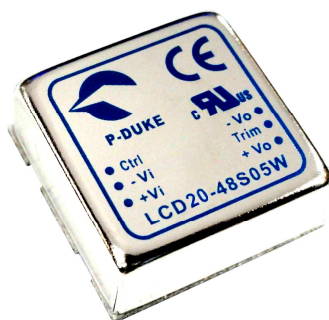




APPLICATIONS

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

FEATURES

- 20 WATTS MAXIMUM OUTPUT POWER
- ULTRA LOW QUIESCENT CURRENT
- SINGLE OUTPUT UP TO 4.5A
- SMALL SIZE AND LOW PROFILE : 1.0 x 1.0 x 0.39 INCH
- HIGH EFFICIENCY UP TO 90%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- MEET EN55022 CLASS A WITHOUT EXTERNAL COMPONENTS
- FIXED SWITCHING FREQUENCY
- INPUT TO OUTPUT ISOLATION:1600VDC
- INDUSTRY STANDARD PIN-OUT LCD15W SERIES COMPATIBLE
- CE MARK MEETS 2006/95/EC, 2011/95/EC AND 2004/108/EC
- 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

LCD20W DC/DC converters provide up to 20 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 18~75VDC, comprehensively protected against over-current, over-voltage

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

OUTPUT SPECIFICATIONS			
Output power		20 Watts	
Voltage accuracy		±1%	
Minimum load		0%	
Voltage adjustability (Note 5)		Single ±10%	
Line regulation	LL to HL at Full Load	Single ± 0.2%	Dual ± 0.5%
Load regulation	No Load to Full Load	Single ± 0.2%	Dual ± 1.0%
	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 (Measured with a 1µF M/C X7R and a 10µF T/C)	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	16.8VDC~20.5VDC	
Over load protection	% of FL at nominal input	150%	
Short circuit protection	Continuous, automatic 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	Nickel-coated 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	15g(0.53oz)		
MTBF (Note 1)	MIL-HDBK-217F	1.469x10 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	Nominal input and full load		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 6)			
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 7)	-40°C ~ +60°C (without derating) +60°C ~ +101°C(with derating)		
Maximum case temperature	105°C		
Storage temperature range	-55°C ~ +125°C		
Thermal impedance (Note 8)	Natural convection	17.6°C/Watt	
	Natural convection with Heat-sink	14.8°C/Watt	
Thermal shock	MIL-STD-810F		
Vibration	MIL-STD-810F		
Relative humidity	5% to 95% RH		

EMC CHARACTERISTICS

EMI (Note 9)	EN55022	Class A, Class B	
ESD	EN61000-4-2	Air Contact	± 8kV
			± 6kV
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 10)	EN61000-4-4	± 2kV	Perf. Criteria A
Surge (Note 10)	EN61000-4-5	± 2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A



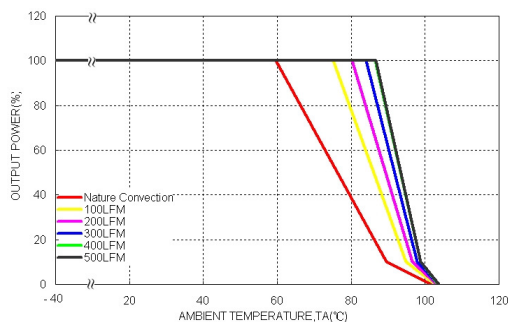
Model Number	Input Range	Output Voltage	Output Current		Output ⁽³⁾ Ripple & Noise	No Load ⁽²⁾ Input Current	Eff ⁽³⁾ (%)	Capacitor ⁽⁴⁾ Load max
			Min. Load	Full Load				
LCD20-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	4500mA	75mVp-p	6mA	88	7000μF
LCD20-24S05W	9 ~ 36 VDC	5 VDC	0mA	4000mA	75mVp-p	6mA	89	5000μF
LCD20-24S12W	9 ~ 36 VDC	12 VDC	0mA	1670mA	100mVp-p	6mA	89	850μF
LCD20-24S15W	9 ~ 36 VDC	15 VDC	0mA	1330mA	100mVp-p	6mA	89	700μF
LCD20-24D12W	9 ~ 36 VDC	± 12 VDC	0mA	± 833mA	100mVp-p	6mA	89	± 500μF
LCD20-24D15W	9 ~ 36 VDC	± 15 VDC	0mA	± 667mA	100mVp-p	6mA	90	± 350μF
LCD20-48S3P3W	18 ~ 75 VDC	3.3 VDC	0mA	4500mA	75mVp-p	4mA	87	7000μF
LCD20-48S05W	18 ~ 75 VDC	5 VDC	0mA	4000mA	75mVp-p	4mA	89	5000μF
LCD20-48S12W	18 ~ 75 VDC	12 VDC	0mA	1670mA	100mVp-p	4mA	89	850μF
LCD20-48S15W	18 ~ 75 VDC	15 VDC	0mA	1330mA	100mVp-p	4mA	90	700μF
LCD20-48D12W	18 ~ 75 VDC	± 12 VDC	0mA	± 833mA	100mVp-p	4mA	89	± 500μF
LCD20-48D15W	18 ~ 75 VDC	± 15 VDC	0mA	± 667mA	100mVp-p	4mA	90	± 350μF

Note

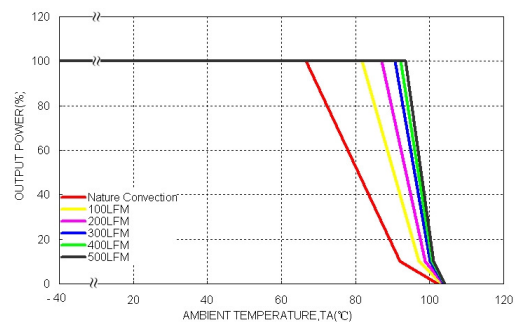
1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and no load.
3. Typical value at nominal input and full load.
4. Test by minimum input and constant resistive load.
5. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the TRIM pin and either the +OUTPUT pin or the -OUTPUT pin.
6. The CTRL pin voltage is reference to -INPUT.
The order number please see product standard table.
7. Test condition with vertical direction by natural convection (20LFM).
8. Heat-sink is optional and P/N:7G-0047C-F
9. The LCD20W series standard module meet EN55022 Class A without external components and meet Class B with external components.
For more detail information, please contact with P-DUKE.
10. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220 μF/100V.

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

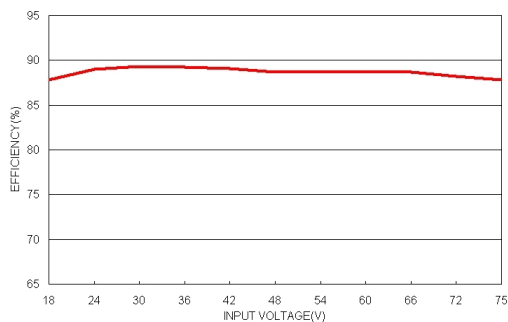
LCD20-48S05W Derating Curve



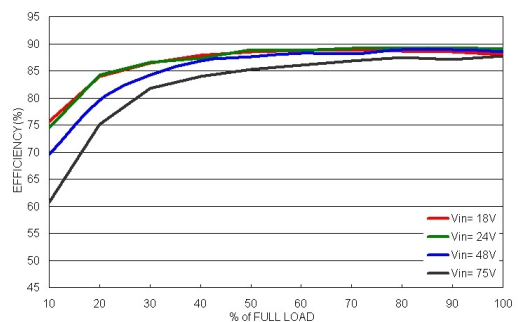
LCD20-48S05W Derating Curve With Heat-sink



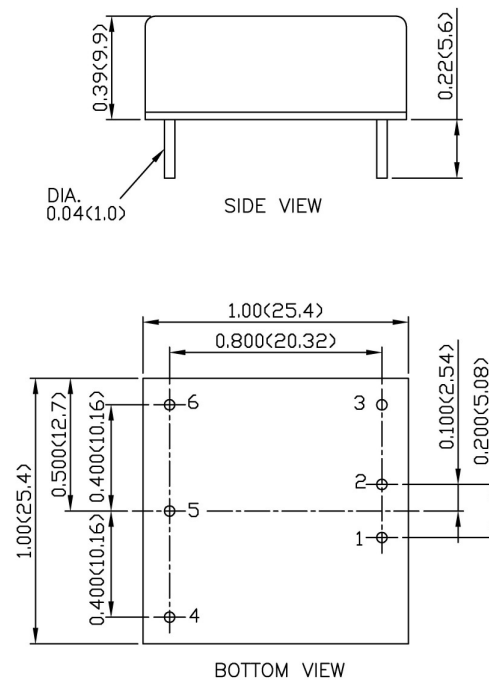
LCD20-48S05W Efficiency VS Input Voltage



LCD20-48S05W Efficiency VS Output Current



MECHANICAL DRAWING :



1. All dimensions in Inch (mm)

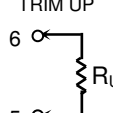
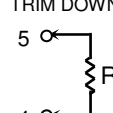
Tolerance: X.XX±0.02 (X.X±0.5)

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.	
TRIM UP 	TRIM DOWN 

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