

AN005e: IC Package / PCB Footprint Guidelines - QFN28 5x5

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This application note is meant to be a practical guideline for a specific TRINAMIC IC package and its PCB footprint. The document covers package dimensions, example footprint and general information on PCB footprints.

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3 Overview

This application note is meant to be a practical guideline for a specific TRINAMIC IC package and its PCB footprint. The document covers package dimensions, example footprint and general information on PCB footprints with their packaging as well.

4 QFN28 5x5 Package Details

4.1 QFN28 5x5

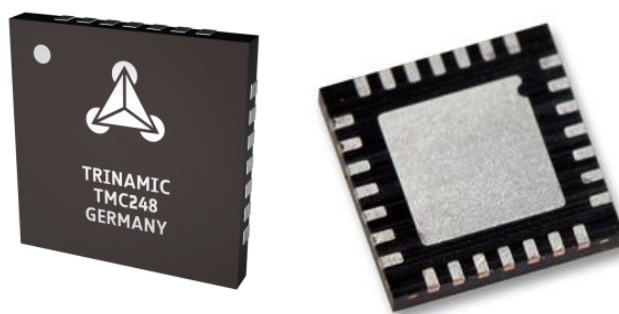


Figure 1: QFN28 5x5 3D examples

4.2 Dimensions

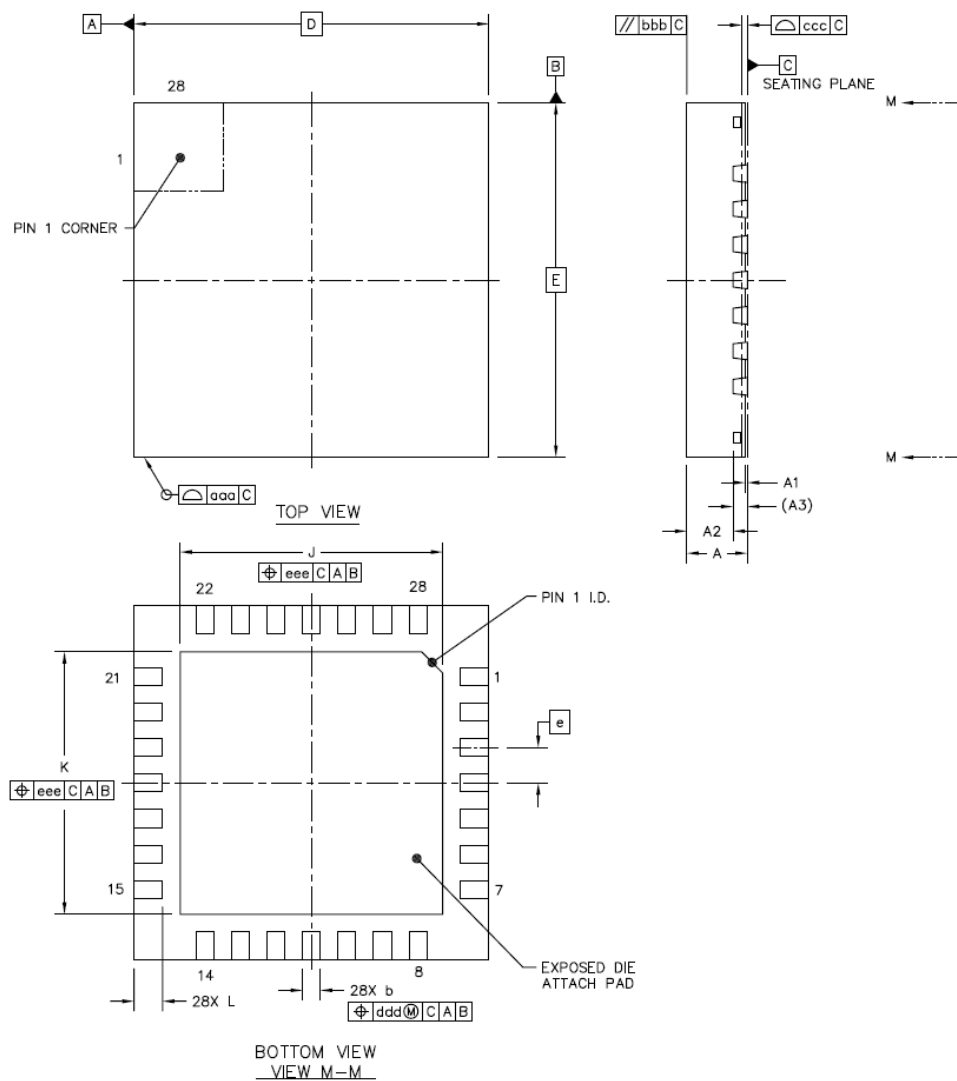


Figure 2: QFN28 5x5 package outline drawings

Table 1: QFN28 5x5 dimensions

Symbol	Dimensions in MILLIMETERS			Dimensions in INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.8	0.85	0.9	0.0315	0.0335	0.0354
A1	0	0.035	0.05	0	0.0014	0.002
A2	–	0.65	0.67	–	0.0256	0.0264
A3	0.203 REF			0.0078 REF		
b	0.2	0.25	0.3	0.0079	0.0098	0.0118
D	5 BSC			0.1969		
E	5 BSC			0.1969		
e	0.5 BSC			0.0197		
J	3.6	3.7	3.8	0.1417	0.1457	0.1496
K	3.6	3.7	3.8	0.1417	0.1457	0.1496
L	0.35	0.4	0.45	0.0137	0.0157	0.0177
aaa	0.1			0.0039		
bbb	0.1			0.0039		
ccc	0.08			0.0031		
ddd	0.1			0.0039		
eee	0.1			0.0039		

4.3 Land Pattern

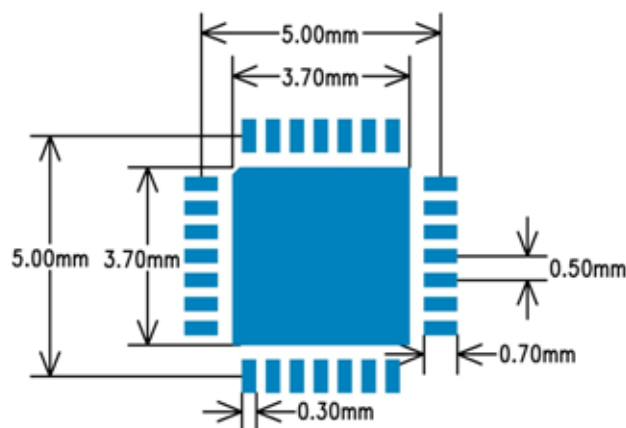


Figure 3: QFN28 5x5 example land patterns (unit: mm)

5 General PCB Footprint and Packaging Information Resources

These guidelines and information are proposals and suggestions as they are proven and work well with TRINAMIC modules. Some ICs are available in Tape & Reel and in IC trays.

5.1 QFN Packages

These are basic guidelines for Quad Flat No Leads Packages (QFNs). They are derived from the Technical Brief TB389 from Renesas (TB389).

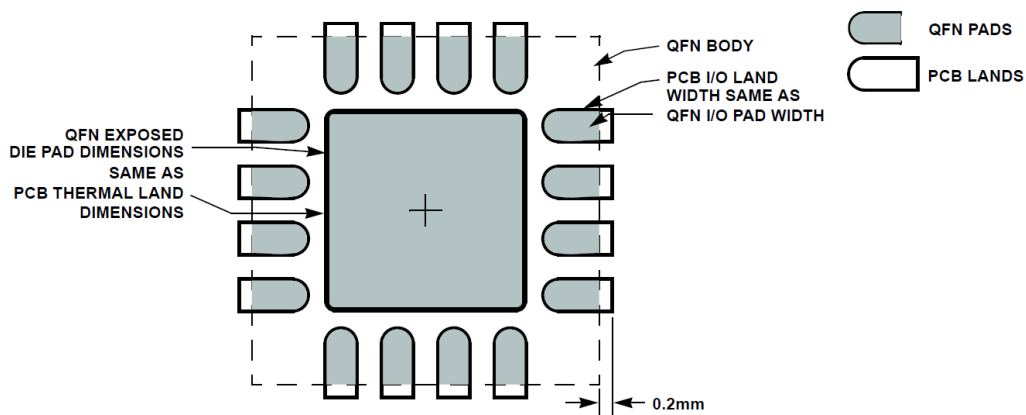


Figure 4: Board Layout of Soldered Pad for QFN Devices according to Renesas TB389

5.2 Tape & reel

Tape & Reel are dependent on the package and will have the following dimensions like shown in Table 2.

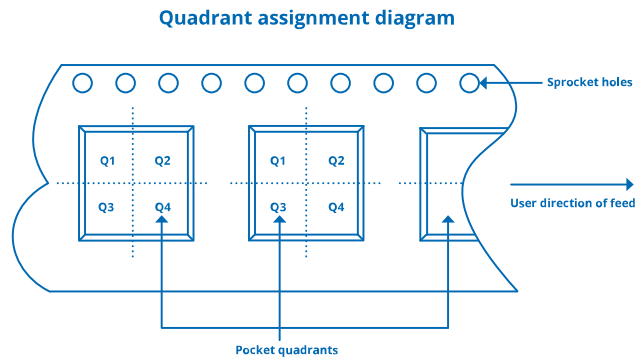


Figure 5: Quadrant assignment within the tape

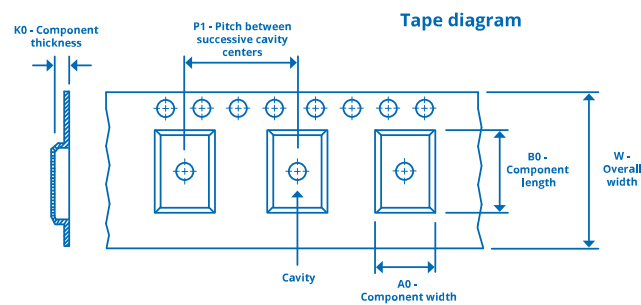


Figure 6: Tape diagram. The pin1 orientation of a IC is in the upper left (Q1).

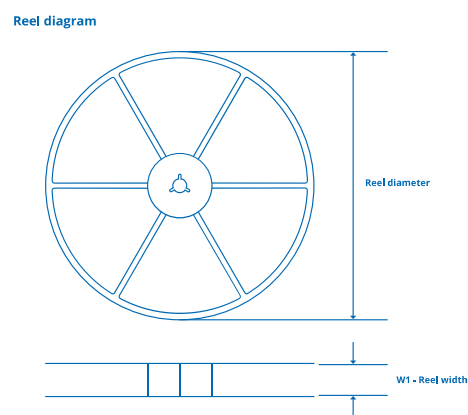


Figure 7: Reel diagram

Table 2: Dimensions and properties of Tape (left) and Reel (right) (unit: mm)

K0	P1	A0	B0	W	Cover Tape width	Tape Mat.	W1	Reel dia.	Reel Hub dia.	Color
1.1	8	5.3	5.3	12	9.2	PS	12	330	100	blue

5.3 Reel Box

A reel is packed in boxes like shown in the following figure 8.

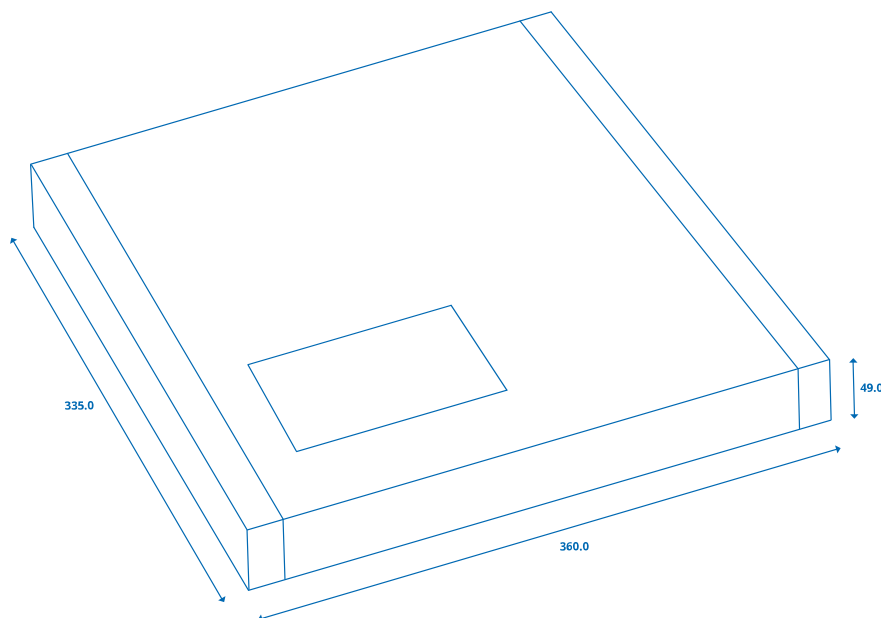


Figure 8: Box for reel with dimensions (unit: mm).

5.4 Tray

The following figure 9 shows common QFN 5x5 mm² trays with their corresponding dimensions. It is capable of a total cell count of 490 (14 x 35). Cells marked with a cross are for vacuum pickup area. The pin1 orientation of a IC is in the lower left of each cell.

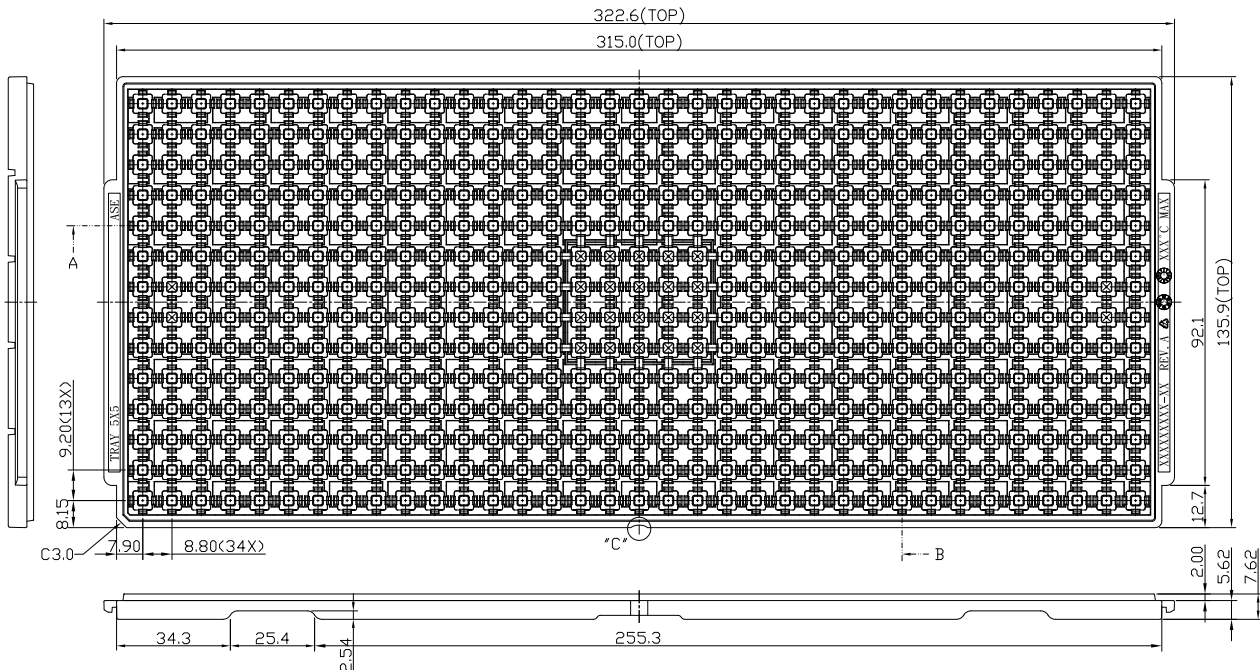


Figure 9: Tray with dimensions (unit: mm). The pin1 orientation of a IC is in the lower left of each cell.

5.5 Tray Box

Trays are packed in boxes like shown in the following figure 10.

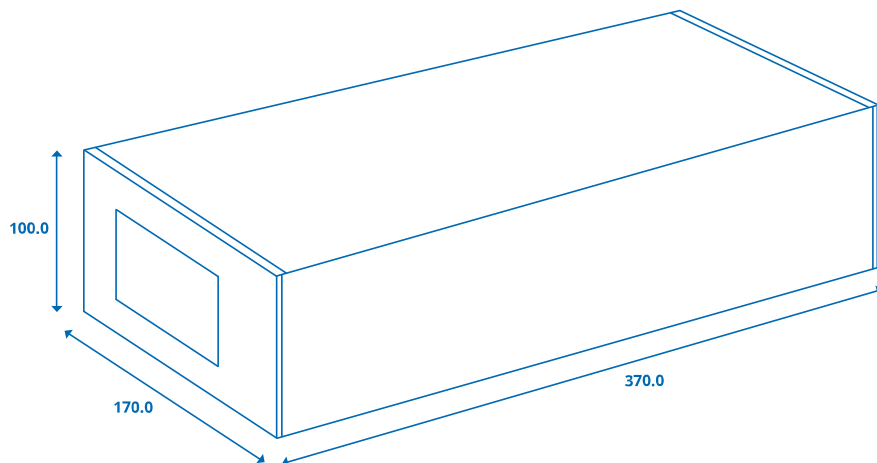


Figure 10: Box for tray with dimensions (unit: mm).

6 Disclaimer

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7 Revision History

Table 3: Document Revision

Version	Date	Author	Description
V1.00	20.05.2017	SK	V1.00 release version
V2.00	02.07.2021	FV	Added Tray and Reel information. Removed outdated notes.
V2.10	30.07.2021	FV	Added boxes for Tray and Reel.
V2.11	09.12.2021	FV	Changed logo to ADI Trinamic.
V2.12	07.02.2022	FV	Changed reference for QFN footprint.