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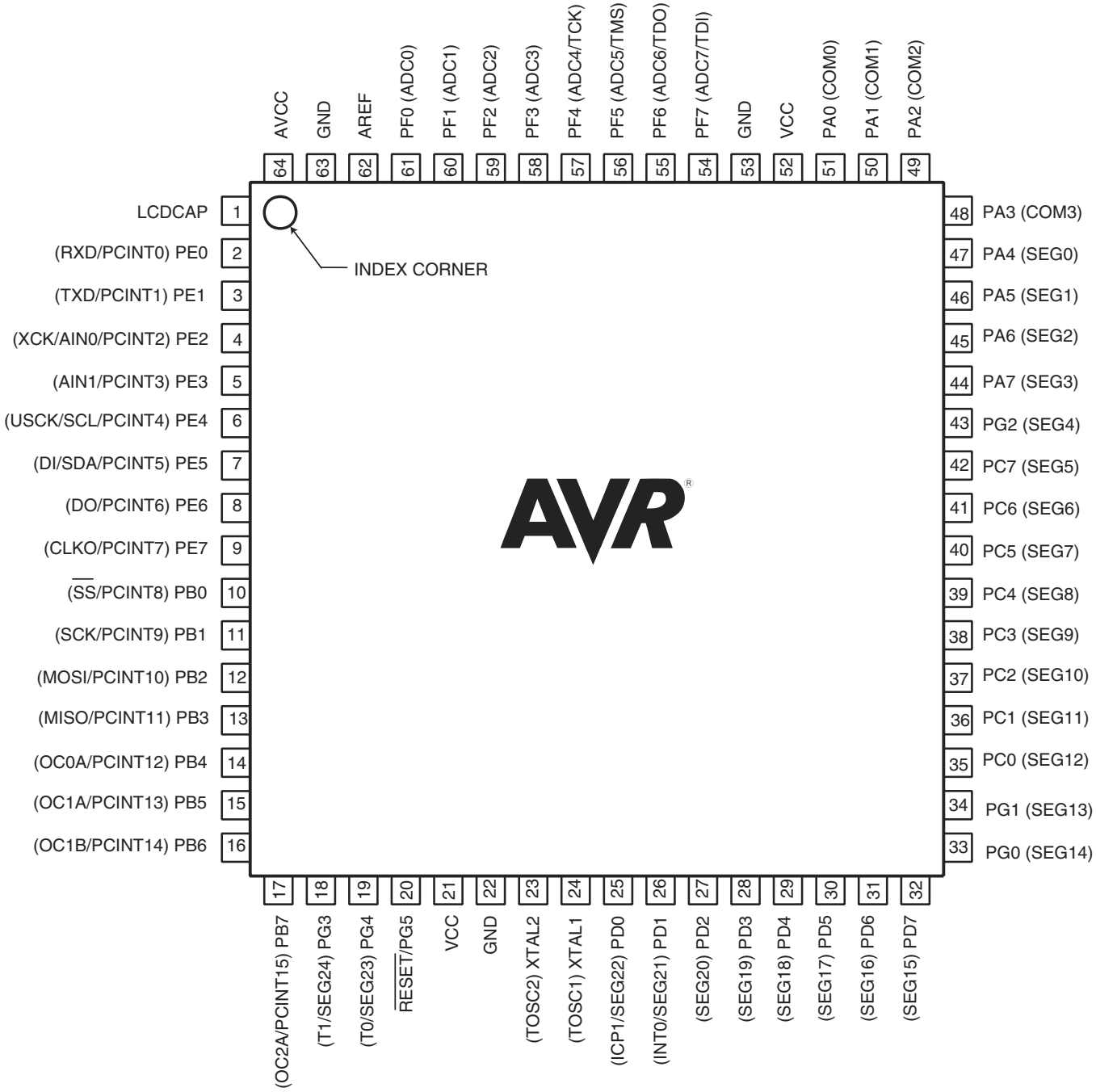
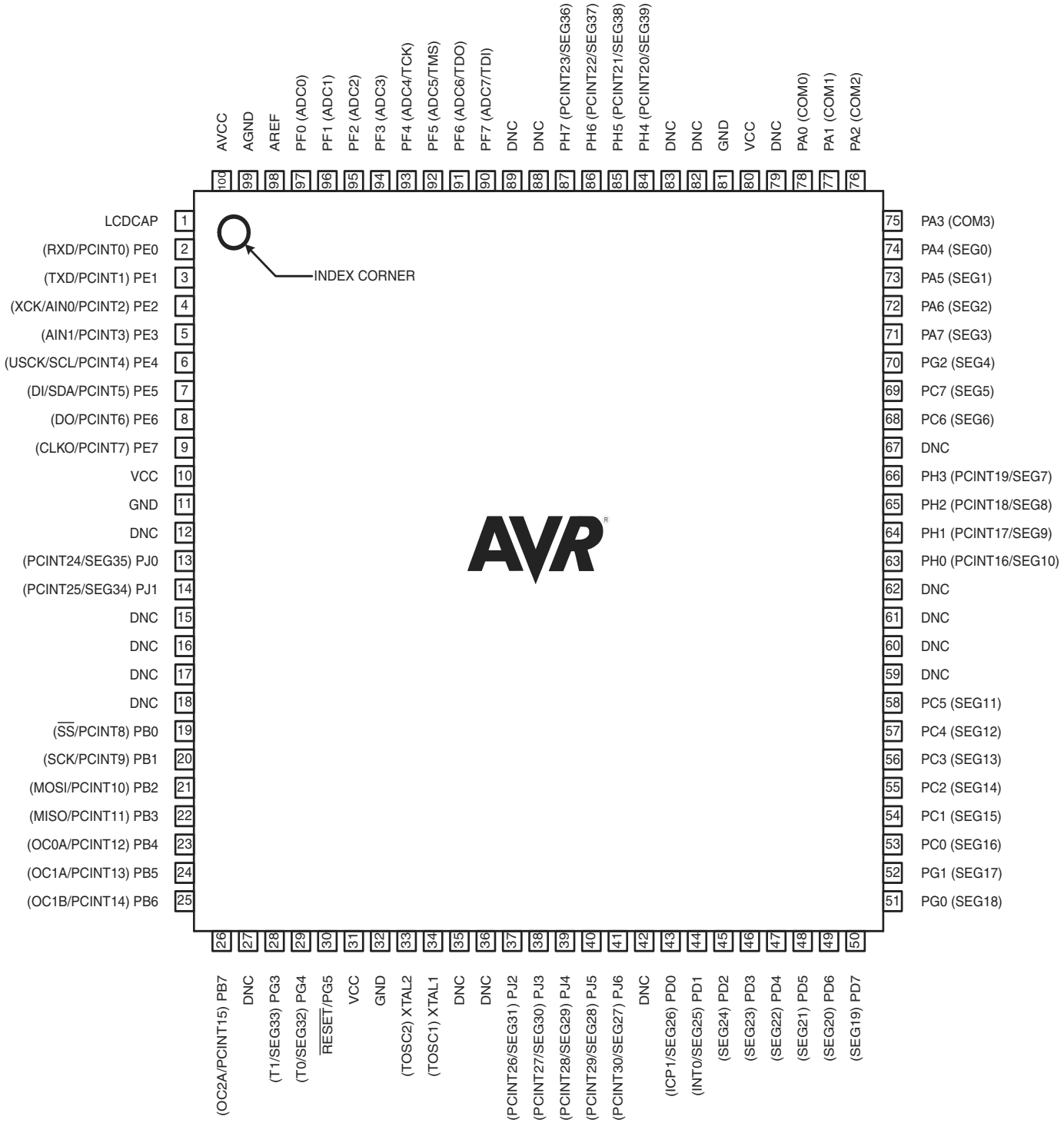
What is "Embedded - Microcontrollers"?

"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	AVR
Core Size	8-Bit
Speed	20MHz
Connectivity	SPI, UART/USART, USI
Peripherals	Brown-out Detect/Reset, LCD, POR, PWM, WDT
Number of I/O	69
Program Memory Size	32KB (16K x 16)
Program Memory Type	FLASH
EEPROM Size	1K x 8
RAM Size	2K x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 5.5V
Data Converters	A/D 8x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	100-TQFP
Supplier Device Package	100-TQFP (14x14)
Purchase URL	https://www.e-xfl.com/product-detail/microchip-technology/atmega3290p-20au


AVCC 64
GND 63
AREF 62
PF0 (ADC0) 61
PF1 (ADC1) 60
PF2 (ADC2) 59
PF3 (ADC3) 58
PF4 (ADC4/TCK) 57
PF5 (ADC5/TMS) 56
PF6 (ADC6/TDO) 55
PF7 (ADC7/TDI) 54
GND 53
VCC 52
PA0 (COM0) 51
PA1 (COM1) 50
PA2 (COM2) 49
LCDCAP 1
(RXD/PCINT0) PE0 2
(TXD/PCINT1) PE1 3
(XCK/AIN0/PCINT2) PE2 4
(AIN1/PCINT3) PE3 5
(USCK/SCL/PCINT4) PE4 6
(DI/SDA/PCINT5) PE5 7
(DO/PCINT6) PE6 8
(CLKO/PCINT7) PE7 9
(SS/PCINT8) PB0 10
(SCK/PCINT9) PB1 11
(MOSI/PCINT10) PB2 12
(MISO/PCINT11) PB3 13
(OC0A/PCINT12) PB4 14
(OC1A/PCINT13) PB5 15
(OC1B/PCINT14) PB6 16
INDEX CORNER
AVR
48 PA3 (COM3)
47 PA4 (SEG0)
46 PA5 (SEG1)
45 PA6 (SEG2)
44 PA7 (SEG3)
43 PG2 (SEG4)
42 PC7 (SEG5)
41 PC6 (SEG6)
40 PC5 (SEG7)
39 PC4 (SEG8)
38 PC3 (SEG9)
37 PC2 (SEG10)
36 PC1 (SEG11)
35 PC0 (SEG12)
34 PG1 (SEG13)
33 PG0 (SEG14)
17 (OC2A/PCINT15) PB7
18 (T1/SEG24) PG3
19 (T0/SEG23) PG4
20 RESET/PG5
21 VCC
22 GND
23 (TOSC2) XTAL2
24 (TOSC1) XTAL1
25 (ICP1/SEG22) PD0
26 (INT0/SEG21) PD1
27 (SEG20) PD2
28 (SEG19) PD3
29 (SEG18) PD4
30 (SEG17) PD5
31 (SEG16) PD6
32 (SEG15) PD7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AGND 99
AREF 98
PF0 (ADC0) 97
PF1 (ADC1) 96
PF2 (ADC2) 95
PF3 (ADC3) 94
PF4 (ADC4/TCK) 93
PF5 (ADC5/TMS) 92
PF6 (ADC6/TDO) 91
PF7 (ADC7/TDI) 90
DNC 89
DNC 88
PH7 (PCINT23/SEG36) 87
PH6 (PCINT22/SEG37) 86
PH5 (PCINT21/SEG38) 85
PH4 (PCINT20/SEG39) 84
DNC 83
DNC 82
GND 81
VCC 80
DNC 79
PA0 (COM0) 78
PA1 (COM1) 77
PA2 (COM2) 76
LCDCAP 1
(RXD/PCINT0) PE0 2
(TXD/PCINT1) PE1 3
(XCK/AIN0/PCINT2) PE2 4
(AIN1/PCINT3) PE3 5
(USCK/SCL/PCINT4) PE4 6
(DI/SDA/PCINT5) PE5 7
(DO/PCINT6) PE6 8
(CLKO/PCINT7) PE7 9
VCC 10
GND 11
DNC 12
(PCINT24/SEG35) PJ0 13
(PCINT25/SEG34) PJ1 14
DNC 15
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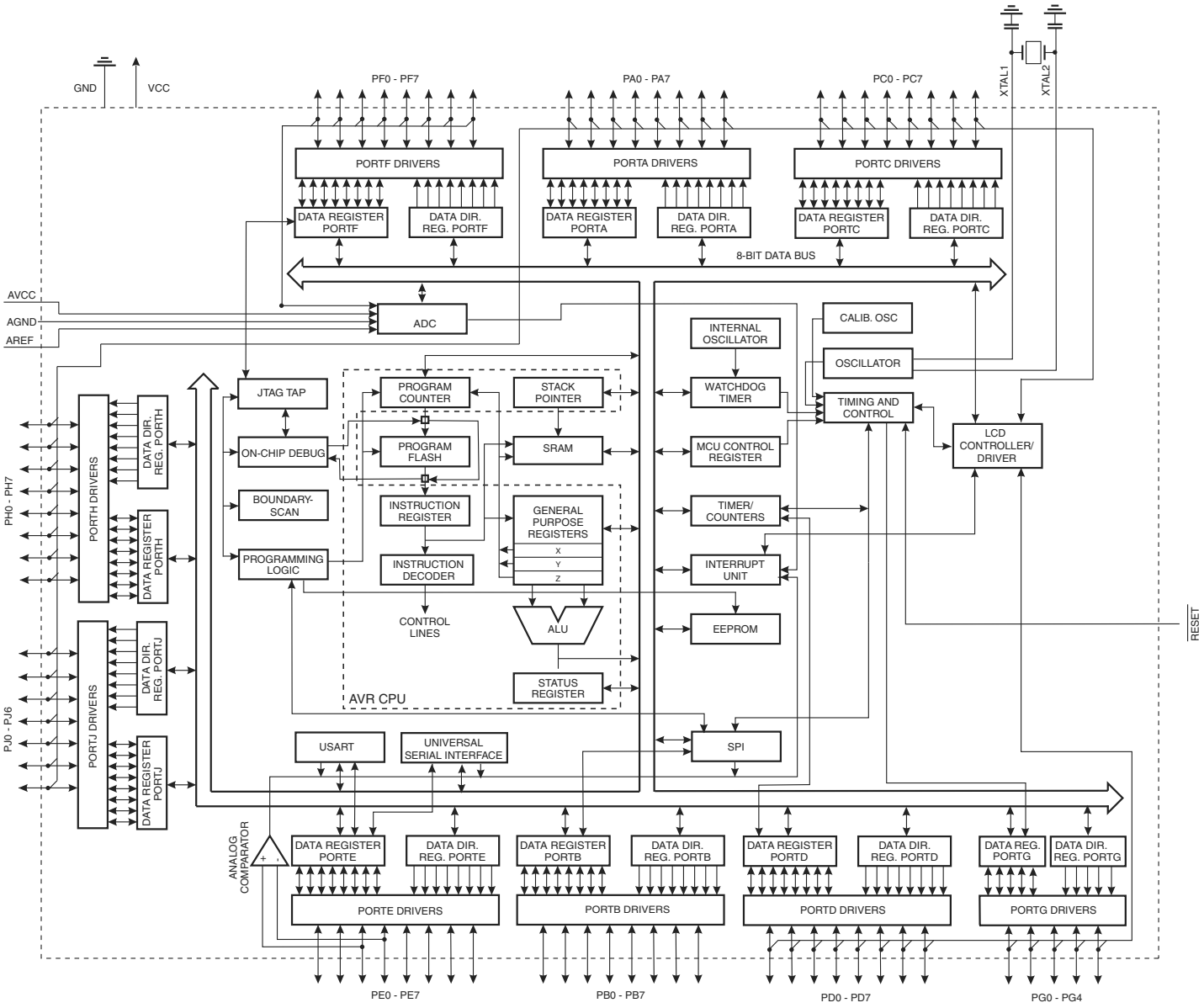
DNC 18
(SS/PCINT8) PB0 19
(SCK/PCINT9) PB1 20
(MOSI/PCINT10) PB2 21
(MISO/PCINT11) PB3 22
(OC0A/PCINT12) PB4 23
(OC1A/PCINT13) PB5 24
(OC1B/PCINT14) PB6 25
INDEX CORNER
AVR
75 PA3 (COM3)
74 PA4 (SEG0)
73 PA5 (SEG1)
72 PA6 (SEG2)
71 PA7 (SEG3)
70 PG2 (SEG4)
69 PC7 (SEG5)
68 PC6 (SEG6)
67 DNC
66 PH3 (PCINT19/SEG7)
65 PH2 (PCINT18/SEG8)
64 PH1 (PCINT17/SEG9)
63 PH0 (PCINT16/SEG10)
62 DNC
61 DNC
60 DNC
59 DNC
58 PC5 (SEG11)
57 PC4 (SEG12)
56 PC3 (SEG13)
55 PC2 (SEG14)
54 PC1 (SEG15)
53 PC0 (SEG16)
52 PG1 (SEG17)
51 PG0 (SEG18)
26 (OC2A/PCINT15) PB7
27 DNC
28 (T1/SEG33) PG3
29 (T0/SEG32) PG4
30 RESET/PG5
31 VCC
32 GND
33 (TOSC2) XTAL2
34 (TOSC1) XTAL1
35 DNC
36 DNC
37 (PCINT26/SEG31) PJ2
38 (PCINT27/SEG30) PJ3
39 (PCINT28/SEG29) PJ4
40 (PCINT29/SEG28) PJ5
41 (PCINT30/SEG27) PJ6
42 DNC
43 (ICP1/SEG26) PD0
44 (INT0/SEG25) PD1
45 (SEG24) PD2
46 (SEG23) PD3
47 (SEG22) PD4
48 (SEG21) PD5
49 (SEG20) PD6
50 (SEG19) PD7


GND
VCC
PF0 - PF7
PA0 - PA7
PC0 - PC7
XTAL1
XTAL2
PORTF DRIVERS
PORTA DRIVERS
PORTC DRIVERS
DATA REGISTER PORTF
DATA DIR. REG. PORTF
DATA REGISTER PORTA
DATA DIR. REG. PORTA
DATA REGISTER PORTC
DATA DIR. REG. PORTC
8-BIT DATA BUS
AVCC
AGND
AREF
ADC
INTERNAL OSCILLATOR
CALIB. OSC
OSCILLATOR
JTAG TAP
PROGRAM COUNTER
STACK POINTER
WATCHDOG TIMER
TIMING AND CONTROL
LCD CONTROLLER/ DRIVER
ON-CHIP DEBUG
PROGRAM FLASH
SRAM
MCU CONTROL REGISTER
BOUNDARY-SCAN
INSTRUCTION REGISTER
GENERAL PURPOSE REGISTERS
X
Y
Z
TIMER/ COUNTERS
PROGRAMMING LOGIC
INSTRUCTION DECODER
INTERRUPT UNIT
CONTROL LINES
ALU
EEPROM
RESET
STATUS REGISTER
AVR CPU
PH0 - PH7
PORTH DRIVERS
DATA DIR. REG. PORTH
DATA REGISTER PORTH
PJ0 - PJ6
PORTJ DRIVERS
DATA DIR. REG. PORTJ
DATA REGISTER PORTJ
USART
UNIVERSAL SERIAL INTERFACE
SPI
ANALOG COMPARATOR
DATA REGISTER PORTE
DATA DIR. REG. PORTE
DATA REGISTER PORTB
DATA DIR. REG. PORTB
DATA REGISTER PORTD
DATA DIR. REG. PORTD
DATA REG. PORTG
DATA DIR. REG. PORTG
PORTE DRIVERS
PORTB DRIVERS
PORTD DRIVERS
PORTG DRIVERS
PE0 - PE7
PB0 - PB7
PD0 - PD7
PG0 - PG4

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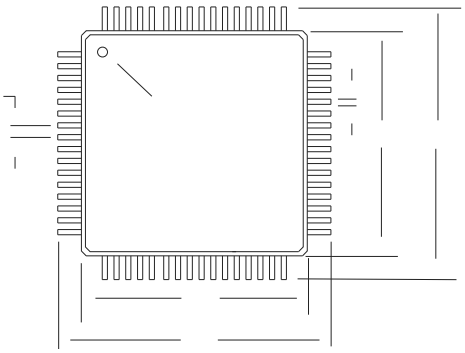
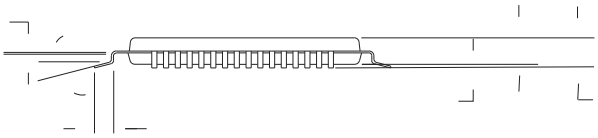
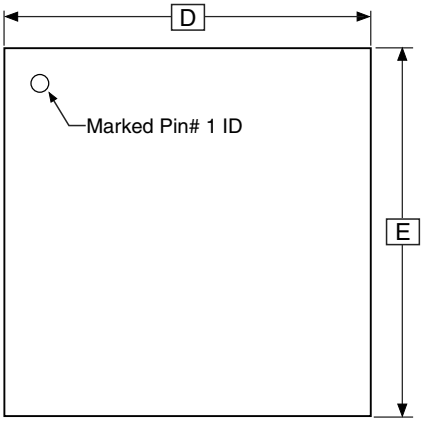
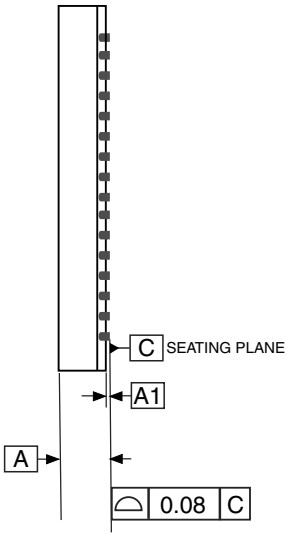




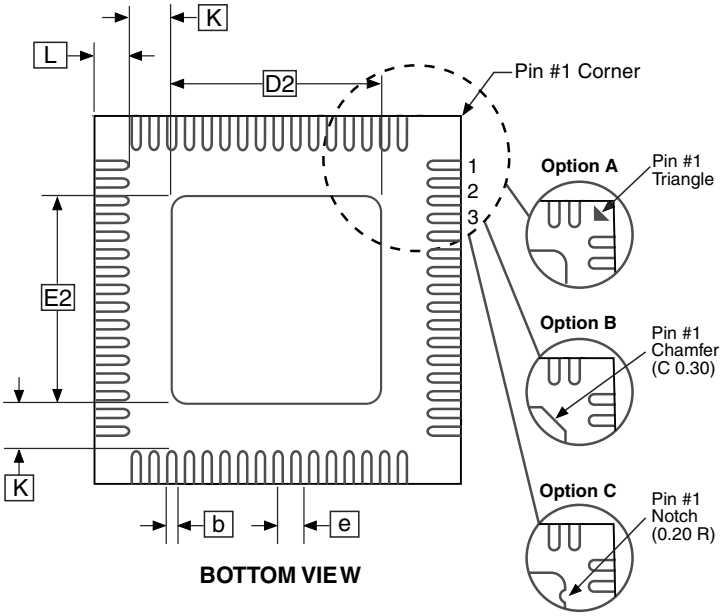
2325 Orchard Parkway San Jose, CA 95131	TITLE	DRAWING NO.	REV.



TOP VIEW



SIDE VIEW



BOTTOM VIEW

COMMON DIMENSIONS
(Unit of Measure = mm)

SYMBOL	MIN	NOM	MAX	NOTE
A	0.80	0.90	1.00	
A1	–	0.02	0.05	
b	0.18	0.25	0.30	
D	8.90	9.00	9.10	
D2	5.20	5.40	5.60	
E	8.90	9.00	9.10	
E2	5.20	5.40	5.60	
e	0.50 BSC			
L	0.35	0.40	0.45	
K	1.25	1.40	1.55	

Notes:
1. JEDEC Standard MO-220, (SAW Singulation) Fig. 1, VMMD.
2. Dimension and tolerance conform to ASMEY14.5M-1994.

2010-10-19

Atmel 2325 Orchard Parkway San Jose, CA 95131	**TITLE** **64M1**, 64-pad, 9 x 9 x 1.0 mm Body, Lead Pitch 0.50 mm, 5.40 mm Exposed Pad, Micro Lead Frame Package (MLF)	**DRAWING NO.** 64M1	**REV.** H