M7019 SERIES

DC/DC POWER SUPPLY

PRODUCT HIGHLIGHTS

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

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_{DC}

Extended Input Option– please consult factory.
IAW MIL-STD-1275E
(12 to 100 V_{DC})
IAW MIL-STD-704A-F (6 to 80 V_{DC})

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_{p-p}, typical (max. 1%) without external capacitance.

Isolation

Input to Output: 200 V_{DC}
Input to Case: 200 V_{DC}
Output to Case: 100 V_{DC}

EMC

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

Turn-on Transient

No overshoot.

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

Protections **

Input

- **Under-Voltage Lockout**
  Standard version converter shuts if input voltage is below 16 ± 1V.
  For extended Input option – please consult factory.
- **Over-Voltage Lockout**
  Standard version converter shuts down if input voltage is above 53 ± 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% ± 5% of nominal voltage.
- **Passive Over-Voltage Protection**
  Transorb at output selected 20% ± 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 °C ± 5 °C.
  Automatic recovery upon cooldown to below +95 °C ± 5 °C.

Environmental Conditions

Designed to meet MIL-STD-810G

Temperature

Methods 501.5 & 502.5
Operating: –55 °C to +85 °C (at baseplate)
Storage: –55 °C to +125 °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

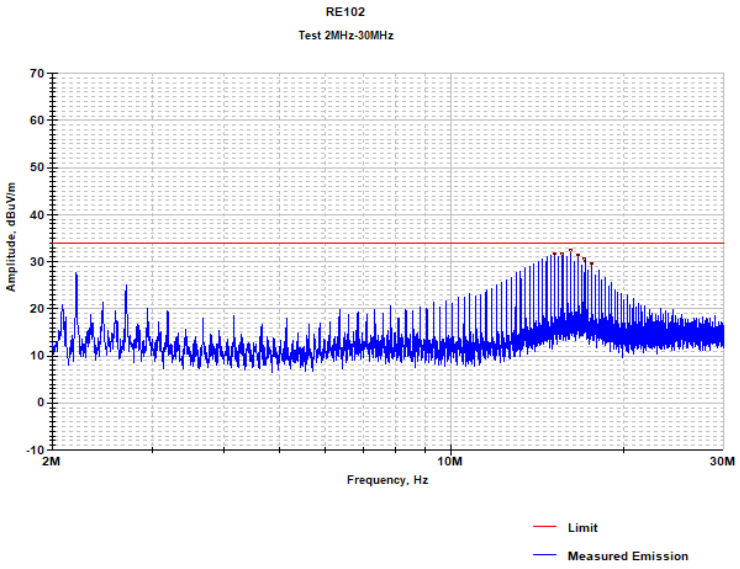
Reliability

150,000 hours, calculated per MIL-STD-217F Notice 2 at +85°C baseplate, Ground Fix environment.

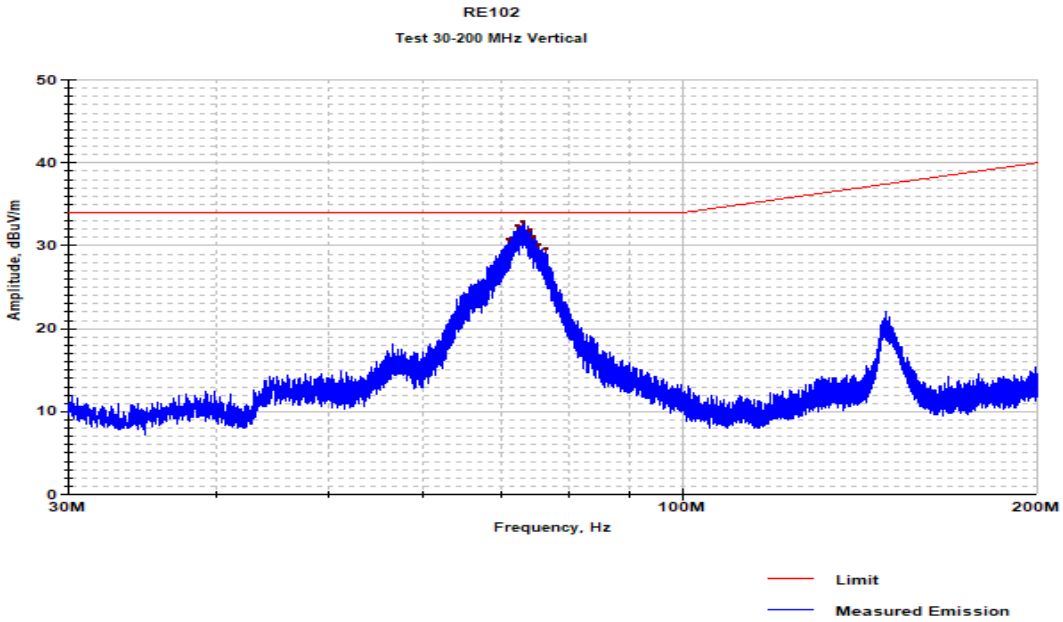
** Thresholds and protections can be modified / removed – please consult factory.

Test Results

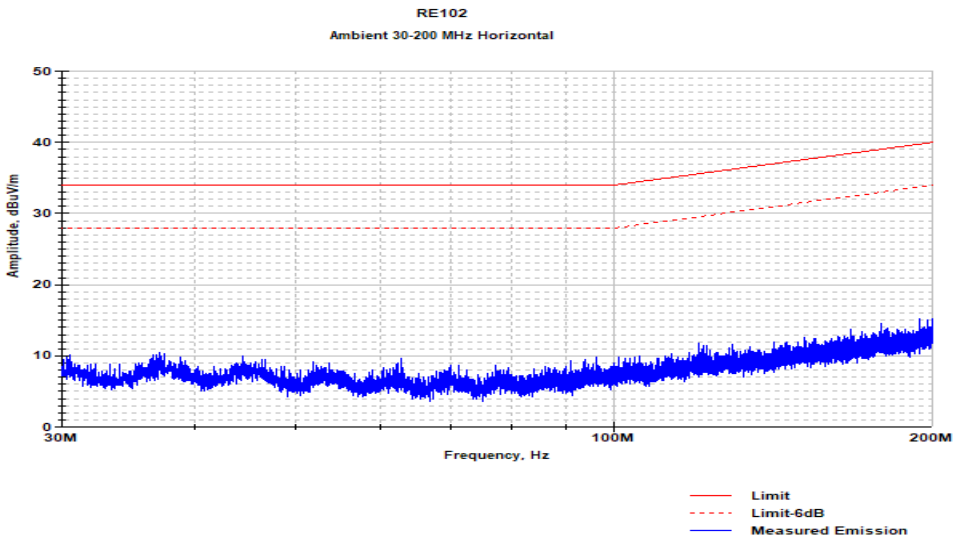
Plot 7.3: RE102 test results within 2 MHz – 30 MHz, vertical polarization



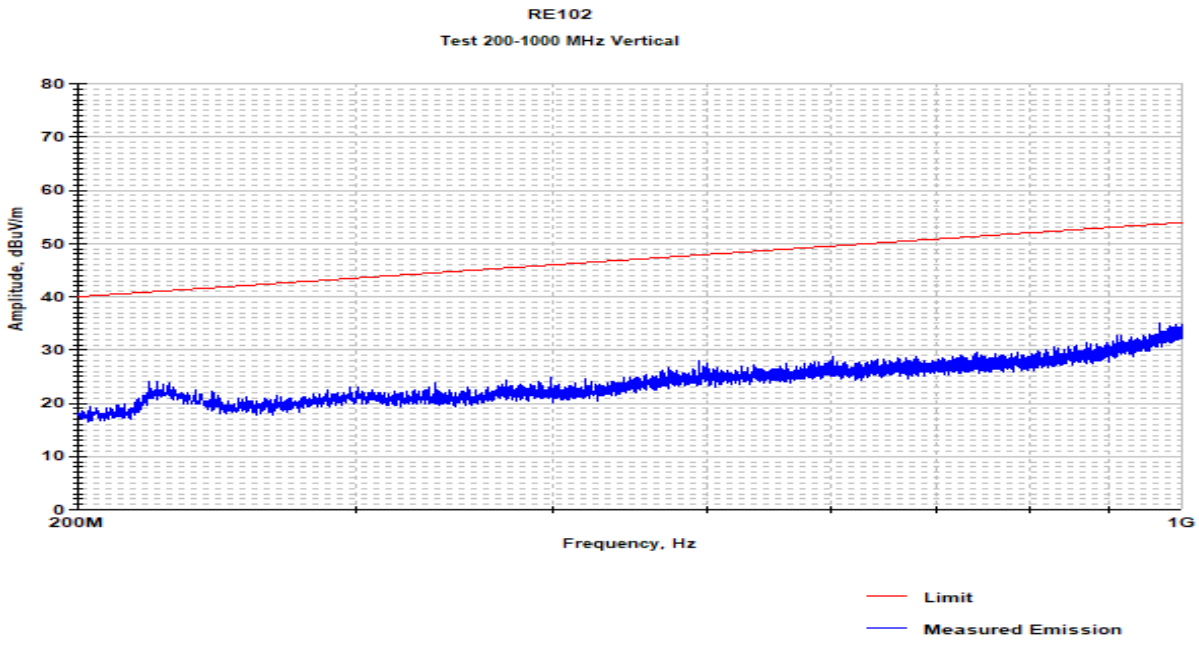
Plot 7.6: RE102 test results within 30 – 200 MHz, vertical polarization



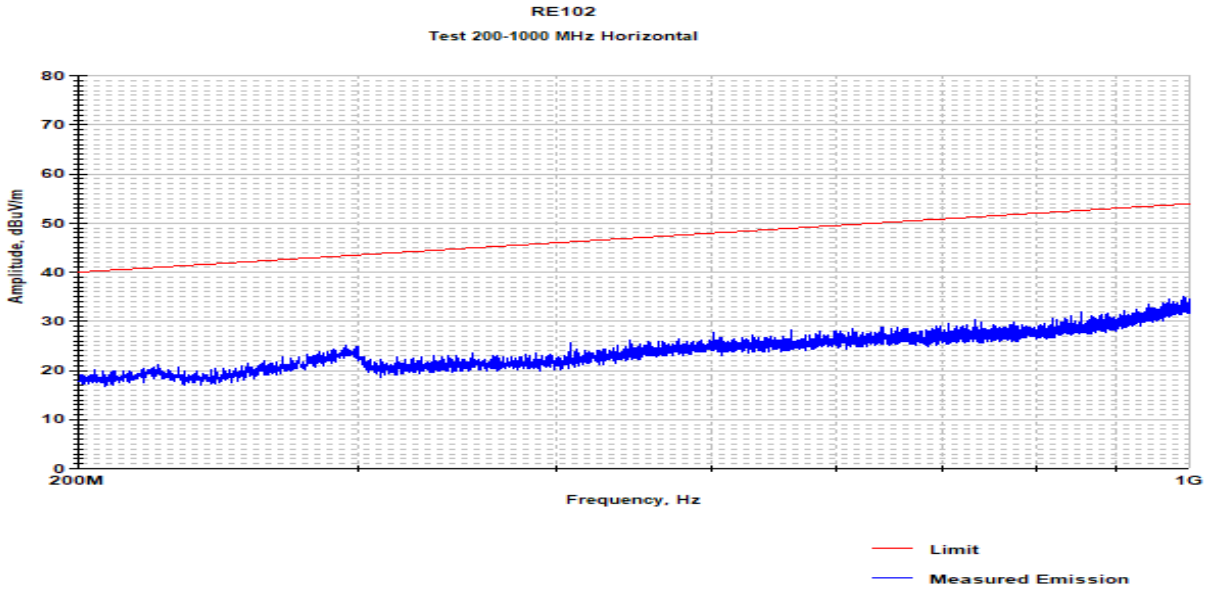
Plot 7.8: RE102 test results within 30 – 200 MHz, horizontal polarization



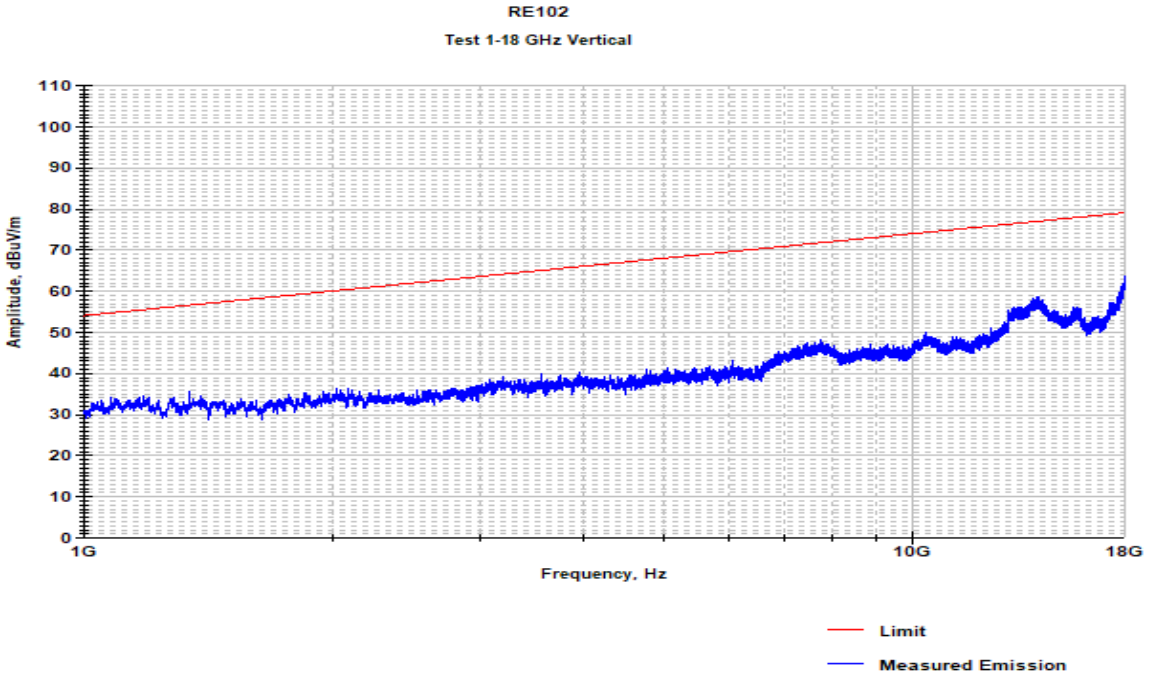
Plot 7.11: RE102 test results within 200 – 1000 MHz, vertical polarization



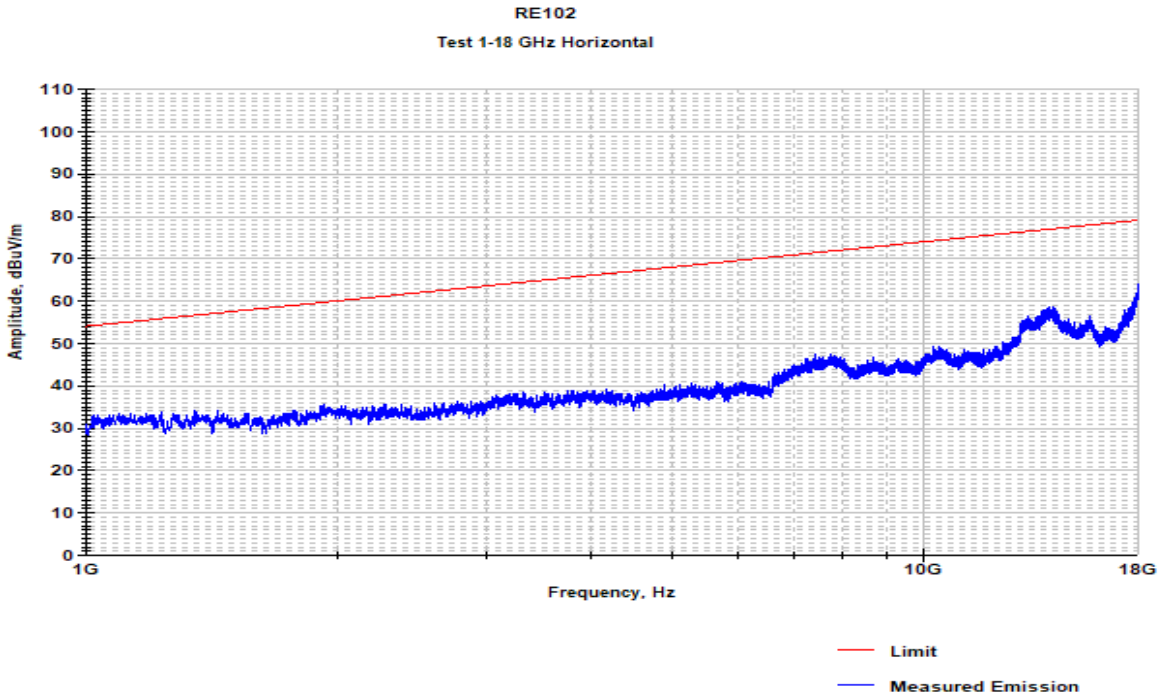
Plot 7.13: RE102 test results within 200 – 1000 MHz, horizontal polarization



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

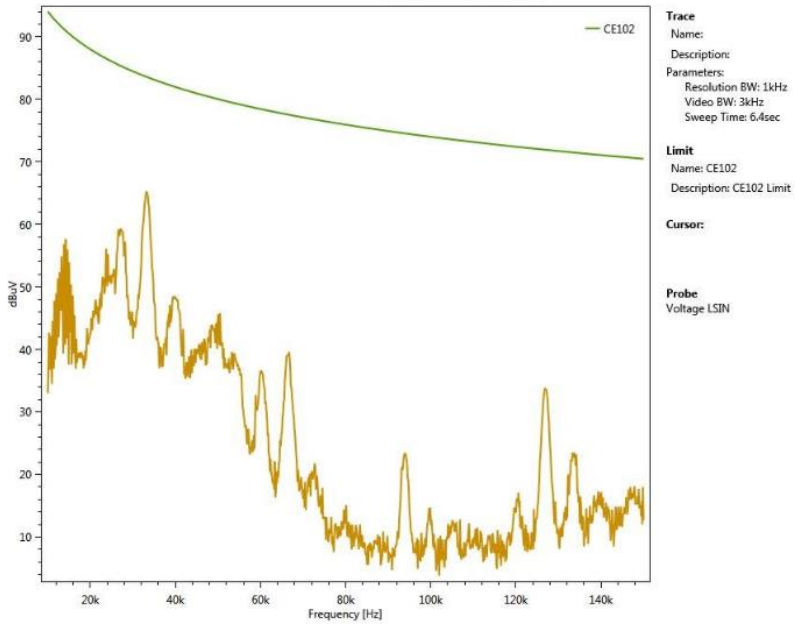


Plot 7.18: RE102 test results within 1000 – 18000 MHz, horizontal polarization



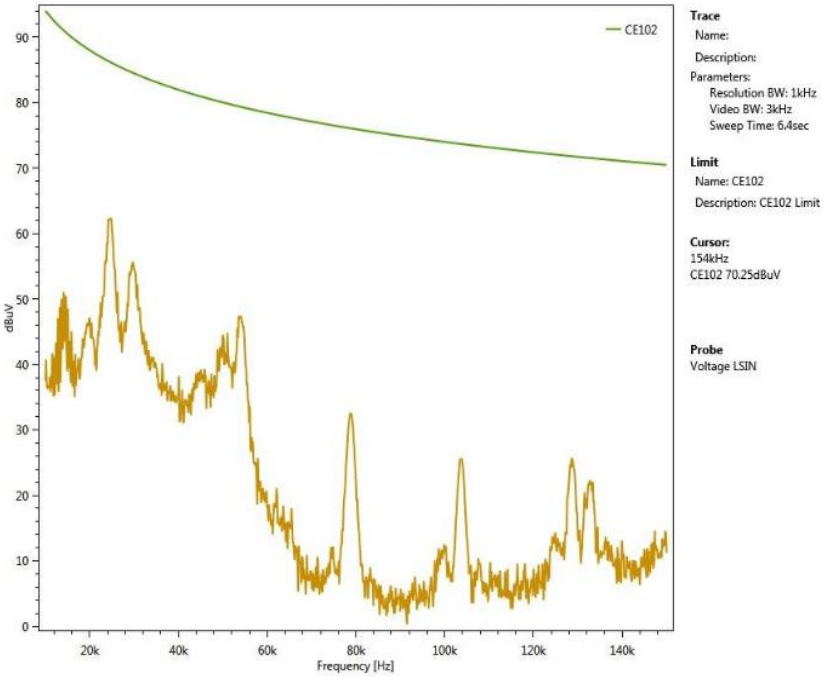
CE102 MIL-STD-461F Conducted Emission, 10 kHz -150 kHz

Line (nominal input voltage, full load)



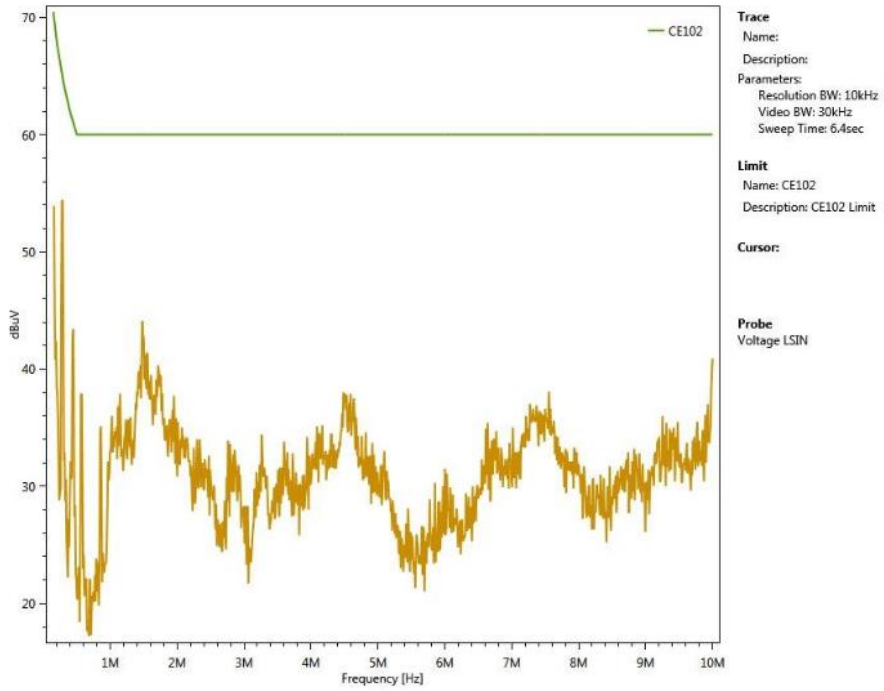
CE102 MIL-STD-461F Conducted Emission, 10 kHz -150 kHz

Return (nominal input voltage, full load)

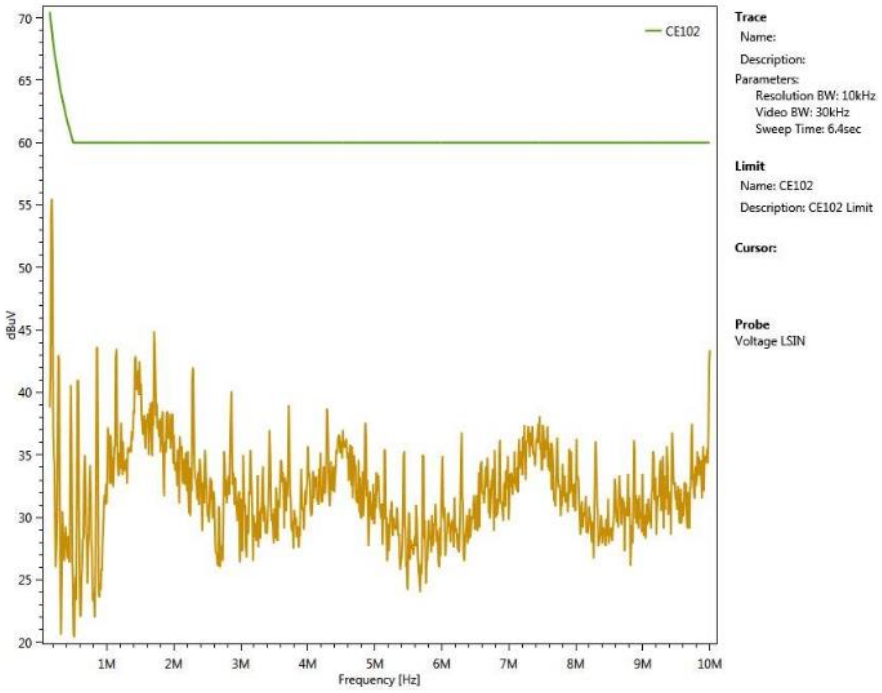


CE102 MIL-STD-461F Conducted Emission, 150 kHz -10 MHz

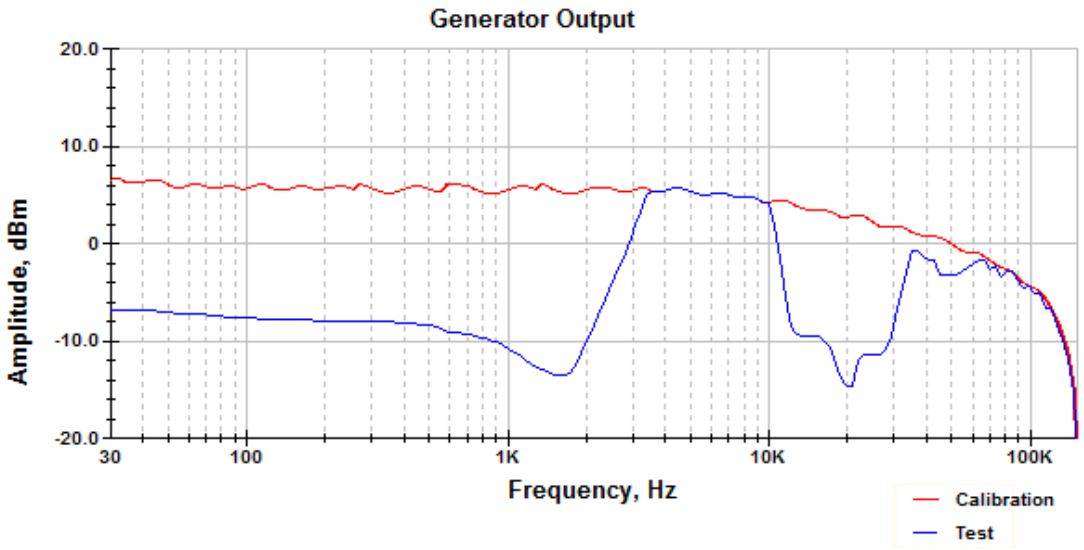
Line (nominal input voltage, full load)



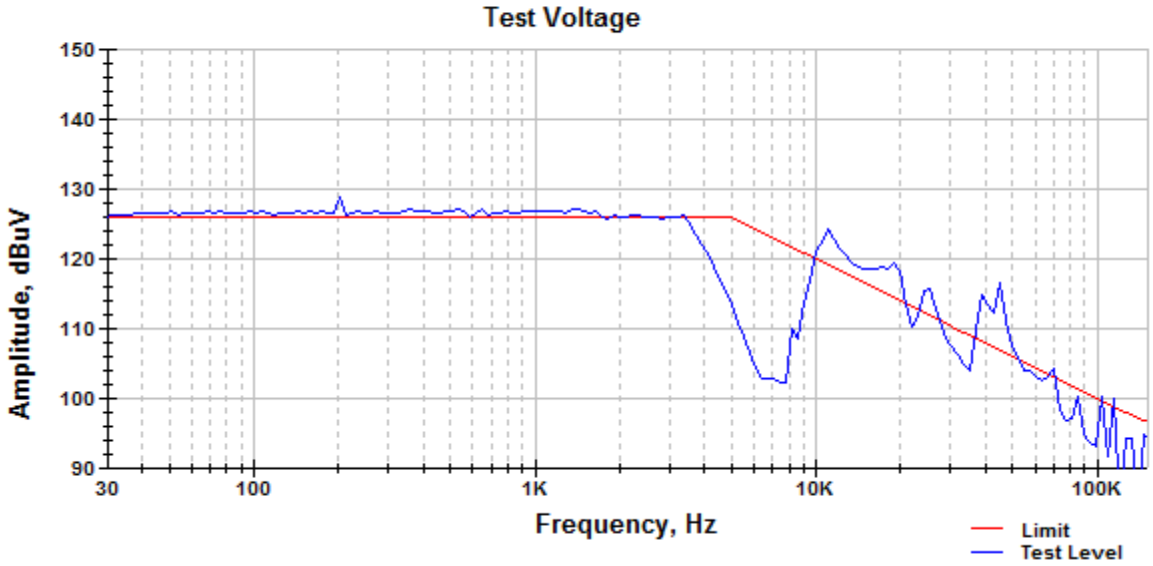
Return (nominal input voltage, full load)



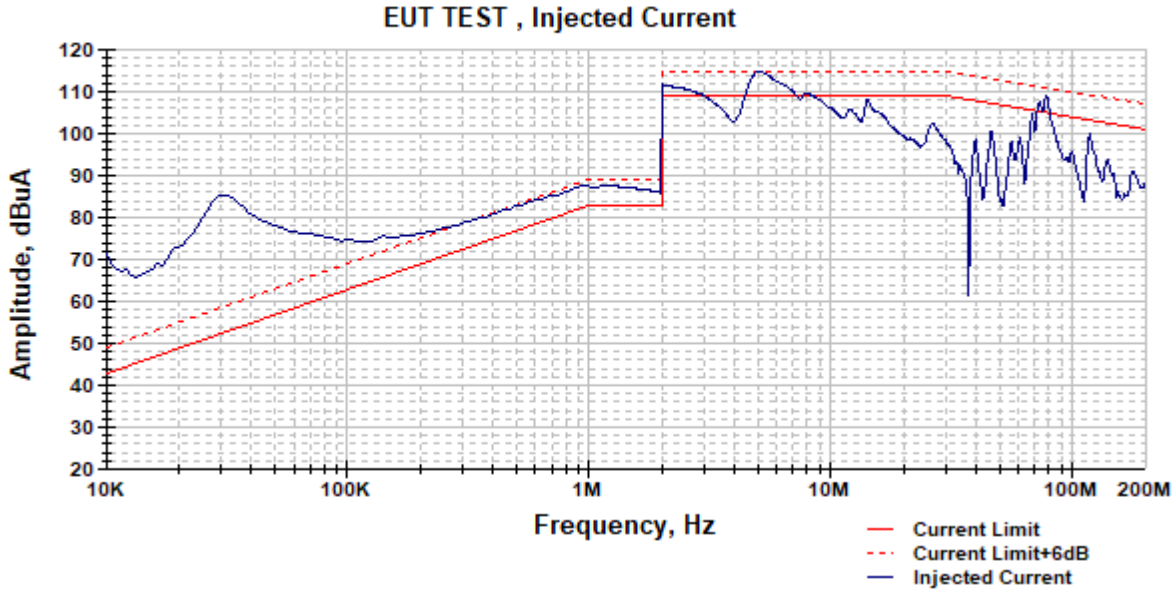
Plot 5.2: CS101 Test Results, Induced Power



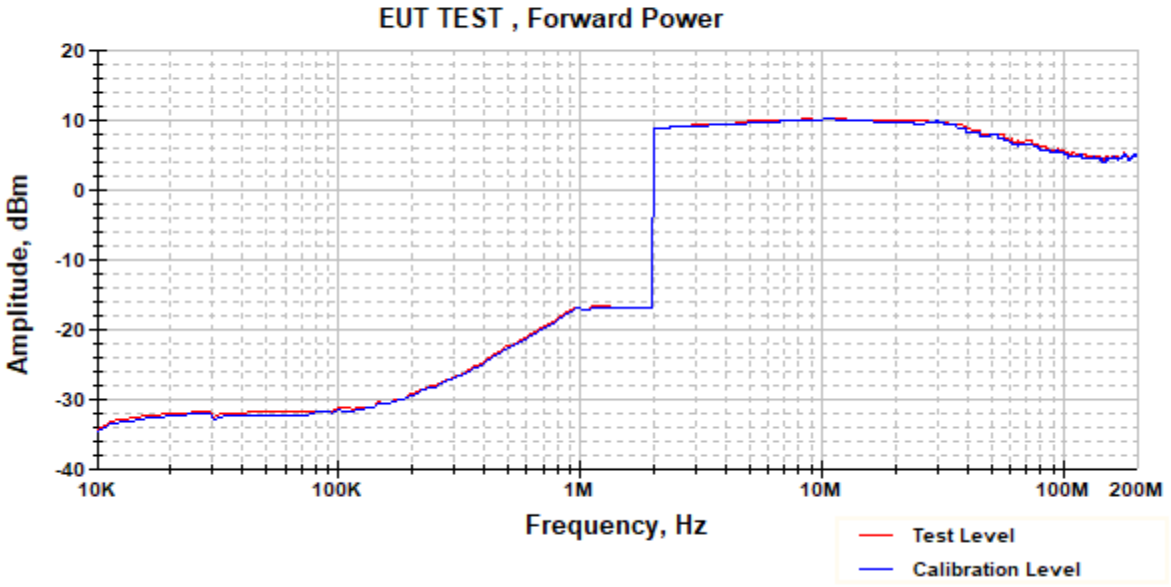
Plot 5.3: CS101 Test Results, Induced Voltage



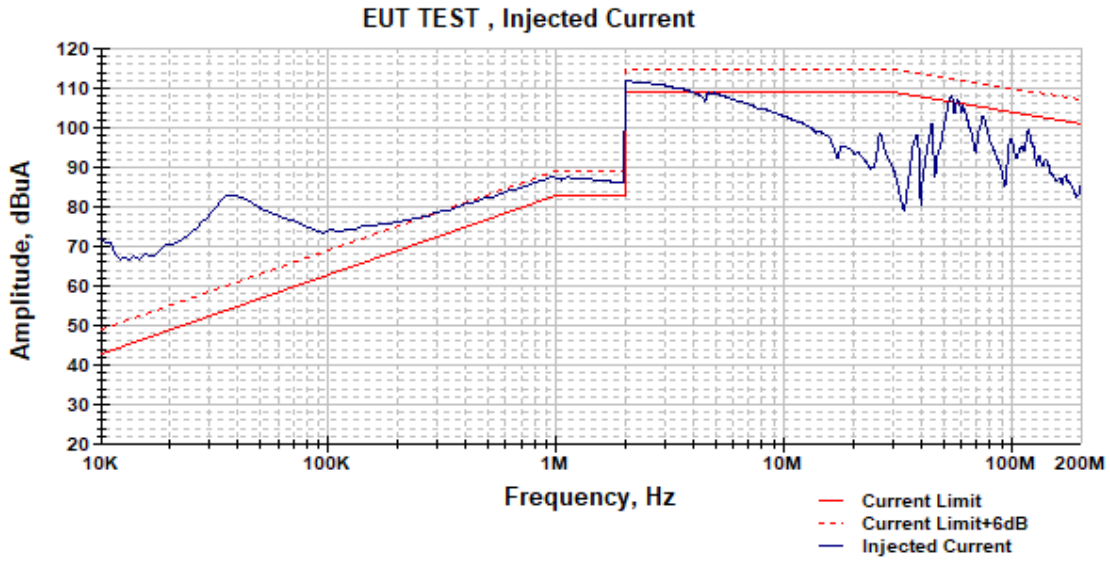
Plot 6.3: CS114 Test results in 0.01 – 200 MHz range, Entire bundle including power leads and signal J1 cable, Induced Current



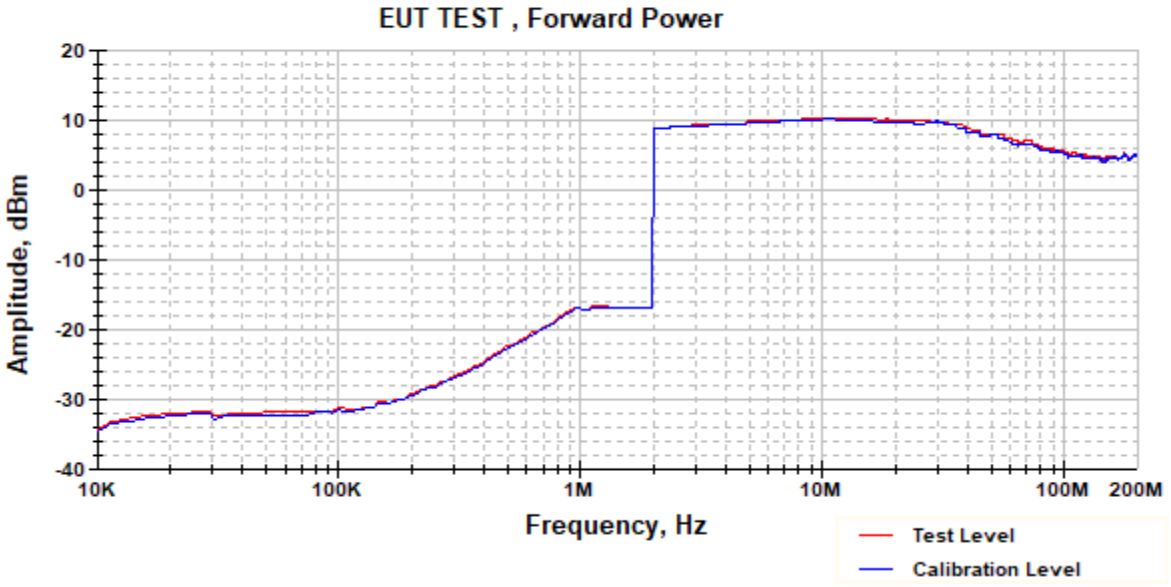
Plot 6.4: CS114 Test results in 0.01 – 200 MHz range, Entire bundle including power leads and signal J1 cable, Forward Power



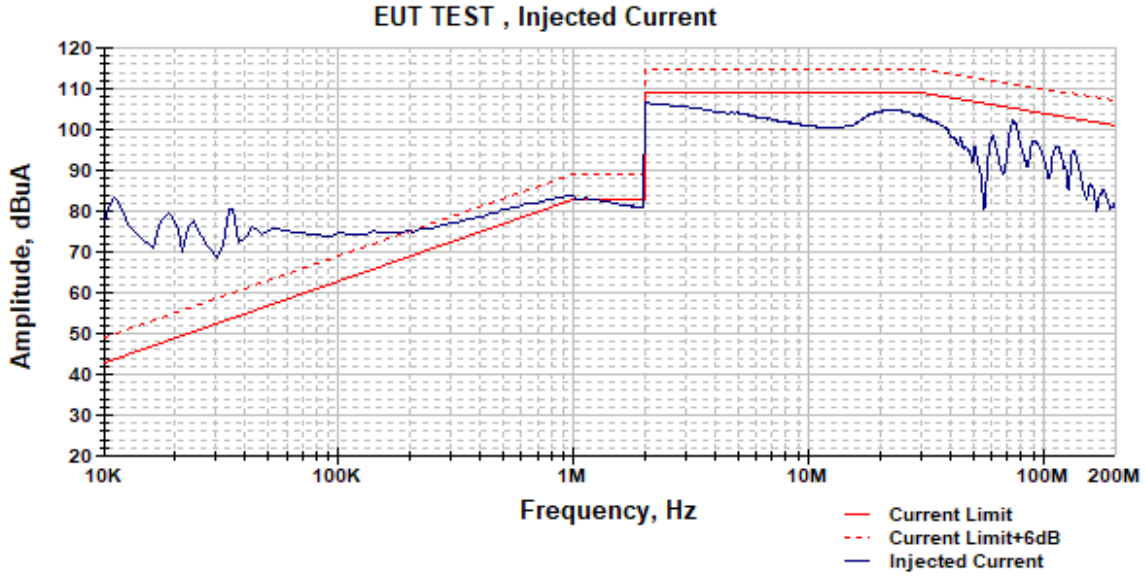
Plot 6.5: CS114 Test results in 0.01 – 200 MHz range, Power cable including returns and grounds, Induced Current



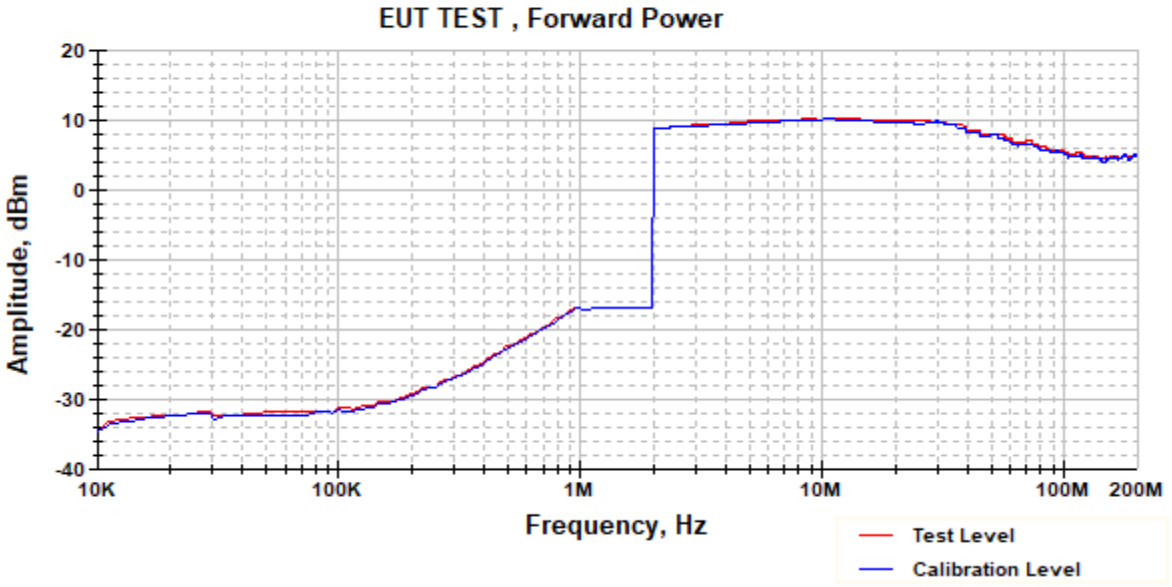
Plot 6.6: CS114 Test results in 0.01 – 200.0 MHz range, Power cable including returns and grounds, Forward Power



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



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



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%.

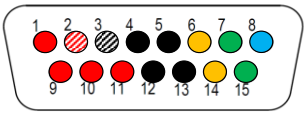
Pin Assignment

Connector: M24308/24-38F or eq.

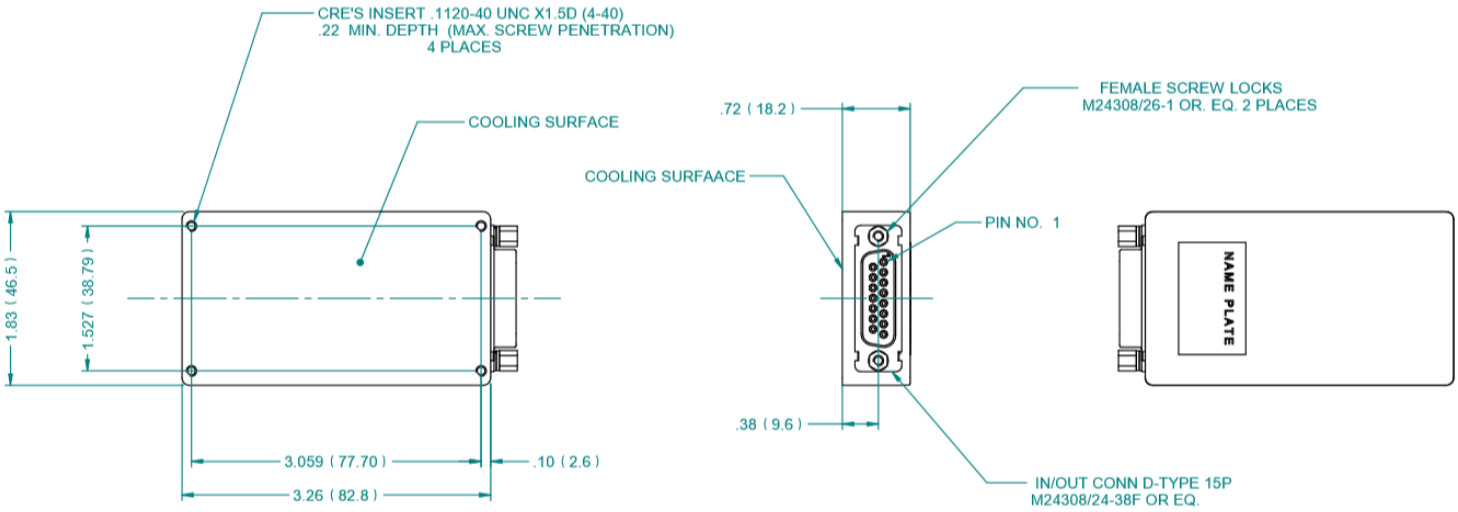
Mates with: M24308/2-2F or eq.

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	+	●



Outline Drawing



Notes

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

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
M7019-100	5 V_{DC}	13 A	82%
M7019-101	12 V_{DC}	8 A	83%
M7019-102	15 V_{DC}	7 A	84%
M7019-103	24 V_{DC}	4 A	85%
M7019-104	28 V_{DC}	3.5 A	86%

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

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