Technical Note

TN_166

FTDI Example IC PCB Footprints

Version 1.0

Issue Date: 2016-04-27

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

Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold FTDI harmless from any and all damages, claims, suits or expense resulting from such use.

Future Technology Devices International Limited (FTDI)
Unit 1, 2 Seaward Place, Glasgow G41 1HH, United Kingdom
Tel.: +44 (0) 141 429 2777 Fax: + 44 (0) 141 429 2758
Web Site: http://ftdichip.com
Copyright © Future Technology Devices International Limited

Table of Contents

1 Introduction 6
1.1 Scope 6
1.1.1 Unavailable Footprints 6
2 All Scaled Footprints 7
2.1 DFN Packages 7
2.2 QFP Packages 7
2.3 QFN Packages 7
2.4 SSOP Packages 7
3 Packages by Product 8
3.1 DFN Packages 8
3.2 QFP Packages 8
3.3 QFN Packages 8
3.4 SSOP Packages 9
4 10-pin DFN 10
4.1 Scaled Footprint 10
4.2 Annotated Footprint 10
5 12-pin DFN 11
5.1 Scaled Footprint 11
5.2 Annotated Footprint 11
6 16-pin QFN (3mm x 3mm) 12
6.1 Scaled Footprint 12
6.2 Annotated Footprint 12
7 16-pin QFN (4mm x 4mm) 13
7.1 Scaled Footprint 13
7.2 Annotated Footprint 13
8 16-pin SSOP- 14
8.1 Scaled Footprint 14

Copyright © Future Technology Devices International Limited

8.2 Annotated Footprint 14
9 16-pin TSSOP 15
9.1 Scaled Footprint 15
9.2 Annotated Footprint 15
10 20-pin QFN 16
10.1 Scaled Footprint 16
10.2 Annotated Footprint 16
11 20-pin SSOP 17
11.1 Scaled Footprint 17
11.2 Annotated Footprint 17
12 24-pin QFN 18
12.1 Scaled Footprint 18
12.2 Annotated Footprint 18
13 24-pin SSOP 19
13.1 Scaled Footprint 19
13.2 Annotated Footprint 19
14 28-pin QFN 20
14.1 Scaled Footprint 20
14.2 Annotated Footprint 20
15 28-pin SSOP 21
15.1 Scaled Footprint 21
15.2 Annotated Footprint 21
16 28-pin TSSOP 22
16.1 Scaled Footprint 22
16.2 Annotated Footprint 22
17 28-pin WQFN 23
17.1 Scaled Footprint 23
17.2 Annotated Footprint 23

Copyright © Future Technology Devices International Limited

18 32-pin LQFP 24
18.1 Scaled Footprint 24
18.2 Annotated Footprint 24
19 32-pin VQFN/QFN (5mm x 5mm) 25
19.1 Scaled Footprint 25
19.2 Annotated Footprint 25
20 32-pin QFN (7mm x 7mm) 26
20.1 Scaled Footprint 26
20.2 Annotated Footprint 26
21 48-pin LQFP 27
21.1 Scaled Footprint 27
21.2 Annotated Footprint 27
22 48-pin VQFN/WQFN (7mm x 7mm) 28
22.1 Scaled Footprint 28
22.2 Annotated Footprint 28
23 48-pin QFN (8mm x 8mm) 29
23.1 Scaled Footprint 29
23.2 Annotated Footprint 29
24 56-pin QFN (7mm x 7mm) 30
24.1 Scaled Footprint 30
24.2 Annotated Footprint 30
25 56-pin VQFN (8mm x 8mm) 31
25.1 Scaled Footprint 31
25.2 Annotated Footprint 31
26 64-pin LQFP 32
26.1 Scaled Footprint 32
26.2 Annotated Footprint 32
27 64-pin TQFP 33

Copyright © Future Technology Devices International Limited

27.1 Scaled Footprint 33
27.2 Annotated Footprint 33
28 64-pin QFN (8mm x 8mm) 34
28.1 Scaled Footprint 34
28.2 Annotated Footprint 34
29 64-pin QFN (9mm x 9mm) 35
29.1 Scaled Footprint 35
29.2 Annotated Footprint 35
29.2.1 Additional Information 36
30 76-pin QFN 37
30.1 Scaled Footprint 37
30.2 Annotated Footprint 37
31 80-pin LQFP 38
31.1 Scaled Footprint 38
31.2 Annotated Footprint 38
32 100-pin LQFP 39
32.1 Scaled Footprint 39
32.2 Annotated Footprint 39
33 100-pin QFN 40
33.1 Scaled Footprint 40
33.2 Annotated Footprint 40
34 Contact Information 41
Appendix A – References 42
Document References 42
Acronyms and Abbreviations 42
Appendix B – List of Tables & Figures 43
List of Tables 43
List of Figures 43

Copyright © Future Technology Devices International Limited

Appendix C – Revision History..... 45

Copyright © Future Technology Devices International Limited

1 Introduction

This Technical Note shows examples of FTDI 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 FTDI hardware such as development and application modules and demo hardware, using the most common and cost effective package types.

Most FTDI IC footprints are included in this document; however some are missing when a package type has not been used for specific FTDI hardware. See Table 1.1 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 millimeters (mm).

Additionally, a range of USB Interface IC solutions from FTDI Chip 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.

http://www.ftdichip.com/Support/Documents/PCBData.htm

Note that all IC footprints may not be available through AltiumLive. It is a live dBase continually being updated.

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

Note: FTDI Cables and Modules are recommended for product test and development prior to custom hardware development.

1.1.1 Unavailable Footprints

Table 1.1 shows that there are some footprints not included in this document as, for example, they have never been used for specific hardware developments within FTDI. Other package options for those products exist and are included in this document.

Note: This is correct at the time of writing and newer products may not be included.

Package	Part Numbers
32-pin WQFN	FT51BQ
44-pin LQFP	FT51AL

Table 1.1 Unavailable Footprints

Copyright © Future Technology Devices International Limited

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 'Packages by Product' in this document, the product datasheet, or check the IC webpage:

http://www.ftdichip.com/Products/ICs.htm

2.1 DFN Packages

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

DFN-10, DFN-12.

Figure 2.1 DFN Packages

2.2 QFP Packages

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

LQFP-32, LQFP-48, LQFP-64, TQFP-64, LQFP-80, LQFP-100.

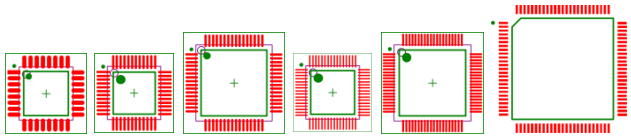

Figure 2.2 QFP Packages

2.3 QFN Packages

Figure 2.3 shown in pin count order from left to right:

QFN-16 (3x3), QFN-16 (4x4), QFN-20, QFN-24, QFN-28, WQFN-28, QFN-32 (5x5), QFN-32 (7x7), QFN-48 (7x7), QFN-48 (8x8), QFN-56 (7x7), VQFN-56 (8x8), QFN-64 (8x8), QFN-64 (9x9), QFN-76, QFN-100.

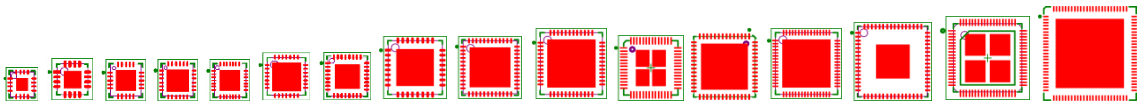

Figure 2.3 QFN Packages

2.4 SSOP Packages

Figure 2.4 shown in pin count order from left to right:

SSOP-16, TSSOP-16, SSOP-20, SSOP-24, SSOP-28, TSSOP-28.

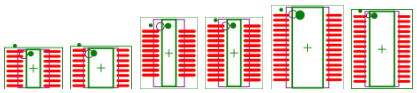

Figure 2.4 SSOP Packages

Copyright © Future Technology Devices International Limited

3 Packages by Product

Package availability for FTDI products is shown in this section.

3.1 DFN Packages

Package	Part Numbers
DFN-10	FT200XD
DFN-12	FT234XD

Table 3.1 DFN Packages

3.2 QFP Packages

Package	Part Numbers
LQFP-32	FT232BL, FT245BL, FT311D-32L1C, FT312D-32L1C, VNC2-32L1B
LQFP-48	FT232HL, FT2232D, VNC1L-1A, VNC2--48L1B
LQFP-64	FT2232HL, FT4232HL, FT313HL, VNC2-64L1B
TQFP-64	FT313HP
LQFP-80	FT905L, FT906L, FT907L, FT908L
LQFP-100	FT900L, FT901L, FT902L, FT903L

Table 3.2 QFP Packages

3.3 QFN Packages

Package	Part Numbers
QFN-16 (3x3)	FT121Q
QFN-16 (4x4)	FT201XQ, FT220XQ, FT230XQ
QFN-20	FT221XQ, FT231XQ
QFN-24	FT240XQ
QFN-28	FT120Q, FT122Q
WQFN-28	FT260Q
QFN-32 (5x5)	FT232RQ, FT245RQ, FT4222HQ
QFN-32 (7x7)	FT311D-32Q1C, FT312D-32Q1C, VNC2-32Q1B
QFN-48 (7x7)	FT51AQ, FT800Q, FT801Q, FT810Q, FT811Q
QFN-48 (8x8)	FT232HQ, VNC2-48Q1B
QFN-56 (7x7)	FT600Q
VQFN-56 (8x8)	FT2232H-56Q, FT4232H-56Q, FT812Q, FT813Q

Copyright © Future Technology Devices International Limited

Package	Part Numbers
QFN-64 (8x8)	VNC2-64Q1B
QFN-64 (9x9)	FT2232HQ, FT4232HQ, FT313HQ
QFN-76	FT601Q, FT905Q, FT906Q, FT907Q, FT908Q
QFN-100	FT900Q, FT901Q, FT902Q, FT903Q

Table 3.3 QFN Packages

3.4 SSOP Packages

Package	Part Numbers
SSOP-16	FT201XS, FT220XS, FT230XS
TSSOP-16	FT121T
SSOP-20	FT221XS, FT231XS
SSOP-24	FT240XS
SSOP-28	FT232RL, FT245RL, FT51CS
TSSOP-28	FT120T, FT122T, FT260S

Table 3.4 SSOP Packages

Copyright © Future Technology Devices International Limited

4 10-pin DFN

The 10-pin DFN is used on the following product:

- FT200XD

This package is nominally 3.00mm x 3.00mm. 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 10-pin DFN Scaled Footprint

4.2 Annotated Footprint

The annotated footprint shows key measurements.

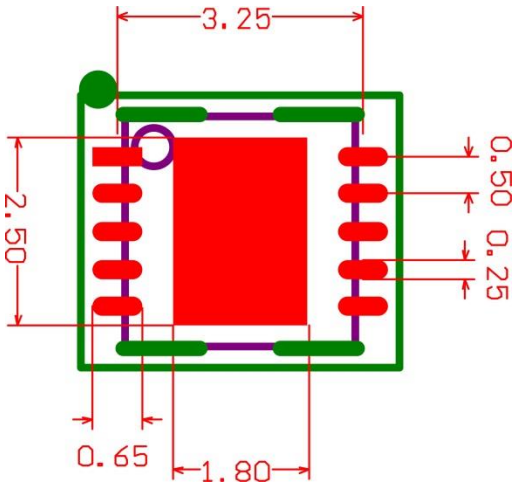

Figure 4.2 10-pin DFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

5 12-pin DFN

The 12-pin DFN is used on the following product:

- FT234XD

This package is nominally 3.00mm x 3.00mm. The solder pads are on a 0.45mm 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 12-pin DFN Scaled Footprint

5.2 Annotated Footprint

The annotated footprint shows key measurements.

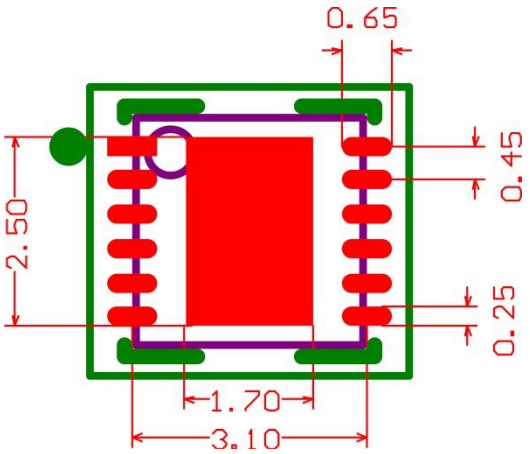

Figure 5.2 12-pin DFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

6 16-pin QFN (3mm x 3mm)

The 16-pin QFN (3mm x 3mm) is used on the following product:

- FT121Q

This package is nominally 3.00mm x 3.00mm. 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 16-pin QFN (3mm x 3mm) Scaled Footprint

6.2 Annotated Footprint

The annotated footprint shows key measurements.

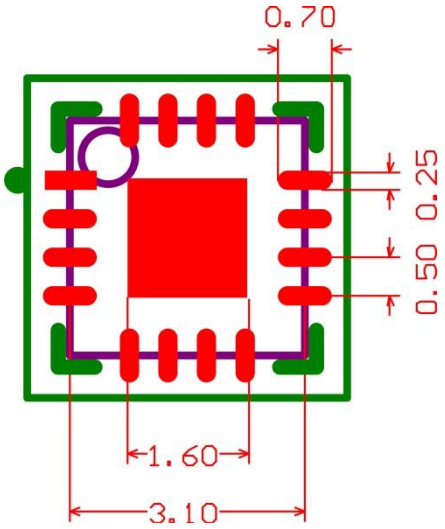

Figure 6.2 16-pin QFN (3mm x 3mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

7 16-pin QFN (4mm x 4mm)

The 16-pin QFN (4mm x 4mm) is used on the following products:

- FT201XQ
- FT220XQ
- FT230XQ

This package is nominally 4.00mm x 4.00mm. The solder pads are on a 0.65mm 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 16-pin QFN (4mm x 4mm) Scaled Footprint

7.2 Annotated Footprint

The annotated footprint shows key measurements.

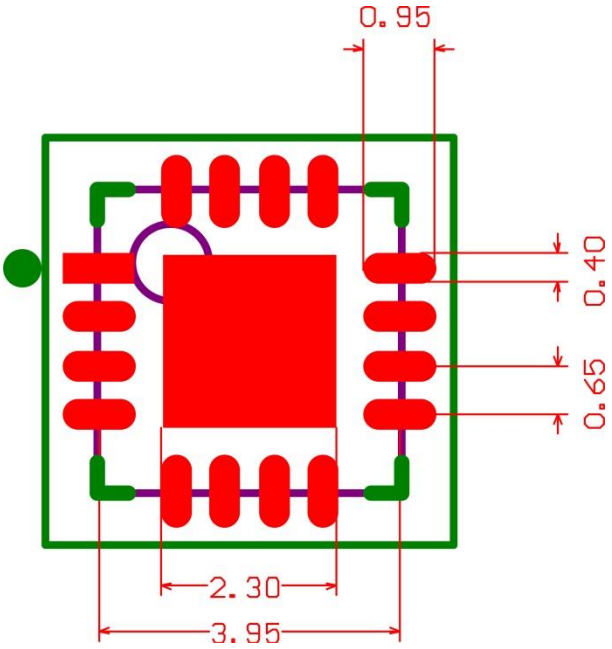

Figure 7.2 16-pin QFN (4mm x 4mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

8 16-pin SSOP-

The 16-pin SSOP is used on the following products:

- FT201XS
- FT220XS
- FT230XS

This package is nominally 4.90mm x 3.91mm body (4.90mm x 5.99mm including pins). The solder pads are on a 0.635mm 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 16-pin SSOP Scaled Footprint

8.2 Annotated Footprint

The annotated footprint shows key measurements.

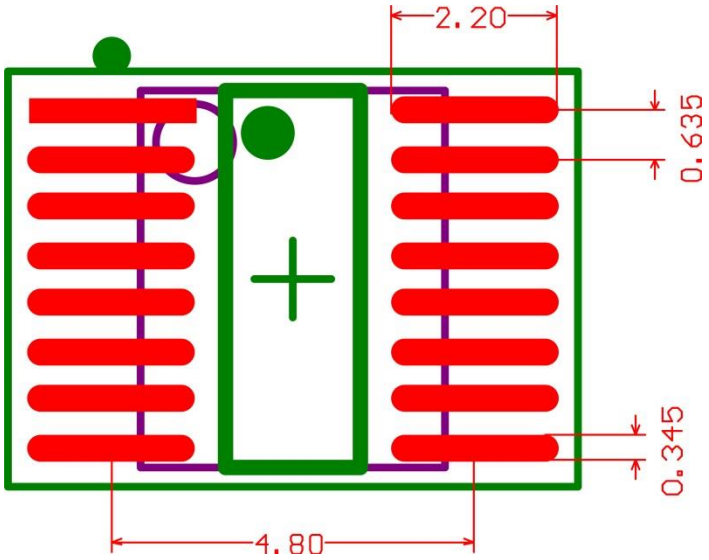

Figure 8.2 16-pin SSOP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

9 16-pin TSSOP

The 16-pin TSSOP is used on the following product:

- FT121T

This package is nominally 5.0mm x 4.4mm body (5.0mm x 6.4mm including pins). The solder pads are on a 0.65mm 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 16-pin TSSOP Scaled Footprint

9.2 Annotated Footprint

The annotated footprint shows key measurements.

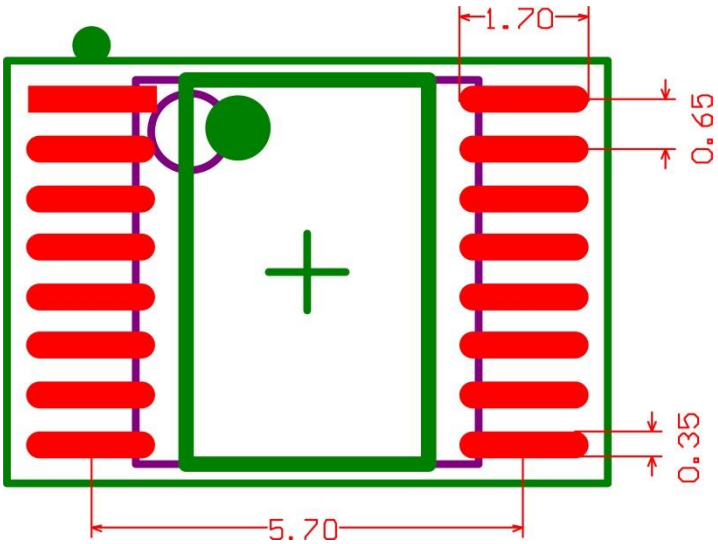

Figure 9.2 16-pin TSSOP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

10 20-pin QFN

The 20-pin QFN is used on the following products:

- FT221XQ
- FT231XQ

This package is nominally 4.00mm x 4.00mm. The solder pads are on a 0.50mm 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 20-pin QFN Scaled Footprint

10.2 Annotated Footprint

The annotated footprint shows key measurements.

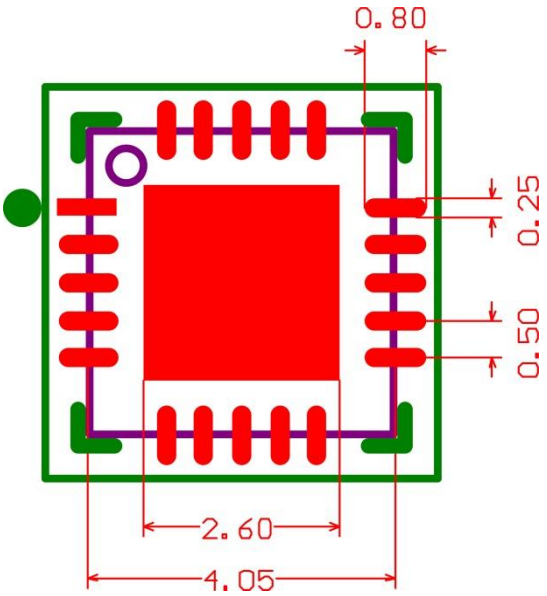

Figure 10.2 20-pin QFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

11 20-pin SSOP

The 20-pin SSOP is used on the following products:

- FT221XS
- FT231XS

This package is nominally 8.66mm x 3.91mm body (8.66mm x 5.99mm including pins). The solder pads are on a 0.635mm 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 20-pin SSOP Scaled Footprint

11.2 Annotated Footprint

The annotated footprint shows key measurements.

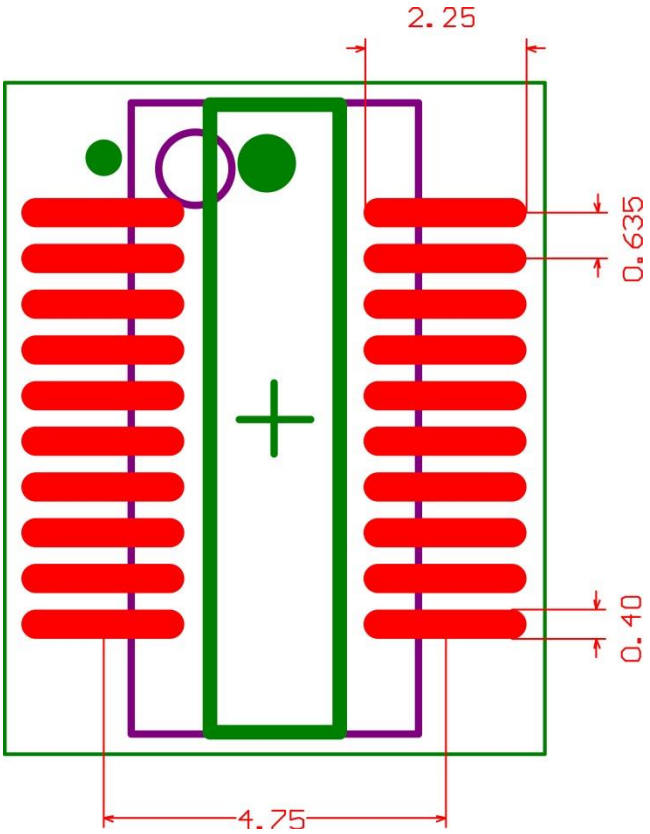

Figure 11.2 20-pin SSOP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

12 24-pin QFN

The 24-pin QFN is used on the following product:

- FT240XQ

This package is nominally 4.00mm x 4.00mm. The solder pads are on a 0.50mm 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 24-pin QFN Scaled Footprint

12.2 Annotated Footprint

The annotated footprint shows key measurements.

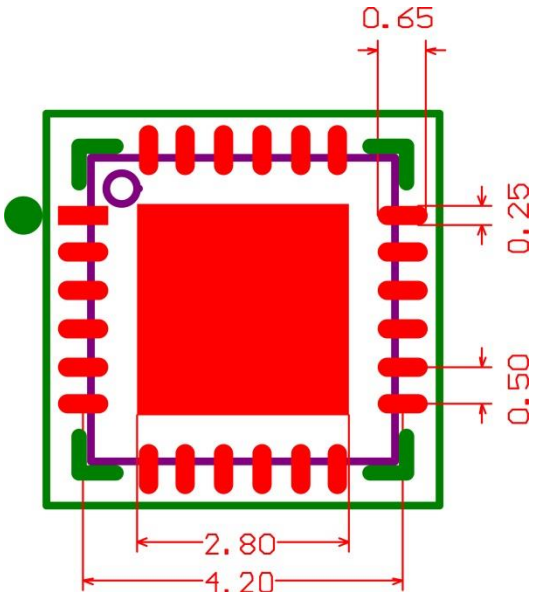

Figure 12.2 24-pin QFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

13 24-pin SSOP

The 24-pin SSOP is used on the following products:

- FT240XS

This package is nominally 8.66mm x 3.91 mm body (8.66mm x 5.99mm including pins). The solder pads are on a 0.635mm 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 24-pin SSOP Scaled Footprint

13.2 Annotated Footprint

The annotated footprint shows key measurements.

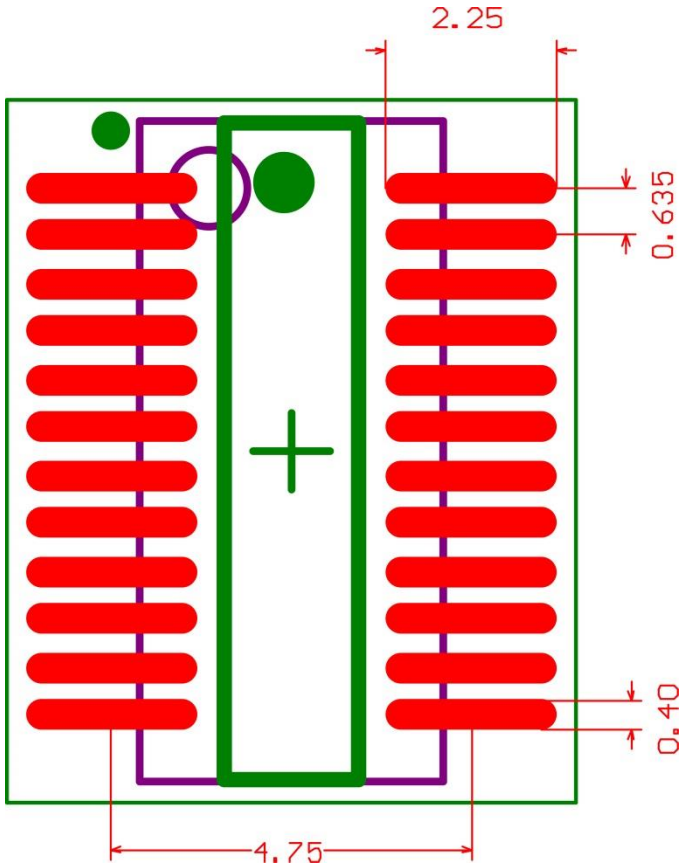

Figure 13.2 24-pin SSOP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

14 28-pin QFN

The 28-pin QFN is used on the following products:

- FT120Q
- FT122Q

This package is nominally 4.00mm x 4.00mm. 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 28-pin QFN Scaled Footprint

14.2 Annotated Footprint

The annotated footprint shows key measurements.

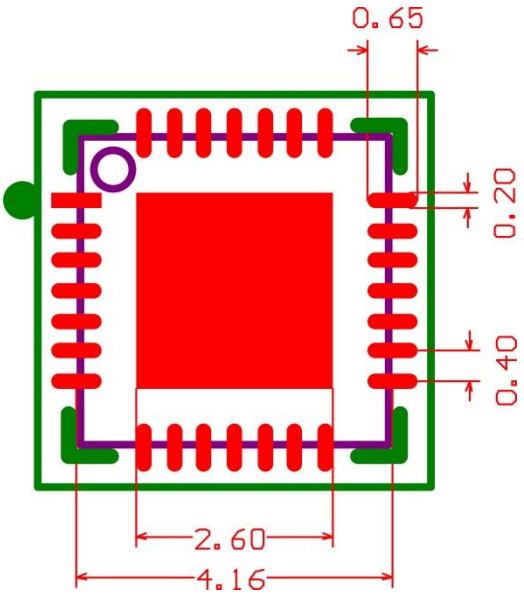

Figure 14.2 28-pin QFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

15 28-pin SSOP

The 28-pin SSOP is used on the following products:

- FT232RL
- FT245RL
- FT51CS

This package is nominally 5.30mm x 10.20mm body (7.80mm x 10.20mm including pins). The solder pads are on a 0.65mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

15.1 Scaled Footprint

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

Figure 15.1 28-pin SSOP Scaled Footprint

15.2 Annotated Footprint

The annotated footprint shows key measurements.

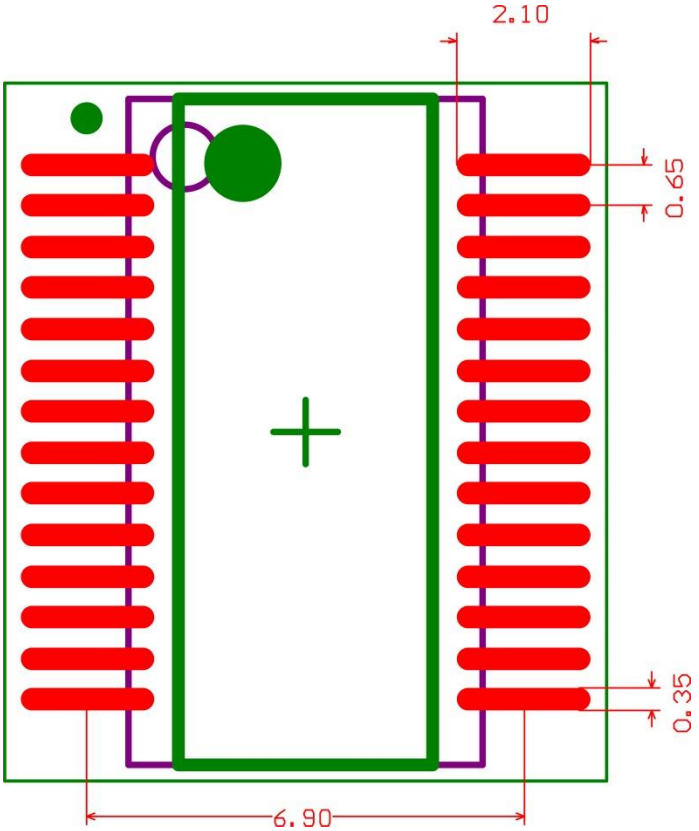

Figure 15.2 28-pin SSOP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

16 28-pin TSSOP

The 28-pin TSSOP is used on the following products:

- FT120T
- FT122T
- FT260S

This package is nominally 9.7mm x 4.4mm body (9.7mm x 6.4mm including pins). The solder pads are on a 0.65mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

16.1 Scaled Footprint

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

Figure 16.1 28-pin TSSOP Scaled Footprint

16.2 Annotated Footprint

The annotated footprint shows key measurements.

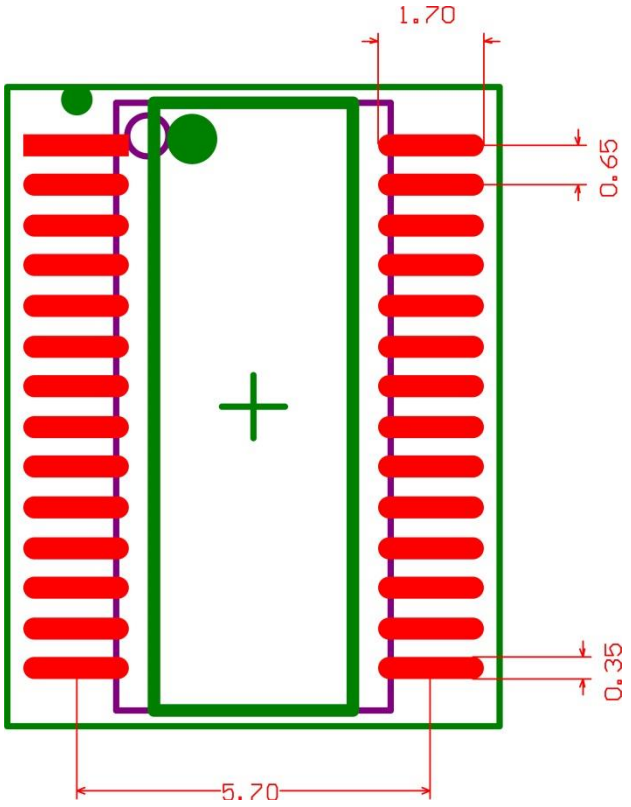

Figure 16.2 28-pin TSSOP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

17 28-pin WQFN

The 28-pin WQFN is used on the following product:

- FT260Q

This package is nominally 5.00mm x 5.00mm. The solder pads are on a 0.50mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

17.1 Scaled Footprint

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

Figure 17.1 28-pin WQFN Scaled Footprint

17.2 Annotated Footprint

The annotated footprint shows key measurements.

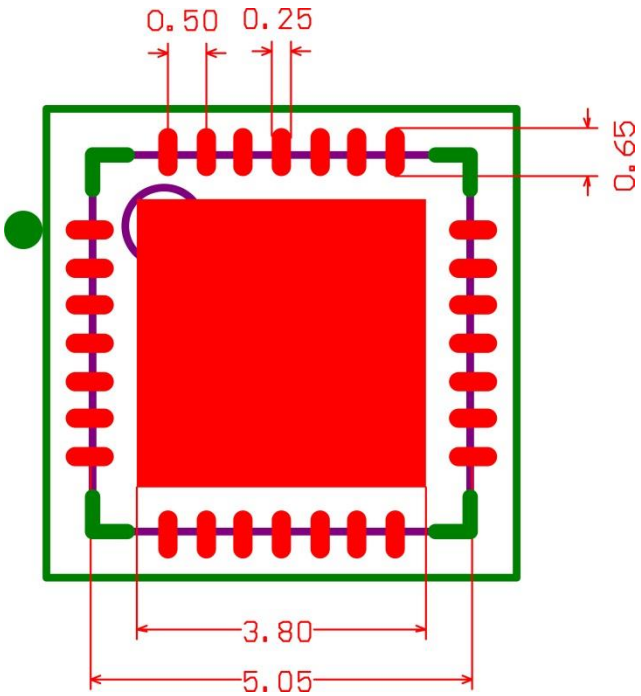

Figure 17.2 28-pin WQFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

18 32-pin LQFP

The 32-pin LQFP is used on the following products:

- VNC2-32L1B
- FT311D-32L1C
- FT312D-32L1C
- FT232BL
- FT245BL

This package is nominally 9.00mm x 9.00mm. The solder pads are on a 0.80mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

18.1 Scaled Footprint

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

Figure 18.1 32-pin LQFP Scaled Footprint

18.2 Annotated Footprint

The annotated footprint shows key measurements.

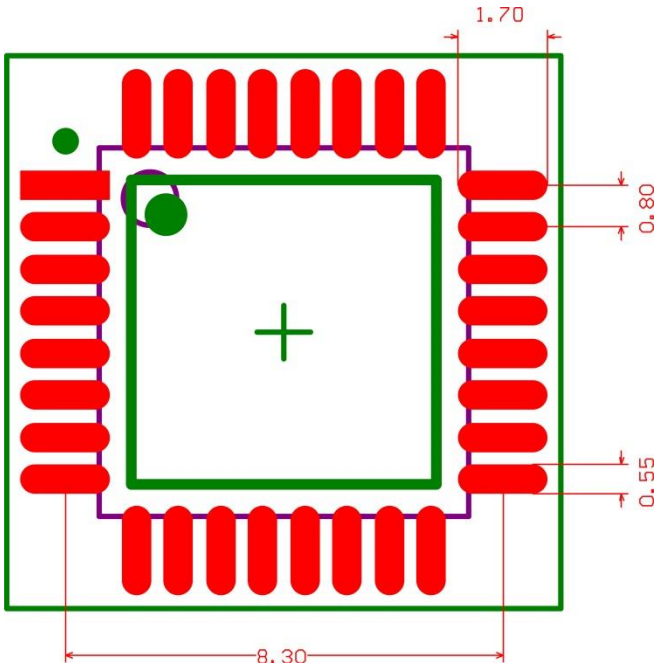

Figure 18.2 32-pin LQFP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

19 32-pin VQFN/QFN (5mm x 5mm)

The 32-pin VQFN/QFN (5mm x 5mm) is used on the following products:

- FT232RQ
- FT245RQ
- FT4222HQ

This package is nominally 5.00mm x 5.00mm. The solder pads are on a 0.50mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

19.1 Scaled Footprint

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

Figure 19.1 32-pin VQFN/QFN (5mm x 5mm) Scaled Footprint

19.2 Annotated Footprint

The annotated footprint shows key measurements.

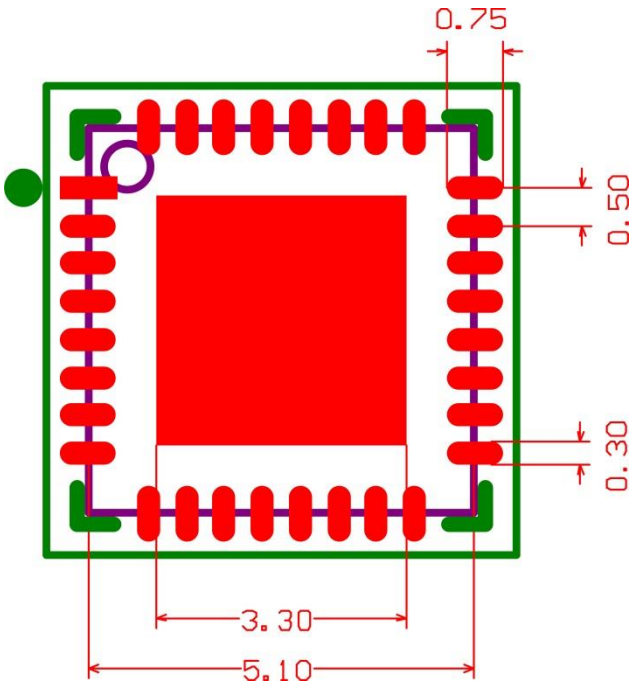

Figure 19.2 32-pin VQFN/QFN (5mm x 5mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

20 32-pin QFN (7mm x 7mm)

The 32-pin QFN (7mm x 7mm) is used on the following products:

- VNC2-32Q1B
- FT311D-32Q1C
- FT312D-32Q1C

This package is nominally 7.00mm x 7.00mm. The solder pads are on a 0.65mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

20.1 Scaled Footprint

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

Figure 20.1 32-pin QFN (7mm x 7mm) Scaled Footprint

20.2 Annotated Footprint

The annotated footprint shows key measurements.

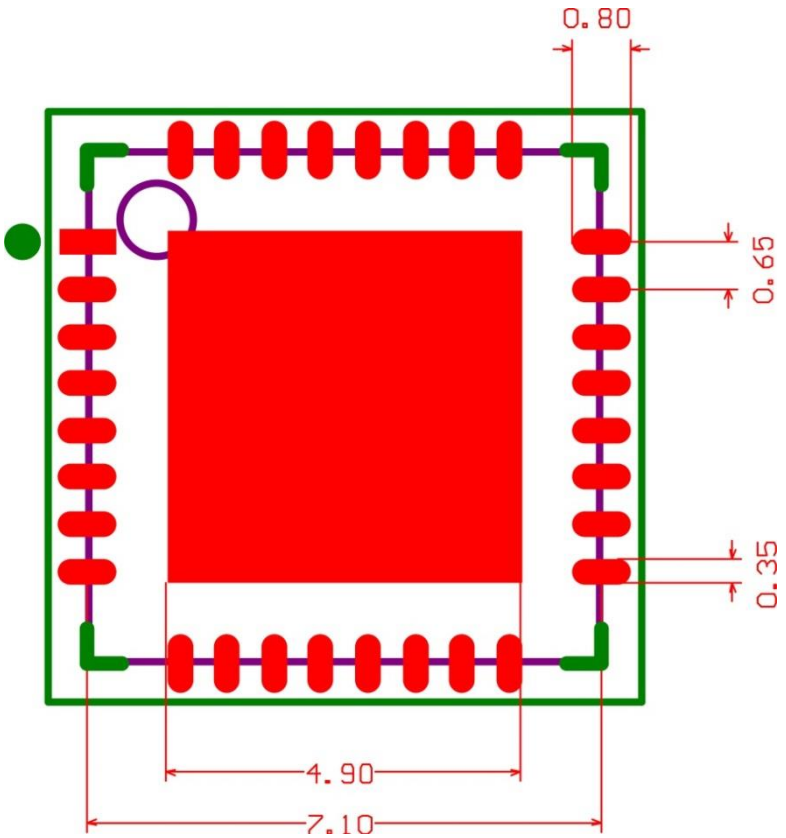

Figure 20.2 32-pin QFN (7mm x 7mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

21 48-pin LQFP

The 48-pin LQFP is used on the following products:

- FT232HL
- FT2232D
- VNC1L-1A
- VNC2-48Q1B

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.

21.1 Scaled Footprint

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

Figure 21.1 48-pin LQFP Scaled Footprint

21.2 Annotated Footprint

The annotated footprint shows key measurements.

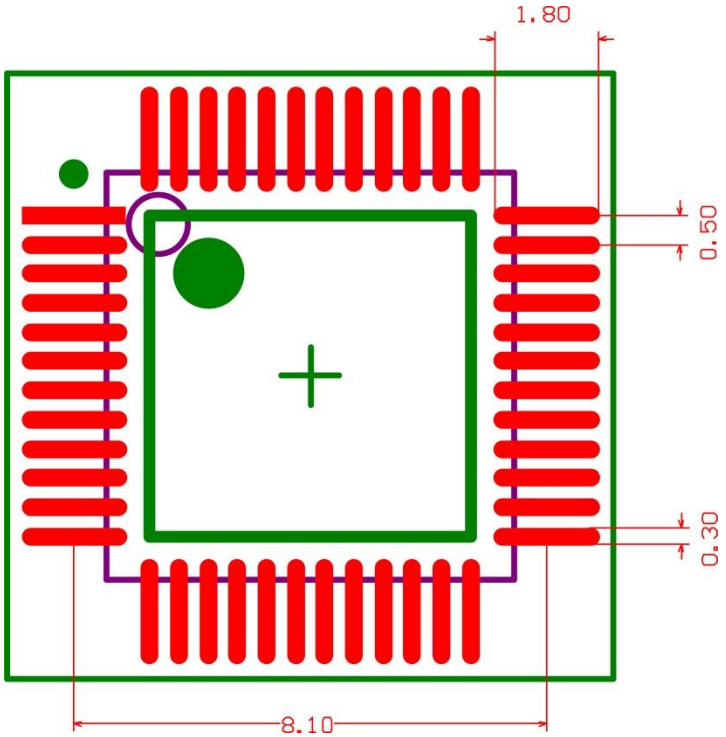

Figure 21.2 48-pin LQFP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

22 48-pin VQFN/WQFN (7mm x 7mm)

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

- FT800Q
- FT801Q
- FT810Q
- FT811Q
- FT51AQ

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.

22.1 Scaled Footprint

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

Figure 22.1 48-pin VQFN/WQFN (7mm x 7mm) Scaled Footprint

22.2 Annotated Footprint

The annotated footprint shows key measurements.

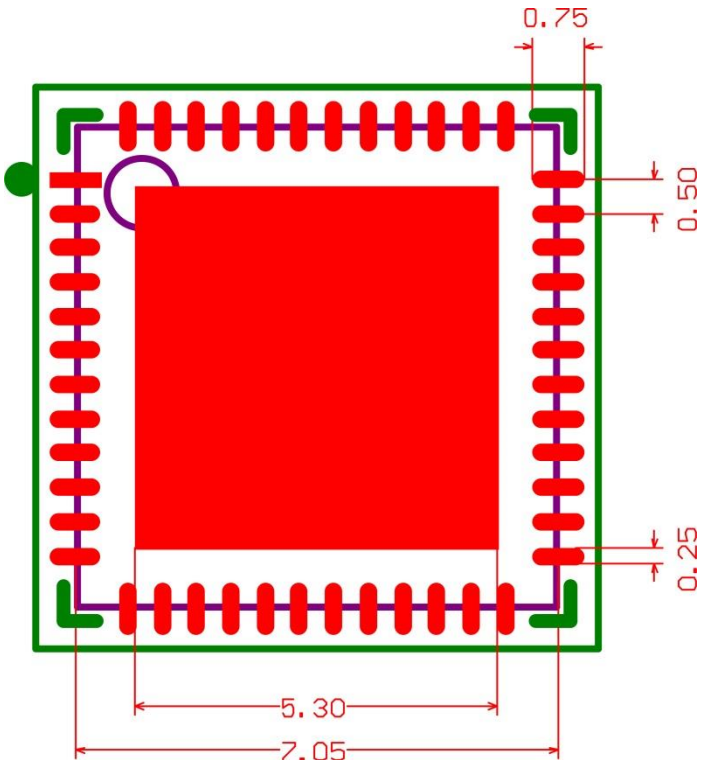

Figure 22.2 48-pin VQFN/WQFN (7mm x 7mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

23 48-pin QFN (8mm x 8mm)

The 48-pin QFN (8mm x 8mm) is used on the following products:

- VNC2-48Q1B
- FT232HQ

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.

23.1 Scaled Footprint

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

Figure 23.1 48-pin QFN (8mm x 8mm) Scaled Footprint

23.2 Annotated Footprint

The annotated footprint shows key measurements.

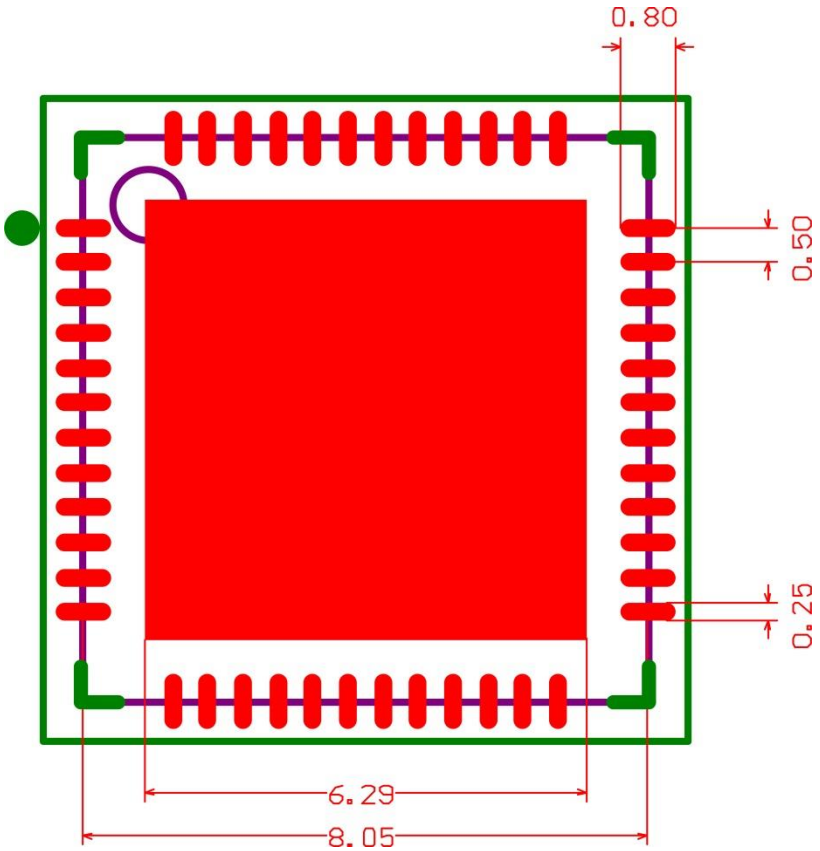

Figure 23.2 48-pin QFN (8mm x 8mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

24 56-pin QFN (7mm x 7mm)

The 56-pin QFN (7mm x 7mm) is used on the following product:

- FT600Q

This package is nominally 7.00mm x 7.00mm. The solder pads are on a 0.40mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

24.1 Scaled Footprint

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

Figure 24.1 56-pin QFN (7mm x 7mm) Scaled Footprint

24.2 Annotated Footprint

The annotated footprint shows key measurements.

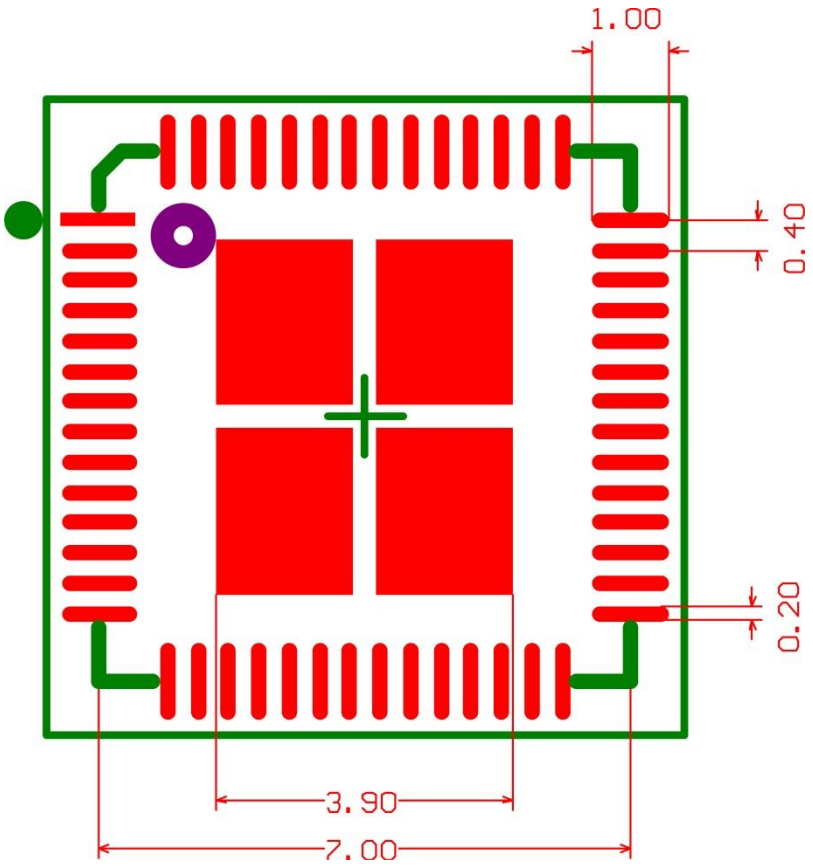

Figure 24.2 56-pin QFN (7mm x 7mm) Annotated Footprint

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

Note: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area. Cross-hatching designs used for less solder paste and less heat up rate required.

Copyright © Future Technology Devices International Limited

25 56-pin VQFN (8mm x 8mm)

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

- FT812Q
- FT813Q
- FT2232HQ
- FT4232HQ

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.

25.1 Scaled Footprint

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

Figure 25.1 56-pin VQFN (8mm x 8mm) Scaled Footprint

25.2 Annotated Footprint

The annotated footprint shows key measurements.

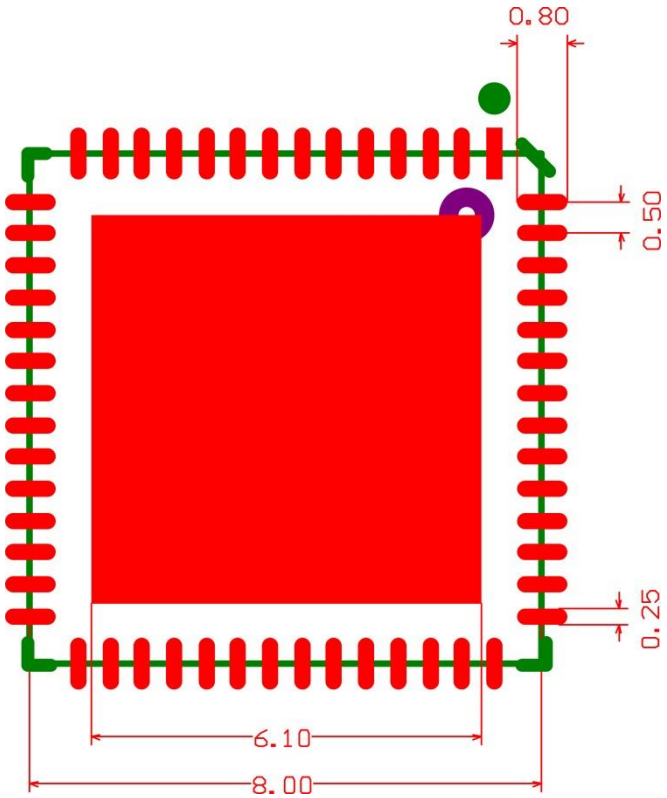

Figure 25.2 56-pin VQFN (8mm x 8mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

26 64-pin LQFP

The 64-pin LQFP is used on the following products:

- VNC2-64L1B
- FT313HL
- FT2232HL
- FT4232HL

This package is nominally 12.00mm x 12.00mm. The solder pads are on a 0.50mm pitch.

Please see the IC Package Parameters in the IC datasheet for full information.

26.1 Scaled Footprint

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

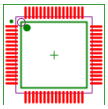

Figure 26.1 64-pin LQFP Scaled Footprint

26.2 Annotated Footprint

The annotated footprint shows key measurements.

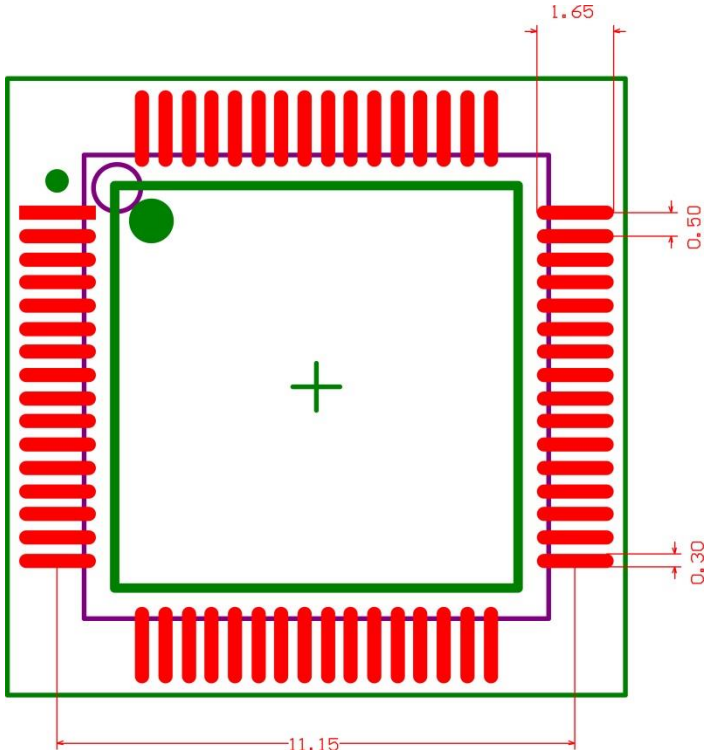

Figure 26.2 64-pin LQFP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

27 64-pin TQFP

The 64-pin TQFP is used on the following products:

- FT313HP

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.

27.1 Scaled Footprint

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

Figure 27.1 64-pin TQFP Scaled Footprint

27.2 Annotated Footprint

The annotated footprint shows key measurements.

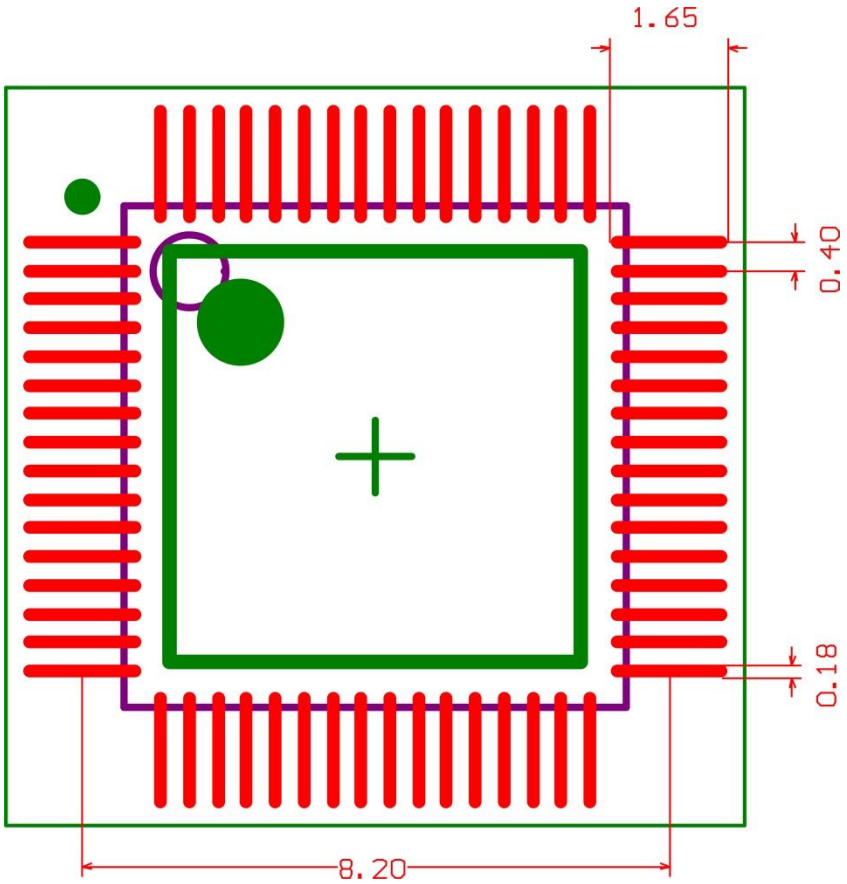

Figure 27.2 64-pin TQFP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

28 64-pin QFN (8mm x 8mm)

The 64-pin QFN (8mm x 8mm) is used on the following product:

- VNC2-64Q1B

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.

28.1 Scaled Footprint

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

Figure 28.1 64-pin QFN (8mm x 8mm) Scaled Footprint

28.2 Annotated Footprint

The annotated footprint shows key measurements.

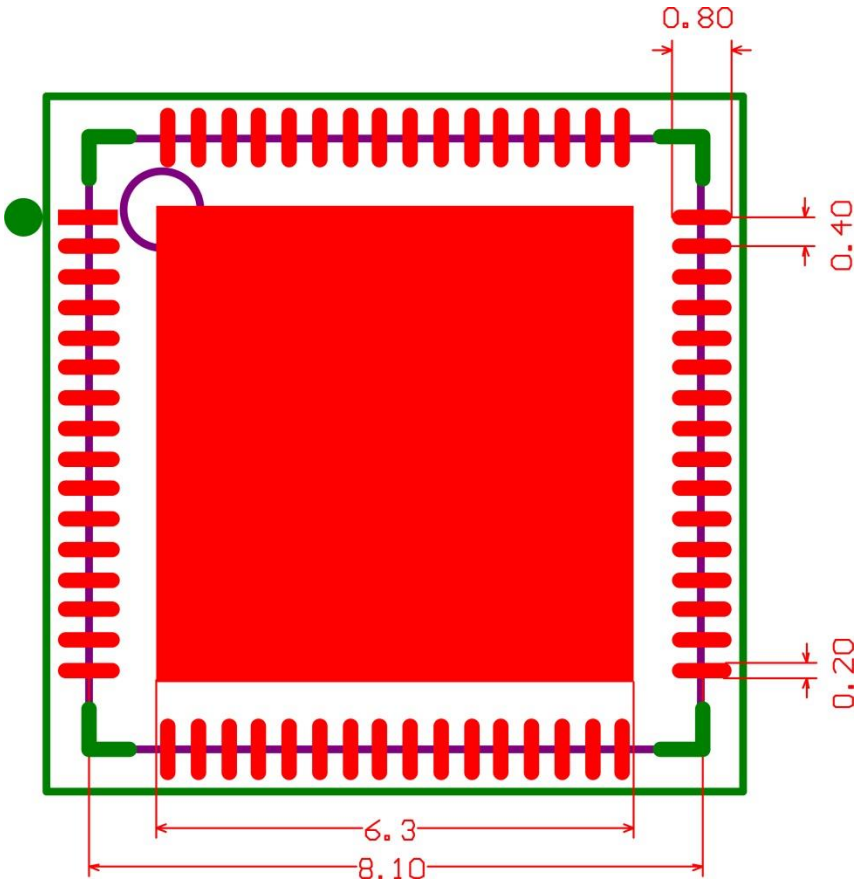

Figure 28.2 64-pin QFN (8mm x 8mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

29 64-pin QFN (9mm x 9mm)

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

- FT313HQ
- FT2232HQ
- FT4232HQ

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.

29.1 Scaled Footprint

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

Figure 29.1 64-pin QFN (9mm x 9mm) Scaled Footprint

29.2 Annotated Footprint

The annotated footprint shows key measurements.

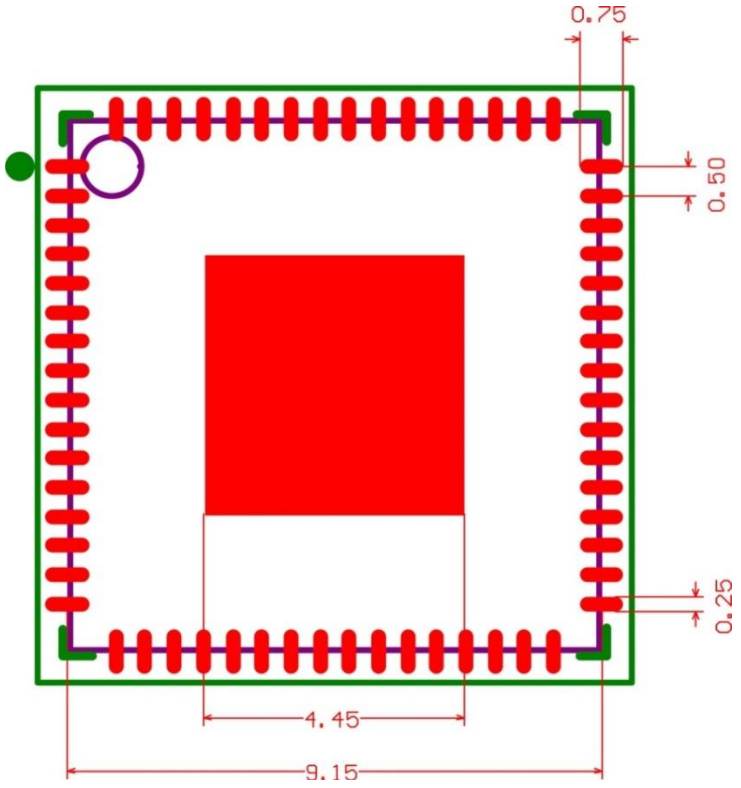

Figure 29.2 64-pin QFN (9mm x 9mm) Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

29.2.1 Additional Information

This package is unique to all the other packages where there is extra strain relief between the exposed pad in the center and the IC pins at the edge of the IC.

The exposed strain relief is connected to the pins so it is very important to ensure that the center exposed pad is not larger than specified, otherwise it could short all the signals together rendering the device and PCB useless.

The exposed strain relief should not be connected to the PCB in any way and this area should be marked as keep out. Only the pins at the edge of the package and the center exposed pad should be connected to the PCB.

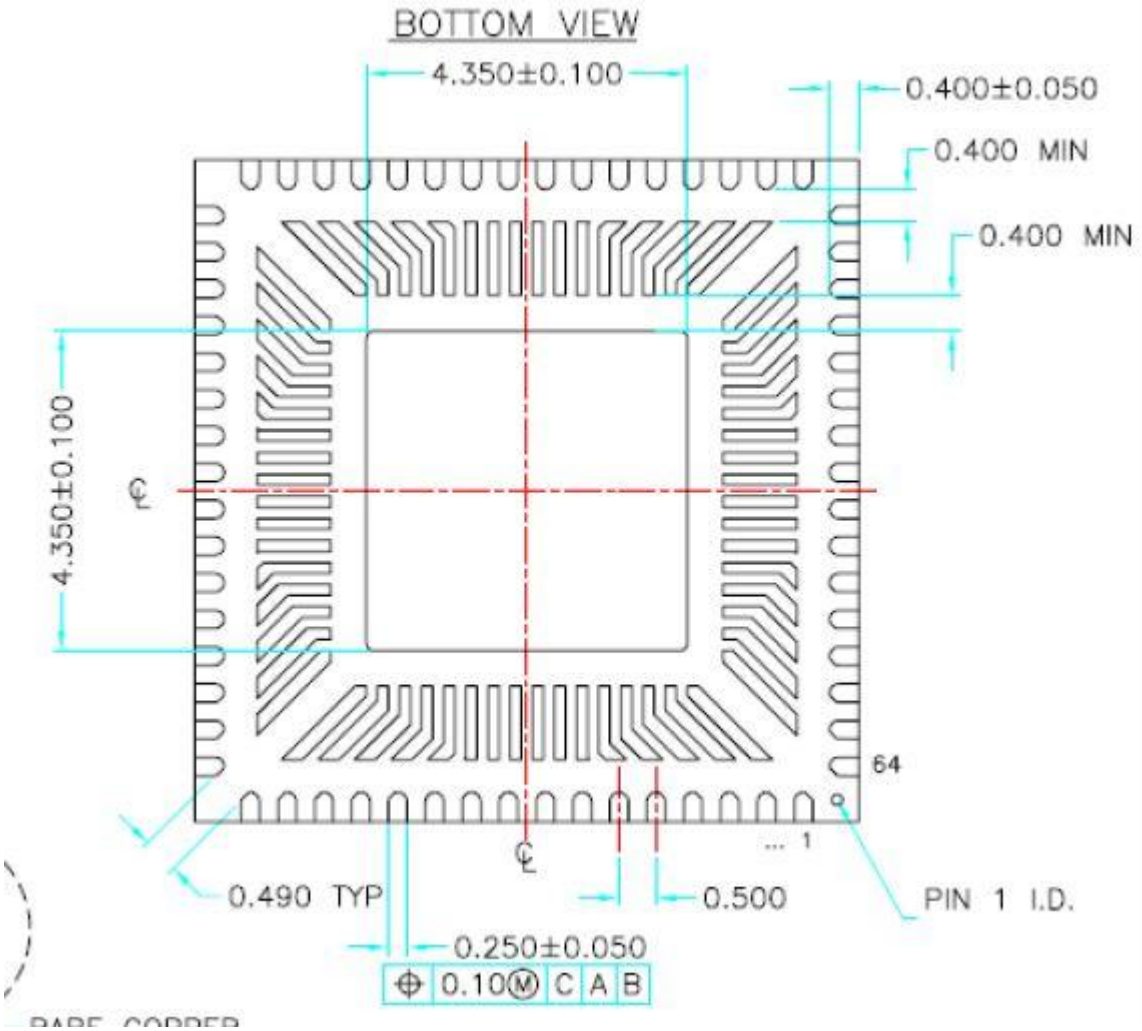

Figure 29.3 64-pin QFN (9mm x 9mm) Bottom View

Copyright © Future Technology Devices International Limited

30 76-pin QFN

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

- FT601Q
- 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.

30.1 Scaled Footprint

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

Figure 30.1 76-pin QFN Scaled Footprint

30.2 Annotated Footprint

The annotated footprint shows key measurements.

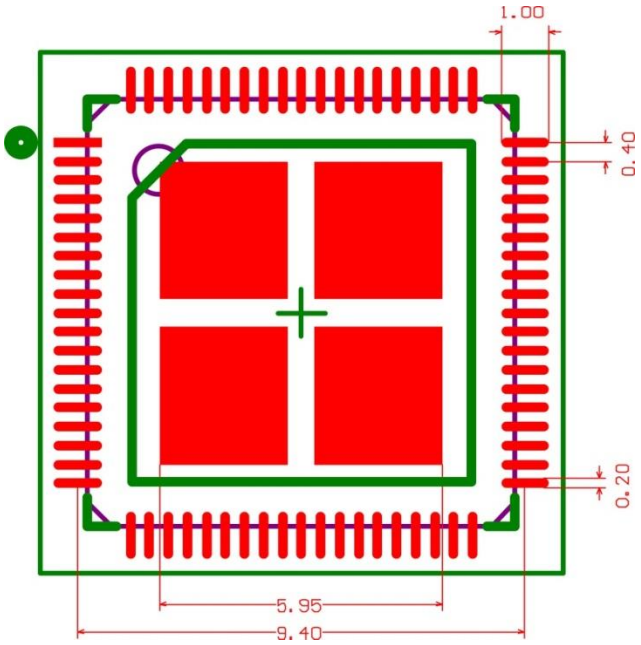

Figure 30.2 76-pin QFN Annotated Footprint

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

Note: Connect exposed center pad to GND. Do not place tracks on the top layer of the PCB in this area. Cross-hatching design used for less solders paste and less heat up rate required.

Copyright © Future Technology Devices International Limited

31 80-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.

31.1 Scaled Footprint

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

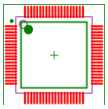

Figure 31.1 80-pin LQFP Scaled Footprint

31.2 Annotated Footprint

The annotated footprint shows key measurements.

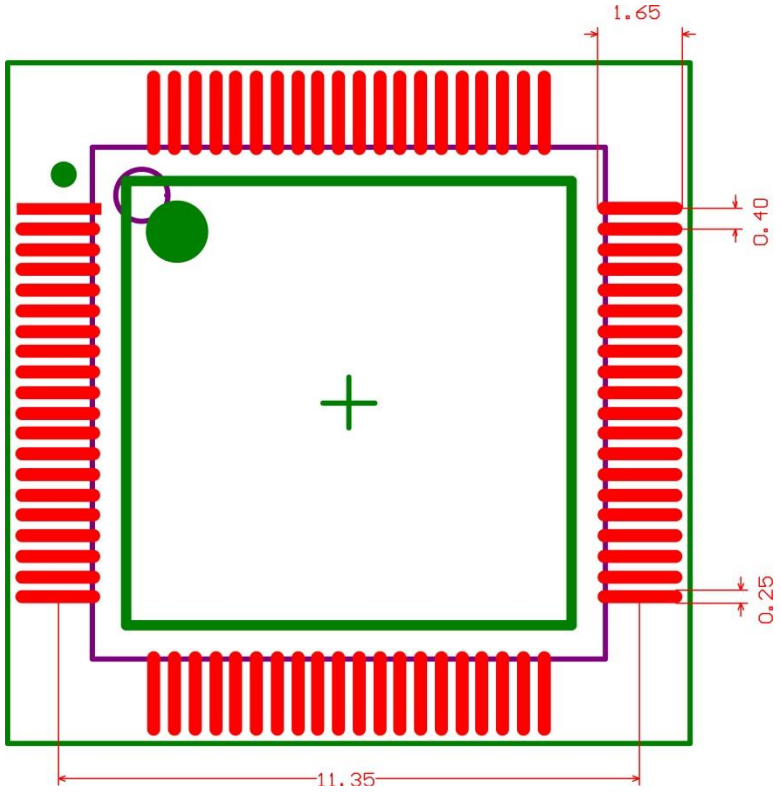

Figure 31.2 80-pin LQFP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

32 100-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.

32.1 Scaled Footprint

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

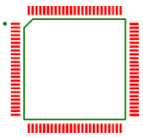

Figure 32.1 100-pin LQFP Scaled Footprint

32.2 Annotated Footprint

The annotated footprint shows key measurements.

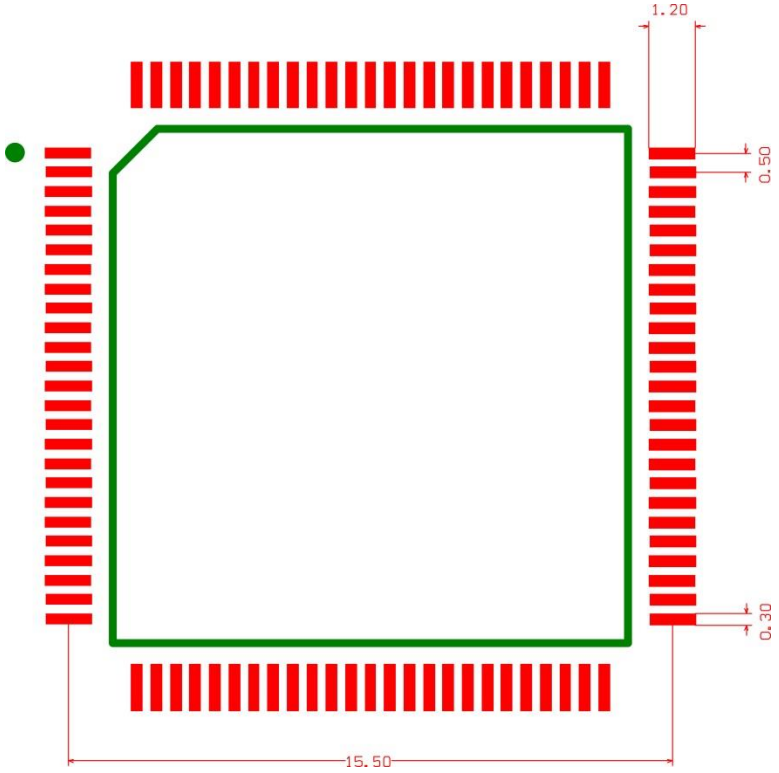

Figure 32.2 100-pin LQFP Annotated Footprint

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

Copyright © Future Technology Devices International Limited

33 100-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.

33.1 Scaled Footprint

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

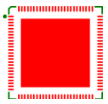

Figure 33.1 100-pin QFN Scaled Footprint

33.2 Annotated Footprint

The annotated footprint shows key measurements.

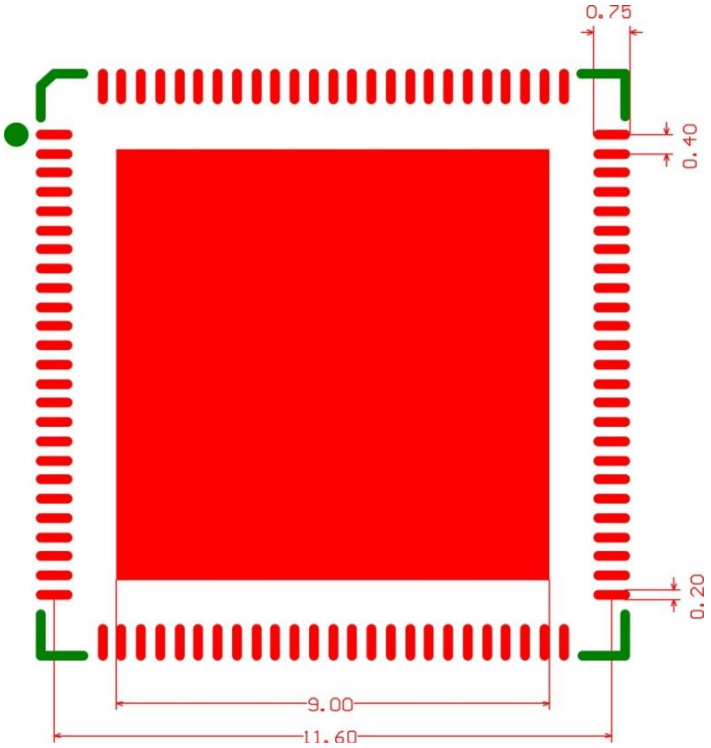

Figure 33.2 100-pin QFN Annotated Footprint

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

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

Copyright © Future Technology Devices International Limited

34 Contact Information

Head Office – Glasgow, UK

Future Technology Devices International Limited
Unit 1, 2 Seaward Place, Centurion Business Park
Glasgow G41 1HH
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales1@ftdichip.com
E-mail (Support) support1@ftdichip.com
E-mail (General Enquiries) admin1@ftdichip.com

Branch Office – Tigard, Oregon, USA

Future Technology Devices International Limited
(USA)
7130 SW Fir Loop
Tigard, OR 97223-8160
USA
Tel: +1 (503) 547 0988
Fax: +1 (503) 547 0987

E-Mail (Sales) us.sales@ftdichip.com
E-Mail (Support) us.support@ftdichip.com
E-Mail (General Enquiries) us.admin@ftdichip.com

Branch Office – Taipei, Taiwan

Future Technology Devices International Limited
(Taiwan)
2F, No. 516, Sec. 1, NeiHu Road
Taipei 114
Taiwan , R.O.C.
Tel: +886 (0) 2 8797 1330
Fax: +886 (0) 2 8751 9737

E-mail (Sales) tw.sales1@ftdichip.com
E-mail (Support) tw.support1@ftdichip.com
E-mail (General Enquiries) tw.admin1@ftdichip.com

Branch Office – Shanghai, China

Future Technology Devices International Limited
(China)
Room 1103, No. 666 West Huaihai Road,
Shanghai, 200052
China
Tel: +86 21 62351596
Fax: +86 21 62351595

E-mail (Sales) cn.sales@ftdichip.com
E-mail (Support) cn.support@ftdichip.com
E-mail (General Enquiries) cn.admin@ftdichip.com

Web Site

http://ftdichip.com

Distributor and Sales Representatives

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

System and equipment manufacturers and designers are responsible to ensure that their systems, and any Future Technology Devices International Ltd (FTDI) devices incorporated in their systems, meet all applicable safety, regulatory and system-level performance requirements. All application-related information in this document (including application descriptions, suggested FTDI devices and other materials) is provided for reference only. While FTDI has taken care to assure it is accurate, this information is subject to customer confirmation, and FTDI disclaims all liability for system designs and for any applications assistance provided by FTDI. Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold harmless FTDI from any and all damages, claims, suits or expense resulting from such use. This document is subject to change without notice. No freedom to use patents or other intellectual property rights is implied by the publication of this document. Neither the whole nor any part of the information contained in, or the product described in this document, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder. Future Technology Devices International Ltd, Unit 1, 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, United Kingdom. Scotland Registered Company Number: SC136640

Copyright © Future Technology Devices International Limited

Appendix A – References

Document References

http://www.ftdichip.com/Support/Documents/PCBData.htm

http://www.ftdichip.com/Products/ICs.htm

Acronyms and Abbreviations

Terms	Description
DFN	Dual-Flat No-Leads Package
IC	Integrated Circuit
LQFP	Low Profile Quad Flat Package
PCB	Printed Circuit Board
QFN	Quad Flat No-Leads Package
SSOP	Shrink Small-Outline Package
TSSOP	Thin-Shrink Small Outline Package
VQFN / WQFN	Very Thin Quad Flat No-Lead Package

Copyright © Future Technology Devices International Limited

Appendix B – List of Tables & Figures

List of Tables

Table 1.1 Unavailable Footprints 6
Table 3.1 DFN Packages 8
Table 3.2 QFP Packages 8
Table 3.3 QFN Packages 9
Table 3.4 SSOP Packages 9

List of Figures

Figure 2.1 DFN Packages 7
Figure 2.2 QFP Packages 7
Figure 2.3 QFN Packages 7
Figure 2.4 SSOP Packages 7
Figure 4.1 10-pin DFN Scaled Footprint 10
Figure 4.2 10-pin DFN Annotated Footprint 10
Figure 5.1 12-pin DFN Scaled Footprint 11
Figure 5.2 12-pin DFN Annotated Footprint 11
Figure 6.1 16-pin QFN (3mm x 3mm) Scaled Footprint 12
Figure 6.2 16-pin QFN (3mm x 3mm) Annotated Footprint 12
Figure 7.1 16-pin QFN (4mm x 4mm) Scaled Footprint 13
Figure 7.2 16-pin QFN (4mm x 4mm) Annotated Footprint 13
Figure 8.1 16-pin SSOP Scaled Footprint 14
Figure 8.2 16-pin SSOP Annotated Footprint 14
Figure 9.1 16-pin TSSOP Scaled Footprint 15
Figure 9.2 16-pin TSSOP Annotated Footprint 15
Figure 10.1 20-pin QFN Scaled Footprint 16
Figure 10.2 20-pin QFN Annotated Footprint 16
Figure 11.1 20-pin SSOP Scaled Footprint 17
Figure 11.2 20-pin SSOP Annotated Footprint 17
Figure 12.1 24-pin QFN Scaled Footprint 18
Figure 12.2 24-pin QFN Annotated Footprint 18
Figure 13.1 24-pin SSOP Scaled Footprint 19
Figure 13.2 24-pin SSOP Annotated Footprint 19
Figure 14.1 28-pin QFN Scaled Footprint 20
Figure 14.2 28-pin QFN Annotated Footprint 20
Figure 15.1 28-pin SSOP Scaled Footprint 21

Copyright © Future Technology Devices International Limited

Figure 15.2 28-pin SSOP Annotated Footprint 21
Figure 16.1 28-pin TSSOP Scaled Footprint 22
Figure 16.2 28-pin TSSOP Annotated Footprint 22
Figure 17.1 28-pin WQFN Scaled Footprint 23
Figure 17.2 28-pin WQFN Annotated Footprint 23
Figure 18.1 32-pin LQFP Scaled Footprint 24
Figure 18.2 32-pin LQFP Annotated Footprint 24
Figure 19.1 32-pin VQFN/QFN (5mm x 5mm) Scaled Footprint 25
Figure 19.2 32-pin VQFN/QFN (5mm x 5mm) Annotated Footprint 25
Figure 20.1 32-pin QFN (7mm x 7mm) Scaled Footprint 26
Figure 20.2 32-pin QFN (7mm x 7mm) Annotated Footprint 26
Figure 21.1 48-pin LQFP Scaled Footprint 27
Figure 21.2 48-pin LQFP Annotated Footprint 27
Figure 22.1 48-pin VQFN/WQFN (7mm x 7mm) Scaled Footprint 28
Figure 22.2 48-pin VQFN/WQFN (7mm x 7mm) Annotated Footprint 28
Figure 23.1 48-pin QFN (8mm x 8mm) Scaled Footprint 29
Figure 23.2 48-pin QFN (8mm x 8mm) Annotated Footprint 29
Figure 24.1 56-pin QFN (7mm x 7mm) Scaled Footprint 30
Figure 24.2 56-pin QFN (7mm x 7mm) Annotated Footprint 30
Figure 25.1 56-pin VQFN (8mm x 8mm) Scaled Footprint 31
Figure 25.2 56-pin VQFN (8mm x 8mm) Annotated Footprint 31
Figure 26.1 64-pin LQFP Scaled Footprint 32
Figure 26.2 64-pin LQFP Annotated Footprint 32
Figure 27.1 64-pin TQFP Scaled Footprint 33
Figure 27.2 64-pin TQFP Annotated Footprint 33
Figure 28.1 64-pin QFN (8mm x 8mm) Scaled Footprint 34
Figure 28.2 64-pin QFN (8mm x 8mm) Annotated Footprint 34
Figure 29.1 64-pin QFN (9mm x 9mm) Scaled Footprint 35
Figure 29.2 64-pin QFN (9mm x 9mm) Annotated Footprint 35
Figure 29.3 64-pin QFN (9mm x 9mm) Bottom View 36
Figure 30.1 76-pin QFN Scaled Footprint 37
Figure 30.2 76-pin QFN Annotated Footprint 37
Figure 31.1 80-pin LQFP Scaled Footprint 38
Figure 31.2 80-pin LQFP Annotated Footprint 38
Figure 32.1 100-pin LQFP Scaled Footprint 39
Figure 32.2 100-pin LQFP Annotated Footprint 39
Figure 33.1 100-pin QFN Scaled Footprint 40
Figure 33.2 100-pin QFN Annotated Footprint 40

Copyright © Future Technology Devices International Limited

Appendix C – Revision History

Document Title: TN_166 FTDI Example IC PCB Footprints
Document Reference No.: FT_001321
Clearance No.: FTDI# 501
Product Page: http://www.ftdichip.com/FTProducts.htm
Document Feedback: Send Feedback

Revision	Changes	Date
1.0	Initial Release	2016-04-27

Copyright © Future Technology Devices International Limited