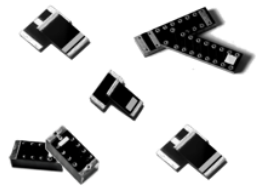


Product image for illustration Purposes only

General Guidelines for the installation of LPRS chip antennas

Table of Contents

1. Storage Conditions

1.1 Storage Temperature.
The chip antennas should be stored in an ambient temperature between -5˚C ~ 40˚C, with a relative humidity of 20% ~70%

1.2 Shelf Life.
The chip antennas should be used within 12 months of purchase.

1.3 Location.
Avoid storing the chip antennas in direct sunlight.

2. Suggestion for PCB layout.

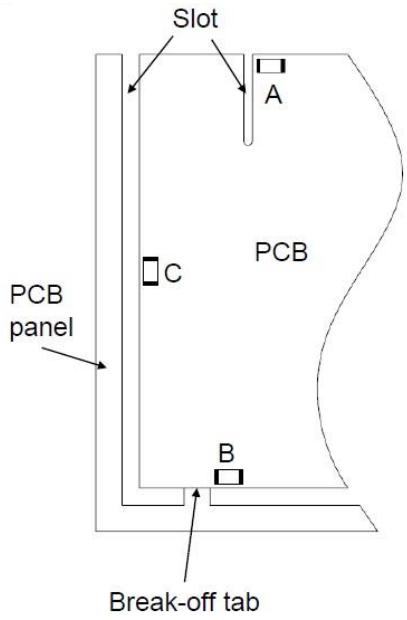


Figure 1 Suggested PCB layout

Depending on the installation location on the PCB, the chip antenna may experience various degrees of stress during the handling process. Therefore, the chip antenna should be placed at a location with the lowest mechanical stress.

Location A: In Figure 1 the chip antenna installed at position A where the PCB may be easily deformed can subject the PCB to high mechanical stress and solder joint cracking may occur.

Location B: When installed at location B near to the break-off tab, punching and cutting of the break-off tab may cause severe bending of the circuit board, cracking of solder joints and potential cracking of the chip antenna itself.

Location C: This location has the lowest mechanical stress and therefore is the best location to fit the antenna. Recommended.

2.1 Suggested Locating & Handling.

Pre-scoring (PCB V-Scoring) for de-panelling is frequently used in the PCB panel process. If possible, avoid placing the chip antenna right beside the pre-scoring line. However, if it is unavoidable then the longer side of the chip antenna should be parallel to the pre-scoring line.

During de-panelling of the PCB, the direction of bending should be toward the side of the PCB where the chip antenna is mounted. This will decrease the stress induced on the solder joints.

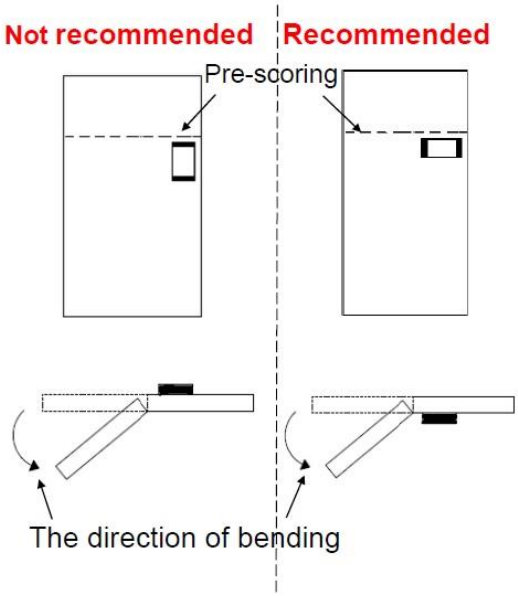


Figure 2 PCB location Advise

3. SMT Process

3.1 Soldering Profile

Please use the following temperature profile for soldering.

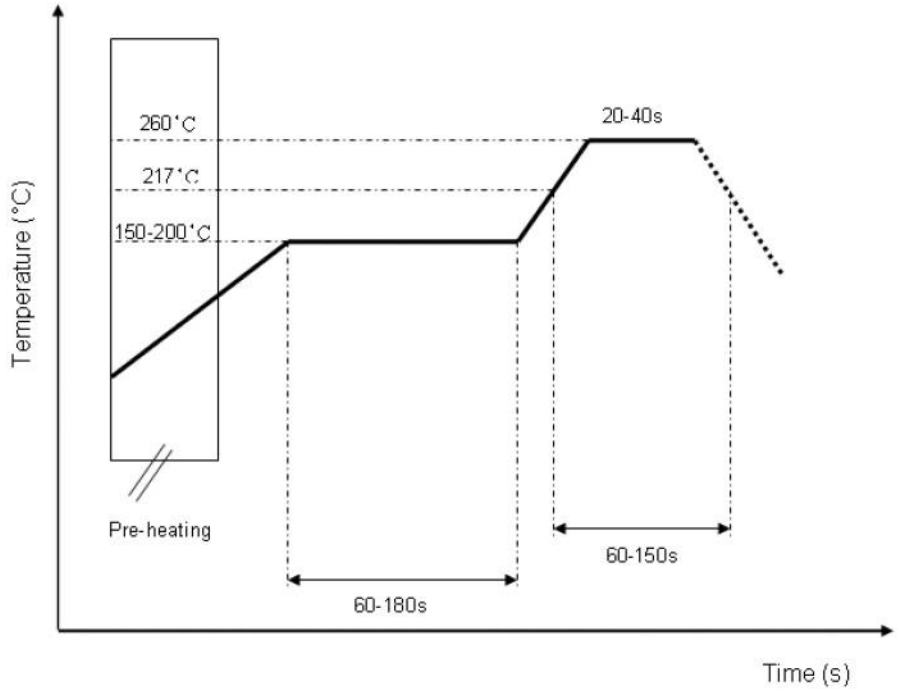


Figure 3 Solder Profile

3.2 Solder Paste

Proper amount of solder paste on soldering pads is the most important factor for the SMT process. In Figure 4, please refer to the "Upper limit of solder amount" for determining the ideal amount of solder paste.

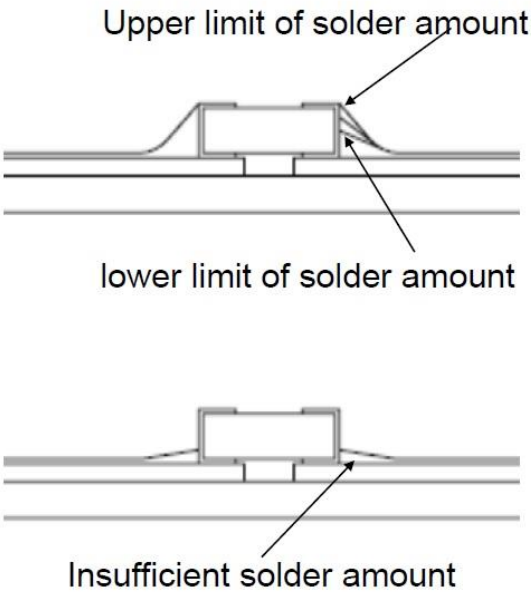


Figure 4 SMT solder paste

3.3 Repair and Re-work

Solder joint repair may be carried out with a soldering iron as shown below in figure 5. Please be aware that to avoid damage the soldering iron tip should not come in contact with the chip antenna.

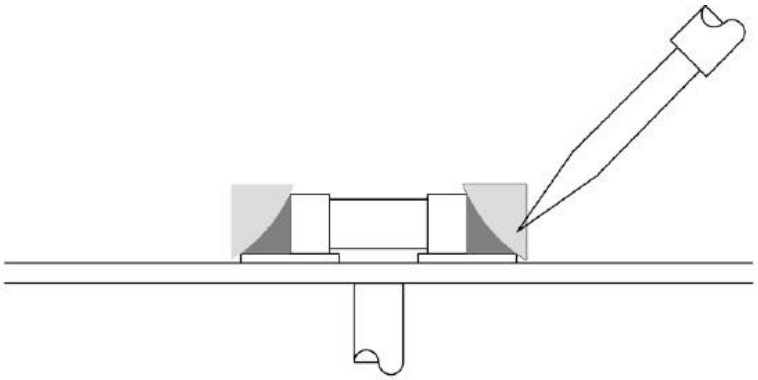


Figure 5 Solder Iron tip position

When soldering, avoid temperatures greater than 300˚C as this could cause cracking or leaching of the silver layer on the chip antenna.

3.4 Cleaning

When using the ultrasonic cleaning method please make sure the ultrasonic energy is not too high in order tp prevent damage to solder joints. Recommended specifications are listed below

Power: 20 W/L max.

Frequency: 40kHz max.

Cleaning time: 3 minutes max.

4. Handling and Assembly after chip antennas are mounted

After the antenna chip is mounted onto the PCB, bending or twisting of the circuit at the locations where chip antennas are mounted may cause cracking of solder joints or of the chip antenna itself.

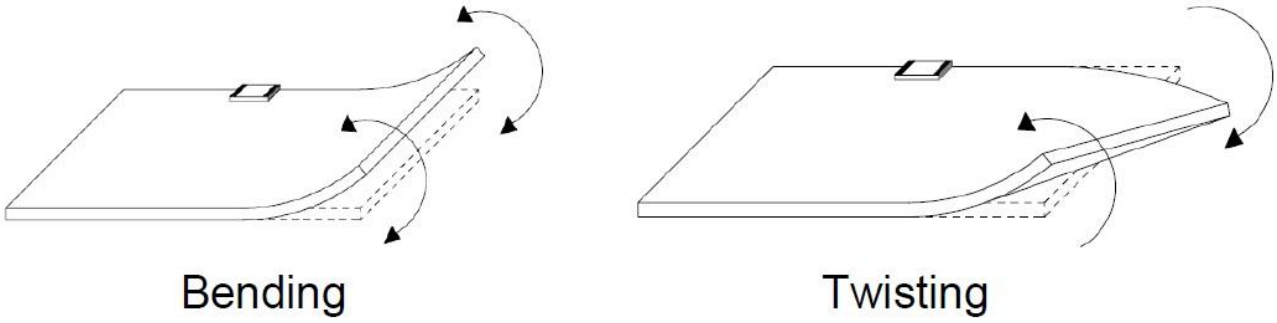
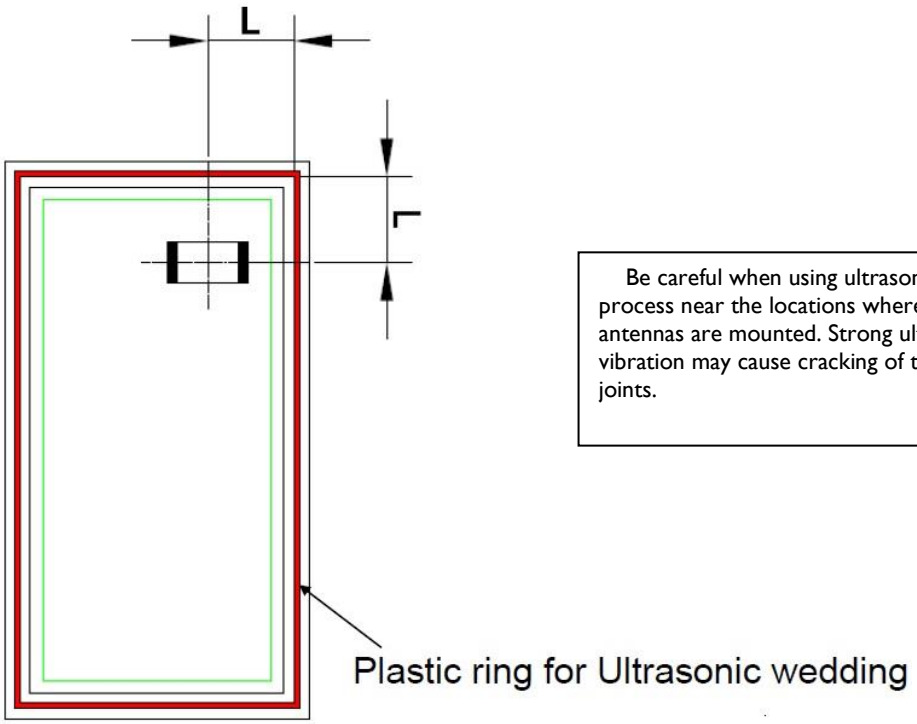


Figure 6 PCB bending & Twisting

5. Assembly and Housing



Be careful when using ultrasonic welding process near the locations where the chip antennas are mounted. Strong ultrasonic vibration may cause cracking of the chip solder joints.

6. Document History

Issue	Date	Revision
1.0	March 2020	Provisional Application Note

Changes to this Document	This data sheet has been updated to reflect changes throughout the range of LPRS modules. Specific changes are recorded in the documentation history above.
Copyright	See: www.lprs.co.uk
Disclaimer	See: www.lprs.co.uk
Terms and Conditions of Use	See: www.lprs.co.uk
Contact Information	For further information or technical assistance please contact:

Low Power Radio Solutions Ltd.
Two Rivers Industrial Estate
Station Lane, Witney
Oxon, OX28 4BH
England

Tel: +44 (0)1993 709418
Fax: +44 (0)1993 708575
Web: http://www.lprs.co.uk
Email: info@lprs.co.uk
Technical: technical@lprs.co.uk