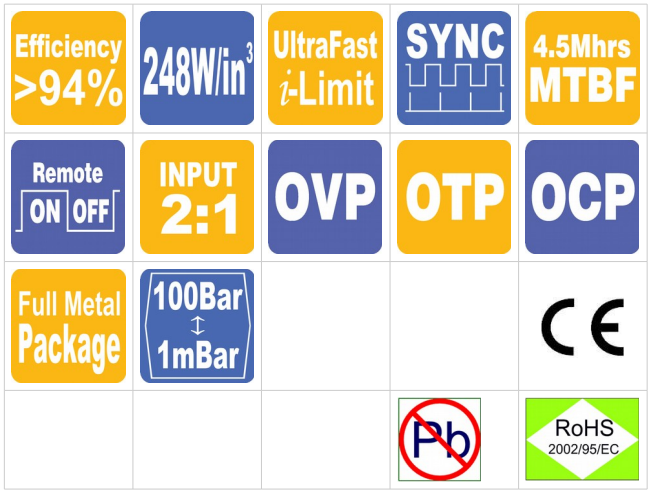
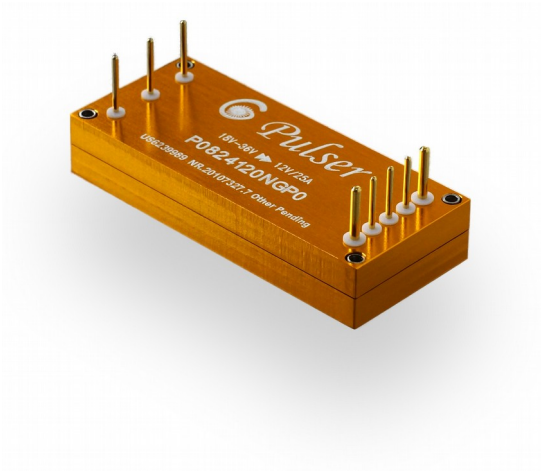




The ***P0824120*** converter delivers 12V/25A output from 18~36V input with industry standard 1/8-Brick pin assignment. The converter core is designed with patented ***"Buck-Reset Forward"*** topology and proprietary ***"Partial-Resonant-Synchronous-Rectifier"*** rectification stage switching at 450kHz frequency to efficiently deliver 300 watts of power, achieving 94% of conversion efficiency and 248W/in^3 of power density. By employing Glary's latest proprietary wide-band ***Pulsed-load-signal-estimator (Pulser)*** circuit technology, its step load performance has been optimized to suppress the peak deviation well under ±8% of its rated output voltage within 40us caused by high ratio pulsed-load, which sinks 0~90% or 0~100% of the rated output current. A ±5% or ±3% of peak deviation can be easily achieved by adding a 470uF or 2200uF of external output capacitor with the pulsed-load respectively.

In order to protect the converter and its load from the risk of over power caused by very low impedance short circuit on output terminal pins, a proprietary **UltraFast i-Limit** technology is also embedded to eliminate the ***"Short-Circuit-Current-Runaway"*** phenomenon, which induces a very high output current in proportion to its minimum duty cycle limited by the propagation delay of the current controlling loop. With the **UltraFast i-Limit**, the propagation delay of the current loop can be largely reduced from 350us to 60nS, effectively limiting the output current to 1/3 of that from conventional converters, without reliability impact when powering ultra-low impedance loads, the ***P0824120*** converter provides superior driving capability to motors and capacitive loads.

All the power semiconductor chips of the ***P0824120*** converter are attached onto the inner surface of a low profile six-sided metallic case to spread heat to the outer surface homogeneously, and further result in lower thermal resistance for better cooling. External cooling means can be attached on its top or bottom sides by using four M2 screws, which provide sufficient mechanical strength for application of vehicles with harsh vibration. In order to to help the heat transfer, the cavity of the metal case is vacuum potted by using thermal conductive silicone, which also maintains hydrostatic pressure balance to secure the operating across 1mBar~100Bar of pressure range. The ***P0824120*** converter can effectively simplify the system power design of critical pulsed-load applications in extreme environments such as deep-water probes, pulsed-laser equipments, pulsed emitters, RF amplifiers, high altitude instruments and similar equipments that other power converter designs cannot serve.

MODEL NAME SYSTEM

P08	24	120	a	b	c	d	XXXX
Series	V_{IN}	V_{OUT}	Class	Enable	Pin Length	Standoff	Suffix
P08	**24:**18V~36V	**120= 12V**	**I**: -40ºC / +110ºC **A**: -60ºC / +130ºC	**P:** Positive **N:** Negative	**0**: 0.12" **1**: 0.16" **2**: 0.20" **3**: 0.24"	**0**: 0.02"	Classification only if used

The selected option codes for the "abcd" section in the model name determine options of the Pulser converter. For example, the P0824**120**IN10 module is **Class-I** converter with negative enable logic, 0.16" of pin length and 0.02" of standoff height.

MODEL LIST (Contact factory for 16~40V input)

Preliminary Data Sheet

Part Number	Maximum Input		Maximum Output		Efficiency
P0824120	18V~36V	325W	12.0V/25A	300W	93%

Part Number	Maximum Input		Maximum Output		Efficiency

*The P0824120 module is designed to demonstrate the **Pulser** technology for pulsed-load applications, which may need different input/output specifications, features and options. Please contact Glary or our local distributors for detailed information of the availability.*

COMMON SPECIFICATIONS

Absolute Maximum Ratings

Temperature	Long Term Storage	-55°C to +125°C
Input Voltage Range	Operation: 24V Models Transient (100mS): 24V Models	 -0.5V to +40Vdc 50V Maximum
Isolation Voltage	Input to Output Input to Case Output to Case	2.0KV Minimum 1.0KV Minimum 1.0KV Minimum
Remote Control		-0.5V to +12Vdc

General Parameters

MTBF	Bellcore TR-332 issue 6	4.50×10^6 hrs @GB/25°C (P0824120abcd)
OTP	T_C	See Startup / Shutdown
Weight	Metal Enclosed	32g

Control Functions

Remote Control	Logic High Logic Low	+3.0V to +6.5V 0V to +1.0V
Input Current of Remote Control Pin		-0.5mA ~ +1.5mA

Input

Operation Voltage Range	24V Models	+18V to +36Vdc
Power ON Voltage Ranges	24V Models	+17.0V to +18.0Vdc
Power OFF Voltage Ranges	24V Models	+15.6V to +16.6Vdc
Off State Input Current	V_{NOM}	6mA Max
Latch-State Input Current	V_{NOM}	8mA Max
Input Capacitance	24V Models	40.0μF Max

Output Limitations

Part Number	Capacitive Load C_E	Pre-biased Voltage V_B	Reverse Current I_B	Short Circuit Output Current I_S	Note
P0824120	<2200uF@480mΩ Load	<11.4V	<500mA@V_B	<75A @ 2mΩ Load	

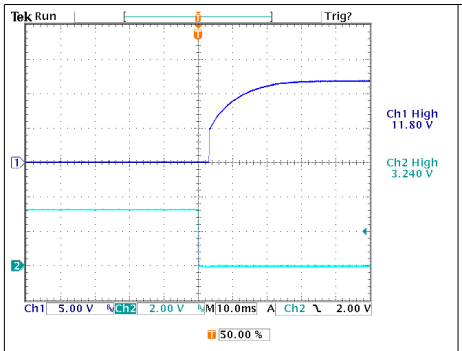
Model Number: P0824120

MODEL PARAMETERS

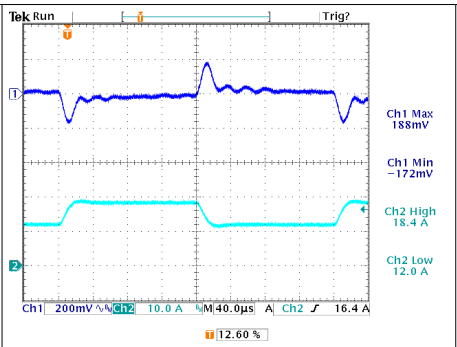
General		
Conversion Efficiency	Typical	See efficiency plots
Switching Frequency	Typical	450KHz

Input/Output		
Reflected Input Ripple Current	L_{EXT} = 10uH	20mA rms/60mAp-p
Input Ripple Rejection (<1KHz)	V_{NOM}, Full Load	-50dB
Voltage Accuracy	Typical	±1.0%
Line Regulation	Full Input Range	±0.2%
Load Regulation	0%~100%	±0.2%
Temperature Drift	-40°C ~100°C	±0.03%/°C
Output Tolerance Band	All Conditions	±4%
Ripple & Noise (20MHz)	Peak-Peak (RMS)	3% (1%) V_O
Over Voltage Protection	V_{NOM}, 10% Load	115~130 %V_O
Output Current Limits	V_{NOM}	108%~125%
Voltage Trim	V_{NOM}, 10% Load	±10%
Step Load (2.5A/μS)	50%~75% Load 10%~90% Load 0%~100% Load	±3%Vo C_{OUT}= 0μF ±5%Vo C_{OUT}= 100μF ±3%Vo C_{OUT}= 2200μF
Start-Up Delay Time	V_{NOM}, Full Load	20mS/250mS

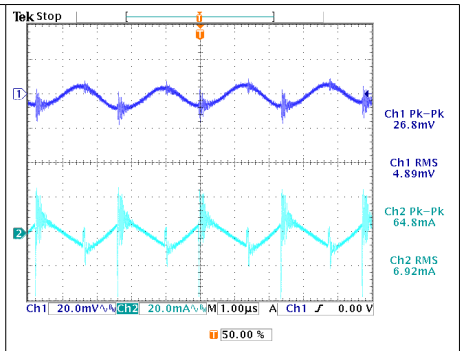
TYPICAL WAVEFORMS



Start-up waveform of E0824120
(V_{IN}: 24V, Load: 25A)

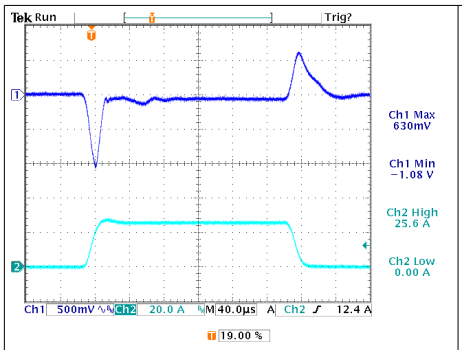


Transient response of P0824120
(V_{IN}: 24V, Load: 18.75A/12.5A@2.5A/μS)

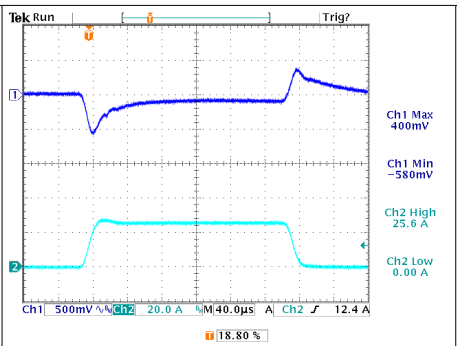


Input-current/Output-voltage ripples of E0824120
(V_{IN}: 24V, Load: 25A, L_{IN}=10uH)

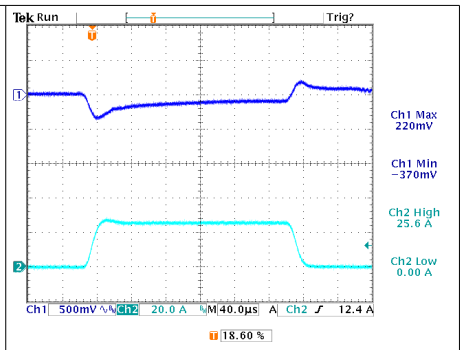
PULSED-LOAD WAVEFORMS



Transient response of P0824120
(V_{IN}: 24V, C_{OUT}: 0μF, Load: 0A/25A@2.5A/μS)



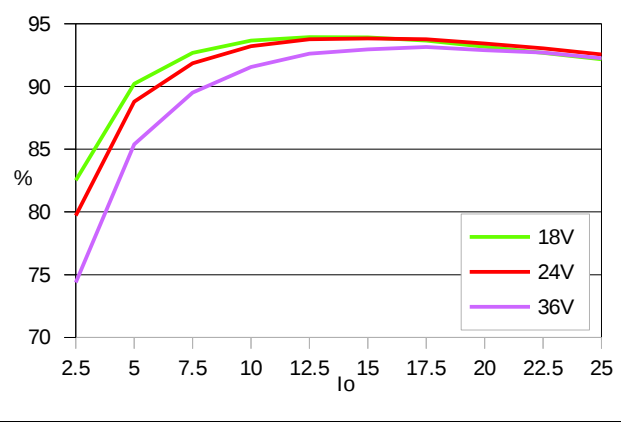
Transient response of P0824120
(V_{IN}: 24V, C_{OUT}: 470μF, Load: 0A/25A@2.5A/μS)



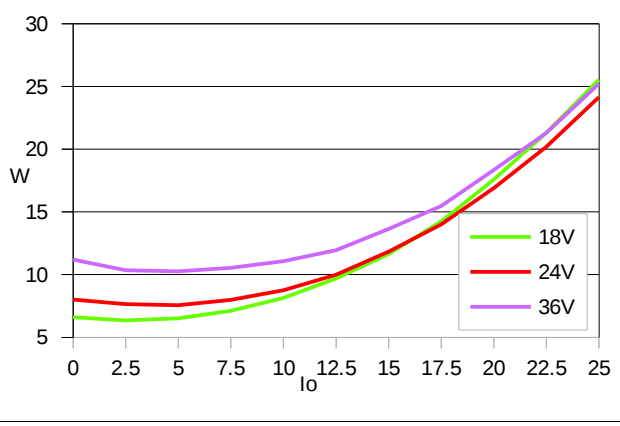
Input/Output ripples of P0824120
(V_{IN}: 24V, C_{OUT}: 2200μF, Load: 0A/25A@2.5A/μS)

Model Number: P0824120

Typical Performance Curves

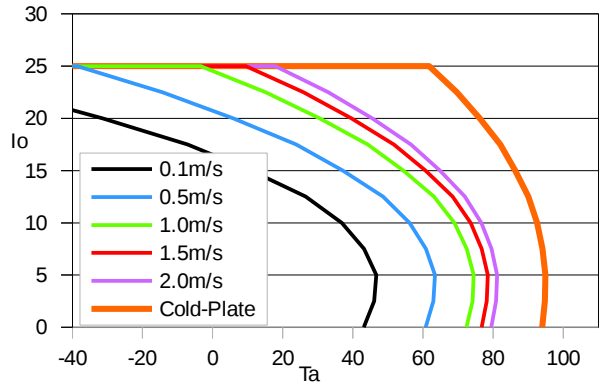


Efficiency plot of P0824120

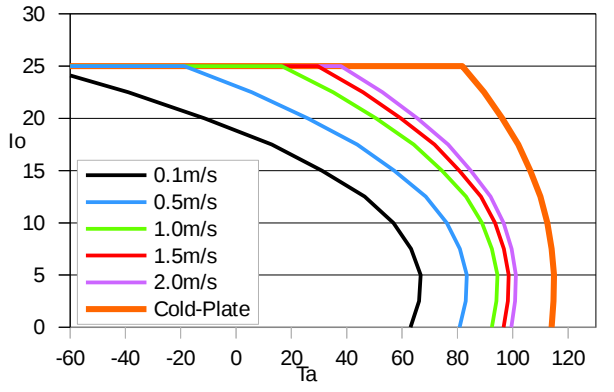


Power loss curves of P0824120

Derating Curves



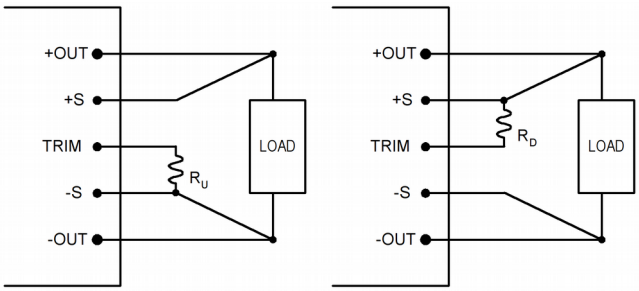
Calculated derating of Class-I P0824120



Calculated derating of Class-A P0824120

Trim and Trim Table

The output of the P0824120 power module can be adjusted for higher or lower than the rated voltage level by connecting the TRIM pin through a resistor to the pins of -S or +S respectively as shown as on the right hand side. The resistor for trimming output voltage higher or lower are denoted as R_U and R_D, which have different resistances for each different output voltage level. The resistance table for trimming the output voltage with 1% of step are listed as below for reference.

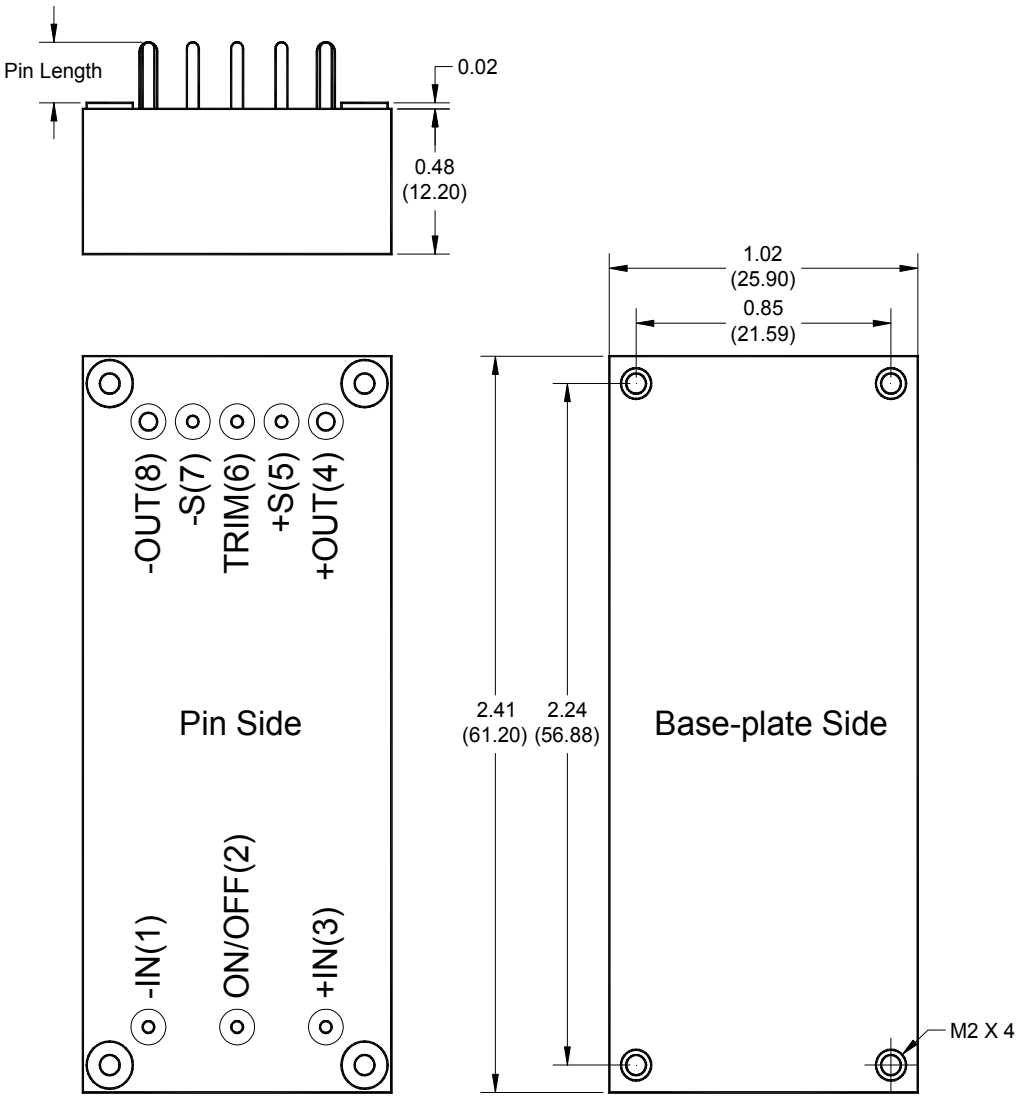


Trim Up	+1%	+2%	+3%	+4%	+5%	+6%	+7%	+8%	+9%	+10%	-	-	-	-	-	-	-	-	-	-
R_U (KΩ)	324.2	162.1	108.1	81.04	64.83	54.03	46.31	40.52	36.02	32.42	-	-	-	-	-	-	-	-	-	-

Trim Down	-1%	-2%	-3%	-4%	-5%	-6%	-7%	-8%	-9%	-10%	-	-	-	-	-	-	-	-	-	-
R_D (KΩ)	78.12	37.03	23.33	16.48	12.37	9.63	7.68	6.21	5.07	4.19	-	-	-	-	-	-	-	-	-	-

** Please contact Glary Power if a trim range beyond ±10% is needed.*

MECHANICAL DRAWING



Designation	Function Description	Pin #
-IN	Negative input	**1**
PC	Remote control. To turn-on and turn-off output.	**2**
+IN	Positive input	**3**
+Vo	Positive output	**4**
+S	Positive remote sense	**5**
TRIM	Output voltage adjust	**6**
-S	Negative remote sense	**7**
-Vo	Negative output	**8**

Dimensions: inches (mm)
Tolerances: .xx±0.02 (.x±0.5)
.xxx±0.01 (.x±0.25)
Weight: 32g
Base plate: Anode oxide aluminum alloy
Mounting inserts: M2 or through-hole
Maximum torque: 1.3in-lb (0.15Nm)
Pin material: Copper alloy or Brass
Pin plating: Golden over Nickel

Dimensions and Pin Connections

NOTE:

1. **It is recommended that the input should be protected by fuses or other protection devices.**
2. Specifications are subject to change without notice.
3. Printed or downloaded datasheets are not subject to Glary document control.
4. Product labels shown, including safety agency certificates, may vary based on the date of manufacture.
5. Information provided in this documentation is for ordering purposes only.
6. This product is not designed for use in critical life support systems, nuclear control systems or other such applications, which necessitate specific safety and regulatory standards other than the ones listed in this datasheet.

IMPORTANT

※ In order to secure effective usage of converter and the validity of Glary's service and warranty coverage, please refer to the application notes for general usage. For needs of usage beyond the application notes, please contact to Glary headquarter or our regional sales representative office for help.