Comparison of efficiency data of International Rectifier's SBI5AS dc-dc converter with the efficiency formula:

$$\eta = \frac{1}{1 + \frac{P_{oh}}{P_o} + \frac{P_o}{P_{sc}}}$$

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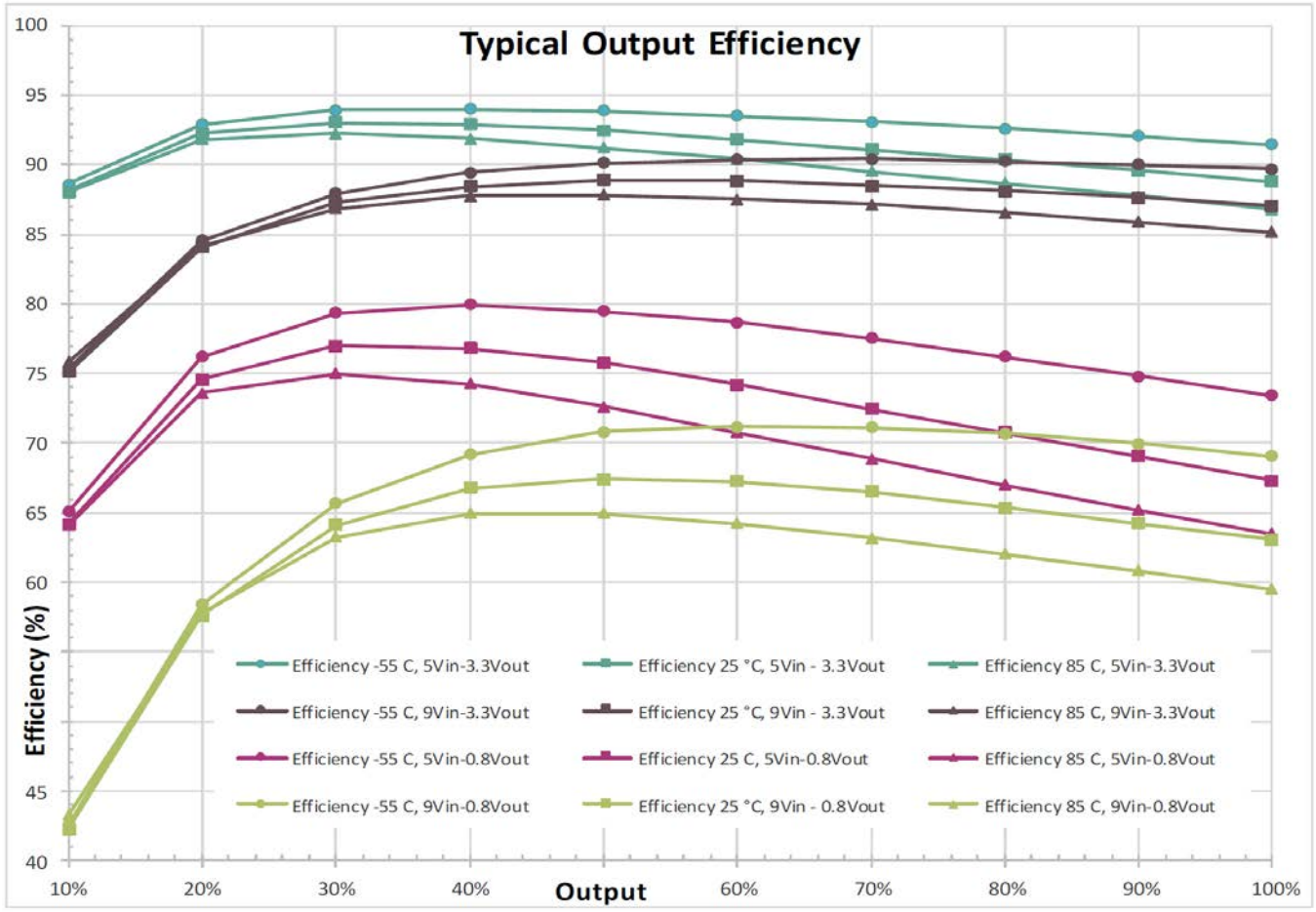
The efficiency data reported by IR in their data sheet PD-97891



P_{oh} and P_{sc}

Vo = 3.3V Room Temp		
P_Sc	P_oh	V_in
173.4798	0.25	5
172.5808	0.64	9

Vo =3.3V Temp = -55C		
P_Sc	P_oh	V_in
236.3637	0.24	5V
247.4263	0.64	9V

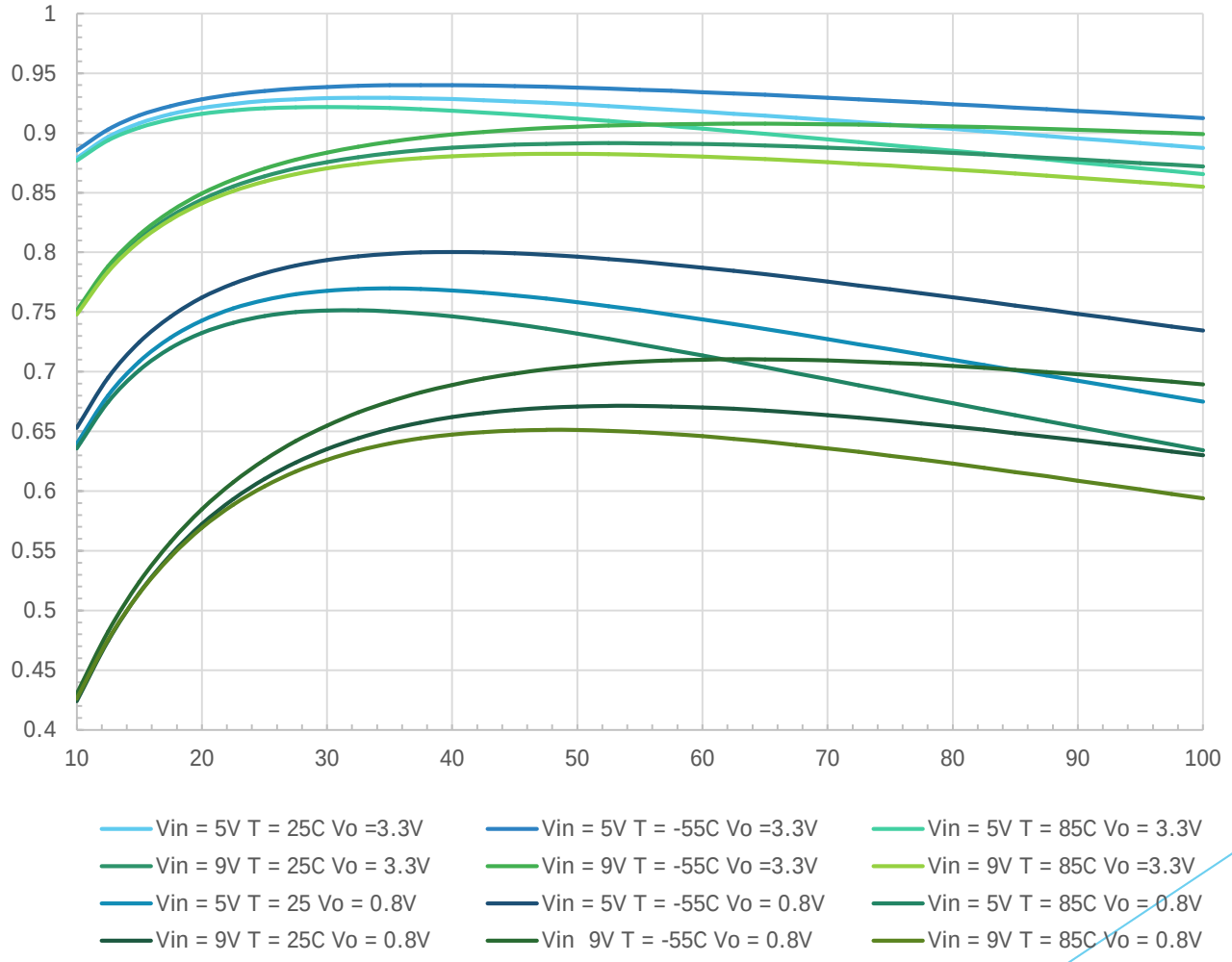
Vo = 3.3V Temp = 85C		
P_Sc	P_oh	V_in
138.8093	0.25	5V
144.244	0.64	9V

Vo = 0.8V Room Temp		
P_Sc	P_oh	V_in
11.17844	0.25	5
10.52513	0.63	9

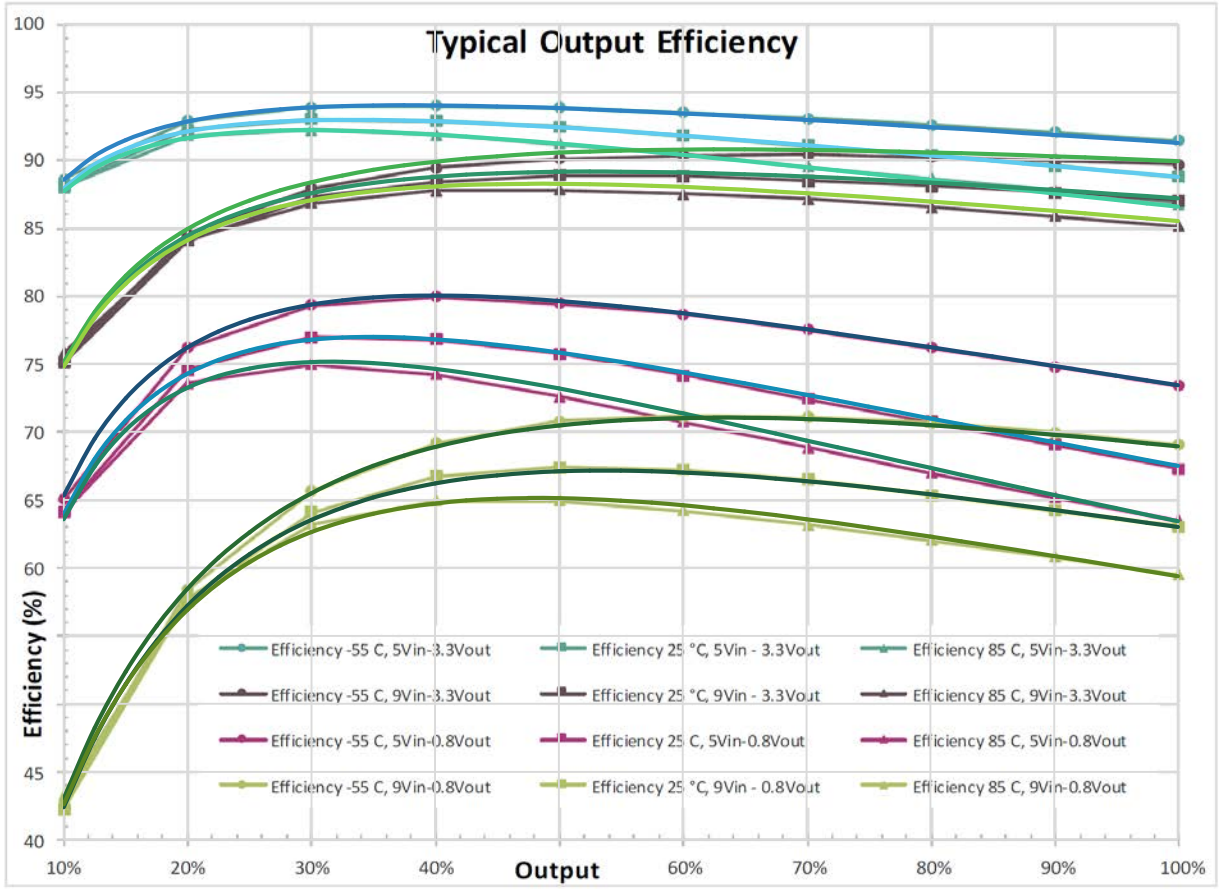
Vo = 0.8V Temp = -55C		
P_Sc	P_oh	V_in
15.40161	0.24	5V
14.92628	0.62	9V

Vo =0.8V Temp = 85C		
P_Sc	P_oh	V_in
9.15231	0.25	5V
8.654598	0.62	9V

The efficiency formula yields the following curves:



When the two are superimposed, the agreement is seen to be excellent.



For an explanation of the efficiency formula and its two parameters, please refer to:

1. My YouTube presentation: https://www.youtube.com/watch?v=UfdBiPEUOac
2. Vatché Vorpérian, "*A Simple Efficiency Formula for Regulated DC-to-DC Converters,*" IEEE Transactions on Aerospace and Electronic Systems Vol. 46, No. 4 Oct. 2010, pp. 2123-2130.
3. Vatché Vorpérian, "*A Recommended Simple and General Formula for the Specification of the Efficiency of Regulated dc-to-dc Converters*" vorperian.com