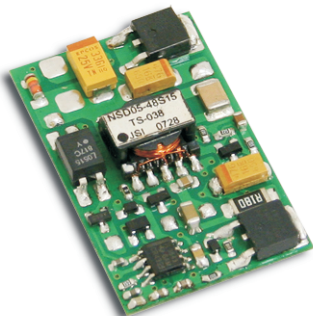




5W DC-DC Regulated Single Output

NSD05-S series

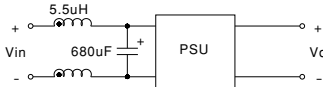


■ Features :

- Wide 4:1 DC input range
- Protections: Short circuit / Overload / Over voltage
- 1000VDC I/O isolation
- Cooling by free air convection
- Built-in remote ON-OFF control
- 100% full load burn-in test
- Low cost
- High reliability
- 2 years warranty

CBCE

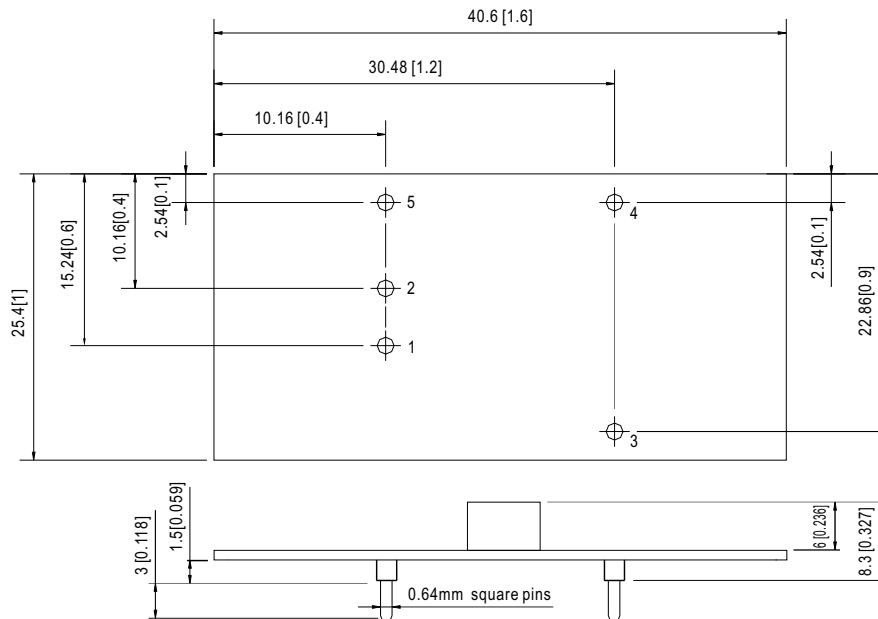
SPECIFICATION

MODEL		NSD05-12S3	NSD05-12S5	NSD05-12S12	NSD05-12S15	NSD05-48S3	NSD05-48S5	NSD05-48S12	NSD05-48S15
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	3.3V	5V	12V	15V
	RATED CURRENT	1.2A	1A	0.42A	0.33A	1.2A	1A	0.42A	0.33A
	CURRENT RANGE	0 ~ 1.2A	0 ~ 1A	0 ~ 0.42A	0 ~ 0.33A	0 ~ 1.2A	0 ~ 1A	0 ~ 0.42A	0 ~ 0.33A
	RATED POWER	3.96W	5W	5.04W	4.95W	3.96W	5W	5.04W	4.95W
	CAPACITIVE LOAD (max.)	1000uF	1000uF	120uF	120uF	1000uF	1000uF	120uF	120uF
	RIPPLE & NOISE (max.) Note.2	75mVp-p							
	VOLTAGE TOLERANCE Note.3	±2.0% max.							
	LINE REGULATION	±1.0%							
LOAD REGULATION	±2.0%	±1.0%	±1.0%	±1.0%	±2.0%	±1.0%	±1.0%	±1.0%	
INPUT	RATED DC INPUT	12VDC				48VDC			
	VOLTAGE RANGE	9.2 ~ 36VDC				18 ~ 72VDC			
	EFFICIENCY (Typ.)	72%	76%	82%	83%	75%	78%	83%	85%
	DC CURRENT	0.7A/12VDC				0.2A/48VDC			
	SHUTDOWN IDLE CURRENT	5mA/12VDC				5mA/48VDC			
PROTECTION	OVERLOAD	Above 105% rated output power Protection type : Over power limiting, recovers automatically after fault condition is removed							
	OVER VOLTAGE(CLAMP)	3.8 ~ 4.6V	5.6 ~ 6.8V	13.5 ~ 16.5V	16.2 ~ 19.8V	3.8 ~ 4.6V	5.6 ~ 6.8V	13.5 ~ 16.5V	16.2 ~ 19.8V
	SHORT CIRCUIT	Recovers automatically after fault condition is removed							
FUNCTION	ON/OFF CONTROL	Logic "1" or open circuit : ON Logic "0" or short to PIN2 : OFF							
ENVIRONMENT	WORKING TEMP.	-25 ~ +70℃							
	WORKING HUMIDITY	0% ~ 95% RH max.							
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 0 ~ 95% RH							
	TEMP. COEFFICIENT	±0.03%/℃ (0~60℃)							
SAFETY & EMC (Note 4)	SAFETY STANDARDS	IEC60950-1 CB approved by TUV							
	ISOLATION VOLTAGE	I/P-O/P:1KVDC							
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH							
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B							
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8; EN55024, light industry level, criteria A							
OTHERS	MTBF	914.4K hrs min. MIL-HDBK-217F (25℃)							
	DIMENSION	40.6*25.4*8.3mm (1.6**1**0.327") (L*W*H)							
	PACKING	0.007Kg; 700pcs/5.9Kg/0.97CUFT							
NOTE	1. All parameters NOT specially mentioned are measured at 12, 48VDC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. 5. To insure proper operation, a 47uF/100V electrolytic capacitor with Esr <1Ω must be added to the input line. 6. EMC filter suggestion(TBD): 								



Mechanical Specification

Unit:mm[inch]

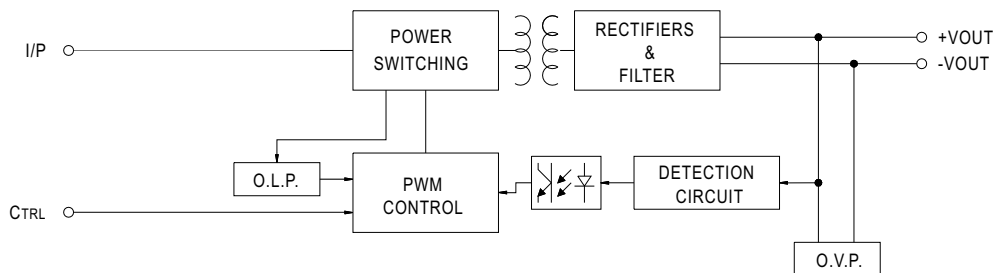


Pin No. Assignment

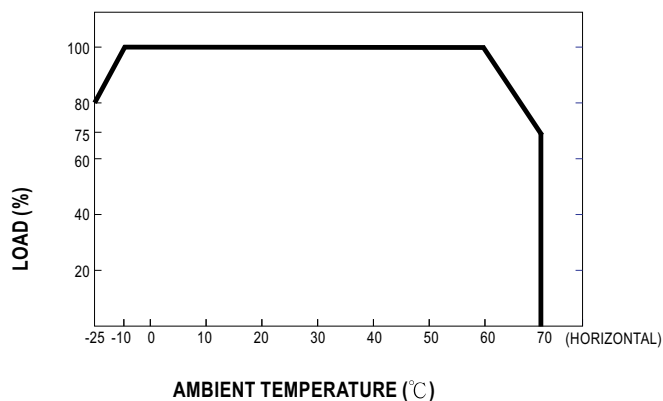
Pin No.	Assignment	Pin No.	Assignment
1	+INPUT	4	-VOUT
2	-INPUT(GND)	5	CONTROL
3	+VOUT		

Block Diagram

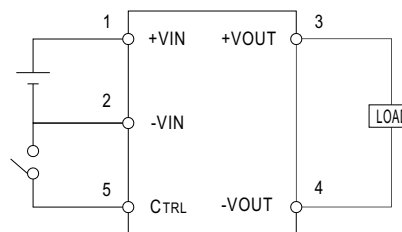
fosc : 350KHz



Derating Curve



ON/OFF Control



CONTROL INPUT.....PIN5
CONTROL COMMON.....PIN2
LOGIC COMPATIBILITY.....CMOS OR OPEN COLLECTOR TTL
CONTROL VOLTAGE
ON.....+5.5VDC min OR OPEN CIRCUIT
OFF.....+2.5VDC max. OR SHORT TO PIN2



5W DC-DC Regulated Single Output

NSD05-S series

MODEL : NSD05-12S15

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 75 mVp-p (Max)	I/P: 12VDC O/P:FULL LOAD Ta:25°C	V1: 21.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 2 %~ -2 % (Max)	I/P: 9.2VDC / 36VDC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.04 %~-0.04 %	P
3	LINE REGULATION	V1: 1%~ -1 % (Max)	I/P: 9.2VDC ~ 36VDC O/P:FULL LOAD Ta:25°C	V1: 0 %~-0.04 %	P
4	LOAD REGULATION	V1: 1 %~ -1 % (Max)	I/P: 12VDC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0 %~ 0 %	P
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	TEST: < 5 %	P
6	DYNAMIC LOAD	V1: 1500 mVp-p	I/P: 12VDC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	213 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	9.2VDC~ 36 VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	5.8V~36 V	P
			I/P: LOW-LINE-0.2V= 9 V HIGH-LINE+5%= 37.8 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	EFFICIENCY	83 % (TYP)	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	82.25%	P
3	INPUT CURRENT	12 VDC/ 0.7A(TYP)	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	I = 0.648 A	P
4	SHUTDOWN IDLE CURRENT	5 mA / 12VDC	I/P: 12 VDC O/P:FULL LOAD Ta:25°C	4.2mA / 12VDC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	Above 105%	I/P: 12VDC O/P: TESTING Ta: 25°C	242 %/12V Over power Limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1: 16.2 V~ 19.8V	O/P: DC SOURCE Ta: 25°C	18V / 0.053 A Recovers automatically after fault condition is removed	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1hour NO DAMAGE	I/P: 36 VDC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	Logic "1" OPEN : ON Logic "0" GON : OFF	I/P: 12VDC O/P: FULL LOAD Ta: 25°C	Logic "1" : POWER ON Logic "0" : POWER OFF	p

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																													
1	TEMPERATURE RISE TEST	MODEL : NSD05-12S12 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 12 VDC O/P: FULL LOAD Ta= 30.4 ℃ 2. HIGH AMBIENT BURN-IN : 1HRS I/P: 12 VDC O/P: FULL LOAD Ta= 70.6 ℃ <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 30.4 ℃</th><th>HIGH AMBIENT Ta= 70.6 ℃</th></tr><tr><td>1</td><td>Q1</td><td>PMBS3904 200mA/40V</td><td>58.8℃</td><td>91.1℃</td></tr><tr><td>2</td><td>C6</td><td>105/50V</td><td>58.5℃</td><td>90.9℃</td></tr><tr><td>3</td><td>T1 COIL</td><td>TS033</td><td>59.9℃</td><td>92.3℃</td></tr><tr><td>4</td><td>U1</td><td>TL3843D</td><td>63.8℃</td><td>95.9℃</td></tr><tr><td>5</td><td>Q6</td><td>CEU1012 10A/120V</td><td>60.2℃</td><td>92.6℃</td></tr><tr><td>6</td><td>D100</td><td>6CWQ04FN 7A/40V</td><td>53.4℃</td><td>86.0℃</td></tr><tr><td>7</td><td>C100</td><td>100uF/10V</td><td>51.1℃</td><td>83.7℃</td></tr><tr><td>8</td><td>PCB</td><td>TI 與 C31 間</td><td>54.3℃</td><td>86.5℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 30.4 ℃	HIGH AMBIENT Ta= 70.6 ℃	1	Q1	PMBS3904 200mA/40V	58.8℃	91.1℃	2	C6	105/50V	58.5℃	90.9℃	3	T1 COIL	TS033	59.9℃	92.3℃	4	U1	TL3843D	63.8℃	95.9℃	5	Q6	CEU1012 10A/120V	60.2℃	92.6℃	6	D100	6CWQ04FN 7A/40V	53.4℃	86.0℃	7	C100	100uF/10V	51.1℃	83.7℃	8	PCB	TI 與 C31 間	54.3℃	86.5℃	P
NO	Position	P/N	ROOM AMBIENT Ta= 30.4 ℃	HIGH AMBIENT Ta= 70.6 ℃																																														
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6	D100	6CWQ04FN 7A/40V	53.4℃	86.0℃																																														
7	C100	100uF/10V	51.1℃	83.7℃																																														
8	PCB	TI 與 C31 間	54.3℃	86.5℃																																														
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 12 VDC O/P: 120 % LOAD Ta:25℃	TEST : OK	P																																													
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 12VDC O/P: 80% LOAD Ta= -25℃	TEST : OK	P																																													
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60 ℃ NO DAMAGE	I/P: 39 VDC O/P:FULL LOAD Ta= 60 ℃ HUMIDITY= 95 %R.H	TEST : OK	P																																													
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~60℃)	I/P: 12 VDC O/P:FULL LOAD	± 0 %(0~60℃)	P																																													
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25℃		TEST : OK	P																																													

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 1KVDC/min	I/P-O/P: 1.2KVDC/min Ta:25°C	I/P-O/P: 0.002 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25°C / 70% RH	I/P-O/P: GΩ26 NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : UL: File NO :			N



5W DC-DC Regulated Single Output

NSD05-S series

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55022 CLASS B	I/P: 12VDC O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab	P
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR: 8KV / Contact: 4KV	I/P: 12 VDC O/P: FULL LOAD Ta: 25°C	CRITERIA A	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 12 VDC O/P: FULL LOAD Ta: 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepared				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 914.4K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q6 Rated CUE1012 : 120 V 10 A	I/P: High-Line +3V = 39 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 65 V (2) 66 V	P
2	Diode Peak Voltage	D100 Rated 6CWQ10FN 7A/100V	I/P: High-Line +3V = 39 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 71 V (2) 54 V	P
3	Input Capacitor Voltage	C6 Rated : 105 / 50V	I/P: High-Line +3V = 39 V O/P: (1) Full Load Turn on / Off (2) Min load Turn on / Off (3) Full Load / Min load Change Ta: 25°C	(1) 39 V (2) 39 V (3) 39 V	P
4	Control IC Voltage Test	U1 Rated TL3843D : 30 V	I/P: High-Line +3V = 39 V O/P: (1) Full Load Turn on / Off (2) Min load Turn on / Off (3) Full Load / Min load Change Ta: 25°C	(1) 11.53 V (2) 10.06 V (3) 11.53 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2007/6/20	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/8/3	PRODUCT SAMPLE W0707B35	PASS	VINCENT TSENG	MAX LIN
2008/4/17	PRODUCT SAMPLE W0803A44	PASS	Sanford Su	VINCENT TSENG

2003/12/12 A50-F023