

Certified Safety Capacitors X², Y³ & X¹, Y²

X², Y³ (LS style) and X¹, Y² (ES style) Class Compliant* chip capacitors specifically designed for use in modem, facsimile, telephone and other electronic equipment where lightning or overvoltage surges can occur. Both styles are rated at 250 Vac safety approved with COG (NPO) and X7R dielectrics available (dependant on style).

X², Y³ (LS style) is certified to EN 60950 and compliant to Standards EN 132400: 1994/A2: 1998/IEC60384-14, Second Edition: 1993/A1:1995.

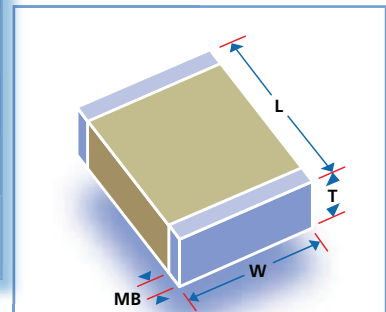
X¹, Y² (ES style) is certified to IEC60384-14, Second Edition: 1993/A1:1995 and compliant to Standards EN 132400: 1994/A2:1998.

Both styles meet the requirements of EN61000-4-5, IEC1000-4-5 and IEC801-4-5.

Certification numbers

| Safety Classification | X ² , Y ³ | X ¹ , Y ² |
|-----------------------|--|--|
| TUV | LS1808N, LS1812N - *T72140287.01 LS1808B - *T72140286.01 | ES 1808 - R60012089 ES 2211, ES 2215 - R2072738.01 ES 2225 - R2072738.02 |
| Standards | EN 132400, EN 60950, IEC 60384-14 2nd Edition, Class X ² Y ³ . | EN 132400, IEC 60384-14 2nd Edition, Class X ¹ Y ² |
| UL | NWQG2.E208336 and NWQG8.E208336 | |

*LS style is compliant with Robustness of Termination (cl 4.3) test according to IEC 60384-1 amendment 3 cl 4.34 and 4.35 Resistance to Soldering Heat (cl 4.4) tested according to IEC 60384-1 amendment 3 cl. 4.14.2, Impulse Test made with 2.5 KV or 5.0KV as required according to 6.4.2.1 in EN 60950. The creepage distance between live parts of different polarity meets the requirements of IEC 60950.



Dimensions - inches/mm

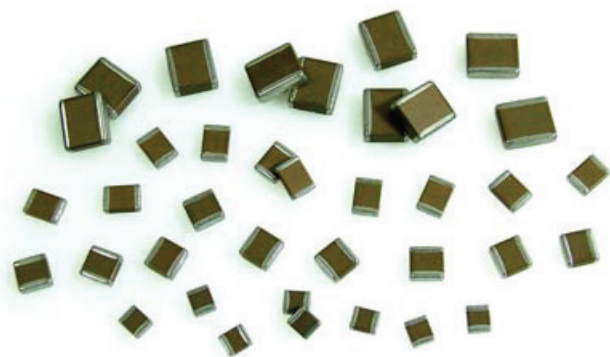
| Safety Classification | Size | X ² , Y ³ | | X ¹ , Y ² | | | |
|-----------------------|---------------------|---------------------------------|---------|---------------------------------|---------|---------|---------|
| | | LS 1808 | LS 1812 | ES 1808 | ES 2211 | ES 2215 | ES 2225 |
| L | inches ±0.015/0.38: | 0.180 | 0.180 | 0.180* | 0.220 | 0.220 | 0.220 |
| | mm ±0.015/0.38: | 4.57 | 4.57 | 4.57 | 5.58 | 5.58 | 5.58 |
| W | inches ±0.02: | 0.080 | 0.125 | 0.080** | 0.110 | 0.150 | 0.250 |
| | mm ±0.508: | 2.03 | 3.18 | 2.03 | 2.79 | 3.81 | 6.35 |
| MB | inches: | 0.024 | 0.024 | 0.020 | 0.300 | 0.300 | 0.300 |
| | mm: | 0.609 | 0.609 | 5.08 | 0.762 | 0.762 | 0.762 |
| Creepage | inches: | 0.102 | 0.102 | 0.100 | 0.157 | 0.157 | 0.157 |
| | mm: | 2.60 | 2.60 | 2.50 | 3.99 | 3.99 | 3.99 |

*Tolerance is ±0.014/0.35 **Tolerance is ±0.012/0.30

How to Order - Certified Safety Capacitors

| LS | 1808 | N | 122 | K | 302 | N | X080 | T | M |
|--|--------------------------|---|--|--|---|---|--|---|---|
| STYLE LS = X ² , Y ³ ES = X ¹ , Y ² | SIZE See Chart | DIELECTRIC N = COG B = X7R | CAPACITANCE Value in Picofarads. Two significant figures, followed by number of zeros: 121 = 120pF | TOLERANCE J = ± 5% K = ± 10% M = ± 20% | VOLTAGE-SURGE Two significant figures, followed by number of zeros: 302 = 3000V (X ² , Y ³) 502 = 5000V (X ¹ , Y ²) | TERMINATION N = Nickel Barrier | THICKNESS OPTION Blank = Standard thickness X = special thickness, specified in inches: X080 = 0.08" X100 = 0.10" X010 = 0.11" X150 = 0.15" | PACKING No suffix = Bulk T = Tape & Reel | MARKING Parts marked: NLS (X ² , Y ³) NY2 (X ¹ , Y ²) |

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- For dielectric characteristics see page 4 & 7.
- Nickel Barrier terminations.
- Capacitance tolerances available ±5%, ±10%, ±20%

Note: Capacitance values are shown below as 3 digit code: 2 significant figures followed by the no. of zeros
e.g. 183 = 18,000pF.

Capacitance values

| Safety Classification | | X ² , Y ³ | | | | | X ¹ , Y ² | | | | | |
|-----------------------|----------------|---------------------------------|----------------|---------------|---------------|----------------|---------------------------------|---------|----------------|----------------|----------------|---------|
| Size | | LS 1808 | | LS 1812 | | | ES 1808 | | ES 2211 | ES 2215 | ES 2225 | |
| Tmax | inches: mm: | 0.065 1.65 | 0.080* 2.03 | 0.065 1.65 | 0.065 1.65 | 0.100* 2.54 | 0.080* 2.03 | | 0.150* 4.00 | 0.150* 4.00 | 0.150* 4.00 | |
| Dielectric | | COG/NPO | | X7R | COG/NPO | | | COG/NPO | X7R | COG/NPO | COG/NPO | COG/NPO |
| 4R7 | | | | | | | • | | | | | |
| 5R0 | | • | | | | | • | | | | | |
| 6R8 | | • | | | | | • | | | | | |
| 8R2 | | • | | | | | • | | | | | |
| 100 | | • | | | | | • | | | | | |
| 120 | | • | | | | | • | | | | | |
| 150 | | • | | | | | • | | | | | |
| 180 | | • | | | | | • | | | | | |
| 220 | | • | | | | | • | | | | | |
| 270 | | • | | | | | • | | | | | |
| 330 | | • | | | | | • | | | | | |
| 390 | | • | | | | | • | | | | | |
| 470 | | • | | | | | • | | | | | |
| 560 | | • | | | | | • | | | | | |
| 680 | | • | | | | | • | | | | | |
| 820 | | • | | | | | • | | | | | |
| 101 | | • | | | | | • | | | | | |
| 121 | | • | | | | | • | | | | | |
| 151 | | • | | • | | | • | • | • | | | |
| 181 | | • | | • | | | • | • | • | | | |
| 221 | | • | | • | | | • | • | • | | | |
| 271 | | • | | • | | | • | • | • | | | |
| 331 | | • | | • | | | • | • | • | | | |
| 391 | | • | | • | | | • | • | • | | | |
| 471 | | • | | • | | | • | • | • | | | |
| 561 | | • | | • | | | • | • | • | | | |
| 681 | | • | | • | | | • | • | • | | | |
| 821 | | | • | • | | | • | | | | | |
| 102 | | | • | • | • | | • | | | • | • | |
| 122 | | | | • | • | | | | | | | |
| 152 | | | | • | • | | | | | | | |
| 182 | | | | | | • | | | | | | |
| 222 | | | | | | • | | | | | | |

* Denotes non standard chip thickness.
Order code needs to have an 'X' inserted together with the dimension in inches -e.g. X080 where dimension is 0.080"