

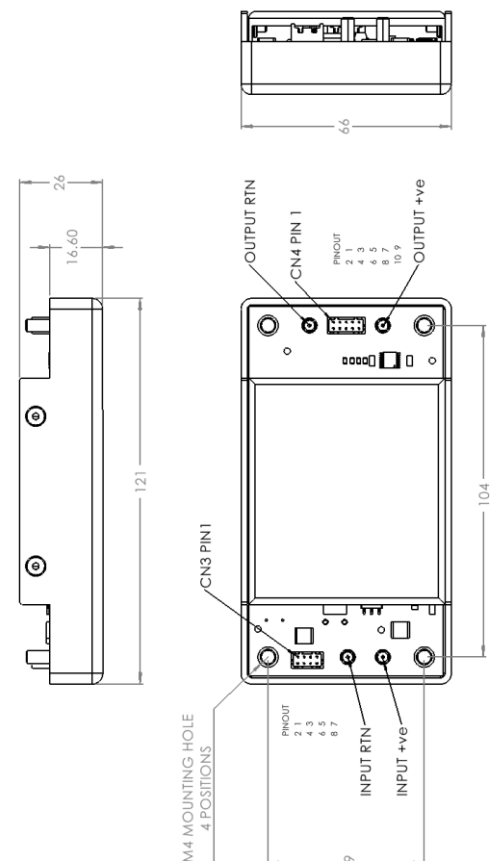


The avanta baseplate cooled DCDC is a mil-spec, low profile, fully compliant, isolated, base plate cooled DCDC power supply with a fully regulated output of up to 150W.

Designed for harsh military applications, the **AVMIL-DB-150-24** is available with a wide 9V to 38VDC input for 12V and 28V military systems, for both platform and terminal connected equipment.

Integrated EMC filtering to MIL-STD 461 and surge protection to MIL-STD 704/ 1275/ DEF-STAN 61-5-part 6 issue 5/6/7 allows for direct connection to the supply voltage. The load dump feature provides full ride through protection against the 202V DC surge required to meet the DEF-STAN 61-5-part 6 issue 6 with no loss of output voltage.

Benefit	Feature
No need for additional filters	EMC to MIL-STD 461G Surge & Transient Protection to: MIL-STD 1275E   DEF-STAN 61-5 Part 6 Reverse Polarity Protection
Simple to cool	Base plate cooled
Fits anywhere	Small form factor Aerospace compliant Land compliant Marine compliant
Easy to integrate	Stocked connectors
Available off the shelf	Distributor stocked



## TECHNICAL DETAILS

### Input Specifications

Input Voltage	9V to 36V DC (power derated by up to 25% at 9V input)
Max Input Current	20A
Input Surge	200V 350ms reducing curve (as per DEF-STAN 61-5 Part 6 Issue 6)
Turn On Voltage	9V
Turn Off Voltage	8V
Threshold	

### Output Specifications

Output Voltage	24V
Load Regulation	+/- 2%
Line regulation	+/- 2%
Output Ripple	<150mV
Maximum Output Current	6.3A

### Protection

Over Current Protection	125% Typical
Over Voltage Protection	125% Typical
Short Circuit Protection	Continuous, Auto Recovery, Hiccup Mode
Over Temperature Protection	105C at the Centre of the Baseplate

### Efficiency

100% Load	89% at Nominal Input Voltage
Turn On Time	30ms

### Isolation

Input to Output	1,500VDC
Input to Case	1,500VDC
Output to Case	1,500VDC
Isolation Resistance Input to Output	100MOhm

### Switching Frequency

MTBF	285kHz Typical
EMC	>100 KHrs

### Mil Standards

Mil-Std 461G	CE101, CE102, CS101, CS103,
MIL-Std 1275D,E,F	50ms Hold-Up
MIL-Std 810F	Shock/Vibration

### DEF-Standards

DEF-STAN 59-411	DCE01, DCE02, DCS02, DCS02, DCS12(Option)
DEF-STAN 00-35	
DEF-STAN 61-5 Part 6	Issue 6 Surge and Load Dump

CE / UKCA



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## Environmental

operation m operating temperature -46°C to +90°C (storage -55°C to +105°C)

over temperature shut down 110°C (automatic re-start at 95°C)

conduction cooled through baseplate

operating humidity DO-160E section 6 category B operating altitude 51,000 ft

operating below sea level 1,500 ft

shock & vibration DO-160E Shock +-6g 11ms any direction

BS EN60068-2-27 15g shocks 11ms ½ sine

vibration DO-160E section 8 procedure 8.7.2 test level C1

WEEE directive 2002-96-EC RoHS directive 2002-95-EC

REACH regulations EU-1907-2006 HAZMAT compliant

unit is conformal coated with non-fungus growth compliant coating (option)

## EMC and safety

safety approvals EN60950-1:2006

emissions MIL-STD-461E/F,

DEF STAN 59-411 with additional input filter

ESD immunity EN61000-4-2, Level 3

radiated immunity EN61000-4-3, 10V/m, level 3 performance criteria a surge EN61000-4-5, installation class 3, perf criteria a

conducted immunity EN61000-4-6, 10V RMS, perf criteria a

## Standard signals and indicators

36V clamped output for auxiliary equipment (max 3A)

**global disable:** turns off the main output and the auxiliary output, input 0V referenced signal

**regulated output disable:** turns off the main regulated output(s), output 0V referenced signal

**remote sense** to compensate for output voltage drops in cables (compensation up to 0.5V across the leads)

**global PSU OK:** floating open collector: closed = PSU OK, open = PSU FAIL

**base plate temperature signal:** provides an accurate voltage proportional to the internal PSU temperature. This signal can be used to warn of a potential over temperature situation that may be the result of a system cooling failure, vastly improving the up time of a system



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## Connections & Pinouts

### CN1 Main Input Connector & CN2 Main Output Connector

Pair of M4 studs for connecting + & - Input/Output

### CN3 Input Signals Connector

PCB (B8B-PHDSS) mating half is PHDR-08VS housing, crimps SPHD-001T-P0.5

- 1 Auxiliary output – Unregulated and clamped to 36V DC (max 3A), referenced to input 0V.
- 2 Input side 0V
- 3 Disable - connect to input 0V to turn all outputs off, leave open/high to turn all outputs on.
- 4 n/c
- 5 n/c
- 6 n/c
- 7 n/c
- 8 n/c

### CN4 Output Signals Connector

PCB (B10B-PHDSS) mating half is PHDR-10VS housing, crimps SPHD-001T-P0.5

- 1 n/c
- 2 Remote sense negative (trim 0.5V max)
- 3 n/c
- 4 Remote sense positive (trim 0.5V max)
- 5 DC OK - (emitter of an opto isolator 20mA max) Short = DC OK
- 6 DC OK + (collector of an opto isolator 20mA max) Short = DC OK
- 7 n/c
- 8 Base plate temperature signal (23 deg C = 580mV),  
referenced to the output 0V  $VO = (+6.25 \text{ mV}/^{\circ}\text{C} \times T \text{ }^{\circ}\text{C}) + 424 \text{ mV}$

Temperature (T) Typical VO

+125°C +1205 mV

+100°C +1049 mV

+25°C +580 mV

0°C +424 mV

-25°C +268 mV

-40°C +174 mV

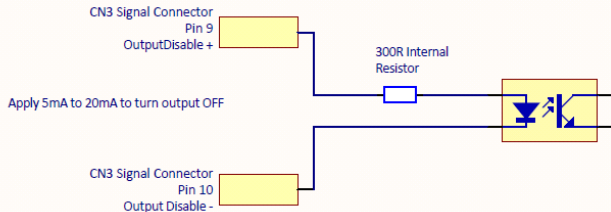
9 Output disable (+) (5v applied across this pin and pin 10 disables the regulated output)

10 Output disable – (used in conjunction with pin 9)



## Signals Control

### Output Disable



Apply 5mA to 20mA to turn output OFF

Apply a potential to the input pins in excess of 5mA to turn unit off

Example 1  
5V supply

Target I = 10mA  
R = 300R  
 $I = (V_{supply} - 2V) / 300$   
 $I = 0.01A$  or 10mA

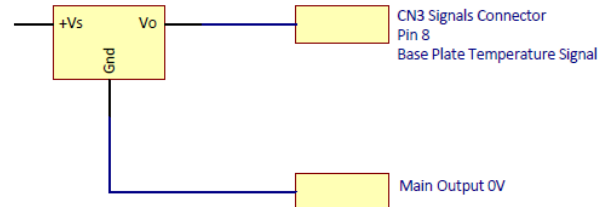
In this example the internal 300 ohms resistor is adequate and 5V can be applied straight to the disable pins

Example 2  
28V supply

Target I = 10mA  
 $R = (V_{supply} - 2V) / 10mA$   
 $R = (28 - 2) / 10mA$   
R = 2,600 ohms  
 $R = 2K6R - 300R = 2,300R$

An external current limit resistor of 2K3 in series with a 28V rail

### Temperature output



This signal is referenced to the Zero Volt output.

A current of < 1mA can be driven from this device

The Formula to calculate temperature is

$$T = (VO - 424mV) / 6.25mV$$

Example 1

Where VO = 580mV

$$T = (580 - 424) / 6.25$$

$$T = 25C$$

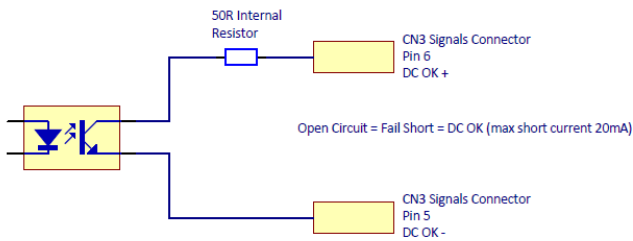
Example 2

Where VO = 1049mV

$$T = (1049 - 424) / 6.25$$

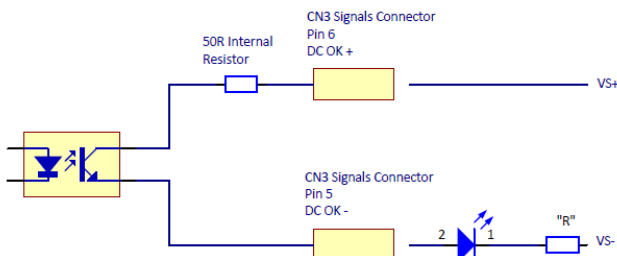
$$T = 100C$$

### DC OK



Open Circuit = Fail Short = DC OK (max short current 20mA)

Both these pins are isolated so can be tied to any rail to achieve a signal



The above circuit shows how an LED can be driven from the DC OK signal

Example

VS+ is 12V, VS- is 0V

LED current is 20mA, LED voltage is 2V

"R" = (12-2) / 20mA

"R" = 10 / 0.02

R = 500 ohms

Placing a 500 ohm resistor in series with a 20mA LED will provide a DC OK

LED ON = DC OK OFF = DC Fail



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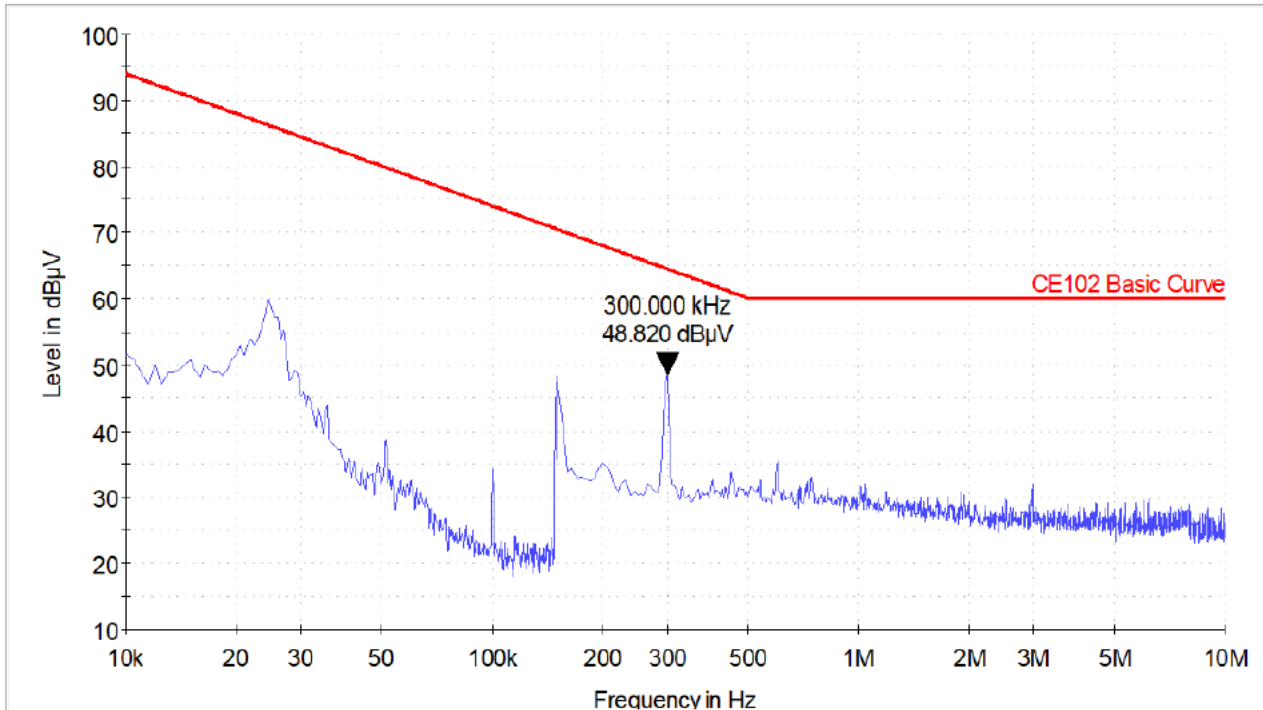
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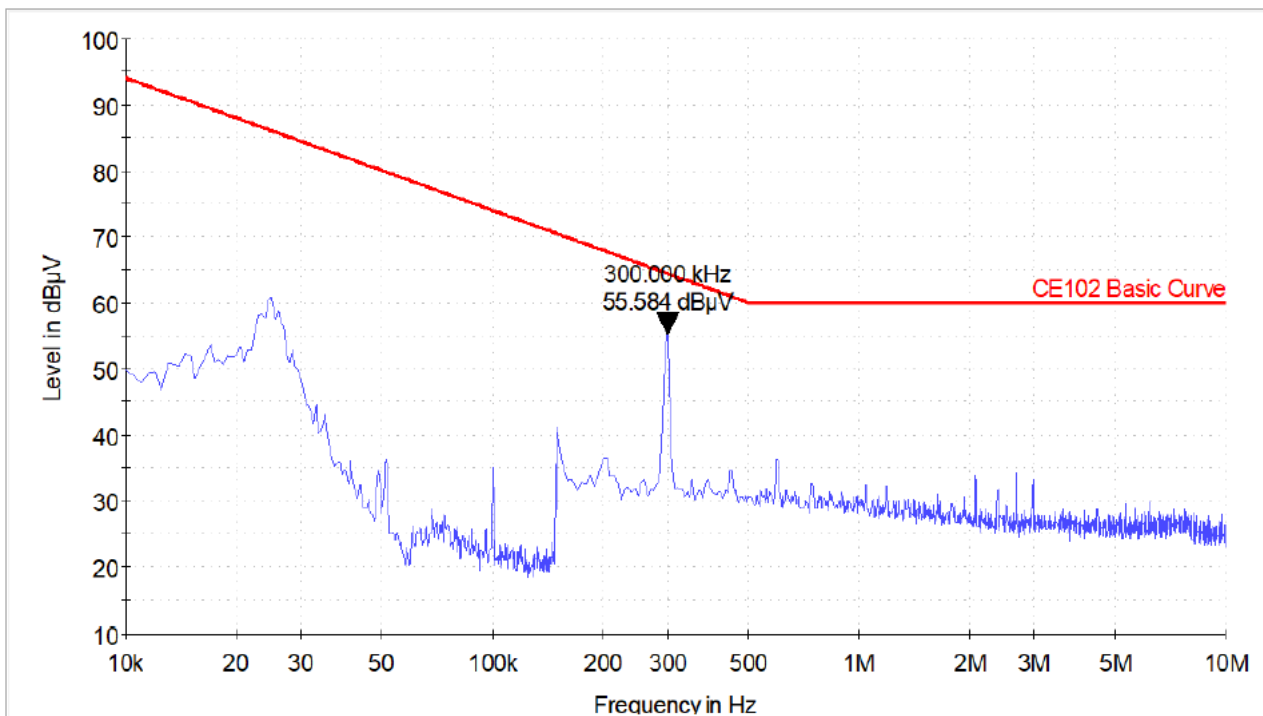
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## EMC Characteristics

MIL-Std 461G, CE102



## 28V Line



## 28V Rtn