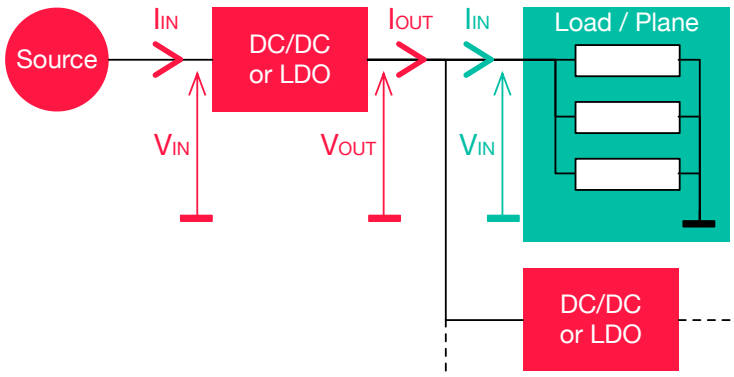
Summary of equations for electrical characteristics of DC/DC, LDO and power planes (loads).

		LDO	DC/DC	Power plane / Load
Input	$V_{IN\ TYP}$	$V_{OUT\ TYP\ SOURCE}$		
	$V_{IN\ MAX}$	$V_{OUT\ MAX\ SOURCE}$		
	$I_{IN\ TYP}$	$I_{OUT\ TYP} + I_{Q\ TYP}$	$P_{IN\ TYP} / V_{IN\ TYP}$	$\sum(I_{TYP\ COMPONENT})$
	$I_{IN\ MAX}$	$I_{OUT\ MAX} + I_{Q\ MAX}$	$P_{IN\ MAX} / V_{IN\ TYP}$	$\sum(I_{MAX\ COMPONENT})$
	$P_{IN\ TYP}$	$V_{IN\ TYP} . I_{IN\ TYP}$	$P_{OUT\ TYP}$ / Efficiency	$V_{IN\ TYP} . I_{IN\ TYP}$
	$P_{IN\ MAX}$	$V_{IN\ TYP} . I_{IN\ MAX}$	$P_{OUT\ MAX}$ / Efficiency	$V_{IN\ TYP} . I_{IN\ MAX}$
Output	$V_{OUT\ TYP}$	Defined by design		N/A
	$V_{OUT\ MAX}$	Defined by design		
	$I_{OUT\ TYP}$	$\sum(I_{IN\ TYP\ CHILDREN})$		
	$I_{OUT\ MAX}$	$\sum(I_{IN\ MAX\ CHILDREN})$		
	$P_{OUT\ TYP}$	$V_{OUT\ TYP} . I_{OUT\ TYP}$		
	$P_{OUT\ MAX}$	$V_{OUT\ TYP} . I_{OUT\ MAX}$		
Loss	$P_{LOSS\ TYP}$	$P_{IN\ TYP} - P_{OUT\ TYP}$		
	$P_{LOSS\ MAX}$	$P_{IN\ MAX} - P_{OUT\ MAX}$		



Comment 1

In component datasheets, maximum currents are given for a typical voltage. Therefore, for simplification, those equations are only expressed with a typical voltage.

If the maximum voltage has to be considered (for exemple, in case of a badly regulated DC/DC), the currents will decrease and the equations will be balanced with minor differences in most cases.

Comment 2

Moreover, the plane is considered as perfect. In reality, a voltage drop should be considered between the regulator output and the component input because of the copper resistance of the power plane shape. Especially if the current is hight (CPU cores, for example).