Technical Note

BRT_TN_004

Bridgetek Example IC PCB Footprints

Version 1.1

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This Technical Note shows examples of Bridgetek IC PCB footprints which can be used as a guide for creating your own IC PCB footprints.

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1 Introduction

This Technical Note shows examples of Bridgetek IC PCB footprints which can be used as a guide for creating your own PCB footprints.

The IC footprints in this document are sourced from various Bridgetek hardware such as development modules and demo hardware, using the most common and cost effective package types.

Most Bridgetek IC footprints are included in this document; however some are missing when a package type has not been used for specific Bridgetek hardware. See **Error! Reference source not found.** for unavailable footprints.

The IC footprints in this document provide:

- A 1:1 scaled IC footprint
- An annotated IC footprint showing some key measurements

All dimensions shown are in millimetres (mm).

Additionally, a range of IC solutions from Bridgetek are available through AltiumLive.

To view Altium files, you need either the full version of 'Altium Designer', or 'Altium Viewer' which can be downloaded for free from Altium's web site.

Note that all IC footprints may not be available through AltiumLive. Please contact Bridgetek in this case.

1.1 Scope

These IC PCB footprints can be used as a guide to create your own IC PCB footprints with particular PCB design tools other than Altium.

Please refer to the IC datasheet for full IC package parameters.

Note 1: These footprints are provided as an example only and are not optimised for all soldering processes. Customers must modify the footprint as required to optimise it to match their soldering process.

Note 2: No guarantees can be provided in this document. These can be used as a guide only.

Note 3: Bridgetek modules are recommended for product test and development prior to custom hardware development.

2 All Scaled Footprints

This section shows all packages scaled to 1:1 size to show the exact package size which can help when selecting a package to use in your design.

Note that not all packages are available for all products. See Section 3 in this document, the product datasheet, or check the IC webpage.

2.1 QFP Packages

Figure 2.1 shown in pin count order from left to right:

LQFP-80, LQFP-100.

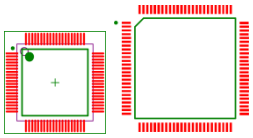

Figure 2.1 QFP Packages

2.2 QFN Packages

Figure 2.2 shown in pin count order from left to right:

VQFN-48 (7x7), QFN-48 (7x7), VQFN-56 (8x8), QFN-56 (8x8), VQFN-64 EP1 (9x9), VQFN-64 EP2 (9x9), QFN-68, QFN-76, QFN-100.

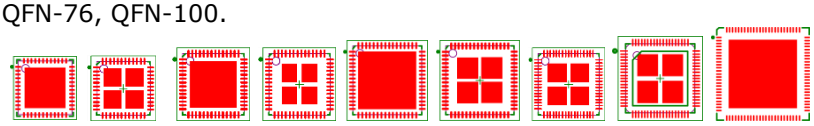

Figure 2.2 QFN Packages

2.2.1 QFN Exposed Pads

Please note that there are different footprints with respect to the exposed pads on the QFN packages.

With "centralized" exposed pads, the solder is centralizing due to surface tension and may weaken the heat dissipation along the corners. This works when the thermal pad is reasonably bigger. See Figure 2.3.

Figure 2.3 Centralized Exposed Pad

With "braced" exposed pads, they have the benefit of preventing solder bridging. There are 4 points to centralize the solder, which makes better bonding and heat dissipation. This also uses less solders paste and less heat up rate required. See Figure 2.4.

Figure 2.4 Braced Exposed Pad

The final QFN soldering quality is largely affected by how the PCB assembly house control their process.

3 Packages by Product

Package availability for Bridgetek products is shown in this section.

3.1 QFP Packages

Package	Part Numbers
LQFP-80	FT905L, FT906L, FT907L, FT908L
LQFP-100	FT900L, FT901L, FT902L, FT903L

Table 3.1 QFP Packages

3.2 QFN Packages

Package	Part Numbers
VQFN-48 (7x7)	FT800Q, FT801Q, FT810Q, FT811Q
QFN-48 (7x7)	FT932Q, FT933Q
VQFN-56 (8x8)	FT812Q, FT813Q
QFN-56 (8x8)	FT931Q
VQFN-64 EP1 (9x9)	BT815Q, BT816Q
VQFN-64 EP2 (9x9)	BT817Q, BT818Q
QFN-68	FT930Q
QFN-76	FT905Q, FT906Q, FT907Q, FT908Q
QFN-100	FT900Q, FT901Q, FT902Q, FT903Q

Table 3.2 QFN Packages

Note: BT815Q/BT816Q and BT817Q/BT818Q have a slightly different package and have been named EP1 and EP2 (Exposed Pad).

4 48-pin VQFN (7mm x 7mm)

The 48-pin VQFN/WQFN (7mm x 7mm) is used on the following products:

- FT800Q
- FT801Q
- FT810Q
- FT811Q

This package is nominally 7.00mm x 7.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

4.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 4.1 48-pin VQFN (7mm x 7mm) Scaled Footprint

4.2 Annotated Footprint

The annotated footprint shows key measurements.

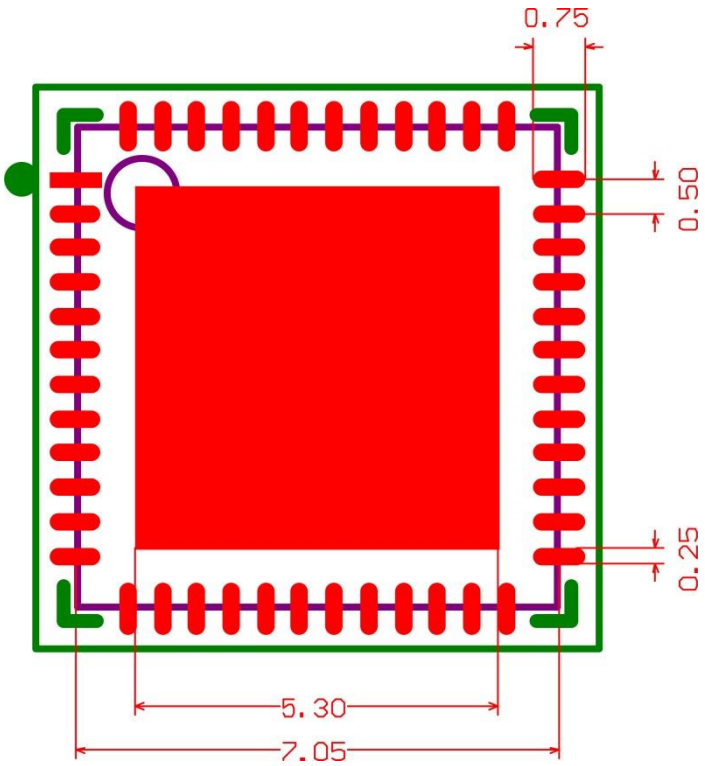

Figure 4.2 48-pin VQFN (7mm x 7mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area.

5 48-pin QFN (7mm x 7mm)

The 48-pin QFN (7mm x 7mm) is used on the following products:

- FT932Q
- FT933Q

This package is nominally 7.00mm x 7.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

5.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 5.1 48-pin QFN (7mm x 7mm) Scaled Footprint

5.2 Annotated Footprint

The annotated footprint shows key measurements.

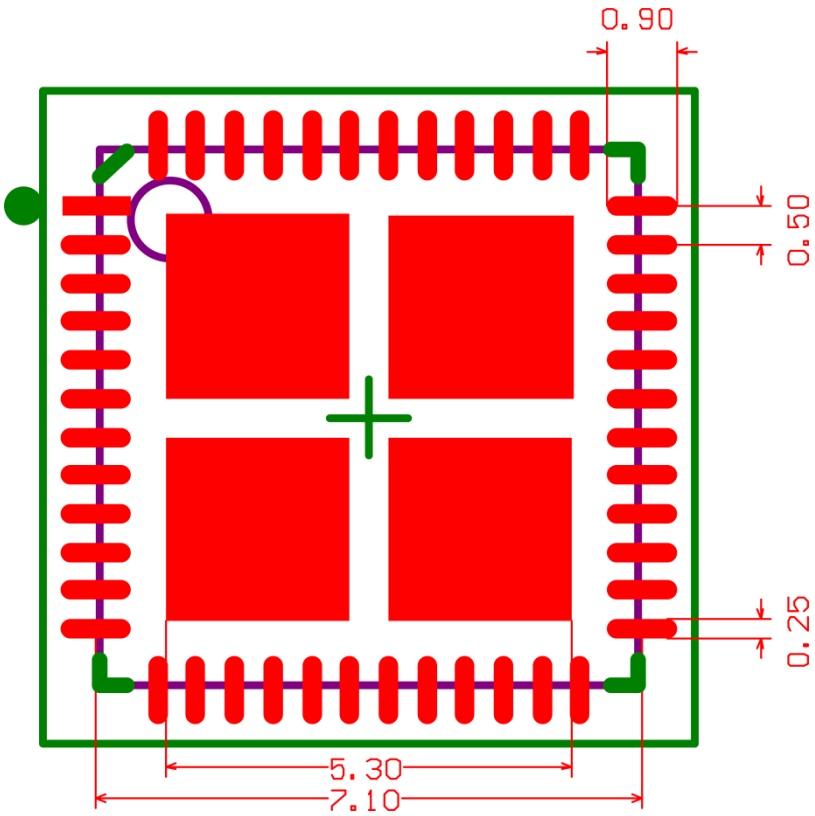

Figure 5.2 48-pin QFN (7mm x 7mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area.

6 56-pin VQFN (8mm x 8mm)

The 56-pin VQFN (8mm x 8mm) is used on the following products:

- FT812Q
- FT813Q

This package is nominally 8.00mm x 8.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

6.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 6.1 56-pin VQFN (8mm x 8mm) Scaled Footprint

Annotated Footprint

The annotated footprint shows key measurements.

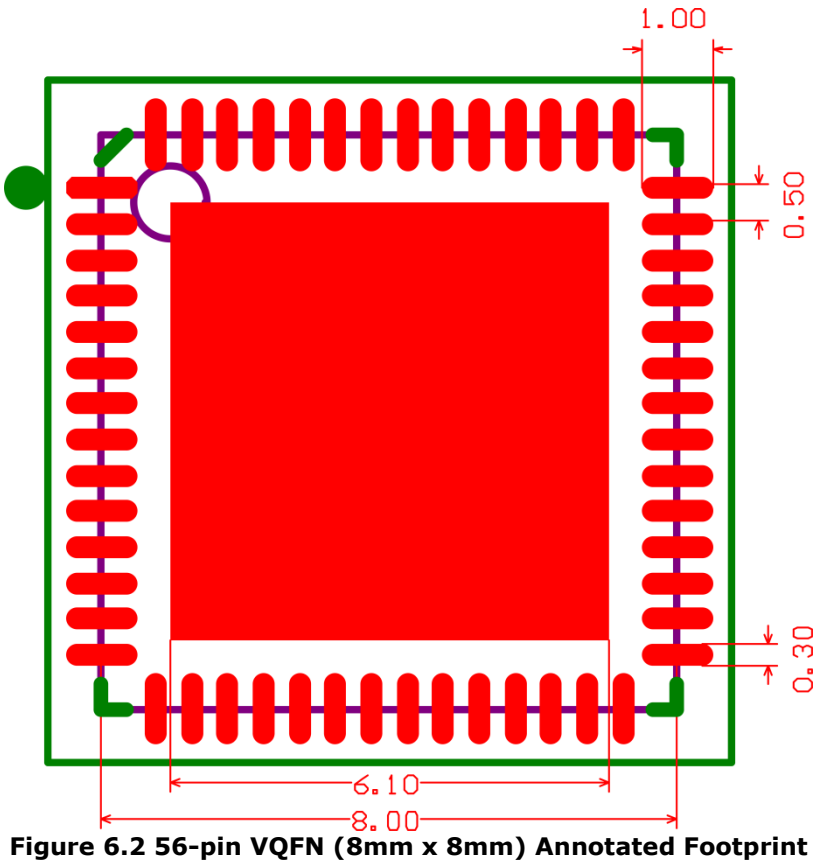

Figure 6.2 56-pin VQFN (8mm x 8mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area.

7 56-pin QFN (8mm x 8mm)

The 56-pin QFN (8mm x 8mm) is used on the following products:

- FT931Q

This package is nominally 8.00mm x 8.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

7.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 7.1 56-pin QFN (8mm x 8mm) Scaled Footprint

7.2 Annotated Footprint

The annotated footprint shows key measurements.

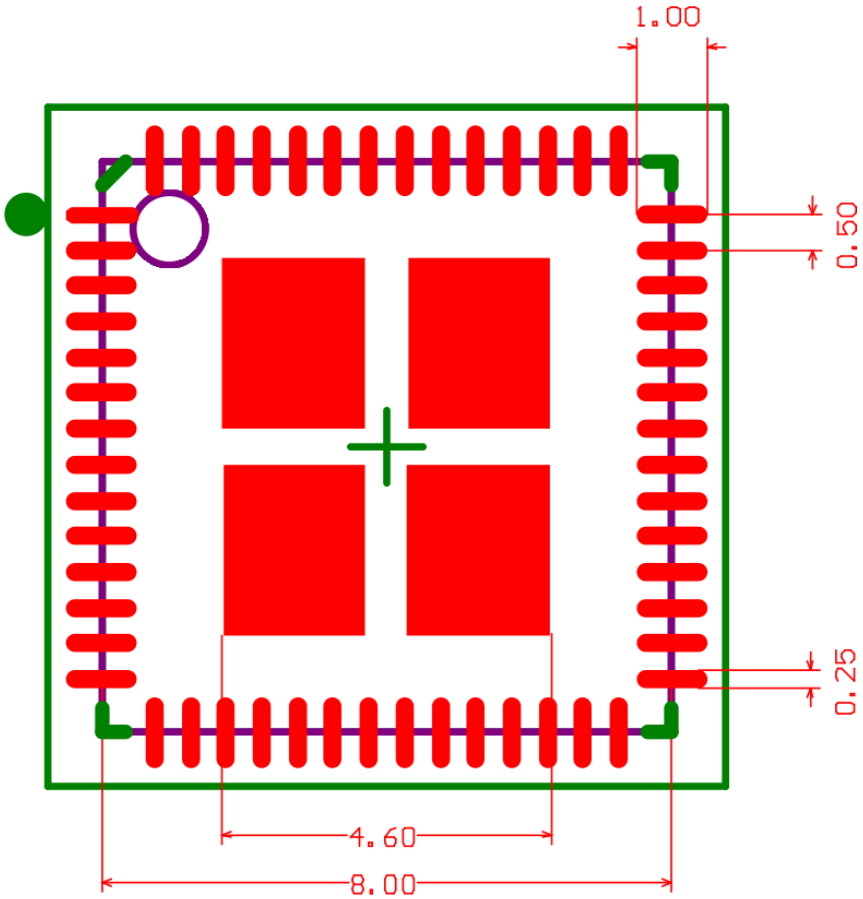

Figure 7.2 56-pin QFN (8mm x 8mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area.

8 64-pin VQFN EP1 (9mm x 9mm)

The 64-pin VQFN EP1 (9mm x 9mm) is used on the following products:

- BT815Q
- BT816Q

This package is nominally 9.00mm x 9.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

8.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 8.1 64-pin VQFN EP1 (9mm x 9mm) Scaled Footprint

8.2 Annotated Footprint

The annotated footprint shows key measurements.

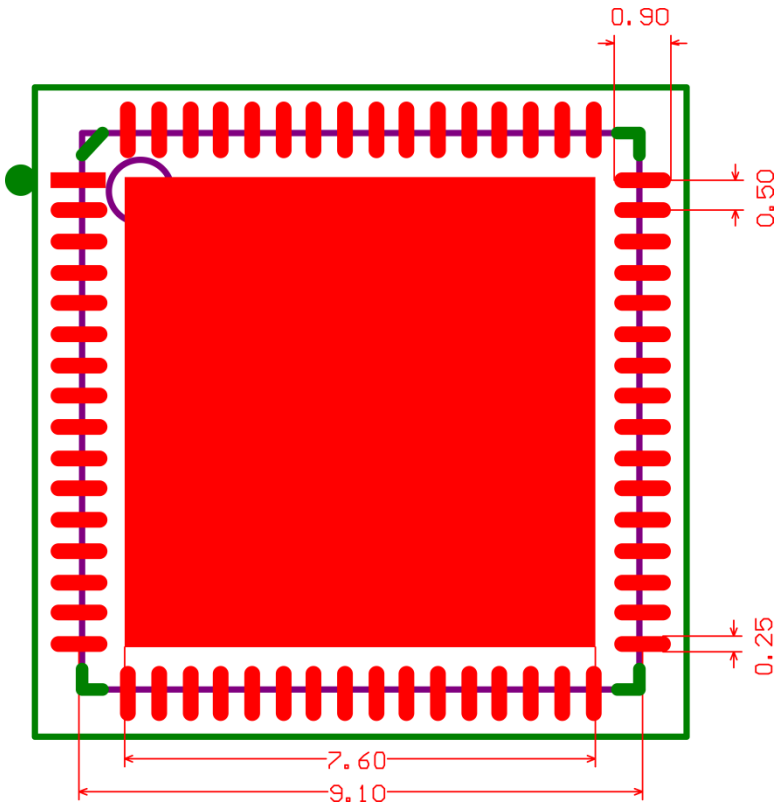

Figure 8.2 64-pin VQFN EP1 (9mm x 9mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area

9 64-pin VQFN EP2 (9mm x 9mm)

The 64-pin VQFN EP2 (9mm x 9mm) is used on the following products:

- BT817Q
- BT818Q

This package is nominally 9.00mm x 9.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

9.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 9.1 64-pin VQFN EP2 (9mm x 9mm) Scaled Footprint

9.2 Annotated Footprint

The annotated footprint shows key measurements.

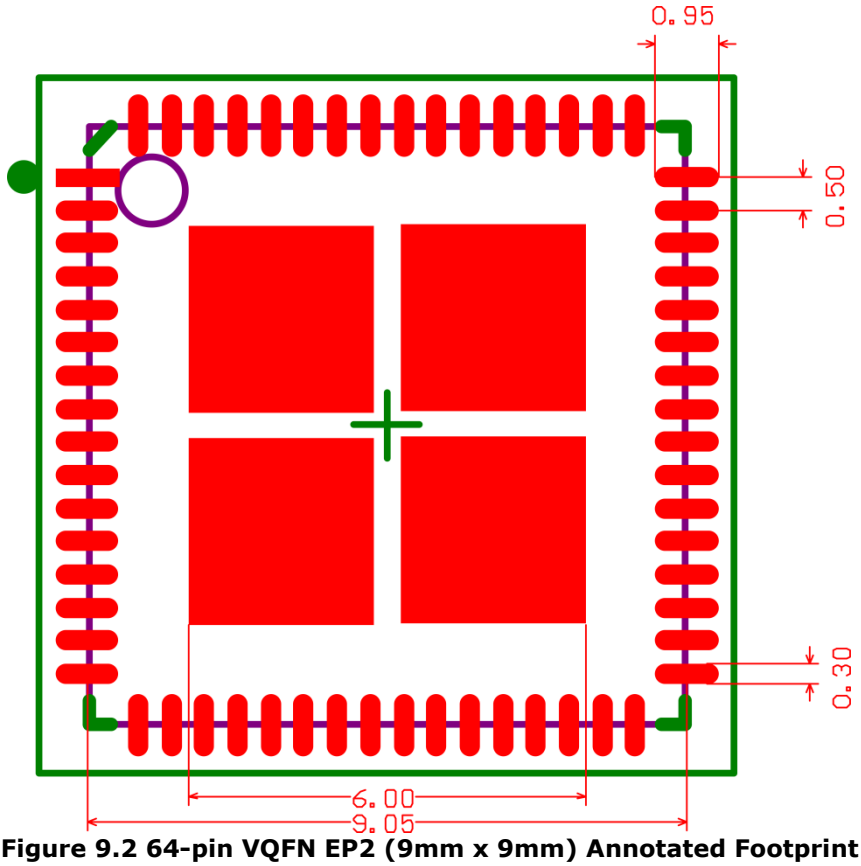

Figure 9.2 64-pin VQFN EP2 (9mm x 9mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area

10 68-pin QFN (8mm x 8mm)

The 68-pin QFN (8mm x 8mm) is used on the following products:

- FT930Q

This package is nominally 8.00mm x 8.00mm. The solder pads are on a 0.40mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

10.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 10.1 68-pin QFN (8mm x 8mm) Scaled Footprint

10.2 Annotated Footprint

The annotated footprint shows key measurements.

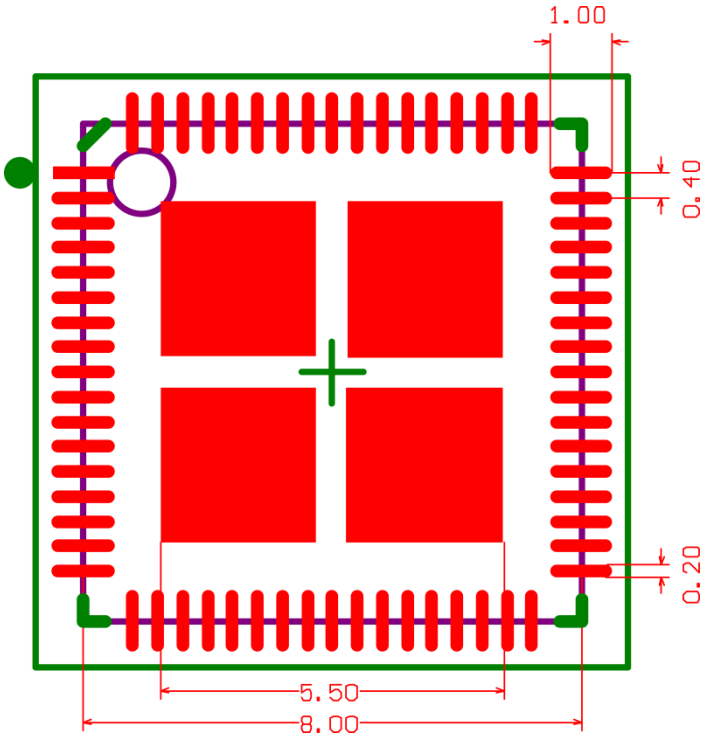

Figure 10.2 68-pin QFN (8mm x 8mm) Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area

11 76-pin QFN

The 76-pin QFN is used on the following products:

- FT905Q
- FT906Q
- FT907Q
- FT908Q

This package is nominally 9.00mm x 9.00mm. The solder pads are on a 0.40mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

11.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

Figure 11.1 76-pin QFN Scaled Footprint

11.2 Annotated Footprint

The annotated footprint shows key measurements.

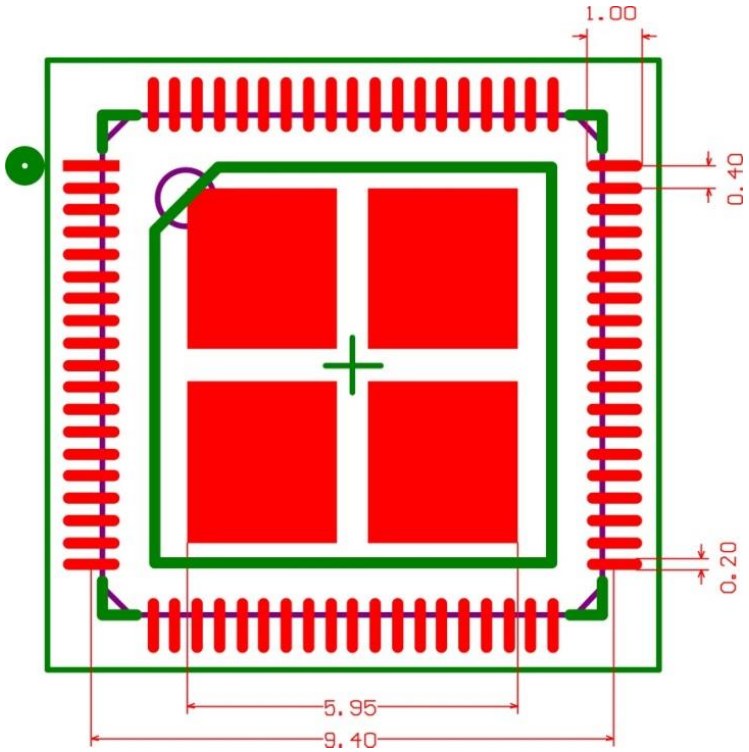

Figure 11.2 76-pin QFN Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area.

1280-pin LQFP

The 80-pin LQFP is used on the following products:

- FT905L
- FT906L
- FT907L
- FT908L

This package is nominally 12.00mm x 12.00mm. The solder pads are on a 0.40mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

12.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

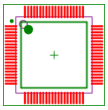

Figure 12.1 80-pin LQFP Scaled Footprint

12.2 Annotated Footprint

The annotated footprint shows key measurements.

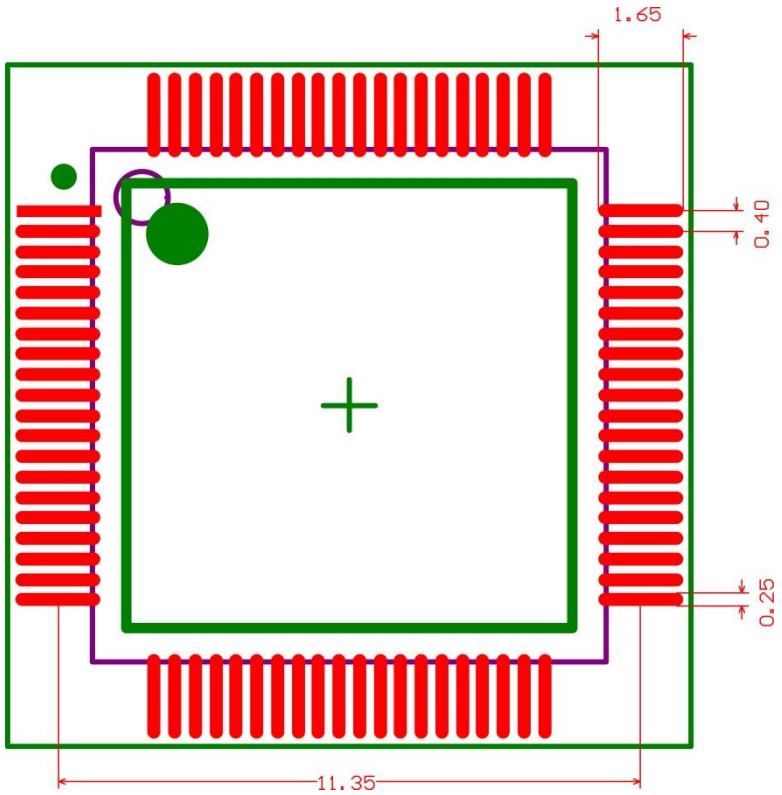

Figure 12.2 80-pin LQFP Annotated Footprint

Note: Red = top layer copper, other colors are mechanical layers.

13 100-pin LQFP

The 100-pin LQFP is used on the following products:

- FT900L
- FT901L
- FT902L
- FT903L

This package is nominally 16.00mm x 16.00mm. The solder pads are on a 0.50mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

13.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

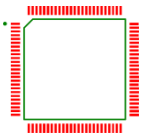

Figure 13.1 100-pin LQFP Scaled Footprint

13.2 Annotated Footprint

The annotated footprint shows key measurements.

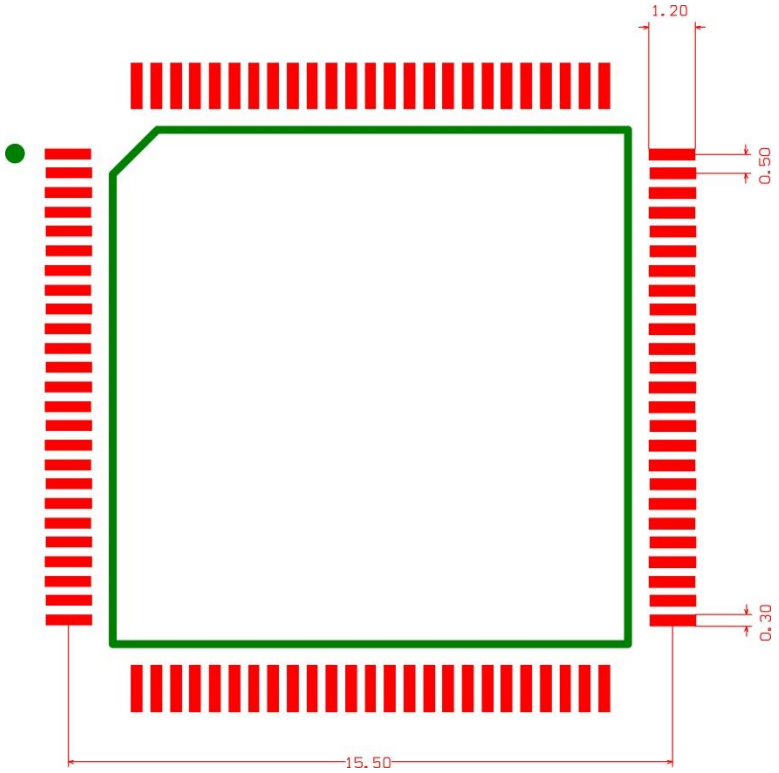

Figure 13.2 100-pin LQFP Annotated Footprint

Note: Red = top layer copper, other colors are mechanical layers.

14 100-pin QFN

The 100-pin QFN is used on the following products:

- FT900Q
- FT901Q
- FT902Q
- FT903Q

This package is nominally 12.00mm x 12.00mm. The solder pads are on a 0.40mm pitch. Please see the IC Package Parameters in the IC datasheet for full information.

14.1 Scaled Footprint

This 1:1 scaled footprint is the exact size when viewed or printed at 100%.

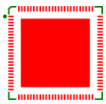

Figure 14.1 100-pin QFN Scaled Footprint

14.2 Annotated Footprint

The annotated footprint shows key measurements.

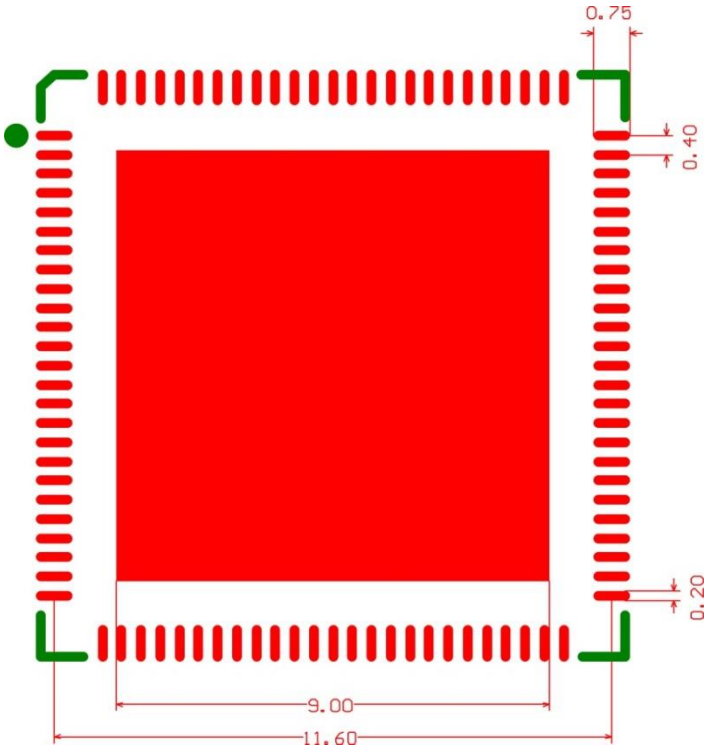

Figure 14.2 100-pin QFN Annotated Footprint

Note 1: Red = top layer copper, other colors are mechanical layers.

Note 2: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area.

15 Contact Information

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Web Site

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Distributor and Sales Representatives

Please visit the Sales Network page of the Bridgetek Web site for the contact details of our distributor(s) and sales representative(s) in your country.

Appendix A– References

Document References

FT80x http://brtchip.com/i-ft80x/

FT81x http://brtchip.com/ft81x/

BT81x http://brtchip.com/bt81x/

FT90x http://brtchip.com/ft900/

FT93x http://brtchip.com/ft93x/

Altium

Acronyms and Abbreviations

Terms	Description
IC	Integrated Circuit
LQFP	Low Profile Quad Flat Package
PCB	Printed Circuit Board
QFN	Quad Flat No-Leads Package
VQFN / WQFN	Very Thin Quad Flat No-Lead Package

Appendix B – List of Tables & Figures

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Appendix C– Revision History

Document Title: Bridgetek Example IC PCB Footprints
Document Reference No.: BRT_000259
Clearance No.: BRT#138
Product Page: http://brtchip.com/
Document Feedback: Send Feedback

Revision	Changes	Date
1.0	Initial Release	14-06-2019
1.1	Added BT817/BT818 and FT931Q PCB footprints. Added section 2.2.1 QFN Exposed Pads.	12-10-2021