

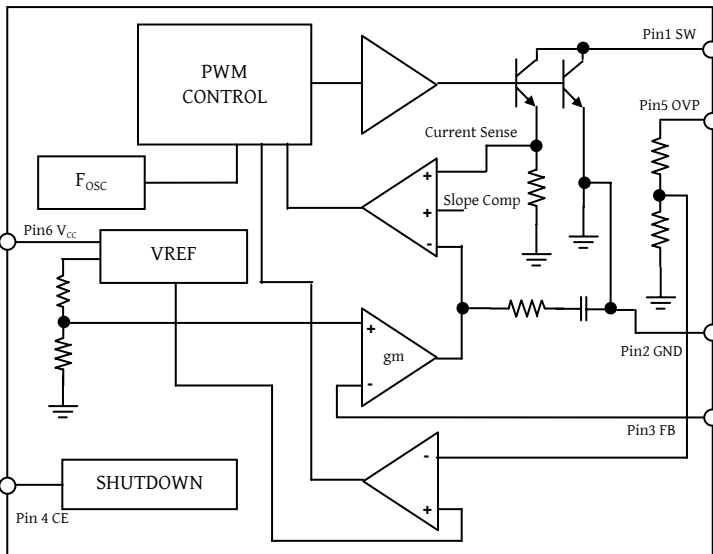
**Features**

- Fast 1.2MHz Switching Frequency
- High Efficiency : 85% Typical
- The minimum input voltage 2.5 V
- Drives 7 Series 2 Parallel LED's with 5V  $V_{IN}$
- Drives 3 Series 5 Parallel LED's with 5V  $V_{IN}$
- Requires Only 0.47uF Output Capacitor
- Inherently Matched LED Current
- Over-voltage protection and UVLO function
- Uses Very Small Inductors
- SOT23-6 Package

**Applications**

- LED series and parallel applications
- LED Display Panels Backlighting.

**Block Diagram**



**Description**

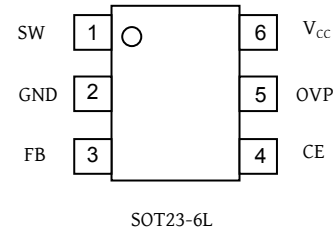
The PA5110 is a white LED constant current driver used for backlighting of digital photo frames or 3 to 5-inch LED screens.

It is a step-up DC/DC converter specifically designed to drive white LED's at a constant current. It can drive up to fifteen LED's.

It switches at 1.2MHz and uses minimal external components which provide cost and real estate saving over alternate solutions.

The output capacitor can be as low as 0.47uF, Feedback voltage is 95mV.

**Pin Configurations**



| Symbol | Description      | Symbol | Description             |
|--------|------------------|--------|-------------------------|
| SW     | Switching Output | VCC    | Power Supply In         |
| GND    | Ground           | OVP    | Over Voltage Protection |
| FB     | Feedback         | CE     | Start-Up                |

| Ordering Information |          |             |
|----------------------|----------|-------------|
| Temperature Range    | Package  | Part Number |
| -40 to 85°C          | SOT23-6L | PA5110-6L   |



**Absolute maximum ratings**

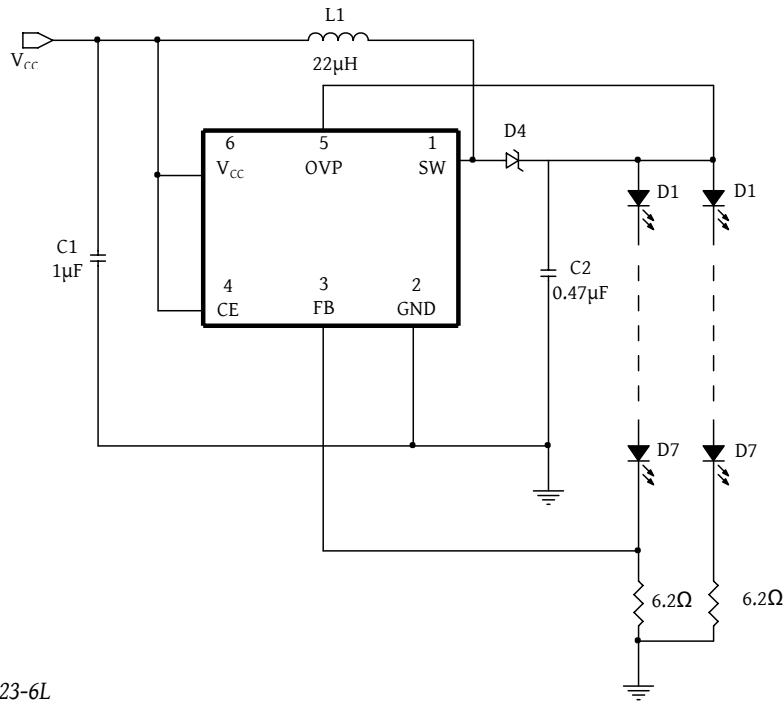
| Parameter                   | Symbol | Value       | Unit |
|-----------------------------|--------|-------------|------|
| Supply Voltage              | VIN    | 20          | V    |
| Feedback Voltage            | FB     | 10          | V    |
| Switch Voltage              | SW     | 32          | V    |
| CE Voltage                  | VCE    | 20          | V    |
| Operating temperature range | Topr   | -25 to +70  | °C   |
| Storage temperature range   | Rstg   | -65 to +150 | °C   |
| Junction temperature        | Tj     | 125         | °C   |

**Electrical Characteristics**

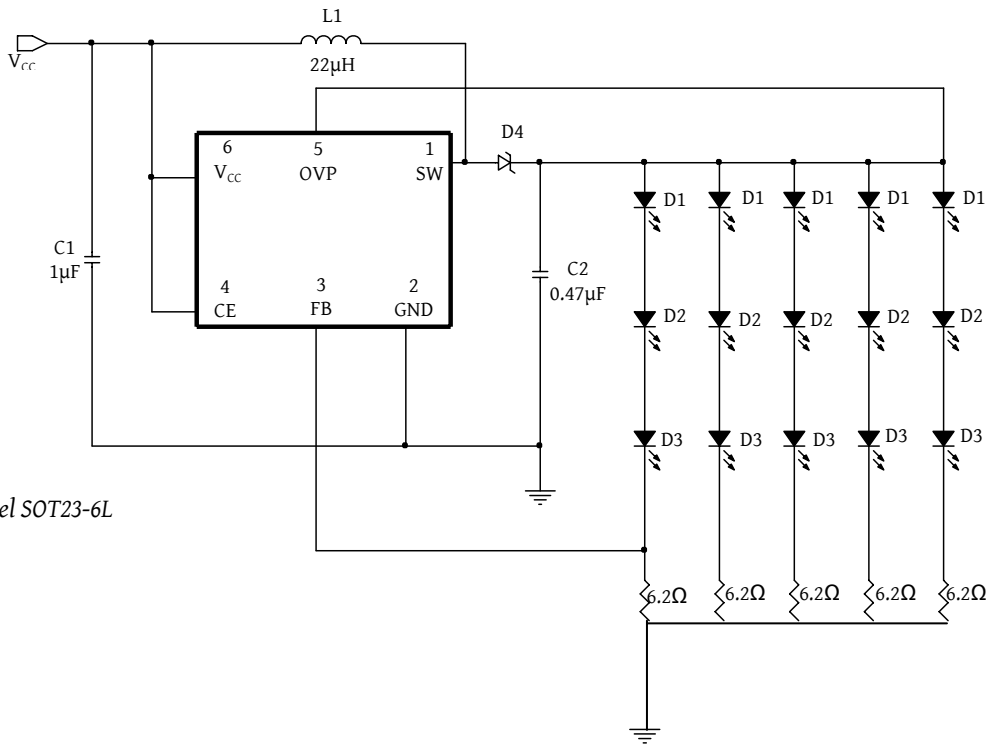
$T_{amb} = 25^{\circ}\text{C}$ ,  $V_{IN}=5\text{V}$ ,  $V_{CE}=5\text{V}$ , unless otherwise specified.

| Parameter                 | Test Conditions / Pins                    | Min | Type       | Max      | Unit                |
|---------------------------|---|-----|------------|----------|---------------------|
| Minimum Operating Voltage |   | 4.5 |            |          | V                   |
| Maximum Operating Voltage |   |     |            | 20       | V                   |
| Feedback Voltage          | $I_{SW}=100\text{mA}$ ,<br>Duty Cycle=66% | 86  | 95         | 104      | mV                  |
| FB Pin Bias Current       |   | 50  | 100        | 200      | nA                  |
| Supply Current            | $V_{CE}=0\text{V}$                        |     | 1.9<br>0.1 | 2.5<br>1 | mA<br>$\mu\text{A}$ |
| Switching Frequency       |   | 0.8 | 1.2        | 1.6      | MHz                 |
| Maximum Duty Cycle        |   | 85  | 90         |          | %                   |
| Switch Current Limit      |   |     | 320        |          | mA                  |
| Switch VCESAT             | $I_{SW} = 250\text{mA}$                   |     | 350        |          | mV                  |
| Switch Leakage Current    | $V_{SW}=5\text{V}$                        |     | 0.01       | 5        | $\mu\text{A}$       |
| CE Voltage High           |   | 1.5 |            |          | V                   |
| CE Voltage Low            |   |     |            | 0.4      | V                   |
| CE Pin Bias Current       |   |     | 65         |          | $\mu\text{A}$       |
| OVP Protection            |   | 27  | 30         | 33       | V                   |

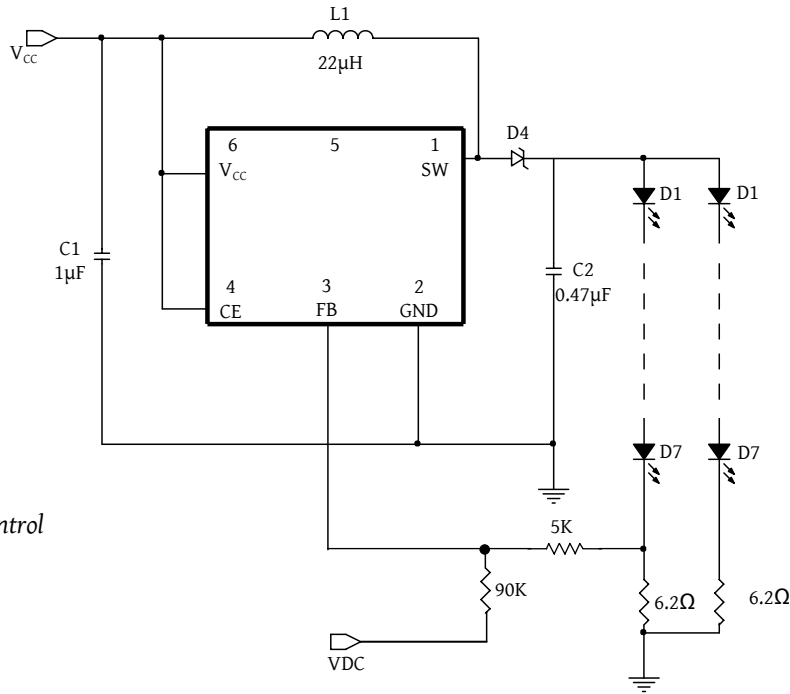
Typical Applications



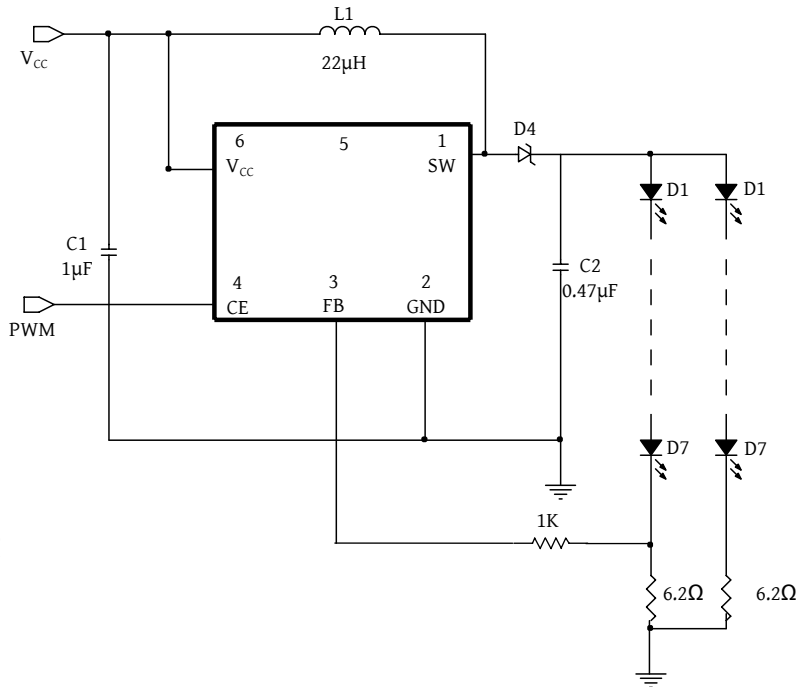
7 Series 2 Parallel SOT23-6L



3 Series 5 Parallel SOT23-6L

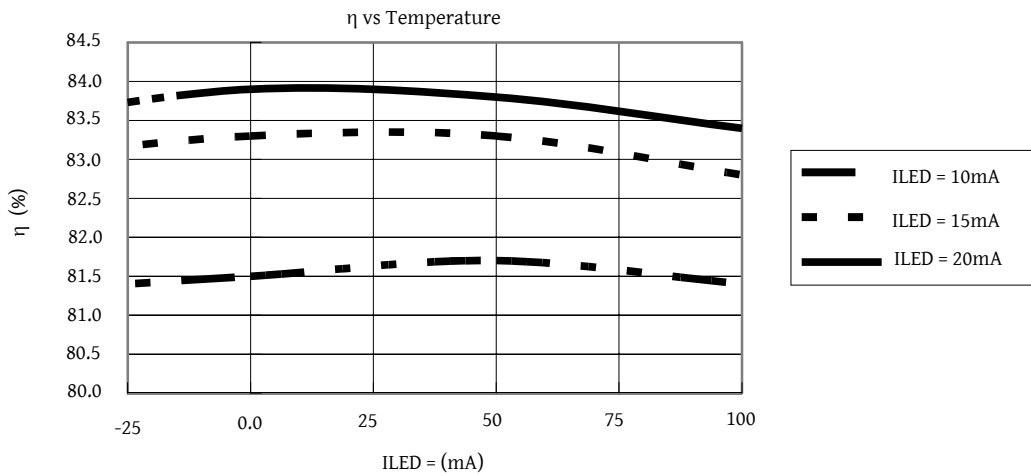
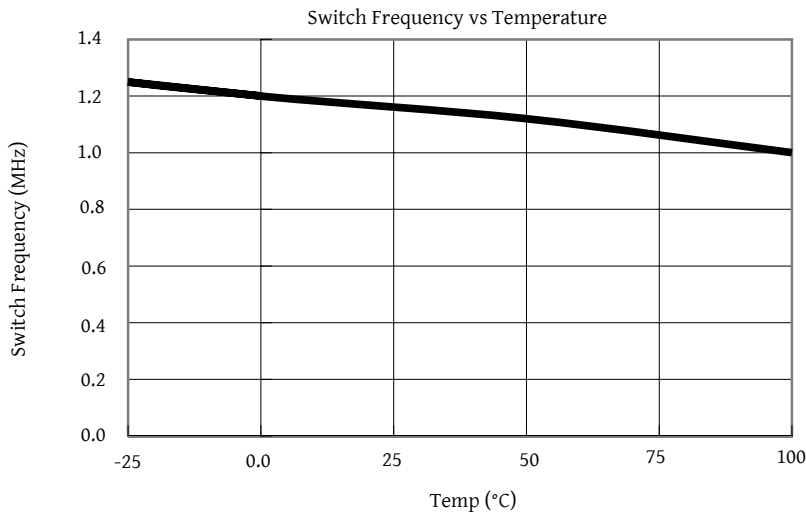
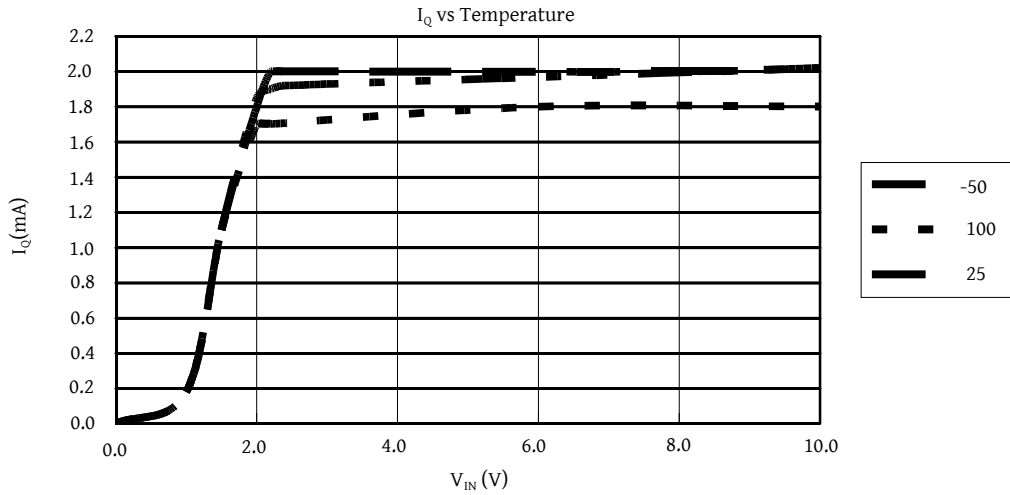


Analog Voltage Backlight Control

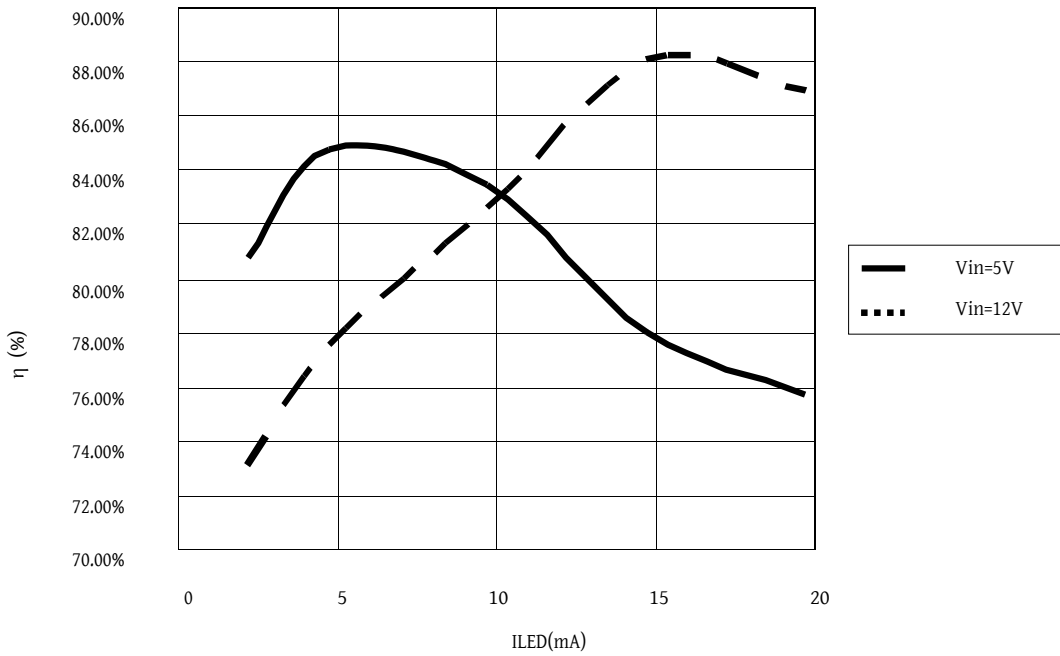


Logic Voltage Backlight Control

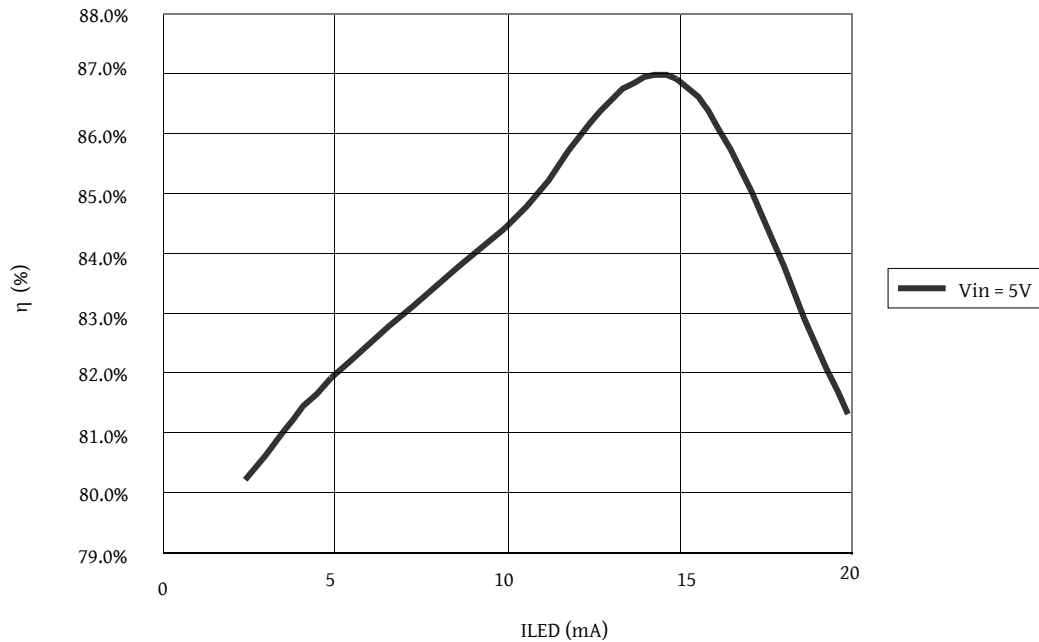
Waveforms



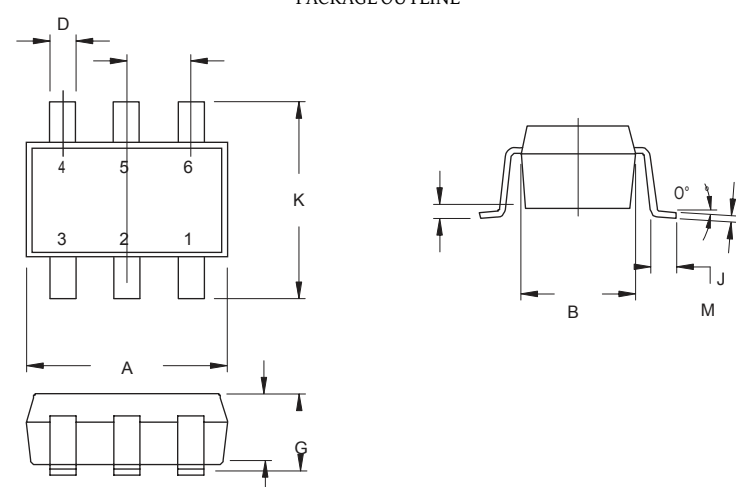

Drive 7 Series 2 Parallel LED's



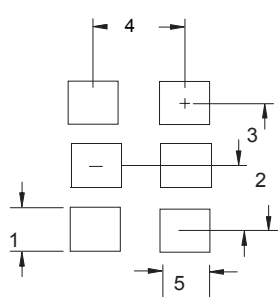
Drive 3 Series 5 Parallel LED's



SOT-23-6 PACKAGE OUTLINE & DIMENSIONS

| PACKAGE OUTLINE   |             | SOT23-6   |        |       |
|---|-------------|---|--------|-------|
|  |             |  |        |       |
| PACKAGE DIMENSIONS  |             |   |        |       |
| DIM   | MILLIMETERS |   | INCHES |       |
|   | MIN         | MAX   | MIN    | MAX   |
| A   | 2.80        | 3.05  | 0.110  | 0.120 |
| B   | 1.50        | 1.75  | 0.059  | 0.070 |
| C   | 0.90        | 1.30  | 0.036  | 0.051 |
| D   | 0.30        | 0.40  | 0.012  | 0.016 |
| E   | 0.85        | 1.05  | 0.033  | 0.040 |
| G   | 0.90        | 1.45  | 0.036  | 0.057 |
| J   | 0.09        | 0.20  | 0.003  | 0.008 |
| K   | 2.60        | 3.00  | 0.102  | 0.118 |
| L   | 0.0         | 0.15  | 0.0    | 0.006 |
| M   | 0.30        | 0.60  | 0.012  | 0.024 |

| MOUNTING PAD  |             |        |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
|---|-------------|--------|--|---------|--|--|-----|-------------|--------|---|------|-------|---|------|-------|---|------|-------|---|------|-------|---|------|-------|
| <table border="1" style="margin: auto;"> <thead> <tr> <th colspan="3" style="text-align: center;">TYPICAL</th> </tr> <tr> <th style="text-align: center;">DIM</th> <th style="text-align: center;">Millimeters</th> <th style="text-align: center;">Inches</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0.70</td> <td style="text-align: center;">0.028</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">1.90</td> <td style="text-align: center;">0.074</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">0.95</td> <td style="text-align: center;">0.037</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">2.40</td> <td style="text-align: center;">0.094</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">1.00</td> <td style="text-align: center;">0.039</td> </tr> </tbody> </table> |             |        |  | TYPICAL |  |  | DIM | Millimeters | Inches | 1 | 0.70 | 0.028 | 2 | 1.90 | 0.074 | 3 | 0.95 | 0.037 | 4 | 2.40 | 0.094 | 5 | 1.00 | 0.039 |
| TYPICAL   |             |        |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
| DIM   | Millimeters | Inches |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
| 1   | 0.70        | 0.028  |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
| 2   | 1.90        | 0.074  |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
| 3   | 0.95        | 0.037  |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
| 4   | 2.40        | 0.094  |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
| 5   | 1.00        | 0.039  |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |
|   |             |        |  |         |  |  |     |             |        |   |      |       |   |      |       |   |      |       |   |      |       |   |      |       |

**NOTES**

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Dimensions are exclusive of mold flash and metal burrs.

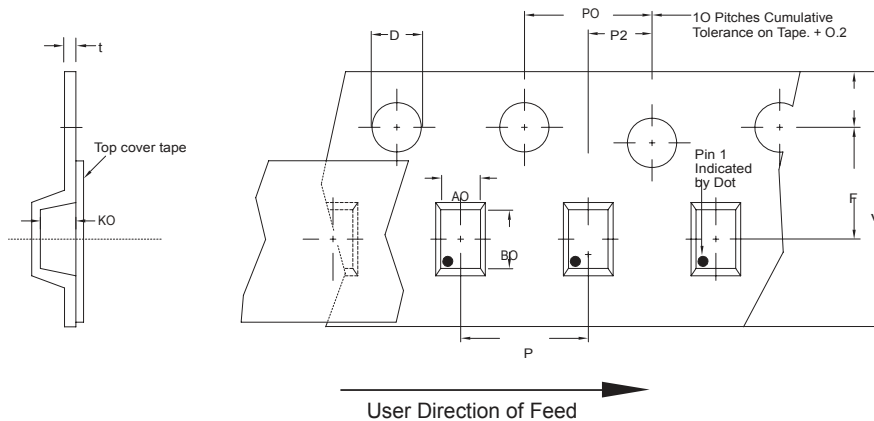
  

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. Suffix -T7 = 7 Inch Reel - 3,000 pieces per 8mm tape,

Outline & Dimensions: Rev 3 - 3/08, 06013

Tape & Reel Specifications (Dimensions in millimeters)

| Reel Dia.  | Tape Width | A0          | B0          | K0          | D           | E           | F           | W           | P0          | P2          | P           | tmax |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|
| 178mm (7") | 8mm        | 3.20 ± 0.10 | 3.20 ± 0.10 | 1.65 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ± 0.30 | 4.00 ± 0.10 | 2.00 ± 0.05 | 4.00 ± 0.10 | 0.25 |



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