

**An outstanding  
passive component**

*~ Giving your PAs of RF with extreme high power at higher frequency, and low capacitance ~*

## CVD Diamond High Power Resistors

CVD diamond high power resistors are the thin film passive components using CVD diamond as the resistor substrate. These resistors can provide extremely high power rating possibilities on smallest area and lower parasitic behavior (i.e., lower pF/W, better isolation), which is ideal for applications such as up to 30 GHz in 5G communications and military millimeter-wave (MMW) devices, phased array radar, high power Wilkinson power dividers/combiners, dual junctions circulator duplexers and feedback networks for power amplifiers (PAs) in RF. All thin film products are made with pure Au contacts, suitable for soldering and wire bonding.

### Typical product specifications

Substrate material : **CVD Diamond**

Substrate thermal conductivity : TC > 1000 W/mK

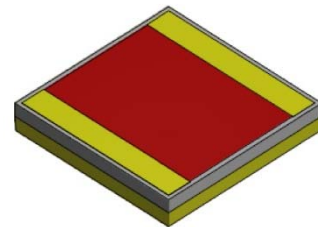
Substrate relative dielectric constant :  $\epsilon_r \approx 5.5$

Resistor material : **TaN**

Resistance : 50  $\Omega$   $\pm$ 5% or trimmed to specification, other values on request

Contact material : **Ti / Pt/ Au**

Backside coating : **Ti / Pt/ Au**



### Standard Designs

Type	RCVD20	RCVD50	RCVD80	RCVD125
#150-112-	1020-B	1019-B	1018-B	1017-B
Length <sup>1</sup> (mm)	1.14	1.40	1.65	2.67
Width <sup>1</sup> (mm)	0.63	1.40	0.89	2.67
Thickness <sup>1</sup> (mm)	0.38	0.38	0.38	0.38
<b>Power CW (W)</b>	<b>20</b>	<b>50</b>	<b>50</b>	<b>125</b>
Capacitance <sup>2</sup> (pF)	0.09	0.25	0.19	0.91
Thermal resistance <sup>2</sup> (K/W)	0.53	0.19	0.26	0.05

<sup>1</sup> dimensional accuracy  $\pm$ 0.127 mm

<sup>2</sup> calculated DC capacitance and CW thermal resistance

Metallization setback from edge : minimally 0.06mm,

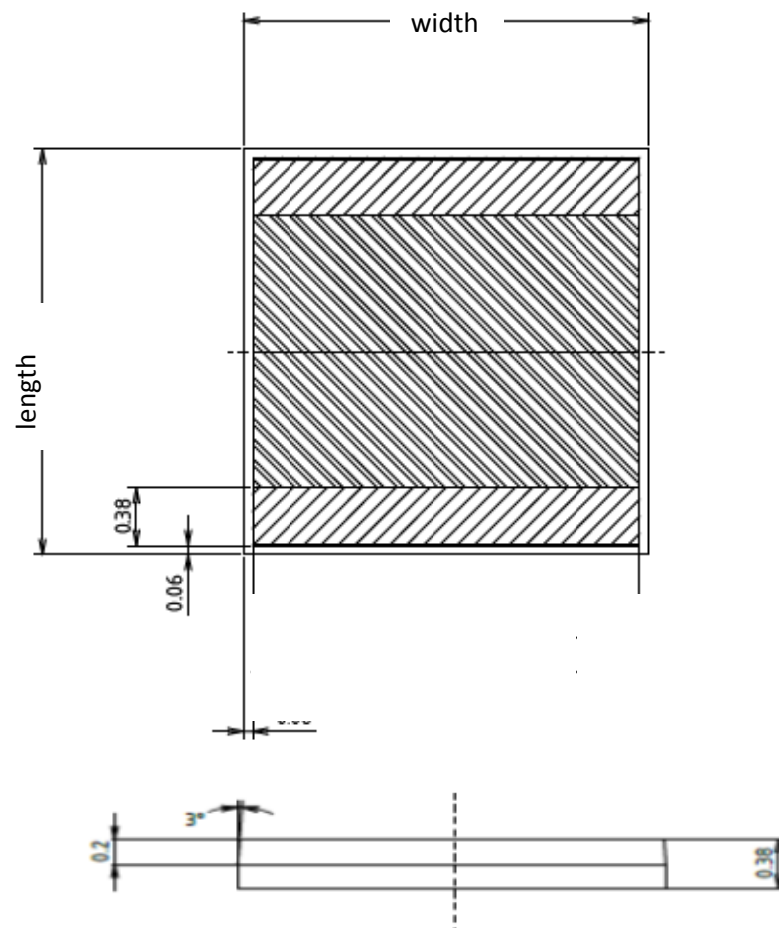
Metallization thickness :  $\pm$ 25% for each layer

Au-contact width 0.23mm (0.38mm for RCVD125)

Au metallization suitable for wire bonding and most solder processes

## Specifications

<b>1 Electrical</b>	Resistance	50 $\Omega$ $\pm$ 5% or trimmed to specification
	Capacitance	0.09-0.91 pF (see table)
	Input power CW	20-125 Watt (see table)
	Peak power	not tested
<b>2 Thermal</b>	Thermal Resistance	0.05-0.53 K/W (see table)
	Operating temperature	lower bound not tested, tested up to 125 °C
	Maximum	
	Temperature Coefficient of Resistance	-1000ppm/K
<b>3 Marking</b>	optional	
<b>4 Quality</b>	Visual and mechanical inspection per 824W154	
<b>5 Packaging</b>	Waffle pack	



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