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Modules

Scalability Guide

RC76xx Series

January 2025

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Contact Information

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Revision History

Revision number	Release date	Changes
1	January 06, 2020	Creation
2	March 17, 2021	Added RC7630 and RC7630-1
3	January 2025	Added RC7630J Changed to Semtech guide template

Contents

1: Introduction

This document describes the physical and functional variations of the RC76 series module. Features that are the same across all the RC module series are not included. For detailed specifications, refer to RC76xx Product Technical Specification available from the Source.

1.1 Mechanical/Hardware Variations

Table 1-1: Mechanical/Hardware Variations

Feature	RC7630	RC7630-1	RC7630J	RC7620	RC7620-1	RC7611	RC7611-1	Section[a]
Thickness	2.50 ± 0.20 mm							1.4
Application core	Cortex A7 (1.3 GHz processor)							3.6.1
RTC — External backup	No							
Low Power State	PSM							3.2.3
Power Supply (absolute max rating)								
Min (V)	0							3.5.1
Max (V)	VBAT_BB: 6.0 VBAT_RF: 5.5							
UVLO threshold voltage, falling[b]								
Min (V)	2.225							3.2.1
Typ (V)	2.4							
Max (V)	2.8							

a. Section references are from RC76xx PTS (subject to change)
b. RC76xx—Hysteresis set in firmware to 425 mV

1.2 Functional Variations

Table 1-2: Functional Variations

Feature	RC7630	RC7630-1	RC7630J	RC7620	RC7620-1	RC7611	RC7611-1	Section[a]
GNSS support	GPS, GLONASS, Galileo, BeiDou							3.4
	GNSS sensitivity for RC76xx is subject to change							
	QZSS			N				
Internal GNSS LNA	N							
RF Diversity	Y							3.3.2

a. Section references are from RC76xx PTS (Subject to change).

2: Hardware Features

2.1 Supported RF Bands

Table 2-1: Supported RF Bands

RAT	Band	RC7630	RC7630-1	RC7630J	RC7620	RC7620-1	RC7611	RC7611-1
LTE	Category	4	1	4	4	1	4	1
	B1		Y		Y			
	B2						Y	
	B3		Y		Y			
	B4						Y	
	B5		Y				Y	
	B7	Y	Y		Y			
	B8	Y	Y		Y			
	B11							
	B12						Y	
	B13						Y	
	B14						Y	
	B17							
	B18		Y					
	B19		Y					
	B20				Y			
	B21	Y	Y					
	B25						Y	

Table 2-1: Supported RF Bands (Continued)

RAT	Band	RC7630	RC7630-1	RC7630J	RC7620	RC7620-1	RC7611	RC7611-1
LTE	B26						Y	
	B28				Y			
	66						Y	
	71						Y	
UMTS	B1				Y			
	B8				Y			
GSM/GPRS/EDGE	E-GSM 900				Y			
	DCS 1800				Y			
GNSS	GPS	Y[a]			Y[a]		Y[a]	
	GLONASS							
	Galileo							
	BeiDou							
	QZSS	Y						

a. SKU-dependent

2.2 Pinout Variations

Table 2-2: Pinout Variations

Pin	RC7630	RC7630-1	RC7630J	RC7620	RC7620-1	RC7611	RC7611-1
2	UART1_RI (Do not install external pull-up on this pin, otherwise the module will not boot.)						
8	UART1_DCD (Do not install external pull-up on this pin, otherwise the module will not boot.)						
9	UART1_DSR (Do not install external pull-up on this pin, otherwise the module will not boot.)						
14-15	Reserved						
17-20	Reserved						
21	Reserved						
31	RF_DIV						
43	EXT_GPS_LNA_EN						
55-58	Reserved						
71-90	Reserved						
91-95	Reserved						
100	Reserved						
102-103	Reserved						
107-108	Reserved						
114-124	Reserved						
153	ANT_CTL0						
154	ANT_CTL1						
155	ANT_CTL2						
156	ANT_CTL3						

2.3 Power Interface Variations

2.3.1 Power On/Off Timing

Note: The host should not drive any signals to the module until >100 ms from the start of the power-on sequence.

Figure 2-1 describes the timing sequence for powering the module on and off.

Note: Before reaching the "Active" state, signals on the host port are considered to be undefined and signal transitions may occur. This undefined state also applies when the module is in reset mode, during a firmware update, or during the power-off sequence. The host must consider these undefined signal activities when designing the module interface.

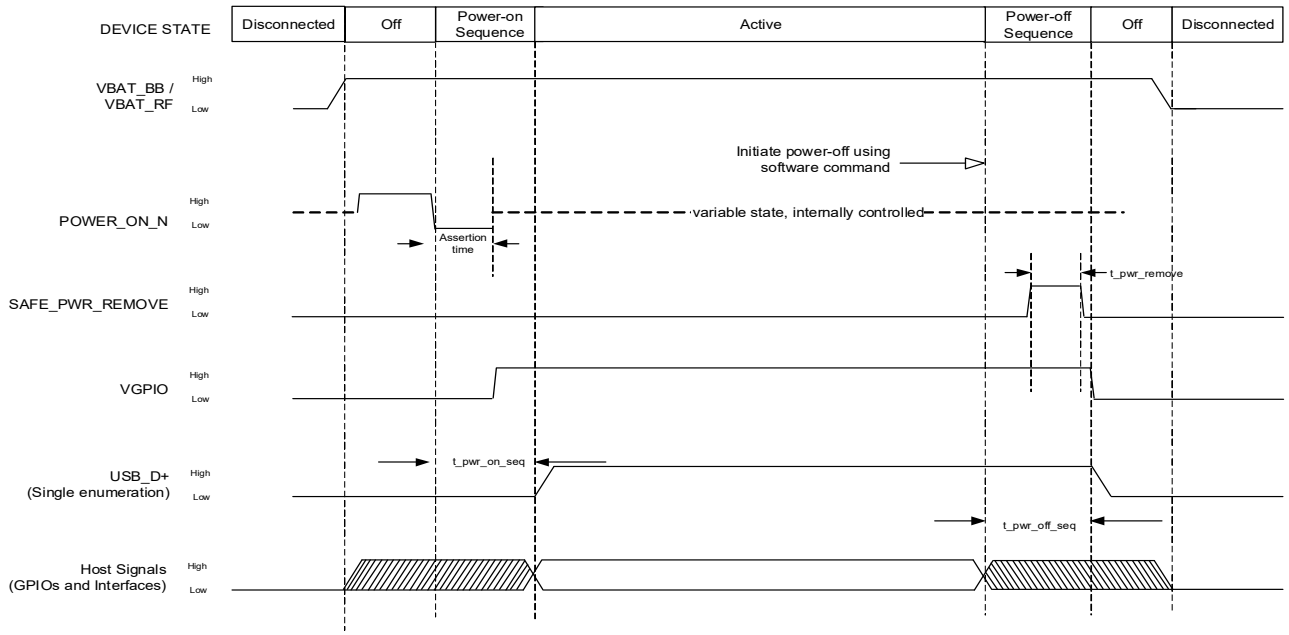

Figure 2-1: Signal Timing (POWER_ON_N, and USB Enumeration)

Table 2-3: POWER_ON_N Timing Parameters

Parameter	Typical	Maximum	Units
t_pwr_on_seq	15	24[a]	s
t_pwr_off_seq	0.4–5.5	6	s
t_pwr_remove	13	-	ms

a. Value is based on disabled custom parameters "HSICENABLE" and "BOOTQUIETDISABLE". Note that there will be an increase in value if either of these custom parameters are enabled.

2.3.2 POWER_ON_N, RESET_IN_N and AT!POWERDOWN Use Cases

Table 2-4 lists the behavior of the RC76xx series module depending on POWER_ON_N, RESET_IN_N and **AT!POWERDOWN** use cases.

Table 2-4: POWER_ON_N, RESET_IN_N and AT!POWERDOWN Use Cases

Use Case		Behavior
POWER_ON_N	VBATT is applied then POWER_ON_N is asserted	Turns ON
	POWER_ON_N is asserted then VBATT is applied	Turns ON
RESET_IN_N[a]	POWER_ON_N is left asserted then RESET_IN_N is asserted	Resets
	POWER_ON_N is de-asserted then RESET_IN_N is asserted	Resets
	POWER_ON_N is de-asserted then RESET_IN_N is asserted with a long pulse (>8 sec)	Emergency OFF
AT!POWERDOWN	POWER_ON_N is asserted then the power OFF command is sent	Restarts
	POWER_ON_N is de-asserted then the power OFF command is sent	Turns OFF

a. This pin should only be used for emergencies such as when the module stops responding to AT commands.

2.3.3 Emergency Power Off

The module can be switched off by controlling the RESET_IN_N pin. This must only be used in emergency situations if the system freezes (not responding to commands).

To perform an emergency power off:

1. De-assert POWER_ON_N.
2. While POWER_ON_N is de-asserted, assert RESET_IN_N (logic low) for at least 8 s.

This immediately powers down the module.

2.4 Current Consumption

All current consumption values are module-specific. For more details, refer to the RC76xx Product Technical Specification available from the Source.