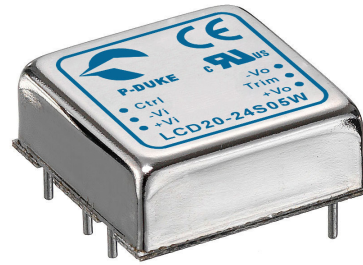


LCD20W SERIES

DC-DC CONVERTER

4:1 ULTRA WIDE INPUT RANGE
UP TO 20Watts



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
- MEET EN55022 CLASS A WITHOUT EXTERNAL COMPONENTS
- 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	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
LCD20-24S3P3W	9 ~ 36	3.3	4500	10	89	7000
LCD20-24S05W	9 ~ 36	5	4000	10	89	5000
LCD20-24S12W	9 ~ 36	12	1670	6	89	850
LCD20-24S15W	9 ~ 36	15	1330	6	89	700
LCD20-24D12W	9 ~ 36	±12	±833	6	89	±500
LCD20-24D15W	9 ~ 36	±15	±667	6	90	±350
LCD20-48S3P3W	18 ~ 75	3.3	4500	10	90	7000
LCD20-48S05W	18 ~ 75	5	4000	10	90	5000
LCD20-48S12W	18 ~ 75	12	1670	4	89	850
LCD20-48S15W	18 ~ 75	15	1330	4	90	700
LCD20-48D12W	18 ~ 75	±12	±833	4	89	±500
LCD20-48D15W	18 ~ 75	±15	±667	4	90	±350

PART NUMBER STRUCTURE

LCD20	-	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 D: Dual	3P3: 3.3 05: 5 12: 12 15: 15 12: ±12 15: ±15	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

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom)		9	24	36	VDC
	48Vin(nom)		18	48	75	
Input reflected ripple current	Nominal input and Full load		30			mAp-p
Start-up voltage	24Vin(nom)					9 VDC
	48Vin(nom)					
Shutdown voltage	24Vin(nom)		8 16			VDC
	48Vin(nom)					
Start up time	Constant resistive load	Power up	30 30			ms
		Remote ON/OFF				
Input surge voltage	1 second, max.	24Vin(nom)	50 100			VDC
		48Vin(nom)				
Input filter			Pi type			
Remote ON/OFF	Referred to -Vin pin	Positive logic	Open or 3 ~ 15VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 15VDC			
		DC-DC ON				
		(Option) DC-DC OFF				
		Negative logic				
		(Standard) DC-DC ON				
DC-DC OFF	-0.5	1.0	mA			
		Input current of Ctrl pin	2.0		mA	
		Remote off input current				

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	-0.2		+0.2	%
		Dual	-0.5		+0.5	
Load regulation	No Load to Full Load	Single	-0.2		+0.2	%
		Dual	-1.0		+1.0	
		Single	-0.1		+0.1	
		Dual	-0.8		+0.8	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Voltage adjustability ⁽²⁾	Single output		-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth		75 100			mVp-p
	With a 1μF M/C X7R and a 10μF T/C					
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250			μs
Over voltage protection			3.3Vout	3.7	5.4	VDC
			5Vout	5.6	7.0	
			12Vout	13.5	19.6	
			15Vout	16.8	20.5	
Over load protection	% of Iout rated; Hiccup mode		150			%
Short circuit protection			Continuous, automatic recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
		Input(Output) to Case	1000			
Isolation resistance	500VDC		1			GΩ
Isolation capacitance			1500			pF
Switching frequency	3.3Vout, 5Vout Others		248	275	303	kHz
			297	330	363	
Safety approvals			UL60950-1 EN60950-1 IEC60950-1			
Case material			Nickel-coated copper			
Base material			FR4 PCB			
Potting material			Silicone (UL94 V-0)			
Weight			15g (0.53oz)			
MTBF	MIL-HDBK-217F, Full load		1.469 x 10 ⁶ hrs			

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+60	°C
	With derating	+60		+101	
Maximum case temperature				105	°C
Storage temperature range		-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM)		17.6		°C/W
	With heat-sink		14.8		
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

EMC SPECIFICATIONS

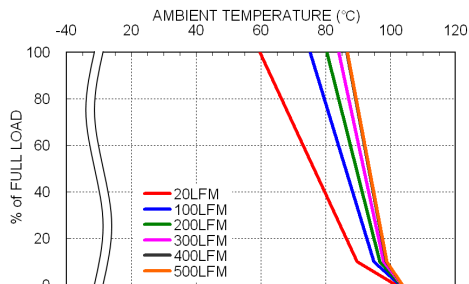
Parameter	Conditions	Level
EMI (3)	EN55022	Class A, Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient (4)	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge (4)	EN61000-4-5 ± 2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6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

Note:

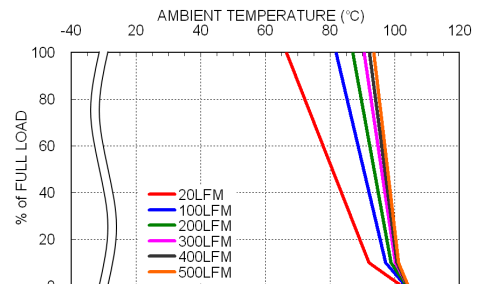
1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either +Vout pin or -Vout pin.
3. The standard modules meet EN55022 Class A without external components and meet Class B with external components. For further information, please contact with P-DUKE.
4. 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, 220µF/100V.

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

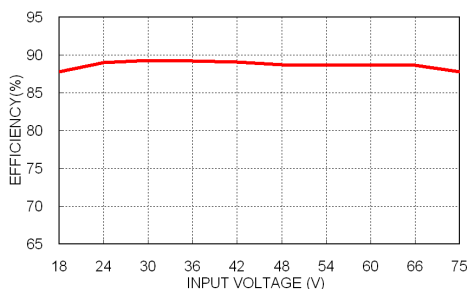
CHARACTERISTIC CURVE



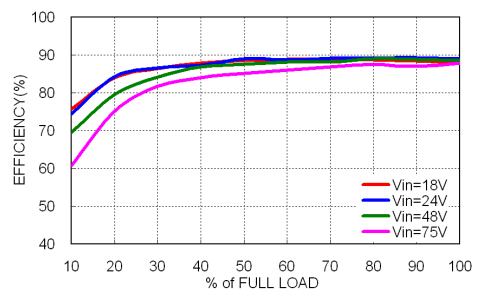
LCD20-48S05W Derating Curve



LCD20-48S05W Derating Curve With Heat-sink

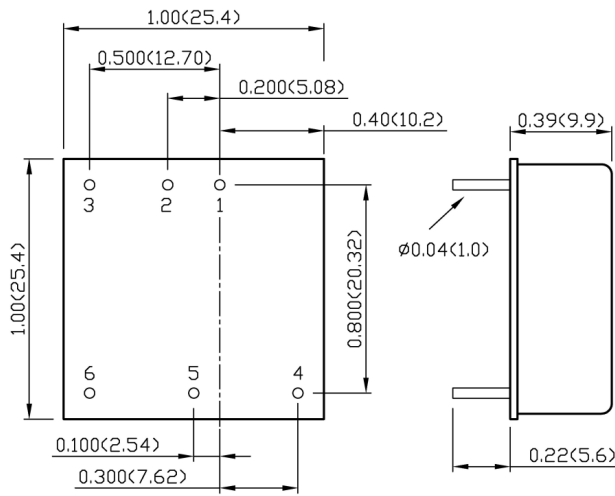


LCD20-48S05W Efficiency vs. Input Voltage



LCD20-48S05W Efficiency vs. Output Load

MECHANICAL DRAWING



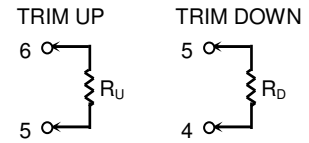
BOTTOM VIEW

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)