

Specifications for

# WisDuo LoRa Module

## RAK4260

Version V1.1 | September 2019



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## 1 Overview

### 1.1 Introduction

The RAK4260 module is based on Microchip's ATSAMR34J18B. It is a SiP device integrating a 32-bit ARM Cortex -M0+ MCU with a LoRa Transceiver in a 6x6 mm compact BGA package.

The SAMR chip provides a number of highly configurable peripherals (configurable as I2C/SPI/UART interfaces). There are 12-bit ADC in addition to the aforementioned.

### 1.2 Additional Features

- Industry's lowest power LoRa® SiP device
- 32-bit Arm® Cortex M0+ MCU and LoRa Transceiver
- Small form factor: 6x6 mm compact BGA package
- 256KB Flash and 40KB RAM accommodates application code and stack
- Most cost and size effective solution, eliminating need for external MCU
- Fully supported 862 to 1020 MHz frequency coverage
- Receive Sensitivity down to -148 dBm
- Maximum Transmit Power up to 20 dBm
- Low RX current of 17mA (typical)
- LoRa Technology, (G)FSK, (G)MSK



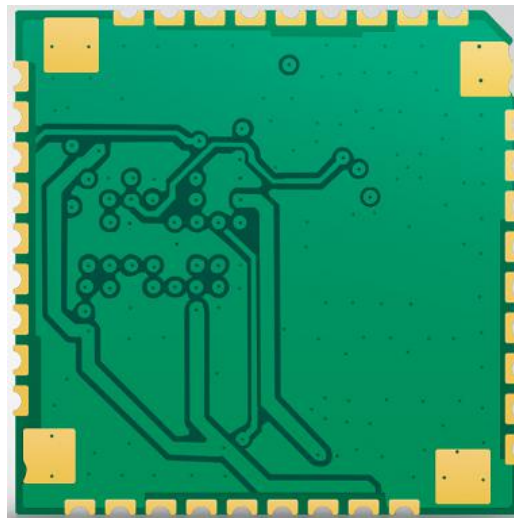
## 2 RAK4260 LoRa Module

### 2.1 Board

Figure 1 and Figure 2 show the top and bottom view of the RAK4260.



*Figure 1 | RAK4260 Top View*



*Figure 2 | RAK4260 Bottom View*

## 2.2 Functional Block Diagram

Block diagram below shows the interfaces of RAK4260.

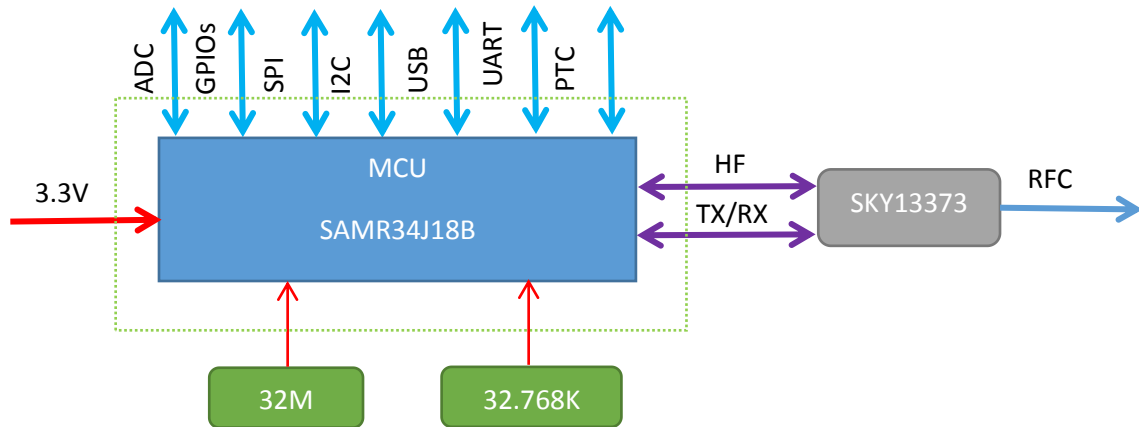


Figure 3 | RAK4260 Interfaces

## 2.3 Operating Frequencies

The ARAK4260 LoRa Module supports LoRaWAN frequency included in Table 1 below:

Region	Frequency ( MHz )
Europe	EU868
North America	US915
Australia	AU915
Asia	AS923
Korea	KR920
Indian	IN865

Table 1 | RAK4260 Interfaces

## 2.4 Power Consumption

Item	Power Consumption	Condition
OUTPUT POWER 20dB(MAX)	126.3mA	PA_BOOST V=3.3V
OUTPUT POWER 17dB	95.6mA(typical)	PA_BOOST V=3.3V
OUTPUT POWER 14dB	33.1mA	RFO_HF V=3.3V
Receive mode	13.6mA	
Sleep mode	1uA	



**Table 2 | RAK4260 Power Consumption**

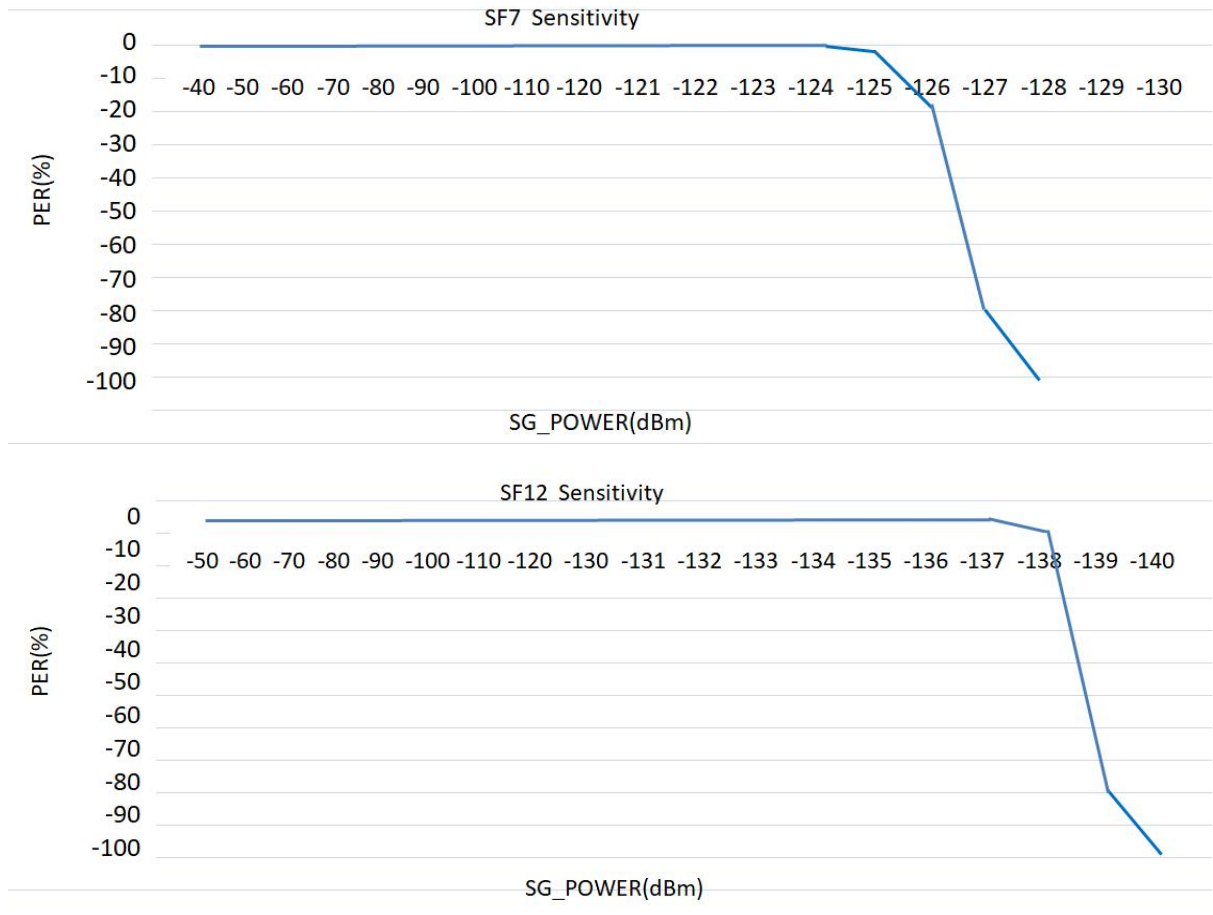
## 2.5 Sensitivity Level

The following chart shows the receiving sensitivity of RAK4260 at 868Mhz.

Receive Power@Ipex	-40	-50	-60	-70	-80	-90	-100	-110	-120	-121	-122	-123	-124	-125	-126	-127	-128	-129	-130
SF7 PER(%)	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	-20	-78	-100	-100	-100

Receive Power@Ipex	-50	-60	-70	-80	-90	-100	-110	-120	-130	-131	-132	-133	-134	-135	-136	-137	-138	-139	-140
SF12 PER(%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0	-7	-80	-140



**Figure 4 | Sensitivity Level**



## 2.6 Board Pinout

PIN	NAME	I/O	Description
1	GND	-	Ground
2	RFC	-	RF port
3	GND	-	Ground
4	PA27	I/O	EIC/GCLK
5	PA06	I/O	EIC/RSTC/ADC/PTC/OPAMP/TC/CCL/SERCOM0
6	PA07	I/O	EIC/RSTC/ADC/OPAMP/TC/CCL/SERCOM0
7	PA08	I/O	ADC/PTC/TC/CCL/SERCOM0/SERCOM2
8	PA09	I/O	EIC/ADC/PTC/TC/CCL/SERCOM0/SERCOM2
9	PB22	I/O	SERCOM5/TC/GCLK/CCL
10	GND	-	Ground
11	VCC3V3	-	3V3 power in
12	VCC3V3	-	3V3 power in
13	PA17_SCL	I/O	EIC/PTC/TC/GCLK/CCL/SERCOM1/SERCOM3
14	PA16_SDA	I/O	EIC/PTC/TC/GCLK/CCL/SERCOM1/SERCOM3
15	PA15	I/O	EIC/TC/GCLK/SERCOM2/SERCOM4
16	PA14	I/O	EIC/TC/GCLK/SERCOM2/SERCOM4
17	GND	-	Ground
18	GND	-	Ground
19	PA18_UART3_TX	I/O	EIC/PTC/TC/AC/CCL/SERCOM1/SERCOM3
20	PA19_UART3_RX	I/O	EIC/PTC/TC/AC/CCL/SERCOM1/SERCOM3
21	NC	-	NO Connect
22	PA23_MOSI	I/O	EIC/PTC/TC/AC/CCL/GCLK/SERCOM3/SERCOM5
23	PA22_SS	I/O	EIC/PTC/TC/AC/CCL/SERCOM3/SERCOM5
24	PB23_SCK	I/O	EIC/SERCOM5/TC/GCLK/CCL
25	PB02_MISO	I/O	EIC/ADC/SERCOM5/TC/SUPC/CCL
26	PA25_USB_P	I/O	EIC/SERCOM3/SERCOM5/TC/USB_DP/CCL
27	PA24_USB_N	I/O	EIC/SERCOM3/SERCOM5/TC/USB_DM/CCL
28	GND	-	Ground
29	RST	-	MCU reset
30	PA30_SWCLK	I/O	SWDCLK
31	PA31_SWDIO	I/O	SWDIO
32	PA04_UART1_TX	I/O	EIC/RSTC/VREFB/ADC/AC/OPAMP/TC/CCL/SERCOM0
33	PA05_UART1_RX	I/O	EIC/RSTC/ADC/AC/OPAMP/TC/CCL/SERCOM0
34	NC	-	NO Connect
35	GND	-	Ground
36	GND	-	Ground
37	GND	-	Ground
38	GND	-	Ground
39	GND	-	Ground
40	GND	-	Ground

**Table 3 | RAK4260 Pinout**

- Pins supporting I2C: PA08, PA09, PA16\_SDA, PA17\_SCL, PA22\_SS, PA23\_MOSI.

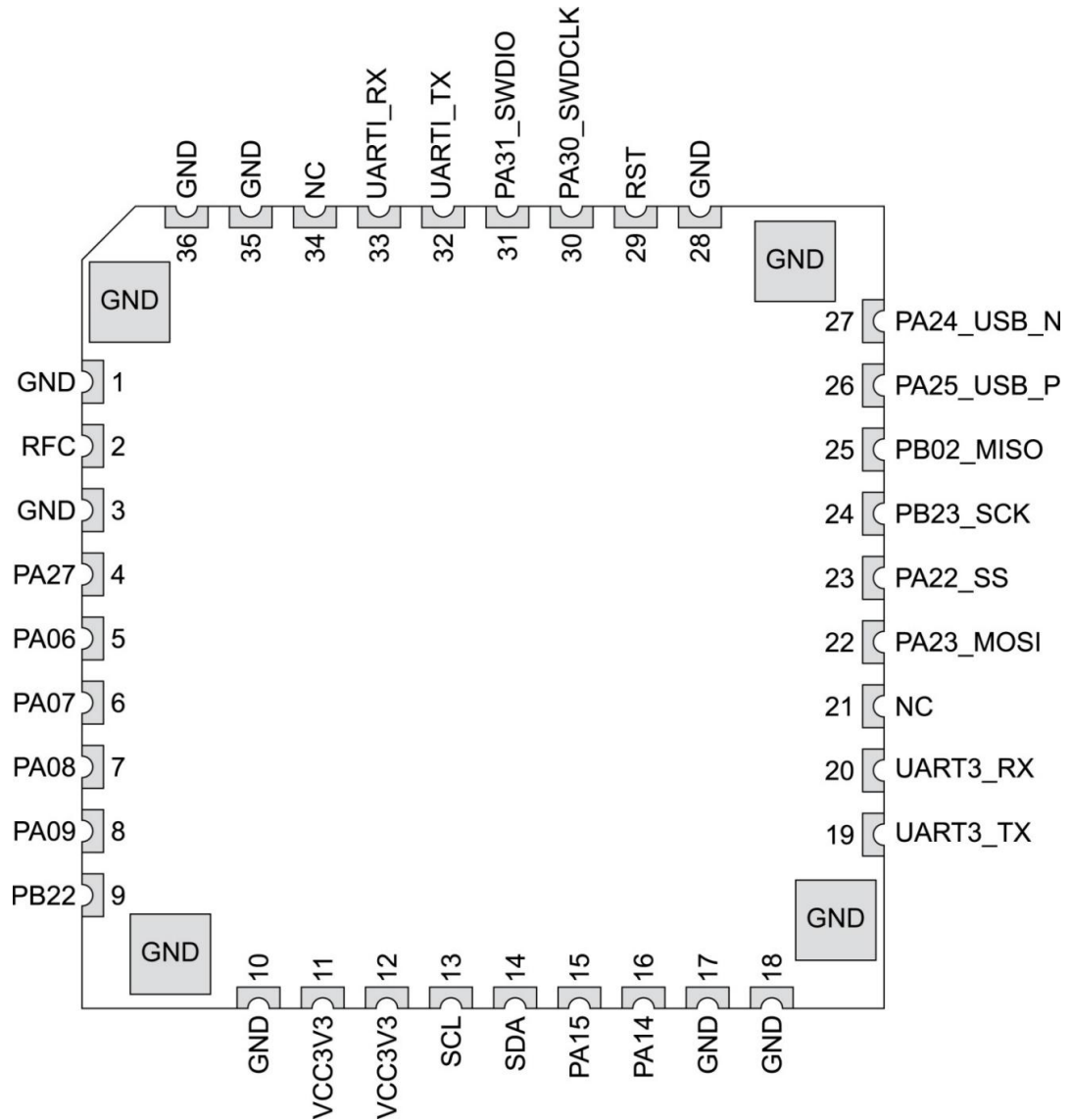


Figure 5 | RAK4260 Board Pinout





## 2.7 Typical Application Circuit

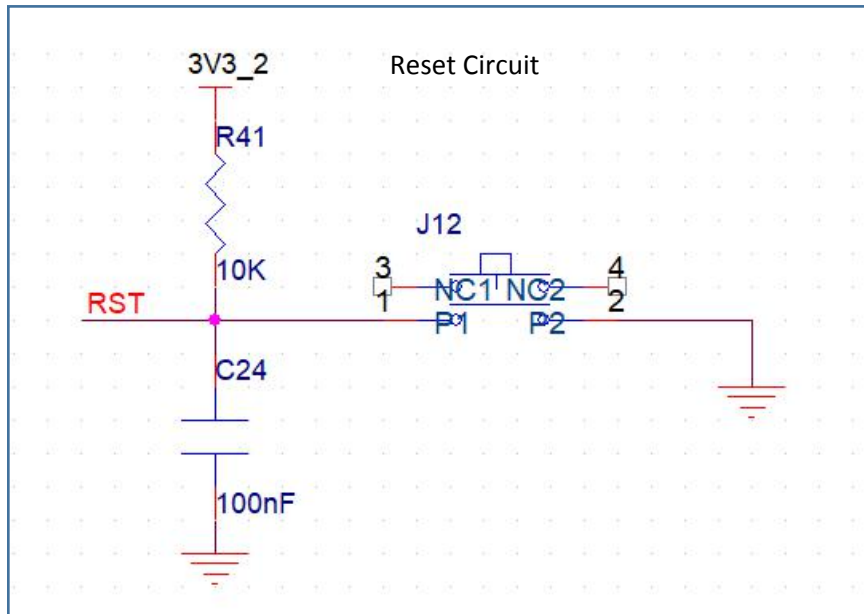
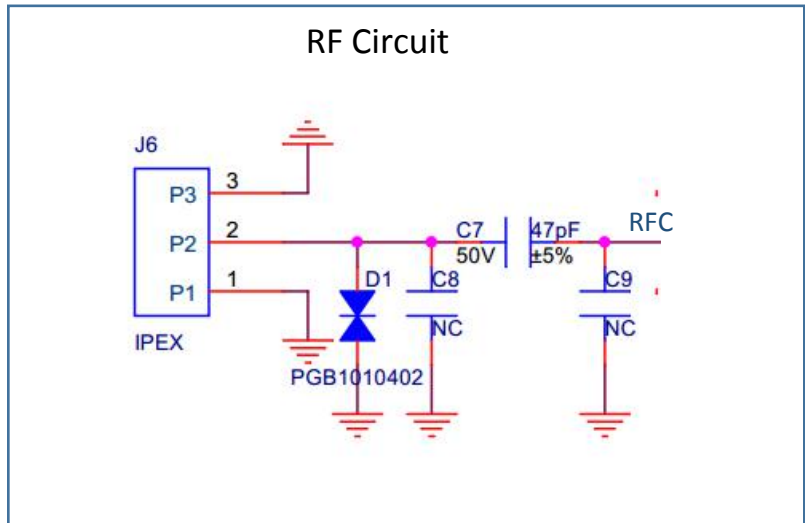


Figure 6 | Application Circuit

## 2.8 Mechanical Dimensions

The mechanical dimension of RAK4260 are shown in Figure 5 and Figure 6 below:

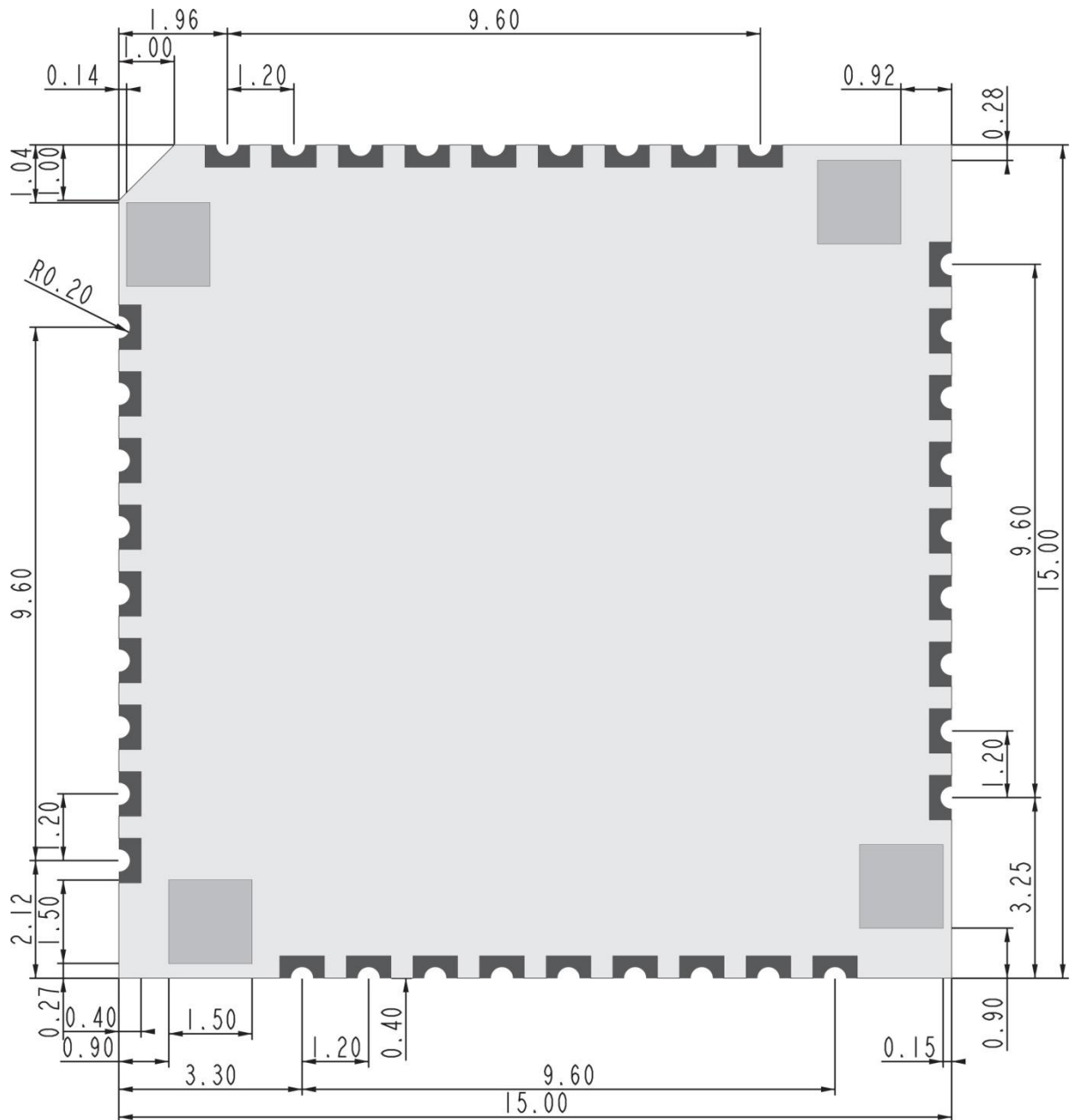


Figure 7 | RAK4260 Dimensions 1



**Figure 8** | RAK4260 Dimensions 2

### 3. Revision History

Revision	Description	Date
1.0	Initial version	2019-09-20
1.1	Minor improvements to the style of the text and diagrams	2019-09-21

### 4. Document Summary

Prepared by	Checked by	Approved by
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**About RAKwireless:**

RAKwireless is the pioneer in providing innovative and diverse cellular and LoRa connectivity solutions for IoT edge devices. It's easy and modular design can be used in different IoT applications and accelerate time-to-market.

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