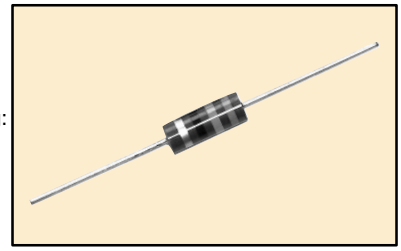
1/4 WATT CARBON COMPOSITION

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	QWCC010	150	QWCC115	2.2K	QWCC222	33K	QWCC333	470K	QWCC447
12	QWCC012	180	QWCC118	2.7K	QWCC227	39K	QWCC339	560K	QWCC456
15	QWCC015	220	QWCC122	3.3K	QWCC233	47K	QWCC347	680K	QWCC468
18	QWCC018	270	QWCC127	3.9K	QWCC239	56K	QWCC356	820K	QWCC482
22	QWCC022	330	QWCC133	4.7K	QWCC247	68K	QWCC368	1M	QWCC510
27	QWCC027	390	QWCC139	5.6K	QWCC256	82K	QWCC382		
33	QWCC033	470	QWCC147	6.8K	QWCC268	100K	QWCC410		
39	QWCC039	560	QWCC156	8.2K	QWCC282	120K	QWCC412		
47	QWCC047	680	QWCC168	10K	QWCC310	150K	QWCC415		
56	QWCC056	820	QWCC182	12K	QWCC312	180K	QWCC418		
68	QWCC068	1K	QWCC210	15K	QWCC315	220K	QWCC422		
82	QWCC082	1.2K	QWCC212	18K	QWCC318	270K	QWCC427		
100	QWCC110	1.5K	QWCC215	22K	QWCC322	330K	QWCC433		
120	QWCC112	1.8K	QWCC218	27K	QWCC327	390K	QWCC439		

SPECIFICATIONS

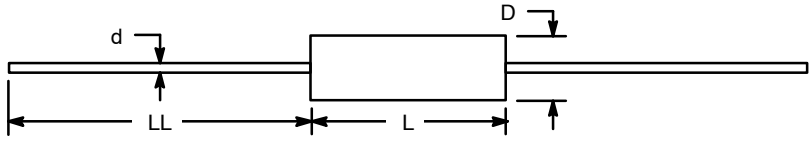
Electrical Characteristics @ 70°C

NTE Number	Resistance Range (Ohms)	Tolerance (%)	Voltage (Volts)	Operating Temperature (T_{opr})	Temperature Coefficient (PPM/°C)
QWCC010 thru QWCC382	10 to 82K	10	250	–55° to +150°C	±0.15%
QWCC410 thru QWCC510	100K to 1M	10	250	–55° to +150°C	±0.15%

Mechanical* (Typical, inches/mm)

NTE Number	Body Length (L)	Body Diameter (D)	Lead Diameter (d)	Lead Length (LL)
QWCC010 thru QWCC510	0.250 (6.35)	0.090 (2.3)	0.024 (0.61)	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.

1/4 WATT CARBON COMPOSITION

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).