



APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

FEATURES

- 30 WATTS MAXIMUM OUTPUT POWER
- ULTRA LOW QUIESCENT CURRENT
- SINGLE OUTPUT UP TO 7A
- SMALL SIZE AND LOW PROFILE : 1.0 x 1.0 x 0.39 INCH
- HIGH EFFICIENCY UP TO 92%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- INPUT TO OUTPUT ISOLATION:1600VDC
- OVER TEMPERATURE PROTECTION
- SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

OPTIONS

Positive logic Remote On/Off, Without trim, Without CTRL pin

DESCRIPTION

LCD30W DC/DC converters provide up to 30 watts of output power in an industry standard package and footprint. These units are specifically designed to meet the power needs of low profile. All models feature with 4:1 ultra wide input voltage of 9~36 VDC and 18~75 VDC, comprehensively protected against over-current, over-voltage and input under-voltage protection conditions, and trimmable output voltage.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS			
Output power			30Watts, max.
Voltage accuracy			±1%
Minimum load			0%
Voltage adjustability (Note 6)	Single	15 & 24Vout	+20%, -10%
		others	+10%, -10%
Line regulation	LL to HL at Full Load	Single	± 0.2%
		Dual	± 0.5%
	No Load to Full Load	Single	± 0.2%
		Dual	± 1.0%
Load regulation	10% Load to 90% Load	Single	± 0.1%
		Dual	± 0.8%
Cross regulation	Asymmetrical load 25% / 100% FL	Dual	± 5%
Ripple and noise	20MHz bandwidth		See table
Temperature coefficient			±0.02% / °C, max.
Transient response recovery time	25% load step change		250µs
Over voltage protection	3.3VDC output		3.7VDC~5.4VDC
	5VDC output		5.6VDC~7.0VDC
	12VDC output		13.5VDC~19.6VDC
	15VDC output		18.3VDC~22.0VDC
	24VDC output		29.1VDC~32.5VDC
Over load protection	% of FL at nominal input		170%
Short circuit protection			Continuous, automatics recovery

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage	Input to Output	1600VDC, min. 1minute
	Input(Output) to Case	1000VDC, min. 1minute
Isolation resistance	500VDC	10 ⁹ ohms, min.
Isolation capacitance		1500pF, max.
Switching frequency	3.3 & 5Vout	275kHz±10%
	Others	330kHz±10%
Design meet safety standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Copper
Base material		FR4 PCB
Potting material		Silicone (UL94-V0)
Dimensions		1.0 X 1.0 X 0.39 Inch (25.4 X 25.4 X 9.9mm)
Weight		16.5g(0.58oz)
MTBF (Note 1)	MIL-HDBK-217F	1.259x10 ⁶ hrs

INPUT SPECIFICATIONS			
Input voltage range	24VDC nominal input		9 ~ 36VDC
	48VDC nominal input		18 ~ 75VDC
Input filter			Pi type
Input surge voltage	24VDC input		50VDC 1sec, max.
	48VDC input		100VDC 1sec, max.
Input reflected ripple current			30mA _{p-p}
Start up time	Nominal input and constant resistive load	Power up	30ms, max.
		Remote ON/OFF	30ms, max.
Start-up voltage	24VDC input		9VDC, max.
	48VDC input		18VDC, max.
Shutdown voltage	24VDC input		8VDC
	48VDC input		16VDC
Remote ON/OFF (Note 7)			
Positive logic(Optional)	DC-DC ON		Open or 3V < Vr < 15V
	DC-DC OFF		Short or 0V < Vr < 1.2V
Negative logic(Standard)	DC-DC ON		Short or 0V < Vr < 1.2V
	DC-DC OFF		Open or 3V < Vr < 15V
Input current of Remote control pin	Nominal input		-0.5mA~1.0mA
Remote off state input current	Nominal input		2.0mA

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature(Note 8)	-40°C ~ +50°C (without derating)
	+50°C ~ +100°C (with derating)
Maximum case temperature	105°C
Storage temperature range	-55°C ~ +125°C
Over temperature protection	115°C
Thermal impedance (Note 9)	Natural convection
	Natural convection with Heat-sink
	15.0°C /Watt 13.8°C /Watt
Thermal shock	MIL-STD-810F
Vibration	MIL-STD-810F
Relative humidity	5% to 95% RH

EMC CHARACTERISTICS

EMI (Note 10)	EN55022		Class A, Class B
ESD	EN61000-4-2	Air Contact	± 8kV ± 6kV
			Perf. Criteria A
Radiated immunity	EN61000-4-3		10V/m Perf. Criteria A
Fast transient (Note 11)	EN61000-4-4		± 2kV Perf. Criteria A
Surge (Note 11)	EN61000-4-5		± 2kV Perf. Criteria A
Conducted immunity	EN61000-4-6		10Vr.m.s Perf. Criteria A



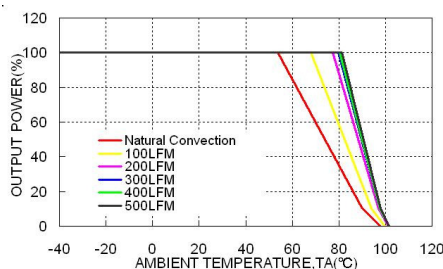
Model Number	Input Range	Output Voltage	Output Current		Output ⁽³⁾⁽⁴⁾ Ripple & Noise	No Load ⁽²⁾ Input Current	Eff ⁽³⁾ (%)	Capacitor ⁽⁵⁾ Load max.
			Min. Load	Full Load				
LCD30-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	7000mA	75mVp-p	10mA	87	10000μF
LCD30-24S05W	9 ~ 36 VDC	5 VDC	0mA	6000mA	75mVp-p	10mA	89	7200μF
LCD30-24S12W	9 ~ 36 VDC	12 VDC	0mA	2500mA	75mVp-p	10mA	89	1200μF
LCD30-24S15W	9 ~ 36 VDC	15 VDC	0mA	2000mA	75mVp-p	10mA	89	1000μF
LCD30-24S24W	9 ~ 36 VDC	24 VDC	0mA	1250mA	75mVp-p	10mA	90	375μF
LCD30-24D12W	9 ~ 36 VDC	± 12 VDC	0mA	± 1250mA	60mVp-p	10mA	89	± 750μF
LCD30-24D15W	9 ~ 36 VDC	± 15 VDC	0mA	± 1000mA	60mVp-p	10mA	91	± 500μF
LCD30-24D24W	9 ~ 36 VDC	± 24 VDC	0mA	± 625mA	75mVp-p	12mA	91	± 180μF
LCD30-48S3P3W	18 ~ 75 VDC	3.3 VDC	0mA	7000mA	75mVp-p	8mA	88	10000μF
LCD30-48S05W	18 ~ 75 VDC	5 VDC	0mA	6000mA	75mVp-p	8mA	90	7200μF
LCD30-48S12W	18 ~ 75 VDC	12 VDC	0mA	2500mA	75mVp-p	8mA	90	1200μF
LCD30-48S15W	18 ~ 75 VDC	15 VDC	0mA	2000mA	75mVp-p	8mA	91	1000μF
LCD30-48S24W	18 ~ 75 VDC	24 VDC	0mA	1250mA	75mVp-p	8mA	92	375μF
LCD30-48D12W	18 ~ 75 VDC	± 12 VDC	0mA	± 1250mA	60mVp-p	8mA	91	± 750μF
LCD30-48D15W	18 ~ 75 VDC	± 15 VDC	0mA	± 1000mA	60mVp-p	8mA	92	± 500μF
LCD30-48D24W	18 ~ 75 VDC	± 24 VDC	0mA	± 625mA	75mVp-p	10mA	92	± 180μF

Note

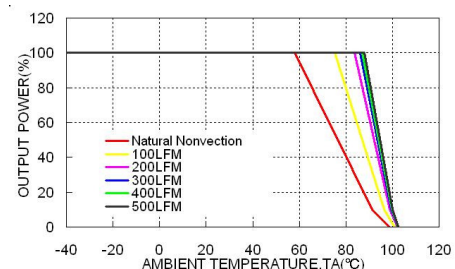
1. MIL-HDBK-217F @Tc=70 °C, Full load.
2. Typical value at nominal input and no load.
3. Typical value at nominal input and full load.
4. The ripple and noise of output voltage 3.3VDC/ 5VDC is measured with a 22μF/25V X7R MLCC;
12VDC/ 15VDC is measured with 2 pcs of 22μF/25V X7R MLCC;
24VDC is measured with 2 pcs of 6.8μF/50V X7R MLCC;
±12VDC/ ±15VDC is measured with a 10μF/25V X7R MLCC for each output ;
±24VDC is measured with a 4.7μF/50V X7R MLCC for each output.
5. Test by minimum input and constant resistive load.
6. 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 the +OUTPUT pin or the -OUTPUT pin.
7. The CTRL pin voltage is reference to -INPUT.
The order number please see product standard table.
8. Test condition with vertical direction by natural convection (20LFM).
9. Heat-sink is optional and P/N:7G-0047C-F
10. The LCD30Wseries standard module meets EN55022 Class A and Class B with external components.
For more detail information, please contact with P-DUKE.
11. 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, 220μF/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, 220μF/100V).

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

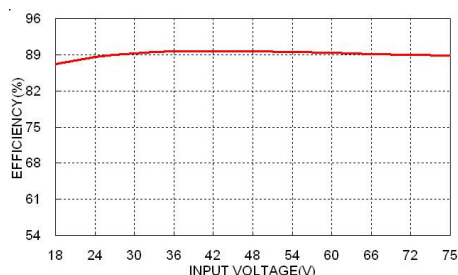
LCD30-48S05W Derating Curve



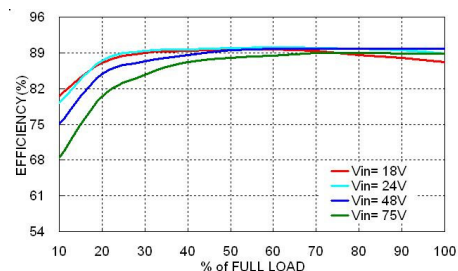
LCD30-48S05W Derating Curve With Heat-sink



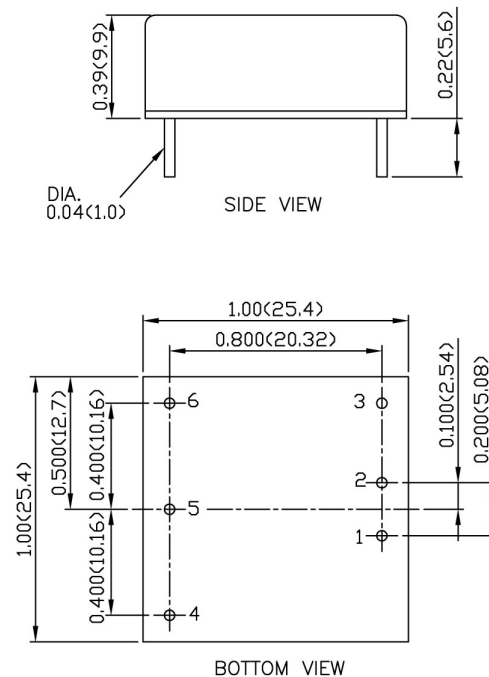
LCD30-48S05W Efficiency VS Input Voltage



LCD30-48S05W Efficiency VS Output Current



MECHANICAL DRAWING :



1. All dimensions in Inch (mm)

Tolerance: X.XX±0.02 (X.X±0.5)

X.XXX±0.01 (X.XX±0.25)

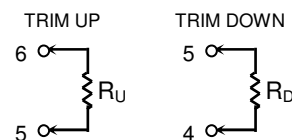
2. Pin pitch tolerance ±0.01 (0.25)

3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	CTRL	CTRL
4	+OUTPUT	+OUTPUT
5	TRIM	COMMON
6	-OUTPUT	-OUTPUT

EXTERNAL OUTPUT TRIMMING

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



PRODUCT STANDARD TABLE

Option	Suffix
Negative logic remote ON/OFF(Standard)	
Positive logic remote ON/OFF	-A
Without CTRL pin	-B
Negative logic remote ON/OFF without TRIM pin	-C
Without CTRL &TRIM pin	-D
Positive logic remote ON/OFF without TRIM pin	-E