INCH-POUND
MIL-C-18312/2D
28 February 2013
SUPERSEDING
MIL-C-18312/2C
27 August 2001

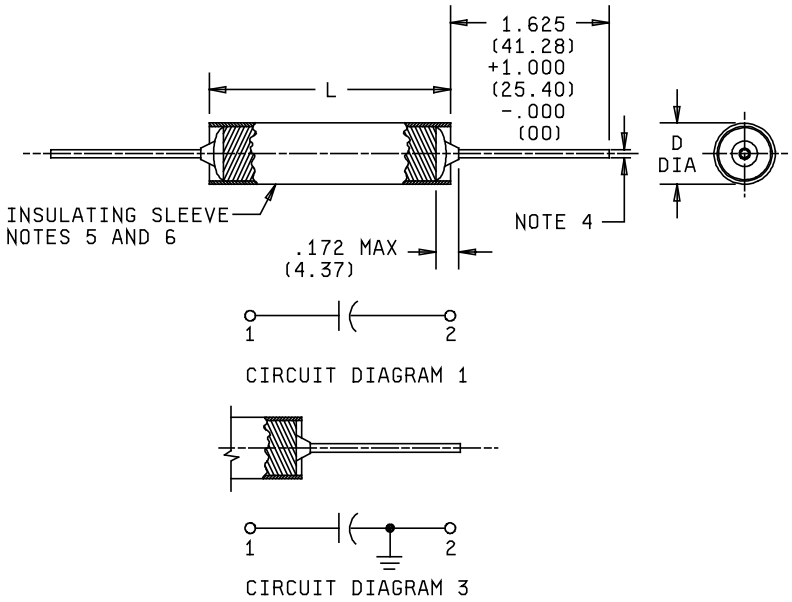
MILITARY SPECIFICATION SHEET

# CAPACITORS, FIXED, METALLIZED (PAPER-PLASTIC, OR PLASTIC FILM) DIELECTRIC, DIRECT CURRENT (HERMETICALLY SEALED IN METAL CASES), STYLE CH09

This specification sheet is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-C-18312.

INACTIVE FOR NEW DESIGN, AFTER 8 JANUARY 1970. USE MIL-PRF-39022/1.




NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. See table I for additional dimensions.
4. Number 24 AWG wire for case diameters of .227 inch (5.77 mm) and under. Number 22 AWG for case diameters .267 inch (6.78 mm) thru .344 inch (8.74 mm) and 20 AWG wire for case diameters .432 inch (10.97 mm) and over.
5. Plastic insulating sleeve shall be transparent. Marking shall be applied to the capacitor case.
6. Plastic insulating sleeve shall extend beyond the capacitor body, but shall not exceed .062 inch (0.79 mm) on either end. Insulating sleeve thickness shall not exceed .016 inch (0.41 mm).

FIGURE 1. Style CH09 capacitors.

REQUIREMENTS:

Dimensions: See and table I.

TABLE I. Characteristics.

| Part or Identifying Number (PIN) 1/ | DC rated voltage (volts) | Capacitance value (µF) | Circuit diagram | Dimensions, nominal (inches) 2/ 3/ | | Superseded MIL-C-18312/1A and MIL-C-18312/2A Capacitance tolerance | |
|---|---|---|---|---|---|---|---|
| | | | | L ±.062 | D +.031 -.051 | ±5% | ±10% |
| CH09A1RA183- | 50 | 0.018 | 1 | .750 | .175 | 0301 | 0302 |
| CH09A3RA183- | 50 | 0.018 | 3 | .688 | .175 | 0303 | 0304 |
| CH09A1RA223- | 50 | 0.022 | 1 | .750 | .175 | 0305 | 0306 |
| CH09A3RA223- | 50 | 0.022 | 3 | .688 | .175 | 0307 | 0308 |
| CH09A1RA273- | 50 | 0.027 | 1 | .750 | .175 | 0309 | 0310 |
| CH09A3RA273- | 50 | 0.027 | 3 | .688 | .175 | 0311 | 0312 |
| CH09A1RA333- | 50 | 0.033 | 1 | .750 | .175 | 0313 | 0314 |
| CH09A3RA333- | 50 | 0.033 | 3 | .688 | .175 | 0315 | 0316 |
| CH09A1RA393- | 50 | 0.039 | 1 | .750 | .195 | 0317 | 0318 |
| CH09A3RA393- | 50 | 0.039 | 3 | .688 | .195 | 0319 | 0320 |
| CH09A1RA473- | 50 | 0.047 | 1 | .750 | .195 | 0321 | 0322 |
| CH09A3RA473- | 50 | 0.047 | 3 | .688 | .195 | 0323 | 0324 |
| CH09A1RA563- | 50 | 0.056 | 1 | .750 | .235 | 0325 | 0326 |
| CH09A3RA563- | 50 | 0.056 | 3 | .688 | .235 | 0327 | 0328 |
| CH09A1RA683- | 50 | 0.068 | 1 | .750 | .235 | 0329 | 0330 |
| CH09A3RA683- | 50 | 0.068 | 3 | .688 | .235 | 0331 | 0332 |
| CH09A1RA823- | 50 | 0.082 | 1 | .750 | .235 | 0333 | 0334 |
| CH09A3RA823- | 50 | 0.082 | 3 | .688 | .235 | 0335 | 0336 |
| CH09A1RA104- | 50 | 0.100 | 1 | .750 | .235 | 0337 | 0338 |
| CH09A3RA104- | 50 | 0.100 | 3 | .688 | .235 | 0339 | 0340 |
| CH09A1RA184- | 50 | 0.180 | 1 | .874 | .312 | 0341 | 0342 |
| CH09A3RA184- | 50 | 0.180 | 3 | .812 | .312 | 0343 | 0344 |
| CH09A1RA224- | 50 | 0.220 | 1 | .874 | .312 | 0345 | 0346 |
| CH09A3RA224- | 50 | 0.220 | 3 | .812 | .312 | 0347 | 0348 |
| CH09A1RA274- | 50 | 0.270 | 1 | .874 | .312 | 0349 | 0350 |
| CH09A3RA274- | 50 | 0.270 | 3 | .812 | .312 | 0351 | 0352 |
| CH09A1RA334- | 50 | 0.330 | 1 | .874 | .312 | 0353 | 0354 |
| CH09A3RA334- | 50 | 0.330 | 3 | .812 | .312 | 0355 | 0356 |
| CH09A1RA394- | 50 | 0.390 | 1 | 1.125 | .312 | 0357 | 0358 |
| CH09A3RA394- | 50 | 0.390 | 3 | 1.062 | .312 | 0359 | 0360 |
| CH09A1RA474- | 50 | 0.470 | 1 | 1.125 | .312 | 0361 | 0362 |
| CH09A3RA474- | 50 | 0.470 | 3 | 1.062 | .312 | 0363 | 0364 |
| CH09A1RA564- | 50 | 0.560 | 1 | 1.125 | .400 | 0365 | 0366 |
| CH09A3RA564- | 50 | 0.560 | 3 | 1.062 | .400 | 0367 | 0368 |
| CH09A1RA684- | 50 | 0.680 | 1 | 1.125 | .400 | 0369 | 0370 |
| CH09A3RA684- | 50 | 0.680 | 3 | 1.062 | .400 | 0371 | 0372 |
| CH09A1RA824- | 50 | 0.820 | 1 | 1.125 | .400 | 0373 | 0374 |
| CH09A3RA824- | 50 | 0.820 | 3 | 1.062 | .400 | 0375 | 0376 |
| CH09A1RA105- | 50 | 1.0 | 1 | 1.125 | .400 | 0377 | 0378 |
| CH09A3RA105- | 50 | 1.0 | 3 | 1.062 | .400 | 0379 | 0380 |
| CH09A1RA155- | 50 | 1.5 | 1 | 1.125 | .500 | 0381 | 0382 |
| CH09A3RA155- | 50 | 1.5 | 3 | 1.062 | .500 | 0383 | 0384 |
| CH09A1RA225- | 50 | 2.2 | 1 | 1.125 | .562 | 0385 | 0386 |

See footnotes at end of table.

TABLE I. Characteristics - Continued.

| PIN 1/ | DC rated voltage (volts) | Capacitance value (µF) | Circuit diagram | Dimensions, nominal (inches) 2/ 3/ | | Superseded MIL-C-18312/1A and MIL-C-18312/2A Capacitance tolerance | |
|---|---|---|---|---|---|---|---|
| | | | | L ±.062 | D +.031 -.051 | ±5% | ±10% |
| CH09A3RA225- | 50 | 2.2 | 3 | 1.062 | .562 | 0387 | 0388 |
| CH09A1RA275- | 50 | 2.7 | 1 | 1.375 | .562 | 0389 | 0390 |
| CH09A3RA275- | 50 | 2.7 | 3 | 1.312 | .562 | 0391 | 0392 |
| CH09A1RA335- | 50 | 3.3 | 1 | 1.375 | .562 | 0393 | 0394 |
| CH09A3RA335- | 50 | 3.3 | 3 | 1.312 | .562 | 0395 | 0396 |
| CH09A1RA395- | 50 | 3.9 | 1 | 1.625 | .562 | 0397 | 0398 |
| CH09A3RA395- | 50 | 3.9 | 3 | 1.562 | .562 | 0399 | 0400 |
| CH09A1RA475- | 50 | 4.7 | 1 | 1.875 | .562 | 0401 | 0402 |
| CH09A3RA475- | 50 | 4.7 | 3 | 1.812 | .562 | 0403 | 0404 |
| CH09A1RA565- | 50 | 5.6 | 1 | 1.625 | .670 | 0405 | 0406 |
| CH09A3RA565- | 50 | 5.6 | 3 | 1.562 | .670 | 0407 | 0408 |
| CH09A1RA685- | 50 | 6.8 | 1 | 1.875 | .670 | 0409 | 0410 |
| CH09A3RA685- | 50 | 6.8 | 3 | 1.812 | .670 | 0411 | 0412 |
| CH09A1RA106- | 50 | 10.0 | 1 | 1.875 | .750 | 0413 | 0414 |
| CH09A3RA106- | 50 | 10.0 | 3 | 1.812 | .750 | 0415 | 0416 |
| CH09A1RA126- | 50 | 12.0 | 1 | 2.375 | .750 | 0417 | 0418 |
| CH09A3RA126- | 50 | 12.0 | 3 | 2.312 | .750 | 0419 | 0420 |
| | | | | | | ±10% | ±20% |
| CH09A1NC104- | 200 | 0.10 | 1 | .844 | .312 | 0421 | 0422 |
| CH09A3NC104- | 200 | 0.10 | 3 | .781 | .312 | 0423 | 0424 |
| CH09A1NC224- | 200 | 0.22 | 1 | 1.125 | .312 | 0425 | 0426 |
| CH09A3NC224- | 200 | 0.22 | 3 | 1.062 | .312 | 0427 | 0428 |
| CH09A1NC474- | 200 | 0.47 | 1 | 1.125 | .400 | 0429 | 0430 |
| CH09A3NC474- | 200 | 0.47 | 3 | 1.062 | .400 | 0431 | 0432 |
| CH09A1NC105- | 200 | 1.0 | 1 | 1.125 | .562 | 0433 | 0434 |
| CH09A3NC105- | 200 | 1.0 | 3 | 1.062 | .562 | 0435 | 0436 |
| CH09A1NC155- | 200 | 1.5 | 1 | 1.844 | .562 | 0437 | 0438 |
| CH09A3NC155- | 200 | 1.5 | 3 | 1.781 | .562 | 0439 | 0440 |
| CH09A1NC225- | 200 | 2.2 | 1 | 1.844 | .562 | 0441 | 0442 |
| CH09A3NC225- | 200 | 2.2 | 3 | 1.781 | .562 | 0443 | 0444 |
| CH09A1NC335- | 200 | 3.3 | 1 | 1.875 | .670 | 0445 | 0446 |
| CH09A3NC335- | 200 | 3.3 | 3 | 1.812 | .670 | 0447 | 0448 |
| CH09A1NC475- | 200 | 4.7 | 1 | 1.875 | 1.000 | 0449 | 0450 |
| CH09A3NC475- | 200 | 4.7 | 3 | 1.812 | 1.000 | 0451 | 0452 |
| CH09A1NC685- | 200 | 6.8 | 1 | 1.875 | 1.000 | 0453 | 0454 |
| CH09A3NC685- | 200 | 6.8 | 3 | 1.812 | 1.000 | 0455 | 0456 |
| CH09A1NC106- | 200 | 10.0 | 1 | 2.375 | 1.000 | 0457 | 0458 |
| CH09A3NC106- | 200 | 10.0 | 3 | 2.312 | 1.000 | 0459 | 0460 |
| CH09A1NC126- | 200 | 12.0 | 1 | 2.625 | 1.000 | 0461 | 0462 |
| CH09A3NC126- | 200 | 12.0 | 3 | 2.562 | 1.000 | 0463 | 0464 |
| CH09A1NE473- | 400 | 0.047 | 1 | 1.125 | .312 | 0465 | 0466 |
| CH09A3NE473- | 400 | 0.047 | 3 | 1.062 | .312 | 0467 | 0468 |
| CH09A1NE104- | 400 | 0.10 | 1 | 1.125 | .400 | 0469 | 0470 |
| CH09A3NE104- | 400 | 0.10 | 3 | 1.062 | .400 | 0471 | 0472 |
| CH09A1NE224- | 400 | 0.22 | 1 | 1.125 | .562 | 0473 | 0474 |
| CH09A3NE224- | 400 | 0.22 | 3 | 1.062 | .562 | 0475 | 0476 |
| CH09A1NE474- | 400 | 0.47 | 1 | 1.625 | .562 | 0477 | 0478 |

See footnotes at end of table.

TABLE I. Characteristics - Continued.

| PIN 1/ | DC rated voltage (volts) | Capacitance value (μF) | Circuit diagram | Dimensions, nominal (inches) 2/ 3/ | | Superseded MIL-C-18312/1A and MIL-C-18312/2A Capacitance tolerance | |
|---|---|---|---|---|---|---|---|
| | | | | L ±.062 | D +.031 -.051 | ±10% | ±20% |
| CH09A3NE474- | 400 | 0.47 | 3 | 1.562 | .562 | 0479 | 0480 |
| CH09A1NE105- | 400 | 1.0 | 1 | 1.875 | .750 | 0481 | 0482 |
| CH09A3NE105- | 400 | 1.0 | 3 | 1.812 | .750 | 0483 | 0484 |
| CH09A1NE225- | 400 | 2.2 | 1 | 1.875 | 1.000 | 0485 | 0486 |
| CH09A3NE225- | 400 | 2.2 | 3 | 1.812 | 1.000 | 0487 | 0488 |
| CH09A1NE335- | 400 | 3.3 | 1 | 2.625 | 1.000 | 0489 | 0490 |
| CH09A3NE335- | 400 | 3.3 | 3 | 2.562 | 1.000 | 0491 | 0492 |
| CH09A1NF103- | 600 | 0.01 | 1 | .812 | .312 | 0493 | 0494 |
| CH09A3NF103- | 600 | 0.01 | 3 | .750 | .312 | 0495 | 0496 |
| CH09A1NF223- | 600 | 0.022 | 1 | .812 | .312 | 0497 | 0498 |
| CH09A3NE155- | 400 | 0.022 | 3 | .750 | .312 | 0499 | 0500 |
| CH09A1NF473- | 600 | 0.047 | 1 | 1.125 | .400 | 0501 | 0502 |
| CH09A3NF473- | 600 | 0.047 | 3 | 1.062 | .400 | 0503 | 0504 |
| CH09A1NF104- | 600 | 0.10 | 1 | 1.125 | .500 | 0505 | 0506 |
| CH09A3NF104- | 600 | 0.10 | 3 | 1.062 | .500 | 0507 | 0508 |
| CH09A1NF224- | 600 | 0.22 | 1 | 1.375 | .562 | 0509 | 0510 |
| CH09A3NF224- | 600 | 0.22 | 3 | 1.312 | .562 | 0511 | 0512 |
| CH09A1NF474- | 600 | 0.47 | 1 | 1.625 | .670 | 0513 | 0514 |
| CH09A3NF474- | 600 | 0.47 | 3 | 1.562 | .670 | 0515 | 0516 |
| CH09A1NF105- | 600 | 1.0 | 1 | 1.844 | 1.000 | 0517 | 0518 |
| CH09A3NF105- | 600 | 1.0 | 3 | 1.781 | 1.000 | 0519 | 0520 |
| CH09A1NF155- | 600 | 1.5 | 1 | 1.875 | 1.000 | 0521 | 0522 |
| CH09A3NF155- | 600 | 1.5 | 3 | 1.812 | 1.000 | 0523 | 0524 |
| CH09A1NF225- | 600 | 2.2 | 1 | 2.625 | 1.000 | 0525 | 0526 |
| CH09A3NF225- | 600 | 2.2 | 3 | 2.562 | 1.000 | 0527 | 0528 |

1/ Complete PIN will include an additional symbol for capacitance tolerance.
2/ Dimensions shown are for bare case. (see ).
3/ See table II for metric equivalents.

TABLE II. Millimeter equivalents of decimal inches.

| Inches | mm | Inches | mm | Inches | mm |
|---|---|---|---|---|---|
| .031 | 0.79 | .688 | 17.48 | 1.562 | 39.67 |
| .051 | 1.30 | .750 | 19.05 | 1.625 | 41.28 |
| .062 | 1.57 | .781 | 19.84 | 1.781 | 45.24 |
| .175 | 4.45 | .812 | 20.62 | 1.812 | 46.02 |
| .195 | 4.95 | .844 | 21.44 | 1.844 | 46.84 |
| .235 | 5.97 | .874 | 22.20 | 1.875 | 47.63 |
| .312 | 7.92 | 1.000 | 25.40 | 2.312 | 58.72 |
| .400 | 10.16 | 1.062 | 26.97 | 2.375 | 60.33 |
| .500 | 12.70 | 1.125 | 28.58 | 2.562 | 65.07 |
| .562 | 14.27 | 1.312 | 33.32 | 2.625 | 66.68 |
| .670 | 17.02 | 1.375 | 34.93 | | |

Case material: Nonmagnetic (end seals may be of magnetic material).

Capacitance value: See table I.

Capacitance tolerance: See table I.

DC rated voltage: See table I.

Seal: Method 112 of MIL-STD-202, condition A. Liquid-filled capacitors: One hour at applicable high ambient temperature ±3°C with no evidence of leakage.

Dielectric withstanding voltage: Method 301 of MIL-STD-202.

Terminal to terminal: 200 percent of rated dc voltage.

Terminal to case (where case not a terminal): 200 percent of rated dc voltage.

Capacitance: Method 305 of MIL-STD-202 (for value and tolerance see table I).

Dissipation factor:

At ±25°C: 1.0 percent.

At high test temperature: 2.0 percent.

Insulation resistance:

Terminal to terminal: See table III.

Terminal to case (case not a terminal): 10,000 megohms.

Barometric pressure: Method 105 of MIL-STD-202. Test condition: .82 inches of mercury (80,000 ft).

Vibration, low frequency: Method 204 of MIL-STD-202, condition B.

Thermal shock: Method 107 of MIL-STD-202, condition A, except the high temperature shall be +125°C for capacitors rated at 200, 400, and 600 volts dc.

Immersion: Method 104 of MIL-STD-202, condition C.

Insulation resistance:

Terminal to terminal: Not less than 1/3 the value specified in table III.

Terminal to case (case not a terminal): 5,000 megohms, minimum.

Dielectric withstanding voltage:

Insulating sleeve: 4,000 volts minimum.

Terminal to terminal: 150 percent of rated dc voltage.

Terminal to case (case not a terminal): 200 percent of rated dc voltage.

Capacitance change: Not to exceed 10 percent of initial value.

Dissipation factor: Not to exceed 110 percent of initial requirement.

Solderability: Method 208 of MIL-STD-202.

Terminal strength: Method 211 of MIL-STD-202, conditions A and D.

Condition A: Applied force 4 1/2 pounds.

Condition D: 3 twists of 360 degrees.

Low temperature and capacitance change with temperature:

Conditions: 48 hours with rated voltage applied.

Capacitance change: See table III.

Life:

Qualification: Test voltage 140 percent of rated voltage, 1,000 hours at high ambient temperature.

Conformance: 250 hours at conditions specified for 1,000-hour test.

Dissipation factor:

At high ambient test temperature (any time 24 to 48 hours from start of test): Not greater than 2.0 percent.

At high ambient test temperature (any time during last 48 hours of test): Not greater than 2.5 percent.

At +25°C (after life test): Not greater than 1.25 percent.

Capacitance:

At +25°C (after life test): Within 10 percent of initial value.

Insulation resistance: At +25°C (after life test).

Terminal to terminal: Not less than 1/3 of value specified in table III.

Terminal to case (case not a terminal): Not less than 5,000 megohms.

Supersession information: See table I.

TABLE III. Characteristic.

| Operating temperature range | -55 to +125°C | | -55 to +85°C |
|---|---|---|---|
| DC voltage rating (volts) | 200 | 400, 600 | 50 |
| High ambient test temperature | +125°C | +125°C | +85°C |
| Low ambient test temperature | -55°C | -55° C | -55°C |
| Megohms x microfarads: | | | |
| At +25°C | 2,000 min | 2,000 min | 25,000 min |
| At high ambient test temperature | 10 min | 40 min | 500 min |
| Insulation resistance (megohms): | | | |
| At +25°C 1/ | 12,000 | 12,000 | 50,000 |
| At high ambient test temperature 1/ | 150 | 600 | 5,000 |
| Capacitance change at low temperature | -15% max | -15% max | -8% max |
| Life test voltage (% rated voltage) | 140 % | 140 % | 140 % |

1/ Need not exceed.

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Referenced documents. In addition to MIL-C-18312, this document references MIL-STD-202.

Custodians:
Army - CR
Navy - EC
Air Force - 85
DLA - CC

Review activities:
Army - AR
Navy - AS, MC, OS
Air Force – 19, 99

Preparing activity:
DLA - CC

(Project 5910-2013-002)

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