



## 3000Vdc Isolation Single & Dual Output 1 Watt Dc-Dc Converter



### FEATURES:

- Small Footprint
- 22PIN SMD Package
- High Efficiency up to 80%
- Recognized By UL 60950-1
- Unregulated Output Types
- High Power Density
- Industry Standard Pinout
- Operating Temperature: -40°C TO +85°C
- No External Component Required



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

Part Number	Output Voltage	Output Current	Efficiency	Package Style
	Vdc	mA	% TYP	
13DS1-XXS03NNL	3.3	303	65	1
13DS1-XXS05NNL	5	200	70	1
13DS1-XXS09NNL	9	112	75	1
13DS1-XXS12N2NL	12	84	78	2
13DS1-XXS15N2NL	15	67	80	2
13DS1-XXD03NNL	±3.3	±150	65	1
13DS1-XXD05NNL	±5	±100	70	1
13DS1-XXD09NNL	±9	±56	75	1
13DS1-XXD12N2NL	±12	±42	78	2
13DS1-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

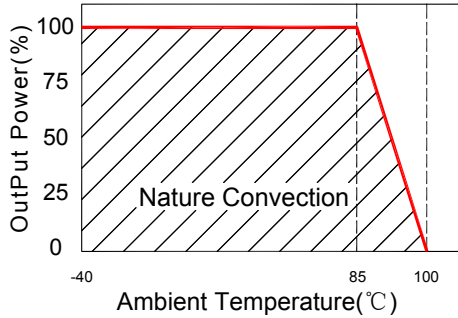
Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	100% full load			±5	%
Short Circuit Protection	Short Term			1 Sec	
Line Regulation	For 1.0% OF Vin		1.2		%
Load Regulation	3.3V (10% To 100% F.L)		15		%
Load Regulation	5V, 9V (10% To 100% F.L)			12&8.0	%
Load Regulation	12V,15V (10% To 100% F.L.)			8.5&7.0	%
Ripple & Noise	BW=DC To 20MHZ			75	mVp-p
Transient response setting time	50% load step change		350		us

### General Specifications

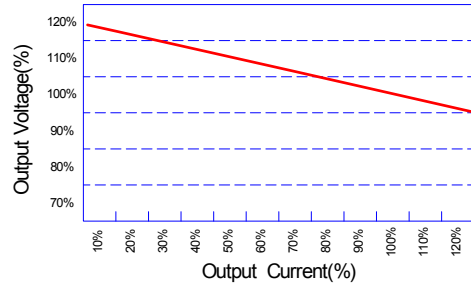
Parameters	Conditions	Min	Typ	Max	Units
Isolation Resistance	500Vdc	1000			MΩ
Switching Frequency	Full load,nominal input		100		KHz
Operating Temperature		-40		85	°C
Humidity	Non Condensing			95	%
Cooling	Free air Convection				
Case material	DAP				
MTBF	MIL-HDBK-217F@25°C	3500000			Hours
Weight	Package1 or Package2		1.8		g
Dimensions	Package 1		15.24x8.0x7.30		mm
Dimensions	Package 2		15.24x8.0x8.50		mm

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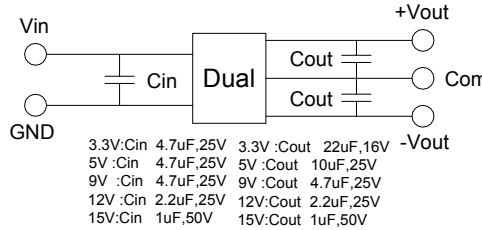
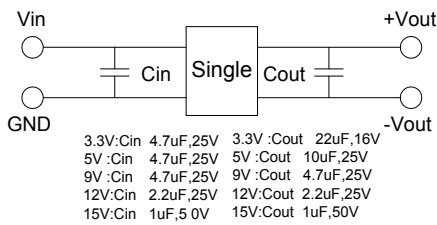
**Temperature Derating Graph**



**Tolerance Envelope Graph**



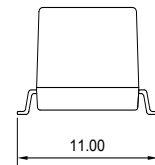
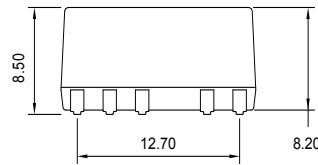
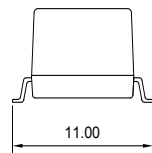
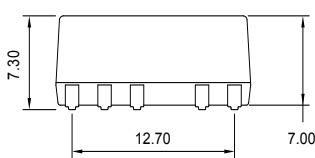
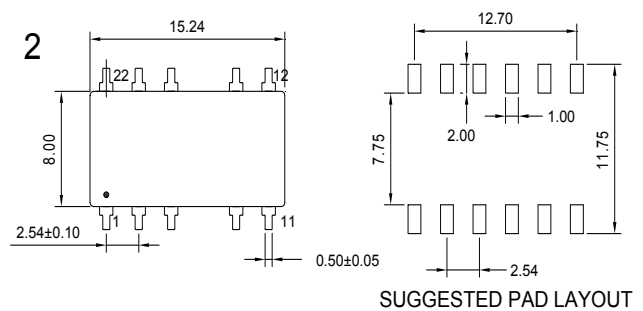
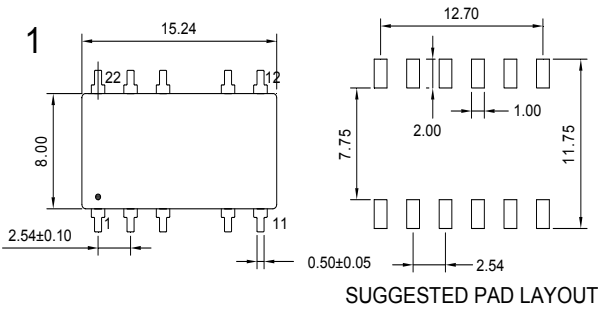
**Recommended Test Circuit**



**Part Number**

**13DS1 - 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