



UMA 0204, UMB 0207

ULTRA PRECISION
THIN FILM MELF RESISTORS
PRODUCT OVERVIEW

DRALORIC BEYSCHLAG RESISTORS

A **WORLD OF**
SOLUTIONS





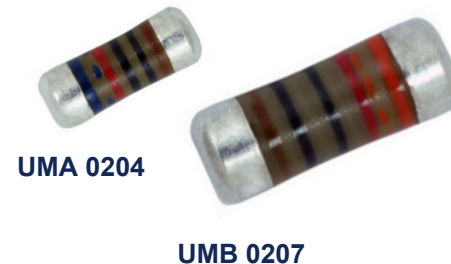
INTRODUCTION

Purpose

- Introduction of the Vishay UMA 0204, UMB 0207 Ultra Precision Thin Film MELF Resistor Series

Objectives

- Present an overview of this product's special performance properties
- Explain product design and features
- Discuss product advantages
- Present typical applications



Welcome to the Vishay UMA 0204, UMB 0207 Ultra Precision Thin Film MELF Resistors product overview. This tutorial will provide an overview of the UMA 0204, UMB 0207 Ultra Precision Thin Film MELF resistor families. The key functional performance parameters of these MELF resistor series will be discussed as well as design, features, and benefits. A selection of potential applications from typical market segments will be presented.



FUNCTIONAL PERFORMANCE OF THE UMA 0204, UMB 0207 SERIES

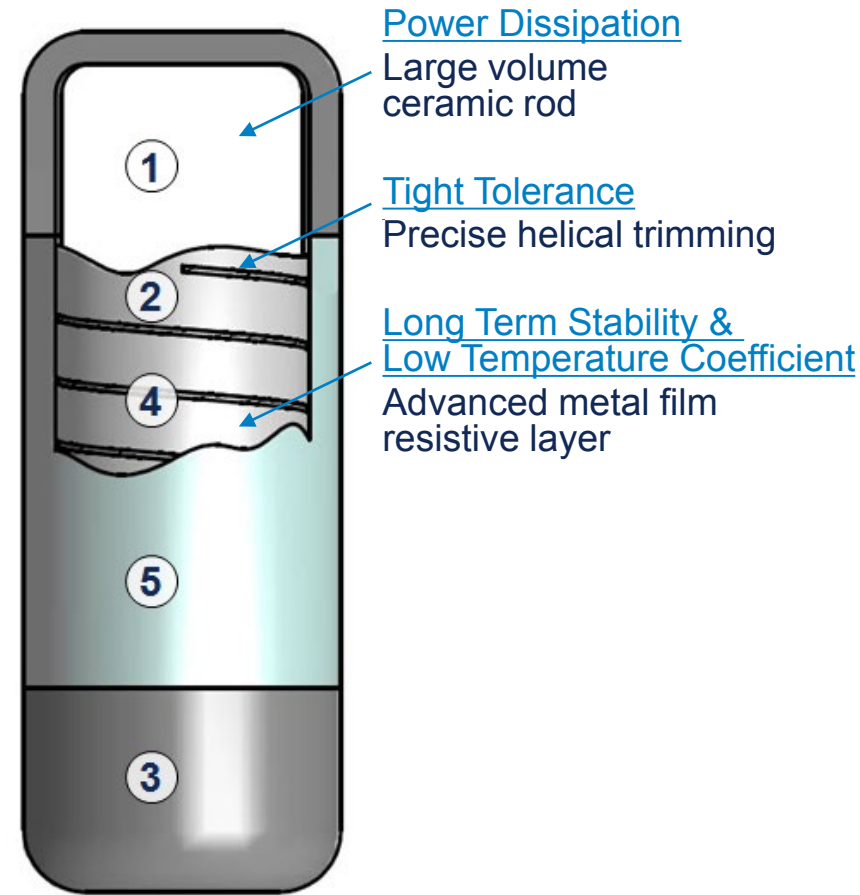
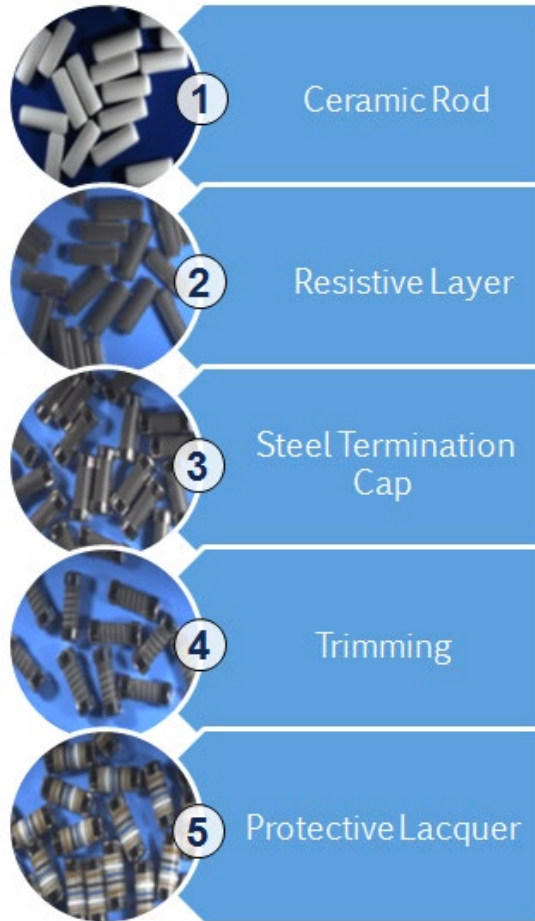
Key Properties

- Superior long term stability (down to $\leq 0.02\%$ after 1000 h life test)
- Tolerance down to $\pm 0.02\%$
- TCR down to ± 5 ppm/K
- High rated dissipation P_{70} up to 0.4 W for case size 0207
- Resistance range from 22 Ω to 390 k Ω
- High operating voltage up to 350 V for case size 0207
- Operating Temperature up to 125°C
- UMA 0204, TCR ± 10 ppm/K with 0.25 % and 0.1 % approved according to EN 140401 – 803
- Intrinsic sulfur resistance

The UMA 0204, UMB 0207 Ultra Precision Thin Film MELF resistor series from Vishay is an excellent choice for today's modern electronics where high precision, excellent long-term stability and reliability are of major concern. The series offers a tight tolerance down to $\pm 0.02\%$ and a low temperature coefficient of ± 5 ppm/K. High-reliability applications will benefit from an excellent low load life drift. The UMA 0204, UMB 0207 Ultra Precision Thin Film MELF resistor series offers superior moisture resistance, sulfur resistivity, and is RoHS compliant as well as halogen free.



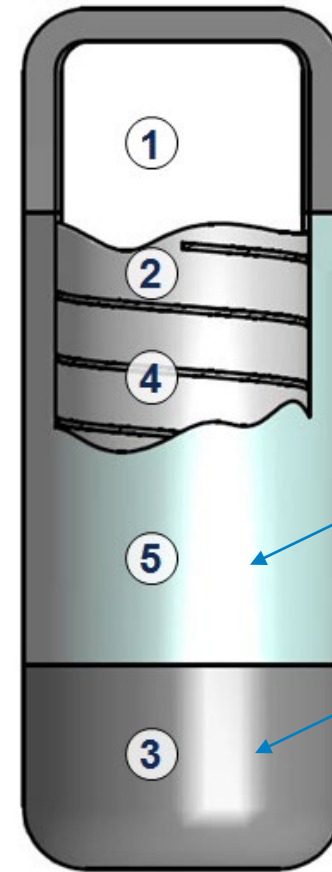
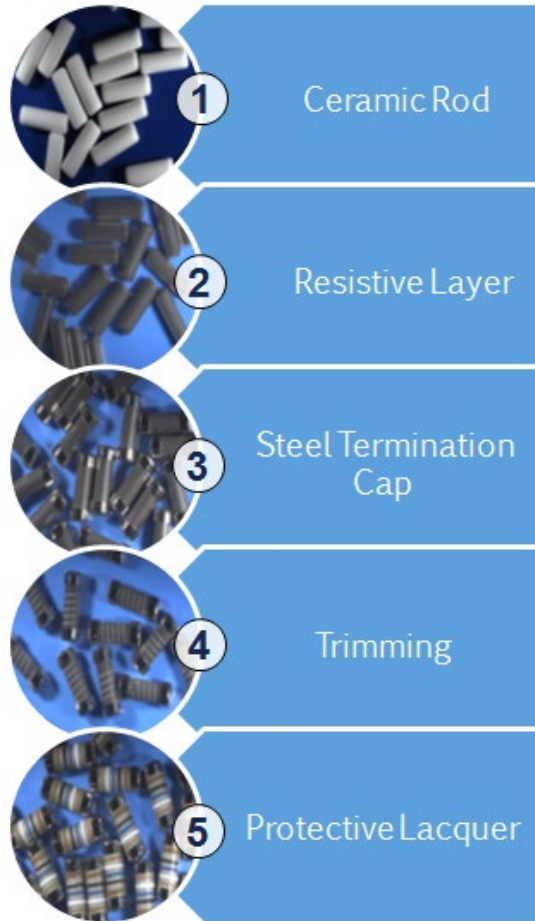
DESIGN OF UMA 0204, UMB 0207 COMPONENTS



The UMA 0204, UMB 0207 MELF resistor series offers significant advantages compared to thin film chip resistors. The cylindrical ceramic substrate is covered by an advanced homogeneous metal film resistive layer that enables a low temperature coefficient. Its cylindrical shape results in a larger substrate volume and a larger resistive element area as compared to chip resistors, allowing for a higher power dissipation. A precise helical laser trimming cut applied to the resistive film allows for a tight tolerance and an even distribution of thermal energy across the entire resistive element, when the resistor is in use. As a result the MELF resistors stability is enhanced.



DESIGN OF UMA 0204, UMB 0207 COMPONENTS



Moisture Resistivity
Protective lacquer

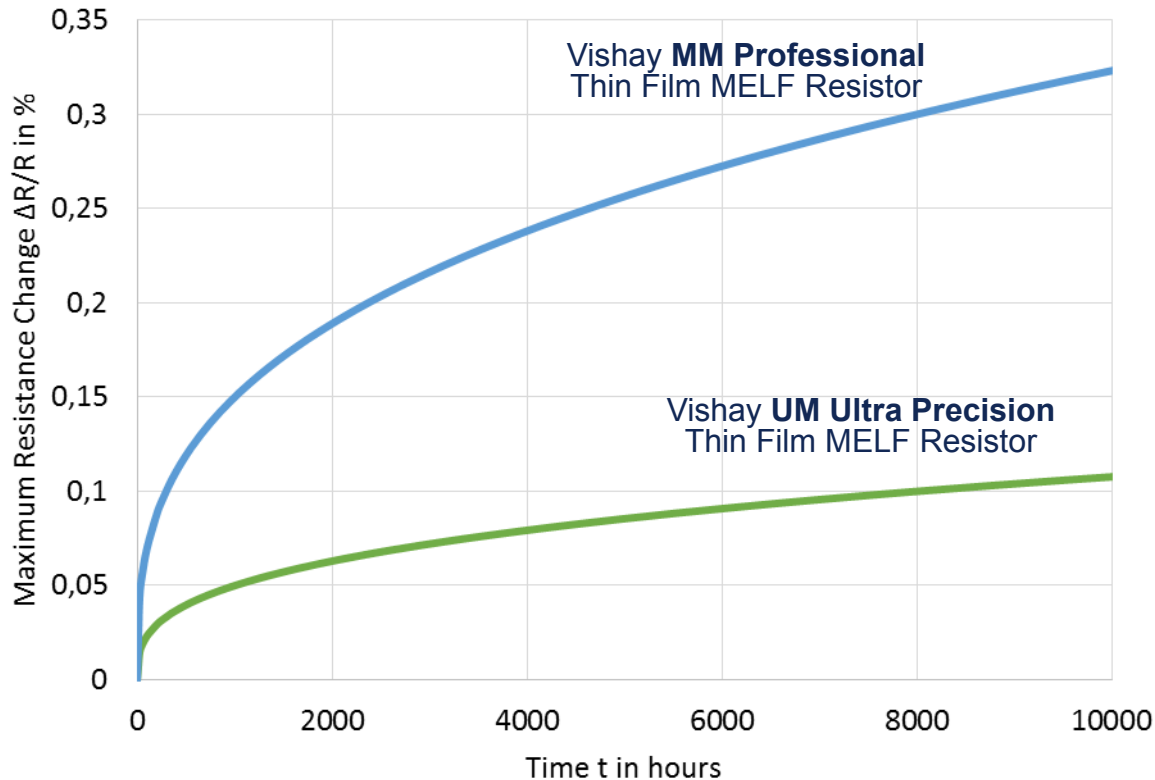
Excellent Solderability
Steel termination cap
plated pure tin on nickel

The MELF resistor's contacts are built from steel termination caps, plated with pure matte tin on nickel, and support excellent solderability. The protective lacquer provides the component with superior moisture resistivity, verified according to the 85°C/85 % biased humidity test for 42 days. The UMA 0204, UMB 0207 MELF resistors offer high reliability in harsh operating environments, including high humidity and high temperature.



TECHNICAL ADVANTAGE: RESISTIVE DRIFT

Resistive Drift at 125°C



| Resistor Type | Maximum Resistive Drift after 1000 hours | Maximum Resistive Drift after 8000 hours |
|---|--|--|
| Vishay – UM Ultra Precision Thin Film MELF Resistor | ±0.05% | ±0.1% |
| Vishay – MM Professional Thin Film MELF Resistor | ±0.15% | ±0.3% |

Resistive drifts shown are considering endurance specification in product datasheets for operation at rated dissipation, resulting in a film temperature of 125 °C.

The UMA 0204, UMB0207 MELF resistors with advanced thin film technology offer an excellent resistive drift as low as 0.05% after 1000 h of operation at full rated power. This is also known as endurance at 70°C test as described in the product datasheet. The chart and table here illustrate the UMA 0204, UMB 0207 Ultra Precision MELF resistors specified resistive drift over time compared to a MM Professional MELF resistor.



APPLICATIONS

Reliable High Precision Electronics



Industrial

- Measurement and Calibration
- Process Control Systems
- Precision Analog Circuits



Avionics

- Aerospace Electronics



Medical

- Medical Equipment

Today, various applications require components with tight tolerance, low temperature coefficient and excellent long-term stability. The Vishay UM MELF resistor series combine the advantages of advanced thin film technology with excellent robustness against environmental influences, such as temperature and humidity. From industrial applications to medical equipment, the UMA 0204, UMB 0207 Ultra Precision Thin Film MELF resistors are the perfect choice for a wide variety of applications with outstanding requirements towards reliable precision and stability.



SUMMARY

- Ultra precision characteristics with tolerance down to $\pm 0.02\%$ and TCR down to ± 5 ppm/K
- Superior load life stability down to $\leq 0.02\%$ after 1000 h life test
- High operating voltage of up to 350 V
- Superior moisture resistivity and intrinsic sulfur resistance
- Excellent choice for most fields of precision electronics where ultra precision, stability and reliability are of major concern

In summary, the Vishay UMA 0204, UMB 0207 Ultra Precision Thin Film MELF Resistor series offers ultra precision characteristics and an excellent long-term stability. Combining the advantages of thin film technology with excellent moisture resistivity and an intrinsic sulfur resistance in one device, the UMA 0204, UMB 0207 series is the perfect choice for most fields of today's and tomorrow's emerging reliable high precision electronics.