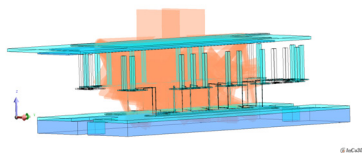


Capacitive effects for EMC analysis

InCa3D 3.1 version opens the doors for higher frequency simulations: in its computations it takes into account the capacitive effects for EMC analysis of your power electronics systems. You are now able to:

Parasitic capacitance matrix between regions, values in pF								
	PCB_P	PCB_M	PHASE1	PHASE2	PHASE3	PLUS	MINUS	HEAT
PCB_P	0	56.46	4.15e-3	4.02e-3	8.93e-3	65.09e-3	7.99e-3	755.6e-3
PCB_M	56.46	0	83.07e-3	68.96e-3	63.49e-3	120.3e-3	49.27e-3	1.462
PHASE1	4.15e-3	83.07e-3	0	64.74e-3	0.834e-3	11.07e-3	54.00e-3	19.66
PHASE2	4.02e-3	68.96e-3	64.74e-3	0	75.32e-3	13.73e-3	60.79e-3	15.81
PHASE3	8.93e-3	63.49e-3	0.834e-3	75.32e-3	0	7.35e-3	23.08e-3	16.42
PLUS	65.09e-3	120.3e-3	11.07e-3	13.73e-3	7.35e-3	0	37.77e-3	44.33
MINUS	7.99e-3	49.27e-3	54.00e-3	60.79e-3	23.08e-3	37.77e-3	0	12.33
HEAT	755.6e-3	1.462	19.66	15.81	16.42	44.33	12.33	0

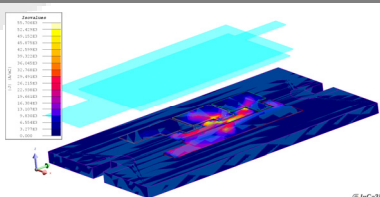
Find out where most **critical parasitic capacitances** are: in fact InCa3D provides all the elements of the capacitance matrix between conductors, possibly separated by dielectrics;



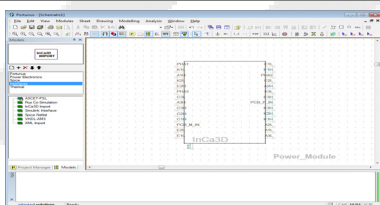
Develop, inside the InCa3D environment, **global models** composed by these capacitances and the resistive-inductive behavior of the structure;



Analyze, in the “Conductor impedances” application, the **resonance frequency** of the system, by plotting 2D curves of equivalent impedances;



Study, in the “Supplied conductors” application, the **common-mode currents** which flow inside parasitic capacitances and which can be responsible of EMC failures in power electronics devices;

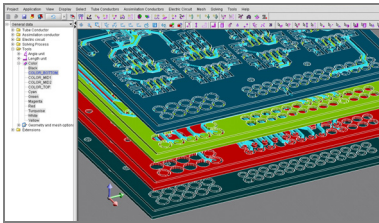


Extract accurate **equivalent RLC circuits** in the most common standard language (SPICE, VHDL-AMS) and include them into circuit-level tools for time-domain simulations taking into account parasitic effects of interconnections.

... And do not forget improvements already existing in previous versions of InCa3D:

- Import of multi-layer PCB structures described in the Gerber format
- Fast multipole solver (FMM) able to simulate very large projects
- Design optimization by the coupling with GOT-It tool

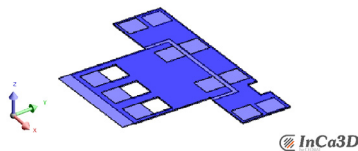
Easy, accurate and high-quality PCBs simulation with the Gerber import



Power electronics devices are very often constituted - among other parts - by multi-layer **Printed Circuit Boards**, where tracks, power/ground planes and vias need to be modeled for performing EMC analysis of the system. Their geometric definition within the InCa3D environment is automated thanks to the Gerber import facility.

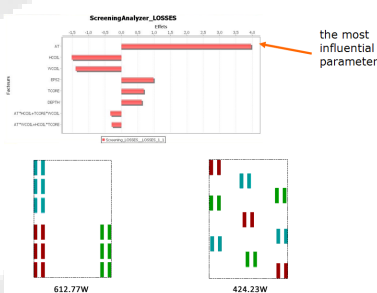
InCa3D is able to read Gerber files describing both **layers and vias**; and it also provides a dedicated working context where user can easily discard useless information (brand name, thermal pads, digital control tracks, etc.) and prepare & simplify the geometry for the most efficient InCa3D simulations.

FMM solver



With the aim of speeding-up simulations and especially dealing with more and more **complex structures**, a robust and efficient solver is provided with InCa3D: it is based on the state-of-the-art Adaptive Multi-Level Fast Multipole Method (AMLFMM) algorithms and it makes it possible computations of electrical interconnection parasitics that were previously unaffordable due to the very large number of required unknowns (meshing elements). To give an example, the computation of the equivalent loop inductance of a busbar meshed with about twelve thousands of elements required 10 GB of RAM memory and 26 minutes of CPU time with the classical solver, while the new **Fast Multipole algorithm** takes only 5 minutes and demands only 1 GB.

GOT-It coupling



InCa3D is coupled to GOT-It, the CEDRAT optimizer software, in order to assist you in exploring the entire space of solutions for your design and find the configuration which **optimizes the product performances**.

Describe geometry and physics of the project by means of the parameters you want to explore, define inside GOT-It the intervals and constraints for these parameters and run the computation; you will be able to:

- determine the most influential parameters;
- find the optimum configuration that allows **reaching the objectives by respecting constraints**;
- perform robustness study and check the technical reliability of the found solution.

Enjoy this new InCa3D 3.1 version!

For more information : cedrat.com > Software > InCa3D