



**Description**

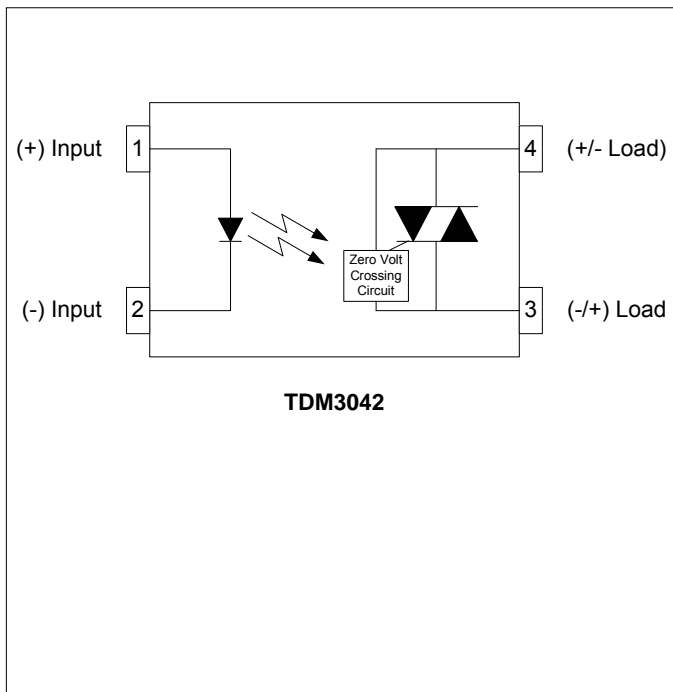
The TDM3042 consists of a single input LED optically coupled to a zero-volt crossing high voltage triac driver. The TDM3042 provides high input-to-output isolation and is designed to drive high-powered triacs. The TDM3042 provides an optically isolated method of interfacing logic level control signals to equipment powered from AC lines rated at 120V and higher.

The TDM3042 comes standard in a miniature 4 pin SOP package.

**Applications**

- Home Appliances
- Motor / Drive Controls
- Solid State Relays
- Solenoid / Valve Controls
- Temperature Controls

**Schematic Diagram**



**Features**

- Ultra Miniature 4-Pin Small Outline Package
- Zero Volt Switching
- 400V Blocking Voltage
- Low Trigger Current (10mA MAX)
- High Input-to-Output Isolation (3.75kV<sub>RMS</sub>)
- Long Life / High Reliability
- RoHS / Pb-Free / REACH Compliant

**Agency Approvals**

UL / C-UL: File # E201932  
VDE: File # 40035191 (EN 60747-5-2)

**Absolute Maximum Ratings**

The values indicated are absolute stress ratings. Functional operation of the device is not implied at these or any conditions in excess of those defined in electrical characteristics section of this document. Exposure to absolute Maximum Ratings may cause permanent damage to the device and may adversely affect reliability.

Storage Temperature .....	-55 to +125°C
Operating Temperature .....	-40 to +100°C
Continuous Input Current .....	50mA
Transient Input Current .....	500mA
Reverse Input Control Voltage .....	5V
Input Power Dissipation .....	70mW
Total Power Dissipation .....	170mW
Solder Temperature – Wave (10sec).....	260°C
Solder Temperature – IR Reflow (10sec).....	260°C

**Ordering Information**

Part Number	Description
TDM3042	4 pin SOP, (100/Tube)
TDM3042-TR	4 pin SOP, Tape and Reel (2000/Reel)

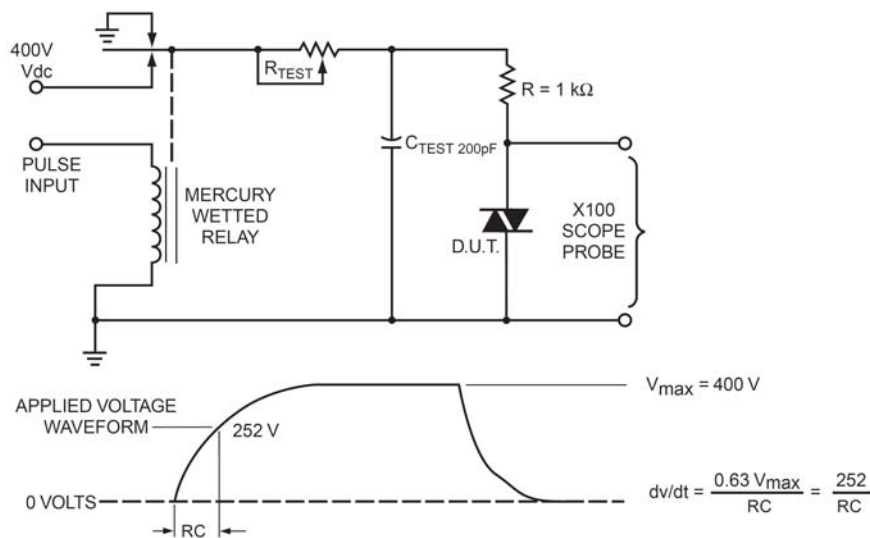
**NOTES:** Suffixes listed above are not included in marking on device for part number identification

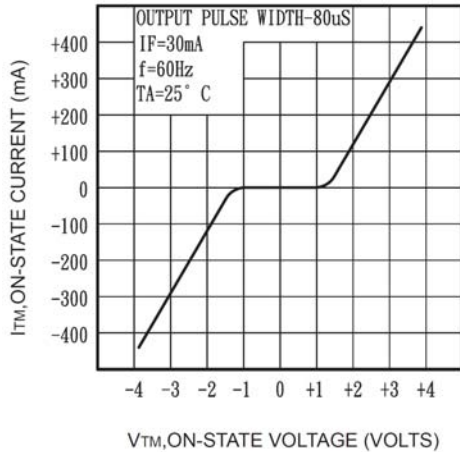
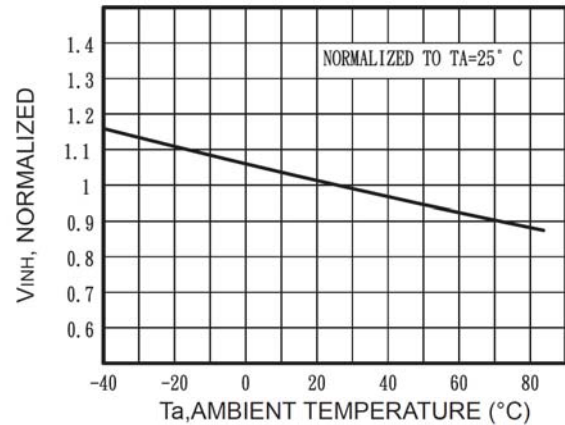
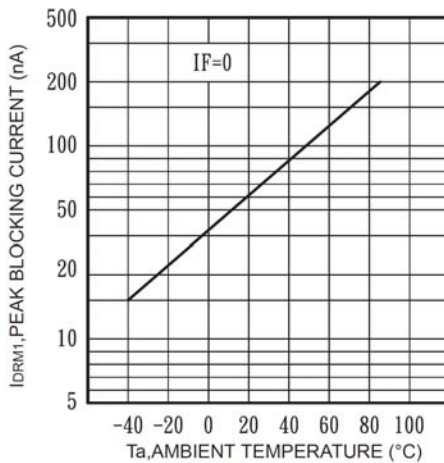
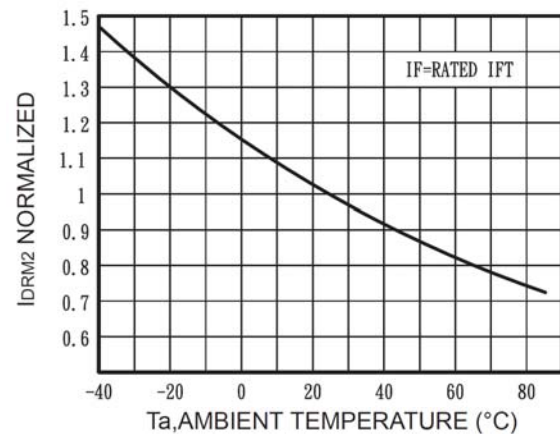
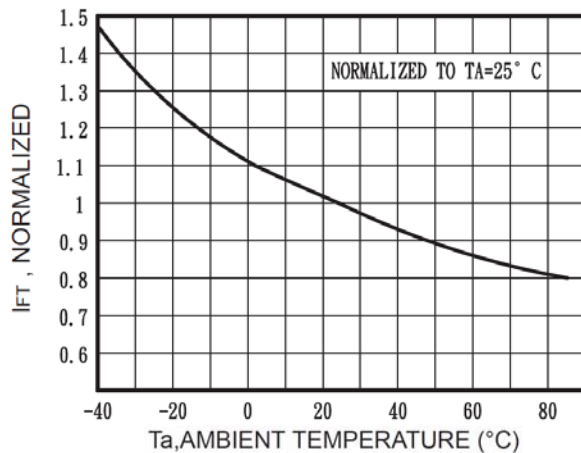
**Electrical Characteristics,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Specifications</b>						
LED Forward Voltage	$V_F$	-	1.4	1.8	V	$I_F = 10\text{mA}$
LED Reverse Voltage	$BV_R$	5	-	-	V	$I_R = 10\mu\text{A}$
Reverse Leakage Current	$I_{InRleak}$	-	-	10	$\mu\text{A}$	$V_R = 6\mu\text{A}$
Trigger Current <sup>1</sup>	$I_{FT}$	-	-	10	mA	Main Terminal Voltage = 3V
<b>Output Specifications</b>						
Blocking Voltage	$V_{DRM}$	400	-	-	V	$I_O = 1\mu\text{A}$
Peak Blocking Current	$I_{DRM1}$	-	60	500	nA	$V_{DRM} = 400\text{V}$
On-State Voltage	$V_{ON}$	-	1.8	3	V	$I_F = 10\text{mA}, I_{TM} = 100\text{mA}$
Leakage Current	$I_{DRM2}$	-	0.2	1	$\mu\text{A}$	$I_F = 0\text{mA}, V_{DRM} = 400\text{V}$
Holding Current	$I_{HOLD}$	-	100	-	$\mu\text{A}$	-
Inhibit Voltage	$V_{INH}$	-	5	20	V	$I_F = 10\text{mA}$
Critical Rate of Rise <sup>2</sup>	$dV/dt$	1,000	2,000	-	$\text{V}/\mu\text{S}$	-
<b>Isolation Specifications</b>						
Isolation Voltage	$V_{ISO}$	3,750	-	-	$V_{RMS}$	$RH \leq 50\%, t=1\text{min}$
Input-Output Resistance	$R_{I-O}$	-	$10^{12}$	-	$\Omega$	$V_{I-O} = 500V_{DC}$

Note 1: Resistive load. For inductive loads, higher drive current is recommended

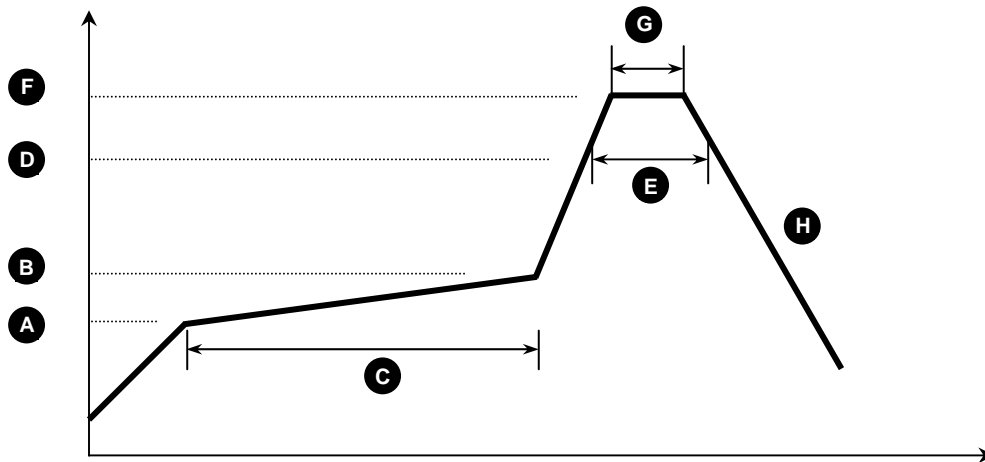
Note 2: This is for static  $dV/dt$ . Test Circuit Below

**TDM3042 Static  $dV/dt$  Test Circuit:**


**TDM3042 Performance & Characteristics Plots,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**
**Figure 1: On-State Characteristics**

**Figure 2: Inhibit Voltage ( $V_{INH}$ ) vs. Temperature ( $^\circ\text{C}$ )**

**Figure 3: Peak Blocking Current ( $I_{DRM1}$ ) vs. Temperature ( $^\circ\text{C}$ )**

**Figure 4: Leakage Current ( $I_{DRM2}$ ) vs. Temperature ( $^\circ\text{C}$ )**

**Figure 5: Trigger Current ( $I_{FT}$ ) vs. Temperature ( $^\circ\text{C}$ )**


**TDM3042 Solder Reflow Temperature Profile Recommendations**
**(1) *Infrared Reflow:***

Refer to the following figure as an example of an optimal temperature profile for single occurrence infrared reflow. Soldering process should not exceed temperature or time limits expressed herein. Surface temperature of device package should not exceed 250°C:



Process Step	Description	Parameter
A	Preheat Start Temperature (°C)	150°C
B	Preheat Finish Temperature (°C)	180°C
C	Preheat Time (s)	90 - 120s
D	Melting Temperature (°C)	230°C
E	Time above Melting Temperature (s)	30s
F	Peak Temperature, at Terminal (°C)	260°C
G	Dwell Time at Peak Temperature (s)	10s
H	Cool-down (°C/s)	<6°C/s

**(2) *Wave Solder:***

Maximum Temperature: 260°C (at terminal)  
 Maximum Time: 10s  
 Pre-heating: 100 - 150°C (30 - 90s)  
 Single Occurrence

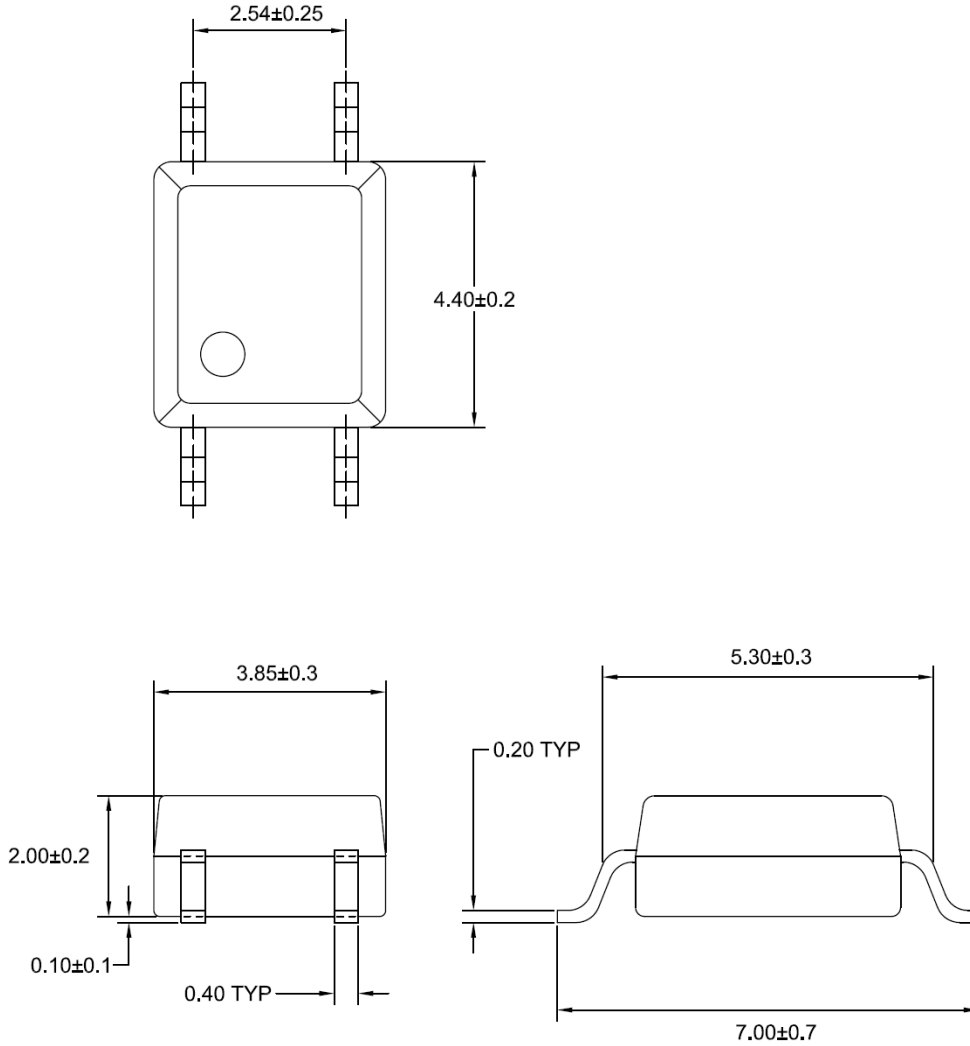
**(3) *Hand Solder:***

Maximum Temperature: 350°C (at tip of soldering iron)  
 Maximum Time: 3s  
 Single Occurrence

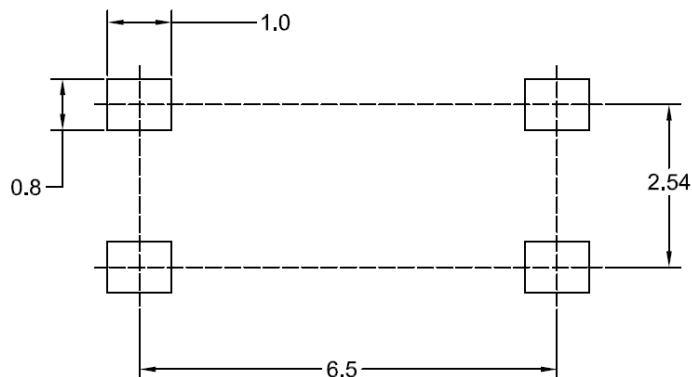
**TDM3042 Package Dimensions**

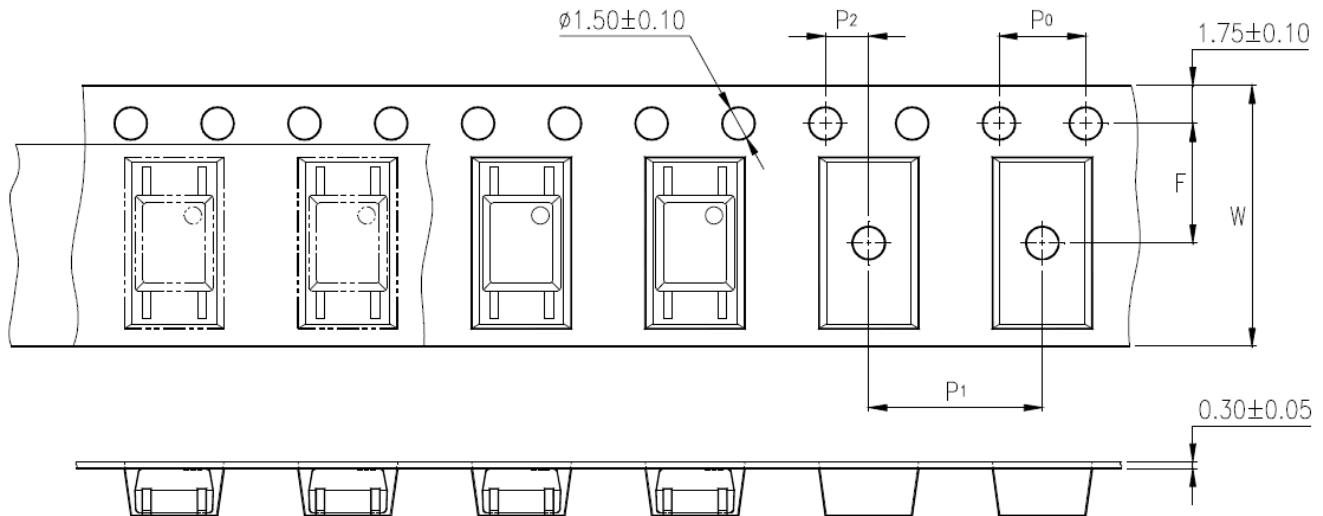
4 PIN SOP Package

**Note:** All dimensions in millimeters [mm]



4 PIN SOP Footprint



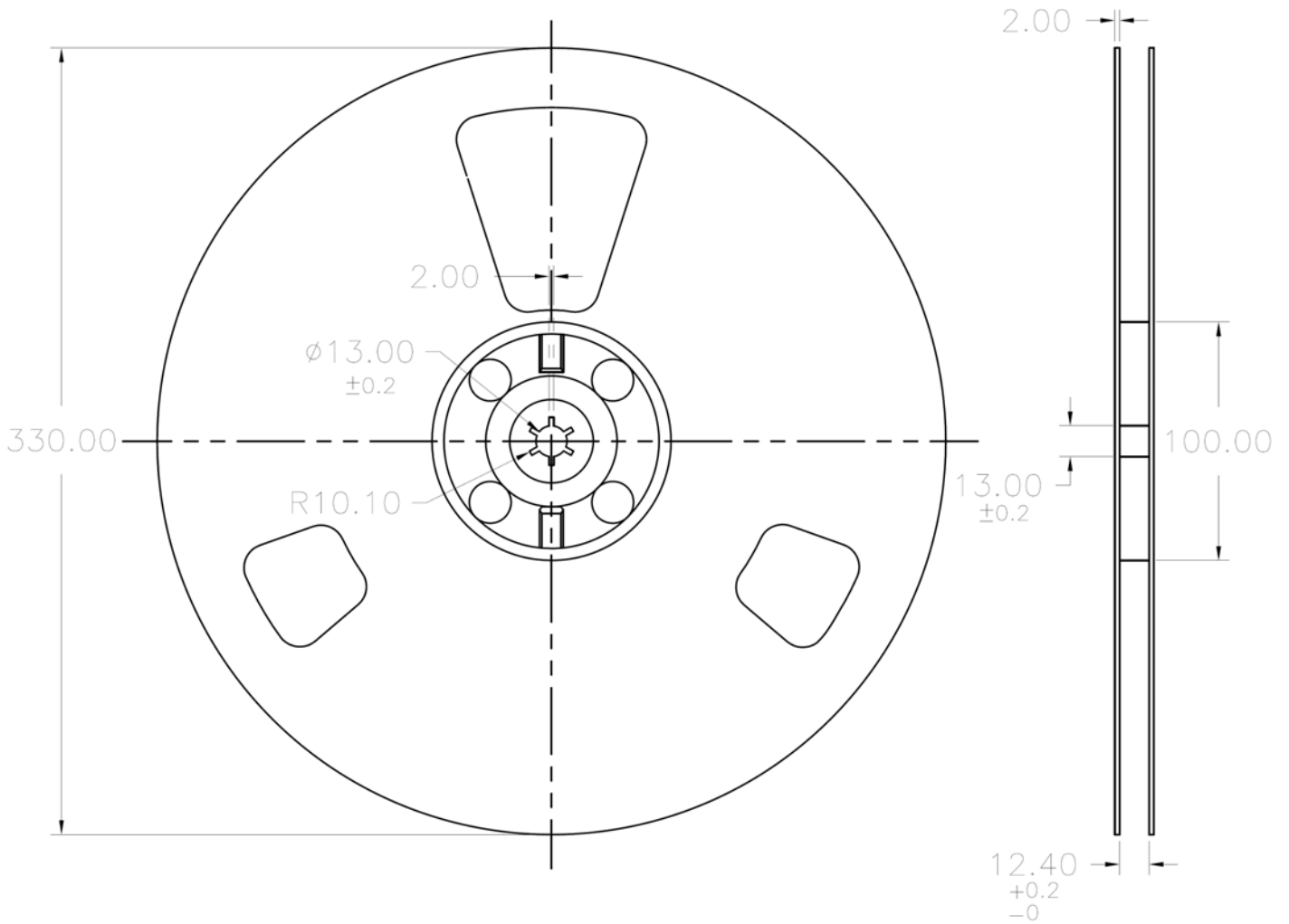
**TDM3042 Packaging Specifications**
*Tape & Reel Specifications (T&R)*
**Note:** All dimensions in millimeters [mm]


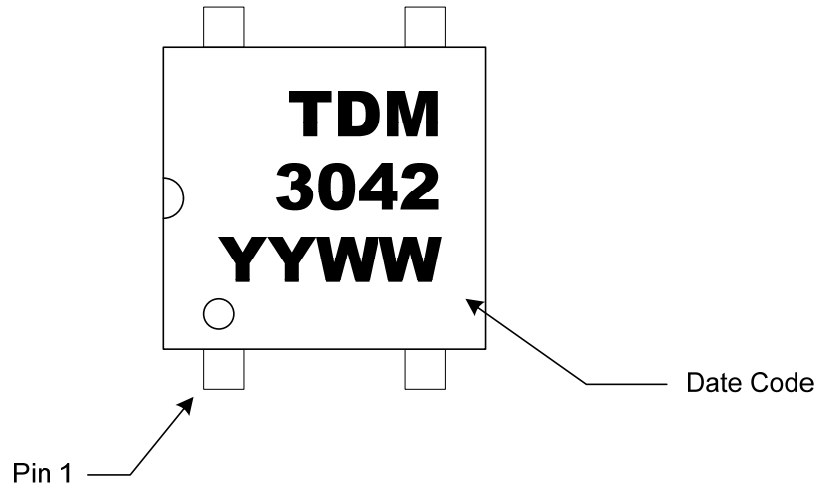
Specification	Symbol	Dimensions, mm ( inches )
Tape Width	W	$12 \pm 0.3$ ( 0.47 )
Sprocket Hole Pitch	P0	$4 \pm 0.1$ ( 0.15 )
Compartment Location	F P2	$5.5 \pm 0.1$ ( 0.217 ) $2 \pm 0.1$ ( 0.079 )
Compartment Pitch	P1	$8 \pm 0.1$ ( 0.315 )

**TDM3042 Packaging Specifications**

*Tape & Reel Specifications (T&R)*

**Note:** All dimensions in millimeters [mm]



**TDM3042 Package Marking**

**TDM3042 Package Weights**

Device	Single Unit	Full Tube (100pcs)	Full Pouch (10 tubes)	Full Reel (2000pcs)
TDM3042	0.10	23	240	-
TDM3042-TR	0.10	-	-	500

**Note:** All weights above are in GRAMS, and include packaging materials where applicable

**DISCLAIMER**

Solid State Optronics (SSO) makes no warranties or representations with regards to the completeness and accuracy of this document. SSO reserves the right to make changes to product description, specifications at any time without further notices. SSO shall not assume any liability arising out of the application or use of any product or circuit described herein. Neither circuit patent licenses nor indemnity are expressed or implied. Except as specified in SSO's Standard Terms & Conditions, SSO disclaims liability for consequential or other damage, and we make no other warranty, expressed or implied, including merchantability and fitness for particular use.

**LIFE SUPPORT POLICY**

SSO does not authorize use of its devices in life support applications wherein failure or malfunction of a device may lead to personal injury or death. Users of SSO devices in life support applications assume all risks of such use and agree to indemnify SSO against any and all damages resulting from such use. Life support devices are defined as devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when used properly in accordance with instructions for use can be reasonably expected to result in significant injury to the user, or (d) a critical component of a life support device or system whose failure can be reasonably expected to cause failure of the life support device or system, or to affect its safety or effectiveness.