LAMBDA

- High Efficiency
- High Power Density (6.6W/in3)
- Up to 6 outputs
- No minimum load
- Fits 1U applications
- Medical Approval
- 3 Year Warranty

NV-Power

350 Watts, Modular power solution

Key Market Segments & Applications

Instrumentation
Medical
Automation
Security
Network Servers and Routers
Broadcast
ATE
Industrial Computing
Lifesciences/Laboratory

Features and Benefits

Feature	Benefit
◆ High Efficiency	◆ Minimises Heat in System
◆ Low Profile	◆ Fits 1U Applications
◆ High Power Density	◆ Less Space

NV350 CONFIGURING

The extensive range of output modules and options make it possible to achieve almost any combination of Volts and Amps. You can create your own NV350 configuration online at **www.nv-power.com**. This method checks your configuration and offers the optimum solution. Alternatively, you can do this manually by using the guide below.

1. Calculate total output power to ensure power requirements within 350W, then select required Cooling, Connection and Controls/Signals from the following table:

Output Power	**NV3**	350W				
Cooling	**S**	**S**tandard air - forward				
	R	**R**everse air				
	C	**C**ustomer air - no fan[1]				
Input Connection	**S**	**S**crew				
	I	IEC320[2]				
Leakage Current	**S**	**S**tandard 300µA	maximum leakage current, Normal Condition, 264Vac, 63Hz. 500µA Single Fault Condition			
Primary Option[3]	**ES5V**	ac good,	psu enable,	5V/2A standby		
	ES12V	ac good,	psu enable,	12V/1A standby		
	IS5V	ac good,	psu inhibit,	5V/2A standby		
	IS12V	ac good,	psu inhibit,	12V/1A standby		
	EN5V	ac good,	psu enable,	5V/2A standby,	global module good	
	EN12V	ac good,	psu enable,	12V/1A standby,	global module good	
	IN5V	ac good,	psu inhibit,	5V/2A standby,	global module good	
	IN12V	ac good,	psu inhibit,	12V/1A standby,	global module good	

NV3	S	S	S	EN5V

1 - Thermocoupled sample recommended to ensure adequate cooling - consult sales
2 - Not with customer air Cooling
3 - The Primary Option uses 1 slot
4 - Normal condition, 500µA Single Fault Condition

NV-350 Datasheet - Document Number 69528 - Revision 8.0 October 05

NV350 CONFIGURING

2. Select Output Modules from the Module Tables below ensuring that no more that 6 slots in total are used.
   Example - if you require 5.2V 40A :-
   a) Select B as closest match for voltage & current and prefix with voltage eg **5.2B**
   b) Repeat for other outputs.

   This will create a complete product description eg **NV3SSSES5V 5.2B 12/15DB** which represents a three output NV350 with Forward air cooling, Screw input terminals, 300µA Leakage, ac good, PSU enable & 5V/2A aux supply
   Output 1 = 5.2V / 40A
   Output 2 = 12V / 13A with screw terminals
   Output 3 = 15V / 4A with screw terminals
   Max 350W continuous output power

3. Contact Lambda to validate configuration and issue a part number.

SINGLE OUTPUT MODULES

Module Code: B			Slots: 2
Voltage Range			Current
3.2	-	3.6	40A
4.75	-	5.5	40A[1]
12	-	15.5	16A[2]
24	-	28	8A[3]

1. 5.2 - 5.5V: linearly derate from 40 to 36A
2. 13.5 - 15.5V: linearly derate from 16 to 13A
3. 26 - 28V: linearly derate from 8 to 7A
4. 12.5 - 15.5V: linearly derate from 13 to 10A
5. 25 - 28V: linearly derate from 7 to 6A

DUAL OUTPUT MODULES

Module Code: DB							Slots: 2	
Max Power ch1+ch2	Output 1				Output 2			
	Voltage Range			Current	Voltage Range			Current	Max Power
132.5W	3.2	-	3.6	25A	3.3	-	5.5	10A	55W
					7	-	15	5A	60W
					24	-	32	2A	50W
195W	4.75	-	5.5	25A	3.3	-	5.5	10A	55W
					7	-	15	5A	60W
					24	-	32	2A	50W
200W	12	-	15	13A[4]	3.3	-	5.5	10A	55W
					7	-	15	5A	60W
					24	-	32	2A	50W
200W	24	-	28	7A[5]	3.3	-	5.5	10A	55W
					7	-	15	5A	60W
					24	-	32	2A	50W

INPUT	
Input Voltage	90-264Vac
Input Frequency	47 - 63 Hz (up to 440Hz with reduced PFC)
Input Harmonics	EN61000-3-2 compliant
Inrush Current	<15A at 25°C and 264Vac (cold start)
Input Fuse	6.3A / 250Vac HBC Fast Acting (not user accessible)
Leakage Current	300µA max at 264Vac & 63Hz, normal condition. 500µA Single Fault Condition.

OUTPUT		
Voltage / Current	See module tables	
Turn on Time	1.5s max	at 90Vac and 100% rated output power
Rise time	<50ms	to 90% of voltage, monotonic rise above 10%
Efficiency	90%	typical
Hold up	16ms min	at 90Vac and 100% rated power
Ripple and Noise	<1%	pk-pk, using EIAJ test method & 20MHz bandwidth
Voltage Accuracy	<1%	of set voltage (±5% for channel 2)
Remote Sense	Yes	standard on single o/p + ch1 of dual modules, max 0.5V total line drop
Minimum Load	No	on any output
Temperature Coefficient	<0.02%	of rated voltage per °C
Load Regulation	<1%	for 0-100% load change (2% for channel 2)
Line Regulation	<0.1%	for 90-264Vac input change
Cross Regulation	<0.1%	for 100% load change on any output
Transient Response	<4%	of set voltage for 50% load change
Recovery	500µs	for recovery to 1% of set voltage
Over Voltage Protection	Yes	
Over Current Protection (singles)	110 - 150%	of module current. Hiccup mode. Module primary side protected
Power Limit (duals)	110 - 150%	of max Power ch1 + ch2. Hiccup mode. Module primary side protected
Short Circuit Protection	Yes	
Over Temperature Protection	Yes	cycle ac off/on to reset Shutdown temperature varies according to ambient, output power & input Voltage. AC fail signal (if fitted) provides 5ms warning of thermal shutdown

ISOLATION		
Input to Output	Reinforced	4.3kV (dc)
Input to Earth	Basic	2.3kV (dc)
Output to Earth		200V (dc)

SIGNALS - Standard	
Ch1/Ch2 Module Good	Open collector output. 'On' indicates output is within 90% (±5%) of nominal
Module Inhibit	TTL logic high inhibits the output (both outputs for duals) of the module
Ch2 On/Off (duals only)	TTL logic high inhibits output 2 of the module
	All signals referenced to 0V of channel

GLOBAL INTERFACE SIGNALS - with Primary Option	
AC good collector AC good emitter	Uncommitted optocoupler. Turns on typically 5ms after ac is good and off typically 5ms before any channel falls below 95% of nominal
Global module good collector Global module good emitter	Uncommitted optocoupler. Turns on typically 200ms after all outputs are within 90% (±5%) of nominal and off typically 5ms before any channel falls below 90% (±5%) of nominal. Do not connect for ES and IS type primary option.
EN/ES & IN/IS Logic 0	TTL low enables (EN or ES) or inhibits (IN or IS) the entire psu including fan (except standby)
EN/ES & IN/IS Logic 1	TTL high enables (EN or ES) or inhibits (IN or IS) the entire psu including fan (except standby)
Standby Supply	5V / 2A (2.5A peak) or 12V / 1A (1.2A peak)

ENVIRONMENT	
Temperature	0° to 50° operational, -40° to 85°C storage (max 12 months) (-25°C to 85°C storage [max 6 months] for IEC320 input version)
Derating	50°C to 70°C derate each output by 2.5% per °C
Low Temperature Start-up	-20°C
Humidity	5-95% RH non condensing
Shock	±3 x 30G shocks in each plane, total 18 shocks 30G shock = 11ms (±0.5ms), half sine conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987.
Vibration	Single axis 10 - 500Hz at 2G (sweep and endurance at resonance) in all 3 planes
Altitude	3,000 metres operational (15,000 metres non operational)
Pollution	Degree 2, Material group 3

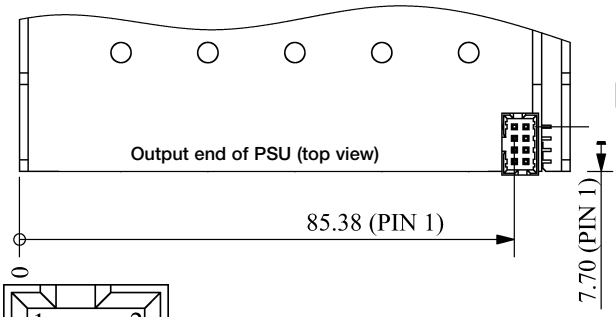
IMMUNITY EN61000-6-2:2001				Criteria
Electrostatic Discharge	EN61000-4-2	Level 3	Air discharge 8kv Contact discharge 4kV	A
Electromagnetic Field	EN61000-4-3	Level 3	(12V/m)	A
Fast / Burst Transient	EN61000-4-4	Level 3	(tested to 2.2kV)	A
Surge Immunity	EN61000-4-5	Level 3	Common mode to 2.2kV Differential mode to 1.1kV	A
Conducted RF Immunity	EN61000-4-6	Level 3	(12V)	A
Power Frequency Magnetic Field	EN61000-4-8	Level 3	(10V/m)	A
Voltage Dips, Variation, Interruptions	EN61000-4-11	Pass		

SAFETY APPROVALS					
	Date	**Amendments**		**Date**	**Amendments**
EN 60950-1	2001		EN 61010-1	2001	
UL 60950-1	2003		IEC 61010-1*	2001	
CSA22.2 No 60950-1	2003		IEC 60601-1	1988	A1: 1991, A2:1995
IEC60950-1*	2001		EN 60601-1[a]	1990	A1:1993, A2:1995, A13:1996
CE Mark	LV Directive 73/23/EEC (EN60950-1:2001)		EN 60601-1[a]		

* CB Certificate and report available on request
a - Medical Approval pending. Check with Technical Sales for status
a - Not applicable to IEC320 input version

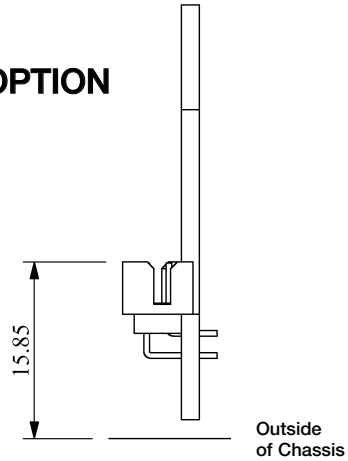
EMISSIONS EN61000-6-3:2001		
Radiated Electric Field	EN55022	Class B (as per CISPR.22) see application note for details
Conducted Emissions	EN55022	Class B (as per CISPR.22)
Conducted Harmonics	EN61000-3-2	Compliant
Flicker	EN61000-3-3	Compliant

PRIMARY OPTION



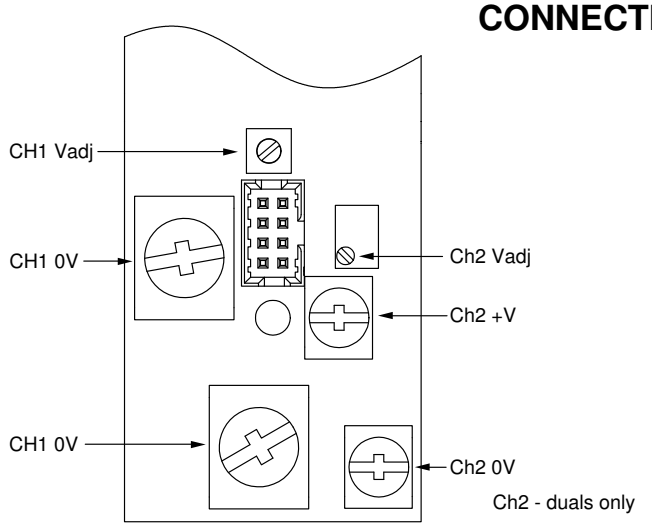
1 +V Standby
2 0V Standby
3 EN/ES & IN/IS Logic 1
4 EN/ES & IN/IS Logic 0
5 Global Module Good Collector
6 Global Module Good Emitter
7 AC good Collector
8 AC good Emitter

Housing: Molex 51110-0860
Crimp pin: 50394
Hand crimp tool: 69008-0959



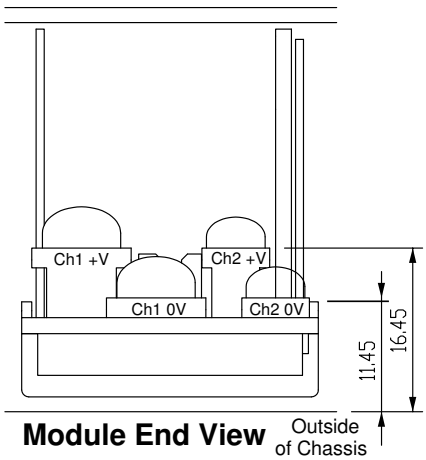
Option End View

OUTPUT CONNECTIONS



Ch2 - duals only

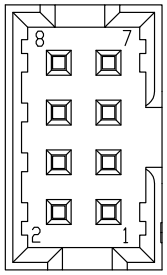
Module Top View



Module End View

Connection Guidelines

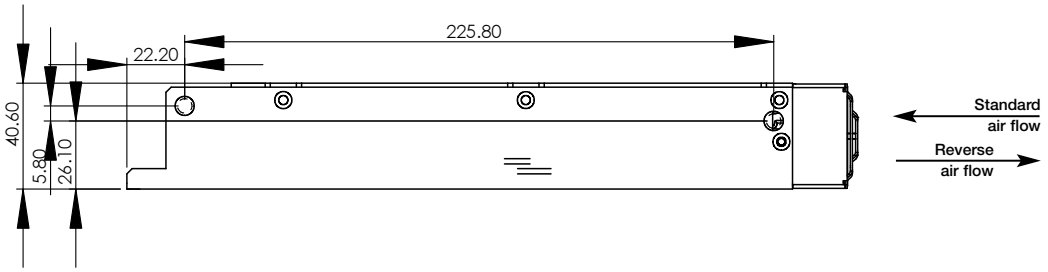
Ring Tags: Up to 50A, AMP PIDG terminals
Red: M3 36151, M4 320551, M5 130660
Blue: M3 320561, M4 320560, M5 130663
Yellow: M3 M4 320568, M5 130167
Crimp tool: 16900 Die set 169404



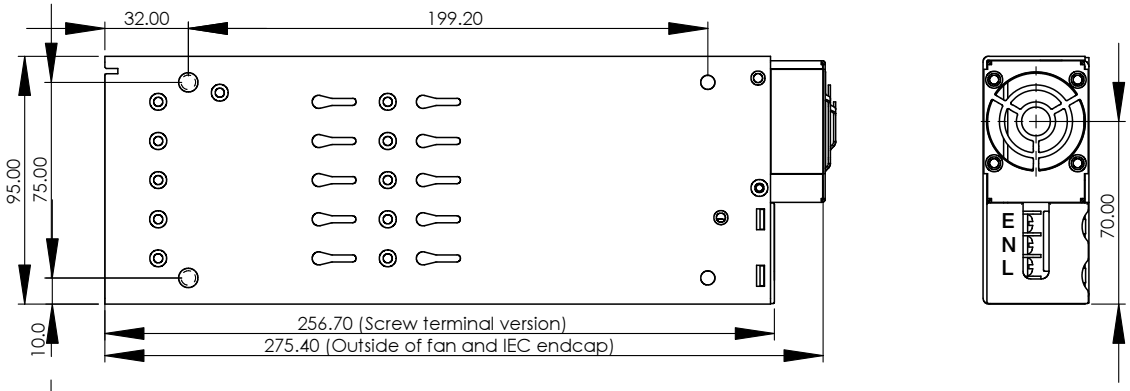
Signals

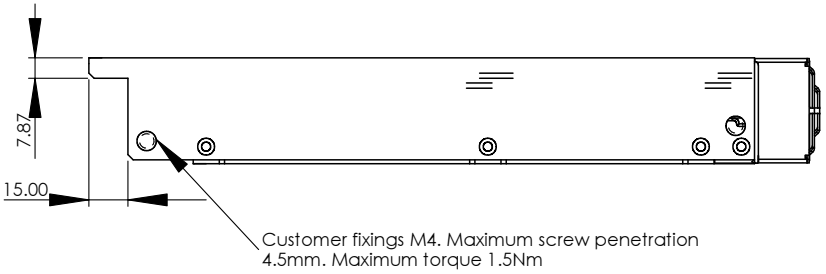
1 Ch2 0V
2 Ch2 Output Good
3 Ch2 On/Off
4 Module Inhibit
5 Ch1 0V
6 Ch1 Output Good
7 Ch1 Remote Sense -
8 Ch1 Remote Sense +

Housing: Molex 51110-0860
Crimp pin: 50394 Hand crimp tool: 69008-0959

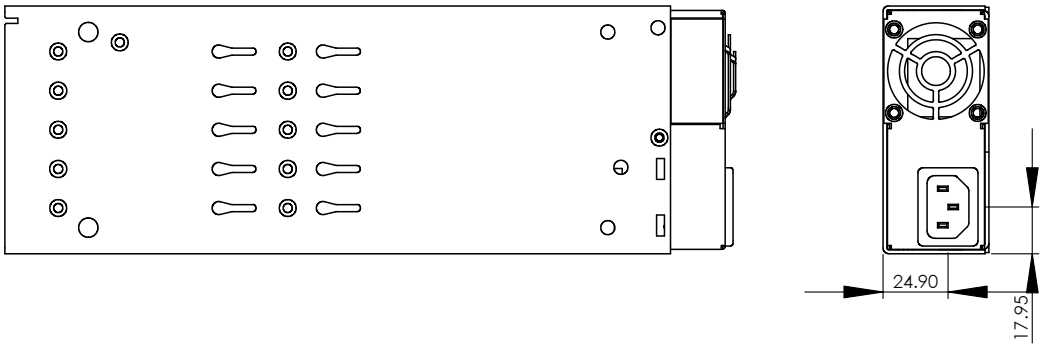


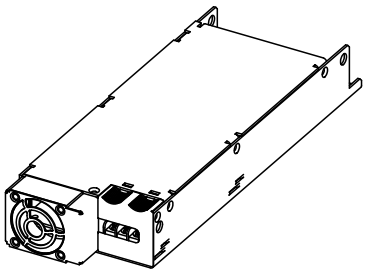
Screw Terminal

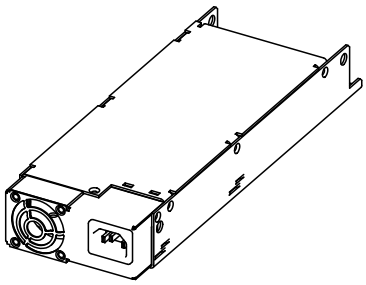




IEC Inlet







Screw terminal **IEC terminal**

NOTES
1) Tolerances:
Edge to edge/Edge to centre, +/-0.5
Centre to centre +/-0.2

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