

# OptoMOS®

## Solid State Switches



| Engineering Specifications                                | LCA110         | LCA120 | LCA125 | PLA110 | LCB110 | LCB120 | XCA110 | XCA120 | OMA130 | OMA160 |
|-----------------------------------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>Output Characteristics</b>                             |                |        |        |        |        |        |        |        |        |        |
| <b>Contact Form</b>                                       | A              | A      | A      | A      | B      | B      | A      | A      | A      | A      |
| <b>Peak Blocking (V)</b>                                  | 350            | 250    | 300    | 400    | 350    | 250    | 300    | 200    | 60     | 250    |
| <b>Continuous Rated Load (mA)</b>                         |                |        |        |        |        |        |        |        |        |        |
| X Configuration                                           | 120            | 170    | 170    | 150    | 120    | 170    | 100    | 150    | 250    | 50     |
| Y Configuration                                           | 200            | 300    | 300    | 210    | 200    | 300    | 150    | 250    | 400    | 80     |
| <b>Peak Load/mA (10msec)</b>                              | 350            | 400    | 400    | 400    | 350    | 400    | 350    | 400    | 500    | 100    |
| <b>On Resistance (Ohms)</b>                               |                |        |        |        |        |        |        |        |        |        |
| X Configuration, Typical                                  | 23             | 12     | 10     | 15     | 23     | 16     | 28     | 15     | 8      | 50     |
| Maximum                                                   | 35             | 20     | 16     | 22     | 35     | 20     | 40     | 25     | 10     | 100    |
| Y Configuration, Typical                                  | 7              | 4      | 4      | 5      | 7      | 5      | 9      | 5      | 2      | 15     |
| Maximum                                                   | 10             | 6      | 5      | 7      | 10     | 6      | 15     | 10     | 3      | 30     |
| <b>Switching Time (Max)</b>                               |                |        |        |        |        |        |        |        |        |        |
| I <sub>CONTROL</sub> (mA)                                 | 5 <sup>1</sup> | 5      | 5      | 5      | 5      | 5      | 5      | 8      | 10     | 10     |
| T <sub>ON</sub> (msec)                                    | 3              | 5      | 5      | 1      | 3      | 5      | 4      | 5      | 5      | 0.125  |
| T <sub>OFF</sub> (msec)                                   | 3              | 5      | 5      | 0.25   | 3      | 5      | 4      | 5      | 5      | 0.125  |
| <b>Off State Leakage (Max) at Full Rated Voltage (μA)</b> | 1              | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 0.025  |
| <b>Typical Capacitance at 0 Volts f = 1MHz (pF)</b>       | 25             | 50     | 50     | 35     | 25     | 50     | 25     | 50     | 50     | 5      |

<sup>1</sup>Also operates with I<sub>CONTROL</sub> = 2mA; T<sub>ON</sub> = 5 msec.; T<sub>OFF</sub> = 3 msec.

|                                       |     |     |     |     |     |     |     |     |     |     |
|---------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Input Characteristics</b>          |     |     |     |     |     |     |     |     |     |     |
| <b>Control Current (mA)**</b>         |     |     |     |     |     |     |     |     |     |     |
| Minimum                               | 2   | 5   | 5   | 5   | 5   | 5   | 5   | 8   | 10  | 10  |
| Maximum                               | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| <b>Voltage Drop (V)</b>               |     |     |     |     |     |     |     |     |     |     |
| Minimum                               | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Maximum                               | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| <b>Reverse Voltage (V, Max)</b>       | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |
| <b>Reverse Leakage (μA, Max)</b>      | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  | 10  |
| <b>Input/Output (Capacitance, pF)</b> | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   |

\*I<sub>CONTROL</sub> represents the forward LED current used to activate the switch.

### Features:

- Small 6-pin DIP package
- Machine insertable/wave solderable
- Two milliwatt logic-compatible drive power
- No moving parts
- Loads up to 400 Volts AC/DC and 400 mA
- Lifetime in excess of 15 billion operations
- Arc-free with no snubbing circuits
- Optimal switching speeds
- 3,750 Volt input/output isolation
- UL recognized: File No. E76270
- CSA compatible
- TO-5 package available
- MIL processing available
- Other configurations available
- BABT (BS 6301/BS 415 / BS7002) approval

When ordering CP Clare solid state switches, a suffix may be added to the part number to specify the following options:

| Suffix | Option                                                             |
|--------|--------------------------------------------------------------------|
| E      | 3,750V Isolation Voltage                                           |
| S      | Gull-Wing Package*                                                 |
| T/R    | Tape and Reel Package*                                             |
| L      | Current Limiting Versions (Available in 110, 120 and 190 Families) |
| C      | Optional 4-Pin Configuration                                       |

### Absolute Maximum Ratings

| Parameter                                   | Min  | Max | Units            |
|---------------------------------------------|------|-----|------------------|
| Input/Output Isolation                      | 2500 | —   | V <sub>RMS</sub> |
| Optional "E" Suffix                         | 3750 | —   | V <sub>RMS</sub> |
| Operating Temperature†                      | -40  | 85  | °C               |
| Storage Temperature                         | -40  | 125 | °C               |
| Soldering Temperature (10 seconds on leads) | —    | 260 | °C               |

All characteristics at 25°C

### \*\*\*Typical Switching Time vs. Temperature:

- - LCA110, LCA120, LCA125 and OMA130
- - XCA110 and XCA120
- - OMA160

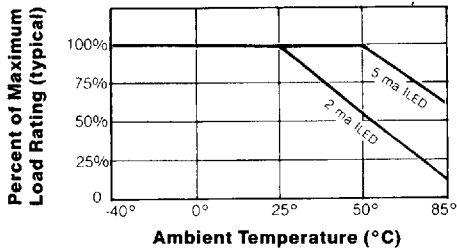
\*For a complete listing of CP Clare Solid State Products ask for our SSP15 catalog.

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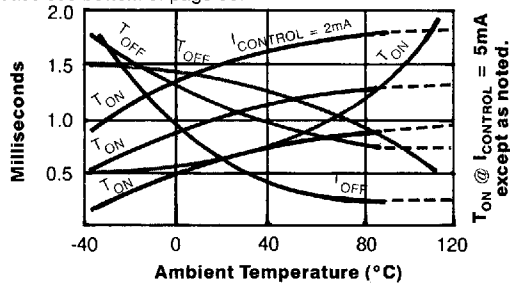
## Operating Specifications

### Performance

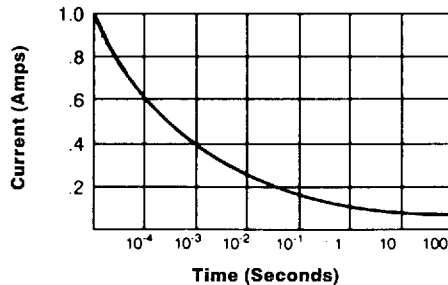
Load vs. Temperature



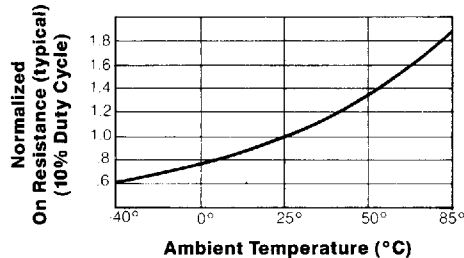
Typical Switching Time vs. Temperature\*\*\*  
Please see bottom of page 36.



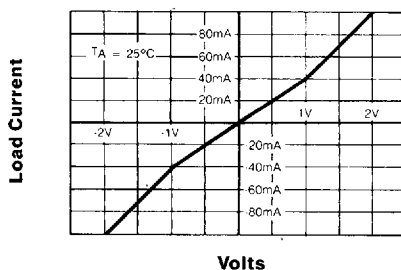
Energy Rating



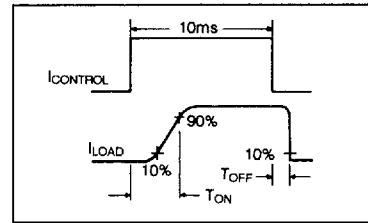
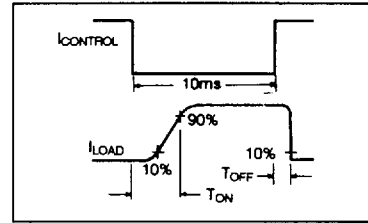
On Resistance vs. Temperature



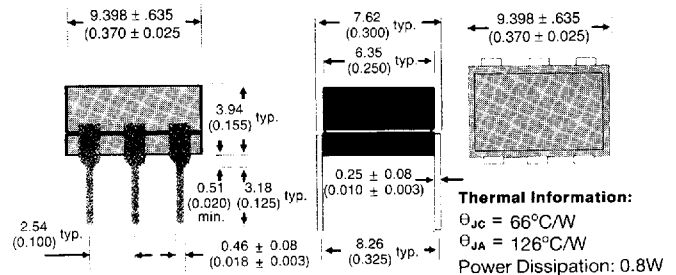
Typical I/V Characteristics



### Switching Characteristics

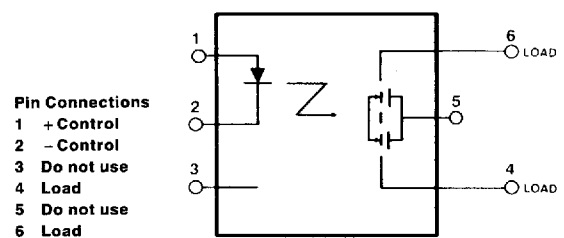


### Package Mechanical Dimensions



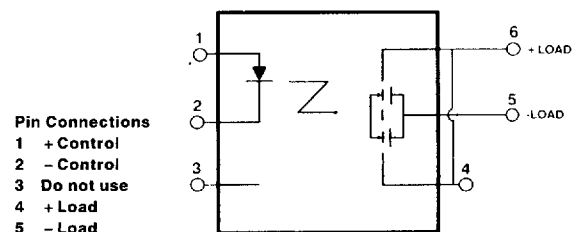
### Configuration X

This is the preferred configuration for AC circuits.

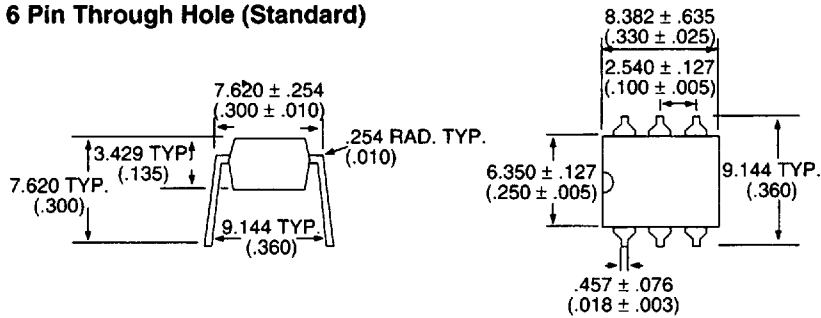


### Configuration Y

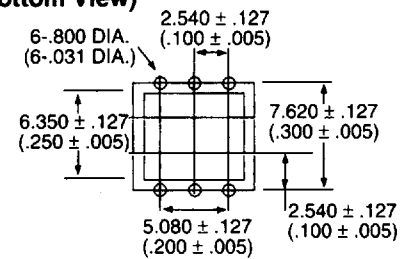
This configuration is most useful for DC circuits where the direction of the current does not change.



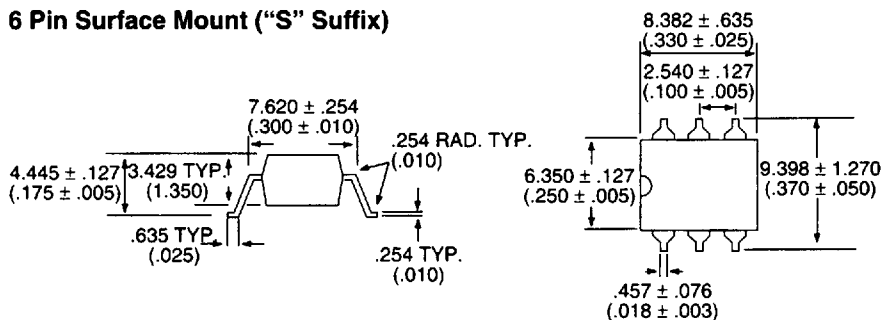
**6 Pin Through Hole (Standard)**



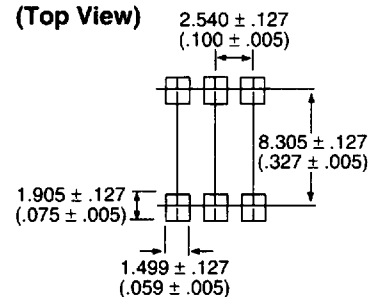
**6 Pin PC Board Pattern (Bottom View)**



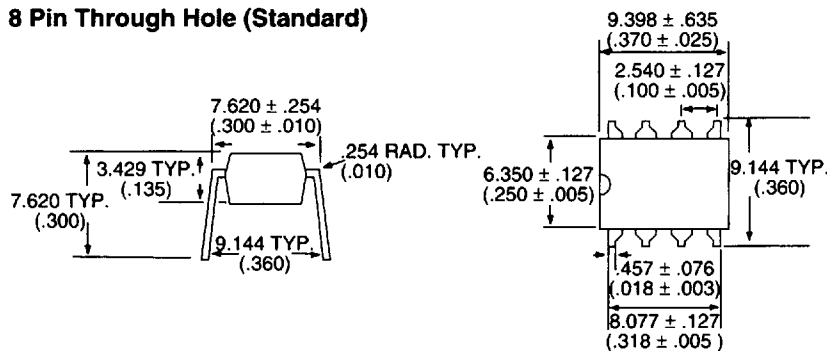
**6 Pin Surface Mount ("S" Suffix)**



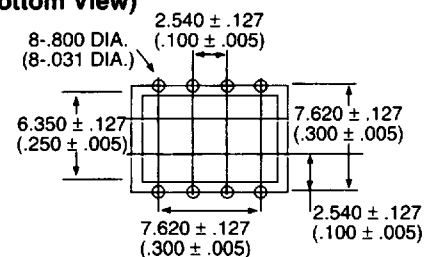
**6 Pin Mounting Pad (Top View)**



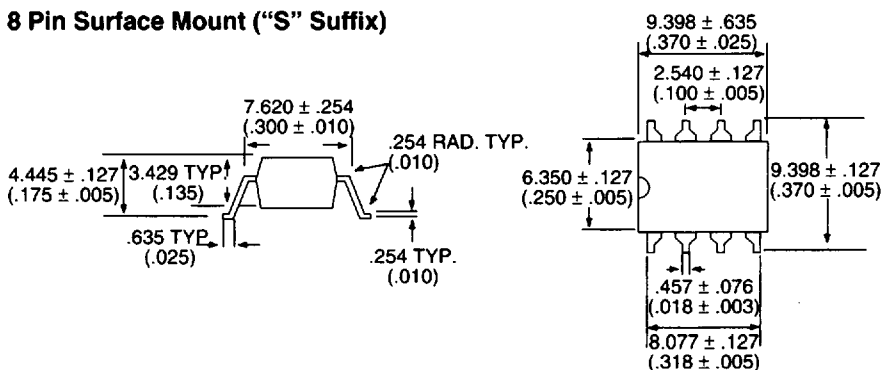
**8 Pin Through Hole (Standard)**



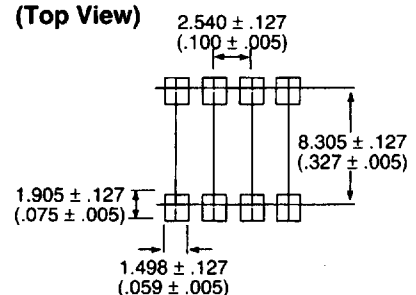
**8 Pin PC Board Pattern (Bottom View)**



**8 Pin Surface Mount ("S" Suffix)**

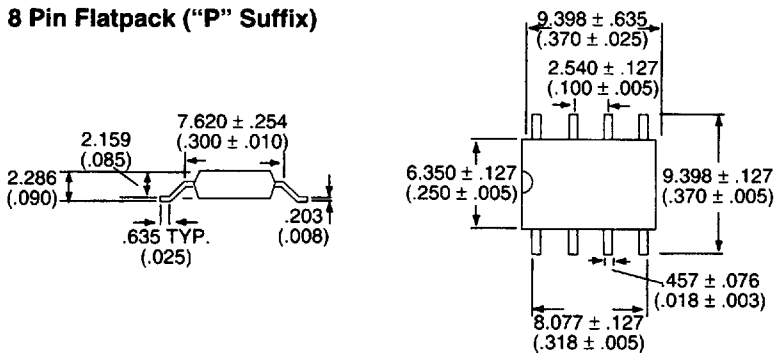


**8 Pin Mounting Pad (Top View)**

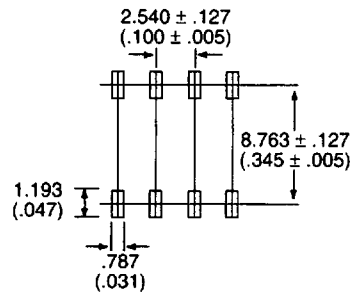


**DIMENSIONS**  
mm  
(Inches)

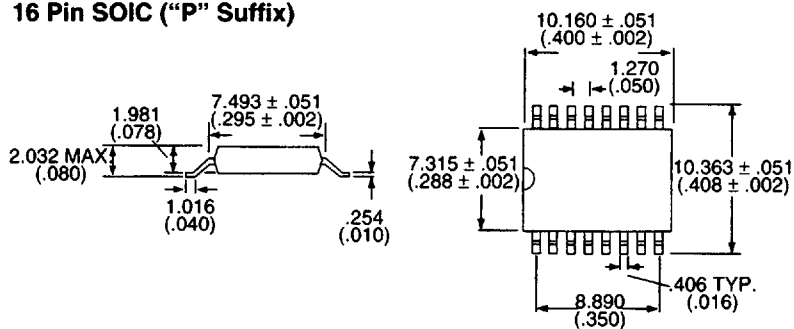
**8 Pin Flatpack ("P" Suffix)**



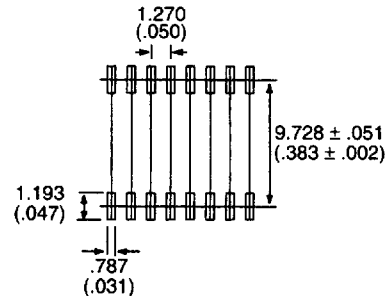
**8 Pin Flatpack Mounting Pad (Top View)**



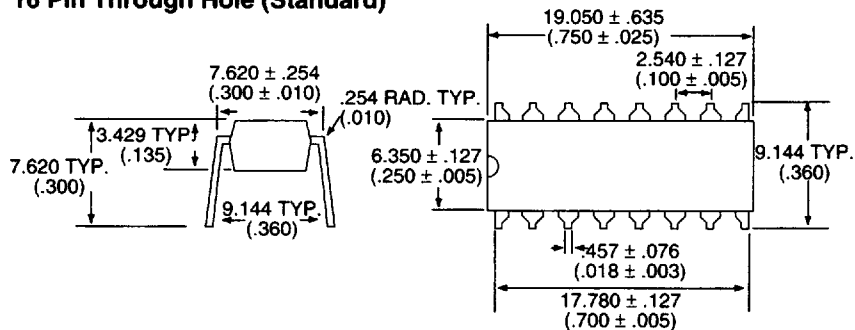
**16 Pin SOIC ("P" Suffix)**



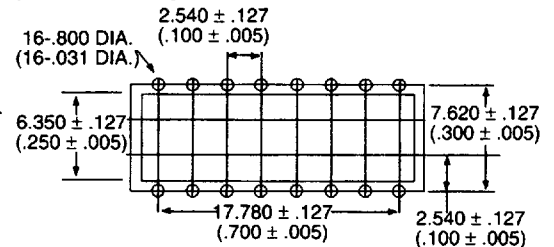
**16 Pin SOIC Mounting Pad (Top View)**



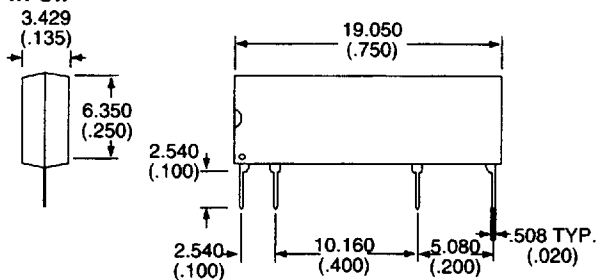
**16 Pin Through Hole (Standard)**



**16 Pin PC Board Pattern (Bottom View)**

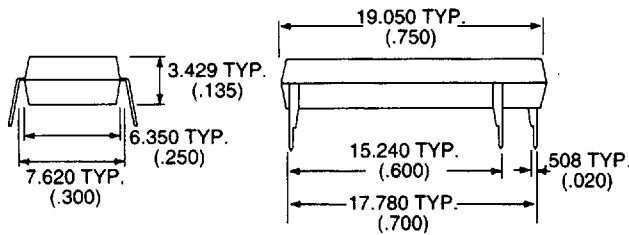


**8 Pin SIP**

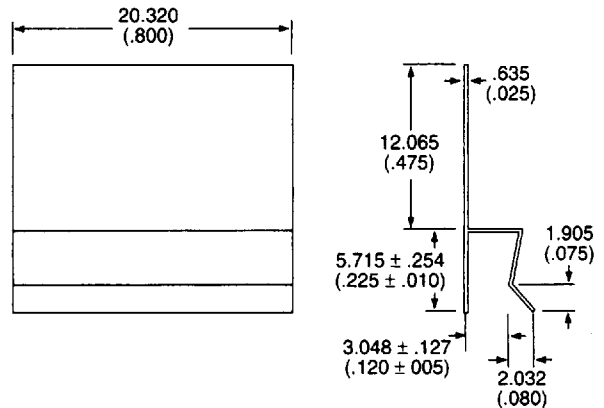


**DIMENSIONS**  
mm  
(Inches)

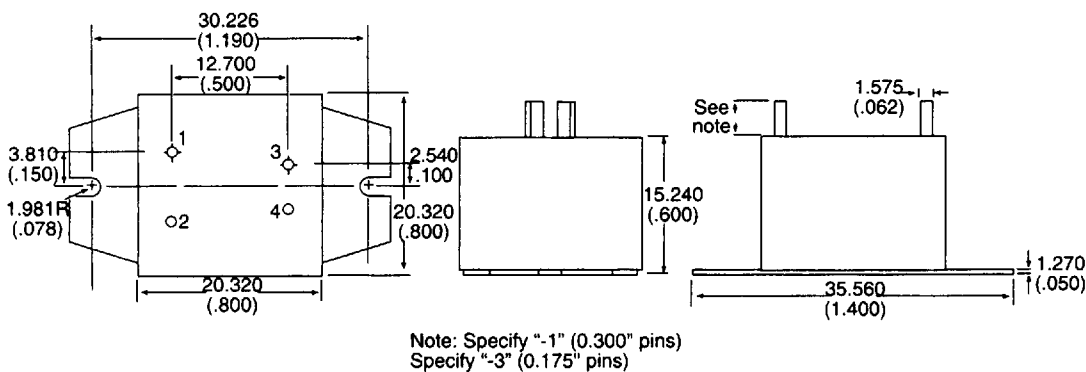
**16 Pin DIP**



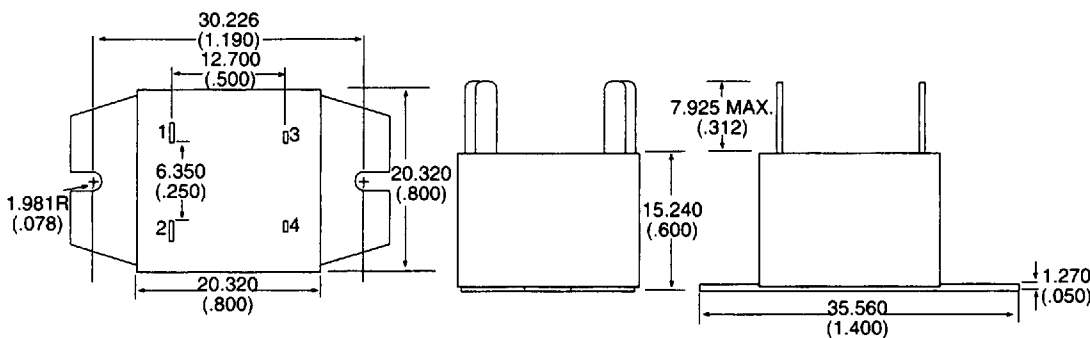
**Thermal Clip**



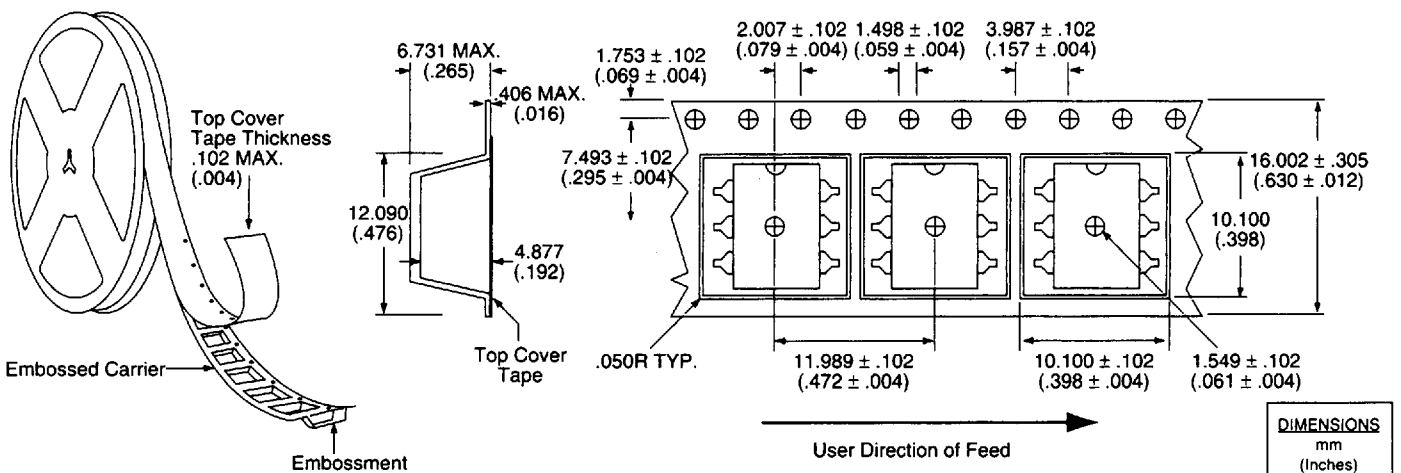
**OptoFILM® 10A Series, Pins**



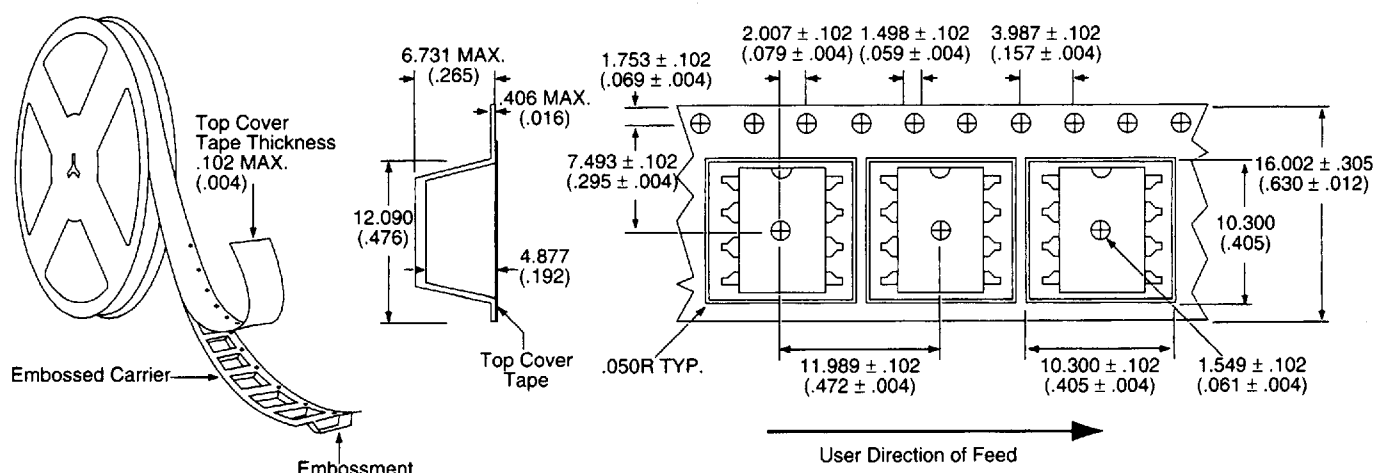
**OptoFILM® 10A Series, Quick Connect**



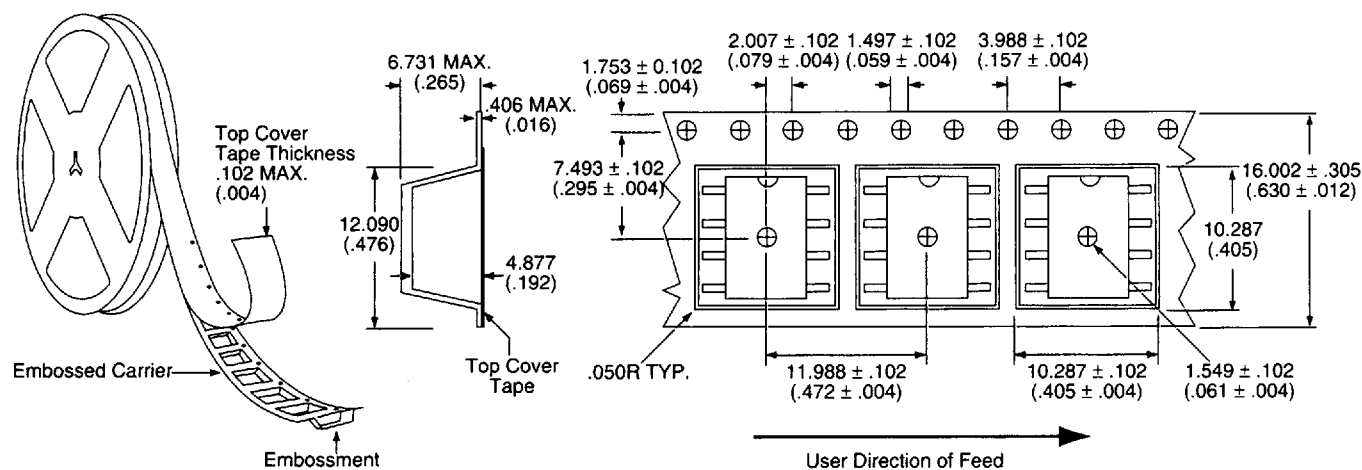
**Tape and Reel Packaging for 6 Pin Surface Mount Package**



**Tape and Reel Packaging for 8 Pin Surface Mount Package**



**Tape and Reel Packaging for 8 Pin Flatpack Package**



**Tape and Reel Packaging for 16 Pin SOIC Package**

