FEATURE

AI7933CLD is a highly integrated IoT module that features an ARM® Cortex-M33 application processor, a low power 1x1 802.11a/b/g/n/ac/ax dual-band Wi-Fi subsystem, a Bluetooth v5.2 subsystem, an Audio subsystem with Cadence Tensilica HiFi4 processor and a Power Management Unit (PMU).

The Wi-Fi subsystem and a Bluetooth v5.2 subsystem offer feature-rich wireless connectivity at high standards, and deliver reliable, cost-effective throughput from an extended distance.

The AI7933CLD is designed to support standard based features in the areas of security, quality of service and international regulations, giving end users the greatest performance any time and in any circumstance.

The AI7933CLD is based on ARM® Cortex-M33 with floating point microcontroller (MCU) including SRAM/ROM memory. The module also supports rich peripheral interfaces, including USB2.0, SDIO, SPI Master, SPI Slave, I2C, I2S, IR input, UART, AUXADC, PWM, and GPIOs.

Platform

- ARM® Cortex-M33 MCU with FPU with up to 300MHz clock speed
- Embedded 1MB SRAM and 8MB PSRAM
- Embedded 16MB serial flash with eXecute In Place (XIP) and on-the-fly AES
- Supports hardware crypto engines including AES, DES/3DES, SHA, ECC, TRNG for network security
- Supports up to 46 general purpose IOs, which are multiplexed with SDIO, SPI, UART, I2C, I2S, AUXADC, PWM and GPIO interfaces
- Supports 12 DMA channels
- Support USB 2.0 OTG
- Support RTC Mode

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Wi-Fi

- IEEE 802.11 1T1R a/b/g/n/ac/ax 5GHz and 2.4GHz bands
- Supports 1x1 20MHz bandwidth, MCS0~8(256-QAM) in 2.4G/5GHz band
- Support uplink MU-OFDMA TX and downlink MU-OFDMA RX
- Support Tx LDPC (Low-density parity check)
- Support Rx STBC
- Wi-Fi security WFA WPA/WPA2/WPA3 personal
- QOS supports of WFA WMM
- Support CSI (Channel Signal Information)

Bluetooth

- BT5.2 LE Isochronous Channel
- BT5.1 Advertising Enhancement
- BT5.0 2M_PHY / Long Range / Advertising Extension / SAM / CS#2 / High Duty Cycle Non-Connectable ADV
- BT4.2 Link Layer Privacy / LE Secure Connection / LE Data Packet Length Extension / Link Layer Extended Scanner Filter Policies
- BT4.1 Link Layer Topology / Secure Connection
- BT4.0 and below BR/EDR
- BR/EDR and BLE dual mode concurrent
- Scatternet support: Up to 7 piconets simultaneously with background inquiry/page scan
- Up to 4 BT link + 8 BLE link
- Support SCO and eSCO link with re-transmission
- Packet loss concealment
- Channel quality driven data rate adaptation
- Channel assessment and WB RSSI for AFH
- Supports Bluetooth/Wi-Fi coexistence

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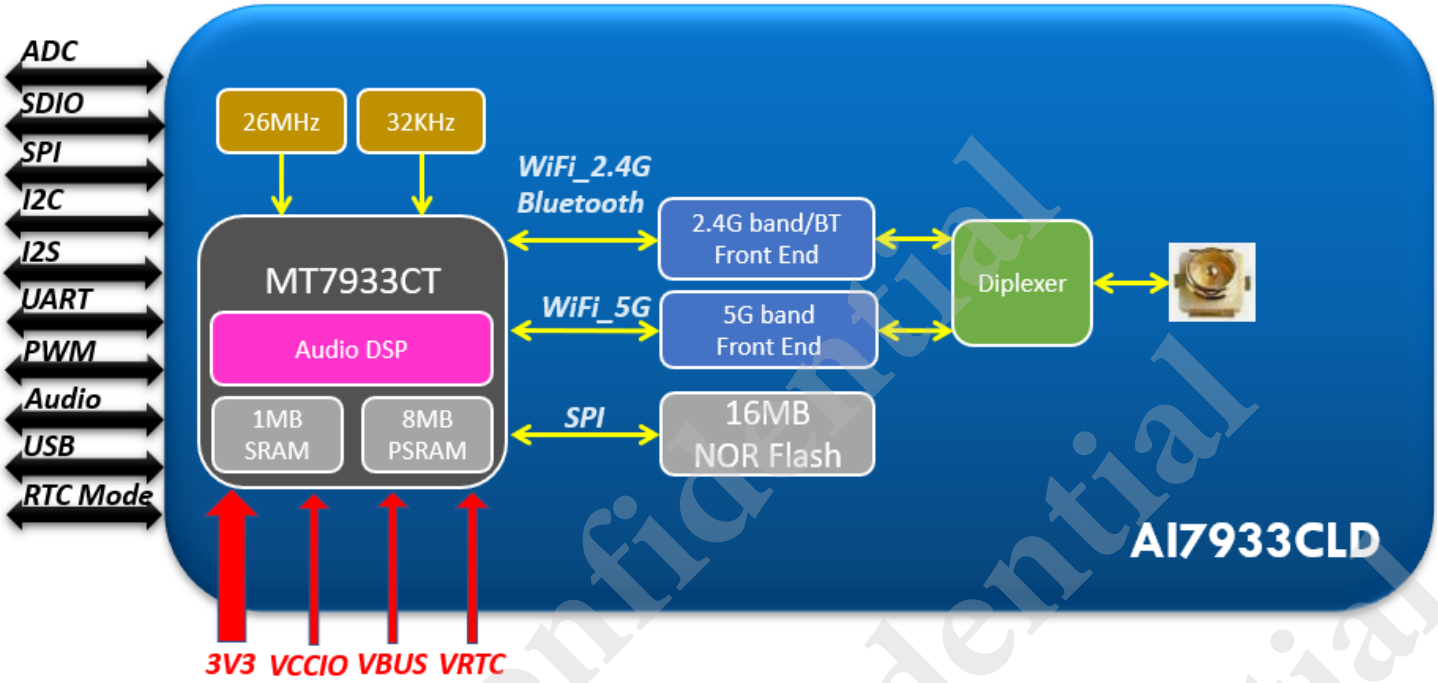
AI7933CLD Block Diagram



Technical Specification

Chipset	MT7933CT (Wi-Fi 6 + BT5.2 + Hi-Fi 4 DSP)
Core	ARM Cortex-M33 with FPU
FPU Clock Speed	300MHz
SRAM	1MB
PSRAM for Applications	8MB
NOR Flash	16MB
Package	LGA type module with shielding cover I-PEX connector on module
Dimension	32 mm x 32 mm x 2.7 mm (Typ.)

Recommended Operation Conditions

Operating Voltage	■ 3.3V
Temperature	■ Operating：-40℃ ~ +85℃ ■ Storage：-40℃ ~ +105℃
Humidity	■ Operating：10 ~ 95% (Non-Condensing) ■ Storage：5 ~ 95% (Non-Condensing)

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PIN Assignment			
Pin No.	**Pin Name**	**Pin No.**	**Pin Name**
A1	GPIO_R_5	C15	GPIO_T_11 (= KPCOL_2)
A2	GPIO_R_4	D1	AU_AMP_VOLN
A3	GPIO_R_0	D2	GPIO_T_5
A4	GPIO_R_8	D14	GND
A5	GPIO_R_9	D15	GPIO_T_10 (= KPCOL_1)
A6	GND	E1	AU_AMP_VOLP
A7	GPIO_R_7	E2	GPIO_T_0
A8	GPIO_T_9 (= KPCOL_0)	E14	GPIO_T_6 (= KPROW_0)
A9	GND	E15	GND
A10	GND	F1	AU_AMP_VORP
A11	GND	F2	GPIO_T_2
A12	NC	F14	GPIO_T_8 (= KPROW_2)
A13	GND	F15	USB_VBUS_IC
A14	GND	G1	AU_AMP_VORN
A15	GND	G2	GPIO_T_3
B1	GPIO_R_3	G14	GND
B2	GPIO_R_2	G15	GND
B3	GPIO_R_1	H1	GND
B4	GPIO_R_10	H2	GPIO_T_1
B5	BASE_3V3_R	H14	GND
B6	GPIO_R_11	H15	A_USB_DM
B7	GPIO_R_6	J1	AU0_VIN0_P
B8	GPIO_T_7 (= KPROW_1)	J2	GND
B9	RTC_3V3	J14	GND
B10	GND	J15	A_USB_DP
B11	BASE_3V3_L	K1	AU0_VIN0_N
B12	BASE_3V3_L	K2	PMU_EN_RTC
B13	GND	K14	IC_VCCIO
B14	GND	K15	GND
B15	GND	L1	AU0_VIN1_N
C1	GND	L2	RTC_EVT
C2	GPIO_T_4	L14	GND
C14	GND	L15	SDIO_CMD

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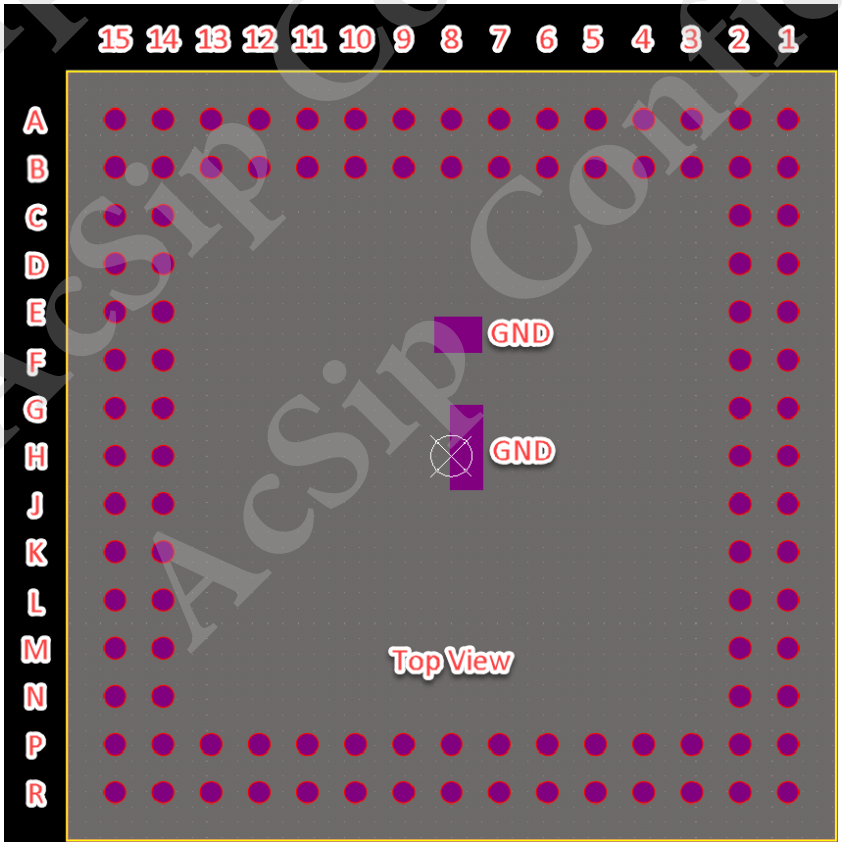
Pin No.	Pin Name	Pin No.	Pin Name
M1	AU0_VIN1_P	P12	GPIO_B_1
M2	GND	P13	SDIO_DAT2
M14	KEY_SYSRST_B	P14	SDIO_DAT3
M15	SDIO_DAT1	P15	SDIO_DAT0
N1	GND	R1	GND
N2	PHYLDO_OUT	R2	AU1_VIN0_P
N14	VCCIO_L	R3	AU1_VIN0_N
N15	SDIO_CLK	R4	GND
P1	MIC_BIAS0	R5	GPIO_B_13
P2	GND	R6	GPIO_B_15
P3	GND	R7	GPIO_B_16
P4	BASE_3V3_B	R8	GPIO_B_10
P5	BASE_3V3_B	R9	GPIO_B_6
P6	GND	R10	GPIO_B_2
P7	GPIO_B_14	R11	GPIO_B_8
P8	GPIO_B_12	R12	GPIO_B_5
P9	GPIO_B_9	R13	GPIO_B_3
P10	GPIO_B_11	R14	GPIO_B_0
P11	GPIO_B_7	R15	GND



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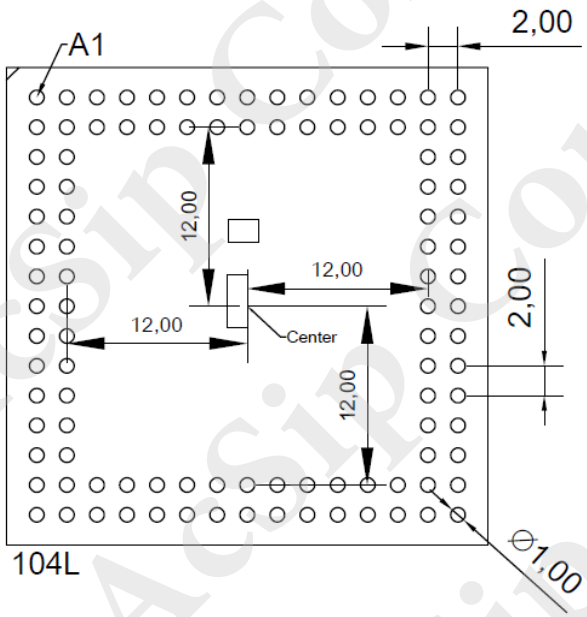
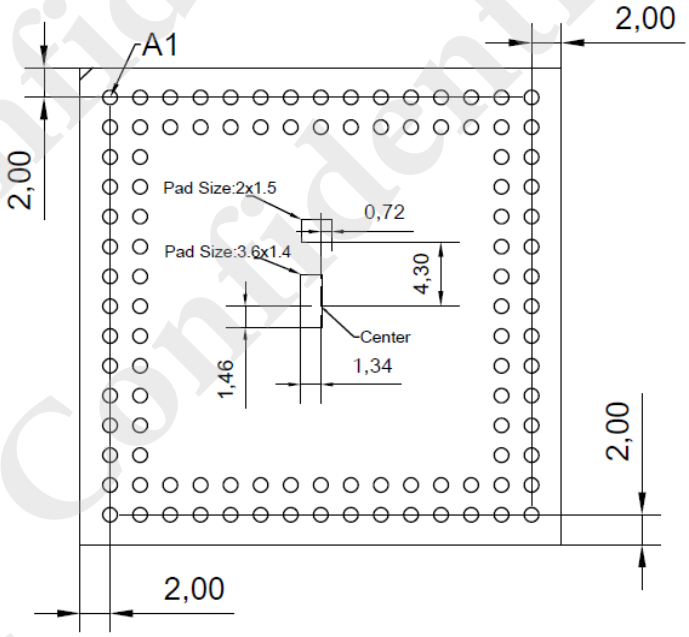
Mechanical Dimension

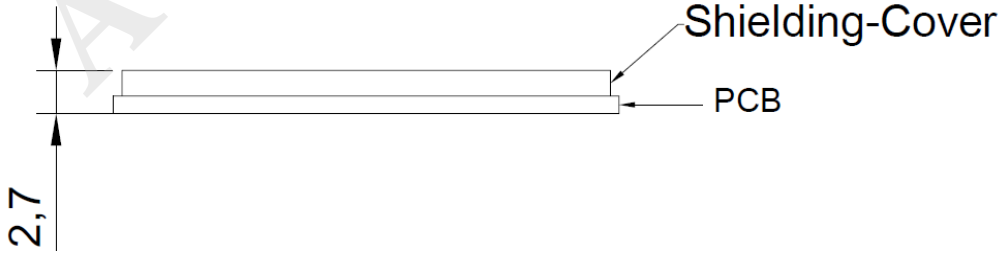
Unit: mm (Typ.)

Top View





Bottom View



Side View

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