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AMERICAN NATIONAL STANDARDS INSTITUTE

EIA STANDARD

EIA RS-376

*Fixed Film Dielectric Capacitors
in Metallic and Non-Metallic Cases
for D.C. Application*

RS-376



July 1970

Engineering Department

ELECTRONIC INDUSTRIES ASSOCIATION

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FIXED FILM DIELECTRIC CAPACITORS IN METALLIC AND NON-METALLIC CASES FOR D.C. APPLICATION

(From Standards Proposal No. 1042, formulated under the cognizance of EIA Working Group P-2.2 on Film, Paper and Plastic Dielectric Capacitors)

1. SCOPE

1.1 This EIA Standard covers the general requirements for direct current (D.C.) film dielectric, fixed capacitors in metallic and non-metallic cases. Capacitors listed are used primarily in entertainment, commercial and industrial equipment for filtering, bypass, coupling, and blocking purposes where D.C. voltages predominate. A.C. application information is given in Par. 5.

1.2 Portions of EIA Standards RS-186 and RS-178, when specified, form a part of this Standard.

2. STANDARD DESIGNATION AND STYLES

2.1 The EIA Standard designation shall consist of eight constituent parts as illustrated below:

<u>376C</u>	<u>08</u>	<u>A</u>	<u>1</u>	<u>M</u>	<u>C</u>	<u>562</u>	<u>J</u>
Class	Style	Terminal	Circuit	Characteristic	Voltage	Capacitance	Tolerance
2.1.1	2.1.2	2.1.3	2.1.4	2.1.5	2.1.6	2.1.7	2.1.8

2.1.1 Class designation

2.1.1.1 Class designation signifies the component is a capacitor made to the requirements of EIA Standard RS-376.

2.1.2 Style designation

Style designation distinguishes the case form and internal construction. (A detailed parts specification with pertinent data on each style can be found in the appendix of this Standard.)

2.1.2.1 Styles 04 and 05 are hermetically sealed, inserted tab, metal cased tubulars with axial wire leads.

2.1.2.2 Styles 08 and 09 are hermetically sealed, extended foil, insulated metal cased tubular capacitors with axial wire leads.

2.1.2.3 Style 25 is a round plastic film wrapped capacitor with plastic end seals and axial wire leads.

2.1.2.4 Style 26 is an oval or flat plastic film wrapped capacitor with plastic end seals and axial wire leads.

2.1.2.5 Style 30 is a round plastic tubed capacitor with plastic end seals and axial leads.

2.1.2.6 Style 31 is a rectangular pre-molded plastic-cased capacitor with plastic end seals and axial leads.

2.1.2.7 Style 32 is a rectangular pre-molded plastic-cased capacitor with plastic end seals and radial leads.

2.1.2.8 Style 33 is a round plastic tubed capacitor with recessed metal end caps and axial leads.

2.1.2.9 Style 40 is a molded cased tubular (either pre-molded or fully molded) with axial leads.

2.1.2.10 Style 42 is a molded cased flat or oval capacitor with mounting feet and radial leads.

2.1.2.11 Style 50 is a dip coated or plastic cased round capacitor with radial leads.

2.1.2.12 Style 52 is a dip coated or plastic cased oval or flat capacitor with radial leads.

2.1.3 Terminal Type

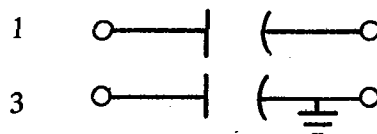
Terminal type is designated as follows:

- A. Axial wire leads
- B. Solder lug (non-removable)
- R. Radial wire leads

2.1.4 Schematic

The schematic circuit number indicates the circuit as follows:

Schematic circuit number



2.1.5 Characteristic

The characteristic letter designates the capacitance change with temperature and the operating temperature range as shown in Table I.

TABLE I
CHARACTERISTIC*

Characteristic Letter	Operating Temp Range -55°C to	Max. DF At 25°C	Maximum Capacitance Change At Indicated Temp.			Max. Cap Change After Life Test
			-55°C % Change	85°C % Change	High Temp % Change	
M	+125°C	0.6%	0 to -10	0 to +10	0 to +20	±5%
X	+100°C	0.6%	0 to -10	0 to +10	0 to +15	±5%
H	+85°C	0.6%	0 to -10	0 to +4		±2%
J	+65°C	0.1%	+0.5 to +1.4		0 to -0.7	±½%
P	+85°C	0.1%	+0.5 to +1.4	-0.3 to -1.0		±2%
T	+170°C	0.1%	0 to +2	0 to -2	0 to -4	±5%
C	+125°C	0.3%	-3 to +3	-2 to +2	-2 to +2	±2%
Y	+100°C	0.3%	-3 to +3	-2 to +2	-2 to +2	±2%

*NOTE: Insulation resistance variation with temperature is shown in detailed parts specifications in appendices of this Standard.

2.1.5.1 Dielectrics

Although not limited to the following plastic films, the dielectric for the various characteristics may be:

- M. Polyethylene terephthalate with a casing capable of operation to 125°C.
- X. Polyethylene terephthalate with a casing limited to operation up to 100°C.
- H. Polyethylene terephthalate with an impregnant limiting operation to 85°C.

- J. Polystyrene for operation to 65°C.
- P. Polystyrene for operation to 85°C.
- T. Polyfluoroethylene for operation to 170°C.
- C. Polycarbonate with a casing capable of operation to 125°C.
- Y. Polycarbonate with a casing limited to operation up to 100°C.

2.1.6 Voltage Rating

The voltage rating is designated by the following descriptive letter:

<u>Voltage Letter</u>	<u>Rated D.C. Voltage</u>
Z	30
A	50
Y	75
B	100
C	200
E	400
F	600
G	1000

2.1.7 Capacitance Value

The nominal capacitance value is described by three digits; the first and second digits are the first and second significant figures of the nominal capacitance expressed in picofarads (pF). The third digit states the number of zeros following the two significant figures.

Example: 5 6 2
5 6 00 pF. or .0056 μ F

2.1.8 Capacitance Tolerance

The allowable capacitance tolerance from the nominal value is expressed by a letter designation as follows:

<u>DESIGNATION</u>	<u>CAPACITANCE TOLERANCE (% OF NOMINAL)</u>
F	±1%
G	±2%
J	±5%
K	±10%
M	±20%



3. STANDARD TESTS

3.1 Standard Test Conditions

3.1.1 Unless otherwise specified, the atmospheric conditions at which tests are to be made, or referred to, are as follows:

Temperature 25°C plus 10°C minus 5°C

Barometric pressure 28" to 32" Hg.

Relative humidity Less than 80%

3.2 Testing Program

3.2.1 Recommended order of tests shall be in the sequence listed in Table II.

TABLE II

Group 1	(All Samples)	Paragraph
Mechanical Inspection		3.3
Marking		4.
Dielectric Test		3.5
Capacitance		3.6
Dissipation factor		3.7
Insulation Resistance		3.8
Leak Test (Metal Cased Styles Only)		3.13
Group 2	(50% of Samples)	
Mechanical Tests (except bending and vibration tests)		3.4
Capacitance change at low temperature		3.10
Capacitance change at high temperature		3.9
Insulation resistance at high temperature		3.8.4
Life		3.11
Group 3	(50% of Samples for non-metal cased styles and 25% for metal cases styles)	
Bending Test		3.4.2.1
Humidity Test		3.12
Group 4	(25% of Samples, metal cased styles)	
Vibration		3.4.5

3.2.2 The types of tests, number of samples and allowable failures shall be determined by agreement between the user and the supplier.

3.2.3 No Sample shall be subjected to both Group 2 and Group 3 tests and Group (and 4) tests.

3.3 Mechanical Inspection

3.3.1 Dimensions must be within the tolerance allowed.

3.3.2 Marking shall be legible, complete and correct.

3.4 Mechanical Tests

3.4.1 Pull Test

3.4.1.1 Capacitors shall withstand a steady pull as specified in the detailed parts specification applied in the direction of the terminal egress for 10 seconds, per RS-186, Method 6, Type 1. Terminals shall not fracture or break, nor shall there be any damage to the capacitor or seal.

3.4.2 Bending Test

3.4.2.1 Capacitors shall have the load specified in the detailed parts specification freely suspended from each of its leads in turn, for 2 (two) bends per RS-186, Method 6, Type III test. Two bends in opposite direction shall be applied. The leads shall not fracture or break, nor shall there be any damage to the capacitor or seal.

3.4.3 Ductility Test

3.4.3.1 Five complete turns of each lead shall be wound around a cylinder having a diameter equal to the nominal diameter of the lead wire. The leads and lead coating shall not fracture or break.

3.4.4 Solderability Test

3.4.4.1 Lead wires shall be subjected to solderability tests of EIA Standard RS-178, Test Condition I. At the completion of the test, the lead wires shall show evidence of acceptable solderability.

3.4.5 Vibration

Metal cased styles shall be subjected to vibration requirements of EIA Standard RS-186, Method 7, Type I test.

The capacitors shall be securely fastened by their normal mounting means. Wire-lead capacitors shall be secured $1/2'' \pm 1/8''$ from the case.