

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance | | Rated Voltage DC (V _r) to 85°C | | | | | | | | |
|-------------|------|--|---|--|---|---|---|---|--|--|
| μF | Code | 2.5V (e) | 4V (G) | 6.3V (J) | 10V (A) | 16V (C) | 20V (D) | 25V (E) | 35V (V) | 50V (T) |
| 0.15 | 154 | | | | | | | | | A(900) |
| 0.22 | 224 | | | | | | | | A(6000) | A(7000) |
| 0.33 | 334 | | | | | | | | A(6000) | A(7000) |
| 0.47 | 474 | | | | | | | A(7000) | A(6000) B(4000) | A(6500), B(6000) C(2300) |
| 0.68 | 684 | | | | | | | A(6000) | A(6000) | B(4000) |
| 1.0 | 105 | | | | R(9000) | A(6200) | A(3000), R(6000) S(6000), T(2000) | A(4000) R(2500,4000) | A(3000) B(2000) | B(3000) C(2500) |
| 1.5 | 155 | | | | | | A(3000) | A(3000) B(1800) | A(3000) B(2500) | C(1500,2000) |
| 2.2 | 225 | | | R(7000) | A(1800) | A(1800,3500) T(2000) | A(3000) B(1700) | A(2500) B(900,1200,2500) | B(750,1500, 2000) C(1000) | C(1500) D(1200) |
| 3.3 | 335 | | | A(2100) | T(1500) | A(3500) B(2500) | A(2500) B(1300) | A(1000,1500) B(750,1500,2000) | B(1000) C(700) | C(1000) D(800) |
| 4.7 | 475 | | | S(4000) | A(1400), B(1400) R(3000,5000) | A(2000) B(800,1500) | A(1800) B(750,1000) | B(700,900,1500) C(700) | B(700,1500) C(600), D(700) | C(800) D(250,300,500,700) X(500) |
| 6.8 | 685 | | | A(1800) | A(1800), B(1300) T(1800) | A(1500) B(600,1200) | A(1000) B(600,1000) C(700) | B(700) C(500,600,700) | C(350) D(150,400, 500) | D(200,300, 500,600) |
| 10 | 106 | | R(3000) | A(1500), B(1500) R(1000,1500,3000) T(1000) | A(900,1800), B(1000) P(2000) ^(M) , S(900) T(1000,2000) | A(1000), B(500,800) C(500), T(800,1000) W(500,600) | B(500,1000) C(500,700) W(250, 500) | B(1800) C(300,500) D(500) | C(600) D(125,300) E(100,150,200)Y(250) | D(500) E(250,300, 400,500) |
| 15 | 156 | | | A(700,1500) | A(1000) B(450,600), C(700) T(1200) | B(500,800) C(300,700) | B(500) C(400,450) | C(220,300) D(100,300) | C(350,450) D(100,300) Y(250) | E(250) V(250) |
| 22 | 226 | | | A(300,500,900) B(375,600) C(500), S(900) | A(900) B(400,500,700) C(300), T(800) | B(400,600) C(150,250,300,375) D(700), W(500) | B(400,600) C(100,150,400) D(200,300) | C(275,400) D(100,200,300) F(300) | D(125,200,300,400) E(125,200,300) Y(200) | |
| 33 | 336 | | | A(600) B(250,350,450,600) T(800) | A(700) B(250,425,500,650) C(150,375,500) W(350) | B(350,500) C(100,150,225,300) D(200), W(140,175, 250,400,500) Y(300,400) | C(300) D(100,200) | C(400) D(100,200,300) E(100,175,200,300) F(150,200,400) Y(200) | D(200,300) E(100,250,300) V(200) | |
| 47 | 476 | | A(500) | A(800) B(250,350,500) C(300), T(1200) | B(250,350,500,650) C(200,350) D(100,300) W(125,150,250) | C(110,350) D(80,100,150,200) W(200) X(180), Y(250) | D(75,100,200) E(70,125,150, 200,250), X(200) | D(125,150,250 E(80,100,125) (Y250) | D(300), E(200,250) V(150,200) | |
| 68 | 686 | | | B(250,350,500) C(150,200) W(110,125,250) | B(600) C(80,100,200,300) D(100,150) W(100,150) Y(100,200) | C(125,200) D(70,100,150) F(200), X(150) Y(150,200,250) | D(70,150, 200,300) E(125,150,200) Y(200) | D(150,200,300) E(125,200) V(80,95,150,200) | V(150,200) | |
| 100 | 107 | B(200) | B(200,250, 350,500) T(500) ^(M) W(100) | B(250,400) C(75,150), D(300) W(100,150), Y(100) | B(400) C(75,100,150,200) D(50,65,80,100,125, 150), E(125), W(150) X(85,150,200) Y(100,150,200) | C(200) D(60,100,125,150) E(55,100,125,150) F(150,200) ^(M) Y(100,150,200) | D(85,100,150) E(100,150,200) V(60,85,100,200) | E(150), V(100) | | |
| 150 | 157 | B(150) | B(250) C(70,80) | C(50,90,150,200,250) D(50,125) Y(40,50) | C(150), D(50,85,100) E(100), F(200) X(100) ^(M) Y(100,150,200) | D(60,85,100,125,150) E(50,100), V(45,75) Y(200) ^(M) | V(80) | V(150) ^(M) | | |
| 220 | 227 | B(150, 200,600) D(45) | D(40,50,100) Y(40,50,75) | C(70,100,125,250) D(50,100,125) E(100), F(200) Y(100,150) | D(40,50,100,150) E(50,60,70,100, 125,150) Y(100,150,200) | D(200) ^(M) E(50,100,150) V(50,75,100,150) | | | | |
| 330 | 337 | Y(40) | C(100) D(35,45,100) F(200) X(100) | C(80,100) D(45,50,70,100) E(50,100,125,150) V(100), Y(75,100,150) | D(50,65,100,150) E(40,50,60,100) V(40,60,100) | E(200) ^(M) | | | | |
| 470 | 477 | D(35) F(200) Y(100) | D(45,100) E(35,45,100) | D(45,60,100,200) E(45,50,60,100,200) V(40,55,100), Y(150) | E(45,50,60,100,200) V(40,60,100) | | | | | |
| 680 | 687 | D(35,50) E(35,50) Y(100) | D(45,60,100) E(40,60,100) | E(45,60,100) V(35,40,50) | E(150) ^(M) V(100) ^(M) | | | | | |
| 1000 | 108 | E(30,40) Y(100) ^(M) | E(40,60) V(25,35,40,50) | E(100) ^(M) , V(40,50) ^(M) | | | | | | |
| 1500 | 158 | D(100) E(50) V(30,40) ^(M) | E(50,75) V(50,75) ^(M) | | | | | | | |

Released ratings^(M tolerance only) (ESR ratings in mOhms in parentheses)

NOTE: Voltage ratings are minimum values. KYOCERA AVX reserves the right to supply higher voltage ratings in the same case size, to the same reliability standards.

RATINGS & PART NUMBER REFERENCE

Table with columns: Part Number, Case Size, Capacitance (µF), Rated Voltage (V), Rated Temperature (°C), Category Voltage (V), Category Temperature (°C), DCL Max. (µA), DF Max. (%), ESR Max. @ 100kHz (mΩ), 100kHz RMS Current (A) (25°C, 85°C, 125°C), MSL. Rows include various TPS series components like TPSA226*006#0500, TPSC226*006#0500, etc.

KYOCERA AVX The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

RATINGS & PART NUMBER REFERENCE

| Part Number | Case Size | Capacitance (µF) | Rated Voltage (V) | Rated Temperature (°C) | Category Voltage (V) | Category Temperature (°C) | DCL Max. (µA) | DF Max. (%) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (A) | | | MSL |
|-----------------------|-----------|------------------|-------------------|------------------------|----------------------|---------------------------|---------------|-------------|------------------------|------------------------|-------|-------|-----------------|
| | | | | | | | | | | 25°C | 85°C | 125°C | |
| TPSE336*035#0100 | E | 33 | 35 | 85 | 23 | 125 | 11.6 | 6 | 100 | 1.285 | 1.156 | 0.514 | 1 ¹⁾ |
| TPSE336*035#0250 | E | 33 | 35 | 85 | 23 | 125 | 11.6 | 6 | 250 | 0.812 | 0.731 | 0.325 | 1 ¹⁾ |
| TPSE336*035#0300 | E | 33 | 35 | 85 | 23 | 125 | 11.6 | 6 | 300 | 0.742 | 0.667 | 0.297 | 1 ¹⁾ |
| TPSV336*035#0200 | V | 33 | 35 | 85 | 23 | 125 | 11.6 | 6 | 200 | 1.118 | 1.006 | 0.447 | 1 ¹⁾ |
| TPSD476*035#0300V | D | 47 | 35 | 85 | 23 | 125 | 16.5 | 6 | 300 | 0.707 | 0.636 | 0.283 | 3 |
| TPSE476*035#0200 | E | 47 | 35 | 85 | 23 | 125 | 16.5 | 6 | 200 | 0.908 | 0.817 | 0.363 | 1 ¹⁾ |
| TPSE476*035#0250 | E | 47 | 35 | 85 | 23 | 125 | 16.5 | 6 | 250 | 0.812 | 0.731 | 0.325 | 1 ¹⁾ |
| TPSV476*035#0150 | V | 47 | 35 | 85 | 23 | 125 | 16.5 | 6 | 150 | 1.291 | 1.162 | 0.516 | 1 ¹⁾ |
| TPSV476*035#0200 | V | 47 | 35 | 85 | 23 | 125 | 16.5 | 6 | 200 | 1.118 | 1.006 | 0.447 | 1 ¹⁾ |
| TPSV686*035#0150 | V | 68 | 35 | 85 | 23 | 125 | 23.8 | 6 | 150 | 1.291 | 1.162 | 0.516 | 1 ¹⁾ |
| TPSV686*035#0200 | V | 68 | 35 | 85 | 23 | 125 | 23.8 | 6 | 200 | 1.118 | 1.006 | 0.447 | 1 ¹⁾ |
| 50 Volt @ 85°C | | | | | | | | | | | | | |
| TPSA154*050#9000 | A | 0.15 | 50 | 85 | 33 | 125 | 0.5 | 4 | 9000 | 0.091 | 0.082 | 0.037 | 1 |
| TPSA224*050#7000 | A | 0.22 | 50 | 85 | 33 | 125 | 0.5 | 4 | 7000 | 0.104 | 0.093 | 0.041 | 1 |
| TPSA334*050#7000 | A | 0.33 | 50 | 85 | 33 | 125 | 0.5 | 4 | 7000 | 0.104 | 0.093 | 0.041 | 1 |
| TPSA474*050#6500 | A | 0.47 | 50 | 85 | 33 | 125 | 0.5 | 4 | 6500 | 0.107 | 0.097 | 0.043 | 1 |
| TPSB474*050#6000 | B | 0.47 | 50 | 85 | 33 | 125 | 0.5 | 4 | 6000 | 0.119 | 0.107 | 0.048 | 1 |
| TPSC474*050#2300 | C | 0.47 | 50 | 85 | 33 | 125 | 0.5 | 4 | 2300 | 0.219 | 0.197 | 0.087 | 1 |
| TPSB684*050#4000 | B | 0.68 | 50 | 85 | 33 | 125 | 0.5 | 4 | 4000 | 0.146 | 0.131 | 0.058 | 1 |
| TPSB105*050#3000 | B | 1 | 50 | 85 | 33 | 125 | 0.5 | 6 | 3000 | 0.168 | 0.151 | 0.067 | 1 |
| TPSC105*050#2500 | C | 1 | 50 | 85 | 33 | 125 | 0.5 | 4 | 2500 | 0.210 | 0.189 | 0.084 | 1 |
| TPSC155*050#1500 | C | 1.5 | 50 | 85 | 33 | 125 | 0.8 | 6 | 1500 | 0.271 | 0.244 | 0.108 | 1 |
| TPSC155*050#2000 | C | 1.5 | 50 | 85 | 33 | 125 | 0.8 | 6 | 2000 | 0.235 | 0.211 | 0.094 | 1 |
| TPSC225*050#1500 | C | 2.2 | 50 | 85 | 33 | 125 | 1.1 | 8 | 1500 | 0.271 | 0.244 | 0.108 | 1 |
| TPSD225*050#1200 | D | 2.2 | 50 | 85 | 33 | 125 | 1.1 | 6 | 1200 | 0.354 | 0.318 | 0.141 | 1 ¹⁾ |
| TPSC335*050#1000 | C | 3.3 | 50 | 85 | 33 | 125 | 1.6 | 6 | 1000 | 0.332 | 0.298 | 0.133 | 1 |
| TPSD335*050#0800 | D | 3.3 | 50 | 85 | 33 | 125 | 1.7 | 6 | 800 | 0.433 | 0.390 | 0.173 | 1 ¹⁾ |
| TPSC475*050#0800 | C | 4.7 | 50 | 85 | 33 | 125 | 2.4 | 6 | 800 | 0.371 | 0.334 | 0.148 | 1 |
| TPSD475*050#0250 | D | 4.7 | 50 | 85 | 33 | 125 | 2.4 | 6 | 250 | 0.775 | 0.697 | 0.310 | 1 ¹⁾ |
| TPSD475*050#0300 | D | 4.7 | 50 | 85 | 33 | 125 | 2.4 | 6 | 300 | 0.707 | 0.636 | 0.283 | 1 ¹⁾ |
| TPSD475*050#0500 | D | 4.7 | 50 | 85 | 33 | 125 | 2.4 | 6 | 500 | 0.548 | 0.493 | 0.219 | 1 ¹⁾ |
| TPSD475*050#0700 | D | 4.7 | 50 | 85 | 33 | 125 | 2.4 | 6 | 700 | 0.463 | 0.417 | 0.185 | 1 ¹⁾ |
| TPSX475*050#0500V | X | 4.7 | 50 | 85 | 33 | 125 | 2.4 | 6 | 500 | 0.447 | 0.402 | 0.179 | 3 |
| TPSD685*050#0200 | D | 6.8 | 50 | 85 | 33 | 125 | 3.4 | 6 | 200 | 0.866 | 0.779 | 0.346 | 1 ¹⁾ |
| TPSD685*050#0300 | D | 6.8 | 50 | 85 | 33 | 125 | 3.4 | 6 | 300 | 0.707 | 0.636 | 0.283 | 1 ¹⁾ |
| TPSD685*050#0500 | D | 6.8 | 50 | 85 | 33 | 125 | 3.4 | 6 | 500 | 0.548 | 0.493 | 0.219 | 1 ¹⁾ |
| TPSD685*050#0600 | D | 6.8 | 50 | 85 | 33 | 125 | 3.4 | 6 | 600 | 0.500 | 0.450 | 0.200 | 1 ¹⁾ |
| TPSD106*050#0500 | D | 10 | 50 | 85 | 33 | 125 | 5 | 6 | 500 | 0.548 | 0.493 | 0.219 | 1 ¹⁾ |
| TPSE106*050#0250 | E | 10 | 50 | 85 | 33 | 125 | 5 | 6 | 250 | 0.812 | 0.731 | 0.325 | 1 ¹⁾ |
| TPSE106*050#0300 | E | 10 | 50 | 85 | 33 | 125 | 5 | 6 | 300 | 0.742 | 0.667 | 0.297 | 1 ¹⁾ |

1¹⁾ – Dry pack option (see How to order) is recommended for reduction of stress during soldering. Dry pack parts should be treated as MSL 3.

For AEC-Q200 availability, please contact KYOCERA AVX.

Moisture Sensitivity Level (MSL) is defined according to J-STD-020

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalogue limit post mounting.

For typical weight and composition see page 259.

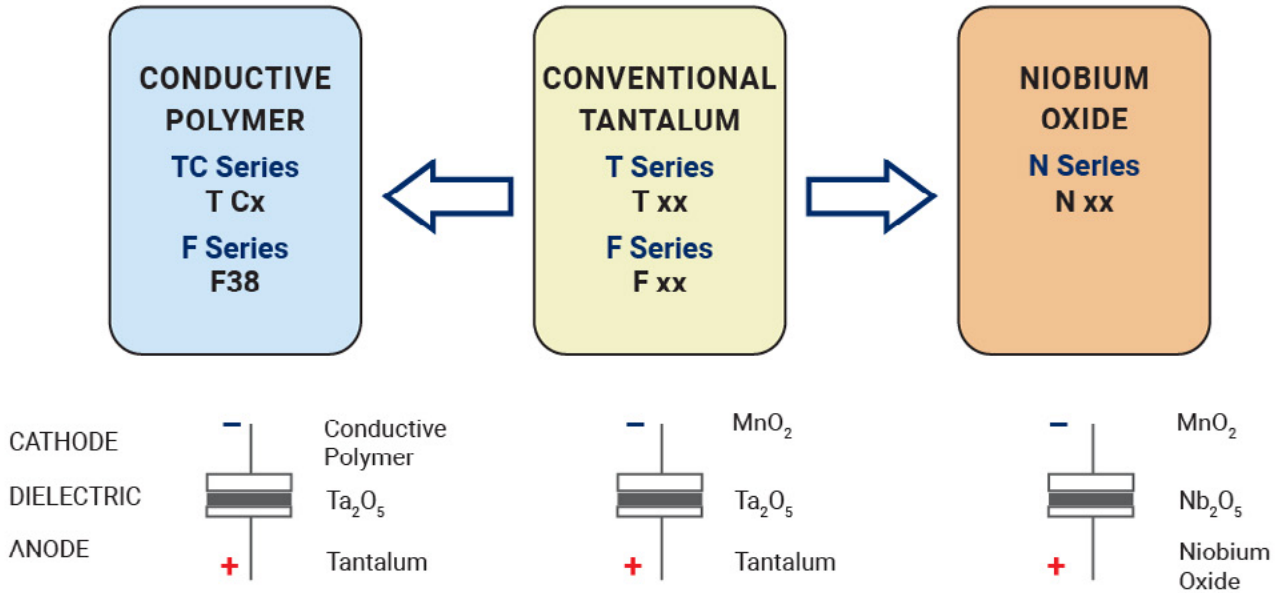
NOTE: KYOCERA AVX reserves the right to supply higher voltage ratings or tighter tolerance part in the same case size, to the same reliability standards.

QUALIFICATION TABLE

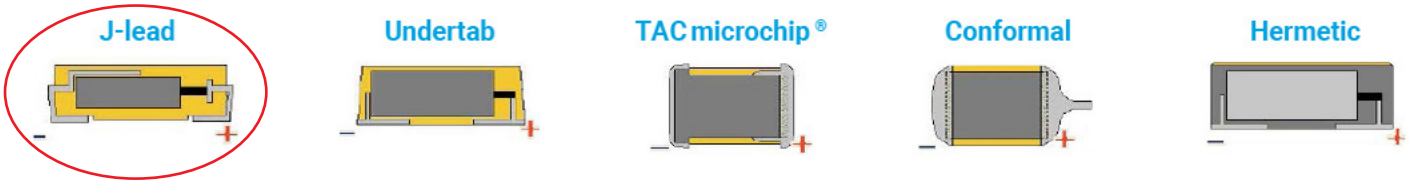
| TEST | TPS series (Temperature range -55°C to +125°C) | | | | | | | | | | |
|-----------------------|---|---------------|---------------|--------------------|------------------------------------|-----------|------------|------------|------------|------------|--|
| | Condition | | | Characteristics | | | | | | | |
| Endurance | Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) at 125°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$. Stabilize at room temperature for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | 1.5 x initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Humidity | Store at 65°C and 95% relative humidity for 500 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | 1.5 x initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ of initial value | | | | | | |
| | | | | DF | 1.2 x initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Temperature Stability | Step | Temperature°C | Duration(min) | | +20°C | -55°C | +20°C | +85°C | +125°C | +20°C | |
| | 1 | +20 | 15 | DCL | IL* | n/a | IL* | 10 x IL* | 12.5 x IL* | IL* | |
| | 2 | -55 | 15 | $\Delta C/C$ | n/a | +0/-10% | $\pm 5\%$ | +10/-0% | +12/-0% | $\pm 5\%$ | |
| | 3 | +20 | 15 | DF | IL* | 1.5 x IL* | IL* | 1.5 x IL* | 2 x IL* | IL* | |
| | 4 | +85 | 15 | ESR | 1.25 x IL* | 2.5 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | |
| | 5 | +125 | 15 | | | | | | | | |
| 6 | +20 | 15 | | | | | | | | | |
| Surge Voltage | Apply 1.3x category voltage (Uc) at 125°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 Ω | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Mechanical Shock | MIL-STD-202, Method 213, Condition C | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | initial limit | | | | | | |
| Vibration | MIL-STD-202, Method 204, Condition D | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | initial limit | | | | | | |

*Initial Limit

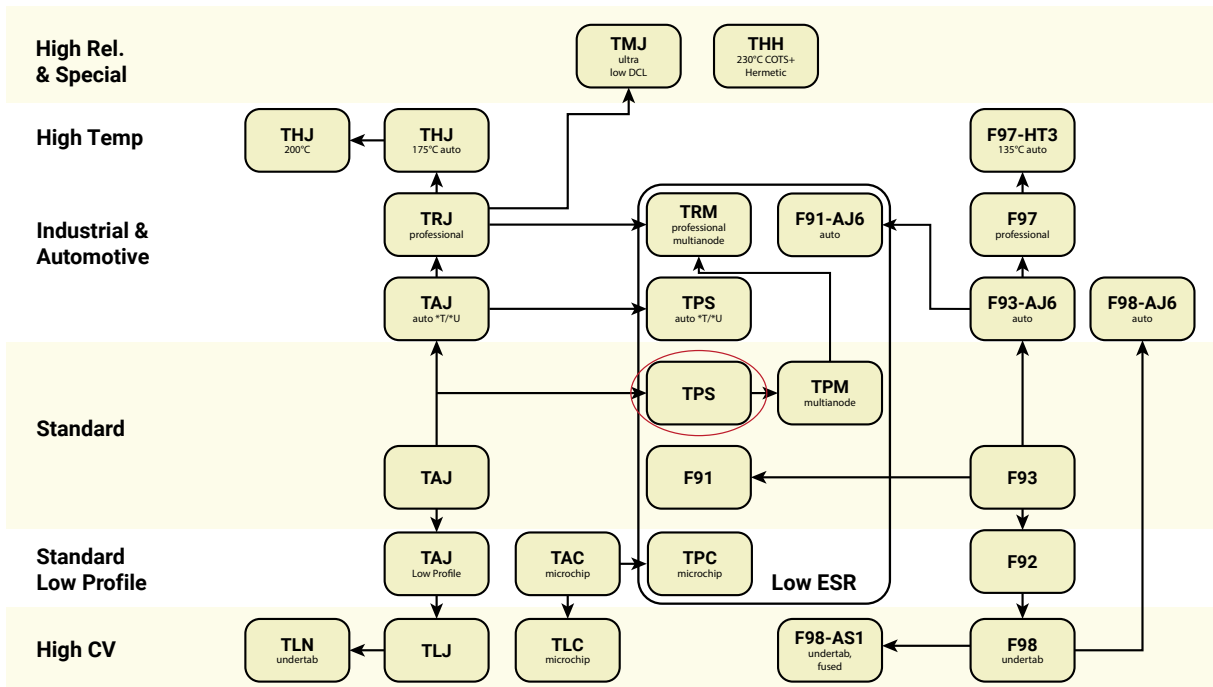
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