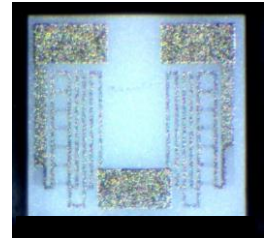


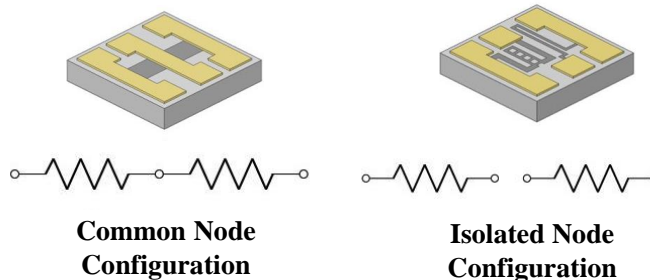
Dual Chip Resistors

PD Series



24x21 Dual Resistor

- Two resistors on a single chip area
- Available styles are common or isolated node
- The nature of this design lends itself to tightly matched TCR and electrical tolerance, with resistance ratios within 0.01% possible (value dependent)
- Can be used in Non-Magnetic Applications



◆ Product Specifications

Resistance Range	2Ω - 1MΩ per resistor (Silicon or Quartz) 2Ω - 160kΩ per resistor (Al ₂ O ₃ , BeO, or AlN)
Resistance Tolerance	±0.01% to ±20% value dependent
Standard Size	30 mil x 30 mil x 10 mil 0.03" x 0.03" x 0.01"

◆ Part Numbering

P D I T - 35 - 30x30 - 10000 - 20000 - A J Q K W

P = Passive Plus

Resistor Style

D = Dual Resistors

Resistor Configuration

C = Common Node Resistors

I = Isolated Resistors

Resistive Material

T = Tantalum Nitride

N = NiChrome

Substrate

See Charts on next page

Length and Width

Packaging

W = Waffle Pack (Standard)*

Resistance Ratio

TCR

See Charts on next page

Resistance Tolerance

See Charts on next page

Termination

See Charts on next page

Resistance for First & Second Resistors

Digits 1-4 are significant figures

Digit 5 is the number of zeros to follow

When required, the "R" is used as a decimal point

and the exponent is omitted.

e.g. 100R5 = 100.5Ω, 10000 = 10000Ω, 10001 = 10000Ω

* All parts are supplied in waffle packs. Other packaging may be available. Contact PPI for additional packaging options.

Dual Chip Resistors

◆ Resistive Materials & Temperature Coefficient of Resistance (TCR)

Resistive Materials					TCR					
Material	Passivation	Sheet Resistivity (Ω/Sq)	Abs. Tolerance	Ratio Tolerance	±150 ppm/°C	±100 ppm/°C	±50 ppm/°C	±25 ppm/°C	±10 ppm/°C	±5 ppm/°C
Tantalum Nitride (TaN)	Self Passivating Ta ₂ O ₅	5 to 270	From ±0.01%	From ±0.01%	Q	V	W	X	Y	Z
					Standard	Yes	---	---	---	---
NiChrome (NiCr)	SiO ₂	5 to 250	From ±0.01%	From ±0.01%	---	---	Yes	Standard	Yes	Yes

◆ Power Handling Range by Material

Power Handling					
Case Size	Alumina	Silicon	AlN	BeO	Quartz
mils (inches)	(C-35)	(C-22)	(C-28)	(C-25)	(C-20)
30 x 30 (0.030 x 0.030)	125 mW	125 mW	500 mW	1.0 W	25 mW

◆ Resistance Tolerance Codes

Tolerance*	B	D	F	G	H	J	K	L	M	Q	S
Code	± 0.1%	± 0.5%	± 1%	± 2%	± 3%	± 5%	± 10%	± 15%	± 20%	± 0.05%	± 0.01%

* Limit of ± 50mΩs

◆ Resistance Ratio Codes

Tolerance To Other Resistors	Code	Tolerance To Other Resistors	Code
±0.01%	G	±0.50%	M
±0.05%	H	±1.00%	N
±0.10%	J	No Ratio	R
±0.25%	K		

Dual Chip Resistors

◆ Terminations

Metallization		Code
Top Side	Bottom Side	
Pd/Au	—	A
Pd/Au	Ta/Pd/Au	D
Pd/Au	Au Sputtered	K

◆ Substrate Materials

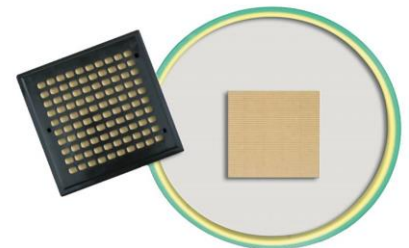
Material	Thickness	Surface Finish	Dielectric Constant (@ 1MHz)	Coefficient of Thermal Expansion (x 10 ⁶ /°C)	Thermal Conductivity (W/m*K)	Code	Power per Resistor
Alumina (Al ₂ O ₃)	0.005" - 0.010"	2μ" - 3μ"	9.9	7 (25°C to < 300°C)	26.9	35	125 mW
Aluminum Nitride (AlN)	0.005" - 0.010"	6μ" - 8μ"	8.0 - 9.1	4.6 - 5.7 (25°C to < 1000°C)	170	28	500 mW
Beryllium Oxide (BeO)	0.005" - 0.010"	< 5μ"	6.76	9 (25°C to < 1000°C)	285	25	1 W
Silicon (Si) (with 12kÅ SiO ₂)	0.005" - 0.010"	Chemical Polish	N/A (SiO ₂ K=1.38)	2.49 - 4.44 (25°C to < 1000°C)	149 (SiO ₂ 1.38)	22	125 mW
Quartz (Fused Silica)	0.005" - 0.010"	60/40 Optical Polish	3.826	0.55 (25°C to < 300°C)	1.38	20	25 mW

◆ Performance Specifications

Higher power ratings, additional sizes, and custom resistors may be available. Please contact sales@passiveplus.com.

◆ Packaging

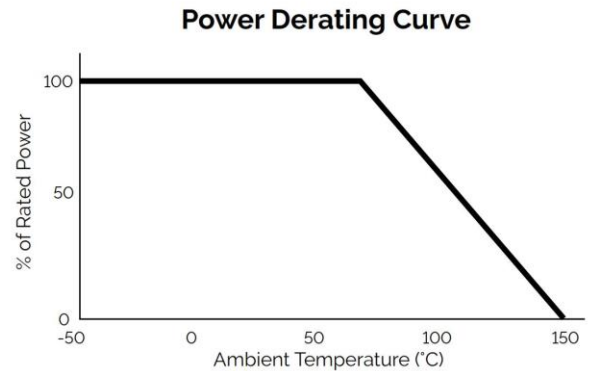
ESD waffle packs are standard. Film rings and gel pack packaging may be available upon request.



Dual Chip Resistors

◆ General Properties

Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Operating Frequency	DC to 500 MHz
Voltage Rating	100V maximum
Power Derating (See Chart at Right)	Full power up to 70°C Derated linearly to zero power at 150°C



◆ Testing

Testing Performed	Specification / Standard
Visual Inspection	MIL-PRF-55342 MIL-STD-883
Mechanical Inspection	MIL-PRF-55342
DC Resistance	MIL-PRF-55342 MIL-STD-202
Resistance Temperature Characteristics (TCR)	MIL-PRF-55342
Short Time Overload	MIL-PRF-55342
High Temperature Exposure	MIL-PRF-55342
Thermal Shock	MIL-PRF-55342 MIL-STD-202
Resistance to Bonding Exposure	MIL-PRF-55342
Wire Bonding Integrity	MIL-PRF-55342
Life Test	MIL-PRF-55342 MIL-STD-202

Typical PPI commercial testing includes 100% visual inspection, 100% electrical testing and TCR sampling. Our parts meet or exceed additional MIL-PRF-55342 and MIL-STD-202 requirements.