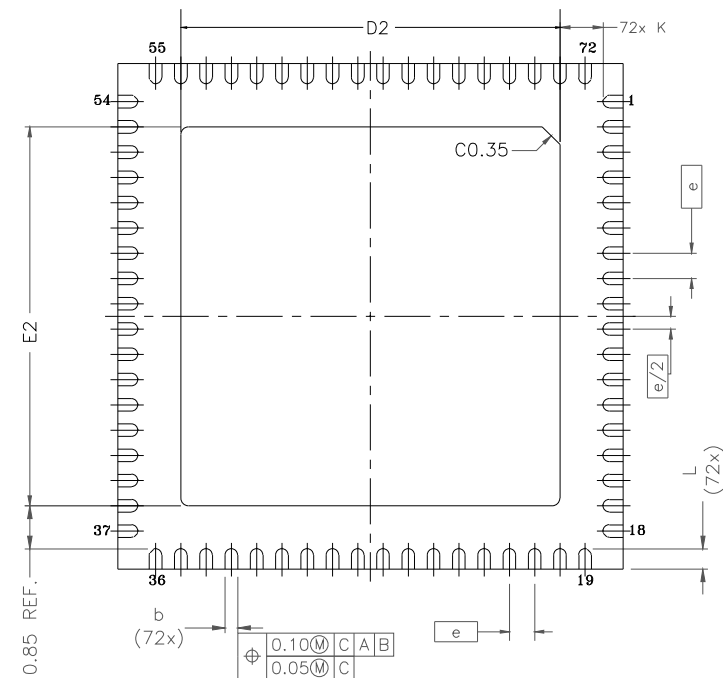


| DATE<br>CREATED                              | REVISIONS |                                     |        |
|----------------------------------------------|-----------|-------------------------------------|--------|
|                                              | REV       | DESCRIPTION                         | AUTHOR |
| 12/5/12                                      | 00        | INITIAL RELEASE.                    | RC     |
| 10/15/13                                     | 01        | ORGANIZE SAWN AND PUNCH DWG         | J.HUA  |
| 11/21/13                                     | 02        | ADD EPAD OPTION                     | J.HUA  |
| 12/12/13                                     | 03        | ADD LAND PATTERN DESCRIPTION        | J.HUA  |
| 3/6/14                                       | 04        | UPDATE "L" DIM ON PUNCH' TO MATCH   | J.HUA  |
| 3/2/17                                       | 05        | ADD EPAD OPTION                     | J.HUA  |
| 5/2/17                                       | 06        | CHANGE QFN TO VQFPFN                | J.HUA  |
| 9/3/19                                       | 07        | Update P1 Dim/ Punch to (D1 add S1) | J.HUA  |
| 7/30/21                                      | 08        | Update Dimensions of Wettable Flank | JHTAN  |
| NOTE: REFER TO DCP FOR OFFICIAL RELEASE DATE |           |                                     |        |



BOTTOM VIEW

1. ALL DIMENSIONING AND TOLERANCING CONFORM TO ANSI Y14.5M-1994
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. INDEX AREA (PIN1 IDENTIFIER)

|                                           |  |                                                                                       |  |                                                                                                     |              |
|-------------------------------------------|--|---------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------|--------------|
| TOLERANCES<br>UNLESS SPECIFIED            |  |  |  | 6024 Silver Creek Valley Road<br>San Jose, CA 95138<br>PHONE: (408) 284-8200<br>FAX: (408) 284-8591 |              |
| DECIMAL      ANGULAR<br>X±<br>XX±<br>XXX± |  | TITLE NL/NLG72 Package Outline Drawing<br>10.0X10.0 mm Body<br>0.50 mm Pitch VFQFPN   |  |                                                                                                     |              |
| SIZE<br><b>C</b>                          |  | DRAWING No.<br>PSC-4208                                                               |  |                                                                                                     | REV<br>08    |
| DO NOT SCALE DRAWING                      |  |                                                                                       |  |                                                                                                     | SHEET 1 OF 6 |

# SAWN OPTION (Q1) PAGE 2 OF 2

| DATE<br>CREATED                              | REV | REVISIONS                           |        |
|----------------------------------------------|-----|-------------------------------------|--------|
|                                              |     | DESCRIPTION                         | AUTHOR |
| 12/5/12                                      | 00  | INITIAL RELEASE.                    | RC     |
| 10/15/13                                     | 01  | ORGANIZE SAWN AND PUNCH DWG         | J.HUA  |
| 11/21/13                                     | 02  | ADD EPAD OPTION                     | J.HUA  |
| 12/12/13                                     | 03  | ADD LAND PATTERN DESCRIPTION        | J.HUA  |
| 3/6/14                                       | 04  | UPDATE "L" DIM on PUNCH" TO MATCH   | J.HUA  |
| 3/2/17                                       | 05  | ADD EPAD OPTION                     | J.HUA  |
| 5/2/17                                       | 06  | CHANGE QFN to VFQFPN                | J.HUA  |
| 9/3/19                                       | 07  | Update P1 Dim/ Punch to (D1 add S1) | J.HUA  |
| 7/30/21                                      | 08  | Update Dimensions of Wettable Flank | JHTAN  |
| NOTE: REFER TO DCP FOR OFFICIAL RELEASE DATE |     |                                     |        |

## EPAD OPTION:

| SYMBOL            | DIMENSION       |          |      | NOTE |
|-------------------|-----------------|----------|------|------|
|                   | MIN.            | NOM.     | MAX. |      |
| D2                | SEE EPAD OPTION |          |      |      |
| E2                | SEE EPAD OPTION |          |      |      |
| K                 | 0.20            | —        | —    |      |
| A2                | 0.00            | 0.65     | 1.00 |      |
| L                 | 0.30            | 0.40     | 0.50 |      |
| COMMON DIMENSIONS |                 |          |      |      |
| DIM<br>SYMBOL     | MIN             | NOM      | MAX  |      |
| A                 | 0.80            | 0.90     | 1.00 |      |
| A1                | 0               | 0.02     | 0.05 |      |
| A3 REF            | —               | 0.20 ref | —    |      |
| b                 | 0.18            | 0.25     | 0.30 |      |
| ⓐ                 | 0.50 BSC        |          |      |      |
| D                 | 10.00 BSC       |          |      |      |
| E                 | 10.00 BSC       |          |      |      |

| SYMBOL | P1   |      |      | P2   |      |      | P3   |      |      | P4   |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
|        | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| E2     | 5.80 | 5.95 | 6.10 | 7.40 | 7.50 | 7.60 | 8.30 | 8.40 | 8.50 | 7.60 | 7.70 | 7.80 |
| D2     | 5.80 | 5.95 | 6.10 | 7.40 | 7.50 | 7.60 | 8.30 | 8.40 | 8.50 | 7.60 | 7.70 | 7.80 |

| SYMBOL | S1   |      |      |
|--------|------|------|------|
|        | MIN. | NOM. | MAX. |
| E2     | 6.40 | 6.50 | 6.60 |
| D2     | 6.40 | 6.50 | 6.60 |

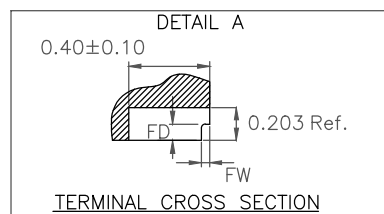


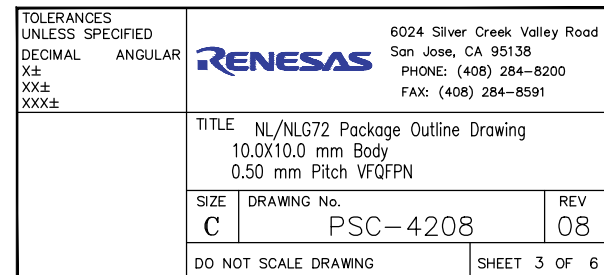
Table 1: Dimensions of wettable flank (DETAIL A)

| Symbol | Unit (mm) |       |
|--------|-----------|-------|
|        | MIN       | MAX   |
| FD     | 0.100     | —     |
| FW     | 0.001     | 0.075 |

|                                |         |                                                                                                                    |     |
|--------------------------------|---------|--------------------------------------------------------------------------------------------------------------------|-----|
| TOLERANCES<br>UNLESS SPECIFIED |         | 6024 Silver Creek Valley Road<br>San Jose, CA 95138<br><b>RENESAS</b> PHONE: (408) 284-8200<br>FAX: (408) 284-8591 |     |
| DECIMAL                        | ANGULAR | TITLE NL/NLG72 Package Outline Drawing<br>10.0X10.0 mm Body<br>0.50 mm Pitch VFQFPN                                |     |
| X±                             |         | SIZE                                                                                                               | REV |
| XX±                            |         | C                                                                                                                  | 08  |
| XXX±                           |         | DRAWING No. PSC-4208                                                                                               |     |
|                                |         | DO NOT SCALE DRAWING                                                                                               |     |
|                                |         | SHEET 2 OF 6                                                                                                       |     |

|                 |     | REVISIONS                            |        |
|-----------------|-----|--------------------------------------|--------|
| DATE<br>CREATED | REV | DESCRIPTION                          | AUTHOR |
| 12/5/12         | 00  | INITIAL RELEASE.                     | RC     |
| 10/15/13        | 01  | ORGANIZE SAWN AND PUNCH DWG          | J.HUA  |
| 11/21/13        | 02  | ADD EPAD OPTION                      | J.HUA  |
| 12/12/13        | 03  | ADD LAND PATTERN DESCRIPTION         | J.HUA  |
| 3/6/14          | 04  | UPDATE "L" DIM ON PUNCH* TO MATCH    | J.HUA  |
| 3/2/17          | 05  | ADD EPAD OPTION                      | J.HUA  |
| 5/2/17          | 06  | CHANGE QFN TO VQFPFN                 | J.HUA  |
| 9/3/19          | 07  | Update P1 Dim/ Punch to (D01 add S1) | J.HUA  |
| 7/30/21         | 08  | Update Dimensions of Wettable Flank  | J.HUAN |

NOTE: REFER TO DCP FOR OFFICIAL RELEASE DATE



# PUNCH OPTION (Q2) PAGE 2 OF 3

| DATE<br>CREATED                              | REVISIONS |                                     |        |
|----------------------------------------------|-----------|-------------------------------------|--------|
|                                              | REV       | DESCRIPTION                         | AUTHOR |
| 12/5/12                                      | 00        | INITIAL RELEASE.                    | RC     |
| 10/15/13                                     | 01        | ORGANIZE SAWN AND PUNCH DWG         | J.HUA  |
| 11/21/13                                     | 02        | ADD EPAD OPTION                     | J.HUA  |
| 12/12/13                                     | 03        | ADD LAND PATTERN DESCRIPTION        | J.HUA  |
| 3/6/14                                       | 04        | UPDATE "L" DIM on PUNCH' TO MATCH   | J.HUA  |
| 3/2/17                                       | 05        | ADD EPAD OPTION                     | J.HUA  |
| 5/2/17                                       | 06        | CHANGE QFN to VFQFPN                | J.HUA  |
| 9/3/19                                       | 07        | Update P1 Dim/ Punch to (D1 add S1) | J.HUA  |
| 7/30/21                                      | 08        | Update Dimensions of Wettable Flank | JHTAN  |
| NOTE: REFER TO DCP FOR OFFICIAL RELEASE DATE |           |                                     |        |

## EPAD OPTION:

| SYMBOL | DIMENSION       |      |      | NOTE |
|--------|-----------------|------|------|------|
|        | MIN.            | NOM. | MAX. |      |
| D2     | SEE EPAD OPTION |      |      |      |
| E2     | SEE EPAD OPTION |      |      |      |
| k      | 0.20            | —    | —    |      |
| N      |                 | 72   |      | 3    |
| Nd     |                 | 18   |      | 6    |
| Ne     |                 | 18   |      | 6    |
| A2     | 0.00            | 0.65 | 1.00 |      |
| L      | 0.30            | 0.40 | 0.50 |      |

### COMMON DIMENSIONS

| SYMBOL \ DIM   | MIN       | NOM      | MAX  |
|----------------|-----------|----------|------|
| A              | 0.80      | 0.90     | 1.00 |
| A1             | 0         | 0.02     | 0.05 |
| D1             | 9.75 BSC  |          |      |
| E1             | 9.75 BSC  |          |      |
| A3 REF         | —         | 0.20 ref | —    |
| Ø              | 0         | —        | 14   |
| T ref.         | —         | 0.45     | —    |
| R1             | —         | 0.20     | —    |
| R ref. b min/2 |           |          |      |
| NOTES          |           | 1,2      |      |
| b              | 0.18      | 0.25     | 0.30 |
| Ⓢ              | 0.50 BSC  |          |      |
| D              | 10.00 BSC |          |      |
| E              | 10.00 BSC |          |      |

| TOLERANCE OF FORM & POSITION |      |
|------------------------------|------|
| aaa                          | 0.15 |
| bbb                          | 0.10 |
| ccc                          | 0.10 |
| ddd                          | 0.05 |
| NOTES                        | 1,2  |

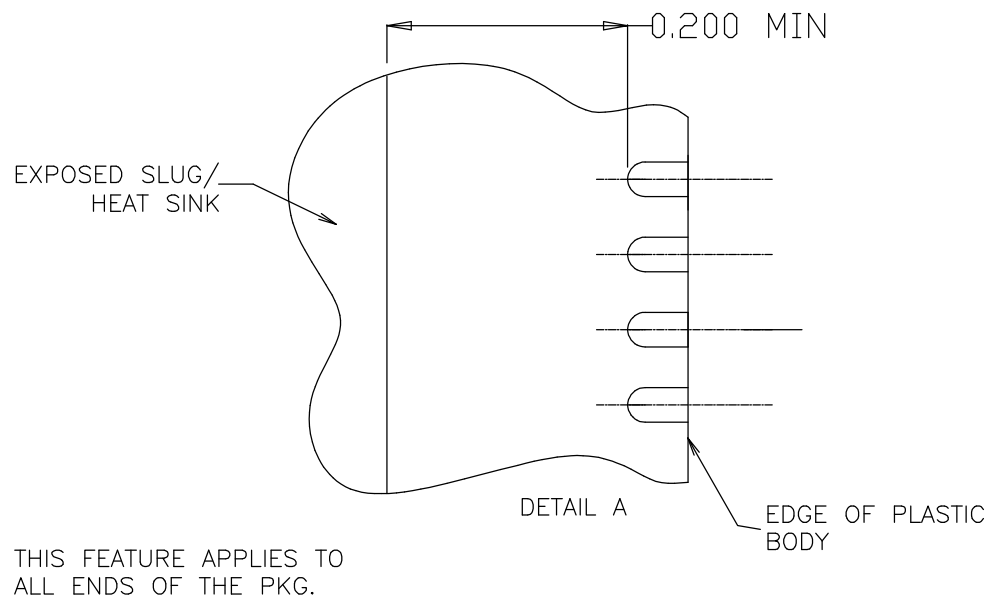
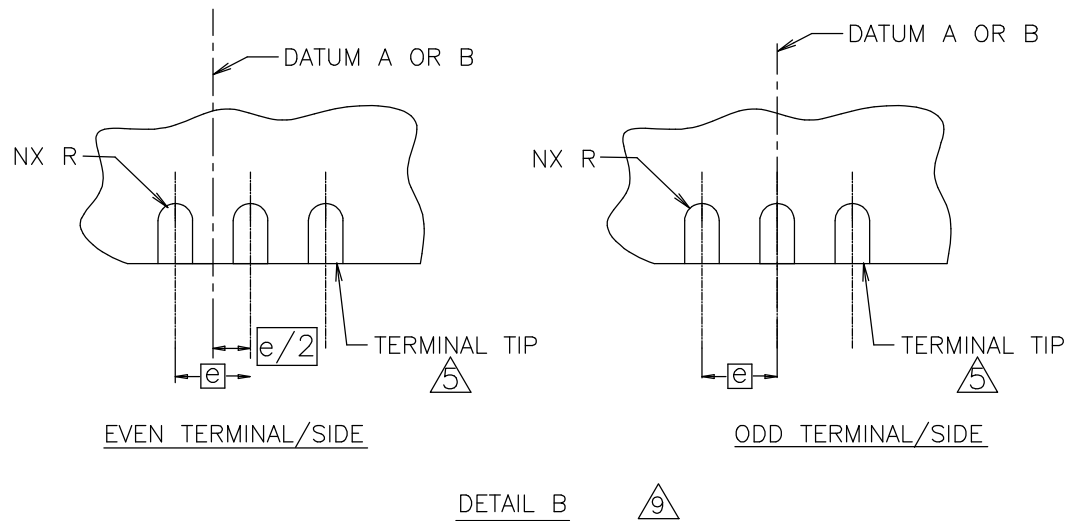
| SYMBOL | D1   |      |      |
|--------|------|------|------|
|        | MIN. | NOM. | MAX. |
| E2     | 5.80 | 5.90 | 6.00 |
| D2     | 5.80 | 5.90 | 6.00 |

### NOTES:

- DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.
- N IS THE TOTAL NUMBER OF TERMINALS.  
Nd IS THE NUMBER OF TERMINALS IN X-DIRECTION &  
Ne IS THE NUMBER OF TERMINALS IN Y-DIRECTION.
- THE TERMINAL #1 IDENTIFIER AND TERMINAL NUMBERING CONVENTION SHALL CONFORM TO JEDEC PUB. 95 SEC. 4.3 SPP-002. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL, BUT MUST BE LOCATED WITHIN THE ZONE INDICATED. THE TERMINAL #1 IDENTIFIER MAY BE EITHER A MOLD OR MARKED FEATURE.
- DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.25mm AND 0.30mm FROM TERMINAL TIP.
- ND AND NE REFER TO THE NUMBER OF TERMINALS ON EACH D AND E SIDE RESPECTIVELY.
- DEPOPULATION IS POSSIBLE IN A SYMMETRICAL FASHION.

|                                |         |                                                                                                                                                                                           |                                      |
|--------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| TOLERANCES<br>UNLESS SPECIFIED |         |  6024 Silver Creek Valley Road<br>San Jose, CA 95138<br>PHONE: (408) 284-8200<br>FAX: (408) 284-8591 |                                      |
| DECIMAL                        | ANGULAR |                                                                                                                                                                                           |                                      |
| X±                             |         | TITLE NL/NLG72 Package Outline Drawing<br>10.0X10.0 mm Body<br>0.50 mm Pitch VFQFPN                                                                                                       |                                      |
| XX±                            |         |                                                                                                                                                                                           |                                      |
| XXX±                           |         | SIZE<br>C                                                                                                                                                                                 | DRAWING No.<br>PSC-4208<br>REV<br>08 |
| DO NOT SCALE DRAWING           |         | SHEET 4 OF 6                                                                                                                                                                              |                                      |

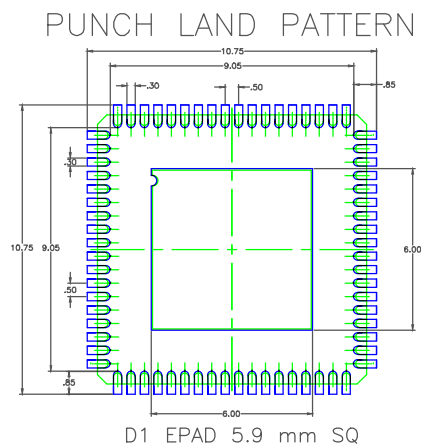
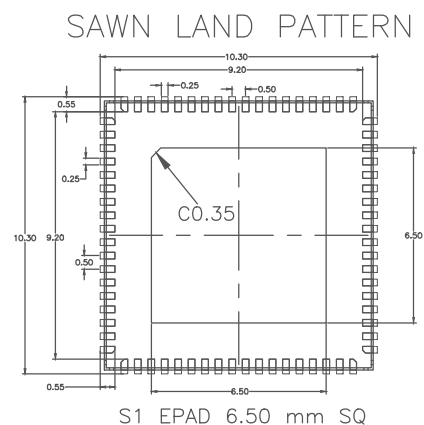
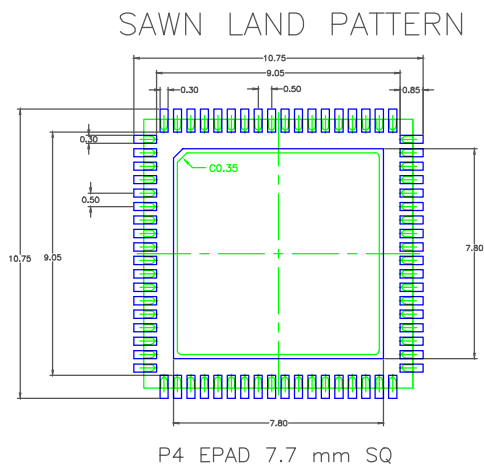
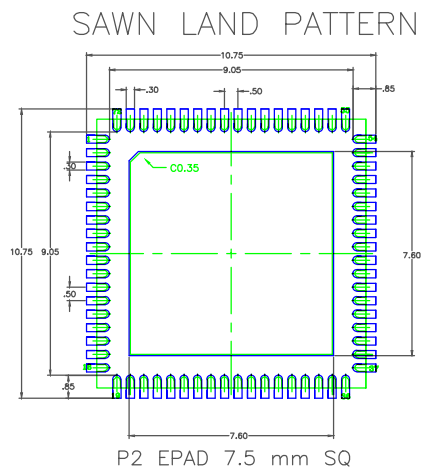
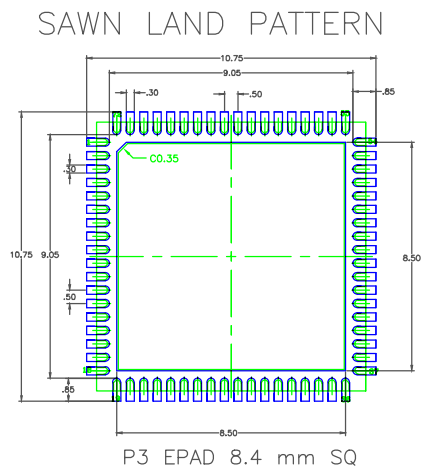
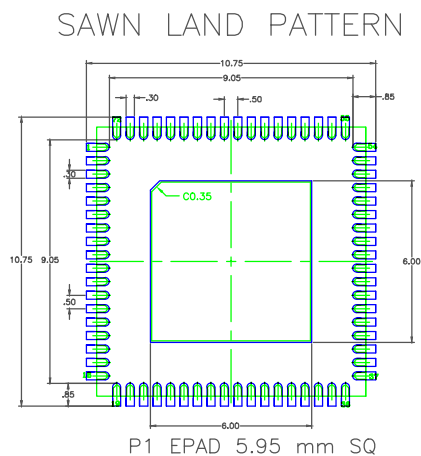
# PUNCH OPTION (Q2) PAGE 3 OF 3



| DATE<br>CREATED | REV | REVISIONS                           |        |
|-----------------|-----|-------------------------------------|--------|
|                 |     | DESCRIPTION                         | AUTHOR |
| 12/5/12         | 00  | INITIAL RELEASE.                    | RC     |
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| 12/12/13        | 03  | ADD LAND PATTERN DESCRIPTION        | J.HUA  |
| 3/6/14          | 04  | UPDATE "L" DIM on PUNCH TO MATCH    | J.HUA  |
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| 5/2/17          | 06  | CHANGE QFN to VQFPN                 | J.HUA  |
| 9/3/19          | 07  | Update P1 Dim/ Punch to (D1 add S1) | J.HUA  |
| 7/30/21         | 08  | Update Dimensions of Wettable Flank | JHTAN  |

NOTE: REFER TO DCP FOR OFFICIAL RELEASE DATE

|                                                                                   |                         |                                                                                                                    |  |
|-----------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------|--|
| <b>TOLERANCES<br/>UNLESS SPECIFIED</b><br>DECIMAL    ANGULAR<br>X±<br>XX±<br>XXX± |                         | 6024 Silver Creek Valley Road<br>San Jose, CA 95138<br><b>RENESAS</b> PHONE: (408) 284-8200<br>FAX: (408) 284-8591 |  |
|                                                                                   |                         | TITLE NL/NLG72 Package Outline Drawing<br>10.0X10.0 mm Body<br>0.50 mm Pitch VQFPN                                 |  |
| SIZE<br><b>C</b>                                                                  | DRAWING No.<br>PSC-4208 | REV<br>08                                                                                                          |  |
| DO NOT SCALE DRAWING                                                              |                         | SHEET 5 OF 6                                                                                                       |  |



# RECOMMENDED LAND PATTERN DIMENSION

## NOTES:

1. ALL DIMENSION ARE IN mm. ANGLES IN DEGREES.
2. TOP DOWN VIEW. AS VIEWED ON PCB.
3. COMPONENT OUTLINE SHOW FOR REFERENCE IN GREEN.
4. LAND PATTERN IN BLUE. NSMD PATTERN ASSUMED.
5. LAND PATTERN RECOMMENDATION PER IPC-7351B GENERIC REQUIREMENT FOR SURFACE MOUNT DESIGN AND LAND PATTERN.

| DATE<br>CREATED | REVISIONS |                                     |        |
|-----------------|-----------|-------------------------------------|--------|
|                 | REV       | DESCRIPTION                         | AUTHOR |
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| 5/2/17          | 06        | CHANGE QFN to VFQFPN                | J.HUA  |
| 9/3/19          | 07        | Update P1 Dim/ Punch to (D1 add S1) | J.HUA  |
| 7/30/21         | 08        | Update Dimensions of Writable Flank | JHTAN  |

NOTE: REFER TO DCP FOR OFFICIAL RELEASE DATE

|                                |         |                                                                                                                       |     |
|--------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------|-----|
| TOLERANCES<br>UNLESS SPECIFIED |         | <b>RENESAS</b><br>6024 Silver Creek Valley Road<br>San Jose, CA 95138<br>PHONE: (408) 284-8200<br>FAX: (408) 284-8591 |     |
| DECIMAL                        | ANGULAR |                                                                                                                       |     |
| X±                             |         | TITLE NL/NLG72 Package Outline Drawing<br>10.0X10.0 mm Body<br>0.50 mm Pitch VFQFPN                                   |     |
| XX±                            |         |                                                                                                                       |     |
| XXX±                           |         | SIZE                                                                                                                  | REV |
|                                |         | C                                                                                                                     | 08  |
| DO NOT SCALE DRAWING           |         | SHEET 6 OF 6                                                                                                          |     |