CNWK6TF Series

6W, Wide 7:1 Input Range, 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
- 5 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°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 coefficiency	Full load	-	-	±0.03	%/°C	
Dynamic load response I_{OUT}=25%~50%~75% of $I_{OUT, rated}$	V_{OUT} = 5V Others Recovery time	-	±4 ±3 300	±8 ±5 500	% V_{OUT} % V_{OUT} uS	
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.

General Specifications

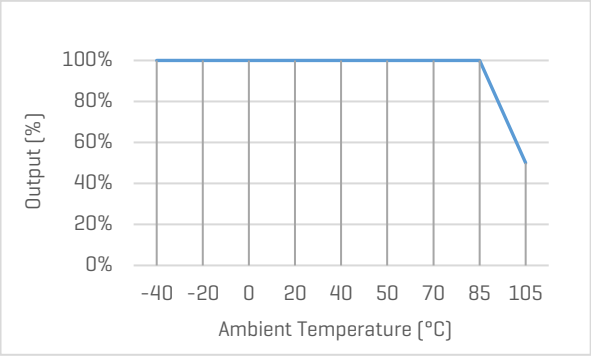
Parameters	Conditions	Min.	Typ.	Max.	Unit	Note
Isolation voltage 1 minute, leakage current 1mA max.	I/P to O/P	3000	-	-	VDC	
Isolation resistance Tested at 500VDC	I/P to O/P	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	I/P to O/P	-	500	-	pF	
Reinforced isolation	Clearance Creepage	4.2 4.5	-	-	mm	
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

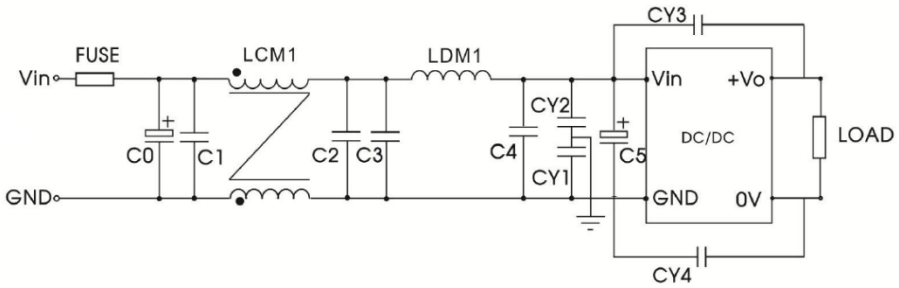


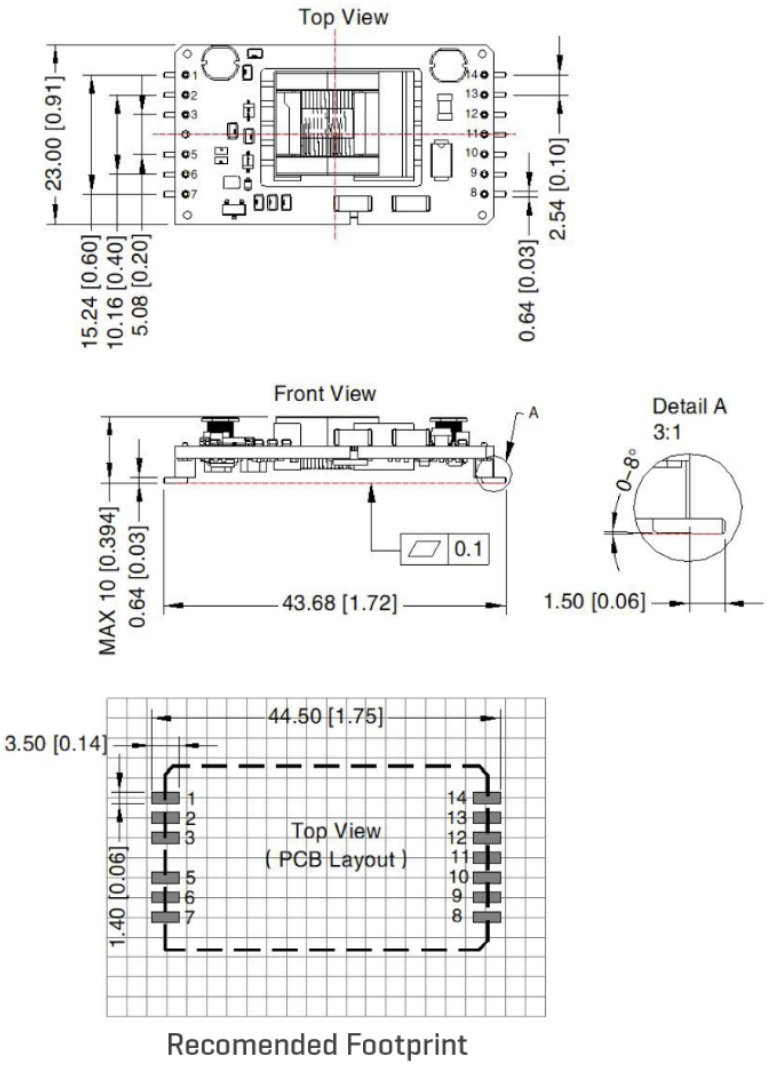
Figure 2. Circuit for EMC enhancement

[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

Mechanical Specifications

Default Package



Recomended 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