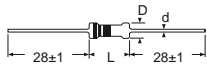


Standard Resistor Values																								
See below for complete part numbers when ordering.																								
1.0	2.0	3.9	7.5	15	30	56	110	220	430	820	1.6K	3.3K	6.2K	12K	24K	47K	91K	180K	360K	680K	1.3M	2.7M	5.1M	10M
1.1	2.2	4.3	8.2	16	33	62	120	240	470	910	1.8K	3.6K	6.8K	13K	27K	51K	100K	200K	390K	750K	1.5M	3.0M	5.6M	
1.2	2.4	4.7	9.1	18	36	68	130	270	510	1.0K	2.0K	3.9K	7.5K	15K	30K	56K	110K	220K	430K	820K	1.6M	3.3M	6.2M	
1.3	2.7	5.1	10	20	39	75	150	300	560	1.1K	2.2K	4.3K	8.2K	16K	33K	62K	120K	240K	470K	910K	1.8M	3.6M	6.8M	
1.5	3.0	5.6	11	22	43	82	160	330	620	1.2K	2.4K	4.7K	9.1K	18K	36K	68K	130K	270K	510K	1.0M	2.0M	3.9M	7.5M	
1.6	3.3	6.2	12	24	47	91	180	360	680	1.3K	2.7K	5.1K	10K	20K	39K	75K	150K	300K	560K	1.1M	2.2M	4.3M	8.2M	
1.8	3.6	6.8	13	27	51	100	200	390	750	1.5K	3.0K	5.6K	11K	22K	43K	82K	160K	330K	620K	1.2M	2.4M	4.7M	9.1M	

**Characteristics**

Terminal Strength	Soldering	Temperature Change	Vibration	Moisture Resistance	Load Life	Dielectric Strength	Insulation Resistance	Short-Time Overload	Voltage Coefficient	Solvents Resistance
0.6mm load 10N (1kg): 10s Δ Rmax. 0.25% + 0.05Ω	2s 230°C 0.5% activated flux Δ Rmax. 0.25% + 0.25Ω	½ hr. @ -55°C ½ hr. @ +155°C 5 cycles: Δ Rmax. 0.25% + 0.25Ω	1.5mm displacement @ 10 to 500 Hz; Δ Rmax. 0.25% + 0.05Ω	Δ Rmax. ±3%	Δ Rmax. ±2.5%	1000 hrs.: 70°C: Phom or Vmax. Δ Rmax. 1% + 0.05Ω	500Vrms appl. for 1 min.: No breakdown	Room temp., dissipation 6.25x Phom. 10 cycles, 5 sec. on, 45 sec. off; Δ Rmax. 0.25% + 0.05Ω	5 ppm	No damage

**CFR Series**

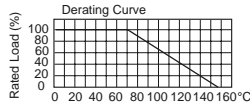


**General Specifications**

Type (Power Rating)	Dimensions (mm)			Max. Working Voltage	Max. Overload Voltage	Rated Ambient Temperature	Temperature Cycling	Resistance Range	Resistance Tolerance
	L	D	d						
1/8 Watt	3.8 ± 0.2	1.8 ± 0.2	0.45	200V	400V	70°C	-55°C to +155°C	1.0Ω to 10 MΩ	±5%
1/4 Watt	6.5 ± 0.5	2.3 ± 0.3	0.60	250V	500V	70°C	-55°C to +155°C	1.0Ω to 10MΩ	±5%
1/2 Watt	9.5 ± 0.5	3.2 ± 0.5	0.60	350V	700V	70°C	-55°C to +155°C	1.0Ω to 10MΩ	±5%

**Features**

- Industry's lowest cost!
- Available in 1/8, 1/4, 1/2 watt; packaged in bulk or tape/reel (except 1/2 watt)
- Exceeds carbon comp MIL-R-11 performance
- Standard tolerance: 65%
- Exceptional long-term stability



Description	Digi-Key Part No.	Pricing					
		5	200	1M	5M	10M	50M
<b>1/8 Watt, 5% Carbon Film Resistors</b> Bulk Package	(Value)HK-ND (i.e. 1.0E8K ND)	28	170	3.63	12.22 V	11.28 V	10.34 V
1/8 Watt, 5% Carbon Film Resistors — Tape and Reel (5,000 pcs./reel — Order in multiples of 5,000)	(Value)ETR-ND (i.e. 1.0E1R-ND)	—	—	—	14.95/M	13.80/M	11.04/M
<b>1/4 Watt, 5% Carbon Film Resistors</b> Bulk Package	(Value)QBK ND (i.e. 1.0QBK ND)	28	33	870	8.27 M	7.89 V	6.24 M
1/4 Watt, 5% Carbon Film Resistors — Tape and Reel (5,000 pcs./reel — Order in multiples of 5,000)	(Value)QTR-ND (i.e. 1.0QTR-ND)	—	—	—	8.94/M	8.25/M	6.60/M
<b>1/2 Watt, 5% Carbon Film Resistors</b> Bulk Package	(Value)H-ND (i.e. 1.0H-ND)	.27	3.96	12.87	11.88/M	10.89/M	9.90/M

"E" = Eighth Watt; "Q" = Quarter Watt; "H" = Half Watt. Please be sure to specify. Half watt available in bulk package only.

**Digi-Key® 1/8 Watt Resistor Assortment**

- RSE200-ND** 200 each of all std. values 5% 1/8 watt carbon film resistors in the series 1.0 - 10 megohms (33,800 total pcs.) ..... **\$409.00**
- RS112-ND** Set of 5 each of 73 standard 5% 1/8 watt carbon film resistors in the series 1.0, 1.2, 1.5, 1.8, 2.2, etc., through 1.0 megohm (365 total pieces) ..... **\$16.96**
- RS212-ND** Set of 5 each of the 72 standard 5% 1/8 watt carbon film resistors in the series 1.1, 1.3, 1.6, 2.0, 2.4, etc., through 910 kilohm (360 total pieces) ..... **\$16.99**

**Digi-Key® 1/4 Watt Resistor Assortment**

- RSQ200-ND** 200 each of all std. values 5% 1/4 watt carbon film resistors in the series 1.0 - 10 megohms (33,800 total pcs.) ..... **\$239.00**
- RS125-ND** Set of 5 each of 73 standard 5% 1/4 watt carbon film resistors in the series 1.0, 1.2, 1.5, 1.8, 2.2, etc., through 1.0 megohm (365 total pieces) ..... **\$14.95**
- RS225-ND** Set of 5 each of the 72 standard 5% 1/4 watt carbon film resistors in the series 1.1, 1.3, 1.6, 2.0, 2.4, etc., through 910 kilohm (360 total pieces) ..... **\$14.95**

**Digi-Key® 1/2 Watt Resistor Assortment**

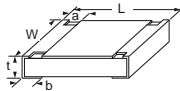
- RSH200-ND** 200 each of all std. values 5% 1/2 watt carbon film resistors in the series 1.0 - 10 megohms (33,800 total pcs.) ..... **\$335.00**
- RS150-ND** Set of 5 each of 73 standard 5% 1/2 watt carbon film resistors in the series 1.0, 1.2, 1.5, 1.8, 2.2, etc., through 1.0 megohm (365 total pieces) ..... **\$16.95**
- RS250-ND** Set of 5 each of the 72 standard 5% 1/2 watt carbon film resistors in the series 1.1, 1.3, 1.6, 2.0, 2.4, etc., through 910 kilohm (360 total pieces) ..... **\$16.95**

**PANASONIC® ERA 0603/0805 .1% Metal Film Chip Resistors**  
Surface Mount — Available In 1/16 and 1/10 Watt

Standard Resistor Values																								
See below for complete part numbers when ordering.																								
100	130	180	240	330	430	560	750	1.0K	1.3K	1.8K	2.4K	3.3K	4.3K	5.6K	7.5K	10K	13K	18K	24K	33K	43K	56K	75K	100K
110	150	200	270	360	470	620	820	1.1K	1.5K	2.0K	2.7K	3.6K	4.7K	6.2K	8.2K	11K	15K	20K	27K	36K	47K	62K	82K	
120	160	220	300	390	510	680	910	1.2K	1.6K	2.2K	3.0K	3.9K	5.1K	6.8K	9.1K	12K	16K	22K	30K	39K	51K	68K	91K	

**Features:**

- High reliability
- Low TCR and current noise
- Excellent non-linearity



Type	Type (Power Rating)	Max. RCWV	Max. Overload Voltage	Dimensions (mm)				Temperature Coefficient	Panasonic Part No.	
				L	W	t	a	b		
0603	1/16 Watt	75V	150V	1.60	0.80	0.45	0.30	0.30	+25ppm/°C	ERA-3YE
0805	1/10 Watt	100V	200V	2.00	1.25	0.50	0.40	0.40	+25ppm/°C	ERA-6YE

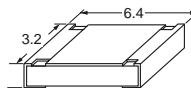
Description	Value Range	Digi-Key Part No.	Pricing					Panasonic Part No.				
			10	50	200	1M	5M					
0603, 1/16 W, .1% Chip Resistors: Tape & Reel (5000/pkg.)	100 - 33K	P(Value)YTR-ND	—	—	—	—	184.94/M	107.96/M	124.84/M	115.59/M	110.97/M	ERA-3YEBxxxV
0603, 1/16 W, .1% Chip Resistors: Tape (200/pkg.)	100 - 33K	P(Value)YCT-ND	9.16	28.94	72.35	217.06	—	—	—	—	—	ERA-3YEBxxx
0805, 1/10 W, .1% Chip Resistors: Tape & Reel (5000/pkg.)	100 - 100K	P(Value)ZTR-ND	—	—	—	—	184.94/M	147.96/M	124.84/M	115.59/M	110.97/M	ERA-6YEBxxxV
0805, 1/10 W, .1% Chip Resistors: Tape (200/pkg.)	100 - 100K	P(Value)ZCT-ND	9.16	28.94	72.35	217.06	—	—	—	—	—	ERA-6YEBxxx

**PANASONIC® Thick Film Chip Resistors / Low Resistance Type**  
For Current Sensing Applications

**Features:**

- 2512 Package (1 watt)
- Available in both 1% and 5% tolerance
- Operating temperature of -55°C to 125°C (derating required above 70°C)

- Resistance Range of 2.0-100mΩ
- Temperature Coefficient: ±100ppm >5mΩ  
±350ppm <5mΩ



Standard Resistor Values (mΩ)						
See below for complete part numbers when ordering.						
3.0	4.0	8.0	12	16	47*	100
5.0	5.0	10	15	20	50	

\* not available in 1% tolerance

Description	Value Range (mΩ)	Digi-Key Part No.	Cut Tape Pricing			Digi-Key Part No.	Tape & Reel Pricing 3,000	Panasonic Part No.
			10	50	200			
2512, 1 W, 5% Chip Resistor	2.0	P(Value)TCT-ND NEW!	24.45	77.22	193.05	P(Value)TTR-ND NEW!	606.06/M	ERJ-M1WTJxxxU
2512, 1 W, 5% Chip Resistors	3.0 - 20	P(Value)TCT-ND NEW!	24.45	77.22	193.05	P(Value)TTR-ND NEW!	514.80/M	ERJ-M1WSJxxxU
2512, 1 W, 5% Chip Resistors	47 - 100	P(Value)TCT-ND	19.45	61.43	153.56	P(Value)TTR-ND	409.50/M	ERJ-L1WKJxxxU
2512, 1 W, 1% Chip Resistors	3.0 - 20	P(Value)MCT-ND NEW!	26.90	84.94	212.36	P(Value)MTR-ND NEW!	566.28/M	ERJ-M1WSFxxxU
2512, 1 W, 1% Chip Resistors	50 - 100	P(Value)MCT-ND	23.34	73.71	184.28	P(Value)MTR-ND	491.40/M	ERJ-L1WKFxxxU