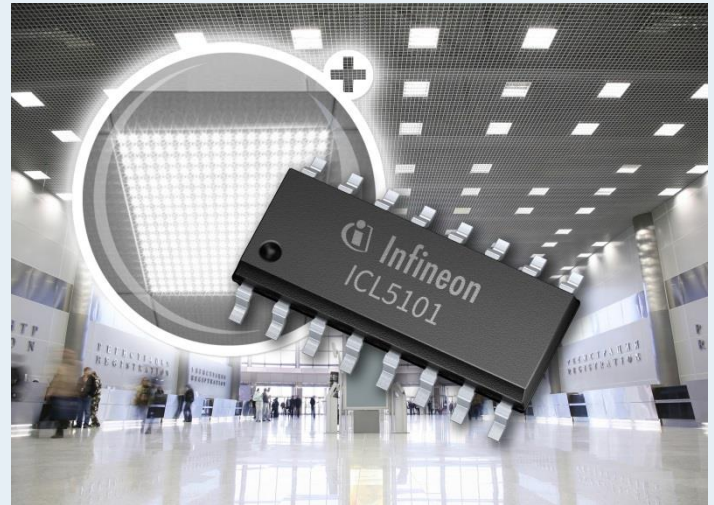


130W 76V CC Board Performance using ICL5101 PFC / LLC Combo IC

KLING Rainer
2016-09-16



CC – Demoboard Sepcification: 130W / 76V – 38V / 1.7A / Constant Current

Application Data Status 21.06.2016		
Board	CC Board Update KLING	RK V1.1.E
IC	ICL5101	PFC / LLC Combo
VACINMin	90 V	
VACINMin	305 V	
VOUTmax	76,0 V	
VOUTmin	38,0 V	
IOUTNom	1700 mA	
IOUTmin @ VOUTmax	14 mA	
IOUTmin @ VOUTmin	43 mA	
POUT	130 W	
VReg	0 to 10V	Interface



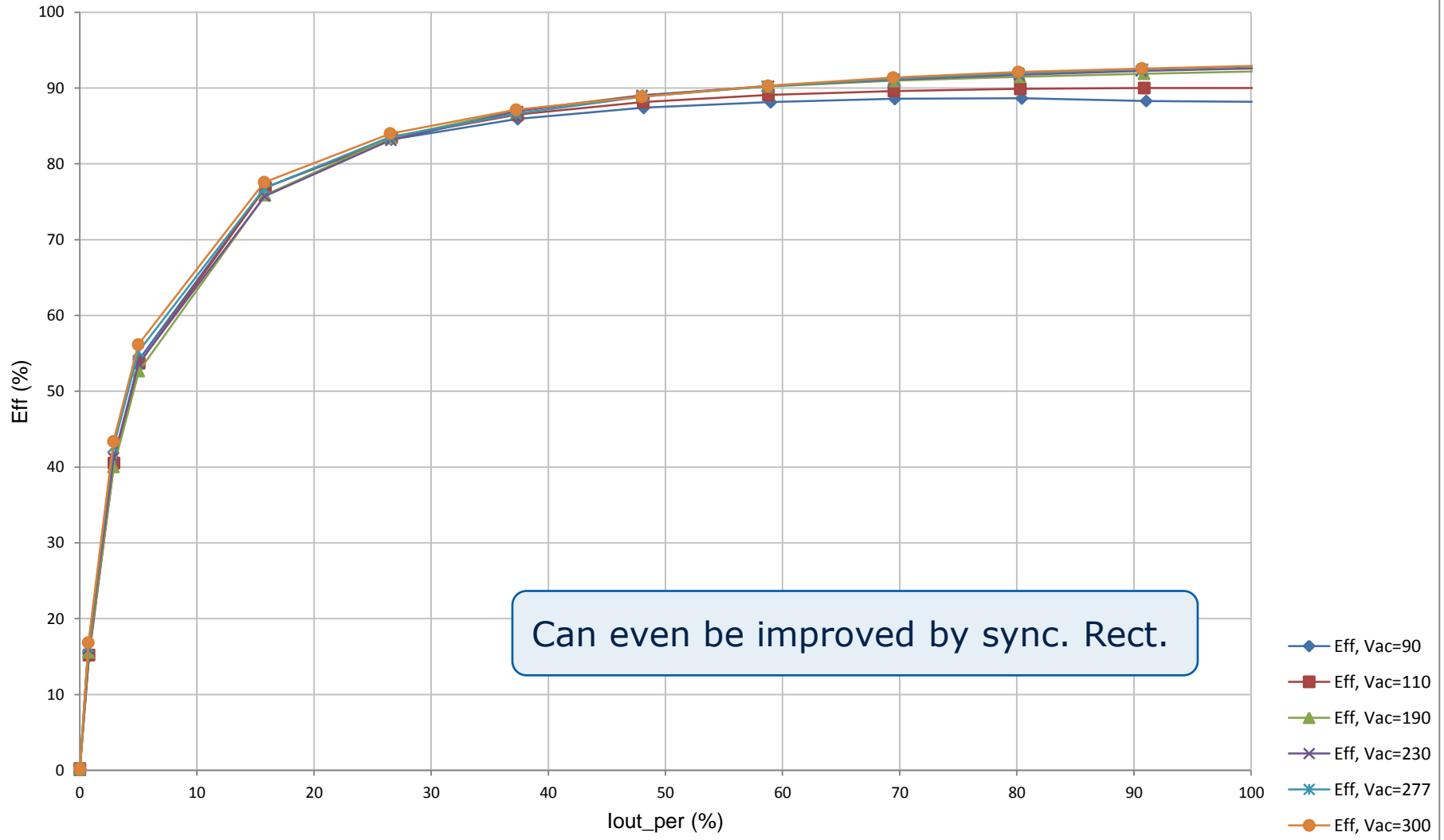
Performance: Summary



	Verification Check List Status 21.06.2016			Market requirement
TTL	Maximum Start Up Time @ 50% Load and V _{ACIN} = 90V	455	ms	< 500 ms
Current Ripple	Output Current Ripple at 100% Load @ V _{ACIN} = 230V	2	%	< ± 10%
Standby	Standby-Power @ V _{OUTmax} V _{Control} = 0V @ V _{ACIN} = 230V	1,36	W	< 500 mW
Efficiency	Efficiency @ V _{ACIN} = 230V and 100% Load @ V _{OUT} = 76V	92,2%	%	> 92 %
	Efficiency @ V _{ACIN} = 230V and 50% Load @ V _{OUT} = 76V	88,3%	%	> 90 %
	Efficiency @ V _{ACIN} = 90V and 50% Load @ V _{OUT} = 76V	87,2%	%	~ 90 %
	Efficiency @ V _{ACIN} = 90V and 50% Load @ V _{OUT} = 38V = 25% Load	89,7%	%	~ 90 %
	<i>Efficiency @ V_{ACIN} = 300V and 100% Load @ V_{OUT} = 76V</i>	92,5%	%	<i>Additional Info</i>
Power Factor	Power Factor @ V _{ACIN} = 230V and 100% Load @ V _{OUT} = 76V	98,2	%	> 95 %
	Power Factor @ V _{ACIN} = 230V and 50% Load @ V _{OUT} = 76V	94,0	%	> 90 %
iTHD	THD @ V _{ACIN} = 230V and 100% Load @ V _{OUT} = 76V	4,1	%	< 20 %
	THD @ V _{ACIN} = 230V and 50% Load @ V _{OUT} = 76V	9,3	%	
Dimming	Dimming Performance @ stable V _{OUTmax}	0,8	%	< 1%
	Dimming Performance @ stable V _{OUTmin}	2,5	%	
Hot Spot	Hotspot on Design @ 90V and T _A = 25°C		°C	BR
	Hotspot on Design @ 264V and T _A = 25°C		°C	DOUT
Protection	Over Voltage Protection	78	V	Floating Load Prot.
	Over Current Protection	n.a.		CC Design
	Short OUPUT Protection	ok		
	Over Temperature Protection	tbd		

Efficiency: $V_{OUT} = 76V$

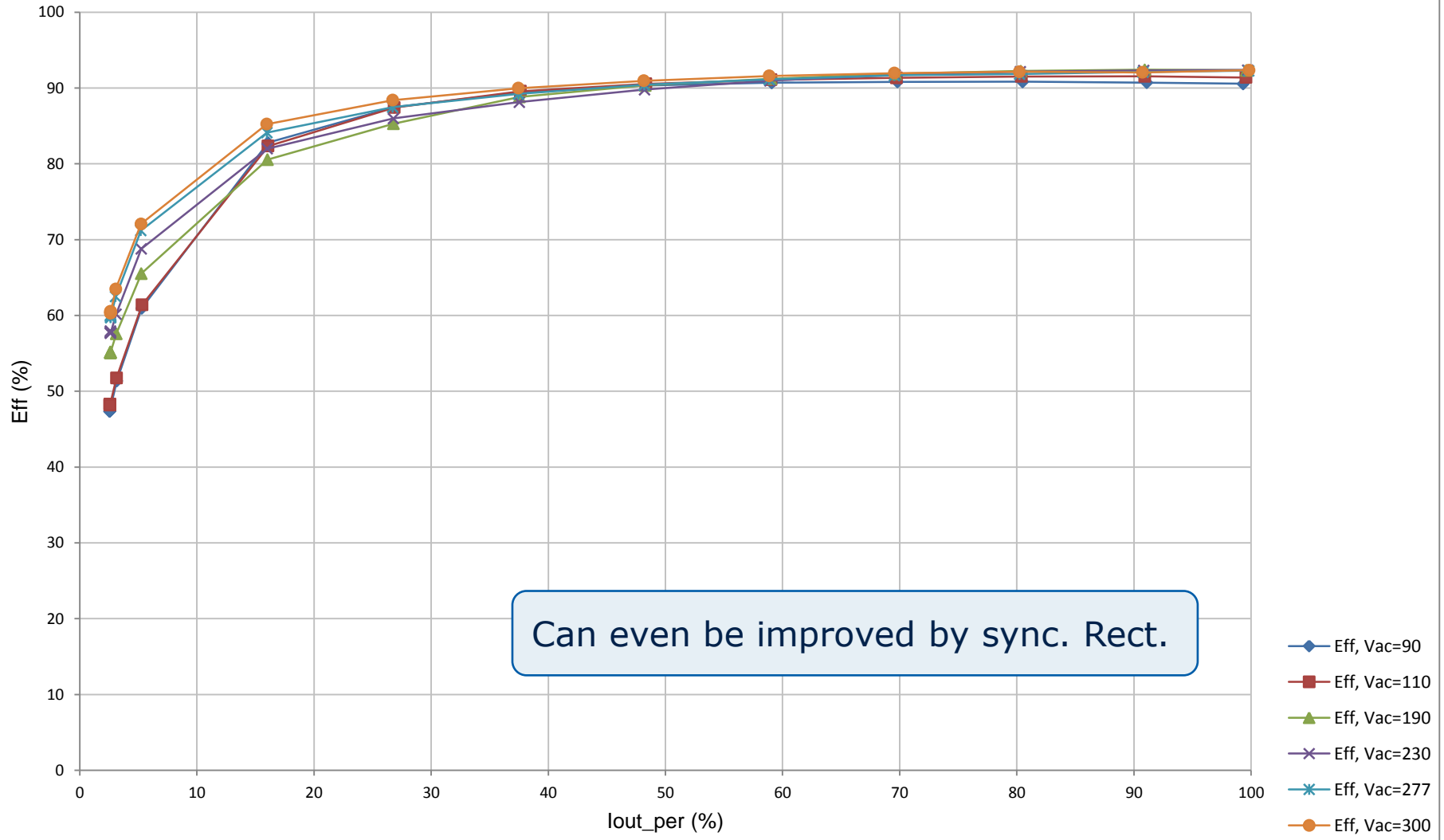
130W_76V_38V_LLC CC Board V1.1E Efficiency, Vo=76



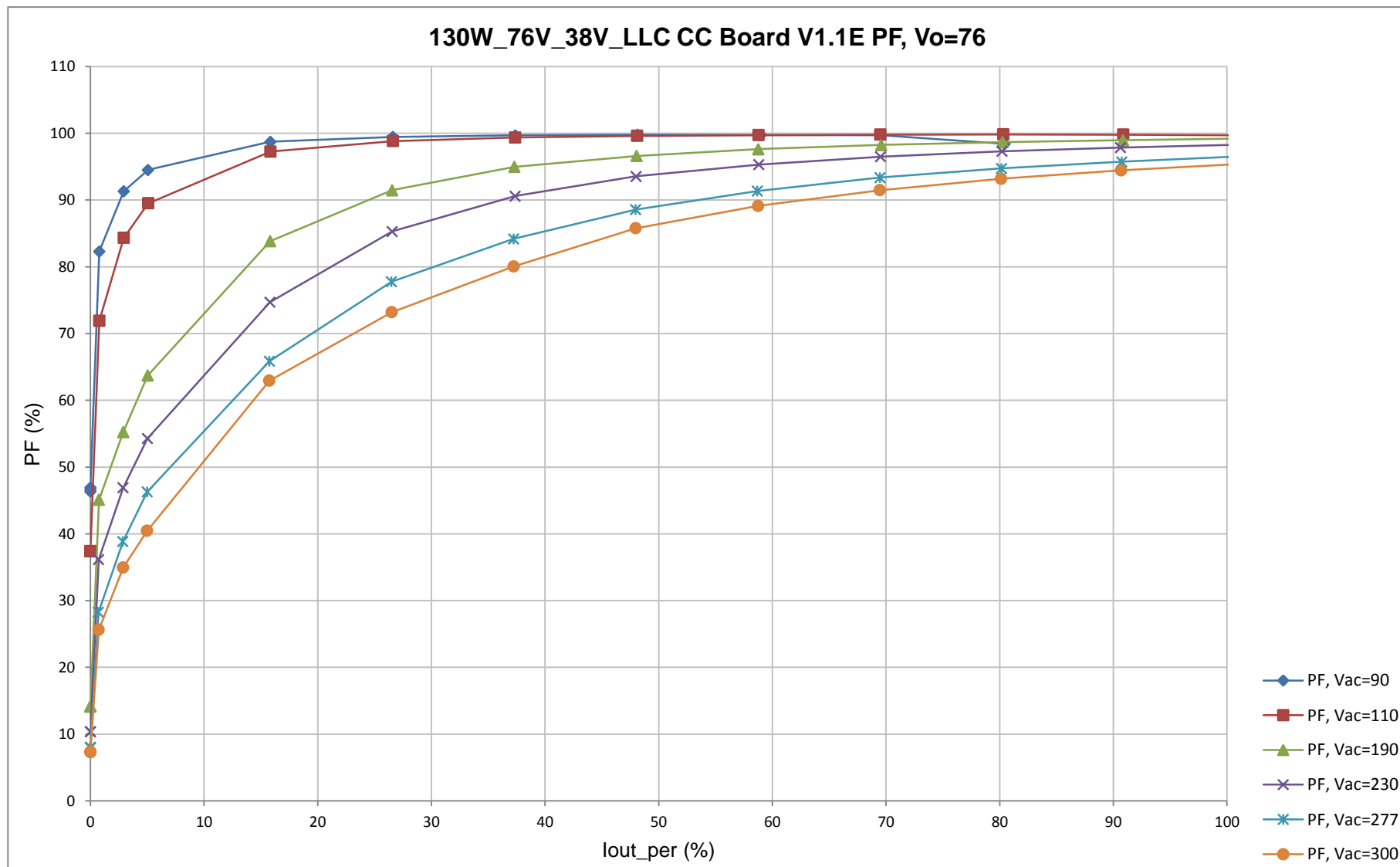
Can even be improved by sync. Rect.

Efficiency: $V_{OUT} = 38V$

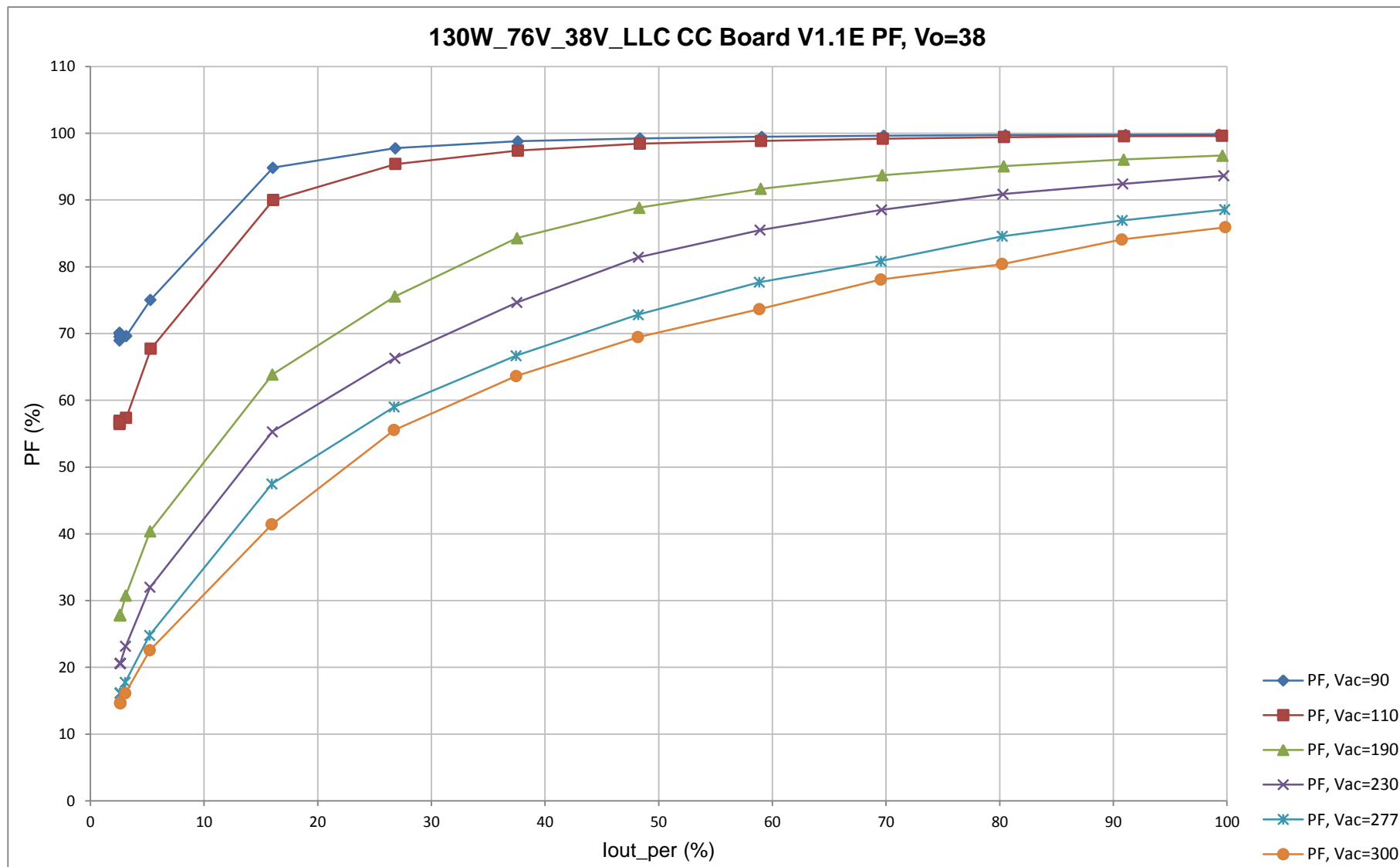
130W_76V_38V_LLC CC Board V1.1E Efficiency, $V_o=38$



Power Factor: $V_{OUT} = 76V$

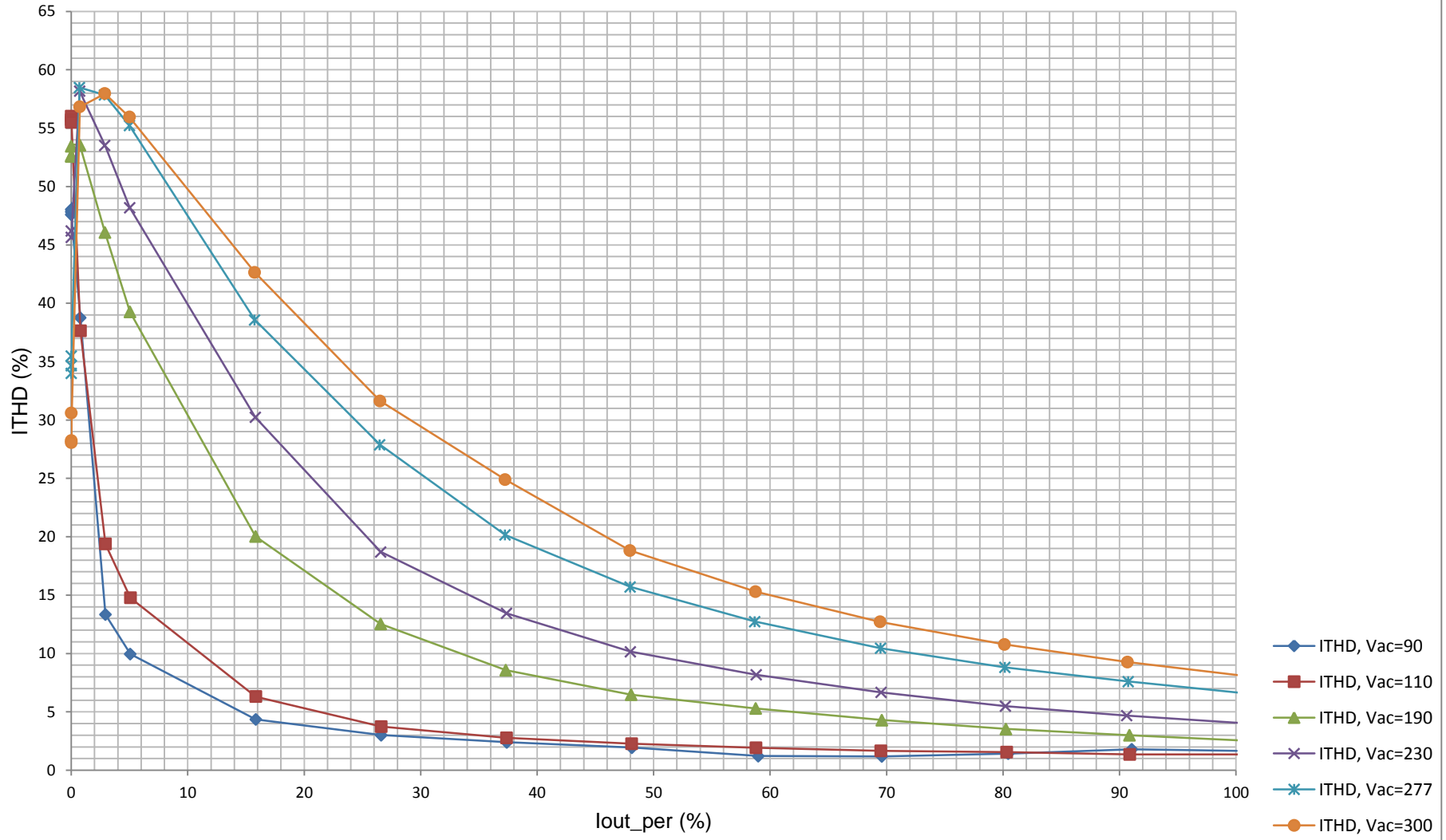


Power Factor: $V_{OUT} = 38V$



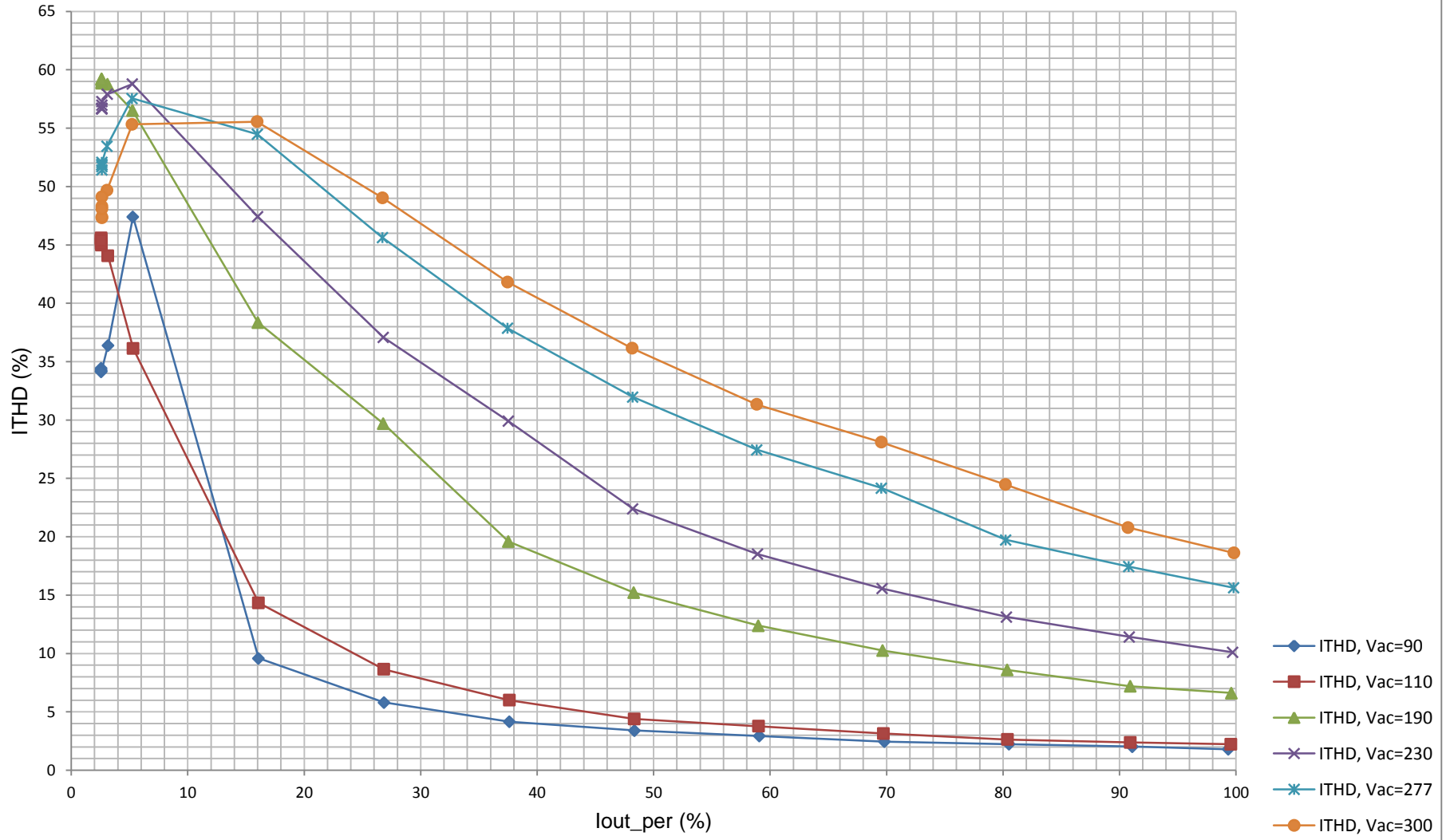
iTHD: $V_{OUT} = 76V$

130W_76V_38V_LLC CC Board V1.1E ITHD, $V_o=76$



iTHD: $V_{OUT} = 38V$

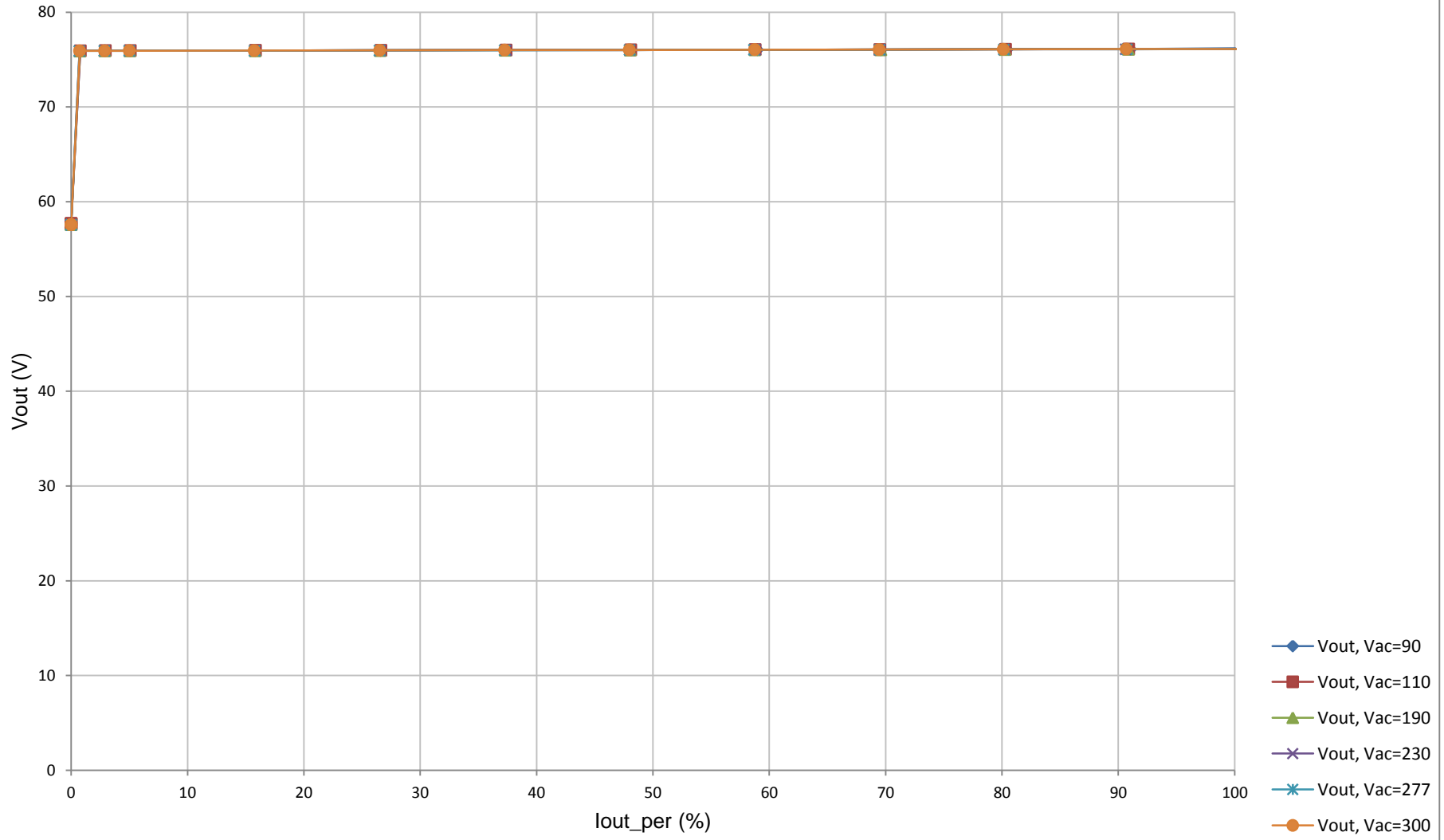
130W_76V_38V_LLC CC Board V1.1E ITHD, $V_o=38$



U-I Characteristic:

$V_{OUT} = 76V$

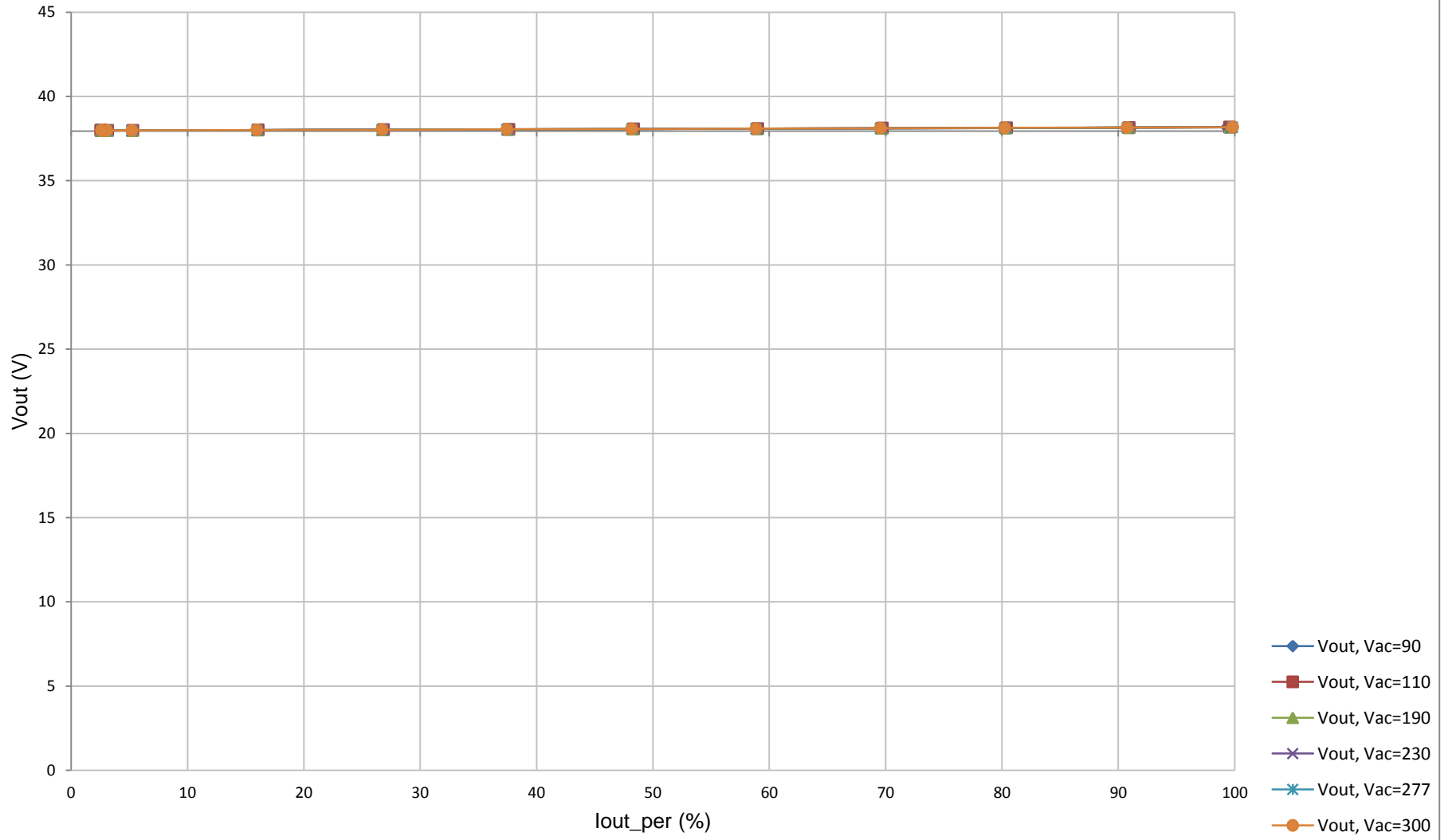
130W_76V_38V_LLC CC Board V1.1E U-I Characteristic, $V_o=76$



U-I Characteristic:

$V_{OUT} = 38V$

130W_76V_38V_LLC CC Board V1.1E U-I Characteristic, Vo=38

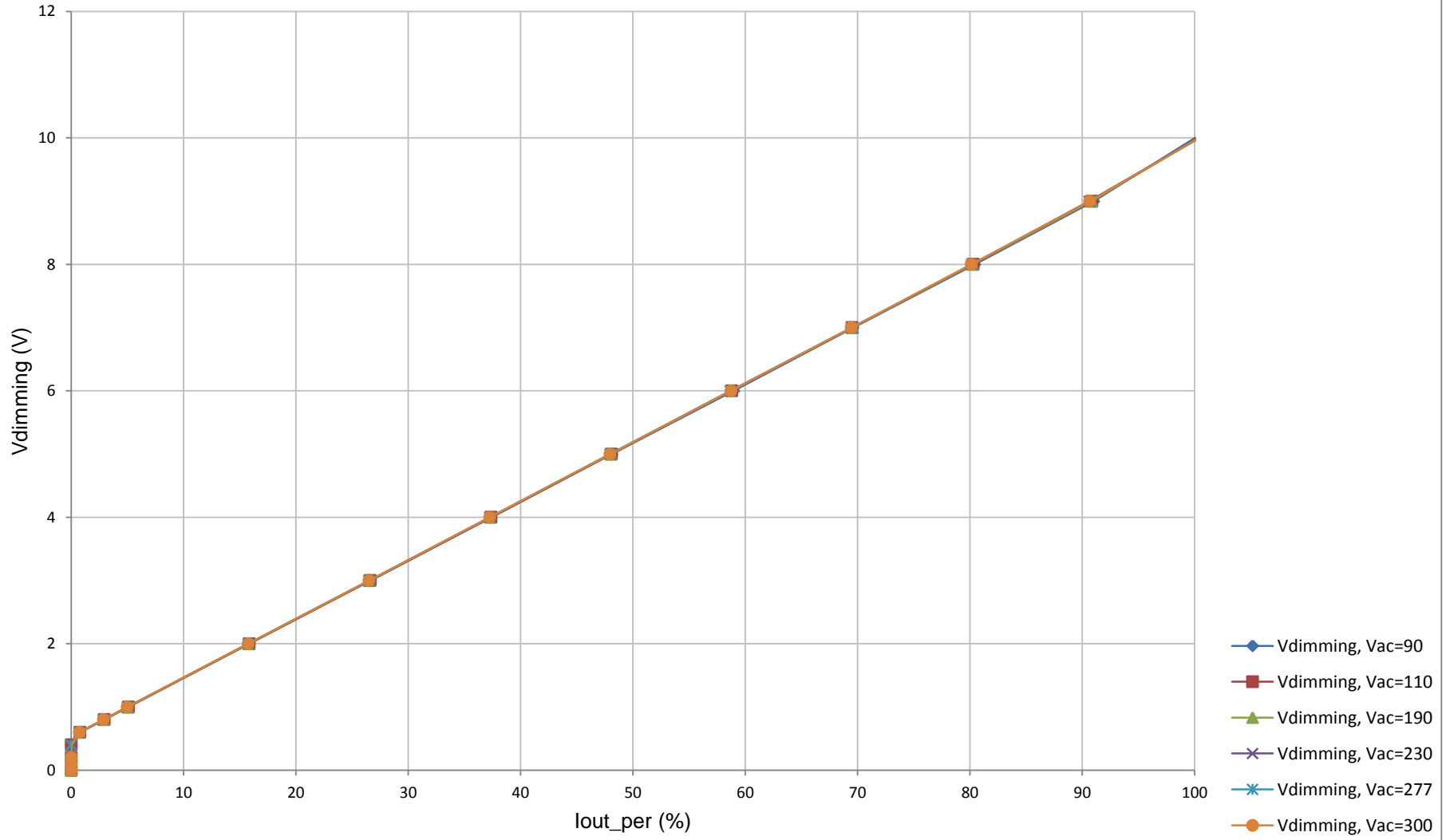


Dimming Characteristic:

$V_{OUT} = 76V$



130W_76V_38V_LLC CC Board V1.1E Dimming, $V_o=76$

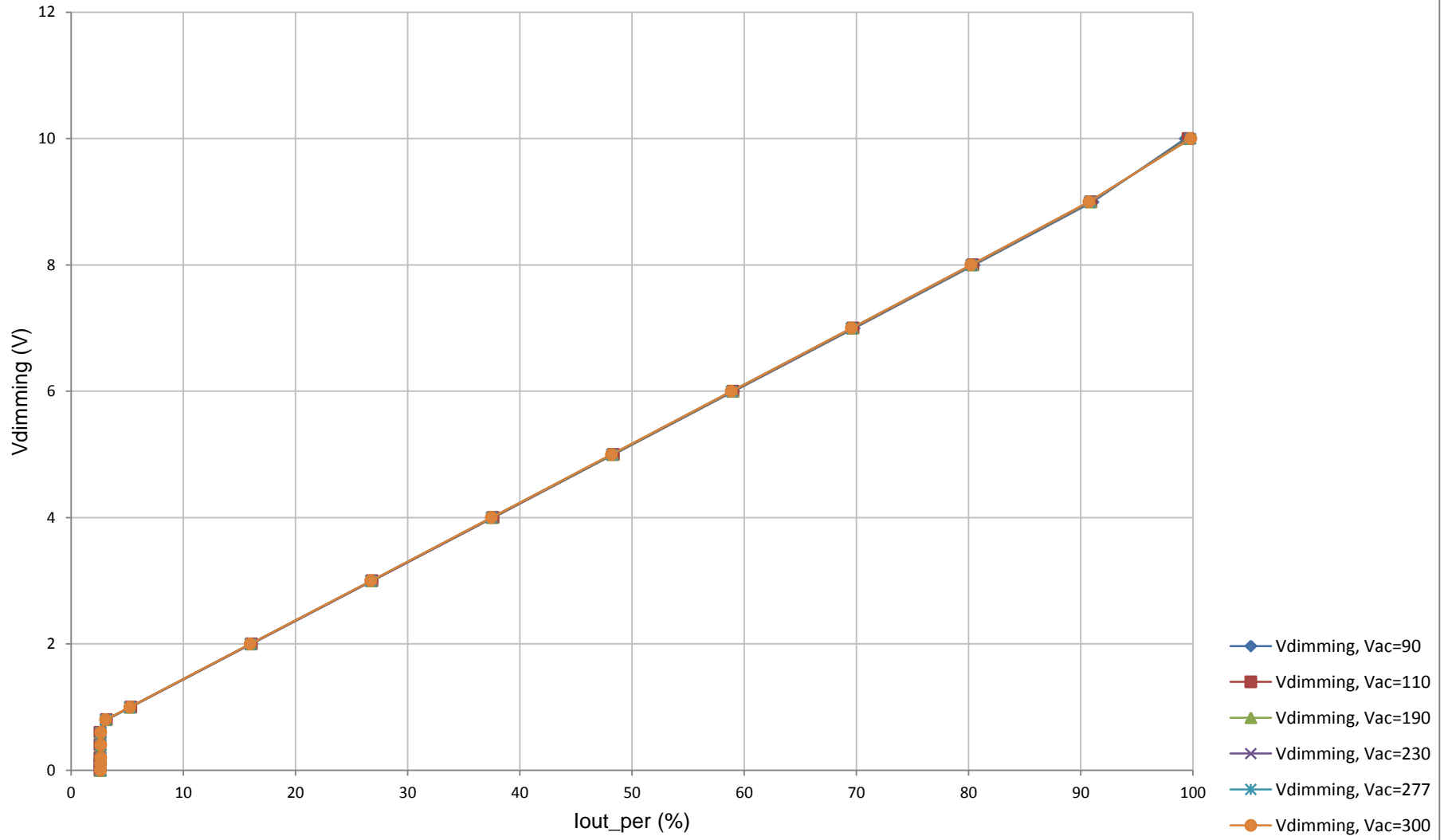


Dimming Characteristic:

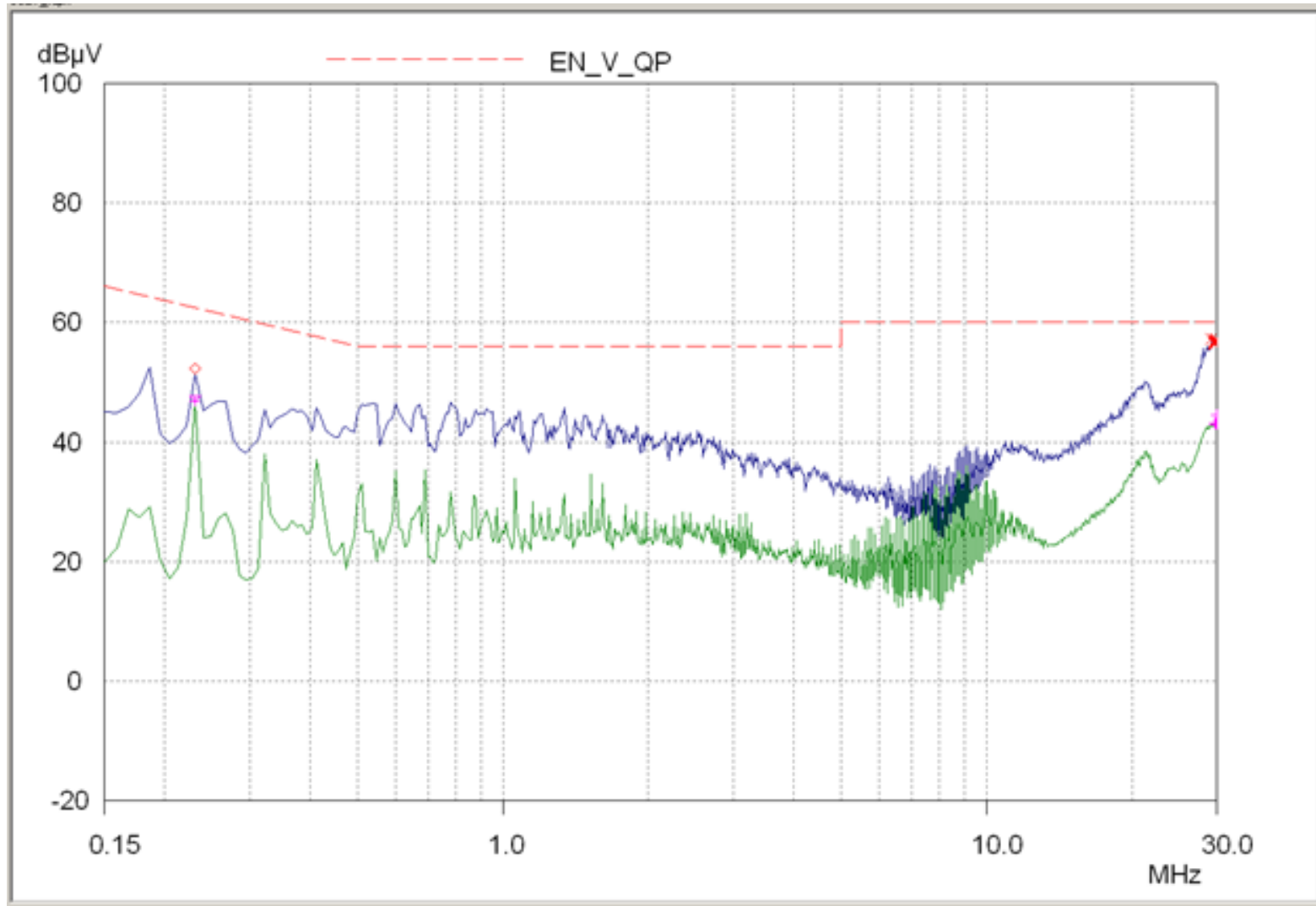
$V_{OUT} = 38V$



130W_76V_38V_LLC CC Board V1.1E Dimming, $V_o=38$

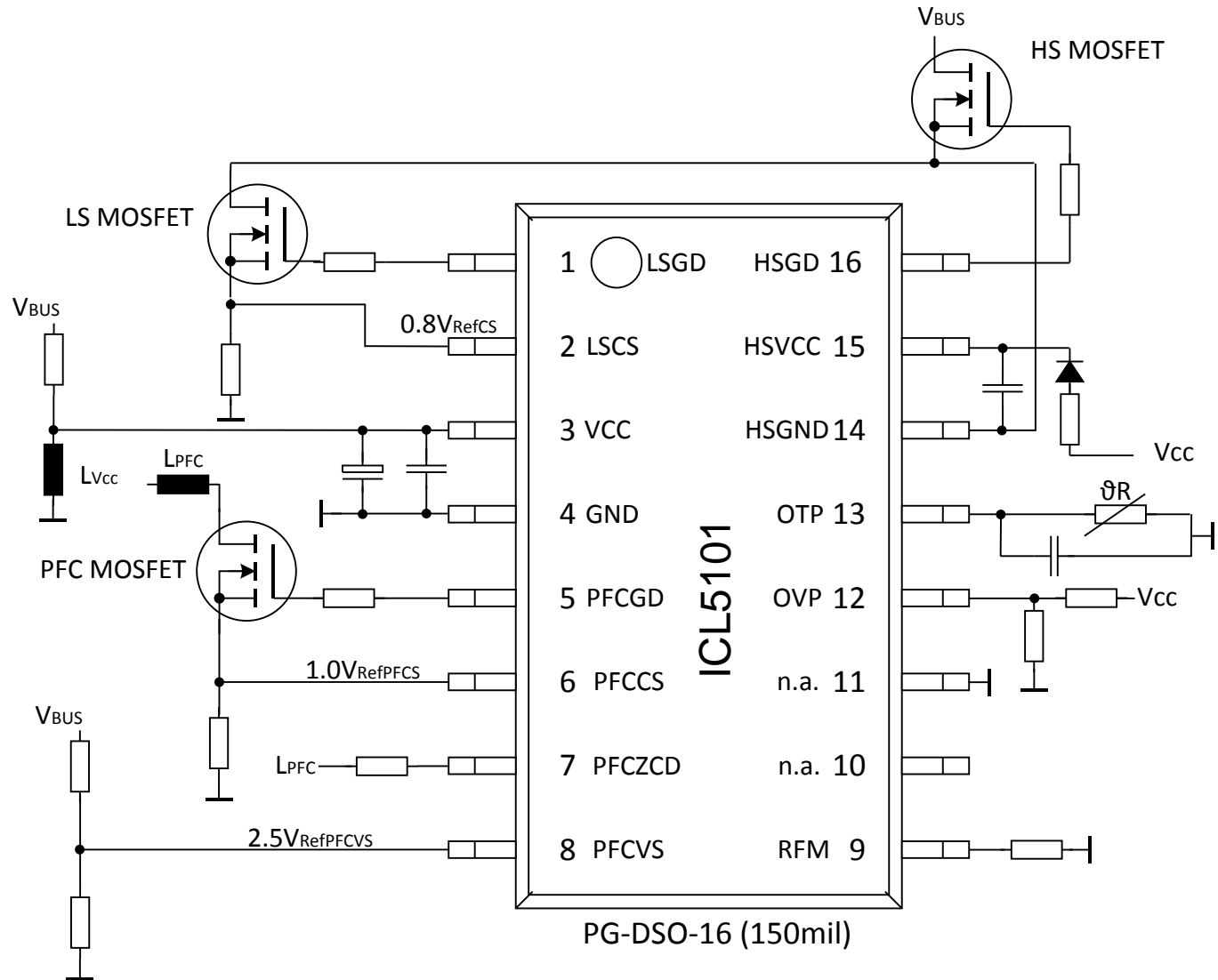


EMI According EN 55022 Standard



ICL5101 Overview

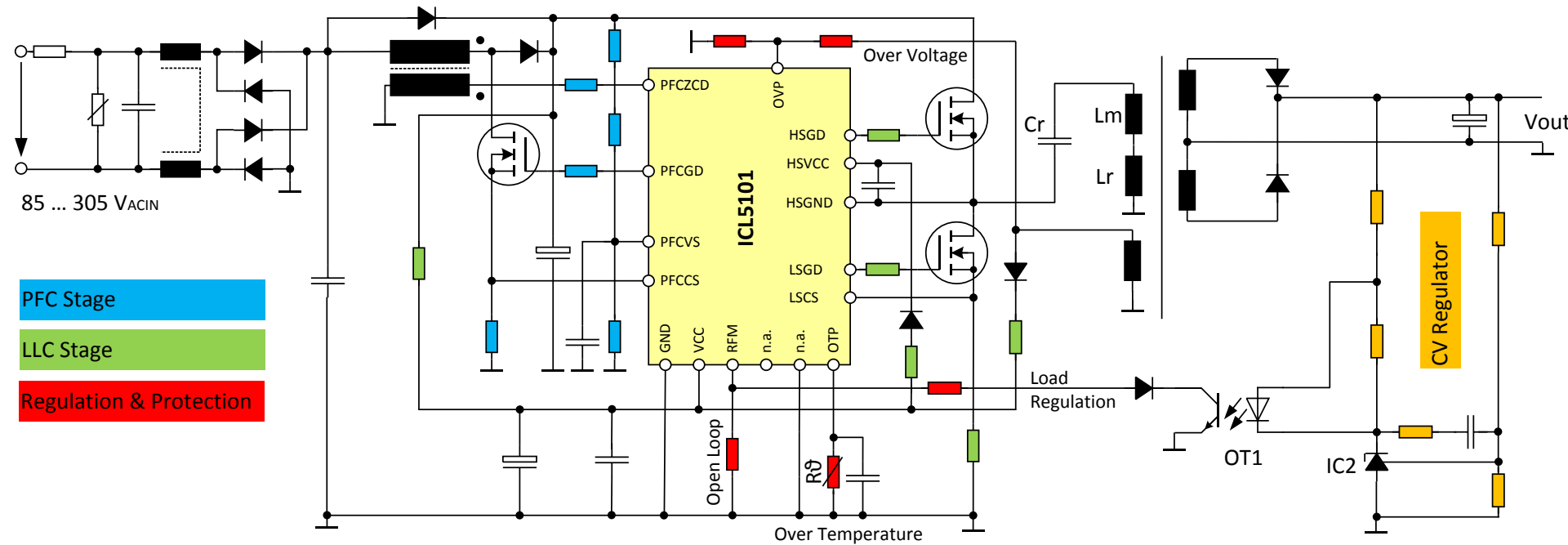
PIN Configuration



ICL5101 Overview

Simplified Schematic

ICL5101 Simplified Diagram





ENERGY EFFICIENCY COMMUNICATIONS SECURITY

Innovative semiconductor solutions for energy efficiency, communications and security.

