PXS series - 15-20W Single High Reliability DC-DC Converters

Outline Product Specification

FEATURES

- ***High reliability / small size***
- ***In photoelectric isolation***
- ***Input voltage range: 16V_{DC} to 40V_{DC}***
- ***Output power: 15W - 20W***
- ***Inhibit and synchronisation functions***
- ***Over current / short circuit protection***
- ***DIP hermetical***

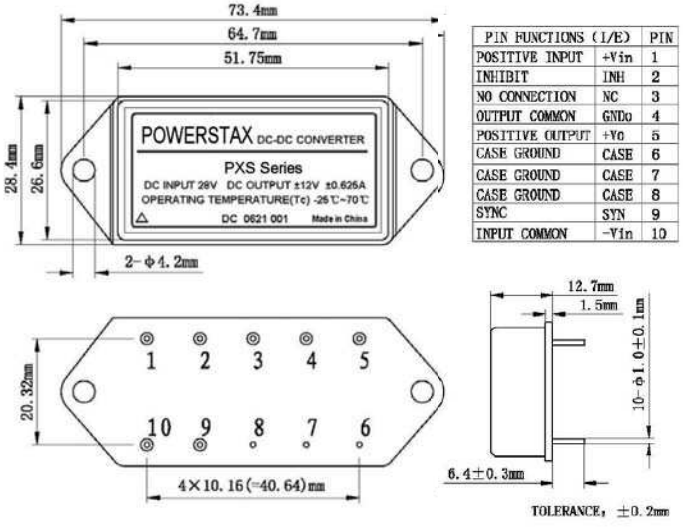
The PXS series single output series module, which adopts Thick-Film Microcircuit Technology, stannic seam welding process, is a kind of perfect converter with high reliability necessary for some applications such as industry and military.

The output voltage is 5V, 12V or 15V. The output power ranges from 15 to 20W. The switching frequency is fixed at 265 KHz to minimize noise.

The input filter circuit is designed to reduce the electro-magnetic interference. The typical input voltage is 28V, and the ranges from 16V to 40V. The PXS Series also provides some control functions such as synchronisation, shut down, and over-current and short circuit protection.

MECHANICAL SPECIFCATIONS

Weight≤45g
Volume18.6cm3



PIN FUNCTIONS (I/E)		PIN
POSITIVE INPUT	+Vin	1
INHIBIT	INH	2
NO CONNECTION	NC	3
OUTPUT COMMON	GNDo	4
POSITIVE OUTPUT	+Vo	5
CASE GROUND	CASE	6
CASE GROUND	CASE	7
CASE GROUND	CASE	8
SYNC	SYN	9
INPUT COMMON	-Vin	10

ABSOLUTE MAXIMUM RATINGS

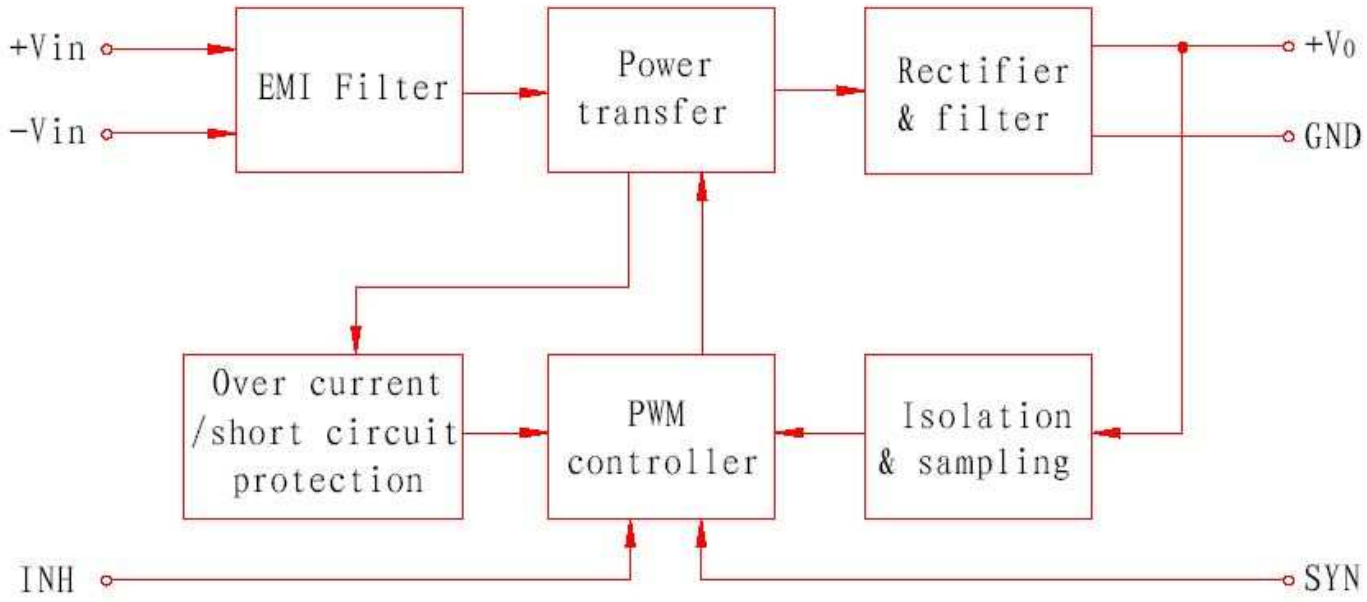
Input Voltage:	+16V_{DC} to +40V_{DC}
Pin-Solder Temp	(10s): 300ºC
Storage Temp:	-55ºC to +125ºC
Output Power:	15 - 20W
Operating Temp (Tc):	-40ºC to +75ºC

NOTES:

1. Please properly connect pins of power module to PCB following instructions of part's specification.
2. To prevent pins of power module from being stressed to cause glass insulators cracked and power module leaked, please install power module with fixed flanges or screws prior to welding pins of power module.
3. The bottom of power module should be stressed to heat sink tightly. If necessary, thermal washers and shockproof gaskets are employed.
4. In any case, bending of pins should be avoided to keep glass insulators from cracking and prevent power module from leaking.

Powerstax plc Tel: +44 (0) 1252 407800 Fax: +44 (0) 1252 407810 E-mail: sales@powerstaxplc.com www.powerstaxplc.com

BLOCK DIAGRAM



Powerstax plc Tel: +44 (0) 1252 407800 Fax: +44 (0) 1252 407810 E-mail: sales@powerstaxplc.com www.powerstaxplc.com

ELECTRICAL CHARACTERISTICS

PARAMETER	CONDITIONS [3]	PXS2805S-15			PXS2812S-20			PXS2815S-20			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
OUTPUT VOLTAGE	V_{IN} =16 V_{DC}～40V_{DC}	4.95	5.00	5.05	11.88	12.00	12.12	14.85	15.00	15.15	VDC
OUTPUT CURRENT	V_{IN} =28V_{DC}	0	—	3	0	—	1.67	0	—	1.33	A
OUTPUT POWER	V_{IN} =28V_{DC}	0	—	15	0	—	20	0	—	20	W
OUTPUT RIPPLE VOLTAGE [1]	V_{IN}=28V ,100%Iout ,20MHz	—	35	50	—	25	50	—	25	50	m V_{P-P}
	MIN～MAX T_C	—	50	90	—	40	90	—	40	90	
LINE REGULATION	V_{IN} =16 to 40V_{DC}	—	10	50	—	10	50	—	10	50	mV
	MIN～MAX T_C	—	15	50	—	15	50	—	15	50	
LOAD REGULATION	Iout=0 to100%	—	5	50	—	5	50	—	5	50	mV
	MIN～MAX T_C	—	15	50	—	15	50	—	15	50	
INPUT VOLTAGE	CONTINUOUS	16	28	40	16	28	40	16	28	40	V_{DC}
	TRANSIENT 50ms	—	—	50	—	—	50	—	—	50	
INPUT CURRENT	Iout=0	—	35	75	—	35	75	—	35	75	m A
	Iout=100%	—	0.70	—	—	0.87	—	—	0.85	—	A
	INHIBITED	—	7	8	—	7	8	—	7	8	mA
INPUT RIPPLE CURRENT	V_{IN}=28V、100%Iout、20MHz	—	20	50	—	20	50	—	20	50	mApp
EFFICIENCY		76	78	—	80	83	—	81	84	—	%
LOAD FAULT SHORT CIRCUIT TO FULL LOAD	SHORT CIRCUIT POWER DISSIPATION	—	—	12	—	—	12	—	—	12	W
	RECOVERY	—	1.4	5	—	1.4	5	—	1.4	5	ms
STEP LOAD RESPONSE. TRANSIENT	50%-100%-50%	—	±200	±300	—	±250	±400	—	±350	±500	mVpk
STEP LOAD RESPONSE. TRANSIENT RECOVERY [2]		—	60	200	—	60	200	—	60	200	us
STEP LINE RESPONSE.	16-40-16V_{DC}	—	±200	±300	—	±400	±500	—	±500	±600	mV
	RECOVERY [2]	—	—	300	—	—	300	—	—	300	us
START-UP	DELAY	—	1.4	5	—	1.4	5	—	1.4	5	ms
	FULL LOAD OVERSHOOT	—	0	50	—	0	120	—	0	150	mVpk
	NO LOAD OVERSHOOT	—	50	250	—	120	600	—	150	750	
Insulation Resistance	≥100MΩ@500VDC（input-output；input-case；output-case）										

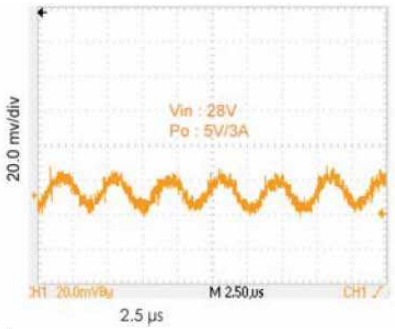
NOTE:

1. Using tip and barrel measurement.
2. Recovery time is measured from application of the transient to the point at which Vout is within 1% of final value. 3. Unless otherwise specified,Tc=25ºC, Vin=28Vdc,100% load.

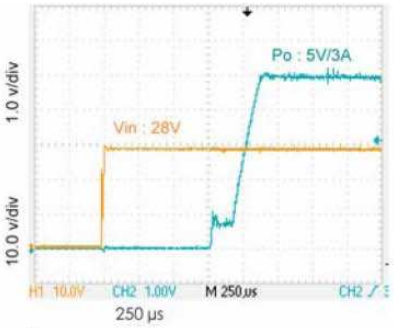
Powerstax plc Tel: +44 (0) 1252 407800 Fax: +44 (0) 1252 407810 E-mail: sales@powerstaxplc.com www.powerstaxplc.com

Performance Characteristics

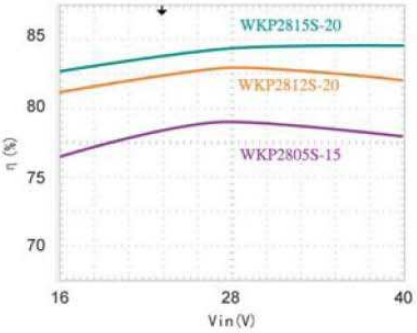
1: Output Ripple Voltage



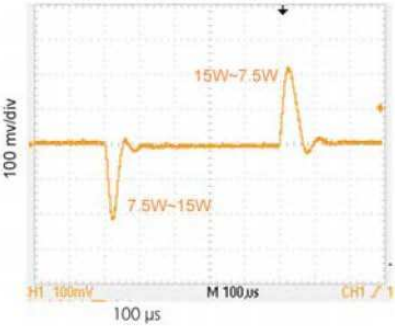
2: Start--Up



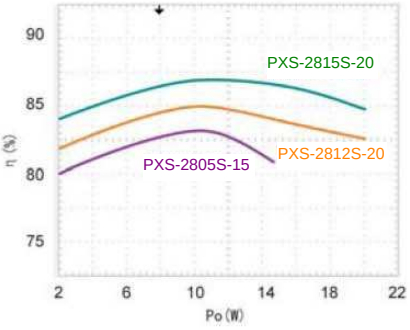
3: Efficiency



4: Step load Response
50%～100%～50%



5: Efficiency



APPLICATION NOTE

INHIBIT FUNCTION

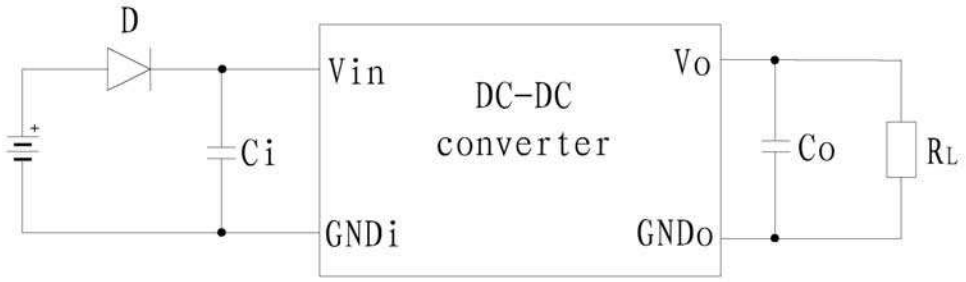
The INH pin is used to achieve the function of external shut down. No connection to Pin 2 is necessary for normal operation of the converter. Shut down may be implemented by simply pulling the Pin 2 below 0.3V referenced to input common.

Over Current/Short Circuit Protection The PXS-20 series of DC/DC converters has the function of over current/short circuit protection. When it is working under load fault condition, the converter will automatically activate the over current/short circuit protection and restore when the fault is removed. It is suggested that the duration of the over current/short circuit must be less than 10s,and the case temperature lower than 105ºC Otherwise, the module will be disabled.

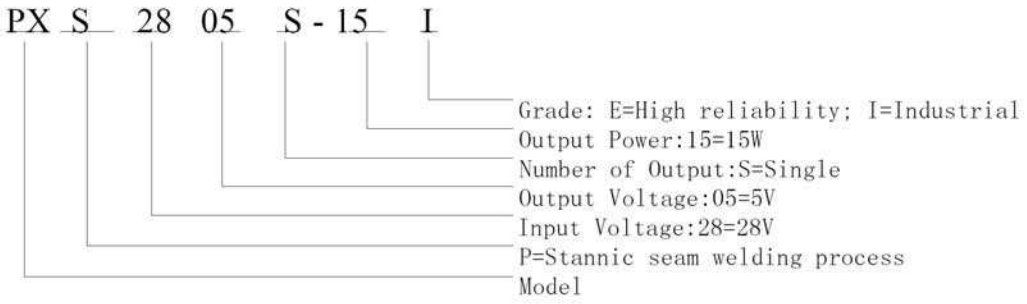
Ripple Voltage While the output V-ripple can• ft satisfy your application, it can still be suppressed by adding a filter capacitor between Vo+ and Vo- outputs. The optimal value for this capacitor is recommended at around 50V/10uF with film or ceramic capacitor as preferable options. Synchronization The PXS-20 series of DC/DC converters allow the designer to match the switching frequency of the converter to the frequency of the system clock or synchronize several modules by synchronization pin. Frequency ranges from 270 to 350 KHz, the level from -0.3 to 10V, and duty cycle from 40% to 60%. Under master and slave configuration, the master module will offer ±3mA current and the slave ones ±0.5mA in maximum. A connection to pin 9 is not necessary for not in use.

Powerstax plc Tel: +44 (0) 1252 407800 Fax: +44 (0) 1252 407810 E-mail: sales@powerstaxplc.com www.powerstaxplc.com

Reverse Polarity Protection:
To avoid the input reverse connection, it's advised to connect a diode in series with the input pin of the converter. (Shown as below)



ORDERING INFORMATION:



Mark specification

Serials Number: DC 0621 001, which indicates this product has been manufactured in the 21st week of 2006, and the sequence number is 001.

Environmental Screening

Test item	Method	Condition	E	I
PRE-CAP Inspection	MIL-STD-883 Method 2017	---	Y	Y
Temp-Cycle	MIL-STD-883 Method 1010	-55°C to +125°C, 10 times	Y	---
Constant Acceleration	MIL-STD-883 Method 2001	500 g, Y1, 1min	Y	---
Burn-in	MIL-STD-883 Method 1015	+85℃, 96h	Y	---
		+85℃, 48h	---	Y
Final Electrical Test	MIL-PRF-38534	+25℃	Y	Y
		+85℃	Y	---
		-40℃	Y	---
Final Visual Inspection	MIL-STD-883 Method 2009	---	Y	Y

Unit B5, Armstrong Mall, Southwood Business Park , Farnborough, Hants, GU14 0NR, England
Tel: +44 (0) 1252 407800 Fax: +44 (0) 1252 407810 E-mail: sales@powerstaxplc.com www.powerstaxplc.com