

Aluminum Capacitors + 85 °C, Miniature, Radial Lead

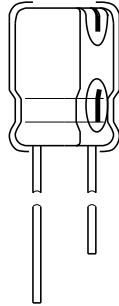


Fig.1 Component outline

FEATURES

- High CV per case size
- Low cost
- Solvent resistant construction (through 100 WVDC)
- Low profile ratings



RoHS
COMPLIANT

| QUICK REFERENCE DATA | |
|---|--|
| DESCRIPTION | VALUE |
| Nominal case size | 0.157" x 0.276" [4.0 x 7.0] to 0.709" x 1.575" [18.0 x 40.0] |
| Operating temperature | - 40 °C to + 85 °C - 25 °C to + 85 °C for 315 WVDC to 450 WVDC units |
| Rated Capacitance range, C _R | 0.1 μF to 18 000 μF |
| Tolerance on C _R | ± 20 % |
| Rated voltage range, U _R | 6.3 WVDC to 450 WVDC |
| Termination | 2 radial leads |
| Life validation test at 85 °C | 2000 hours: Δ CAP ± 20 % from initial measurement. Δ DF 2 x initial specified limit. Δ DCL ≤ initial specified limit |
| Shelf life at 85 °C | 1000 hours: Δ CAP ± 20 % from initial measurement. Δ DF 2 x initial specified limit. Δ DCL ≤ initial specified limit |
| DC leakage current | rated voltage for 1 and 2 minutes for 6.3 WVDC to 100 WVDC units: I < 0.03 CV or 4 μA (whichever is greater). I < 0.04 CV or 3 μA (whichever is greater). rated voltage for 1 minute for 160 WVDC to 450 WVDC units: I < 0.1 CV + 40 μA and CV ≤ 1000; I < 0.04 CV + 100 μA and CV > 1000 |
| Solvent Resistance | Capacitors rated 6.3 WVDC to 100 WVDC will withstand exposure of up to 5 minutes in Freon TE, TES, TMS by either vapor immersion or ultrasonic degreasing |

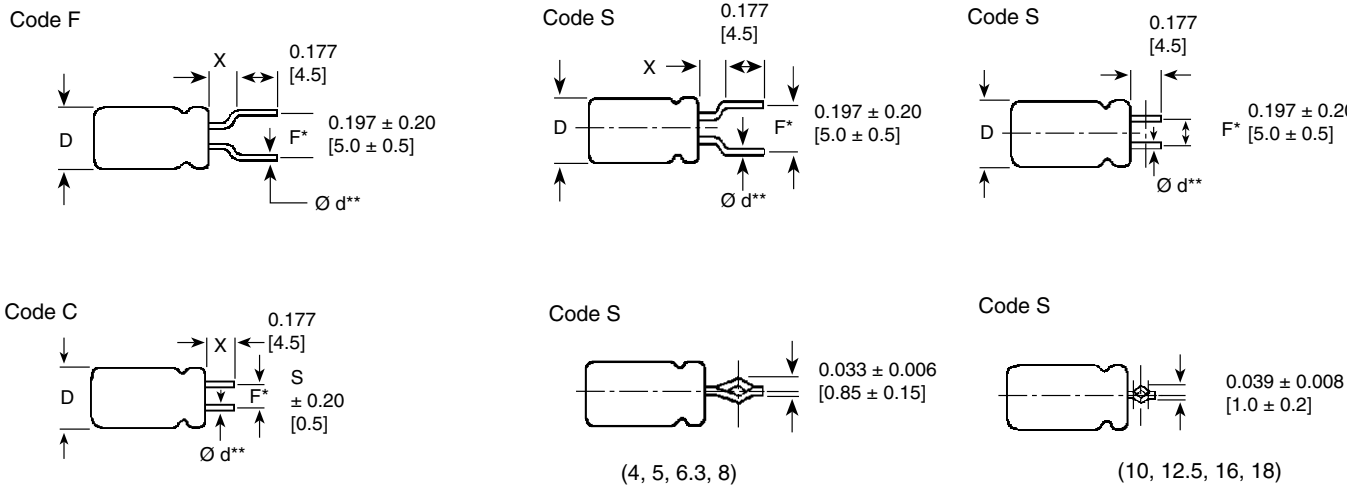
| RIPPLE CURRENT MULTIPLIERS | | | | | | |
|----------------------------|---------------|---------|-------------|-----------|-------|----------|
| TEMPERATURE | | | | | | |
| Ambient Temperature | | | Multipliers | | | |
| ≤ + 70 °C | | | 1.27 | | | |
| + 85 °C | | | 1.0 | | | |
| FREQUENCY (Hz) | | | | | | |
| WVDC | Cap. (μF) | 50 - 60 | 100 - 120 | 300 - 400 | 1 kHz | ≤ 10 kHz |
| 6.3 - 100 | 0 - 47 | 0.75 | 1 | 1.35 | 1.57 | 2.00 |
| | 100 - 470 | 0.80 | 1 | 1.23 | 1.34 | 1.50 |
| | 1000 - 18 000 | 0.85 | 1 | 1.10 | 1.13 | 1.15 |
| 160 - 450 | 0.47 - 220 | 0.80 | 1 | 1.25 | 1.40 | 1.60 |

| LOW TEMPERATURE PERFORMANCE | | | |
|---|---------------------|---------------------|--|
| MAXIMUM IMPEDANCE RATIO Z ^(T) /Z ^(+20 °C) | | | |
| MAXIMUM AT 120 Hz | | | |
| Rated Voltage (WVDC) | Z - 25 °C/Z + 20 °C | Z - 40 °C/Z + 20 °C | |
| 6.3 | 4.0 | 10.0 | |
| 10.0 | 3.0 | 8.0 | |
| 16.0 | 2.0 | 6.0 | |
| 25.0 | 2.0 | 4.0 | |
| 35.0 - 100.0 | 2.0 | 3.0 | |
| 160.0 - 200.0 | 3.0 | 4.0 | |
| 250.0 | 3.0 | 6.0 | |
| 315.0 - 400.0 | 6.0 | - | |
| 450.0 | 15.0 | - | |

| DIMENSIONS in inches [millimeters] | | | | |
|------------------------------------|----------------------------|----------------|-------------------------|------------------------|
| CASE CODE | NOMINAL CASE SIZE D X L | LEAD SPACING S | NOMINAL LEAD DIAMETER D | TYPICAL WEIGHT (GRAMS) |
| HW | 0.157 x 0.276 [4.0 x 7.0] | 0.059 [1.5] | 0.018 [0.45] | 0.20 |
| JW | 0.197 x 0.276 [5.0 x 7.0] | 0.079 [2.0] | 0.018 [0.45] | 0.30 |
| AW | 0.248 x 0.276 [6.3 x 7.0] | 0.098 [2.5] | 0.018 [0.45] | 0.40 |
| JA | 0.197 x 0.433 [5.0 x 11.0] | 0.079 [2.0] | 0.020 [0.50] | 0.44 |

| DIMENSIONS in inches [millimeters] | | | | |
|------------------------------------|-----------------------------|----------------|-------------------------|------------------------|
| CASE CODE | NOMINAL CASE SIZE D X L | LEAD SPACING S | NOMINAL LEAD DIAMETER D | TYPICAL WEIGHT (GRAMS) |
| AA | 0.248 x 0.433 [6.3 x 11.0] | 0.098 [2.5] | 0.020 [0.50] | 0.60 |
| BB | 0.315 x 0.453 [8.0 x 11.5] | 0.138 [3.5] | 0.024 [0.60] | 0.95 |
| CC | 0.394 x 0.492 [10.0 x 12.5] | 0.197 [5.0] | 0.024 [0.60] | 1.48 |
| CD | 0.394 x 0.630 [10.0 x 16.0] | 0.197 [5.0] | 0.024 [0.60] | 1.75 |
| CG | 0.394 x 0.787 [10.0 x 20.0] | 0.197 [5.0] | 0.024 [0.60] | 2.37 |
| DG | 0.492 x 0.787 [12.5 x 20.0] | 0.197 [5.0] | 0.024 [0.60] | 3.73 |
| DK | 0.492 x 0.984 [12.5 x 25.0] | 0.197 [5.0] | 0.024 [0.60] | 4.85 |
| EK | 0.630 x 0.984 [16.0 x 25.0] | 0.295 [7.5] | 0.031 [0.80] | 7.08 |
| EN | 0.630 x 1.240 [16.0 x 31.5] | 0.295 [7.5] | 0.031 [0.80] | 8.94 |
| ER | 0.630 x 1.398 [16.0 x 35.5] | 0.295 [7.5] | 0.031 [0.80] | 10.50 |
| FR | 0.709 x 1.398 [18.0 x 35.5] | 0.295 [7.5] | 0.031 [0.80] | 12.53 |
| FV | 0.709 x 1.575 [18.0 x 40.0] | 0.295 [7.5] | 0.031 [0.80] | 15.71 |

ELECTROLYTIC CAPACITOR WITH CUT OR FORMED LEADS in inches [millimeters]



| DIMENSIONS in inches [millimeters] | | | | | | |
|------------------------------------|------------------|--------------|-------------|-------------|-------------|-------------|
| FORMING METHOD | FORMED LEAD CODE | DIMENSIONS | | | | |
| | | D | L.S. | P | e*** | X (Max.) |
| Formed and Cut | F | 0.157 [4.0] | 0.197 [5.0] | 0.059 [1.5] | - | 0.059 [1.5] |
| | | 0.197 [5.0] | 0.197 [5.0] | 0.079 [2.0] | - | 0.059 [1.5] |
| | | 0.248 [6.3] | 0.197 [5.0] | 0.098 [2.5] | - | 0.098 [2.5] |
| | | 0.315 [8.0] | 0.197 [5.0] | 0.138 [3.5] | - | 0.098 [2.5] |
| Cut | C | 0.394 [10.0] | 0.197 [5.0] | - | - | - |
| | | 0.492 [12.5] | 0.197 [5.0] | - | - | - |
| | | 0.630 [16.0] | 0.295 [7.5] | - | - | - |
| | | 0.709 [18.0] | 0.295 [7.5] | - | - | - |
| Snap-in | S | 0.157 [4.0] | 0.197 [5.0] | 0.059 [1.5] | 0.043 [1.1] | 0.059 [1.5] |
| | | 0.197 [5.0] | 0.197 [5.0] | 0.079 [2.0] | 0.043 [1.1] | 0.059 [1.5] |
| | | 0.248 [6.3] | 0.197 [5.0] | 0.098 [2.5] | 0.043 [1.1] | 0.059 [1.5] |
| | | 0.315 [8.0] | 0.197 [5.0] | 0.138 [3.5] | 0.051 [1.3] | 0.059 [1.5] |
| | | 0.394 [10.0] | 0.197 [5.0] | - | 0.051 [1.3] | - |
| | | 0.492 [12.5] | 0.197 [5.0] | - | 0.051 [1.3] | - |
| | | 0.630 [16.0] | 0.295 [7.5] | - | 0.051 [1.3] | - |
| | | 0.709 [18.0] | 0.295 [7.5] | - | 0.051 [1.3] | - |

Note: Coding of cut or formed lead to be added to the end of type number in 15th position (with position 14 coded "6").
* Formed lead. ** Lead thickness Ø d depends on capacitor specification. *** Lead protrusion at bottom of tape.

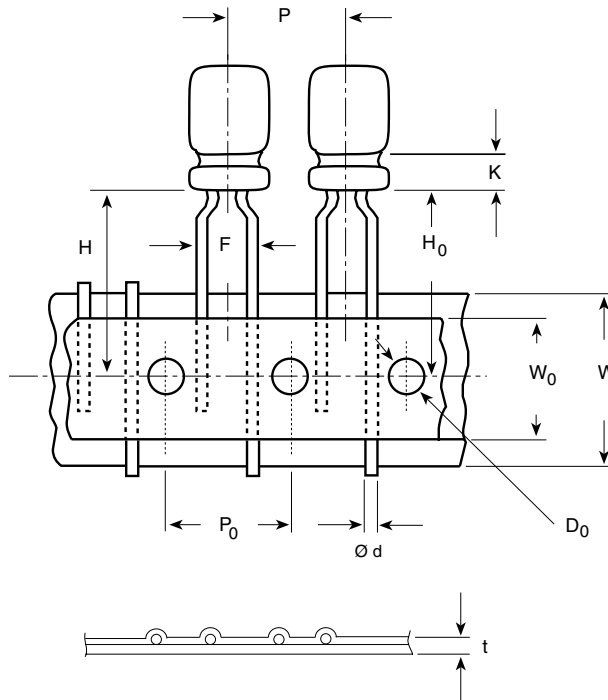
| TAPED CAPACITORS FOR AUTOMATIC INSERTION SYSTEMS in inches [millimeters] | | | | | |
|--|-----------|---------------|------------|-------------|---|
| PACKAGING | LEAD CODE | SPECIFICATION | | LEAD SPACE | CAPACITOR SIZES AVAILABLE |
| | | LEAD STYLE | + LEADER - | | |
| Ammo Pack | P | Formed Lead** | - | 0.197 [5.0] | 0.157 x 0.276 - 0.492 x 0.787 [4.0 x 7.0 - 12.5 x 20.0] |

Note: The ammo pack code is to be added to the end of type number in the 15th position (with position 14 coded as "8" as appropriate.) To specify formed, cut or snap-in leads and for tape and ammo, both positions 14 and 15 of the type number must be filled in with the proper codes.

** Except 0.394 [10.0 mm] and 0.492 [12.5 mm] diameter have straight unformed leads.

TAPING SPECIFICATIONS in inches [millimeters]

Formed Lead Type



| DIMENSIONS in inches [millimeters] | | | | | | | | |
|--|----------------------------------|------------------------------|-------------------------------|------------------------------|-------------------------------|-------------------------------|------------------------|------------------------|
| ITEM | CASE SIZE (Diameter x Length) | | | | | | | |
| | FORMED LEAD TYPE | | | | | | STRAIGHT LEAD TYPE | |
| | 0.157 x 0.276 [4.0 x 7.0] | 0.197 x 0.276 [5.0 x 7.0] | 0.197 x 0.433 [5.0 x 11.0] | 0.248 x 0.276 [6.3 x 7.0] | 0.248 x 0.433 [6.3 x 11.0] | 0.315 x 0.453 [8.0 x 11.5] | 0.394 [10.0] (Dia.) | 0.492 [12.5] (Dia.) |
| Ø d - Lead-wire Diameter | 0.018 [0.45] | 0.018 [0.45] | 0.020 [0.5] | 0.018 [0.45] | 0.020 [0.5] | 0.024 [0.6] | 0.024 [0.6] | 0.024 [0.6] |
| P - Pitch of Component | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.591 [15.0] |
| P ₀ - Feed Hole Pitch | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.500 [12.7] | 0.591 [15.0] |
| F - Lead-to-lead Distance | 0.197 [5.0] | 0.197 [5.0] | 0.197 [5.0] | 0.197 [5.0] | 0.197 [5.0] | 0.197 [5.0] | 0.197 [5.0] | 0.197 [5.0] |
| K - Clinch Height | 0.059 [1.5] | 0.059 [1.5] | 0.098 [2.5] | 0.059 [1.5] | 0.098 [2.5] | 0.157 [4.0] | — | — |
| H - Height of Component from Tape Center | 0.689 [17.5] | 0.689 [17.5] | 0.728 [18.5] | 0.689 [17.5] | 0.728 [18.5] | 0.787 [20.0] | 0.728 [18.5] | 0.630 [16.0] |
| H ₀ - Lead-wire Clinch Height | 0.630 [16.0] | 0.630 [16.0] | 0.630 [16.0] | 0.630 [16.0] | 0.630 [16.0] | 0.630 [16.0] | — | — |
| W - Tape Width | 0.709 [18.0] | 0.709 [18.0] | 0.709 [18.0] | 0.709 [18.0] | 0.709 [18.0] | 0.709 [18.0] | 0.709 [18.0] | 0.709 [18.0] |
| W ₀ - Hold Down Tape Width | 0.512 [13.0] | 0.512 [13.0] | 0.512 [13.0] | 0.512 [13.0] | 0.512 [13.0] | 0.512 [13.0] | 0.512 [13.0] | 0.512 [13.0] |
| D ₀ - Feed Hole Diameter | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] |
| t - Total Tape Thickness | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] | 0.157 [4.0] |



| ELECTRICAL DATA | |
|-----------------|-------------------------------------|
| SYMBOL | DESCRIPTION |
| μF | rated capacitance |
| ± % | M = ± 20 % |
| DC | voltage rating at 85 °C |
| JA | see dimensions in millimeters table |
| 6 | packaging code |
| A | termination |

ORDERING EXAMPLE*

Electrolytic capacitor 515D series

515D 107M 6R3 JA 6A E3

6A = Bulk, Uncut leads.

6C = Cut leads (not stocked).

6F = Formed and cut leads (not stocked).

6S = Snap-in leads (not stocked).

For Cases Codes HW, JW, AW, JA, AA, BB, CC, CD, CG, and DG only: 8P = Ammo-Pack.

All items stating "not stocked" are items that are not generally stocked unless a Purchase Order is placed. Lead time is 14 - 15 weeks for these items unless there is excess inventory.

* Suffix E3 denotes lead (Pb)-free/RoHS compliant products.

| ELECTRICAL DATA AND ORDERING INFORMATION | | | | |
|--|-------------------|-----------------------------|--|---------------------------------|
| CAPACITANCE (μF) | PART NUMBER | NOMINAL CASE SIZE D x L | Max. RIPPLE at + 85 °C 120 Hz (mA) | Max. DF at + 20 °C 120 Hz |
| 6.3 WVDC at + 85 °C, SURGE = 8 V | | | | |
| 22.0 | 515D226M6R3JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 34.0 | 0.24 |
| 33.0 | 515D336M6R3JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 42.0 | 0.24 |
| 47.0 | 515D476M6R3JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 50.0 | 0.24 |
| 100.0 | 515D107M6R3JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 77.0 | 0.24 |
| 220.0 | 515D227M6R3AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 215.0 | 0.24 |
| 330.0 | 515D337M6R3AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 265.0 | 0.24 |
| 470.0 | 515D477M6R3BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 360.0 | 0.24 |
| 1000.0 | 515D108M6R3CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 570.0 | 0.24 |
| 2200.0 | 515D228M6R3DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 1050.0 | 0.24 |
| 3300.0 | 515D338M6R3DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 1250.0 | 0.24 |
| 4700.0 | 515D478M6R3EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 1700.0 | 0.24 |
| 6800.0 | 515D688M6R3EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 1900.0 | 0.24 |
| 10 000.0 | 515D109M6R3EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 2250.0 | 0.24 |
| 15 000.0 | 515D159M6R3FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 2680.0 | 0.24 |
| 18 000.0 | 515D189M6R3FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 2750.0 | 0.24 |
| 10 WVDC at + 85 °C, SURGE = 13 V | | | | |
| 22.0 | 515D226M010JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 38.0 | 0.20 |
| 33.0 | 515D336M010JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 47.0 | 0.20 |
| 47.0 | 515D476M010JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 59.0 | 0.20 |
| 100.0 | 515D107M010JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 145.0 | 0.20 |
| 220.0 | 515D227M010AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 230.0 | 0.20 |
| 330.0 | 515D337M010BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 330.0 | 0.20 |
| 470.0 | 515D477M010BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 390.0 | 0.20 |
| 1000.0 | 515D108M010CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 630.0 | 0.20 |
| 2200.0 | 515D228M010DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 1100.0 | 0.20 |
| 3300.0 | 515D338M010DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 1400.0 | 0.20 |
| 4700.0 | 515D478M010EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 1800.0 | 0.20 |
| 6800.0 | 515D688M010EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 2150.0 | 0.20 |
| 10 000.0 | 515D109M010FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 2500.0 | 0.20 |
| 15 000.0 | 515D159M010FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 2720.0 | 0.20 |
| 16 WVDC at + 85 °C, SURGE = 20 V | | | | |
| 10.0 | 515D106M016JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 28.0 | 0.16 |
| 22.0 | 515D226M016JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 44.0 | 0.16 |
| 33.0 | 515D336M016JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 57.0 | 0.16 |
| 47.0 | 515D476M016JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 168.0 | 0.16 |

| ELECTRICAL DATA AND ORDERING INFORMATION | | | | |
|---|--------------------|------------------------------------|---|--|
| CAPACITANCE (μF) | PART NUMBER | NOMINAL CASE SIZE D x L | Max. RIPPLE at + 85 °C 120 Hz (mA) | Max. DF at + 20 °C 120 Hz |
| 16 WVDC at + 85 °C, SURGE = 20 V | | | | |
| 100.0 | 515D107M016AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 175.0 | 0.16 |
| 220.0 | 515D227M016BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 300.0 | 0.16 |
| 330.0 | 515D337M016BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 360.0 | 0.16 |
| 470.0 | 515D477M016CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 470.0 | 0.16 |
| 1000.0 | 515D108M016CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 790.0 | 0.16 |
| 2200.0 | 515D228M016DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 1350.0 | 0.16 |
| 3300.0 | 515D338M016EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 1700.0 | 0.16 |
| 4700.0 | 515D478M016EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 2100.0 | 0.16 |
| 6800.0 | 515D688M016FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 2500.0 | 0.16 |
| 10000.0 | 515D109M016FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 2640.0 | 0.16 |
| 25 WVDC at + 85 °C, SURGE = 32 V | | | | |
| 4.7 | 515D475M025JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 30.0 | 0.14 |
| 10.0 | 515D106M025JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 33.0 | 0.14 |
| 22.0 | 515D226M025JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 51.0 | 0.14 |
| 33.0 | 515D336M025JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 63.0 | 0.14 |
| 47.0 | 515D476M025JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 115.0 | 0.14 |
| 100.0 | 515D107M025AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 185.0 | 0.14 |
| 220.0 | 515D227M025BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 320.0 | 0.14 |
| 330.0 | 515D337M025CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 420.0 | 0.14 |
| 470.0 | 515D477M025CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 540.0 | 0.14 |
| 1000.0 | 515D108M025DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 950.0 | 0.14 |
| 2200.0 | 515D228M025EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 1550.0 | 0.14 |
| 3300.0 | 515D338M025EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 1950.0 | 0.14 |
| 4700.0 | 515D478M025FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 2360.0 | 0.14 |
| 35 WVDC at + 85 °C, SURGE = 44 V | | | | |
| 4.7 | 515D475M035JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 24.0 | 0.12 |
| 10.0 | 515D106M035JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 36.0 | 0.12 |
| 22.0 | 515D226M035JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 57.0 | 0.12 |
| 33.0 | 515D336M035JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 105.0 | 0.12 |
| 47.0 | 515D476M035AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 140.0 | 0.12 |
| 100.0 | 515D107M035BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 230.0 | 0.12 |
| 220.0 | 515D227M035CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 370.0 | 0.12 |
| 330.0 | 515D337M035CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 490.0 | 0.12 |
| 470.0 | 515D477M035CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 640.0 | 0.12 |
| 1000.0 | 515D108M035DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 1100.0 | 0.12 |
| 2200.0 | 515D228M035EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 1850.0 | 0.12 |
| 3300.0 | 515D338M035FR6AE3 | 0.709 x 1.382 [18.0 x 35.5] | 2220.0 | 0.12 |
| 4700.0 | 515D478M035FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 2490.0 | 0.12 |
| 50 WVDC at + 85 °C, SURGE = 63 V | | | | |
| 0.1 | 515D104M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 1.0 | 0.10 |
| 0.22 | 515D224M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 2.3 | 0.10 |
| 0.33 | 515D334M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 3.5 | 0.10 |
| 0.47 | 515D474M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 5.0 | 0.10 |
| 1.0 | 515D105M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 10.0 | 0.10 |
| 2.2 | 515D225M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 19.0 | 0.10 |
| 3.3 | 515D335M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 24.0 | 0.10 |
| 4.7 | 515D475M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 29.0 | 0.10 |
| 10.0 | 515D106M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 44.0 | 0.10 |
| 22.0 | 515D226M050JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 95.0 | 0.10 |
| 33.0 | 515D336M050AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 125.0 | 0.10 |

**ELECTRICAL DATA AND ORDERING INFORMATION**

| CAPACITANCE (μ F) | PART NUMBER | NOMINAL CASE SIZE D x L | Max. RIPPLE at + 85 °C 120 Hz (mA) | Max. DF at + 20 °C 120 Hz |
|---|-------------------|-----------------------------|--|---------------------------------|
| 50 WVDC at + 85 °C, SURGE = 63 V | | | | |
| 47.0 | 515D476M050AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 150.0 | 0.10 |
| 100.0 | 515D107M050BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 250.0 | 0.10 |
| 220.0 | 515D227M050CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 440.0 | 0.10 |
| 330.0 | 515D337M050CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 580.0 | 0.10 |
| 470.0 | 515D477M050DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 760.0 | 0.10 |
| 1000.0 | 515D108M050EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 1350.0 | 0.10 |
| 2200.0 | 515D228M050FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 2090.0 | 0.10 |
| 63 WVDC at + 85 °C, SURGE = 79 V | | | | |
| 4.7 | 515D475M063JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 45.0 | 0.08 |
| 10.0 | 515D106M063JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 70.0 | 0.08 |
| 22.0 | 515D226M063AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 115.0 | 0.08 |
| 33.0 | 515D336M063AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 140.0 | 0.08 |
| 47.0 | 515D476M063BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 190.0 | 0.08 |
| 100.0 | 515D107M063CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 300.0 | 0.08 |
| 220.0 | 515D227M063CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 490.0 | 0.08 |
| 330.0 | 515D337M063DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 680.0 | 0.08 |
| 470.0 | 515D477M063DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 880.0 | 0.08 |
| 1000.0 | 515D108M063EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 1550.0 | 0.08 |
| 2200.0 | 515D228M063FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 2200.0 | 0.08 |
| 100 WVDC at + 85 °C, SURGE = 125 V | | | | |
| 0.1 | 515D104M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 2.1 | 0.08 |
| 0.22 | 515D224M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 4.7 | 0.08 |
| 0.33 | 515D334M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 7.0 | 0.08 |
| 0.47 | 515D474M100JA6AE3 | 0.197 x .0433 [5.0 x 11.0] | 10.0 | 0.08 |
| 1.0 | 515D105M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 21.0 | 0.08 |
| 2.2 | 515D225M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 30.0 | 0.08 |
| 3.3 | 515D335M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 40.0 | 0.08 |
| 4.7 | 515D475M100JA6AE3 | 0.197 x 0.433 [5.0 x 11.0] | 45.0 | 0.08 |
| 10.0 | 515D106M100AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 75.0 | 0.08 |
| 22.0 | 515D226M100BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 130.0 | 0.08 |
| 33.0 | 515D336M100CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 170.0 | 0.08 |
| 47.0 | 515D476M100CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 230.0 | 0.08 |
| 100.0 | 515D107M100DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 400.0 | 0.08 |
| 220.0 | 515D227M100EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 710.0 | 0.08 |
| 330.0 | 515D337M100EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 860.0 | 0.08 |
| 470.0 | 515D477M100EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 1100.0 | 0.08 |
| 1000.0 | 515D108M100FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 1690.0 | 0.08 |
| 160 WVDC at + 85 °C, SURGE = 200 V | | | | |
| 0.47 | 515D474M160AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 12.0 | 0.20 |
| 1.0 | 515D105M160AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 17.0 | 0.20 |
| 2.2 | 515D225M160AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 26.0 | 0.20 |
| 3.3 | 515D335M160BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 35.0 | 0.20 |
| 4.7 | 515D475M160BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 40.0 | 0.20 |
| 10.0 | 515D106M160CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 65.0 | 0.20 |
| 22.0 | 515D226M160CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 110.0 | 0.20 |
| 33.0 | 515D336M160DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 150.0 | 0.20 |
| 47.0 | 515D476M160DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 180.0 | 0.20 |
| 100.0 | 515D107M160EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 300.0 | 0.20 |
| 220.0 | 515D227M160FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 510.0 | 0.20 |

| ELECTRICAL DATA AND ORDERING INFORMATION | | | | |
|---|--------------------|------------------------------------|---|--|
| CAPACITANCE (μF) | PART NUMBER | NOMINAL CASE SIZE D x L | Max. RIPPLE at + 85 °C 120 Hz (mA) | Max. DF at + 20 °C 120 Hz |
| 200 WVDC at + 85 °C, SURGE = 250 V | | | | |
| 0.47 | 515D474M200AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 12.0 | 0.20 |
| 1.0 | 515D105M200AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 17.0 | 0.20 |
| 2.2 | 515D225M200AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 26.0 | 0.20 |
| 3.3 | 515D335M200BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 35.0 | 0.20 |
| 4.7 | 515D475M200CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 45.0 | 0.20 |
| 10.0 | 515D106M200CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 70.0 | 0.20 |
| 22.0 | 515D226M200CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 110.0 | 0.20 |
| 33.0 | 515D336M200DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 160.0 | 0.20 |
| 47.0 | 515D476M200DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 180.0 | 0.20 |
| 100.0 | 515D107M200EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 330.0 | 0.20 |
| 220.0 | 515D227M200FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 520.0 | 0.20 |
| 250 WVDC at + 85 °C, SURGE = 300 V | | | | |
| 0.47 | 515D474M250AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 12.0 | 0.20 |
| 1.0 | 515D105M250AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 17.0 | 0.20 |
| 2.2 | 515D225M250BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 30.0 | 0.20 |
| 3.3 | 515D335M250CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 35.0 | 0.20 |
| 4.7 | 515D475M250CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 45.0 | 0.20 |
| 10.0 | 515D106M250CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 70.0 | 0.20 |
| 33.0 | 515D336M250DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 160.0 | 0.20 |
| 47.0 | 515D476M250EK6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 210.0 | 0.20 |
| 100.0 | 515D107M250FR6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 340.0 | 0.20 |
| 315 WVDC at + 85 °C, SURGE = 365 V | | | | |
| 1.0 | 515D105M315AA6AE3 | 0.248 x 0.433 [6.3 x 11.0] | 17.0 | 0.20 |
| 2.2 | 515D225M315BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 30.0 | 0.20 |
| 3.3 | 515D335M315CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 35.0 | 0.20 |
| 4.7 | 515D475M315CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 45.0 | 0.20 |
| 10.0 | 515D106M315CG6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 70.0 | 0.20 |
| 22.0 | 515D226M315DK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 120.0 | 0.20 |
| 33.0 | 515D336M315EK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 150.0 | 0.20 |
| 47.0 | 515D476M315EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 190.0 | 0.20 |
| 100.0 | 515D107M315FV6AE3 | 0.709 x 1.575 [18.0 x 40.0] | 340.0 | 0.20 |
| 350 WVDC at + 85 °C, SURGE = 400 V | | | | |
| 1.0 | 515D105M350BB6AE3 | 0.315 x .453 [8.0 x 11.5] | 18.0 | 0.25 |
| 2.2 | 515D225M350CC6AE3 | 0.394 x .492 [10.0 x 12.5] | 28.0 | 0.25 |
| 3.3 | 515D335M350CD6AE3 | 0.394 x .630 [10.0 x 16.0] | 35.0 | 0.25 |
| 4.7 | 515D475M350CD6AE3 | 0.394 x .630 [10.0 x 16.0] | 40.0 | 0.25 |
| 10.0 | 515D106M350DG6AE3 | 0.492 x .787 [12.5 x 20.0] | 70.0 | 0.25 |
| 22.0 | 515D226M350DK6AE3 | 0.492 x .984 [12.5 x 25.0] | 110.0 | 0.25 |
| 33.0 | 515D336M350EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 140.0 | 0.25 |
| 47.0 | 515D476M350FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 220.0 | 0.25 |
| 400 WVDC at + 85 °C, SURGE = 450 V | | | | |
| 1.0 | 515D105M400BB6AE3 | 0.315 x 0.453 [8.0 x 11.5] | 18.0 | 0.25 |
| 2.2 | 515D225M400CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 28.0 | 0.25 |
| 3.3 | 515D335M400CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 35.0 | 0.25 |
| 4.7 | 515D475M400CD6AE3 | 0.394 x 0.787 [10.0 x 20.0] | 45.0 | 0.25 |
| 10.0 | 515D106M400DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 70.0 | 0.25 |
| 22.0 | 515D226M400DK6AE3 | 0.630 x 0.984 [16.0 x 25.0] | 110.0 | 0.25 |
| 33.0 | 515D336M400EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 140.0 | 0.25 |
| 47.0 | 515D476M400FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 220.0 | 0.25 |

**ELECTRICAL DATA AND ORDERING INFORMATION**

| CAPACITANCE (μ F) | PART NUMBER | NOMINAL CASE SIZE D x L | Max. RIPPLE at + 85 °C 120 Hz (mA) | Max. DF at + 20 °C 120 Hz |
|---|-------------------|-----------------------------|--|---------------------------------|
| 450 WVDC at + 85 °C, SURGE = 500 V | | | | |
| 1.0 | 515D105M450CC6AE3 | 0.394 x 0.492 [10.0 x 12.5] | 19.0 | 0.25 |
| 2.2 | 515D225M450CD6AE3 | 0.394 x 0.630 [10.0 x 16.0] | 29.0 | 0.25 |
| 4.7 | 515D475M450DG6AE3 | 0.492 x 0.787 [12.5 x 20.0] | 50.0 | 0.25 |
| 10.0 | 515D106M450EK6AE3 | 0.492 x 0.984 [12.5 x 25.0] | 75.0 | 0.25 |
| 22.0 | 515D226M450EN6AE3 | 0.630 x 1.240 [16.0 x 31.5] | 110.0 | 0.25 |
| 33.0 | 515D336M450FR6AE3 | 0.709 x 1.398 [18.0 x 35.5] | 170.0 | 0.25 |

LOW PROFILE RATINGS in inches [millimeters]

| CAPACITANCE (μ F) | PART NUMBER | NOMINAL CASE SIZE D x L | Max. RIPPLE at + 85 °C 120 Hz (mA) | Max. DF at + 20 °C 120 Hz |
|---|-------------------|----------------------------|--|---------------------------------|
| 6.3 WVDC at + 85 °C, SURGE = 8 V | | | | |
| 22.0 | 515D226M6R3HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 34.0 | 0.24 |
| 33.0 | 515D336M6R3JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 42.0 | 0.24 |
| 47.0 | 515D476M6R3JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 50.0 | 0.24 |
| 100.0 | 515D107M6R3AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 77.0 | 0.24 |
| 10 WVDC at + 85 °C, SURGE = 13 V | | | | |
| 22.0 | 515D226M010JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 38.0 | 0.20 |
| 33.0 | 515D336M010JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 47.0 | 0.20 |
| 47.0 | 515D476M010AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 59.0 | 0.20 |
| 16 WVDC at + 85 °C, SURGE = 20 V | | | | |
| 10.0 | 515D106M016HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 28.0 | 0.16 |
| 22.0 | 515D226M016JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 44.0 | 0.16 |
| 33.0 | 515D336M016AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 57.0 | 0.16 |
| 47.0 | 515D476M016AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 68.0 | 0.16 |
| 25 WVDC at + 85 °C, SURGE = 32 V | | | | |
| 10.0 | 515D106M025JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 33.0 | 0.14 |
| 22.0 | 515D226M025AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 51.0 | 0.14 |
| 33.0 | 515D336M025AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 63.0 | 0.14 |
| 35 WVDC at + 85 °C, SURGE = 44 V | | | | |
| 4.7 | 515D475M035HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 24.0 | 0.12 |
| 10.0 | 515D106M035JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 36.0 | 0.12 |
| 22.0 | 515D226M035AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 57.0 | 0.12 |
| 50 WVDC at + 85 °C, SURGE = 63 V | | | | |
| 0.1 | 515D104M050JW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 1.0 | 0.10 |
| 0.22 | 515D224M050HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 2.3 | 0.10 |
| 0.33 | 515D334M050HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 3.5 | 0.10 |
| 0.47 | 515D474M050HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 5.0 | 0.10 |
| 1.0 | 515D105M050HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 10.0 | 0.10 |
| 2.2 | 515D225M050HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 19.0 | 0.10 |
| 3.3 | 515D335M050HW6AE3 | 0.157 x 0.276 [4.0 x 7.0] | 24.0 | 0.10 |
| 4.7 | 515D475M050JW6AE3 | 0.197 x 0.276 [5.0 x 7.0] | 29.0 | 0.10 |
| 10.0 | 515D106M050AW6AE3 | 0.248 x 0.276 [6.3 x 7.0] | 44.0 | 0.10 |



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