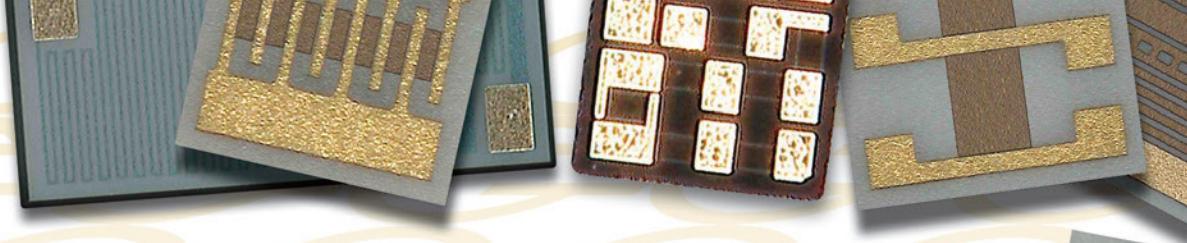
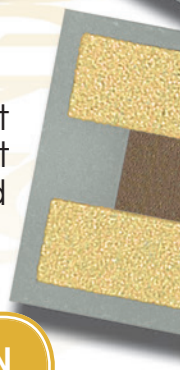


R Series

Thin Film Resistors – Top Side Terminations

Compex's line of wire-bondable thin film resistors offers our customers significant flexibility to meet the most challenging designs. Built to the customer's exact specifications, available alternatives include single, dual, center-tap, array, and custom configurations. Standard and microwave frequency options up to 40 GHz or higher are available, voltage rating up to 100V.



- **CUSTOM MANUFACTURED TO PROVIDE THE OPTIMUM PART FOR EACH APPLICATION**
- **ALUMINA, ALUMINUM NITRIDE, BERYLLIUM OXIDE, SILICON, AND QUARTZ**
- **TOLERANCE DOWN TO 0.01%**

R Part Number Assembly

Example shown: Compex Series R, center tap TaN resistor, C-35 (alumina), .020" x .020" x .010", PdAu bonding pad, bottom side bare, 1000Ω ± 5%, 150 PPM TCR, regular trim 100 mW

R T 2 – 35 - 20 x 20 x 10 – A – 10000 – J – Q E

Resistor Style
M (Microwave)
R (Standard – DC to 500 MHz)

Resistive Metallization
T (Tantalum Nitride) or
N (NiChrome)

Number of Resistors per Device

Material Type
See R Selection Charts (at right)

Length x Width (mils)
See R Chip Dimensions (at right)

Thickness (mils)
10 mil standard (exception 12 x 9 size, standard is 5 mils).
Other thicknesses available, please consult factory.

Bonding Pad Metallization
See R Selection Charts (at right)

Power Handling Code
from Table (at right)

Temperature Coefficient of Resistance (TCR)
See R Selection Charts (at right)

Resistance Tolerance
See R Resistance Tolerance Codes (below)

Resistance (Ω)
First 4 digits represent significant figures and the last, the number of zeros to follow. When required, the "R" is used as a decimal point and the succeeding digit represents significant figures only. e.g.: 10001 = 10000 Ω, 10000 = 1000 Ω, 100R5 = 100.5 Ω

Note: Standard dimensional tolerance for length and width is ± 2 mils. The thickness tolerance is ± 1 mil.

Standard Resistance Tolerance Codes

Tolerance	Code	Tolerance	Code	Tolerance	Code	Tolerance	Code
± 20%	M	± 5%	J	± 1%	F	±.05%	Q
± 15%	L	± 3%	H	± .5%	D	±.01%	S
± 10%	K	± 2%	G	±.1%	B		

R Selection Charts

Note: Selection Charts are for guidance only. All Compex parts are built to specific customer requirements.

Microwave Resistance Range by Case Size (Ohms)

Case Size Mils	Min	Max
12X9	4	500
14X12	4	750
20X10	6	1000
15X15	4	1000
20X20	4	1250
30X20	4	2500
40X20	4	3750
30X30	2	2500
35X35	2	3000
40X40	2	3750
50X25	3	5000
60X30	3	5000
50X50	2	5000
60X60	2	5000
80X50	2	5000
100X50	2	5000
120X60	2	5000
100X100	2	5000

Standard Resistance Range by Case Size (Ohms)

Case Size Mils	Min*	Max Alumina	Max Silicon
12X9	1-3	25K	150K
14X12	1-3	40K	200K
20X10	1-3	60K	250K
15X15	1-2	70K	500K
20X20	1-2	125K	750K
30X20	1-2	200K	1M
40X20	1-2	250K	1.5M
30X30	1-2	275K	2M
35X35	1-2	300K	3M
40X40	1-2	500K	5M
50X25	1-2	300K	3M
60X30	1-2	500K	6M
50X50	1-2	700K	7M
60X60	1-2	2M	15M
80X50	1-2	2M	20M
100X50	1-2	2.5M	25M
120X60	1-2	3M	30M
100X100	1-2	3.5M	35M

Minimum Power Handling by Material and Size**

Case Size Mils	Alumina C-35	Silicon C-22	AlN C-28	BeO C-25	Quartz C-20
12X9	50 mW	50 mW	200 mW	400 mW	10 mW
14X12	100 mW	100 mW	400 mW	800 mW	20 mW
20X10	100 mW	100 mW	400 mW	800 mW	20 mW
15X15	100 mW	100 mW	400 mW	800 mW	20 mW
20X20	250 mW	250 mW	1.0 W	2.0 W	50 mW
30X20	250 mW	250 mW	1.0 W	2.0 W	50 mW
40X20	250 mW	250 mW	1.0 W	2.0 W	50 mW
30X30	250 mW	250 mW	1.0 W	2.0 W	50 mW
35X35	250 mW	250 mW	1.0 W	2.0 W	50 mW
40X40	350 mW	350 mW	1.4 W	2.8 W	70 mW
50X25	350 mW	350 mW	1.4 W	2.8 W	70 mW
60X30	500 mW	500 mW	2.0 W	4.0 W	100 mW
50X50	500 mW	500 mW	2.0 W	4.0 W	100 mW
60X60	500 mW	500 mW	2.0 W	4.0 W	100 mW
80X50	500 mW	500 mW	2.0 W	4.0 W	100 mW
100X50	500 mW	500 mW	2.0 W	4.0 W	100 mW
120X60	750 mW	750 mW	3.0 W	6.0 W	125 mW
100X100	750 mW	750 mW	3.0 W	6.0 W	125 mW

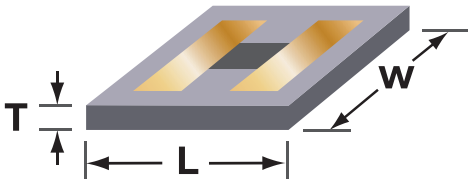
Power Handling Codes

Watts	Code
10 mW	A
20 mW	B
50 mW	C
75 mW	D
100 mW	E
150 mW	F
250 mW	G
500 mW	H
750 mW	J
1 W	K
2 W	L
3 W	N
4 W	P
5 W	Q
10 W	S
15 W	T
20 W	V
25 W	W
50 W	X

*Min Value TCR 150 ppm for TaN and 25 ppm for NiC.
**Higher Power ratings available, please consult factory.

Bonding Pad Metallizations			Temperature Coefficient of Resistance	
Metallization		Code	Parts Per Million (PPM)	Code
Pd/Au Top Side	Bare Bottom Side	A	±150	Q
Pd/Au Top Side	Ta/Pd/Au Bottom Side	D	±100	V
Pd/Au Top Side	Ti/Pt/Au Bottom Side	L	±50	W
Ni/Au	Application Specific	P	±25	X
TiW/Au Top Side	Bare Bottom Side	E	±10	Y
TiW/Au Top Side	Ta/Pd/Au Bottom Side	F	±5	Z
Window	Silicon Only	W		
Custom	Application Specific	X		

R Chip Dimensions



Testing Performed	Specification/Standard
Visual Inspection	MIL-PRF-55342 Para 4.8.1 MIL-STD-883 Method 2032
Mechanical Inspection	MIL-PRF-55342 Para 4.8.1
DC Resistance	MIL-PRF-55342 Para 4.8.2 MIL-STD-202 Method 303
Resistance Temperature Characteristic (TCR)	MIL-PRF-55342 Para 3.16 MIL-STD-202 Method 304
Short Time Overload	MIL-PRF-55342 Para 3.12
High Temperature Exposure	MIL-PRF-55342 Para 3.13
Thermal Shock	MIL-PRF-55342 Para 3.9 MIL-STD-202 Method 107
Resistance to Bonding Exposure	MIL-PRF-55342 Para 3.14.2
Wire Bonding Integrity	MIL-PRF-55342 Para 4.8.13
Life Test	MIL-PRF-55342 Para 3.17 MIL-STD-202 Method 108 (rated voltage @ 70°C for 2000 hours)

Performance Specifications

Typical Compex commercial testing includes 100% visual, mechanical, resistance, short time overload, and Resistance Temperature Characteristic. Our parts also meet or exceed additional MIL-PRF-55342 and MIL-STD-202 requirements outlined in the table at left. Please consult the factory for your exact testing requirements.

Higher power ratings, additional sizes, and custom resistors available. Please contact factory to request free samples.

R Series

Thin Film Resistors – Single or Dual Edge Wrap

Compex's line of wire-bondable and edge-terminated thin film resistors offers our customers significant flexibility to meet the most challenging designs. Built to the customer's exact specifications, available alternatives include single, dual, center-tap, array, and custom configurations. Standard and microwave frequency options up to 40 GHz or higher are available, voltage rating up to 100V.

- **CUSTOM MANUFACTURED TO PROVIDE THE OPTIMUM PART FOR EACH APPLICATION**
- **ALUMINA, ALUMINUM NITRIDE AND BERYLLIUM OXIDE**
- **TOLERANCE DOWN TO 0.01%**

R Part Number Assembly

Example shown: Compex Series R, Microwave Frequency, Dual edge-wrap SMT style TaN Resistor, C-28 (AIN), .040" x .020" x .010", 200Ω ± 2%, 150 PPM TCR, 1W

M T 1 – 28 - 40 x 20 x 10 – N – 200R0 – G – Q K

Resistor Style
M (Microwave)
R (Standard – DC to 500 MHz)

Resistive Metallization
T (Tantalum Nitride) or
N (NiChrome)

Number of Resistors per Device

Material Type
See R Selection Charts (at right)

Length x Width (mils)
See R Chip Dimensions (at right)

Thickness (mils)
10 mil standard (exception 12 x 9 size, standard is 5 mils).
Other thicknesses available, please consult factory.

Bonding Pad Metallization
See R Selection Charts (at right)

Power Handling Code
from Table (at right)

Temperature Coefficient
of Resistance (TCR)
See R Selection Charts (page 17)

Resistance Tolerance
See R Resistance Tolerance
Codes (below)

Resistance (Ω)
First 4 digits represent significant figures and the last, the number of zeros to follow. When required, the "R" is used as a decimal point and the succeeding digit represents significant figures only. e.g.: 10001 = 10000 Ω, 10000 = 1000 Ω, 100R5 = 100.5 Ω

Note: Standard dimensional tolerance for length and width is ± 2 mils. The thickness tolerance is ± 1 mil.

Standard Resistance Tolerance Codes

Tolerance	Code	Tolerance	Code	Tolerance	Code	Tolerance	Code
± 20%	**M**	± 5%	**J**	± 1%	**F**	±.05%	**Q**
± 15%	**L**	± 3%	**H**	± .5%	**D**	±.01%	**S**
± 10%	**K**	± 2%	**G**	±.1%	**B**		

R Selection Charts

Note: Selection Charts are for guidance only. All Compex parts are built to specific customer requirements.

Microwave Resistance Range by Case Size (Ohms)

Case Size Mils	Min	Max
12X9	4	500
14X12	4	750
20X10	6	1000
15X15	4	1000
20X20	4	1250
30X20	4	2500
40X20	4	3750
30X30	2	2500
35X35	2	3000
40X40	2	3750
50X25	3	5000
60X30	3	5000
50X50	2	5000
60X60	2	5000
80X50	2	5000
100X50	2	5000
120X60	2	5000
100X100	2	5000

Standard Resistance Range by Case Size (Ohms)

Case Size Mils	Min*	Max Alumina
12X9	1-3	25K
14X12	1-3	40K
20X10	1-3	60K
15X15	1-2	70K
20X20	1-2	125K
30X20	1-2	200K
40X20	1-2	250K
30X30	1-2	275K
35X35	1-2	300K
40X40	1-2	500K
50X25	1-2	300K
60X30	1-2	500K
50X50	1-2	700K
60X60	1-2	2M
80X50	1-2	2M
100X50	1-2	2.5M
120X60	1-2	3M
100X100	1-2	3.5M

Minimum Power Handling by Material and Size**

Case Size Mils	Alumina C-35	AlN C-28	BeO C-25
12X9	50 mW	200 mW	400 mW
14X12	100 mW	400 mW	800 mW
20X10	100 mW	400 mW	800 mW
15X15	100 mW	400 mW	800 mW
20X20	250 mW	1.0 W	2.0 W
30X20	250 mW	1.0 W	2.0 W
40X20	250 mW	1.0 W	2.0 W
30X30	250 mW	1.0 W	2.0 W
35X35	250 mW	1.0 W	2.0 W
40X40	350 mW	1.4 W	2.8 W
50X25	350 mW	1.4 W	2.8 W
60X30	500 mW	2.0 W	4.0 W
50X50	500 mW	2.0 W	4.0 W
60X60	500 mW	2.0 W	4.0 W
80X50	500 mW	2.0 W	4.0 W
100X50	500 mW	2.0 W	4.0 W
120X60	750 mW	3.0 W	6.0 W
100X100	750 mW	3.0 W	6.0 W

Power Handling Codes

Watts	Code
10 mW	A
20 mW	B
50 mW	C
75 mW	D
100 mW	E
150 mW	F
250 mW	G
500 mW	H
750 mW	J
1 W	K
2 W	L
3 W	N
4 W	P
5 W	Q
10 W	S
15 W	T
20 W	V
25 W	W
50 W	X

*Min Value TCR 150 ppm for TaN and 25 ppm for NiC.
**Higher Power ratings available, please consult factory.

Bonding Pad Metallizations

Metallization	Applications	Code
1 Side Wrap	Epoxy or Au/Sn	H
1 Side Wrap	Epoxy, Au/Sn, Sn Solder	M
2 Sided Wrap	Epoxy or Au/Sn	J
2 Sided Wrap	Epoxy, Au/Sn, Sn Solder	N
Custom	Application Specific	X

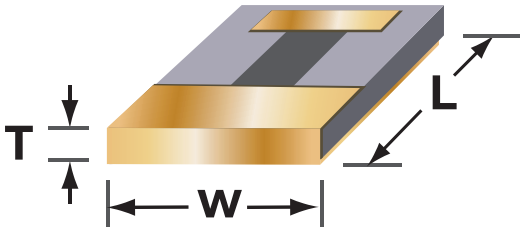
Performance Specifications

Typical Compex commercial testing includes 100% visual, mechanical, resistance, short time overload, and Resistance Temperature Characteristic. Our parts also meet or exceed additional MIL-PRF-55342 and MIL-STD-202 requirements outlined in the table on page 17. Please consult the factory for your exact testing requirements.

Higher power ratings, additional sizes, and custom resistors available. Please contact factory to request free samples.

R Chip Dimensions

Single Edge-Wrap



Dual Edge-Wrap