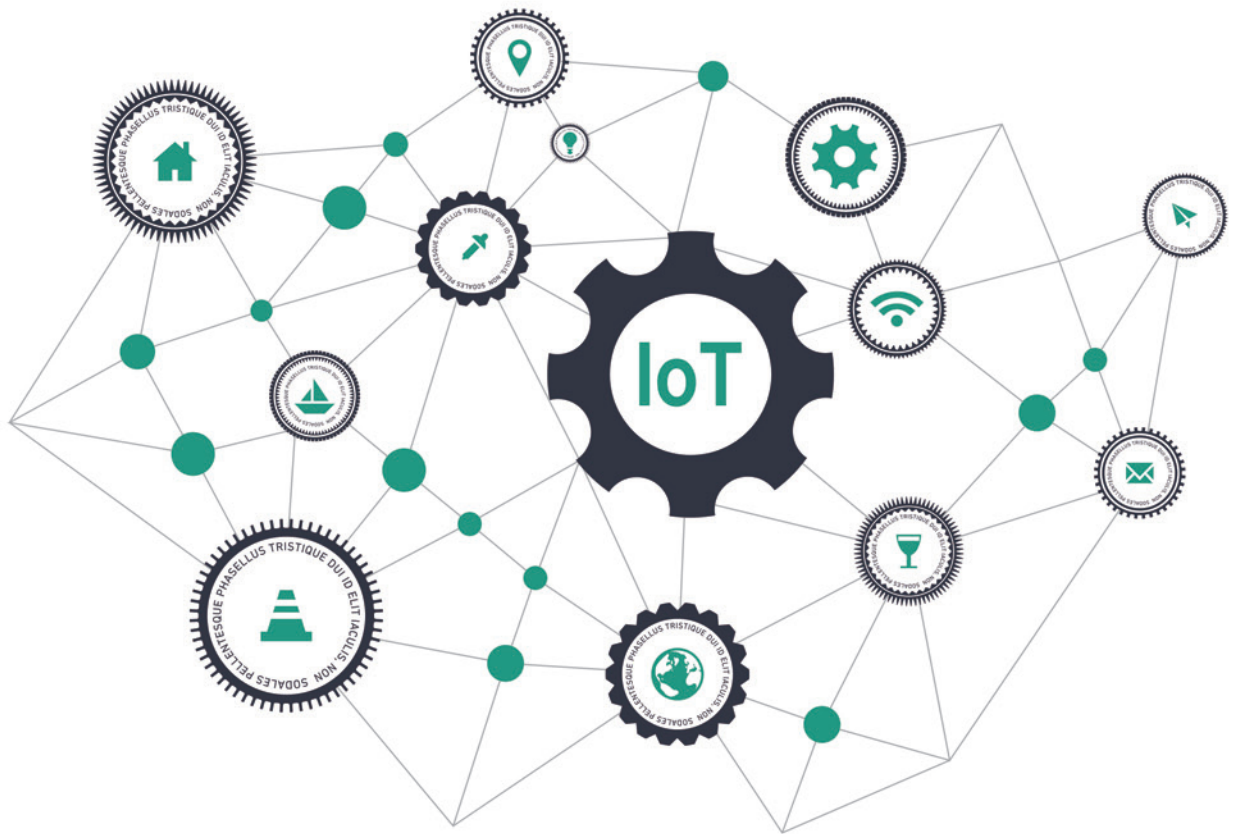
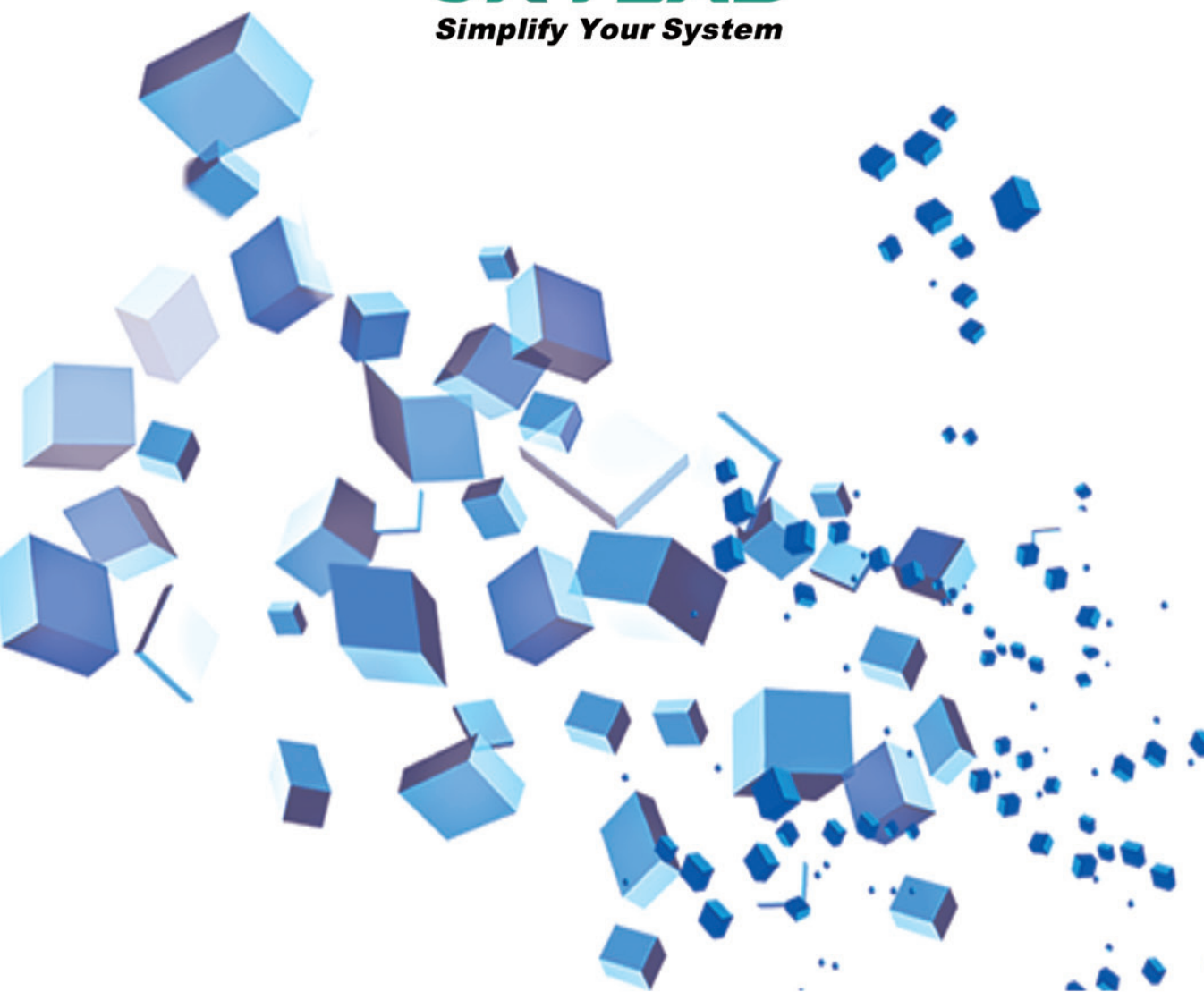




WiFi · BLUETOOTH · GNSS · UWB

SKYLAB

Simplify Your System



Company profile

SKYLAB M&C Technology Co.,Ltd, specialized in WiFi, Bluetooth,GNSS, UWB and other wireless products research and develop. Aiming to supply high-quality, high-performance wireless modules and relevant application solutions to domestic and foreign customers who need OEM/ODM and system integrated.Committed to create long-term market value and potential increase for customers.

Since 2002, SKYLAB has replied on developing experiences of wireless communication field, build a powerful team that own rich experiences of GNSS/WiFi/Bluetooth/GPRS hardware&software development and RF technology.

Focus on Customer`s Demands and Expectations ; Offer Top-quality Products and Best Services ; Help Customers to Create Values Continuously.

— SKYLAB





CATALOG

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WiFi Modules

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02

BLE Modules

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WiFi Modules

PRODUCT SELECTOR

Series (IEEE802.11)	b/g/n USB	ac USB	WiFi AP Router modules					IOT AP	WiFi & BT combo modules			
Model	WG209	WG217	SKW77	SKW97	SKW99	SKW 92A	SKW 93A	SKW 92B	WG215	WG221	WG222	WG225
Size LxWxH (mm)	30x15 x2.8	36x15 x3.2	59x28.9 x9.0	40.5 x27.5 x2.9	48.4 x25.7 x9.0	40.5x25 x3.0	36.4 x30.5 x14.8	40.5x25 x3.0	25.5x18 x3.2	12x 12 x2.3	31.3 x 20.3 x 3.2	12 x 12 x 1.8
Chipset	MT 7601U	RTL 8811	MT 7620A	QCA 9531	QCA 9531	MT 7628N	MT 7628A +7610E	MT 7688A	ESP32	RTL 8723DS	MT 7697	RTL 8821CS
Packaging	SMD	S & P	Pin header	SMD	Pin header	SMD	Pin Header	SMD	SMD	SMD	SMD	SMD
Frequency (GHz)	2.4-2.5	2.4-2.5 5.0-5.8	2.4-2.5	2.4-2.5	2.4-2.5	2.4-2.5	2.4-2.5 5.0-5.8	2.4-2.5	2.4-2.5	2.4-2.5	2.4-2.5 5.0-5.8	2.4-2.5 5.0-5.8
Data Rate (Mbps)	150	433	300	300	300	300	733	300	150	150	150	150
Transmitted power (dBm)	18	18	28	18	18	18	18	18	18	18	18	18
Transmission Distance (m)	150	120	2000	150	150	150	150	150	150	150	150	150
Interface	1	1	1,2,3,4, 9,10	1,2,3,10	1,2,3,10	1,2,3,4, 5,6,7,8, 9,10	1,2,3,4, 5,6,7,8, 9,10	1,2,3,4, 5,6,7,8, 9,10	3,6,10, 11,12	3,9,11	3,4,5, 10,12,13	3,9,11
Volt (V)	3.3	3.3 5.0	3.3 5.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Antenna	1 IPEX , 1 PCB	1 IPEX 1 PCB	2 IPEX	2 IPEX	2 IPEX	2 IPEX	3 IPEX	1 IPEX	1 IPEX 1 PCB	1 PCB pin	1 IPE X 1PCB	1 PCB pin

Interface:

- 1. USB2.0
- 2. WAN/LAN
- 3. UART
- 4. I²S
- 5. I²C
- 6. SPI
- 7. SD
- 8. PWM
- 9. PCM
- 10. GPIO
- 11. SDIO
- 12. ADC
- 13. IR

Packaging

- S= SMD P= Pin header

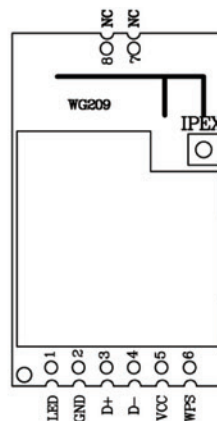
WG209 2.4GHz USB WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n 2.4GHz USB WLAN WiFi module
- Main Chipset: MT7601U
- USB 2.0 high speed interface
- Optional: IPEX connector or PCB Antenna
- 72.2 Mbps for 20 MHz ; 150 Mbps for 40 MHz channel operations
- Windows XP 32/64, 2000, Vista 32/64bit, Windows 7 32/64bit, Linux, Android
- Manufactured in ISO9001/IATF16949 certified production sites



Interface
USB 2.0 Slave 1



Electrical Data

Size	30(L) x 15(W) x 9.0(H) mm
Power Supply	3.3V or 5.0V (5V as default)
Packaging	SMD or 4pin/6pin Connector
Transmit Power	target power tolerance ± 2 dBm
	IEEE 802.11b: +18 dBm for 802.11b CCK
	IEEE 802.11g: +16dBm @ 6, 9, 12, 18, 24, 36, 48Mbps
	+15dBm @ 54Mbps
	IEEE 802.11n: +15dBm @ MCS 7/15@HT20
Power Consumption	TX: 700mW; RX: 450mW
	64/128/152-bit WEP encryption
Wireless Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

Environmental data, quality & reliability

- Operating temperature: -20°C~ + 55°C
- Storage Temperature: -40°C~ +125°C

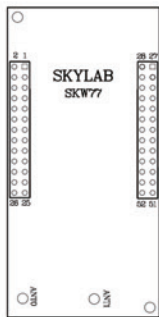
Certification and approvals

- FCC CE IC certified

SKW77 High Power & Long Range AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n 2.4GHz AP/Router WLAN WiFi Module
- Main Chipset: MT7620A
- 2x2 MIMO at 300Mbps PHY data rate
- Antenna: IPEX connector
- Built-in High Gain PA/LNA
- Working mode: AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/IATF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle & USB camera
SD	1
WAN/LAN	1WAN, 2 LAN
I2S	1
UART	For Debug Only)
GPIO	13
PCM	1

Electrical Data

Size	59(L) x 28.9(W) x 9.0(H) mm
Power Supply	3.3V+/-5%
DDR2	512Mb as default
Flash	64Mb and 128Mb available
Transmit Power	IEEE 802.11n: 25dBm @HT40 MCS7
	25dBm@HT20 MCS7
	IEEE 802.11g: 27dBm
	IEEE 802.11b: 29dBm
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

Environmental data, quality & reliability

Operating temperature: -20°C~ + 55°C

Storage Temperature: -40°C~ +125°C

SKW92A 2.4GHz 2X2MIMO AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n 2.4GHz AP/Router WLAN WiFi Module
- Main Chipset: MT7628N
- 2T2R mode at 300Mbps PHY data rate
- 580MHz MIPS CPU
- Antenna : 2 IPEX connectors
- Lowest standby current: 180mA
- Working mode: AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle & USB camera
I2C	1
SD	1
I2S	1
WAN/LAN	1 WAN, 4 LAN
PCM	1
PWM	1
SPI Master	Support SPI slave devices
UART	2
GPIO	35

Electrical Data

Size	40.5(L) x 25(W) x 3.0(H) mm
Power Supply	3.3V+/-5%
DDR2	512Mb as default, Customize
Flash	64Mb as default, Customize
Transmit Power	IEEE 802.11n: 16dBm @HT20/40 MCS7
	IEEE 802.11g: 15dBm IEEE 802.11b: 18dBm
	IEEE 802.11b: 18dBm @11MHz
Data rate	300Mbps -2T2R
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

Environmental data, quality & reliability

- Operating temperature: -20°C~ + 55°C
- Storage Temperature: -40°C~ +125°C

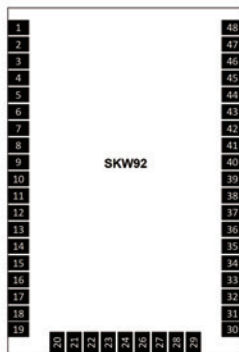
Certification and approvals

- FCC/CE certified

SKW92B IoT 2.4GHz 1X1MIMO AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n IoT 2.4GHz AP/Router WLAN WiFi Module
- Main Chipset: MT7688A
- Antenna : 1 IPEX connector
- Lowest standby current: 160mA
- Working mode: IoT AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle & USB camera
I2C	1
SD	1
I2S	1
WAN/LAN	1 WAN, 4 LAN
PCM	1
PWM	1
SPI Master	Support SPI slave devices
UART	2
GPIO	35

Electrical Data

Size	40.5(L) x 25(W) x 3.0(H) mm
Power Supply	3.3V +/- 5%
DDR2	512Mb as default, Customize
Flash	64Mb as default, Customize
Transmit Power	IEEE 802.11n: 16dBm @HT20/40 MCS7
	IEEE 802.11g: 16dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Data rate	150Mbps -1T1R
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

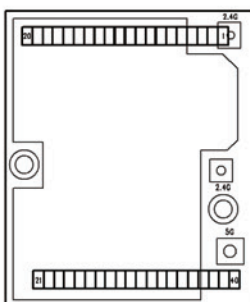
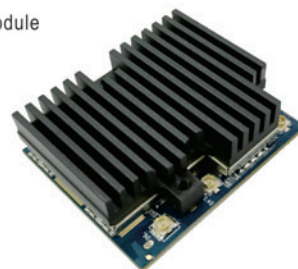
Environmental data, quality & reliability

- Operating temperature: -20°C ~ +55°C
- Storage Temperature: -40°C ~ +125°C

SKW93A 2.4GHz & 5GHz 3X3MIMO AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n/ac 2.4GHz & 5GHz AP/Router WLAN WIFI Module
- Main Chipset: MT7628A+7610E
- 3X3MIMO at 733Mbps PHY data rate
- Dual-core MIPS1004Kc (580MHz)
- Antenna : 3 IPEX connectors
- Lowest standby current: 280mA
- Working mode: AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle & USB camera
I2C	1
SD	1
I2S	1
WAN/LAN	1WAN,2LAN
PCM	1
PWM	1
SPI Master	Support SPI slave devices
UART	2
GPIO	27

Electrical Data

Size	36.4(L) x 30.5(W) x 14.8(H) mm
Power Supply	3.3V+/-5%
DDR2	1024Mb (Max)
Flash	256Mb (Max)
Transmit Power	IEEE 802.11ac: 13dBm @HT80 MCS9 /5GHz band
	IEEE 802.11ac: 16dBm @HT80 MCS0 /5GHz band
	IEEE 802.11n: 14dBm @HT20/40 MCS7 /5GHz band
	IEEE 802.11n: 16dBm @HT20/40 MCS0 /5GHz band
	IEEE 802.11n: 16dBm @HT20/40 MCS7 /2.4GHz band
	IEEE 802.11g: 16dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Data rate	733Mbps -3T3R
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

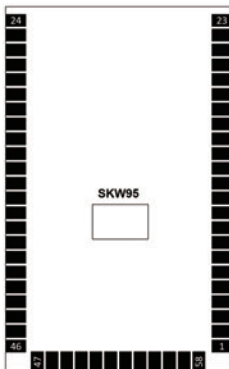
Environmental data, quality & reliability

- Operating temperature: -20°C~ + 55°C
- Storage Temperature: -40°C~ +125°C

SKW95 IoT 2.4GHz 1X1MIMO AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n IoT 2.4GHz AP/Router WLAN WIFI Module
- Main Chipset: MT7688A
- 580MHz MIPS CPU
- Antenna : 1 IPEX connector
- Lowest standby current: 160mA
- Working mode: IoT AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle& USB camera
I2C-SDIO	Controlled by I2C_MODE register
SD-XC/eMMC	Controlled by the EPHY_APGPIO_AIO_EN[4:1] and SD_MODE register
I2S	192K/24bits, Controlled by I2S_MODE register
WAN/LAN	1WAN,4LAN
PCM	Input-Min 3.5ns
PWM	4
SPI slave	1
UART	2
GPIO	35

Electrical Data

Size	33.2(L) x 18.7(W) x 3.0(H) mm
Power Supply	3.3V +/-5%
DDR2	1024Mb (Max)
Flash	256Mb (Max)
Transmit Power	IEEE 802.11n: 16dBm @HT20/40 MCS7
	IEEE 802.11g: 16dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Data rate	150Mbps -1T1R
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

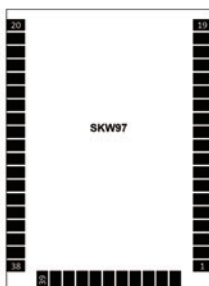
Environmental data, quality & reliability

- Operating temperature: -20°C~ + 55°C
- Storage Temperature: -40°C~ +125°C

SKW97 2.4GHz 2X2MIMO AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n 2.4GHz AP/Router WLAN WiFi Module
- Main Chipset: QCA9531
- 2x2 MIMO at 300Mbps PHY data rate
- 650MHz MIPS CPU
- Antenna : 2 IPEX connectors
- Lowest standby current: 180mA
- Working mode: AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle& USB camera
UART	Default baud rate is 115200bps
WAN/LAN	1WAN,4LAN
UART	For Debug Only
GPIO	9

Electrical Data

Size	40.5(L) x 27.5(W) x 2.9(H) mm
Power Supply	3.3V+/-5%
DDR2	1024Mb (Max)
Flash	256Mb (Max)
Transmit Power	IEEE 802.11n: 13-16dBm @HT20/40 MCS7
	IEEE 802.11g: 14-17dBm @54MHz
	IEEE 802.11b: 16-20dBm @11MHz
Data rate	300Mbps -2T2R
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

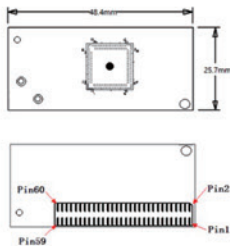
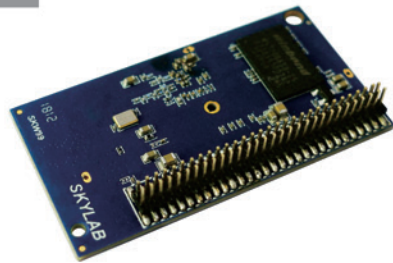
Environmental data, quality & reliability

- Operating temperature: -20°C~ + 55°C
- Storage Temperature: -40°C~ +125°C

SKW99 2.4GHz 2X2MIMO AP/Router WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n 2.4GHz 2X2MIMO WLAN WiFi Module
- Main Chipset: QCA9531
- 2x2 MIMO at 300Mbps PHY data rate
- 650MHz MIPS CPU
- Antenna : 2 IPEX connectors
- Lowest standby current: 180mA
- Working mode: AP/AP Client/Bridge/Repeater/Router mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

USB 2.0	Support USB slave devices & 3/4G USB dongle& USB camera
UART	Default baud rate is 115200bps
WAN/LAN	1WAN,4LAN
UART	For Debug Only
GPIO	12

Electrical Data

Size	48.4(L) x 25.7(W) x 9.0(H) mm
Power Supply	3.3V+/-5%
DDR2	1024Mb (Max)
Flash	256Mb (Max)
Transmit Power	IEEE 802.11n: 13-16dBm @HT20/40 MCS7 IEEE 802.11g: 14-17dBm @54MHz IEEE 802.11b: 16-20dBm @11MHz
Data rate	300Mbps -2T2R
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption AES-CCM & TKIP encryption

Environmental data, quality & reliability

- Operating temperature: -20°C~ + 55°C
- Storage Temperature: -40°C~ +125°C

WG217 2.4GHz & 5GHz Dual Band ac USB WiFi Module

Highlights

- Compliant to IEEE 802.11a/b/g/n/ac 2.4GHz & 5GHz USB WLAN WiFi Module
- Main Chipset: RTL8811CU-CG
- 2.4G or 5G ITIR mode
- USB 2.0 high speed interface
- Optional: IPEX connector or PCB Antenna
- Supports for Windows XP 32/64, 2000, Vista 32/64bit, Windows 7 32/64bit, Linux, Android
- Manufactured in ISO9001/IATF16949 certified production sites



Interface
USB 2.0 Slave 1



Electrical Data

Size	36(L) x 15(W) x 3.2(H) mm
Power Supply	3.5V ~ 5.5V
DDR2	SMD or 4pin/6pin Connector
Flash	IEEE 802.11ac: 11-14dBm @AC80 MCS7
Transmit Power	IEEE 802.11n: 13-16dBm @HT40 MCS7
	13-16dBm@HT20 MCS7
	IEEE 802.11g: 15-17dBm
	IEEE 802.11b: 16-18dBm
Data rate	433Mbps
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

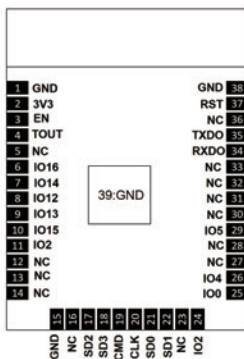
Environmental data, quality & reliability

- Operating temperature: -10°C ~ +70°C
- Storage Temperature: -40°C ~ +125°C

WG219 2.4GHz IOT UART WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n/e/l 2.4GHz IOT UART WLAN WiFi Module
- Main Chipset: ESP8266
- Optional Antenna : PCB antenna or IPEX connector
- WiFi Direct (P2P): P2P Discovery, P2P Group, Owner mode and P2P Power Management
- Support mesh network
- Working mode: Soft AP/ Station/Soft AP+Station
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

GPIO	17
I2C	1
I2S	1
UART	2
SDIO	1
SPI	As Master or Slave, 1
HSPI	Slave (High Speed), 1
PWM	4
IR Remote	1

Electrical Data

Size	25.5(L) x 18(W) x 3.2(H) mm
Power Supply	3.3V+/-10%
Transmit Power	IEEE 802.11n: 12-14dBm @HT20 MCS7
	IEEE 802.11g: 16dBm
	IEEE 802.11b: 18dBm
Data rate	72.2Mbps at 2.4GHz
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

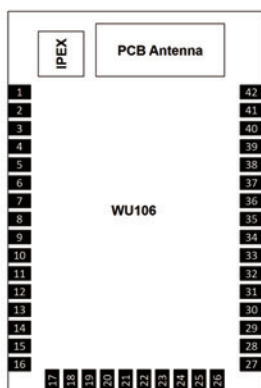
Environmental data, quality & reliability

- Operating temperature: -40°C~ + 85°C
- Storage Temperature: -40°C~ +125°C

WU106 2.4GHz IOT UART WiFi Module

Highlights

- Compliant to IEEE 802.11b/g/n/ 2.4GHz IoT WLAN WiFi Module
- Main Chipset: MT7687
- Optional Antenna : PCB antenna or IPEX connector
- 150Mbps PHY data rate at 2.4GHz 1T1R
- Working mode: AP/ Station
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

UART	2
I2C	1
I2S	1
GPIO	28

Electrical Data

Size	31.3(L) x 20.3(W) x 3.2(H) mm
Power Supply	3.3V+/-10%
Transmit Power	IEEE 802.11n: 15dBm @HT20/40 MCS7
	IEEE 802.11g: 16dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Data rate	150Mbps at 2.4GHz
Wireless Security	WPA/WPA2, WEP, TKIP and AES, WPS2.0, WAPI

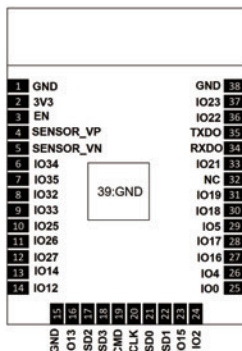
Environmental data, quality & reliability

- Operating temperature: -20°C~ +55°C
- Storage Temperature: -40°C~ +125°C

WG215 IoT UART WiFi Module

Highlights

- 2.4GHz WiFi and Bluetooth Combo Module
- Main chipset: ESP32 chip
- Compliant to IEEE 802.11b/g/n/e/i for WiFi
- Compliant with Bluetooth V4.0 BR/EDR and BLE V4.2
- Support MESH network
- Optional Antenna: PCB antenna or IPEX connector
- Working mode: Soft AP/ Infrastructure mode
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

UART	2
SDIO/SPI	1 (Can be re-used)
ADC	16
GPIO	33

Electrical Data

Size	25.5(L) x 18(W) x 3.2(H) mm
Power Supply	3.3V+/-10%
Transmit Power	IEEE 802.11n: 12-14dBm @HT20/40 MCS7
	IEEE 802.11g: 16dBm
	IEEE 802.11b: 18dBm
Data rate	150Mbps
Flash	32Mb
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

Environmental data, quality & reliability

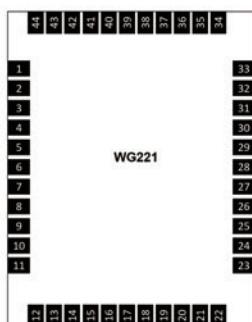
Operating temperature: -20°C~ + 70°C

Storage Temperature: -40°C~ +125°C

WG221 SDIO 2.4GHz WiFi and UART Bluetooth Combo Module

Highlights

- Compliant to IEEE 802.11b/g/n
- Main Chipset: RTL8723DS
- SDIO Version 1.1/2.0 for WLAN
- Support BT-WLAN co-existence
- Compliant with Bluetooth v2.1 + EDR and v4.2 system
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

SDIO	1
UART	1
PCM	1

Electrical Data

Size	12(L) x 12(W) x 2.3(H) mm
Power Supply	3.3V+/-5%
Transmit Power	IEEE 802.11n: 14dBm @HT20/40 MCS7 /2.4GHz band
	IEEE 802.11g: 16dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Data rate	150Mbps at 2.4GHz
Antenna	PCB pin
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption
Operation	Linux kernel 2.6.18~ 4.12.12
System	Android 4.0 ~ 6.0

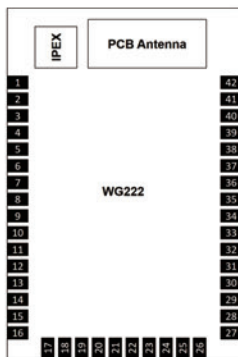
Environmental data, quality & reliability

- Operating temperature: -20°C~ + 70°C
- Storage Temperature: -55°C~ +125°C

WG222 2.4GHz & 5GHz Dual-Band WiFi and BLE Combo Module

Highlights

- Compliant to IEEE 802.11a/b/g/n
- Main Chipset: MT7697
- 150Mbps at 1T1R dual-band
- Compliant with Bluetooth v4.2 BLE specification
- Working mode: AP, Station, AP/Client
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

UART	1
I2S	1
I2C	1
ADC	4
GPIO	23
IR	1

Electrical Data

Size	31.3(L) x 20.3(W) x 3.2(H) mm
Power Supply	3.3V+/-10%
Transmit Power	IEEE 802.11n: 14-17dBm @HT20 MCS7 /5GHz band
	IEEE 802.11n: 14-17dBm @HT40 MCS7 /5GHz band
	IEEE 802.11n: 15-18dBm @HT20/40 MCS7 /2.4GHz band
	IEEE 802.11g: 15-18dBm @54Mbps
	IEEE 802.11b: 18-21dBm @11Mbps
Data rate	150Mbps at 2.4GHz
Wireless	PCB Antenna or External Antenna
Antenna	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption

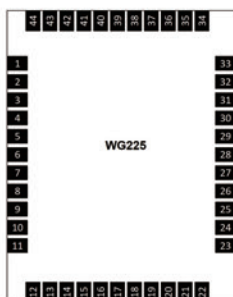
Environmental data, quality & reliability

- Operating temperature: -20°C~ + 70°C
- Storage Temperature: -40°C~ +125°C

WG225 SDIO 2.4GHz & 5GHz WiFi and UART BT2.1/4.2 Combo Module

Highlights

- Compliant to IEEE 802.11 a/b/g/n/ac
- SDIO Version: 1.1/2.0/3.0 for WLAN
- Main Chipset: RTL8821CS
- Compliant with Bluetooth v2.1 + EDR and v4.2 system
- Support BT-WLAN co-existence
- Manufactured in ISO9001/ITAF16949 certified production sites



Interfaces

SDIO	1
UART	1
PCM	1

Electrical Data

Size	12(L) x 12(W) x 1.8(H) mm
Power Supply	3.3V+/-5%
Transmit Power	IEEE 802.11ac: 11±1.5dBm @HT80 MCS9 /5GHz band
	IEEE 802.11ac: 13±1.5dBm @HT80 MCS0 /5GHz band
	IEEE 802.11n: 12±1.5dBm @HT20/40 MCS7 /5GHz band
	IEEE 802.11n: 14±1.5dBm @HT20/40 MCS0 /5GHz band
	IEEE 802.11n: 14±2dBm @HT20/40 MCS7 /2.4GHz band
	IEEE 802.11g: 16±2dBm @54Mbps
	IEEE 802.11b: 18±2dBm @11Mbps
Data rate	433.3Mbps at 5GHz in 11ac mode
Wireless	64/128/152-bit WEP encryption
Security	WPA/WPA2 enterprise encryption
	AES-CCM & TKIP encryption
Operating System	Linux kernel 2.6.18~ 4.12.12
	Android 4.0 ~ 6.0

Environmental data, quality & reliability

- Operating temperature: -20°C~ + 70°C
- Storage Temperature: -40°C~ +135°C

BLE Modules



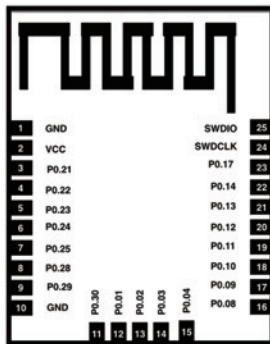
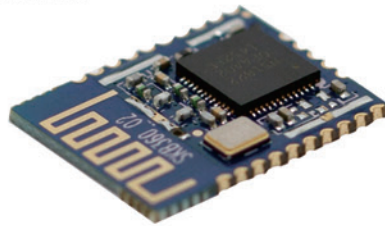
BLE Modules

PRODUCT SELECTOR							
Model		SKB360	SKB360I	SKB361	SKB362	SKB369	SKB501
Chipset		nRF51802	nRF51822	nRF51822	nRF51822	nRF52832	nRF52840
Size(LxWxH)mm		17.4x13.7x1.9	15.8x13.7x1.9	17.4x13.7x1.9	19x12x1.9	17.4x13.7x1.9	17.4x13.7x1.9
Receive Sensitivity (dBm)		-93	-93	-93	-93	-96	-98
Transmit Power		+4	+4	+4	+4	+4	+8
Flash Memory		256K	256K	256K	128K	512K	1MB
RAM Memory		16K	16K	16K	16K	64K	125K
Power consumption (uA)	Broadcasting interval 100ms	270	270	270	270	210	210
	Continuous Transmission	223	223	223	223	220	220
	Deep sleep	0.28	0.28	0.28	0.28	0.2	0.4
	Standby	2.43	2.43	2.43	2.43	2.0	1.2
Range		70	70	70	70	100	500
Interface		UART/SPI/GPIO/I ² C				UART/SPI/I ² C/I ² S	UART/SPI/GPIO/I ² C
Antenna		PCB/External	IPEX	Ceramic	PCB	PCB/External	PCB

SKB360 Bluetooth 4.0 Low Energy Module

Highlights

- Main Chipset: nRF51822
- 2.4 GHz Bluetooth® 4.0 compliant low energy single-mode protocol stack
- Peripheral and Broadcaster roles
- -93dBm sensitivity in Bluetooth low energy mode
- 250Kbps, 1Mbps, 2Mbps supported data rates
- Tx Power -20 to +4 dBm in 4 dB steps
- Tx Power -30 dBm Whisper mode
- 1.15mA peak RX, 1.3mA peak TX (+4dBm for 2.17Kbyte/s transmission rates)
- 2.5us wake-up using 16MHz RCOSC
- 0.6uA@3V OFF mode
- 1.2uA@3V in OFF mode +1 region RAM retention
- 2.6uA@3V ON mode, all blocks IDLE
- AES HW encryption
- Dimension: 17.4(L)*13.7(W)*1.9(H) mm
- Manufactured in ISO/IATF 16949 certified production sites



Interfaces

Antenna	PCB Antenna
UART	1
SPI	3
I2C	2
GPIO	20, Controlled over AT command

Electrical Data

Power Supply 2.2-3.6V

Environmental data, quality & reliability

Operating temperature: -40 to +85 °C

Power Consumption: Sleep Mode 0.28uA
Idle Mode 2.43uA

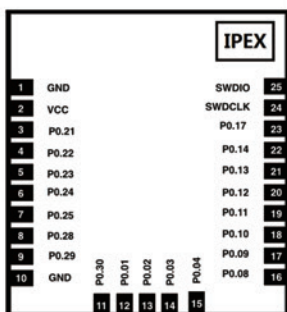
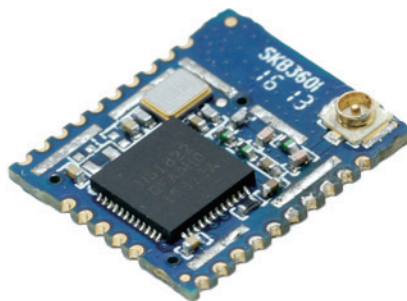
Certification

FCC/CE/RoHS Compliant (Lead-free)

SKB360I Bluetooth 4.0 Low Energy Module

Highlights

- Main Chipset: nRF51822
- 2.4 GHz Bluetooth® 4.0 low energy single-mode protocol stack
- -93dBm sensitivity in Bluetooth low energy mode
- 250Kbps, 1Mbps, 2Mbps supported data rates
- Tx Power -20 to +4 dBm in 4 dB steps
- Tx Power -30 dBm Whisper mode
- 4.2us wake-up using 16MHz RCOSC
- 0.6uA at 3V OFF mode
- 1.2uA at 3V in OFF mode +1 region RAM retention
- 2.6uA at 3V ON mode, all blocks IDLE
- AES HW encryption
- Dimension: 15.8(L)x13.7(W) x2.6(H) mm
- Manufactured in ISO 9001/IATF 16949 certified production sites



Interfaces

Antenna	External Antenna
UART	1
SPI	3
I2C	2
GPIO	20, Controlled over AT commend

Electrical Data

Power Supply	1.8-3.6V
Power Consumption	Sleep Mode 0.28uA
	Idle Mode 2.43uA

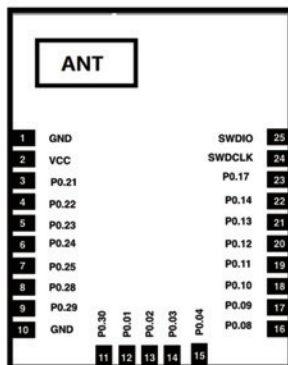
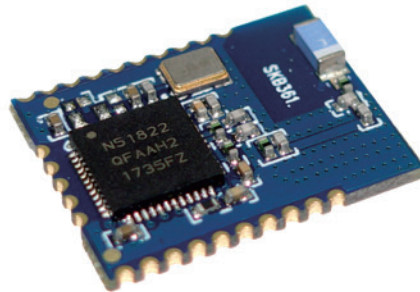
Environmental data, quality & reliability

- Operating temperature: -40 to +85 °C

SKB361 Bluetooth 4.0 Low Energy Module

Highlights

- Main Chipset: nRF51822
- Bluetooth® 4.0 low energy single-mode protocol stack
- -93dBm sensitivity in Bluetooth low energy mode
- 250Kbps, 1Mbps, 2Mbps supported data rates
- Tx Power -20 to +4 dBm in 4 dB steps
- Tx Power -30 dBm Whisper mode
- 4.2us wake-up using 16MHz RCOSC
- 0.6uA at 3V OFF mode
- 1.2uA at 3V in OFF mode +1 region RAM retention
- 2.6uA at 3V ON mode, all blocks IDLE
- AES HW encryption
- Dimension: 17.4(L)*13.7(W)*1.9(H) mm
- Manufactured in ISO 9001/IATF 16949 certified production sites



Interfaces

Antenna	Chip Antenna
UART	1
SPI	3
I2C	2
GPIO	20, Controlled over AT commend

Electrical Data

Power Supply	1.8-3.6V
Power Consumption	Sleep Mode 0.28uA
	Idle Mode 2.43uA

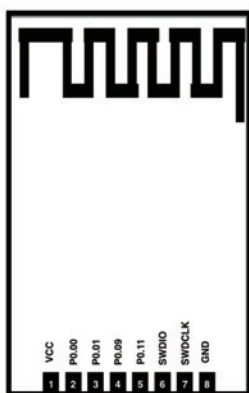
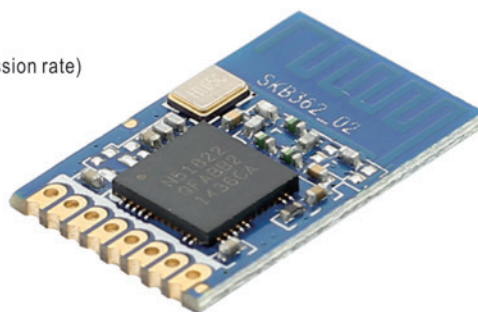
Environmental data, quality & reliability

- Operating temperature: -40 to +85 °C
- RoHS Compliant (Lead-free)

SKB362 Bluetooth 4.0 Low Energy Module

Highlights

- Main Chipset: nRF51822
- 2.4 GHz Bluetooth® 4.0 compliant low energy single-mode protocol stack
- Peripheral and Broadcaster roles
- -93dBm sensitivity in Bluetooth low energy mode
- 250Kbps, 1Mbps, 2Mbps supported data rates
- Tx Power -20 to +4 dBm in 4 dB steps
- Tx Power -30 dBm Whisper mode
- 1.15mA peak RX, 1.3mA peak TX (+4dBm for 2.17Kbyte/s transmission rate)
- 2.5us wake-up using 16MHz RCOS
- 0.6uA@3V OFF mode
- 1.2uA@3V in OFF mode +1 region RAM retention
- 2.6uA@3V ON mode, all blocks IDLE
- 8/9/10 bit ADC-6 configurable channels
- 2.17K byte/s transmission rate 115200bps
- AES HW encryption
- Dimension: 12(L)x19(W) x1.9(H) mm
- Manufactured in ISO/IATF 16949 certified production sites



Interfaces

Antenna	PCB Antenna
UART	1
SPI	1
I2C	1
GPIO	4, Controlled over AT commend

Electrical Data

Power Supply	1.8-3.6V
Power Consumption	Sleep Mode 0.28uA
	Idle Mode 2.43uA

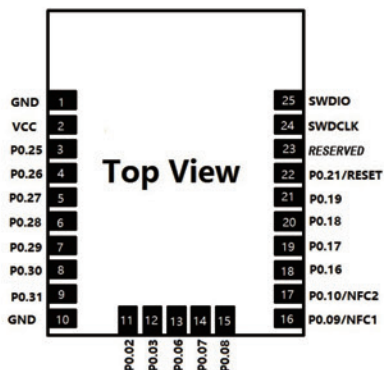
Environmental data, quality & reliability

Operating Temperature:	-25°C~75°C
Storage temperature:	-40 to +85 °C
RoHS Compliant (Lead-free)	

SKB369 Bluetooth 4.2 Low Energy Module

Highlights

- Main Chipset: nRF52832
- Bluetooth® 4.2 low energy single-mode
- protocol stack: L2CAP, ATT, GAP, GATT and SM protocols
- Central and Peripheral roles
- Supported data rates up to 1Mbps
- Support NFC-A
- AES HW encryption
- Dimension: 17.4(L)*13.7(W)*1.9(H) mm
- Manufactured in ISO 9001/IATF 16949 certified production sites



Interfaces

Antenna	PCB Antenna/External Antenna
UART	1
SPI	3
I2C	2
ADC	6
GPIO	19, Controlled over AT commend

Electrical Data

Power Supply	1.8-3.6V
Power Consumption	Sleep Mode 0.2uA
	Idle Mode 1.2uA

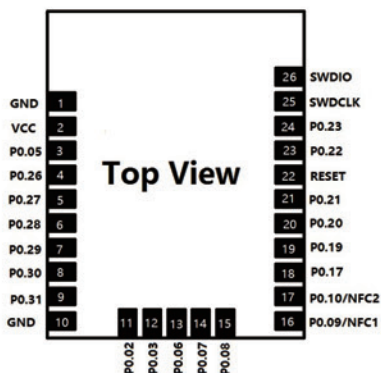
Environmental data, quality & reliability

Operating temperature -40 to +85 °C
 FCC/CE/BQB Certified
 RoHS Compliant (Lead-free)

SKB501 Bluetooth 5.0 Low Energy Module

Highlights

- IMain Chipset: nRF52840
- IBluetooth 5 ready multi-protocol radio
- IBluetooth 5 data rate: 2Mbps, 1Mbps, 500Kbs, 125Kbs
- I32-bit ARM Cortex-M4F @ 64MHz
- IUp to 111 dB link budget for Bluetooth long range mode
- INFC-A on-chip
- IProgrammable output power from +8dBm to -20dBm
- I-96dBm Sensitivity for Bluetooth low energy
- IDimension: 17.4(L)x13.7(W)x1.9(H) mm
- IManufactured in ISO 9001/IATF 16949 certified production sites



Interfaces

Antenna	PCB Antenna/External Antenna
UART	1
SPI	3
I2C	2
TWI	2
ADC	6
GPIO	20, Controlled over AT commend

Electrical Data

Power Supply	1.7-3.6V
Power Consumption	Sleep Mode 0.4uA
	Idle Mode 1.2uA

Environmental data, quality & reliability

Operating Temperature:	-40°C~85°C
Storage Temperature:	-40°C~125°C

BLE Beacon

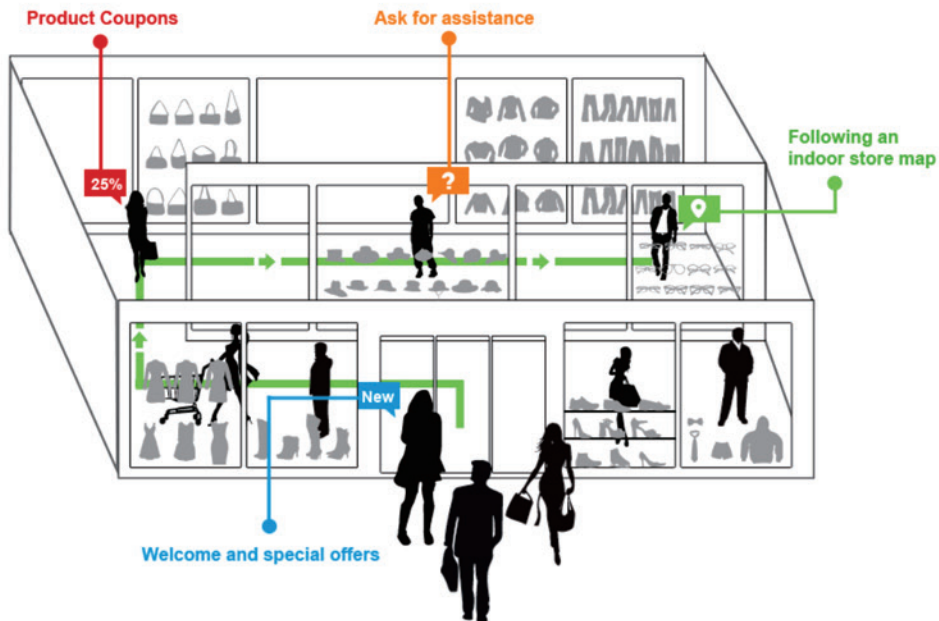
Compatible with eddystone and iBeacon

Picture	Item	Dimension (mm)	Chipset	Battery	Interval Time Options	UUID/ Major/ Minor	APP/SDK	Waterpro of
	VG01	47.5(R) x16.1(H)	nRF51822	CR2477 *1pcs	100-1000ms is available 200ms default	Programmable	YES, the APP and SDK is same	No
	VG02	72x45x26	nRF51822	AA *2pcs	100-1000ms is available 500ms default			Yes

Range : 70m in the open air

Reference battery life in different configuration

Item	Transmit Power	Advertise Interval	Battery Life
VG01	0db	100ms	6 months
		200ms	12 months
		500ms	25 months
VG02	0db	100ms	12 months
		200ms	24 months
		500ms	50 months



VDB1508 BLUETOOTH 4.2/5.0 ID CARD

Highlights

- Rechargeable with Lion-Battery of 600mAH.
- Scan and transmit simultaneously.
- Waterproof.
- Anti-dismantling



Electrical Data

	BLE4.2 ID Card	BLE5.0 ID Card
Broadcasting Mode	15 months (1Hz, 0dBm)	12 months (1Hz, 0dBm)
Transmit Power	-20 to +4dBm, adjustable, interval: 4dBm	-20 to +8dBm, adjustable, interval: 4dBm
Receive Sensitivity	-91dBm	-95dBm@1Mbps -103dBm@125Kbps
Indicator light	Charging indicator light; Working indicator light	
SOS button	Short press on yellow button	
NFC		Support
Turn ON/OFF	Turn ON - Long press on yellow button; Turn OFF - 3 times short press then long press on yellow button	Turn ON - Long press on yellow button; Turn OFF - 3 times short press then long press on yellow button
Transmission Distance	30m	100m
Battery capacity	600mAH 20~40°C	
Charging Method	Magnetic charge Cable	
Duration of charging	4 hours	
Working Temperature		
Waterproof & Dustproof	IP67 (can be put in water)	
Dimension	85.33(L)*53.92(W)*7.26(H)mm	
Weight	29g	
Parts	Magnetic charge Cable, Lanyard	

VG08 BLE Bracelet For OLED Display Fitness Tracker

Highlights

- Main chipset: Nordic 52832
- Waterproof level: IP67
- Standby time: 25 days
- Battery capacity: 60mh
- Backlight time: 8 seconds
- BT 4.2 version



Interfaces

- USB For charging (Input Voltage 5V)

Electrical Data

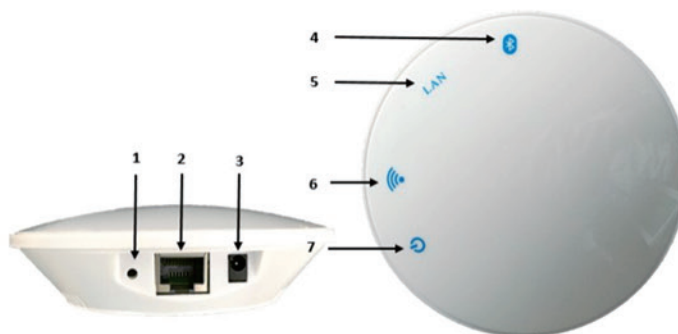
Size	Resolution:128*64 for OLED Screen: 0.96'
RAM	64kb
Flash	512kb
Texture of material	Band: TPU Subject: ABS + PC
Supported System	Android 4.4 or above IOS 9.0 or above

Function

Item	Support	Nonsupport	Item	Support	Nonsupport
LED		X	Pedometer/ Calories/Distance	√	
Sleeping monitoring	√		Vibration	√	
Goal completed reminder	√		Alarm clock	√	
Reminder	√		Heart rate	√	
Blood pressure	√		Over The air	√	
UV		X	Brightness adjust		X
G-sensor	√ 3D accelerated		Light sensor		X
Range sensor		X	GPS		X

TD05A Bluetooth Gateway With PoE or DC Power supply

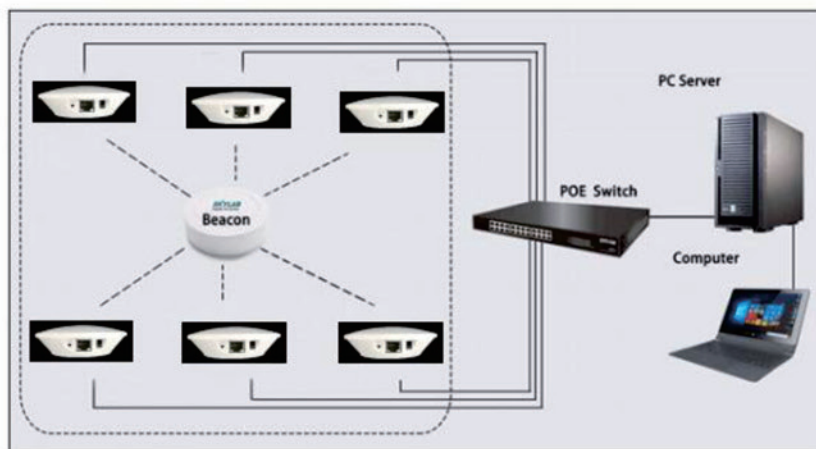
- 1: Reset
- 2: Network Interface
- 3: Power Interface
- 4: Bluetooth LED
- 5: Network LED
- 6: WiFi LED
- 7: Power LED



Highlights

- Supports the POE switch power supply and 5V adapter power supply.
- Support IEEE 802.3 standard-compliant solution, including pre-standard PoE support.
- Support IEEE 802.11 b/g/n Protocol
- Support Bluetooth ® 4.2 One WAN/LAN variable network port
- Operating temperature: -20 ~ 70℃
- Working mode: AP client - LAN port
- Gateway - WAN port
- The max data rate of WIFI 100Mbps
- BLE 1Mbps

Application diagram for indoor positioning





GNSS Modules

PRODUCT SELECTOR													
Model		SKG 09D	SKG 09A	SKG 09BL	SKG 12D	SKG 12A	SKG 12BL	SKM 52	SKM 53	SKM 61	SKM 81	SKM 51	SKM 55
SeriesL/W/H (mm)		10×9.7×2.2			16×12.2×2.4			20×20×4.9	20×30×8.5	30×26×7.6	18×18×4.3	50.5×38.5×18	46×45×15
Type	GPS/Qzss	•	•	•	•	•	•	•	•	•	•	•	•
	SBAS	•	•		•	•		•	•	•	•	•	•
	GPS/BDS GLONASS	•			•			•		•	•	•	•
	Timing												
	High Precision	•	•		•	•							
	Low Power	•	•								•		
Power	Supply Voltage (V)	3.0~4.2V	3.0~4.2V	3.0~4.2V	3.0~4.2V	3.0~4.2V	3.0~4.2V	3.0~4.2V	3.3~5.5V	3.3~5.5V	3.3~5.5V	3.3~5.5V	3.3~5.5V
Interface	UART	•	•	•	•	•	•	•	•	•	•	•	•
	USB												
Features	Programmable	•	•		•	•		•	•	•	•	•	•
	Antenna Detecting	•	•		•	•							
	Additional LNA	•	•	•	•	•	•	•	•	•	•	•	•
	Periodic Mode	•	•	•	•	•	•	•	•	•	•	•	•
	Configuration PIN			•			•						
	Time Pulse	•	•	•	•	•	•	•			•		
	Interference Canceller	•	•	•	•	•	•	•	•	•	•	•	•
	AGPS	•	•	•	•	•	•	•	•	•	•	•	•
	Easy	•	•	•	•	•	•	•	•	•	•	•	•
	Data Logging	•	•		•	•		•	•	•	•	•	•

SKG09A High Performance GPS Module

Highlights

- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Ultra low power consumption. Lowest standby current: < 0.20 mA
- ± 10 ns high accuracy time pulse (1PPS)
- Indoor and outdoor multi-path detection and compensation
- Easy to be integrated, response to customer's demands or product design quickly
- Manufactured in ISO9001 / IATF16949 certified production sites



10	GND		RESET	9
11	RF_IN	SKG09A/ B/BLD	VCC	8
12	GND		NC	7
Top View				
13	LNA_EN		V_BCKP	6
14	VCC_RF		EXTINT	5
15	VANT		PPS	4
16	GPIO14		RXD	3
17	GPIO15		TXD	2
18	GPIO0		GND	1

Interfaces

UART	1
GPIO	3

Electrical Data

Size	10.1(L) x 9.7 (W) x 2.2(H)mm	
Power Supply	3.0~4.2V	
Reserve Power	2.0~4.2V	
Power Consumption	Tracking	17mA @3.3V Typical
	Acquisition	22mA @3.3V
Antenna	50Ω Antenna Detection	
Time Pulse	Configurable 0.1Hz~20Hz	
Protocol	NMEA0183	
Receiver Type	GPS, L1 frequency band, C/A code,	
	22 Tracking / 66 Acquisition-Channel	
Sensitivity	Tracking	-165dBm Typical
	Acquisition	-148dBm Typical
Accuracy	Position	3.0m CEP50 without SA(Typical Open Sky)
	Velocity	0.1m/s without SA
	Timing (PPS)	10ns RMS
TTFF	Cold Start	23s(Typical Open Sky)
	Warm Start	2-3s
	Hot Start	1s
	Re-Acquisition	<1s
Assisted GPS support	EPO	
Maximum Update Rate	10Hz	
Operational Limits	Altitude	Max 18,000m
	Velocity	Max 515m/s
	Acceleration	Less than 4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C

Storage Temperature: -40°C to +125°C

SKG12 A High Performance GPS Module

Highlights

- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Ultra low power consumption. Lowest standby current: < 0.20 mA
- ± 10 ns high accuracy time pulse (1PPS)
- Easy to be integrated, response to customer's demands or product design quickly
- Manufactured in ISO9001 / IATF16949 certified production sites



1	GND	2	GND
2	GP014	3	RF IN
3	GP015	4	GND
4	NC	5	VCC OUT
5	NC	6	V_ANT
6	TXD1	7	SKG12A/SRL
7	TXD1	8	NC
8	TXD0	9	NC
9	TXD0	10	EXTINT1
10	V_BCKP	11	PPS
11	VCC	12	GP011
12	GND	13	FIXLED

Interfaces

UART	2
GPIO	3

Electrical Data

Size	16.0(L) x 12.2(W) x 2.4(H)mm
Power Supply	3.0~4.2V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 18mA @3.3V Typical Acquisition 23mA @3.3V
Antenna	50Ω Antenna Detection
Time Pulse	Configurable 0.1Hz ~ 20Hz
Protocol	NMEA0183, RTCM, User-defined
Receiver Type	GPS, L1 frequency band, C/A code 22 Tracking / 66 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky) Velocity 0.1m/s without SA Timing (PPS) 10ns RMS
TTFF	Cold Start 23s(Typical Open Sky) Warm Start 2-3s Hot Start 1s Re-Acquisition <1s
Assisted GPS support	EPO
Maximum Update Rate	10Hz
Operational Limits	Altitude Max 18,000m Velocity Max 515m/s Acceleration Less than 4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C
Storage Temperature: -40°C to +125°C

Certification

CE /FCC/RoHS certified (Lead-free)

SKG09BL High Performance GPS Module

Highlights

- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Ultra low power consumption
- ± 10 ns high accuracy time pulse (1PPS)
- NMEA Output: GGA,GSA,GSV,RMC,VTG,GLL
- Manufactured in ISO9001 / IATF16949 certified production sites



10	GND		RESET	9
11	RF_IN	SKG09A/ B/BL/D	VCC	8
12	GND		NC	7
13	LNA_EN	Top View	V_BCKP	6
14	VCC_RF		EXTINT	5
15	VANT		PPS	4
16	GPIO14		RXD	3
17	GPIO15		TXD	2
18	GPIO0		GND	1

Interfaces

UART	1
GPIO	2

Electrical Data

Size	10.1 (L)x 9.7(W) x 2.2(H)mm
Power Supply	3.0-4.2V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 16mA @3.3V Typical Acquisition 19mA @3.3V
Antenna	50Ω
Protocol	NMEA0183
Receiver Type	GPS, L1 frequency band, C/A code, 22 Tracking / 66 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky) Velocity 0.1m/s without SA Timing (PPS) 10ns RMS
TTFF	Cold Start 23s(Typical Open Sky) Warm Start 2-3s Hot Start 1s Re-Acquisition <1s
Assisted GPS support	EPO
Maximum Update Rate	10Hz
Operational Limits	Altitude Max 18,000m Velocity Max 515m/s Acceleration Less than 4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C

Storage Temperature: -40°C to +125°C

SKG12BL High Performance GPS Module

Highlights

- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Ultra low power consumption
- ± 10 ns high accuracy time pulse (1PPS)
- NMEA Output: GGA,GSA,GSV,RMC,VTG,GLL
- Manufactured in ISO9001 / IATF16949 certified production sites



13	GND	12	GND
14	GPIO14	11	RF_IN
15	GPIO15	10	GND
16	NC	9	VCC_OUT
17	NC	8	V_ANT
18	TXD1	7	NC
19	RXD1	6	NC
20	TXD0	5	NC
21	RXD0	4	EXTINT1
22	V_BACKP	3	PPS
23	VCC	2	GPIO11
24	GND	1	FIXED

Interfaces

UART	2
GPIO	3

Electrical Data

Size	16.0(L)x 12.2(W) x 2.4(H)mm
Power Supply	3.0~4.2V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 23mA @3.3V Typical
	Acquisition 26mA @3.3V
Antenna	50Ω
Protocol	NMEA0183, RTCM
Receiver Type	GPS, L1 frequency band, C/A code, 22 Tracking / 66 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 10ns RMS
TTFF	Cold Start 23s(Typical Open Sky)
	Warm Start 2-3s
	Hot Start 1s
	Re-Acquisition <1s
Assisted GPS support	EPO
Maximum Update Rate	10Hz
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s
	Acceleration Less than 4g

Environmental data, quality & reliability

- Operation temperature: -40°C to +85°C
- Storage Temperature: -40°C to +125°C

Certification

- CE /FCC/RoHS certified (Lead-free)

SKG09D GPS/BDS/GLONASS/GALILEO Multi-system Positioning Module

Highlights

- GPS/GLONASS/BDS/GALILEO/QZSS receiver
- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Ultra low power consumption. Lowest standby current: < 0.20 mA
- ± 10 ns high accuracy time pulse (1PPS)
- Indoor and outdoor multi-path detection and compensation
- Manufactured in ISO9001 / IATF16949 certified production sites



10	GND		RESET	9
11	RF_IN	SKG09A/ B/BL/D	VCC	8
12	GND		NC	7
13	LNA_EN	Top View	V_BCKP	6
14	VCC_RF		EXTINT	5
15	VANT		PPS	4
16	GPIO14		RXD	3
17	GPIO15		TXD	2
18	GPIO0		GND	1

Interfaces

UART	1
GPIO	3

Electrical Data

Size	10.1(L) x 9.7(W) x 2.2(H)mm
Power Supply	3.0-4.2V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 25mA @3.3V Typical
	Acquisition 30mA @3.3V
Antenna	50Ω Antenna Detection
Protocol	NMEA0183, User-defined
Receiver Type	GPS/GLONASS/BDS/GALILEO/QZSS
	33 Tracking / 99 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 10ns RMS
TTFF	Cold Start 23s(Typical Open Sky)
	Warm Start 2-3s
	Hot Start 1s
	Re-Acquisition <1s
Maximum Update Rate	10Hz
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s
	Acceleration Less than 4g

Environmental data, quality & reliability

- Operation temperature: -40°C to +85°C
- Storage Temperature: -40°C to +125°C

SKG12D GPS/BDS/GLONASS/GALILEO Multi-system Positioning Module

Highlights

- GPS/GLONASS/BDS/GALILEO/QZSS receiver
- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Ultra low power consumption. Lowest standby current: < 0.20 mA
- ±10ns high accuracy time pulse (1PPS)
- Indoor and outdoor multi-path detection and compensation
- Small dimension and easy to be integrated
- Manufactured in ISO9001 / IATF16949 certified production sites



1	GND	12	GND
2	GP014	13	RF_IN
3	GP015	14	GND
4	NC	15	VCC_OUT
5	NC	16	V_ANT
6	TXD1	17	NC
7	RXD1	18	NC
8	TXD0	19	NC
9	RXD0	20	EXTINT1
10	V_BACKP	21	PPS
11	VCC	22	GP011
12	GND	23	FIXED

Interfaces

UART	2
GPIO	3

Electrical Data

Size	16.0(L) x 12.2(W) x 2.4(H)mm
Power Supply	3.0-4.2V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 35mA @3.3V Typical
	Acquisition 40mA @3.3V
Antenna	50Ω Antenna Detection
Protocol	NMEA0183, RTCM, User-defined
Receiver Type	GPS/GLONASS/BDS/GALILEO;
	33 Tracking / 99 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 10ns RMS
	Cold Start 23s(Typical Open Sky)
TTFF	Warm Start 2-3s
	Hot Start 1s
	Re-Acquisition <1s
Maximum Update Rate	10Hz
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s
	Acceleration Less than 4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C
 Storage Temperature: -40°C to +125°C

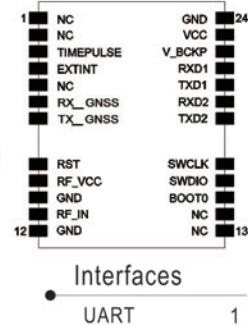
Certification

CE /FCC/RoHS certified (Lead-free)

SKM-4DU High Performance GNSS/INS Module

Highlights

- Combined with GNSS/INS
- GNSS positioning: BDS/GPS/GLONASS
- 100% continuous positioning in tunnel
- Power consumption 150mA@3.3V typical
High Sensitivity:-165dBm
- Build in high performance three-axis gyroscope
and three-axis accelerometer
- Support AGNSS, fast positioning
- Manufactured in ISO9001 / IATF16949 certified production sites



Electrical Data

Size	12(L)x 6.9(w)x2.2(H)mm
Power Supply	3.0~3.3V
Power Consumption	150mA@3.3V typical
Protocol	NMEA0183, RTCM, User-defined
Receiver Type	GPS L1C/A GLONASS L1OF BDS B1
TTFF	Cold Start 27s Warm Start 3s Hot Start 1s Auxiliary start 5s
Sensitivity	Tracking -165dBm Re-Acquisition -148dBm Cold Start -160dBm Warm Start -148dBm Hot Start -156dBm
Horizontal Position accuracy	Autonomous: 2.5m SBAS: 2.0m
Timing accuracy	RMS: 30ns 99%:60ns
Velocity Accuracy	0.05m/s
Lost GNSS for 60s	Positioning accuracy ≤10% of distance travelled without GNSS
Navigation Data Update Rate	1Hz as default 5Hz in max
Operational Limits	Altitude <=50,000m Velocity <=500m/s Acceleration <=4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C
Storage Temperature: -40°C to +125°C

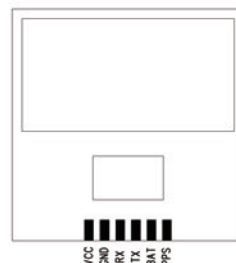
Certification

FCC, CE compliance
RoHS compliance (Lead-free)

SKM52 GNSS Module with Antenna

Highlights

- GPS/GLONASS/GALILEO/BDS/QZSS receiver
- Ultra high sensitivity: -165dBm
- Internal back-up battery
- Extremely fast TTFF at low signal level
- Built in high gain LNA
- Ultra Low power consumption: Typical 20mA@3.3V
- Manufactured in ISO9001 / IATF16949 certified production sites



Interfaces

UART

1

Electrical Data

Size	20(L)x20(W)x4.9(H)mm
Power Supply	3.0~4.2V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 20mA @3.3V Typical Acquisition 24mA @3.3V
Antenna	50 Ω, integrated
Protocol	NMEA0183
Receiver Type	GPS/GLONASS/GALILEO/BDS/QZSS, 22 Tracking / 66 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky) Velocity 0.1m/s without SA Timing (PPS) 60ns RMS
TTFF	Cold Start 23s(Typical Open Sky) Warm Start 2-3s Hot Start 1s Re-Acquisition <1s
Assisted GPS support	1Hz as default
Maximum Update Rate	10Hz in max
Operational Limits	Altitude Max 18,000m Velocity Max 515m/s Acceleration Less than 4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C

Storage Temperature: -40°C to +125°C

SKM53 GPS Module with Antenna

Highlights

- Ultra high sensitivity: -165dBm
- Internal back-up battery
- Extremely fast TTFF at low signal level
- Built in high gain LNA
- Low power consumption: Typical 30mA@3.3V
- Manufactured in ISO9001 / IATF 16949 certified production sites



Interfaces

UART 1

Electrical Data

Size	30(L) x20(W) x 8.5(H)mm
Power Supply	3.3-5.5V
Power Consumption	Tracking 30mA @3.3V Typical
	Acquisition 33mA @3.3V
	Sleep/Standby Mode TBD
Protocol	NMEA0183
Antenna	50 Ω , integrated
Receiver Type	GPS, L1 frequency band, C/A code, 22 Tracking / 66 Acquisition-Channel
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 60ns RMS
TTFF	Cold Start 23s (Typical in Open Sky)
	Warm Start 2-3s
	Hot Start 1s
	Re-Acquisition <1s
Assisted GPS support	1Hz as default
Maximum Update Rate	10Hz in max
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s

Environmental data, quality & reliability

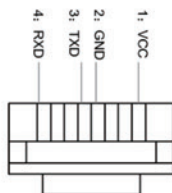
Operation temperature: -40°C to +85°C(without backup battery)

Storage Temperature: -40°C to +125°C

SKM61 GNSS Modules with Integrated Antenna

Highlights

- GPS/GLONASS/GALILEO/BDS/QZSS receiver
- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Internal back-up battery
- Low power consumption: Typical 20mA@5V
- Manufactured in ISO9001 / IATF16949 certified production sites



Interfaces

UART 1

Electrical Data

Power Supply	3.3~5.5V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 35mA@3.3V Typical
	Acquisition 40mA@3.3V
Protocol	NMEA0183, User-defined
Receiver Type	GPS/GLONASS/GALILEO/BDS/QZSS
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 60ns RMS
	Cold Start 23s(Typical Open Sky)
TTFF	Warm Start 2-3s
	Hot Start 1s
	Re-Acquisition <1s
Assisted GPS support	1Hz as default
Maximum Update Rate	10Hz in max
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s
	Acceleration Less than 4g
Size	30(L)x26(W)x7.6(H)mm

Environmental data, quality & reliability

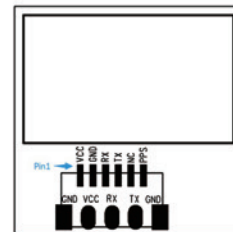
Operation temperature: -40°C to +85°C

Storage Temperature: -40°C to +125°C

SKM81 GNSS Modules with Integrated Antenna

Highlights

- GPS/GLONASS/GALILEO/BDS/QZSS receiver
- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Low power consumption: Typical 20mA@5V
- ± 10 ns high accuracy time pulse (1PPS)
- Manufactured in ISO9001 / IATF16949 certified production sites



Interfaces

UART

1

Electrical Data

Size	18(L)x18(W)x6.3(H)mm
Power Supply	3.3~5.5V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 25mA@3.3V Typical
	Acquisition 30mA@3.3V
Protocol	NMEA0183
Receiver Type	GPS/GLONASS/GALILEO/BDS/QZSS
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 60ns RMS
TTFF	Cold Start 23s(Typical Open Sky)
	Warm Start 2-3s
	Hot Start 1s
	Re-Acquisition <1s
Assisted GPS support	1Hz as default
Maximum Update Rate	10Hz in max
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s
	Acceleration Less than 4g

Environmental data, quality & reliability

Operation temperature: -40°C to +85°C

Storage Temperature: -40°C to +125°C

G-Mouse



SKM51



SKM55

Configuration for SKM51

Protocol \ Connector	Micro-fit 3.0	Audio
Rs232	SKM51RM	SKM51RA
UART(TTL)	SKM55TM	SKM51TA

Configuration for SKM55

Protocol \ Connector	Micro-fit 3.0	USB	Db9
Rs232	SKM55RM	/	SKM55RD
USB	/	SKM55U	/
UART(TTL)	SKM55TM	/	/

SKM55 G-Mouse

Highlights

- GPS/ BDS/ GLONASS/GALILEO/QZSS receiver
- Ultra high sensitivity: -165dBm
- Extremely fast TTFF at low signal level
- Internal back-up battery
- Low power consumption: Typical 20mA@5V
- Manufactured in ISO9001 / IATF16949 certified production sites



Interfaces

UART 1

Electrical Data

Size	46(L) x 45(W) x 15(H)mm
Power Supply	3.5~5.5V
Reserve Power	2.0~4.2V
Power Consumption	Tracking 35mA@3.3V typical
	Acquisition 40mA@3.3V
	Sleep/Standby Mode TBD
Protocol	NMEA0183, User-defined
Receiver Type	GPS/BDS/GALILEO/GLONASS
Sensitivity	Tracking -165dBm Typical
	Acquisition -148dBm Typical
Accuracy	Position 3.0m CEP50 without SA(Typical Open Sky)
	Velocity 0.1m/s without SA
	Timing (PPS) 60ns RMS
TTFF	Cold Start 23s (Typical in Open Sky)
	Warm Start 3s
	Hot Start 1s
	Re-Acquisition <1s
Assisted GPS support	1Hz as default
Maximum Update Rate	10Hz in max
Operational Limits	Altitude Max 18,000m
	Velocity Max 515m/s
	Acceleration Less than 4g

Environmental data, quality & reliability

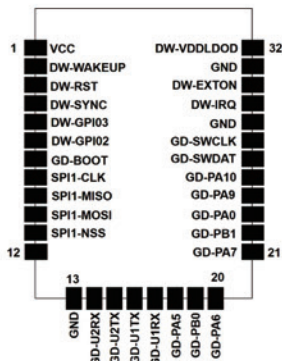
Operation temperature: -40°C to +85°C(without backup battery)

Storage Temperature: -40°C to +125°C

SKU603 Ultra Wideband Module

Highlights

CPU	GD32F130G8U6	- Core: ARM® Cortex®-M3 RISC core 48MHz maximum frequency - Single-cycle multiplication and hardware division 64 KB on-chip Flash memory - up to 8 KB SRAM memory - one 12-bit ADC - up to five general-purpose 16-bit timers, a general-purpose 32-bit timer
UWB Transceiver IC	Dw1000	- IEEE 802.15.4-2011 UWB compliant - Supports 4 RF bands from 3.5 GHz to 6.5 GHz - Programmable transmitter output power - Fully coherent receiver for maximum range - Data rates of 110Kbps, 850Kbps, 6.8 Mbps - Maximum packet length of 1023 bytes for high data throughput applications - Integrated MAC support features Supports 2-way ranging and TDOA
Accelerometer	LIS2DH12	- Ultra-low power consumption down to 2uA $\pm 2g/\pm 4g/\pm 8g/\pm 16g$ selectable full scales "Sleep-to-wake" and "return-to-sleep" functions - Motion detection - Free-fall detection



Interfaces

USART	2
I2C	2
Serial Wire JTAG Debug Port	1

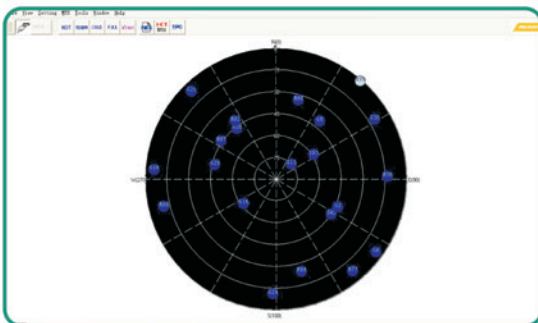
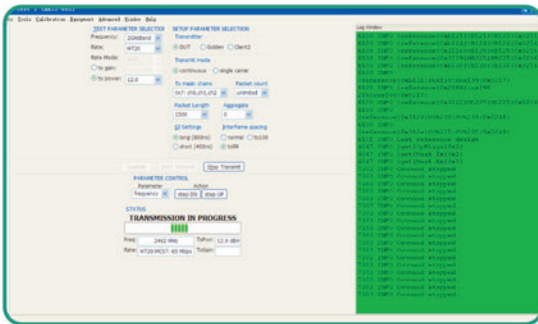
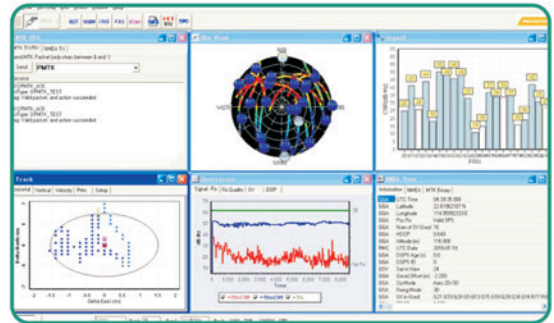
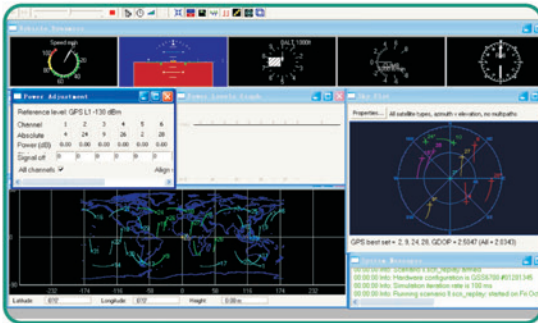
Electrical Data

Size	28.8(L)×15.8(W)×2.5(H) mm
Power Supply	2.8V~3.6V
Power Consumption	2uA
Frequency Range	3244MHz---6999MHz
Channel Bandwidths	500MHz Channel 1, 2, 3 and 5

Environmental data, quality & reliability

- Operation temperature: -30°C to +85°C
- Storage Temperature: -40°C to +85°C

Production Test



SKYLAB

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WGS84:N22°28'20.41" E114°03'04.26"