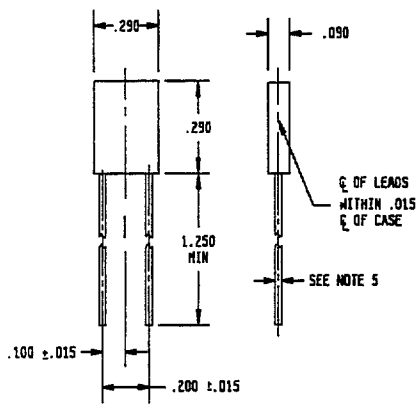
INCH-POUND
MIL-PRF-39014/2K
16 September 1997
SUPERSEDING
MIL-C-39014/2J
13 January 1993

PERFORMANCE SPECIFICATION SHEET

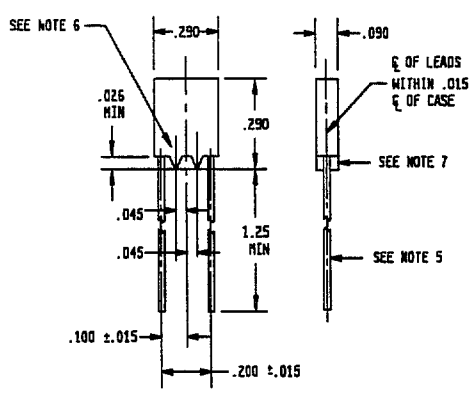
# CAPACITORS, FIXED, CERAMIC DIELECTRIC (GENERAL PURPOSE), ESTABLISHED RELIABILITY AND NONESTABLISHED RELIABILITY, STYLE CKR06, NATO TYPE DESIGNATION NCC62

This specification 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 and MIL-PRF-39014.




CONFIGURATION WITHOUT STANDOFFS




OPTIONAL CONFIGURATION WITH STANDOFFS

| Inches | mm |
|---|---|
| .015 | 0.38 |
| .026 | 0.66 |
| .045 | 1.14 |
| .090 | 2.29 |
| .100 | 2.54 |
| .200 | 5.08 |
| .290 | 7.37 |
| 1.250 | 31.75 |

FIGURE 1. Dimensions and configuration.

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.010 inch (0.25 mm).
4. Lead length may be a minimum of .625 inch (15.88 mm) for use in tape and reel automatic insertion equipment, when specified.
5. Lead diameter shall be .023 inch (0.58 mm) to .029 inch (0.74 mm).
6. Optional standoffs shall be of triangular shape so that the standoff will provide line contact with the surface upon which the capacitor is mounted.
7. Thickness of standoffs shall be .075 inch (1.90 mm) to the body thickness.
8. Insulation coating shall not extend more than .018 inch (0.46 mm) along lead wires.
9. At the option of the user, the standoff configuration may be substituted as a replacement for the nonstandoff configuration of the same style.
10. For flush mounting .078 inch (1.98 mm), printed circuit hole diameter is required to clear shoulder.

FIGURE 1. Dimensions and configurations - Continued.

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Case type: Molded.

Capacitance value: See table I.

Capacitance tolerance: See table I.

Operating temperature range: -55°C to +125°C.

Voltage rating: See table I.

Radiographic inspection (failure rate level 'S' (0.001 percent/1,000 hours only)): In accordance with MIL-PRF-39014.

Dissipation factor: Not more than 2.5 percent.

Dielectric withstanding voltage:

Body insulation: Shall be able to withstand 1,300 volts between leads and case.

Insulation resistance (IR):

At 25°C: Not less than 100,000 megohms or 1,000 megohm-microfarads whichever is less.

At 125°C: Not less than 10,000 megohms or 100 megohm-microfarads whichever is less.

Voltage-temperature limits: In accordance with MIL-PRF-39014.

| Capacitance change with reference to +25°C | |
|---|---|
| Step A through step D of MIL-PRF-39014, voltage-temperature limit cycle table Bias = 0 volts | Step E through step G of MIL-PRF-39014, voltage-temperature limit cycle table Bias = rated voltage |
| ±15 percent | +15 percent, -25 percent |

Immersion:

IR: Not less than 50 percent of initial 25°C requirement.

Salt spray (corrosion): Not applicable.

Resistance to soldering heat: Shall be in accordance with method 210 of MIL-STD-202, test condition D. The immersion depth for capacitors with standoffs shall be .024 inch (0.61 mm) minimum.

ΔC: +15 percent, -5 percent of the initial 25°C measurement.

Solderability: The leads shall be solderable up to .020 inch (0.51 mm) from the body egress.

Workmanship: For optional standoff configuration, exposed copper or bare leads shall be permitted to a maximum of .020 inch (0.51 mm) from the body egress. For parts without standoffs, workmanship shall be in accordance with MIL-PRF-39014.

Life:

Rated conditions, 100 percent of dc rated voltage at 125°C.

0 hour through 3,000 hours:

IR: At 25°C, not less than 50 percent of initial 25°C requirement.
At 125°C, not less than 50 percent of initial 125°C requirement.

ΔC: ±20 percent from initial measured value.

Dissipation factor: Not greater than 2.5 percent.

4,000 hours through 32,000 hours:

IR: At 25°C, not less than 15 percent of initial 25°C requirement.
At 125°C, not less than 15 percent of initial 125°C requirement.

ΔC: ±20 percent from initial measured value.

Dissipation factor: Not greater than 2.5 percent.

Accelerated conditions, 200 percent of dc rated voltage at 125°C.

0 hour and 250 hours:

IR: At 25°C, not less than 50 percent of initial 25°C requirement.
At 125°C, not less than 50 percent of initial 125°C requirement.

ΔC: ±20 percent from initial measured value.

Dissipation factor: Not greater than 2.5 percent.

1,000 hours, 2,000 hours, and 4,000 hours:

IR: At 25°C, not less than 15 percent of initial 25°C requirement.
At 125°C, not less than 15 percent of initial 125°C requirement.

ΔC: ±20 percent from initial measured value.
Dissipation factor: Not greater than 2.5 percent.

Part or Identifying Number (PIN): Established reliability - M39014/02-(dash number from table I).
Nonestablished reliability - M39014/02C (failure rate level M dash number from table I).

Supersession data: See table II.

TABLE I. Dash number and electrical characteristics.

| Dash number 1/ 2/ | | | | Capacitance (pF) | Capacitance tolerance (± percent) | DC rated voltage (volts) |
|---|---|---|---|---|---|---|
| Failure rate level (%/1,000 hours) | | | | | | |
| 1.0 (M) | 0.1 (P) | 0.01 (R) | 0.001 (S) | | | |
| 1201- | 1241- | 1281- | 1321- | 1,200 | 10 | 200 |
| 1202- | 1242- | 1282- | 1322- | 1,500 | 10 | 200 |
| 1203- | 1243- | 1283- | 1323- | 1,500 | 20 | 200 |
| 1204- | 1244- | 1284- | 1324- | 1,800 | 10 | 200 |
| 1206- | 1246- | 1286- | 1326- | 2,200 | 10 | 200 |
| 1207- | 1247- | 1287- | 1327- | 2,200 | 20 | 200 |
| 1208- | 1248- | 1288- | 1328- | 2,700 | 10 | 200 |
| 1209- | 1249- | 1289- | 1329- | 3,300 | 10 | 200 |
| 1210- | 1250- | 1290- | 1330- | 3,300 | 20 | 200 |
| 1211- | 1251- | 1291- | 1331- | 3,900 | 10 | 200 |
| 1212- | 1252- | 1292- | 1332- | 4,700 | 10 | 200 |
| 1213- | 1253- | 1293- | 1333- | 4,700 | 20 | 200 |
| 1214- | 1254- | 1294- | 1334- | 5,600 | 10 | 200 |
| 1215- | 1255- | 1295- | 1335- | 6,800 | 10 | 200 |
| 1216- | 1256- | 1296- | 1336- | 6,800 | 20 | 200 |
| 1217- | 1257- | 1297- | 1337- | 8,200 | 10 | 200 |
| 1218- | 1258- | 1298- | 1338- | 10,000 | 10 | 200 |
| 1219- | 1259- | 1299- | 1339- | 10,000 | 20 | 200 |
| 1231- | 1271- | 1311- | 1351- | 12,000 | 10 | 100 |
| 1220- | 1260- | 1300- | 1340- | 15,000 | 10 | 100 |
| 1221- | 1261- | 1301- | 1341- | 18,000 | 10 | 100 |
| 1222- | 1262- | 1302- | 1342- | 22,000 | 10 | 100 |
| 1232- | 1272- | 1312- | 1352- | 27,000 | 10 | 100 |
| 1223- | 1263- | 1303- | 1343- | 33,000 | 10 | 100 |
| 1224- | 1264- | 1304- | 1344- | 39,000 | 10 | 100 |
| 1225- | 1265- | 1305- | 1345- | 47,000 | 10 | 100 |
| 1226- | 1266- | 1306- | 1346- | 56,000 | 10 | 100 |
| 1227- | 1267- | 1307- | 1347- | 68,000 | 10 | 100 |
| 1229- | 1269- | 1309- | 1349- | 82,000 | 10 | 100 |
| 1230- | 1270- | 1310- | 1350- | 100,000 | 10 | 100 |
| 1233- | 1273- | 1313- | 1353- | 120,000 | 10 | 50 |
| 1234- | 1274- | 1314- | 1354- | 150,000 | 10 | 50 |
| 1235- | 1275- | 1315- | 1355- | 180,000 | 10 | 50 |
| 1236- | 1276- | 1316- | 1356- | 220,000 | 10 | 50 |
| 1237- | 1277- | 1317- | 1357- | 270,000 | 10 | 50 |
| 1238- | 1278- | 1318- | 1358- | 330,000 | 10 | 50 |
| 1239- | 1279- | 1319- | 1359- | 390,000 | 10 | 50 |
| 1240- | 1280- | 1320- | 1360- | 470,000 | 10 | 50 |
| 1404- | 1408- | 1412- | 1416- | 560,000 | 10 | 50 |
| 1405- | 1409- | 1413- | 1417- | 680,000 | 10 | 50 |
| 1406- | 1410- | 1414- | 1418- | 820,000 | 10 | 50 |
| 1407- | 1411- | 1415- | 1419- | 1,000,000 | 10 | 50 |

1/ Dash number shall include the letter "V" to indicate the optional standoff configuration (when applicable) or "-" shall be deleted for the configuration without the standoff.
2/ For nonestablished reliability (product level C) parts, the complete PIN shall include the letter "C" in place of "-" at the beginning of the dash number and the failure rate level "M" dash number (e.g. M39014/02C1201).

TABLE II. Substitutability data.

| Dash number in MIL-C-39014/2E, /2F, /2G, /2H, /2J and MIL-PRF-39014/2K 1/ | | | | | MIL-C-39014/2D | | | | | Substitutable for dash number in MIL-C-39014/2B and 2C | | | | | MIL-C-39014/2 and /2A | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 2/ | M | P | R | S | L | M | P | R | S | L | M | P | R | S | L | M | P | R | S |
| 1361 | 1201 | 1241 | 1281 | 1321 | 0361 | 0201 | 0241 | 0281 | 0321 | — | 0201 | 0241 | 0281 | 0321 | — | 0001 | 0002 | 0003 | 0004 |
| 1362 | 1202 | 1242 | 1282 | 1322 | 0362 | 0202 | 0242 | 0282 | 0322 | — | 0202 | 0242 | 0282 | 0322 | — | 0005 | 0006 | 0007 | 0008 |
| 1363 | 1203 | 1243 | 1283 | 1323 | 0363 | 0203 | 0243 | 0283 | 0323 | — | 0203 | 0243 | 0283 | 0323 | — | 0009 | 0010 | 0011 | 0012 |
| 1364 | 1204 | 1244 | 1284 | 1324 | 0364 | 0204 | 0244 | 0284 | 0324 | — | 0204 | 0244 | 0284 | 0324 | — | 0013 | 0014 | 0015 | 0016 |
| None | None | None | None | None | None | None | None | None | None | — | 0205 | 0245 | 0285 | 0325 | — | 0017 | 0018 | 0019 | 0020 |
| 1366 | 1206 | 1246 | 1286 | 1326 | 0366 | 0206 | 0246 | 0286 | 0326 | — | 0206 | 0246 | 0286 | 0326 | — | 0021 | 0022 | 0023 | 0024 |
| 1367 | 1207 | 1247 | 1287 | 1327 | 0367 | 0207 | 0247 | 0287 | 0327 | — | 0207 | 0247 | 0287 | 0327 | — | 0025 | 0026 | 0027 | 0028 |
| 1368 | 1208 | 1248 | 1288 | 1328 | 0368 | 0208 | 0248 | 0288 | 0328 | — | 0208 | 0248 | 0288 | 0328 | — | 0029 | 0030 | 0031 | 0032 |
| 1369 | 1209 | 1249 | 1289 | 1329 | 0369 | 0209 | 0249 | 0289 | 0329 | — | 0209 | 0249 | 0289 | 0329 | — | 0033 | 0034 | 0035 | 0036 |
| 1370 | 1210 | 1250 | 1290 | 1330 | 0370 | 0210 | 0250 | 0290 | 0330 | — | 0210 | 0250 | 0290 | 0330 | — | 0037 | 0038 | 0039 | 0040 |
| 1371 | 1211 | 1251 | 1291 | 1331 | 0371 | 0211 | 0251 | 0291 | 0331 | — | 0211 | 0251 | 0291 | 0331 | — | 0041 | 0042 | 0043 | 0044 |
| 1372 | 1212 | 1252 | 1292 | 1332 | 0372 | 0212 | 0252 | 0292 | 0332 | — | 0212 | 0252 | 0292 | 0332 | — | 0045 | 0046 | 0047 | 0048 |
| 1373 | 1213 | 1253 | 1293 | 1333 | 0373 | 0213 | 0253 | 0293 | 0333 | — | 0213 | 0253 | 0293 | 0333 | — | 0049 | 0050 | 0051 | 0052 |
| 1374 | 1214 | 1254 | 1294 | 1334 | 0374 | 0214 | 0254 | 0294 | 0334 | — | 0214 | 0254 | 0294 | 0334 | — | 0053 | 0054 | 0055 | 0056 |
| 1375 | 1215 | 1255 | 1295 | 1335 | 0375 | 0215 | 0255 | 0295 | 0335 | — | 0215 | 0255 | 0295 | 0335 | — | 0057 | 0058 | 0059 | 0060 |
| 1376 | 1216 | 1256 | 1296 | 1336 | 0376 | 0216 | 0256 | 0296 | 0336 | — | 0216 | 0256 | 0296 | 0336 | — | 0061 | 0062 | 0063 | 0064 |
| 1377 | 1217 | 1257 | 1297 | 1337 | 0377 | 0217 | 0257 | 0297 | 0337 | — | 0217 | 0257 | 0297] | 0337 | — | 0065 | 0066 | 0067 | 0068 |
| 1378 | 1218 | 1258 | 1298 | 1338 | 0378 | 0218 | 0258 | 0298 | 0338 | — | 0218 | 0258 | 0298 | 0338 | — | 0069 | 0070 | 0071 | 0072 |
| 1379 | 1219 | 1259 | 1299 | 1339 | 0379 | 0219 | 0259 | 0299 | 0339 | — | 0219\ | 0259 | 0299 | 0339 | — | 0073 | 0074 | 0075 | 0076 |
| 1380 | 1231 | 1271 | 1311 | 1351 | 0380 | 0231 | 0271 | 0311 | 0351 | — | — | — | — | — | — | — | — | — | — |
| 1381 | 1220 | 1260 | 1300 | 1340 | 0381 | 0220 | 0260 | 0300 | 0340 | — | 0220 | 0260 | 0300 | 0340 | — | 0077 | 0078 | 0079 | 0080 |
| 1382 | 1221 | 1261 | 1301 | 1341 | 0382 | 0221 | 0261 | 0301 | 0341 | — | 0221 | 0261 | 0301 | 0341 | — | 0081 | 0082 | 0083 | 0084 |
| 1383 | 1222 | 1262 | 1302 | 1342 | 0383 | 0222 | 0262 | 0302 | 0342 | — | 0222 | 0262 | 0302 | 0342 | — | 0085 | 0086 | 0087 | 0088 |
| 1384 | 1232 | 1272 | 1312 | 1352 | 0384 | 0232 | 0272 | 0312 | 0352 | — | — | — | — | — | — | — | — | — | — |
| 1385 | 1223 | 1263 | 1303 | 1343 | 0385 | 0223 | 0263 | 0303 | 0343 | — | 0223 | 0263 | 0303 | 0343 | — | 0089 | 0090 | 0091 | 0092 |
| 1386 | 1224 | 1264 | 1304 | 1344 | 0386 | 0224 | 0264 | 0304 | 0344 | — | 0224 | 0264 | 0304 | 0344 | — | 0093 | 0094 | 0095 | 0096 |
| 1387 | 1225 | 1265 | 1305 | 1345 | 0387 | 0225 | 0265 | 0305 | 0345 | — | 0225 | 0265 | 0305 | 0345 | — | 0097 | 0098 | 0099 | 0100 |
| 1388 | 1226 | 1266 | 1306 | 1346 | 0388 | 0226 | 0266 | 0306 | 0346 | — | 0226 | 0266 | 0306 | 0346 | — | 0101 | 0102 | 0103 | 0104 |
| 1389 | 1227 | 1267 | 1307 | 1347 | 0389 | 0227 | 0267 | 0307 | 0347 | — | 0227 | 0267 | 0307 | 0347 | — | 0105 | 0106 | 0107 | 0108 |
| None | None | None | None | None | None | None | None | None | None | — | 0228 | 0268 | 0308 | 0348 | — | 0109 | 0110 | 0111 | 0112 |
| 1390 | 1229 | 1269 | 1309 | 1349 | 0390 | 0229 | 0269 | 0309 | 0349 | — | 0229 | 02659 | 0309 | 0349 | — | 0113 | 0114 | 0115 | 0116 |
| 1391 | 1230 | 1270 | 1310 | 1350 | 0391 | 0230 | 0270 | 0310 | 0350 | — | 0230 | 0270 | 0310 | 0350 | — | 0117 | 0118 | 0119 | 0120 |
| 1392 | 1233 | 1273 | 1313 | 1353 | 0392 | 0233 | 0273 | 0313 | 0353 | — | — | — | — | — | — | — | — | — | — |
| 1393 | 1234 | 1274 | 1314 | 1354 | 0393 | 0234 | 0274 | 0314 | 0354 | — | — | — | — | — | — | — | — | — | — |
| 1394 | 1235 | 1275 | 1315 | 1355 | 0394 | 0235 | 0275 | 0315 | 0355 | — | — | — | — | — | — | — | — | — | — |
| 1395 | 1236 | 1276 | 1316 | 1356 | 0395 | 0236 | 0276 | 0316 | 0356 | — | — | — | — | — | — | — | — | — | — |
| 1396 | 1237 | 1277 | 1317 | 1357 | 0396 | 0237 | 0277 | 0317 | 0357 | — | — | — | — | — | — | — | — | — | — |
| 1397 | 1238 | 1278 | 1318 | 1358 | 0397 | 0238 | 0278 | 0318 | 0358 | — | — | — | — | — | — | — | — | — | — |
| 1398 | 1239 | 1279 | 1319 | 1359 | 0398 | 0239 | 0279 | 0319 | 0359 | — | — | — | — | — | — | — | — | — | — |
| 1399 | 1240 | 1280 | 1320 | 1360 | 0399 | 0240 | 0280 | 0320 | 0360 | — | — | — | — | — | — | — | — | — | — |
| 1400 | 1404 | 1408 | 1412 | 1416 | 0400 | 0404 | 0408 | 0412 | 0416 | — | — | — | — | — | — | — | — | — | — |
| 1401 | 1405 | 1409 | 1413 | 1417 | 0401 | 0405 | 0409 | 0413 | 0417 | — | — | — | — | — | — | — | — | — | — |
| 1402 | 1406 | 1410 | 1414 | 1418 | 0402 | 0406 | 0410 | 0414 | 0418 | — | — | — | — | — | — | — | — | — | — |
| 1403 | 1407 | 1411 | 1415 | 1419 | 0403 | 0407 | 0411 | 0415 | 0419 | — | — | — | — | — | — | — | — | — | — |

1/ Dash numbers in lower failure rate level columns are substitutable for dash numbers in all higher failure rate level columns.

2/ Revision E only.

Marking: For parts without standoffs, marking shall be in accordance with MIL-PRF-39014. For parts with standoffs, marking shall be as shown in the following example:

| FRONT | | BACK | |
|---|---|---|---|
| M39014<br>2-1201<br>V12345 | Abbreviated military part number<br>"V" for standoffs and manufacture's name or CAGE code | 9301A<br>J100V<br>122K | Data and lot codes<br>"J" brand and voltage capacitance and tolerance |

Established reliability with optional standoff

| FRONT | | BACK | |
|---|---|---|---|
| C39014<br>2-1201<br>V12345 | Abbreviated military part number<br>"V" for standoffs and manufacture's name or CAGE code | 9301A<br>J100V<br>122K | Data and lot codes<br>"J" brand and voltage capacitance and tolerance |

Nonestablished reliability with optional standoff 1/

At the option of the manufacturer, marking may be on one side of the capacitor.

1/ NOTE: The marking requirement for nonestablished reliability (product level C) differs from the actual PIN of the nonestablished reliability part in the placement of the character "C".

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

Review activities:
Army - AR, AT, AV, CR4, MI
Navy - MC, TD
Air Force -19, 99
DLA - CC

Preparing activity:
Army - CR

Agent:
DLA - CC

(Project 5910-1934-02)