

LCD30W SERIES

DC-DC CONVERTER

4:1 ULTRA WIDE INPUT RANGE
UP TO 30Watts



FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- SMALL SIZE AND LOW PROFILE : 1.0 x 1.0 x 0.39 INCH
- SIX-SIDED CONTINUOUS SHIELD
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

1600VDC ISOLATION	REMOTE CONTROL	UVP	OCP	SCP	OVP	OTP	LOW STANDBY POWER
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TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25°C otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load (1)
	VDC	VDC	mA	mA	%	μF
LCD30-24S3P3W	9 ~ 36	3.3	7000	10	88	10000
LCD30-24S05W	9 ~ 36	5	6000	10	89	7200
LCD30-24S12W	9 ~ 36	12	2500	10	89	1200
LCD30-24S15W	9 ~ 36	15	2000	10	89	1000
LCD30-24S24W	9 ~ 36	24	1250	10	90	375
LCD30-24D12W	9 ~ 36	±12	±1250	10	89	±750
LCD30-24D15W	9 ~ 36	±15	±1000	10	91	±500
LCD30-24D24W	9 ~ 36	±24	±625	12	91	±180
LCD30-48S3P3W	18 ~ 75	3.3	7000	10	88	10000
LCD30-48S05W	18 ~ 75	5	6000	10	90	7200
LCD30-48S12W	18 ~ 75	12	2500	8	90	1200
LCD30-48S15W	18 ~ 75	15	2000	8	91	1000
LCD30-48S24W	18 ~ 75	24	1250	8	92	375
LCD30-48D12W	18 ~ 75	±12	±1250	8	91	±750
LCD30-48D15W	18 ~ 75	±15	±1000	8	92	±500
LCD30-48D24W	18 ~ 75	±24	±625	10	92	±180

PART NUMBER STRUCTURE

LCD30 -	48	S	05	W	-	A	HS
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Option		Assembly Option
	24: 9~36 48: 18~75	S: Single	3P3: 3.3 05: 5 12: 12 15: 15 15: 24	4:1	☐ : Negative logic remote ON/OFF(Standard) A: Positive logic remote ON/OFF B: Without Ctrl pin C: Negative logic remote ON/OFF without Trim pin D: Without Ctrl & Trim pin E: Positive logic remote ON/OFF without Trim pin		☐ : No assembly HS: Heat-sink HC: Heat-sink with Clamp
		D: Dual	12: ±12 15: ±15 24: ±24				

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom) 48Vin(nom)	9 18	24 48	36 75	VDC
Input reflected ripple current	Nominal input and Full load		30		mAp-p
Start-up voltage	24Vin(nom) 48Vin(nom)			9 18	VDC
Shutdown voltage	24Vin(nom) 48Vin(nom)		8 16		VDC
Start up time	Constant resistive load Power up Remote ON/OFF			30 30	ms
Input surge voltage	1 second, max. 24Vin(nom) 48Vin(nom)			50 100	VDC
Input filter				Pi type	
Remote ON/OFF	Referred to -Vin pin Positive logic DC-DC ON (Option) DC-DC OFF Negative logic DC-DC ON (Standard) DC-DC OFF Input current of Ctrl pin Remote off input current	-0.5		Open or 3 ~ 15VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 15VDC 1.0	mA mA

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load Single Dual	-0.2 -0.5		+0.2 +0.5	%
Load regulation	No Load to Full Load Single Dual 10% Load to 90% Load Single Dual	-0.2 -1.0 -0.1 -0.8		+0.2 +1.0 +0.1 +0.8	%
Cross regulation	Asymmetrical load 25%/100% FL Dual	-5.0		+5.0	%
Voltage adjustability ⁽²⁾	Single output 15Vout, 24Vout Others	-10 -10		+20 +10	%
Ripple and noise	Measured by 20MHz bandwidth Single With a 22μF/25V X7R MLCC 3.3Vout, 5Vout With 2 pcs of 22μF/25V X7R MLCC 12Vout, 15Vout With 2 pcs of 6.8μF/50V X7R MLCC 24Vout Dual With a 10μF/25V X7R MLCC for each output 12Vout, ±15Vout With a 4.7μF/50V X7R MLCC for each output 24Vout		75 75 75 60 75		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250		μs
Over voltage protection	3.3Vout 5Vout 12Vout 15Vout 24Vout	3.7 5.6 13.5 18.3 29.1		5.4 7.0 19.6 22.0 32.5	VDC
Over load protection	% of Iout rated; Hiccup mode		170		%
Short circuit protection				Continuous, automatic recovery	

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute Input to Output Input(Output) to Case	1600 1000			VDC
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				1500	pF
Switching frequency	3.3Vout, 5Vout Others	248 297	275 330	303 363	kHz
Safety approvals				UL60950-1 EN60950-1 IEC60950-1	
Case material				Copper	
Base material				FR4 PCB	
Potting material				Silicone (UL94 V-0)	
Weight				16.5g (0.58oz)	
MTBF	MIL-HDBK-217F, Full load			1.259 x 10 ⁶ hrs	

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+50	°C
	With derating	+50		+100	°C
Maximum case temperature				105	°C
Over temperature protection			115		°C
Storage temperature range		-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM)		15.0		°C/W
	With heat-sink		13.8		°C/W
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	

EMC SPECIFICATIONS

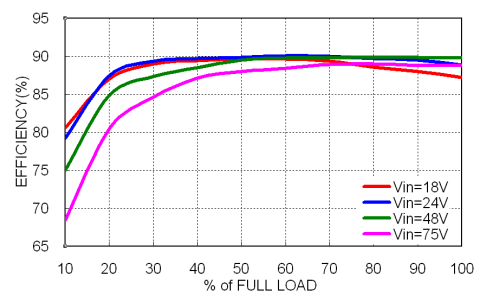
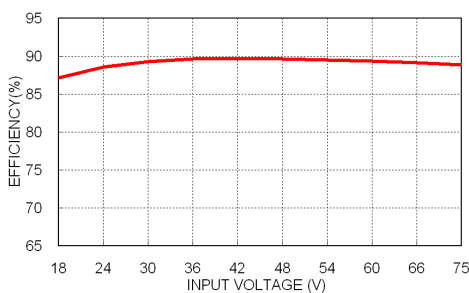
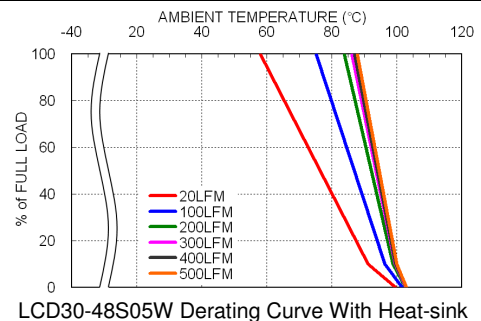
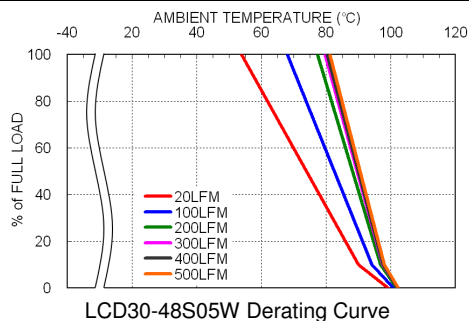
Parameter	Conditions	Level
EMI (3)	EN55022	Class A, Class B
ESD	EN61000-4-2 Air ± 8 kV and Contact ± 6 kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient (4)	EN61000-4-4 ± 2 kV	Perf. Criteria A
Surge (4)	EN61000-4-5 ± 2 kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10 Vr.m.s	Perf. Criteria A

Note:

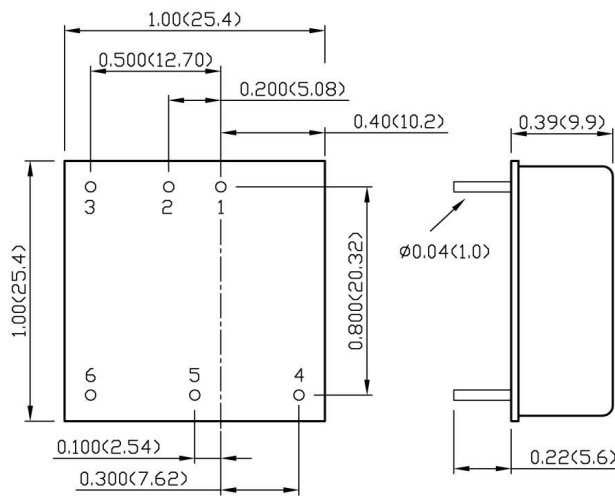
- Test by minimum input and constant resistive load.
- Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either +Vout pin or -Vout pin.
- The standard modules meet EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
- The external input components are required if the module has to meet EN61000-4-4, EN61000-4-5.
The LCD30-24XXXW recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220 μ F/100V) and a TVS (SMDJ58A, 58V, 3000Watt peak pulse power) to connect in parallel.
The LCD30-48XXXW recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220 μ F/100V).

CAUTION: This power module is not internally fused. An input line fuse must always be used.

CHARACTERISTIC CURVE



MECHANICAL DRAWING



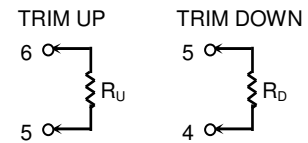
BOTTOM VIEW

PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	+Vout	+Vout
5	Trim	Common
6	-Vout	-Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)