

Packaging

Tape and Reel Specification for Integrated Circuits

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Introduction

Many Surface Mounted Devices (SMDs) are packaged for shipment in embossed tape and wound onto reels. The Renesas tape and reel specifications comply with the Electronics Industries Association (EIA) standards for "Embossed Carrier Taping of Surface Mount Components for Automatic Handling".

- EIA-481 for 8, 12, 16, 24, 32, 44, and 56mm Wide Tape

(Except the orientation of square package)

Renesas now supplies many different SMDs in tape and reel, as shown in [Table 1](#).

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|----------------------------------|------------------------|------------------------|------------------------|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| xxxxxx-T7A | Note 4 | Note 5 | 250 | 7&2.4 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 |
| xxxxxx-T7 | Note 4 | Note 5 | Note 5 | 7&2.4 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 |
| xxxxxx-TK | Note 4 | Note 5 | 1000 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 | Note 5 |
| SOIC(N) (SOPN) | 8 | 0.155x0.194in | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| SOIC(N) (SOPN) | 14 | 0.155x0.342in | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| SOIC(N) (SOPN) | 16 | 0.155x0.391in | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| SOIC(W) (SOPW) | 16 | 0.296x0.407in | 1000/250 | 13&4/7&2.4 | 34 | 420mm | 45 | 552mm | 16mm | 12mm |
| SOIC(W) (SOPW) | 18 | 0.296x0.456in | 1000 | 13&4 | 34 | 420mm | 45 | 552mm | 24mm | 12mm |
| SOIC(W) (SOPW) | 20 | 0.296x0.506in | 1000 | 13&4 | 34 | 420mm | 45 | 552mm | 24mm | 12mm |
| SOIC(W) (SOPW) | 24 | 0.296x0.606in | 1000 | 13&4 | 34 | 420mm | 45 | 552mm | 24mm | 12mm |
| SOIC(W) (SOPW) (or EPSOIC) | 28 | 0.296x0.706in | 1000 | 13&4 | 34 | 420mm | 45 | 552mm | 24mm | 12mm |
| EIAJ SOIC | 8 | 0.217x0.217in | 2,500 | 13&4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| MSOP | 8/10 | 3.0x3.0mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TSSOP | 8 | 4.4x3.0mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TSSOP (or EPTSSOP) | 14/16 | 4.4x5.0mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TSSOP (Custom) | 14/16 | 4.4x5.0mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| TSSOP | 20 | 4.4x6.5mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| TSSOP (or EPTSSOP) | 24 | 4.4x7.8mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| TSSOP (or EPTSSOP) | 28/38 | 4.4x9.7mm | 2500/1000/ 250 | 13&4/13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|--------------------|------------|----------------------|-----------------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| TSSOP | 48 | 12.5x6.1mm | 1000 | 13&4 | 50 | 600mm | 50 | 600mm | 24mm | 12mm |
| QSOP (SSOP) | 16 | 0.155x0.194in | 2500/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QSOP (SSOP) | 20/24 | 0.155x0.342in | 2500/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| QSOP (SSOP) | 28 | 0.155x0.391in | 2500/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| SSOP | 16 | 0.209x0.244in | 1000/ 250 | 13&4/ 7&2.4 | 24 | 420mm | 45 | 552mm | 16mm | 12mm |
| SSOP | 20 | 0.209x0.284in | 1000/ 250 | 13&4/ 7&2.4 | 34 | 420mm | 45 | 552mm | 16mm | 12mm |
| SSOP | 24 | 0.209x0.323in | 1000/ 250 | 13&4/ 7&2.4 | 34 | 420mm | 45 | 552mm | 16mm | 12mm |
| SSOP | 28 | 0.209x0.402in | 1000 | 13&4 | 34 | 420mm | 45 | 552mm | 24mm | 12mm |
| PLCC | 20 | 0.350x0.350in | 1000 | 13&4 | 53 | 660mm | 64 | 792mm | 16mm | 12mm |
| PLCC | 28 | 0.450x0.450in | 750 | 13&4 | 15 | 256mm | 25 | 416mm | 24mm | 16mm |
| PLCC | 32 | 0.450x0.550in | 750 | 13&4 | 15 | 256mm | 25 | 416mm | 24mm | 16mm |
| PLCC | 44 | 0.650x0.650in | 500 | 13&4 | 15 | 384mm | 25 | 624mm | 32mm | 24mm |
| PLCC | 68 | 0.950x0.950in | 250 | 13&6 | 25 | 832mm | 25 | 832mm | 44mm | 32mm |
| PLCC | 84 | 1.150x1.150in | 200 | 13&6 | 25 | 936mm | 25 | 936mm | 44mm | 36mm |
| TQFP | 32 | 5x5x1.0mm | 2000/ 1000 | 13&6/ 13&6 | 33 | 400mm | 33 | 400mm | 16mm | 12mm |
| TQFP/EPAD TQFP | 32/48 | 7x7x1.0mm | 1000 | 13&6 | 34 | 420mm | 45 | 552mm | 16mm | 12mm |
| TQFP/EPAD | 64/44 | 10x10x1.0mm | 1000 | 13&4 | 26 | 420mm | 35 | 552mm | 24mm | 16mm |
| TQFP | 64/44 | 10x10x1.0mm | 1000 | 13&6 | 25 | 400mm | 30 | 480mm | 24mm | 16mm |
| TQFP | 80 | 14x14x1.0mm | 1000 | 13&4 | 10 | 240mm | 20 | 480mm | 24mm | 24mm |
| TQFP (Note 6) | 80 | 12x12x1.0mm | 1000 | 13&4 | 25 | 600mm | 25 | 600mm | 24mm | 24mm |
| TQFP | 100 | 12x12x1.0mm | 1000 | 13&4 | 50 | 1200mm | 50 | 1200mm | 24mm | 24mm |
| LQFP | 48 | 7x7x1.4mm | 1000 | 13&6 | 34 | 420mm | 45 | 552mm | 16mm | 12mm |
| LQFP | 80 | 10x10x1.4mm | 1000 | 13&4 | 25 | 400mm | 30 | 480mm | 24mm | 16mm |
| LQFP | 80/128 | 14x14x1.4mm | 500 | 13&4 | 21 | 420mm | 28 | 552mm | 32mm | 24mm |
| LQFP | 128 | 14x20x1.4mm | 1000 | 13&4 | 10 | 160mm | 20 | 390mm | 44mm | 24mm |
| LQFP (Note 6) | 128 | 14x20x1.4mm | 500 | 13&4 | 25 | 600mm | 25 | 600mm | 44mm | 24mm |
| LQFP (or PQLQP) | 144 | 20x20x1.4mm | 600 | 13&6 | 15 | 320mm | 25 | 640mm | 44mm | 32mm |
| LQFP | 160 | 24x24x1.4mm | 500 | 13&6 | 20 | 640mm | 20 | 640mm | 44mm | 32mm |
| LQFP | 208 | 28x28x1.4mm | 500 | 13&6 | 10 | 360mm | 20 | 720mm | 44mm | 36mm |
| MQFP | 44 | 10x10x2.0mm | 500 | 13&6 | 25 | 624mm | 25 | 624mm | 24mm | 24mm |
| MQFP | 80 | 14x20x2.7mm | 500 | 13&6 | 10 | 193mm | 20 | 385mm | 44mm | 24mm |
| QFP | 128 | 14x20x2.72mm | 500 | 13&6 | 25 | 600mm | 25 | 600mm | 44mm | 24mm |
| PBGA (fBGA) | 160/196 | 12x12x1.4mm | 1000 | 13&6 | 25 | 400mm | 30 | 480mm | 24mm | 16mm |
| PBGA (fBGA) | 192 | 14x14x1.32mm | 1000 | 13&6 | 10 | 240mm | 20 | 480mm | 24mm | 24mm |
| PBGA (fBGA) | 196 | 15x15x1.4mm | 750 | 13&6 | 10 | 240mm | 20 | 480mm | 24mm | 24mm |
| PBGA (fBGA) | 256/316 | 17x17x1.4mm | 500 | 13&6 | 10 | 240mm | 20 | 480mm | 24mm | 24mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|-----------------------|------------|----------------------|-----------------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| TFBGA | 35 | 4.7x6.3x1.06mm | 3000/250 | 13&4/7&2.4 | 70 | 560mm | 70 | 560mm | 16mm | 8mm |
| TFBGA (Note 6) | 144 | 7x7x1.2mm | 2500 | 13&4 | 50 | 600mm | 50 | 600mm | 16mm | 12mm |
| TFBGA (Note 6) | 144 | 7x7x1.3mm | 2500 | 13&4 | 50 | 600mm | 50 | 600mm | 16mm | 12mm |
| LFBGA | 60 | 5.71x8.46x1.216mm | 2500/250 | 13&4/7X2.4 | 70 | 560mm | 70 | 560mm | 16mm | 12mm |
| LGA | 10 | 3x3x1.7mm | 6000 | 13&4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TDFN | Note 4 | 1.6x1.6x0.75mm | 1000/ 250 | 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| TDFN | Note 4 | 2.0x2.0x0.75mm | 1000/ 250 | 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| TDFN (13" Packing) | Note 4 | 2.0x2.0x0.75mm | 6000 | 13&4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| TDFN | 22 | 3.0x6.0x0.75mm | 6000/250 | 13&4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| TDFN | Note 4 | 2x3x0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TDFN | Note 4 | 3x3x0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TDFN | Note 4 | 4x3x0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TDFN | Note 4 | 4x4x0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| TDFN | Note 4 | 5x3x0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN | Note 4 | 2x2x0.9mm | 6000/ 250 | 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN | Note 4 | 2x3x0.9mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN | Note 4 | 3x3x0.9mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN | Note 4 | 4x3x0.9mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN | Note 4 | 4x4x0.9mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN | Note 4 | 4x5.5x1.3mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| DFN/TDFN | Note 4 | 5x3x0.9/ 0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/TQFN | Note 4 | 3x3x0.9/ 0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|-----------------------|------------|-------------------------|------------------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| QFN (Note 7) | Note 4 | 3x3x0.9mm | 6000/ 1000/ 100 | 13&4/ 13&4/ 7&2.4 | 20 | 160mm | 50 | 400mm | 12mm | 8mm |
| QFN (Note 8) | Note 4 | 3x3x0.9mm | 1000/ 100 | 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/TQFN | Note 4 | 3x4x0.9/ 0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/TQFN | Note 4 | 3.5x3.5x0.9/ 0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/TQFN/ FCQFN | Note 4 | 4x4x0.9/0.75/ 0.85mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/TQFN | Note 4 | 4x5x0.9/ 0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/TQFN | Note 4 | 4x6x0.9/ 0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |
| QFN (Note 8) | Note 4 | 4x7x0.9mm | 1000/ 100 | 13&4/ 13&4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| TQFN | Note 4 | 4.5x6.5x0.75mm | 3000/ 2500 | 7&2.4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 16mm | 8mm |
| QFN | 22 | 4.5x7.5x1.9mm | 3000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 50 | 400mm | 50 | 400mm | 16mm | 8mm |
| QFN/TQFN | Note 4 | 5x5x0.9/0.75mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| QFN/WFQFN (Note 7) | Note 4 | 5x5x0.9mm | 6000/ 1000/ 100 | 13&4/ 13&4/ 7&2.4 | 20 | 160mm | 50 | 400mm | 12mm | 8mm |
| QFN | 32/39 | 5x6x0.9/0.75mm | 6000/ 2500/ 1000 | 13&4/ 13&4/ 7&2.4 | 100 | 800mm | 100 | 800mm | 12mm | 8mm |
| QFN/TQFN | Note 4 | 5x7x0.9/ 0.75mm | 2500/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 20 | 160mm | 48 | 390mm | 16mm | 8mm |
| QFN/TQFN | Note 4 | 5x10x0.9/ 0.75mm | 4000/ 1000 | 13&4/ 13&4 | 34 | 408mm | 45 | 540mm | 24mm | 12mm |
| QFN/TQFN | Note 4 | 6x4x0.9/ 0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |
| QFN | 23 | 6.5x9.0x1.95mm | 1000/ 250 | 13&4/ 7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |
| QFN/TQFN | Note 4 | 6x6x0.9/ 0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |
| QFN (Note 7) | Note 4 | 6x6x0.9mm | 1000/ 100 | 13&4/ 7&2.4 | 14 | 168mm | 34 | 408mm | 16mm | 12mm |
| QFN/TQFN | Note 4 | 7x7x0.9/ 0.75mm | 4000/3000 1000/250 | 13&4/13&4 13&4/7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|------------------------|------------|----------------------|-----------------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| QFN (Note 6) | Note 4 | 7x7x0.9mm | 3000 | 13&4 | 15 | 180mm | 35 | 420mm | 16mm | 12mm |
| QFN/TQFN | Note 4 | 8x8x0.9/ 0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |
| QFN/TQFN | Note 4 | 9x9x0.9/ 0.75mm | 4000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 34 | 408mm | 45 | 540mm | 16mm | 12mm |
| QFN/TQFN | Note 4 | 10x10x0.9/0.75mm | 3000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 26 | 416mm | 34 | 544mm | 24mm | 16mm |
| QFN/HDA | Note 4 | 15x15x3.5/2.2mm | 500 | 13&4 | 20 | 400mm | 20 | 400mm | 24mm | 20mm |
| QFN/HDA | Note 4 | 15x15x3.6mm | 500 | 13&4 | 20 | 400mm | 20 | 400mm | 24mm | 20mm |
| QFN/HDA (Punch QFN) | 26 | 17x17x7.5mm | 250 | 13&4 | 10 | 240mm | 20 | 480mm | 24mm | 24mm |
| QFN/HDA | 27 | 17.2x11.45x2.5mm | 1000 | 13&4 | 10 | 200mm | 20 | 400mm | 24mm | 20mm |
| QFN/HDA | 22 | 19.0x13.0x5.3mm | 350 | 13&4 | 10 | 240mm | 20 | 480mm | 32mm | 24mm |
| QFN/HDA | 35 | 12.0x11.0x5.2mm | 500 | 13&4 | 26 | 416mm | 34 | 544mm | 24mm | 16mm |
| QFN/HDA | 40 | 17.0x19.0x3.55mm | 500 | 13&4 | 10 | 240mm | 20 | 480mm | 32mm | 24mm |
| QFN/HDA | 42/58 | 18.0x23.0x7.5mm | 100 | 13&4 | 10 | 240mm | 20 | 480mm | 44mm | 24mm |
| X2QFN | 28 | 4x5x0.38mm | 6000 | 13&4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| aQFN | 69 | 5x5x0.85mm | 1000/ 100 | 7&2.4/ 7&2.4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| WFQFN | 40 | 6.0x6.0x0.85mm | 4000/ 1000 | 13&4/ 13&4 | 34 | 420mm | 45 | 552mm | 16mm | 12mm |
| MO-169 (TO-262) | 3/7 | 0.400x0.415in | 800 | 13&4 | 50 | 800mm | 50 | 800mm | 24mm | 16mm |
| SOT-23 | 3 | 0.051x0.115in | 3000/ 1000 | 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |
| SOT-23 | 5/6/8 | 0.065x0.115in | 3000/ 1000 | 7&2.4/ 7&2.4 | 63 | 250mm | 126 | 500mm | 8mm | 4mm |
| SC70 | 3 | 0.049x0.079in | 3000/ 1000 | 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |
| SC70 | 5/6 | 0.049x0.079in | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 4 | 1.16x0.98mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 6 | 1.36x0.8mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 6 | 1.36x0.865mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 6 | 1.0x1.5mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 8 | 1.0x1.8mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 9 | 1.28x1.36mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 9 | 1.45x1.45mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 9 | 1.32x1.54mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|--------------|------------|----------------------|----------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| WLCSP | 9 | 1.41x1.41mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 9 | 1.425x1.425mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 10 | 1.02x2.02mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 12 | 1.29x1.69mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 12 | 1.48x1.98mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 12 | 1.39x1.69mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 12 | 1.70x1.30mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 15 | 1.51x2.15mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 16 | 1.655x1.655mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 16 | 1.74x1.74mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 16 | 1.78x1.78mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 16 | 2.16x2.16mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 20 | 2.55x2.05mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 20 | 1.595x2.335mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 20 | 1.72x2.335mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP | 20 | 1.74x2.15mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP | 20 | 1.82x2.15mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 20 | 2.07x1.67mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 20 | 1.64x2.18mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 20/24 | 1.60x2.40mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 25 | 2.11x2.13mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 25 | 2.13x2.11mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 25 | 2.34x2.38mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 25 | 2.33x2.07mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 25 | 2.64x2.64mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|--------------|------------|----------------------|-------------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| WLCSP | 28 | 1.66x2.86mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP | 28 | 2.92x2.185mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP (8mm) | 30 | 2.33x2.61mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 30 | 2.33x2.61mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP | 35 | 2.14x2.88mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 35 | 3.67x2.551mm | 3000/1000 | 7&2.4/ 7&2.4 | 200 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 36 | 2.41x2.41mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 36 | 2.53x2.53mm | 3000/1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |
| WLCSP | 40 | 3.26x2.06m | 3000 | 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP | 40 | 3.27x2.01mm | 3000/1000 | 7&2.4/ 7&2.4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 42 | 2.80 x 3.20mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 42 | 2.57x2.919mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 46 | 2.82x3.31mm | 3000/ 1000 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 12mm | 4mm |
| WLCSP | 48 | 2.55x3.36mm | 3000 | 13&4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 52 | 3.14x3.54mm | 3000/ 1000 | 13&4/ 7&2.4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 54 | 3.67x2.551mm | 3000/ 1000 | 13&4/ 7&2.4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 56 | 3.11x3.21mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 56 | 3.22x3.37mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 62 | 3.69x3.69mm | 3000/1000/ 250 | 13&4/ 7&2.4/ 7&2.4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 64 | 4.0025x4.0025mm | 3000 | 13&4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 64 | 4.04x4.04mm | 3000/ 1000 | 13&4/ 7&2.4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 72 | 3.27x3.67mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 72 | 3.54x3.94mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 72 | 3.608x4.009mm | 3000/ 1000 | 13&4/ 7&2.4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 72 | 4.00x4.50mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 90 | 3.74x4.14mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 96 | 4.025x6.105mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 99 | 4.00x4.80mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 108 | 4.00x5.20mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| WLCSP | 121 | 5.526x5.540mm | 3000 | 13/4 | 250 | 2000mm | 150 | 1200mm | 12mm | 8mm |
| OCSF | 9 | 2.13x2.13mm | 2,500 | 7&2.4/ 7&2.4 | 95 | 380mm | 125 | 500mm | 8mm | 4mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|--------------|------------|----------------------|------------------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| μTDFN | 6 | 1.2x1.0x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTDFN | 6 | 1.6x1.6x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTDFN | 8 | 2.0x2.0x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTQFN | 8 | 1.4x1.2x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTQFN | 8 | 2.0x3.0x0.50mm | 6000/ 1000/ 250 | 13&4/ 13&4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTQFN | 10 | 1.8x1.4x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 12mm | 4mm |
| μTQFN | 10 | 2.1x1.6x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTQFN | 12 | 2.2x1.4x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTQFN | 16 | 2.6x1.8x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| μTQFN | 20 | 3.2x1.8x0.50mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 100 | 400mm | 100 | 400mm | 8mm | 4mm |
| PQFN | 32 | 5x5x0.63 mm | 6000 | 13&4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| PQFN | 32 | 5x5x0.77 mm | 6000 | 13&4 | 77 | 616mm | 77 | 616mm | 12mm | 8mm |
| PQFN | 39 | 5x6x0.75 mm | 6000/ 2500/ 1000 | 13&4/ 13&4/ 7&2.4 | 100 | 800mm | 100 | 800mm | 12mm | 8mm |
| ODFN | 4 | 1.5x1.5x0.70mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |
| ODFN | 4 | 2.01x1.25x1.0mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |
| ODFN | 6 | 1.5x1.6x0.70mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |
| ODFN | 5/6/8 | 2.0x2.1x0.70mm | 3000/ 1000/ 250 | 7&2.4/ 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |
| ODFN | 10 | 2.1x3.5x0.65mm | 1000/ 250 | 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 12mm | 4mm |
| ODFN | 8 | 3.0x3.0x0.70mm | 1000/ 250 | 7&2.4/ 7&2.4 | 40 | 160mm | 100 | 400mm | 8mm | 4mm |

TABLE 1. PACKAGE AND TAPE SPECIFICATIONS (Continued)

| PACKAGE TYPE | # OF LEADS | NOMINAL PACKAGE SIZE | UNITS PER REEL | REEL AND HUB SIZE (Note 3) | TRAILER "A" | | LEADER "B" | | POCKET TAPE | |
|--------------|------------|----------------------|----------------|-------------------------------|-------------|--------|------------|--------|-------------|------------|
| | | | | | POCKETS | LENGTH | POCKETS | LENGTH | WIDTH | PITCH (P1) |
| ODFN | 8 | 2.36x2.94x1.35mm | 1000/ 250 | 7&2.4/ 7&2.4 | 40 | 320mm | 100 | 800mm | 12mm | 8mm |

NOTES:

1. Pocket count and trailer and leader lengths are nominal counts/dimensions.
2. Package size in inches (unless otherwise indicated).
3. Reel and hub size; Example: 13&4 = 13 inch reel with 4 inch hub.
4. Multiple lead counts.
5. Dependent upon the specific package type. Reference specific package type and number of leads in [Table 1](#) for additional information.
6. Products starting with "TW"
7. Products starting with "ZL"
8. Products starting with "Q"

General Information

The Renesas tape and reel packing system protects the product from mechanical and electrical damage and is designed for automatic pick-and-place equipment.

The tape and reel packing system consists of a pocket carrier tape sealed with protective cover tape to hold the devices in place.

The devices are loaded into the carrier pockets with leads down.

The tape is wound onto a plastic reel for labeling and then packaged for shipment.

All tape sizes are supplied on 7inch and 13inch diameter reels.

The conductive carrier tape and antistatic coated transparent cover tape and reel provide ESD protection.

Information labels, ESD labels, and barcode labels (if required) are placed on each reel.

Transparent cover tape allows device verification and brand inspection without having to remove or handle components.

No more than two date codes are combined on any one reel.

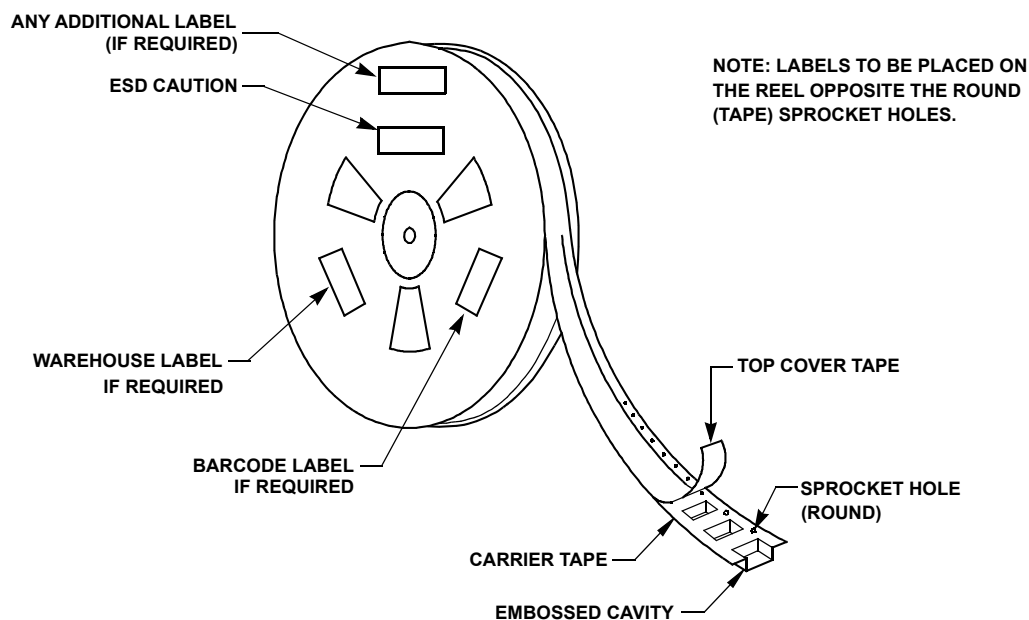


FIGURE 1. TAPE/REEL AND LABEL INFORMATION

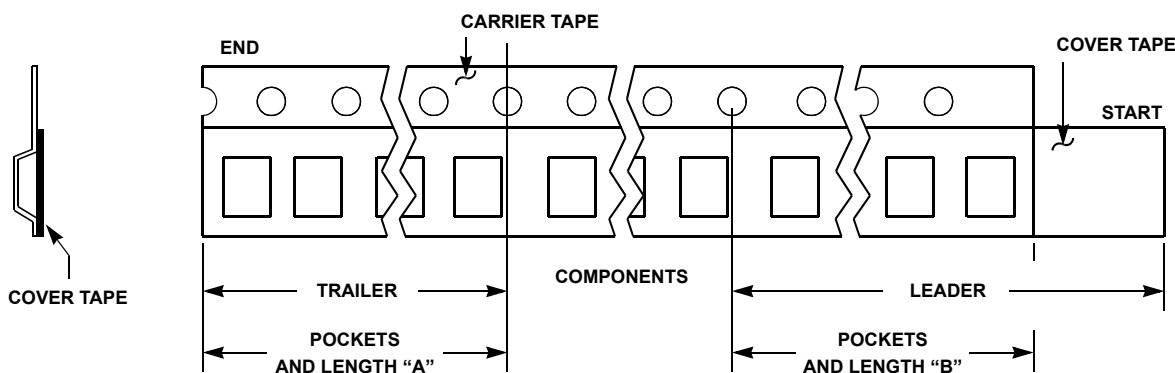


FIGURE 2. TAPE LEADER AND TRAILER

Materials and Design

Carrier Tape

The pocketed carrier tape is made of conductive polystyrene plus carbon material (or equivalent). The surface resistivity is $10^6 \Omega/\text{sq.}$ maximum.

Pocket tapes are designed so that the components remain in position for automatic handling after the cover tape is removed.

Each pocket has a hole in the center for automated sensing of whether the pocket is occupied, thus facilitating device removal.

Sprocket holes along the edge of the carrier tape enable direct feeding into automated board assembly equipment.

See [Figures 3](#) and [4](#) for carrier tape dimensions.

Cover Tape

The cover tape is made of antistatic transparent polyester film.

The surface resistivity is less than $10^{10} \Omega/\text{sq.}$ maximum.

The cover tape is heat-sealed or pressure sealed to the edges of the carrier tape to encase the devices in the pockets.

The force to peel back the cover tape from the carrier tape shall be a mean value of 30gm to 80gm (0.3N to 0.8N).

Reel

The device loading orientation is in compliance with EIA-481 (see [Figure 5](#)).

The loaded carrier tape is wound onto a reel that is uniformly sized for all packages (see [Figure 6](#)).

The reel is made of antistatic high impact polystyrene. The surface resistivity is less than $10^{10} \Omega/\text{sq.}$ maximum.

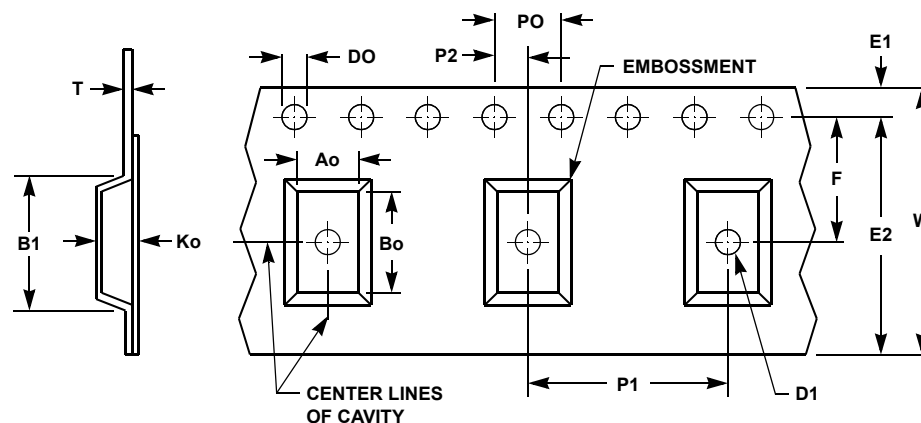


FIGURE 3. CONFIGURATION DRAWING FOR 8, 12, 16, 24MM POCKET TAPE

| W (NOMINAL) TAPE WIDTH | B1 (MAXIMUM) (Note 14) | F (NOMINAL) | E2 (MINIMUM) |
|------------------------|------------------------|----------------|-----------------|
| 8mm (0.315in) | 4.35 (0.171in) | 3.5 (0.138in) | 6.25 (0.246in) |
| 12mm (0.472in) | 8.2 (0.323in) | 5.5 (0.217in) | 10.25 (0.404in) |
| 16mm (0.629in) | 12.1 (0.476in) | 7.5 (0.295in) | 14.25 (0.561in) |
| 24mm (0.945in) | 20.1 (0.791in) | 11.5 (0.453in) | 22.25 (0.876in) |

NOTES:

9. Dimensions are in millimeters and are nominal unless otherwise indicated (inches are in parentheses for reference only).
10. "T" dimension, nominal 0.30 or 0.35.
11. "P1" cavity pitch is 4.0mm minimum and increases in 4.0mm increments depending on package size, (see [Table 1](#)).
12. "P0" dimension is 4.0mm.
13. "P2" dimension is 2.0mm.
14. "B1" actual dimension is determined by package size.
15. "D1" diameter is 1.5mm minimum.
16. "Do" diameter is 1.5mm.
17. "E1" dimension is 1.75mm.
18. "Ao", "Bo", "Ko" dimensions determined by component size.

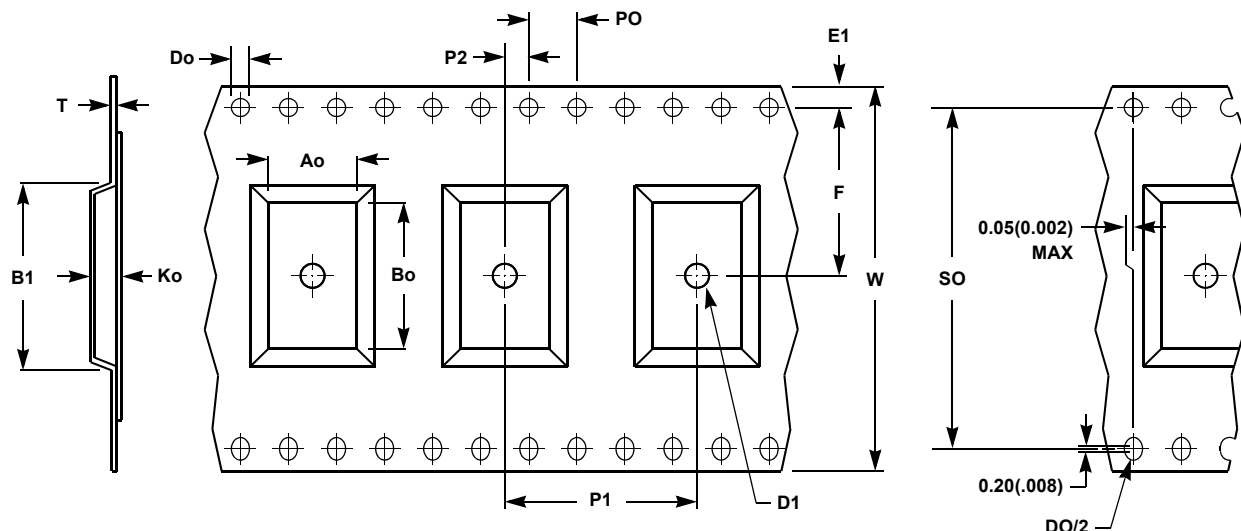


FIGURE 4. CONFIGURATION DRAWING FOR 32MM AND 44MM POCKET TAPE

| W (NOMINAL) TAPE WIDTH | B1 (MAXIMUM) (Note 24) | F (NOMINAL) | SO (NOMINAL) |
|------------------------|---|----------------|----------------|
| 32mm (1.260in) | 23.0 (0.906in) | 14.2 (0.559in) | 28.4 (1.118in) |
| 44mm (1.732in) | 35.0 (1.378in) | 20.2 (0.795in) | 40.4 (1.591in) |

NOTES:

- 19. Dimensions are in millimeters and are nominal unless otherwise indicated (inches are in parentheses for reference only).
- 20. "T" dimension, nominal 0.30 or 0.35.
- 21. "P1" cavity pitch is 8.0mm minimum and increases in 4.0mm increments depending on package size, (see [Table 1](#)).
- 22. "P0" dimension is 4.0mm.
- 23. "P2" dimension is 2.0mm.
- 24. "B1" actual dimension is determined by package size.
- 25. "D1" diameter is 2.0mm minimum.
- 26. "Do" diameter is 1.5mm.
- 27. "E1" dimension is 1.75mm.
- 28. "Ao", "Bo", "Ko" dimensions determined by component size.

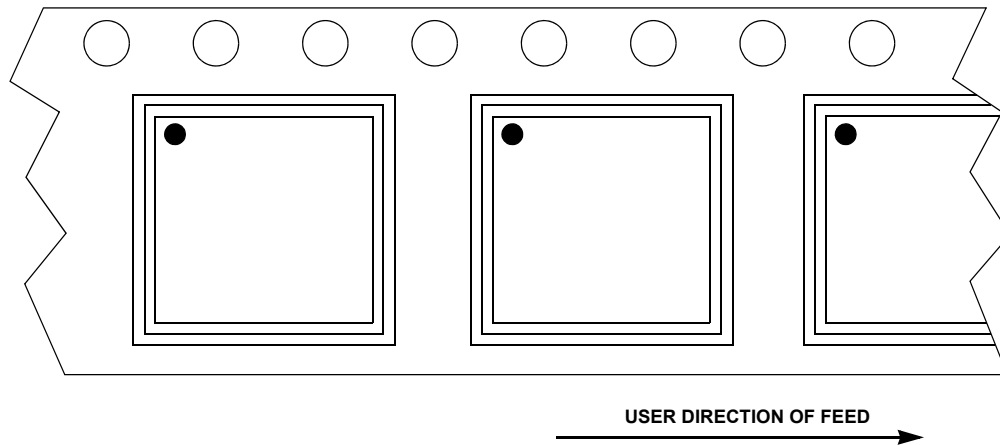


FIGURE 5A. SQUARE - BGA, QFN, DFN, ODFN, AND CSP

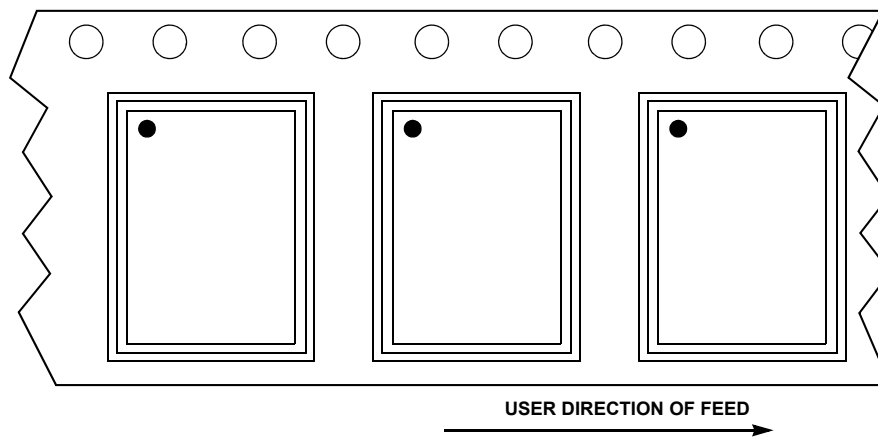


FIGURE 5B. RECTANGULAR - QFN, ODFN, AND DFN

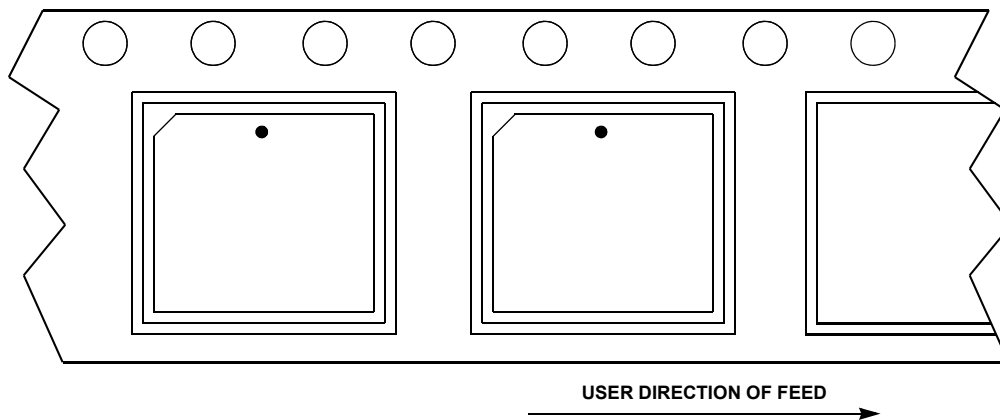


FIGURE 5C. PLCC

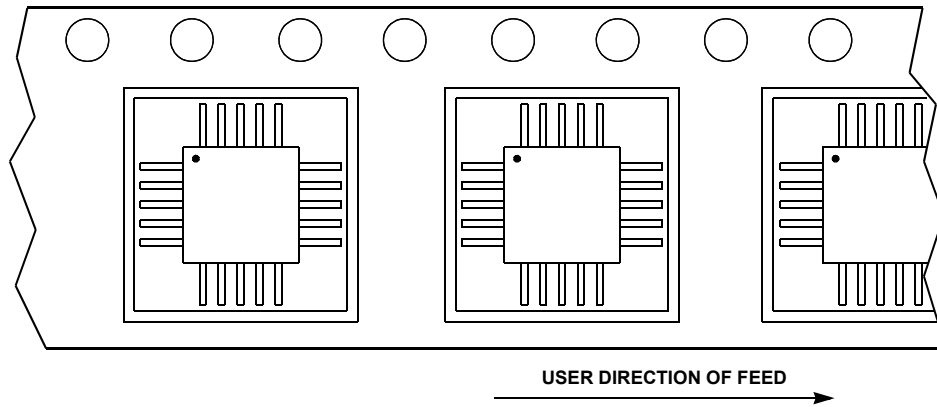


FIGURE 5D. SQUARE - MQFP, TQFP, AND LQFP

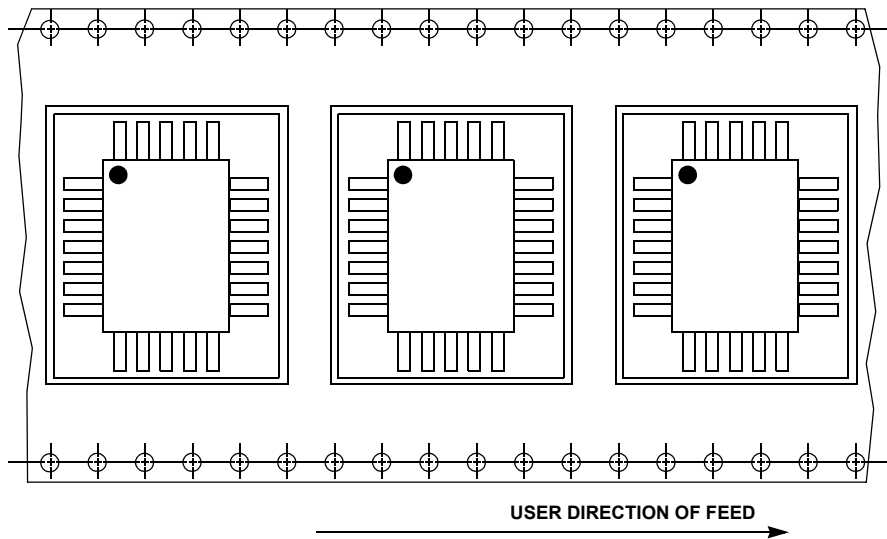


FIGURE 5E. RECTANGULAR - MQFP, TQFP, AND LQFP

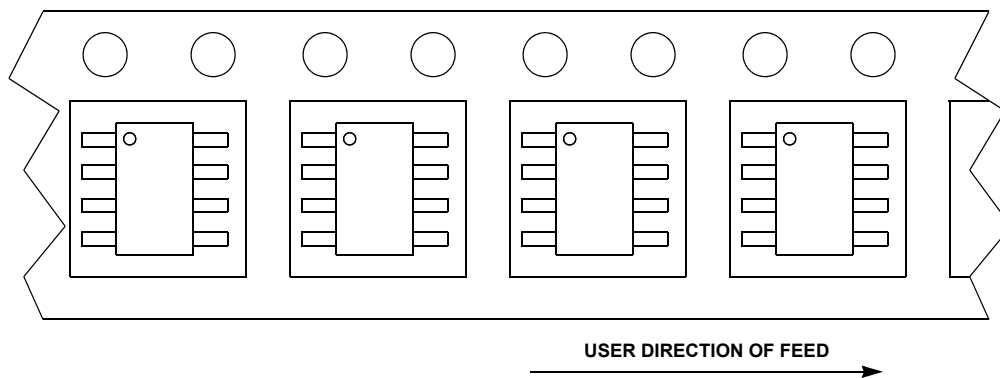


FIGURE 5F. SOIC, MSOP, TSSOP, QSOP, AND PSOP

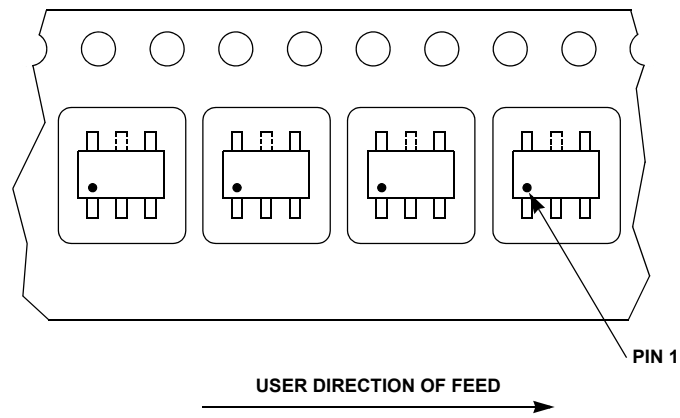


FIGURE 5G. SOT-23 AND SC-70

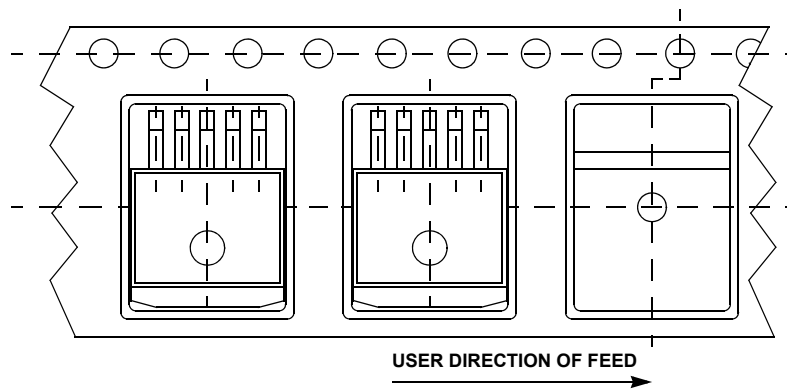
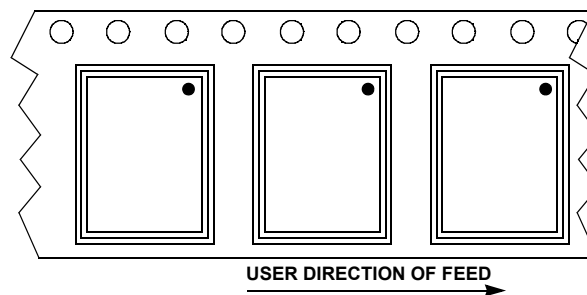
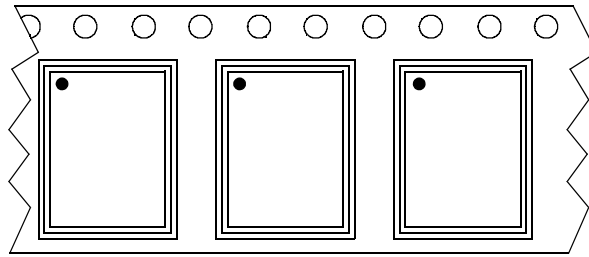


FIGURE 5H. MO-169



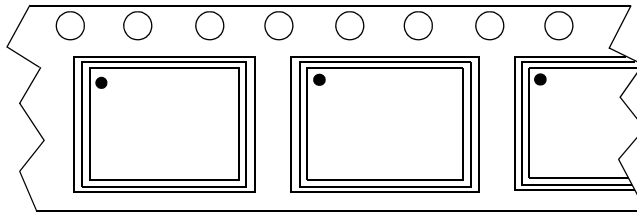
NOTE: THE BUMPS (BALLS) ARE FACING DOWN IN THE POCKET
MAY BE APPLICABLE ONLY FOR PRODUCTS BEFORE MAY 01, 2008

FIGURE 5I. RECTANGULAR - CSP



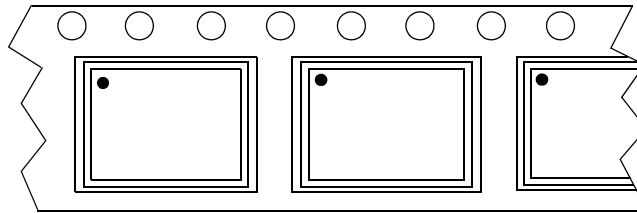
USER DIRECTION OF FEED →
 NOTE: ALL NEW PRODUCTS FOLLOW THIS A1 (PIN 1) ORIENTATION
 EFFECTIVE DATE: MAY 01, 2008

FIGURE 5J. RECTANGULAR - CSP



USER DIRECTION OF FEED →
 NOTE: SPECIFICALLY FOR 8 BUMP 1.40x1.20mm CSP

FIGURE 5K. RECTANGULAR - CSP



USER DIRECTION OF FEED →
 NOTE: ALL NEW PRODUCTS FOLLOW THIS A1 (PIN 1) ORIENTATION
 EFFECTIVE DATE: MAY 01, 2008

FIGURE 5L. RECTANGULAR - HDA

FIGURE 5. MECHANICAL POLARIZATION DIAGRAMS

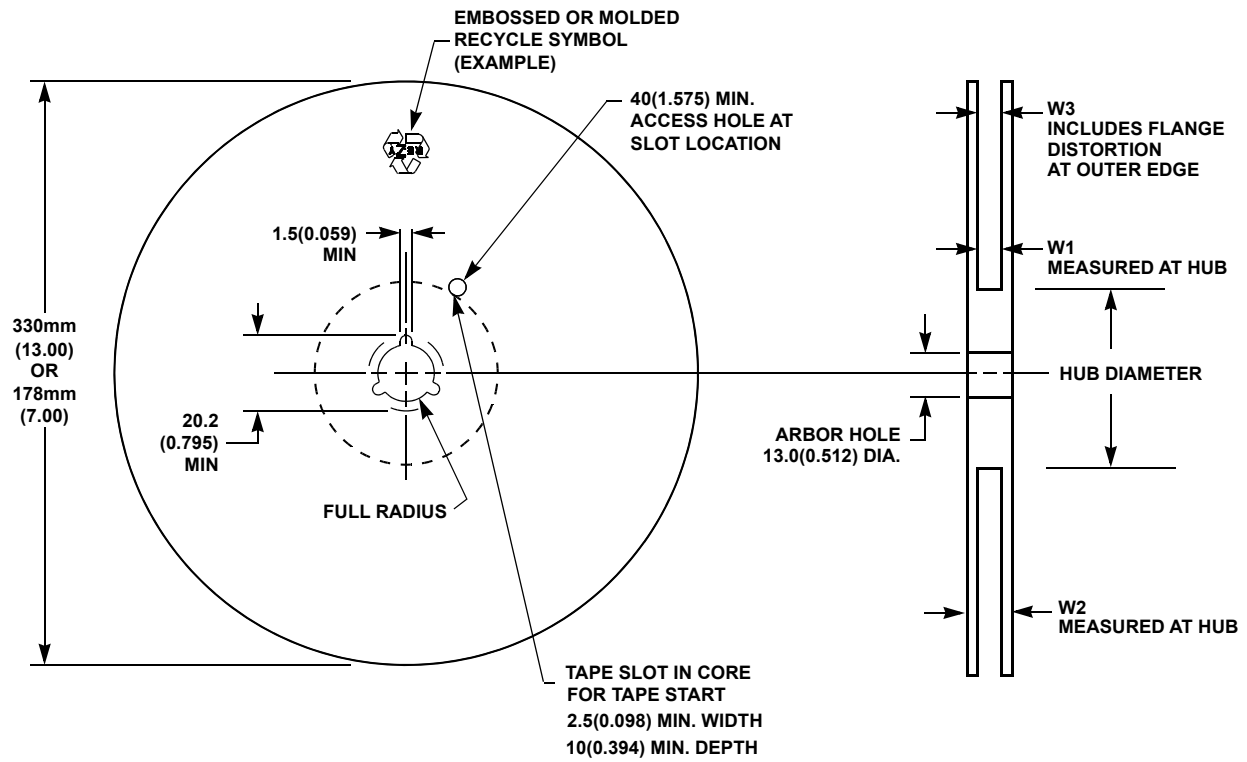


FIGURE 6. REEL DIMENSIONS

| TAPE WIDTH | W1 (NOMINAL) | W2 (MAXIMUM) | W3 (MAXIMUM) |
|----------------|----------------|----------------|----------------|
| 8mm (0.315in) | 8.4 (0.331in) | 14.4 (0.567in) | 10.9 (0.429in) |
| 12mm (0.472in) | 12.4 (0.488in) | 18.4 (0.724in) | 15.4 (0.606in) |
| 16mm (0.629in) | 16.4 (0.646in) | 22.4 (0.882in) | 19.4 (0.764in) |
| 24mm (0.945in) | 24.4 (0.961in) | 30.4 (1.197in) | 27.4 (1.079in) |
| 32mm (1.260in) | 32.4 (1.276in) | 38.4 (1.512in) | 35.4 (1.394in) |
| 44mm (1.732in) | 44.4 (1.748in) | 50.4 (1.984in) | 47.4 (1.866in) |

NOTE:

29. Dimensions are in millimeters (inches are in parentheses for reference only).

Revision History

| DATE | REVISION | CHANGE |
|--------------|----------|---|
| Dec 8, 2021 | 35 | Added 5X5X0.9 WFQFN remark Added LFBGA 5.71X8.46X1.216mm Packing spec. |
| Oct 15, 2021 | 34 | Added 3000/reel into 7X7 QFN packing spec. Added FCQFN 4X4 QFN on the standard 4X4 QFN packing spec Added 1.28x 1.36mm WLCSP packing spec. Added 3.74x4.14mm WLCSP packing spec. Added 3x3x1.7mm LGA packing spec. |
| Jan 13, 2020 | 33 | Removed 32LD uTDFN 5 x 5 x 0.63 mm (Not used) from page 8. Added 32LD PQFN 5 x 5 x 0.63 mm Tape/Reel information on page 8. Added 32LD PQFN 5 x 5 x 0.77 mm Tape/Reel information on page 8. Added 39LD PQFN 5 x 7 x 0.75 mm Tape/Reel information on page 8. |
| Nov 21, 2019 | 32 | Added TFBGA 35 BALL 4.7x6.3x1.06mm Tape & Reel information Added TDFN 22LD 3.0x6.0x0.75mm Tape & Reel information Added HDA/QFN 35LD 12.0x11.0x5.2mm Tape & Reel information Added WLCSP 10LD 1.02x2.02mm Tape & Reel information Added WLCSP 36LD 2.41x2.41mm Tape & Reel information Added 39LD & 0.75 thickness into 5X6 QFN Tape & Reel information |
| Jun 11, 2019 | 31 | Added Revision History Removed Figure 5I (Square WLCSP Package): Similar information in Figure 5A. Updated QFN/TQFN 8X8 0.75/0.90 package Leader & Trailer to 408mm & 540mm. Added 8LD 1.0x1.8 WLCSP Tape & Reel information Added 20LD 1.595x2.335 WLCSP Tape & Reel information Added 35LD 3.67x2.551 WLCSP Tape & Reel information Added 42LD 2.57x2.919 WLCSP Tape & Reel information Added 48LD 2.55x3.36 WLCSP Tape & Reel information Added 72LD 3.54x3.94 WLCSP Tape & Reel information |

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