



VC7000-Series Product Brief

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General Description

RF transceiver VC7000 series is Vertexcom's first-generation sub-GHz radios to fulfill the wireless communications needs for IoT applications. It features low power consumption, long-range and robust wireless links, being able to reject nearby and far-off large interfering RF signals. Its resistance to de-sensitizing strong interferers make it a perfect solution to applications of complex sub-GHz mesh networking. Varieties of power-saving modes are employed to reflect characteristics of IoT networks and can be leveraged to reduce power consumption at the system level. With these features, VC7000 is a perfect fit for IoT applications, demanding wide coverage, reliable link quality and long battery life.

RF transmit/receive frontend, RF synthesizer, T/R switches, power amplifiers and high-dynamic range ADCs are integrated on a single die. In addition, a radio controller is embedded for radio control and simple protocol processing; SPI is the interface to host system. The high-level integration enables low-cost and small footprint solutions for the ever-increasing demands of IoT applications.

Features

- Support IEEE 802.15.4g/Wi-SUN
- Support wireless M-Bus
- Radio frequency bands: 169, 315, 433, 490, 868 and 915 MHz
- Excellent selectivity performance
 - Adjacent channel rejection: 48 dB
 - Blocking performance: 75 dB
- Best-in-class receiver sensitivity
 - -109 dBm at 50 kbps GFSK
- Maximum data rate: 300 kbps
- Maximum transmit output power
 - +20 dBm
 - +13 dBm
- Automatic output power ramping
- Current consumption
 - Shut-down: 40 nA
 - Sleep mode: 0.8 μ A
 - Receive mode: 18 mA
 - Transmit mode: 96 mA at +20 dBm
- Modulation schemes: OOK, (G)FSK, 4(G)FSK and GMSK

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Low Power High Performance Sub-GHz RF Transceiver



- Automatic RX wake-up for low power listen
- Fast wake-up and AGC for low-power listen
- Functions for wireless link robustness
 - RF channel hopping
 - Retransmission
 - Auto-acknowledgement
- Digital RSSI and clear channel assessment (CCA) for CSMA and listen-before-talk systems
- Support packet over packet reception for reliable communication
- Early termination of receive mode for incorrect preamble reception
- Hardware-based user identification listen mode to eliminate false wake-up
- Oscillators: 32 MHz XO, 32 kHz RCO and a fast wake-up RCO
- One SPI interface to host MCU
- Single power supply voltage with integrated LDOs: 2.0 V ~ 3.6 V
- Package: QFN-32 (5 x 5mm)
- Ambient temperature range: -40 °C ~ +85 °C

Applications

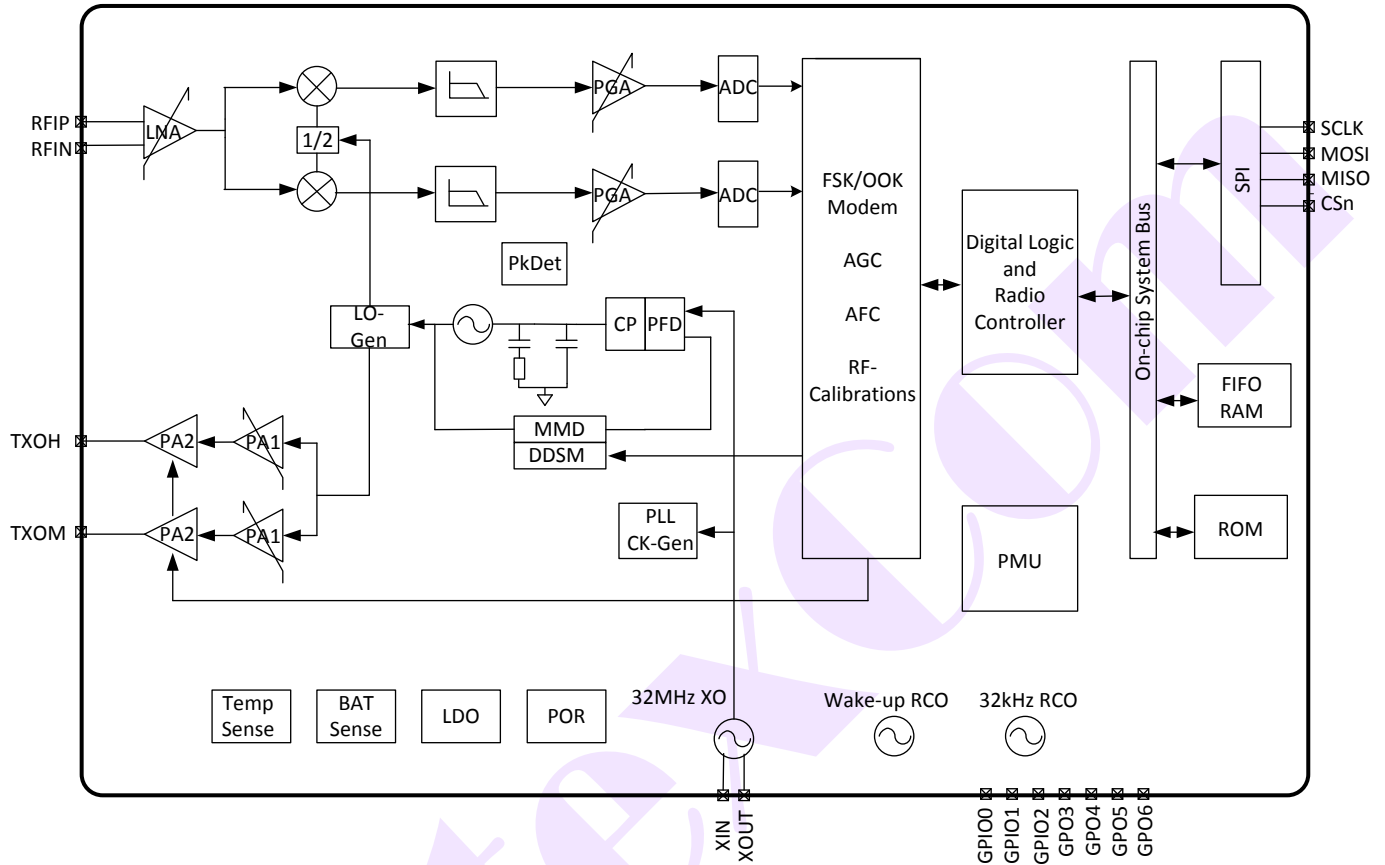
- 802.15.4g based proprietary networks
- Wi-SUN FAN applications
- Wireless M-Bus
- Smart metering, such as gas, water, and electricity meters, etc.
- Smart home and building
- Industrial monitoring and control
- Wireless alarm and security systems

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Block Diagram



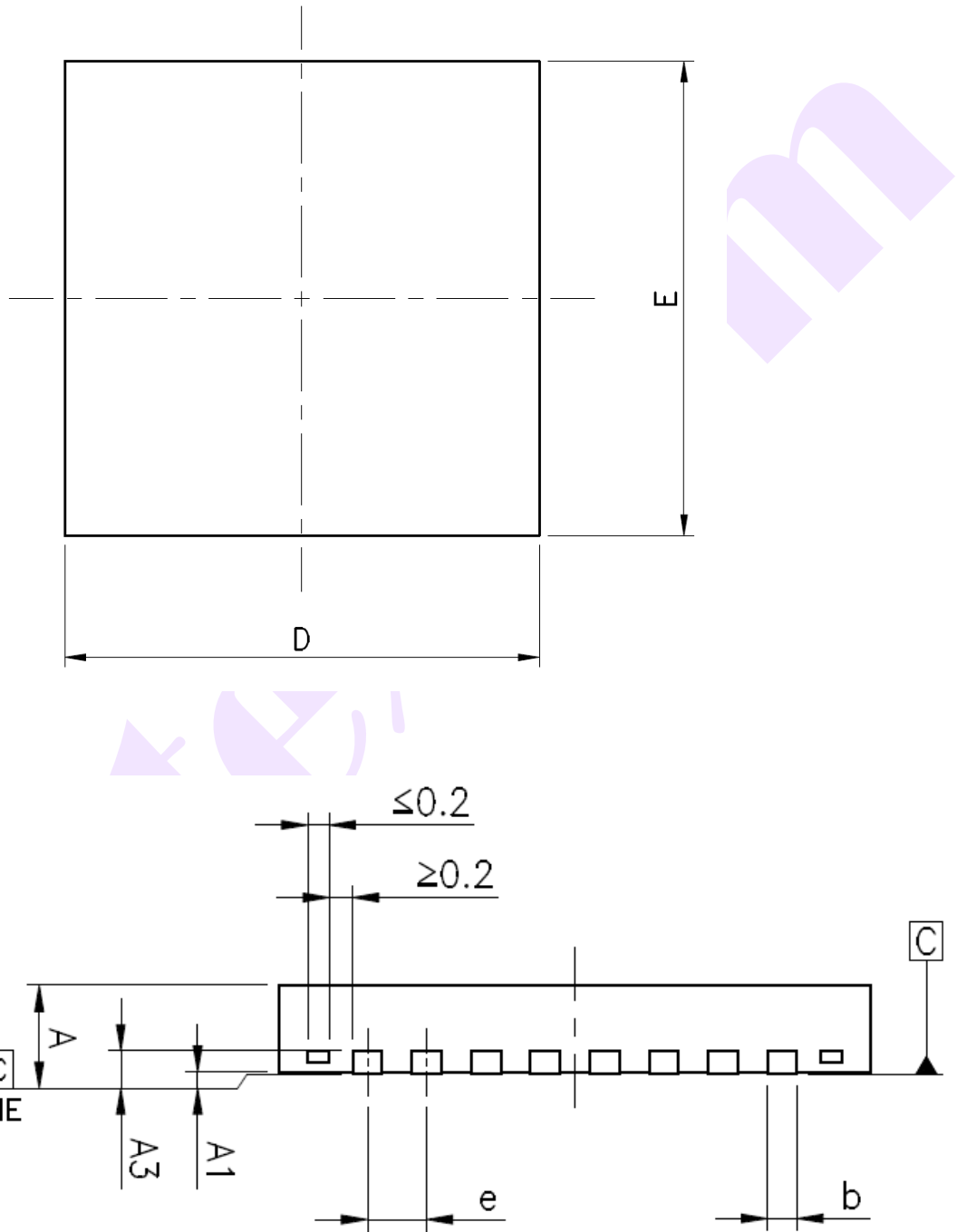
VC7000 Series	RF Band Supported
VC7000U	915, 868, 490, 433, 315 MHz and others
VC7000C	915, 868, 230 MHz and others (Available only upon request)

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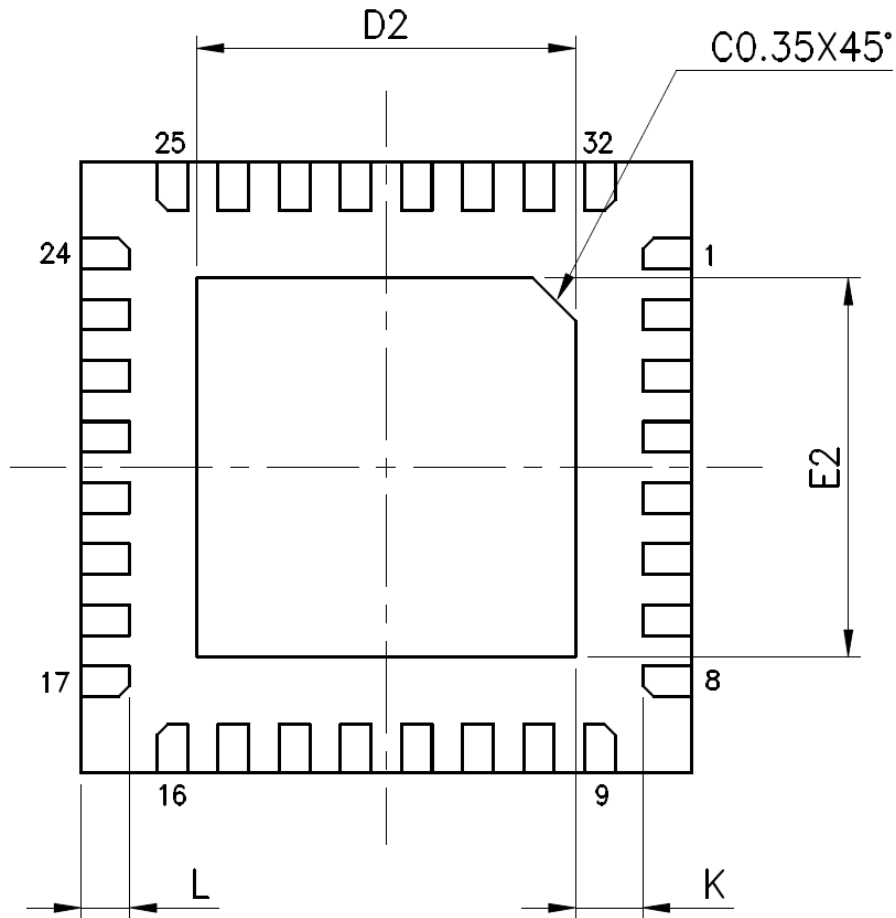


QFN-32 Package Information



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JEDEC OUTLINE	PACKAGE TYPE					
	MO-220			MO-220		
PKG CODE	WQFN(X532)			VQFN(Y532)		
SYMBOLS	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.80	0.85	0.90
A1	0.00	0.02	0.05	0.00	0.02	0.05
A3	0.203 REF.			0.203 REF.		
b	0.18	0.25	0.30	0.18	0.25	0.30
D	5.00 BSC			5.00 BSC		
E	5.00 BSC			5.00 BSC		
e	0.50 BSC			0.50 BSC		
L	0.35	0.40	0.45	0.35	0.40	0.45
K	0.20	—	—	0.20	—	—

PAD SIZE	D2			E2			LEAD FINISH		JEDEC CODE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	Pure Tin	PPF	
153X15* MIL	3.20	3.25	3.30	3.20	3.25	3.30	V	V	W(V)HHD-5

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Ordering Information

Part No.	Description	Frequency Band	Standards	MCU	Flash	RAM	PKG	Body Size
VC7000U	Sub-GHz RF Transceiver	315, 433, 490, 868, 915 MHz	IEEE 802.15.4g, Wi-SUN, Wireless M-Bus	N/A	N/A	--	QFN-32	5 x 5mm
VC5800+7000U	Sub-GHz Gateway Chipset	315, 433, 490, 868, 915 MHz	IEEE 802.15.4g, Wi-SUN, Wireless M-Bus	ARM Cortex M4	2 MB	512 KB	QFN-88 + QFN-32	10 x 10mm + 5 x 5mm