

Modular series product specification

model DX5-zzzz-nnnn **(4 Slots)**

where D = DC Mid Power Series

x = S for 8" model, or C for 9" model with special output terminal configuration

5 = 500W Max. Output Power

z = an alpha-numeric character designating choice of output modules

n = an optional suffix indicating add-on semi-custom options. Inquire with APS

model DC7-zzzzz-nnnn **(6 Slots)**

where D = DC Power Input

C = C for 9" Chassis

7 = 750W Max. Output Power

z = an alpha-numeric character designating choice of output modules

n = an optional suffix indicating add-on semi-custom options. Inquire with APS

Specifications are subject to change during development phase.

Unless otherwise stated, continued are at rated load, nominal Vdc out, 115Vac 60Hz line, 25°C ambient.

General

| Parameter | Conditions | Limits |
|--------------------------|--------------------------------------------------------|----------------------------------------|
| Maximum Output Loading | 5" wide model, 4 modules 7.5" wide model, 6 modules | 500 Watts average 750 Watts average |
| Input Voltage | All models | 36-75Vdc |
| Inrush Current | 36-75VDC at 20C | <40Apk |
| Start-up Delay | | < 1.5 sec |
| Input Fusing | | provided on board |
| Conducted & Radiated EMI | FCC Part 15 CISPR 22 quasi-peak and average | class A class A |
| Switching Frequency | All modules | 500KHz nominal |

General, continued

| | | |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DC Power Fail Warning | Indicate input DC voltage falls below 35VDC | 470 Ω internal pull-up to 5V AUX <0.8V sinking 2mA to AUX RETURN |
| 5V AUX Output | Useful for circuits that drive Sysytem Inhibit. Floating output can be grounded to any DC output in the user's system. | 5Vdc +/- 5% tolerance, 50mA max |
| System Inhibit | Apply 5Vdc to INH+ with INH- grounded at AUXRTN. | Shuts down all modules to zero output. 5V AUX remains on. Fan remains on during inhibit. Customer can specify individual modules not to be shutdown during inhibit. |
| Efficiency | depends on output module configuration | 70% typical |
| Safety Agency Approvals, see output selection | UL60950 3rd Edition CSA22.2#60950 3rd Edition TUV EN60950 3rd Edition | Pending |
| Hi-pot | Input - Output (per safety agency) | 726Vdc for 1 minute |
| Operating Temperature | All models | 0°C - 50°C, de-rate o/p currents and total power to 50% @ 70°C |
| Over-temperature Protection | blocked fan or high ambient air temperature | Outputs are inhibited. Fan power and 5V AUX continue. |
| Fan | | Dual ball bearing, 15CFM, 12Vdc, 60mm, 50,000hrs. |
| Air Flow Direction | | Intake through fan, exhaust out DC end |
| Storage Temperature | | - 25°C to 85°C |
| Reletive Humidity | non-condensing | 0% - 95% |
| Altitude | operating non-operating | < 10,000 ft above sea level < 50,000 ft above sea level |
| Dimensions | length, model DC5- / DC7- length, model DS5- width height | 9.0" 8.0" 5.0" 4 Slots (500Watt), 7.5" 6 Slots (750Watt) 2.5" |
| Mounting | 4 Slot 500W model: 6 Slot 750W model: see outline / mounting drawing for locations | #8-32 UNC, 0.25" max penetration (M4 x0.7 available) M4 x 0.7, 6.35mm max penetration (#8-32 UNC available) |
| Weight | 4 Slot 500W model: 6 Slot 750W model: | < 4 lbs. < 6 lbs. |
| Shock and Vibration | Mil Std 810E | designed to meet |
| DC Input Terminals | | Positive, Return, and Field Ground on 7/16" spacing barrier strip with captive clamps for wire or lugs |
| DC Output Terminals | standard: custom: | #6-32 Phil-slot screw terminals on 0.4" spacing. Inquire to APS. |

Output Modules

| Parameter | Conditions | | | | | |
|------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------|--------------------------|--------------------------|--------------------------|
| Module Designation | | A | B | D | E | G |
| Nominal Output Voltage | user connected for +/- polarity as desired | 2V | 2V | 3.3V | 3.3V | 5V |
| Rated Output Current | | 35A | 25A | 35A | 25A | 35A |
| Max. Continuous Watts | (++) | 70W | 50W | 115.5W | 82.5W | 175W |
| Voltage Adjust Setpoint | factory standard, consult APS for custom pre-sets | 1.980-2.020 | 1.980-2.020 | 3.267-3.333 | 3.267-3.333 | 4.950-5.050 |
| Voltage Adjust Range | | 1.8-2.2 | 1.8-2.2 | 3.0-3.6 | 3.0-3.6 | 4.5-5.5 |
| Load Regulation | no load-rated load, @ term: with Remote Sense: | <2.5% <0.2% | <2.5% <0.2% | <1.5% <0.2% | <1.5% <0.2% | <1% <0.2% |
| Line Regulation | 90- 132 / 180- 264 Vac | <0.2% | <0.2% | <0.2% | <0.2% | <0.1% |
| Cross Regulation | from other modules | <0.2% | <0.2% | <0.2% | <0.2% | <0.1% |
| Ripple & Noise | 20MHz BW measure differential noise at load end of cable | 50mVpp | 50mVpp | 50mVpp | 50mVpp | 50mVpp |
| Overvoltage Protection Latching Shutdown | Reset by cycling AC line, or a one second pulse to the System Inhibit | 2.7-3.3 | 2.7-3.3 | 4.2-4.9 | 4.2-4.9 | 5.9-6.7 |
| Overload Current Limit | Instantaneous | <52.5A | <37.5A | <52.5A | <37.5A | <52.5A |
| Short Circuit Current | | <35A rms | <25A rms | <35A rms | <25A rms | <35A rms |
| Overload Protection | | Survive any overload including short circuit, automatic recovery when load fault is removed. | | | | |
| Temperature Coefficient | after 30 min. warm up | 0.07% / °C | 0.07% / °C | 0.07% / °C | 0.07% / °C | 0.07% / °C |
| Remote Sense | | Yes | Yes | Yes | Yes | Yes |
| DC OK Signal | logic 1 = "OK" logic 0 = "NOT OK" | 1.92<Vo<2.39 2.53<Vo<1.80 | Yes | 3.2<Vo<3.9 4.2<Vo<2.9 | 3.2<Vo<3.9 4.2<Vo<2.9 | 4.9<Vo<5.5 5.9<Vo<4.5 |
| Current Share / Monitor | | Yes | Yes | Yes | Yes | Yes |
| Safety Agency Approvals | UL, CSA, TUV | Pending | Pending | Pending | Pending | Pending |

Output Modules

| Parameter | Conditions | | | | | |
|------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------|------------------------------|----------------------------------|----------------------------------|
| Module Designation | | H | L | N | S | U |
| Nominal Output Voltage | user connected for +/- polarity as desired | 5V | 12V | 15V | 24V | 48V |
| Rated Output Current | | 25A | 12.5A | 8A | 5A | 3A |
| Max. Continuous Watts | (++) | 125W | 150W | 120W | 120W | 144W |
| Voltage Adjust Setpoint | factory standard, consult APS for custom pre-sets | 4.950-5.050 | 11.880-12.120 | 14.850-15.150 | 23.760-24.240 | 47.520-48.480 |
| Voltage Adjust Range | | 4.5-5.5 | 10.8-13.2 | 13.5-16.5 | 21.6-26.4 | 43.2-52.8 |
| Load Regulation | no load-rated load, @ term: with Remote Sense: | <1% <0.2% | <0.5% <0.2% | <0.5% <0.2% | <0.5% <0.2% | <0.5% <0.2% |
| Line Regulation | 90- 132 / 180- 264 Vac | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| Cross Regulation | from other modules | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| Ripple & Noise | 20MHz BW measure differential noise at load end of cable | 50mVpp | 100mVpp | 100mVpp | 100mv Vpp | 100mVpp |
| Overvoltage Protection Latching Shutdown | Reset by cycling AC line, or a one second pulse to the System Inhibit | 5.9-6.7 | 14.7-15.6 | 18.0-20.0 | 29.0-32.0 | 54.0-62.0 |
| Overload Current Limit | Instantaneous | <37.5A | <19A | <19.2A | <12A | <4.5A |
| Short Circuit Current | | <25A rms | <19A rms | <19.2A rms | <12A rms | <4.5A rms |
| Overload Protection | | Survive any overload including short circuit, automatic recovery when load fault is removed. | | | | |
| Temperature Coefficient | after 30 min. warm up | 0.07% / °C | 0.07% / °C | 0.07% / °C | 0.07% / °C | 0.07% / °C |
| Remote Sense | | Yes | Yes | Yes | Yes | Yes |
| DC OK Signal | logic 1 = "OK" logic 0 = "NOT OK" | 4.9<Vo<5.5 5.9<Vo<4.5 | 11.7<Vo<13.6 13.4<Vo<10.9 | 14.4<Vo<16.8 18.0<Vo<13.2 | 23.52<Vo<25.00 27.00<Vo<21.60 | 47.04<Vo<50.00 54.00<Vo<43.20 |
| Current Share / Monitor | | Yes | Yes | Yes | Yes | Yes |
| Safety Agency Approvals | UL, CSA, TUV | Pending | Pending | Pending | Pending | Pending |

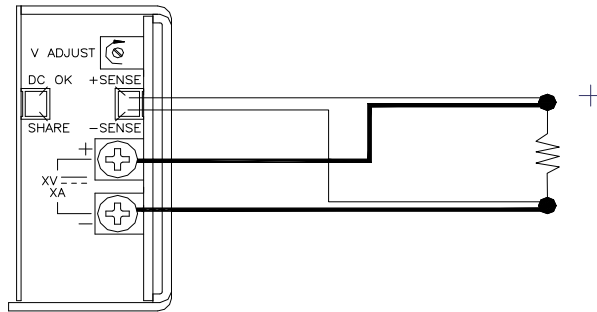
Dual Output Modules: These modules are designed for balanced loads & operate with total output voltage regulated

| Parameter | Conditions | V | W | X | Y |
|------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------|---------------|------------------------------|
| Module Designation | | V | W | X | Y |
| Nominal Output Voltage | + & - polarity have an un-grounded common terminal | +5V & -5V | +12V & -12V | +15V & -15V | +24V & -24V |
| | load can be connected from + to -, for output Vdc: | 10V | 24V | 30V | 48V |
| Rated Output Current | | 12A / 12A | 5A / 5A | 4A / 4A | 2.5A / 2.5A |
| Max.Continuous Watts | ++ | 120W | 120W | 120W | 120W |
| Voltage Adjust Setpoint | at + & - rated load: factory standard, consult APS for custom pre-sets | 4.950-5.050 | 11.880-12.120 | 14.850-15.150 | 23.760-24.240 |
| Voltage Adjust Range | | 4.5-5.5 | 10.8-13.2 | 13.5-16.5 | 21.6-26.4 |
| Load Regulation | No load-rated load, @ term. | <5% | <5% | <5% | <5% |
| Cross Regulation See note 1 | From other polarity, No load-rated load | <5% | <5% | <5% | <5% |
| Cross Regulation | From other modules | <0.1% | <0.1% | <0.1% | <0.1% |
| Line Regulation | 90 - 132 / 180-264 Vac | <0.1% | <0.1% | <0.1% | <0.1% |
| Ripple & Noise: measured from common to either output | 20MHzBW measure differential noise at load end of cable | 50mVpp | 100mVpp | 100mVpp | 100mVpp |
| Overvoltage Protection, sensed from common to +ve terminal Latching Shutdown | Reset by cycling AC line, or a one second pulse to the System Inhibit | 6.4-7.1 | 14.7-16.5 | 17.5-19.5 | 27.0-30.0 |
| Overload current limit | Instantaneous | <18A | <7.5A | <6A | <3.75A |
| Short Circuit Current | Across any output terminals | <36A rms | <15A rms | <12A rms | <7.5A rms |
| Overload Protection | Short on -VDC may activate OVP | Survive any overload including short circuit, automatic recovery when load fault is removed. | | | |
| Temperature Coefficient | after 30 minute warm-up | .02% / °C | | | |
| Remote Sense | | No | No | No | No |
| DC OK Signal | | 4.7<Vo<5.7 6.1<Vo<4.3 | Yes | Yes | 23.5<Vo<25.0 27.0<Vo<21.6 |
| Current Share / Monitor | | No | No | No | No |
| Safety Agency Approvals | UL, CSA, TUV | Yes | | | |

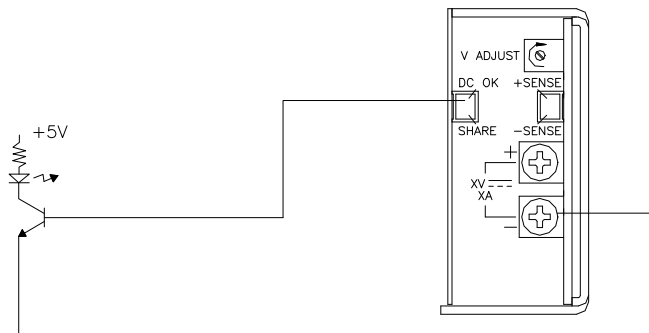
Note 1. Load Regulation and Cross Regulation will nearly cancel each other when Loads are equal.
(++) If output voltage is set above nominal, current must be de-rated to avoid exceeding max. power.

Application Notes

The remote sense feature feeds back into the voltage regulation of the module; the impedance of the feedback wire is not a factor. No RC or special network is needed. Just run 18-20 gauge wire along with load wires across the load. If multiple loads are in parallel, connect the remote sense wires to the common node.

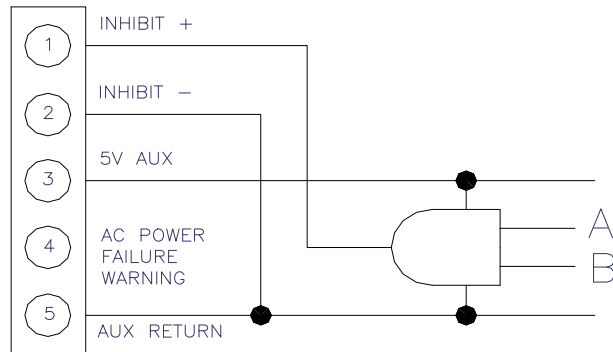


- There is NO adjustment for over-voltage protection. If the module is adjusted to a different voltage than Nominal, the OVP set point remains the same. They are independent of each other.
- When voltage sense lines are used with modules connected for current sharing, the voltage sense connectors of all shared modules must be connected together.
- When similar modules are connected together for current sharing, all the current share connectors must be connected together. Note that all modules in a current share mode of operation must have their output voltages adjusted to $\pm 0.5\%$ of the nominal voltage before the current share, voltage sense terminals and output terminals are connected together.
- Never connect the common of the module(s) to chassis as ground. Typically the chassis will be grounded to earth ground, in which case all isolation is lost. This violates the safety agency approval of the supply, and can be potentially dangerous.
- For modules w/o remotes sense, the DC OK signal returns on same connector. Otherwise, the DC OK signal returns with common. This is a TTL level signal of less than 5 mA.

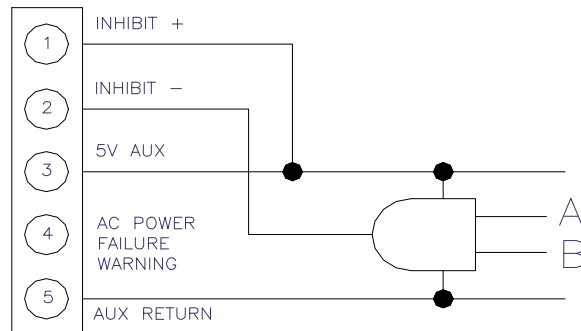


Inhibit Function

The Inhibit Function allows the modules in the power supply to be shut down. The 5V AUX is always present, even when the module outputs are shut down by INHIBIT. The 5V AUX can supply up to 1A on the new units.



Inhibit with a logic “HI”



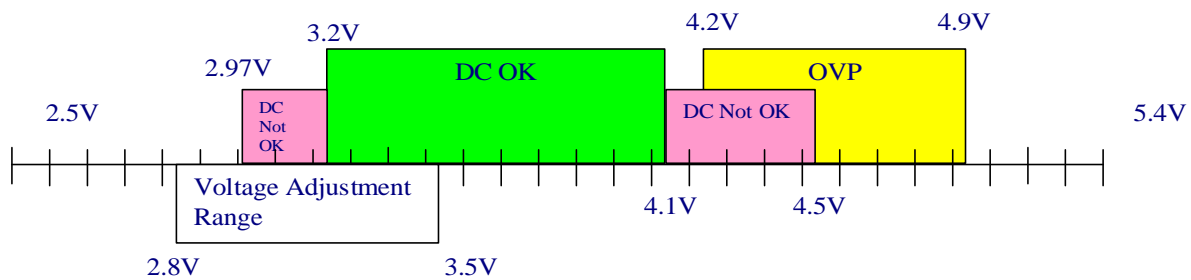
Inhibit with a logic “LOW”

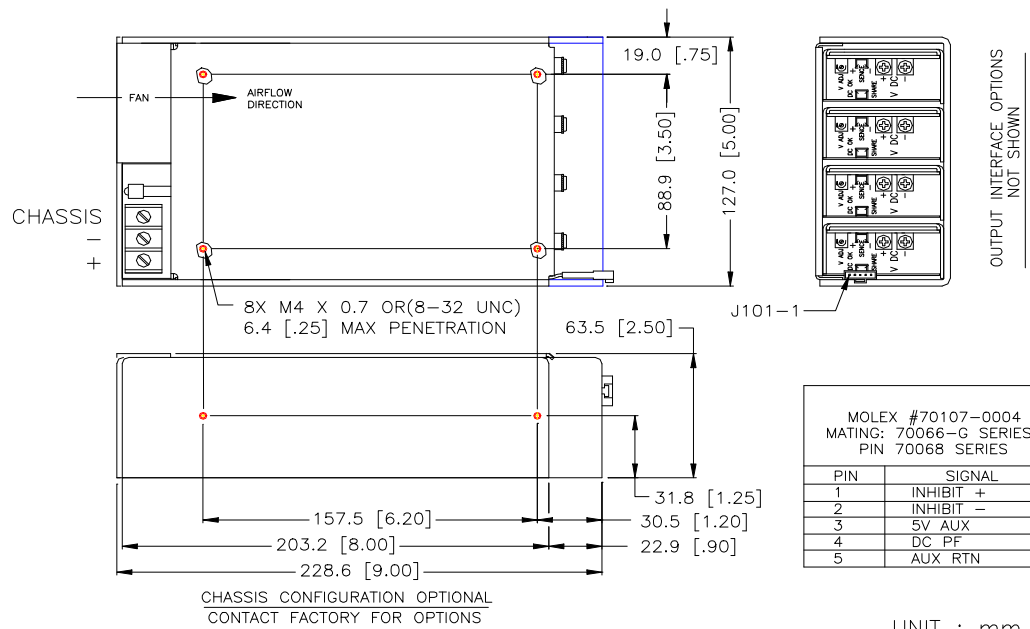
Notes:

1. All single output modules are isolated and can be referenced as either positive or negative.
2. Each output can be used up to its rated capacity as long as the total unit wattage is Not exceeded.
3. For 8" chassis without output terminal block, specify MPS prefix. For 9" chassis with output terminal block, specify MPC prefix.

Sample Voltage Line, Module D (3.3V)

(see specification chart for the actual voltage ranges for your modules)

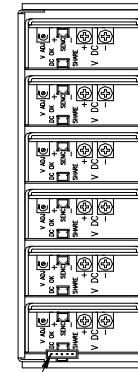
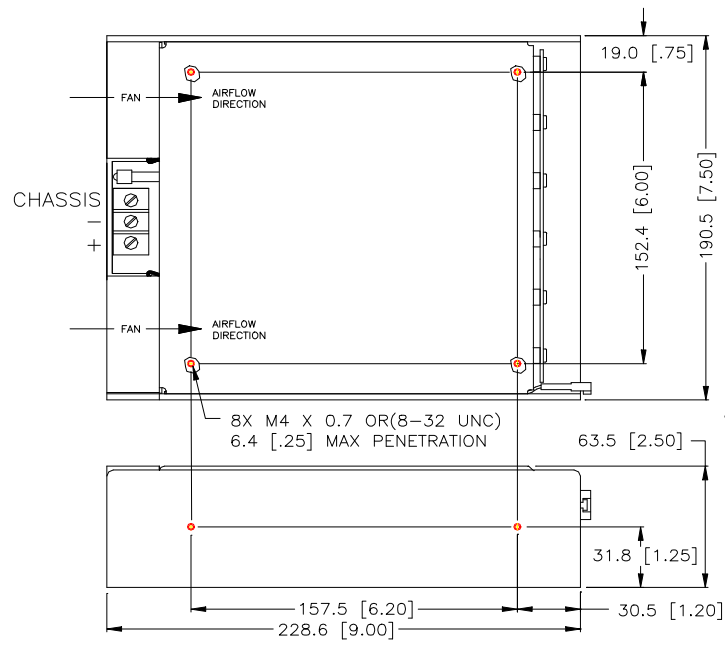




MOLEX #70107-0004
MATING: 70066-G SERIES.
PIN 70068 SERIES

| PIN | SIGNAL |
|-----|-----------|
| 1 | INHIBIT + |
| 2 | INHIBIT - |
| 3 | 5V AUX |
| 4 | DC PF |
| 5 | AUX RTN |

UNIT : mm [INCH]



OUTPUT INTERFACE OPTIONS NOT SHOWN

J101 PINOUT
MOLEX #70107-0004
MATING: 70066-G SERIES.
PIN 70068 SERIES

| PIN | SIGNAL |
|-----|-----------|
| 1 | INHIBIT + |
| 2 | INHIBIT - |
| 3 | 5V AUX |
| 4 | DC PF |
| 5 | AUX RTN |

UNIT : mm [INCH]