



10W DC-DC Regulated Dual Output

NSD10-D series

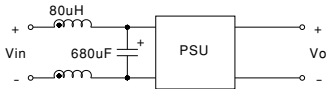


■ Features :

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

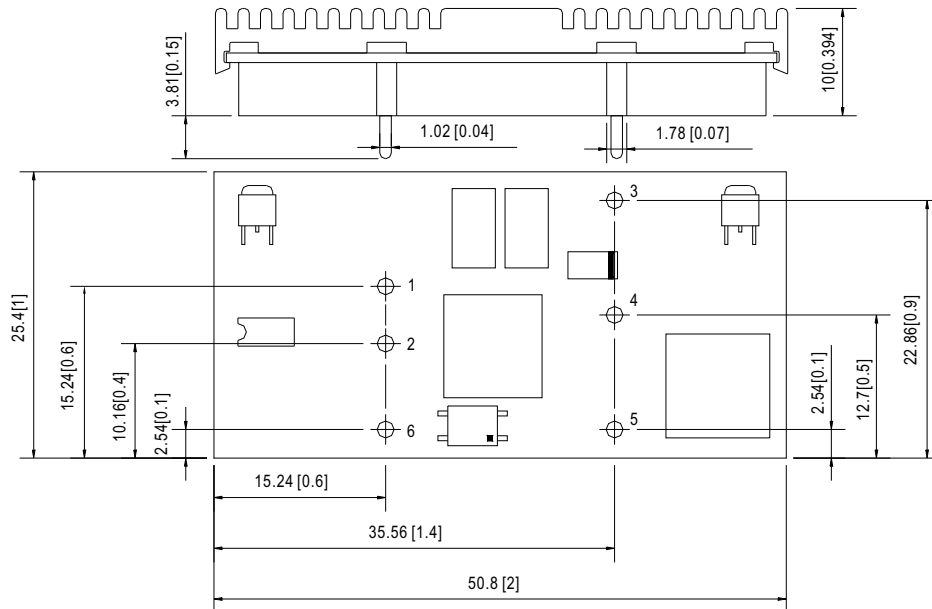


SPECIFICATION

MODEL		NSD10-12D5		NSD10-12D12		NSD10-12D15		NSD10-48D5		NSD10-48D12		NSD10-48D15			
OUTPUT	DC VOLTAGE	5V	-5V	12V	-12V	15V	-15V	5V	-5V	12V	-12V	15V	-15V		
	RATED CURRENT	1A	1A	0.42A	0.42A	0.33A	0.33A	1A	1A	0.42A	0.42A	0.33A	0.33A		
	CURRENT RANGE	0.05 ~ 1A	0.05 ~ 1A	0.02 ~ 0.42A	0.02 ~ 0.42A	0.016 ~ 0.33A	0.016 ~ 0.33A	0.05 ~ 1A	0.05 ~ 1A	0.02 ~ 0.42A	0.02 ~ 0.42A	0.016 ~ 0.33A	0.016 ~ 0.33A		
	RATED POWER	10W													
	CAPACITIVE LOAD (max.)	±1000uF													
	RIPPLE & NOISE (max.)	Note.2 75mVp-p(10% ~ 100% load)													
	VOLTAGE TOLERANCE	Note.3 ±4.0%		±2.0%		±2.0%		±3.0%		±2.0%		±2.0%			
	LINE REGULATION	±1.0%													
INPUT	LOAD REGULATION	±3.0%		±2.0%		±1.0%		±2.0%		±2.0%		±1.0%			
	RATED DC INPUT	12VDC							48VDC						
	VOLTAGE RANGE	9.8 ~ 36VDC							22 ~ 72VDC						
	EFFICIENCY (Typ.)	76%		77%		77%		78%		77%		77%			
	DC CURRENT	1.4A/12VDC							0.4A/48VDC						
SHUTDOWN IDLE CURRENT		20mA/12VDC													
PROTECTION	OVERLOAD	Above 105% rated output power Protection type : Over power limiting, recovers automatically after fault condition is removed													
	OVER VOLTAGE(CLAMP)	5.75 ~ 7.5V	-5.75 ~ -7.5V	13.8 ~ 18V	-13.8 ~ -18V	17.3 ~ 22.5V	-17.3 ~ -22.5V	5.75 ~ 7.5V	-5.75 ~ -7.5V	13.8 ~ 18V	-13.8 ~ -18V	17.3 ~ 22.5V	-17.3 ~ -22.5V		
	SHORT CIRCUIT	Note.4 Recovers automatically after fault condition is removed													
FUNCTION	ON/OFF CONTROL	Logic "1" OPEN: ON logic "0" GND: 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 5)	SAFETY STANDARDS	UL60950-1 approved, Design refer to TUV EN60950-1													
	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 EN61000-4-2,3,4,6,8; EN55024, light industry level, criteria A													
OTHERS	MTBF	1878.5K hrs min. MIL-HDBK-217F (25℃)													
	DIMENSION	50.8*25.4*10mm (2**1**0.394") (L*W*H)													
	PACKING	0.02Kg; 300pcs/7Kg/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. Short circuit not more than 60 seconds. 5. 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. 6. To insure proper operation, a 220uF/100V electrolytic capacitor with Esr <1Ω must be added to the input line. 7. EMC filter suggestion:														
															

Mechanical Specification

Unit:mm[inch]

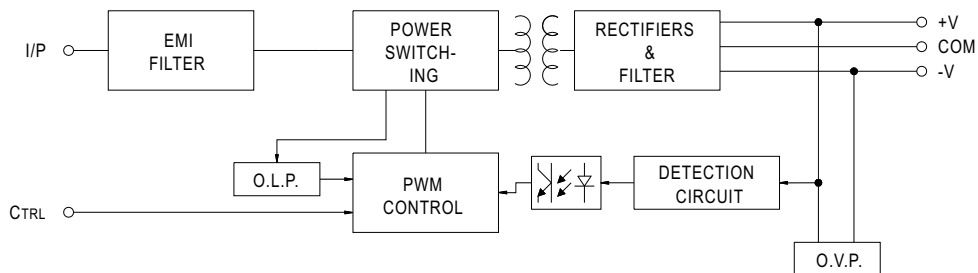


Pin. No Assignment

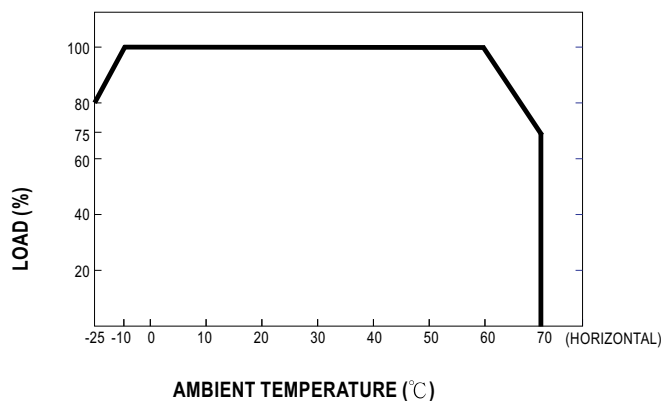
Pin No.	Assignment	Pin No.	Assignment
1	+INPUT	4	COMMON
2	-INPUT(GND)	5	-OUT
3	+OUT	6	CONTROL

Block Diagram

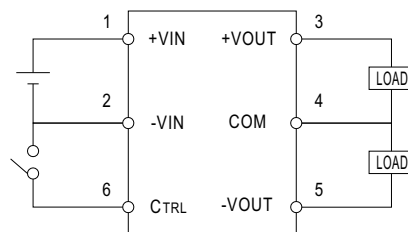
fosc : 350KHz



Derating Curve



ON/OFF Control



CONTROL INPUT.....PIN6
 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



10W DC-DC Regulated Dual Output

NSD10-D series

MODEL : NSD10-48D5

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 75 mVp-p (Max) V2: 75 mVp-p (Max)	I/P: 48VDC O/P:FULL LOAD Ta:25°C	V1: 32 mVp-p (Max) V2: 16 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 3 %~ -3 % (Max) V2: 3 %~ -3 % (Max)	I/P: 22VDC / 72VDC O/P:FULL/ MIN LOAD Ta:25°C	V1: 1.8 %~-1.8 % V2: 1.6 %~-1.6 %	P
3	LINE REGULATION	V1: 1%~ -1 % (Max) V2: 1%~ -1% (Max)	I/P: 22VDC ~ 72VDC O/P:FULL LOAD Ta:25°C	V1: 0.12 %~-0.12 % V2: 0 %~ 0 %	P
4	LOAD REGULATION	V1: 2 %~ -2 % (Max) V2: 2 %~ -2 % (Max)	I/P: 48VDC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.3 %~-0.3 % V2: 0.3 %~-0.3 %	P
5	CROSS REGULATION	V1: 2 %~ -2 % (Max) V2: 2 %~ -2 % (Max)	I/P: 48V VDC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25°C	V1: 1 %~-1 % V2: 1.2 %~-1.2 %	P
6	OVER/UNDERSHOOT TEST	< ±5%	I/P: 48 VDC O/P:FULL LOAD Ta:25°C	TEST: < 5 %	P
7	DYNAMIC LOAD	V1: 1000 mVp-p	I/P: 48VDC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	207 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	22VDC~ 72 VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	14.6 V~ 72 V	P
			I/P: LOW-LINE-0.2V= 21.8 V HIGH-LINE+5%= 75.6 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	EFFICIENCY	78 % (TYP)	I/P: 48 VDC O/P:FULL LOAD Ta:25°C	79.6 %	P
3	INPUT CURRENT	48 VDC/ 0.4A(TYP)	I/P: 48 VDC O/P:FULL LOAD Ta:25°C	I = 0.26 A	P
4	SHUTDOWN IDLE CURRENT	20 mA / 48VDC	I/P: 48 VDC O/P:FULL LOAD Ta:25°C	18.4 mA / 48VDC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	Above 105%	I/P: 48VDC O/P: TESTING Ta: 25°C	157 % Over power Limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1: 5.75 V~ 7.5V CH2: -5.75 V~ -7.5V	I/P: DC SOURCE O/P: MIN LOAD Ta: 25°C	6.25V / CH1 / 0.17A 6.25 V / CH2 / 0.17A Recovers automatically after fault condition is removed	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 60 SECOND NO DAMAGE	I/P: 72 VDC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Constant Current Limiting	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: 48VDC 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 : NSD10-48D5 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 48VDC O/P: FULL LOAD Ta= 25.9℃ 2. HIGH AMBIENT BURN-IN : 1 HRS I/P: 48 VDC O/P: FULL LOAD Ta= 59.2 ℃ <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 25.9 ℃</th><th>HIGH AMBIENT Ta= 59.2 ℃</th></tr><tr><td>1</td><td>D100</td><td>EC21QS04 2A/40V</td><td>68.9℃</td><td>99.0℃</td></tr><tr><td>2</td><td>D200</td><td>EC21QS04 2A/40V</td><td>70.6℃</td><td>100.4℃</td></tr><tr><td>3</td><td>L100</td><td>TS-027</td><td>69.0℃</td><td>99.8℃</td></tr><tr><td>4</td><td>C106</td><td>33U/10V 125℃</td><td>61.5℃</td><td>91.9℃</td></tr><tr><td>5</td><td>C5</td><td>474/100V 125℃</td><td>64.2℃</td><td>94.9℃</td></tr><tr><td>6</td><td>T1 COIL</td><td>TS-015</td><td>74.9℃</td><td>106.5℃</td></tr><tr><td>7</td><td>Q1</td><td>BCX56 1A/80V</td><td>62.7℃</td><td>93.2℃</td></tr><tr><td>8</td><td>Q2</td><td>IRFR220N 5A/200V</td><td>63.3℃</td><td>94.0℃</td></tr><tr><td>9</td><td>L1</td><td>3.3UH</td><td>63.0℃</td><td>93.7℃</td></tr><tr><td>10</td><td>U1</td><td>TL3843</td><td>71.1℃</td><td>101.1℃</td></tr><tr><td>11</td><td>CASE</td><td>上方中間處</td><td>61.5℃</td><td>91.6℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 25.9 ℃	HIGH AMBIENT Ta= 59.2 ℃	1	D100	EC21QS04 2A/40V	68.9℃	99.0℃	2	D200	EC21QS04 2A/40V	70.6℃	100.4℃	3	L100	TS-027	69.0℃	99.8℃	4	C106	33U/10V 125℃	61.5℃	91.9℃	5	C5	474/100V 125℃	64.2℃	94.9℃	6	T1 COIL	TS-015	74.9℃	106.5℃	7	Q1	BCX56 1A/80V	62.7℃	93.2℃	8	Q2	IRFR220N 5A/200V	63.3℃	94.0℃	9	L1	3.3UH	63.0℃	93.7℃	10	U1	TL3843	71.1℃	101.1℃	11	CASE	上方中間處	61.5℃	91.6℃	P
NO	Position	P/N	ROOM AMBIENT Ta= 25.9 ℃	HIGH AMBIENT Ta= 59.2 ℃																																																													
1	D100	EC21QS04 2A/40V	68.9℃	99.0℃																																																													
2	D200	EC21QS04 2A/40V	70.6℃	100.4℃																																																													
3	L100	TS-027	69.0℃	99.8℃																																																													
4	C106	33U/10V 125℃	61.5℃	91.9℃																																																													
5	C5	474/100V 125℃	64.2℃	94.9℃																																																													
6	T1 COIL	TS-015	74.9℃	106.5℃																																																													
7	Q1	BCX56 1A/80V	62.7℃	93.2℃																																																													
8	Q2	IRFR220N 5A/200V	63.3℃	94.0℃																																																													
9	L1	3.3UH	63.0℃	93.7℃																																																													
10	U1	TL3843	71.1℃	101.1℃																																																													
11	CASE	上方中間處	61.5℃	91.6℃																																																													
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 48VDC O/P: 120 % LOAD Ta:25℃	TEST : OK	P																																																												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 48VDC O/P: 100 % 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: 75VDC O/P:FULL LOAD Ta= 60 ℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																												
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~60℃)	I/P: 48 VDC O/P:FULL LOAD	± 0.012 %(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: 1.5KVDC/min	I/P-O/P: 1.8KVDC/min Ta:25℃	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℃ / 70% RH	I/P-O/P: 30GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : UL: File NO : E183223			P



10W DC-DC Regulated Dual Output

NSD10-D series

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55022 CLASS B	I/P: 48VDC 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: 48 VDC O/P: FULL LOAD Ta: 25°C	CRITERIA A	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 1878.5K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated IRFR220N 5A/200V	I/P: High-Line +3V = 75 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 135 V (2) 170 V	P
2	Diode Peak Voltage	D100 Rated EC21QS04 2A/40V D200 Rated EC21QS04 2A/40V	I/P: High-Line +3V = 75 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 39.4 V (2) 26 V (1) 39.6 V (2) 30 V	P
3	Input Capacitor Voltage	C5 Rated : 474 / 100V	I/P: High-Line +3V = 75 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) 74.85 V (2) 74.95 V (3) 74.95 V	P
4	Control IC Voltage Test	U1 Rated TL3843D : 20 V	I/P: High-Line +3V = 75 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) 13.17 V (2) 9.96 V (3) 13.17 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2007/1/11	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/3/5	PRODUCT SAMPLE W0702A48	PASS	VINCENT TSENG	MAX LIN
2007/5/24	PRODUCT SAMPLE W0705B71	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023