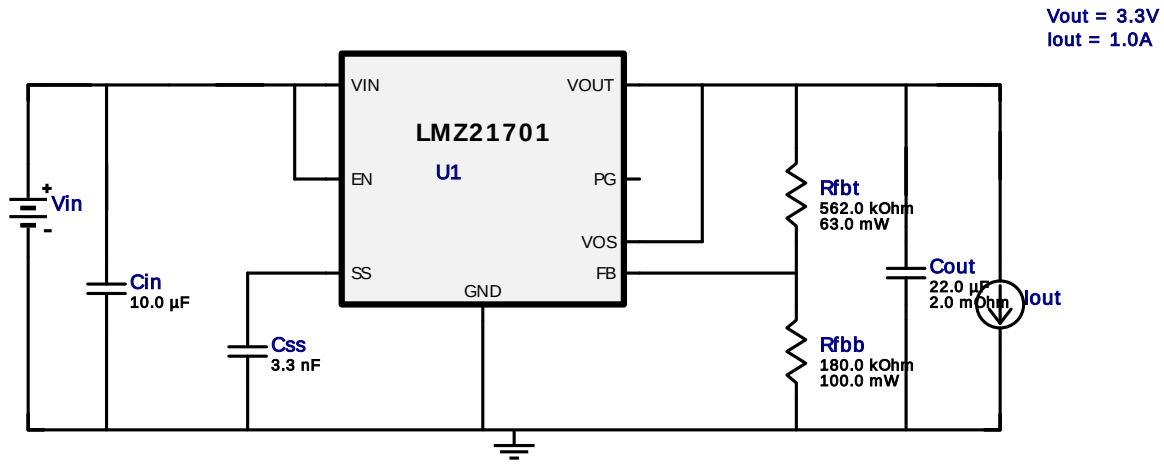
WEBENCH® Design Report

VinMin = 5.0V
VinMax = 12.0V
Vout = 3.3V
Iout = 1.0A

Device = LMZ21701SILR
Topology = Buck
Created = 8/2/16 6:36:50 PM
BOM Cost = $1.96
BOM Count = 6
Total Pd = 0.52W

Design : 4758476/1 LMZ21701SILR
LMZ21701SILR 5.0V-12.0V to 3.30V @ 1.0A

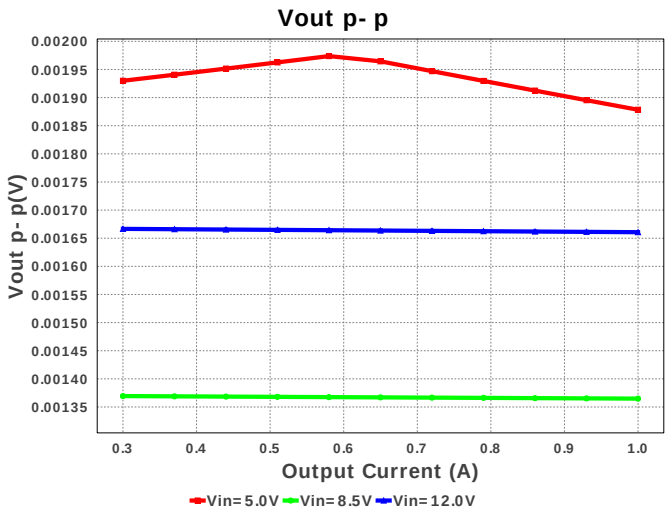


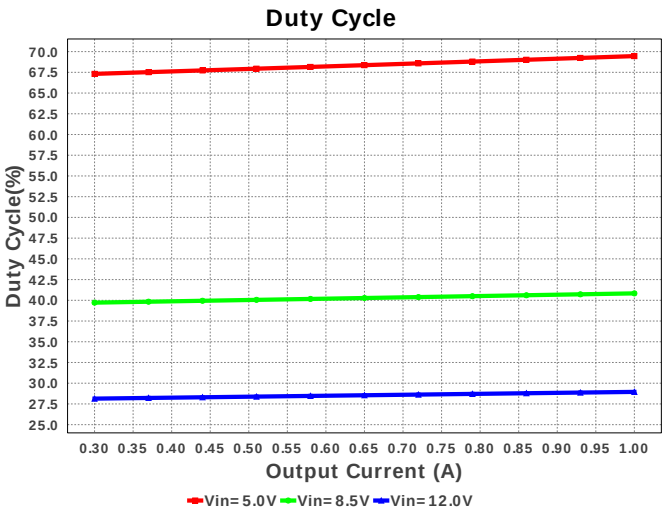
My Comments

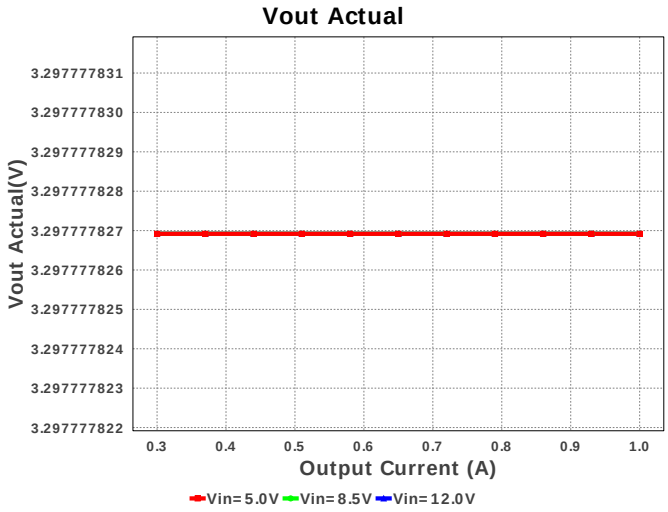
No comments

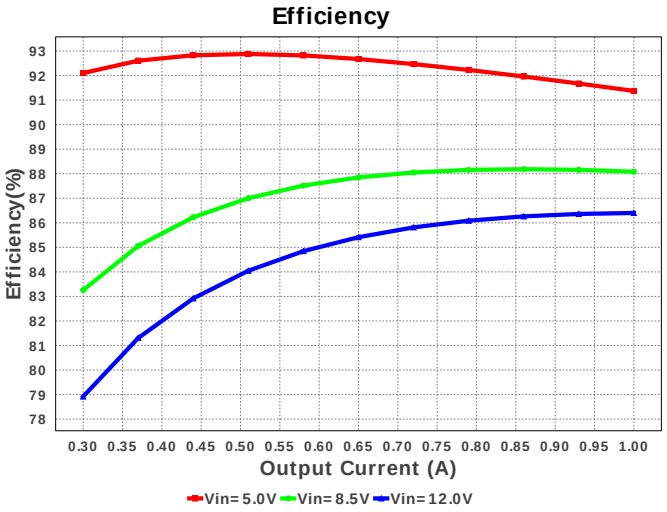
Electrical BOM

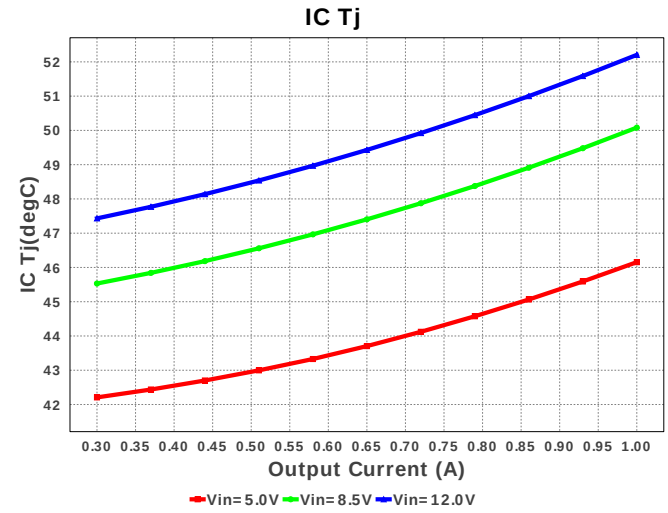
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	TMK316BJ106KL-T Series= X5R	Cap= 10.0 uF VDC= 25.0 V IRMS= 0.0 A	1	$0.05	1206 11 mm²
2.	Cout	Taiyo Yuden	JMK212BJ226KG-T Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.13	0805 7 mm²
3.	Css	MuRata	GRM216R71E332KA01D Series= X7R	Cap= 3.3 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
4.	Rfbb	Yageo America	RC0603FR-07180KL Series= ?	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
5.	Rfbt	Vishay-Dale	CRCW0402562KFKED Series= CRCW..e3	Res= 562.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
6.	U1	Texas Instruments	LMZ21701SILR	Switcher	1	$1.75	SIL0008B 14 mm²

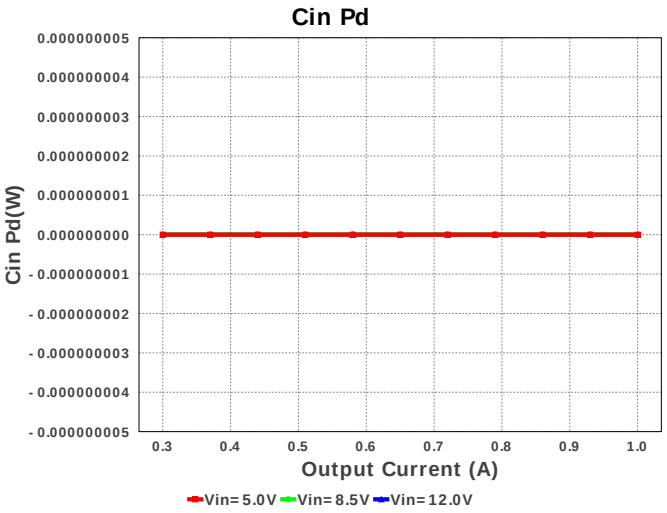


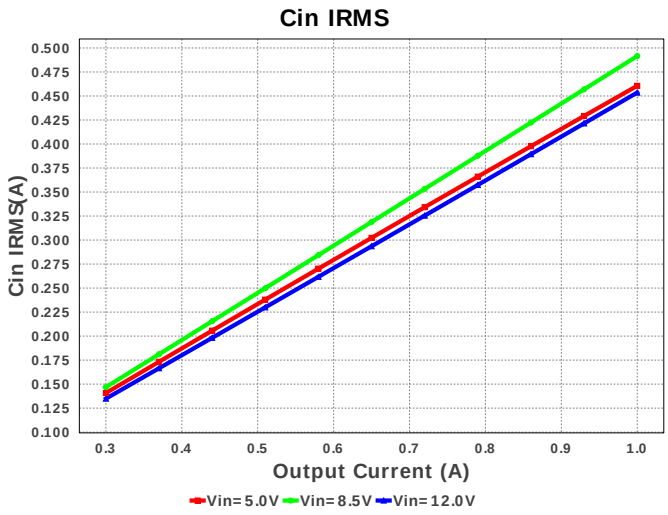


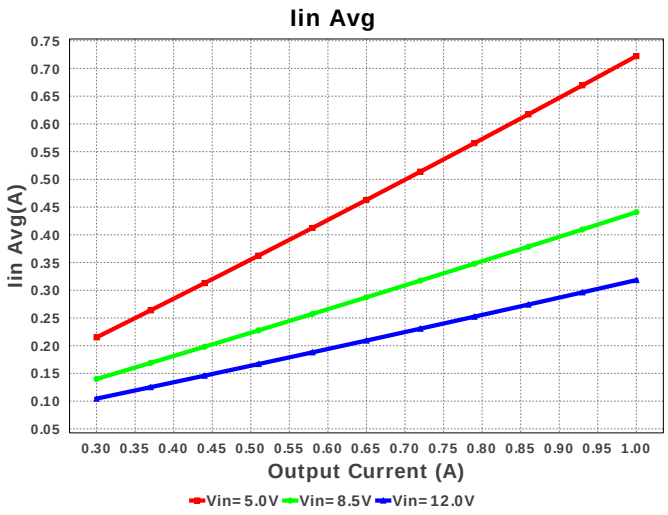


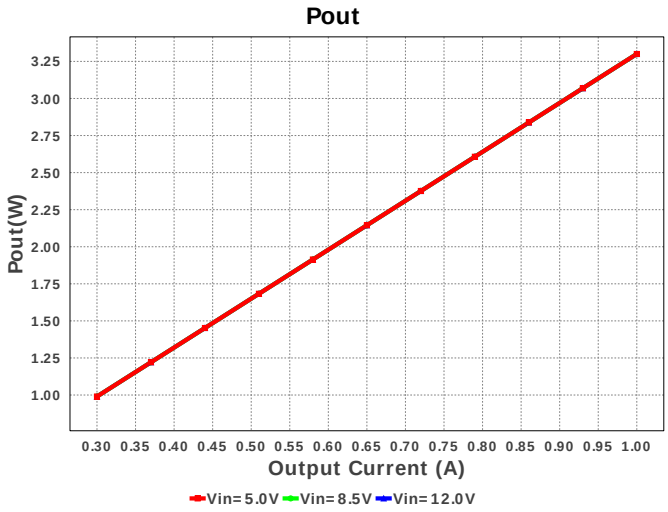


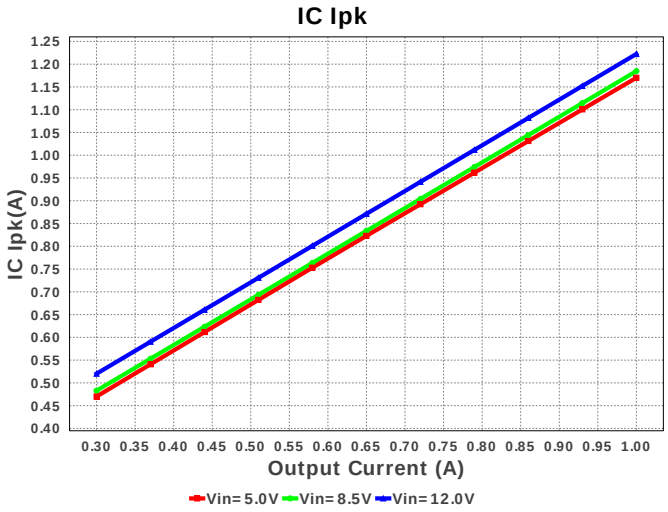


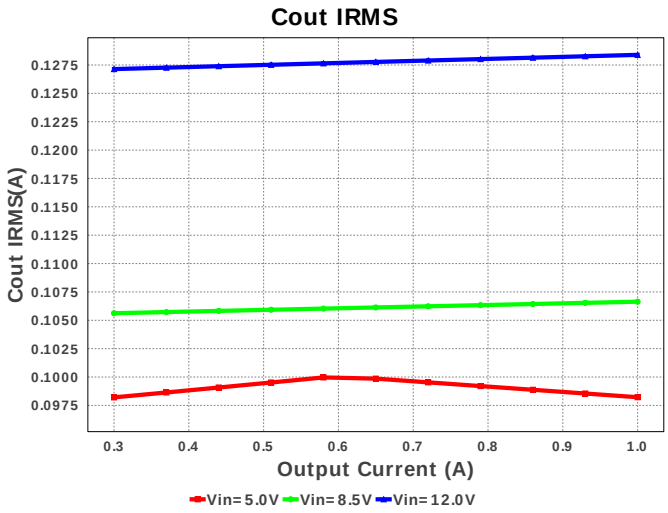


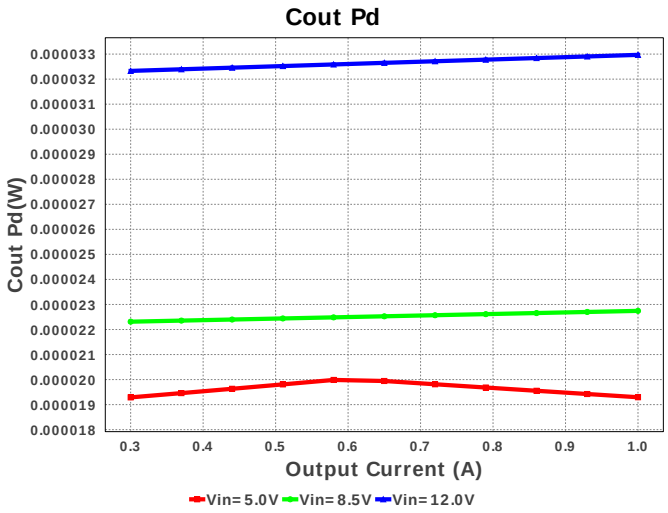


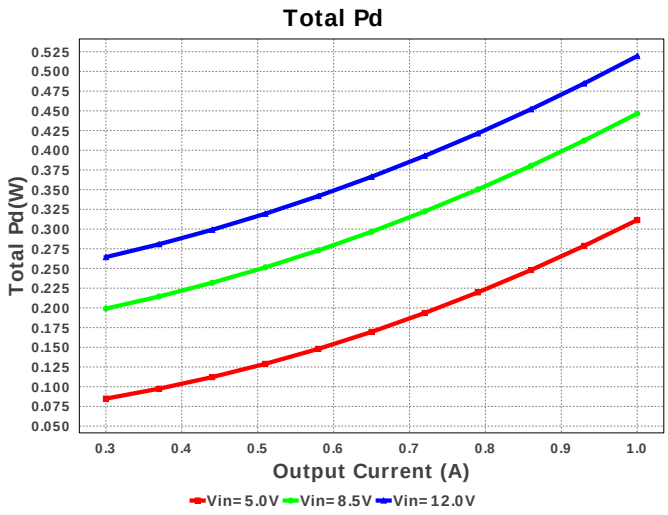


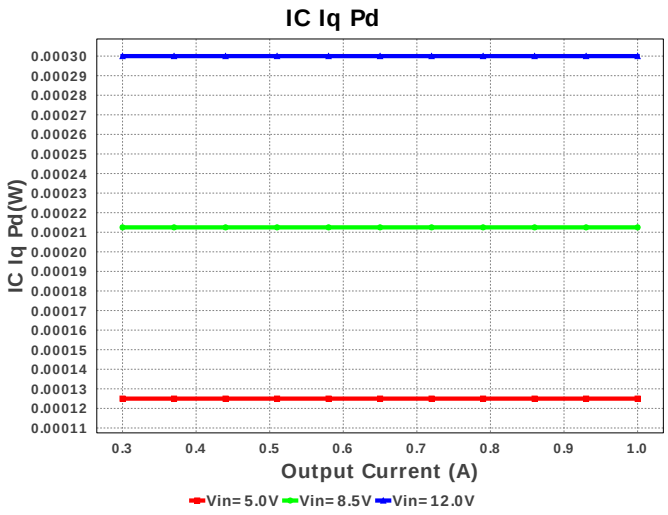


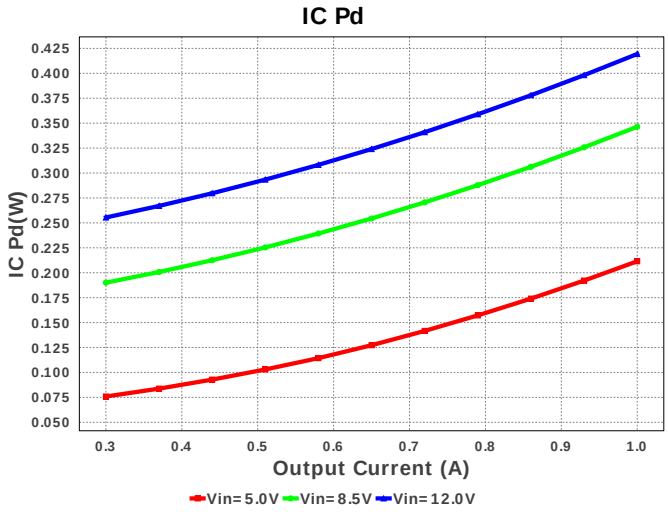












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	453.542 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	128.392 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.222 A	Current	Peak switch current in IC
4.	Iin Avg	318.29 mA	Current	Average input current
5.	BOM Count	6	General	Total Design BOM count
6.	FootPrint	47.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	2.574 MHz	General	Switching frequency
8.	Pout	3.3 W	General	Total output power
9.	Total BOM	$1.96	General	Total BOM Cost
10.	Vout Actual	3.298 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	28.953 %	Op_point	Duty cycle
13.	Efficiency	86.4 %	Op_point	Steady state efficiency
14.	IC Tj	52.204 degC	Op_point	IC junction temperature
15.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.0 A	Op_point	Iout operating point
17.	VIN_OP	12.0 V	Op_point	Vin operating point
18.	Vout p-p	1.661 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
20.	Cout Pd	32.969 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	300.0 µW	Power	IC Iq Pd
22.	IC Pd	419.395 mW	Power	IC power dissipation
23.	Total Pd	519.449 mW	Power	Total Power Dissipation
24.	Vout Tolerance	1.53 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	12.0	Maximum input voltage

#	Name	Value	Description
3.	VinMin	5.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LMZ21701	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	40.0	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 3A output current, 3V to 17V Input Voltage Range, Adjustable output voltage from 0.9V to 6VOptional Softstart Capacitor for slow startup, Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. **LMZ21701** Product Folder : http://www.ti.com/product/LMZ21701 : contains the data sheet and other resources.