

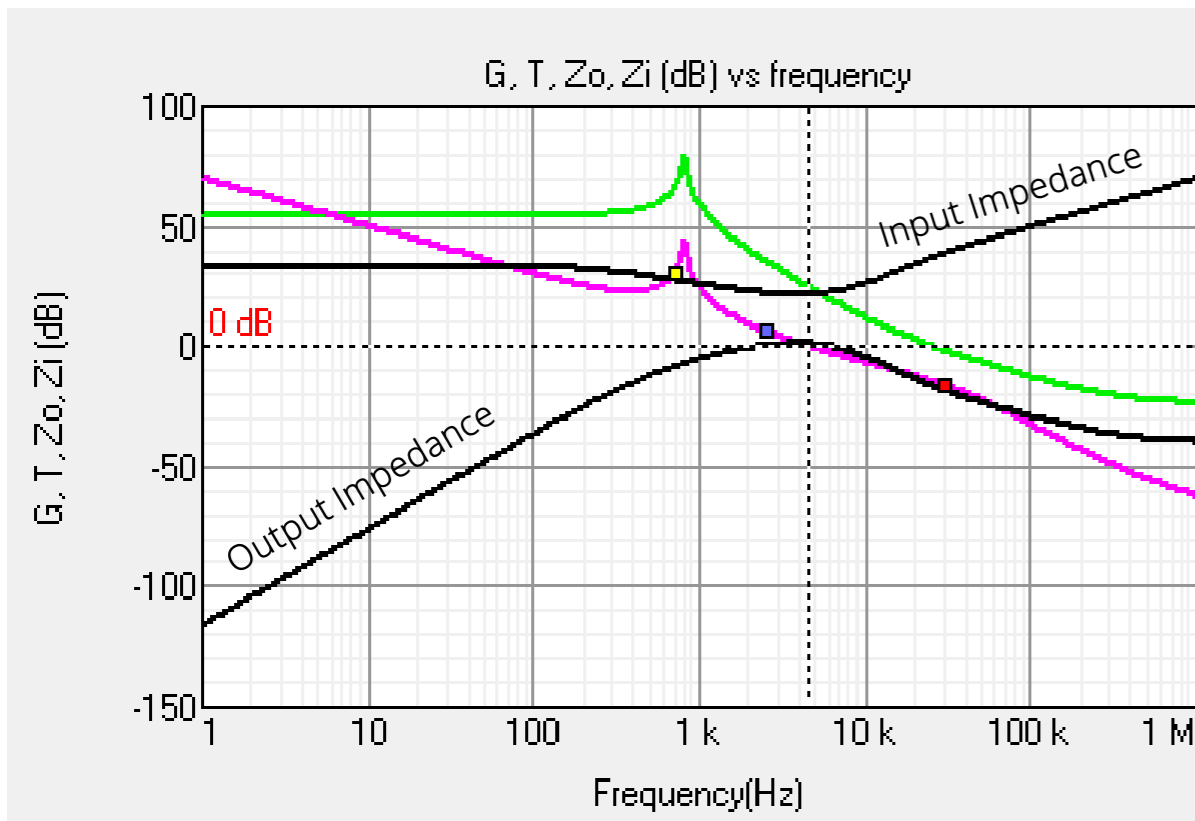
## New Input Impedance Calculation

Check the system level stability with the new  $Z_o - Z_i$  built-in function

For every DC-DC converter and control type, the input impedance ( $Z_i$ ) and the output impedance ( $Z_o$ ) are shown as additional Bode Plots

Use the interactive SmartCtrl's Solution Map to shape  $Z_o$  and  $Z_i$  in order to assure the system level stability

This analysis is very interesting for telecom dc distributed systems, power distribution in satellites, etc.



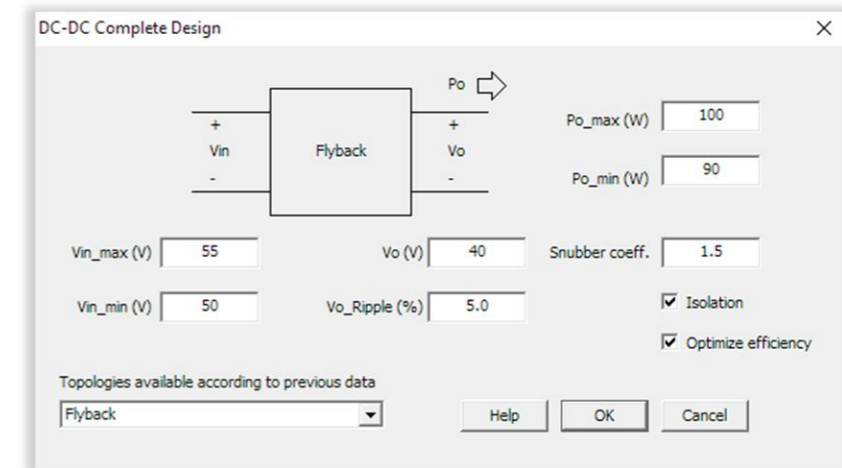
SmartCtrl distributors: <http://powersmartcontrol.com/how-to-buy/worldwide-distribution>

SmartCtrl® is developed by Power Smart Control S.L. a power electronics company



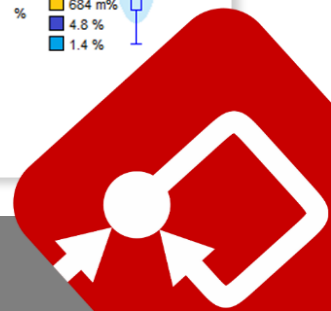
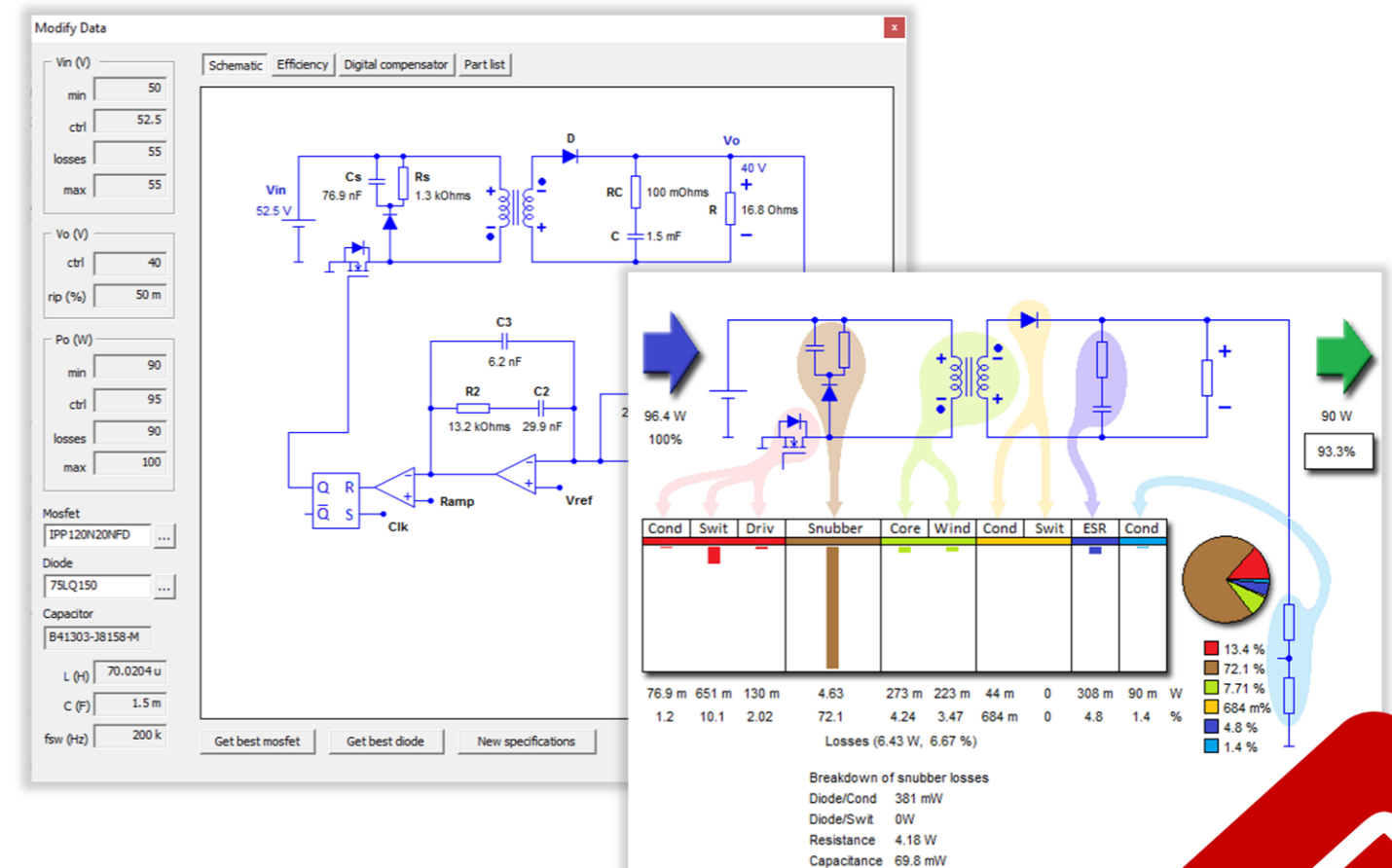
## From specs to circuit

Starting from a specification, design **quickly** and **visually** the best control for your converter and get the results for an analog or digital control.



## Automatic design of the power stage and the analog controller:

- Power stage optimization
- Best MOSFET and diode selection from vendors database
- Automatic Snubber design
- Complete power losses calculations conduction and switching losses. SiC MOSFET and diodes are also considered
- Analog controller optimization



## Complete transformer and inductor design

```

TOPOLGY
Flyback (Voltage mode controlled)

MOSFET
Name = IPP120N20NFD

DIODE
Name = 75LQ150

CAPACITOR
(calculated)
Cr = 2.47006 uF
Vr = 40 V
Ir = 2.03743 A

(available in warehouse)
Name = B41303-J8158-M
np = 1
Cr_sel = 1.5 mF
Vr_sel = 63 V
Ir_sel = 3.5 A
ESR_sel = 100 mOhms

INDUCTOR CORE MATERIAL
Name = 3C90
Bsats = 470 mT
Kc = 4.981
alfa = 1.343
beta = 2.513

INDUCTOR CORE MATERIAL
Name = 3C90
Bsats = 470 mT
Kc = 4.981
alfa = 1.343
beta = 2.513

INDUCTOR CONDUCTOR
Name = 1x400x0_07
nc = 400
D = 70 um
D_ext = 2 mm

INDUCTOR CORE GEOMETRY
Name = EQ30
Nv = 8
Ocupa = 69.5984
G = 104.026
L = 70.0204 u
Ae = 0.000108 m^2
Wa = 5.2e-005 m^2
le = 46 mm
Cf = 426 m^-1
Ve = 4.97e-006 m^3
lm = 60 mm
lw = 5.3 mm

INDUCTOR CONDUCTOR
Name = 1x400x0_07
nc = 400
D = 70 um
D_ext = 2 mm

```

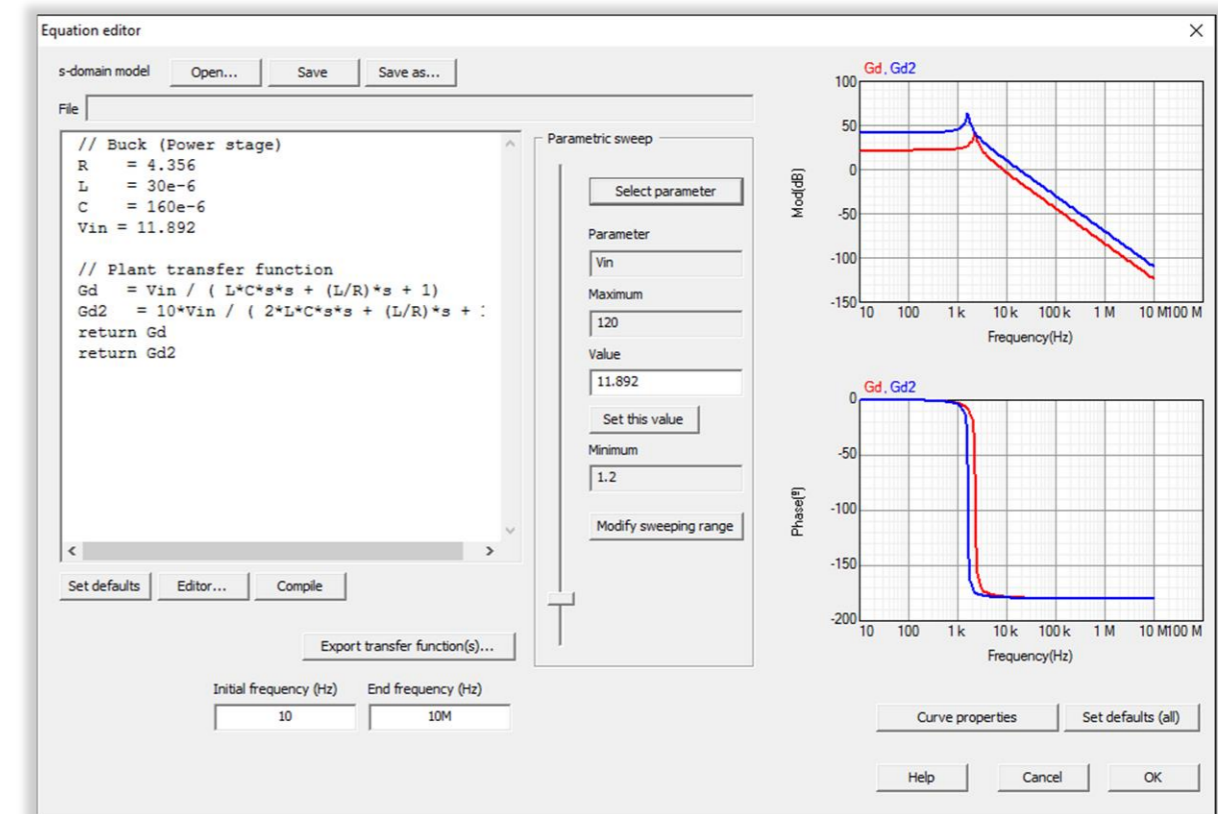
## The New Complete Vendor's Database

- The more important manufacturers database are now included in SmartCtrl to optimize the power stage
- MOSFET, Diodes, Core materials, Core Shapes, Conductors (AWG, Litz wires, etc.), Capacitors
- These database can be easily exported / imported and changed by user

Name	Ae	Wa	le	Cf	Ve	lm	lw
E5_3/2_7/2	2.66	1.5	12.5	4.7	33.3	12.6	1.9
E6_3/2_9/2	3.3	1.62	12.2	3.67	40.6	12.8	1.85
EP5	3	1.89	9.7	3.2	28.7	10.5	4
P9/5	10.1	3.1	12.5	1.24	126	18.9	3.6
RM4/ILP	14.5	3.75	17.3	1.19	251	20.7	4.3
EFD10/5/3	7.2	4.2	23.7	3.29	171	14.8	3.75
EP7	10.7	4.3	15.5	1.45	165	17.7	5
RM5/ILP	24.5	4.6	17.5	0.71	430	24.9	3.6
P11/7	16.2	4.8	15.5	0.956	251.1	22.6	4.4
P11/7/1	19	4.8	16.3	0.86	309.9	22.6	4.45
RM6S/ILP	37.5	6.3	21.8	0.58	820	31	4.5
EFD12/6/3_5	11.4	6.5	28.5	2.5	325	18.6	4.55
RM4	11	7.4	21.3	1.94	230	20	7
RM4/I	13.8	7.4	23.3	1.69	322	20	7
PT14/8	23.3	7.9	21.1	0.91	492	29.2	5.8
PTS14/8	22	7.9	22.5	1.02	495	29.2	5.8
P14/8	25.1	8.8	19.8	0.789	495	28.9	5.6
P14/8/I	29.9	8.8	21	0.7	628	28.9	5.6
RM5	21.2	9.5	21.4	1.01	450	25	6.3
RM5/I	24.8	9.5	23.2	0.935	574	24.9	6.3
EP10	11.3	11.4	19.3	1.7	215	21.5	7.4
E13/7/4	12.4	11.6	29.7	2.39	369	24	4.5

## The New Equations Editor

- This built-in function supports the definition of customized plants and sensors transfer functions.
- Multiple transfer functions can be plotted at the same time to compare the results.
- Sensitivity analysis can be performed for any of the parameter of custom model.



## From specs to bits: Automatic design of the digital control

Output data

RESULTS

Compensator (Digital):

```

-----
b0      = 39.4688
b1      = -36.0313
b2      = -39.375
b3      = 36.125

a0      = 1
a1      = -1.03125
a2      = 0.03125
a3      = -0

```

