Huawei AirEngine 6760-51EI Access Point Datasheet

Product Overview

Huawei AirEngine 6760-51EI is the latest-generation 802.11ax access point (AP) specially designed for use in rail transportation scenarios. It is compatible with IEEE 802.11a/b/g/n/ac/ac wave2 standards, supports four spatial streams, and offers a rate of up to 4.8 Gbps. It complies with EN50155 vehicle-mounted electronic equipment standards, and supports fast handover, meeting train-ground backhaul network deployment requirements.

AirEngine 6760-51EI

- 802.11ax standards compliance, PHY data rates up to 1.15Gbps (4x4 40MHz on 2.4GHz) or 4.8Gbps (4x4 160MHz on 5GHz).
- External dual-band antenna (2.4 GHz or 5 GHz) with considerable flexibility in coordinating antenna directions, ensuring full coverage.
- Soft handover technology that sets up links before link handovers to implement train-ground fast link handover and minimize packet loss during the handover.
- Uses high-level materials, an overall heat dissipation design, meeting water- and dust-proof, and anti-vibration requirements of vehicle-mounted deployment scenarios.

NOTE

- *AirEngine6760-51EI cannot be used independently, and you must purchase a vehicle-mounted AP case.*
- *The device rate is the theoretical speed of Wi-Fi and may vary based on different environments or devices.*

Feature Descriptions

Wi-Fi 6 (802.11ax) standards

- As the latest generation Wi-Fi standards of IEEE 802.11, 802.11ax improves the access capacity and bandwidth in high-density access scenarios, reducing service latency and improving user experience.
- MU-MIMO on the 2.4 GHz or 5 GHz frequency bands, allowing an AP to transmit data to and receive data from multiple STAs simultaneously and multiplying the utilization of radio spectrum resources.
- Wi-Fi 6 supports 1024 QAM modulation, improving data transmission efficiency by 25% compared with 802.11ac (256 QAM).
- OFDMA scheduling enables multiple STAs to receive and send information at the same time, reducing latency and improving network efficiency.
- Spatial reuse (SR) technology uses basic service set (BSS) coloring to enable APs and STAs to distinguish BSSs and allows multiple STAs to transmit data at the same time.

Train-ground fast link handover

Huawei Wi-Fi-based train-ground fast link handover offers many technology advantages, including low latency, high reliability, large bandwidth, and zero packet loss.

- **Low latency**: The vehicle-mounted AirEngine 6760-51EI sets up links with multiple trackside APs simultaneously and chooses the optimal link as data backhaul link. The corresponding trackside AP works as the data backhaul AP. During the link handover, the vehicle-mounted AP does not need to associate or negotiate keys with the trackside AP to switch to because a link is already established between them. This greatly reduces the link handover delay.

- **High reliability**: The implementation of Huawei AirEngine 6760-51EI's fast link handover is similar to soft handover, where multiple links are set up simultaneously to ensure that data can be backhauled over another link when the current backhaul link deteriorates. To ensure reliable signals, Huawei's link handover algorithm introduces the filtering algorithm to process signals and the P/N criterion to help determine link handovers. In addition, the signal lower and upper RSSI limits can be specified, based on which the algorithm controls the signal RSSI of the backhaul link within the allowed range, so that the signals do not fluctuate too much.
- **High bandwidth**: Huawei's AirEngine 6760-51EI supports IEEE 802.11ax, and complies with IEEE 802.11a/b/g/n/ac/ac wave2, provides a rate of up to 4.8Gbps at the 5G frequency band.
- **Zero packet loss**: Huawei's fast link handover technology achieves almost zero packet loss during link handovers. Before a link handover, the AirEngine 6760-51EI transmits unicast packets with the originally associated AP; after the link handover, the AirEngine 6760-51EI transmits unicast packets with the newly associated AP.

High-level protection

- Adopts a high-grade die casting aluminum shell and overall heat dissipation design. In addition, the Ethernet interface supports 6 kA/6 kV surge protection, meeting industrial-grade requirements.
- Adopts metal fasteners and cable connectors to secure the connection and ensure the stability of the device.

Wired and wireless dual security guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

Authentication and encryption for wireless access

- The APs support WEP, WPA/WPA2-PSK, WPA3-SAE, WPA/WPA2-PPSK, WPA/WPA2/WPA3-802.1X, and WAPI authentication/encryption modes to ensure security of the wireless network. The authentication mechanism is used to authenticate user identities so that only authorized users can access network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that the data can only be received and parsed by expected users.

Rogue device monitoring

- Huawei APs support WIDS/WIPS, and can monitor, identify, defend, counter, and perform refined management on the rogue devices, to provide security guarantees for air interface environment and wireless data transmission.

Wired access authentication and encryption for the AP

- The AP access control ensures validity of APs. The CAPWAP link protection and DTLS/IPsec encryption provide security assurance, improving data transmission security between the AP and the WLAN AC.

Automatic radio calibration

Automatic radio calibration allows an AP to collect signal strength and channel parameters of surrounding APs and generate an AP topology according to the collected data. Based on interference from and loads of authorized APs, rogue APs, and no Wi-Fi interference sources, each AP automatically adjusts its transmit power and working channel to make the network operate at the optimal performance. In this way, network reliability and user experience are improved.

Automatic application identification

Huawei APs support smart application control technology and can implement visualized control on Layer 4 to Layer 7 applications.

Traffic identification

- Coupled with Huawei WLAN ACs, the APs can identify over 6000 common applications in various office scenarios. Based on the identification results, policy control can be implemented on user services, including priority adjustment, scheduling, blocking, and rate limiting to ensure efficient bandwidth resource use and improve quality of key services.

Traffic statistics collection

- Traffic statistics of each application can be collected globally, by SSID, or by user, enabling the network administrator to know application use status on the network. The network administrator or operator can implement visualized control on service applications on smart terminals to enhance security and ensure effective bandwidth control.

Basic Specifications

Fat/Fit AP mode

Item	Description
WLAN features	Compliance with IEEE 802.11ax and compatibility with IEEE 802.11a/b/g/n/ac/ac Wave 2 Maximum ratio combining (MRC) Space time block code (STBC) Cyclic Delay Diversity (CDD)/Cyclic Shift Diversity (CSD) Beamforming DL/UL MU-MIMO DL/UL OFDMA Compliance with 1024-QAM and compatibility with 256-QAM/64-QAM/16-QAM/8-QAM/QPSK/BPSK Target wake time (TWT)* Low-density parity-check (LDPC) Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Short guard interval (GI) in 20 MHz, 40 MHz, 80 MHz, and 160 MHz modes Priority mapping and scheduling that are compliant with Wi-Fi multimedia (WMM) to implement priority-based data processing and forwarding. Automatic and manual rate adjustment (the rate is adjusted automatically by default) WLAN channel management and channel rate adjustment **NOTE** *For detailed management channels, see the Country Code & Channel Compliance Table.* Automatic channel scanning and interference avoidance Separate service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs Signal sustain technology (SST) Unscheduled automatic power save delivery (U-APSD) Control and Provisioning of Wireless Access Points (APs) in Fit AP mode Automatic login in Fit AP mode Extended Service Set (ESS) in Fit AP mode Multi-user CAC Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks 802.11k and 802.11v smart roaming 802.11r fast roaming (≤ 50 ms)
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compliance with IEEE 802.1q SSID-based VLAN assignment Uplink VLAN trunks on Ethernet ports Management channel of the AP's uplink port in tagged and untagged mode DHCP client, obtaining IP addresses through DHCP Tunnel data forwarding and direct data forwarding STA isolation in the same VLAN IPv4/IPv6 access control lists (ACLs)

Item	Description
	Link Layer Discovery Protocol (LLDP) Uninterrupted service forwarding upon CAPWAP channel disconnection in Fit AP mode Unified authentication on the AC in Fit AP mode AC dual-link backup in Fit AP mode Network Address Translation (NAT) in Fat AP mode IPv6 in Fit AP mode Soft Generic Routing Encapsulation (GRE) IPv6 Source Address Validation Improvements (SAVI) Multicast Domain Name Service (mDNS) gateway protocol: supports AirPlay and AirPrint service sharing between users of different VLANs
QoS features	WMM parameter management for each radio WMM power saving Priority mapping for upstream packets and flow-based mapping for downstream packets Queue mapping and scheduling User-based bandwidth limiting Adaptive bandwidth management (automatic bandwidth adjustment based on the user quantity and radio environment) to improve user experience Smart Application Control (SAC) in Fit AP mode Airtime scheduling Application acceleration for VR and mobile gaming Air interface HQoS scheduling Support for Microsoft Lync APIs and high voice call quality through Lync API identification and scheduling
Security features	Open system authentication WEP authentication/encryption using a 64-bit, 128-bit, 152-bit or 192-bit encryption key WPA2-PSK authentication and encryption (WPA2 personal) WPA2-802.1X authentication and encryption (WPA2 enterprise) WPA3-SAE authentication and encryption (WPA3 personal) WPA3-802.1X authentication and encryption (WPA3 enterprise) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication WPA2-PPSK authentication and encryption in Fit AP mode Wireless intrusion detection system (WIDS) and wireless intrusion prevention system (WIPS), including rogue device detection and countermeasure, attack detection and dynamic blacklist, and STA/AP blacklist and whitelist 802.1X authentication, MAC address authentication, and Portal authentication DHCP snooping Dynamic ARP Inspection (DAI) IP Source Guard (IPSG) 802.11w Protected Management Frames (PMFs)
Maintenance features	Unified management and maintenance on the AC in Fit AP mode Automatic login, automatic configuration loading, and plug-and-play (PnP) in Fit AP mode Automatic batch upgrade in Fit AP mode Telnet STelnet using SSHv2

Item	Description
	SFTP using SSHv2 Remote wireless O&M through the Bluetooth console port Web system-based AP management in Fat AP mode, login through HTTP or HTTPS Real-time configuration monitoring and fast fault location using the NMS SNMP v1/v2/v3 in Fat AP mode System status alarm Network Time Protocol (NTP) in Fat AP mode

Technical Specifications

Item		Description
Technical specifications	Dimensions (H x W x D)	208 x 35x 225 mm
	Weight	1.40kg
	Interface type	1 x 100M/1G/2.5G/5GE (RJ-45) 1 x 10M/100M/1GE (RJ-45) 1x 10G SFP+ **NOTE** • *5GE supports PoE input.*
	BLE	BLE 5.2
	LED indicator	Indicates the power-on, startup, running, alarm, and fault states of the system
Power specifications	Power input	PoE power supply: In compliance with 802.3at
	Maximum power consumption	23.8 W **NOTE** *The actual maximum power consumption depends on local laws and regulations.*
Environmental specifications	Operating temperature	-40℃ ～+65℃
	Storage temperature	-40℃ ～+70℃
	Operating humidity	5%～95%(non-condensing)
	Altitude	-60m～5000m
	Atmospheric pressure	53kPa～106kPa
Radio specifications	Antenna type	External antennas
	Maximum number of SSIDs for each radio	≤ 16
	Maximum number of users	≤1024 (512/Radio) **NOTE** *The actual number of users varies according to the environment.*
	Maximum transmit power	2.4GHz: 30dBm (combined power) 5GHz: 30dBm (combined power) **NOTE**

Item		Description
		• *For details about the transmit power with different radios, see the Specification Query Tool.* • *The actual transmit power depends on local laws and regulations.*
	Power increment	1dBm
	Maximum number of non-overlapping channels	2.4 GHz(2.412GHz～2.472GHz) 802.11b/g 20MHz: 3 802.11n 20MHz: 3 40MHz: 1 802.11ax 20MHz: 3 40MHz: 1 5 GHz(5.18GHz～5.825GHz) 802.11a 20MHz: 13 802.11n 20MHz: 13 40MHz: 6 802.11ac 20MHz: 13 40MHz: 6 80MHz: 3 160MHz: 1 802.11ax 20MHz: 13 40MHz: 6 80MHz: 3 160MHz: 1 **NOTE** *The table uses the number of non-overlapping channels supported by China as an example. The number of non-overlapping channels varies in different countries. For details, see the Country Codes & Channels Compliance.*
	Receiver sensitivity	• 2.4GHz 802.11b: -99dBm/1Mbit/s;-96dBm/2Mbit/s;-93dBm/5.5Mbit/s;-90dBm/11Mbit/s; • 2.4GHz 802.11g: -99dBm/6Mbit/s;-96dBm/9Mbit/s;-94dBm/12Mbit/s;-92dBm/18Mbit/s;-89dBm/24Mbit/s;-86dBm/36Mbit/s;-82dBm/48Mbit/s;-80dBm/54Mbit/s; • 2.4GHz 802.11n(HT20): -98dBm/MCS0;-96dBm/MCS1;-94dBm/MCS2;-91dBm/MCS3;-88dBm/MCS4;-84dBm/MCS5;-81dBm/MCS6;-80dBm/MCS7; • 2.4GHz 802.11n(HT40): -95dBm/MCS0;-94dBm/MCS1;-91dBm/MCS2;-88dBm/MCS3;-85dBm/MCS4;-81dBm/MCS5;-79dBm/MCS6;-78dBm/MCS7; • 2.4GHz 802.11ac(VHT20): -98dBm/MCS0NSS1;-96dBm/MCS1NSS1;-94dBm/MCS2NSS1;-91dBm/MCS3NSS1;-

Item		Description
		88dBm/MCS4NSS1;-84dBm/MCS5NSS1;-81dBm/MCS6NSS1;-80dBm/MCS7NSS1;-77dBm/MCS8NSS1; • 2.4GHz 802.11ac(VHT40): -95dBm/MCS0NSS1;-94dBm/MCS1NSS1;-92dBm/MCS2NSS1;-88dBm/MCS3NSS1;-85dBm/MCS4NSS1;-81dBm/MCS5NSS1;-79dBm/MCS6NSS1;-78dBm/MCS7NSS1;-73dBm/MCS8NSS1;-71dBm/MCS9NSS1; • 2.4GHz 802.11ax(HE20): -98dBm/MCS0NSS1;-96dBm/MCS1NSS1;-94dBm/MCS2NSS1;-91dBm/MCS3NSS1;-88dBm/MCS4NSS1;-84dBm/MCS5NSS1;-81dBm/MCS6NSS1;-80dBm/MCS7NSS1;-77dBm/MCS8NSS1;-74dBm/MCS9NSS1;-72dBm/MCS10NSS1;-70dBm/MCS11NSS1; • 2.4GHz 802.11ax(HE40): -95dBm/MCS0NSS1;-94dBm/MCS1NSS1;-91dBm/MCS2NSS1;-88dBm/MCS3NSS1;-85dBm/MCS4NSS1;-81dBm/MCS5NSS1;-79dBm/MCS6NSS1;-78dBm/MCS7NSS1;-73dBm/MCS8NSS1;-71dBm/MCS9NSS1;-68dBm/MCS10NSS1;-66dBm/MCS11NSS1; • 5GHz 802.11a: -97dBm/6Mbit/s;-95dBm/9Mbit/s;-94dBm/12Mbit/s;-92dBm/18Mbit/s;-89dBm/24Mbit/s;-86dBm/36Mbit/s;-82dBm/48Mbit/s;-79dBm/54Mbit/s; • 5GHz 802.11n(HT20): -96dBm/MCS0;-93dBm/MCS1;-91dBm/MCS2;-88dBm/MCS3;-85dBm/MCS4;-81dBm/MCS5;-79dBm/MCS6;-78dBm/MCS7; • 5GHz 802.11n(HT40): -94dBm/MCS0;-93dBm/MCS1;-91dBm/MCS2;-86dBm/MCS3;-83dBm/MCS4;-81dBm/MCS5;-78dBm/MCS6;-76dBm/MCS7; • 5GHz 802.11ac(VHT20): -96dBm/MCS0NSS1;-93dBm/MCS1NSS1;-91dBm/MCS2NSS1;-88dBm/MCS3NSS1;-85dBm/MCS4NSS1;-81dBm/MCS5NSS1;-79dBm/MCS6NSS1;-78dBm/MCS7NSS1;-75dBm/MCS8NSS1; • 5GHz 802.11ac(VHT40): -94dBm/MCS0NSS1;-93dBm/MCS1NSS1;-91dBm/MCS2NSS1;-86dBm/MCS3NSS1;-83dBm/MCS4NSS1;-81dBm/MCS5NSS1;-78dBm/MCS6NSS1;-76dBm/MCS7NSS1;-73dBm/MCS8NSS1;-71dBm/MCS9NSS1; • 5GHz 802.11ac(VHT80): -91dBm/MCS0NSS1;-88dBm/MCS1NSS1;-86dBm/MCS2NSS1;-83dBm/MCS3NSS1;-81dBm/MCS4NSS1;-78dBm/MCS5NSS1;-76dBm/MCS6NSS1;-74dBm/MCS7NSS1;-70dBm/MCS8NSS1;-68dBm/MCS9NSS1; • 5GHz 802.11ac(VHT160): -88dBm/MCS0NSS1;-85dBm/MCS1NSS1;-83dBm/MCS2NSS1;-80dBm/MCS3NSS1;-77dBm/MCS4NSS1;-73dBm/MCS5NSS1;-71dBm/MCS6NSS1;-68dBm/MCS7NSS1;-66dBm/MCS8NSS1;-64dBm/MCS9NSS1; • 5GHz 802.11ax(HE20): -96dBm/MCS0NSS1;-93dBm/MCS1NSS1;-91dBm/MCS2NSS1;-88dBm/MCS3NSS1;-85dBm/MCS4NSS1;-81dBm/MCS5NSS1;-79dBm/MCS6NSS1;-75dBm/MCS7NSS1;-73dBm/MCS8NSS1;-71dBm/MCS9NSS1;-68dBm/MCS8NSS1;-65dBm/MCS9NSS1; • 5GHz 802.11ax(HE40): -94dBm/MCS0NSS1;-93dBm/MCS1NSS1;-91dBm/MCS2NSS1;-86dBm/MCS3NSS1;-83dBm/MCS4NSS1;-81dBm/MCS5NSS1;-78dBm/MCS6NSS1;-76dBm/MCS7NSS1;-73dBm/MCS8NSS1;-71dBm/MCS9NSS1;-68dBm/MCS8NSS1;-65dBm/MCS9NSS1; • 5GHz 802.11ax(HE80): -91dBm/MCS0NSS1;-88dBm/MCS1NSS1;-86dBm/MCS2NSS1;-83dBm/MCS3NSS1;-81dBm/MCS4NSS1;-78dBm/MCS5NSS1;-76dBm/MCS6NSS1;-74dBm/MCS7NSS1;-70dBm/MCS8NSS1;-68dBm/MCS9NSS1;-

Item		Description
		65dBm/MCS10NSS1;-63dBm/MCS11NSS1; • 5GHz 802.11ax(HE160): -88dBm/MCS0NSS1;-85dBm/MCS1NSS1;-83dBm/MCS2NSS1;-80dBm/MCS3NSS1;-77dBm/MCS4NSS1;-73dBm/MCS5NSS1;-71dBm/MCS6NSS1;-68dBm/MCS7NSS1;-65dBm/MCS8NSS1;-64dBm/MCS9NSS1;-59dBm/MCS10NSS1;-57dBm/MCS11NSS1;

Standards Compliance

Item	Description		
Vehicle-mounted electronic equipment standards	• EN50155		
Safety standards	• UL 60950-1/22 • CAN/CSA 22.2 No.60950-1	• IEC 60825-1/2 • EN 60950-1/22	• GB 4943
Radio standards	• ETSI EN 300 328 • ETSI EN 301 893	• FCC Part 15C: 15.247 • FCC Part 15C: 15.407	• RSS-210 • AS/NZS 4268
EMC standards	• EN 301 489-1 • EN 301 489-17 • FCC Part 15 • ICES-003 • YD/T 1312.2-2004	• ITU k.20 • GB 9254 • GB 17625.1 • AS/NZS CISPR22 • EN 55022	• EN 55024 • CISPR 22 • CISPR 24 • IEC61000-4-6 • IEC61000-4-2
IEEE standards	• IEEE 802.11a/b/g • IEEE 802.11n • IEEE 802.11ac • IEEE 802.11ax • IEEE 802.11s	• IEEE 802.11d • IEEE 802.11e • IEEE 802.11k • IEEE 802.11i	• IEEE 802.11v • IEEE 802.11w • IEEE 802.11r • IEEE 802.11h
Security standards	• 802.11i，Wi-Fi Protected Access 2(WPA2)，WPA，WPA2，WPA2-Enterprise，WPA2-PSK，WPA3，WAPI • 802.1X • Advanced Encryption Standards(AES)，Temporal Key Integrity Protocol(TKIP)，WEP，Open • EAP Type(s)		
EMF	• CENELEC EN 62311 • CENELEC EN 50385	• OET65 • RSS-102	• FCC Part1&2 • FCC KDB Series
RoHS	• Directive 2002/95/EC & 2011/65/EU		
Reach	• Regulation 1907/2006/EC		
WEEE	• Directive 2002/96/EC & 2012/19/EU		

More Information

For more information about Huawei WLAN products, visit http://e.huawei.com or contact us in the following ways:

- Global service hotline: http://e.huawei.com/en/service-hotline
- Logging in to the Huawei Enterprise technical support web: http://support.huawei.com/enterprise/
- Sending an email to the customer service mailbox: support_e@huawei.com

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