

Package : VQFP

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1. Structure and materials

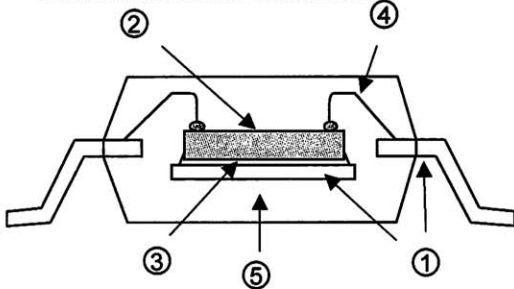


Fig. 1 Structure

No.	Item	Materials
①	Lead Frame	VQFP48 : Alloy42 (External lead : Pb free solder plating) except VQFP48 : Cu-Alloy (External lead : Pb free solder plating)
②	Die	Silicon
③	Die Attach	Ag Paste
④	Wire	Au
⑤	Molding	Epoxy Resin

2. Tape and Reel information

2. 1. Packing specification

Tape	VQFP48/48C : Embossed carrier tape VQFP64/80/100 : Embossed carrier tape (with dry pack)
Quantity	See the table on page 4/4
Direction of feed	E2 (See Fig. 2)

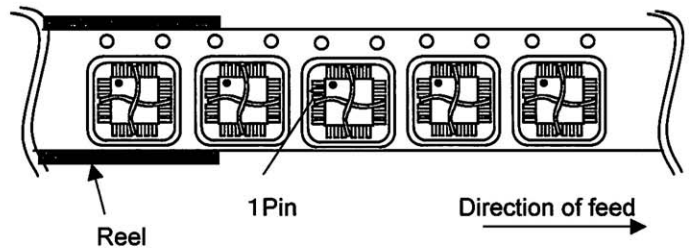


Fig. 2 Typical Tape and Reel configuration

2. 2. Tape and Reel specification

2. 2. 1. Tape and reel dimensions (See the table on page 4/4)

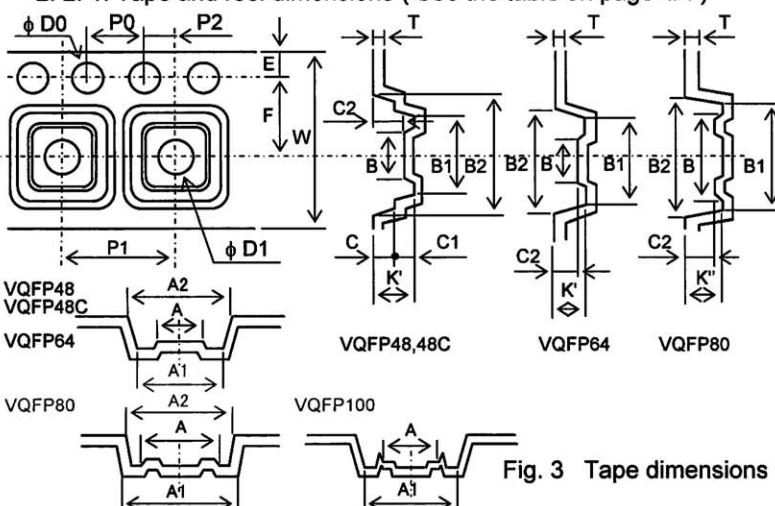


Fig. 3 Tape dimensions

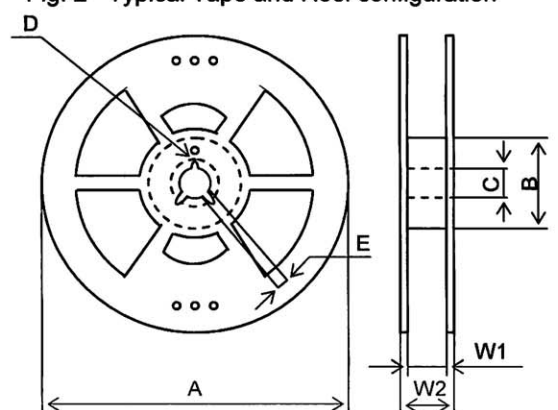


Fig. 4 Reel dimensions

2. 3. Leader and Trailer

2. 3. 1. Leader

No component pockets are 40 pockets or more.

2. 3. 2. Trailer

No component pockets are 10 pockets or more.

Tape is free from reel.

2. 4. Label for Reel and Box

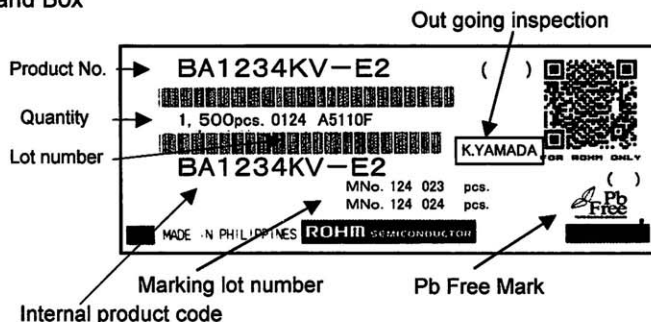


Fig. 5 Label example

2. 5. Packing style

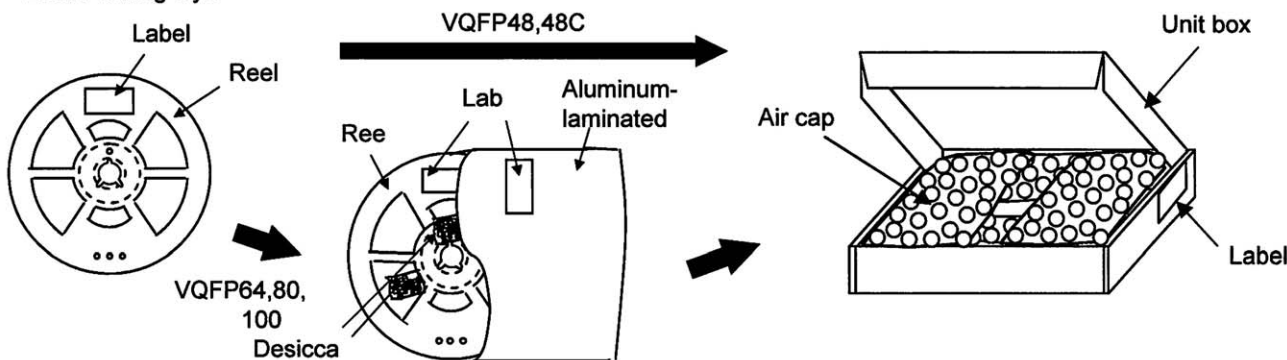
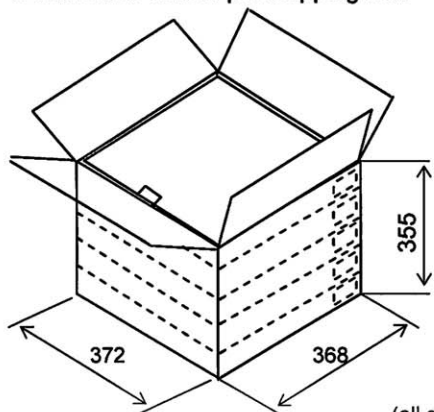


Fig. 6 Packing style

2. 6. Shipping style

5 unit boxes or less per shipping box



(all dimensions in mm)

Fig. 7 Shipping box dimensions and Shipping style

2. 7. Packing materials

Item	Material
Embossed carrier tape	PS
Cover tape	PET + PE
Reel	PS
*1 Desiccant	Silicagel
*1 Envelope	Aluminum-laminated
Air cap	Polyethylene
Unit box	Cardboard
Shipping box	Cardboard

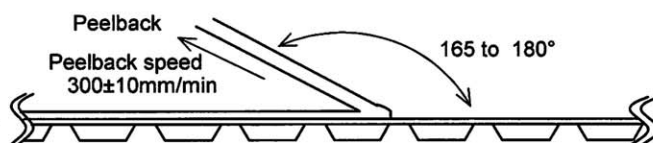
*Please obey the indication of top side in a shipping box.
*1: VQFP64,80,100

2. 8. Others

2. 8. 1. Peelback strength

Cover tape peelback strength is 0.2 to 0.7N.

Fig. 8 Test method



2. 8. 2. Missing Ics

- (1) No consecutive dropouts.
- (2) A maximum 0.1% of specified number of products in each packing may be missing.

3. Storage conditions

3. 1. Storage environment

Recommended storage conditions are as follows :

- Temperature : 5 to 30°C
- Humidity : 40 to 70% RH

3. 2. Storage period

-Specified storage period : 1 year

3.3. Specified storage period until soldering

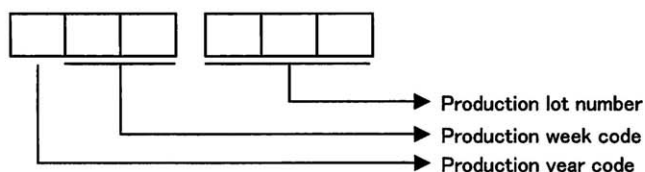
Regarding the dry packed packages , assemble package within 168hours , after dry pack is opened .

If the storage period has expired , the products must be baked 125°C for 24hours.

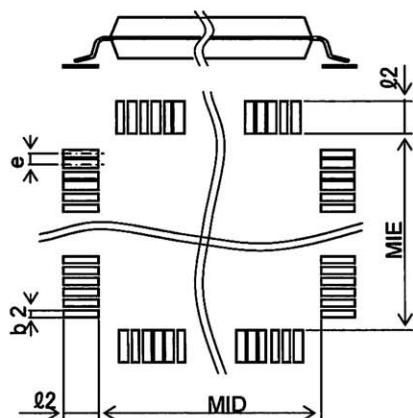
Maximum 2times baking for keeping solderbility.

Execute baking by 60°C/48hours while put in the embossed tape.

4. Marking lot number



5. Footprint dimensions (Optimize footprint dimensions to the board design and soldering condition)

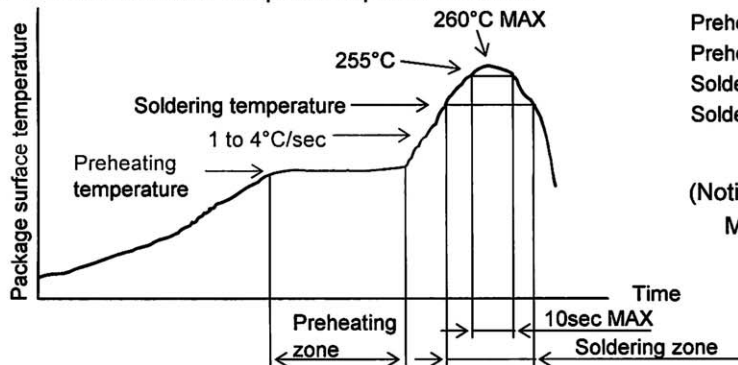


(all dimensions in mm)

Package	Land pitch e	Land space		Land length	Land width
		MID	MIE	≥ l2	b2
VQFP48	0.50	7.40	7.40	1.10	0.25
VQFP48C	0.50	7.20	7.20	1.10	0.25
VQFP64	0.50	10.20	10.20	1.20	0.25
VQFP80	0.50	12.20	12.20	1.20	0.25
VQFP100	0.50	14.20	14.20	1.20	0.25

6. Soldering conditions

6. 1. Recommended temperature profile for reflow



- Preheating temperature ; 130°C to 190°C
- Preheating zone ; 120sec MAX
- Soldering temperature ; 220°C to 230°C
- Soldering zone ; 60sec MAX

(Notice)
Maximum 2-times soldering

6. 2. Recommended condition for wave soldering

Process	Conditions	
	Temperature	Time
Preheating	120°C to 150°C	60sec MAX
Soldering	260°C ± 3°C	12sec MAX

(Notice) Soldering time is provided for total soldering time in case of dual wave soldering.

6. 2. 1. Notes for wave soldering

- (1) Do not use other soldering methods with wave soldering.
- (2) Recommend to clean the board to eliminate flux, solder waste, and other impurities for reliability, after soldering.
- (3) Optimize soldering condition to prevent solder bridging.

6. 3. Recommended condition for solder iron

Recommended condition for solder iron

- Solder iron temperature : 380°C or less
- Mounting time : 4sec or less

< Tape dimensions >

Package	Quantity (pcs)	Tape dimensions (all dimensions in mm)										
		A	A1	A2	B	B1	B2	C	C1	C2	D0	D1
VQFP48	1500	6.0	9.5	9.8	6.0	9.5	10.8	0.8	1.4	1.7	φ1.5	φ1.6
VQFP48C	1500	6.0	9.5	9.8	6.0	9.5	10.8	0.8	1.4	1.7	φ1.5	φ1.6
VQFP64	1000	8.5	12.6	12.9	8.5	12.6	12.9	—	—	1.75	φ1.5	φ2.0
VQFP80	1000	11.0	14.3	14.5	11.0	14.3	14.5	—	—	1.55	φ1.5	φ2.0
VQFP100	500	14.0	16.5	(16.78)	14.0	16.5	(16.78)	—	0.3	(1.6)	φ1.5	φ2.0
Tolerance		—	±0.1	±0.1	—	±0.1	±0.1	—	—	±0.1	$\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$	$\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$

Package	Tape dimensions (all dimensions in mm)							
	E	F	K'	P0	P1	P2	T	W
VQFP48	1.75	7.5	2.2	4.0	12.0	2.0	0.3	16.0
VQFP48C	1.75	7.5	2.2	4.0	12.0	2.0	0.3	16.0
VQFP64	1.75	11.5	2.2	4.0	16.0	2.0	0.3	24.0
VQFP80	1.75	11.5	2.15	4.0	16.0	2.0	0.3	24.0
VQFP100	1.75	11.5	1.9	4.0	20.0	2.0	0.3	24.0
Tolerance		±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.3

< Reel dimensions >

Package	Reel dimensions (all dimensions in mm)							
	A	B	C	D	E	W1	W2	
VQFP48	φ330	φ80	φ13.0	φ20.2	1.5	17.5	22.5	
VQFP48C	φ330	φ80	φ13.0	φ20.2	1.5	17.5	22.5	
VQFP64	φ330	φ100	φ13.0	φ20.2	1.5	25.5	30.5	
VQFP80	φ330	φ100	φ13.0	φ20.2	1.5	25.5	30.5	
VQFP100	φ330	φ100	φ13.0	φ20.2	1.5	25.5	30.5	
Tolerance		—	—	±0.2	MIN	MIN	±1.0	MAX

< Dehydrated weight >

Dehydrated weight dimensions in g
0.19
0.19
0.35
0.50
0.70

Notes

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