VC7300 USB Module User Guide

Reported FAE Dept.



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- Module Type
- IC Version Recognition
- Schematic
- I/O Function
- LED Behavior
- Operation and Networking
- Download Image to Device





P/N	RF IC	Flash	Antenna	Power
VC7300AU RFMM-USB	VC7300AU	512KB	Chip Dipole (by Ipex to SMA connector)	20dBm
VC7300BU RFMM-USB	VC7300BU	1024KB	Chip Dipole (by Ipex to SMA connector)	20dBm







Anti-Static Shielding Bag

QR Code





VC7300BU

Anti-Static Shielding Bag

QR Code















Default matching for SKU1 SKU1: JP, MPA, Freq: 922~928MHz SKU2: FCC, HPA, Freq: 902~928MHz

Matching Difference between JP and FCC band

	R5	R6	LCK1	MI	M2	SAW1
JP	N/A	2.2nH	22nH	6.8nH	2.2pF	B4336
FCC	00hm	N/A	22nH	3.3nH	3.3pF	B4301

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You can easily find the connector from the market. (Pitch=2.0mm)





Description	LED Behavior	
Device has not joined the PAN	Red & Green twinkle	
Device completes join the PAN	All LED off	
Device go into boot mode	Green LED	
System error	Red LED on	
Transmit packet	Green LED blink	
Receive packet	Red LED blink	
System bootup	Red & Green LED blink	



- 1. Connect VC7300 USB Wi-SUN module to PC USB port.
- 2. Execute Tera Term.











Key in reboot, and show the boot information.

SCOM11:115200baud - Tera Term VT	Poot	SCOM10:115200baud - Tera Term VT	Nodo
File Edit Setup Control Window Help	ποοι	File Edit Setup Control Window Help	Noue
reboot		reboot	^
ota part base 0x1000000 size 262144, main part base 0x4000 size	503808	ota part base 0x1000000 size 262144, main part base 0x4000 size 5	03808
<pre>vc_lfs_init, baseaddr 0x1078000, totalsize 32768, sector count</pre>	8,lookahead	<pre>vc_lfs_init, baseaddr 0x1078000, totalsize 32768, sector count 8</pre>	,lookahead
32		32	
vc_lfs_init, err 0x0		vc_lfs_init, err 0x0	
SFTRST		SFTRST	
VERTEXCOM Technologies, Inc.		VERTEXCOM Technologies, Inc.	
NET : sicslowpan		NET : sicslowpan	
LLSEC : nullsec		LLSEC : nullsec	
MAC : WISUN		MAC : WISUN	
RDC : wisunrdc		RDC : wisunrdc	
SW BRANCH : v1.0.0.0		SW BRANCH : v1.0.0.0	
NODE ID : <u>0xf994</u> Serial Number		NODE ID : 0xf995 Serial Number	
NODE MAC : <u>ff:ff:ff:ff:f4:5a:0d:ce</u> MAC Address		NODE MAC : <u>ff:ff:ff:ff:f4:5a:0d:cf</u> MAC Address	
Net Service Start:		Net Service Start:	
RAND INIT : 0x3899		KAND INIT : 0x3263	
NODE ID : 0XT994		NODE ID : 0X1995	
NODE MAC : TT:TT:TT:TT:T4:5d:0u:Ce		NODE MAL : TT:TT:TT:TT:T4:5d:00:CT	
MDL init		MDL i nit	
mmer, 1110 m may huffer sz=712 m ry huff=20019150 m systick offset=1008		m may huffer sz-712 m ry huff-20016778 m systick offset-1008	
m_max_burrer_sz=712; m_rx_burr=z0019130; m_systick_orrset=1000		m_max_buffer_s2=712, m_fx_buff=20010778, m_systick_offset=1008	
$\frac{1}{10000000000000000000000000000000000$		TC version = 7000b4	
spacing 200		spacing 200	
rx[141], rx ack[142], tx[143], tx complete[144], eapol[145], ref	fresh timing	rx[141], rx ack[142], tx[143], tx complete[144], eapol[145], refr	esh timing
[146], collision[147], unicast[148], broadcast[149], broadcast i	interval[150	[146], collision[147], unicast[148], broadcast[149], broadcast in	terval[150
], rpl[151], pcs fail[152], system pause[153], rpl leave[154], w	wakeup[155],], rpl[151], pcs fail[152], system pause[153], rpl leave[154], wa	keup[155],
factory[156]		factory[156]	
wisun_mac_trickle_timers_init		wisun_mac_trickle_timers_init	
<pre>br timer[0x20005689], node timer[0x2000569A]</pre>		br timer[0x20005555], node timer[0x20005566]	
WiSUN: starting as coordinator Root		WiSUN: starting as node Node	
Starting: 'vertexcom_apps_test_process'		Starting: 'vertexcom_apps_test_process'	~





Key in cfg wisun, check Channel Plan and Net Name are same.

SCOM11:115200baud - Tera Term VT	Doot	SOM10:115200baud - Tera Term VT	Nodo
File Edit Setup Control Window Help	κουι	File Edit Setup Control Window Help	Noue
<pre>[146], collision[147], unicast[148], broadcast[149], broadcast</pre>	interval[150	IC version = 7000b4	^
], rpl[151], pcs fail[152], system pause[153], rpl leave[154],	wakeup[155],	spacing 200	
factory[156]		rx[141], rx_ack[142], tx[143], tx_complete[144], eapol[145], re	fresh timing
wisun_mac_trickle_timers_init		<pre>[146], collision[147], unicast[148], broadcast[149], broadcast</pre>	interval[150
<pre>br timer[0x20005689], node timer[0x2000569A]</pre>], rpl[151], pcs fail[152], system pause[153], rpl leave[154],	wakeup[155],
WiSUN: starting as coordinator		factory[156]	
Starting: 'vertexcom_apps_test_process'		wisun_mac_trickle_timers_init	
		br timer[0x20005555], node timer[0x20005566]	
rpl_root_init		WiSUN: starting as node	
dhcp6s: Listening on port 547 my_addr = 1		Starting: 'vertexcom_apps_test_process'	
vc# Watchdog enabled			
WiSUN: get rpl ready		vc# Watchdog enabled	
cfg wisun		WiSUN: node No Pan state Node is not join PAN yet there is a	DO PANid
wisun.PANid = 272 Default PANid		cfg wisun Node is not joint AN yet, there is t	
wisun.UDI = 200 Channel Plan		wisun.UDI = 200 	
wisun.chPlan = 0 Charner Flan		wisun.chPlan = 0 Challier Plan	
wisun.chFun = 2		wisun.chFun = 2	
wisun.control = 0		wisun.control = \emptyset	
wisun.ch0 = 902200		wisun.ch0 = 902200	
wisun.spacing = 200		wisun.spacing = 200	
wisun.fixed = 0		wisun.tixed = 0	
wisun.cnnum = 129		wisun.cnnum = 129	
wisun.routing_method = 0x1		wisun.routing_method = 0x1	
wisun.wetName = [vertexcom] Net Name		wisun.netname = [vertexcom] Net Name	
wisun.eapoi_ready = 1		wisun.eapoi_ready = 0	
wisun $\alpha = 1$		wisun oc $= 1$	
wisup $oxNum = 2$		wisup $oxNum = 2$	
wisun $exNumStart1 = 10$		wisun evNumStart1 - 10	
wisun.exNumEnd1 = 20		wisup exNumEnd1 = 20	
wisun.exNumStart2 = 40		wisun.exNumStart2 = 40	
wisun.exNumEnd2 = 50		wisun.exNumEnd2 = 50	
wisun.mask = $0xa 0x1b 0x2c 0x3d 0x0 0x0 0x4e 0x5f 0x0 0x0 0x0 0$	0 0x0 0x0 0	wisun.mask = 0xa 0x1b 0x2c 0x3d 0x0 0x0 0x4e 0x5f 0x0 0x0 0x0 0	0 0 0 0 0 0 0 0
x0 0x0		x0 0x0	
1			~





Key in cent nv to check if Frequency Band settings are same.

COM11:115200baud - Tera Term VT	SCOM10:115200baud - Tera Term VT	Nodo
File Edit Setup Control Window Help	File Edit Setup Control Window Help	Noue
], rpl[151], pcs fail[152], system pause[153], rpl leave[154], wakeup[155],	rx[141], rx_ack[142], tx[143], tx_complete[144], eapol[145], refr	resh timing^
factory[156]	<pre>[146], collision[147], unicast[148], broadcast[149], broadcast in</pre>	nterval[150
wisun_mac_trickle_timers_init], rpl[151], pcs fail[152], system pause[153], rpl leave[154], wa	akeup[155],
<pre>br timer[0x20005689], node timer[0x2000569A]</pre>	factory[156]	
WiSUN: starting as coordinator	wisun_mac_trickle_timers_init	
Starting: 'vertexcom_apps_test_process'	<pre>br timer[0x20005555], node timer[0x20005566]</pre>	
	WiSUN: starting as node	
rpl_root_init	Starting: 'vertexcom_apps_test_process'	
dhcp6s: Listening on port 547 my_addr = 1		
vc# Watchdog enabled	vc# Watchdog enabled	
WiSUN: get rpl ready	WiSUN: node No Pan state	
cent nv	cent nv	
cent nv	cent nv	
series_number 73010638	series_number 73010639	
date 20200114	date 20200114	
carrier_frequency 915000000 Frequency Band	carrier_frequency 915000000 Frequency Band	
xtal_offset 44	xtal_offset 33	
pa_sel 1	pa_sel 1	
tx_power_default 20	tx_power_default 20	
tx_power_cal_offset 39	tx_power_cal_offset 41	
rssi_offset 8	rssi_offset 9	
elna_rssi_offset 25	elna_rssi_offset 26	
fe_hw_cfg:	fe_hw_cfg:	
[0]ELNA state : enable	[0]ELNA state : enable	
[1]EPA state : disable	[1]EPA state : disable	
[2]Antenna diversity : disable	[2]Antenna diversity : disable	
mac_addr tt:tt:tt:tt:t4:5a:0d:ce	mac_addr ff:ff:ff:ff:f4:5a:0d:cf	
cca_threshold -112	cca_threshold -112	
rftest Ø	rftest 0	
chip_ia 0	chip_id 0	
board_1d 0	board_10 0	
temp_offset 0	temp_offset 0	
Tec 0 (0:01sable,1:NKNSC,2:RSC)	Tec 0 (0:01sable,1:NKNSC,2:KSC)	
vet D	Nett	



After 3~5 minutes, Networking is complete automatically.

SCOM11:115200baud - Tera Term VT	Poot	SCOM10:115200baud - Tera Term VT	Nodo
File Edit Setup Control Window Help	κουι	File Edit Setup Control Window Help	Noue
MAC : WISUN		NODE ID : 0xf995	^
RDC : wisunrdc		NODE MAC : ff:ff:ff:ff:f4:5a:0d:cf	
SW BRANCH : v1.0.0.0			
NODE ID : 0xf994		Net Service Start:	
NODE MAC : ff:ff:ff:ff:f4:5a:0d:ce		RAND INIT : 0x3263	
		NODE ID : 0xf995	
Net Service Start:		NODE MAC : ff:ff:ff:ff:f4:5a:0d:cf	
RAND INIT : 0x3899		random_init: seed = 0x3263	
NODE ID : 0xf994		MPL: init	
NODE MAC : ff:ff:ff:ff:f4:5a:0d:ce		<pre>m_max_buffer_sz=712, m_rx_buff=20016778, m_systick_offset=1008</pre>	
random_init: seed = 0x3899		m_ack_buff=20016a60	
MPL: init		IC version = 7000b4	
<pre>m_max_buffer_sz=712, m_rx_buff=20019150, m_systick_offset=1008</pre>		spacing 200	
m_ack_buff=20019438		rx[141], rx_ack[142], tx[143], tx_complete[144], eapol[145], refr	esh timing
IC version = 7000b4		[146], collision[147], unicast[148], broadcast[149], broadcast in	iterval[150
spacing 200], rp1[151], pcs fai1[152], system pause[153], rp1 leave[154], wa	ikeup[155],
rx[141], rx_ack[142], tx[143], tx_complete[144], eapo1[145], re	fresh timing	factory[156]	
[146], collision[14/], unicast[148], broadcast[149], broadcast	interval[150	WISUN_MAC_TRICKIE_TIMERS_INIT	
], rp1[151], pcs ta11[152], system pause[153], rp1 leave[154],	wakeup[155],	br timer[0x20005555], node timer[0x20005566]	
factory[156]		WISUN: Starting as node	
wisun_mac_trickie_timers_init		starting: vertexcom_apps_test_process	
WistMy stanting as coordinator		vet blatchdog onabled	
Starting: 'vertexcem apps test process'		VC# Watchuog enableu	
scarcing: vercexcom_apps_cesc_process		version[A][5]	
rnl root init		Receive PC [334990] Node receive PC from Root	
dhcn6s: Listening on port 547 my addr = 1		WiSIN: restart rn]	
vc# Watchdog enabled		WiSIN: init crystal drift hase time[339][334776]	
WiSIN: get rpl ready A node joins the PA	٨N	RPI: Following BR CCA Setting = -100	
[373714][RPL_]OTN] 2:]]addr=FE:FE:FE:FE:F4:5A:0D:CE_device=200	1:db8::3 par	[368167][DHCP] Get global address 2001:db8::3	
ent=2001:db8::1	indeerre par	[369269][RPL JOIN] device=2001:db8::3 parent=2001:db8::1	
Border Router new pc version[6][1800269]		WiSUN: get rpl ready Node is assigned IPv6 Address and joins t	the PAN
[2772787][RPL JOIN] 2: 11addr=FF:FF:FF:FF:F4:5A:0D:CF device=20	01:db8::3 pa	new pc version[5][6][1868212]	
rent=2001:db8::1		[2768361][RPL JOIN] device=2001:db8::3 parent=2001:db8::1	
		The IPv6 Address of parent node is 2001:db8::1	~





Key in rpl, check networking status.

COM11:115200baud - Tera Term VT	Poot	Scom10:115200baud - Tera Term VT	Node
<u>Eile Edit Setup Control Window H</u> elp	ποοι	<u>Eile Edit Setup Control Window H</u> elp	Noue
br timer[0x20005549], node timer[0x2000555A]		<pre>^Starting: 'vertexcom_apps_test_process'</pre>	^
WiSUN: starting as coordinator			
Starting: 'vertexcom_apps_test_process'		vc# Watchdog enabled	
		WiSUN: node No Pan state	
rpl_root_init		version[0][26]	
dhcp6s: Listening on port 547 my_addr = 1		Receive PC[129884]	
vc# Watchdog enabled		WiSUN: restart rpl	
WiSUN: get rpl ready		WiSUN: init crystal drift base time[191][188484]	
<pre>[217548][RPL JOIN] 2: lladdr=FF:FF:FF:FF:F4:5A:0D:CF device=200</pre>	1:db8::3 par	RPL: Following BR CCA Setting = -100	
ent=2001:db8::1		<pre>[213953][DHCP] Get global address 2001:db8::3</pre>	
rpl		<pre>[214813][RPL JOIN] device=2001:db8::3 parent=2001:db8::1</pre>	
Network status		WiSUN: get rpl ready	
- MAC addresses:		rpl	
ff:ff:ff:ff:f4:5a:0d:ce		Network status	
- Unicast IPv6 addresses:		- MAC addresses:	
2001:db8::1		ff:ff:ff:ff:f4:5a:0d:cf	
fe80::fdff:ffff:f45a:dce		- <u>Unicast IPv6 ad</u> dresses:	
- Multicast IPv6 addresses:		- 2001:db8::3 Node is assigned IPv6 Address	
ff02::1:ff00:1		fe80::fdff:ffff:f45a:dcf	
ff02::1a		- Multicast IPv6 addresses:	
ff03::fc		ff02::1:ff00:3	
ff03::2		ff02::1a	
ff02::2		ff03::fc	
ff03::1		ff03::2	
ff02::1		ff02::2	
ff02::1:ff5a:dce There are two nodes in this Routing Ta	able	ff03::1	
- IPv6 prefix: The last IPv6 code of the root node is	1	ff02::1	
fe80::/64 The last II v0 code of the root hode is	<u>_</u>	ff02::1:ff5a:dcf	
- Default route: The last IPV6 code of the other hode is	53	- IPv6 prefix:	
None		fe80::/64	
VC+RPN: 2 in total Routing link]		- Default route:	
<pre>VC+RPL:[0001] => DODAG root (lifetime: 4294967295 seconds)]</pre>		<pre> fe80::fdff:ffff:f45a:dce (lifetime: 0 seconds)</pre>	
<pre>VC+RPL:[0003] => [0001] (lifetime: 14389 seconds)]</pre>		[VC+RPN: 0 in total Routing link]	



Key in cfg wisun, check networking configuration settings.

Second Se	Doot	Second Commentation Commentatio	Nodo
Eile Edit Setup Control Window Help	ποοι	<u>Eile Edit Setup Control Window H</u> elp	Noue
factory[156]		<pre>^Starting: 'vertexcom_apps_test_process'</pre>	^
wisun_mac_trickle_timers_init			
br timer[0x20005549], node timer[0x2000555A]		vc# Watchdog enabled	
WiSUN: starting as coordinator		WiSUN: node No Pan state	
Starting: 'vertexcom_apps_test_process'		version[0][29]	
		Receive PC[172405]	
rpl_root_init		WiSUN: restart rpl	
dhcp6s: Listening on port 547 my_addr = 1		WiSUN: init crystal drift base time[212][215333]	
vc# Watchdog enabled		RPL: Following BR CCA Setting = -100	
WiSUN: get rpl ready		[242708][DHCP] Get global address 2001:db8::3	
[240567][RPL JOIN] 2: 11addr=FF:FF:FF:FF:F4:5A:0D:CF device=2001:d	b8::3 par	[243683][RPL JOIN] device=2001:db8::3 parent=2001:db8::1	
ent=2001:db8::1		WiSUN: get rpl ready Nede has island the DANL DANUM will	
cfg wisun		cfg wisun Node has joined the PAN, PANId Will	
wisun.PANid = 272 Default PANid		wisun.PANid = 272 be assigned and same as the root	
wisun.UDI = 200		wisun.UDI = 200	
wisun.chPlan = 0 Channel Plan		wisun.chPlan = 0 Channel Plan	
wisun.chFun = 2		wisun.chFun = 2	
wisun.control = 0		wisun.control = 0	
wisun.ch0 = 902200		wisun.ch0 = 902200	
wisun.spacing = 200		wisun.spacing = 200	
wisun.fixed = 0		wisun.fixed = 0	
wisun.chNum = 129		wisun.chNum = 129	
wisun.routing_method = 0x1		wisun.routing_method = 0x1	
wisun.NetName = [VertexCom] Net Name		wisun.NetName = [VertexCom] Net Name	
wisun.eapol_ready = 1		wisun.eapol_ready = 1	
wisun.rd = 1		wisun.rd = 1	
wisun.oc = 1		wisun.oc = 1	
wisun.exNum = 2		wisun.exNum = 2	
wisun.exNumStart1 = 10		wisun.exNumStart1 = 10	
wisun.exNumEnd1 = 20		wisun.exNumEnd1 = 20	
wisun.exNumStart2 = 40		wisun.exNumStart2 = 40	
wisun.exNumEnd2 = 50		wisun.exNumEnd2 = 50	
wisun.mask = 0xa 0x1b 0x2c 0x3d 0x0 0x0 0x4e 0x5f 0x0 0x0 0x0 0x0 0	0x0 0x0 0	wisun.mask = 0xa 0x1b 0x2c 0x3d 0x0 0x0 0x4e 0x5f 0x0 0x0 0x0 0x0	0x0 0x0 0
x0 0x0		x0 0x0	



Key in nbr link, and show the communication status.

SCOM11:115200baud - Tera Term VT	Root	ECOM10:115200baud - Tera Term VT -	Node
<u>Eile Edit Setup Control Window H</u> elp	Root	<u>Eile E</u> dit <u>S</u> etup C <u>o</u> ntrol <u>W</u> indow <u>H</u> elp	noue
wisun.spacing = 200		wisun.spacing = 200	1
wisun.fixed = 0		wisun.fixed = 0	
wisun.chNum = 129		wisun.chNum = 129	
wisun.routing_method = 0x1		wisun.routing_method = 0x1	
wisun.NetName = [VertexCom]		wisun.NetName = [VertexCom]	
wisun.eapol_ready = 1		wisun.eapol_ready = 1	
wisun.rd = 1		wisun.rd = 1	
wisun.oc = 1		wisun.oc = 1	
wisun.exNum = 2		wisun.exNum = 2	
wisun.exNumStart1 = 10		wisun.exNumStart1 = 10	
wisun.exNumEnd1 = 20		wisun.exNumEnd1 = 20 LOI = Link Quality Indicator	
wisun.exNumStart2 = 40		wisun.exNumStart2 = 40 DCSI - Deceived Signal Strength Indic	ator
wisun.exNumEnd2 = 50		wisun.exNumEnd2 = 50	alui
wisun.mask = 0xa 0x1b 0x2c 0x3d 0x0 0x0 0x4e 0x5f 0x0 0x0 0x0 0x	x0 0x0 0x0 0	wisun.mask = 0xa 0x1b 0x2c 0x3d <mark>0</mark> x0 0x0 0x4e 0x5f 0x0 0x0 0x0 0x0) 0x0 0x0 0
x0 0x0		x0 0x0	
nbr		nbr	
NBR TABLE: NBR_TABLE_MAX_NEIGHBORS 60		NBR TABLE: NBR_TABLE_MAX_NEIGHBO <mark>R</mark> S 50	
Index LinkLocalAddress [link_stats_tbl] [ds6_neighbors]	[rpl_parents	Index LinkLocalAddress [link_stats_tbl] [ds6_neighbors] [r	pl_parents
]]	
00 ff:ff:ff:ff:f4:5a:0d:cf [1:0] [1:0] [0:0]		00 ff:ff:ff:ff:f4:5a:0d:ce [1:0] [1:1]	
nbr link		nbr link	
link_stats:		link_stats:	
<pre>lladdr etx lqi rssi rsl freshness last_tx_time</pre>		lladdr etx lqi rssi rsl freshness last_tx_time	
ff:ff:ff:ff:f4:5a:0d:cf 128 237 -27 146 1 566		ff:ff:ff:ff:f4:5a:0d:ce 128 236 -36 139 1 559	
vc# The MAC Address of neighbor node		The MAC Address of neighbor node	
vc#		vc#	~





- 1. Connect VC7300 Wi-SUN USB module to PC USB port.
- 2. Execute VertexCom_UART_DownloadTool.exe.





- Select the corresponding COM port and click "Connect" to connect the device.
- 4. Click "Load" and select the image to be downloaded. The source path will be displayed under F/W Download.

Serial Port Setting ×			
Serial Port Settings			
COM Port	COM10 ~		
Connect	Disco	onnect	









- 5. Click "Program (F10)" to start downloading.
- 6. The process bar will display the download progress.

(Program first and then verify).







- 7. After verification is completed, the device will automatically reboot and display D/L Stop.
- 8. Remove VC7300 Wi-SUN USB module from the PC, and start using the device.











