

# Inspection of Solder Joints for Quad Flat No-Lead (QFN) and Dual Flat No-Lead (DFN) Leadless Packages

## 1.0 Land Pad Design for QFN and DFN

The industry standard IPC-SM-782 specification is used as the reference for determining PCB land patterns. Since the QFN and DFN are new package styles, it is recommended that this user guide should be used in conjunction with the reference J-STD-002C which includes the proposed (in ballot) soldering criteria for the QFN/DFN.


## 2.0 Inspection

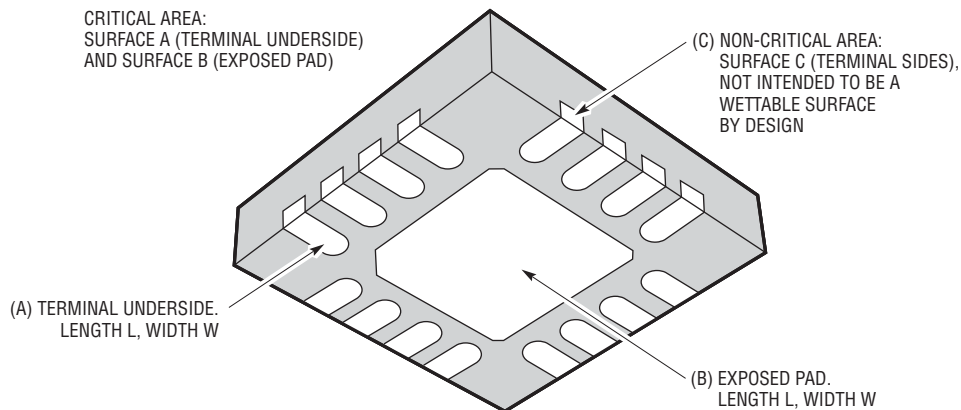
Inspection of QFN and DFN style packages soldered on a PCB is typically done with X-ray equipment for assembly process monitor. X-ray can detect solder bridging, shorts, opens, voids and solder joint fillet under the leads and exposed pads which are determined as the critical area of termination. The non-critical areas of termination are on the sides of the lead and outside of the package which by design do not have a preplated surface for solder to wet

and build up on the sides. As such, the inspection of the non-critical areas of termination will not typically show the formation of solder fillets or a build up of solder on the sides of the leads.

## 3.0 Soldering Criteria

All terminations shall exhibit a continuous solder coating free from defects for a minimum of 95% of the critical area of any individual termination. For the exposed pad packages, the exposed pad surfaces shall exhibit continuous solder coating free from defects for a minimum 80% of the critical area of those surfaces. Exposed terminal metal is allowable on surface mount components at the toe end and on the vertical surfaces that are either unplated or sawed during the package manufacturing.

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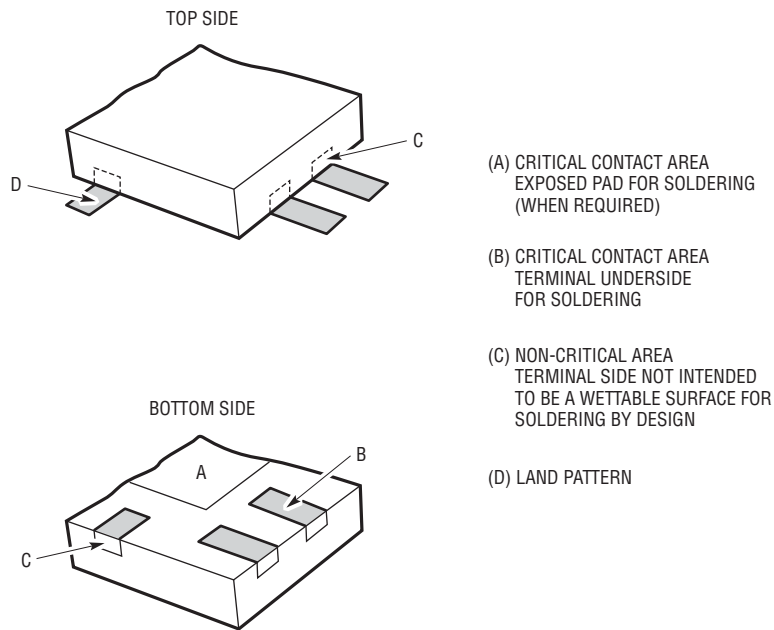


**Figure 1. Quad Flat No-Lead (QFN)/Dual Flat No-Lead (DFN)  
– Critical and Non-Critical Areas of Termination**

# QFN/DFN

## Inspection of Solder Joints

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**Figure 2. Quad Flat No-Lead (QFN)/Dual Flat No-Lead (DFN)  
– Inspection Critical and Non-Critical Areas**

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