

FEATURES :

- 18PIN&22PIN SMD Package
- No-load input current as low as 5mA
- Continuous short-circuit protection
- High Efficiency up to 87%
- Unregulated Output Types
- 1.5KVDC ~ 3KVDC Isolation
- Operating Temperature:-40°C TO +105°C
- Industry Standard Pinout
- Design refer to IEC62368, UL62368, EN62368



**DC-DC Converter
13DS1C SERIES**

**1Watt
1.5KV ~ 3KV Isolated
Single & Dual Output
SMD18 & SMD22**

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

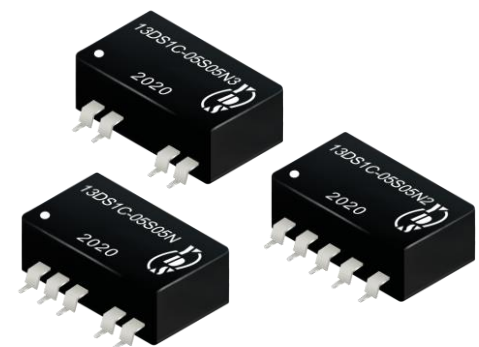
Part Number	Output Voltage	Output Current	Efficiency	Capacitive Load(μF)	Package Style
	Vdc	mA	%TYP	Max.	
13DS1C-05S03NY ^{(P)(H3)}	3.3	303	76	2400	1/2/3
13DS1C-05S05NY ^{(P)(H3)}	5	200	82	2400	1/2/3
13DS1C-05S09NY ^{(P)(H3)}	9	112	83	1000	1/2/3
13DS1C-05S12NY ^{(P)(H3)}	12	84	84	470	1/2/3
13DS1C-05S15NY ^{(P)(H3)}	15	67	84	330	1/2/3
13DS1C-05S24NY ^{(P)(H3)}	24	42	85	100	1/2/3
13DS1C-05D03NY ^{(P)(H3)}	±3.3	±151	76	±1200	1/2/3
13DS1C-05D05NY ^{(P)(H3)}	±5	±100	82	±1200	1/2/3
13DS1C-05D09NY ^{(P)(H3)}	±9	±56	83	±470	1/2/3
13DS1C-05D12NY ^{(P)(H3)}	±12	±42	84	±220	1/2/3
13DS1C-05D15NY ^{(P)(H3)}	±15	±34	84	±1000	1/2/3
13DS1C-05D24NY ^{(P)(H3)}	±24	±21	85	±47	1/2/3
13DS1C-XXS03NYP ^(H3)	3.3	303	78	2400	1/2/3
13DS1C-XXS05NYP ^(H3)	5	200	82	2400	1/2/3
13DS1C-XXS09NYP ^(H3)	9	112	85	1000	1/2/3
13DS1C-XXS12NYP ^(H3)	12	84	85	680	1/2/3
13DS1C-XXS15NYP ^(H3)	15	67	87	330	1/2/3
13DS1C-XXS24NYP ^(H3)	24	42	85	220	1/2/3
13DS1C-XXD03NYP ^(H3)	±3.3	±151	78	±1200	1/2/3
13DS1C-XXD05NYP ^(H3)	±5	±100	82	±1200	1/2/3
13DS1C-XXD09NYP ^(H3)	±9	±56	85	±680	1/2/3
13DS1C-XXD12NYP ^(H3)	±12	±42	85	±330	1/2/3
13DS1C-XXD15NYP ^(H3)	±15	±34	87	±220	1/2/3
13DS1C-XXD24NYP ^(H3)	±24	±21	85	±100	1/2/3

Note:

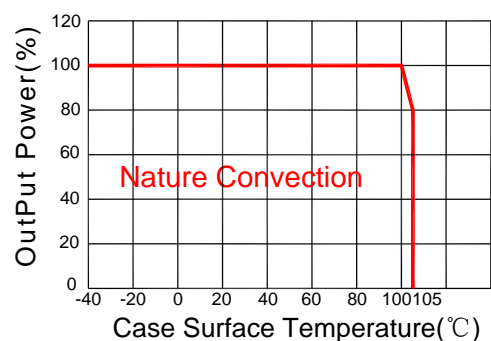
1: No suffix is standard isolation (1.5KVDC) e.g, 13DS1C-12S05NP ,
*add suffix "H3" for 3KVDC isolation, e.g, 13DS1C-12S05NPH3, 13DS1C-15S12NPH3,
Y = 1 or 2 or 3 for package, No suffix Y package1, When Y=2, package2, and so on,
e.g, 13DS1C-24S05N2P, 13DS1C-15S12N3PH3

2: No suffix P is No short circuit protection , e.g, 13DS1C-05S05N,
*add suffix "P" for short circuit protection,
e.g, 13DS1C-05S05NP, 13DS1C-05S12N3PH3

3: "XX" Is Input Voltage : 12=12Vdc, 15=15Vdc, 24=24Vdc
e.g, 13DS1C-12S05N3P, 13DS1C-15S12NPH3.



Temperature Derating Graph



Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Range	Vo,Io Nom@Vin:5V		±10		%
	Vo,Io Nom@ Vin:12V,15V,24V		±20		%
Filter	Capacitor				

Output Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	100% full load			±5	%
Short Circuit Protection	without suffix "P"			1	Sec
	With Suffix "P"		Continuous		
Line Regulation	For 1.0% OF Vin		1.2		%
Load Regulation	3.3V (10% To 100% F.L)		15	20	%
	5V (10% To 100% F.L)		10	15	%
	9V (10% To 100% F.L)		8	10	%
	12V (10% To 100% F.L)		7	10	%
	15V (10% To 100% F.L)		6	10	%
Ripple & Noise	BW=DC To 20MHz @Vo:3.3V,5V,9V,12V,15V		30	75	mVp-p
	BW=DC To 20MHz @ Vo:24V		50	100	mVp-p

General Specifications

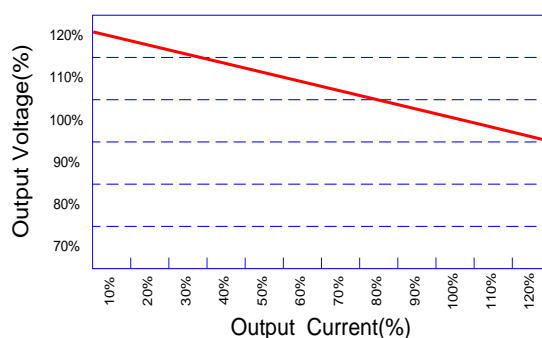
Parameters	Conditions	Min	Typ	Max	Units
Isolation Resistance	500Vdc	1000			MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V		20		pF
Switching Frequency	Full load, nominal input @5V Vin		370		KHz
	Full load, nominal input @other Vin		250		KHz
Operation Temperature		-40		+105	°C
Storage Temperature		-55		+125	°C
Humidity	Non Condensing		95		%
Cooling	Free air Convection				
Case material	DAP				
MTBF	MIL-HDBK-217F@25°C	3500000			Hours
Weight	Package 1/2/3		1.36		g
Dimensions	Package 1/2/3	15.24x8.0x7.3			mm

Part Number

13DS1C - 15 S 12 N 3 P H3
 A B C D E F G H

A:Series
 B:Input Voltage
 C:Single(S)/Dual(D)Output
 D:Output Voltage
 E:Unregulated(N)
 F:Packge
 G:Protection
 H:Isolation Voltage

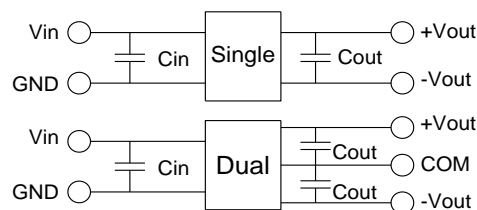
Tolerance Envelope Graph



Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 1 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Air ±8kV , Contact ±4kV perf. Criteria B

Recommended Test Circuit



Vin	Cin	Single Vout	Cout	Dual Vout	Cout
5Vdc	4.7µF/25V	3.3Vdc	10µF/16V	±3.3Vdc	±4.7µF/16V
12Vdc	2.2µF/25V	5Vdc	10µF/16V	±5Vdc	±4.7µF/16V
15Vdc	2.2µF/25V	9Vdc	2.2µF/16V	±9Vdc	±1µF/16V
24Vdc	1µF/50V	12Vdc	2.2µF/25V	±12Vdc	±1µF/25V
--	--	15Vdc	1µF/25V	±15Vdc	±1µF/25V
--	--	24Vdc	1µF/50V	±24Vdc	±1µF/50V

EMC (CLASS B) compliance circuit

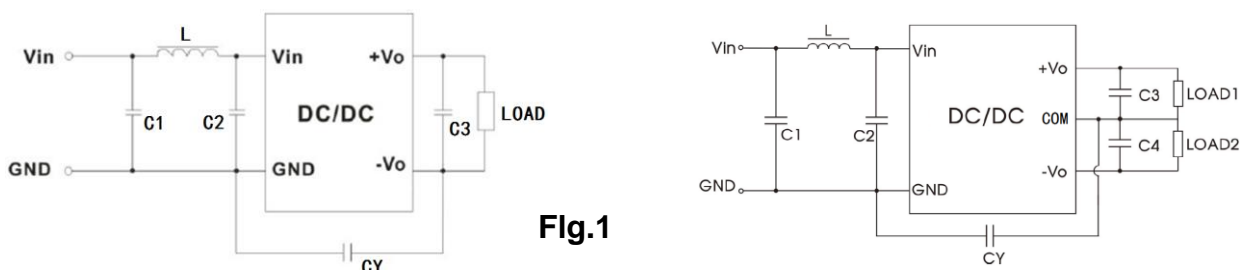
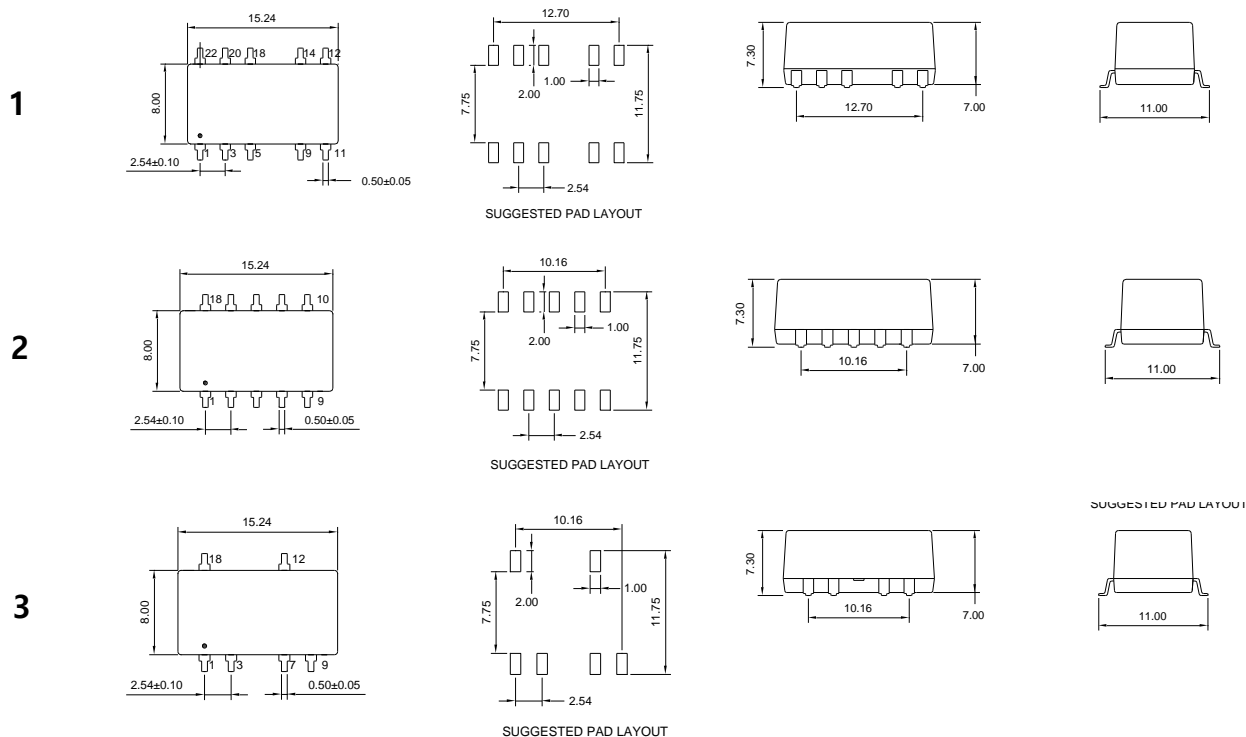


Fig.1

EMC recommended circuit value table

EMI	C1	4.7μF /50V
	C2	4.7μF /50V
	CY	1nF/4kV
	C3	Recommended Test Circuit
	L	6.8μH

Markings and Dimensions



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

PIN Connection

PIN	1	3	5	7	9	10	11	12	14	16	18	20	22
Package1 (Single)	-Vin	+Vin	NC*	--	-Vout	--	NC	NC	+Vout	--	NC	NC	NC
Package1 (Dual)	-Vin	+Vin	NC*	--	Com	--	-Vout	NC	+Vout	--	NC	NC	NC
Package2/3 (Single)	-Vin	+Vin	NC*	-Vout	-Vout	NC*	--	+Vout	NC*	NC*	NC	--	--
Package2/3 (Dual)	-Vin	+Vin	NC*	Com	-Vout	NC*	--	+Vout	NC*	NC*	NC	--	--

NOTE: NC* Means When the Package 2 is NC, When the Package 3 is NO PIN