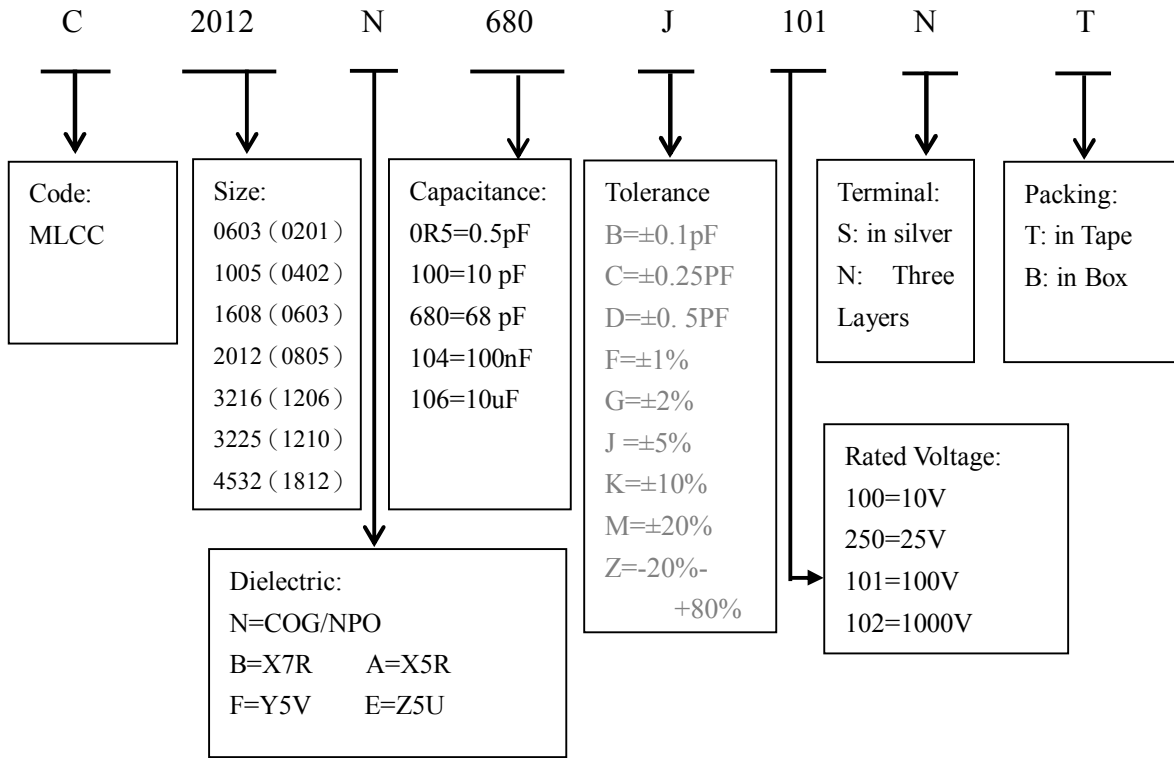


1. PART NUMBER

e.g.: C2012N680J101NT

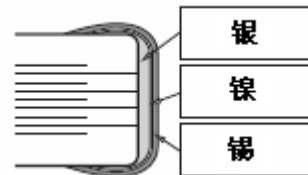


2. STRUCTURE

介质: Dielectric 电极: Electrode 端头: Terminal 银: Silver 镍: Nickel 锡: Tin



Inner Structure



Three Electrode layers

3. SIZE AND ELECTRICAL PARAMETERS



| SIZE (mm) | | DIMENSION (mm) | | | |
|-----------|--------|-----------------|-----------------|-----------------|-----------------|
| INCH | METRIC | L | W | T | E |
| 0201 | 0603 | 0.6 ± 0.03 | 0.3 ± 0.03 | 0.3 ± 0.03 | 0.15 ± 0.05 |
| 0402 | 1005 | 1.00 ± 0.05 | 0.50 ± 0.05 | 0.50 ± 0.05 | 0.25 ± 0.10 |
| 0603 | 1608 | 1.60 ± 0.10 | 0.80 ± 0.10 | 0.80 ± 0.10 | 0.30 ± 0.10 |
| 0805 | 2012 | 2.00 ± 0.20 | 1.25 ± 0.20 | 0.70 ± 0.20 | 0.50 ± 0.20 |
| | | | | 1.00 ± 0.20 | |
| | | | | 1.25 ± 0.20 | |
| 1206 | 3216 | 3.20 ± 0.30 | 1.60 ± 0.2 | 0.70 ± 0.20 | 0.50 ± 0.25 |
| | | | | 1.00 ± 0.20 | |
| | | | | 1.25 ± 0.20 | |
| 1210 | 3225 | 3.20 ± 0.30 | 2.50 ± 0.30 | 1.25 ± 0.30 | 0.75 ± 0.25 |
| | | | | 1.50 ± 0.30 | |
| 1812 | 4532 | 4.50 ± 0.40 | 3.20 ± 0.30 | ≤ 2.5 | 0.75 ± 0.20 |

4. DIELECTRIC CHARACTERISTIC INTRODUCTION AND TEST METHOD

| ITEM | STANDARD | | | | TEST METHOD |
|---------------------------------|---|--|-----------|---------|--|
| Capacitance | 0.5PF-47uF | | | | COG: |
| Tolerance | B=±0.1PF | C=±0.25PF | D=±0.5.PF | | C≤1000PF : 1MHz±10% |
| | F=±1% | G=±2% | J=±5% | | 1.0±0.2Vrms |
| Rated Voltage | 16、25、50、100、200、500、1000、2000 V(DC) | | | | C>1000PF: 1KHz±10% |
| | | | | | 1.0±0.2Vrms |
| Dissipation Factor | COG/NPO | DF≤0.15% | | | X7R/X5R: |
| | X7R/X5R | DF≤2.5%(≥50V) , ≤3.0%(25V) , ≤3.5%(16V) | | | 1KHz±10% 1.0±0.2Vrms |
| | Y5V/Z5U | DF ≤ 7%(C ≥ 100nF) . ≤ 3.5%(C<100nF) | | | Y5V/Z5U: |
| Insulation Resistance(IR) | COG/NPO | C≤10NF IR>50000MΩ ; C>10NF IR>5000Ω F | | | Test voltage: rated |
| | X7R/X5R | C≤25NF IR>10000MΩ ; C>25NF RXC>100Ω F | | | Time: 1 minute |
| | Y5V/Z5U | C≤25NF IR>4000MΩ ; C>25NF RXC>100Ω F | | | Temperature: 18-25℃ Humidity: <80% |
| Dielectric withstanding voltage | No damage after test | | | | Apply 2.5x rated voltage to both terminations for 5 seconds, charge and discharge current are less than 50mA. (This test doesn't apply to high-voltage MLCC) |
| Termination Adhesion | No damage after test | | | | Test Condition: 5N 10±1S |
| Bending Strength | No damage after test and capacitance tolerance shall not be more than 10% | | | | After soldering capacitor on the PCB, 1mm per 1 second of bending for this PCB shall be applied. |
| Solderability | Temperature | 235±5℃ | | | Completely immerse the capacitor in the molthen rosin for 2s and then put it in the 10mm molthen solder with a temperature of 235±5℃ (265±5℃) for 2(5)s. after that pick it up, clean the solvent and inspect it under 10x or more microscope. |
| | Time | 1±1S | | | |
| | Cover | ≥95 | | | |
| Resistance to soldering Heat | Tempertaure | 265±5℃ | | | |
| | Time | 1±1S | | | |
| | Cover | ≥95 | | | |
| | ΔC/C | ≤0.5% or 0.5PF | | | |
| Temperature Cycling | Dielectric | COG/NPO | X7R/X5R | Y5V/Z5U | Temperature: -55 ± 3℃ ~125 ± 3℃ |
| | ΔC/C | ≤1% | ≤±10% | ≤±30% | COG/X7R |
| | No damage after test | | | | -25±3℃~85±3℃ Y5V -10±3℃~85±3℃ Z5U Cycle times: 5 times per 30s Resume time: 24h |

| | | | | | |
|--|----------------------|----------|---------|--------------------------------|--|
| Humidity and Moisture Resistance | Dielectric | COG/NPO | X7R/X5R | Y5V/Z5U | Permanent Moisture T=40±2°C T=21D Relative Humidity: 93+2~3% Resume Time: 1-2h |
| | ΔC/C | ≤2% | ≤10% | ≤20% | |
| | DF | 0.03 | 0.05 | 0.07 | |
| | IR | RXC>25S | RXC>25S | RXC>25S | |
| No damage after test | | | | | |
| T.C. characteristics | dielectric | ΔC/C | | T.C. | |
| | COG/NPO | ±30PPM | | +20°C → -55°C → +20°C → +125°C | |
| | X7R/X5R | ±15°C | | +20°C → -55°C → +20°C → +125°C | |
| | Z5U | ±22%~56% | | +20°C → +10°C → +20°C → +85°C | |
| | Y5V | ±22%~82% | | +20°C → -25°C → +20°C → +85°C | |
| Vibration | No damage after test | | | f=10-500Hz 0.75MM/2S | |
| Bump | No damage after test | | | 4000 times | |
| Life test | dielectric | COG/NPO | X7R/X5R | Y5V/Z5U | Temperature: +125°C NPO/X7R +85°C Y5V/Z5U T=100 h Resume time: 24h |
| | ΔC/C | ≤2% | ≤±12.5% | ≤±30% | |
| | DF | 0.003 | 0.003 | 0.05 | |
| | IR | RXC>25S | RXC>25S | RXC>25S | |

5. T.C.CHARACTERISTICS

| Dielectric | NPO(COG) | X7R(X5R) | Y5V |
|-----------------------|-----------|---------------|----------|
| Operating Temperature | -55~125°C | -55~125(85)°C | -30~85°C |
| T.C.Characteristics | ±30PPM/°C | ±15% | -20~+80% |

COG8/NPO Typical Characteristics



X7R/X5R Typical Characteristics



Y5V Typical Characteristics



6. VOLTAGE AND CAPACITANCE (COG/NPO)

| Size | Voltage | Capacitance |
|------|---------|-------------------|
| 0201 | 25V | 0.5 PF -1000PF |
| | 50V | 0.5 PF -680PF |
| 0402 | 25V | 0.5 PF -2200PF |
| | 50V | 0.5 PF -2200PF |
| 0603 | 25V | 0.5 PF -10000PF |
| | 50V | 0.5 PF -10000PF |
| 0805 | 25V | 0.5 PF -68000PF |
| | 50V | 0.5 PF -47000PF |
| 1206 | 16V | 0.5 PF -100000PF |
| | 25V | 0.5 PF -100000PF |
| | 50V | 0.5 PF -68000PF |
| 1210 | 25V | 470 PF -47000PF |
| | 50V | 560 PF -56000PF |
| 1812 | 25V | 1000 PF -100000PF |
| | 50V | 1000 PF -47000PF |

(X7R/X5R)

| Size | Voltage | Capacitance |
|------|---------|-----------------|
| 0402 | 6.3V | 100 PF -1.0 uF |
| | 10V | 100 PF -680nF |
| | 16V | 100 PF -220nF |
| 0603 | 6.3V | 100 PF -4.7 uF |
| | 10V | 100 PF -4.7 uF |
| | 16V | 100 PF -2.2 uF |
| | 25V | 100 PF -2.2 uF |
| | 50V | 100 PF -1.0 uF |
| 0805 | 6.3V | 220 PF -10 uF |
| | 10V | 220 PF -10 uF |
| | 16V | 220 PF -10 uF |
| | 25V | 220 PF -4.7 uF |
| | 50V | 220 PF -2.2 uF |
| 1206 | 6.3V | 220 PF -10 uF |
| | 10V | 220 PF -10uF |
| | 16V | 220 PF -10 uF |
| | 25V | 220 PF -10 uF |
| | 50V | 220 PF -10 uF |
| 1210 | 6.3V | 1000 PF -47 uF |
| | 10V | 1000 PF -22 uF |
| | 16V | 1000 PF -22 uF |
| | 25V | 1000 PF -22 uF |
| | 50V | 1000 PF -10 uF |
| 1812 | 25V | 10000 PF -47 uF |
| | 50V | 10000 PF -22 uF |

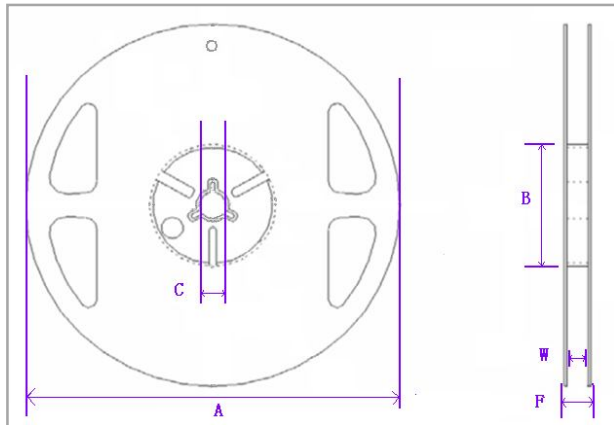
(Y5V)

| Size | Voltage | Capacitance |
|------|---------|---------------|
| 0402 | 6.3V | 100nF -1 uF |
| | 10V | 100nF -1 uF |
| | 16V | 22nF -680nF |
| | 50V | 22nF -680nF |
| 0603 | 6.3V | 680nF-4.7 uF |
| | 10V | 22nF -4.7 uF |
| | 16V | 22nF -4.7 uF |
| | 25V | 22nF -2.2 uF |
| | 50V | 22nF -1 uF |
| 0805 | 6.3V | 4.7 uF -10 uF |
| | 10V | 2.2 uF -10 uF |
| | 16V | 22nF -4.7 uF |
| | 25V | 22nF -2.2 uF |
| | 50V | 22nF -1 uF |
| 1206 | 6.3V | / |
| | 10V | 2.2uF -22 uF |
| | 16V | 1uF -10 uF |
| | 25V | 22nF -10 uF |
| | 50V | 22nF -10 uF |
| 1210 | 6.3V | 22nF-47 uF |
| | 10V | 10uF-22 uF |
| | 16V | 2.2uF-10 uF |
| | 25V | 220nF-2.2 uF |
| | 50V | 22nF -10 uF |
| 1812 | 25V | 10uF-47 uF |
| | 50V | 22nF-22uF |

7.Packing Information

Reel

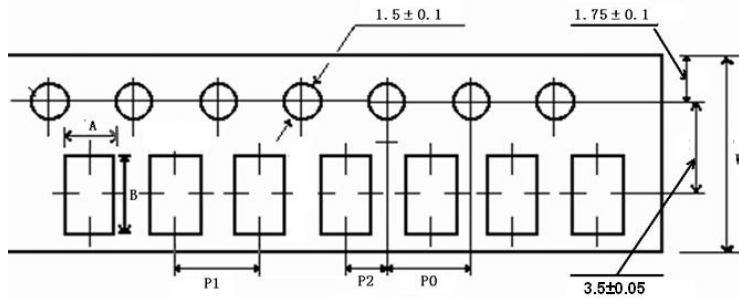
| Dimension | | A | B | C | F | W |
|--|------|-------------|-------------|-------------|-------------|-------------|
| 0201 0402 0603 0805 1206 1210 | mm | 178±2.0 | 60.0±1.0 | 13.5±0.5 | 11.4±0.1 | 9.00±0.3 |
| | Inch | 7.008±0.079 | 2.362±0.039 | 0.531±0.020 | 0.449±0.039 | 0.354±0.012 |
| | mm | 178±2.0 | 60.0±1.0 | 13.5±0.5 | 15.4±1.0 | 13.0±0.3 |
| | Inch | 7.008±0.079 | 2.362±0.039 | 0.531±0.020 | 0.606±0.039 | 0.512±0.012 |



Packing Quantity

| | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 |
|--------------|---------|------|------|------|------|-------|--------|
| Paper Tape | 10K/15K | 10K | 4K | 4K | 4K | | |
| Plastic Tape | | | | 2K | 2K | 1K/2K | 500PCS |

Tape



Unit: mm

| TYPE | A | B | W | P0 | P1 | P2 |
|------|-----------|-----------|------------|-----------|-----------|-----------|
| 0201 | 0.38±0.05 | 0.68±0.05 | 8.00±0.20 | 4.00±0.10 | 2.00±0.10 | 2.00±0.05 |
| 0402 | 0.65±0.10 | 1.15±0.10 | 8.00±0.20 | 4.00±0.10 | 2.00±0.10 | 2.00±0.05 |
| 0603 | 1.10±0.10 | 1.90±0.10 | 8.00±0.20 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 |
| 0805 | 1.65±0.20 | 2.40±0.20 | 8.00±0.20 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 |
| 1206 | 2.00±0.20 | 3.60±0.20 | 8.00±0.20 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 |
| 1210 | 2.80±0.10 | 3.50±0.10 | 8.00±0.20 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 |
| 1812 | 3.60±0.20 | 4.90±0.20 | 12.00±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 |

8.WELDING TEMPERATURE

Suitable reflow temperature



1-2°C/Sec ramp

Preheat 150-183°C: 2-3 minutes

Time above 183°C: 60-100 seconds

Peak Temperature: 230±10°C

Module should only be in oven for 5.5-6 minute