMC_ALE, EVENTOUT	-
-	60	82	M15	101	E3	M15	K10	84	103	PD13	I/O	FT	-	TIM4_CH2, LPTIM1_OUT, QUADSPI_BK1_IO3, SAI2_SCK_A, FMC_A18, EVENTOUT	-
-	-	83	-	102	-	-	G8	85	104	VSS	S	-	-	-	-
-	-	84	J13	103	-	J13	F8	86	105	VDD	S	-	-	-	-
-	61	85	M14	104	F1	M14	K11	87	106	PD14	I/O	FT	-	TIM4_CH3, UART8_CTS, FMC_D0, EVENTOUT	-
-	62	86	L14	105	E2	L14	K12	88	107	PD15	I/O	FT	-	TIM4_CH4, UART8_RTS, FMC_D1, EVENTOUT	-
-	-	87	L15	106	-	L15	J12	89	108	PG2	I/O	FT	-	FMC_A12, EVENTOUT	-
-	-	88	K15	107	-	K15	J11	90	109	PG3	I/O	FT	-	FMC_A13, EVENTOUT	-

Table 10. STM32F722xx and STM32F723xx pin and ball definition (continued)

Pin Number										Pin name (function after reset)(1)	Pin type	I/O structure	Notes	Alternate functions	Additional functions
STM32F722xx					STM32F723xx										
LQFP64	LQFP100	LQFP144	UFBGA176	LQFP176	WLCSP100	UFBGA176	UFBGA144	LQFP144	LQFP176						
-	-	-	K9	-	-	K9	-	-	-	VSS	S	-	-	-	-
-	-	-	K10	-	-	K10	-	-	-	VSS	S	-	-	-	-

1. Function availability depends on the chosen device.
2. PC13, PC14, PC15 and PI8 are supplied through the power switch. Since the switch only sinks a limited amount of current (3 mA), the use of GPIOs PC13 to PC15 and PI8 in output mode is limited:
   - The speed should not exceed 2 MHz with a maximum load of 30 pF.
   - These I/Os must not be used as a current source (e.g. to drive an LED).
3. Main function after the first backup domain power-up. Later on, it depends on the contents of the RTC registers even after reset (because these registers are not reset by the main reset).
4. ULPI signals not available on the STM32F723xx devices.
5. FT = 5 V tolerant except when in analog mode or oscillator mode (for PC14, PC15, PH0 and PH1).
6. If the device is in regulator OFF/internal reset ON mode (BYPASS_REG pin is set to VDD), then PA0 is used as an internal reset (active low).

Table 35. Switching output I/O current consumption[1] (continued)

Symbol	Parameter	Conditions	I/O toggling frequency (fsw) MHz	Typ V_{DD} = 3.3 V	Typ V_{DD} = 1.8 V	Unit
I_{DDIO}	I/O switching Current	C_{EXT} = 22 pF $C = C_{INT} + C_S + C_{EXT}$	2	0.3	0.1	mA
			8	1.0	0.5	
			25	3.5	1.6	
			50	5.9	4.2	
			60	10.0	4.4	
			84	19.12	5.8	
			90	19.6	-	
		C_{EXT} = 33 pF $C = C_{INT} + C_S + C_{EXT}$	2	0.3	0.2	
			8	1.3	0.7	
			25	3.5	2.3	
			50	10.26	5.19	
			60	16.53	-	

1. CINT + $C_{S,}$ PCB board capacitance including the pad pin is estimated to15 pF.

On-chip peripheral current consumption

The MCU is placed under the following conditions:

- At startup, all I/O pins are in analog input configuration.
- All peripherals are disabled unless otherwise mentioned.
- I/O compensation cell enabled.
- The ART/L1-cache is ON.
- Scale 1 mode selected, internal digital voltage V12 = 1.32 V.
- HCLK is the system clock. $f_{PCLK1} = f_{HCLK}/4$, and $f_{PCLK2} = f_{HCLK}/2$.
  The given value is calculated by measuring the difference of current consumption
  – with all peripherals clocked off
  – with only one peripheral clocked on
  – f_{HCLK} = 216 MHz (Scale 1 + over-drive ON), f_{HCLK} = 168 MHz (Scale 2), f_{HCLK} = 144 MHz (Scale 3)
- Ambient operating temperature is 25 °C and V_{DD}=3.3 V.

Table 36. Peripheral current consumption (continued)

Peripheral		I_{DD}(Typ)(1)			Unit
		Scale 1	Scale 2	Scale 3	
APB2 (up to 108 MHz)	TIM1	24.9	23.8	20	µA/MHz
	TIM8	24.5	23.7	20	
	USART1	12.4	11.6	10	
	USART6	12.3	11.7	10	
	ADC1(5)	6.3	5.8	4.9	
	ADC2(5)	6.3	5.6	4.9	
	ADC3(5)	6.4	5.8	5	
	SDMMC1	9.1	8.3	7.1	
	SDMMC2	7	7.2	6	
	SPI1/I2S1(3)	3.2	3.2	2.6	
	SPI4	2.9	2.9	2.2	
	SYSCFG	1	1	0.7	
	TIM9	9.9	9.1	7.8	
	TIM10	7	6.4	5.6	
	TIM11	7.2	6.8	5.7	
	SPI5	4.8	4.1	3.6	
	SAI1	5.6	4.9	4.2	
	SAI2	5.4	4.7	4	
	USB PHY HS Controller	8.3	7.9	6.7	

1. When the I/O compensation cell is ON, I_{DD} typical value increases by 0.22 mA.
2. The BusMatrix is automatically active when at least one master is ON.
3. To enable an I2S peripheral, first set the I2SMOD bit and then the I2SE bit in the SPI_I2SCFGR register.
4. When the DAC is ON and EN1/2 bits are set in DAC_CR register, add an additional power consumption of 0.75 mA per DAC channel for the analog part.
5. When the ADC is ON (ADON bit set in the ADC_CR2 register), add an additional power consumption of 1.73 mA per ADC for the analog part.

Table 38. Low-power mode wakeup timings (continued)

Symbol	Parameter	Conditions	Typ(1)	Max(1)	Unit
t_{WUSTOP}(2)	Wakeup from Stop mode with MR/LP regulator in Under-drive mode	Main regulator in under-drive mode (Flash memory in Deep power-down mode)	107.4	113.2	µs
		Low power regulator in under-drive mode (Flash memory in Deep power-down mode)	112.7	120	
tWUSTDBY(2)	Wakeup from Standby mode	Exit Standby mode on rising edge	308	313	µs
		Exit Standby mode on falling edge	307	313	

1. Guaranteed by characterization results.
2. The wakeup times are measured from the wakeup event to the point in which the application code reads the first

5.3.9 External clock source characteristics

High-speed external user clock generated from an external source

In bypass mode the HSE oscillator is switched off and the input pin is a standard I/O. The external clock signal has to respect the *Table 62: I/O static characteristics*. However, the recommended clock input waveform is shown in *Figure 36*.

The characteristics given in *Table 39* result from tests performed using an high-speed external clock source, and under ambient temperature and supply voltage conditions summarized in *Table 17*.

Table 39. High-speed external user clock characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f_{HSE_ext}	External user clock source frequency(1)	-	1	-	50	MHz
V_{HSEH}	OSC_IN input pin high level voltage		$0.7V_{DD}$	-	V_{DD}	V
V_{HSEL}	OSC_IN input pin low level voltage		V_{SS}	-	$0.3V_{DD}$	
$t_{w(HSE)}$ $t_{w(HSE)}$	OSC_IN high or low time(1)		5	-	-	ns
$t_{r(HSE)}$ $t_{f(HSE)}$	OSC_IN rise or fall time(1)		-	-	10	
$C_{in(HSE)}$	OSC_IN input capacitance(1)	-	-	5	-	pF
$DuCy_{(HSE)}$	Duty cycle	-	45	-	55	%
I_L	OSC_IN Input leakage current	$V_{SS} \leq V_{IN} \leq V_{DD}$	-	-	±1	µA

1. Guaranteed by design.

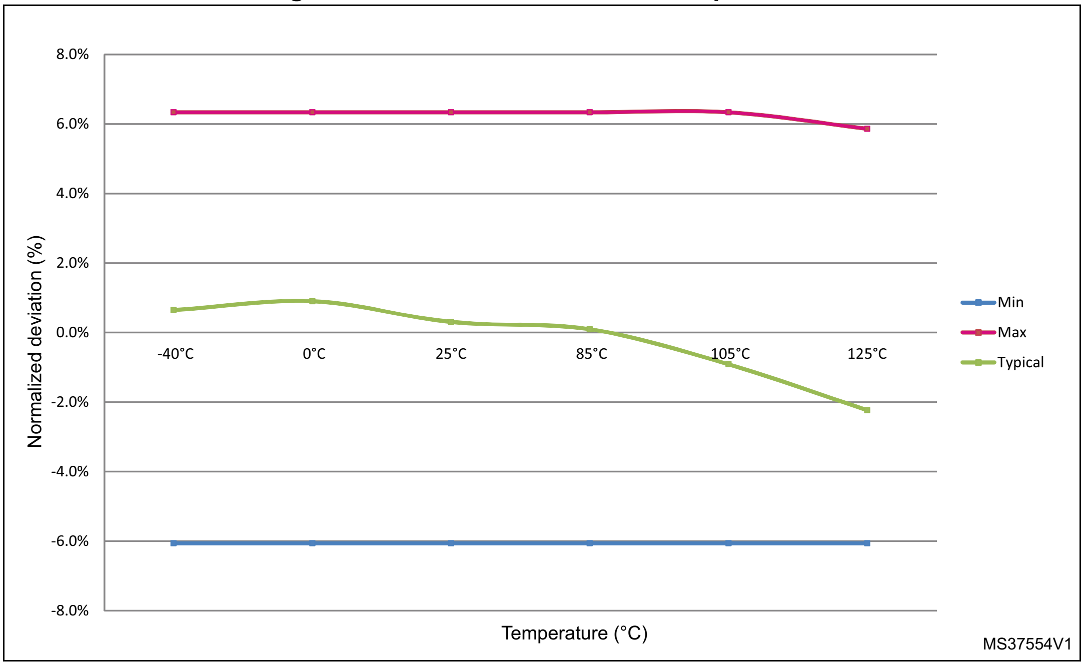
Low-speed internal (LSI) RC oscillator

Table 44. LSI oscillator characteristics [1]

Symbol	Parameter	Min	Typ	Max	Unit
f_{LSI}[2]	Frequency	17	32	47	kHz
$t_{su(LSI)}$[3]	LSI oscillator startup time	-	15	40	µs
$I_{DD(LSI)}$[3]	LSI oscillator power consumption	-	0.4	0.6	µA

1. V_{DD} = 3 V, T_A = –40 to 105 °C unless otherwise specified.
2. Guaranteed by characterization results.
3. Guaranteed by design.

Figure 41. LSI deviation versus temperature



5.3.11 PLL characteristics

The parameters given in *Table 45* and *Table 46* are derived from tests performed under temperature and V_{DD} supply voltage conditions summarized in *Table 17*.

Table 45. Main PLL characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f_{PLL_IN}	PLL input clock[1]	-	0.95[2]	1	2.10	MHz
f_{PLL_OUT}	PLL multiplier output clock	-	24	-	216	
f_{PLL48_OUT}	48 MHz PLL multiplier output clock	-	-	48	75	
f_{VCO_OUT}	PLL VCO output	-	100	-	432	

Static latchup

Two complementary static tests are required on six parts to assess the latchup performance:

- A supply overvoltage is applied to each power supply pin
- A current injection is applied to each input, output and configurable I/O pin

These tests are compliant with EIA/JESD 78A IC latchup standard.

Table 60. Electrical sensitivities

Symbol	Parameter	Conditions	Class
LU	Static latch-up class	T_A = +105 °C conforming to JESD78A	II level A

5.3.19 I/O current injection characteristics

As a general rule, current injection to the I/O pins, due to external voltage below V_{SS} or above V_{DD} (for standard, 3 V-capable I/O pins) should be avoided during normal product operation. However, in order to give an indication of the robustness of the microcontroller in cases when abnormal injection accidentally happens, susceptibility tests are performed on a sample basis during device characterization.

Functional susceptibilty to I/O current injection

While a simple application is executed on the device, the device is stressed by injecting current into the I/O pins programmed in floating input mode. While current is injected into the I/O pin, one at a time, the device is checked for functional failures.

The failure is indicated by an out of range parameter: ADC error above a certain limit (>5 LSB TUE), out of conventional limits of induced leakage current on adjacent pins (out of –5 µA/+0 µA range), or other functional failure (for example reset, oscillator frequency deviation).

Negative induced leakage current is caused by negative injection and positive induced leakage current by positive injection.

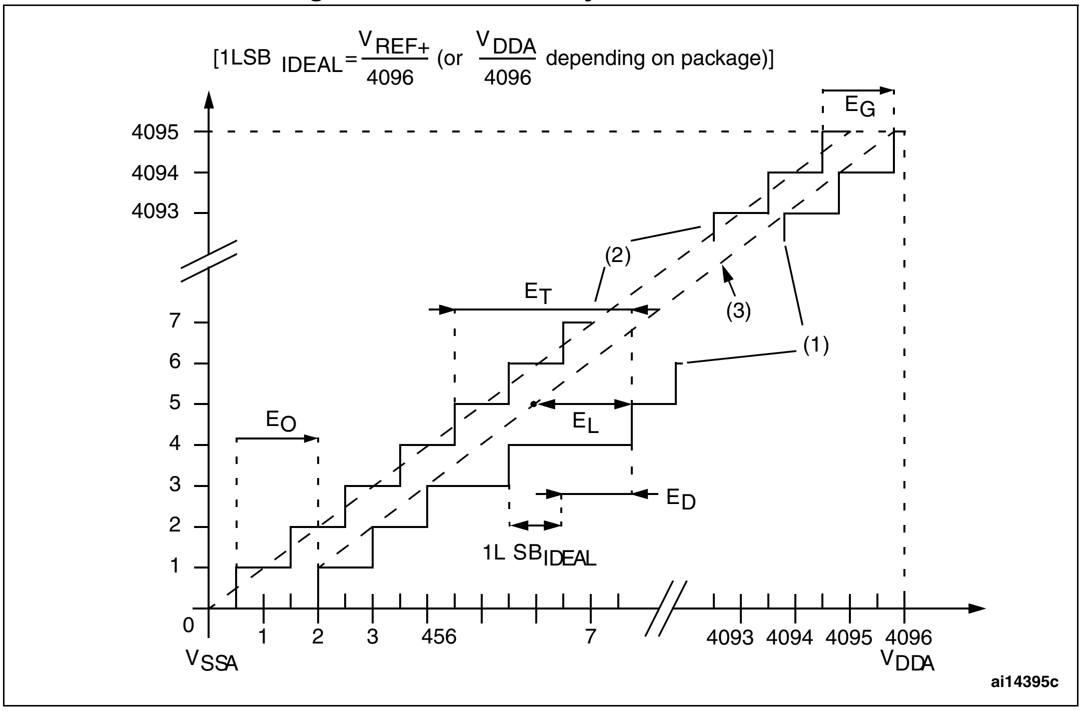
The test results are given in *Table 61*.

Table 61. I/O current injection susceptibility(1)

Symbol	Description	Functional susceptibility		Unit
		Negative injection	Positive injection	
I_{INJ}	Injected current on BOOT0, PDR_ON, BYPASS_REG, OTG_HS_REXT	-0	0	mA
	Injected current on NRST	-0	NA	
	Injected current on PF9, PF10, PH0_OSCIN, PH1_OSCOUT, PC0, PC1, PC2, PC3, PB14(2), PB15(2)	-0	NA	
	Injected current on any other FT or FTf pins	-5	NA	
	Injected current on any other pins	-5	+5	

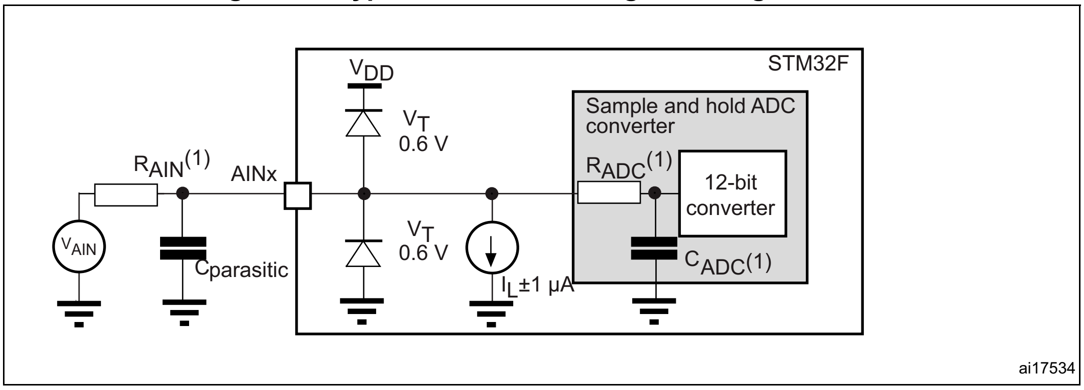
1. NA = not applicable.

Figure 47. ADC accuracy characteristics



1. See also *Table 70*.
2. Example of an actual transfer curve.
3. Ideal transfer curve.
4. End point correlation line.
5. E_T = Total Unadjusted Error: maximum deviation between the actual and the ideal transfer curves.
   EO = Offset Error: deviation between the first actual transition and the first ideal one.
   EG = Gain Error: deviation between the last ideal transition and the last actual one.
   ED = Differential Linearity Error: maximum deviation between actual steps and the ideal one.
   EL = Integral Linearity Error: maximum deviation between any actual transition and the end point correlation line.

Figure 48. Typical connection diagram using the ADC



1. Refer to *Table 68* for the values of R_{AIN}, R_{ADC} and C_{ADC}.
2. $C_{parasitic}$ represents the capacitance of the PCB (dependent on soldering and PCB layout quality) plus the pad capacitance (roughly 5 pF). A high $C_{parasitic}$ value downgrades conversion accuracy. To remedy this, f_{ADC} should be reduced.

Figure 53. SPI timing diagram - slave mode and CPHA = 1

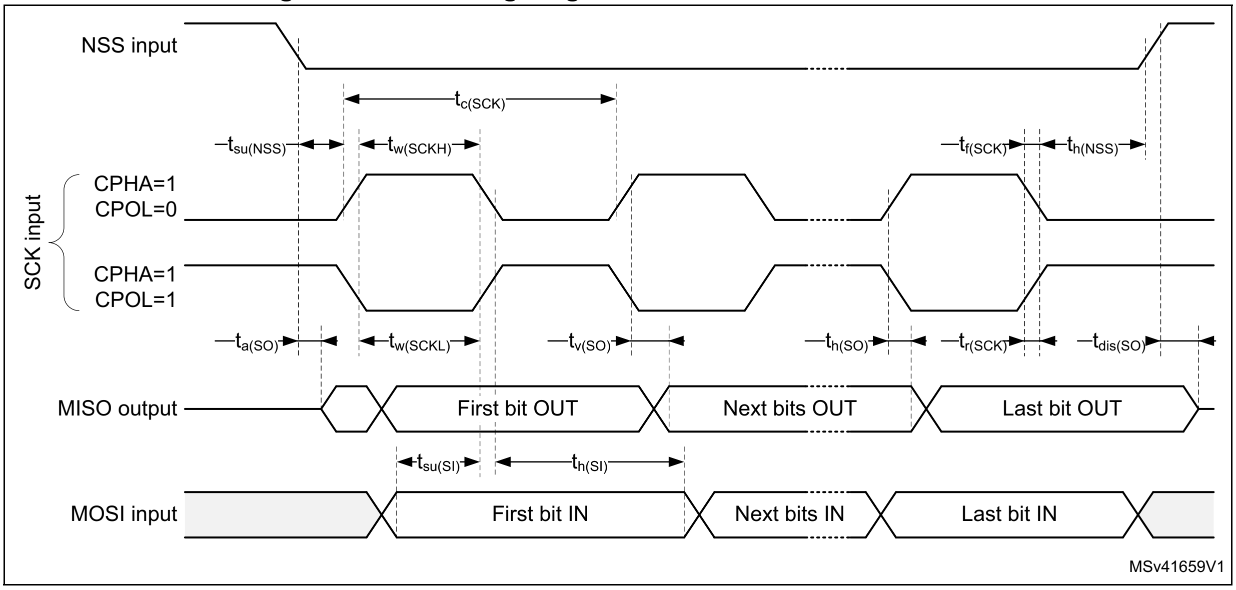


Figure 54. SPI timing diagram - master mode

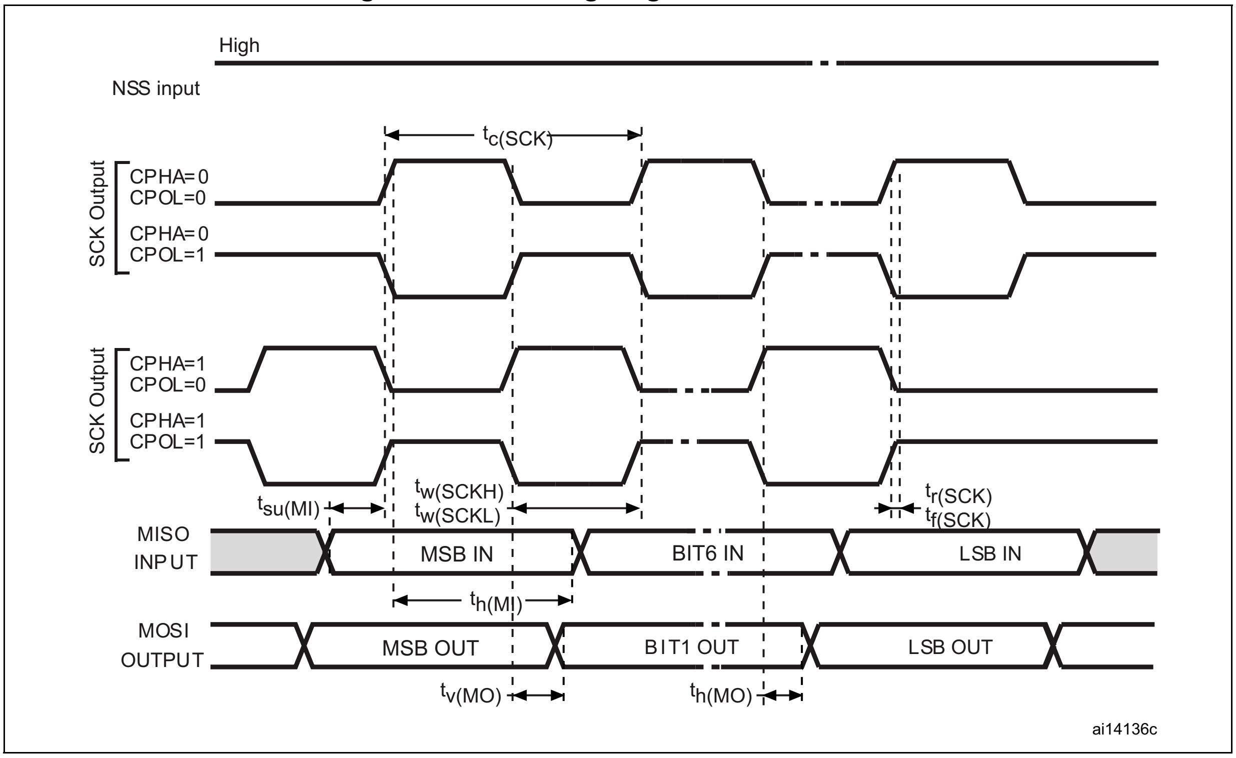


Table 89. USB HS clock timing parameters(1)

Symbol	Parameter		Min	Typ	Max	Unit
-	f_{HCLK} value to guarantee proper operation of USB HS interface		30	-	-	MHz
F_{START_8BIT}	Frequency (first transition)	8-bit ±10%	54	60	66	MHz
F_{STEADY}	Frequency (steady state) ±500 ppm		59.97	60	60.03	MHz
D_{START_8BIT}	Duty cycle (first transition)	8-bit ±10%	40	50	60	%
D_{STEADY}	Duty cycle (steady state) ±500 ppm		49.975	50	50.025	%
t_{STEADY}	Time to reach the steady state frequency and duty cycle after the first transition		-	-	1.4	ms
t_{START_DEV}	Clock startup time after the de-assertion of SuspendM	Peripheral	-	-	5.6	ms
t_{START_HOST}		Host	-	-	-	
t_{PREP}	PHY preparation time after the first transition of the input clock		-	-	-	µs

1. Guaranteed by design.

Figure 60. ULPI timing diagram

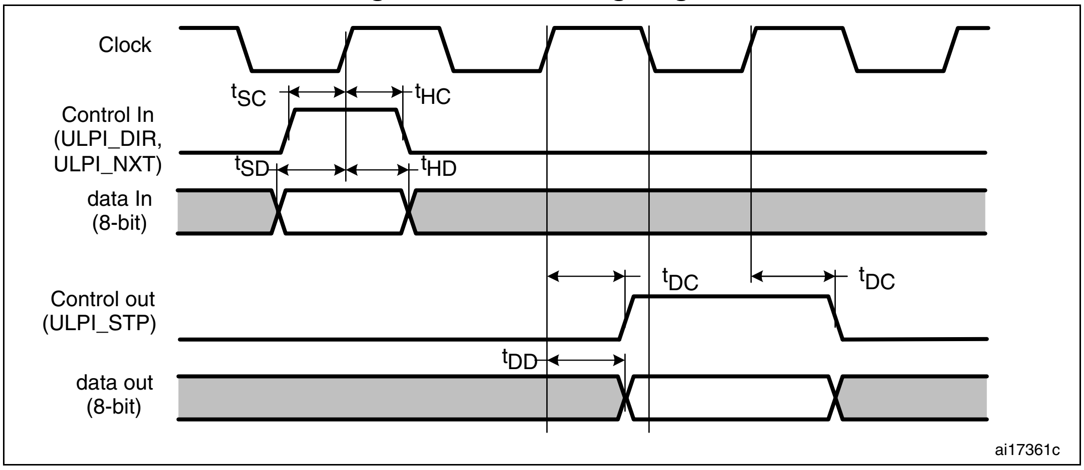


Figure 67. Synchronous non-multiplexed NOR/PSRAM read timings

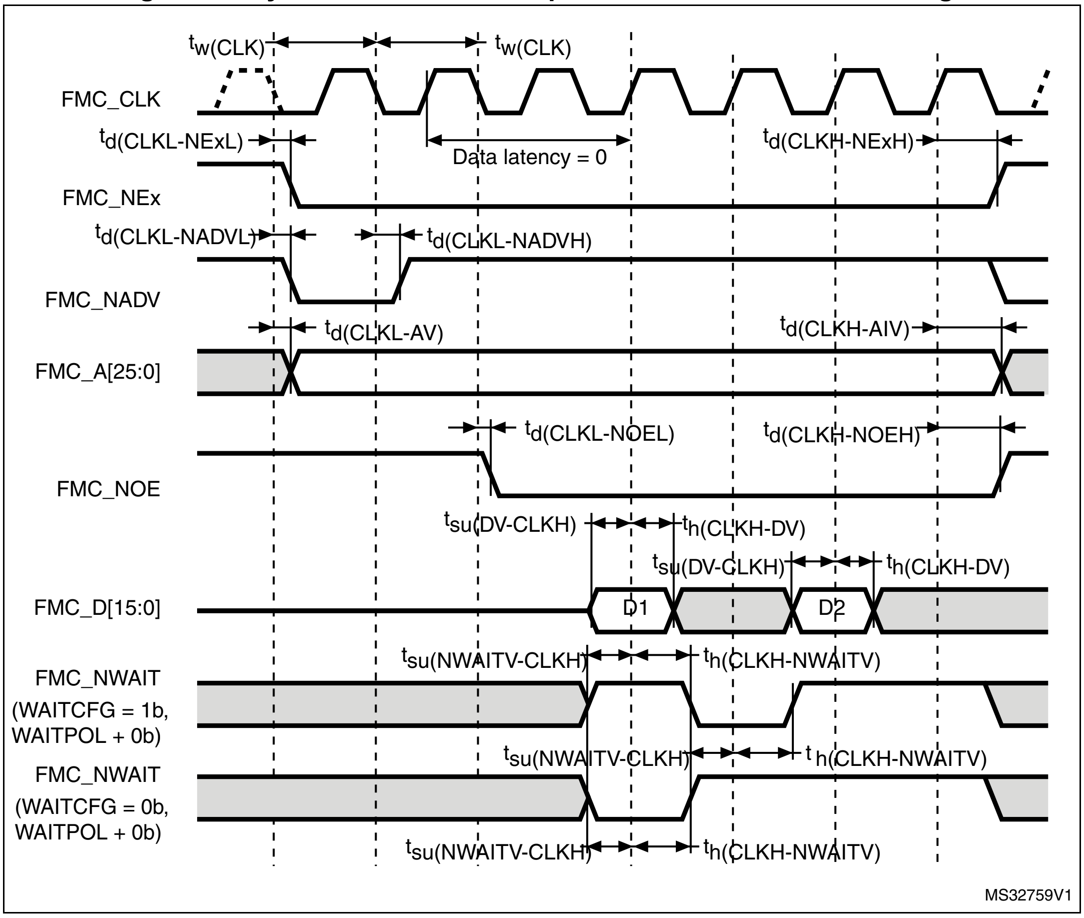


Table 104. Synchronous non-multiplexed NOR/PSRAM read timings(1)

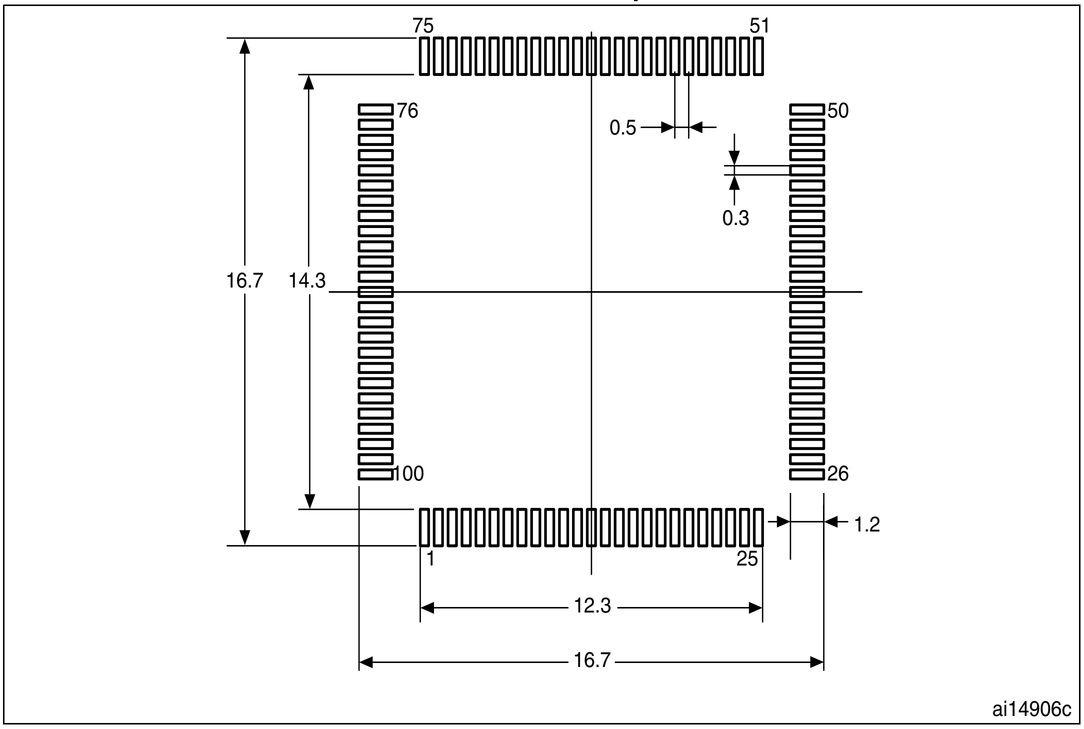
Symbol	Parameter	Min	Max	Unit
$t_{w(CLK)}$	FMC_CLK period	2Thclk - 0.5	-	ns
$t_{(CLKL\text{-}NExL)}$	FMC_CLK low to FMC_NEx low (x=0..2)	-	2	
$t_{d(CLKH\text{-}NExH)}$	FMC_CLK high to FMC_NEx high (x= 0…2)	Thclk +0.5	-	
$t_{d(CLKL\text{-}NADVL)}$	FMC_CLK low to FMC_NADV low	-	0.5	
$t_{d(CLKL\text{-}NADVH)}$	FMC_CLK low to FMC_NADV high	0	-	
$t_{d(CLKL\text{-}AV)}$	FMC_CLK low to FMC_Ax valid (x=16…25)	-	3	
$t_{d(CLKH\text{-}AIV)}$	FMC_CLK high to FMC_Ax invalid (x=16…25)	Thclk	-	
$t_{d(CLKL\text{-}NOEL)}$	FMC_CLK low to FMC_NOE low	-	2	
$t_{d(CLKH\text{-}NOEH)}$	FMC_CLK high to FMC_NOE high	Thclk -0.5	-	
$t_{su(DV\text{-}CLKH)}$	FMC_D[15:0] valid data before FMC_CLK high	0.5	-	
$t_{h(CLKH\text{-}DV)}$	FMC_D[15:0] valid data after FMC_CLK high	4	-	
$t_{(NWAIT\text{-}CLKH)}$	FMC_NWAIT valid before FMC_CLK high	2	-	
$t_{h(CLKH\text{-}NWAIT)}$	FMC_NWAIT valid after FMC_CLK high	3	-	

Table 117. LQPF100, 14 x 14 mm 100-pin low-profile quad flat package mechanical data (continued)

Symbol	millimeters			inches[(1)]		
	Min	Typ	Max	Min	Typ	Max
E1	13.800	14.000	14.200	0.5433	0.5512	0.5591
E3	-	12.000	-	-	0.4724	-
e	-	0.500	-	-	0.0197	-
L	0.450	0.600	0.750	0.0177	0.0236	0.0295
L1	-	1.000	-	-	0.0394	-
k	0°	3.5°	7°	0°	3.5°	7°
ccc	-	-	0.080	-	-	0.0031

1. Values in inches are converted from mm and rounded to 4 decimal digits.

Figure 83. LQFP100, 14 x 14 mm, 100-pin low-profile quad flat package recommended footprint



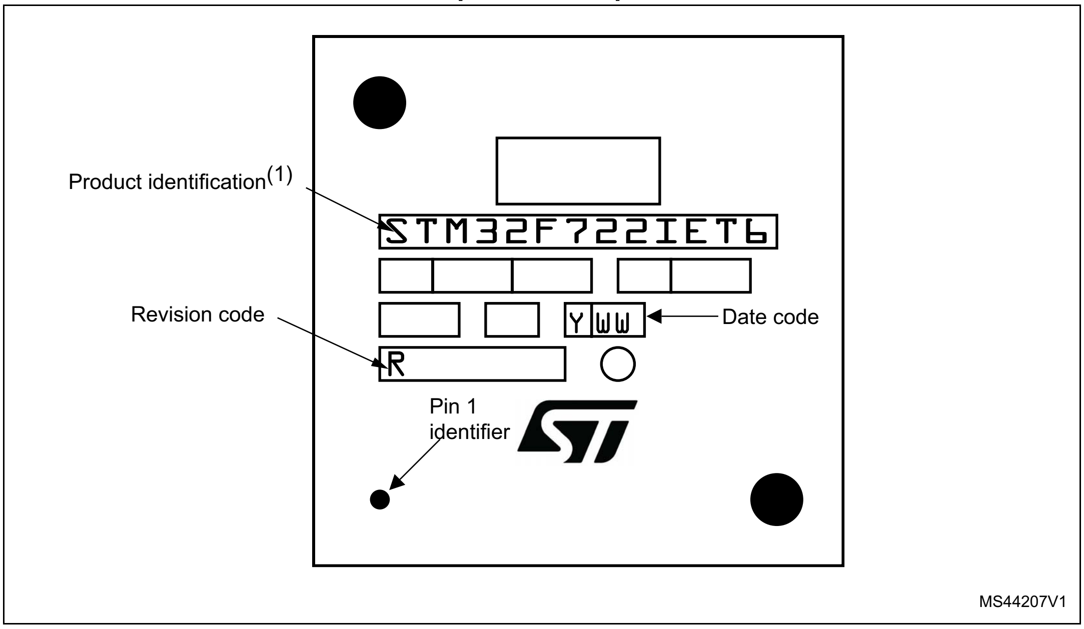
1. Dimensions are expressed in millimeters.

LQFP176 device marking

The following figure gives an example of topside marking orientation versus pin 1 identifier location.

Other optional marking or inset/upset marks, which identify the parts throughout supply chain operations, are not indicated below.

Figure 90. LQFP176, 24 x 24 mm, 176-pin low-profile quad flat package top view example



1. Parts marked as “ES”, “E” or accompanied by an Engineering Sample notification letter, are not yet qualified and therefore not yet ready to be used in production and any consequences deriving from such usage will not be at ST charge. In no event, ST will be liable for any customer usage of these engineering samples in production. ST Quality has to be contacted prior to any decision to use these Engineering samples to run qualification activity.

7 Ordering information

Table 127. Ordering information scheme

Example:	STM32	F	722	V	C	T	6	xxx

Device family

STM32 = ARM-based 32-bit microcontroller

Product type

F = general-purpose

Device subfamily

722 = STM32F722xx, no OTG PHY HS
723 = STM32F723xx, with OTG PHY HS

Pin count

R = 64 pins

V = 100 pins

Z = 144 pins

I = 176 pins

Flash memory size

C = 256 Kbytes of Flash memory

E = 512 Kbytes of Flash memory

Package

T = LQFP

K = UFBGA (10 x 10 mm)

I = UFBGA (7 x 7 mm)

Y = WLCSP

Temperature range

6 = Industrial temperature range, –40 to 85 °C.

7 = Industrial temperature range, –40 to 105 °C.

Options

xxx = programmed parts

TR = tape and reel

For a list of available options (speed, package, etc.) or for further information on any aspect of this device, contact the nearest ST sales office.