

## **M7019 SERIES**

*DC/DC POWER SUPPLY*



### **PRODUCT HIGHLIGHTS**

- **DC/DC POWER SUPPLY**
- **SINGLE OUTPUT**
- **UP TO 100 W**
- **MINIATURE**
- **HIGH DENSITY**

## M7019 Series– DC/DC Power Supply

### Applications

Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial Power Supply

### Special Features

- Miniature size
- High efficiency
- Input / Output isolation
- Fixed switching freq.
- EMI filters included
- Remote inhibit (On/Off)
- Non-latching protections:
  - Input under/over voltage
  - Overload/Short-circuit
  - Over temperature

### Electrical Specifications

#### DC Input Standard Version

Normal steady-state voltage range:  
18 to 48 V<sub>DC</sub>

Extended Input Option– please  
consult factory.

IAW MIL-STD-1275E  
(12 to 100 V<sub>DC</sub>)

IAW MIL-STD-704A-F (6 to 80 V<sub>DC</sub>)

#### Output voltage regulation

Less than ±1% (low to high input  
voltage, no load to full load,  
–55 °C to +85 °C at baseplate).

#### DC Output

Voltage range: 3.3 to 56 V  
Current range: 0 to 15 A  
Power range: 0 to 100 W

#### Efficiency

87% typical (28V variant, at  
nominal input voltage, full load,  
room temperature)

#### Ripple and Noise

100-150 mV<sub>p-p</sub>, typical (max. 1%)  
without external capacitance.

#### Isolation

Input to Output: 200 V<sub>DC</sub>  
Input to Case: 200 V<sub>DC</sub>  
Output to Case: 100 V<sub>DC</sub>

#### EMC

Designed to meet\* MIL-STD-461F  
CE101, CE102, CS101, CS114,  
CS115, CS116, RE101, RE102,  
RS101, RS103.

#### Turn-on Transient

No overshoot.

\* Compliance achieved with 5μH LISN, shielded harness and static resistive load.

## M7019 Series– DC/DC Power Supply

### Protections \*\*

#### Input

- **Under-Voltage Lockout**  
Standard version converter shuts if input voltage is below  $16 \pm 1V$ .  
**For extended Input option – please consult factory.**
- **Over-Voltage Lockout**  
Standard version converter shuts down if input voltage is above  $53 \pm 1V$ .  
**For extended Input option – please consult factory.**
- **Reverse Polarity Protection**  
Protection for unlimited time.

#### Output

- **Active Over-Voltage Protection**  
Secondary control circuit takes over if output voltage exceeds  $110\% \pm 5\%$  of nominal voltage.
- **Passive Over-Voltage Protection**  
Transorb at output selected  $20\% \pm 5\%$  above nominal voltage.
- **Overload / Short-Circuit Protection**  
Output voltage turns off and on periodically with low duty-cycle (hiccup) to protect system conductors and converter from short circuit and overload.

#### General

- **Over Temperature Protection**  
Shutdown if baseplate temperature exceeds  $+105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ .  
Automatic recovery upon cooldown to below  $+95\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ .

### Environmental Conditions

Designed to meet MIL-STD-810G

#### Temperature

Methods 501.5 & 502.5  
Operating:  $-55\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  (at baseplate)  
Storage:  $-55\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$  (ambient)

#### Vibration

Method 514.6  
Category 7: Aircraft – Jet, IAW figure C-6,  
13.7grams, 1 hour per axis.

Category 24: Minimum integrity, IAW figure E-3,  
7.7 grams, 1 hour per axis.

#### Altitude

Method 500.5  
Procedures I – up to 70,000 ft. (non-operational)  
Procedure II – up to 70,000 ft. (operational)

#### Shock

Method 516.6  
Operational shock: 30 g, 11 ms, half-sine  
Crash safety: 100 g, 6 ms, half-sine

#### Humidity

Method 507.5  
Up to 95% RH

#### Salt Fog

Method 509.5

### Reliability

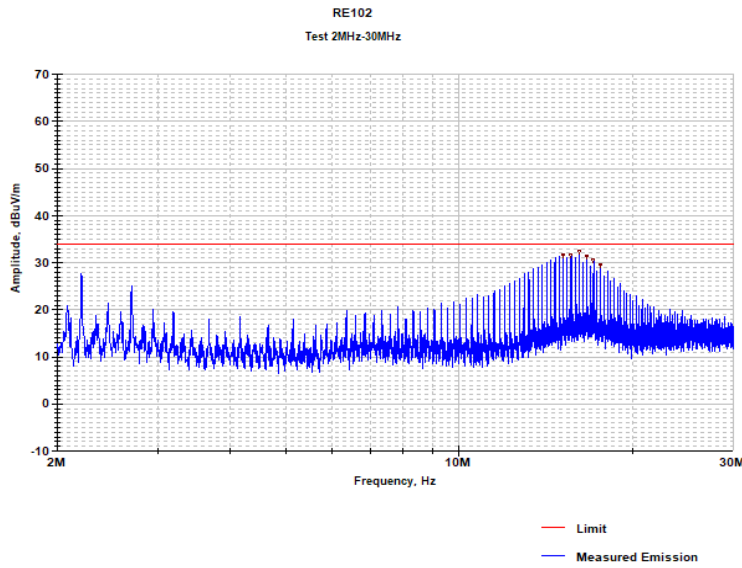
150,000 hours, calculated per MIL-STD-217F Notice 2 at  $+85\text{ }^{\circ}\text{C}$  baseplate, Ground Fix environment.

\*\* Thresholds and protections can be modified / removed – please consult factory.

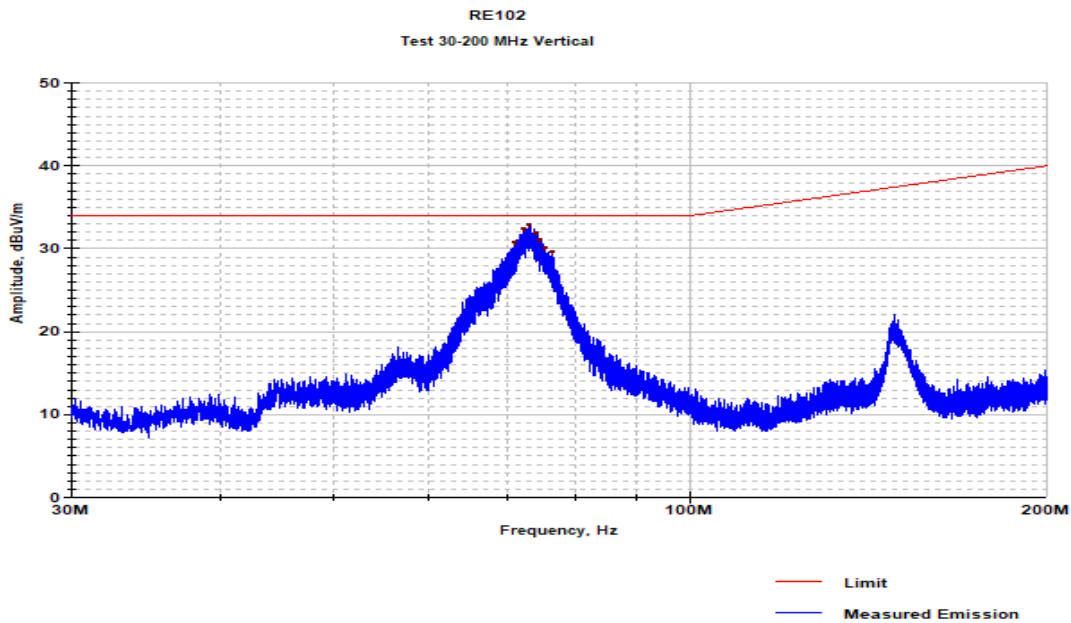
## M7019 Series– DC/DC Power Supply

### Test Results

**Plot 7.3: RE102 test results within 2 MHz – 30 MHz, vertical polarization**

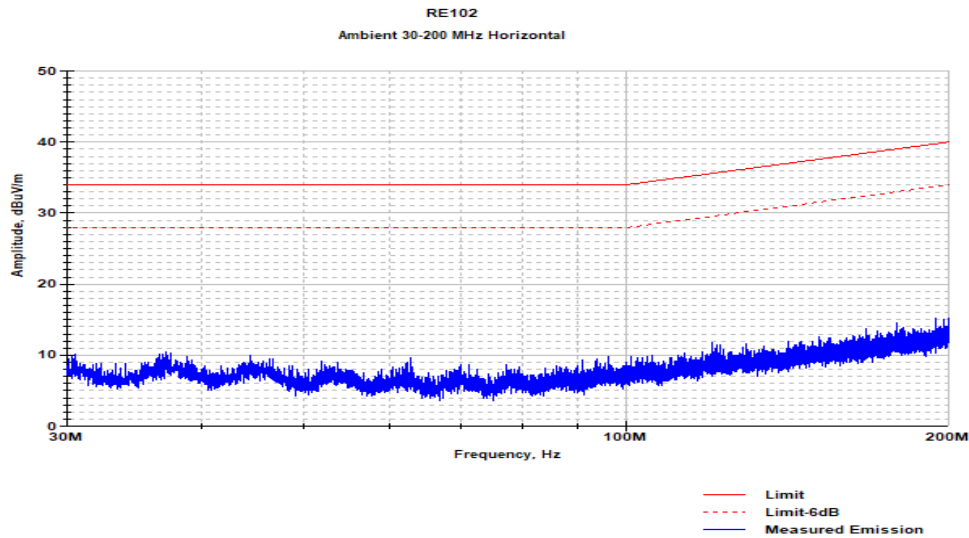


**Plot 7.6: RE102 test results within 30 – 200 MHz, vertical polarization**

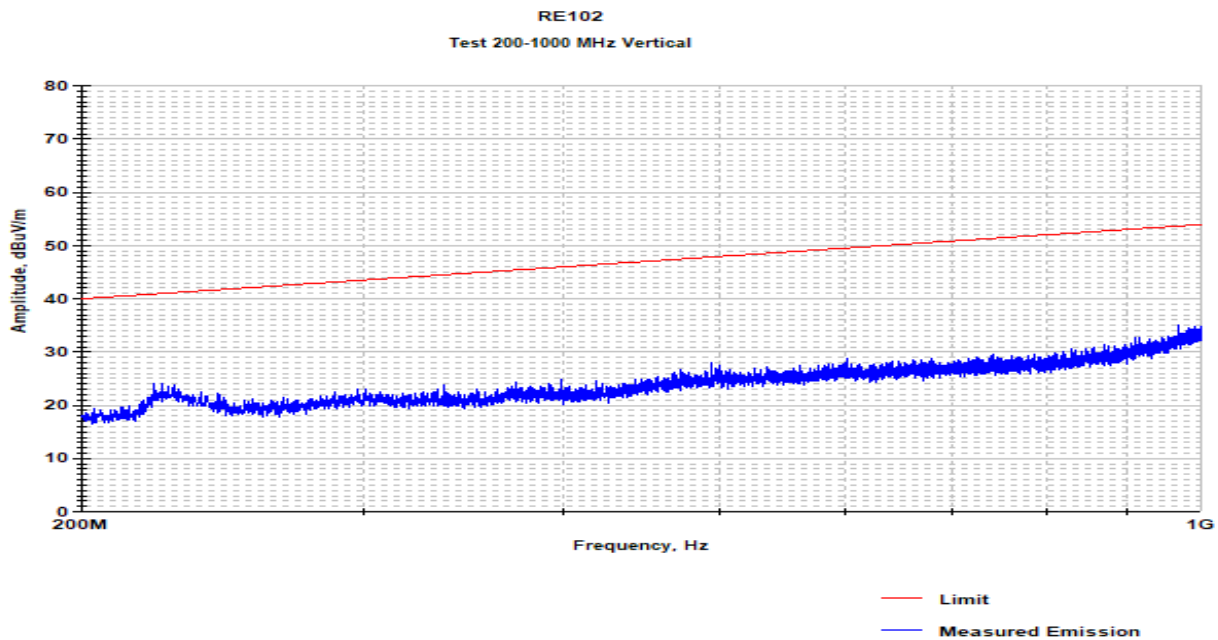


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*Plot 7.8: RE102 test results within 30 – 200 MHz, horizontal polarization*

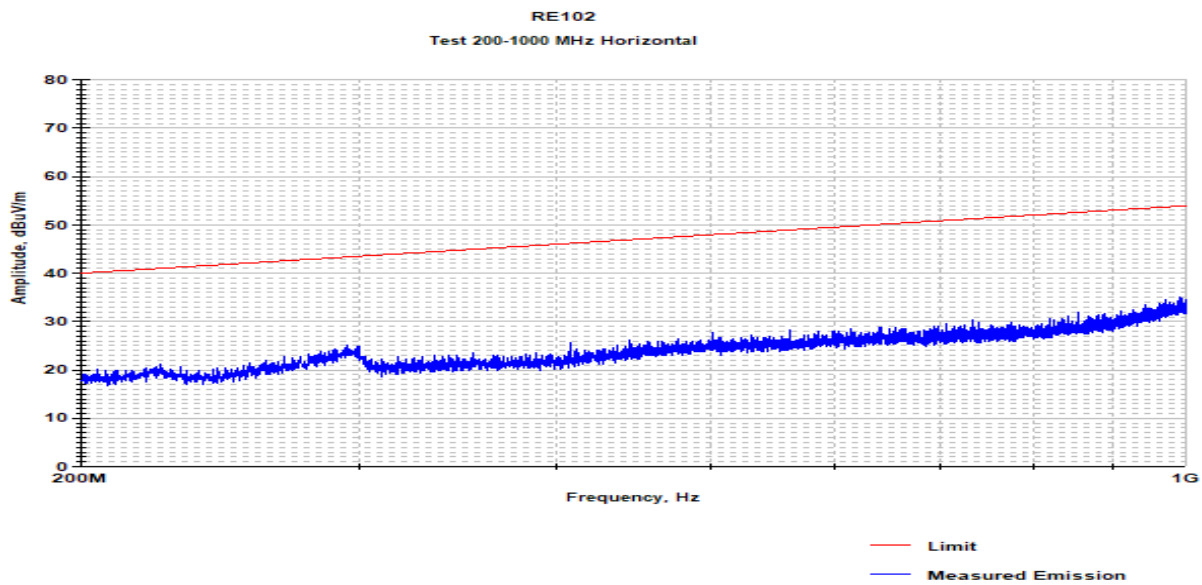


*Plot 7.11: RE102 test results within 200 – 1000 MHz, vertical polarization*

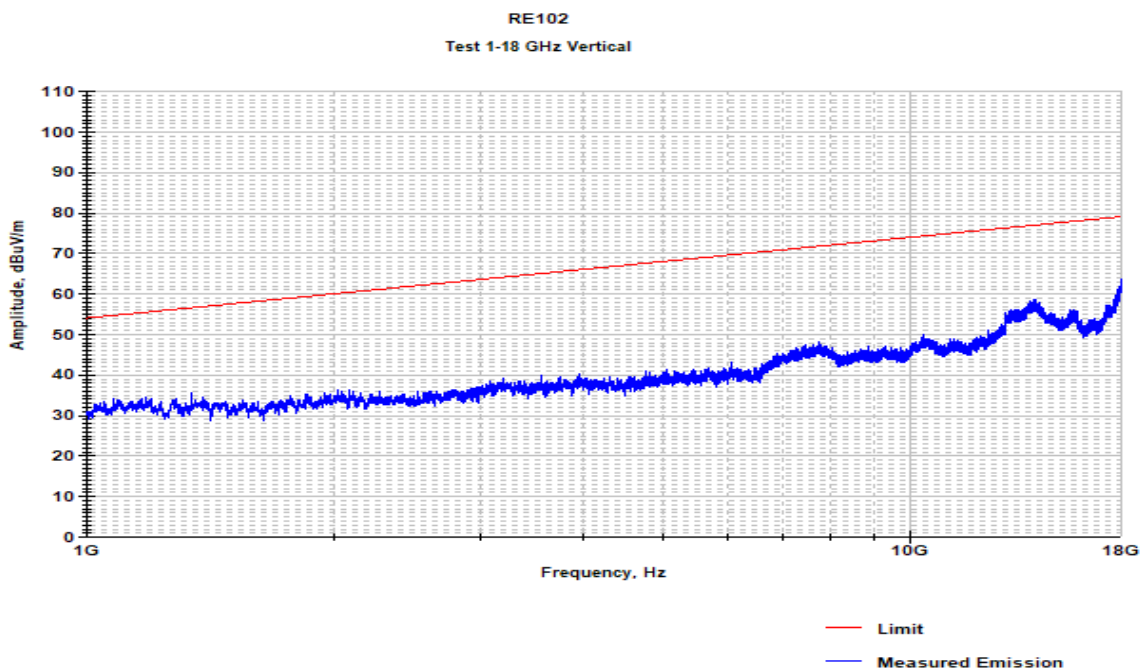


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Plot 7.13: RE102 test results within 200 – 1000 MHz, horizontal polarization

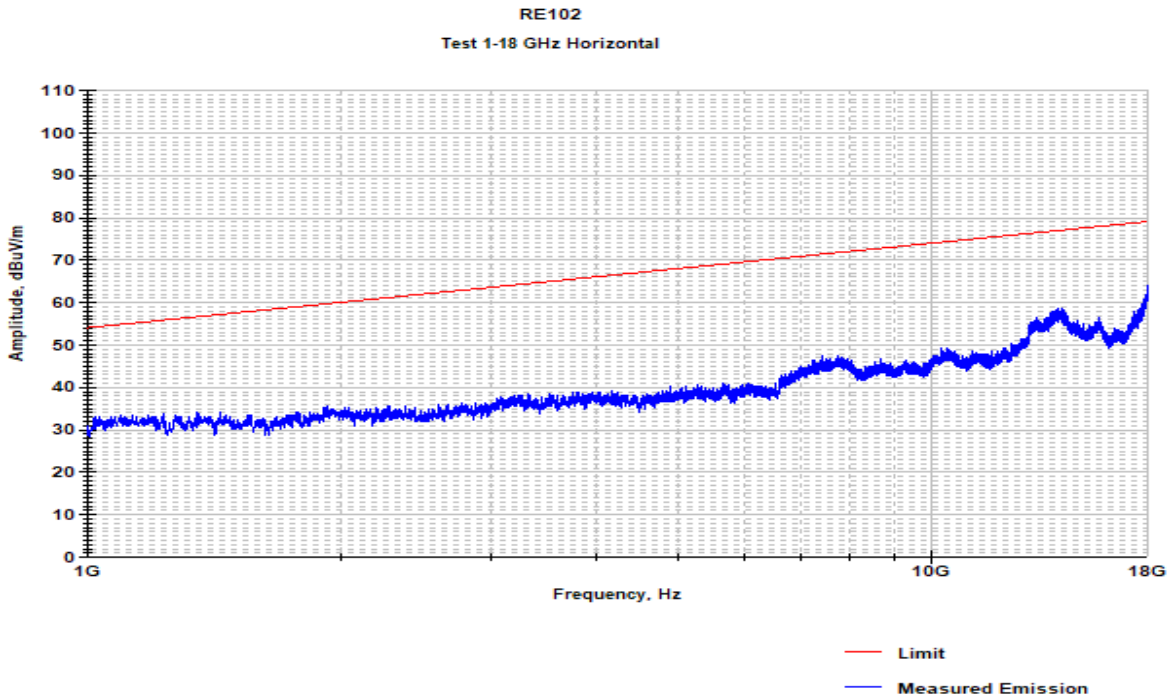


Plot 7.16: RE102 test results within 1000 – 18000 MHz, vertical polarization



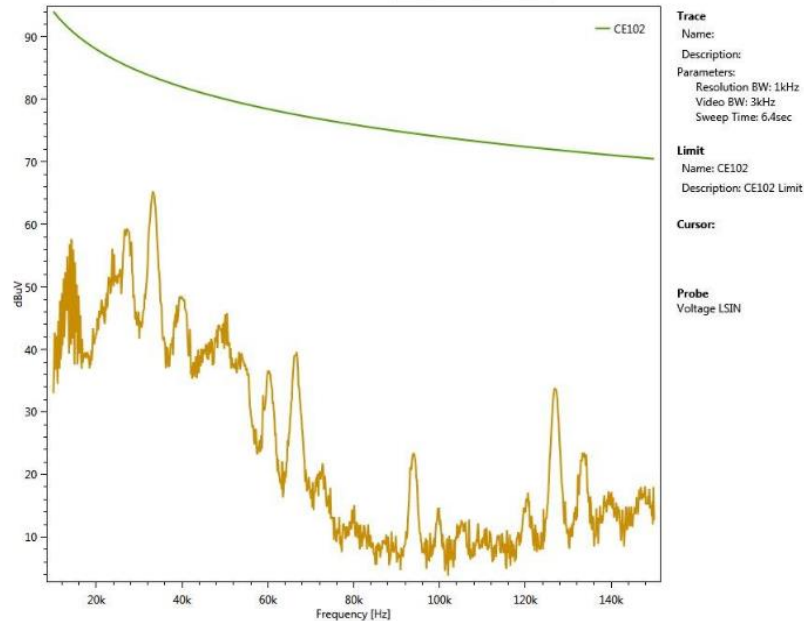
## M7019 Series— DC/DC Power Supply

**Plot 7.18: RE102 test results within 1000 – 18000 MHz, horizontal polarization**



**CE102 MIL-STD-461F Conducted Emission, 10 kHz -150 kHz**

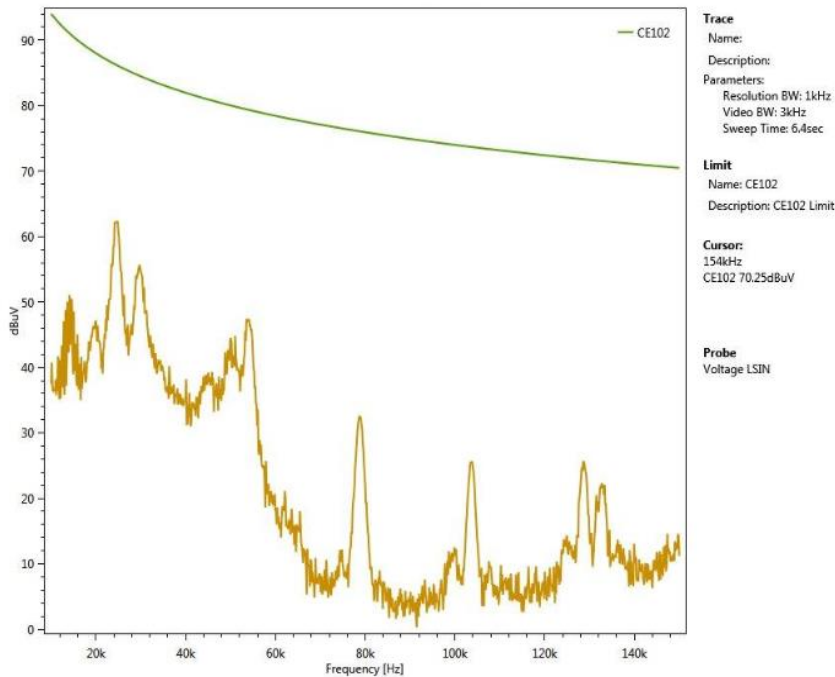
Line (nominal input voltage, full load)



## M7019 Series– DC/DC Power Supply

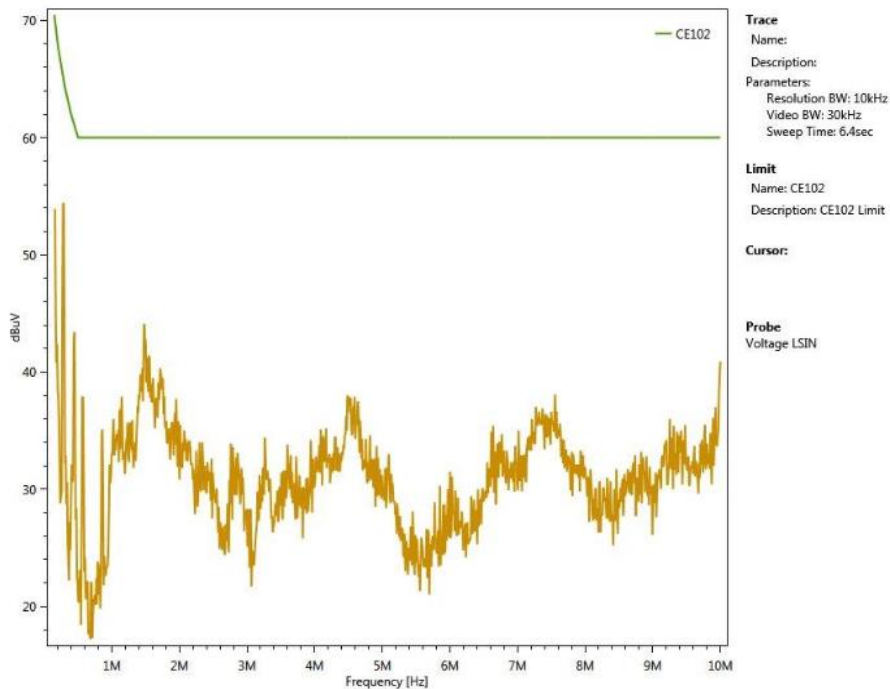
### CE102 MIL-STD-461F Conducted Emission, 10 kHz -150 kHz

Return (nominal input voltage, full load)



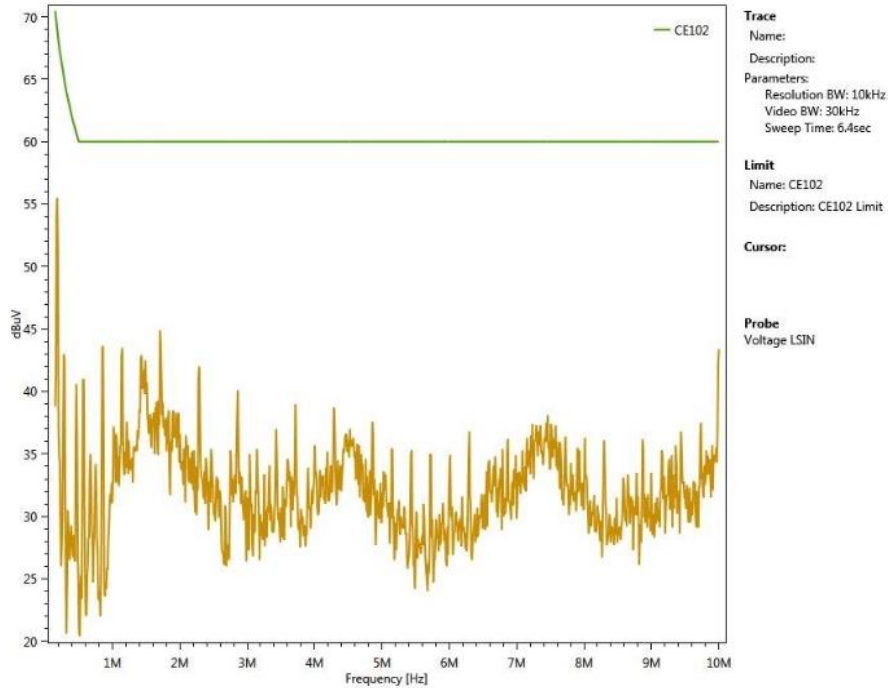
### CE102 MIL-STD-461F Conducted Emission, 150 kHz -10 MHz

Line (nominal input voltage, full load)

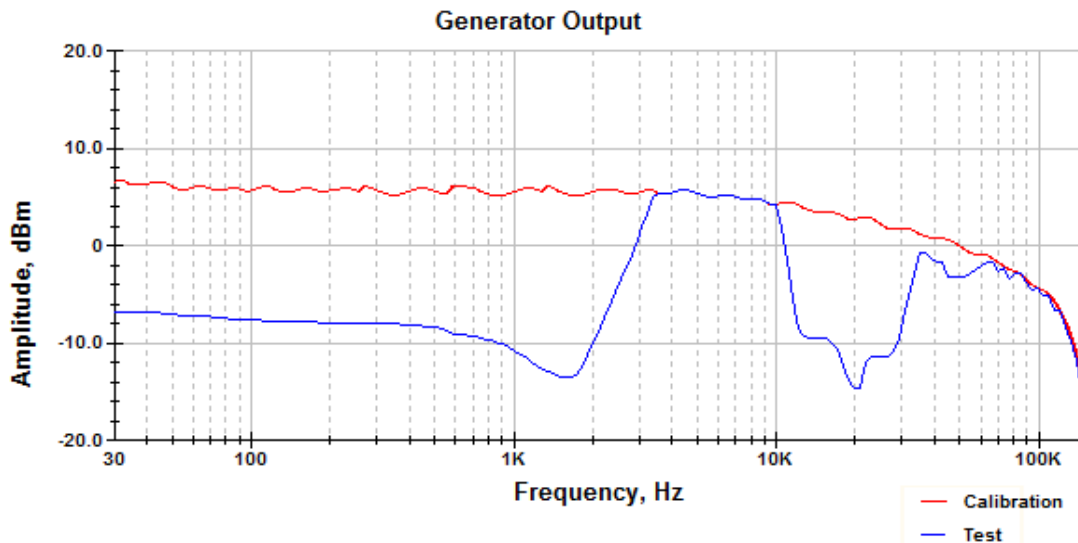


## M7019 Series— DC/DC Power Supply

Return (nominal input voltage, full load)

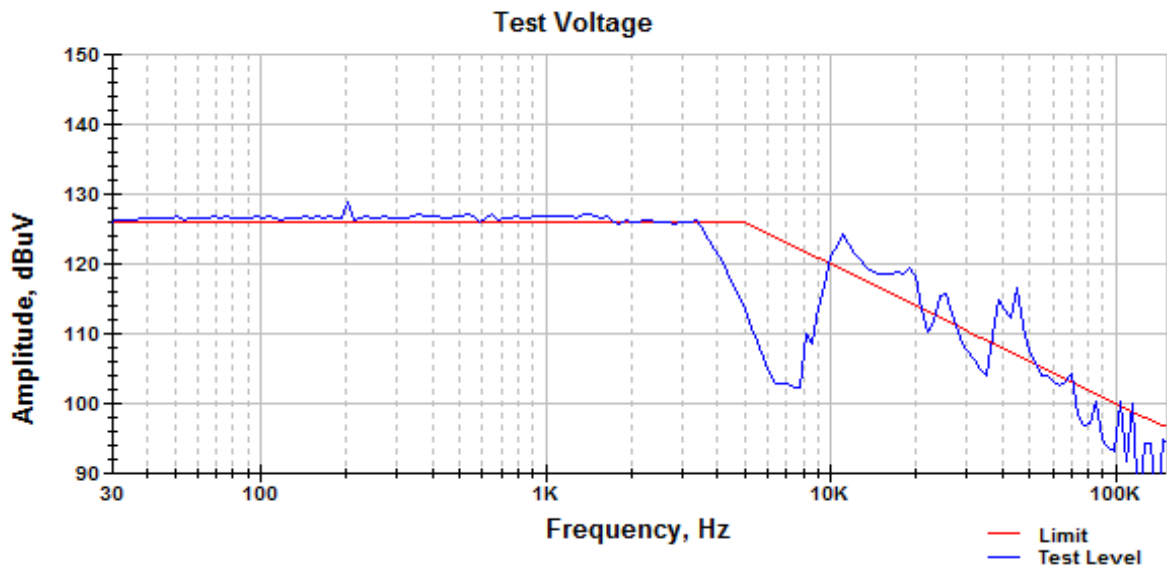


**Plot 5.2: CS101 Test Results, Induced Power**

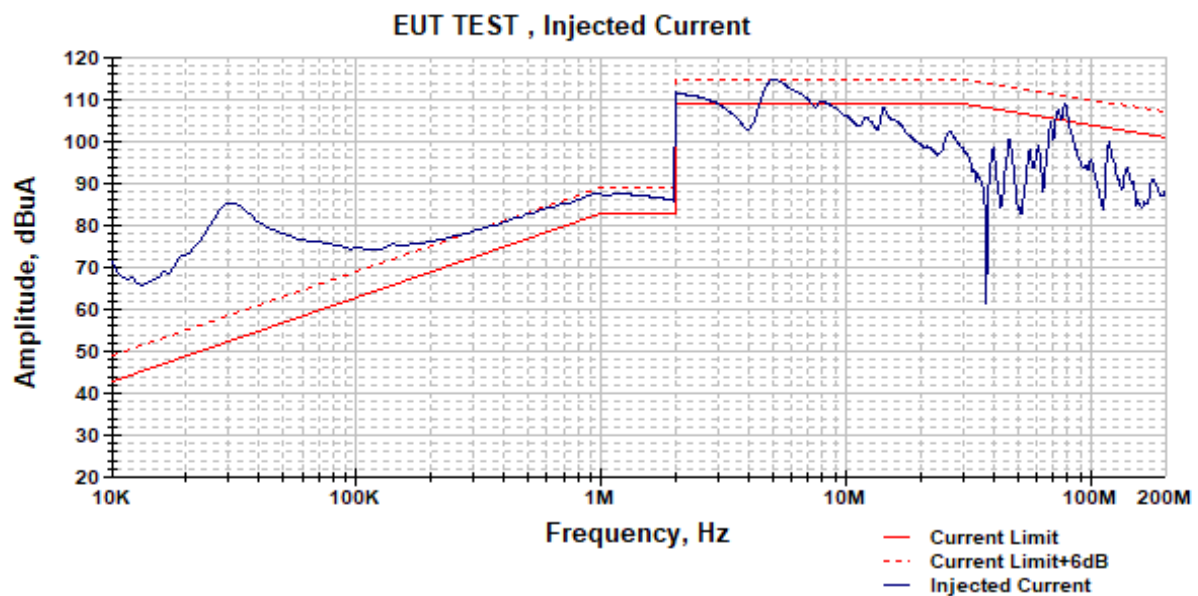


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*Plot 5.3: CS101 Test Results, Induced Voltage*

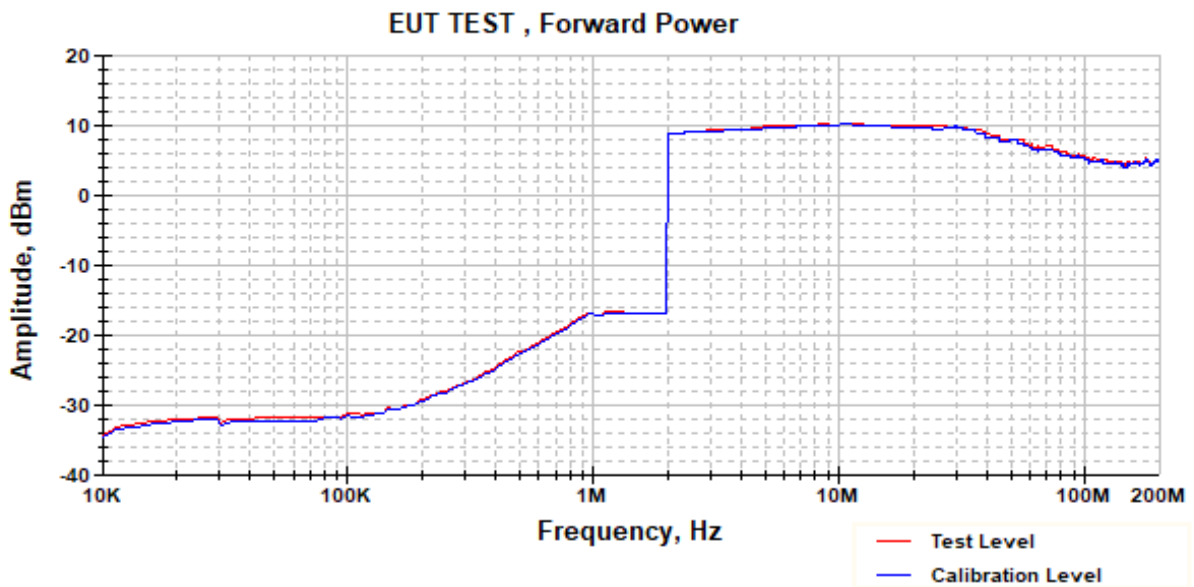


*Plot 6.3: CS114 Test results in 0.01 – 200 MHz range, Entire bundle including power leads and signal J1 cable, Induced Current*

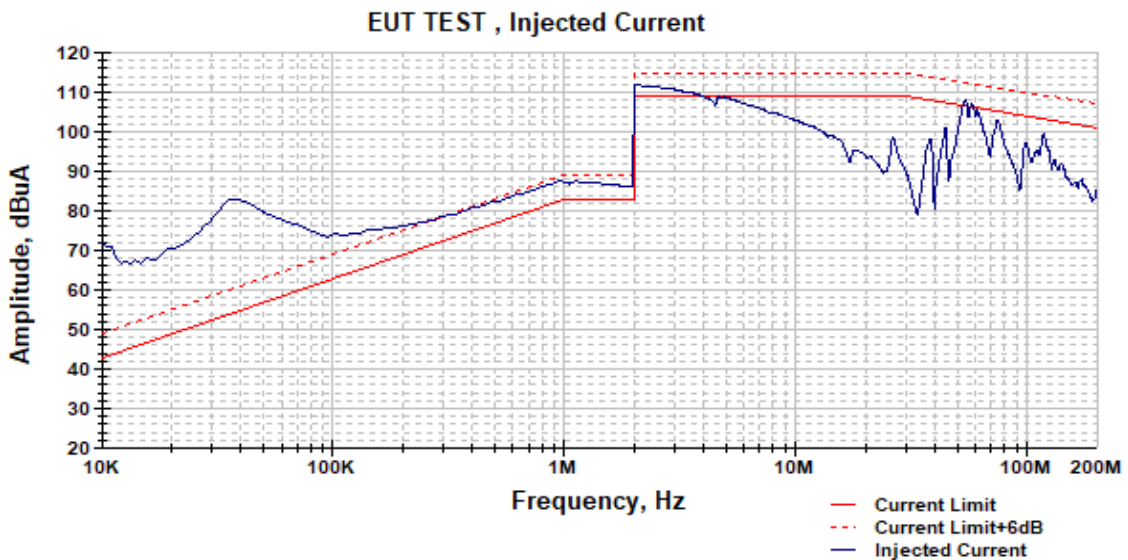


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**Plot 6.4: CS114 Test results in 0.01 – 200 MHz range, Entire bundle including power leads and signal J1 cable, Forward Power**

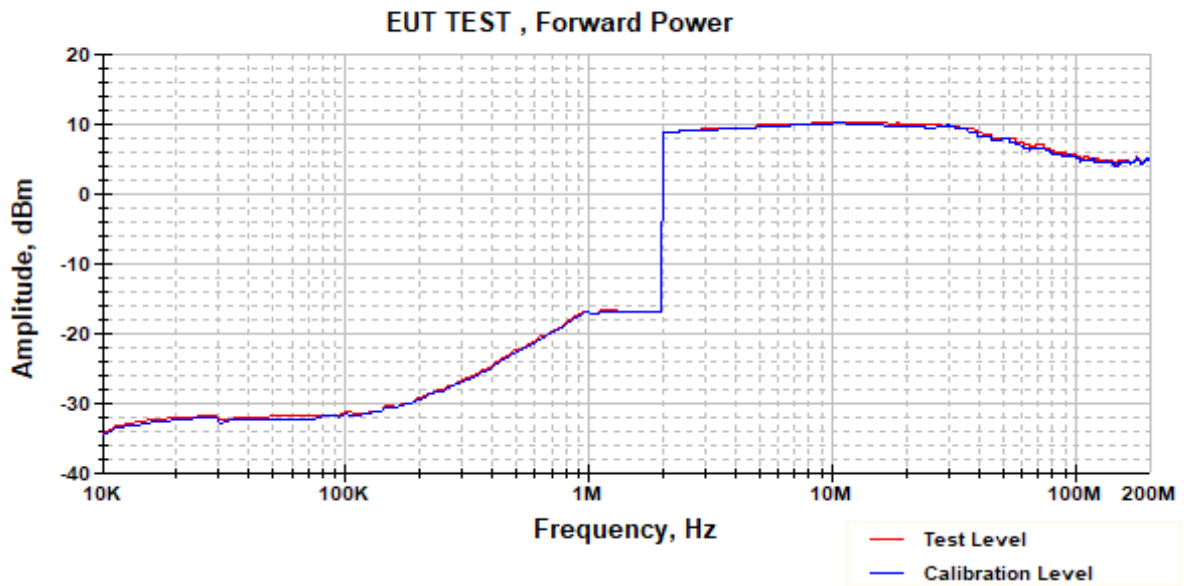


**Plot 6.5: CS114 Test results in 0.01 – 200 MHz range, Power cable including returns and grounds, Induced Current**

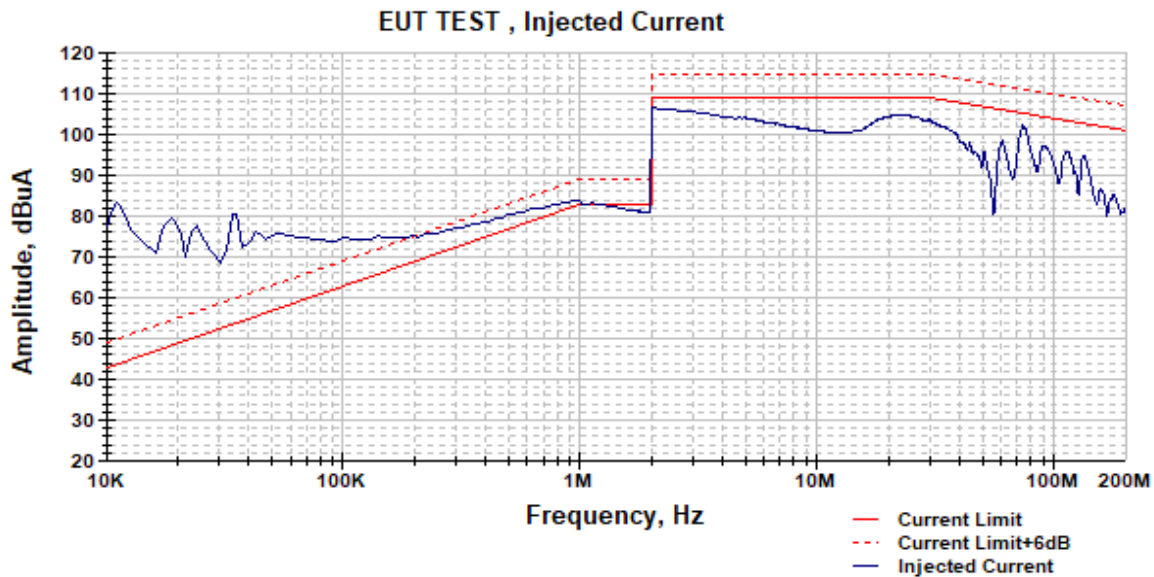


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*Plot 6.6: CS114 Test results in 0.01 – 200.0 MHz range, Power cable including returns and grounds, Forward Power*

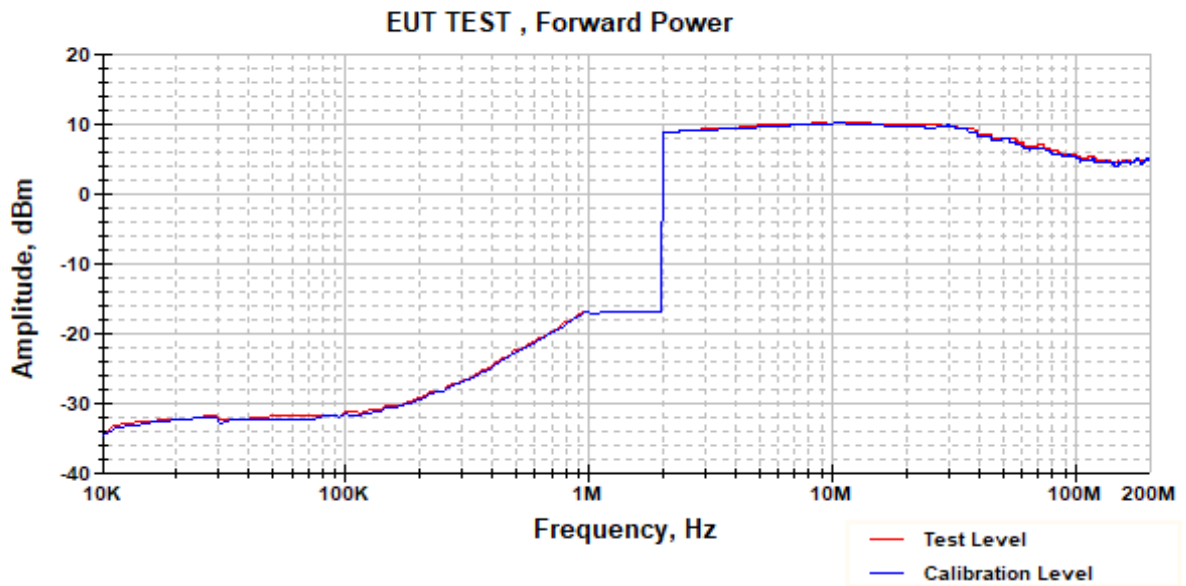


*Plot 6.7: CS114 Test results in 0.01 – 200.0 MHz range, Hot power lead excluding returns and grounds, Induced Current*



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*Plot 6.8: CS114 Test results in 0.01 – 200.0 MHz range, Hot power lead excluding returns and grounds, Forward Power*



## M7019 Series– DC/DC Power Supply

### Functions and Signals

#### **INHIBIT** (pin 8)

Description: The **INHIBIT** signal is used to turn the power supply ON and OFF.

Operation: Applying “1” or leaving open will turn the power supply ON. For constant operation, leave this pin unconnected.

Applying “0” or shorting this pin to its return line will turn the power supply OFF.

(Optional to change the logic of this signal. Please consult with factory.)

Signal Type: 5V TTL or dry contact (open/short).

Return line: This signal is referenced to **INPUT RTN** pin.

**Optional to change the logic of this signal. Please consult with the factory.**

#### **SENSE** (pin 2) & **SENSE RTN** (pin 3)

Description: The **SENSE** is used to compensate for voltage drop across the output wires by sensing the voltage at the load and correcting the increasing the output voltage accordingly, to provide the desired voltage at the load's terminals.

Operation: Connect the **SENSE** pin to the positive load terminal, and the **SENSE RTN** pin to the negative (return) load terminal.

The sense compensation is typically limited to 5% or 0.5V – the lesser of the two.

**Note:** If not used, connect **SENSE** directly to **OUTPUT** pins, and the **SENSE RTN** pin directly to the **OUTPUT RTN** pins.

**DO NOT LEAVE THE SENSE/SENSE RTN PINS UNCONNECTED-** the output voltage will increase by 5% to 8%.

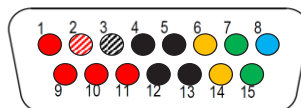
### Pin Assignment

**Connector:** M24308/24-38F or eq.

**Mates with:** M24308/2-2F or eq.

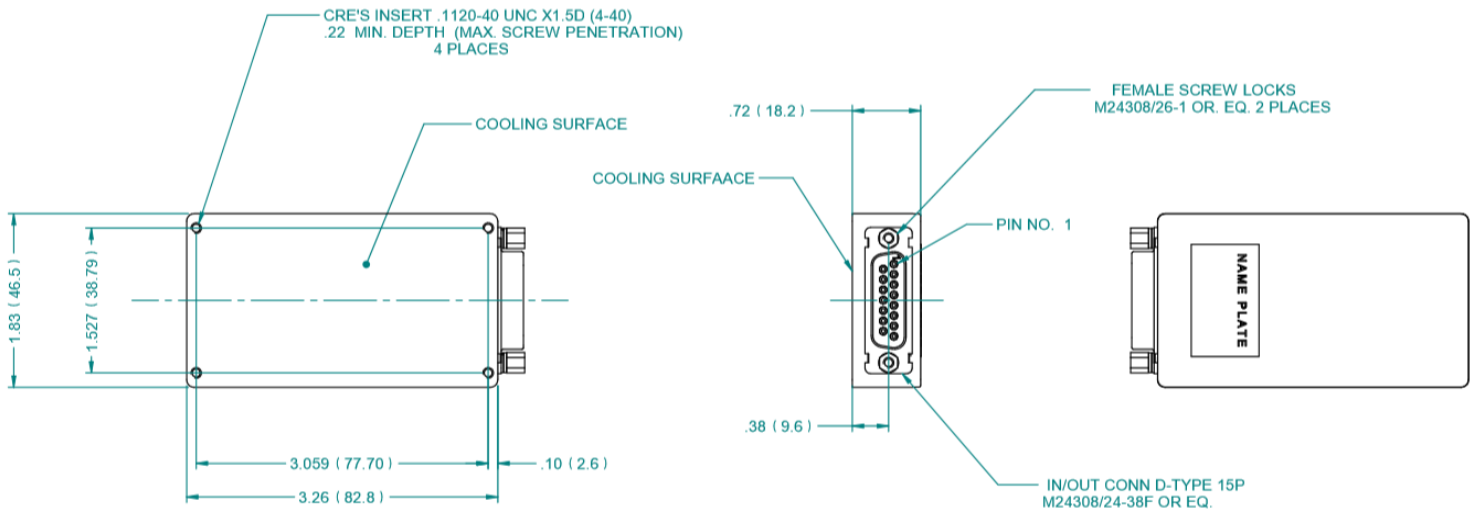
Pin No.	Function		
1	OUTPUT	+	●
2	SENSE	+	◐
3	SENSE RTN	-	◑
4	OUTPUT RTN	-	●
5	OUTPUT RTN	-	●
6	INPUT RTN	-	●
7	INPUT	+	●
8	INHIBIT	+	●

Pin No.	Function		
9	OUTPUT	+	●
10	OUTPUT	+	●
11	OUTPUT	+	●
12	OUTPUT RTN	-	●
13	OUTPUT RTN	-	●
14	INPUT RTN	-	●
15	INPUT	+	●



## M7019 Series– DC/DC Power Supply

### Outline Drawing



### Notes

1. Dimensions are in inches [mm]
2. Tolerance is:  
.XX  $\pm$  0.02 in  
.XXX  $\pm$  0.010 in
3. Weight: 134 g

## M7019 Series– DC/DC Power Supply

### Standard Configurations

This P/N can be configured to any output voltage within its possible range (see 'DC Output – Voltage range' in 'Electrical Specifications' table).

Part Number	Output Voltage	Max Output Current	Minimum Efficiency
M7019100	5 V <sub>DC</sub>	13 A	82%
M7019101	12 V <sub>DC</sub>	8 A	83%
M7019102	15 V <sub>DC</sub>	7 A	84%
M7019103	24 V <sub>DC</sub>	4 A	85%
M7019104	28 V <sub>DC</sub>	3.5 A	86%

Additional standard configurations available. **Consult factory for details.**

*Note: Specifications are subject to change without prior notice by the manufacturer.*