

A0101-02G-08G-P0-SMAFF Datasheet

Key Features

- Passive Device
- Frequency: 2 to 8 GHz
- Insertion Loss 2 to 8 GHz: < 2 dB
- Max CW Power Input: +40 dBm
- Max Peak Power Input: 1kW
 - 1 μ s Pulse Width
 - 0.1% Duty Cycle
- Steady State Recovery Time: < 500 ns at +30 dBm Pulsed
- -3 dB Response Time: < 50 ns at +30 dBm Pulsed
- Dimensions: 0.5in (W) x 0.5in (H) x 1.96in (L)



Applications

- Wideband Receiver Protection
- Cosite Interference Mitigation
- Simultaneous Transmit and Receive
- Enhance and Optimize Dynamic Range
- Wideband SDR/ADC Protection

Product Overview

The Metamagnetics' A0101-02G-08G-P0-SMAFF absorptive Auto-Tune Filter® (AtF) is a coaxially packaged adaptive wideband filter well suited for interference mitigation applications that require wide instantaneous bandwidth, low insertion loss, and high-power handling capability.

The AtF is a passive device that can be used to protect front end receivers and amplifiers from high power interfering signals. It is designed to selectively limit incident high power signals above the device's threshold ($P_{\text{threshold}}$), while exhibiting low linear insertion loss to below threshold signals.

The AtF automatically creates notches in its passband in response to above threshold signals without any prior knowledge about these high-power signals. The width and depth of these notches are proportional to how much above threshold the high-power signals are. The **selectivity** of the device corresponds to this notch width.

RF Specifications

| Linear Mode ($P_{input} < P_{threshold}$) 2 – 8 GHz | | | | | |
|---|---|------|------|------|------|
| Parameter | Conditions | Min. | Typ. | Max. | Unit |
| Return Loss (S_{11}) | $T_{ambient} = +20^{\circ}C$ 50 Ω system $P_{input} = -20dBm$ CW | 12.5 | 26 | — | dB |
| Insertion Loss (S_{21}) | | 1.10 | 1.60 | 2 | dB |
| Group Delay | | 0.50 | 0.60 | 0.80 | ns |

| Limiting Mode ($P_{input} > P_{threshold}$) 2 – 8 GHz | | | | | |
|---|--|------|------|------|------|
| Parameter | Conditions ¹ | Min. | Typ. | Max. | Unit |
| P1dB | | -2 | 4 | 11 | dBm |
| Power Leakage | $P_{input} = +20$ dBm | 3 | 9 | 12 | dBm |
| | $P_{input} = +30$ dBm | 8 | 17 | 22 | dBm |
| Selectivity ² (-3 dB Notch Width) | $P_{input} = +10$ dBm CW | 4 | 7 | 10 | MHz |
| | $P_{input} = +20$ dBm CW | 15 | 20 | 24 | MHz |
| | $P_{input} = +30$ dBm CW | 68 | 80 | 92 | MHz |
| Selectivity ³ (Notch Depth) | $P_{input} = +10$ dBm CW | 5 | 7 | 11 | dB |
| | $P_{input} = +20$ dBm CW | 14 | 17 | 21 | dB |
| | $P_{input} = +30$ dBm CW | 16 | 18 | 23 | dB |
| Response Time ⁴ (-3 dB) | 1 μ s Pulse Width 0.1% Duty Cycle | 50 | 150 | 400 | ns |
| Recovery Time ⁵ (Steady State) | 1 μ s Pulse Width 0.1% Duty Cycle | 400 | 450 | 500 | ns |

¹ Unless otherwise noted test conditions are as follows: $T_{ambient} = +20^{\circ}C$, 50 Ω system.

² See graphs on Page 8 for selectivity magnitude and phase curves for several input power levels.

³ See graphs on Page 9 for average notch depth across frequency for several input power levels.

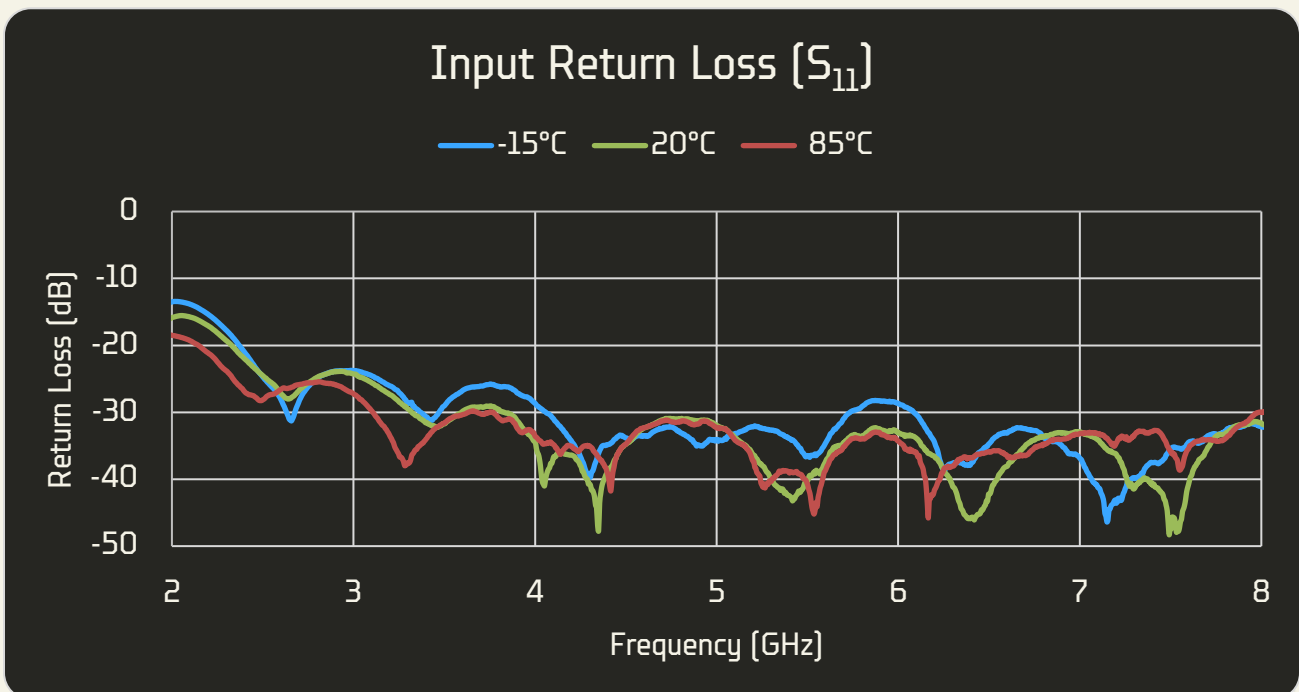
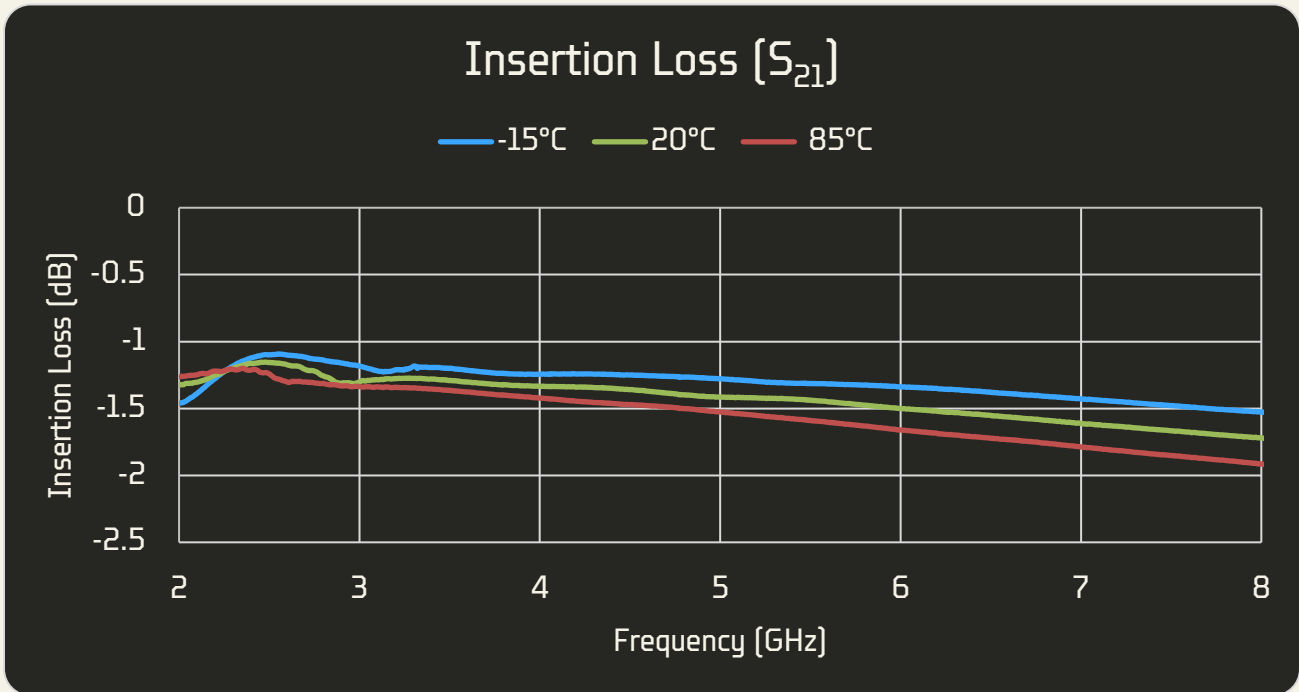
⁴ See graph on Page 10 for response and recovery time vs. input power. (*High Power Signal Frequency: 5 GHz*)

Maximum Ratings and Handling Procedures

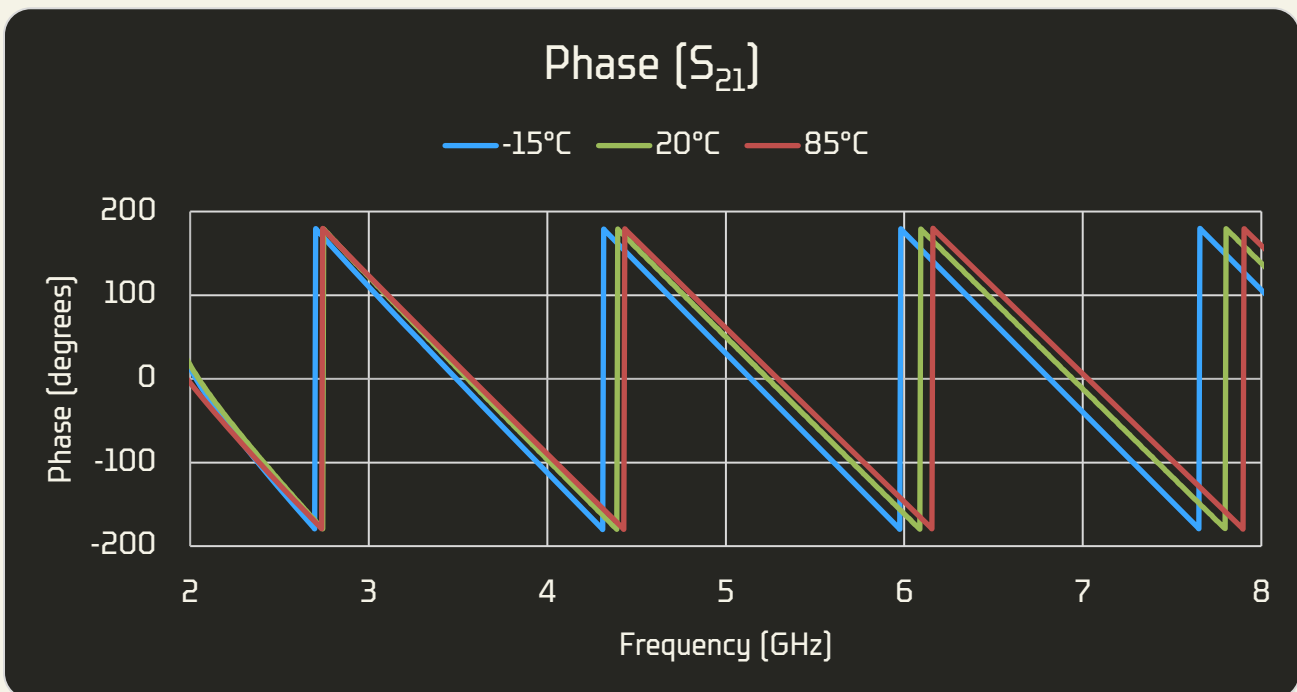
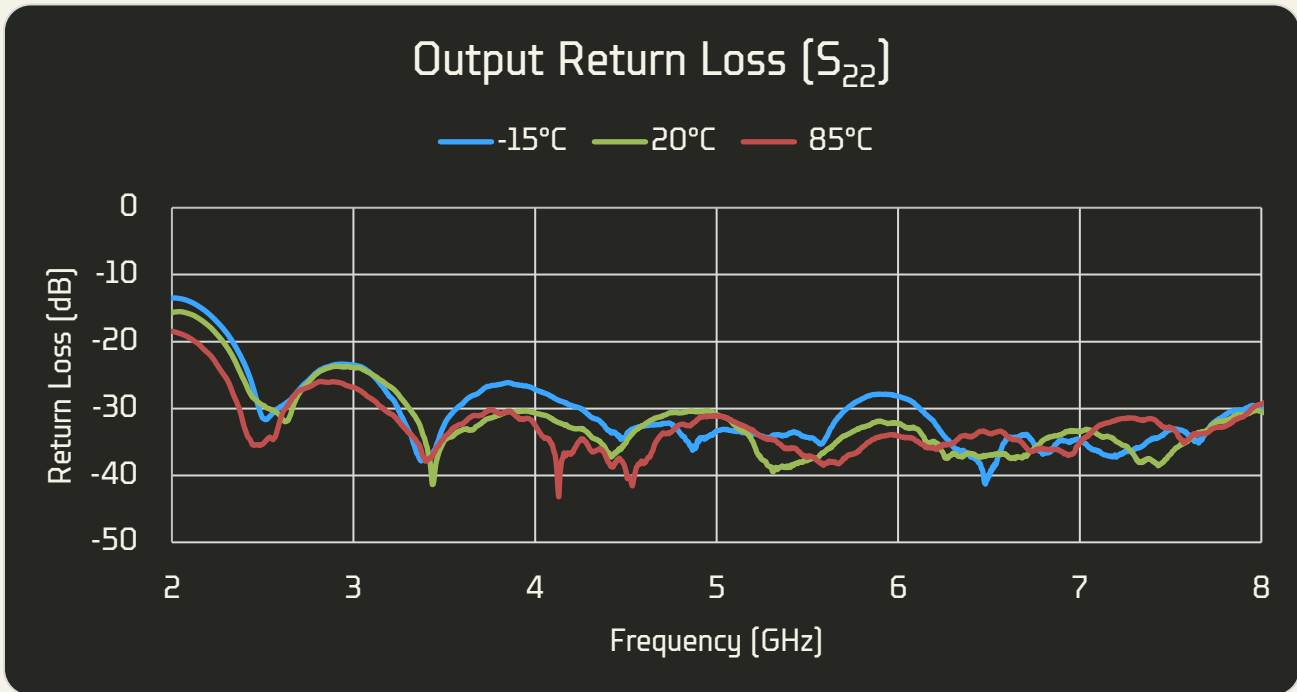
| Absolute Maximum Ratings | | |
|--|------------|--------------|
| Parameter | Rating | Unit |
| Peak Power (1 μ s Width, 0.1% Duty Cycle) | 1000 | Watts |
| RF Incident Power (CW) | +40 | dBm |
| Operating Temperature | -15 to +85 | $^{\circ}$ C |
| Storage Temperature | -40 to +85 | $^{\circ}$ C |

| Handling Procedures | |
|-------------------------------------|--|
| Magnetic Field Sensitivity | These devices ARE sensitive to magnetic fields |
| | Keep away from permanent magnets or ferrous tools during operation and testing |
| Electrostatic Discharge Sensitivity | These devices are NOT sensitive to ESD |

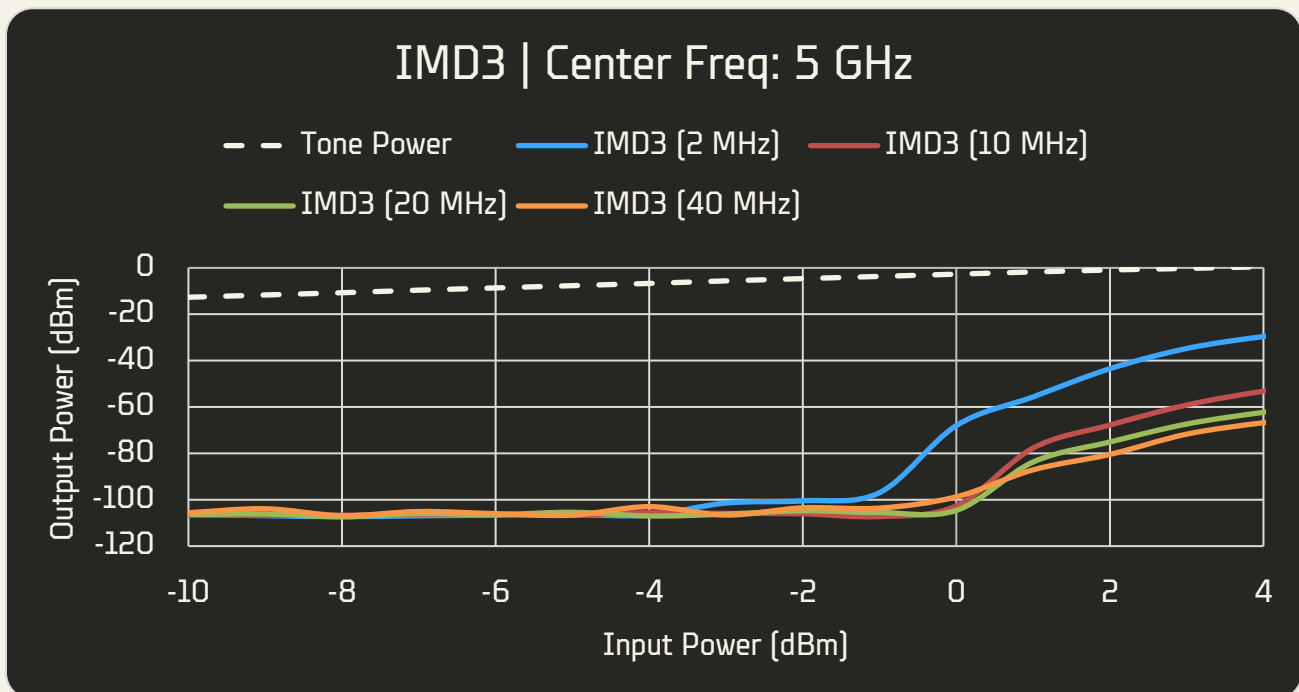
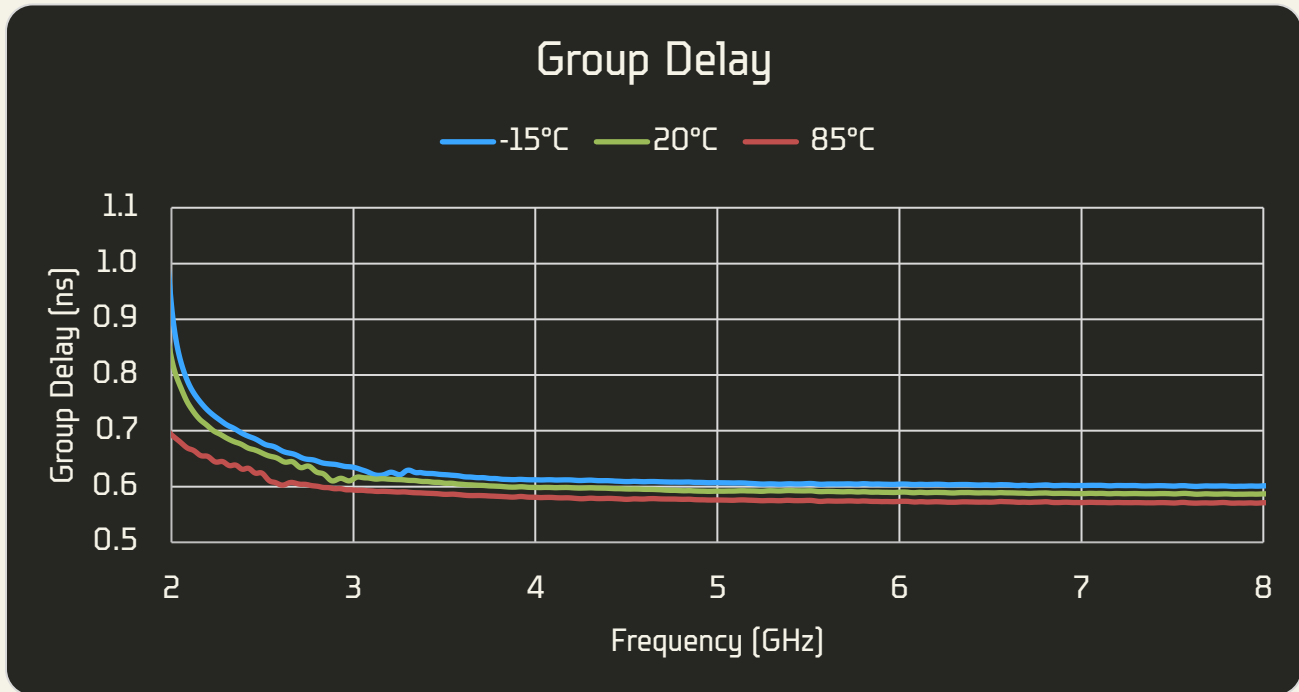
Performance Data – Linear Mode



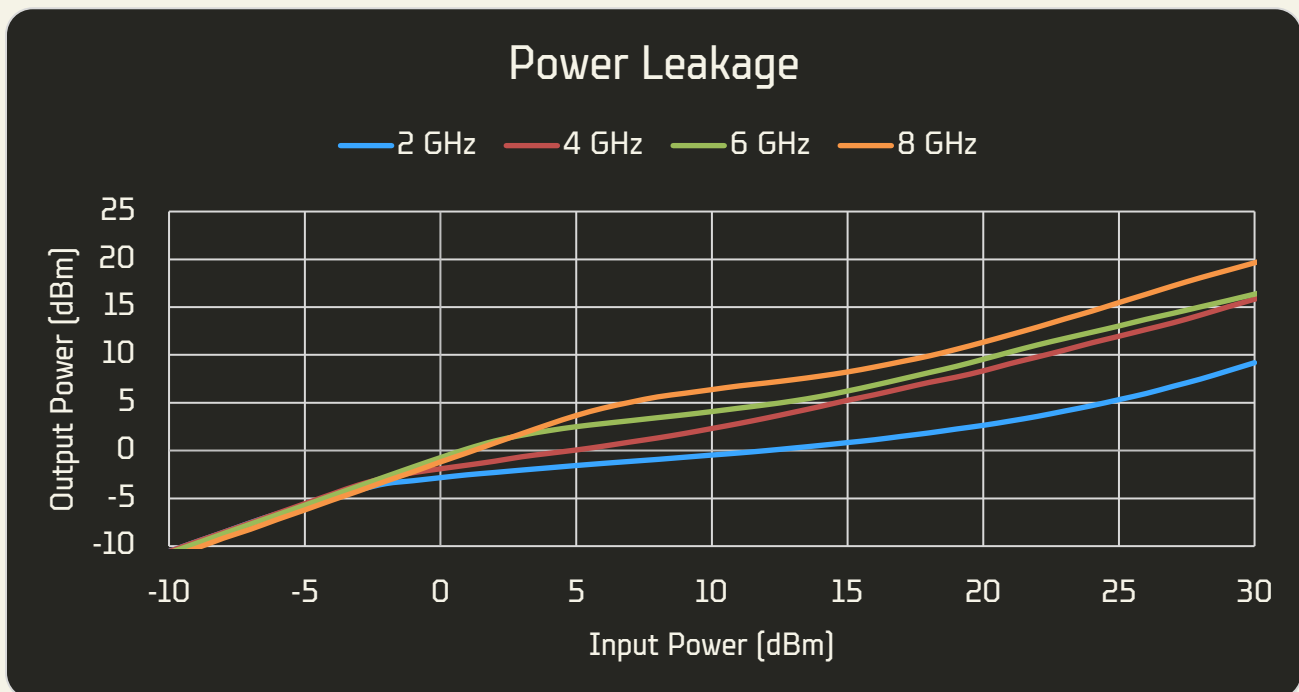
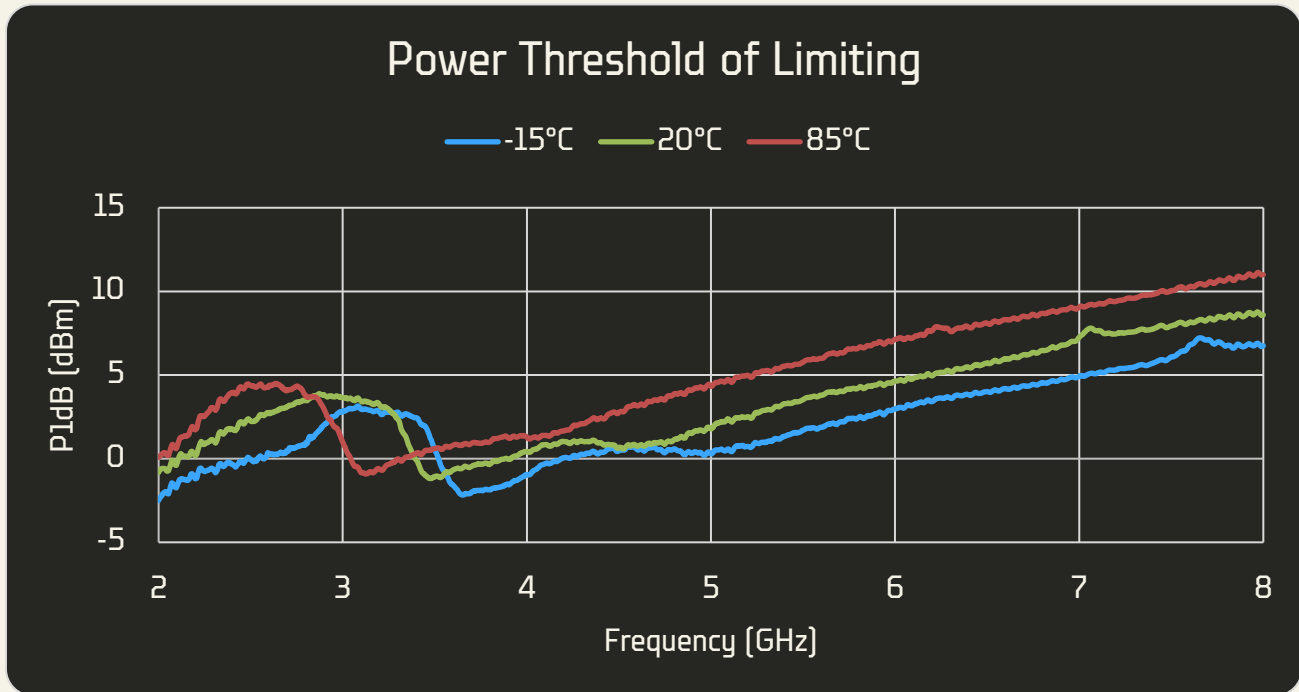
Performance Data – Linear Mode



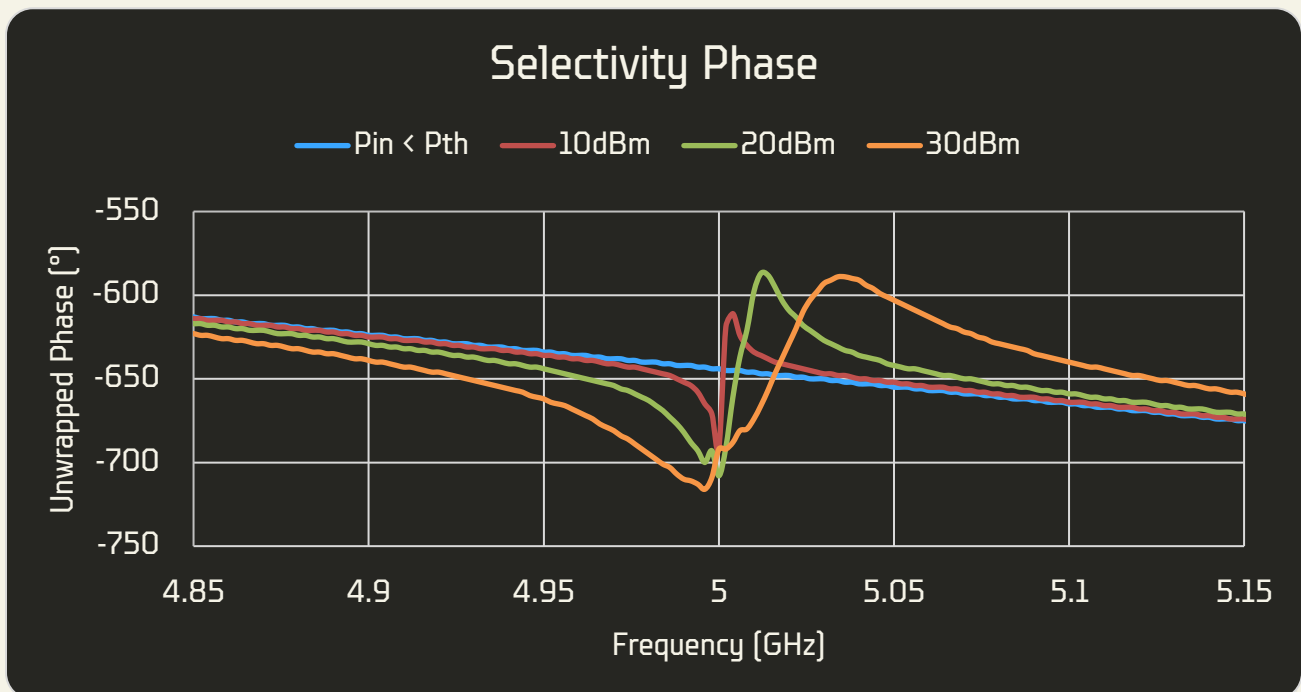
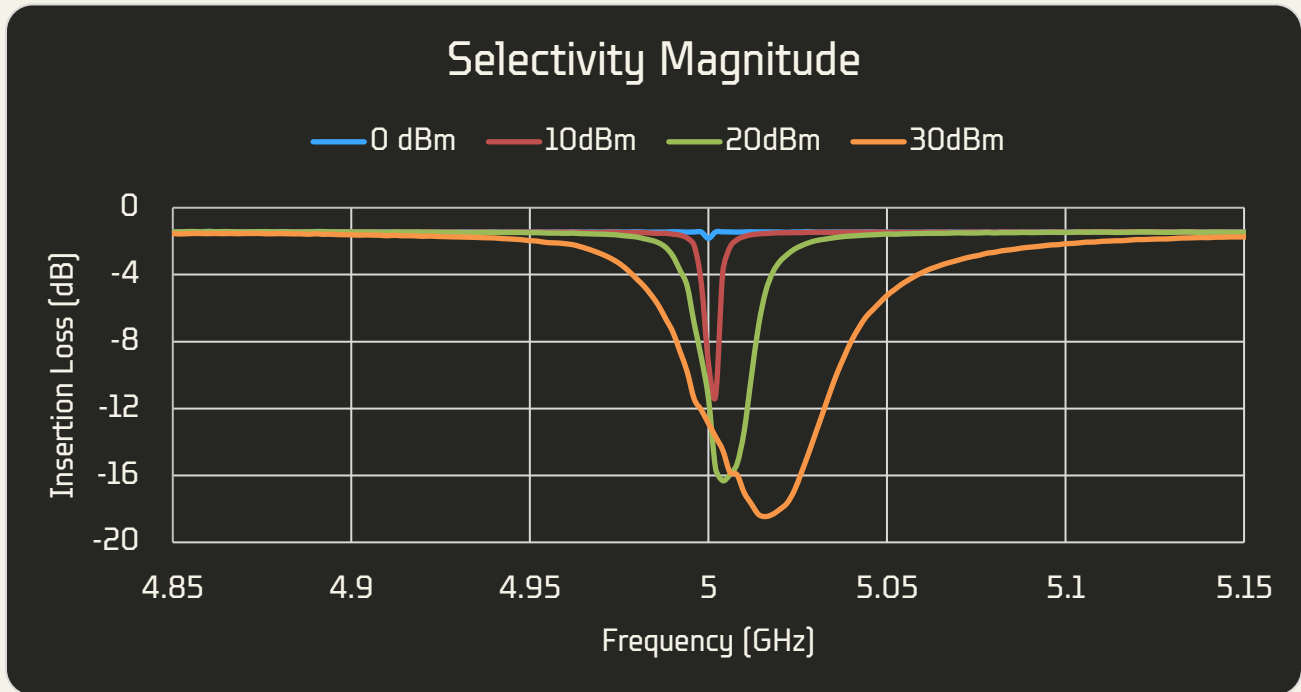
Performance Data – Linear Mode



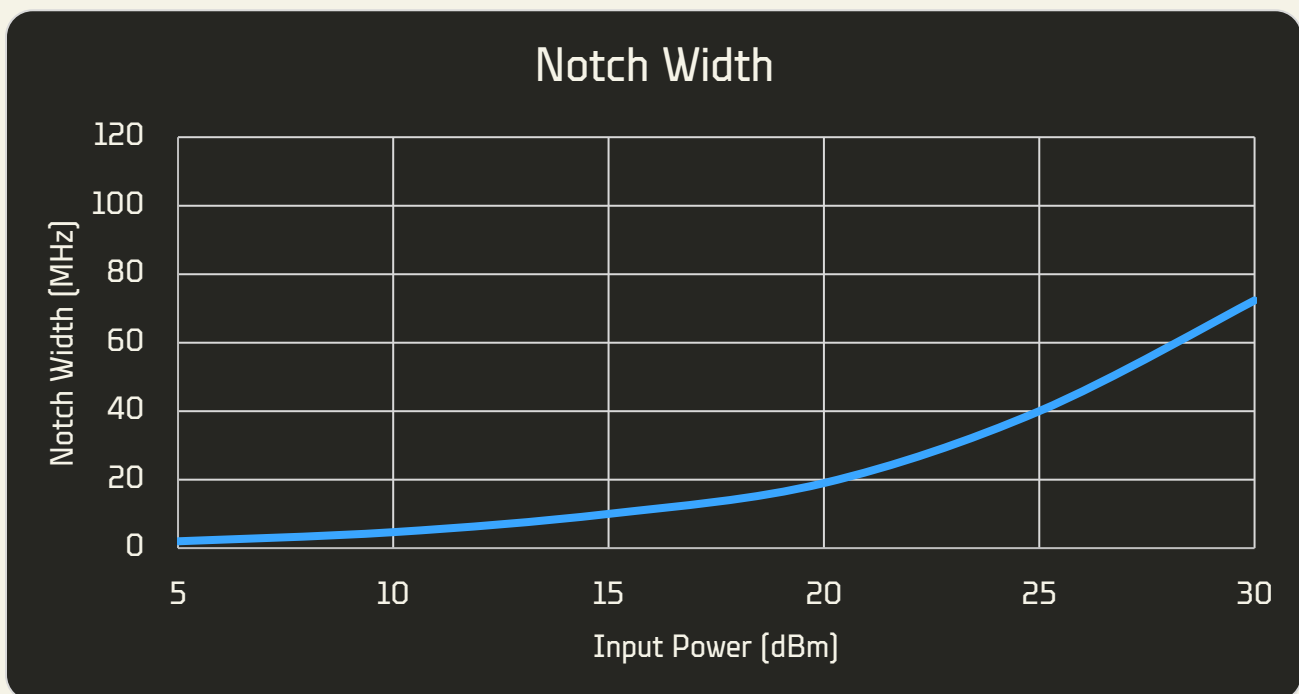
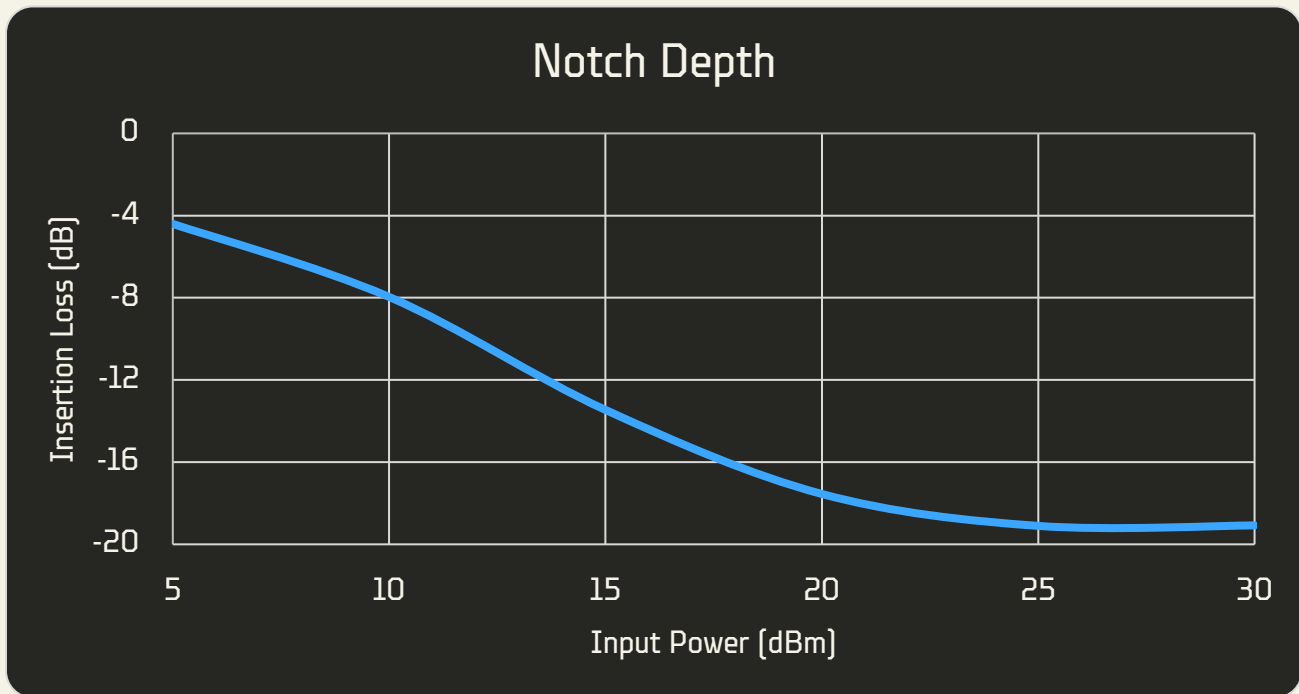
Performance Data – Limiting Mode



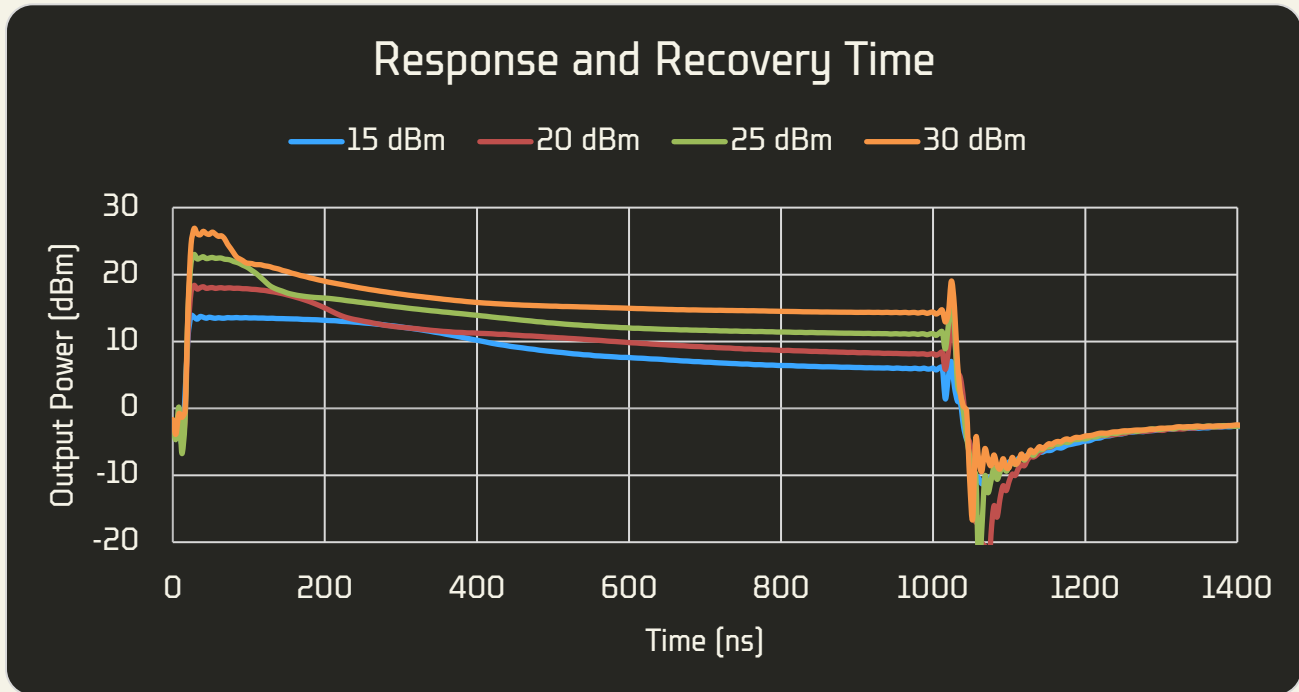
Performance Data – Limiting Mode



Performance Data – Limiting Mode

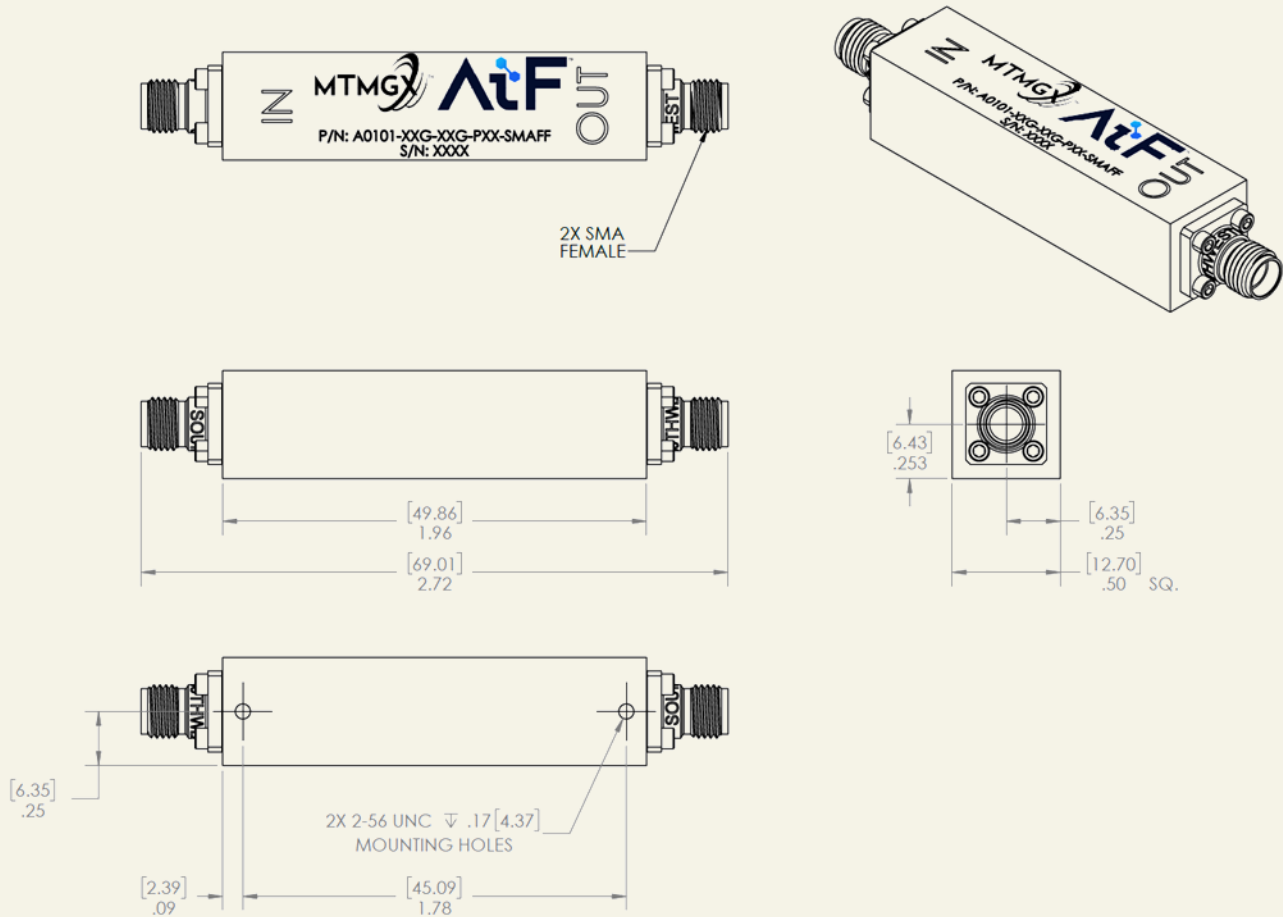


Performance Data – Limiting Mode



High Power Signal Frequency: 5 GHz

Package Outline Dimensions



Ordering Information

| Part Number | Package Type |
|------------------------|----------------------------|
| A0101-02G-08G-P0-SMAFF | Connectorized (SMA Female) |

Contact Information

For the latest specifications, additional product information, worldwide sales, and distribution locations:

Address: 261 Cedar Hill Street, Suite 130, Marlborough, MA 01752

Telephone: (781) 562-0756

Fax: (781) 253-3913

Web: www.metamag.us

Email: sales@metamag.us

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