

FEATURES :

- 20W DIL Package
- 8:1 Wide Input Voltage Range
- High Efficiency Up To 92%
- Regulated Output Types
- No Minimum Load Required
- Over Power and Short Circuit Protection
- Over Temperature Protection
- Operating Temperature: -40°C To +83°C (Without Derating)
- UL94V-0 Package Material
- 100% Burned In
- 3 Years Warranty

Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified

Selection Guide

Part Number	Input Voltage Range	Input Current		Output Voltage	Output Current	Efficiency (@36Vin)	Maximum capacitor Load
		No-Load	Full-Load				
	Vdc	mA (typ)	mA (typ)	Vdc	mA (typ)	% (typ)	µF
SYNC20-36S05	9-75	8	617	5	4000	90	6800
SYNC20-36S12	9-75	8	611	12	1667	91	1200
SYNC20-36S15	9-75	8	618	15	1334	90	750
SYNC20-36S24	9-75	8	604	24	833	92	300
SYNC20-36D12	9-75	8	617	±12	±833	90	±600
SYNC20-36D15	9-75	8	611	±15	±667	91	±390

Part Number

SYNC
20
-
36
S
05

A
B
C
D
E

- A : Series
 B : Output Power
 C : Input Voltage
 D : Single/Dual Output
 E : Output Voltage

DC-DC Converter

SYNC20 SERIES

20Watt

1600Vdc Isolated

8 : 1 Input Voltage Range

Single/Dual Output

2" X 1" Size



Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Input Voltage		9	36	75	Vdc
Input Surge Voltage (100 ms max.)		-0.7		100	Vdc
Start-up Voltage				9	Vdc
Under Voltage Shutdown			7.5		Vdc
Start-up Time	Constant Resistive Load, Nominal Vin	Power-up	30		ms
		Remote ON/OFF	30		
Input Filter	All Models		Internal Pi type		
Remote ON/OFF (Ctrl PIN Refer To -Vin PIN)	Positive Logic	DC/DC ON	Open or 3.5 Vdc – 12 Vdc		
		DC/DC OFF	Short or 0 Vdc – 1.2 Vdc		
	Input Current of Ctrl PIN		-0.5	0.5	mA
	Remote Off Input Current		3		

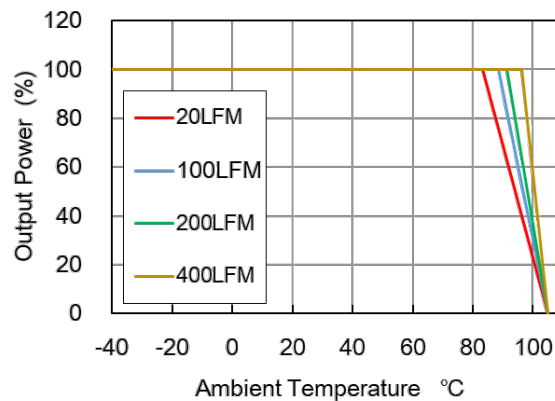
Output Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	100% Load	-2		+2	%
Line Regulation	Vin(min) to Vin(max) @100% Load	-0.2		+0.2	%
Load Regulation	0% Load to 100% Load	-0.5		+0.5	%
Ripple & Noise (BW=20MHz)	5Vout			100	mVp-p
	12Vout			100	
	15Vout			150	
	24Vout			150	
Transient Response Setting Time	25% Load Step Change		350	500	us
Transient Response Deviation	25% Load Step Change	-5	±3	+5	%
Temperature Coefficient		-0.02		+0.02	%/°C
Voltage Adjustability	% of Vout	-10		+10	%
Output Power Protection	% of Io, Hiccup mode, Auto-recovery	115	150	190	%
Short Circuit Protection	Continuous [Hiccup Mode], Auto-Recovery				
Over Voltage Protection	5Vout		6.2		Vdc
	12Vout, ±12Vout		15		
	15Vout, ±15Vout		18		
	24Vout		30		

General Specifications

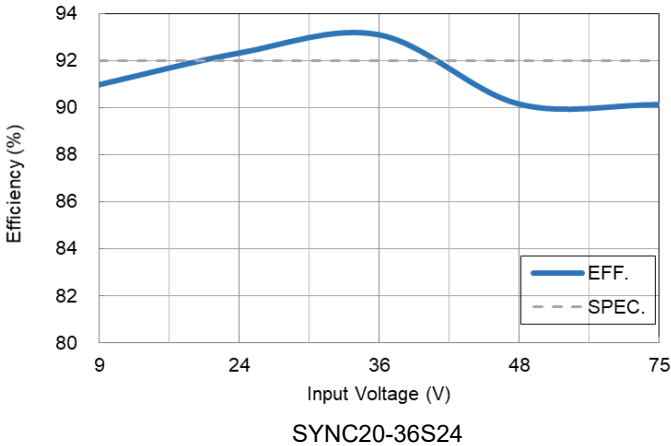
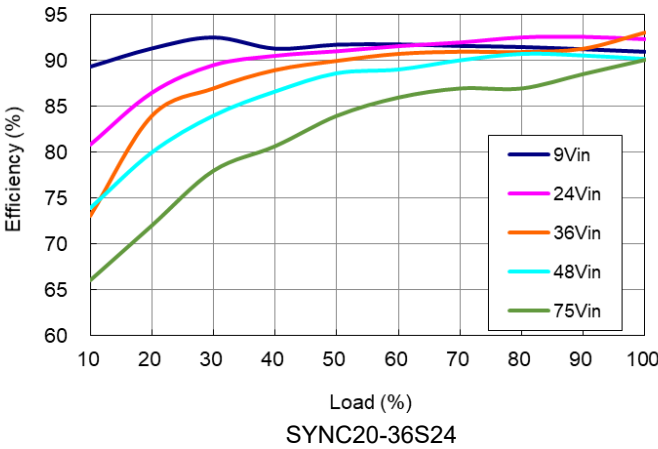
Parameters	Conditions	Min	Typ	Max	Units	
Isolation Voltage	Input to Output (60sec)	1600			Vdc	
	Input (Output) to Case (60sec)	1000			Vdc	
Isolation Resistance	500Vdc	1000			MΩ	
Isolation Capacitance	100kHz, 1V			2200	pF	
Switching Frequency	Full Load, Nominal Input	200	235	270	KHz	
Operating Ambient Temperature (Power Derating See Derating Graph)	Nominal Vin, 100% Load	SYNC20-36S05, SYNC20-36S15, SYNC20-36D12,	-40		77.2	°C
		SYNC20-36S12, SYNC20-36D15			80.2	
		SYNC20-36S24			83.3	
Thermal Impedance	20LFM		12.5		°C/W	
	100LFM		9.5			
	200LFM		7.8			
	400LFM		5.1			
Maximum Case Temperature				105	°C	
Over Temperature Protection	Case temperature		120		°C	
Storage Temperature		-55		125	°C	
Humidity	Non Condensing	5		95	%	
Cooling	Natural Convection					
Case Material	Copper					
Potting Material	Silicone (UL94-V0)					
MTBF	MIL-HDBK-217F@25°C (calculated)		976,017		Hours	
Weight			35		g	
Dimensions	50.8 x 25.4 x 11.6				mm	

Temperature Derating Graph

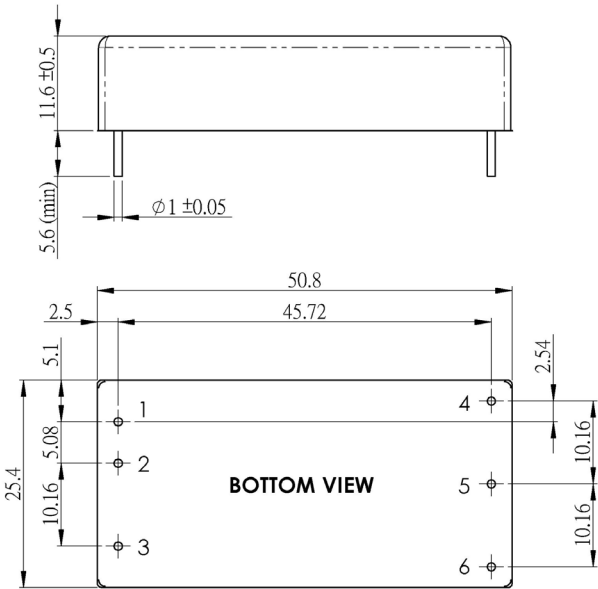


SYNC20-36S24

Characteristic Curve



Dimensions

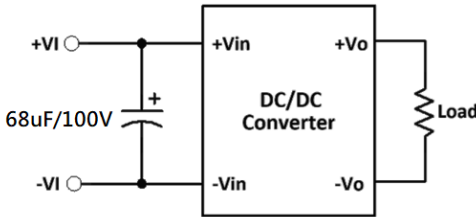


Unit: mm
Tolerance: XX.X ± 0.5 ; XX.XX ± 0.25

PIN Assignment

Pin	Single	Dual	Diameter
1	+Vin	+Vin	1.0mm[0.04"]
2	-Vin	-Vin	1.0mm[0.04"]
3	Ctrl	Ctrl	1.0mm[0.04"]
4	+Vout	+Vout	1.0mm[0.04"]
5	-Vout	Com	1.0mm[0.04"]
6	Trim	-Vout	1.0mm[0.04"]

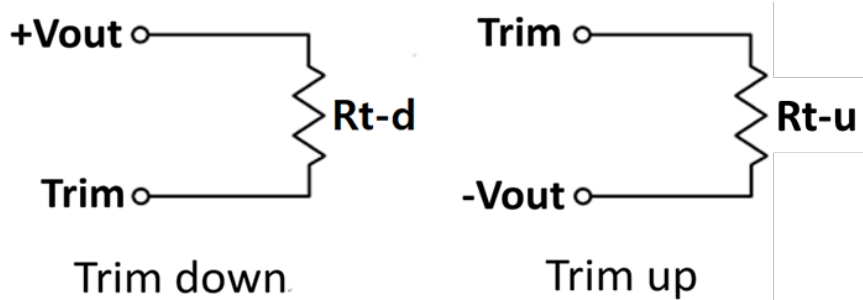
Application Examples



It is necessary to parallel a capacitor across the input pins under normal operation.
Minimum Capacitance: 68 μ F/100V.

External Output Trimming

Output can be externally trimmed by using the method, shown as below.



SYNC20-36S05

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
	down	Rt-d =	138.88KΩ	62.41KΩ	36.92KΩ	24.18KΩ	16.53KΩ	11.44KΩ	7.79KΩ	5.06KΩ	2.94KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
	up	Rt-u =	106.87KΩ	47.76KΩ	28.06KΩ	18.21KΩ	12.30KΩ	8.36KΩ	5.55KΩ	3.44KΩ	1.79KΩ

SYNC20-36S12

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
	down	Rt-d =	280.90KΩ	125.65KΩ	73.90KΩ	48.02KΩ	32.50KΩ	22.15KΩ	14.76KΩ	9.21KΩ	4.90KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
	up	Rt-u =	225.50KΩ	100.75KΩ	59.17KΩ	38.38KΩ	25.90KΩ	17.58KΩ	11.64KΩ	7.19KΩ	3.72KΩ

SYNC20-36S15

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
	down	Rt-d =	499.18KΩ	223.09KΩ	131.06KΩ	85.05KΩ	57.44KΩ	39.03KΩ	25.88KΩ	16.02KΩ	8.35KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
	up	Rt-u =	404.82KΩ	180.91KΩ	106.27KΩ	68.95KΩ	46.56KΩ	31.64KΩ	20.97KΩ	12.98KΩ	6.76KΩ

SYNC20-36S24

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
	down	Rt-d =	598.97KΩ	267.93KΩ	157.59KΩ	102.42KΩ	69.31KΩ	47.24KΩ	31.48KΩ	19.66KΩ	10.46KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
	up	Rt-u =	486.83KΩ	217.87KΩ	128.21KΩ	83.38KΩ	56.49KΩ	38.56KΩ	25.75KΩ	16.14KΩ	8.67KΩ