The following document contains information on Cypress products. Although the document is marked with the name "Spansion" and "Fujitsu", the company that originally developed the specification, Cypress will continue to offer these products to new and existing customers.

Continuity of Specifications
There is no change to this document as a result of offering the device as a Cypress product. Any changes that have been made are the result of normal document improvements and are noted in the document history page, where supported. Future revisions will occur when appropriate, and changes will be noted in a document history page.

Continuity of Ordering Part Numbers
Cypress continues to support existing part numbers. To order these products, please use only the Ordering Part Numbers listed in this document.

For More Information
Please contact your local sales office for additional information about Cypress products and solutions.

About Cypress
Cypress (NASDAQ: CY) delivers high-performance, high-quality solutions at the heart of today's most advanced embedded systems, from automotive, industrial and networking platforms to highly interactive consumer and mobile devices. With a broad, differentiated product portfolio that includes NOR flash memories, F-RAM™ and SRAM, Traveo™ microcontrollers, the industry's only PSoC® programmable system-on-chip solutions, analog and PMIC Power Management ICs, CapSense® capacitive touch-sensing controllers, and Wireless BLE Bluetooth® Low-Energy and USB connectivity solutions, Cypress is committed to providing its customers worldwide with consistent innovation, best-in-class support and exceptional system value.

FUJITSU

32-bit Microcontrollers
FM3 Family MB9B210T Series

FM3 Fujitsu Cortex M3

MB9B210T series are highly integrated 32-bit microcontrollers dedicated for embedded controllers with high-performance and competitive cost. MB9B210T series are based on the ARM Cortex-M3 Processor with Flash memory and SRAM, and has peripheral functions such as Motor Control timers, ADCs, and Communication interfaces.

■FEATURES

- **32bit ARM Cortex-M3 Core**
  Processor version : r2p1
- **Clock**
  Maximum clock frequency : 144MHz
- **Base Timer** : 16 channels(Max.)
- **Multi-function Timer** : 3 units(Max.)
  16-bit free-run timer ×3channels/unit
  Input capture ×4channels/unit
  Output compare ×6channels/unit
  A/D activating compare ×3channels/unit
  Waveform generator ×3channels/unit
  16-bit PPG timer ×3channels/unit
- **QPRC** : 3 channels(Max.)
- **Dual Timer** : 1 unit
- **Watch dog Timer** : 1 channel(SW) + 1 channel(HW)
- **USB2.0(Function/Host)** : 2 channels(Max.)
- **Ethernet-MAC**
  1 channel(Max.) MII:1ch(Max.)/RMII:1ch(Max.)
- **Multi-function Serial Interface** : 8 channels(Max.)
  Selectable from UART/CSIO/LIN/I^{2}C
- **External Bus Interface**
- **DMA Controller** : 8 channels
- **External Interrupt Controller Unit**
  – Up to 32 external vectors
  – Include one non-maskable interrupt(NMI)
- **12-bit A/D Converter** :
  MB9BF216S/217S/218S : 24 channels(3 units)
  MB9BF216T/217T/218T : 32 channels(3 units)
- **Low Power Mode**
  Sleep mode/Timer mode/Stop mode supported
- **General Purpose I/O port**
  MB9BF216S/217S/218S : 122(Max.)
  MB9BF216T/217T/218T : 154(Max.)
- **Debug**
  –Serial Wire JTAG Debug Port (SWJ-DP)
  –Embedded Trace Macrocells (ETM)
- **Low Voltage Detector**
- **Clock Super Visor**
- **Power Supply** : 2.7V to 5.5V

■PRODUCT LINEUP

Part number / Parameter	MB9BF216S/T	MB9BF217S/T	MB9BF218S/T
Flash (Byte)	512K	768K	1M
RAM (Byte)	64K	96K	128K

■ORDERING INFORMATION

Part number	Package
MB9BF216SPMC	Plastic・LQFP(0.5mm pitch),144-pin (FPT-144P-M08)
MB9BF217SPMC	
MB9BF218SPMC	
MB9BF216TPMC	Plastic・LQFP(0.5mm pitch),176-pin (FPT-176P-M07)
MB9BF217TPMC	
MB9BF218TPMC	
MB9BF216TBGL	Plastic・PFBGA(0.8mm pitch),192-pin (BGA-192P-M06)
MB9BF217TBGL	
MB9BF218TBGL	

■PACKAGE EXAMPLE OF REFERENCE
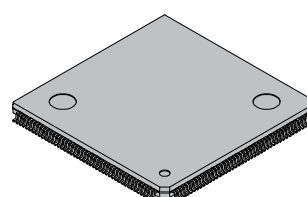
Plastic ・ LQFP, 176-pins
(FPT-176P-M07)

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■BLOCK DIAGRAM

MB9BF216/217/218

TRST X,TCK
TDI,TMS
TDO
TRACED [3:0]
TRACECLK

SWJ-DP | ETM
TPIU | ROM Table

Cortex -M3 Core 144 MHz (Max.)

MPU | NVIC

I
D
Sys

SRAM 0 32/48/64Kbyte

On-chip Flash 512Kbyte / 768Kbyte / 1024 Kbyte

Flash I/F
Security
Trace Buffer (16Kbyte)

SRAM 1 32/48/64Kbyte

Dual -Timer

WatchDog Timer (Software)

Clock Reset Generator

WatchDog Timer (Hardware)

CSV

INITX

AHB-APB Bridge: APB0(Max.72MHz)

Multi-layer AHB (Max.144MHz)

USB 2.0 (Host/ Func) PHY
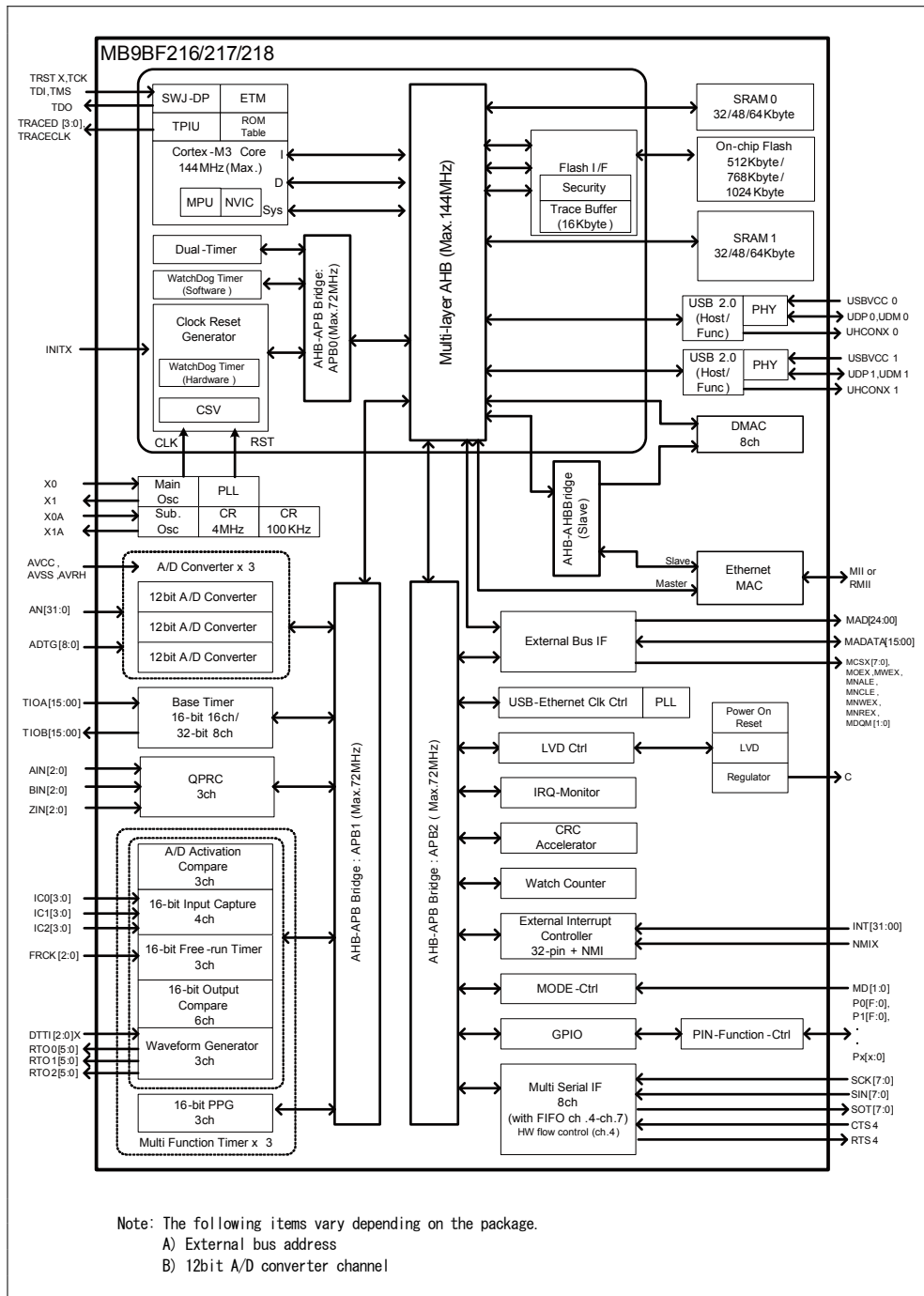USBVCC 0
UDP 0,UDM 0
UHCONX 0

USB 2.0 (Host/ Func) PHY
USBVCC 1
UDP 1,UDM 1
UHCONX 1

DMAC 8ch

CLK | RST

AHB-AHBBridge (Slave)

X0
X1
X0A
X1A

Main Osc | PLL
Sub. Osc | CR 4MHz | CR 100KHz

Slave
Master

Ethernet MAC

MII or RMII

AVCC , AVSS ,AVRH

A/D Converter x 3
12bit A/D Converter
12bit A/D Converter
12bit A/D Converter

AN[31:0]

ADTG[8:0]

External Bus IF

MAD[24:00]
MADATA[15:00]
MCSX[7:0],
MOEX ,MWEX ,
MNALE ,
MNCLE ,
MNWEX ,
MNREX ,
MDQM [1:0]

TIOA[15:00]
TIOB[15:00]

Base Timer 16-bit 16ch/ 32-bit 8ch

AHB-APB Bridge : APB1 (Max.72MHz)

AHB-APB Bridge : APB2 (Max.72MHz)

USB-Ethernet Clk Ctrl | PLL

Power On Reset
LVD
Regulator

AIN [2:0]
BIN [2:0]
ZIN [2:0]

QPRC 3ch

LVD Ctrl

IRQ-Monitor

C

CRC Accelerator

Watch Counter

A/D Activation Compare 3ch

IC0[3:0]
IC1[3:0]
IC2[3:0]

16-bit Input Capture 4ch

FRCK [2:0]

16-bit Free -run Timer 3ch

16-bit Output Compare 6ch

External Interrupt Controller 32-pin + NMI

INT [31:00]
NMIX

DTTI [2:0]X
RTO 0[5:0]
RTO 1[5:0]
RTO 2[5:0]

Waveform Generator 3ch

MODE -Ctrl

MD [1:0]
P0[F:0],
P1[F:0],
:
:
Px[x:0]

GPIO

PIN-Function -Ctrl

16-bit PPG 3ch

Multi Function Timer x 3

Multi Serial IF 8ch (with FIFO ch .4-ch.7) HW flow control (ch.4)

SCK [7:0]
SIN [7:0]
SOT [7:0]
CTS 4
RTS 4

Note: The following items vary depending on the package.
    A) External bus address
    B) 12bit A/D converter channel

■STARTER KIT

A starter kit for FM3 family is on sale respectively from IAR Systems and KEIL.

- **IAR Systems**
  With IAR Systems starter kit, a high performance board can be used for evaluation.
- **KEIL**
  With KEIL starter kit, a simple board can be used for evaluation.

NP706-00011-1v0-E