

Substrates and Metallization

COMPEX offers an extensive variety of substrates in both Class I and Class II categories with dielectric constants ranging from 3.8 to 25,000 and beyond. These are the same substrates used to fabricate our components. Other dielectric materials are available; please consult our factory.

CLASS I Dielectric Materials: This class of dielectrics consists of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects, and high insulation and dielectric breakdown.

Type	Ins. Res. (MEG-OHMS 100VDC @ 25°C)	Temperature Coefficient (%) -55 to 125°C	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
C-20	1000000	Negligible	0.0001	3.8	Quartz
C-25*	1000000	Negligible	0.0001	6.6	BEO
C-28*	1000000	Negligible	0.0001	8.7	ALN
C-30	1000000	P180 ±50	0.0006	9.6	Alumina 96
C-35*	1000000	P180 ±50	0.0006	9.8	Alumina 99.5
C-50	1000000	0 ±30	0.002	36	Titanate
C-55	1000000	0 ±30	0.005	55	Titanate
NEW C-58	1000000	0 ±30	0.005	90	Titanate
C-60	1000000	N750 ±100	0.002	90	Titanate
C-70	1000000	N1500 ±400	0.0025	150	Titanate
C-75	1000000	N2200 ±400	0.003	280	Titanate

*Typically used for submounts and substrates only.

CLASS II Dielectric Materials: This class of material is characterized by high dielectric constants, increased losses and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where the small chip size is necessary. Used as bypass capacitors, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	Ins. Res. (MEG-OHMS 100VDC @ 25°C)	Temperature Coefficient (%) -55 to 125°C	-30 to 85°C	Dissipation Factor (@ 1MHz)	Voltage Coefficient of C at 10V/mil	Aging (%) HR/ Decade	Frequency Coefficient of C% (1kHz to 10MHz)	Dielectric Constant (K)
C-80	100,000	5 to -10		0.01	±1	2.0	-12	280
C-90	100,000	10 to -10		0.015	±2	3.0	-6	900
C-100	100,000	3 to -10		0.015	±2	3.5	-12	2,000
C-120	100,000	5 to -25		0.02	±2	3.0	-12	4,000
C-130	100,000		5 to -50	0.025	-10	3.0	-9	5,000
C-135	100,000	15 to -15		0.035	-10	3.0	-9	5,000
C-140	100,000		5 to -70	0.025	-50	3.0	-10	9,000
C-160	100,000		5 to -80	0.03	-50	3.0	-10	16,000
NEW C-200	100,000	15 to -15		0.025	-10	3.0	-9	25,000

New Materials

- **C-58:** Highest dielectric constant material available in the industry, with 0 ±30ppm temperature stability.
- **C-200:** Ultra High K X7R material. Capacitance change ±15% from -55 to 125°C. 100pF in a 10 x 10 size. 1,000pF in a 30 x 30 size.

Substrates can be supplied as follows:

- **Bare**
- **Metallized**
 - gold over nickel or platinum
 - tin over nickel
 - custom schemes and patterns to customer specifications
- **Thickness range:**
3 mils and up
- **Length and Width:**
up to 2" depending on material

Standard Electrode Metallizations

Tin (T): This economical metallization consists of 150 micro-inches of tin over non-magnetic leach-resistant nickel which is ideal for virtually every type of solder and soldering technique including reflow.

Gold (G): This metallization consists of a minimum of 70 micro-inches of gold over non-magnetic leach-resistant nickel or platinum which is ideal for all wirebonding methodologies. Please consult our factory for optimum metallization options for solder applications.