
1 FCC part 15 subpart B

1.1 9500 MPR-A unlicensed radio

The JF6-9558H/6933B-9500MPT (MPT-HL) unlicensed radio provides fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada requirements) allow immediate turn-up. After the license is received, the unlicensed MPT-HL radio can be easily converted to the lower 6 GHz licensed band.

The JF6-9558L/6933B-9558L and JF6-9558L-D/6933B-9558L-D (MPT-HLC) unlicensed radio provides fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada requirements) allow immediate turn-up. After the license is received, the unlicensed MPT-HLC radio can be easily converted to the lower 6 GHz licensed band.

The JF6-9558HC/6933B-9558HC (9558HC) unlicensed radio provides fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada requirements) allow immediate turn-up. The 9558HC unlicensed radio cannot be upgraded to licensed operation.

The JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L and JF6-9558L-D/6933B-9558L-D unlicensed radio operates in the 5725-5850 Information, Scientific, and Medical (ISM) band in accordance with FCC Part 15.247 and IC RSS-210. This unlicensed radio, although operating in the same band as a spread spectrum radio, operates using narrower bandwidths than spread spectrum.

1.2 FCC Class B compliance statement

The JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D unlicensed radio have been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and IC RSS-210. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D complies with the emission limits in FCC Part 15.247. Manufacturing, marketing and importing of this device will cease by March 2, 2018.

1.3 FCC Class B requirements

This device complies with part 15 of the FCC Rules and IC RSS-210. Operation is subject to the following three conditions: (1) this device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation. (3) This device must be professionally installed.

Cet appareil radio est conforme à IC RSS-210. Son fonctionnement respecte les trois conditions suivantes: 1) cette radio ne cause pas d'interférences néfastes, 2) cette radio peut recevoir des interférences, ainsi que des interférences qui peuvent causer des opérations non désirées, et 3) cette radio doit être installée par des Professionnels.



Caution: Changes or modifications not expressly approved by Alcatel-Lucent could void the authority to operate the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D (unlicensed) radio.



Caution: Installation, Turn-Up, Maintenance, and Operation Instruction supplied with the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D (unlicensed) radio require strict adherence for continued part 15 of the FCC Rules and IC RSS-210 compliance.



Warning: Regulatory compliance warning: Physical changes or modifications to the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D (unlicensed) radio are strictly prohibited.

Avertissement pour conformité réglementaire: changements physiques ou modifications sur les radios JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D (sans licence) sont strictement interdit.

3.7 JF6-9558H and JF6-9558HC (unlicensed) radio

The JF6-9558H/6933B-9500MPT (MPT-HL), JF6-9558HC/6933B-9558HC (MPT-HC), JF6-9558L/6933B-9558L (MPT-HLC), and JF6-9558L-D/6933B-9558L-D (MPT-HLC) unlicensed radio provides fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada requirements) allow immediate turn-up. After the license is received, the unlicensed radio can be easily converted to the lower 6 GHz licensed band.

The JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D unlicensed radio operates in the 5725-5850 Information, Scientific, and Medical (ISM) band in accordance with FCC Part 15.247 and IC RSS-210. This unlicensed radio, although operating in the same band as a spread spectrum radio, operates using narrower bandwidths than spread spectrum.

3.7.1 FCC class B compliance statement

The JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D unlicensed radio have been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and IC RSS-210. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

3.7.2 FCC class B requirements

This device complies with part 15 of the FCC Rules and IC RSS-210. Operation is subject to the following three conditions: (1) this device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation. (3) This device must be professionally installed.



Caution: Changes or modifications not expressly approved by Alcatel-Lucent could void the authority to operate the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D unlicensed radio.



Caution: Installation, Turn-Up, Maintenance, and Operation Instruction supplied with the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D unlicensed radio require strict adherence for continued part 15 of the FCC Rules and IC RSS-210 compliance.

- LAG L1, Ring should not be created: they cannot work
- PPP must be disabled (otherwise a PPP Failure alarm will be raised)
- For monodirectional links with the MPT-HLS, the space diversity combiner should be equipped only on the receiver side.
- For monodirectional links with the MPT-HLS, the RF switch should be mounted and connected.
- “No Tx Radio Alarms” alarm profile must be configured in the radio panel (otherwise all the Tx Radio alarms will be raised)

7.2.27 Unlicensed radio for MPT-HL, MPT-HLC and 9558HC in the ANSI market

The JF6-9558H/6933B-9500MPT (MPT-HL) unlicensed radio provide fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada (IC) requirements) allow immediate Turn-Up. After the license is received, the unlicensed MPT-HL radio can be easily converted to the lower 6 GHz licensed band.

The JF6-9558L/6933B-9558L and JF6-9558L-D/6933B-9558L-D (MPT-HLC) unlicensed radio provides fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada requirements) allow immediate turn-up. After the license is received, the unlicensed MPT-HLC radio can be easily converted to the lower 6 GHz licensed band.

The JF6-9558HC/6933B-9558HC (9558HC) unlicensed radio provide fast deployment of service with microwave radio. No license and small antennas (no FCC and Industry Canada (IC) requirements) allow immediate Turn-Up. The 9558HC unlicensed radio cannot be upgraded to licensed operation.



Caution: Changes or modifications not expressly approved by Alcatel-Lucent could void the authority to operate the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D (unlicensed) radio.



Caution: Installation, Turn-Up, Maintenance, and Operation Instruction supplied with the JF6-9558H/6933B-9500MPT, JF6-9558HC/6933B-9558HC, JF6-9558L/6933B-9558L, and JF6-9558L-D/6933B-9558L-D (unlicensed) radio require strict adherence for continued part 15 of the FCC Rules and IC RSS-210 compliance.

Table 20 **Unlicensed radio**

Transceiver	FCC ID	Industry Canada ID
9558HC	JF6-9558HC	6933B-9558HC
MPT-HL	JF6-9558H	6933B-9500MPT
MPT-HLC	JF6-9558L	6933B-9558L
MPT-HLC	JF6-9558L-D	6993-9558L-D

See the 9500 MPR-A Equipping Options drawing, found in *9500 MPR-A Electronic Documentation* for unlicensed radio configurations and equipping options.

The MPT-HL/HLC and 9558HC unlicensed radio operate in the 5725-5850 Information, Scientific, and Medical (ISM) band in accordance with FCC Part 15.247 and IC RSS-210. This unlicensed radio, although operating in the same band as a spread spectrum radio, operates using narrower bandwidths than spread spectrum. Advantages, disadvantages, and antenna recommendations for the unlicensed radio follow:

Advantages:

- Fast installation and Turn-Up
- Between 6.6 — 185 Mb/s user configurable data payload capacity consisting of a combination of E1/DS1, DS3, STM-1/OC-3, and/or Ethernet traffic
- Field convertible to lower 6 GHz licensed band (MPT-HL/HLC)
- Field expandable to higher capacities.
- Common network management with licensed radios.
- Common spares and training with licensed radios
- Adaptive Modulation - automatic interference countermeasures

Disadvantages:

- Interference from other 5725-5850 ISM band transmissions are possible
- Operating restrictions
- 5.725 to 5.850 GHz band
- Performance could deteriorate due to interference as the frequency band becomes congested.

Antenna Recommendations:

- Frequency – 5.8 GHz

- Size and Type – 2, 4, 6, 8, or 10 foot parabolic; 1 or 2 foot flat panel.
 - Parabolic antennas, See [Table 21](#).
 - Flat antennas, See [Table 21](#).
- Gain and 3 dB Beamwidth

This device has been designed to operate with the antennas listed below, and having a maximum gain of 42.5 dB. Antennas not included in this list or having a gain greater than 42.5 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Table 21 **5.8 GHz unlicensed antenna options**

PARABOLIC	FLAT
MPT-HL/HLC/9558HC	MPT-HL/HLC/9558HC
2 ft parabolic – 29 dB/6°	1 ft flat panel – 23 dB/9°
4 ft parabolic – 35 dB/3°	2 ft flat panel – 28 dB/3.5°
6 ft parabolic – 38 dB/2°	—
8 ft parabolic – 41 dB/1.5°	—
10 ft parabolic – 42.5 dB/1.2°	—

These antennas can only be used in a fixed point-to-point configuration.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

The antennas used for this transmitter must be installed to provide a separation distance of at least 12 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.



Caution: Danger of public exposure to long term RF radiated energy. When using a 1 ft flat panel antenna with a 1 watt (+30 dBm) output power, the antenna must be located in an area that does not allow the general population access to within 12 meters (5.8 Ghz) of the antenna.

Frequency Plan:

- For MPT-HL frequency plan for the 5.725 and 5.850 GHz unlicensed band, see [Figure 60](#).

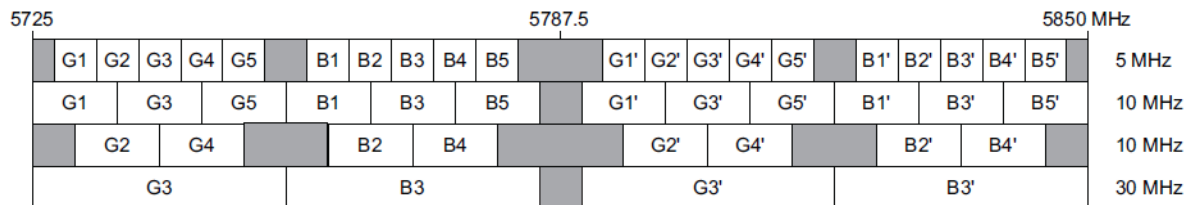
- For MPT-HLC frequency plan for the 5.725 and 5.850 GHz unlicensed band, see [Figure 61](#).
- For 9558HC frequency plan for the 5.725 and 5.850 GHz unlicensed band, see [Figure 62](#).

Output Power: A requirement of operating in the unlicensed band is to limit transmit output power to not more than +30.0 dBm at the antenna port. It is the responsibility of the user to transmit not more than +30.0 dBm.



Note: To meet FCC part 15 requirements, output power for 9558HC 30 MHz 4QAM and 8QAM channels must not be provisioned greater than 24 dBm. This is not enforced by the user interface and is the responsibility of the operator to guarantee provisioning of the radio transmit power. For transmit power specification, refer to the *9500 MPR-A MPT-HL Engineering Specifications*.

Figure 60 Frequency plan MPT-HL: 5.725 to 5.850 GHz unlicensed band (FCC Part 15 and IC RSS-210)

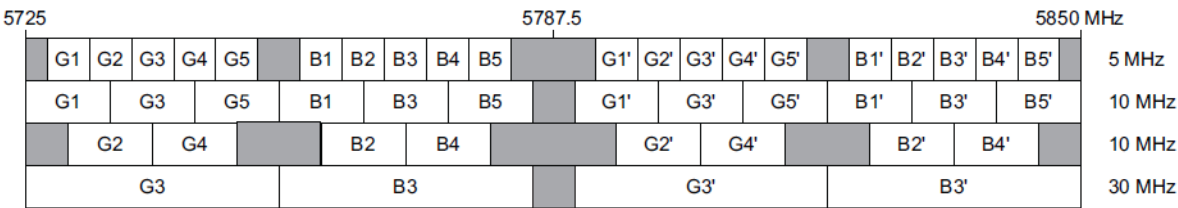


Transmit Channel	Frequency (MHz)	Receive Channel	Frequency (MHz)
G1	5730	G1'	5795
G2	5735	G2'	5800
G3	5740	G3'	5805
G4	5745	G4'	5810
G5	5750	G5'	5815
B1	5760	B1'	5825
B2	5765	B2'	5830
B3	5770	B3'	5835
B4	5775	B4'	5840
B5	5780	B5'	5845

Notes:

- 1. The drawing above shows the 5 MHz channels used by the JF6-9558H/ 5933B-9558MPT radio. Gray channels are designated “G”. Blue channels are designated “B”. Transmit and receive channels have a 65 MHz separation.
- 2. RF filters are centered on channels G3, B3, G3’, and B3’.
- 3. The flexibility of the JF6-9558H/6933B-9500MPT allows any radio to grow to 183 Mb/s without a hardware upgrade.

Figure 61 Frequency plan 9558HLC: 5.725 to 5.850 GHz unlicensed band (FCC Part 15 and IC RSS-210)

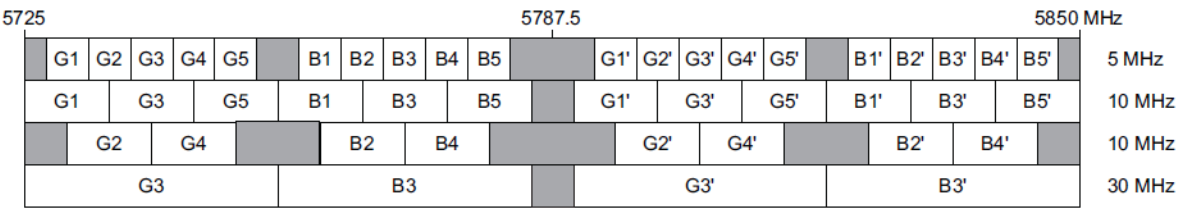


Transmit Channel	Frequency (MHz)	Receive Channel	Frequency (MHz)
G1	5731	G1'	5794
G2	5736	G2'	5799
G3	5741	G3'	5804
G4	5746	G4'	5809
G5	5751	G5'	55814
B1	5761	B1'	5824
B2	5766	B2'	5829
B3	5771	B3'	5834
B4	5776	B4'	5839
B5	5781	B5'	5844

Notes:

- 1. The drawing above shows the 5 MHz channels used by the F6-9558L-D/ 6933B-9558L-D radio. Gray channels are designated “G”. Blue channels are designated “B”. Transmit and receive channels have a 63 MHz separation.
- 2. RF filters are centered on channels G3, B3, G3’, and B3’.
- 3. The flexibility of the F6-9558L-D/6933B-9558L-D allows any radio to grow to 183 Mb/s without a hardware upgrade.

Figure 62 Frequency plan 9558HC: 5.725 to 5.850 GHz unlicensed band (FCC Part 15 and IC RSS-210)



Transmit Channel	Frequency (MHz)	Receive Channel	Frequency (MHz)
G1	5730.5	G1'	5794.5
G2	5735.5	G2'	5799.5
G3	5740.5	G3'	5804.5
G4	5745.5	G4'	5809.5
G5	5750.5	G5'	5814.5
B1	5760.5	B1'	5824.5
B2	5765.5	B2'	5829.5
B3	5770.5	B3'	5834.5
B4	5775.5	B4'	5839.5
B5	5780.5	B5'	5844.5

Notes:

1. The drawing above shows the 5 MHz channels used by the JF6-9558HC/ 6933B-9558HC radio. Gray channels are designated “G”. Blue channels are designated “B”. Transmit and receive channels have a 64 MHz separation.
2. RF filters are centered on channels G3, B3, G3', and B3'.
3. The flexibility of the JF6-9558HC/6933B-9558HC allows any radio to grow to 185 Mb/s without a hardware upgrade.

7.2.28 Radio configurations with MPR-e

The following radio configurations are available with MPR-e:

- 1+0 full outdoor with MPT ODU
- 1+0 repeater (with MPT-HC/XP/HQAM/XP-HQAM/9558HC only)