JAMECO ELECTRONICS **Jameco SKU Number: 2101358**

MEAN WELL

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

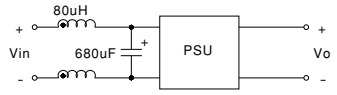
c UL us CE

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%											
	LOAD REGULATION	±3.0%		±2.0%		±1.0%		±2.0%		±2.0%		±1.0%	
INPUT	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											

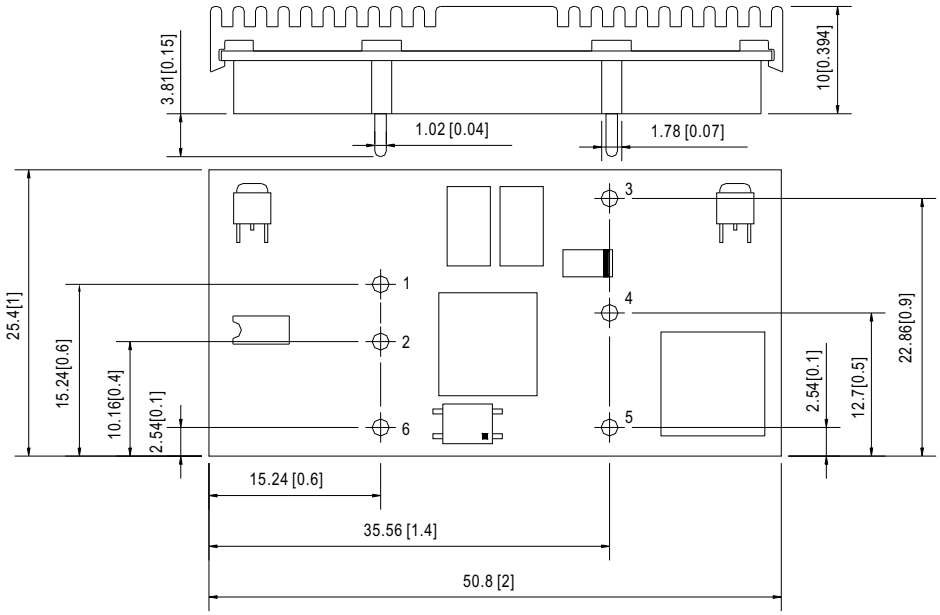
NOTE

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]

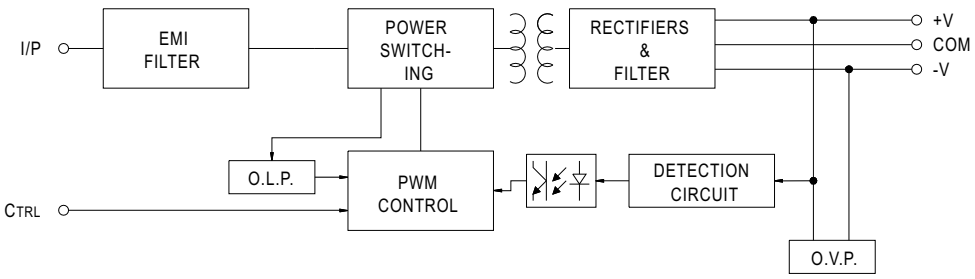


Pin. No Assignment

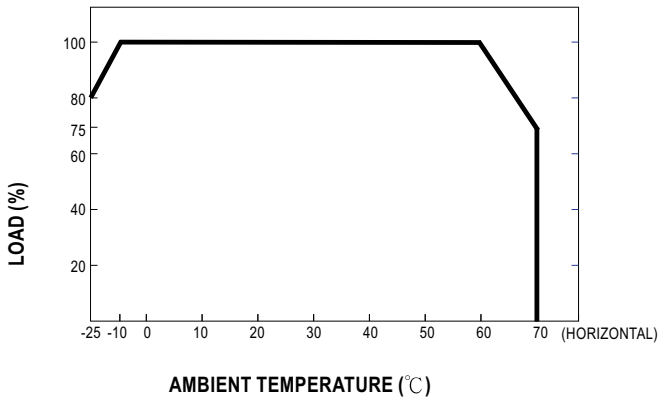
Pin No.	Assignment	Pin No.	Assignment
1	+INPUT	4	COMMON
2	-INPUT(GND)	5	-OUT
3	+OUT	6	CONTROL

■ Block Diagram

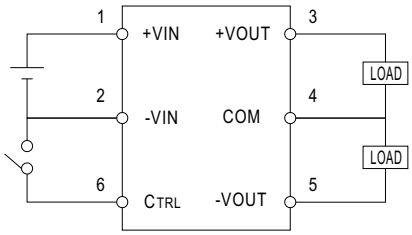
fosc : 350KHz



■ 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

MODEL：NSD10-48D12

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℃	V1: 20 mVp-p (Max) V2: 20 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 2 %~ -2 % (Max) V2: 2 %~ -2 % (Max)	I/P: 22VDC / 72VDC O/P:FULL/ MIN LOAD Ta:25℃	V1: 1.2 %~ -1.2 % V2: 1.2 %~ -1.2 %	P
3	LINE REGULATION	V1: 1%~ -1 % (Max) V2: 1%~ -1% (Max)	I/P: 22VDC ~ 72VDC O/P:FULL LOAD Ta:25℃	V1: 0 %~ 0 % V2: 0.05 %~ -0.05 %	P
4	LOAD REGULATION	V1: 2 %~ -2 % (Max) V2: 2 %~ -2 % (Max)	I/P: 48VDC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.05 %~ -0.05 % V2: 0.05 %~ -0.05 %	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℃	V1: 0.83 %~ -0.83 % V2: 0.83 %~ -0.83 %	P
6	OVER/UNDERSHOOT TEST	< ±5%	I/P: 48 VDC O/P:FULL LOAD Ta:25℃	TEST: < 5 %	P
7	DYNAMIC LOAD	V1: 1200 mVp-p	I/P: 48VDC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	156 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℃	14.5 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	77 % (TYP)	I/P: 48 VDC O/P:FULL LOAD Ta:25℃	78.5 %	P
3	INPUT CURRENT	48 VDC/ 0.4A(TYP)	I/P: 48 VDC O/P:FULL LOAD Ta:25℃	I = 0.27 A	P
4	SHUTDOWN IDLE CURRENT	20 mA / 48VDC	I/P: 48 VDC O/P:FULL LOAD Ta:25℃	18.6 mA / 48VDC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	Above 105%	I/P: 48VDC O/P:TESTING Ta:25℃	157% / 48V Over power Limiting, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1: 13.8 V~ 18V CH2: -13.8 V~ -18V	I/P: DC SOURSE O/P:MIN LOAD Ta:25℃	14.8V / CH1 / 0.32A 14.8V / CH2 / 0.32A 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℃	NO DAMAGE Constant Current Limiting	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	Logic “1” OPEN : ON Logic “0” GON : OFF	I/P: 48VDC O/P:FULL LOAD Ta:25℃	Logic “1” : POWER ON Logic “0” :POWER OFF	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">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></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P: 48VDC
O/P: 120 % LOAD
Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 48VDC
O/P: 100 % LOAD
Ta= -25 ℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 60 ℃
NO DAMAGE</td><td>I/P: 75VDC
O/P:FULL LOAD
Ta= 60 ℃
HUMIDITY= 95 %R.H</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %(0~60℃)</td><td>I/P: 48 VDC
O/P:FULL LOAD</td><td>± 0.012 %(0~60℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">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℃</td><td>TEST： OK</td><td>P</td></tr>
</table>

SAFETY TEST

NO	TEST ITEM	SPECICATION	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: 30 GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO ： UL: File NO ：E183223			P

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℃	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℃	CRITERIA A	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 48 VDC O/P:FULL LOAD Ta:25℃	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℃	(1) 178 V (2) 192 V	P
2	Diode Peak **Voltage**	D100 Rated EC11FS2-TE12L 1A/200V D200 Rated EC11FS2-TE12L 1A/200V	I/P:High-Line +3V = 75 V O/P: (1)Full Load Turn on (2)Output Short Ta:25℃	(1) 188 V (2) 60 V (1) 185 V (2) 67 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℃	(1) 74.7 V (2) 74.81 V (3) 74.81 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℃	(1) 15.8 V (2) 10.52 V (3) 15.8 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