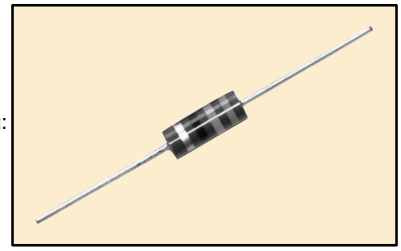
1 WATT CARBON COMPOSITION

Features:

- Low inductance / High Frequency Performance
- High Surge / High Pulse Capability
- Rugged Construction



Carbon Composition resistors are commonly used in high frequency, fusing, or pulse applications including:

- Snubbers
- Lightening Surge Protection Circuits
- Grounding Resistors
- RFI Suppression

Value in Ohms	NTE Stock Number	Value in Ohms	NTE Stock Number	Value in Ohms	NTE Stock Number	Value in Ohms	NTE Stock Number	Value in Ohms	NTE Stock Number
10	1WCC010	150	1WCC115	2.2K	1WCC222	33K	1WCC333	470K	1WCC447
15	1WCC015	220	1WCC122	3.3K	1WCC233	47K	1WCC347	680K	1WCC468
22	1WCC022	330	1WCC133	4.7K	1WCC247	68K	1WCC368	1M	1WCC510
33	1WCC033	470	1WCC147	6.8K	1WCC268	100K	1WCC410		
47	1WCC047	680	1WCC168	10K	1WCC310	150K	1WCC415		
68	1WCC068	1K	1WCC210	15K	1WCC315	220K	1WCC422		
100	1WCC110	1.5K	1WCC215	22K	1WCC322	330K	1WCC433		

SPECIFICATIONS

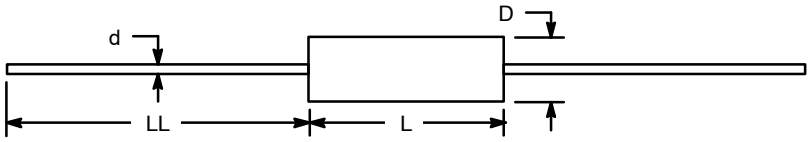
Electrical Characteristics @ 70°C

NTE Number	Resistance Range (Ohms)	Tolerance (%)	Voltage (Volts)	Operating Temperature (T_{opr})	Temperature Coefficient (PPM/°C)
1WCC010 thru 1WCC510	10 to 1M	10	500	–55° to +150°C	±0.15%

Mechanical* (Typical, inches/mm)

NTE Number	Body Length (L)	Body Diameter (D)	Lead Diameter (d)	Lead Length (LL)
1WCC010 thru 1WCC115	0.562 (14.27)	0.225 (5.72)	0.036 (0.91)	1.000 (25.4)
1WCC122	0.591 (15.0)	0.236 (6.0)	0.032 (0.80)	1.102 (28.0)
1WCC133 thru 1WCC268	0.562 (14.27)	0.225 (5.72)	0.036 (0.91)	1.000 (25.4)
1WCC310	0.591 (15.0)	0.236 (6.0)	0.032 (0.80)	1.102 (28.0)
1WCC315 thru 1WCC333	0.562 (14.27)	0.225 (5.72)	0.036 (0.91)	1.000 (25.4)
1WCC347	0.591 (15.0)	0.236 (6.0)	0.032 (0.80)	1.102 (28.0)
1WCC368 thru 1WCC510	0.562 (14.27)	0.225 (5.72)	0.036 (0.91)	1.000 (25.4)

* These dimensions are for reference only, please consult the factory for actual size.



GENERAL INFORMATION

Pros and Cons of Carbon Composition Resistors

Carbon Composition resistors offer excellent surge and high–frequency performance due to the bulk nature of the resistance element. Unlike wirewound and film resistors, there are no windings of resistance wire, nor any film depositions to open under overload pulses. Since the resistance element is a hot–molded solid core comprised of resin and a carbon slug, without helical turns of resistance wire or film, the inductance is extremely low, essentially the same as a straight piece of wire. The trade–off for the excellent surge and high–frequency capability is a rather unstable environmental performance, particularly in humid environments, a condition well known by most circuit designers. Carbon composition resistors therefore should not be utilized in precision applications, which are generally better suited by other resistor families such as NTE's standard Metal Film types.

There is no single resistor family, however, that offers the unique specialty performance levels of the composition construction, but depending on circuit requirements, other models will often provide a suitable replacement.

GENERAL INFORMATION (Cont'd)

Moisture / Humidity Considerations

Carbon Composition resistors are not as stable as other types of resistors, especially in higher humidity conditions and therefore not suitable for precision applications. For example, carbon comps may shift up to 10% during endurance testing. Most general purpose chip resistors have a maximum shift under the same conditions of less than 3%.

Carbon comps are also highly susceptible to moisture penetration. Damp heat testing may cause carbon comps to shift up to 10%. For that reason, carbon comps are recommended to be used soon after purchase, especially once the bag is opened. However, even in a sealed poly–bag, carbon comps may shift up to 5% in a year. Resistance changes due to humidity/ moisture can be positive or negative (mostly positive) and is usually reversible by conditioning the resistors at 100°–105°C or by dry storage.

Before being considered failures, out–of–tolerance resistors should be conditioned in a dry oven at a temperature of 100°C +5°C for 96 ±4 hours prior to conducting resistance measurements, although some customers have had satisfactory results by baking 12–24 hrs at 110°–120°C. Regardless of the amount of baking, some units may not return to the original value.

Typical levels of shift due to the absorption of moisture is generally less than 10% after 10 days of cycled humidity at 80–100% RH levels. Low and medium–value composition resistors typically exhibit less change due to humidity than high–value resistors. Parts should be stored in low humidity conditions (45% RH max). Conditioned (dry) resistors are the most sensitive to humidity.

In operation, moisture absorption is minimized by operating the resistors with as little as 1/8th rated wattage load (the self–heating effect causes parts to dehumidify).