

FEATURES:

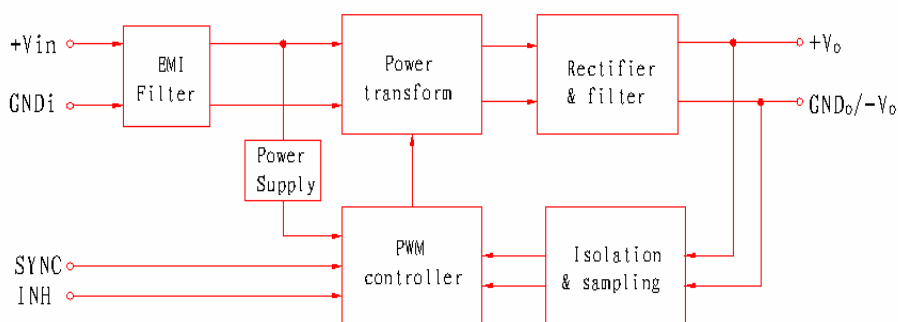
- High reliability, compact size
- Photoelectric isolation
- Input voltage range: 16V_{DC} to 40V_{DC}
- Output power: 12W~15W
- Inhibit function
- Short circuit protection
- DIP hermetical



DESCRIPTION:

The WK3028***-15 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 5V, 12V, 15V; the dual output voltage is $\pm 12V$ or $\pm 15V$. The output power is 12W~15W. 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 WK3028***-15 series also provides some control functions such as shut down, and short circuit protection.

BLOCK DIAGRAM:



ABSOLUTE MAXIMUM RATINGS:

Output Power:	12W~15W
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:

SINGLE OUTPUT:

PARAMETER	CONDITIONS ¹⁾	WK302805S-12			WK302812S-15			WK302815S-15			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
OUTPUT VOLTAGE	$V_{IN}=28V_{DC}$	4.95	5.00	5.05	11.88	12.00	12.12	14.85	15.00	15.15	V_{DC}
OUTPUT CURRENT	$V_{IN}=16V_{DC}\sim 40V_{DC}$	0	—	2.4	0	—	1.25	0	—	1.0	A
OUTPUT POWER	$V_{IN}=28V_{DC}$	—	—	12	—	—	15	—	—	15	W
OUTPUT RIPPLE VOLTAGE ²⁾	$V_{IN}=28V_{DC}$, FULL LOAD, 20MHZ	—	50	80	—	50	80	—	50	80	mV_{p-p}
	MIN~MAX T_c	—	50	100	—	50	100	—	50	100	
LINE REGULATION	$V_{IN}=16V_{DC}\sim 40V_{DC}$	—	20	50	—	20	50	—	20	50	mV
	MIN~MAX T_c	—	20	50	—	20	50	—	20	50	
LOAD REGULATION	$V_{IN}=28V_{DC}$	—	20	50	—	20	50	—	20	50	mV
	MIN~MAX T_c	—	20	50	—	20	50	—	20	50	
INPUT VOLTAGE	CONTINUOUS	16	28	40	16	28	40	16	28	40	V
	50V/50ms	—	—	50	—	—	50	—	—	50	
INPUT CURRENT	NO LOAD	—	10	20	—	10	20	—	10	20	mA
	FULL LOAD	—	550	564	—	654	678	—	645	670	
	INHIBITED	—	5	8	—	5	8	—	5	8	
INPUT RIPPLE CURRENT ³⁾	$V_{IN}=28V_{DC}$, FULL LOAD, 20MHZ	—	50	80	—	50	80	—	50	80	mA_{p-p}
EFFICIENCY	$V_{IN}=28V_{DC}$, FULL LOAD	76	78	—	79	82	—	80	83	—	%
SHORT CIRCUIT POWER DISSIPATION	$V_{IN}=28V_{DC}$	—	0.5	2	—	0.5	2	—	0.5	2	W
STEP LOAD RESPONSE TRANSIENT	$V_{IN}=28V_{DC}$	—	±200	±300	—	±200	±300	—	±200	±300	mV
STEP LOAD RESPONSE TRANSIENT RECOVERY ⁴⁾	50%~100%~50%	—	200	300	—	200	300	—	200	300	μs
STEP LINE RESPONSE TRANSIENT	$16V_{DC}\sim 40V_{DC}\sim 16V_{DC}$	—	50	100	—	50	100	—	50	100	mV
STEP LINE RESPONSE TRANSIENT RECOVERY ⁴⁾		—	200	300	—	200	300	—	200	300	μs
START-UP	DELAY	—	10	20	—	10	20	—	10	20	ms
	FULL LOAD OVERSHOOT	—	100	500	—	100	500	—	100	500	mV_{pk}
CAPACITIVE LOAD	$V_{IN}=28V_{DC}$, FULL LOAD	—	—	1000	—	—	470	—	—	330	μF
INSULATION RESISTANCE ⁵⁾	≥100MΩ @ 500Vdc ((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.

DUAL OUTPUT:

PARAMETER	CONDITIONS ¹⁾	WK302812D-15			WK302815D-15			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
OUTPUT VOLTAGE	$V_{IN}=28V_{DC}$ $\pm V_O$	11.88	12.00	12.12	14.85	15.00	15.15	V
OUTPUT CURRENT	$V_{IN}=16V_{DC} \sim 40V_{DC}$	0	—	625	0	—	500	mA
OUTPUT POWER	$V_{IN}=28V_{DC}$	—	—	15	—	—	15	W
OUTPUT RIPPLE VOLTAGE ²⁾	$V_{IN}=28V$ 、FULL LOAD、20MHZ	—	50	80	—	50	80	mV _{p-p}
	MIN~MAX T_C	—	50	100	—	50	100	
LINE REGULATION	$V_{IN}=16V_{DC} \sim 40V_{DC}$	—	20	50	—	20	50	mV
	MIN~MAX T_C	—	20	50	—	20	50	
LOAD REGULATION	$V_{IN}=28V_{DC}$	—	20	50	—	20	50	mV
	MIN~MAX T_C	—	20	50	—	20	50	
CROSS REGULATION	20%~80%	—	3	5	—	3	5	%
	10%~50%	—	2	3	—	2	3	
INPUT VOLTAGE	CONTINUOUS	16	28	40	16	28	40	V
	50V/50ms	—	—	50	—	—	50	
INPUT CURRENT	NO LOAD	—	20	30	—	20	30	mA
	FULL LOAD	—	638	670	—	638	670	
	INHIBITED	—	5	8	—	5	8	
INPUT RIPPLE CURRENT ³⁾	$V_{IN}=28V_{DC}$ FULL LOAD 20MHZ	—	50	80	—	50	80	mA _{p-p}
EFFICIENCY	$V_{IN}=28V_{DC}$ FULL LOAD	80	84	—	80	84	—	%
SHORT CIRCUIT POWER DISSIPATION	$V_{IN}=28V_{DC}$	—	0.5	2	—	0.5	2	W
STEP LOAD RESPONSE. TRANSIENT	$V_{IN}=28V_{DC}$	—	± 200	± 300	—	± 200	± 300	mV
STEP LOAD RESPONSE. TRANSIENT RECOVERY ⁴⁾	50%~100%~50%	—	200	300	—	200	300	μs
STEP LINE RESPONSE. TRANSIENT	$16V_{DC} \sim 40V_{DC} \sim 16V_{DC}$	—	± 200	± 300	—	± 200	± 300	mV
STEP LINE RESPONSE. TRANSIENT RECOVERY ⁴⁾		—	200	300	—	200	300	μs
START-UP	DELAY	—	10	20	—	10	20	ms
	FULL LOAD OVERSHOOT	—	100	500	—	100	500	mV _{pk}
CAPACITIVE LOAD	$V_{IN}=28V_{DC}$ FULL LOAD	—	—	220	—	—	100	μF
INSULATION RESISTANCE ⁵⁾	$\geq 100M\Omega$ @ 500VDC (INPUT - OUTPUT; INPUT - CASE; OUTPUT - CASE)							

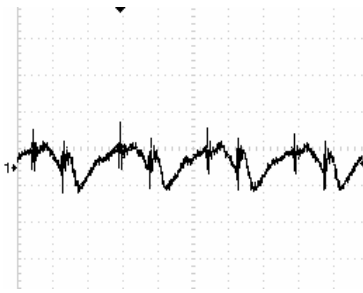
NOTE:

- 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.

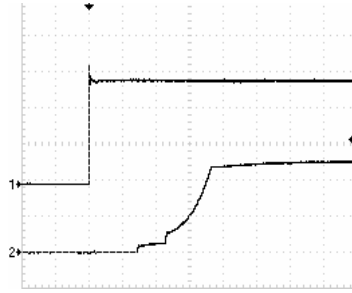
TYPICAL PERFORMANCE CURVES:

Single output (e.g. WK302805S-12):

1: Output Ripple Voltage



2: Start - Up

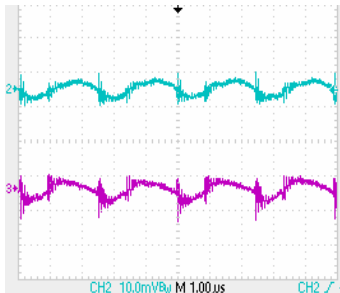


3: Step load Response

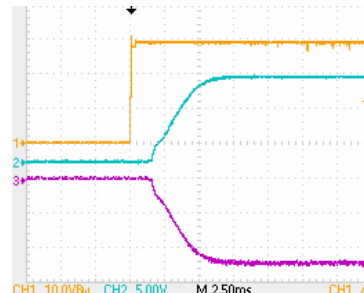


Dual output (e.g. WK302812D-15):

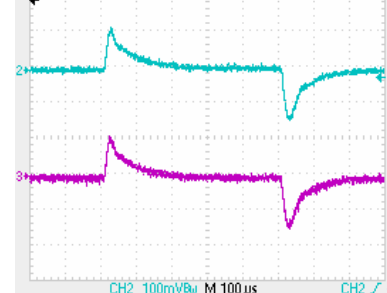
1: Output Ripple Voltage



2: Start-Up

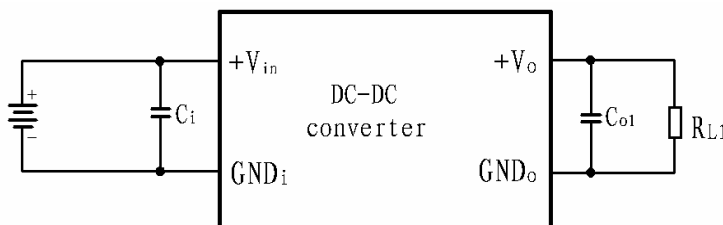


3: Step load Response



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

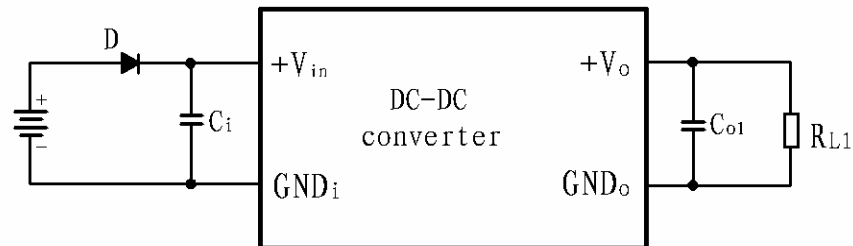
While the output V-ripple can't satisfy your application, it can still be suppressed by adding a filter capacitor between Vo and GND_o outputs.

● Synchronization

The WK3028***-15 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).



● Connection of Output in Series

Any of the bi output converters can be configured to produce an output of 24V ($\pm 12V$ output models), or 30V ($\pm 15V$ output models) by connecting the load across the output (+) and the output (-) with output ground, and leaving the common pin floating.

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:

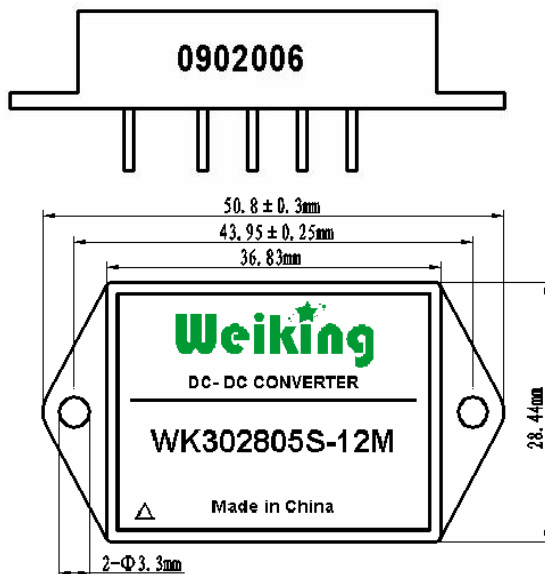
M/E:					
Num	TEST ITEMS		METHODS	REQUEST	CONDITIONS
1	Internal Visual		MIL-STD-883 Method 2017	100%	---
2	Temp-Cycle		MIL-STD-883 Method 1010	100%	-55°C to +125°C, 10 times
3	Constant Acceleration		MIL-STD-883 Method 2001	100%	3000g, Y1, 1min
4	Burn-in		MIL-STD-883 Method 1015	100%	T _C :+105°C 160h (M)
					T _C :+85°C 96h (E)
5	Final Electrical Test	Natural temperature	MIL-PRF-38534	100%	+25°C
		High temperature		100%	T _C : +105°C(M) T _C : +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 _c +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: 10.4cm³ Weight: ≤40g Package Form: H and K for customers to choose

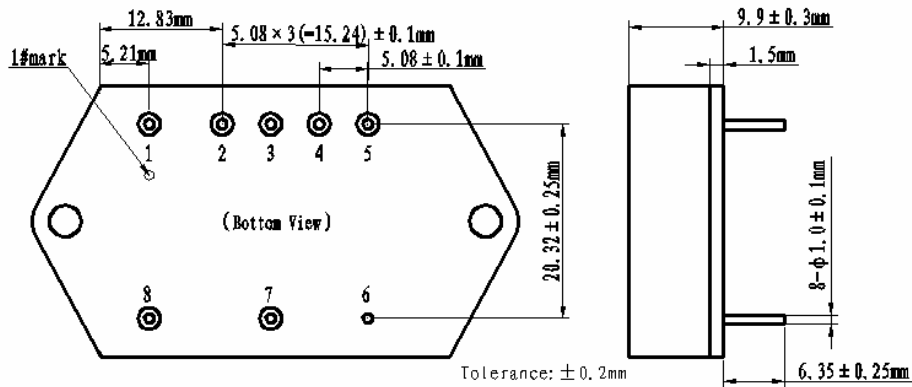
Encapsulation: Hermetically Sealed Welded Seam Shell Material: Cold Rolled Steel

K form (e.g. WK302805S-12M) :

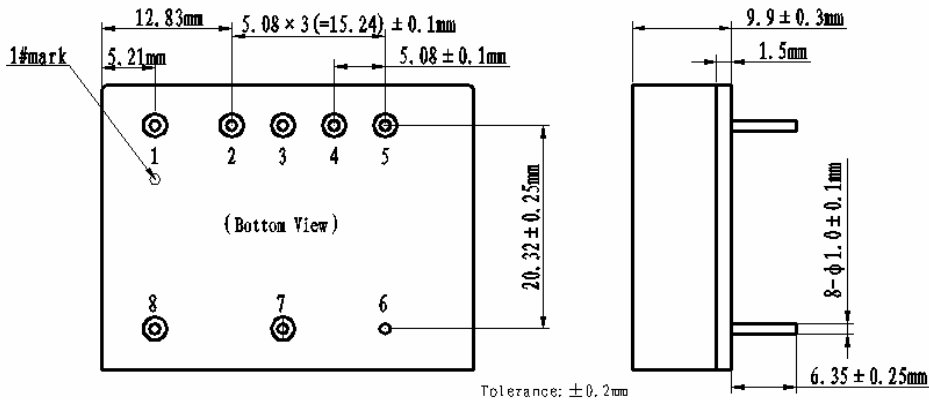
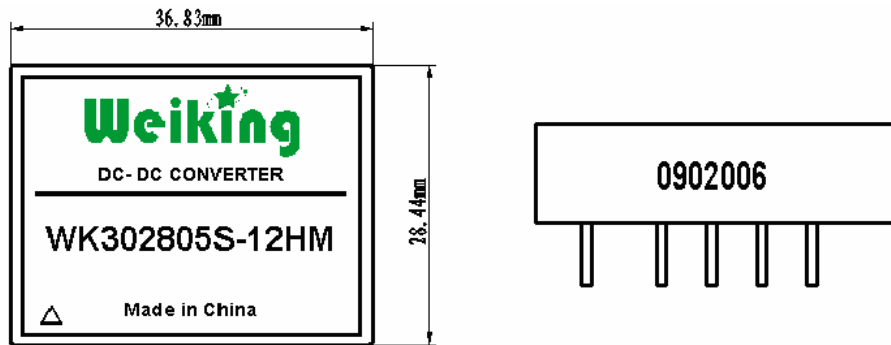


PIN FUNCTIONS

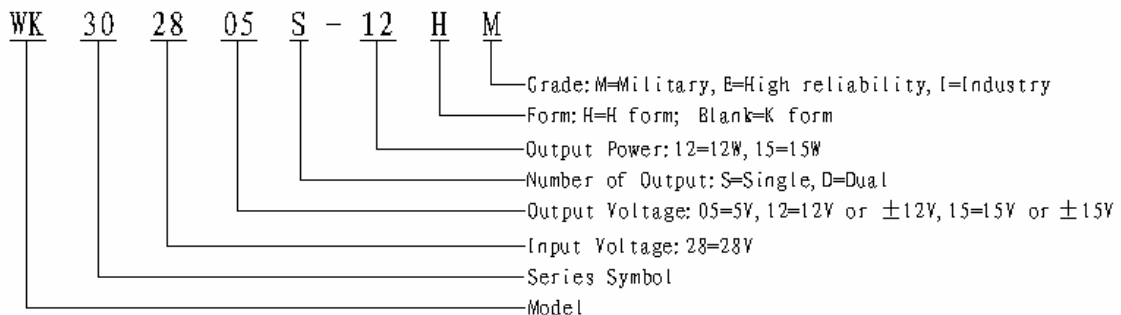
PIN	SINGLE		DUAL	
1	INHIBIT	INH	INHIBIT	INH
2	NO CONNECTION	NC	POSITIVE OUTPUT	+V _o
3	OUTPUT COMMON	GND _o	OUTPUT COMMON	GND _o
4	POSITIVE OUTPUT	+V _o	NEGATIVE OUTPUT	-V _o
5	SYNC	SYNC	SYNC	SYNC
6	CASE GROUND	CASE	CASE GROUND	CASE
7	INPUT COMMON	GND _i	INPUT COMMON	GND _i
8	POSITIVE INPUT	+V _{in}	POSITIVE INPUT	+V _{in}



H form (e.g. WK302805S-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.