

# ECMS1V0905

## Common mode choke, surface mount



### Product features

- High frequency filter
- Square type closed magnetic core
- Current rating up to 6 A
- 10 mm x 7.5 mm surface mount package in a 4.8 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 <sup>5</sup> | Impedance <sup>1</sup> (Ω)<br>minimum | Impedance <sup>1</sup> (Ω)<br>typical | DCR <sup>2</sup> (mΩ)<br>@ +25 °C<br>maximum | Rated current <sup>3</sup><br>(A)<br>maximum | Rated voltage<br>(Vdc)<br>maximum | Insulation<br>resistance <sup>4</sup> @<br>(MΩ) minimum |
|--------------------------|---------------------------------------|---------------------------------------|----------------------------------------------|----------------------------------------------|-----------------------------------|---------------------------------------------------------|
| ECMS1V0905-301-R         | 225                                   | 300                                   | 6.0                                          | 6.0                                          | 80                                | 10                                                      |
| ECMS1V0905-601-R         | 450                                   | 600                                   | 8.0                                          | 5.5                                          | 80                                | 10                                                      |
| ECMS1V0905-701-R         | 500                                   | 700                                   | 10                                           | 5.0                                          | 80                                | 10                                                      |
| ECMS1V0905-102-R         | 750                                   | 1000                                  | 13                                           | 4.0                                          | 80                                | 10                                                      |
| ECMS1V0905-222-R         | 1700                                  | 2200                                  | 50                                           | 3.0                                          | 80                                | 10                                                      |
| ECMS1V0905-272-R         | 2000                                  | 2700                                  | 80                                           | 2.0                                          | 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

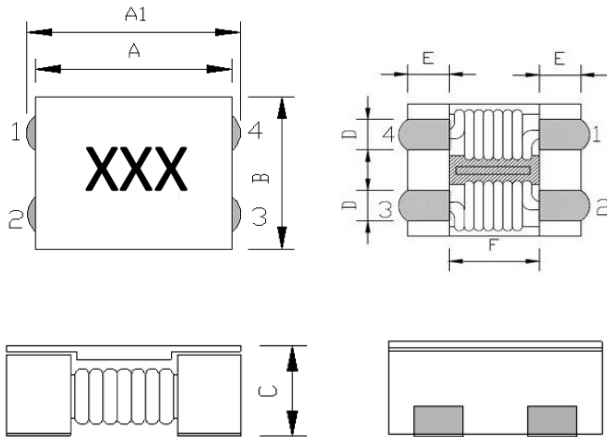
ECMS1V = Product code

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

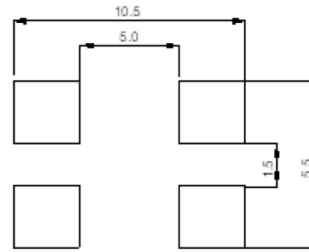
## Mechanical parameters, schematic, pad layout (mm)



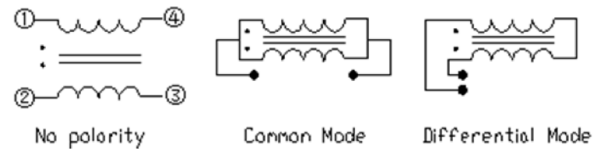
| Dimension | Value       |
|-----------|-------------|
| A         | 9.0 ± 0.5   |
| A1        | 9.5 ± 0.5   |
| B         | 7.0 ± 0.5   |
| C         | 4.8 maximum |
| D         | 1.5 typical |
| E         | 1.7 typical |
| F         | 5.6 typical |

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

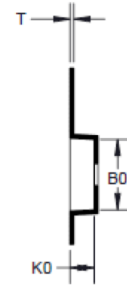
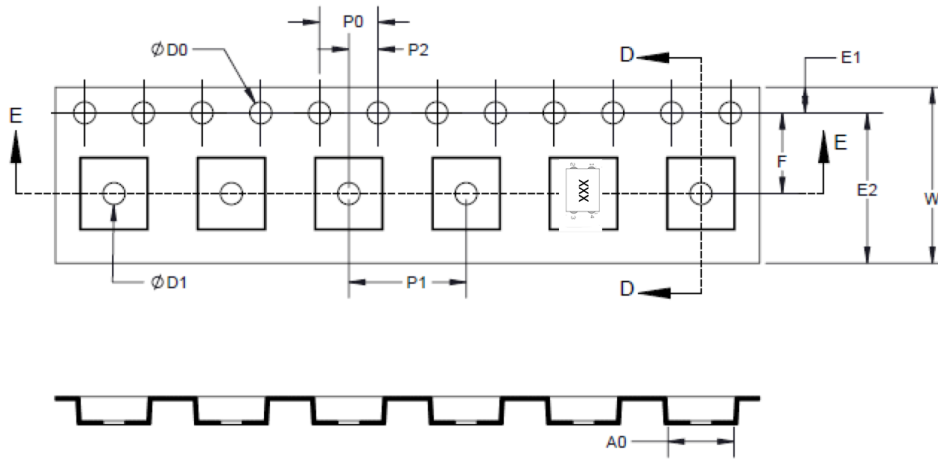


## Schematic

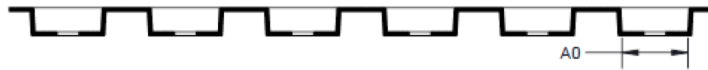


### Packaging information (mm)

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



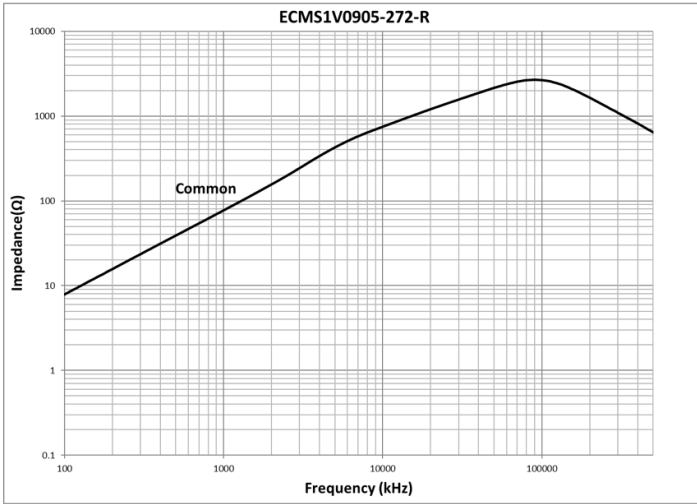
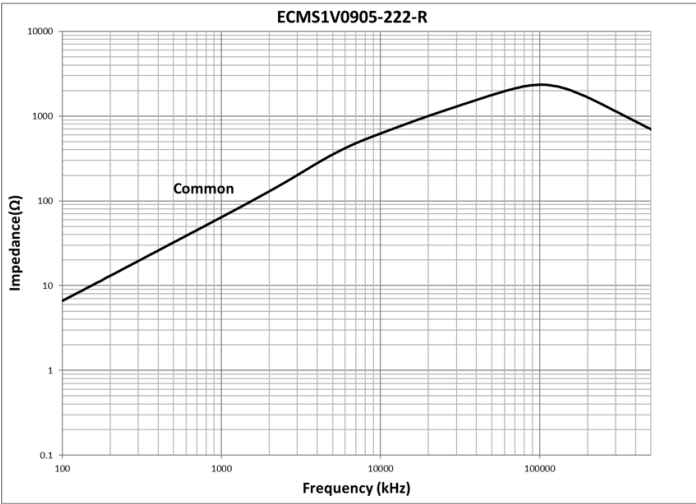
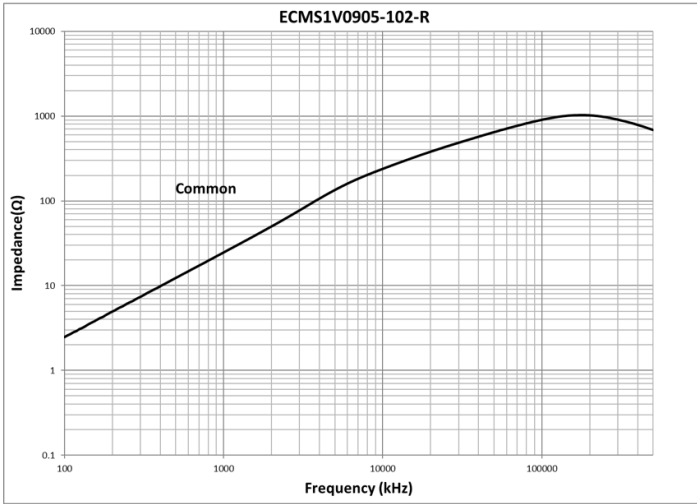
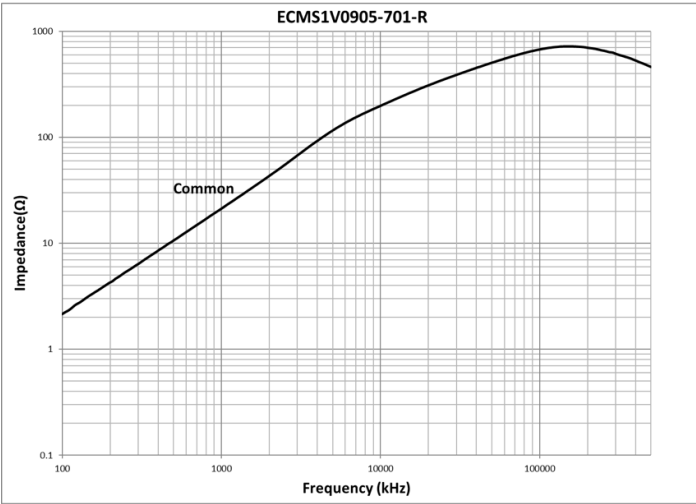
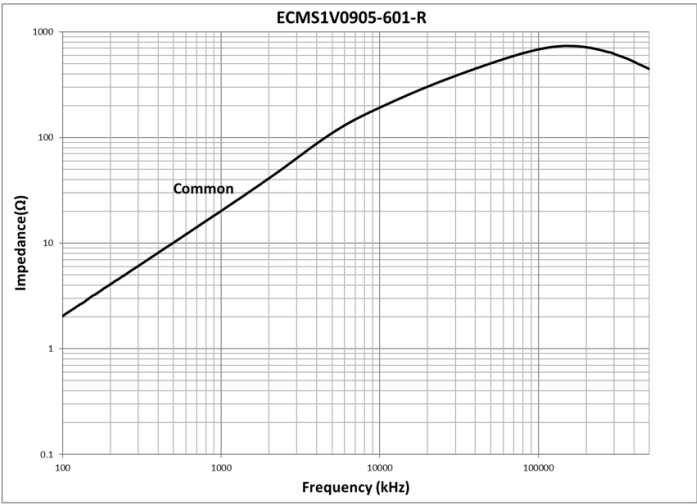
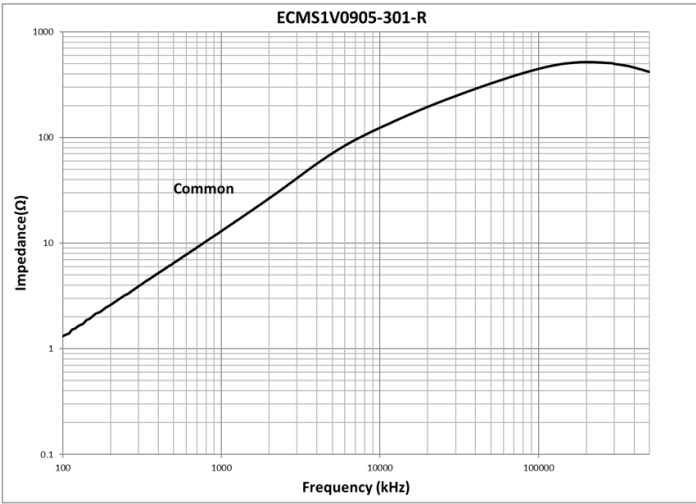
SECTION D-D



SECTION E-E

| Dimension | Value       |
|-----------|-------------|
| W         | 24.0 ±0.3   |
| F         | 11.5 ±0.1   |
| E1        | 1.75 ±0.1   |
| E2        | na          |
| P0        | 4.0 ±0.1    |
| P1        | 16 ±0.1     |
| P2        | 2.0 ±0.1    |
| D0        | 1.5 +0.1/-0 |
| D1        | 1.5 +0.1/-0 |
| A0        | 9.5 ±0.1    |
| B0        | 7.7 ±0.1    |
| K0        | 5.0 ±0.1    |
| T         | 0.4 ±0.05   |

Impedance vs frequency



## Solder reflow profile

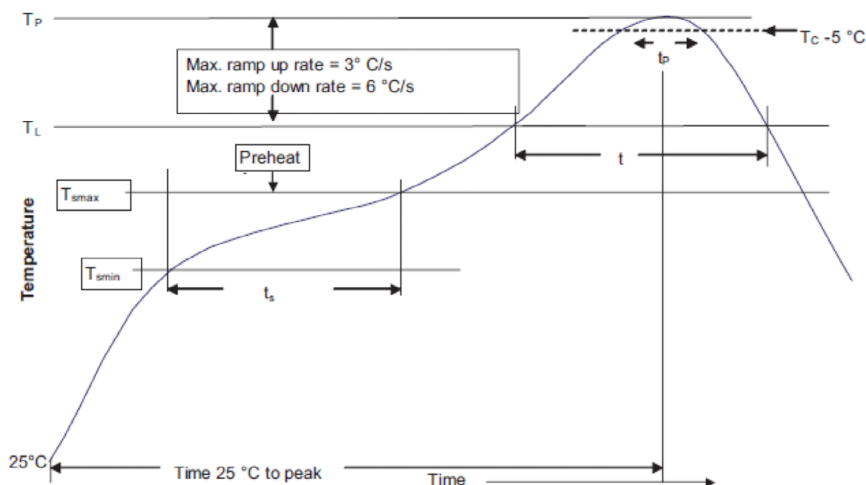


Table 1 - Standard SnPb solder ( $T_C$ )

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> ≥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 <sup>3</sup> <350 | Volume mm <sup>3</sup> 350 - 2000 | Volume mm <sup>3</sup> >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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