

★★★ ARMORED & SECURITY

DC to DC Converters
X4 Revision



APS-12UP28-75/X4

Benefits at a Glance

- Delivers up to 2100 watts
- 28 VDC at 75 ADC output
- High efficiency, up to 97%
- Compact unit
- Lightweight
- No minimum load required
- Fixed frequency operation at 400 kHz
- Fully protected (OTP, OCP, OVP, UVLO)
- Input reverse polarity protection
- High reliability

About the X4 Revision

Our 2100-watt power supply is based on a high efficiency, non-isolated, DC to DC switched-mode, single-output converter. It is specifically designed for automotive applications and converts 12 VDC input power to 28 VDC used by the system.

Units will withstand a wide operational temperature range and are well suited for high-temperature environments. They operate at a fixed switching frequency and follow conservative component de-rating guidelines.

These high-power units use synchronous rectification technology and advanced electronic circuitry, resulting in power you can count on.

Designed and manufactured in the USA.



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DC to DC Converter Specifications

	Parameter	Notes	Min	Typ	Max	Units
Max ratings	Operating input voltage		10		16	V
	Operating surge protection	100ms transient with 1ms rise time			30	V
	Operating temperature	At the top thermal interface Base Plate temperature	-40		95	°C
	Non-operating temperature	Ambient storage temperature	-55		100	°C
Input characteristics	Operating input voltage range		10	13.2	16	V
	Maximum input current	P _o =2100W at 10VDC in		223	227	A
	Startup voltage	V _{in}		9.5		V
	Shutdown voltage	V _{in}		9.0		V
	Input standby current	V _{in} =12V, converter disabled		1.25	3	mA
	Input no-load current	V _{in} =12V, converter enabled		1.25	1.5	A
Output characteristics	Output voltage set point	V _{in} =12V, I _o =0A	27.8	28.3	30	V
	Output regulation - over line			±80	±120	mV
	Output regulation - V _{in} =14V	0A-75A		-1.4		V
	Output regulation - V _{in} =13V	0A-75A		-1.7		V
	Output regulation - V _{in} =12V	0A-75A		-2.0		V
	Output regulation - V _{in} =11.5V	0A-75A		-2.3		V
	Total output voltage range	Over sample, line, load, temperature and life	-25.8		30.5	V
	Output voltage, ripple and noise	20MHz bandwidth, 10µF tantalum, +1µF ceramic				
	Peak to peak	Full load (resistive)		300	500	mV _{p-p}
	RMS	Full load (resistive)		60	110	mV _{RMS}
	Output DC current limit inception	Non-latching	83	90	105	A
	Output DC current limit shutdown	Output voltage at which converter shuts down		22		V
	Peak short-circuit current	Non-latching, startup into 10mR		140		A
	Peak short-circuit pulse duration	Non-latching, startup into short		32		ms
	RMS short-circuit current	Non-latching, startup into short		25		A _{RMS}
	Dynamic response					
	Load change 19A-75A-19A	di/dt=3.5A/µs, 26 ft. input cable AWG 1/0, 6 ft. load cable		±3		V
	Load change 5A-75A-5A	di/dt=1A/µs, 30 ft. input cable AWG 1/0, 6 ft. load cable		-2/+0.2		
	Output over-voltage protection	Non-latching	32.7	34.8	37	V
	Efficiency at 100% load			96.0		%
Feature characteristics	Switching frequency			400		KHz
	On/off control: Converter on	Voltage at on/off pin	8	12	16	V
	On/off control: Converter off	Voltage at on/off pin	0		1.8	V
	Turn-on time					
	From on/off control	On/off from high to V _o =90%V _{OUT} (NOM), full load (res. mode)	500	530	560	ms
	By input voltage (on/off=V _{in})	V _{in} reaching UVLO threshold to V _o =90%V _{OUT} (NOM), full load	500	530	560	ms
	Output voltage rise time	Time from 10% to 90% V _{OUT} (NOM)		12		ms
	Over temperature shutdown—OTP	Non-latching				
	Base plate temperature			100		°C
	OTP restart hysteresis	Measured on the PCB		10		°C
Auto-restart period			500		ms	

Testing conditions: T_a=25°C, V_{in}=12VDC, unless otherwise noted. Not required to operate below 10V.

Notes: ¹Input and output voltages are measured at input and output terminals of the converter. ²V_s-voltage at external power supply used for testing. V_{in}<V_s due to voltage drop in input cable. ³All protections are non-latching. Once protection (OVP, OCP, input UVLO) are tripped, converter enters auto-restart mode with 500 ms off time.