Weiking Electronics Manufacture (Xi'an) Co.,Ltd

WKI28XXS-20
Single Output Series
High Reliability DC-DC Converters

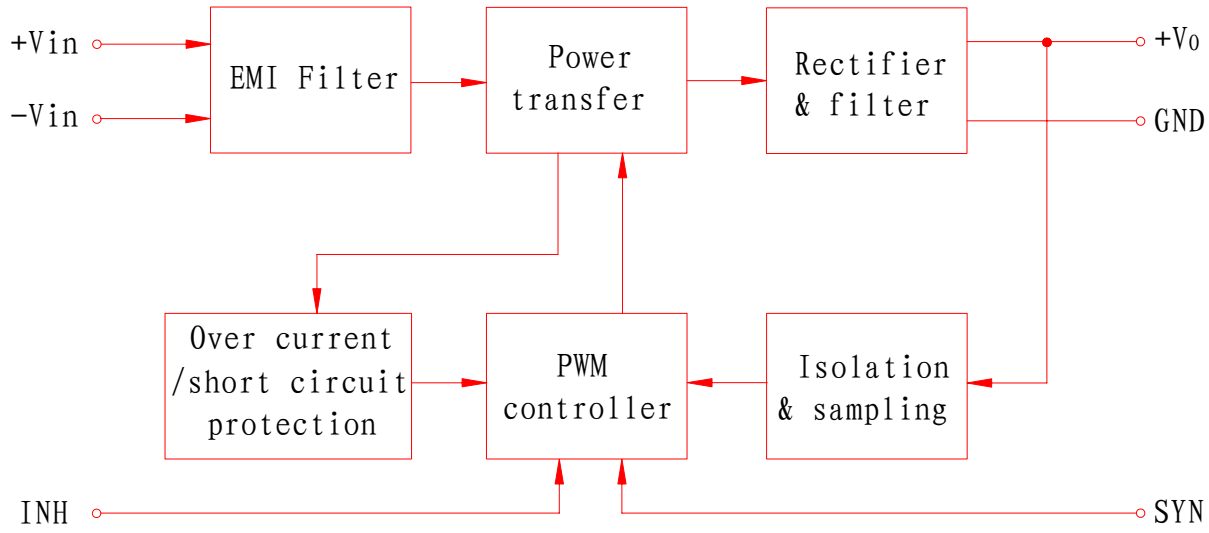
FEATURES:

- High reliability，small size
- In photoelectric isolation
- Input Voltage range：16V_{DC}～40V_{DC}
- Output Power：15～20W
- Inhibit and synchronization functions
- Output over current /short circuit protection
- DIP hermetical

DESCRIPTION:

The WKI28XXS-20 single output series module, which adopts Thick-Film Microcircuit Technology, parallel seam welding process, is a kind of perfect converter with high reliability necessary for some applications such as aviation, aerospace 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 WKI28XXS-20 series also provides some control functions such as synchronization, shut down, and over-current and short circuit protection.

BLOCK DIAGRAM:



ABSOLUTE MAXIMUM RATINGS：

Input Voltage： $16V_{DC}$～$40V_{DC}$ Output Power： 15W～20W

Operating Temp(T_C)： -55℃～+105℃(M)/ -40℃～+85℃(E)

Storage Temp： -65℃～+150℃（M）/ -55℃～+125℃（E）

Pin-Solder Temp (10S)： 300℃

THE ELECTRICAL CHARACTERISTICS：

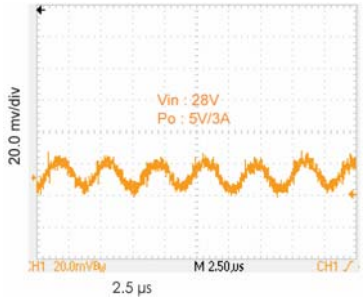
PARAMETER	CONDITIONS	WKI2805S-15			WKI2812S-20			WKI2815S-20			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
OUTPUT VOLTAGE	V_{IN} =16 V_{DC}～40V_{DC}	4.95	5.00	5.05	11.88	12.00	12.12	14.85	15.00	15.15	V_{DC}
OUTPUT CURRENT	V_{IN} =28V_{DC}	0	—	3	0	—	1.67	0	—	1.33	A
OUTPUT POWER	V_{IN} =28V_{DC}	0	—	15	0	—	20	0	—	20	W
OUTPUT RIPPLE VOLTAGE [1]	V_{IN}=28V、FULL LOAD、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	NO LOAD TO FULL	—	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	NO LOAD	—	35	75	—	35	75	—	35	75	m A
	FULL LOAD	—	0.70	—	—	0.87	—	—	0.85	—	A
	INHIBITED	—	7	8	—	7	8	—	7	8	mA
INPUT RIPPLE CURRENT	V_{IN}=28V、FULL LOAD、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	mV
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	500VDC，≥100MΩ（input-output；input-case；output-case）										

NOTE：

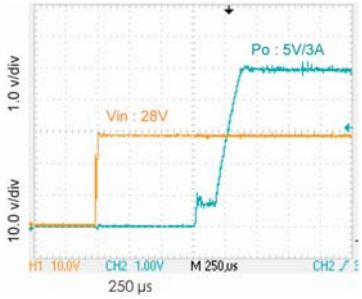
1. Using tip and barrel measurement.
2. Recovery time is measured from application of the transient to the point at which Vout is within 1% of final value.
3. 25℃ Tc,28VDC Vin,100% load, unless otherwise specified.

Typical Performance Curves：

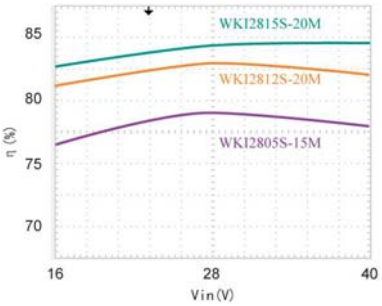
1：Output Ripple Voltage



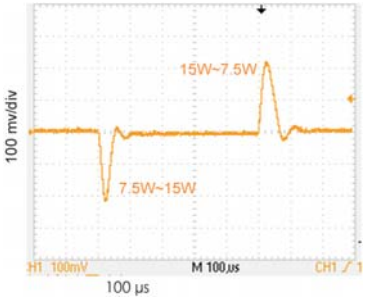
2：Start--Up



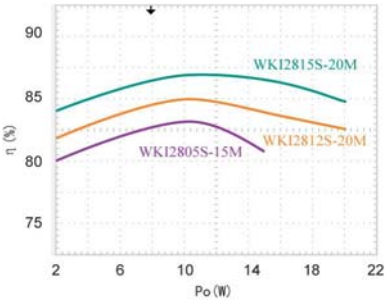
3：Input Voltage-Efficiency



4： Step load Response
50%～100%～50%



5： Output Power-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 WKI28XXS-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 105℃, Otherwise, the module will be disabled.

Ripple Voltage

While the output V-ripple can't 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/ 10μF with film or ceramic capacitor as preferable options.

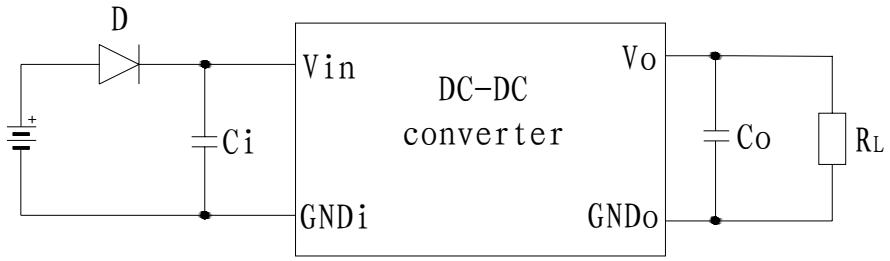
Synchronization

The WKI28XXS-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

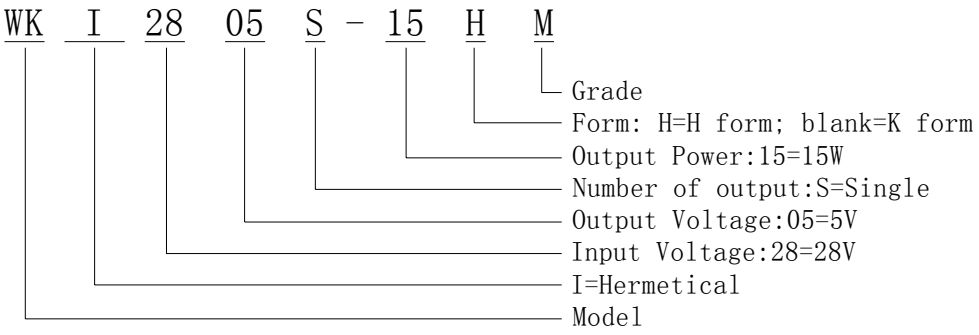
current and the slave ones ±0.5mA in maximum.

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	Request	Condition
PRE-CAP Inspection	MIL-STD-883 Method 2017	100%	---
Temp-Cycle	MIL-STD-883 Method 1010	100%	-65°C to+ 150°C(M)，10 times -55°C to +125°C(E)，10 times
Constant Acceleration	MIL-STD-883 Method 2001	100%	3000 g, Y1，1min
Burn-in	MIL-STD-883 Method 1015	100%	Tc +105℃(M)/ +85℃(E)，160h
Final Electrical Test	MIL-PRF-38534	100%	-55°C, +25°C, +105°C(M) -40°C, +25°C, +85°C(E)
Hermeticity Testing	MIL-STD-883 Method 1014	100%	Fine Leak, Cond. A1 Gross Leak, Cond. C1
Final Visual Inspection	MIL-STD-883 Method 2009	100%	---

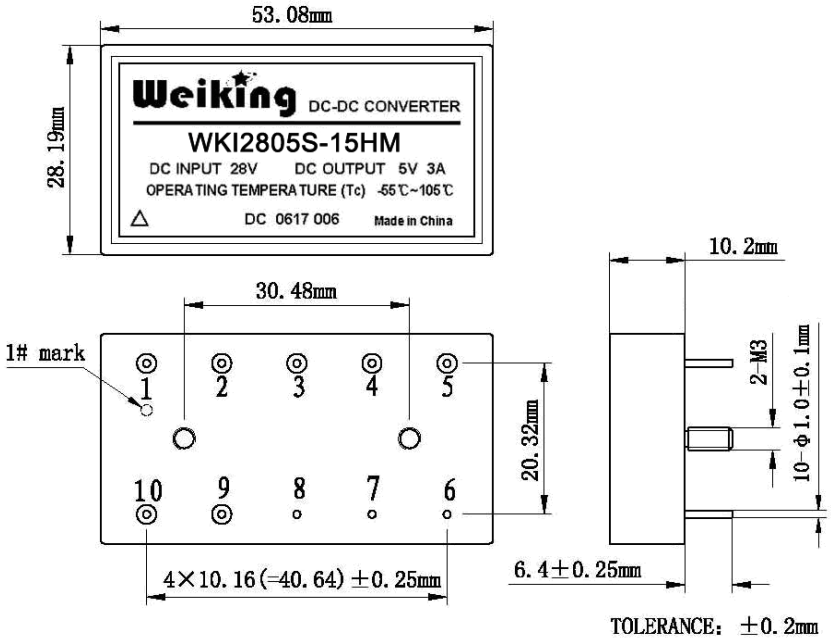
MECHANICAL SPECIFICATIONS:

Weight：≤56g　　Volume：15.1cm^3

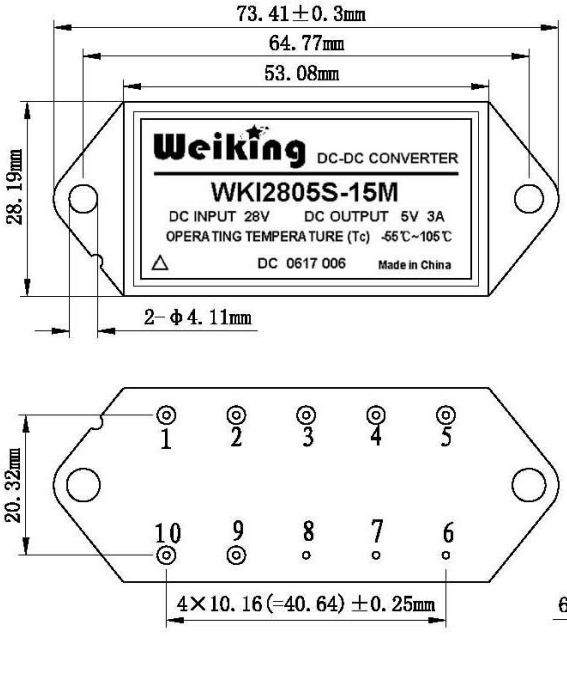
Encapsulation：Seam Seal　　Shell Material：Cold Rolled Steel

Package style：Two kinds of form (H and K) for customers to choose

H form：



K form：



PIN FUNCTIONS (M/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