HUAPTEC

We Improve Your Mobile Signal

User's Manual

F27K-6S-IoT,F27-6S-IoT
F23K-6S-IoT,F23-6S-IoT

MADE IN HUAPTEC

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How it works

F23K Model and F27K Model boosters are designed to help mobile users amplify weak signals of 2G, 3G, 4G and 5G. They are bi-directional amplifiers.
The donor antenna receives the signals from the cell tower, amplifies it, and transmits to the signal booster. Then the indoor antenna will receive the signal and retransmit it to your mobile device.
The signals produced by your phone are also amplified by the indoor antenna via the booster and donor antenna.

Glossary of Terms

Item	Definition
600MHz	Available on NR600(663～698MHz/617 ～652MHz) network
700MHz	Available on LTE(A+B)700(698～716MHz/728～746MHz) network
700MHz	Available on LTE C700(776～787MHz/746～757MHz) network
800MHz	Available on CDMA850(824～849MHz/869～894MHz) network
1800MHz	Available on PCS1900(1850~ 1915MHz/1930-1995MHz) networks
2100MHz	Available on AWS2100(1710-1755MHz/2110-2155MHz) networks
RF	Radio Frequency
ATT	Attenuation
ALC	Automatic Level Control
AGC	Automatic Gain Control
MGC	Manual Gain Control
LNA	Low Noise Amplifier
PA	Power Amplifier
dB	Decibel
dBm	Decibels relative to 1 mill watt
UL	Uplink
DL	Downlink
Hz	Hertz
MHZ	Megahertz
NF	Noise Figure
RSSI	Received Signal Strength Indicator

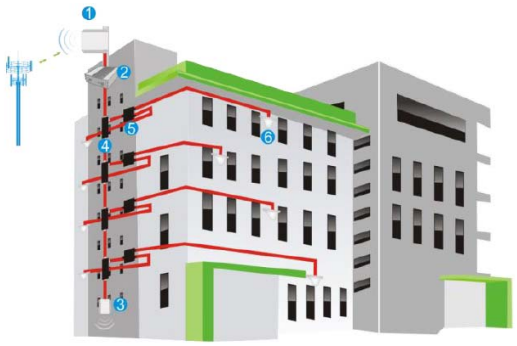
No.	Name	Description	Quantity
1	Hiboost Industrial Booster		1
2	Adapter	12V/8.5A	1
3	Plastic Expansion bolt	08	5
4	Tapping Screw	M6*50	4
5	User Manual		1

Model	Standard Package Content	Quantity
F27-6S-IoT, F27K-6S-IoT		1
F23-6S-IoT, F23K-6S-IoT		1

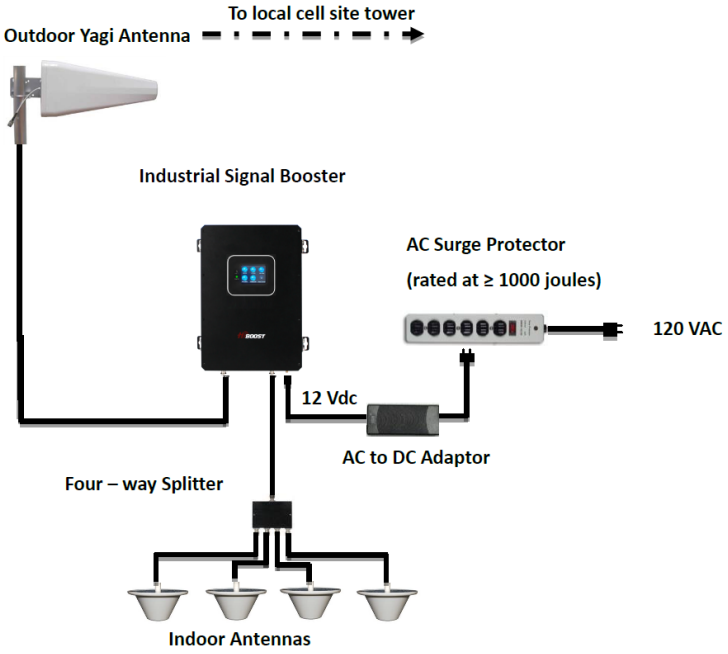
F27 Model (F27-6S-IoT, F27K-6S-IoT) and F23 Model (F23-6S-IoT and F23K-6S-IoT) Industrial boosters cannot transmit signals without an outside and inside antenna connected by a cable. F27 Model (F27-6S-IoT, F27K-6S-IoT) and F23 Model (F23-6S-IoT, F23K-6S-IoT) Industrial boosters can install up to 15 indoor antennas, usually, we recommend install up to 8~10 indoor antennas（*Note:the Multiple antenna connecting method reference on next page--Multiple antenna installation Sample*）. The detail number of antennas, length of cable or other accessories needed can vary according to the size and make of the structure, lack of signal strength, or where the structure resides. Or you can contact us or our reseller to find out what you need.

Notice: Booster Model Character “K” means modem inside device.

Multiple antenna installation Sample



1.Outdoor Antenna 2. Booster 3.Indoor Panel Antenna
4. Coupler 5. Splitter 6. Omni ceiling antenn

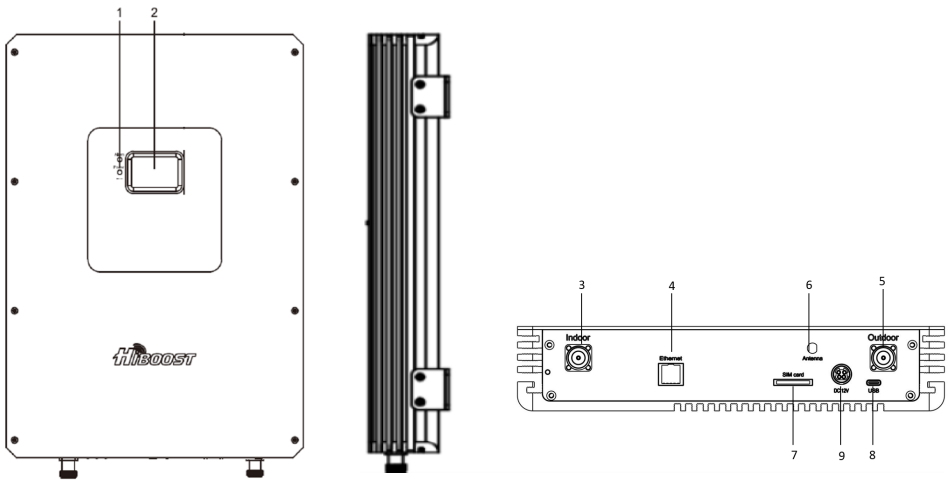


Features

- ✓ Embedded CPU, self-adaptive intelligent system to make booster system very easy to install and better performance is guaranteed under complex and constantly changing RF environment.
- ✓ ISO: Intelligent isolation processing to avoid self-oscillation, quite wide adjusting range to stabilize the signal strength/quality for clearer voice/ higher data speed and avoid interference to mobile network
- ✓ ALC: Intelligent ALC, quite wide adjusting range to improve the signal quality for clearer voice and higher data speed
- ✓ LCD Display: Displays each of Sub-Band status, actual gain, uplink and downlink output power which makes booster installation and troubleshooting much easier.
- ✓ MGC: control button to adjust the gain for both uplink and downlink independently, 31dB range
- ✓ Excellent RF performance, larger coverage area, clearer voice and higher speed data services.
- ✓ Elegant design, small size, very low power consumption to save cost during operation and low heat dissipation.

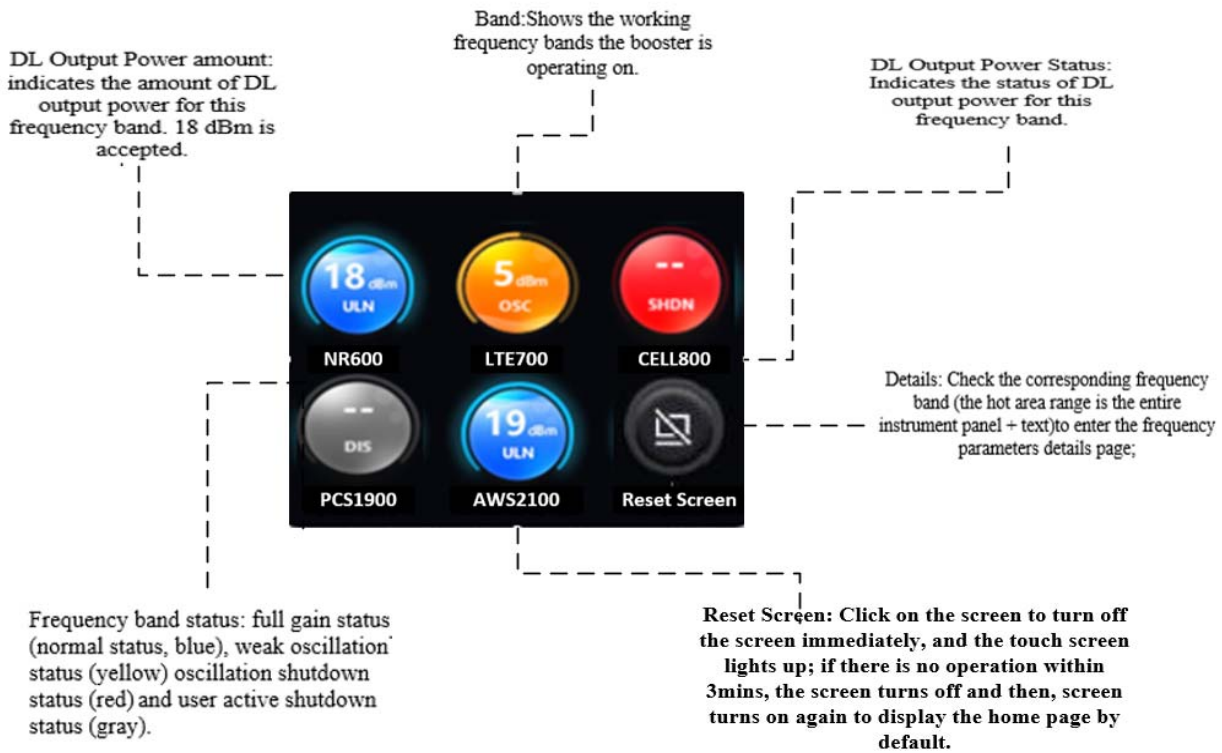
Booster Port's Description

The following image shows the key components of the booster. There are 3 parts: first part is LCD indicator, which will show the booster status. Second part is LED light (Alarm LED and NET LED). Third part is connectors to the outdoor antenna and indoor antenna. The following tables and graphs show the details.



1-LED Light, 2-LCD, 3-Outdoor Antenna Port, 4-Ethernet Port, 5-Indoor Antenna Port, 6- Power Port, 7-SIM Card Slot, 8-Debug Port, 9-Antenna Port)

LCD Screen Operation



Install HiBoost Booster system

Before you install

• Make sure you have sufficient cable length between proposed outdoor/indoor antennas.
• Make sure the place where you install the booster is near to one existing electrical outlet. It should also be well ventilated, away from excessive heat, moisture, and direct sunlight.
Install tools and accessories：

No.	Name	Specification	Quantity	Remark
1	Plastic expansion bolt	<P8	5	Standard accessories
2	Tapping screw	M6*50	4	Standard accessories
3	Hanging folder		1	Standard accessories
4	Reciprocating drill		1	Engineering-owned
5	Shot bit	08	1	Engineering-owned

Installation overview

The booster has LCD display and intelligent self-adaptive system, LCD displays real time working state, and intelligent self-adaptive system can automatically calculate and adjust the booster to obtain its best performance, so it is very easy
to install for end-user.
General installation steps：
Step l. Install your outdoor antenna on the roof where there is the strongest signal. Step2. Install the indoor antenna where you want to improve the signal.
Step 2. Mount your signal booster, connect the cables to the signal booster from the outdoor antenna and indoor antenna at the designated ports, and connect the booster to the AC supply (make sure all the cables are connected).
Step4. Plug in the booster to a power supply and self-adaptive system will automatically adjust best performance in 30 seconds. (NB! Before you plug it in, make sure all the cables are connected firmly!). For more details, refer to "Booster Commissioning".

1. Outdoor Antenna 2. Booster 3. Indoor Antenna

Booster Implementation and Testing

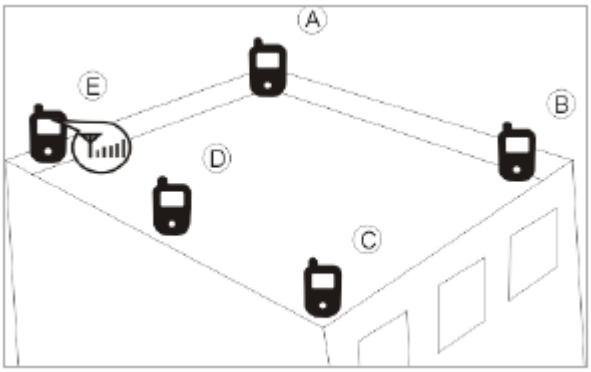
How to find the position with the strongest receiving signal?

The booster's main function is to improve weak RF signal inside a house, office or any other indoor area. The receiving strength of the outdoor antenna and the strength of the signal reception outdoors directly affect the efficiency of indoor coverage. That's why it's crucially important to install the outdoor antenna in the point where signal reception is the strongest.

There is a recommended method for finding strongest receiving signal to use mobile phone to test signal bars.

Mobile Phone Method

You can use telephone to test signal strength near the window or on the top of the building. The number of bars on network indicator will define approximate strength of the received signal. Normally the roof of the building is the best place to receive the strongest signal. As shown on the graph below, you need to test the signal in points from A to E, and select a place with best signal strength for outdoor installation. It is recommended to use mobile app that can display signal level, since it is more accurate than checking signal bars.



More tips: Please try to pick up signal from cell towers that are not so busy, which can be estimated by the population density in the area served by this tower. It's also recommended to avoid a cell tower near a supermarket, shopping mall, stadium and any other public place visited by many people regularly. This will help on successful phone call connections or higher speed data services.

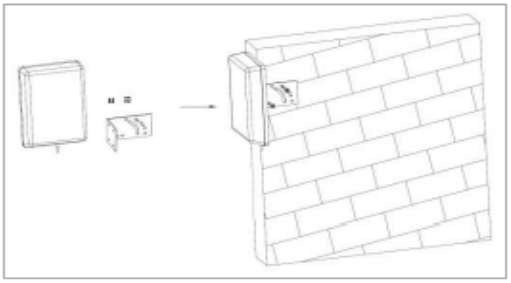
1.Install Outdoor Antenna

In most cases, the panel antenna is the best choice. You can also choose wide band YAGI antenna as an option.

There are 2 types of installation: wall mount or pole mount.

Install outdoor panel antenna onto the wall for your reference:

Step1: Unscrew antenna from L-mounting bracket on antenna base with wrench. Step2: Mount vertical plate of the L-bracket on the wall with supplied screws. Step3: Screw antenna back onto horizontal plate.

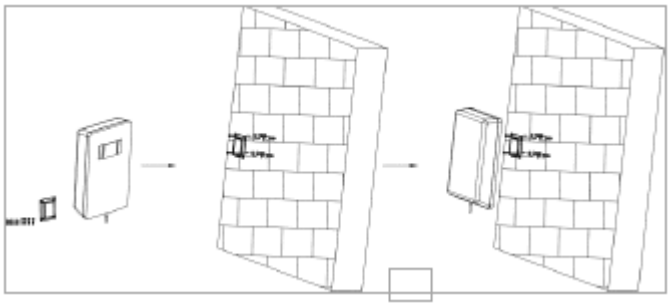


Notes:

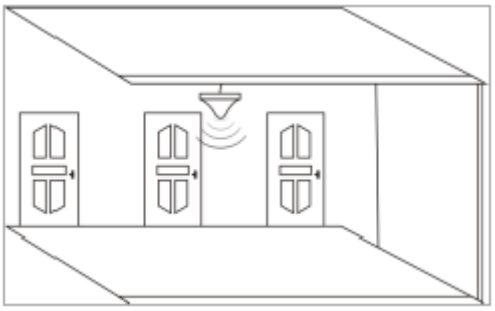
Wrap waterproof tape around the connectors between outdoor antenna and feeder line to avoid water or other kinds of damage.

2. Install Indoor Antenna

According to the requirement of practical application, please select Indoor panel antenna, or Omni-ceiling antenna as indoor antenna for coverage
Install indoor panel as reference.
Step1: Select a place on a wall projecting the area where you want reception. Normally, to provide an overall coverage, you will need to choose a corner. Step2: Mount the bracket on the wall after drilling the screw to the wall.
Step3: Put the panel antenna on the bracket.



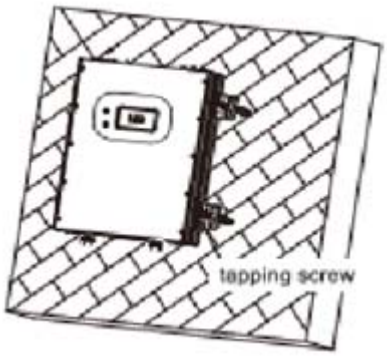
When you choose Indoor ceiling omni antenna or whip antenna, the best place to install it is the center of your house as the graph shows.



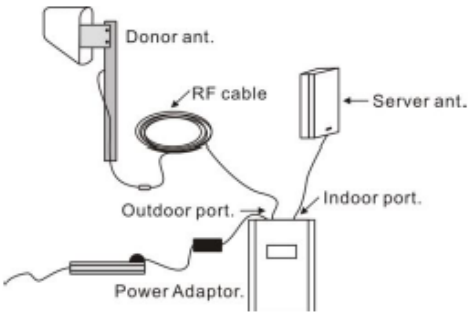
3. Install the signal booster

Step1: Select an indoor location near to a power outlet on a wall.
Step2: Mount the booster with the screws included as shown in the figure.
Step3: Connect the outdoor antenna cables to booster connector marked “outdoor”. Tighten the connection with hand or wrench.

Step4: Connect the indoor antenna cables to booster connector marked “indoor”. Tighten the connection with hand or wrench.
Step5: Connect the AC power cord to the signal booster, and then connect the plug to the electrical outlet to power on the booster



Booster installation



Connection from booster

4. Booster Commissioning

Overview: The booster has quite intelligent startup system, booster commissioning is an automatic process to guarantee its optimal performance.

After finishing the booster system installation, please power on the booster, the booster starts its initialization to check it is receiving signal, the isolation status to ensure its best performance. This will take around 3~5 seconds.

After the booster start up, please check whether the coverage is good. If it is good, the booster system is completed.

You can check the output power displayed in LCD. It may vary at 1~3dB difference which is normal due to outdoor signal conditions. It would be perfect that the output power reaches its rated one for largest coverage; but you can always leave it even though it doesn't as long as the coverage is good enough for you.

In case the coverage is not enough, please take below measures as per below conditions.

1. The rated output power is reached, but the coverage is not enough or the signal in specific areas has not been improved
   - ✓ Check whether the indoor antenna is installed correctly or not, you may try to move the antenna location to improve coverage.
   - ✓ Check if it is necessary to adjust the direction of the indoor antenna.
   - ✓ Check whether it is necessary to add more indoor antennas since barriers block the signal penetration.

2. The rated output power is not reached.

✓ Please adjust the outdoor antenna to get a stronger receiving signal in order to get higher output power (not necessarily to reach rated value as long as the coverage is enough)

✓ Please observe the LCD display, if the reading gain is less than rated value and Alarm LED would be blinking, user could observe abnormal status description in Sub-system interface or receive a warming message to remind user ISO abnormal status. **Measures：** One of below actions are recommended to eliminate ISO problems and increase the gain

- Adjust the antenna's directions or locations, or enlarge the distance between them.
- Enlarge the vertical or horizontal distance between donor antenna and server antenna.
- Use the barrier, such as walls, to increase the isolation.
- Change server antenna (server antenna can be changed to other antenna type which has better directional antenna pattern, also you can let server antenna and donor antenna point opposite direction).
- Reduce the booster's downlink gain by the control button. Keep the uplink attenuation value and downlink attenuation value same then restart the booster.

More about "Alarm" legend indication

Alarm Status: indicates if the booster has enough isolation between outdoor and indoor antennas in order to avoid loop back or so-called self-oscillation. Hiboost is an ideal mechanism. Smart AGC, to avoid interference with operator mobile networks. "Alarm" long-team up on LCD display means not only device is powering on, but also ISO function is working great and self-oscillation has been eliminated.

LED	Status	Meaning	Solution
Alarm LED	Green	No loop back or no self-oscillation	NO action is needed.
	Slow Flashing Green (Per 2.5S off, 0.5S on)	Slight loop back or self—oscillation (1dB≤ISO Attenuation≤14dB)	NO action is needed.
	Quick Flashing Green (Per 0.5S off, 0.5S on)	Deep loop back or self—oscillation (15dB≤ISO Attenuation<42dB)	Not working properly. Check if there would be self-oscillation message and Sub-band interface. Please check the Troubleshooting section to get a solution if coverage is not good.
	Red	The booster sub-band auto shuts off for protection due to severe loop back or self-oscillation (ALC≥42dB,ISO≥42dB)	Not working properly. Please check the Troubleshooting section to get a solution.
	OFF	The booster not power up	

More about "NET" legend indication

NET indicates the connection establishment between booster and Bluetooth/Wifi, if the connection established well, NET LED will show Green UP status, otherwise light would be blinking or off.

LCD	Status	Meaning	Solution Methods
NET status	Green Light up	Mobile could connect to booster through Bluetooth/Wi-Fi	Working properly.
	No light up .	Mobile not connect to booster through Bluetooth/Wi-Fi	Not working properly, please contact with Huaptec EU for assistance.

How to connecting Wi-Fi/bluetooth?
Please download "Signal Supervisor" APP on APP store firstly.
(IOS system by App Store,Android system by Google play).

Quick Troubleshooting Guide

Problem	Solution
The signal booster has no power.	Check that the AC outlet is working.
The booster's power is on but the phone is not connected to the network and still cannot communicate with the signal.	Try to fasten the connections between the different parts of the system. Change the direction of the donor antenna or its installation position.
Good downlink signal with poor communication quality.	Check whether there's interference. Consult the operator whether the signal source base station works well.
The power is on but the coverage is not good.	Check Alarm LED indications. Take the actions mentioned below.

Eliminate Alarm LED Quick Flashing and RED problems:

▲ Adjust the outdoor antenna direction, keeping it away from the indoor antenna. Restart booster.
▲ Increase the vertical or horizontal distance between the outdoor antenna and indoor antenna. Restart booster.
▲ Use barriers such as walls to increase the isolation.
▲ Change the indoor antenna type to an antenna with a more directional antenna pattern. Orient the indoor antenna and outdoor antenna so they point in opposite directions.
▲ Reduce the booster's downlink gain using the manual gain controls. Keep the uplink gain value and downlink gain value the same, then restart the booster.

Note: Uplink gain must be equal to or not less than 5dB below the downlink gain, to avoid interference with the local carrier's cell site network.
Target: This situation refers to ISO issue and if issue resolved, the Alarm LED would show Green light UP status.

Eliminate poor coverage problems when gain or output power value abnormal in Sub-Band Interface:

- If the signal has not been improved, please check below:
- The weak downlink signal leads to the low output signal level. Change the direction or position of the outdoor antenna. You may also try replacing the outdoor antenna with a higher gain antenna to increase the incoming signal.
- Check to see if it is necessary to add more indoor antennas. Barriers such as walls can block the signal indoors. You should also check the booster to make sure the power is maximized. Try installing more indoor antennas or replace the booster with a higher powered one.
- If the signal in a small section of the building hasn't been improved, try the following:
- Check to see if the indoor antenna is installed correctly. Try moving the antenna to improve coverage.
- Try adjusting the direction the indoor antenna is pointing.

Remark:

- When increasing the downlink gain, make sure the isolation is adequate to prevent system oscillation

Note: The Alarm LED long-term Green up and the problems of self-oscillation and strong downlink signals are fixed. In most cases, there is no need to take any additional measures except for deep self-oscillation or excessively strong signals from the tower. The self-adaptive ALC and isolation gain processing system automatically solve most problems.

Industrial booster warning label

WARNING. This is NOT a CONSUMER device.It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MU ST have an FCC LICENSE or express consent of an FCC Licensee to operate this device.Unauthorized use may result in significant forfeiture penalties,including penalties in excess of $100,000 for each continuing violation.

Notice:

The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

Main Specification

RF Parameter	UL		DL
Frequency Range	600 MHz	663～698MHz	617～652MHz
	700 MHz	698～716MHz	728～746MHz
	700 MHz	776～787MHz(for FCC) 777～787MHz(for IC)	746～757MHz (for FCC) 746～756MHz (for IC)
	800 MHz	824～849MHz	869～894MHz
	1800 MHz	1850～1915MHz	1930～1995MHz
	2100 MHz	1710～1755MHz	2110～2155MHz
Max. Gain	F23K Model F27K Model	75dB 80dB	80 dB 85 dB
Max. output power	F23K Model F27K Model	23dBm 23dBm	23dBm 27dBm
MGC (Step Attenuation)	>31 dB/1 dB step		
Automatic Gain Control	≥31dB		
Electrical Parameter			
Power Supply	Quint/Sextuplet Band		Input AC 100-240 V, 50/60 Hz, Output DC 12 V / 8.5 A
Power Consumption	Quint/Sextuplet Band		<84W
Input & Output Impedance	50 ohm		
Mechanical Parameter			
1 /O Port Type	N-Female		
Dimensions	Quint/Sextuplet Band		280*400*53 mm
Weights	Quint/Sextuplet Band		<8kg
Environment Parameter			
Operating Temperature	- 10ºC～+55ºC		
Relative Humidity	5%-95%		
Barometric Pressure	55 kPa -106 kPa		
Environment Conditions	IP40		

Authorized Accessories List

Outdoor Antenna & Cable Kit Options
Outdoor antenna HODL698-2700V8i60A 617-960/1710-2700MHz 8/9dBi Outdoor cable Hiboost240/4D 49.2ft/15M

Indoor Antenna & Cable Kit Options
Indoor antennaAI698-2700V09iB 617-960MHz/1710-2700MHz 7dBi Indoor cable Hiboost240/4D 30ft/9.14M

Notice: Above equipment are necessary accessories for HiBoost booster implementation, Huaptec really recommend operator to purchase Outdoor Antenna and Indoor antenna follow above standards, which could enable booster to achieve best working performance, but they are not provided by Huaptec.

Notice:Please using authorized antennas, cables, and/or coupling devices conforming with ERP/ EIRP and/or indoor-only restriction

Product Warranty

30-Day Money-Back Guarantee
All Hi boost products are protected by 30-day money-back guarantee. If for any reason the performance of the received product is not acceptable， the client can return the product within 30-day period and get spent money back.
2-Year Warranty
Hi boost signal boosters are covered with2-year warranty. Huaptec offers two options for the products under warranty: repair or replace.
This warranty does not apply to Hi Boost signal boosters or kits that have been subjected to misuse, abuse, neglect or mishandling and that have its physical or electronic properties altered or damaged. Failure to use surge protected AC power strip with at least a 1000 Joule rating will void your warranty.
All Hi boost products that are packaged with Hi boost accessory products are intended for use and resale as a single unit, and such product kits are required to be sold to the end users or subsequent reseller as packaged.
For any questions or suggestions do not hesitate to contact Huaptec Support Team on the phone (469) 871-2552 or by e-mail info@hiboost.com.

Huaptec Contact Way

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Phone/Fax:086-0755-29921615	Phone/Fax:44 (20) 3239-5802	Phone: (469) 871-2552
Address: 3rd FL,E BLDG, Sogood Science Park, SanWei community, Hangcheng Street, Bao'an District, Shenzhen, China.518102	Address: Herderstr. 94, 40721 Hilden, Germany	Address: 3150 Premier Dr., Ste. 130, Irving, TX 75063
E-mail :tech@huaptec.com	E-mail:sales2@huaptec.eu	E-mail: info@hiboost.com
Website:www.huaptec.com	Website:www.hiboost.com.eu	Website: www. hiboost.com

FCC and ISEDC Statements

FCC RF EXPOSURE STATEMENT

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instruction for satisfying RF exposure compliance. This transmitter must not be collocated or operating in conjunction with any other antenna or trans-mite. This equipment should be installed and operated with minimum distance 26cm between the radiator& your body.

ISEDC RF EXPOSURE STATEMENT

The devices is compliance with RF exposure limits. The minimum distance from body to use the device is 26 CM.

Le présent appareil est conforme aux conformité ou aux limites d'intensité de champ RF. La distance minimale du corps à utiliser le dispositif est de 26 CM.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a

residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help Changes or modifications not expressly approved by HiBoost could void the user's authority to operate the equipment. For a complete list of antennas and cables approved for use with these boosters see Authorized Kitting Options.

FCC 27.50(d)(4) Statement: Fixed, mobile, and portable (handheld) stations operating in the 1710-1755 MHz band are limited to 1-watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground.

FURTHER INFORMATION ON SIGNAL BOOSTER END-USE REGISTRATION

The following links are the currently active contacts for booster registration with U.S. wireless providers:

https://www.uscellular.com/uscellular/support/fcc-booster-registration.jsp

https://www.sprint.com/legal/fcc_boosters.html

https://www.verizonwireless.com/solutions-and-services/acces-sories/register-signal-booster/ https://support.t-mobile.com/docs/DOC-9827

https://securec45.securewebsession.com/attsignalbooster.com/

ISEDC Statement: This device complies with Innovation, Science, and Economic Development Canada licence-exempt RSS standard(s). Opera-tion is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d' Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivant-es :

(1) l'appareil nedoit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionne-ment.

This device complies with Innovation, Science and Economic Development Canada ICES-003 Compliance Label: CAN ICES-3 (B)/ NMB-3(B). Le présent appareil est conforme Innovation, science et développement économique Canada ICES-003 Étiquette de conformité: CAN ICES-3 (B) / NMB-3 (B). Please follow the link to access the CPC-2-1-05:

http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08942.html