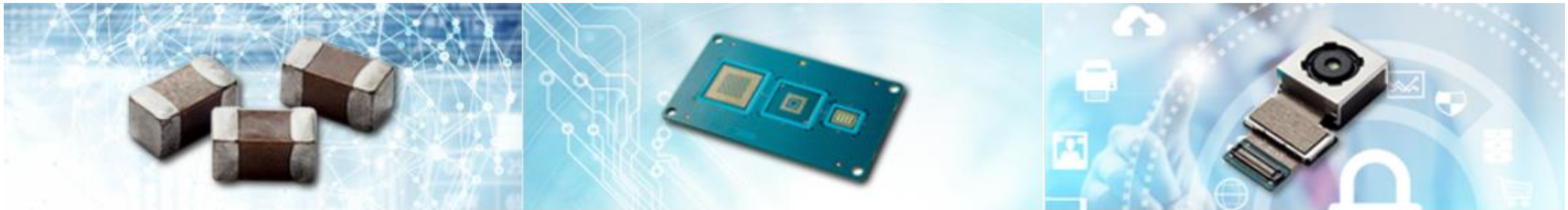


# Automotive MLCC Roadmap

2023.Q2



# Automotive MLCC 2.5V ~ 100V



| Size  | Voltage | <10p | <100p | 100p | 220p | 470p | 1n | 2.2n | 4.7n | 10n | 22n | 47n | 100n | 220n     | 470n | 1μ | 2.2μ | 4.7μ  | 10μ | 22μ | 47μ  | 100μ | 220μ | Voltage |
|-------|---------|------|-------|------|------|------|----|------|------|-----|-----|-----|------|----------|------|----|------|-------|-----|-----|------|------|------|---------|
| 1210" | 100V    |      |       |      |      |      |    |      |      |     |     |     | COG  |          |      |    |      |       | X7S |     |      |      |      | 100V    |
|       | 50V     |      |       |      |      |      |    |      |      |     |     |     | 2023 |          |      |    |      |       |     |     | 2024 |      |      | 50V     |
|       | 25V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     | X7S |      |      |      | 25V     |
|       | 16V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     | X7R  |      |      | 16V     |
|       | 10V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      | X7T  |      | 10V     |
|       | 6.3V    |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      | X7T  |      | 6.3V    |
|       | 4V      |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      | X7T  | 2024 | 4V      |
| 2.5V  |         |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      | X7T  | 2.5V |         |
| 1206" | 100V    |      |       |      |      |      |    |      |      |     |     |     |      | COG 2024 |      |    | X7S  | Q1.24 |     |     |      |      |      | 100V    |
|       | 50V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      | X7S   |     |     |      |      |      | 50V     |
|       | 25V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     | X7S |      |      |      | 25V     |
|       | 16V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     | X7S  |      |      | 16V     |
|       | 10V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 10V     |
| 0805" | 100V    |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 100V    |
|       | 50V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 50V     |
|       | 25V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 25V     |
|       | 16V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 16V     |
|       | 10V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 10V     |
| 0603" | 100V    |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 100V    |
|       | 50V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 50V     |
|       | 25V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 25V     |
|       | 16V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 16V     |
|       | 10V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 10V     |
| 0402" | 100V    |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 100V    |
|       | 50V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 50V     |
|       | 25V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 25V     |
|       | 16V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 16V     |
|       | 10V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 10V     |
| 0201" | 100V    |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 100V    |
|       | 50V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 50V     |
|       | 25V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 25V     |
|       | 16V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 16V     |
|       | 10V     |      |       |      |      |      |    |      |      |     |     |     |      |          |      |    |      |       |     |     |      |      |      | 10V     |

Fully qualified according  
AEC-Q200 & VW80808

3 & 5mm guaranteed  
bending capability available

R&D

**Recommended**

Smaller / Higher V  
available

NRND

**X7R | X7S | X7T**

- 10% tolerance is standard
- 6.3V | 16V | 50V | 100V in focus
- E3 is recommended

1 | 2.2 | 4.7

**COG**

- 5% tolerance is standard
- 50V & 100V are most used
- E6 is recommended

1 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8

# Automotive MLCC High Voltage



| Size  | Voltage | TCC     | 10p | 100p     | 220p | 470p | 1n  | 2.2n  | 4.7n | 10n | 15n  | 22n   | 33n  | 47n | 100n  | 220n | 330n  | 470n | 1000n |      |
|-------|---------|---------|-----|----------|------|------|-----|-------|------|-----|------|-------|------|-----|-------|------|-------|------|-------|------|
| 1812" | 2kV     | X7R     |     |          |      |      |     | Q1.24 |      |     |      |       |      |     |       |      |       |      |       |      |
|       | 1kV     |         |     |          |      |      |     |       |      |     |      |       |      |     | 2024  |      |       |      |       |      |
|       | 630V    |         |     |          |      |      |     |       |      |     |      |       |      |     |       |      | Q1.24 |      |       |      |
|       | 250V    |         |     |          |      |      |     |       |      |     |      |       |      |     |       |      |       |      |       | 2024 |
| 1210" | 1kV     | COG     |     |          |      |      | COG |       |      |     |      | Q1.24 |      |     |       |      |       |      |       |      |
|       |         | X7R     |     |          |      |      |     |       |      |     |      | X7R   |      |     |       |      |       |      |       |      |
|       | 630V    | COG     |     |          |      |      |     |       |      | COG |      |       |      |     |       |      |       |      |       |      |
|       |         | X7R     |     |          |      |      |     |       |      |     |      |       | X7R  |     | Q1.24 |      |       |      |       |      |
| 250V  | X7R     |         |     |          |      |      |     |       |      |     |      |       |      |     |       | X7R  |       |      |       |      |
| 1206" | 2kV     | X7R     |     |          |      |      |     |       |      |     |      |       |      |     | 2024  |      |       |      |       |      |
|       | 1kV     | COG     |     | COG      |      |      |     |       |      |     |      |       |      |     |       |      |       |      |       |      |
|       |         | X7R     |     |          |      |      | X7R |       |      |     |      |       |      |     |       |      |       |      |       |      |
|       | 630V    | COG     |     | COG      |      |      |     |       |      |     |      |       |      |     |       |      |       |      |       |      |
|       |         | X7R     |     |          |      |      | X7R |       |      |     |      |       | 2023 |     |       |      |       |      |       |      |
|       | 250V    | COG     |     |          |      |      | COG |       |      |     |      |       |      |     |       |      |       |      |       |      |
| X7R   |         |         |     |          |      |      |     |       |      |     | X7R  |       |      |     | 2023  |      |       |      |       |      |
| 0805" | 630V    | COG     | COG |          |      |      |     | 2023  |      |     |      |       |      |     |       |      |       |      |       |      |
|       | 250V    |         |     | COG      |      |      |     |       |      |     |      |       |      |     |       |      |       |      |       |      |
|       |         |         | X7R |          | X7R  |      |     |       |      |     |      |       |      |     | 2024  |      |       |      |       |      |
| 0603" | 250V    | COG/X7R |     | COG 2023 |      |      |     |       |      |     | 2024 |       |      |     |       |      |       |      |       |      |
| Size  | Voltage | TCC     | 10p | 100p     | 220p | 470p | 1n  | 2.2n  | 4.7n | 10n | 15n  | 22n   | 33n  | 47n | 100n  | 220n | 330n  | 470n | 1000n |      |

Under Development  
Recommended

- X7R & COG
- -55°C ~ 125°C