
SMD Common Mode Chokes

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OPERATING PRINCIPLE

Interferences propagating via supply or signal lines can be suppressed by placing a high impedance in series. This can be provided by a ferrite inductor. However, saturation by the supply current can be a problem. Remedies are a low permeability material or a gapped / open magnetic circuit. The disadvantage is the large number of turns required to achieve the required inductance, leading to high copper losses. With standard suppression methods in a signal path, the wanted signal is often suppressed along with the interference, and in many modern applications (EDP for instance) this leads to unacceptable loss of signal. This can be overcome with **current compensation**, based on the fact that supply or signal currents in both lines are opposite and have equal magnitude.

In Philips' new interference-suppression beads, a pair of conductors within a single soft-ferrite block are connected along their lengths by an air gap. Common-mode signals - interference signals passing in the same direction along the input and output channels of a device (a IC for instance) - serve to reinforce the magnetic flux around both conductor, and are therefore attenuated. In contrast, the wanted signal passing along the input and output channels serves to cancel the flux around the conductors and therefore passes unattenuated.

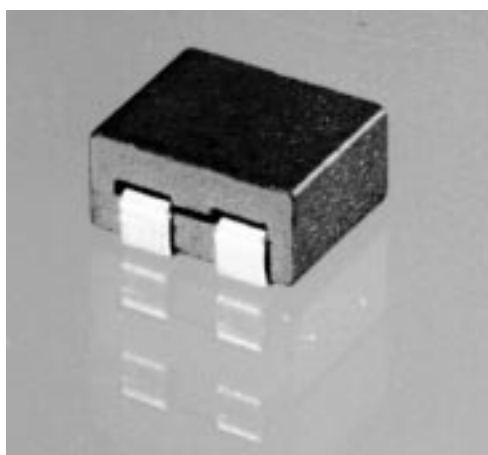
These common mode chokes are available in 2 sizes in **4S2** material with 2 different winding configurations.

In combination with appropriate tracks on the PCB the products can also serve as

- **MULTI-TURN CHOKE**
- **TRANSFORMER**

The main application areas for the SMD common mode choke can be found in e.g.

- **Electronic data processing**
- **Telecommunication**
- **Consumer electronics**
- **Domestic appliances**



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FEATURES

- *Resistant to mechanical shocks and pressure*
- *High resistivity material*
- *Low tolerances of mechanical dimensions enable automatic mounting*
- *Flat sides to improve handling by automatic placement machines*
- *Low leakage inductance*
- *Suitable for different functions, depending on PCB connections*

APPLICATIONS

- *EMI suppression*
- *Supply line filtering*
- *Data line filtering*

TYPE DESCRIPTION

e.g. **CMS2-5.6/3/4.8-4S2**

(1) (2) (3)(4)(5) (6)

- (1)Product type (CMS=Common Mode Surface mountable choke)
- (2)Number of strips
- (3)Width nominal (in mm)
- (4)Height maximum including wire (in mm)
- (5)Length nominal including wire (in mm)
- (6)Material grade

PACKAGING AND ORDERING CODES (11 NC)

4330 030 36881 (Type number CMS2-5.6/3/4.8-4S2)

4330 030 36911 (Type number CMS4-11/3/4.8-4S2)

The first 11 digits of the 12 NC are sufficient to order the desired SMD bead.

SMD common mode chokes are delivered taped and reeled, ready for use on automatic mounting machines.
Packaging is according to IEC 286-A and EIA 481-A.

Packing quantity: 2400 Pcs./Reel

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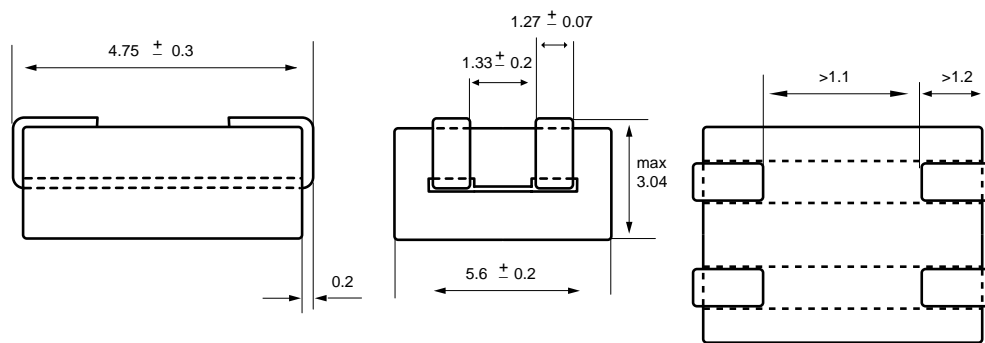


Fig.1 SMD common mode choke with two conductors (CMS2-5.6/3/4.8)

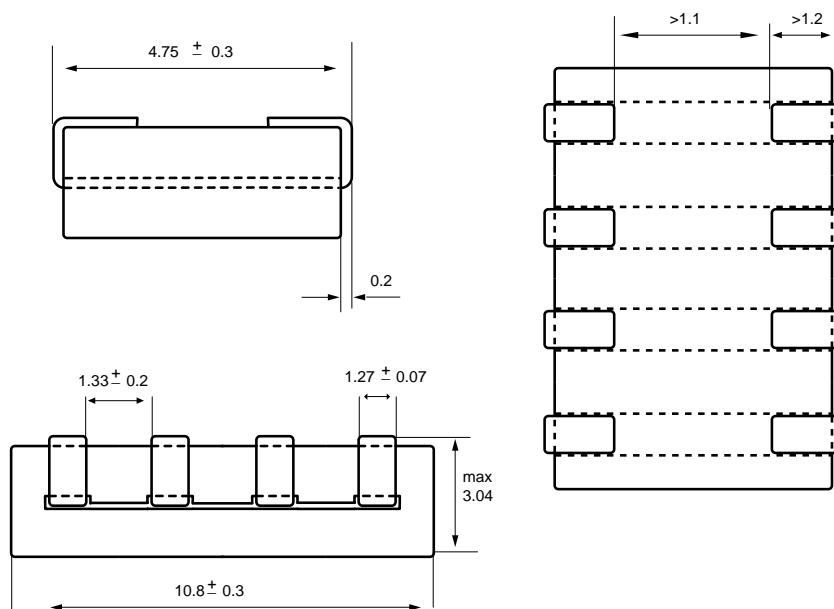


Fig.2 SMD common mode choke with four conductors (CMS4-11/3/4.8)

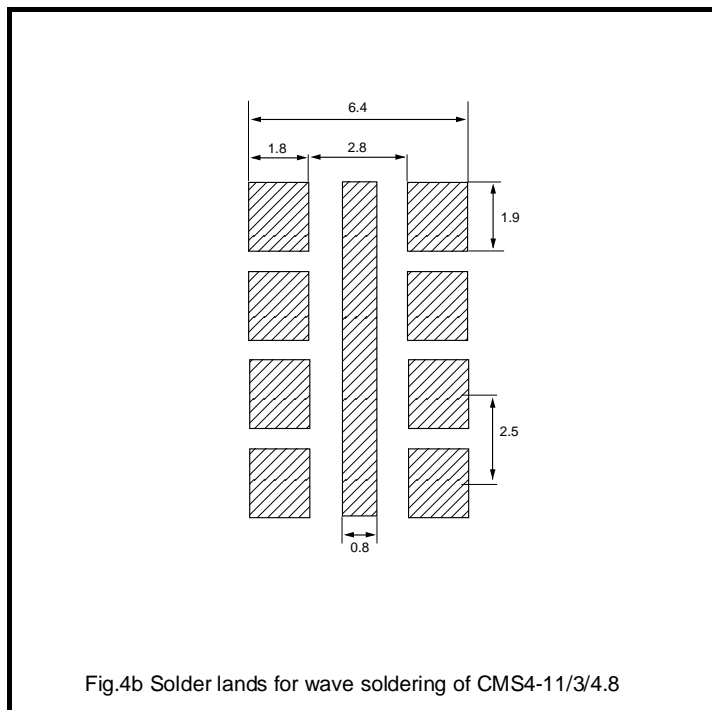
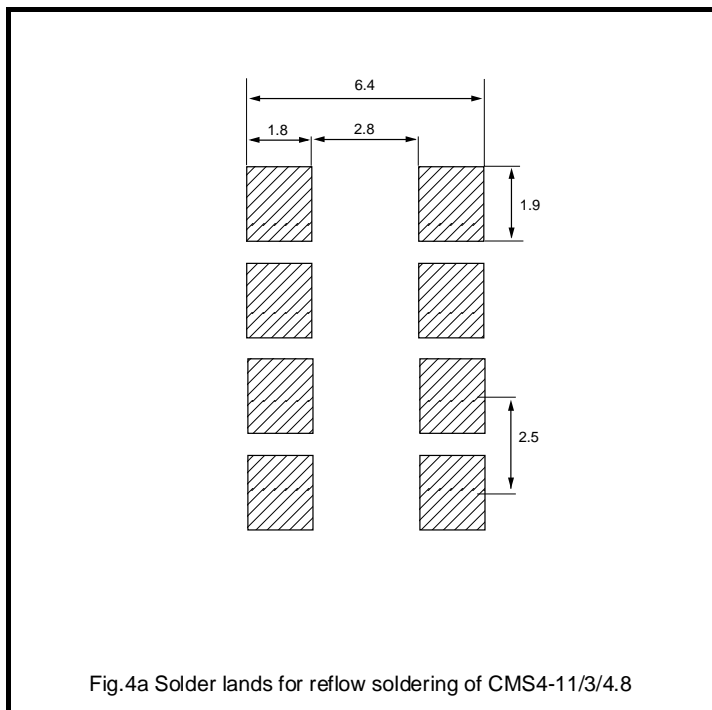
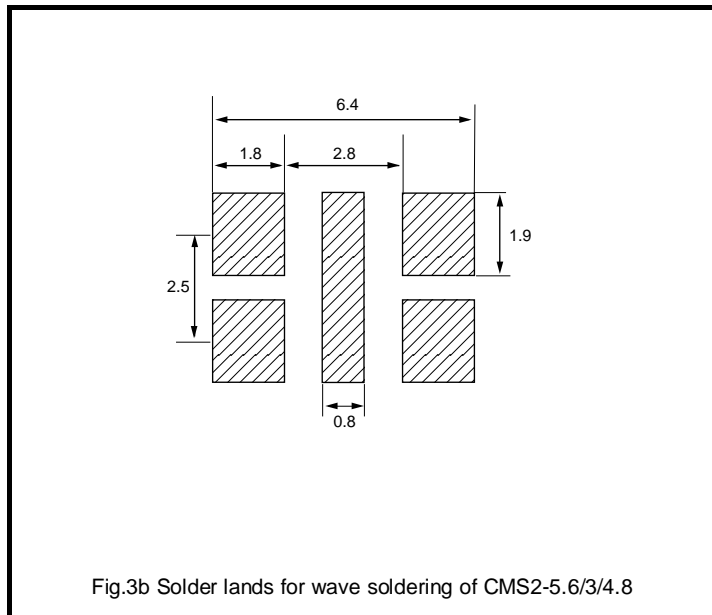
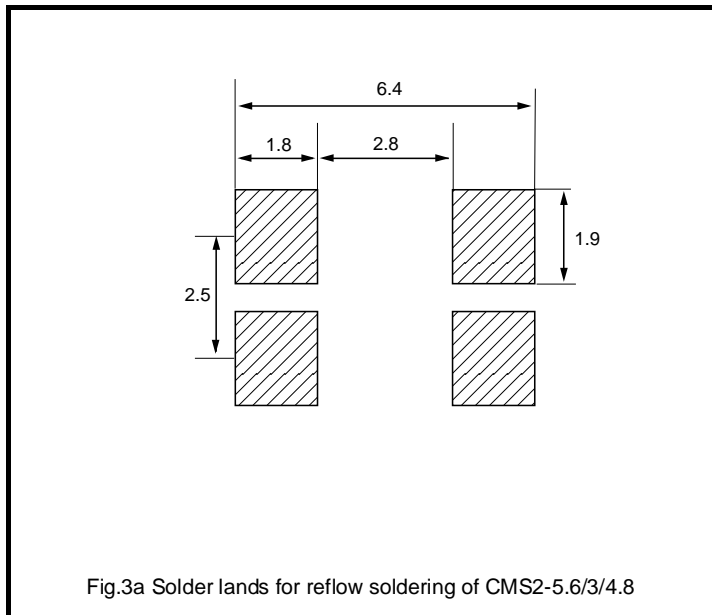
Electrical characteristics

type number	remark	Impedance (Ω) at frequency			Mass (g)
		30 MHz	100 MHz	300 MHz	
CMS2-5.6/3/4.8-4S2		23	35	50	≈ 0.3
CMS4-11/3/4.8-4S2	inner channel	13	23	42	≈ 0.6
	outer channel	16	30	50	

*Nominal impedance values measured at 25 °C with HP4191A impedance analyzer.
Minimum values may be up to 20% lower!

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Recommended Solder Lands



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Typical Impedance Curves

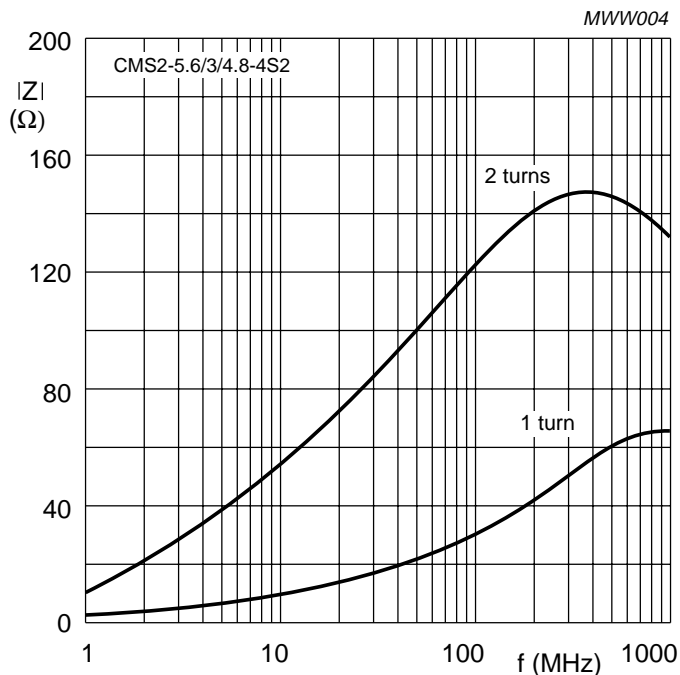


Fig.5 Impedance as a function of frequency for CMS2-5.6/3/4.8 (1 and 2 turns).

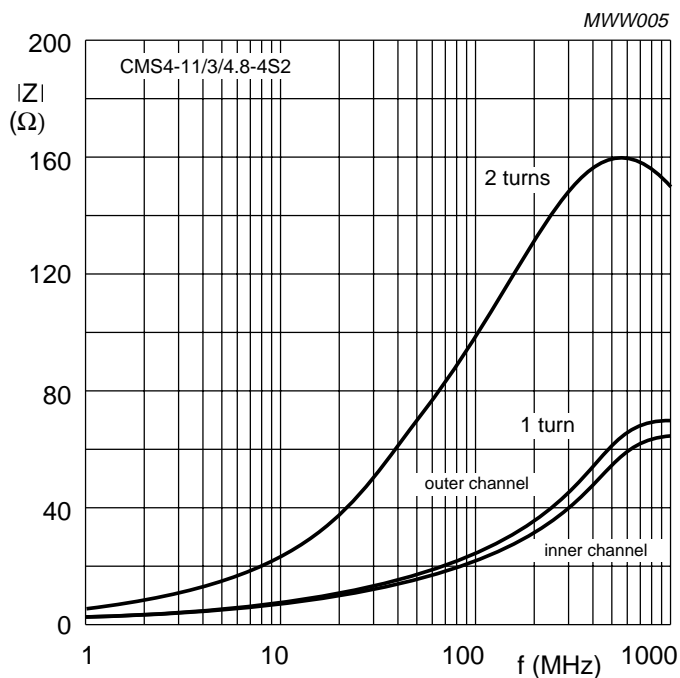
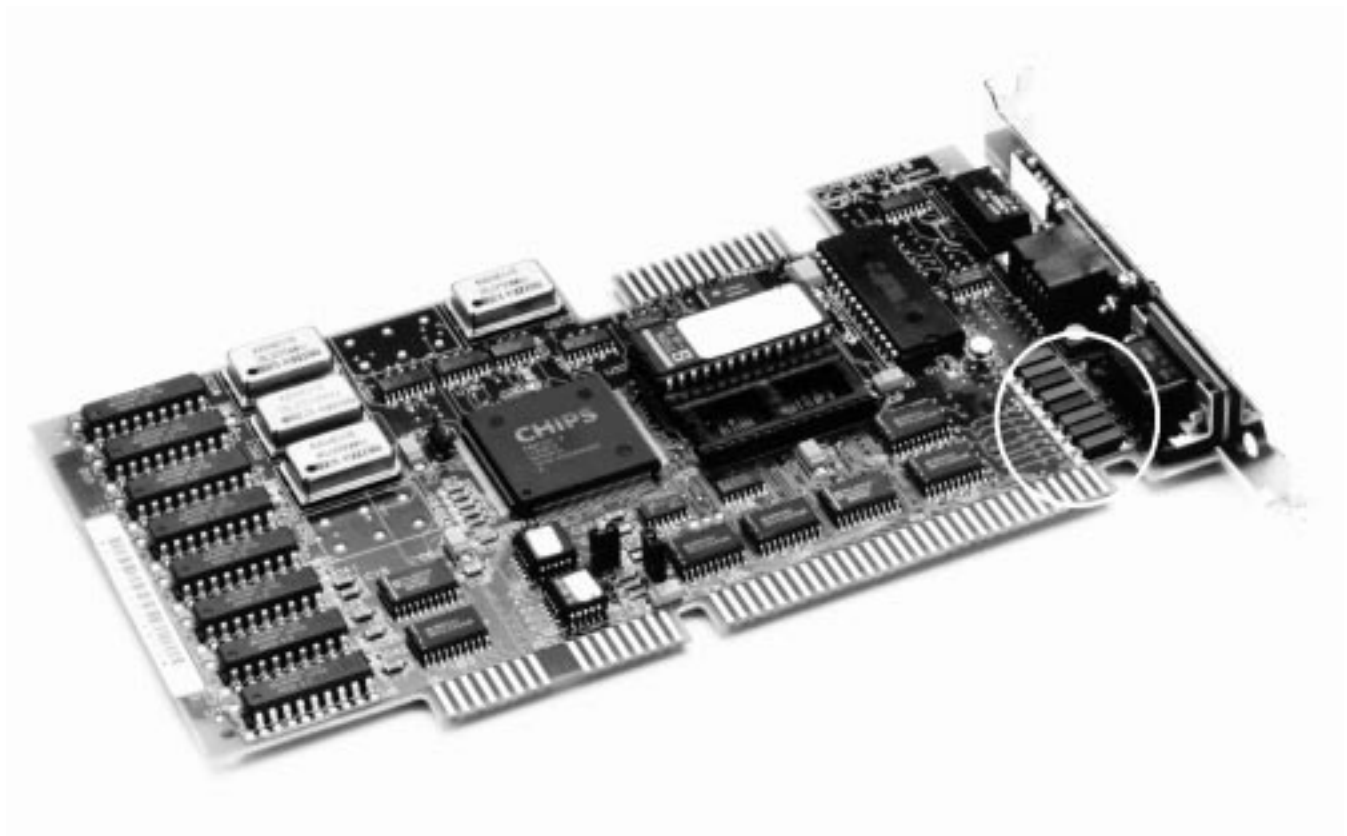


Fig.6 Impedance as a function of frequency for CMS4-11/3/4.8 (1 and 2 turns).



SMD beads in action