

AWK-3251A-RCC Series

Wi-Fi 5 (802.11ac) railway onboard IP30 wireless AP/clients



Features and Benefits

- Concurrent dual-band Wi-Fi with aggregated data rates up to 1.267 Gbps
- Supports up to 120 concurrent device connections and client isolation
- Wireless inter-carriage connections with Auto Carriage Connection (ACC)
- Seamless data offloading with sub-150 ms client-based Turbo Roaming

Certifications



EN 50155

Introduction

The AWK-3251A-RCC Series is a range of IP30-rated Wi-Fi 5 (802.11ac) AP/clients designed for railway onboard use, providing a reliable solution for dedicated applications such as inter-carriage backbone networks and onboard passenger infotainment systems. The Auto Carriage Connection (ACC) feature simplifies deployment and enhances the reliability of wireless carriage backbone networks. Optimized for passenger Wi-Fi services, the AWK-3251A-RCC Series supports concurrent 2.4/5 GHz dual-band connectivity, up to 120 client connections, and data rates of up to 1.267 Gbps. In addition, the AWK-3251A-RCC Series can be powered via PoE for easier installation and flexible deployment.

Specifications

WLAN Interface

WLAN Standards	2.4 GHz: 802.11b/g/n with 256 QAM support 5 GHz: 802.11a/n/ac Wave 2 with 256 QAM support
Frequency Band for US (20 MHz operating channels)	AWK-3251A-RCC-US models only: 2.412 to 2.462 GHz (11 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ¹ 5.500 to 5.700 GHz (11 channels) ¹ 5.745 to 5.825 GHz (5 channels)
Frequency Band for UN (20 MHz operating channels)	AWK-3251A-RCC-UN models only: 2.412 to 2.472 GHz (13 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ¹ 5.500 to 5.700 GHz (11 channels) ¹ 5.745 to 5.825 GHz (5 channels) Available channels change depending on the selected country or region code.
Wireless Security	WEP encryption (64-bit and 128-bit) WPA/WPA2/WPA3-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES) WPA/WPA2/WPA3-Personal
Transmission Rate	2.4 GHz: 802.11b: 1 to 11 Mbps 802.11g: 6 to 54 Mbps 802.11n: 6.5 to 300 Mbps 5 GHz: 802.11a: 6 to 54 Mbps 802.11n: 6.5 to 300 Mbps 802.11ac: 6.5 to 867 Mbps
Transmitter Power for 802.11a	22±1.5 dBm @ 6 Mbps

1. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However, according to regulations, after switching channels, a 60-second availability check period is required before starting the service.

	22±1.5 dBm @ 9 Mbps 22±1.5 dBm @ 12 Mbps 20.5±1.5 dBm @ 18 Mbps 20.5±1.5 dBm @ 24 Mbps 20.5±1.5 dBm @ 36 Mbps 20±1.5 dBm @ 48 Mbps 20±1.5 dBm @ 54 Mbps
Transmitter Power for 802.11n (5 GHz)	22±1.5 dBm @ MCS0 20 MHz 22±1.5 dBm @ MCS1 20 MHz 22±1.5 dBm @ MCS2 20 MHz 20±1.5 dBm @ MCS3 20 MHz 19.5±1.5 dBm @ MCS4 20 MHz 19.5±1.5 dBm @ MCS5 20 MHz 19.5±1.5 dBm @ MCS6 20 MHz 19±1.5 dBm @ MCS7 20 MHz 22±1.5 dBm @ MCS8 20 MHz 22±1.5 dBm @ MCS9 20 MHz 22±1.5 dBm @ MCS10 20 MHz 20±1.5 dBm @ MCS11 20 MHz 19.5±1.5 dBm @ MCS12 20 MHz 19.5±1.5 dBm @ MCS13 20 MHz 19.5±1.5 dBm @ MCS14 20 MHz 19±1.5 dBm @ MCS15 20 MHz 21±1.5 dBm @ MCS0 40 MHz 21±1.5 dBm @ MCS1 40 MHz 21±1.5 dBm @ MCS2 40 MHz 19.5±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 19±1.5 dBm @ MCS5 40 MHz 19.5±1.5 dBm @ MCS6 40 MHz 19±1.5 dBm @ MCS7 40 MHz 21±1.5 dBm @ MCS8 40 MHz 21±1.5 dBm @ MCS9 40 MHz 21±1.5 dBm @ MCS10 40 MHz 19.5±1.5 dBm @ MCS11 40 MHz 19±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 19±1.5 dBm @ MCS14 40 MHz 19±1.5 dBm @ MCS15 40 MHz
Transmitter Power for 802.11ac (5 GHz, Dual Chain)	21.5±1.5 dBm @ MCS0 20 MHz 21.5±1.5 dBm @ MCS1 20 MHz 21±1.5 dBm @ MCS2 20 MHz 20±1.5 dBm @ MCS3 20 MHz 19.5±1.5 dBm @ MCS4 20 MHz 19.5±1.5 dBm @ MCS5 20 MHz 19.5±1.5 dBm @ MCS6 20 MHz 19±1.5 dBm @ MCS7 20 MHz 19±1.5 dBm @ MCS8 20 MHz 21±1.5 dBm @ MCS0 40 MHz 21±1.5 dBm @ MCS1 40 MHz 21±1.5 dBm @ MCS2 40 MHz 19.5±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 19±1.5 dBm @ MCS5 40 MHz 19±1.5 dBm @ MCS6 40 MHz 19±1.5 dBm @ MCS7 40 MHz 18.5±1.5 dBm @ MCS8 40 MHz 18±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS0 80 MHz 20±1.5 dBm @ MCS1 80 MHz 20±1.5 dBm @ MCS2 80 MHz 17±1.5 dBm @ MCS3 80 MHz 17±1.5 dBm @ MCS4 80 MHz 17±1.5 dBm @ MCS5 80 MHz 17±1.5 dBm @ MCS6 80 MHz 17±1.5 dBm @ MCS7 80 MHz 17±1.5 dBm @ MCS8 80 MHz 17±1.5 dBm @ MCS9 80 MHz
Transmitter Power for 802.11b	25.5±1.5 dBm @ 1 Mbps 25.5±1.5 dBm @ 2 Mbps

	26±1.5 dBm @ 5.5 Mbps 26±1.5 dBm @ 11 Mbps
Transmitter Power for 802.11g	26±1.5 dBm @ 6 Mbps 26±1.5 dBm @ 9 Mbps 26±1.5 dBm @ 12 Mbps 25±1.5 dBm @ 18 Mbps 25±1.5 dBm @ 24 Mbps 24.5±1.5 dBm @ 36 Mbps 23.5±1.5 dBm @ 48 Mbps 23±1.5 dBm @ 54 Mbps
Transmitter Power for 802.11n (2.4 GHz)	24.5±1.5 dBm @ MCS0 20 MHz 24.5±1.5 dBm @ MCS1 20 MHz 24±1.5 dBm @ MCS2 20 MHz 24±1.5 dBm @ MCS3 20 MHz 23.5±1.5 dBm @ MCS4 20 MHz 23.5±1.5 dBm @ MCS5 20 MHz 22.5±1.5 dBm @ MCS6 20 MHz 22±1.5 dBm @ MCS7 20 MHz 24±1.5 dBm @ MCS8 20 MHz 24.5±1.5 dBm @ MCS9 20 MHz 24±1.5 dBm @ MCS10 20 MHz 24±1.5 dBm @ MCS11 20 MHz 23.5±1.5 dBm @ MCS12 20 MHz 23±1.5 dBm @ MCS13 20 MHz 22±1.5 dBm @ MCS14 20 MHz 21.5±1.5 dBm @ MCS15 20 MHz 24±1.5 dBm @ MCS0 40 MHz 24±1.5 dBm @ MCS1 40 MHz 24±1.5 dBm @ MCS2 40 MHz 24±1.5 dBm @ MCS3 40 MHz 23.5±1.5 dBm @ MCS4 40 MHz 23.5±1.5 dBm @ MCS5 40 MHz 22.5±1.5 dBm @ MCS6 40 MHz 22±1.5 dBm @ MCS7 40 MHz 24±1.5 dBm @ MCS8 40 MHz 24±1.5 dBm @ MCS9 40 MHz 24±1.5 dBm @ MCS10 40 MHz 24±1.5 dBm @ MCS11 40 MHz 23.5±1.5 dBm @ MCS12 40 MHz 23±1.5 dBm @ MCS13 40 MHz 22.5±1.5 dBm @ MCS14 40 MHz 21.5±1.5 dBm @ MCS15 40 MHz
Transmitter Power for 802.11ac (2.4 GHz, Dual Chain)	25±1.5 dBm @ MCS0 20 MHz 25±1.5 dBm @ MCS1 20 MHz 25±1.5 dBm @ MCS2 20 MHz 25±1.5 dBm @ MCS3 20 MHz 24±1.5 dBm @ MCS4 20 MHz 23.5±1.5 dBm @ MCS5 20 MHz 22.5±1.5 dBm @ MCS6 20 MHz 22±1.5 dBm @ MCS7 20 MHz 21.5±1.5 dBm @ MCS8 20 MHz 25±1.5 dBm @ MCS0 40 MHz 25±1.5 dBm @ MCS1 40 MHz 25±1.5 dBm @ MCS2 40 MHz 25±1.5 dBm @ MCS3 40 MHz 24±1.5 dBm @ MCS4 40 MHz 23.5±1.5 dBm @ MCS5 40 MHz 22.5±1.5 dBm @ MCS6 40 MHz 22±1.5 dBm @ MCS7 40 MHz 21.5±1.5 dBm @ MCS8 40 MHz 21±1.5 dBm @ MCS9 40 MHz
Receiver Sensitivity for 802.11a (measured at 5.680 GHz)	Typ. -88 @ 6 Mbps Typ. -88 @ 9 Mbps Typ. -85 @ 12 Mbps Typ. -84 @ 18 Mbps Typ. -81 @ 24 Mbps Typ. -77 @ 36 Mbps Typ. -74 @ 48 Mbps Typ. -72 @ 54 Mbps

Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz)	Typ. -88 dBm @ MCS0 20 MHz Typ. -84 dBm @ MCS1 20 MHz Typ. -83 dBm @ MCS2 20 MHz Typ. -80 dBm @ MCS3 20 MHz Typ. -76 dBm @ MCS4 20 MHz Typ. -72 dBm @ MCS5 20 MHz Typ. -70 dBm @ MCS6 20 MHz Typ. -68 dBm @ MCS7 20 MHz Typ. -89 dBm @ MCS8 20 MHz Typ. -87 dBm @ MCS9 20 MHz Typ. -85 dBm @ MCS10 20 MHz Typ. -81 dBm @ MCS11 20 MHz Typ. -78 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -73 dBm @ MCS14 20 MHz Typ. -71 dBm @ MCS15 20 MHz Typ. -85 dBm @ MCS0 40 MHz Typ. -82 dBm @ MCS1 40 MHz Typ. -79 dBm @ MCS2 40 MHz Typ. -77 dBm @ MCS3 40 MHz Typ. -73 dBm @ MCS4 40 MHz Typ. -69 dBm @ MCS5 40 MHz Typ. -68 dBm @ MCS6 40 MHz Typ. -66 dBm @ MCS7 40 MHz Typ. -87 dBm @ MCS8 40 MHz Typ. -84 dBm @ MCS9 40 MHz Typ. -82 dBm @ MCS10 40 MHz Typ. -79 dBm @ MCS11 40 MHz Typ. -75 dBm @ MCS12 40 MHz Typ. -72 dBm @ MCS13 40 MHz Typ. -70 dBm @ MCS14 40 MHz Typ. -69 dBm @ MCS15 40 MHz
Receiver Sensitivity for 802.11ac (5 GHz, Dual Chain)	Typ. -89 dBm @ MCS0 20 MHz Typ. -86 dBm @ MCS1 20 MHz Typ. -84 dBm @ MCS2 20 MHz Typ. -81 dBm @ MCS3 20 MHz Typ. -78 dBm @ MCS4 20 MHz Typ. -74 dBm @ MCS5 20 MHz Typ. -72 dBm @ MCS6 20 MHz Typ. -71 dBm @ MCS7 20 MHz Typ. -67 dBm @ MCS8 20 MHz Typ. -86 dBm @ MCS0 40 MHz Typ. -84 dBm @ MCS1 40 MHz Typ. -81 dBm @ MCS2 40 MHz Typ. -78 dBm @ MCS3 40 MHz Typ. -75 dBm @ MCS4 40 MHz Typ. -71 dBm @ MCS5 40 MHz Typ. -70 dBm @ MCS6 40 MHz Typ. -69 dBm @ MCS7 40 MHz Typ. -64 dBm @ MCS8 40 MHz Typ. -63 dBm @ MCS9 40 MHz Typ. -84 dBm @ MCS0 80 MHz Typ. -81 dBm @ MCS1 80 MHz Typ. -79 dBm @ MCS2 80 MHz Typ. -76 dBm @ MCS3 80 MHz Typ. -73 dBm @ MCS4 80 MHz Typ. -69 dBm @ MCS5 80 MHz Typ. -67 dBm @ MCS6 80 MHz Typ. -65 dBm @ MCS7 80 MHz Typ. -61 dBm @ MCS8 80 MHz Typ. -60 dBm @ MCS9 80 MHz
Receiver Sensitivity for 802.11b (measured at 2.437 GHz)	Typ. -96 dBm @ 1 Mbps Typ. -92 dBm @ 2 Mbps Typ. -91 dBm @ 5.5 Mbps Typ. -88 dBm @ 11 Mbps
Receiver Sensitivity for 802.11g (measured at 2.437 GHz)	Typ. -90 dBm @ 6 Mbps Typ. -89 dBm @ 9 Mbps Typ. -88 dBm @ 12 Mbps Typ. -86 dBm @ 18 Mbps Typ. -82 dBm @ 24 Mbps

	Typ. -79 dBm @ 36 Mbps Typ. -75 dBm @ 48 Mbps Typ. -73 dBm @ 54 Mbps
Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz)	Typ. -89 dBm @ MCS0 20 MHz Typ. -86 dBm @ MCS1 20 MHz Typ. -84 dBm @ MCS2 20 MHz Typ. -81 dBm @ MCS3 20 MHz Typ. -77 dBm @ MCS4 20 MHz Typ. -73 dBm @ MCS5 20 MHz Typ. -72 dBm @ MCS6 20 MHz Typ. -70 dBm @ MCS7 20 MHz Typ. -91 dBm @ MCS8 20 MHz Typ. -88 dBm @ MCS9 20 MHz Typ. -86 dBm @ MCS10 20 MHz Typ. -82 dBm @ MCS11 20 MHz Typ. -80 dBm @ MCS12 20 MHz Typ. -75 dBm @ MCS13 20 MHz Typ. -74 dBm @ MCS14 20 MHz Typ. -73 dBm @ MCS15 20 MHz Typ. -87 dBm @ MCS0 40 MHz Typ. -84 dBm @ MCS1 40 MHz Typ. -82 dBm @ MCS2 40 MHz Typ. -78 dBm @ MCS3 40 MHz Typ. -75 dBm @ MCS4 40 MHz Typ. -71 dBm @ MCS5 40 MHz Typ. -70 dBm @ MCS6 40 MHz Typ. -68 dBm @ MCS7 40 MHz Typ. -88 dBm @ MCS8 40 MHz Typ. -85 dBm @ MCS9 40 MHz Typ. -83 dBm @ MCS10 40 MHz Typ. -80 dBm @ MCS11 40 MHz Typ. -77 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -71 dBm @ MCS14 40 MHz Typ. -70 dBm @ MCS15 40 MHz
Receiver Sensitivity for 802.11ac (2.4 GHz, Dual Chain)	Typ. -90 dBm @ MCS0 20 MHz Typ. -87 dBm @ MCS1 20 MHz Typ. -85 dBm @ MCS2 20 MHz Typ. -82 dBm @ MCS3 20 MHz Typ. -79 dBm @ MCS4 20 MHz Typ. -75 dBm @ MCS5 20 MHz Typ. -73 dBm @ MCS6 20 MHz Typ. -72 dBm @ MCS7 20 MHz Typ. -68 dBm @ MCS8 20 MHz Typ. -88 dBm @ MCS0 40 MHz Typ. -85 dBm @ MCS1 40 MHz Typ. -83 dBm @ MCS2 40 MHz Typ. -80 dBm @ MCS3 40 MHz Typ. -77 dBm @ MCS4 40 MHz Typ. -72 dBm @ MCS5 40 MHz Typ. -71 dBm @ MCS6 40 MHz Typ. -70 dBm @ MCS7 40 MHz Typ. -66 dBm @ MCS8 40 MHz Typ. -64 dBm @ MCS9 40 MHz
WLAN Operation Mode	Access point Client Client-Router Master Slave Sniffer ACC
Antenna Connectors	2 x QMA

Ethernet Interface

Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3ab for 1000BaseT(X) IEEE 802.3at for PoE IEEE 802.1Q for VLAN Tagging IEEE 802.1X for authentication
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	1 Supports IEEE 802.3at PoE

Ethernet Software Features

Management	DHCP Server DHCP Client DNS HTTP IPv4 LLDP SMTP SNMPv1/v2c/v3 Syslog TCP/IP Telnet UDP VLAN MXconfig
Security	HTTPS/SSL RADIUS SSH
Time Management	SNTP Client

Firewall

Filter	ICMP MAC address IP protocol Port-based Client Isolation
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Serial Interface

Console Port	RS-232 8-pin RJ45
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LED Interface

LED Indicators	PWR1, PWR2, PoE, System, LAN, 2.4GHz, 5GHz, SIG
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Input/Output Interface

Digital Inputs	2 Max. input current: 8 mA +13 to +30 V for state 1 +3 to -30 V for state 0
Alarm Contact Channels	Relay output with current carrying capacity of 1 A @ 24 VDC
Buttons	Reset button

Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions	45 x 130 x 118 mm (1.77 x 5.12 x 4.65 in)

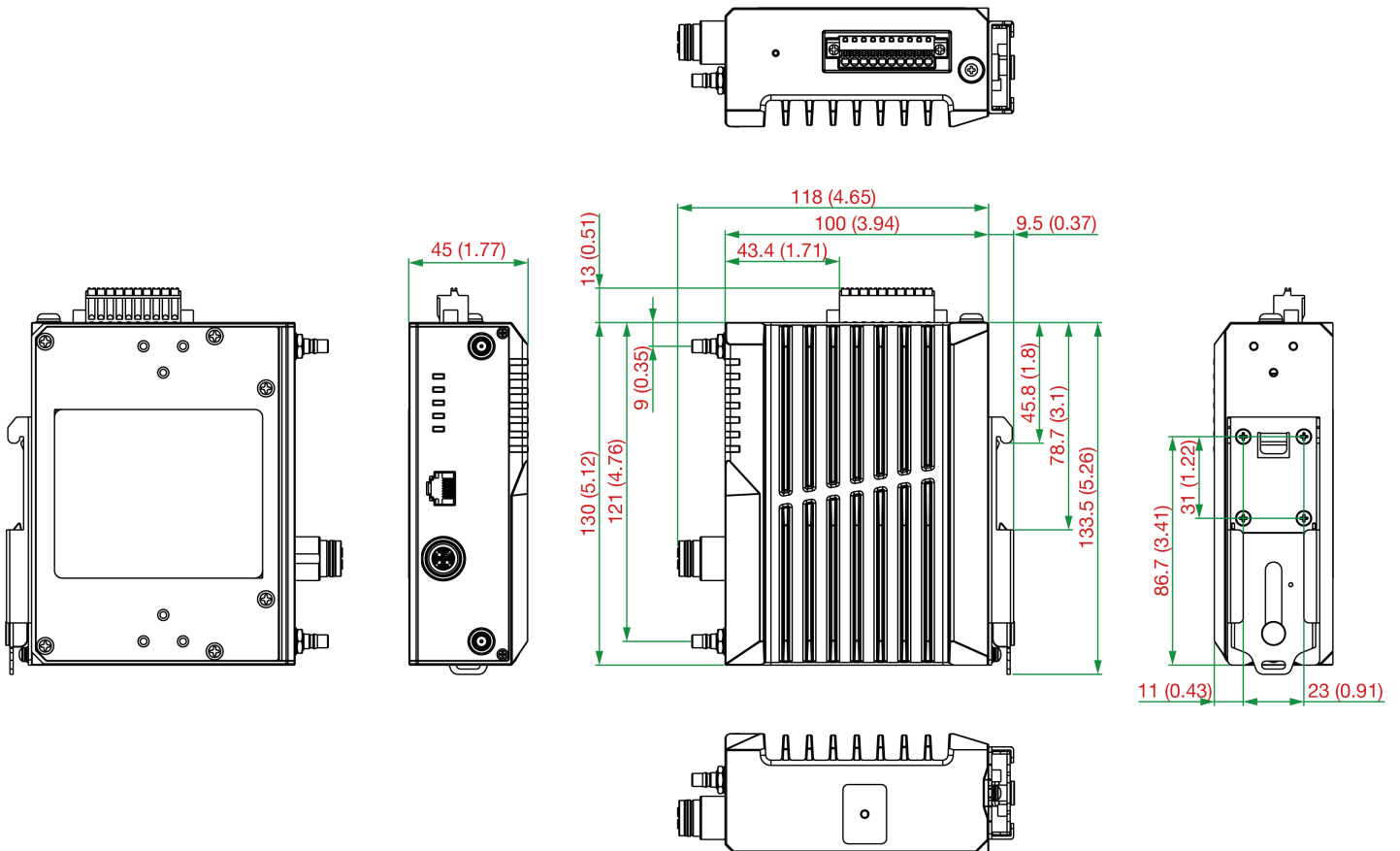
Weight	800 g (1.76 lb)
Installation	DIN-rail mounting Wall mounting (with optional kit)
Power Parameters	
Input Current	12-48 VDC, 2.01-0.5 A
Input Voltage	12 to 48 VDC Redundant dual inputs 48 VDC Power over Ethernet
Power Connector	1 removable 10-contact terminal block(s)
Power Consumption	24.12 W (max.)
Environmental Limits	
Operating Temperature	Standard models: -25 to 60°C (-13 to 140°F) Wide temp. models: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
EMC	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V/m IEC 61000-4-8 PFMF: 30 A/m
Safety	IEC 60950-1 IEC 62368-1 UL 62368-1
Railway	EN 50121-4 EN 50155
Railway Fire Protection	EN 45545-2
Radio	EN 300 328, EN 301 489-1/17, EN 301 893, FCC, MIC, TELEC, NCC, RCM, SRRC, IC
MTBF	
Time	838,684 hrs
Standards	Telcordia Standard SR-332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x AWK-3251A-RCC Series wireless AP/client
Installation Kit	1 x cap, for RJ45 console port 1 x cap, for M12 Ethernet port 1 x cable holder with screw 1 x DIN-rail kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Band	Operating Temp.	Conformal Coating
AWK-3251A-M12-RCC-US	US	-25 to 60°C	-
AWK-3251A-M12-RCC-US-T	US	-40 to 75°C	-
AWK-3251A-M12-RCC-US-CT-T	US	-40 to 75°C	✓
AWK-3251A-M12-RCC-UN	UN	-25 to 60°C	-
AWK-3251A-M12-RCC-UN-T	UN	-40 to 75°C	-
AWK-3251A-M12-RCC-UN-CT-T	UN	-40 to 75°C	✓

Accessories (sold separately)

Wall-Mounting Kits

WK-35-01	Wall-mounting kit with 2 plates (35 x 44 x 2.5 mm) and 6 screws
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