U9C4612S, Isolation Power-over-Ethernet (PoE) PD Module

Product Description

The U9C4612S is an isolation, regulated DC-DC converter for power-over-ethernet (PoE) that has a wide input range, 42~57V, and produces 15W of peak output power, yielding an excellent power density.

The U9C4612S is designed for IEEE 802.3af compliant devices and it has self-protection features, including input under-voltage lockout, input overvoltage lockout and over temperature shutdown, overcurrent protection with hiccup, and the output may be short-circuited indefinitely. Moreover, the synchronous rectifier flyback topology offers high efficiency to minimize the heat in no fan operation.

Features

- IEEE802.3af compliant
- 12.95W DC-DC converter
- 42~57 input voltage range
- 87% efficiency
- OCP/OVP/OTP protection
- 1500Vdc input-to-output isolation
- 58mm x 14mm x16mm size
- Operating temperature range -20℃ to +60℃

Applications

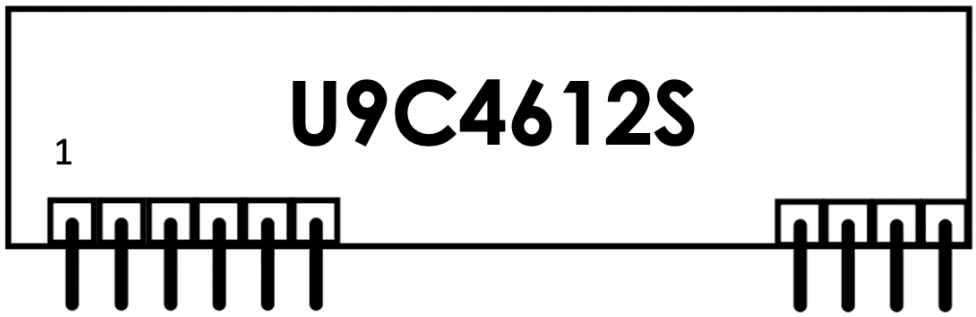
- IEEE802.3af compliant devices
- Security camera
- VoIP phone
- WLAN access points
- IoT devices

Ordering Information

Models				
Part Number	**Input voltage range**	**Output voltage range**	**Output wattage**	**Efficiency typ.**
U9C4612S	42 ~ 57V	12V	12.95W	87%
U9C4012S	42 ~ 57V	12V	25.5W	88%
U9C4040	42 ~ 57V	40V	25.5W	90.5%
U9C4812	42 ~ 57V	12V	62W	91%
U9C4824	42 ~ 57V	24V	62W	91.5%

Note: All specifications are at nominal line voltage, full load, 25℃, unless otherwise stated.

Package Reference



Pin Functions

Input/Output connections		
Pin	**Designation**	**Function**
1	+Vin	Positive Input Voltage
2	-Vin	Negative input Voltage
3~6, 9	NC	N/A
7	-Vout	Negative Output Voltage
8	+Vout	Positive Output Voltage
10	-Vout	Negative Output Voltage

U9C4612S Electrical Characteristics

Absolute	Conditions	Min	Typ	Max	Units
Input Voltage		42		57	Vdc
Input Surge Voltage	1 sec or 100ms			60	Vdc
Isolation Voltage (input/output)	Impulse test			1500	Vdc
Continuous Output Power		12.95			W
Peak Output Current				1.25	A
Operating temp		-20		60	℃
Storage temp	Vin=zero	-40		85	℃
Input					
Operating Voltage		42	48	57	Vdc
Input Undervoltage Turn-on	1 sec		37.5		Vdc
Input Undervoltage Turn-off			30.5		Vdc
Input Quiescent	Vin=48V, EN=0V		1		mA
On Resistance of Internal Hotswap			0.48		ohm
Output					
Voltage Accuracy		-3		+3	%
Efficiency – Full load	Vin=48V, Iout=1.079A		87		%
Efficiency – Half load	Vin=48V, Iout=0.54A		86		%
Line Regulation	Low line to high line @full load	-0.5		+0.5	%
Load Regulation	No load to full load	-1		+1	%
Ripple Noise	Cout=0.1uF 50V		300	400	mVp-p
Temperature Coefficient		-0.02		0.02	%/℃
Over Voltage Protection	Hiccup		16		Vdc
Short Circuit Protection	Hiccup				
Maximum Load Cap	Low ESR			10,000	μF

Note: All specifications are at nominal line voltage and at 25℃, unless otherwise stated and for design reference only.

U9C4612S Electrical Characteristics (CONT.)

General	Conditions	Min	Typ	Max	Units
Over Temperature Protection			125		℃
Switching Frequency			250		KHz
ESD			RoHS-6		
RoHS Rating			RoHS-6		

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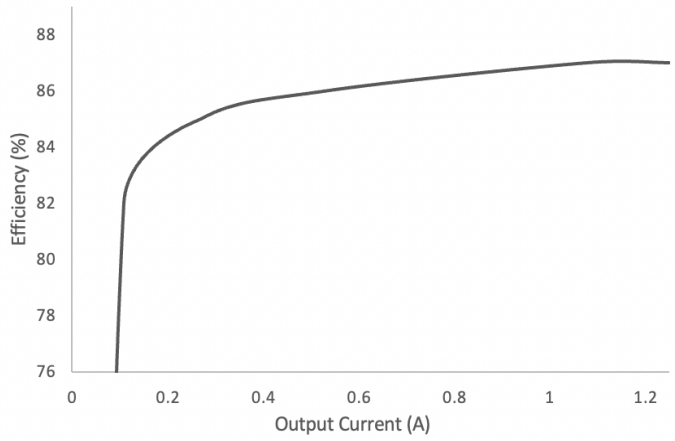
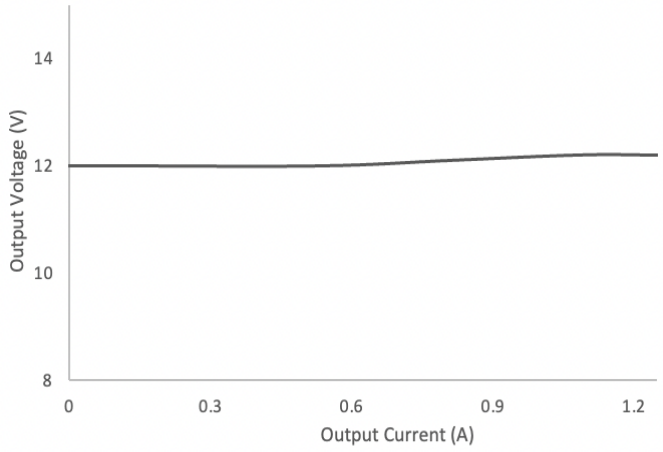
U9C4612S Typical Performance Curves

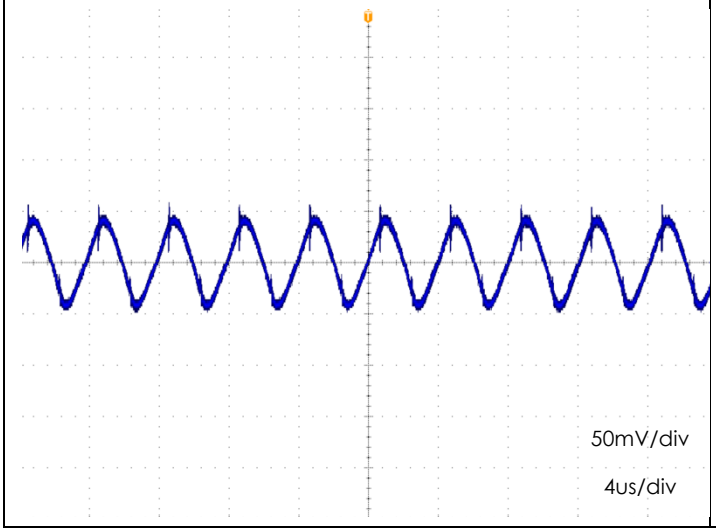
Efficiency vs. Load current (48Vin, Ta=+25℃)



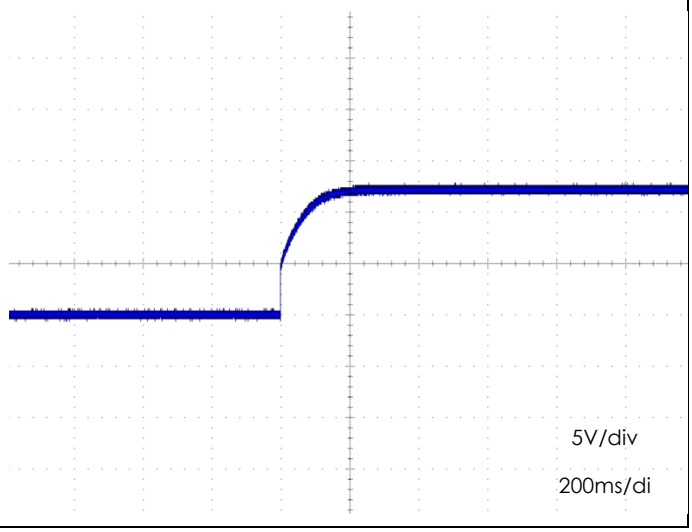
Load Regulation (Ta=+25℃)



Output Ripple (Vin=48V, Iout=1.079A, Ta=+25℃)



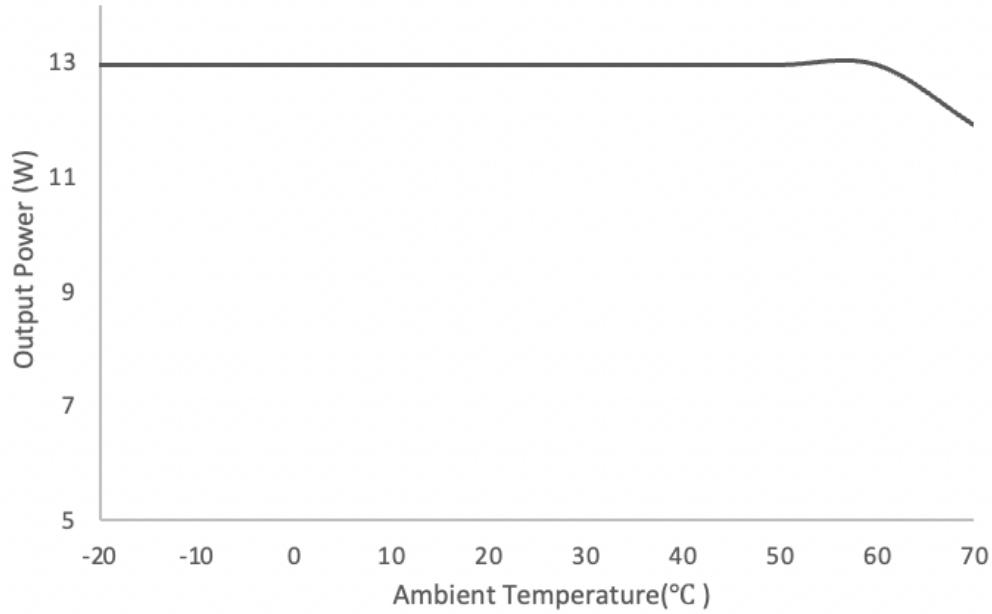
Vout Start-up (Vin=48V, Iout=1.079A, Ta=+25℃)



Operating Thermal Range

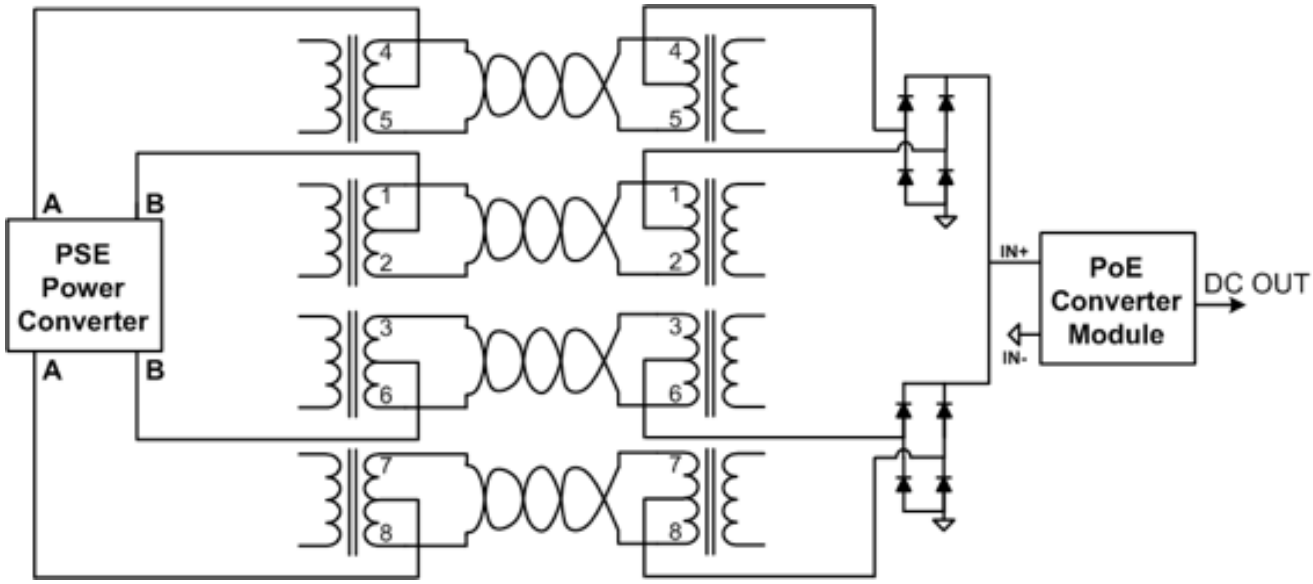
U9C4612S is capable of handling 12.95W continuous power, like any other power component, it will generate heat and de-rate with operating temperature as profile of figure below. It's important that this be taken into consideration at design phase.

U9C4612S Operating Profile



Connection with 1000BASE-T Ethernet

Unlike 10BASE-T and 100BASE-T uses all four cable pairs for transmission in both directions, the additional. data pairs are added. The following diagram shows how to connect modules to support 1000BASE-T Ethernet.



Product Dimension