深圳市海天雄电子有限公司
Shenzhen Haitianxiong Electronic Co., Ltd.

# CES-IMX6UL-CORE（PIN）

# Product Manual

ARM SOC Module

Rev. V1.0

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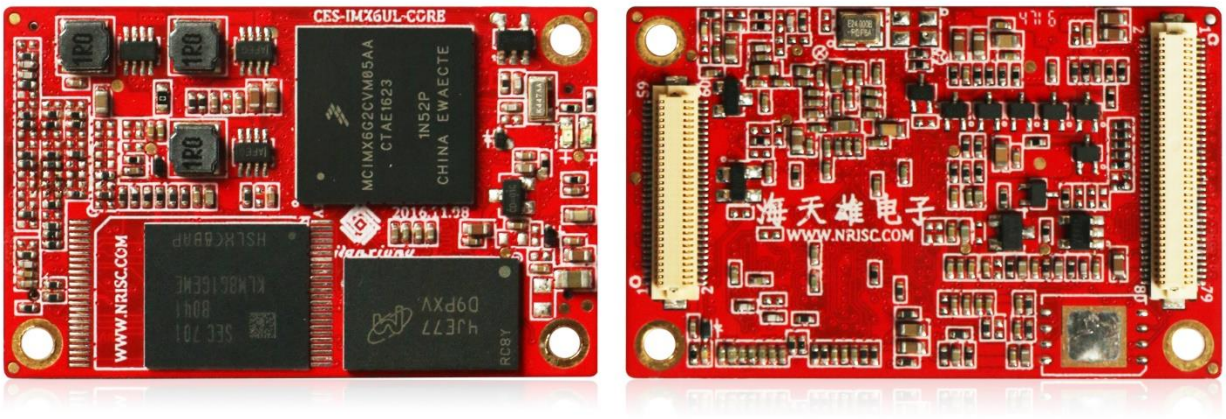


## Introduction

CES-IMX6UL-CORE, adopt NXP ARM Cortex-A7 i.MX6UL processor, onboard 512MB DDR3 memory and 8GB high-speed eMMC4.5 storage, 32KB data cache, 32KB instruction cache, 128KB L2 cache. CES-IMX6UL-CORE provides rich functional interfaces, support LVDS and RGB 2* display control interface, 2* Ethernet interface, 3 *USB 2.0 HOST, 1* USB OTG, 3* UART serial port, 1* I2C1 interface, 1 *RS485 interface, 2 *CAN bus interface, 1 *CMOS CAMERA interface. CES-IMX6UL-CORE is suitable for different product applications, including automotive telematic, human-machine interface, IOT gateway, home energy management system, intelligent energy information concentrator, intelligent industrial control system, electronic POS equipment, portable medical equipment, printer and 2D scanner.

## Feature

- Adopt NXP ARM Cortex-A7 i.MX6UL Processor
- 32KB data cache, 32KB instruction cache, 128KB L2 cache
- Onboard 512MB DDR3 and 8GB flash eMMC4.5
- Support LVDS and RGB Display Control Interfaces
- Support Linux4.1

# Specification

| | |
|---|---|
| **Processor** | |
| CPU | Use NXP ARM Cortex-A7 i.MX6UL processor |
| Cache | 32KB/32KB Cache and 128KB L2 Cache |
| **Storage** | |
| DDR | 512MB DDR3 |
| FLASH | 8GB eMMC, optional 16GB/32GB/64GB |
| **B2B Connectors** | |
| Connectors | Precision Hirose 0.5mm double row connector, 1* 2 * 30PIN connector and 1* 2 * 40PIN connector |
| Pin Numbers | 140PIN |
| Pin Function | POWER、GPIO、ADC、RGB、I2C、UART、SPI、USB、CAN、PWM、RESET 等 |
| **B2B Fixed Hole** | |
| Fixed Hole | 3 |
| **Operation System** | |
| System | Linux4.1 |
| **Environment** | |
| Work Environment | Temperature: -10~60℃，Humidity: 5%~90%RH@31℃, no condensation |
| Storage Environment | Temperature: -40~85℃， Humidity: 5%-95%RH@39℃, no condensation |
| **Size** | |
| Size(mm) | 42*58mm |

## Pin Definition

| J1 | | | | |
|---|---|---|---|---|
| PIN NO. | Signal Name | CPU Ball Number | CPU Ball Name | Remark |
| 1 | CAN1_TX /UART3_CTS | H15 | UART3_CTS_B | CAN/UART |
| 2 | UART3_TXD | H17 | UART3_TX_DATA | UART |
| 3 | CAN1_RX /UART3_RTS | G14 | UART3_RTS_B | CAN/UART |
| 4 | UART3_RXD | H16 | UART3_RX_DATA | UART |
| 5 | UART5_TXD | F17 | UART5_TX_DATA | UART |
| 6 | UART4_TXD | G17 | UART4_TX_DATA | UART |
| 7 | UART5_RXD | G13 | UART5_RX_DATA | UART |
| 8 | UART4_RXD | G16 | UART4_RX_DATA | UART |
| 9 | GND | | | Power Ground |
| 10 | GND | | | Power Ground |
| 11 | ENET2_TX_CLK/ECSPI4_MISO | D17 | ENET2_RX_DATA1 | LAN/SPI |
| 12 | ENET1_TX_CLK/ | F14 | ENET2_TX_DATA1 | LAN |
| 13 | ENET2_RXER/ECSPI4_SS0 | D16 | ENET2_RX_EN | LAN/SPI |
| 14 | ENET1_RXER | D15 | ENET1_RX_ER | LAN |
| 15 | ENET2_RXD0 | C17 | ENET2_RX_DATA0 | LAN |
| 16 | ENET1_RXD0 | F16 | ENET1_RX_DATA0 | LAN |
| 17 | ENET2_RXD1 | C16 | ENET2_RX_DATA1 | LAN |
| 18 | ENET1_RXD1 | E17 | ENET1_RX_DATA1 | LAN |
| 19 | ENET2_CRS_DV | B17 | ENET2_RX_EN | LAN |
| 20 | ENET1_CRS_DV | E16 | ENET1_RX_EN | LAN |
| 21 | ENET2_TXEN/ ECSPI4_MOSI | B15 | ENET2_TX_EN | LAN/SPI |
| 22 | ENET1_TXEN | F15 | ENET1_TX_EN | LAN |
| 23 | ENET2_TXD1/ ECSPI4_SCLK | A16 | ENET2_TX_DATA1 | LAN/SPI |
| 24 | ENET1_TXD1 | E14 | ENET1_TX_DATA1 | LAN |
| 25 | ENET2_TXD0 | A15 | ENET2_TX_DATA0 | LAN |
| 26 | ENET1_TXD0 | E15 | ENET1_TX_DATA0 | LAN |
| 27 | LCD_DATA23 | B16 | LCD_DATA23 | LCD |
| 28 | GND | | | Power Ground |
| 29 | LCD_DATA21 | B14 | LCD_DATA21 | LCD |
| 30 | LCD_DATA22 | A14 | LCD_DATA22 | LCD |

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|---|---|---|---|---|
| 31 | LCD_DATA19 | D14 | LCD_DATA19 | LCD |
| 32 | LCD_DATA20 | C14 | LCD_DATA20 | LCD |
| 33 | LCD_DATA17 | B13 | LCD_DATA17 | LCD |
| 34 | LCD_DATA18 | A13 | LCD_DATA18 | LCD |
| 35 | LCD_DATA15 | D13 | LCD_DATA15 | LCD |
| 36 | LCD_DATA16 | C13 | LCD_DATA16 | LCD |
| 37 | LCD_DATA13 | B12 | LCD_DATA13 | LCD |
| 38 | LCD_DATA14 | A12 | LCD_DATA14 | LCD |
| 39 | LCD_DATA11 | D12 | LCD_DATA11 | LCD |
| 40 | LCD_DATA12 | C12 | LCD_DATA12 | LCD |
| 41 | LCD_DATA9 | A11 | LCD_DATA9 | LCD |
| 42 | LCD_DATA10 | E12 | LCD_DATA10 | LCD |
| 43 | LCD_DATA7 | D11 | LCD_DATA7 | LCD |
| 44 | LCD_DATA8 | B11 | LCD_DATA8 | LCD |
| 45 | LCD_DATA5 | B10 | LCD_DATA5 | LCD |
| 46 | LCD_DATA6 | A10 | LCD_DATA6 | LCD |
| 47 | LCD_DATA3 | D10 | LCD_DATA3 | LCD |
| 48 | LCD_DATA4 | C10 | LCD_DATA4 | LCD |
| 49 | LCD_DATA1 | A9 | LCD_DATA1 | LCD |
| 50 | LCD_DATA2 | E10 | LCD_DATA2 | LCD |
| 51 | LCD_RST | E9 | LCD_RESET | LCD |
| 52 | LCD_DATA0 | B9 | LCD_DATA0 | LCD |
| 53 | LCD_PCLK | A8 | LCD_CLK | LCD |
| 54 | LCD_HSYNC | D9 | LCD_HSYNC | LCD |
| 55 | LCD_DE | B8 | LCD_ENABLE | LCD |
| 56 | LCD_VSYNC | C9 | LCD_VSYNC | LCD |
| 57 | GND | | | Power Ground |
| 58 | GND | | | Power Ground |
| 59 | SD1_DATA1 | B2 | SD1_DATA1 | SD/MMC |
| 60 | SD1_DATA0 | B3 | SD1_DATA0 | SD/MMC |
| 61 | SD1_DATA3 | A2 | SD1_DATA3 | SD/MMC |
| 62 | SD1_DATA2 | B1 | SD1_DATA2 | SD/MMC |
| 63 | SD1_CLK | C1 | SD1_CLK | SD/MMC |
| 64 | SD1_CMD | C2 | SD1_CMD | SD/MMC |
| 65 | GND | | | Power Ground |
| 66 | GND | | | Power Ground |
| 67 | CSI_MCLK/I2C1_SDA | F5 | CSI_MCLK | CAMERA/I2C |
| 68 | CSI_PIXCLK/I2C1_SCL | E5 | CSI_PIXCLK | CAMERA/I2C |
| 69 | CSI_DATA6/GPIO4_27 | D2 | CSI_DATA06 | CAMERA/GPIO |

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|---|---|---|---|---|
| 70 | CSI_DATA7/GPIO4_28 | D1 | CSI_DATA07 | CAMERA/GPIO |
| 71 | CSI_DATA4 /GPIO4_25 | D4 | CSI_DATA04 | CAMERA/GPIO |
| 72 | CSI_DATA5/GPIO4_26 | D3 | CSI_DATA05 | CAMERA/GPIO |
| 73 | CSI_DATA2 /GPIO4_23 | E2 | CSI_DATA02 | CAMERA/GPIO |
| 74 | CSI_DATA3 /GPIO4_24 | E1 | CSI_DATA03 | CAMERA/GPIO |
| 75 | CSI_DATA0 /GPIO4_21 | E4 | CSI_DATA00 | CAMERA/GPIO |
| 76 | CSI_DATA1 /GPIO4_22 | E3 | CSI_DATA01 | CAMERA/GPIO |
| 77 | CSI_HSYNC /I2C2_SCL | F3 | CSI_HSYNC | CAMERA/I2C |
| 78 | CSI_VSYNC /I2C2_SDA | F2 | CSI_VSYNC | CAMERA/I2C |
| 79 | GND | | | Power Ground |
| 80 | NVCC_CSI | | | DC Power（input） |

| J2 | | | | |
|---|---|---|---|---|
| PIN NO. | Signal Name | CPU Ball Number | CPU Ball Name | Remark |
| 1 | GND | | | Power Ground |
| 2 | DCDC_5V | | | DC 5V Power（input） |
| 3 | GND | | | Power Ground |
| 4 | DCDC_5V | | | DC 5V Power（input） |
| 5 | GND | | | Power Ground |
| 6 | VDD_COIN_3V | | | RTC Power（input） |
| 7 | PMIC_ON_REQ | T9 | SNVS_PMIC_ON_REQ | PMIC Control pin (output) |
| 8 | PMIC_STBY_REQ | U9 | CCM_PMIC_STBY_REQ | PMIC Control pin (output) |
| 9 | BOOT_MODE1/ SHIFT_SHCP | U10 | BOOT_MODE1 | BOOT MODE/GPIO |
| 10 | NC | | | NC |
| 11 | BOOT_MODE0/ SHIFT_SDI | T10 | BOOT_MODE0 | BOOT MODE/GPIO |
| 12 | ONOFF | R8 | ONOFF | ONOFF |
| 13 | USB_OTG2_VBUS | U12 | USB_OTG2_VBUS | USB |
| 14 | POR_B | P8 | POR_B | POR_B |
| 15 | USB_OTG2_DP | U13 | USB_OTG2_DP | USB |

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|---|---|---|---|---|
| 16 | USB_OTG1_VBUS | T12 | USB_OTG1_VBUS | USB |
| 17 | USB_OTG2_DN | T13 | USB_OTG2_DN | USB |
| 18 | USB_OTG1_DP | U15 | USB_OTG1_DP | USB |
| 19 | GND | | | Power Ground |
| 20 | USB_OTG1_DN | T15 | USB_OTG1_DN | USB |
| 21 | CLK1_N | P16 | CCM_CLK1_N | LVDS |
| 22 | GND | | | Power Ground |
| 23 | CLK1_P | P17 | CCM_CLK1_P | LVDS |
| 24 | NUSB_OTG_CHD | U16 | USB_OTG1_CHD_B | USB |
| 25 | GND | | | Power Ground |
| 26 | GND | | | Power Ground |
| 27 | TEMPSENSOR_ALERT/SNVS_TAMPER8 | N9 | GPIO5_IO08/SNVS_TAMPER8 | GPIO |
| 28 | ENET2_nRST/SNVS_TAMPER9 | R6 | GPIO5_IO09/SNVS_TAMPER9 | GPIO |
| 29 | ENET2_nINT/SNVS_TAMPER6 | N11 | GPIO5_IO06/SNVS_TAMPER6 | INT/GPIO |
| 30 | ENET1_nRST/SNVS_TAMPER7 | N10 | GPIO5_IO07/SNVS_TAMPER7 | GPIO |
| 31 | AUD_INT/SNVS_TAMPER4 | P9 | GPIO5_IO04/SNVS_TAMPER4 | INT/GPIO |
| 32 | ENET1_nINT/SNVS_TAMPER5 | N8 | GPIO5_IO05/SNVS_TAMPER5 | INT/GPIO |
| 33 | SPK_CTL/SNVS_TAMPER2 | P11 | GPIO5_IO02/SNVS_TAMPER2 | GPIO |
| 34 | SNVS_TAMPER3 | P10 | GPIO5_IO03/SNVS_TAMPER3 | GPIO |
| 35 | PWM_Buzzer/SNVS_TAMPER0 | R10 | GPIO5_IO00/SNVS_TAMPER0 | GPIO |
| 36 | TOUCH_INT/SNVS_TAMPER1 | R9 | GPIO5_IO01/SNVS_TAMPER1 | INT/GPIO |
| 37 | SAI2_TXD/JTAG_NTRST | N14 | JTAG_TRST_B | AUDIO/JTAG |
| 38 | JTAG_MOD | P15 | JTAG_MOD | JTAG |
| 39 | SAI2_MCLK/JTAG_TMS | P14 | JTAG_TMS | AUDIO/JTAG |
| 40 | SAI2_RXD /JTAG_TCK | M14 | JTAG_TCK | AUDIO/JTAG |
| 41 | SAI2_SYNC /JTAG_TDO | N15 | JTAG_TDO | AUDIO/JTAG |
| 42 | SAI2_BCLK /JTAG_TDI | N16 | JTAG_TDI | AUDIO/JTAG |

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|---|---|---|---|---|
| 43 | BLT_PWM/GPIO_8 | N17 | GPIO1_IO08 | PWM/GPIO |
| 44 | JSETUART1/GPIO_9 | M15 | GPIO1_IO09 | GPIO |
| 45 | ENET_MDIO/GPIO_6 | K17 | GPIO1_IO06 | LAN/GPIO |
| 46 | ENET_MDC/GPIO_7 | L16 | GPIO1_IO07 | LAN/GPIO |
| 47 | ADC1_IN4/GPIO_4 | M16 | GPIO1_IO04 | ADC/GPIO |
| 48 | GPIO_5 | M17 | GPIO1_IO05 | GPIO |
| 49 | ADC1_IN2/GPIO_2 | L14 | GPIO1_IO02 | ADC/GPIO |
| 50 | ADC1_IN3/GPIO_3 | L17 | GPIO1_IO03 | ADC/GPIO |
| 51 | USB_OTG1_ID /GPIO_0 | K13 | GPIO1_IO00 | USB/GPIO |
| 52 | ADC1_IN1/GPIO_1 | L15 | GPIO1_IO01 | ADC/GPIO |
| 53 | UART2_TXD | J17 | UART2_TX_DATA | UART |
| 54 | UART1_TXD | K14 | UART1_TX_DATA | UART |
| 55 | UART2_RXD | J16 | UART2_RX_DATA | UART |
| 56 | UART1_RXD | K16 | UART2_RX_DATA | UART |
| 57 | CAN2_TX /UART2_CTS | J15 | UART2_CTS_B | CAN/UART |
| 58 | RS485_R/D /UART1_CTS | K15 | UART1_CTS_B | RS485/UART |
| 59 | CAN2_RX /UART2_RTS | H14 | UART2_RTS_B | CAN/UART |
| 60 | SD1_CD /UART1_RTS | J14 | UART1_RTS_B | SD/UART |

# Service Support

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# Statement

The information in this manual is for reference only and is subject to change without notice.

For more product information, visit www.nrisc.com

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