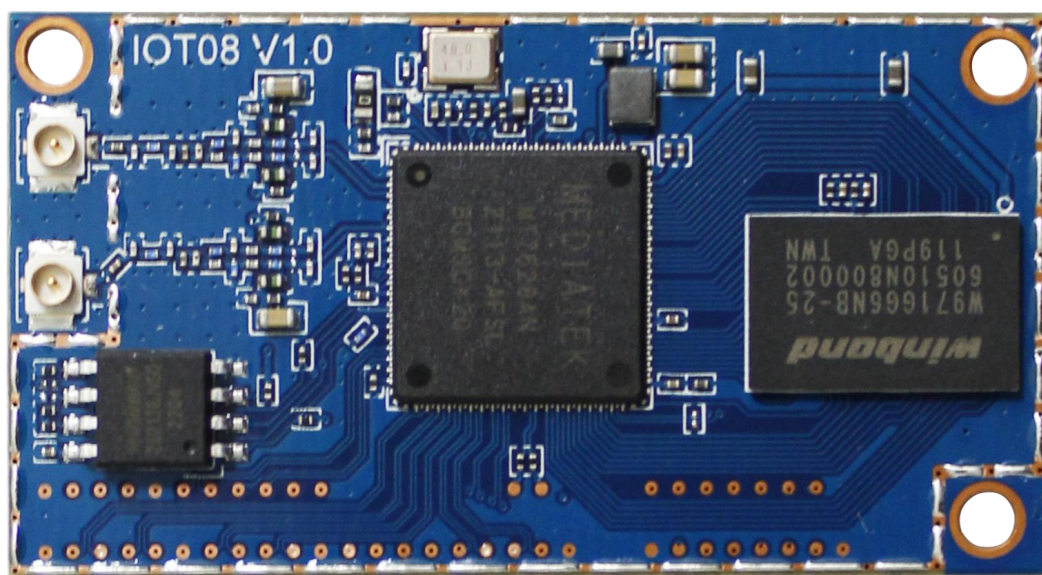


Com IoT08

802.11b/g/n 无线路由核心模组

产品规格书



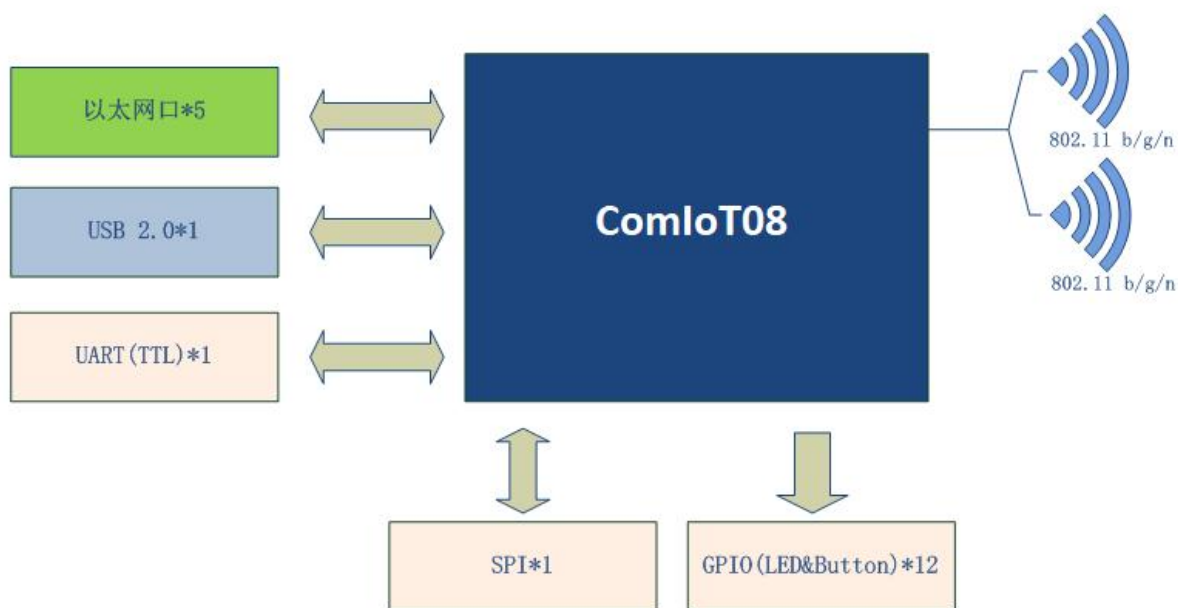
- 低功耗
- 可开放开发资料
- 支持 Mesh
- 300M 无线传输速率
- 支持 OpenWRT 方案

1. 产品介绍

Com IoT08模块是由深圳星恒讯科技有限公司研发并生产的一个无线路由核心模组。它是一个高集成的小型 802.11 b/g/n Wi-Fi网关模组。Com IoT08模组将Wi-Fi功能，网口，串口，USB及路由系统集成在一个低成本的封装中，只需要进行简单的几个外部电路就可以把模块完美应用起来。

该模块基于MTK的MT7628方案，集成了 802.11n 2x2 MAC/BB/radio 以及内部 PA 和 LNA。它支持 802.11n, 20 MHz 和 40 MHz 信道分别高达 150 Mbps 和 300 Mbps, 以及 IEEE 802.11b/g 数据速率。模块支持OpenWRT的操作系统，同时支持AP模式和客户端模式，包含各类应用软件，以减少客户的开发和设计工作。

硬件架构如下图所示：



硬件框图设计

1.1 协议规范

模块支持以下协议规范:

- IEEE Std. 802.11b
- IEEE Std. 802.11g
- IEEE Std. 802.11n

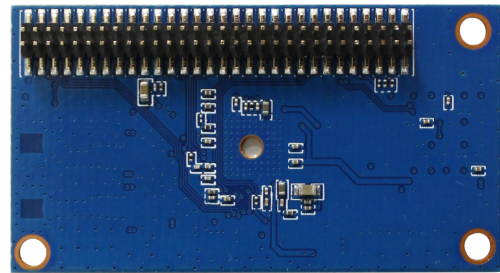
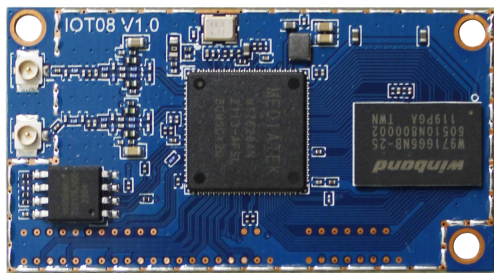
1.2 模块信息

| | |
|---------|--|
| 主芯片 | MTK MT7628DAN (可支持 MT7628NN) |
| Flash | 8MByte (最大可支持 32MByte) |
| 内存 | 64MByte (最大可支持 128MByte) |
| 射频频率 | 2.40~2.4835GHz |
| WiFi 协议 | 802.11b/g/n(2X2) |
| 调制解调 | 11b: DBPSK, DQPSK and CCK and DSSS 11g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: MCS0~15 OFDM |
| 理论带宽 | 11b:1, 2, 5.5 and 11Mbps 11g:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~5, up to 300Mbps |
| 排针 | 60pin CONN, 1.27mm pitch, |
| 主要接口 | Ethernet, UART, USB |
| PCB | 4层 |
| 尺寸/重量 | 49mm(W)*26mm(L)/15g |
| 天线 | 标准 ipex |
| 工作温度 | -30°C to +70°C |

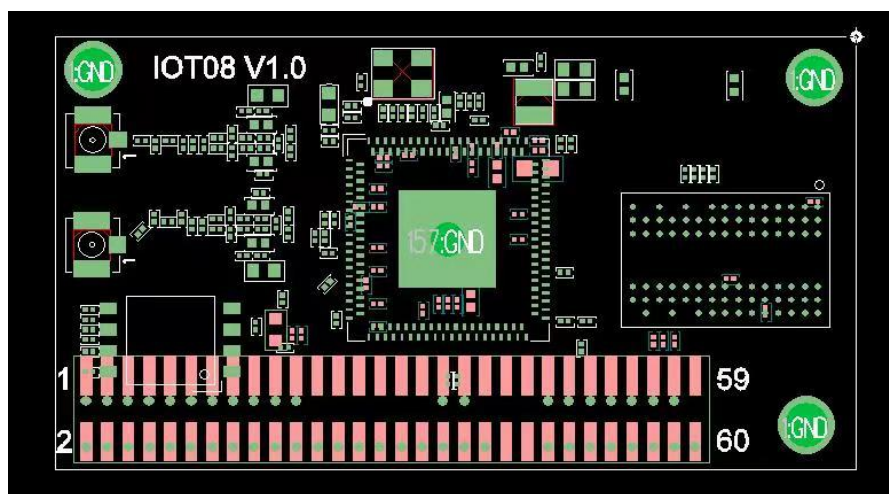
| | |
|-----------|-----------------|
| 存储温度 | -40°C to +150°C |
| 工作电压 | 3.3V +/-10% |
| 平均功耗 | 1.5W |
| GPIO 输出电压 | 2.5 V +/-10% |

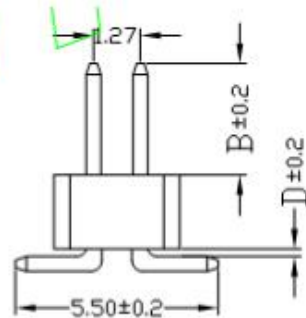
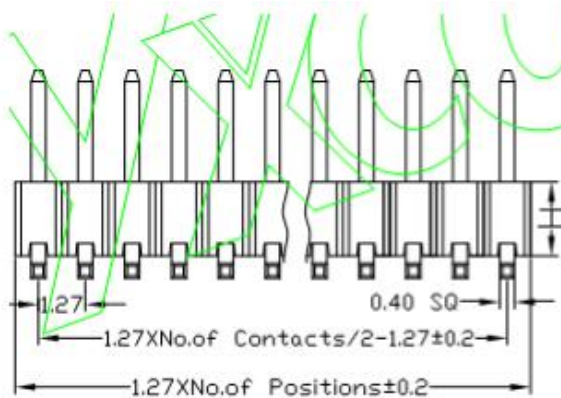
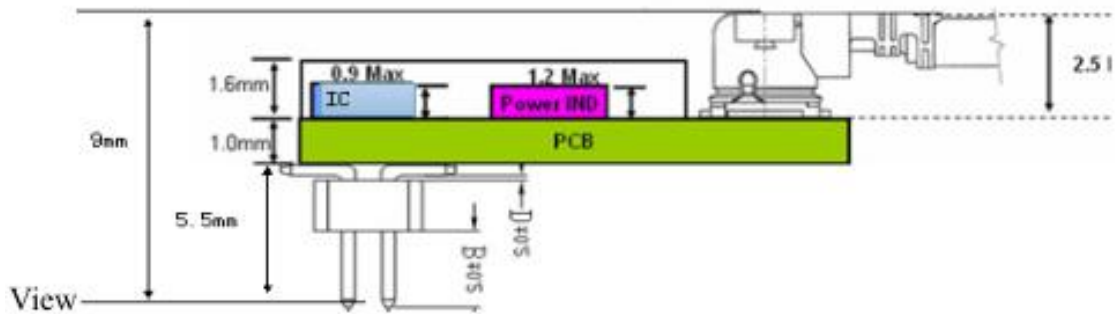
2. 结构尺寸

2.1 外观



2.2 管脚





| Dimension antitheses list | | | | | | | |
|---------------------------|---|-----|-----|-----|-----|-----|----------|
| ITEM | D | B | B | | H | | |
| Standard | 0 | 1.2 | 1.8 | 3.0 | 4.0 | 1.6 | 2.0 2.54 |
| ... | | | | | | | |

2.3 引脚定义

| 引脚 | 名称 | 描述 |
|----|----------------------|---------------|
| 1 | GND | GROUND |
| 2 | GND | GROUND |
| 3 | LED_LINK_0(GPIO#11) | ETH_PORT0_LED |
| 4 | LAN_PORT1_RX+ | Ethernet port |
| 5 | LED_LINK_1 (GPIO#14) | ETH_PORT1_LED |
| 6 | LAN_PORT1_RX- | Ethernet port |
| 7 | LED_LINK_2 (GPIO#15) | ETH_PORT2_LED |
| 8 | LAN_PORT1_TX+ | Ethernet port |
| 9 | GND | GROUND |
| 10 | LAN_PORT1_TX- | Ethernet port |

| | | |
|----|----------------|---|
| 11 | LAN_PORT0_TX+ | Ethernet port |
| 12 | GND | GROUND |
| 13 | LAN_PORT0_TX- | Ethernet port |
| 14 | LAN_PORT2_TX+ | Ethernet port |
| 15 | LAN_PORT0_RX+ | Ethernet port |
| 16 | LAN_PORT2_TX- | Ethernet port |
| 17 | LAN_PORT0_RX- | Ethernet port |
| 18 | LAN_PORT2_RX+ | Ethernet port |
| 19 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V |
| 20 | LAN_PORT2_RX- | Ethernet port |
| 21 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V |
| 22 | GND | GROUND |
| 23 | I2S_CLK_GPIO#3 | 可配置成I2S或GPIO |
| 24 | WAN_PORT4_RX+ | Ethernet port |
| 25 | I2S_DO_GPIO#1 | 可配置成I2S或GPIO |
| 26 | WAN_PORT4_RX- | Ethernet port |
| 27 | I2S_DI_GPIO#0 | 可配置成I2S或GPIO |
| 28 | WAN_PORT4_TX+ | Ethernet port |
| 29 | I2S_WS_GPIO#2 | 可配置成I2S或GPIO |
| 30 | WAN_PORT4_TX- | Ethernet port |
| 31 | UART1_RXD | UART1,TTL,Serial data in |
| 32 | LAN_PORT3_RX+ | Ethernet port |
| 33 | UART1_TXD | UART1,TTL,Serial data Out |
| 34 | LAN_PORT3_RX- | Ethernet port |
| 35 | USB_DP | USB signal, |
| 36 | LAN_PORT3_TX+ | Ethernet port |

| | | |
|----|---------------------|--|
| 37 | USB_DM | USB signal |
| 38 | LAN_PORT3_TX- | Ethernet port |
| 39 | SYSTEM_LED(GPIO#11) | SYSTEM LED |
| 40 | GND | GROUND |
| 41 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V |
| 42 | NC | NC |
| 43 | Reset_GPIO#36 | external power on reset , it has an internal 10 K pull up resistance,the external pull low effective. |
| 44 | NC | NC |
| 45 | WPS_RST_PBC_GPIO#38 | KEY_INPUT to start WPS function, it has an internal 10 K pull-up resistance,the external pull low effective. |
| 46 | GND | GROUND |
| 47 | GND | GROUND |
| 48 | SPI_MISO | SPI serial interface |
| 49 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V |
| 50 | SPI_CLK | SPI serial interface |
| 51 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V |
| 52 | SPI_MOSI | SPI serial interface |
| 53 | LED_LINK4_GPIO#39 | ETH_PORT4_LED |
| 54 | LED_LINK3_GPIO#40 | ETH_PORT3_LED |
| 55 | SPI_CS1 | |
| 56 | WLAN_LED (GPIO#44) | Wireless LED |
| 57 | UART0_RX | UART1,TTL,Serial data in |
| 58 | UART0_TX | UART1,TTL,Serial data out |
| 59 | GND | GROUND |
| 60 | GND | GROUND |

3. 射频规格

3.1 802.11b 模式

| 项目 | 规格 | | | | |
|--|-------------------|------|------|------|--|
| 协议 | IEEE802.11b | | | | |
| 模式 | DSSS / CCK | | | | |
| 频段 | CH1 to CH13 | | | | |
| 速率 | 1, 2, 5.5, 11Mbps | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |
| 2. Power Levels(Calibrated) | | | | | |
| 1) 16dBm Target | 18 | 20 | 22 | dBm | |
| 3. Spectrum Mask @ target power | | | | | |
| 1) $f_c \pm 11\text{MHz}$ to $\pm 22\text{MHz}$ | - | - | -30 | dBr | |
| 2) $f_c > \pm 22\text{MHz}$ | - | - | -50 | dBr | |
| 4. Frequency Error | -20 | 0 | +20 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |
| 5. Minimum Input Level Sensitivity | | | | | |
| 1) 1Mbps ($\text{FER} \leq 8\%$) | - | -92 | -94 | dBm | |
| 2) 2Mbps ($\text{FER} \leq 8\%$) | - | -90 | -92 | dBm | |
| 3) 5.5Mbps ($\text{FER} \leq 8\%$) | - | -88 | -90 | dBm | |
| 4) 11Mbps ($\text{FER} \leq 8\%$) | - | -87 | -89 | dBm | |
| 6. Maximum Input Level ($\text{FER} \leq 8\%$) | -20 | -10 | - | dBm | |

3.2 802.11g 模式

| 项目 | 规格 |
|----|-------------|
| 协议 | IEEE802.11g |
| 模式 | OFDM |

| 频段 | CH1 to CH13 | | | |
|--|----------------------------------|------|------|------|
| 速率 | 6, 9, 12, 18, 24, 36, 48, 54Mbps | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit |
| 2. Power Levels | | | | |
| 1) 16dBm Target @6Mbps | 16 | 18 | 20 | dBm |
| 2) 14dBm Target @54Mbps | 15 | 17 | 19 | dBm |
| 3. Spectrum Mask @ target power | | | | |
| 1) at fc +/- 11MHz | - | - | -20 | dBr |
| 2) at fc +/- 20MHz | - | - | -28 | dBr |
| 3) at fc > +/-30MHz | - | - | -40 | dBr |
| 4. Constellation Error(EVM)@ target power | | | | |
| 1) 6Mbps | - | -25 | -5 | dB |
| 2) 9Mbps | - | -28 | -8 | dB |
| 3) 12Mbps | - | -28 | -10 | dB |
| 4) 18Mbps | - | -28 | -13 | dB |
| 5) 24Mbps | - | -31 | -16 | dB |
| 6) 36Mbps | - | -31 | -19 | dB |
| 7) 48Mbps | - | -32 | -22 | dB |
| 8) 54Mbps | - | -32 | -25 | dB |
| 5. Frequency Error | -20 | 0 | +20 | ppm |
| RX Characteristics | Min. | Typ. | Max. | Unit |
| 6. Minimum Input Level Sensitivity | | | | |
| 1) 6Mbps (PER ≤ 10%) | - | -88 | -90 | dBm |
| 2) 9Mbps (PER ≤ 10%) | - | -86 | -88 | dBm |
| 3) 12Mbps (PER ≤ 10%) | - | -84 | -86 | dBm |
| 4) 18Mbps (PER ≤ 10%) | - | -82 | -84 | dBm |
| 5) 24Mbps (PER ≤ 10%) | - | -80 | -82 | dBm |
| 6) 36Mbps (PER ≤ 10%) | - | -77 | -79 | dBm |
| 7) 48Mbps (PER ≤ 10%) | - | -75 | -77 | dBm |

| | | | | | |
|---|-----|-----|-----|-----|--|
| 8) 54Mbps (PER \leq 10%) | - | -73 | -75 | dBm | |
| 7. Maximum Input Level (PER \leq 10%) | -20 | -10 | - | dBm | |

3.3 802.11n HT20 模式

| 项目 | 规格 | | | | |
|---|---------------------------|------|------|------|--|
| 协议 | IEEE802.11n HT20 @ 2.4GHz | | | | |
| 模式 | OFDM | | | | |
| 频段 | CH1 to CH13 | | | | |
| 速率(MCS) | MCS0~15 | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |
| 2. Power Levels | | | | | |
| 1) 17dBm Target@MCS0 | 16 | 18 | 20 | dBm | |
| 2) 13dBm Target@MCS7 | 14 | 16 | 18 | dBm | |
| 3. Spectrum Mask @target power | | | | | |
| 1) at fc +/- 11MHz | - | - | -20 | dBr | |
| 2) at fc +/- 20MHz | - | - | -28 | dBr | |
| 3) at fc > +/-30MHz | - | - | -45 | dBr | |
| 4. Constellation Error(EVM)@ target power | | | | | |
| 1) MCS0 | - | -25 | -5 | dB | |
| 2) MCS1 | - | -25 | -10 | dB | |
| 3) MCS2 | - | -28 | -13 | dB | |
| 4) MCS3 | - | -28 | -16 | dB | |
| 5) MCS4 | - | -31 | -19 | dB | |
| 6) MCS5 | - | -31 | -22 | dB | |
| 7) MCS6 | - | -32 | -25 | dB | |
| 8) MCS7 | - | -32 | -28 | dB | |
| 5. Frequency Error | -20 | 0 | +20 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |

| | | | | | |
|---|-----|-----|-----|-----|--|
| 6. Minimum Input Level Sensitivity | | | | | |
| 1) MCS0 (PER \leq 10%) | - | -83 | -85 | dBm | |
| 2) MCS1 (PER \leq 10%) | - | -80 | -82 | dBm | |
| 3) MCS2 (PER \leq 10%) | - | -79 | -81 | dBm | |
| 4) MCS3 (PER \leq 10%) | - | -77 | -79 | dBm | |
| 5) MCS4 (PER \leq 10%) | - | -75 | -77 | dBm | |
| 6) MCS5 (PER \leq 10%) | - | -73 | -75 | dBm | |
| 7) MCS6 (PER \leq 10%) | - | -71 | -73 | dBm | |
| 8) MCS7 (PER \leq 10%) | - | -69 | -71 | dBm | |
| 7. Maximum Input Level (PER \leq 10%) | -20 | -10 | - | dBm | |

3.4 802.11n HT40 模式

| 项目 | 规格 | | | | |
|--|---------------------------|------|------|------|--|
| 协议 | IEEE802.11n HT40 @ 2.4GHz | | | | |
| 模式 | OFDM | | | | |
| 频段 | CH3 to CH11 | | | | |
| 速率(MCS) | MCS0~15 | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |
| 2. Power Levels (Calibrated) | | | | | |
| 1) 16dBm Target @MCS0 | 15 | 17 | 19 | dBm | |
| 2) 13dBm Target@MCS7 | 13 | 15 | 17 | dBm | |
| 3. Spectrum Mask @14dBm | | | | | |
| 1) at fc +/- 22MHz | - | - | -20 | dBr | |
| 2) at fc +/- 40MHz | - | - | -28 | dBr | |
| 3) at fc > +/-60MHz | - | - | -45 | dBr | |
| 4. Constellation Error(EVM)@target power | | | | | |
| 1) MCS0 | - | -25 | -5 | dB | |

| | | | | | |
|---|-------------|-------------|-------------|-------------|--|
| 2) MCS1 | - | -25 | -10 | dB | |
| 3) MCS2 | - | -28 | -13 | dB | |
| 4) MCS3 | - | -28 | -16 | dB | |
| 5) MCS4 | - | -30 | -19 | dB | |
| 6) MCS5 | - | -30 | -22 | dB | |
| 7) MCS6 | - | -32 | -25 | dB | |
| 8) MCS7 | - | -32 | -28 | dB | |
| 5. Frequency Error | -20 | 0 | +20 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |
| 6. Minimum Input Level Sensitivity | | | | | |
| 1) MCS0 (PER \leq 10%) | - | -82 | -84 | dBm | |
| 2) MCS1 (PER \leq 10%) | - | -79 | -81 | dBm | |
| 3) MCS2 (PER \leq 10%) | - | -77 | -79 | dBm | |
| 4) MCS3 (PER \leq 10%) | - | -75 | -77 | dBm | |
| 5) MCS4 (PER \leq 10%) | - | -72 | -74 | dBm | |
| 6) MCS5 (PER \leq 10%) | - | -70 | -72 | dBm | |
| 7) MCS6 (PER \leq 10%) | - | -68 | -70 | dBm | |
| 8) MCS7 (PER \leq 10%) | - | -66 | -68 | dBm | |
| 7. Maximum Input Level (PER \leq 10%) | -20 | -10 | - | dBm | |

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