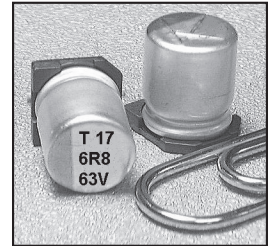


# NSPE-T Series Hybrid Aluminum Electrolytic Capacitors



- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
  - EXTENDED LOAD LIFE AT HIGH TEMPERATURE (1,500 ~ 3,000 HOURS @ +125°C)
  - HIGH VOLTAGE RATINGS (16 ~ 125VDC)
  - LOW ESR AND HIGH RIPPLE CURRENT RATINGS
  - 6.3x6.3mm ~ 10x12.8mm CASE SIZES
  - REFLOW SOLDERING RATED TO +260°C (+250°C 80V & 125V)
  - MEETS THE REQUIREMENTS OF AEC-Q200\*
- \*Contact NIC for supporting test data

Available with Wide  
Anti-Vibration  
Terminations



## CHARACTERISTICS

|   |                              |  |   |    |    |    |    |     |     |     |  |  |
|---|------------------------------|--|---|----|----|----|----|-----|-----|-----|--|--|
| Rated Voltage Range                         | 16 ~ 125Vdc                  |  |   |    |    |    |    |     |     |     |  |  |
| Rated Capacitance Range                     | 6.8 ~ 560μF                  |  |   |    |    |    |    |     |     |     |  |  |
| Operating Temp. Range                       | -55 ~ +125°C                 |  |   |    |    |    |    |     |     |     |  |  |
| Capacitance Tolerance                       | ±20% (M)                     |  |   |    |    |    |    |     |     |     |  |  |
| Max. Leakage Current After 2 Minutes @ 20°C | 16 ~ 63Vdc                   | 0.01CV   |   |    |    |    |    |     |     |     |  |  |
|   | 80 ~ 125Vdc                  | Less than 0.05CV or 100μA whichever is greater                     |   |    |    |    |    |     |     |     |  |  |
| Working and Surge Voltage Ratings           | W.V. (Vdc)                   | 16   | 25  | 35 | 40 | 50 | 63 | 80  | 100 | 125 |  |  |
|   | S.V. (Vdc)                   | 20   | 32  | 44 | 50 | 63 | 79 | 100 | 125 | 157 |  |  |
| Tan δ @ 120Hz/20°C                          |                              | 0.16   |   |    |    |    |    |     |     |     |  |  |
| Impedance Ratio                             | Z -55°C/Z +20°C              | 1 ~ 2.5  |   |    |    |    |    |     |     |     |  |  |
|   | Z +125°C/Z +20°C             | 0.6 ~ 1.0  |   |    |    |    |    |     |     |     |  |  |
| Load Life Test @ 125°C and Rated Voltage    | W.V. (Vdc)                   | 16   | 25  | 35 | 40 | 50 | 63 | 80  | 100 | 125 |  |  |
|   | Case Dia.                    | 16V  | φ6.3 = 1,500 hrs, φ8 & 10 = 2500 hrs.                     |    |    |    |    |     |     |     |  |  |
|   |                              | 25V & up   | 6.3X6.3 = 1500 hrs, 6.3X8 = 2000 hrs, φ8 & 10 = 3000 hrs. |    |    |    |    |     |     |     |  |  |
|   | Capacitance Change           | Within ±30% of initial measured value                              |   |    |    |    |    |     |     |     |  |  |
|   | Tan δ and ESR                | Less than 200% of specified max. value                             |   |    |    |    |    |     |     |     |  |  |
|   | Leakage Current              | Less than specified max. value                                     |   |    |    |    |    |     |     |     |  |  |
|   | ESR                          | Less than 200% of specified max. value                             |   |    |    |    |    |     |     |     |  |  |
|   | Resistance to Soldering Heat | Hot Plate at +250°C for 30 seconds with electrodes facing downward |   |    |    |    |    |     |     |     |  |  |
| Capacitance Change                          |                              | Within ±10% of the initial measured value                          |   |    |    |    |    |     |     |     |  |  |
| Dissipation Factor                          |                              | Less than the initial limit  |   |    |    |    |    |     |     |     |  |  |
| Leakage Current                             |                              | Less than the initial limit  |   |    |    |    |    |     |     |     |  |  |
| ESR   |                              | Less than 130% of specified value                                  |   |    |    |    |    |     |     |     |  |  |

## STANDARD PRODUCTS AND CASE SIZES Dφ x L (mm)

| PART NUMBER               | Cap. (μF) | Working Voltage | Case Size (D X L) mm | Max. Tan δ 120Hz/20°C | Max. ESR (mΩ) AT 100kHz/20°C | Max. Ripple Current (mA rms) AT 100KHz/125°C | Load Life Hours (+125°C) |
|---------------------------|-----------|-----------------|----------------------|-----------------------|------------------------------|--|--------------------------|
| NSPE-T121M16V6.3X8NLBYF   | 120       | 16              | 6.3X8                | 0.16                  | 40                           | 1160   | 1500                     |
| NSPE-T271M16V8X10.8NLBYF  | 270       |                 | 8X10.8               | 0.16                  | 26                           | 1540   | 2500                     |
| NSPE-T471M16V10X10.8NLBYF | 470       |                 | 10X10.8              | 0.16                  | 21                           | 2010   | 2500                     |
| NSPE-T561M16V10X12.8NLBYF | 560       |                 | 10X12.8              | 0.16                  | 15                           | 2320   | 2500                     |
| NSPE-T470M25V6.3X6.3NLBYF | 47        | 25              | 6.3X6.3              | 0.16                  | 60                           | 890  | 1500                     |
| NSPE-T680M25V6.3X8NLBYF   | 68        |                 | 6.3X8                | 0.16                  | 45                           | 980  | 2000                     |
| NSPE-T151M25V8X10.8NLBYF  | 150       |                 | 8X10.8               | 0.16                  | 27                           | 1330   | 3000                     |
| NSPE-T271M25V10X10.8NLBYF | 270       |                 | 10X10.8              | 0.16                  | 22                           | 1520   | 3000                     |
| NSPE-T331M25V10X12.8NLBYF | 330       |                 | 10X12.8              | 0.16                  | 16                           | 1740   | 3000                     |
| NSPE-T270M35V6.3X6.3NLBYF | 27        | 35              | 6.3X6.3              | 0.16                  | 100                          | 760  | 1500                     |
| NSPE-T470M35V6.3X8NLBYF   | 47        |                 | 6.3X8                | 0.16                  | 60                           | 910  | 2000                     |
| NSPE-T101M35V8X10.8NLBYF  | 100       |                 | 8X10.8               | 0.16                  | 30                           | 1260   | 3000                     |
| NSPE-T151M35V10X10.8NLBYF | 150       |                 | 10X10.8              | 0.16                  | 23                           | 1480   | 3000                     |
| NSPE-T221M35V10X12.8NLBYF | 220       |                 | 10X12.8              | 0.16                  | 17                           | 1700   | 3000                     |
| NSPE-T180M40V6.3X6.3NLBYF | 18        | 40              | 6.3X6.3              | 0.16                  | 110                          | 720  | 1500                     |
| NSPE-T270M40V6.3X8NLBYF   | 27        |                 | 6.3X8                | 0.16                  | 70                           | 870  | 2000                     |
| NSPE-T560M40V8X10.8NLBYF  | 56        |                 | 8X10.8               | 0.16                  | 32                           | 1220   | 3000                     |
| NSPE-T101M40V10X10.8NLBYF | 100       |                 | 10X10.8              | 0.16                  | 24                           | 1440   | 3000                     |
| NSPE-T121M40V10X12.8NLBYF | 120       |                 | 10X12.8              | 0.16                  | 18                           | 1650   | 3000                     |

For Automotive Applications See Part Numbering System. For non-Y legacy parts contact NIC for availability

Performance Passives By Design

NIC Components Corp.  
100 Baylis Road. Melville, NY 11747

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www.niccomp.com

Last Updated 01-26-2023 Specification subject to change without notice. Please check web site for latest information.

**STANDARD PRODUCTS AND CASE SIZES  $D\phi \times L$  (mm)**

| PART NUMBER                | Cap. ( $\mu$ F) | Working Voltage | Case Size (D X L) mm | Max. Tan $\delta$ 120Hz/20°C | Max. ESR (m $\Omega$ ) AT 100kHz/20°C | Max. Ripple Current (mA rms) AT 100KHz/125°C | Load Life Hours (+125°C) |
|----------------------------|-----------------|-----------------|----------------------|------------------------------|---------------------------------------|--|--------------------------|
| NSPE-T100M50V6.3X6.3NLBYF  | 10              | 50              | 6.3X6.3              | 0.16                         | 120                                   | 690  | 1500                     |
| NSPE-T150M50V6.3X8NLBYF    | 15              |                 | 6.3X8                | 0.16                         | 80                                    | 840  | 2000                     |
| NSPE-T330M50V8X10.8NLBYF   | 33              |                 | 8X10.8               | 0.16                         | 35                                    | 1170   | 3000                     |
| NSPE-T560M50V10X10.8NLBYF  | 56              |                 | 10X10.8              | 0.16                         | 25                                    | 1390   | 3000                     |
| NSPE-T820M50V10X12.8NLBYF  | 82              |                 | 10X12.8              | 0.16                         | 19                                    | 1590   | 3000                     |
| NSPE-T6R8M63V6.3X6.3NLBYF  | 6.8             | 63              | 6.3X6.3              | 0.16                         | 150                                   | 670  | 1500                     |
| NSPE-T100M63V6.3X8NLBYF    | 10              |                 | 6.3X8                | 0.16                         | 100                                   | 740  | 2000                     |
| NSPE-T220M63V8X10.8NLBYF   | 22              |                 | 8X10.8               | 0.16                         | 40                                    | 1090   | 3000                     |
| NSPE-T330M63V8X10.8NLBYF   | 33              |                 | 8X10.8               | 0.16                         | 40                                    | 1090   | 3000                     |
| NSPE-T330M63V10X10.8NLBYF  | 33              |                 | 10X10.8              | 0.16                         | 30                                    | 1260   | 3000                     |
| NSPE-T470M63V10X10.8NLBYF  | 47              |                 | 10X10.8              | 0.16                         | 30                                    | 1260   | 3000                     |
| NSPE-T560M63V10X12.8NLBYF  | 56              |                 | 10X12.8              | 0.16                         | 22                                    | 1440   | 3000                     |
| NSPE-T120M80V10X10.8LLBYF  | 12              | 80              | 10X10.8              | 0.16                         | 70                                    | 900  | 3000                     |
| NSPE-T150M80V10X10.8LLBYF  | 15              |                 | 10X10.8              | 0.16                         | 70                                    | 900  | 3000                     |
| NSPE-T180M80V10X12.8LLBYF  | 18              |                 | 10X12.8              | 0.16                         | 50                                    | 1100   | 3000                     |
| NSPE-T100M100V10X10.8LLBYF | 10              | 100             | 10X10.8              | 0.16                         | 80                                    | 870  | 3000                     |
| NSPE-T120M100V10X10.8LLBYF | 12              |                 | 10X10.8              | 0.16                         | 80                                    | 870  | 3000                     |
| NSPE-T150M100V10X12.8LLBYF | 15              |                 | 10X12.8              | 0.16                         | 60                                    | 1000   | 3000                     |
| NSPE-T100M125V10X10.8LLBYF | 10              | 125             | 10X10.8              | 0.16                         | 90                                    | 750  | 3000                     |

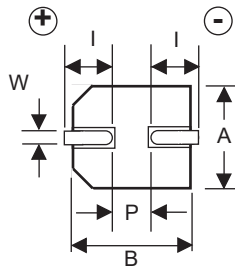
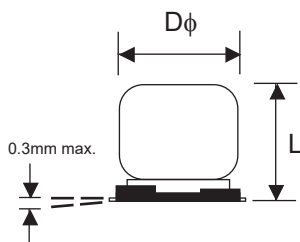
For Automotive Applications See Part Numbering System. For non-Y legacy parts contact NIC for availability

**RIPPLE CURRENT FREQUENCY CORRECTION FACTOR**

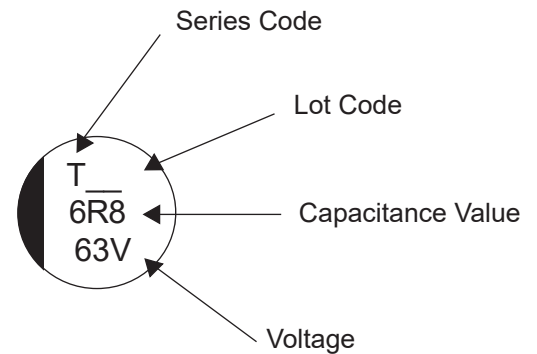
| Frequency        | 100Hz | 1KHz | 10KHz | 100KHz |
|------------------|-------|------|-------|--------|
| 6.8 ~ 33 $\mu$ F | 0.05  | 0.32 | 0.67  | 1.0    |
| 47 ~ 560 $\mu$ F | 0.10  | 0.35 | 0.70  | 1.0    |

**DIMENSIONS (mm)**

| Case Size | $D\phi \pm 0.5$ | L max. | A, B $\pm 0.2$ | W         | I $\pm 0.2$ | P $\pm 0.2$ |
|-----------|-----------------|--------|----------------|-----------|-------------|-------------|
| 6.3x6.3   | 6.3             | 6.3    | 6.6            | 0.5 ~ 0.8 | 2.5         | 2.2         |
| 6.3x8     | 6.3             | 8.0    | 6.6            | 0.5 ~ 0.8 | 2.5         | 2.2         |
| 8x10.8    | 8.0             | 10.8   | 8.3            | 0.7 ~ 1.0 | 2.9         | 3.2         |
| 10x10.8   | 10              | 10.8   | 10.3           | 1.0 ~ 1.4 | 3.2         | 4.6         |
| 10x12.8   | 10              | 12.8   | 10.3           | 1.0 ~ 1.4 | 3.2         | 4.6         |



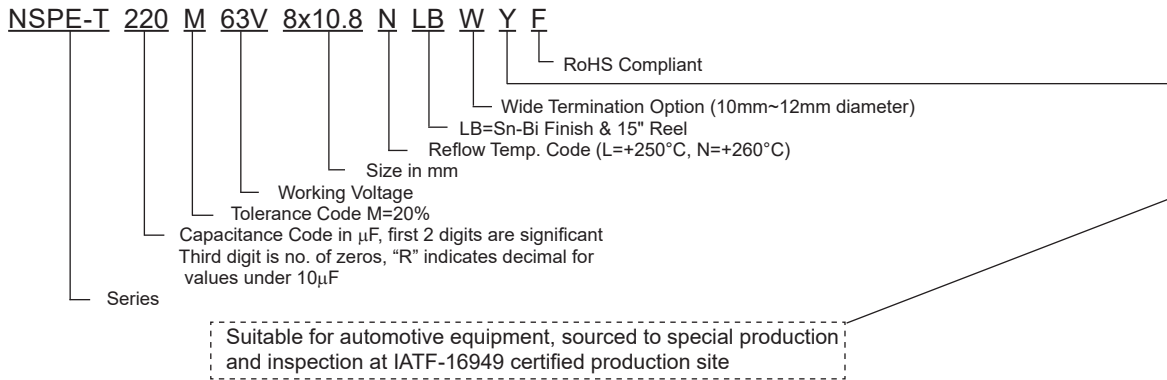
**Part Marking**



**PRECAUTIONS**

Please review the notes on correct use, safety and precautions found at <https://www.niccomp.com/resource/files/aluminum/AlumApplInfoCautions.pdf>  
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)

**PART NUMBER SYSTEM**

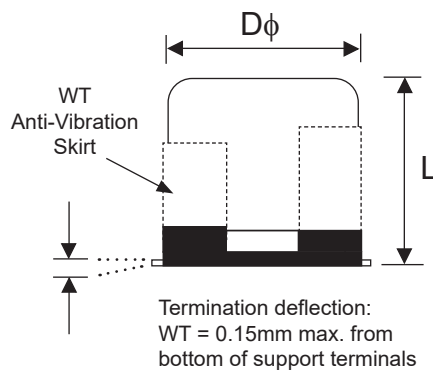
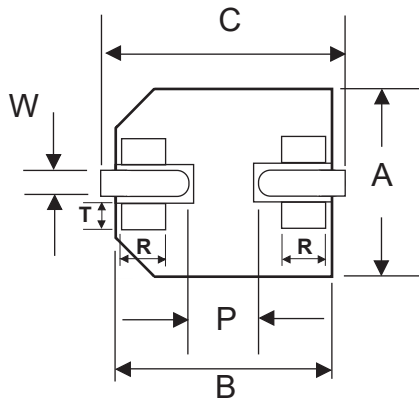


| Code | Plating | Termination Type  | Automotive | Reel Size |
|------|---------|-------------------|------------|-----------|
| LB   | Sn-Bi   | Standard          | No         | 15" Reel  |
| LBW  | Sn-Bi   | Wide Terminations | No         | 15" Reel  |
| LBWY | Sn-Bi   | Wide Terminations | Yes        | 15" Reel  |

**W (WIDE TERMINATIONS) COMPONENT DIM. (mm)**

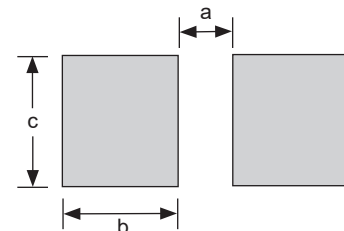
| Case Size | $D\phi \pm 0.5$ | L max. | A, B $\pm 0.2$ | C $\pm 0.2$ | P     | W         | R     | T     |
|-----------|-----------------|--------|----------------|-------------|-------|-----------|-------|-------|
| 6.3x6.3   | 6.3             | 6.5    | $6.6 \pm 0.2$  | 7.3         | (2.2) | 0.5 ~ 0.8 | (1.7) | (0.7) |
| 6.3x8     | 6.3             | 8.2    | $6.6 \pm 0.2$  | 7.3         | (2.2) | 0.5 ~ 0.8 | (1.7) | (0.7) |
| 8x10.8    | 8.0             | 11.2   | 8.3            | 9.0         | (3.2) | 0.7 ~ 1.0 | (0.7) | (1.3) |
| 10x10.8   | 10.0            | 11.2   | 10.3           | 11.0        | (4.6) | 1.0 ~ 1.4 | (0.7) | (1.3) |
| 10x12.8   | 10.0            | 13.5   | 10.3           | 11.0        | (4.6) | 1.0 ~ 1.4 | (0.7) | (1.3) |

(Reference dimensions)

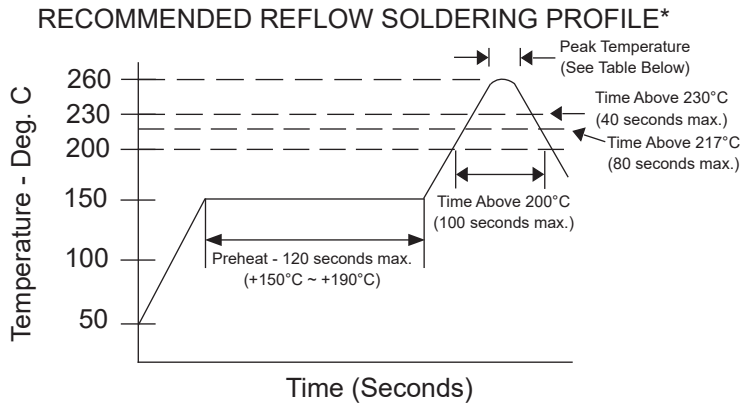


**W (WIDE TERMINATIONS) LAND PATTERN DIM. (mm)**

| Case Size | a   | b   | c   |
|-----------|-----|-----|-----|
| 6.3x6.3   | 1.6 | 4.0 | 3.0 |
| 6.3x8     | 2.5 | 4.5 | 4.7 |
| 8x10.8    | 2.5 | 4.5 | 4.7 |
| 10x10.8   | 3.8 | 4.8 | 4.7 |
| 10x12.8   | 3.8 | 4.8 | 4.7 |

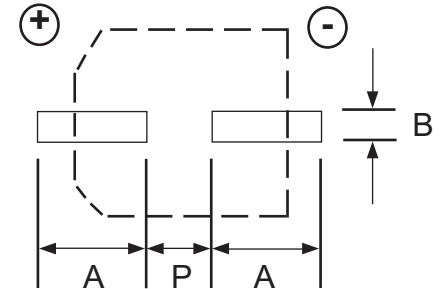


| W (Wide Terminations) Anti-Vibration Test |   |
|---|---|
| Test Method                               | Direction: X, Y, Z axis<br>Frequency & Duration: 5 to 2000Hz reciprocation for 20 minutes, 2 hours each direction<br>Peak to Peak Amplitude: 5mm<br>Peak Acceleration: 30G<br>Sweep Type: Log |
| $\Delta$ Capacitance                      | Within $\pm 10\%$ of initial value  |
| Tangent of Loss                           | $\leq$ Specified value  |
| Leakage Current                           | $\leq$ Specified value  |



**LAND PATTERN DIM. (mm)**

| Case Dia. | A   | B   | P   |
|-----------|-----|-----|-----|
| 6.3       | 3.6 | 1.8 | 1.8 |
| 8         | 4.1 | 2.1 | 2.8 |
| 10        | 4.4 | 2.5 | 4.3 |



**PEAK TEMPERATURE AND DURATION**

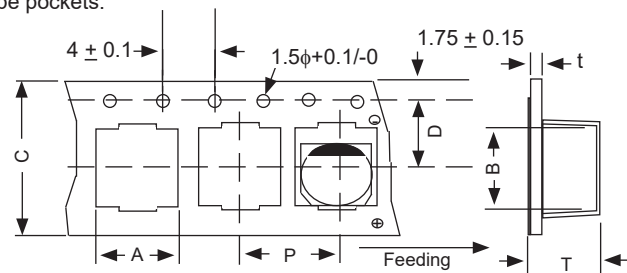
| Rated Voltage/Diameter   | Time Above +200°C | Time Above +217°C | Time Above +230°C | Peak Temperature     |
|--------------------------|-------------------|-------------------|-------------------|----------------------|
| 16V ~ 63V / 6.3mm ~ 10mm | 100 sec. max.     | 80 sec. max.      | 40 sec. max.      | +260°C (5 sec. max.) |
| 80 ~ 125V / 10mm         |                   |                   |                   | +250°C (5 sec. max.) |

\*Two reflow passes are permissible with a cool down to room temperature required between the first and second pass.

**TAPING SPECIFICATIONS (mm)**

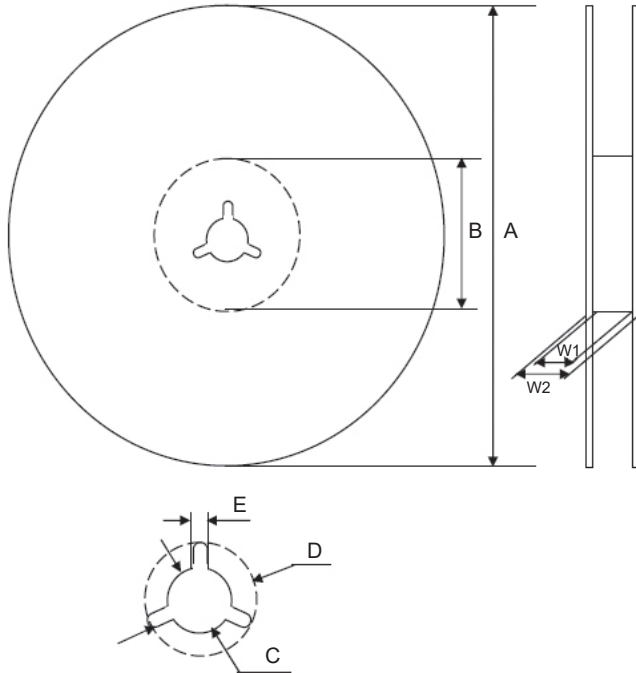
- Both Leader and Trailer tape: Minimum 40mm (1.57") empty carrier tape pockets.
- Leader tape: Approximately 20cm of cover tape at leader.
- Connection: Maximum 3 connections (slices) per reel.

| Case Size | A    | B    | C    | D    | P    | T    | t    |
|-----------|------|------|------|------|------|------|------|
| 6.3x6.3   | ±0.5 | ±0.5 | ±0.3 | ±0.1 | ±0.1 | ±0.2 | max. |
| 6.3x8     | 7.0  | 7.0  | 16.0 | 7.5  | 12.0 | 6.5  | 0.6  |
| 6.3x8     | 7.0  | 7.0  | 16.0 | 7.5  | 12.0 | 8.2  | 0.6  |
| 8x10.8    | 8.7  | 8.7  | 24.0 | 11.5 | 16.0 | 11.0 | 0.6  |
| 10x10.8   | 10.7 | 10.7 | 24.0 | 11.5 | 16.0 | 11.0 | 0.6  |
| 10x12.8   | 10.7 | 10.7 | 24.0 | 11.5 | 16.0 | 13.3 | 0.6  |



V-Chip 15" (380mm) Reels (LB suffix)

Dimensions (mm)



| Case Size                | Tape Width | W1          | W2          |
|--------------------------|------------|-------------|-------------|
| 6.3x6.3, 6.3x8           | 16.0       | 16.5 ~ 18.5 | 19.5 ~ 24.0 |
| 8x10.5, 10x10.5, 10x12.8 | 24.0       | 24.5 ~ 26.5 | 27.5 ~ 32.0 |

| Case Size                | Tape Width | A          | B       | C           | D           | E           |
|--------------------------|------------|------------|---------|-------------|-------------|-------------|
| 6.3x6.3, 6.3x8           | 16.0       | φ380<br>±2 | φ80~105 | φ13<br>±0.5 | φ21<br>±1.0 | 2.0<br>±0.5 |
| 8x10.5, 10x10.5, 10x12.8 | 24.0       |            |         |             |             |             |

| Case Size | Qty per Reel |
|-----------|--------------|
|           | 15" (380mm)  |
| 6.3x6.3   | 1000         |
| 6.3x8     | 900          |
| 8x10.5    | 500          |
| 10x10.5   | 500          |
| 10x12.8   | 400          |