

## CITC Technical Specification

# Specification for Mobile Repeaters (Mobile Signal Boosters)

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## Scope

This specification applies to mobile repeaters, generally known as mobile signal boosters.

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.

## Enforcement

This specification shall enter into force on 20/07/2021.

Any previous version of this technical specification is withdrawn.

## General Requirements

- All equipment must comply with the requirement of CITC specification GEN001, be safe and must not adversely affect other electrical equipment.
- All telecommunications and radio terminal equipment must comply with the relevant technical specifications established by CITC. In addition, such equipment may be subject to regulations for Declaration of Conformity or registration. Please Visit [www.citc.gov.sa](http://www.citc.gov.sa) for details.
- If more than one interface type is offered by a piece of equipment, each interface must meet the applicable technical specifications.
- Further information on the characteristics and presentation of network interfaces can be found by visiting operator's website.
- 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.

## 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	

880 - 915 MHz uplink 925 - 960 MHz downlink	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
880 - 915 MHz uplink 925 - 960 MHz downlink	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
1710 - 1785 MHz uplink 1805 - 1880 MHz downlink	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
1920 - 1980 MHz uplink 2110 - 2170 MHz downlink	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
2300-2400 MHz	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
2500-2690 MHz	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
3300-3800 MHz	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

## Licensing Requirements

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

## 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:

### Signals detection and relay

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

### 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.

### 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.

## 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.

## 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:

$$-103 \text{ dBm/MHz} - \text{RSSI}$$

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.

## Noise figure

The equipment noise figure shall not exceed 14 dB.

## 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

## History

For your reference the latest version of the technical specification is published on the CITC website (<https://www.citc.gov.sa>).

Description	Status	Date
	Issue 1	03/01/2021
	Issue 2	10/07/2021