

| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | |
|--|----------------------|--------------|-------------|--------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| INPUT | | | | |
| Reverse voltage | | V_R | 6 | V |
| Forward current - continuous | | I_F | 60 | mA |
| Power dissipation | | P_{diss} | 100 | mW |
| OUTPUT | | | | |
| Off state output terminal voltage | | V_{DRM} | 600 | V |
| Peak non-repetitive surge current | PW = 100 ms, 120 pps | I_{TSM} | 1 | A |
| Power dissipation | | P_{diss} | 200 | mW |
| On-state RMS current | | $I_{T(RMS)}$ | 100 | mA |
| COUPLER | | | | |
| Total power dissipation | | P_{tot} | 300 | mW |
| Operating temperature | | T_{amb} | -55 to +100 | $^{\circ}\text{C}$ |
| Storage temperature | | T_{stg} | -55 to +150 | $^{\circ}\text{C}$ |
| Soldering temperature | 10 s | T_{slid} | 260 | $^{\circ}\text{C}$ |

Note

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability

| THERMAL CHARACTERISTICS | | | | |
|---|----------------|-------|-----------------------------|--|
| PARAMETER | SYMBOL | VALUE | UNIT | |
| Maximum LED junction temperature | $T_{jmax.}$ | 125 | $^{\circ}\text{C}$ | |
| Maximum output die junction temperature | $T_{jmax.}$ | 125 | $^{\circ}\text{C}$ | |
| Thermal resistance, junction emitter to board | θ_{JEB} | 150 | $^{\circ}\text{C}/\text{W}$ | |
| Thermal resistance, junction emitter to case | θ_{JEC} | 139 | $^{\circ}\text{C}/\text{W}$ | |
| Thermal resistance, junction detector to board | θ_{JDB} | 78 | $^{\circ}\text{C}/\text{W}$ | |
| Thermal resistance, junction detector to case | θ_{JDC} | 103 | $^{\circ}\text{C}/\text{W}$ | |
| Thermal resistance, junction emitter to junction detector | θ_{JED} | 496 | $^{\circ}\text{C}/\text{W}$ | |
| Thermal resistance, case to ambient | θ_{CA} | 3563 | $^{\circ}\text{C}/\text{W}$ | |

Note

- The thermal model is represented in the thermal network below. Each resistance value given in this model can be used to calculate the temperatures at each node for a given operating condition. The thermal resistance from board to ambient will be dependent on the type of PCB, layout and thickness of copper traces. For a detailed explanation of the thermal model, please reference Vishay's Thermal Characteristics of Optocouplers application note



| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|---|--------|--------------|------|------|------|------------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| INPUT | | | | | | | |
| Reverse current | $V_R = 6\text{ V}$ | | I_R | - | - | 10 | μA |
| Forward voltage | $I_F = 30\text{ mA}$ | | V_F | - | 1.2 | 1.5 | V |
| OUTPUT | | | | | | | |
| Leakage with LED off, either direction | $V_{DRM} = 600\text{ V}$ | | I_{DRM} | - | 10 | 500 | nA |
| Critical rate of rise off-state voltage | $V_D = 400\text{ V}$ | | dV/dt_{cr} | 1500 | 2000 | - | V/ μs |
| COUPLER | | | | | | | |
| LED trigger current, current required to latch output | | VO3053 | I_{FT} | - | - | 5 | mA |
| | | VO3052 | I_{FT} | - | - | 10 | mA |
| Peak on-state voltage, either direction | $I_{TM} = 100\text{ mA peak}$, $I_F = \text{rated } I_{FT}$ | | V_{TM} | - | 1.7 | 3 | V |
| Holding current, either direction | | | I_H | - | 200 | - | μA |
| Coupling capacitance | 10 kHz | | C_{IO} | - | 0.4 | - | pF |

Note

- Typical values are characteristics of the device and are the result of engineering evaluations. Typical values are for information only and are not part of the testing requirements.

| SAFETY AND INSULATION RATINGS | | | | |
|--|---|------------|----------------|--------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Climatic classification | According to IEC 68 part 1 | | 55 / 100 / 21 | |
| Pollution degree | According to DIN VDE 0109 | | 2 | |
| Comparative tracking index | Insulation group IIIa | CTI | 175 | |
| Maximum rated withstanding isolation voltage | According to UL1577, $t = 1\text{ min}$ | V_{ISO} | 4420 | V_{RMS} |
| Tested withstanding isolation voltage | According to UL1577, $t = 1\text{ s}$ | V_{ISO} | 5300 | V_{RMS} |
| Maximum transient isolation voltage | According to DIN EN 60747-5-5 | V_{IOTM} | 8000 | V_{peak} |
| Maximum repetitive peak isolation voltage | According to DIN EN 60747-5-5 | V_{IORM} | 890 | V_{peak} |
| Isolation resistance | $T_{amb} = 25\text{ }^{\circ}\text{C}$, $V_{IO} = 500\text{ V}$ | R_{IO} | $\geq 10^{12}$ | Ω |
| | $T_{amb} = 100\text{ }^{\circ}\text{C}$, $V_{IO} = 500\text{ V}$ | R_{IO} | $\geq 10^{11}$ | Ω |
| Output safety power | | P_{SO} | 500 | mW |
| Input safety current | | I_{SI} | 250 | mA |
| Input safety temperature | | T_S | 175 | $^{\circ}\text{C}$ |
| Creepage distance | DIP-6, SMD-6 with option 7 and 9 | | ≥ 7 | mm |
| Clearance distance | | | ≥ 7 | mm |
| Creepage distance | DIP-6, 400 mil, option 6 | | ≥ 8 | mm |
| Clearance distance | | | ≥ 8 | mm |
| Insulation thickness | | DTI | ≥ 0.4 | mm |
| Input to output test voltage, method A | $V_{IORM} \times 1.6 = V_{PR}$, 100 % sample test with $t_M = 10\text{ s}$, partial discharge $< 5\text{ pC}$ | V_{PR} | 1669 | V_{peak} |

Note

- As per IEC 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

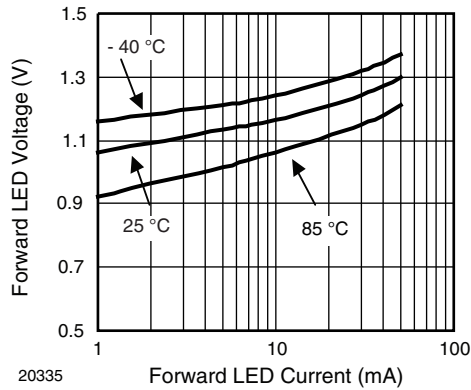


Fig. 1 - Forward Voltage vs. Forward Current

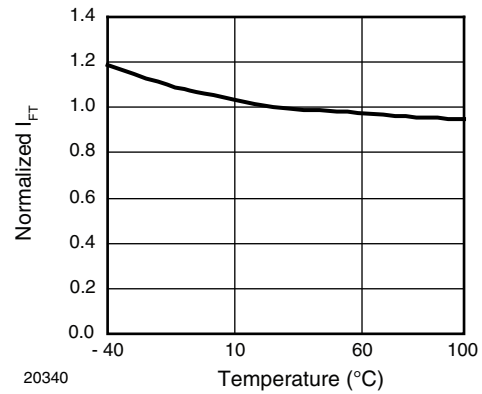


Fig. 4 - Normalized Trigger Current vs. Temperature

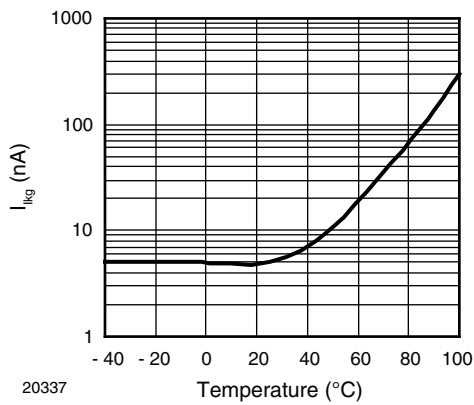


Fig. 2 - Off-State Leakage Current vs. Temperature

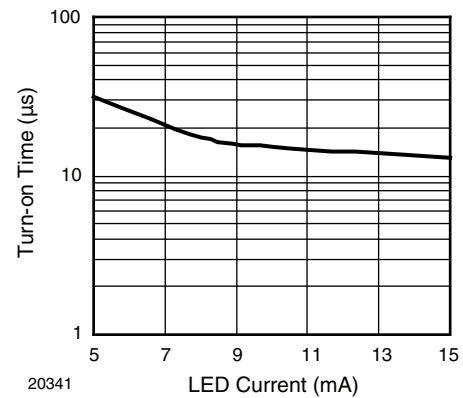


Fig. 5 - Turn-on Time vs. LED Current

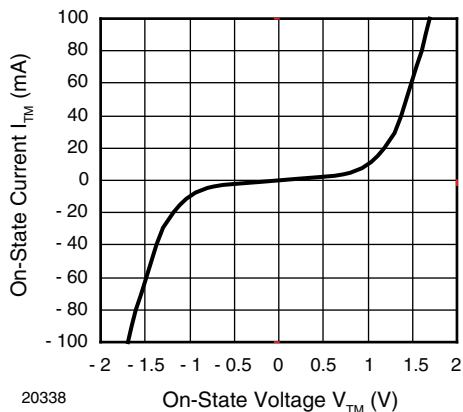


Fig. 3 - On-State Current vs. V_{TM}

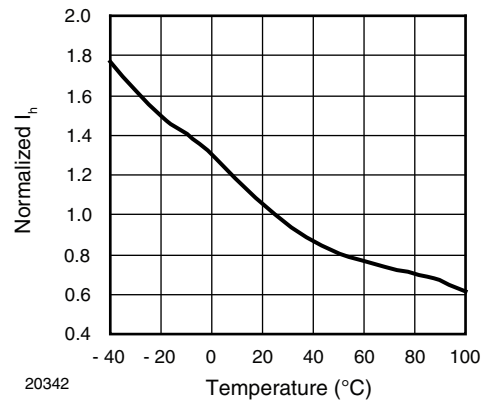


Fig. 6 - Normalized Holding Current vs. Temperature

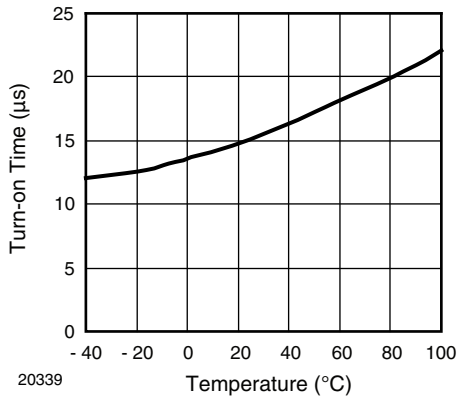


Fig. 7 - Turn-on Time vs. Temperature

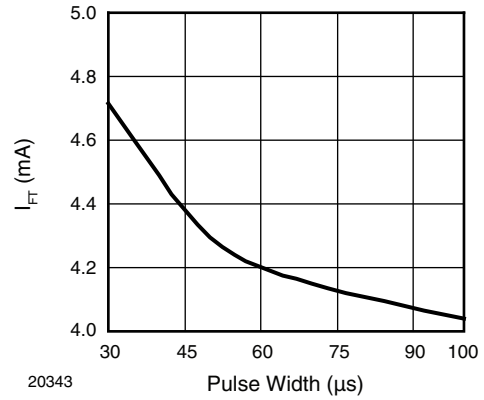
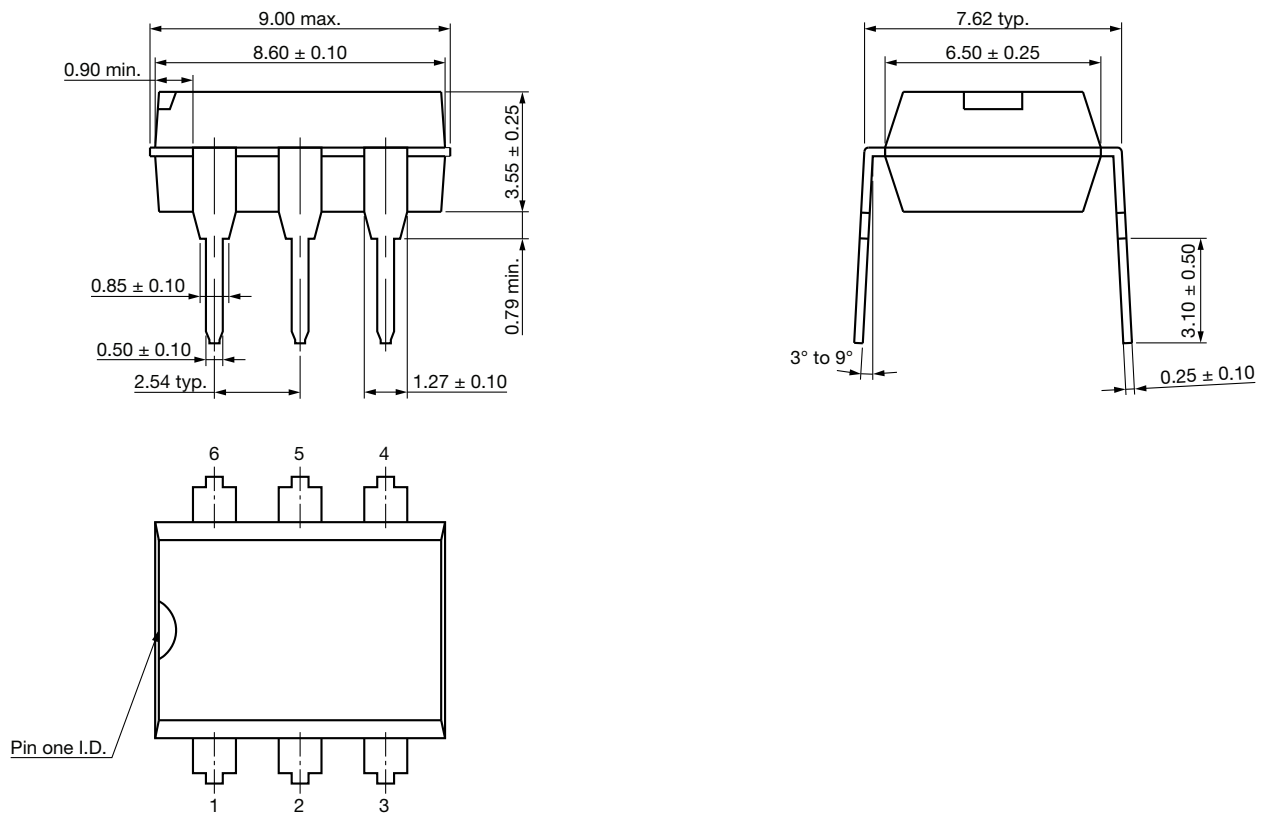


Fig. 8 - Trigger Current vs. Pulse Width

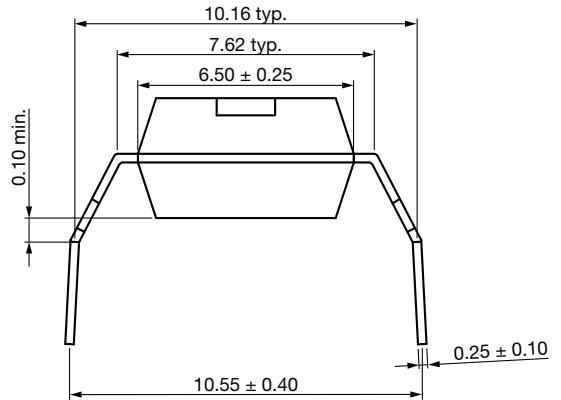
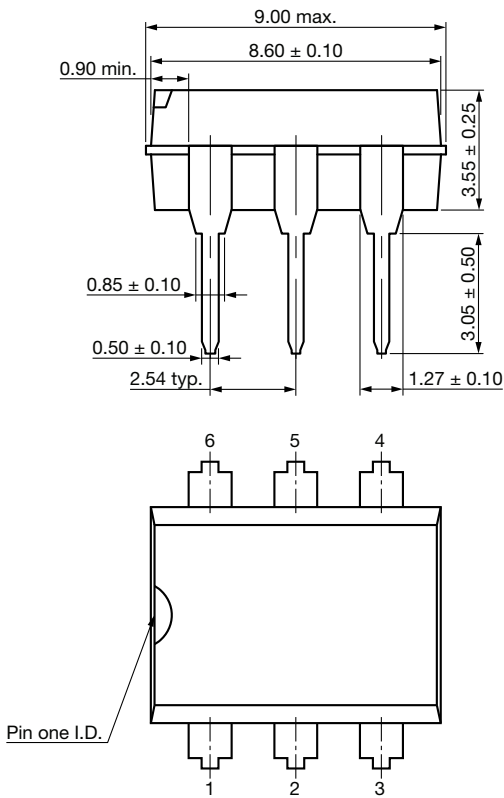
PACKAGE DIMENSIONS (in millimeters)

DIP-6

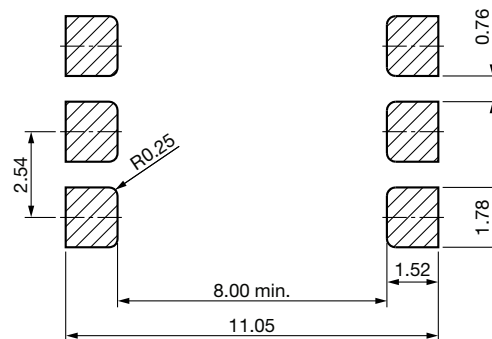
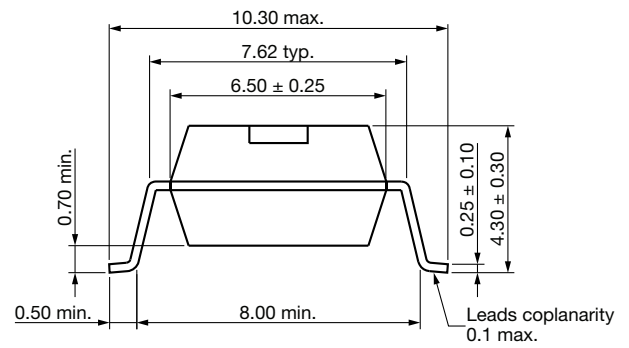
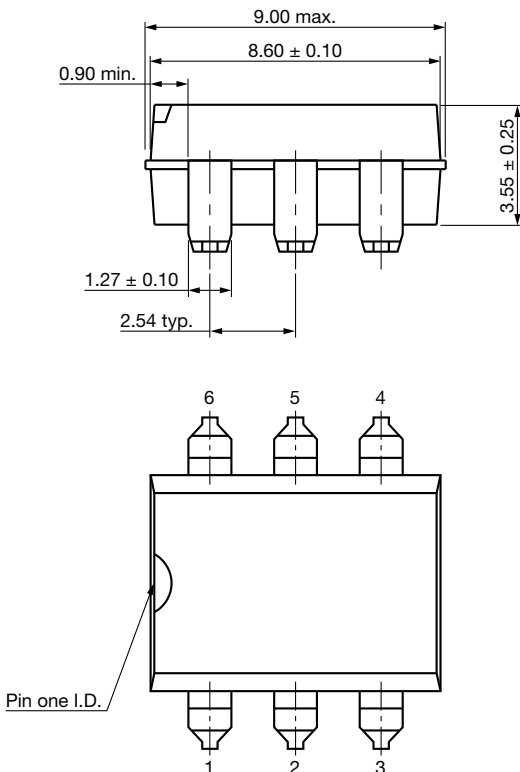




DIP-6, 400 mil, Option 6

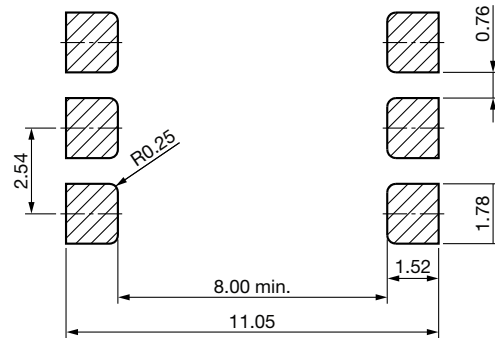
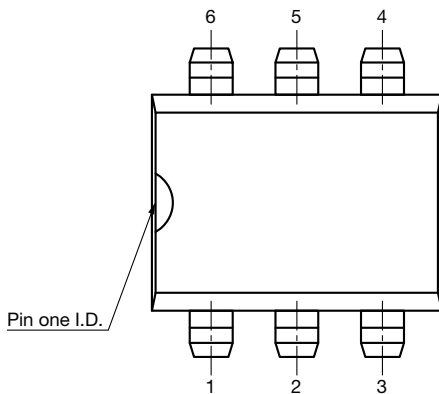
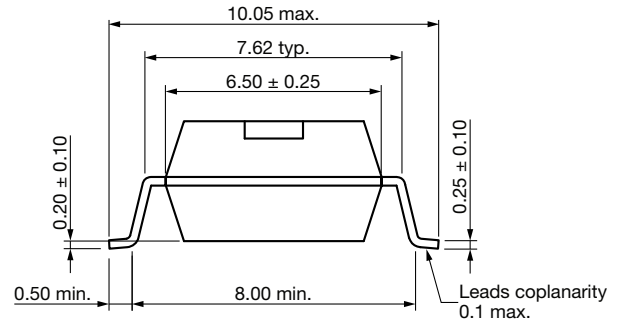
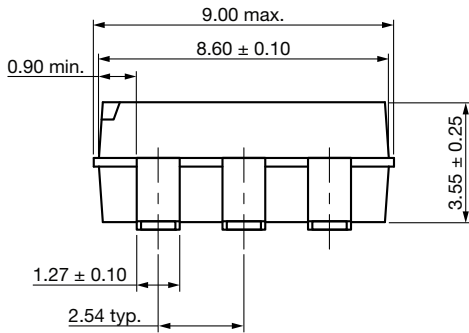


SMD-6, Option 7

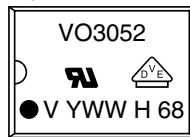




SMD-6, Option 9



PACKAGE MARKING (example of VO3052-X016)



Notes

- The VDE logo is only marked on option1 parts
- Tape and reel suffix (T) is not part of the package marking

PACKING INFORMATION (in millimeters)

Tube

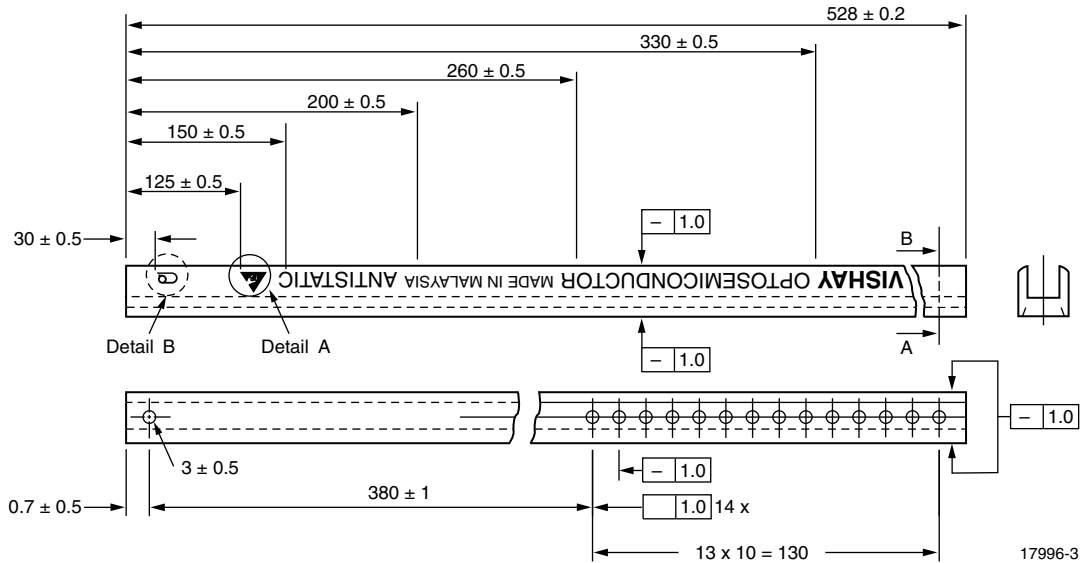


Fig. 9 - Shipping Tube Specifications for DIP-6 Packages

| DEVICES PER TUBS | | | |
|------------------|------------|-----------|-----------|
| TYPE | UNITS/TUBE | TUBES/BOX | UNITS/BOX |
| DIP-6 | 50 | 40 | 2000 |

DIP-6

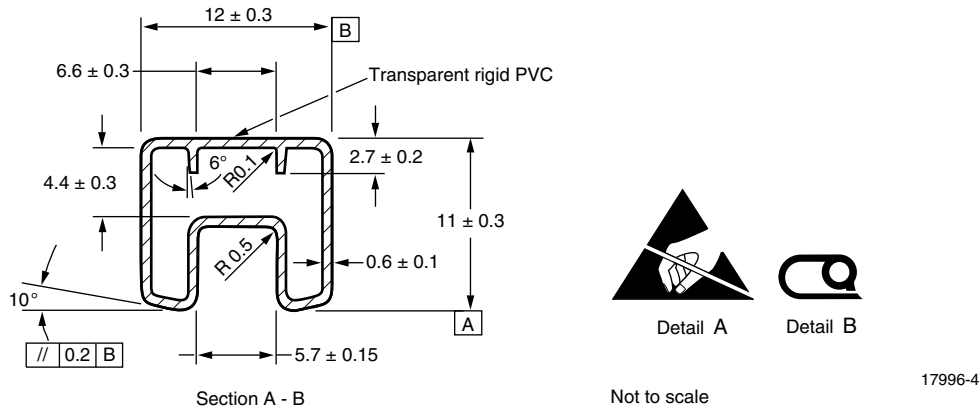


Fig. 10 - Tube Shipping Medium

DIP-6, 400 mil, Option 6

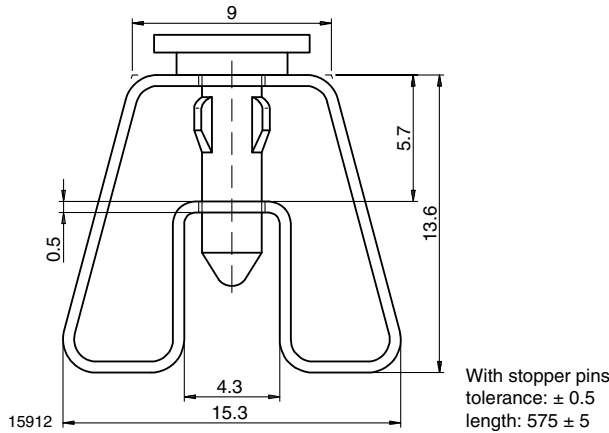
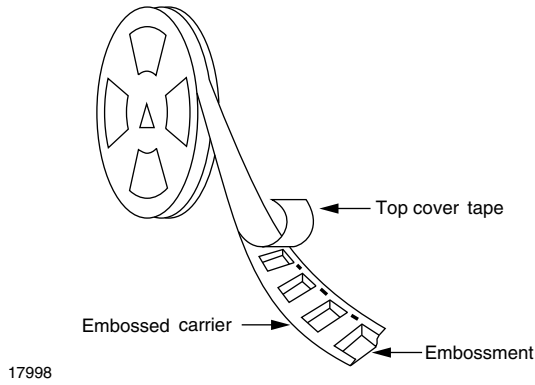


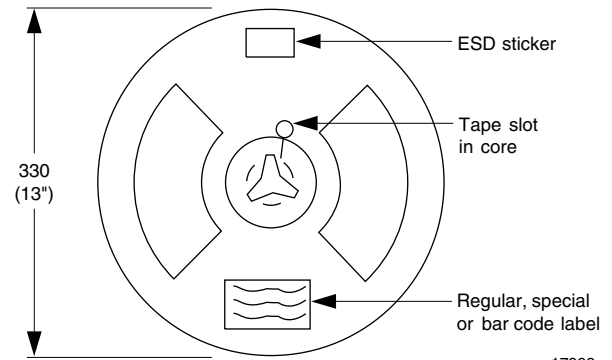
Fig. 11 - Tube Shipping Medium

Tape and Reel



17998

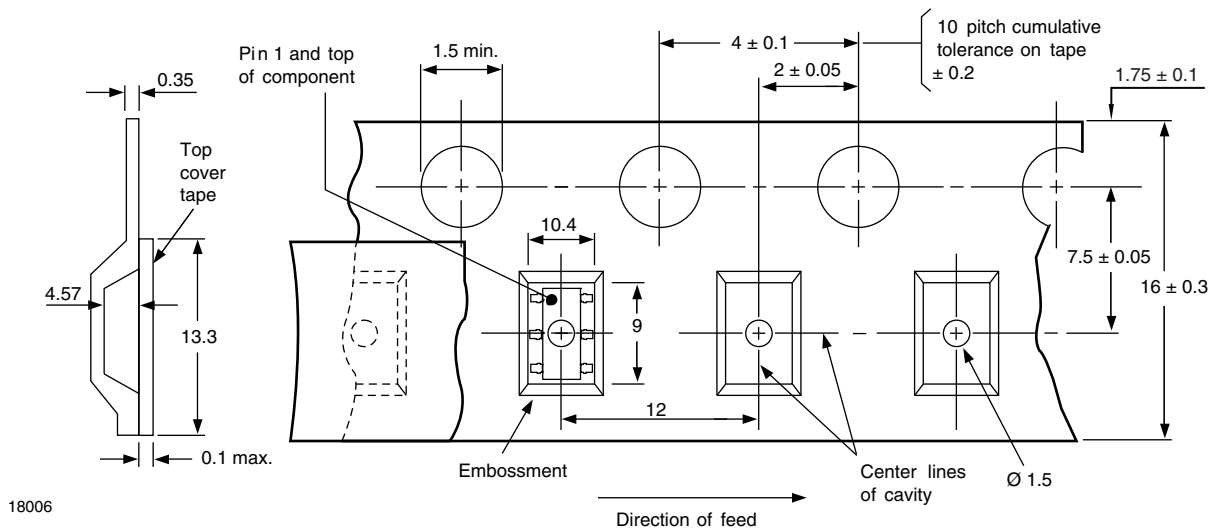
Fig. 12 - Tape and Reel Shipping Medium



17999

Fig. 13 - Tape and Reel Shipping Medium

SMD-6, Option 7



18006

Fig. 14 - Tape and Reel Packing (1000 pieces on Reel)

SMD-6, Option 9

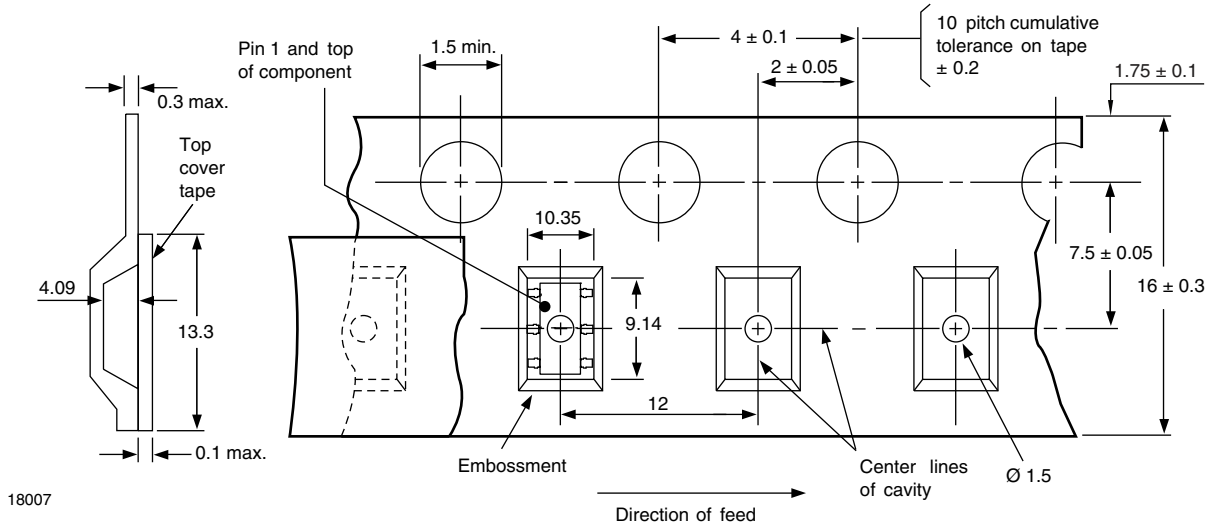


Fig. 15 - Tape and Reel Shipping Medium

SOLDER PROFILES

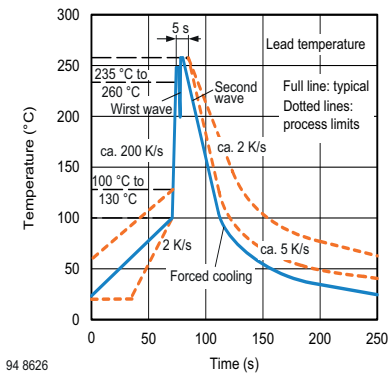


Fig. 16 - Wave Soldering Double Wave Profile According to J-STD-020 for DIP Devices

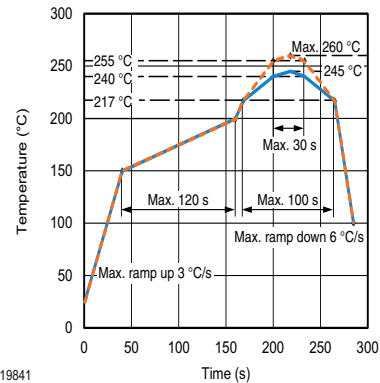


Fig. 17 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020 for SMD Devices

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2

Floor life: unlimited

Conditions: $T_{amb} < 30\text{ °C}$, $RH < 85\%$

Moisture sensitivity level 1, according to J-STD-020



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