

Power Supplies for Outdoor 5G Base Station Application

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With the advent of the 5G era, mainstream applications of the IoT (Internet of Things) are developing towards following directions, such as Home and office automation, Smart meter and smart grid, Health care and eHealth, Tracking system and Intelligent transport system, Autonomous car and Industry 4.0 applications.



Fig.1 Mainstream applications of the IoT in 5G era

The three key technologies of 5G communication are millimeter wave (mmWave), Massive Multiple-Input, Multiple-Output (MIMO) technology, and Small Cell. (1) Millimeter-wave technology has three major characteristics, large bandwidth, low latency, and high transmission rate.

Large bandwidth means that more devices can be connected at the same time, facilitating the realization of the IoT and smart cities. (2) Low latency means the response time of information transmission is very short, and message responses are real-time, which helps to realize self-driving and reduce road traffic risks. (3) The high transmission rate is helpful to promote the development of big data and AI cloud computing, as well as the cloud audiovisual industry.

Since the band frequency of 5G is higher than 4G, its signals are prone to suffer from interference or shielding, especially the high-frequency millimeter wave (mmWave), and the transmission distance will be far less than that of the low-frequency band. Therefore, when planning to increase the coverage of 5G high-frequency signals, it is necessary to deploy more base stations, which is why small base stations have attracted much attention. Figure 2 shows the concept of the 5G base station application. To meet the demand of bandwidth consumption in urban areas for voice, video, and data, telecom companies are forced to build more small base stations to meet the user' s needs. All in all, small base station infrastructure is expected to be another large-scale market in 5G terminal devices.

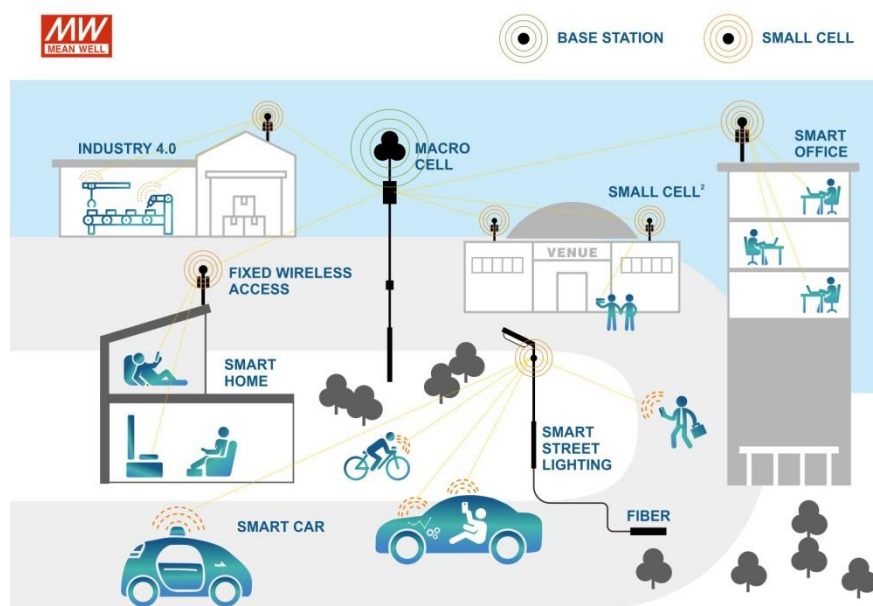


Fig. 2 Layout of 5G Base Station Application

As shown in Figure 3, small base stations require power supplies just like the rest of electronic devices, and because they are normally installed in outdoor environments, it is recommended to choose MEAN WELL HEP series to enhance the reliability of the entire base station. The power demand of base stations is proportional to the number of users.

When the power requirements are greater than 1000W, the UHP-1500/2500 series are highly recognized for the base station. Base station manufacturers only need to install power supplied in a waterproof, dust-proof, and heat dissipation working environment. The heat generated by the power supply can be dissipated through the structure of the base station by conduction cooling.

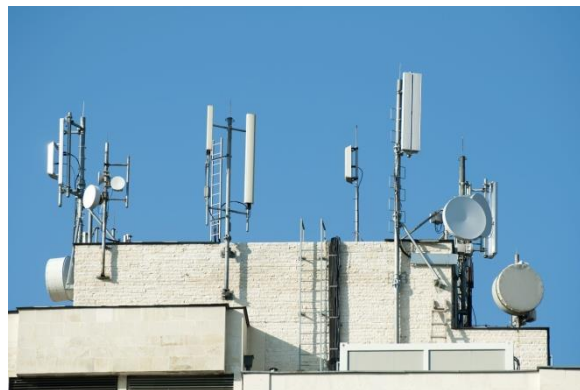


Fig. 3 Small Base Station

To provide a complete solution for a harsh environment, MEAN WELL launched the HEP-1000-W series. The appearance difference is shown in Figure 4. The main difference between this series and the previous HEP-1000 series is the input and output cables. HEP-1000-W series adopts outdoor waterproof cables instead of the terminal block. Yet, both series comply with IP67. With such a high standard, HEP-1000 series is an ideal choice in a humid, dusty environment for 4G/5G base station, laser machines, and charging related applications.



Fig. 3 Appearance Difference between HEP-1000 and HEP-1000-W

The HEP-1000 series adopts MEAN WELL's unique fully potting design and filled with top-grade silicone gel. Full potted design not only helps the heat dissipate effectively but also decreases the chances of failure caused by the high dust and high humidity environment. As the stability of power supplies are ensured, the overall maintenance costs can be reduced simultaneously.

HEP-1000 series function table

I/O TYPE	□: Function type	Communication protocol	Note
Terminal type HEP-1000-□	Blank	PMbus	In stock
	CAN	CANbus	By request
Cable type HEP-1000-W□	Blank	PV/PC programmable	By request
	PM	PMbus	By request
	CAN	CANbus	By request
	CPM	Charger with PMbus	By request
	CCAN	Charger with CANbus	By request

Note: Terminal type with Charger function by programmer or PMbus/CANbus setting.



The HEP-1000-W series is also designed with power supply and charging functions. With programmable voltage and constant current function (PV/PC), by applying a 0~5 DC voltage, the output voltage can be adjusted in a wide range from 50% to 125% and constant current 20% to 100%. Featuring built-in standard communication PMBus and CANBus protocols, HEP-1000-W series can be integrated into the high-end system seamlessly, making it a controllable peripheral device to bring several benefits, such as power conservation, easy monitoring, and fast communication. The case design and the firmware functions make HEP-1000-W a perfect fit for digital power management requirements, electrolysis, burn-in equipment, charging equipment, and laser applications.

- IP67 fully potted design · suitable for outdoor application.
- Built-in active PFC with the efficiency of 96%
- Wide operating temperature range -40~+70°C.
- Withstand 10G vibration test
- Built-in 2/3 stage charging curves and programmable curve
- Output voltage and current programmable
- Protections: OVP/OLP/Short circuit/OTP
- PMbus/CANbUS Protocol available
- Built-in DC OK signal and 12V auxiliary output
- 6 years warranty.

MEAN WELL owns a complete product line of power supply featuring high-wattage and high-efficiency as well as high product quality and reliability.



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1

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