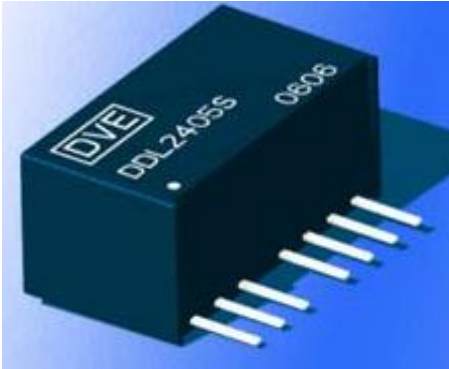




DDL Series Isolated 2W Wide Input Single Output DC-DC Converters



FEATURES

- 2:1 Wide Range Voltage Input
- Efficiency up to 82%
- Temperature Range -40°C to 85°C
- 1kVDC Isolation
- Single Output
- UL 94V-0 Package Material
- Industry Standard Pinout
- MTTF>3,500,000 hours

APPLICATIONS

The DDL Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage range: 2:1);
- 2) Where isolation is necessary between input and output (Isolation Voltage =1000VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanding.

SELECTION GUIDE						
Order Code	Nominal Input Voltage (V)	Rated Output Voltage (V)	Output Current (mA)		Efficiency (% Typ)	Package Style
			Min	Max		
DDL0505S	5	5	40	400	67	SIP
DDL0509S	5	9	22	222	70	SIP
DDL0512S	5	12	16	166	72	SIP
DDL0515S	5	15	13	133	72	SIP
DDL1205S	12	5	40	400	75	SIP
DDL1209S	12	9	22	222	80	SIP
DDL1212S	12	12	16	166	80	SIP
DDL1215S	12	15	13	133	80	SIP
DDL2405S	24	5	40	400	77	SIP
DDL2409S	24	9	22	222	80	SIP
DDL2412S	24	12	16	167	82	SIP
DDL2415S	24	15	13	133	81	SIP
DDL4805S	48	5	40	400	73	SIP
DDL4809S	48	9	22	222	78	SIP
DDL4812S	48	12	16	166	80	SIP
DDL4815S	48	15	13	133	78	SIP

INPUT CHARACTERISTICS					
Parameter	Conditions	MIN	TYP	MAX	Units
Voltage Range	All DDL05 Types	4.5	5	9	VDC
	All DDL12 Types	9	12	18	
	All DDL24 Types	18	24	36	
	All DDL48 Types	36	48	72	

OUTPUT CHARACTERISTICS					
Parameter	Conditions	MIN	TYP	MAX	Units
Output Voltage Accuracy	Refer To Recommended Circuit		±1	±3	%
Line Regulation	Input Voltage From Low To High		±0.2	±0.5	%
Load Regulation	From 10% To 100% Load		±0.5	±0.75	%
Temperature Drift(Vout)	Refer To Recommended Circuit			0.03	%/°C
Temperature Rise	Full load		30		°C
Ripple	B/W=20Hz to 300kHz			40	mV p-p
Noise	B/W=DC to 20MHz		75	100	mV p-p

ABSOLUTE MAXIMUM RATINGS	
Output Short-circuit protection	Continuous
Lead temperature 1.5mm from case for 10 seconds	300°C

1 All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.

2 See below recommended circuits for more details.



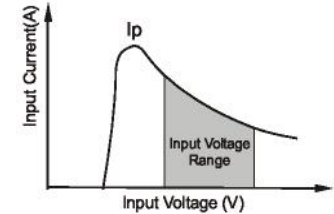
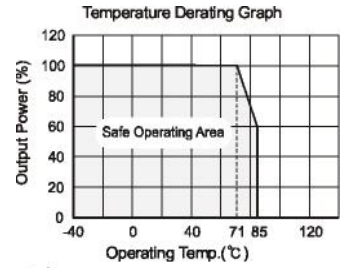
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ISOLATION CHARACTERISTICS					
Parameter	Conditions	MIN	TYP	MAX	Units
Isolation Test Voltage	Flash Test for 1 minute	1000			VDC
Resistance	Viso=500VDC	1			GΩ

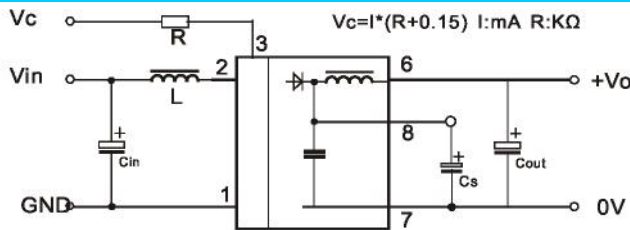
GENERAL CHARACTERISTICS					
Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	100% Load, Nominal Input Voltage	80		200	kHz
	10% Load, Nominal Input Voltage	250		600	

ENVIRONMENTAL					
Parameter	Conditions	MIN	TYP	MAX	Units
Operation		-40		85	°C
Storage temperature		-55		125	°C
Storage humidity				95	%
Cooling	Free air convection				



(Figure 2)

TYPICAL APPLICATION CIRCUIT



Input Current

Nominal input voltage range. The input current of the power supply must be sufficient to the startup current (I_p) of the DC/DC module (see Figure 2)

Output Load

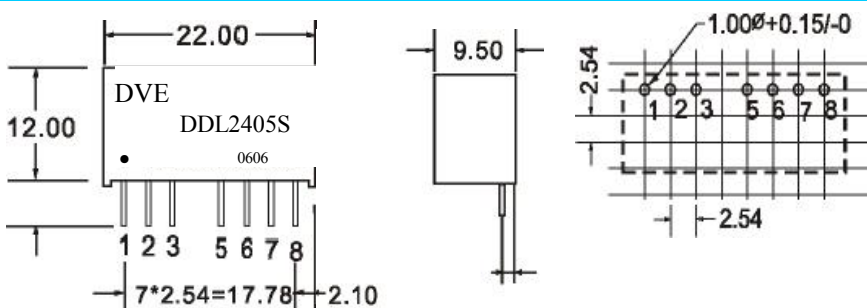
In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a minimum load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load **no less than 10% full load, the product never work under no load!**

If the actual load is less than the specified minimum load, the output ripple will increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, a proper resistor is needed at the output end in order to increasing the load, or contact our company for other lower output power products.

FOOTPRINT DETAILS

pin		pin	
1	GND	6	+Vo
2	Vin	7	0V
3	CTRL	8	CS
5	NC		

OUTLINE DIMENSIONS



Note: All Pins on a 2.54mm pitch; All Pin diameters are 0.80 mm(Tolerance:±0.15).

APPLICATION NOTE

Recommended Circuit

All the DDL Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (See Figure 1). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high.(See Table 2).If you want to use the products in high EMI, please choose our metal packaged products.

CS Pin

By connecting a low ESR capacitor between this terminal and the pin-7 (connecting to the anode of the capacitor), the output ripple and noise may be further improved. When the output power is down to 1 W, it is suggested to connect a capacitor (C_s) between the terminal CS and the terminal 0V. Generally, the capacitance is no greater than 100μF.

When the output power is up to 1 W, it is suggested to connect a capacitor (C_s) between the CS and the 0V, otherwise perpetual damage might be done. (See Table 1)

CTRL When open or high impedance, converter work well.; When control pin positive referenced to the negative input (equal to import to earth), converter shutdown; Please note that the input current should between 5-10mA,exceeding the maximum 20mA will cause permanence damage to converter.

No parallel connection or plug and play.

External Capacitor Table(See Table 1

V_{OUT}	$C_{OUT}(Max)$
5	470μF
9	200μF
12	200μF
15	100μF
24	47μF