Thin Film High Density Interconnect Products (HDI)

High Density Interconnect Products

- Single Layer
  - Substrate Characteristics
  - Pattern Capabilities
  - Resistor Parameters
  - Protective Coating
  - High Conductance Power Lines
  - Laser Machined Shapes
  - Line Width Control

- Multi-Layer
  - Air or Polyimide Supported Bridges
  - Backside Patterning
  - Front to Back Via Connection
  - Multi-Layer Interconnect Metalization
  - High Temperature Applications

- General Information
- Design Layout Guidelines for Ceramic and Quartz
- Design Layout Guidelines for Microwave Applications
- Design Layout Guidelines for Silicon

Vishay

www.vishay.com
Thin Film Through Hole Resistors

**Film**
- TAMELOX or TANTALUM NITRIDE
- NICHROME

**Performance**
- CTSP Series (NS)
- TSP Series (NS)
- VTF Series (NS)
- TAS Series (NE)
- CNS Series (NE)
- 100-267 Series (NS)
- RMKD
- RMK VD Series
- RMK HT Series
- HVPS Series (NS)
- TFS Series (NE)

**Applications**
- Resistor Network Applications
- Network
- DISCRETE
- TEMPERATURE SENSORS

**Dimensions**
- Low Profile 0.020 Inches
- Standard 0.28 Inches
- Low Profile 0.20 Inches
- High Temperature
- Voltage Divider

**Performance Key**
- ABS TRACKING
- ABS RATIO
- TOL

**Standards**
- STANDARD PRODUCTS
- CUSTOM PRODUCTS

**Resistor Network Applications**
- Hybrid & Wraparound, Single-In-Line

**Network**
- SIP
- MOLDED
- CONFORMAL
- SANDWICH
- DIP
- HERMETIC

**SIP**
- Low Profile 0.20 Inches
- Decade Divider

**MOLDED**
- Low Profile 0.020 Inches

**CONFORMAL**
- Standard 0.28 Inches

**SANDWICH**
- Low Profile 0.20 Inches

**DIP**
- NICHROME

**HERMETIC**
- NICHROME

**TEMPERATURE SENSORS**
- Hybrid & Wraparound, Single-In-Line

**NICHROME**
- TAMELOX or TANTALUM NITRIDE
- TAMELOX
- TAMELOX
- NICHROME
- NICHROME
- NICHROME
- NICHROME

**TAMELOX**
- TANTALUM NITRIDE
- TANTALUM NITRIDE

**TANTALUM NITRIDE**
- TANTALUM NITRIDE

**TSP Series (NS)**
- TSP Series (NS)

**CNS Series (NE)**
- 100-267 Series (NS)

**HD Series (NS)**
- HD Series (NS)

**CNS Series (NE)**
- CNS Series (NE)

**VTF Series (NS)**
- VTF Series (NS)

**TAS Series (NE)**
- TAS Series (NE)

**CTSP Series (NS)**
- CTSP Series (NS)

**CNS 471 (NE)**
- CNS 471 (NE)

**100-267 Series (NS)**
- 100-267 Series (NS)

**RMKD**
- RMKD

**RMK VD Series**
- RMK VD Series

**RMK HT Series**
- RMK HT Series

**HVPS Series (NS)**
- HVPS Series (NS)

**TFS Series (NE)**
- TFS Series (NE)

**NICHROME**
- TAMELOX or TANTALUM NITRIDE
- TANTALUM NITRIDE
- NICHROME

**TANTALUM NITRIDE**
- TANTALUM NITRIDE

**TAMELOX**
- TAMELOX
- TAMELOX

**Performance Key**
- ABS TRACKING
- ABS RATIO
- TOL
Thin Film Chip Resistors Wire Bondable Dual Value

<table>
<thead>
<tr>
<th>SIZE (inches)</th>
<th>POWER VALUE RANGE</th>
<th>PERFORMANCE</th>
<th>FILM</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.030 x 0.030</td>
<td>125mW 25Q - 39KQ</td>
<td>▲</td>
<td>TaN</td>
<td>CTT</td>
</tr>
<tr>
<td>0.030 x 0.030</td>
<td>500mW 50Q - 39KQ</td>
<td>▲</td>
<td>NQ</td>
<td>CTA</td>
</tr>
<tr>
<td>0.100 x 0.100</td>
<td>250mW 100Q - 1MEGQ</td>
<td>▲</td>
<td>NQ</td>
<td>CCC</td>
</tr>
</tbody>
</table>

- Dual Value Chip Resistors
- Top Contact
- User Trim
- Alumina
- Silicon
- Quartz

Performance Key
- ▲: ±50ppm/°C ±0.5%
- ▲: ±100ppm/°C ±1%
- ▲: ±25ppm/°C ±0.1%
- ▲: ±10ppm/°C ±0.05%

Vishay Thin Film Products
www.vishay.com
Thin Film Capacitors
MOS/MNOS
(Wire Bondable Back Contact)

**Performance Key**

- ▲: TCC + 15 ± 25ppm/°C, TOL 5%
- ■: TCC + 45 ± 25ppm/°C, TOL 5%
- ◆: TCC + 45 ± 25ppm/°C, TOL 10%
- ■: TCC + 45 ± 25ppm/°C, TOL 25%

**Thin Film Capacitors MOS/MNOS**

- SINGLE VALUE
  - 0.020 x 0.020: 0.5pF - 51pF, Performance: ▲, Working Voltage: 40V - 100V, NCA
  - 0.030 x 0.030: 33pF - 330pF, Performance: ■, Working Voltage: 50V - 100V, NCB
  - 0.040 x 0.040: 56pF - 330pF, Performance: ■, Working Voltage: 25V - 100V, NCC
  - 0.050 x 0.055: 150pF - 470pF, Performance: ■, Working Voltage: 50V - 100V, NCD
  - 0.060 x 0.060: 360pF - 1000pF, Performance: ■, Working Voltage: 25V - 40V, NCE

- BINARY MULTI-VALUE ARRAY
  - 0.020 x 0.030: 3.75pF or 15pF TOTAL 4 - VALUES, Performance: ◆, Working Voltage: 30V - 100V, CBA
  - 0.020 x 0.048: 31pF TOTAL 5 - VALUES, Performance: ■, Working Voltage: 75V, CBB
  - 0.046 x 0.046: 90pF TOTAL 5 - VALUES, Performance: ■, Working Voltage: 75V, CBC
Thin Film
Filter Network
Resistor-Capacitor
Array
(Wire Bondable)

Performance Key

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCR</td>
<td>± 100ppm/°C</td>
</tr>
<tr>
<td>TOL</td>
<td>± 10%</td>
</tr>
<tr>
<td>TCR</td>
<td>± 200ppm/°C</td>
</tr>
<tr>
<td>TOL</td>
<td>± 10%</td>
</tr>
</tbody>
</table>
### Thin Film Chip Resistor Arrays

**Wire Bondable**

<table>
<thead>
<tr>
<th>SIZE (inches)</th>
<th>VALUE RANGE</th>
<th>DESCRIPTION</th>
<th>PERFORMANCE</th>
<th>FILM</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.060 x 0.090</td>
<td>50Ω - 1MΩ</td>
<td>8 RESISTORS ISOLATED</td>
<td>▲</td>
<td>Ta₂N</td>
<td>CLA</td>
</tr>
<tr>
<td>0.060 x 0.090</td>
<td>50Ω - 1MΩ</td>
<td>8 RESISTORS COMMON</td>
<td>■</td>
<td>Ta₂N</td>
<td>CLB</td>
</tr>
<tr>
<td>0.030 x 0.030</td>
<td>400Ω - 240KΩ</td>
<td>13 RESISTORS MULTI-TAP</td>
<td>●</td>
<td>Ta₂N</td>
<td>MTR</td>
</tr>
<tr>
<td>0.040 x 0.040</td>
<td>1.1KΩ - 275KΩ</td>
<td>20 RESISTORS MULTI-TAP</td>
<td>▽</td>
<td>Ta₂N</td>
<td>MTT</td>
</tr>
</tbody>
</table>

**Performance Key**

- ▲: TCR ± 10ppm/°C, TOL ± 0.1%
- ■: TCR ± 25ppm/°C, TOL ± 1%
- ●: TCR ± 100ppm/°C, TOL ± 10%
Thin Film
Chip
Voltage Dividers

Performance Key

▲
TCR ± 50ppm/°C
TOL ± 5%
Thin Film Products

Vishay

Thin Film
High TCR Sensor
(Wire Bondable Top Contact)

Performance Key

TCR + 1800ppm/°C
TOL 1%

TCR + 3000ppm/°C
TOL 1%

TCR + 4800ppm/°C
TOL 1%

Size (inches) Value Range

Single Value
0.020 x 0.020
51Ω - 24KΩ

Dual Value
0.030 x 0.030
51Ω - 51KΩ

Model

RTA

Ni

Pt

Pd

RTB

Ni

Pt

Pd
Thin Film Inductor (Wire Bondable)

INDUCTOR CHIP

- SINGLE VALUE
  - SIZE (inches)
    - RANGE
    - PERFORMANCE
  - MODEL
    - PSC TYPE S

- MULTI-VALUE TUNABLE
  - SIZE (inches)
    - RANGE
    - PERFORMANCE
  - MODEL
    - PSC TYPE T

Performance Key

- Q @ 1MHz
  - 0.05
  - TOLERANCE ±5%
- Q @ 1MHz
  - 0.08
  - TOLERANCE ±10%
Thin Film Metalized Plates

**SIZE** | **SUBSTRATE MATERIAL** | **METALIZATION FILMS**
--- | --- | ---
2 to 4 INCHES | ALUMINA | NiCr, Cu, Ta₂N, Ni, TiW, Pd, Al, Au
2 to 3 INCHES | QUARTZ | NiCr, Ta₂N, Ni, TiW, Pd, Al, Au
2 to 4 INCHES | ALUMINUM NITRIDE | NiCr, Cu, Ta₂N, Ni, TiW, Pd, Al, Au
2 to 3 INCHES | BERYLLIUM OXIDE | NiCr, Cu, Ta₂N, Ni, TiW, Pd, Al, Au
3 to 5 INCHES | SILICON | NiCr, Ta₂N, Ni, TiW, Pd, Al, Au

**CAPABILITY SHEET**