

EST7610

3-Channel PC Power Supply Supervisors



Description

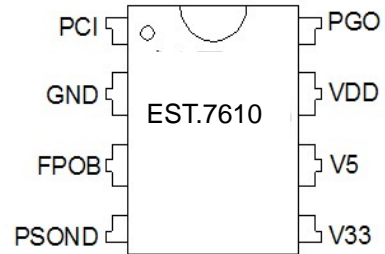
The EST.7610 is a PC switching power supply monitor with minimum external components. It provides protection circuits, power-good output (PGO), fault protection output (FPOB) and on/off control (PSONB).

The over-voltage protection (OVP) monitors 3.3V, 5V and 12V (12V supplies voltage detects via VDD pin). The under-voltage protection (UVP) monitors 3.3V and 5V. When an OV or UV condition is detected, the fault protection output (FPOB) is latched high and the power good output (PGO) go low. PSONB from low to high resets the latch. When OV, UV and PGI are all right, the power good output (PGO) will be issue. A built-in 4ms delay and 38ms debounce for PSONB turn off FPOB.

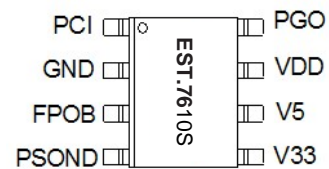
Features

- The Over Current Protection monitors 3.3V/5V and double 12V output currents and related lockout
- Both of fault protection output and power good output are open drain output stage
- 75ms delay for SPS short circuit protect
- 38ms PSONB input signal de-bounce
- 20us for OVP noise immunity de-bounce.
- 73us for internal noise immunity de-bounce
- 300ms power good delay time for PGO
- 4ms time delay between PGO and FPOB when PSONB turn of

Pin Assignments



DIP-8L

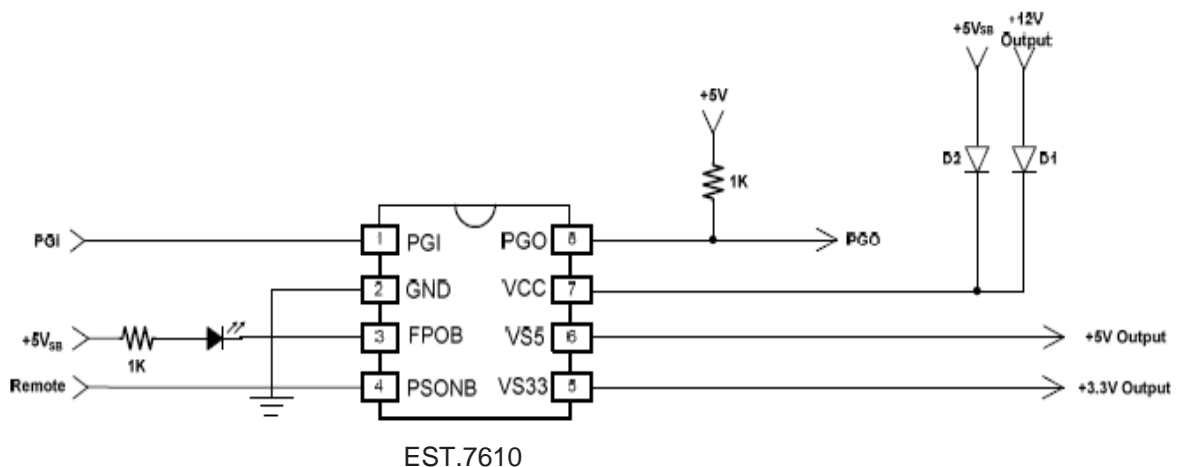


SOP-8L

Ordering Information

| Order Number | Package Type | Packing | Top Marking |
|--------------|--------------|-------------|-------------|
| EST7610 | DIP-8 (RoHS) | Tube | EST.7610 |
| EST7610S | SOP-8 (RoHS) | Tube | EST.7610S |
| EST7610SR | SOP-8 (RoHS) | Tape & Reel | EST.7610S |

Typical Application Circuit



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Pin Description

| Pin | Symbol | Function |
|-----|--------|---|
| 1 | PGI | Power good input signal pin |
| 2 | GND | Ground |
| 3 | FPOB | Inverted fault protection output ,open drain output stage |
| 4 | PSONB | Remote ON/OFF switch input pin |
| 5 | V33 | 3.3V over/under voltage protection input pin |
| 6 | V5 | 5.0V over/under voltage protection input pin |
| 7 | VDD | Power supply |
| 8 | PGO | power good output stage pin |

Absolute Maximum Ratings

| Parameter | Symbol | Ratings | Unit |
|------------------------------|----------------------|------------|------|
| Storage Temperature (Tstg) | --- | -40 to 140 | °C |
| Operating Temperature (Topr) | --- | -25 to 125 | °C |
| Junction Temperature (Tj) | --- | 150 | °C |
| Supply Voltage (VCC) | VCC | -0.5 to 18 | V |
| Input Voltage Range (VI) | PGI, PSON, VS5, VS33 | -0.5 to 16 | V |
| Output Voltage Range (VO) | FPOB | -0.5 to 16 | V |
| | PGO | -0.5 to 16 | V |
| Power Dissipation | PD | 650 | mW |
| Thermal Resistance | θ_{JA} | 85 | °C/W |
| ESD(HBM) | | Class 2A | V |

Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Time-switching Characteristics (VDD=12V, Ta=25°C)

| Switching Characteristic | | | | | | |
|--------------------------|--------|------|------|------|------|--------------------------|
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
| PGI to PGO Delay Time | T1 | 200 | 300 | 480 | ms | VCC=12V, Ta = full range |
| Short Circuit Delay Time | T2 | 49 | 75 | 100 | ms | |
| PGO to FPO/Delay Time | T3 | 2 | 4 | 6 | ms | |
| UVP Delay Time | T4 | 160 | 190 | 240 | us | |
| PSON/De-bounce Time | T5 | 24 | 38 | 61 | ms | |
| OVP Delay Time | T6 | 46 | 66 | 86 | us | |

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DC Electrical Characteristics (VCC =12V, Ta=25)

Input Power Supply:

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|----------------------------------|-------------------|------|------|---------|------|------------|
| Supply Voltage | V _{CC} | 4.2 | 12 | 18 | V | |
| Supply Current | I _{CC} | | 2 | 3 | mA | VPSON = 5V |
| Power On Reset Threshold Voltage | V _{POR} | | 3.6 | | V | |
| Power On Reset | V _{HYST} | | | +/- 0.6 | V | |

Over-Voltage function:

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|------------------------|---------------------|------|------|------|------|------------|
| Over-Voltage Threshold | OVT _{VS33} | 3.7 | 3.9 | 4.1 | V | |
| | OVT _{VS5} | 5.7 | 5.85 | 6.0 | V | |
| | OVT _{VS12} | 12.8 | 13.4 | 13.9 | V | For VCC |

Under-Voltage function:

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-------------------------|---------------------|------|------|------|------|------------|
| Under-Voltage Threshold | UVT _{VS33} | 2.0 | 2.2 | 2.4 | V | |
| | UVT _{VS5} | 3.3 | 3.5 | 3.7 | V | |
| | UVT _{VS12} | 8.8 | 9.3 | 9.8 | V | For VCC |

PSONB, Analog Input function:

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-------------------|-------------------|------|--------|------|------|------------|
| Threshold Voltage | | 0.9 | 1.2 | 1.5 | V | |
| Hysteresis | V _{HYST} | | +/- 50 | | mV | |

PGI, Analog Input:

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------|-------------------|------|--------|------|------|--------------------|
| Threshold Voltage of PGI | T _{d1} | 1.16 | 1.25 | 1.33 | V | Enable/Disable UVP |
| | T _{d2} | 0.6 | 0.63 | 0.75 | V | PGO Enable |
| | TR | 1.18 | 1.23 | 1.28 | V | PGO/UVP Disable |
| | V _{HYST} | | +/- 50 | | mV | |

FPOB, Open Drain Output:

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------|--------|------|------|------|------|------------|
| Leakage Current | ILKG | | | 5 | uA | VFPOB=5V |
| Low Level Output Voltage | VOL | | | 0.3 | V | ISINK=10mA |
| | | | | 0.7 | V | |

PGO, Open Drain Output:

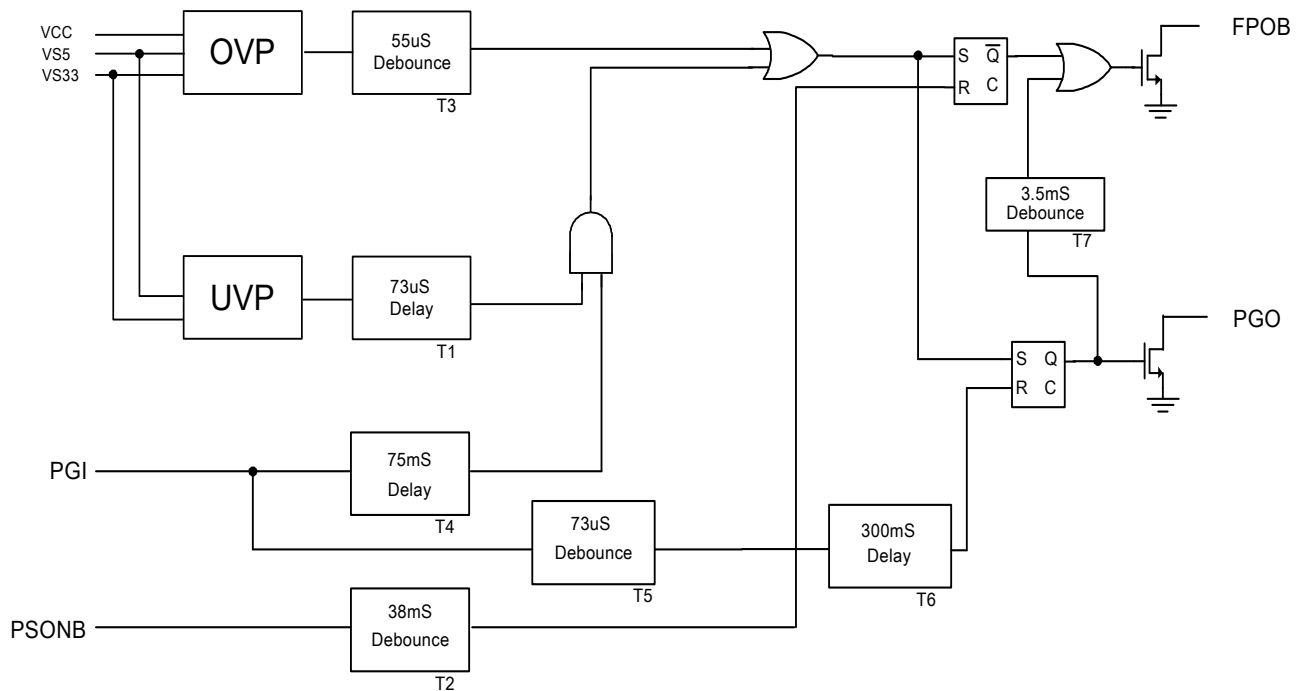
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------|--------|------|------|------|------|------------|
| Leakage Current | ILKG | | | 5 | uA | VPGO=5V |
| Low Level Output Voltage | VOL | | | 0.4 | V | ISINK=10mA |
| | | | | 0.8 | V | ISINK=30mA |

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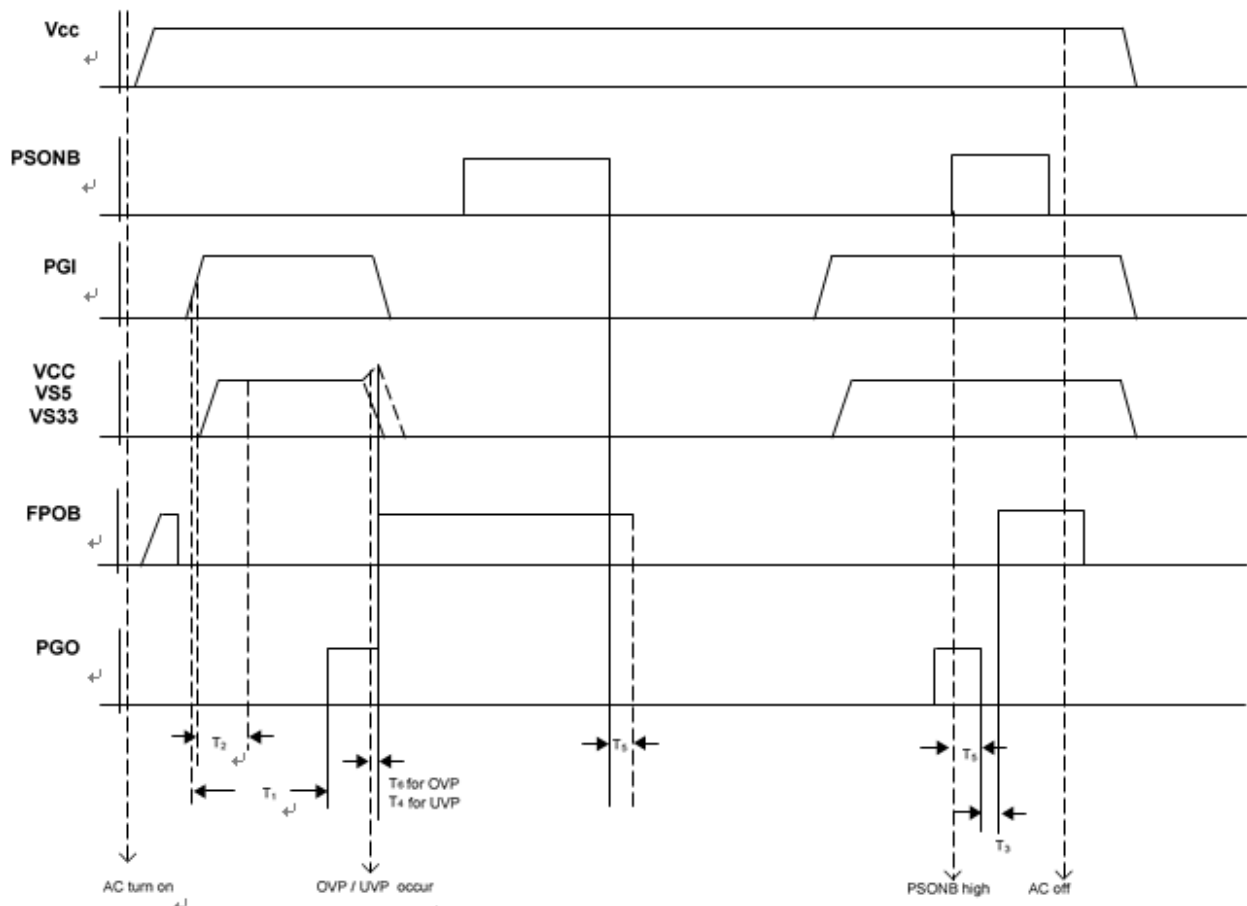
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Block Diagram



Time Chart

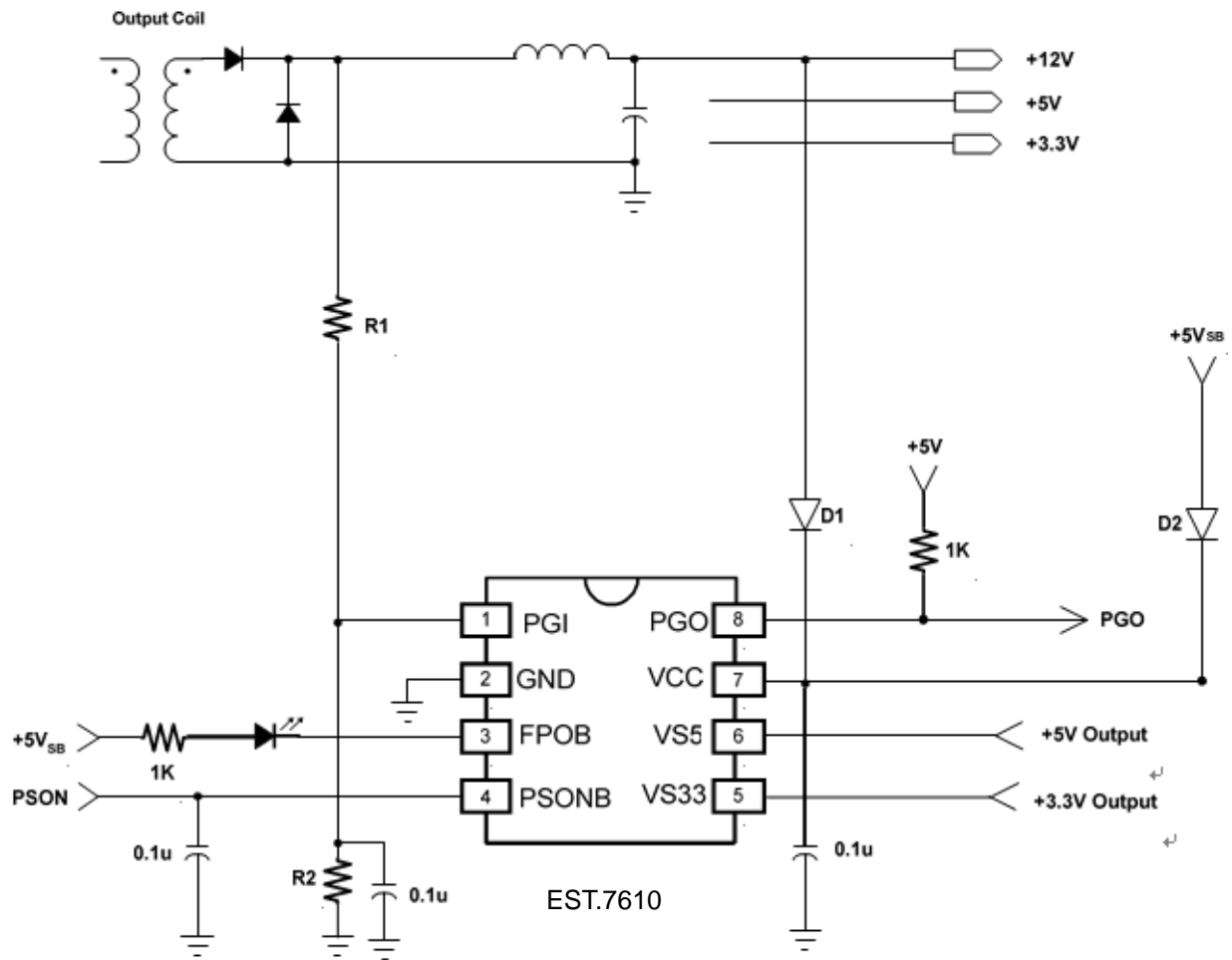


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Application Circuit



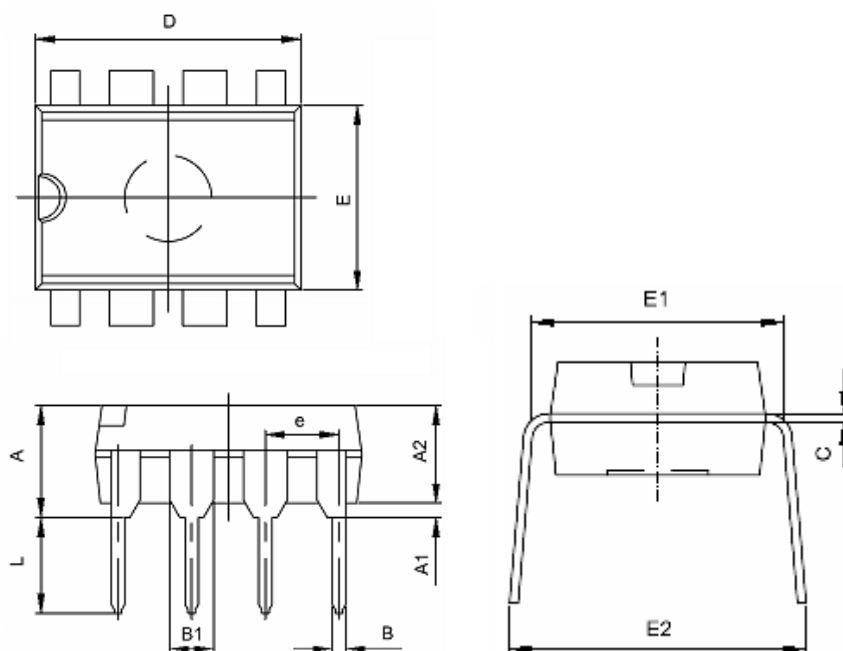
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PACKAGING INFORMATION

DIP-8 Package



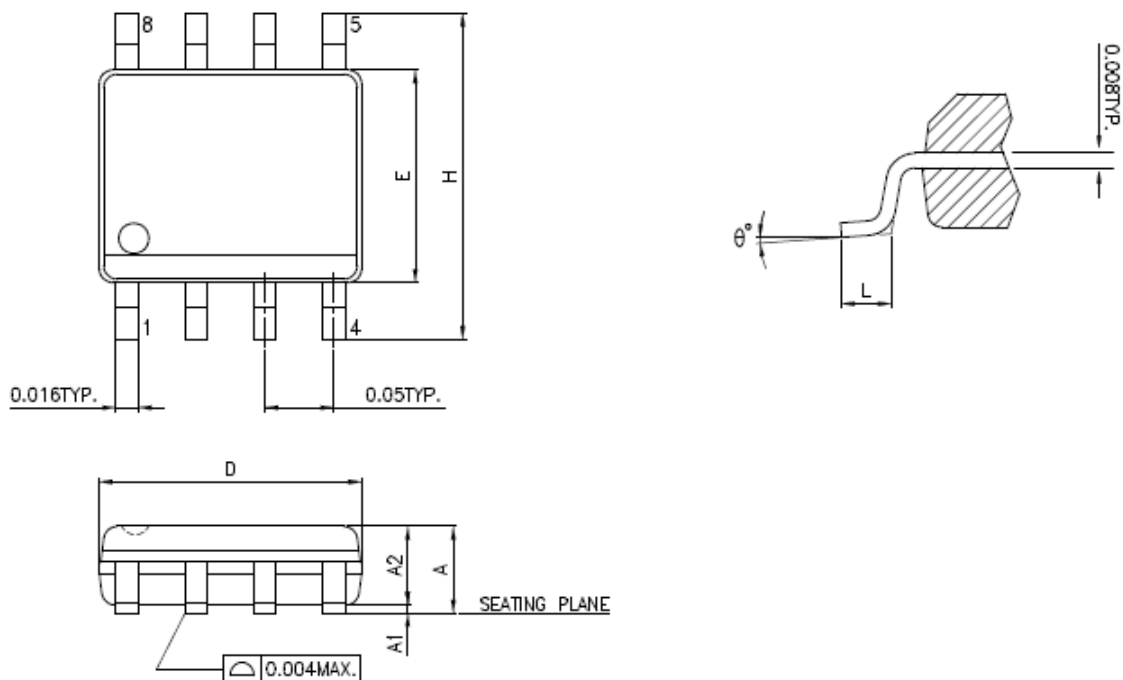
| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 3.710 | 4.310 | 0.146 | 0.170 |
| A1 | 0.510 | | 0.020 | |
| A2 | 3.200 | 3.600 | 0.126 | 0.142 |
| B | 0.360 | 0.560 | 0.014 | 0.022 |
| B1 | 1.524(TYP) | | 0.060(TYP) | |
| C | 0.204 | 0.360 | 0.008 | 0.014 |
| D | 9.000 | 9.400 | 0.354 | 0.370 |
| E | 6.200 | 6.600 | 0.244 | 0.260 |
| E1 | 7.620(TYP) | | 0.300(TYP) | |
| e | 2.540(TYP) | | 0.100(TYP) | |
| L | 3.000 | 3.600 | 0.118 | 0.142 |
| E2 | 8.200 | 9.400 | 0.323 | 0.370 |

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SOP-8 Package (mm)



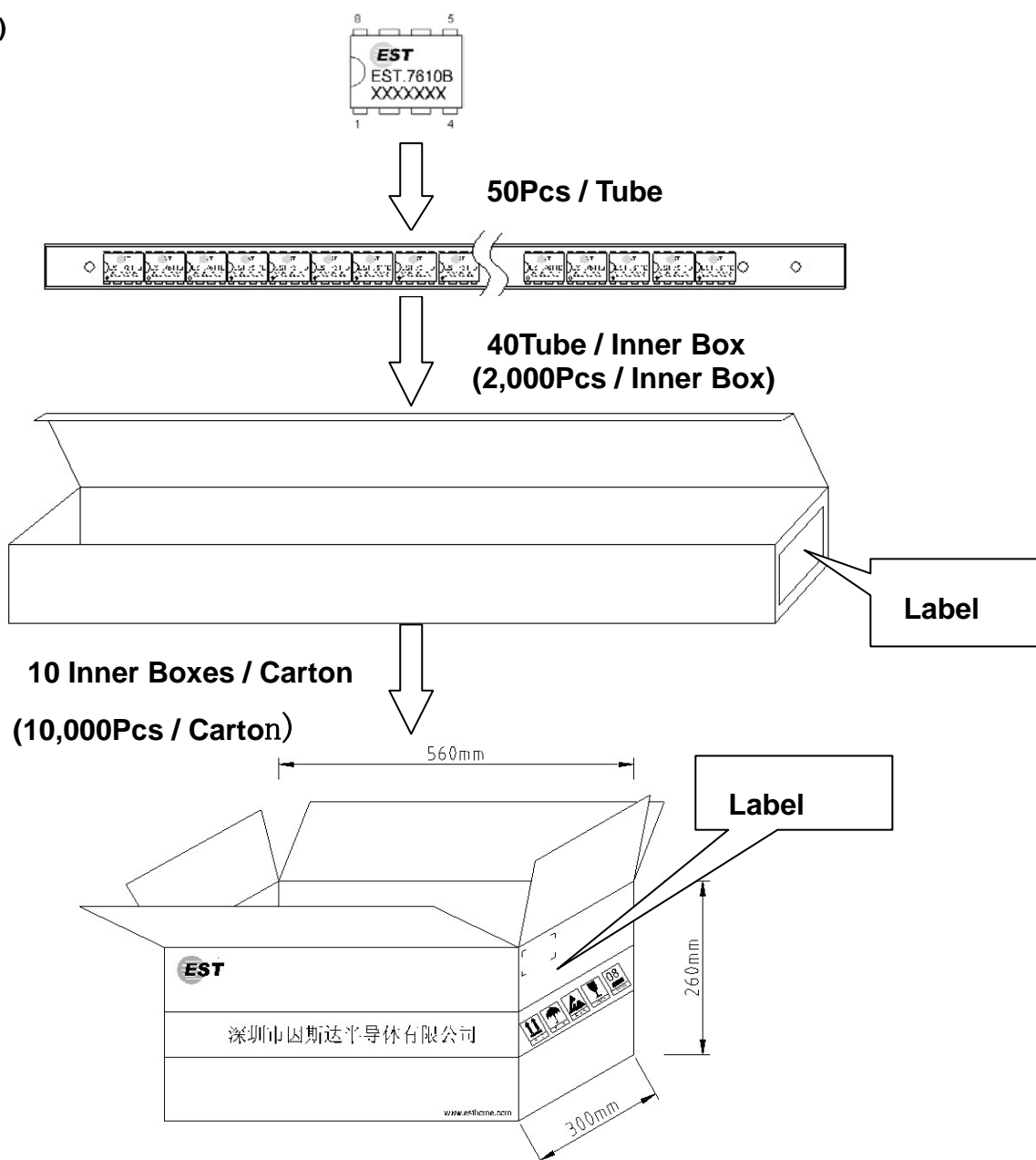
| Symbols | Dimensions In Inches | | | Dimensions In millimeters | | |
|----------|----------------------|-------|-------|---------------------------|-------|-------|
| | MIN. | NOR. | MAX. | MIN. | NOR. | MAX. |
| A | 0.050 | 0.061 | 0.072 | 1.270 | 1.549 | 1.829 |
| A1 | 0.000 | ----- | 0.010 | 0.000 | ----- | 0.254 |
| A2 | ----- | ----- | 0.062 | ----- | ----- | 1.575 |
| D | 0.185 | 0.193 | 0.200 | 4.699 | 4.902 | 5.080 |
| E | 0.147 | 0.154 | 0.160 | 3.734 | 3.912 | 4.064 |
| H | 0.225 | 0.237 | 0.249 | 5.715 | 6.020 | 6.325 |
| L | 0.013 | 0.033 | 0.053 | 0.330 | 0.838 | 1.346 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

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Packing Information:

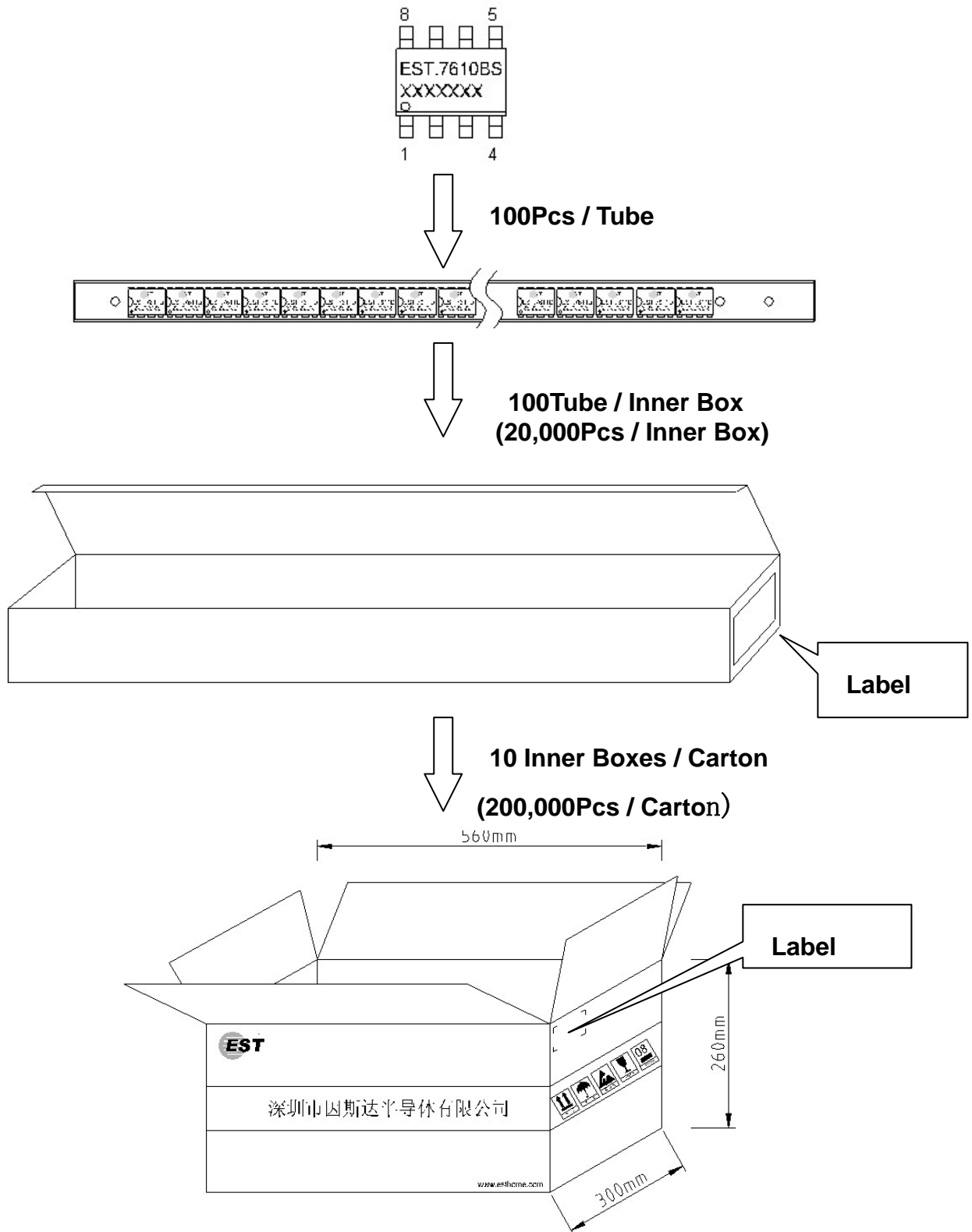
★DIP-8: (Tube)



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★SOP-8: (Tube)

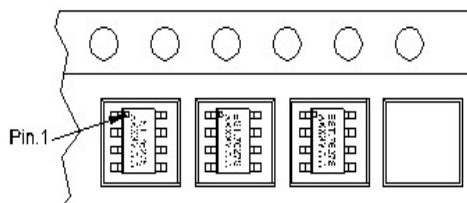
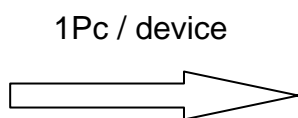
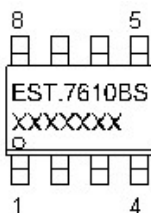
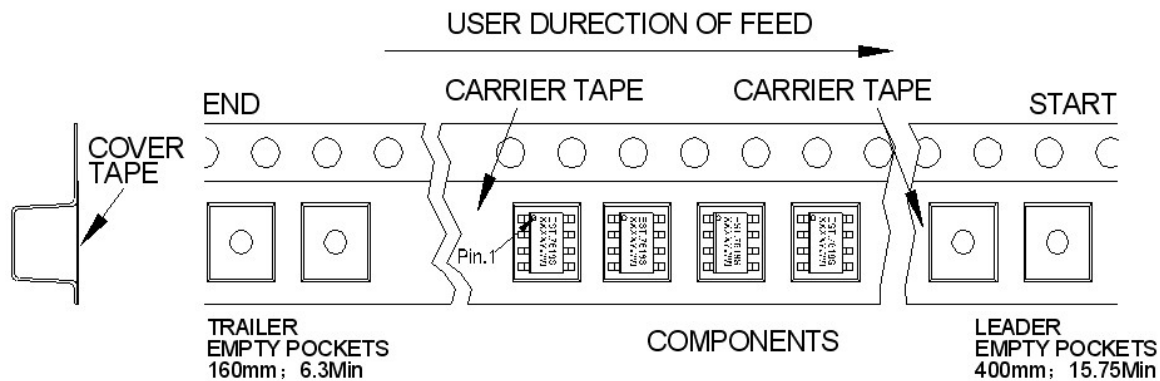


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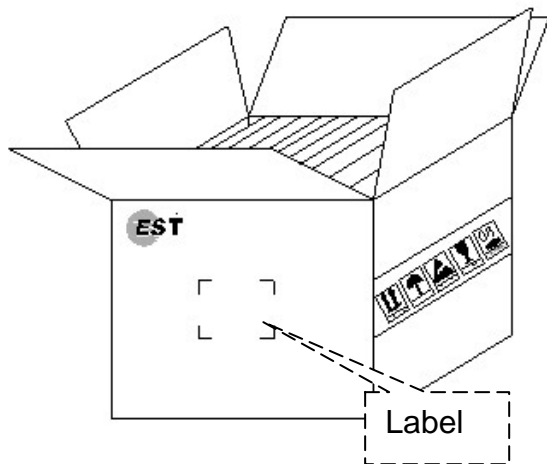
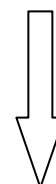


Shipping packing:

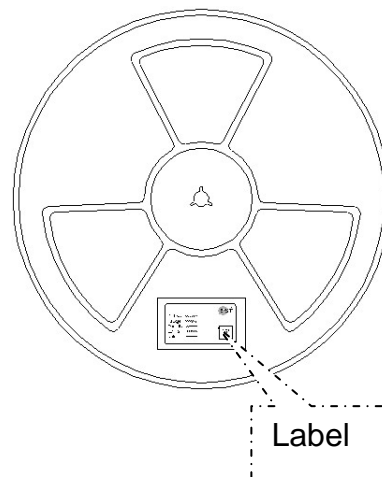
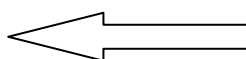
★SOP-8:(tape & Reel)



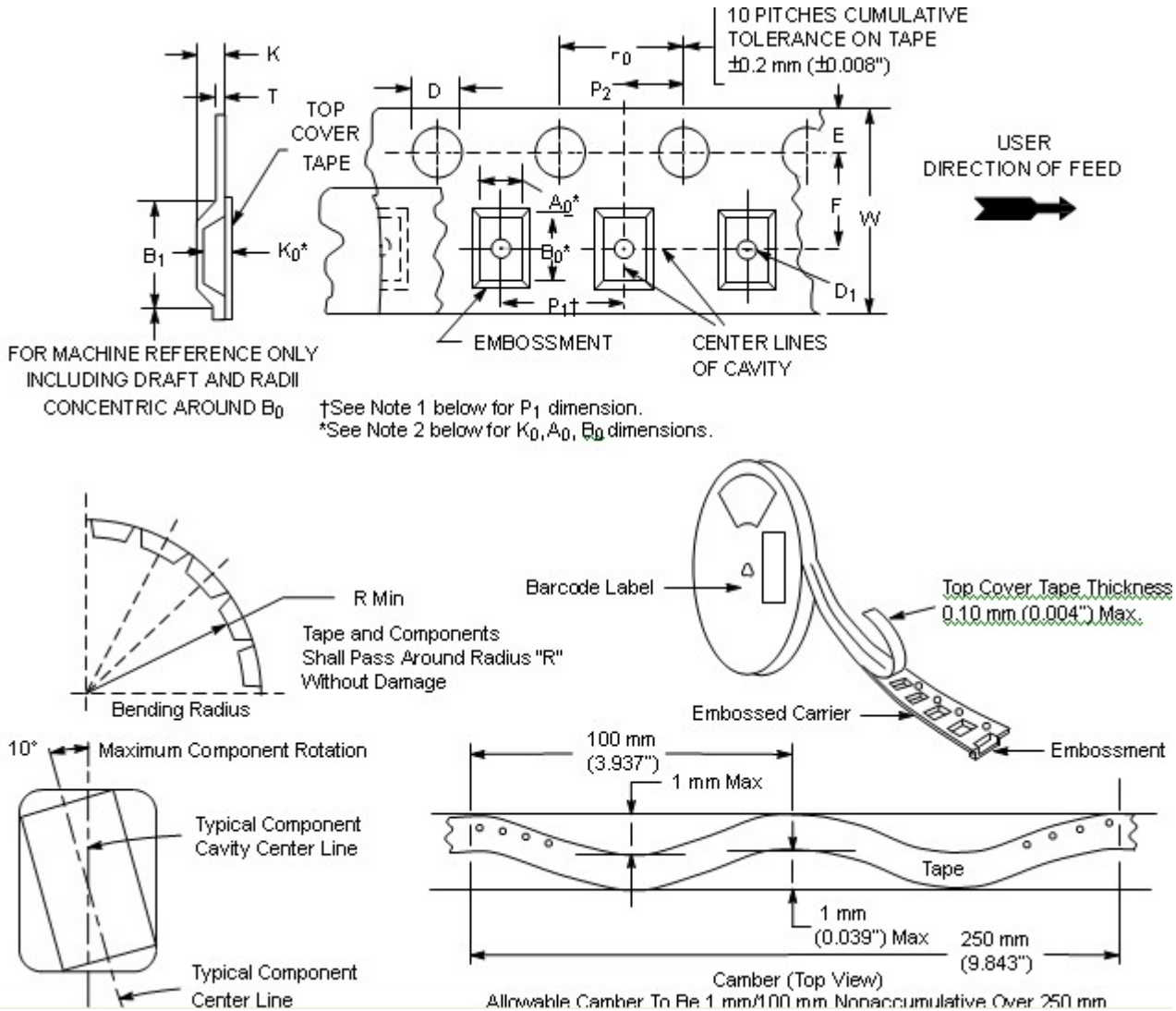
2500 devices / Reel



12 Reel / Carton
(30,000Pcs / Carton)



Embossed Tape and Reel Data Carrier Tape Specifications



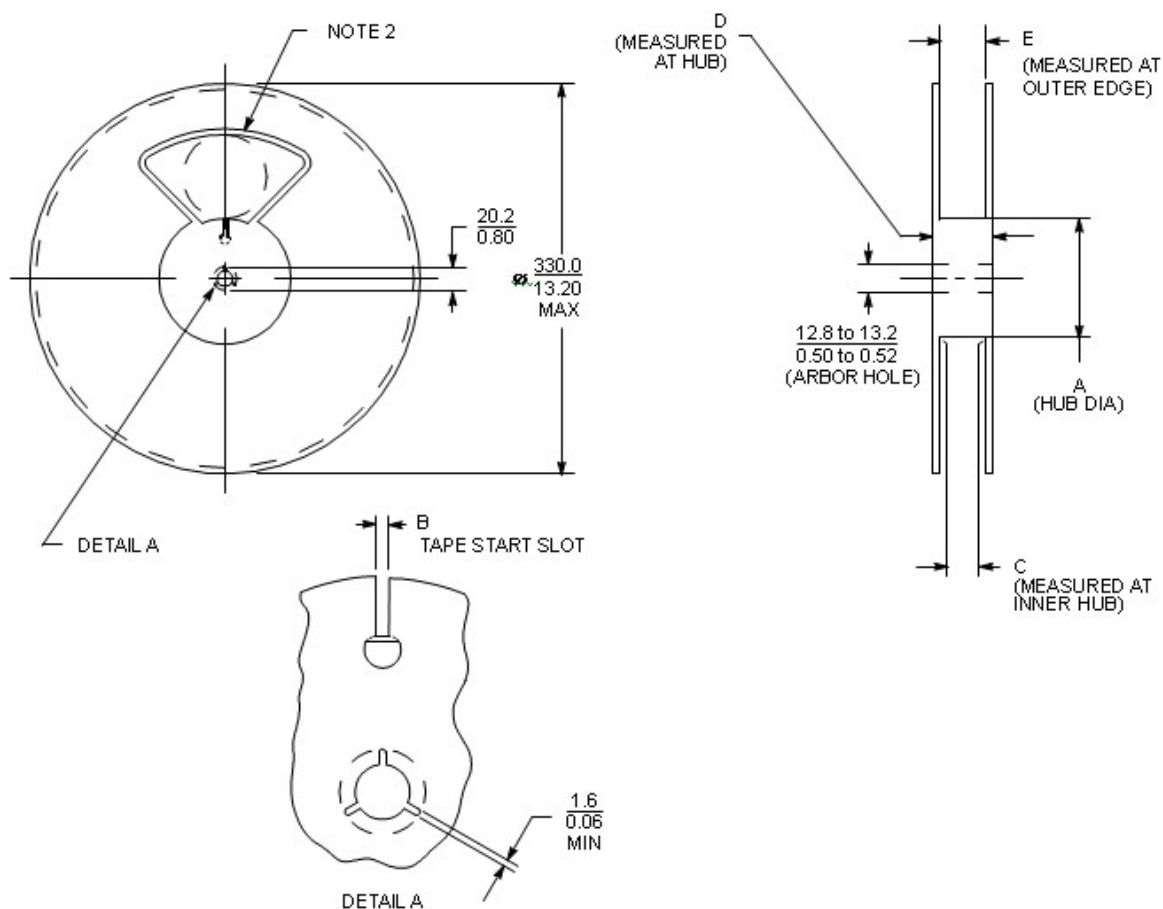
DIMENSIONS

| Tape | B_1 Max (Note 1) | D | D_1 | E | F | K | P_0 | P_2 | R Min | T Max | W Max |
|-------|-----------------------|---|--|--------------------------------------|--------------------------------------|---------------------------|-------------------------------------|-------------------------------------|------------------|--------------------|-------------------------------------|
| 8 mm | 4.55 mm (0.1793) | 1.5 + 0.1 mm - 0.0 (0.059 + 0.0043 - 0.0) | 1.0 Min (0.0393) or 0.5 mm Min (0.0203) | 1.75 ± 0.1 mm (0.069 ± 0.0043) | 3.5 ± 0.05 mm (0.138 ± 0.0023) | 2.4 mm Max (0.0943) | 4.0 ± 0.1 mm (0.157 ± 0.0043) | 2.0 ± 0.1 mm (0.079 ± 0.0023) | 25 mm (0.983) | 0.6 mm (0.0243) | 8.3 mm (0.3273) |
| 12 mm | 8.2 mm (0.3233) | | 1.5 mm Min (0.0603) | | 5.5 ± 0.05 mm (0.217 ± 0.0023) | 6.4 mm Max (0.2523) | | | | | 12 ± 0.30 mm (0.470 ± 0.0123) |
| 16 mm | 12.1 mm (0.4763) | | 7.5 ± 0.10 mm (0.295 ± 0.0043) | | 7.9 mm Max (0.3113) | 16.3 mm (0.6423) | | | | | |
| | | | 11.5 ± 0.1 mm (0.453 ± 0.0043) | | 11.9 mm Max (0.4683) | 24.3 mm (0.9573) | | | | | |

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Reel Dimensions



| Reel | Tape | A | | B | | C | | D | E |
|----------------------|--------------------|---------------------|-------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
| | | Min | Max | Min | Max | Min | Max | | |
| 178.0 (7.01) | 16.0 (0.63) | | 50.0 (1.97) | 6.5 (0.26) | 7.5 (0.30) | 16.4 (0.65) | 18.4 (0.72) | 22.4 (0.88) | 19.4 (0.76) |
| 330.0 (12.99) | 12.0 (0.47) | 178.0 (7.01) | | 4.5 (0.18) | 5.5 (0.22) | 12.4 (0.49) | 14.4 (0.57) | 18.4 (0.72) | 15.4 (0.61) |
| 330.0 (12.99) | 56.0 (2.20) | 150.0 (5.91) | | 10.0 (0.39) | 11.0 (0.43) | 56.4 (2.22) | 58.4 (2.30) | 62.4 (2.46) | 59.4 (2.34) |
| 330.0 (12.99) | 44.0 (1.73) | 100.0 (3.94) | | 10.0 (0.39) | 11.0 (0.43) | 44.4 (1.75) | 46.4 (1.83) | 62.4 (2.46) | 47.4 (1.87) |
| 330.0 (12.99) | 32.0 (1.26) | 100.0 (3.94) | | 10.0 (0.39) | 11.0 (0.43) | 32.4 (1.28) | 34.4 (1.35) | 38.4 (1.51) | 35.4 (1.39) |
| 330.0 (12.99) | 24.0 (0.94) | 60.0 (2.36) | | 9.5 (0.37) | 10.5 (0.41) | 24.4 (0.96) | 26.4 (1.04) | 30.4 (1.51) | 27.4 (1.08) |
| 330.0 (12.99) | 16.0 (0.63) | | | 6.5 (0.26) | 7.5 (0.30) | 16.4 (0.65) | 18.4 (0.72) | 22.4 (0.88) | 19.4 (0.76) |
| 330.0 (12.99) | 12.0 (0.47) | | | 4.5 (0.18) | 5.5 (0.22) | 12.4 (0.49) | 14.4 (0.57) | 18.4 (0.72) | 15.4 (0.61) |
| 330.0 (12.99) | 8.0 (0.31) | 50.0 (1.97) | | 2.5 (0.10) | 3.5 (0.14) | 8.4 (0.33) | 9.9 (0.39) | 14.4 (0.57) | 10.9 (0.43) |
| 178.0 (7.01) | 12.0 (0.47) | 50.0 (1.97) | | 4.5 (0.18) | 5.5 (0.22) | 12.4 (0.49) | 14.4 (0.57) | 18.4 (0.72) | 15.4 (0.61) |
| 178.0 (7.00) | 8.0 (0.31) | 50.0 (1.97) | | 2.5 (0.10) | 3.5 (0.14) | 8.4 (0.33) | 9.9 (0.39) | 14.4 (0.47) | 10.9 (0.43) |
| 330.0 (12.99) | 8.0 (0.31) | 50.0 (1.97) | | 4.0 (0.16) | 5.0 (0.20) | 8.4 (0.33) | 9.9 (0.39) | 14.4 (0.57) | 10.9 (0.43) |
| 178.0 (7.00) | 8.0 (0.31) | 50.0 (1.97) | | 4.0 (0.16) | 5.0 (0.20) | 8.4 (0.33) | 9.9 (0.39) | 14.4 (0.57) | 10.9 (0.43) |