

## CST Technical Specification

# Specification for Mobile Repeaters (Mobile Signal Boosters)

Document Number: RI116  
Revision: Issue 03  
Date: Feb 2024

This technical specification is issued by The Communications, Space and Technology Commission in the Kingdom of Saudi Arabia in accordance with the provisions of the Communications and Information Technology Act issued by Royal Decree No. (M/106) dated 02/11/1443 AH and its bylaw, and the Commission's regulation.

Communications, Space and Technology Commission (CST)  
Kingdom of Saudi Arabia - P.O Box 75606 – Riyadh 11588

Telephone: + 966 1 14618000  
Fax: + 966 1 14618120  
E-mail: [info@cst.gov.sa](mailto:info@cst.gov.sa)  
Website: [www.cst.gov.sa](http://www.cst.gov.sa)

**Document History Table**

Version	Issue Date	Description
Issue 1	January 2021	
Issue 2	July 2021	
Issue 3	Feb 2024	

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## 1- Scope

- 1-1 This specification applies to mobile repeaters, generally known as mobile signal boosters.
- 1-2 Mobile repeaters or signal boosters are devices used to extend the coverage of mobile networks in areas where the surroundings are preventing a suitable reception of radio waves like inside a building or a car.

## 2- Enforcement

- 2-1 This specification shall enter into force from issue date.
- 2-2 Any previous version of this technical specification is withdrawn.

### 3- General Requirements

- 3-1 All equipment must comply with the requirement of CST specification GEN001, be safe and must not adversely affect other electrical equipment.
- 3-2 All telecommunications and radio terminal equipment must comply with the relevant technical specifications established by CST. In addition, such equipment may be subject to regulations for Declaration of Conformity or registration. Please Visit [www.CST.gov.sa](http://www.CST.gov.sa) for details.
- 3-3 If more than one interface type is offered by a piece of equipment, each interface must meet the applicable technical specifications.
- 3-4 Further information on the characteristics and presentation of network interfaces can be found by visiting operator's website.
- 3-5 It is mandatory that test reports are obtained from a laboratory that has been accredited by a body that is a member of the ILAC Mutual Recognition Arrangement.

### 4- Limits and conditions

Testing should be carried out to ensure compliance with the listed specifications.

Frequency band	Max Output Power or Magnetic Field	Usage	Standard	Comments
703 – 733 MHz uplink	Uplink: 24 dBm e.i.r.p.	Mobile repeater	EN 301 908-15	4G B28
758 – 788 MHz downlink	Downlink: 17 dBm e.i.r.p.		EN 301 489-50	
832 – 862 MHz uplink	Uplink: 24 dBm e.i.r.p.	Mobile repeater	EN 301 908-15	4G B20
791 – 821 MHz downlink	Downlink: 17 dBm e.i.r.p.		EN 301 489-50	

<b>880 – 915 MHz uplink</b> <b>925 – 960 MHz downlink</b>	Uplink: 33 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 303 609 EN 301 489- 50	2G GSM900
<b>880 – 915 MHz uplink</b> <b>925 – 960 MHz downlink</b>	Uplink: 24 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 301 908-15 EN 301 489- 50	3G and 4G B8
<b>1710 – 1785 MHz uplink</b> <b>1805 – 1880 MHz downlink</b>	Uplink: 24 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 301 908-15 EN 301 489- 50	4G B3
<b>1920 – 1980 MHz uplink</b> <b>2110 – 2170 MHz downlink</b>	Uplink: 24 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 301 908-15 EN 301 489- 50	4G B1
<b>2300-2400 MHz</b>	Uplink: 24 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 301 908-15 EN 301 489- 50	4G B40, 5G n40
<b>2500-2690 MHz</b>	Uplink: 24 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 301 908-15 EN 301 489- 50	4G B41, 5G n41
<b>3300-3800 MHz</b>	Uplink: 24 dBm e.i.r.p. Downlink: 17 dBm e.i.r.p.	Mobile repeater	EN 301 908-13 EN 301 489-52	5G n78

## 5- Licensing Requirements

Facilities-Based Unified Telecommunications Services License is required for importation of mobile repeaters devices.

## 6- Additional Requirements

In addition to meeting all the requirements detailed in the “Regulations for Selling and Using Mobile Repeaters”, all mobile repeaters must comply with the following:

### 6-1 Signals detection and relay

The equipment must detect and relay only mobile signals. Therefore, it is going to ignore any other types of signals.

### 6-2 Automatic Standby/Shutoff

Signal Boosters and Repeaters must show an automatic standby/shutoff mode which will reduce the repeater output power to no more than -70 dBm/MHz while not in use for more than 1 minute.

### 6-3 Anti-Oscillation

The repeater or signal booster must deploy an anti-oscillation detection and mitigation feature that shows its results within 0.3 seconds for the uplink and 1 second for the downlink. The device shall either power off, restart or reduce its output power until oscillations are no longer detected.

#### **6-4 Gain**

The overall maximum system gain of the repeater or signal booster, referenced to its input and output ports, is limited to 100 dB for indoor use and 20 dB for vehicular use. The system gain shall be calculated as the difference between the carrier power received at the devices input port and the carrier power submitted at the devices output port.

#### **6-5 Gain Control**

The repeater or signal booster must be capable of automatic gain control to protect against excessive input signals- The gain adjustment shall limit the uplink noise to:

**-103 dBm/MHz – RSSI**

where RSSI is the Received Signal Strength expressed in dBm per band of operation at the port of the device.

The device must power off completely if the restrictions can not be met.

#### **6-6 Noise figure**

The equipment noise figure shall not exceed 14 dB.



## 7- References

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

### **EN 303 609**

Global System for Mobile communications (GSM);

GSM Repeaters;

Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU

### **EN 301 908-1**

IMT cellular networks;

Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements

### **EN 301 908-15**

IMT cellular networks;

Harmonised Standard for access to radio spectrum; Part 15: Evolved Universal Terrestrial Radio Access (E-UTRA FDD) Repeaters

### **EN 301 489-1**

ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility

### **EN 301 489-50**

ElectroMagnetic Compatibility (EMC)

standard for radio equipment and services;

Part 50: Specific conditions for Cellular Communication Base Station

(BS), repeater and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU