

CNWK6TF Series

6W, Wide 7:1 Input, 3KV Isolation, Ultra-flat SMD DC/DC Converters



Features

- Rated power: 6W Max.
- Input voltage: 6-42VDC
- Regulated output
- High efficiency up to 82%
- Isolation voltage 3KVDC
- Creepage distance: 4.5mm
Clearance: 4.2mm
- Operating temperature range: -40 ~ +105°C ambient
- RoHS compliant
- Ultra-flat SMD package
- Under voltage, over voltage, over current, and short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty



Overview

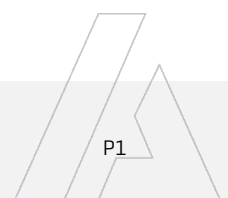
The CNWK6TF series are 6Watt DC/DC converters with ultra-flat SMD package. The series features 6-42VDC wide input voltage range, 3KVDC isolation voltage, -40 ~ +105°C operating temperature range, and fully protected for UVP, OVP, OCP and SCP. The series also are designed to meet IEC/EN/UL 62368-1 for safe use in the information industry. These converters can be widely used in applications such as automotive electronics, industrial automation, electric power, and information technology.

Model Numbers

*Model Number	Input Voltage [VDC]			V _{OUT} [VDC]	Output Current [mA] Max.		Efficiency [%] Typ.	Capacitive Load [uF] Max.
	Nom.	Range	*Max.		V _{IN} <9V	V _{IN} =9...42V		
CNWK6TF-2405	24	6-42	45	5	960	1200	78	1000
CNWK6TF-2412	24	6-42	45	12	400	500	80	470
CNWK6TF-2415	24	6-42	45	15	320	400	80	220
CNWK6TF-2424	24	6-42	45	24	200	250	82	100

*Input voltage exceeds the maximum value may cause permanent damage to the converters.

*Only typical models are listed. Other models may be available upon request.

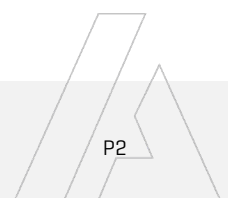


Electrical Specifications

Unless otherwise indicated, specifications are measured at $T_A=25^{\circ}\text{C}$, nominal input voltage, full load after warm up.

Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Input current	Full load	-	321	-	mA	
Input current	No load	-	8	-	mA	
Reflected ripple current		-	30	-	mA	
Input voltage surge	1 second max	-0.7	-	50	Vdc	
Startup input voltage		-	-	6	VDC	
Input under voltage shutdown		3.5	4.5	-	VDC	
Startup time			10	150	mS	
Output voltage accuracy	$I_{OUT}=5$ to 100%	-	± 1	± 3	%	
Line regulation Full load, $V_{IN} = V_{IN, Min}$ to $V_{IN, Max}$		-	± 0.2	± 0.5	%	
Load regulation $I_{OUT}=5\%$ to 100% of $I_{OUT, rated}$		-	± 0.5	± 1.0	%	
Output ripple and noise	20MHz bandwidth	-	60	150	mVp-p	
Temperature coefficient	Full load	-	-	± 0.03	%/ $^{\circ}\text{C}$	
Dynamic load response $I_{OUT}=25\% \sim 50\% \sim 75\%$ of $I_{OUT, rated}$	$V_{OUT} = 5V$ Others Recovery time	-	± 4 ± 3 300	± 8 ± 5 500	% V_{OUT} % V_{OUT} μS	
Output over voltage protection		110	-	160	% V_{OUT}	
Output over current protection		110	-	300	% I_{OUT}	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				
Hot plug		None				

* Operating with less than 5% of rated load will not cause damage to the converters, but the performances data may not fall into the specifications, and stable operating is not assured.



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General Specifications

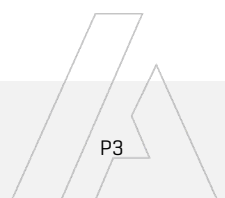
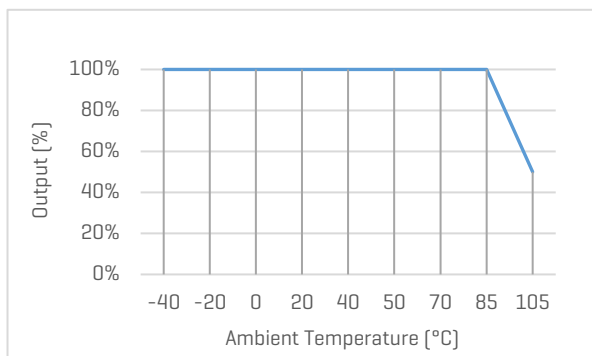
Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage 1 minute, leakage current 1mA max.	I/P to O/P	3000	-	-	VDC	
Isolation resistance Tested at 500VDC	I/P to O/P	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	I/P to O/P	-	500	-	pF	
Reinforced isolation	Clearance Creepage	4.2 4.5	-	-	mm	
Switching frequency	Full load	-	300	-	KHz	PWM mode
Operating temperature	See "Derating Curve"	-40	-	+105	°C	
Storage temperature		-55	-	+125	°C	
Storage humidity	None condensing	5	-	95	%RH	
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C	
Cooling method		Free air convection				
MTBF	MIL-HDBK-217F	>1,000,000 Hours, T _A =25°C				
Design based on standards		IEC/EN/UL 62368-1				
Safety certifications		IEC/EN 62368-1				
EMC		CISPR32, EN55032 Class A without external circuit				
Size, and Weight	Default package	43.6x 23.0 x 10.0 mm, 7.9g				

Characteristic Curves

Derating Curve

Output vs Ambient Temperature

No Heatsink



Recommended Application Circuit

Typical Application Circuit

*Typical application circuit is to further lower the input and output ripple. It is not required for general use.



Figure 1. Typical external circuit

[Table 1] Recommended component spec

V _{OUT} [VDC]	C _{IN}	C _{OUT}
5	100uF, 63V	220uF, 16V
12, 15	100uF, 63V	220uF, 35V
24	100uF, 63V	100uF, 35V

EMC Enhancement for EN55032 Class B

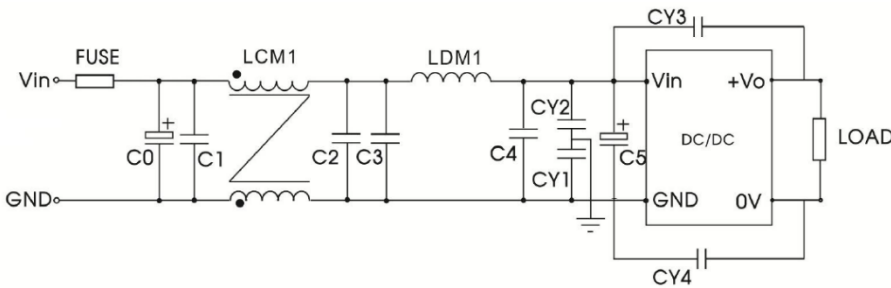
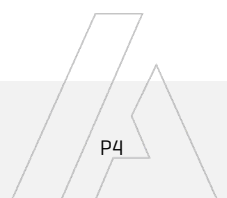


Figure 2. Circuit for EMC enhancement

[Table 2] Recommended component spec

Component	LCM1	LDM1	C0	C1 ... C4	C5	CY1, CY2	CY3, CY4
Spec	1mH	4.7uH	680uF, 63V	10uF, 100V	82uF, 100V	100pF, 400VAC	2200pF, 400VAC



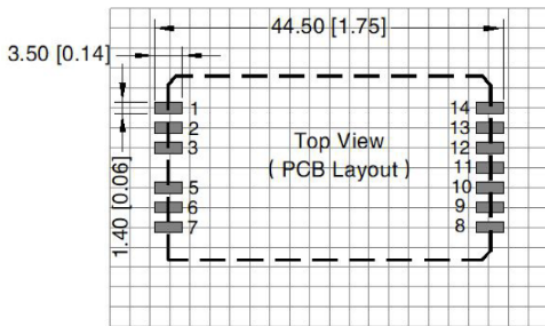
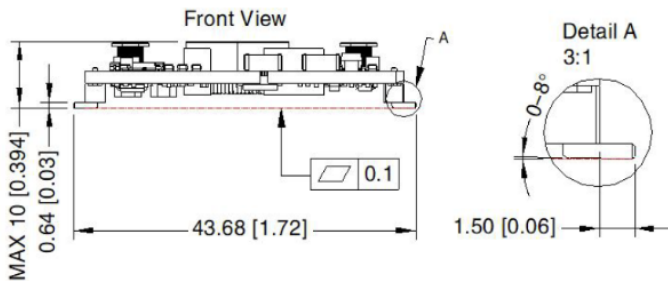
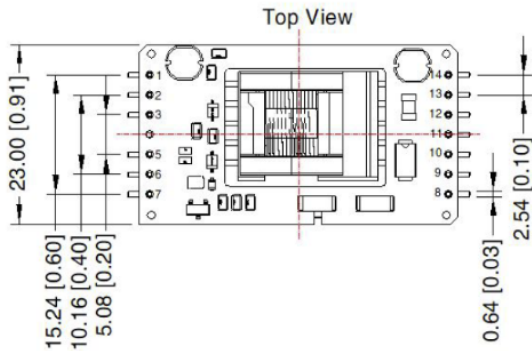
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Mechanical Specifications

Default Package



Recommended Footprint

Pin Definition

Pin #	Single Out
1, 2, 3	V_{IN}
4	No pin
5, 6, 7	GND
8, 9, 12	No connection
10, 11	$-V_{OUT}$
13, 14	$+V_{OUT}$

* Unless otherwise specified unit: mm [inch]

* General tolerance: ± 0.50 [± 0.020]

* Pin thickness: ± 0.10 [± 0.004]

* Footprint grid 2.54 x 2.54 mm

