

## 1000Vdc Isolation Single & Dual Output 1watt Dc-Dc Converter



### Features:

- Small Footprint
- 22PIN SMD Package
- High Efficiency up to 80%
- Unregulated Output Types
- High Power Density
- No External Component Required
- Operating Temperature:-40°C TO +85°C
- Industry Standard Pinout



Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified

Part Number	Output Voltage	Output Current	% EFF.	Package Style
	Vdc	mA	%TYP	
13DS4-XXS03NNL	3.3	303	65	1
13DS4-XXS05NNL	5	200	70	1
13DS4-XXS09NNL	9	112	75	1
13DS4-XXS12N2NL	12	84	78	2
13DS4-XXS15N2NL	15	67	80	2
13DS4-XXD03NNL	±3.3	±150	65	1
13DS4-XXD05NNL	±5	±100	70	1
13DS4-XXD09NNL	±9	±56	75	1
13DS4-XXD12N2NL	±12	±42	78	2
13DS4-XXD15N2NL	±15	±34	80	2

Note:1."XX" Is Input Voltage:03=3.3Vdc,05=5Vdc, 09=9Vdc,12=12Vdc, 15=15Vdc. 2. Over 12Vdc,15Vdc input voltage, using the 2nd package.

3.The input voltage increases, there will be an increase in efficiency.

### Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	Vo, Io Nom			±10	%
Filter	Capacitor				

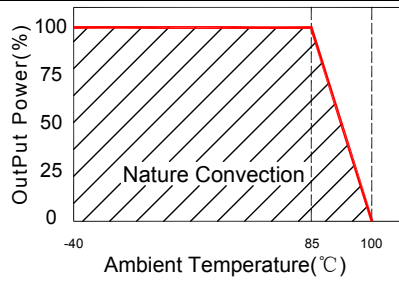
### Output Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	100% full load			±5	%
Short Circuit Protection	Short Term			1 Sec	
Line Regulation	For 1.0% OF Vin		1.2		%
Load Regulation	3.3V (10% To 100% F.L)		15		%
Load Regulation	5V,9V(10% To 100% F.L)			12&8.0	%
Load Regulation	12V,15 V(10% To 100% F.L)			8.5&7.0	%
Ripple & Noise	BW=DC To 20MHz			100	mVp-p
Transient response setting time	50% load step change		350		us

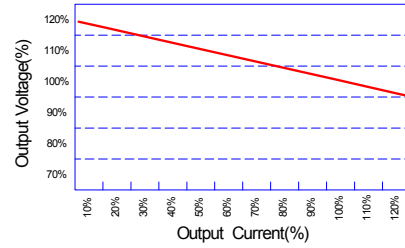
### General Specifications

Parameters	Conditions	Min	Typ	Max	Units
Isolation Resistance	500Vdc	1000			MΩ
Switching Frequency	Full load,nominal input		100		KHz
Operating Temperature		-40		85	°C
Humidity	Non Condensing			95	%
Cooling	Free air Convection				
Case material	DAP				
MTBF	MIL-HDBK-217F@25°C	3500000			Hours
Weight	Package1 or Package2		1.8		g
Dimensions	Package1		15.24x8.0x7.30		mm
Dimensions	Package2		15.24x8.0x8.50		mm

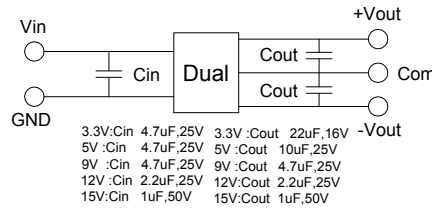
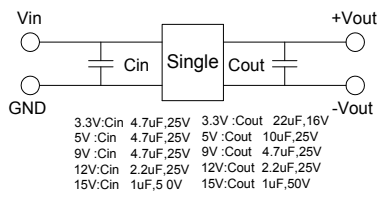
## Temperature Derating Graph



## Tolerance Envelope Graph



## Recommended Test Circuit

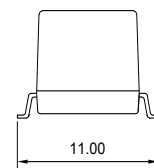
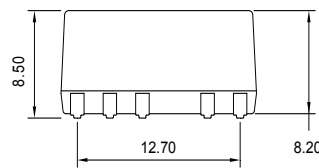
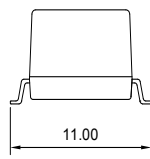
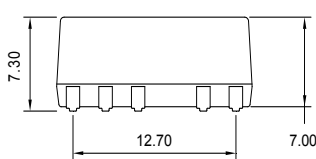
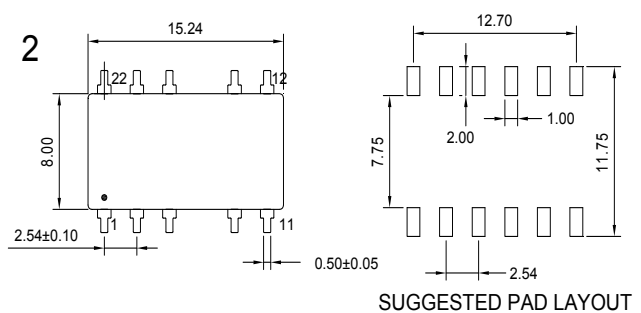
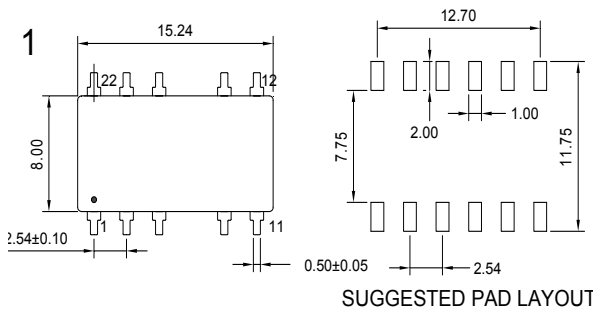


## Part Number

13DS4 - 05 S 12 N 2 NL  
 A B C D E F G

A: Series  
 B: Input Voltage  
 C: Single(S)Dual(D)  
 D: Output Voltage  
 E: Unregulated(N)  
 F: Package  
 G: RoHS Version

## Markings and Dimensions



Unit: mm Unless otherwise specified, all tolerances are ±0.25

## PIN Connection

Pin	1	3	5	9	11	12	14	18	20	22
Single	-Vin	+Vin	NC	-Vout	NC	NC	+Vout	NC	NC	NC
Dual	-Vin	+Vin	NC	Com	-Vout	NC	+Vout	NC	NC	NC