

### FEATURES:

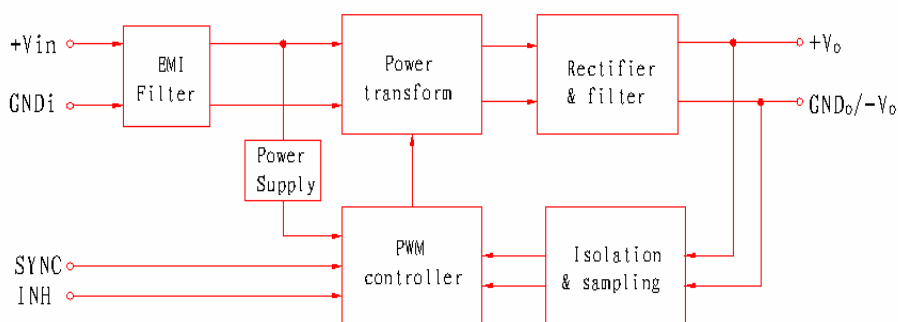
- High reliability, compact size
- Photoelectric isolation
- Input voltage range: 16V<sub>DC</sub> to 40V<sub>DC</sub>
- Output power: 12W
- Inhibit function
- Short circuit protection
- DIP hermetical



### DESCRIPTION:

The WK30285R2S-12 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 single output voltage is 5.2V. The output power is 12W. The switching frequency is fixed at 430 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 WK30285R2S-12 series also provides some control functions such as shut down, and short circuit protection.

### BLOCK DIAGRAM:



### ABSOLUTE MAXIMUM RATINGS:

Output Power:	12W
Operating Temp( $T_C$ ):	-55°C ~ 105°C (M) / -40°C ~ 85°C (E/I)
Storage Temp:	-55°C ~ 125°C (M/E/I)
Pin-Solder Temp (10s):	300°C

## THE ELECTRICAL CHARACTERISTICS:

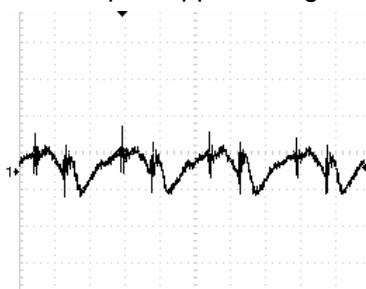
PARAMETER	CONDITIONS <sup>1)</sup>	WK30285R2S-12			UNITS
		MIN	TYP	MAX	
OUTPUT VOLTAGE	$V_{IN}=28V_{DC}$	5.15	5.20	5.25	V
OUTPUT CURRENT	$V_{IN}=16V_{DC}\sim 40V_{DC}$	0	—	2.3	A
OUTPUT POWER	$V_{IN}=28V_{DC}$	—	—	12	W
OUTPUT RIPPLE VOLTAGE <sup>2)</sup>	$V_{IN}=28V_{DC}$ , FULL LOAD, 20MHz	—	50	80	$mV_{p-p}$
	MIN~MAX $T_c$	—	50	100	
LINE REGULATION	$V_{IN}=16V_{DC}\sim 40V_{DC}$	—	20	50	mV
	MIN~MAX $T_c$	—	20	50	
LOAD REGULATION	$V_{IN}=28V_{DC}$	—	20	50	mV
	MIN~MAX $T_c$	—	20	50	
INPUT VOLTAGE	CONTINUOUS	16	28	40	V
	50V/50ms	—	—	50	
INPUT CURRENT	NO LOAD	—	10	20	mA
	FULL LOAD	—	550	564	
	INHIBITED	—	5	8	
INPUT RIPPLE CURRENT <sup>3)</sup>	$V_{IN}=28V_{DC}$ , FULL LOAD, 20MHz	—	50	80	$mA_{p-p}$
EFFICIENCY	$V_{IN}=28V_{DC}$ , FULL LOAD	76	78	—	%
SHORT CIRCUIT POWER DISSIPATION	$V_{IN}=28V_{DC}$	—	0.5	2	W
STEP LOAD RESPONSE TRANSIENT	$V_{IN}=28V_{DC}$	—	$\pm 200$	$\pm 300$	mV
STEP LOAD RESPONSE TRANSIENT RECOVERY <sup>4)</sup>	50%~100%~50%	—	200	300	$\mu s$
STEP LINE RESPONSE TRANSIENT	$16V_{DC}\sim 40V_{DC}\sim 16V_{DC}$	—	50	100	mV
STEP LINE RESPONSE TRANSIENT RECOVERY <sup>4)</sup>		—	200	300	$\mu s$
START-UP	DELAY	—	10	20	ms
	FULL LOAD OVERSHOOT	—	100	500	$mV_{pk}$
CAPACITIVE LOAD	$V_{IN}=28V_{DC}$ , FULL LOAD	—	—	820	$\mu F$
INSULATION RESISTANCE <sup>5)</sup>	$\geq 100M\Omega @ 500V_{DC}$ (INPUT - OUTPUT; INPUT - CASE; OUTPUT - CASE)				

### NOTE:

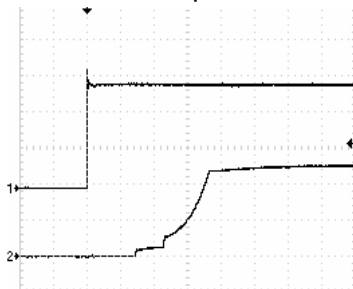
- 1) Unless otherwise specified,  $T_a=25^{\circ}C$ ,  $28V_{DC}$   $V_{in}$ , 100% load.
- 2) Using tip and barrel measurement.
- 3) Design guarantee.
- 4) To need times that Output voltage is renewed to 1% range of the stability value.
- 5) Only under the control of being machining for insulation resistance, each circuit should be assured to suffice need.

## TYPICAL PERFORMANCE CURVES:

1: Output Ripple Voltage



2: Start - Up

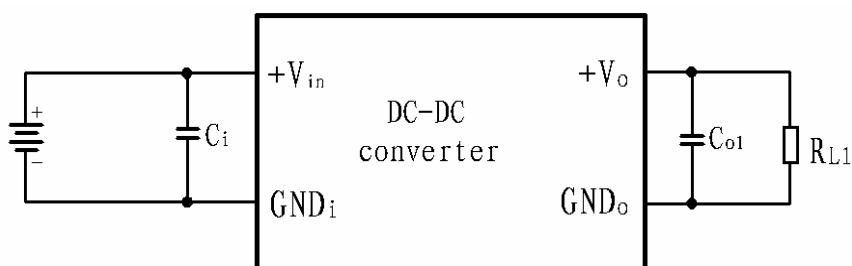


3: Step load Response



## APPLICATION NOTE:

- DC-DC converter typical connection shown as below:



- **INHIBIT FUNCTION**

The INH pin is used to control the on/off inhibit function. No connection to Pin 1 is necessary for normal operation of the converter. Shut down may be implemented by simply pulling the Pin 1 below 0.3V referenced to input common. The INH pin should be empty when not in use.

- **Over Current/Short Circuit Protection**

The series of DC-DC converters feature internal over current/short circuit protection. When it is operating under a load fault condition, the converter will automatically activate the over current/short circuit protection feature and restore the converter to normal operating conditions when the load fault is removed.

- **Ripple Voltage Suppress**

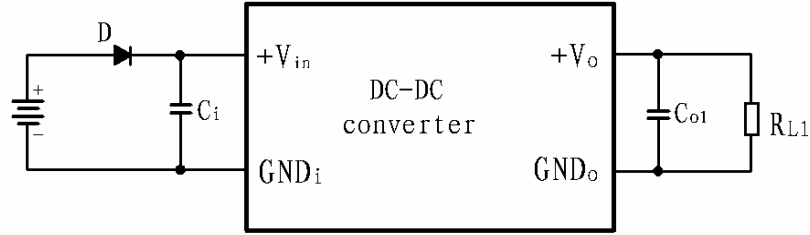
While the output V-ripple can't satisfy your application, it can still be suppressed by adding a filter capacitor between  $V_o$  and  $GND_o$  outputs.

- **Synchronization**

The series of DC-DC converters is to be synchronized to an external clock. The external signal frequency ranges from 500 KHz to 550 KHz, the level from 4.5 V to 5.5V, the synchronization pulse width should be between 15ns and 150ns. The sync pin should be empty when not in use.

- **Reverse Polarity Protection**

To avoid damage to the converter caused by reverse input connections, it's advised to connect a diode in series with the input pin of the converter. (Shown as below).



## 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.

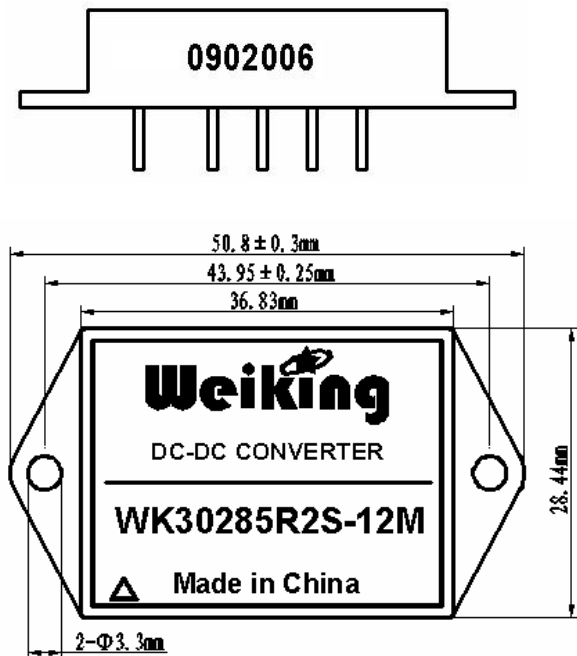
4) In any case, bending of pins should be avoided to keep glass insulators from cracking and prevent power module from leaking.

## ENVIRONMENTAL SCREENING:

M/E:					
Num	TEST ITEMS		METHODS	REQUEST	CONDITIONS
1	Internal Visual		MIL-STD-883 Method 2017	100%	---
2	Temp-Cycle		MIL-STD-883 Method 1010	100%	-55°C to +125°C, 10 times
3	Constant Acceleration		MIL-STD-883 Method 2001	100%	3000g, Y1, 1min
4	Burn-in		MIL-STD-883 Method 1015	100%	T <sub>C</sub> :+105°C 160h (M)
					T <sub>C</sub> :+85°C 96h (E)
5	Final Electrical Test	Natural temperature	MIL-PRF-38534	100%	+25°C
		High temperature		100%	T <sub>C</sub> : +105°C(M) T <sub>C</sub> : +85°C(E)
		Low temperature		100%	-55°C(M)/ -40°C(E)
6	Seal (Fine and Gross)		MIL-STD-883 Method 1014	100%	Fine Leak, Cond. A1
					Gross Leak, Cond. C1
7	External Visual		MIL-STD-883 Method 2009	100%	---
I:					
Num	TEST ITEMS		METHODS	REQUEST	CONDITIONS
1	Internal Visual		MIL-STD-883 Method 2017	100%	---
2	Burn-in		MIL-STD-883 Method 1015	100%	T <sub>C</sub> +85°C 48h
3	Final Electrical Test		MIL-PRF-38534	100%	+25°C
4	External Visual		MIL-STD-883 Method 2009	100%	---

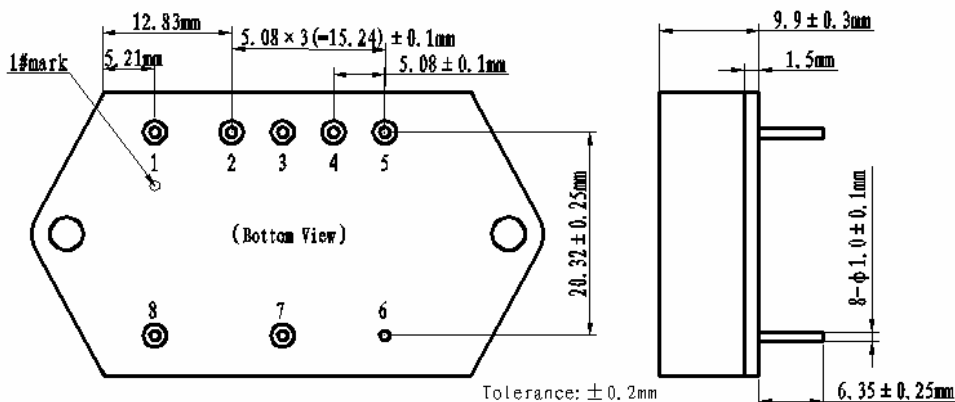
# MECHANICAL SPECIFICATIONS:

Volume: 10.4cm<sup>3</sup>      Weight: ≤40g      Package Form: H and K for customers to choose  
 Encapsulation: Hermetically Sealed Welded Seam      Shell Material: Cold Rolled Steel  
 K form (e.g. WK30285R2S-12M) :

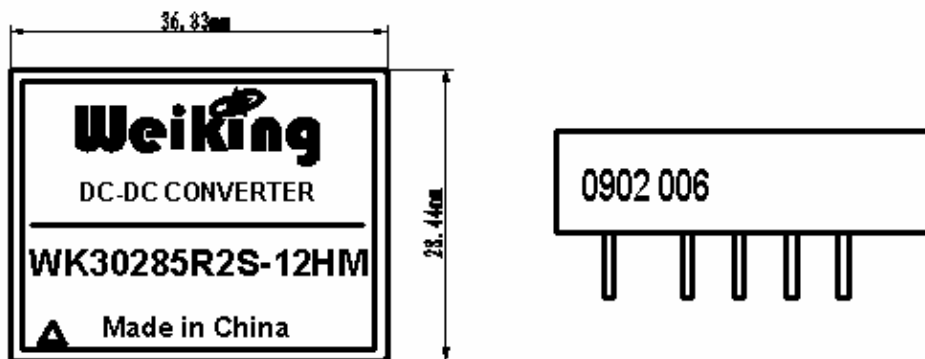


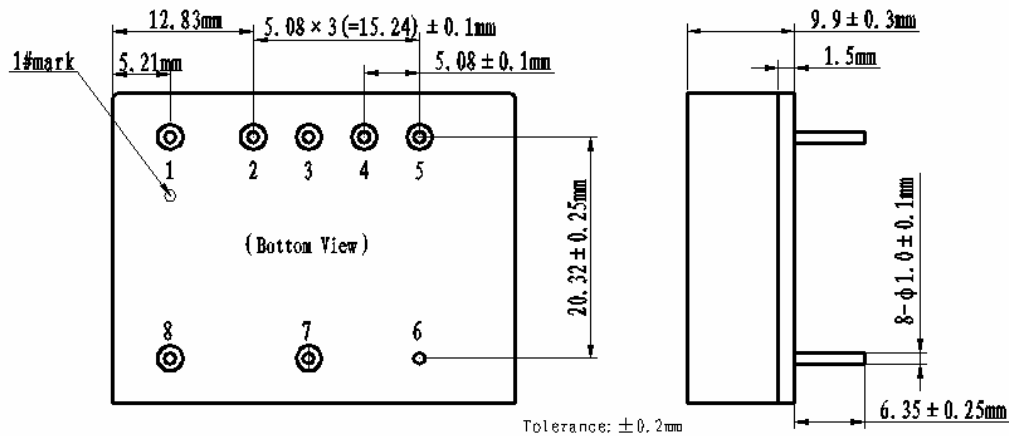
PIN FUNCTIONS

PIN	SINGLE	
1	INHIBIT	INH
2	NO CONNECTION	NC
3	OUTPUT COMMON	GND <sub>o</sub>
4	POSITIVE OUTPUT	+V <sub>o</sub>
5	SYNC	SYNC
6	CASE GROUND	CASE
7	INPUT COMMON	GND <sub>i</sub>
8	POSITIVE INPUT	+V <sub>in</sub>

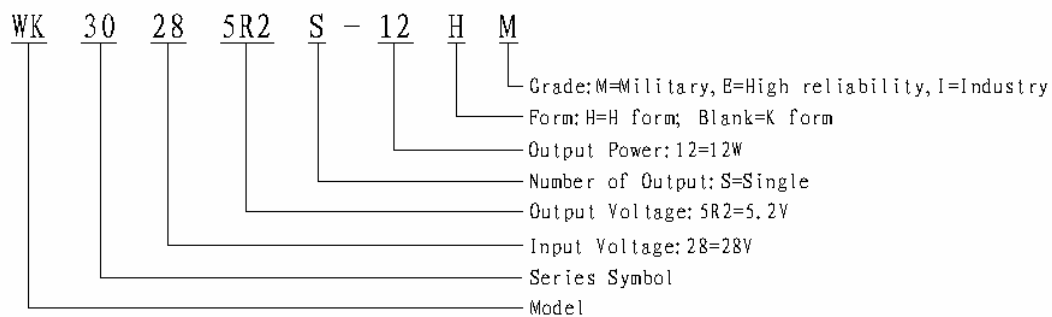


H form (e.g. WK30285R2S-12HM) :





## ORDERING INFORMATION:



## Mark specification:

Serial Number: 0902 006, example indicates this product has been manufactured in the 2nd week of 2009, and the sequence number is 006.