Secure, Rugged Wi-Fi Embedded OEM open board modules

BB-WLNN-xx-DP551 Series

ADVANTECH

www.advantech.com



PRODUCT FEATURES

- Quick time to market and reduced integration costs
- 802.11a/b/g/n Wi-Fi (2.4 GHz, 5 GHz)
- Airborne PowerSave firmware reduces power consumption and extends battery life in mobile devices
- Extended operating temperature range (-40 to +85°C) and environmental specifications
- AirborneM2M SpeedLink roaming provides enhanced connection reliability
- Advanced Enterprise Class wireless security
- AirborneM2M PortFlex capability enables any combination of COM ports (UART, SPI, GPIO, Ethernet and 802.11 interfaces)
- FCC Part 15 Class B Sub C Modular Approval minimizes regulatory requirements
- Backwards compatible with previous generations of AirborneM2M embedded modules

AirborneM2M[™] Embedded Dual Band Wireless Device Server and Ethernet Solution Modules Serial & Ethernet to 802.11a/b/g/n (2.4 GHz, 5 GHz)

The AirborneM2M line of highly-integrated 802.11 wireless modules allows OEMs to Wi-Fi enable devices used in a variety of machine-to-machine (M2M) applications. Advantech delivers all the necessary RF technology, networking stacks and advanced security features in a compact, single-board package, reducing integration costs for OEMs and providing a quick time to market.

Big Performance in Small, Ruggedized Package

The AirborneM2M series provides the industry's most rugged, highly-integrated, embedded WiFi module solution. AirborneM2M modules meet extended operating temperature specifications of the most demanding M2M applications.

Utilizing a 32-bit ARM9 processor and high-performance Atheros AR6203 802.11 radio, AirborneM2M modules deliver increased transmit power and receive sensitivity contributing to superior range performance.

SpeedLink[™] Roaming

AirborneM2M SpeedLink roaming feature provides enhanced connection reliability, enabling OEM devices to roam freely within a wireless network without loss of data or connection.

Flexible & Easy to Integrate

AirborneM2M incorporates support for both serial and Ethernet to WiFi 802.11 2.4 or 5 GHz communications. Utilizing AirborneM2M PortFlex capability, OEMs can configure via software any combination of UART, SPI, Ethernet, GPIO and 802.11 interfaces. Each individual port can be independently configured. A development kit is also available to aid developers (sold separately).

The AirborneM2M modules are footprint and pin compatible with their predecessors. Our commitment to maintaining hardware and software compatibility assures OEMs of a simple, future-proof migration path even as wireless technology evolves.

Enterprise Class Security

Security protocols are important to mission-critical wireless M2M applications. The AirborneM2M multi-layered security approach addresses the requirements of enterprise-class networks and corporate IT departments. These advanced security features include wireless security (801.11i/WPA2 Enterprise); network security (EAP authentication and certificate support); communication security (SSH functionality and fully encrypted data tunnels); and device security (multilevel encryption capability to protect configuration data).

ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION	
BB-WLNN-ER-DP551	802.11a/b/g/n, 10/100 Ethernet Router (NAT Level 3), Advanced Enterprise Security	
BB-WLNN-AN-DP551	802.11a/b/g/n, UART Interface, Advanced Enterprise Security	
BB-WLNN-SE-DP551	802.11a/b/g/n, Serial Device Server, UART with RS- 232/422/485 Driver Control, Advanced Enterprise Security	
BB-WLNN-SP-DP551	802.11a/b/g/n, SPI Interface, Advanced Enterprise Security	
BB-WLNN-EK-DP551	Design and Development Kit	

ACCESSORIES - sold separately

BB-ACH2-DBAT-DP002 - 2dBi Portable (rubber duck), 2.4/5GHz Antenna BB-ACH2-DBAT-DP003 - 3.8/5.5dBi Portable (rubber duck), 2.4/5GHz Antenna

BB-ACH0-CA-DP003-G - Airborne Ethernet Cable, RJ-45 to Hirose Connector

All product specifications are subject to change without notice. BB-WLNN-xx-DP551_EthernetDualBand-WiFiModules_1319ds



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SPECIFICATIONS

TECHNOLOGY Technology IEEE 802.11a/b/g/n, Wi-Fi Compliant 2.4 ~ 2.4835 GHz (US/Canada/Europe) 5.75.2 ~ 5.825 GHz Modulation Technology DSSS, CCK, OFDM Modulation Technology DBSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM Network Access Modes Infrastructure (Client), Ad Hoc Channels 11 Channels 802.11a Europe: 13 Channels 802.11a Europe: 13 Channels 802.11b Japan: 14 Channels 802.11b Japan: 14 Channels 802.11a Vireless Data Rate 802.11b:11, 55, 52, 1 Mbps 802.11a GS, 54, 48, 36, 24, 39, 26, 19, 51, 36, 5 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, APP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBn 36Mb/s = -80 dBm -802.11b 18Mb/s = -80 dBm -802.11b 18Mb/s = -80 dBm -802.11b 18Mb/s = -80 dBm 1Mbb/s = -80 dBm 54Mb/s = -74 dBm -802.11a 18Mb/s = -80 dBm -802.11a 18Mb/s = -80 dBm -802.11a 18Mb/s = -80 dBm -802	SPECIFICATION	>			
2.4 ~ 2.483 GHz (US/Canada/Europe) 5.150 ~ 5.350 GHz 5.725 ~ 5.825 GHz Modulation Technology Modulation Type DBPSK, CCK, BPSK, QPSK, 16QAM, 64QAM Network Access Modes Infrastructure (Client), Ad Hoc US/Canada: 11 Channels 802.11b/g 13 Channels 802.11a Europe: 13 Channels 802.11a France: 4 Channels 802.11b/g 13 Channels 802.11a France: 4 Channels 802.11b/g 13 Channels 802.11a 802.11b/g 13 Channels 802.11a 802.11b/g 23 Channels 802.11a 802.11b/g 802.11b/15.5.2.1 Mbps 802.11b/s 802.11b/15.5.2.4 dB/s 36.6 Mbps 802.11a 80Mb/s = -80 dBm 1Mb/s = -84 dBm 804.0 Mb/s = -80 dBm 1Mb/s = -80 dBm 1Mb/s = -80 dBm 110/s 802.11a /b 802.11	TECHNOLOGY				
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5.725 ~ 5.825 GHz Modulation Technology DSSS, CCK, QFDM Modulation Type DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM Network Access Modes Infrastructure (Client), Ad Hoc US/Canada: 11 Channels 802.11b/g Europe: 13 Channels 802.11a Europe: 13 Channels 802.11a France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b Solution Type 802.11b/g Vireless Data Rate 802.11b:11, 55, 2, 1 Mbps 802.11a (54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11a (55, 58, 5, 42, 39, 26, 19, 5, 13, 65 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -78 dBm Receive Sensitivity 6Mb/s = -89 dBm 1Mb/s = -86 dBm 1Mb/s = -86 dBm 1Mb/s = -80 dBm 6Mb/s = -90 dBm 1380/s = -14 dBm 6Mb/s = -90 dBm 149 6Mb/s = -90 dBm 140/s = -20 dBm 6Mb/s = -80 dBm 140/s = -80 dBm 6Mb/s = -80 dBm 158,002.1x (EAP) Supplican	Fraguanay				
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Channels 19 Channels 802.11a France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b 13 Channels 802.11a 13 Channels 802.11a Wireless Data Rate 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps MAC CSMACA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -78 dBm Receive Sensitivity 6Mb/s = -78 dBm - 802.11 b/g 11Mb/s = -86 dBm 1Mb/s = -80 dBm 11Mb/s = -80 dBm 1Mb/s = -92 dBm 54Mb/s = -74 dBm Receive Sensitivity 36Mb/s = -76 dBm - 802.11 a 18Mb/s = -80 dBm 1Mb/s = -80 dBm 6Mb/s = -90 dBm 1Mb/s = -80 dBm 6Mb/s = -90 dBm 1Mb/s = -80 dBm 6Mb/s = -90 dBm 802.11a 1 13 BMb/s = -86 dBm 6Mb/s = -90 dBm 802.11a = 17 dBm 802.11a/b/g 802.11a = 17 dBm 802.11a/b/g Supports Certificates and Private Key Upload and Storage (Multiple) ransmit Power 602.11a = 17 dBm - client mode 150 MA (maximum Gai @ 5 GHz = 5.5 dBi - vo (2) U.F. Coax			13 Channels 802.11a		
France: 4 Channels 802.11b/g Japan: 14 Channels 802.11b 13 Channels 802.11g 23 Channels 802.11g Wireless Data Rate 802.11b/g: 52, 2, 1Mps MAC CSMACA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -72 dBm 802.11b /g 6Mb/s = -89 dBm 11Mb/s = -84 dBm 18Mb/s = -84 dBm -802.11 b/g 6Mb/s = -74 dBm 11Mb/s = -84 dBm 6Mb/s = -89 dBm 11Mb/s = -80 dBm 18Mb/s = -80 dBm 11Mb/s = -80 dBm 6Mb/s = -90 dBm 12L 11 dB 18Mb/s = -80 dBm 6Mb/s = -90 dBm 6Mb/s = -90 dBm 12L 11 dB 18Mb/s = -80 dBm 12L 11 dB 1802.111 = 17 dBm		Europe:	13 Channels 802.11b/g		
Japan: 14 Channels 802.11b 13 Channels 802.11g 23 Channels 802.11a Wireless Data Rate 802.111; 5, 5, 2, 1 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -78 dBm 36Mb/s = -78 dBm 36Mb/s = -80 dBm 11Mb/s = -86 dBm 11Mb/s = -86 dBm 11Mb/s = -80 dBm 11Mb/s = -80 dBm 1202.11 a 18Mb/s = -71 dBm 802.112 b< 15 dBm	Channels		19 Channels 802.11a		
13 Channels 802.11g 23 Channels 802.11a Wireless Data Rate 802.11b:11, 5.5, 2, 1 Mbps 802.11a (5.5, 85, 42, 39, 26, 19, 5, 13, 6.5 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -78 dBm Receive Sensitivity - 802.11 b/g 11Mb/s = -80 dBm 11Mb/s = -92 dBm 54Mb/s = -74 dBm Receive Sensitivity - 802.11 a 6Mb/s = -90 dBm 11Mb/s = -80 dBm 7ansmit Power - 802.11 a 8002.11a = 12.6 dBm 802.11b = 15 dBm 802.11a = 17 dBm 802.11a = 17 dBm 802.11a = 17 dBm Security Protocols - client mode Antenna Maximum Gain @ 5 GHz = 5.5 dBi Maximum Gain @ 5 GHz = 5		France:	4 Channels 802.11b/g		
23 Channels 802.11a Wireless Data Rate 802.11b:11, 55, 2, 1 Mbps 802.11a: 65, 58, 54, 23, 36, 24, 18, 12, 9, 6 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -78 dBm Receive Sensitivity 18Mb/s = -86 dBm 11Mb/s = -86 dBm 11Mb/s = -86 dBm 11Mb/s = -92 dBm 54Mb/s = -74 dBm Receive Sensitivity 36Mb/s = -74 dBm 92 dBm 11Mb/s = -80 dBm 11Mb/s = -92 dBm 54Mb/s = -74 dBm 802.11a = 15 dBm 802.11a = 12 6 dBm 802.11a = 17 dBm 802.11a = 17 dBm 802.11a = 17 dBm Security Protocols - client mode Antenna Maximum Gain @ 5 GHz = 5.5 dBi		Japan:	14 Channels 802.11b		
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Wireless Data Rate 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -78 dBm Receive Sensitivity 18Mb/s = -89 dBm - 802.11 b/g 6Mb/s = -74 dBm 7.8 dBm 11Mb/s = -86 dBm 11Mb/s = -86 dBm 11Mb/s = -86 dBm 11Mb/s = -80 dBm 6Mb/s = -74 dBm Receive Sensitivity 36Mb/s = -74 dBm - 802.11 a 18Mb/s = -80 dBm 11Mb/s = -86 dBm 6Mb/s = -80 dBm 6Mb/s = -74 dBm 802.110 = 15 dBm 802.110 = 15 dBm 802.111 = 17 dBm 802.111 a 18Mb/s = -80 dBm 6Mb/s = -90 dBm 802.112 = 17 dBm 802.112 = 17 dBm 802.112 = 17 dBm 802.112 = 17 dBm 802.112 = 17 dBm Security Protocols - client mode - client mode VI_s = 15 dBm - fxS1, LEAP Supports Certificates and Private Key Upload and Storage (Multiple) Two (2) U.FL Coaxial Connectors, 50 Ohms Maximum Gain @ 5 GHz = 5.5 dBi					
802.11n: 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -78 dBm 36Mb/s = -78 dBm 802.11 b/g 18Mb/s = -84 dBm - 802.11 b/g 6Mb/s = -89 dBm 1Mb/s = -92 dBm 1Mb/s = -86 dBm MAC S6Mb/s = -74 dBm Receive Sensitivity 36Mb/s = -80 dBm - 802.11 a 18Mb/s = -86 dBm 900 Bm 6Mb/s = -80 dBm - 802.11 a 18Mb/s = -86 dBm 902.111 = 15 dBm 802.11g = 12.6 dBm 802.111 = 17 dBm 802.11g = 12.6 dBm 802.111 = 17 dBm 802.11k = 17 dBm 802.112 = 17 dBm 802.11k = 17 dBm Security Protocols - cleint mode - client mode Disabled, WEP 64 & 128bit, WPA (TKIP), WPA (AES), WPA2 (AES), 802.1 x (EAP) Supplicant 802.111, WPA & WPA2 Supply styperst Certificates and Private Key Upload and Storage (Multiple) Antenna Maximum Gain @ 2.4 GHz = 4.1 dBi Supply 3.3 VDC +/-5%, 650 mA (MAX) Supply In-rush Current 1500 mA (maximum) for 400us DC Characteristics Operating C					
MAC CSMA/CA with ACK, RTS, CTS Network Protocols TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING 54Mb/s = -72 dBm 36Mb/s = -72 dBm 36Mb/s = -88 dBm 18Mb/s = -84 dBm - 802.11 b/g 6Mb/s = -89 dBm 11Mb/s = -86 dBm 1Mb/s = -86 dBm Amb/s = -74 dBm 54Mb/s = -74 dBm Receive Sensitivity 36Mb/s = -80 dBm - 802.11 a 18Mb/s = -86 dBm Mb/s = -90 dBm 6M2.11g = 12.6 dBm 802.11b = 15 dBm 802.11g = 12.6 dBm 802.11a = 17 dBm 802.11a = 17 dBm Security Protocols - client mode Disabled, WEP 64 & 128bit, WPA (TKIP), WPA (AES), WPA2 (AES), 802.1x (EAP) Supplicant 802.11, WPA & WPA2 Enterprise supplicants (EAP-TLS, EAP-TTLS(MSCHAPv2), EAP-FAST, LEAP) Supports Certificates and Private Key Upload and Storage (Multiple) Two (2) U.FL Coaxial Connectors, 50 Ohms Maximum Gain @ 5 GHz = 5.5 dBi Maximum Gain @ 2.4 GHz = 4.1 dBi Supply 3.3 VDC +/-5%, 650 mA (MAX) Supply Supply In-rush Current 1500 mA (maximum) for 400us Operating Current (Tx, 802.11g) = 370 mA (typical) Operating Current (Rx, 802.11g) = 200 mA (typical) Operating Current (Rx, 802.11g) = 200 mA (typical)	Wireless Data Rate				
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	MTBF Calc Method	MIL 217F (Pa	arts Count Reliability Prediction)		

North America	FCC Title 47 Part 15 Class B Sub C Intentional Radiator
CE - Directives (Europe)	 2014/35/EU - Low Voltage Directive 2014/53/EU - Radio Equipment Directive (RED) Hereby, Advantech Advantech declares that the radio equipment type Wi-Fi module is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: www.advantech-bb.com 2011/65/EU - Reduction of Hazardous Substances Directive (RoHS) 2012/19/EU - Waste Electrical & Electronic Equipment Directive (WEEE)
CE - Standards (Europe)	 EMC: ETSI EN 300 328 v2.1.1 - EMC & Radio Spectrum Matters (ERM) Wideband Transmission Systems - 2.4 GHz ISM Band ETSI EN 301 893 v1.8.5 - EMC & Radio Spectrum Matters (ERM) Wideband Transmission Systems - 5 GHz ISM Band ETSI EN 301 489-1 v2.1.1 - Applied in accordance with the specific requirements of: ETSI EN 301 489-17 v3.1.1 - EMC & Radio Spectrum Matters (ERM) Broadband Data Systems EN 55022+AC, Class A - Information Technology Equipment (ITE) - RF Emissions EN 55024 - Information Technology Equipment (ITE) - Immunity Characteristics - Limits and Methods of Measurement Safety: EN 60950-1 + A1 + A11 + A12 + A2 - Information Technology Equipment (ITE) - Safety - Part 1 - General Requirements RF Exposure: EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for EM fields (0 Hz to 300 GHz)

