

ICL501-3 VRD/POL Inductor



Features

- Designed for use with IDT's proprietary coupled inductor multi-phase DC-DC converter topology
- Low height and small size allows use in both imbedded (VRD) and module (VRM) applications
- Robust SMD package is compatible with SMT assembly process handling
- Provides increase in VR efficiency compared to ICL501-1

Applications

- VRDs (Imbedded)
- VRMs (Module)
- POLs
- VRM 10.x / VRM11 based designs.
- DDR2/3 memory

The ICL 501-3 using IDT's coupled inductor technology solves the most pressing problem facing IA-32 VRDs and VRMs. This patented technology solves the trade-off between efficiency and elimination of bulk capacitors by dramatically lowering the VRM output inductance while using industry-standard components and relatively low switching frequencies. This technology provides superior transient response performance to higher frequency solutions due to the unique method of coupling between phases, and enables high-current designs with little or no electrolytic output bypass capacitance. The ICL501-3 coupled inductor can be used in both VRD and module VRM applications. Its small size and low height make it possible to design high-density VRMs and to fit the inductors very close to the CPU socket in VRD applications. This device can also be used in high-current System VRM (SVRM) applications where small size, high efficiency, and low total BOM cost is critical.

Electrical Specifications

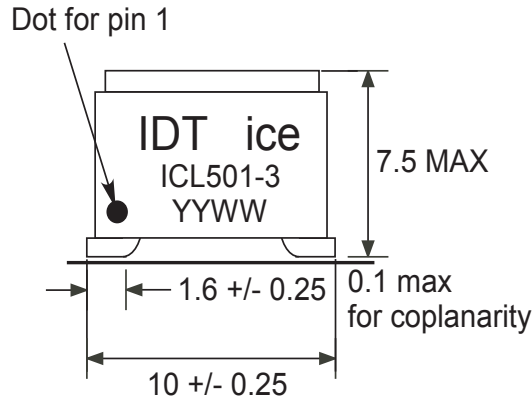
Parameter	Test Conditions	Min	Typ	Max	Unit
Turns Ratio (1 - 2) : (4 - 3)				1:1	-
L_S (1-2)	100mV @ 500 kHz rms	350	500	650	nH
L_S (4-3)	100mV @ 500 kHz rms	350	500	650	nH
LL (1-2)	short 4+3, 1.0 Vrms @ 1 MHz	45		60	nH
DCR (each winding)				0.3	m Ω

1. Electrical specifications at 25°C unless noted otherwise.
2. DC current, PCB layout, trace thickness and width, airflow, and proximity to other devices will affect inductor temperature rise.
3. Operating temperature range: 0°C to 100°C.
4. Meets UL 94V-0.

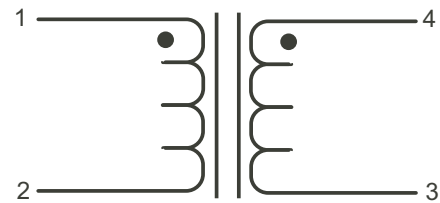
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Front View

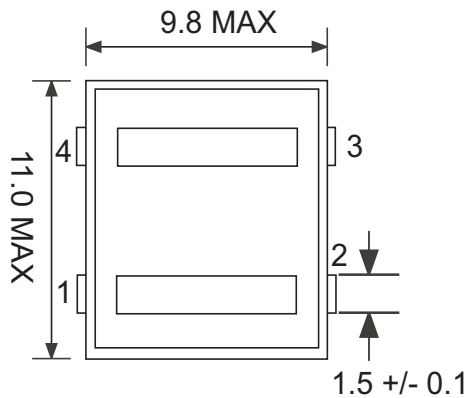


Schematic

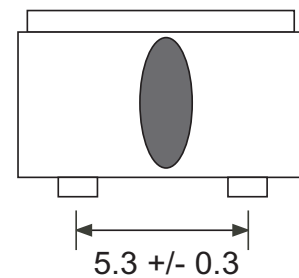


units: mm

Top View

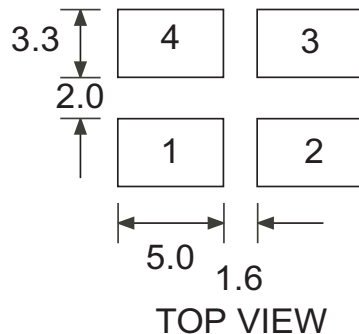


Side View

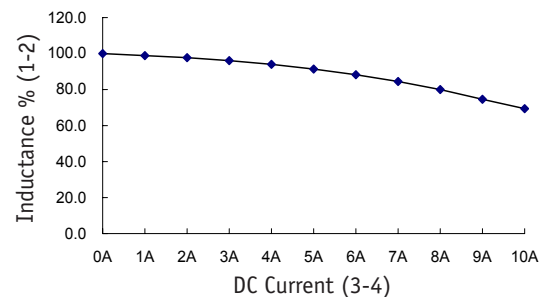


units: mm

Layout



Inductance vs. Current



Magnetizing inductance (1-2) vs. DC current applied (3-4)

The technology utilized in conjunction with the coupled inductor ("the CL") described in this data sheet includes intellectual property (the "IP") owned by IDT, Inc. and is covered by one or more of the following U.S. patents: 6,545,450; 6,686,727; 6,696,823. In connection with the end customer's purchase of the CL from "ICE Components, Inc.", the end customer is hereby granted a non-exclusive, worldwide, royalty-free license (without rights to sublicense) to use and incorporate the IP in the end customer's product that also incorporates the CL. In no way does this license extend to customer end products which do not incorporate the CL to implement the IP.

Specifications subject to change without notice.