



# WIRE BONDABLE PASSIVE COMPONENTS

Vishay Electro-Films

## Full Range of Wire Bondable Passive Components



### INTRODUCTION

Vishay Electro-Films (EFI) offers a full range of wire bondable passive components that includes thin film resistors, MOS and MNOS capacitors, and thin film spiral inductors. All members of this product family share Vishay EFI's high standards for performance and quality.

In addition to the standard products listed here, Vishay EFI offers custom designs with unique values, sizes, and configurations. Custom products also offer the option of a wide range of substrate materials and film compositions that provide maximum flexibility for high end applications.

### INTRODUCTION

- High reliability military, space, and medical components
- Hybrid applications where epoxy die attach and wire bonding are the assembly technique
- Lumped element filters
- Impedance tuning networks
- Analog designs requiring high precision and / or high levels of customization
- Applications requiring miniature form factors

A detailed description of layout guidelines for custom parts can be found at:

- Layout guidelines - [www.vishay.com/doc?49271](http://www.vishay.com/doc?49271), [www.vishay.com/doc?49109](http://www.vishay.com/doc?49109)

### RESOURCES

- For technical questions contact [efi@vishay.com](mailto:efi@vishay.com)
- Sales contacts: [www.vishay.com/doc?99914](http://www.vishay.com/doc?99914)

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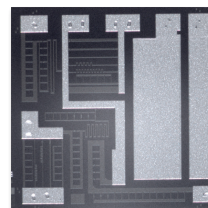
### Custom Thin Film Resistor / Capacitor / Inductor Networks

In many state of the art designs, miniaturization has become a critical factor. Embedding passive component networks in a common substrate achieves high levels of miniaturization without compromising performance. Custom embedded RLC networks free designers from constraints in value selection and layout guidelines.

Vishay EFI has the capability to insure excellent performance by implementing 100 % testing at frequencies ranging from DC to microwave.

#### Features

- Alumina, AlN, silicon, or quartz substrates available
- Laser trim capabilities for tight tolerance
- Product testing available from DC to RF





### Thin Film Wire Bondable Resistors

Vishay EFI offers standard thin film wire bondable resistors to fit a variety of hybrid circuit applications. Standard products are fabricated on an oxidized silicon substrate using tantalum nitride as the resistor element and with aluminum contact pads. However, these resistors may be customized for other applications by using different materials. The resistors are also available on quartz, alumina, and AlN substrates; the resistor film can be nickel chromium; gold contact pads are also available; and gold backing can be provided. Please consult the Vishay website for Vishay EFI's complete resistor product offering.

#### Features

- Small size
- Tight tolerance value
- Low temperature coefficient of resistance (TCR)
- Excellent life stability value
- High reliability
- Good power handling capabilities (to 1 W)
- Wide range of values and topologies

Family	Size (mils)	Value Range ( $\Omega$ )	Best TCR (ppm/ $^{\circ}$ C)	Best Tolerance (%)	Features
<a href="#">SFM</a> 	20 x 20	1 to 1M	$\pm 25$	$\pm 0.1$	Small size, power handling to 250 mW
<a href="#">BCR</a> 	20 x 20	10 to 1M	$\pm 25$	$\pm 0.1$	Only one bond required
<a href="#">SFX</a> 	40 x 40	510K to 20M	$\pm 50$	$\pm 0.1$	High value resistor in small size
<a href="#">CTR</a> 	30 x 30	1 to 1M	$\pm 25$	$\pm 0.1$	Voltage divider with tight resistor ratio ( $R1 = R2$ )
<a href="#">STR</a> 	30 x 30	1 to 1M	$\pm 25$	$\pm 0.1$	Voltage divider with tight resistor ratio ( $R1 < R2$ )
<a href="#">MTR / MTI</a> 	30 x 30 / 38 x 38	100 to 240K / 1.1K to 275K	$\pm 100$	$\pm 5 /$ $\pm 2$	Selectable values by wire bonding
<a href="#">CLA, CLB</a> 	60 x 90	20 to 1M	$\pm 25$	$\pm 0.1$	8-resistor array available, either isolated or bussed



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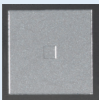
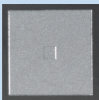

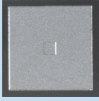
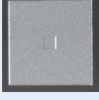



### MOS and MNOS Wire Bondable Capacitors

Vishay EFI capacitors are based on silicon oxide and silicon oxide / nitride combinations. The high quality dielectric film deposited by our state of the art equipment is the key factor for the high performance that characterizes these capacitors.

A wide range of values and sizes helps simplify the integration of these products into new and existing applications.

#### Features

- Sizes range from 20 by 20 mils to 60 by 60 mils
- Tight tolerance value
- Low temperature coefficient of capacitance (TCC): (+45 ± 25 ppm/°C MNOS, +15 ± 25 ppm/°C MOS)
- Excellent life stability value
- Wide range of capacitance values (0.5 pF to 1000 pF)

Family	Size (mils)	Value Range (pF)	Best Tolerance (%)	Features
<a href="#">NCAA</a> 	20 x 20	0.5 to 51	5	Single capacitor
<a href="#">NCBB</a> 	30 x 30	33 to 100	2.5	Single capacitor
<a href="#">NCCC</a> 	40 x 40	56 to 220	2.5	Single capacitor
<a href="#">NCDD</a> 	55 x 55	150 to 510	2.5	Single capacitor
<a href="#">NCEE</a> 	60 x 60	360 to 1000	2.5	Single capacitor
<a href="#">CBA</a> 	19 x 30	3.75 and 15	10	Four capacitors in binary increments
<a href="#">CBB</a> 	19 x 48	31	10	Five capacitors in binary increments
<a href="#">CBC</a> 	44 x 44	93	10	Five capacitors in binary increments



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## Thin Film Spiral Inductors

Vishay EFI offers a family of thin film spiral inductors for wire bondable applications. An equivalent circuit model is provided to allow designers to improve the design accuracy and shorten development time by utilizing computer simulation tools.

### Features

- RF modeled to facilitate computer simulation
- Small size
- Low DCR, high Q (DCR as low as 0.25 Ω, Q of 14 at 1 GHz)
- High SRF (10 GHz)
- Excellent life stability value
- High reliability
- Good power handling capabilities
- Wide range of values



Family	Size (mils)	Value Range (nH)	Best Tolerance (%)
<a href="#">PSC</a>	45 x 45	3 to 50	10
<a href="#">RFLW</a>	30 x 30 / 50 x 50	3 to 30 / 20 to 150	10

### PSC COMPONENT PERFORMANCE

