

PDL02 SERIES

DC / DC Single & Dual Output: 2 Watts



Features

- 2:1 Input voltage range
- 5V, 12V, 24V & 48V input voltage options
- Single & Dual outputs
- Fixed switching frequency 100KHz
- Industry Standard SIP package
- High efficiency up to 805%
- Regulated output & Short circuit protection
- 1000V isolation
- Low ripple & Noise
- External ON/OFF control
- Safety approvals EN60950, UL60950

Input Voltage	5VDC (4.5 ~ 9) 12VDC (9 ~ 18) 24VDC (18 ~ 36) 48VDC (36 ~ 75)
Input Filter	Capacitor type
Input Surge Voltage. (100mS)	5V: 15VDC, 12V : 36VDC, 24V: 50VDC. 48V: 100VDC
Input Reflected Ripple Current	5V input (10uF/MLCC) 400mA p-p 12V input (10uF/MLCC) 150mA p-p 24V input (2.2uF/MLCC) 380mA p-p 48V input (2.2uF/MLCC) 170mA p-p
Start Up time	1mS typical constant resistive load
Remote ON/OFF (Positive logic)	DC-DC ON Open or high impedance DC-DC OFF Control pin applied current 4 ~ 8mA max via 1Kohm
Output power	2 watts
Voltage Accuracy	±1.0%
Minim Load	See table for minimum load requirement
Line Regulation	±0.5% Low Load to 100%
Load Regulation	Single ±0.85% , Dual ±1% (Loa load to -100%)
Cross Regulation	±5% Asymmetrical load: 25-100% load)
Ripple & noise	See table. 20MHZ bandwidth
Temp. Coefficient	±0.1% / °C
Transient Response	500uS (25% load step change)
Overload Protection	Typically 150% of load
Short Circuit protection	Continuous hiccup mode

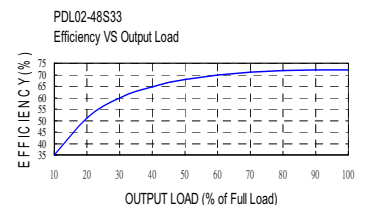
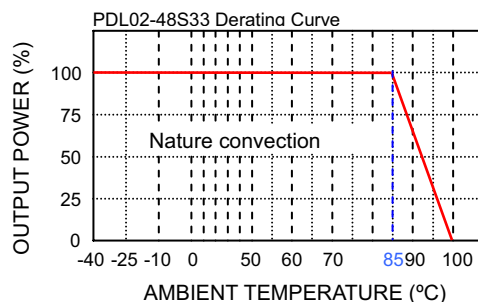
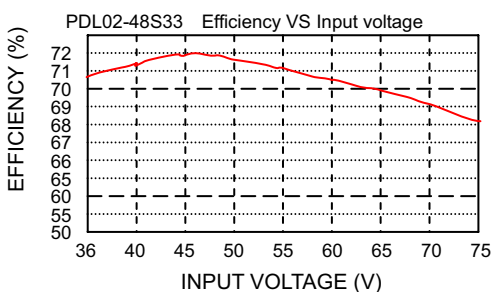
Efficiency	Model dependant 65 ~ 80%
Isolation	1600VDC
Isolation Cap.	300pF
Switching Freq.	100KHz
Safety	EN60950-1, UL60950-1
Case Material	Non-conductive black plastic
Base Material	None
Potting	Epoxy UL94-V0
Dimensions	21.8 x 9.1 x 11.2mm
Weight	4.8g
MTBF	5.107 x 10 ⁸ Hrs
Operating Temp	-40°C to +85°C (with derating)
Thermal shock	MIL-STD-810F
Vibration	10-55Hz, 10G, 30min along X, Y,Z
Humidity	5-95% RH
EMC	EN55022 Class A Consult office for Class B design
ESD	EN61000-4-2
Radiated Immunity	EN61000-4-3
Fast Transients	EN61000-4-4
Surge	EN61000-4-5
Conducted Immunity	EN61000-4-6

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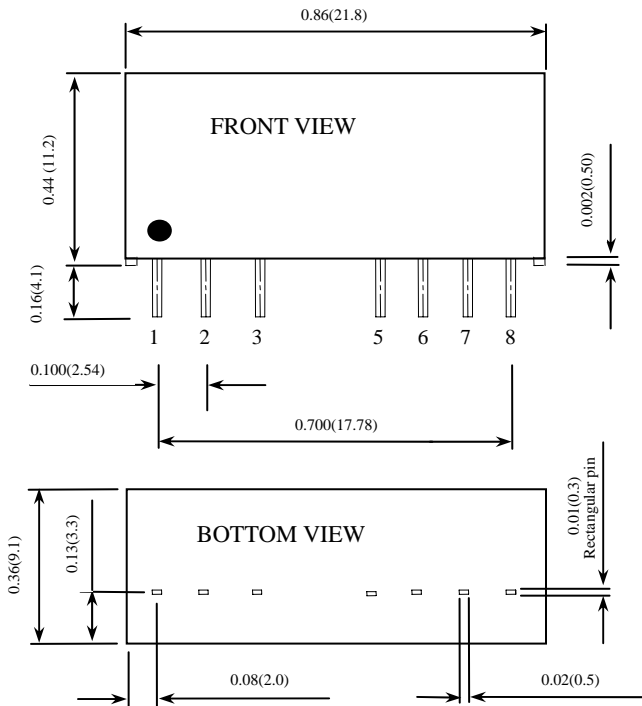
Model	Input V	Output V	Output Current		Output ⁽⁴⁾ Ripple & Noise	Input Current		Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min Load	Full Load		No load ⁽³⁾	Full load ⁽²⁾		
PDL02-05S33	4.5 – 9 V	3.3 V	50mA	500mA	50mVp-p	60mA	540mA	65	2200uF
PDL02-05S05	4.5 – 9 V	5 V	40mA	400mA	50mVp-p	55mA	615mA	69	1000uF
PDL02-05S09	4.5 – 9 V	9 V	22mA	222mA	50mVp-p	55mA	596mA	71	470uF
PDL02-05S12	4.5 – 9 V	12 V	17mA	167mA	50mVp-p	75mA	588mA	72	170uF
PDL02-05S15	4.5 – 9 V	15 V	13mA	134mA	50mVp-p	40mA	582mA	73	110uF
PDL02-05D05	4.5 – 9 V	±5 V	±20mA	±200mA	50mVp-p	75mA	645mA	77	±470uF
PDL02-05D12	4.5 – 9 V	±12 V	±8mA	±83mA	50mVp-p	75mA	595mA	78	±100uF
PDL02-05D15	4.5 – 9 V	±15 V	±7mA	±67mA	50mVp-p	90mA	598mA	78	±47uF
PDL02-12S33	9 – 18 V	3.3 V	50mA	500mA	50mVp-p	20mA	202mA	72	2200uF
PDL02-12S05	9 – 18 V	5 V	40mA	400mA	50mVp-p	25mA	234mA	75	1000uF
PDL02-12S09	9 – 18 V	9 V	22mA	222mA	50mVp-p	25mA	222mA	79	470uF
PDL02-12S12	9 – 18 V	12 V	17mA	167mA	50mVp-p	30mA	219mA	80	170uF
PDL02-12S15	9 – 18 V	15 V	13mA	134mA	50mVp-p	30mA	220mA	80	110uF
PDL02-12D05	9 – 18 V	±5 V	±20mA	±200mA	50mVp-p	50mA	242mA	73	±470uF
PDL02-12D12	9 – 18 V	±12 V	±8mA	±83mA	50mVp-p	40mA	224mA	78	±100uF
PDL02-12D15	9 – 18 V	±15 V	±7mA	±67mA	50mVp-p	40mA	226mA	78	±47uF
PDL02-24S33	18 – 36 V	3.3 V	50mA	500mA	50mVp-p	10mA	102mA	71	2200uF
PDL02-24S05	18 – 36 V	5 V	40mA	400mA	50mVp-p	10mA	115mA	76	1000uF
PDL02-24S09	18 – 36 V	9 V	22mA	222mA	50mVp-p	15mA	109mA	80	470uF
PDL02-24S12	18 – 36 V	12 V	17mA	167mA	50mVp-p	15mA	109mA	80	170uF
PDL02-24S15	18 – 36 V	15 V	13mA	134mA	50mVp-p	15mA	108mA	81	110uF
PDL02-24D05	18 – 36 V	±5 V	±20mA	±200mA	50mVp-p	15mA	117mA	75	±470uF
PDL02-24D12	18 – 36 V	±12 V	±8mA	±83mA	50mVp-p	20mA	112mA	78	±100uF
PDL02-24D15	18 – 36 V	±15 V	±7mA	±67mA	50mVp-p	20mA	110mA	80	±47uF
PDL02-48S33	36 – 75 V	3.3 V	50mA	500mA	50mVp-p	10mA	52mA	70	2200uF
PDL02-48S05	36 – 75 V	5 V	40mA	400mA	50mVp-p	10mA	60mA	74	1000uF
PDL02-48S09	36 – 75 V	9 V	22mA	222mA	50mVp-p	10mA	56mA	78	470uF
PDL02-48S12	36 – 75 V	12 V	17mA	167mA	50mVp-p	10mA	55mA	80	170uF
PDL02-48S15	36 – 75 V	15 V	13mA	134mA	50mVp-p	10mA	55mA	79	110uF
PDL02-48D05	36 – 75 V	±5 V	±20mA	±200mA	50mVp-p	10mA	62mA	75	±470uF
PDL02-48D12	36 – 75 V	±12 V	±8mA	±83mA	50mVp-p	10mA	57mA	77	±100uF
PDL02-48D15	36 – 75 V	±15 V	±7mA	±67mA	50mVp-p	12mA	57mA	77	±47uF

- Notes:
- 1.BELLCORE TR-NWT-000332. Case: 50% Stress. Temperature at 40°C.(Ground fixed and controlled environment).
 - 2.Maximum value at nominal input voltage and full load.
 - 3.Typical value at nominal input voltage and no load.
 - 4.Typical value at nominal input voltage and full load.
 - 5.Test by minimum Vin and constant resistive load.
 - 6.The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
 - 7.It will not damage the device without inserting external input capacitors. There is a smaller reflected ripple current when put a capacitor at input.
 - 8.The PDL02 series meet EN55022 Class A with external L-C filter before the input pins to the converter. (Connect networks following Class B figure.)
 Recommend: 05 Vin : C1=10µF/25V 1812 MLCC. L1=2.2uH 0504 SMD Inductor P/N:PMT-059
 12 Vin : C1=10µF/25V 1812 MLCC. L1=2.2uH 0504 SMD Inductor P/N:PMT-059
 24 Vin : C1=6.8µF/50V 1812 MLCC. L1=3.3uH 0504 SMD Inductor P/N:PMT-044.
 48 Vin : C1=2.2µF/100V 1812 MLCC. L1=10uH 0504 SMD Inductor P/N:PMT-047.
 9. An external filter capacitor is required if the module has to meet EN61000-4-5.
 The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ.

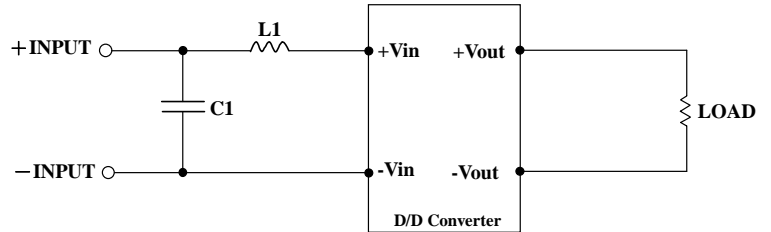


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DC / DC Single & Dual Output: 2 Watts



1. All dimensions in Inches (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)

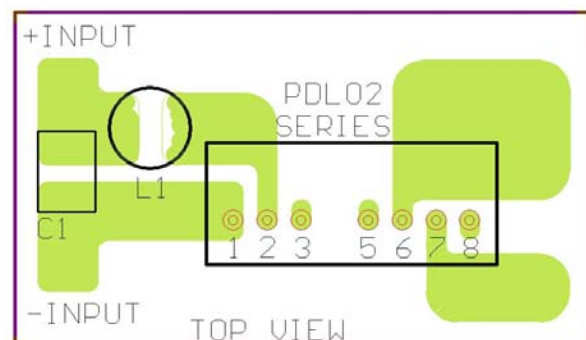


Recommended Filter for EN55022 Class B Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	L1
PDL02-05XXX	22uF/25V 1812 MLCC	3.3uH 2.0A 0.06Ω 0504 SMDInductor,P/N:PMT-044
PDL02-12xxx	22uF/25V 1812 MLCC	3.3uH 2.0A 0.06Ω 0504 SMDInductor,P/N:PMT-044
PDL02-24xxx	4.7uF/50V 1812 MLCC	12uH 1.4A 0.12Ω 0504 SMDInductor,P/N:PMT-062
PDL02-48xxx	2.2uF/100V 1812 MLCC	27uH 0.9A 0.2Ω 0504 SMDInductor,P/N:PMT-063

Pin Assignment		
PIN	SINGLE	DUAL
1	- Input	- Input
2	+ Input	+ Input
3	CTRL	CTRL
5	NC	NC
6	+ Output	+ Output
7	- Output	COM
8	NC	- Output



Recommended EN55022 Class B Filter Circuit Layout