



E3206 & E3205 MCU Datasheet

Release 00.14

SemiDrive

Device Overview

E3206/E3205 High-Reliable MCU are the next-generation high-performance MCU designed for automotive applications. It integrates ARM Cortex-R5 lock-step CPU cores and up to 640KB SRAM to support the increasing demands on computing and program/data storage. It is also equipped with rich communication interfaces such as CANFD, LIN, USB, 10/100M Ethernet TSN for seamless integration into automotive system at minimal BOM cost. Its internal HSM supports true random number generator and high-performance crypto engines for AES, RAS, ECC, SHA as well as SM2/3/4/9 standards. It is designed to meet the security requirement on secure boot, secure communication, OTA, etc.

1.1 Key Features

Main features of E3206/E3205 MCU are listed as below:

CPU Cluster

- 400MHz Dual-Core ARM Cortex-R5F
- Fixed Lock-Step Operation
- 32KB I-Cache, 32KB D-Cache
- 128KB TCM
- With FPU & MPU

ADC

- 3x 12-bit SAR ADC
- 40 shared analog input channels¹
- Support single-end / differential mode
- Support 0~5V input range

ACMP

- 4x Analog comparator
- 40 shared analog input channels²
- Support single-end / differential mode
- Support 0~5V input range

Storage

- 1x SDIO / eMMC (SEHC1)

Power Management

- Full PMU integration
- Temperature Sensor
- Voltage detector

¹ 32 shared analog input channels in E3205. Please see [Ordering Information](#) (page 10) for detailed part comparison.

² 32 shared analog input channels in E3205. Please see [Ordering Information](#) (page 10) for detailed part comparison.

³ RAM size includes TCM on CPU core.

Internal Memory

- 640KB RAM³
- ECC protection enabled

XSPI Memory Interface

- Support 16-bit/8-bit/4-bit mode
- Support Octal-SPI / Qual-SPI FLASH
- Support HyperFLASH / HyperRAM

Peripherals

- 8x CAN/CANFD
- 12x LIN/UART
- 1x 10/100M Ethernet TSN
- 1x USB2.0 Host/Device
- 1x I2S/TDM
- 4x I2C
- 6x SPI
- 2x ePWM, 8-ch per ePWM
- 2x eTimer, 8-ch per eTimer

Hardware Secure Module (HSM)

- High-performance Secure Core
- TRNG
- AES/SHA/RSA/ECC
- SM2/3/4/9

1.2 Block Diagram

This section provides main functional blocks of each part in E3200 family. Please refer to *Ordering Information* (page 10) for detailed part comparison.

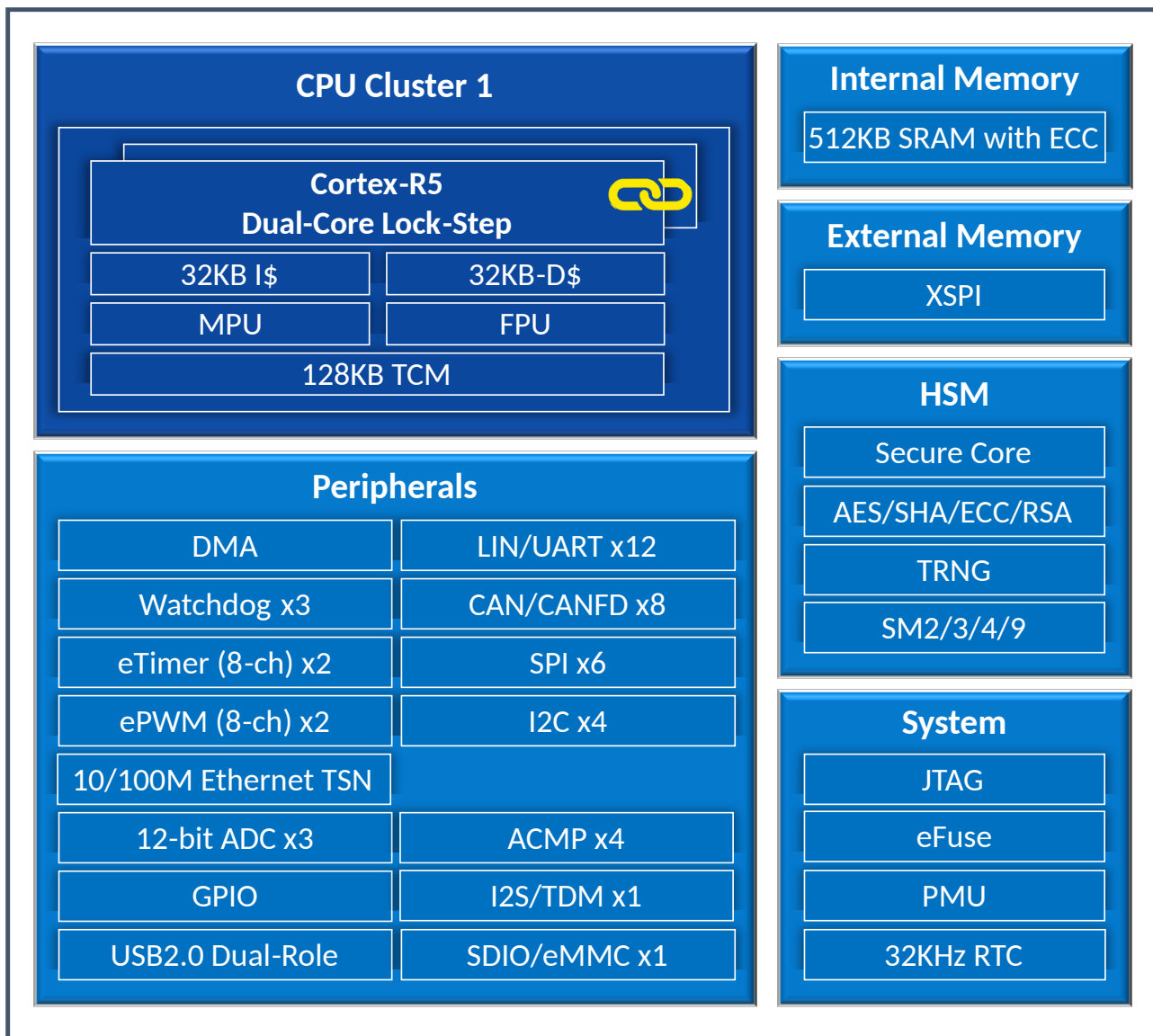


Fig. 1.1: Block Diagram for E3206/E3205

Ordering Information

This section provides detailed part specifications and comparison.

2.1 Part Specifications

The following table provides detailed specifications for E3200 family of MCU.

Table 2.1: Part Specifications

Part Number	Feature	Package	Temperature	Notes
E3206-ALEAA	1x R5 Lock-Step, CAN, LIN, Ethernet TSN,	LQFP176	-40 ~ 150 °C T _j	-
E3205-ALDAA	1x R5 Lock-Step, CAN, LIN, Ethernet TSN,	LQFP144	-40 ~ 150 °C T _j	-

2.2 Part Comparison

		E3206	E3205
CPU Cluster		400MHz Cortex-R5F DCLS	
Internal Memory ¹		640KB	640KB
HSM/Crypto		AES/SHA/ECC/RSA, SM2/3/4/9	
XSPI Memory Interface		Octal-SPI/Quad-SPI FLASH/HyperFLASH/HyperRAM	
Interfaces	USB2.0	1	
	CANFD	8	
	SDIO/eMMC	1	
	I2S	1	
	Ethernet TSN	10/100M	
	LIN/UART	12	
	SPI	6	
	I2C	4	
Timer	ePWM	2x 8-ch	
	eTimer	2x 8-ch	
	Watchdog Timer	3	
Analog	ADC	3	
	ACMP	4	
	Analog Input Channel	40	32
Power Management	External Power Supply	3.3V	
	PMU	Integrated DCDC	
	Temperature Sensor	Integrated Temperature Sensor	
	Voltage Detector	Integrated HV/LV Detector	
RTC		32KHz RTC	

¹ RAM size includes TCM on CPU core.

Mechanical Information

This section provides mechanical information about the MCU.

3.1 Package Outline

Package details of E3206 and E3205 are as below:

Part Name	Package Type	Package Size
E3205	LQFP144	20.00x20.00x1.60 mm
E3206	LQFP176	24.00x24.00x1.60 mm

The following figures provide the mechanical information for the package LQFP176.

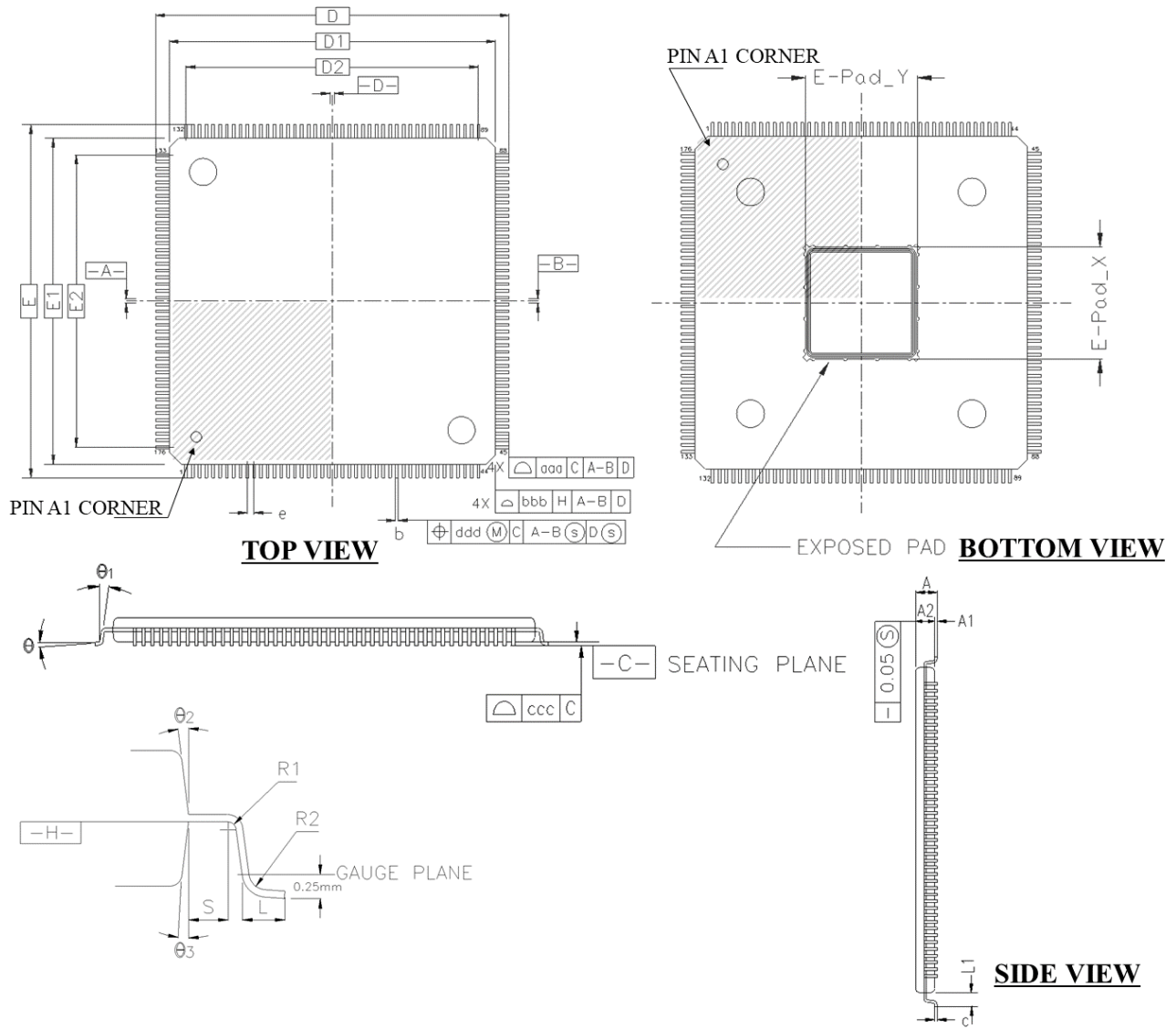


Fig. 3.1: Package Outline: LQFP176

POD NO. AND REV. : SD-P0002-A

PACKAGE TYPE : EP-LQFP (EXPOSED PAD LQFP)

PACKAGE SIZE : 24.00x24.00x1.60mm

UNIT: mm

SYMBOL	COMMON DIMENSIONS			SYMBOL	COMMON DIMENSIONS		
EP-LQFP	MIN.	NOR.	MAX.	EP-LQFP	MIN.	NOR.	MAX.
A	---	---	1.60	R1	0.08	---	---
A1	0.05	---	0.15	R2	0.08	---	0.20
A2	1.35	1.40	1.45	θ	0°	3.5°	7°
D	26.00		BSC	$\theta 1$	0°	---	---
D1	24.00		BSC	$\theta 2$	11°	12°	13°
D2	21.50		REF.	$\theta 3$	11°	12°	13°
E	26.00		BSC	TOLERANCES OF FORM AND POSITION			
E1	24.00		BSC				
E2	21.50		REF.	aaa	0.20		
b	0.17	0.20	0.27	bbb	0.20		
c	0.09	0.13	0.20	ccc	0.08		
e	0.50		BSC	ddd	0.08		
E-Pad_X	8.10		REF.	N	176		
E-Pad_Y	8.10		REF.				
L	0.45	0.60	0.75				
L1	1.00		REF.				
S	0.20	---	---				

Fig. 3.2: Package Dimension: LQFP176

The following figures provide the mechanical information for the package LQFP144.

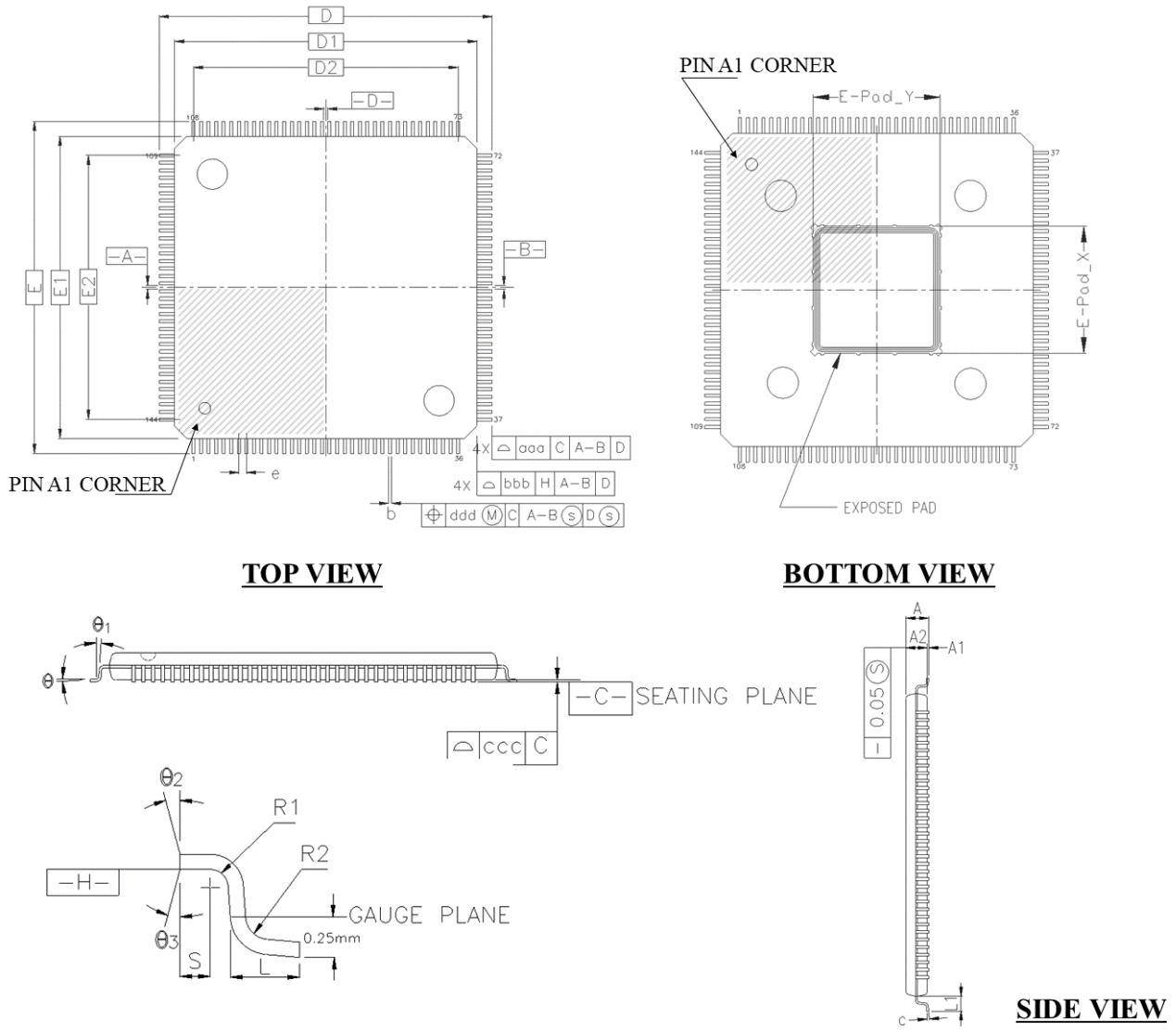


Fig. 3.3: Package Outline: LQFP144

POD NO. AND REV. : SD-P0003-A

PACKAGE TYPE : EP-LQFP (EXPOSED PAD LQFP)

PACKAGE SIZE : 20.00x20.00x1.60mm

UNIT: mm

SYMBOL	COMMON DIMENSIONS			SYMBOL	COMMON DIMENSIONS		
	EP-LQFP	MIN.	NOR.		MAX.	EP-LQFP	MIN.
A	---	---	1.60	R1	0.08	---	---
A1	0.05	---	0.15	R2	0.08	---	0.20
A2	1.35	1.40	1.45	θ	0°	3.5°	7°
D	22.00		BSC	$\theta 1$	0°	---	---
D1	20.00		BSC	$\theta 2$	11°	12°	13°
D2	17.50		REF.	$\theta 3$	11°	12°	13°
E	22.00		BSC	TOLERANCES OF FORM AND POSITION			
E1	20.00		BSC				
E2	17.50		REF.	aaa	0.20		
b	0.17	0.20	0.27	bbb	0.20		
c	0.09	0.13	0.20	ccc	0.08		
e	0.50		BSC	ddd	0.08		
E-Pad_X	8.10		REF.	N	144		
E-Pad_Y	8.10		REF.				
L	0.45	0.60	0.75				
L1	1.00		REF.				
S	0.20	---	---				

Fig. 3.4: Package Dimension: LQFP144

3.2 Tray Dimension

The following figures provide the tray dimensions.

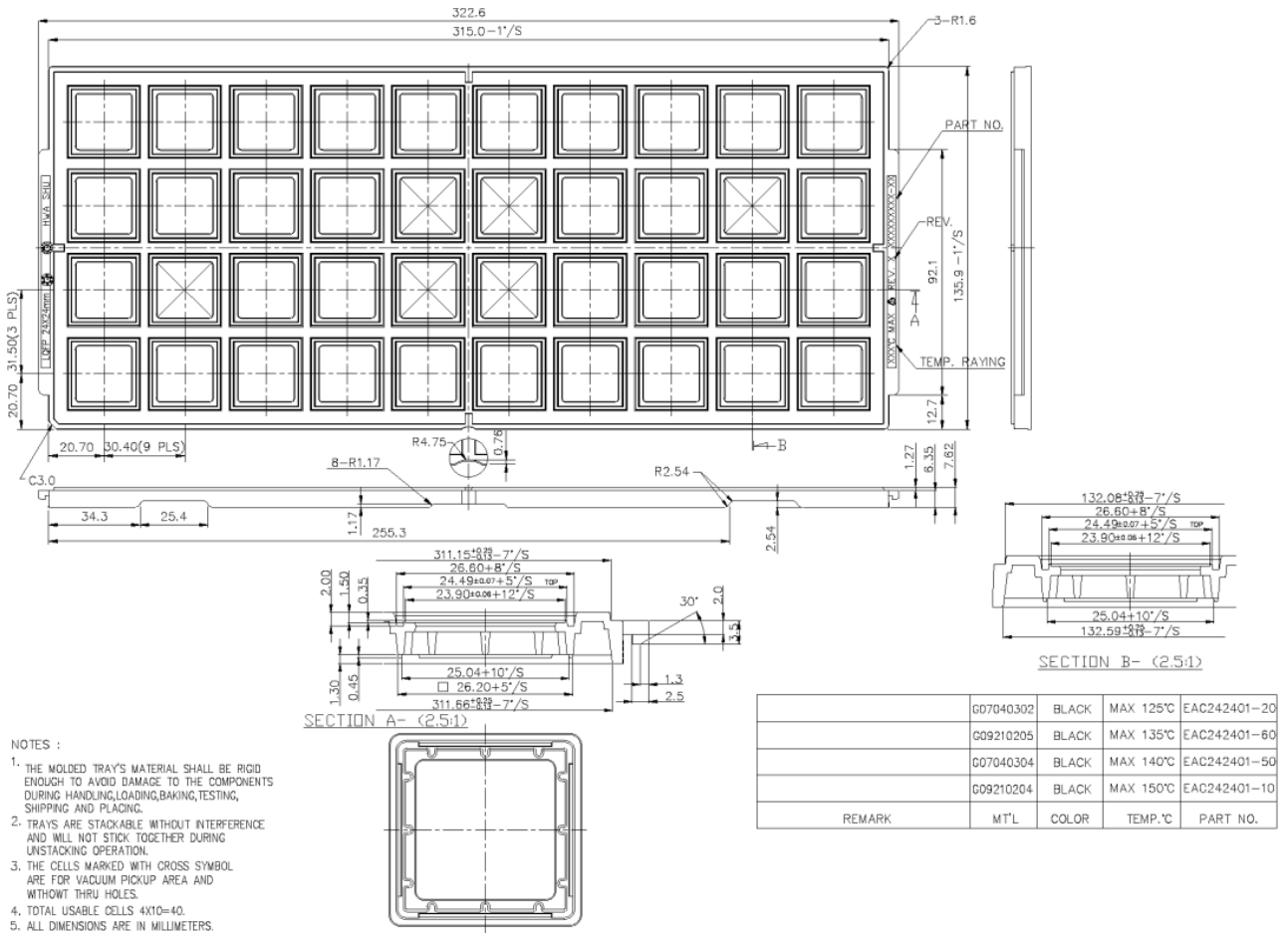


Fig. 3.5: Tray Dimension (1)

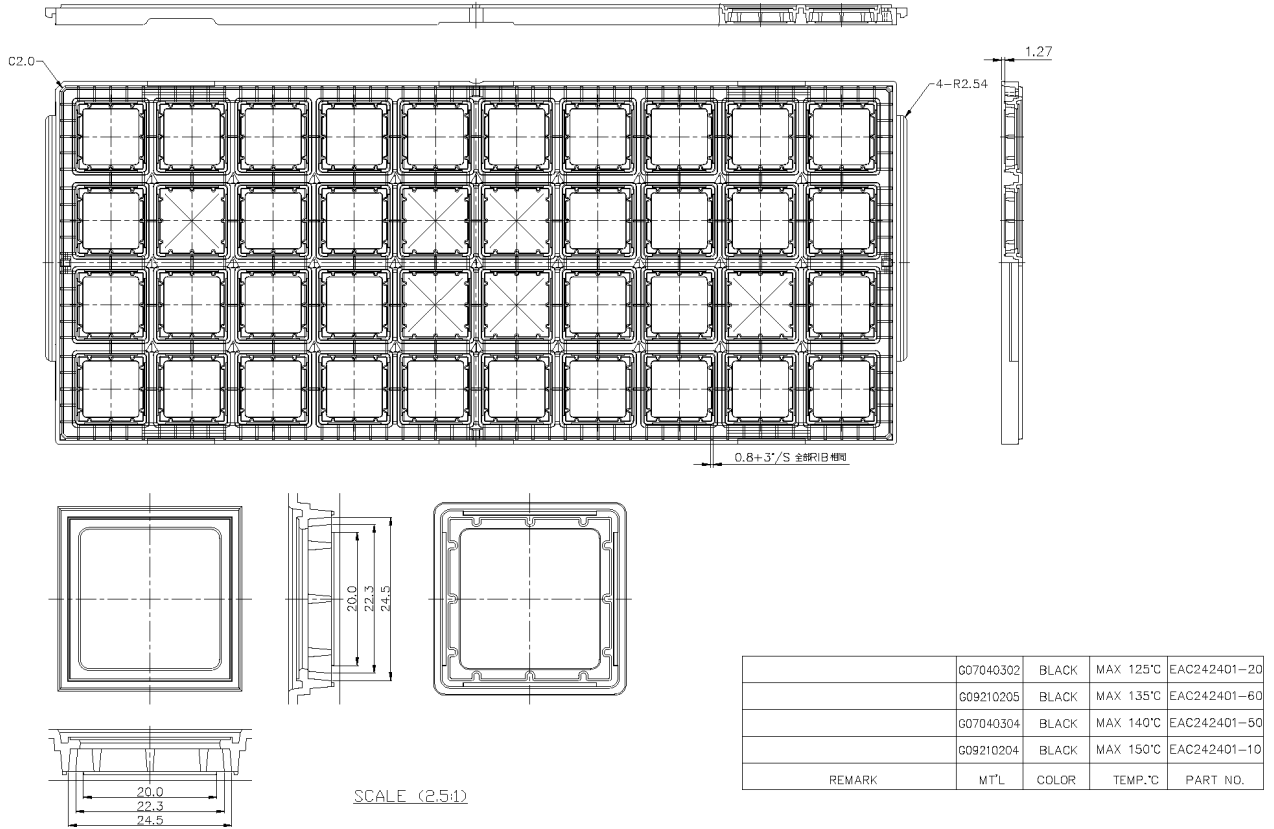


Fig. 3.6: Tray Dimension (2)

单击下面可查看定价，库存，交付和生命周期等信息

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