

ECMS1V0704

Common mode choke, surface mount



Product features

- High frequency filter
- Square type closed magnetic core
- Current rating up to 15 A
- 8.0 mm x 6.5 mm surface mount package in a 3.8 mm height
- Moisture sensitivity level (MSL): 1

Applications

- Battery backup
- Renewable energy products
- High tech consumer products
- Appliances
- LED lighting
- Smart meters
- Industrial IoT equipment
- Motion controls
- Power supplies
- Medical equipment

Environmental compliance and general specifications

- Storage temperature (component):
-40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C
(ambient plus self-temperature rise)
- Solder reflow temperature:
J-STD-020 (latest revision) compliant



Powering Business Worldwide

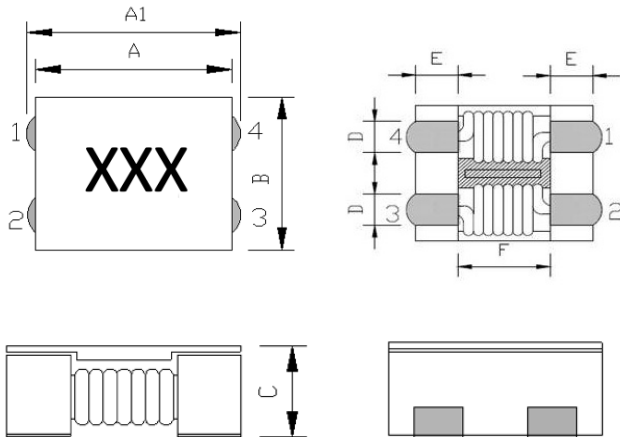
Product specifications

| Part number ⁵ | Impedance ¹ (Ω) minimum | Impedance ¹ (Ω) typical | DCR ² (mΩ) @ +25 °C maximum | Rated current ³ (A) maximum | Rated voltage (Vdc) maximum | Insulation resistance ⁴ @ (MΩ) minimum |
|--------------------------|---------------------------------------|---------------------------------------|--|--|-----------------------------------|---|
| ECMS1V0704-700-R | 40 | 70 | 5 | 15 | 80 | 10 |
| ECMS1V0704-141-R | 100 | 140 | 10 | 9 | 80 | 10 |
| ECMS1V0704-301-R | 225 | 300 | 10 | 5 | 80 | 10 |
| ECMS1V0704-451-R | 275 | 450 | 10 | 5 | 80 | 10 |
| ECMS1V0704-701-R | 500 | 700 | 15 | 4 | 80 | 10 |
| ECMS1V0704-102-R | 800 | 1020 | 17 | 3 | 80 | 10 |
| ECMS1V0704-132-R | 910 | 1300 | 21 | 2.5 | 80 | 10 |
| ECMS1V0704-272-R | 2000 | 2700 | 63 | 1 | 80 | 10 |
| ECMS1V0704-302-R | 2500 | 3000 | 75 | 0.9 | 80 | 10 |

1. Impedance test parameters: 100 MHz, 0.1 Vrms, parallel connection (1,2 - 4,3), +25 °C
2. DCR test parameters: parallel connection (1,2 - 4,3), 4-wire method measured at +25°C
3. Rated current: DC current for an approximate temperature rise of 40 °C without core loss. It is recommended that the temperature of the part not exceed +125 °C under worst case operating conditions verified in the end application.

4. Insulation resistance: Coil to coil
5. Part Number Definition: ECMS1Vxxx-yyy-R
ECMS1V = Product code
xxx= Size indicator
yyy= Typical impedance value in ohms. R= decimal point, if no R is present then last digit indicates the number of zeros
-R suffix = RoHS compliant

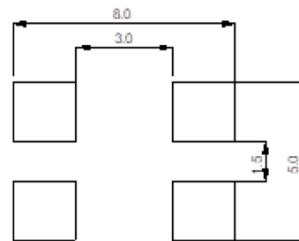
Mechanical parameters, schematic, pad layout (mm)



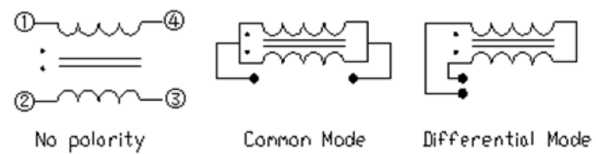
| Dimension | Value |
|-----------|-------------|
| A | 7.0 ±0.5 |
| A1 | 7.5 ±0.5 |
| B | 6.0 ±0.5 |
| C | 3.8 maximum |
| D | 1.5 typical |
| E | 1.7 typical |
| F | 3.5 typical |

Part marking: xxx= Typical impedance value in ohms
All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ±0.5 millimeters unless stated otherwise
Traces or vias underneath the inductor is not recommended

Recommended PCB Layout

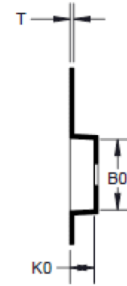
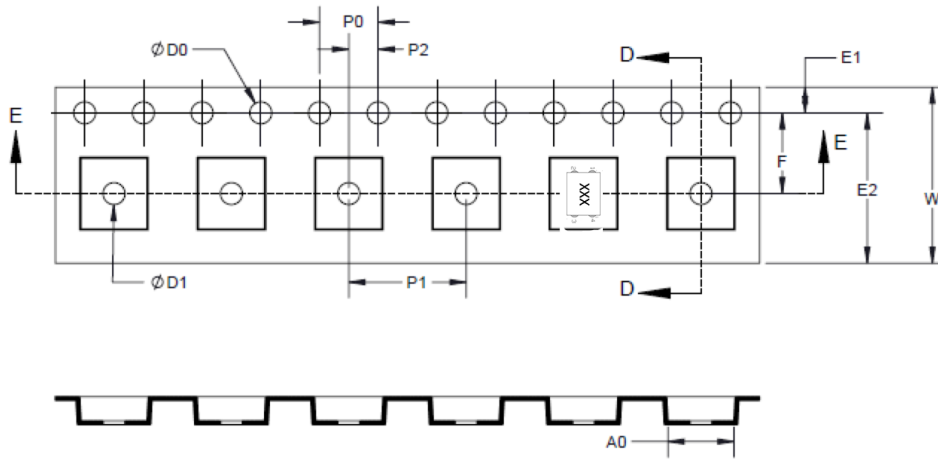


Schematic

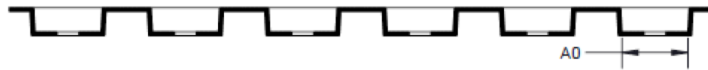


Packaging information (mm)

Supplied in tape and reel packaging, 13" diameter reel (EIA-481 compliant)
1500 parts per reel



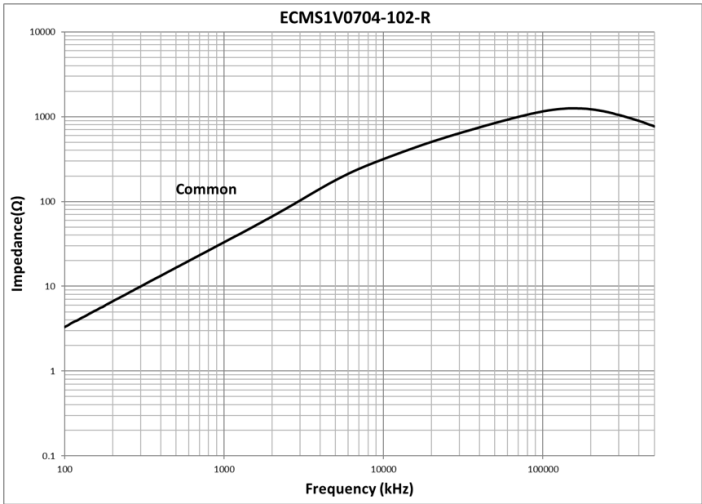
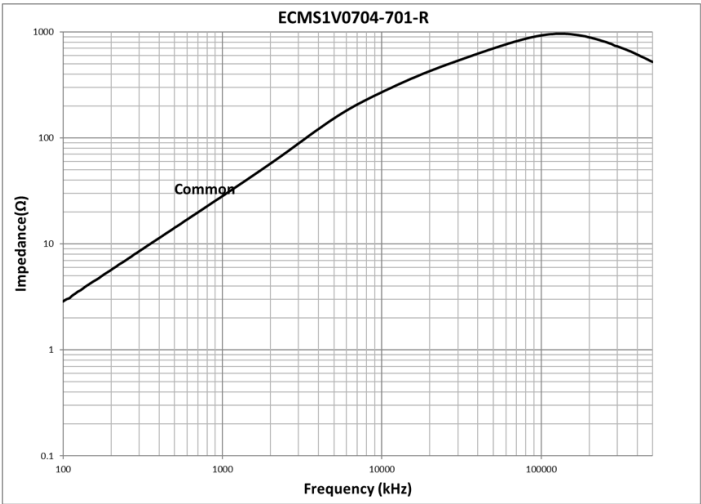
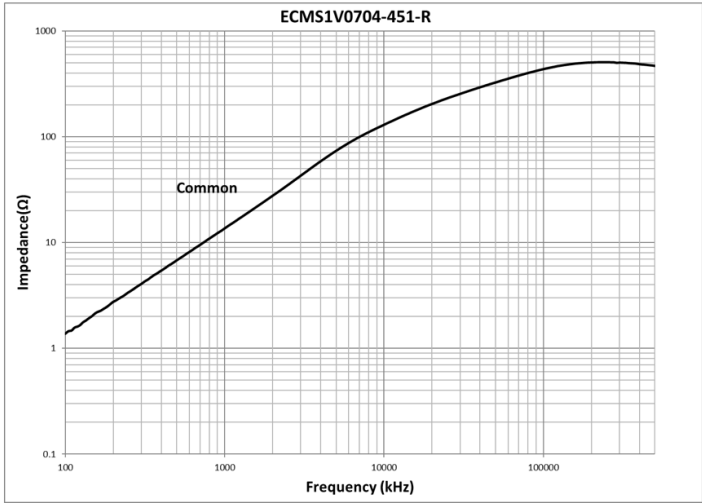
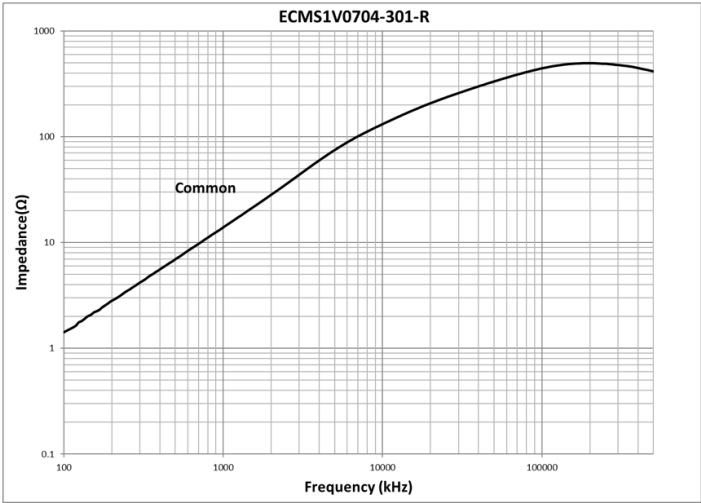
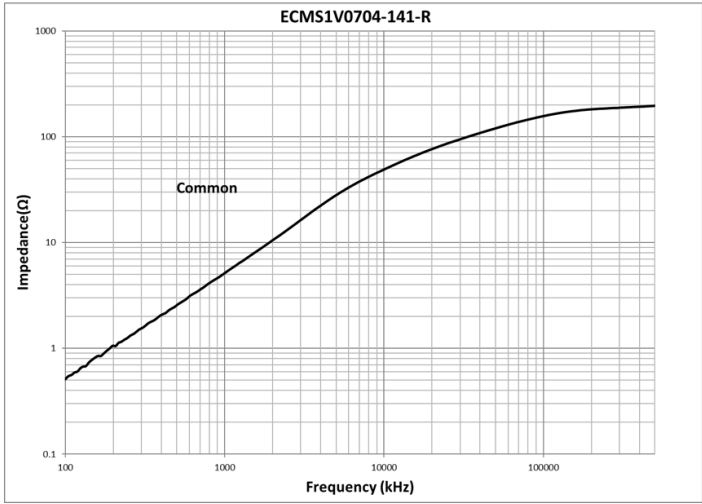
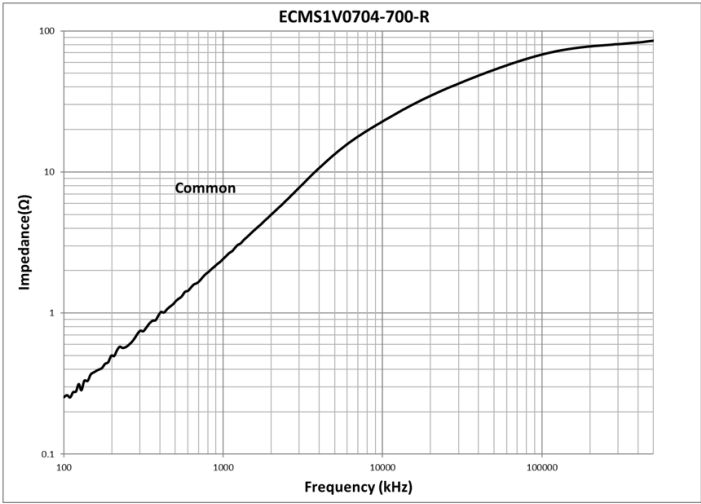
SECTION D-D



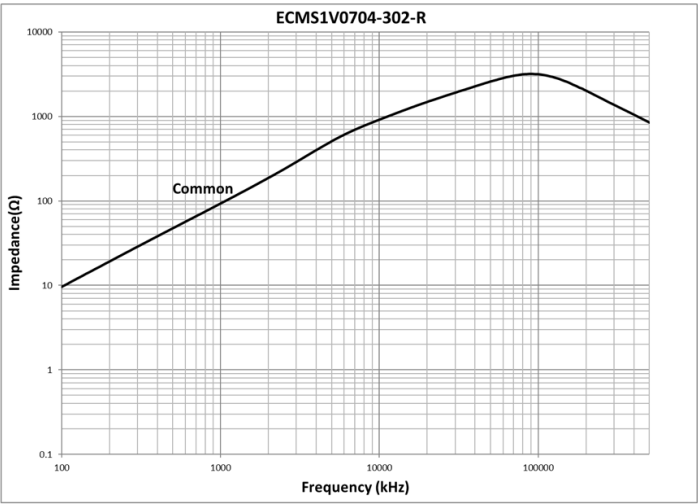
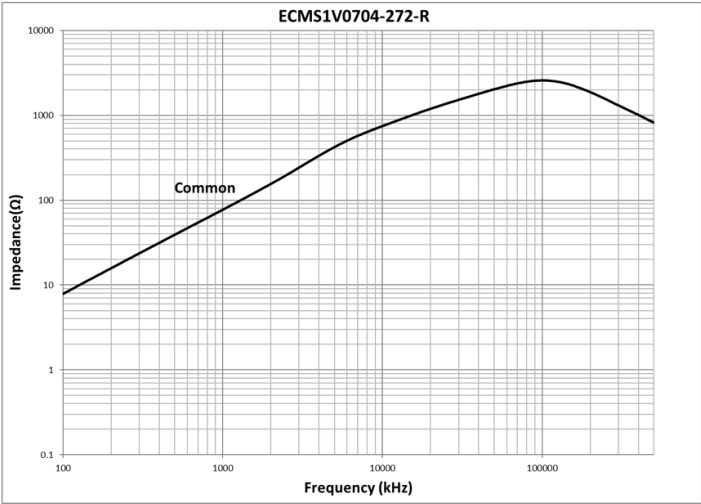
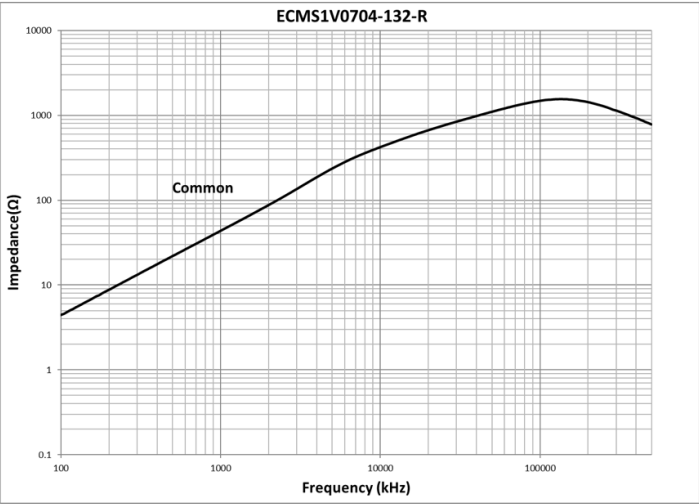
SECTION E-E

| Dimension | Value |
|-----------|-------------|
| W | 16 ±0.3 |
| F | 7.5 ±0.1 |
| E1 | 1.75 ±0.1 |
| E2 | na |
| P0 | 4.0 ±0.1 |
| P1 | 12 ±0.1 |
| P2 | 2.0 ±0.1 |
| D0 | 1.5 +0.1/-0 |
| D1 | 1.5 +0.1/-0 |
| A0 | 7.5 ±0.1 |
| B0 | 7.2 ±0.1 |
| K0 | 4.2 ±0.1 |
| T | 0.4 ±0.05 |

Impedance vs frequency



Impedance vs frequency



Solder reflow profile

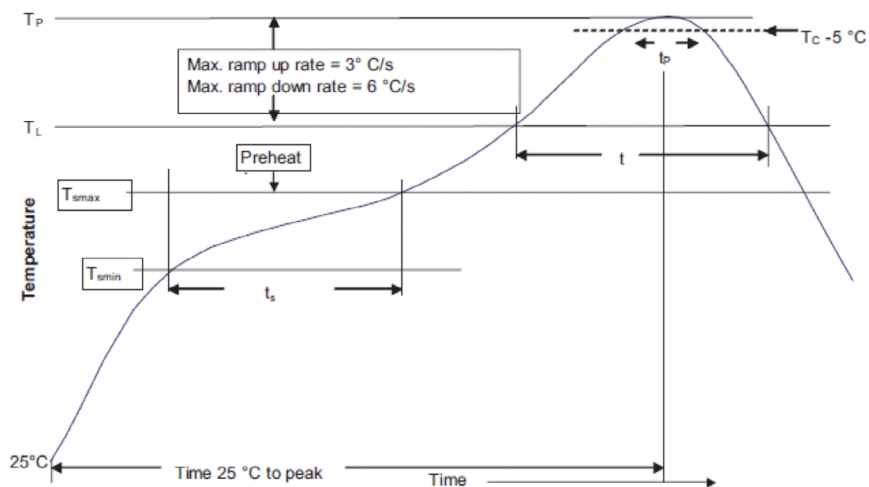


Table 1 - Standard SnPb solder (T_C)

| Package thickness | Volume mm ³ <350 | Volume mm ³ ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5 mm) | 235 °C | 220 °C |
| ≥2.5 mm | 220 °C | 220 °C |

Table 2 - Lead (Pb) free solder (T_C)

| Package thickness | Volume mm ³ <350 | Volume mm ³ 350 - 2000 | Volume mm ³ >2000 |
|-------------------|-----------------------------|-----------------------------------|------------------------------|
| <1.6 mm | 260 °C | 260 °C | 260 °C |
| 1.6 – 2.5 mm | 260 °C | 250 °C | 245 °C |
| >2.5 mm | 250 °C | 245 °C | 245 °C |

Reference J-STD-020

| Profile feature | Standard SnPb solder | Lead (Pb) free solder |
|---|----------------------|-----------------------|
| Preheat and soak | | |
| • Temperature min. (T_{smin}) | 100 °C | 150 °C |
| • Temperature max. (T_{smax}) | 150 °C | 200 °C |
| • Time (T_{smin} to T_{smax}) (t_s) | 60-120 seconds | 60-120 seconds |
| Ramp up rate T_L to T_P | 3 °C/ second max. | 3 °C/ second max. |
| Liquidous temperature (T_L) | 183 °C | 217 °C |
| Time (t_L) maintained above T_L | 60-150 seconds | 60-150 seconds |
| Peak package body temperature (T_P)* | Table 1 | Table 2 |
| Time (t_P)* within 5 °C of the specified classification temperature (T_C) | 20 seconds* | 30 seconds* |
| Ramp-down rate (T_P to T_L) | 6 °C/ second max. | 6 °C/ second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

* Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

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