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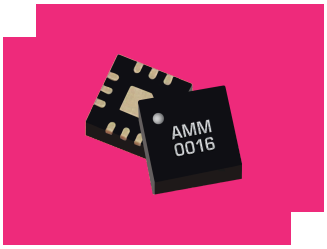
AMM-10858PSM

3-30 GHz Broadband Driver Amplifier

DEVICE OVERVIEW

General Description

The AMM-10858PSM is a wideband pHEMT-based GaAs surface-mount driver amplifier operating from 3 to 30 GHz. This amplifier offers high gain at 20 dB, +20 dBm saturated output power, and strong linearity with output IP3 of +29 dBm. It's an excellent driver for our H- and S-diode mixers and multipliers, and comes in a compact 3 mm surface-mount package for easy integration onto printed circuit boards.



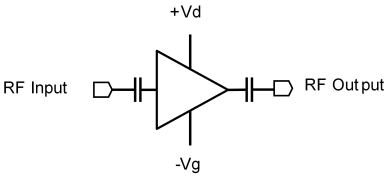
Features

- Wideband, 3 to 30 GHz
- High Gain, 20 dB Typical
- High Output Power, +20 dBm Typical
- Minimal Application Circuit
- Internal Blocking Capacitors
- Small 3 x 3 mm QFN Package

Applications

- Satellite Communications
- Electronic Warfare
- Driver Amplifier for H and S - Diode Mixers
- Test and Measurement Equipment
- Wireless Backhaul

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
AMM-10858PSM	3-30 GHz Broadband Driver Amplifier	Plastic QFN	REACH RoHS	Released	EAR99
EVB-AMM-10858P	Evaluation Board, 3 - 30 GHz Broadband Driver Amplifier	EVB	REACH RoHS	Released	EAR99

Table Of Contents

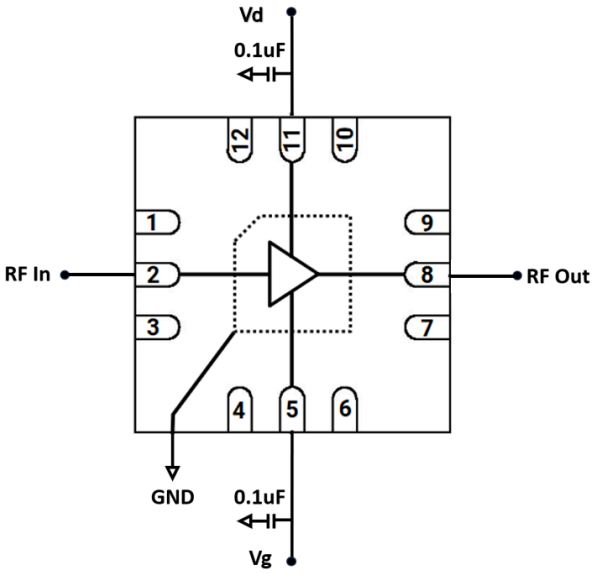
Revision History

Revision Code	Revision Date	Comment
-	2026-04-01	Initial Release

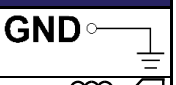
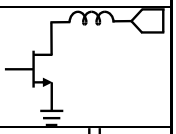
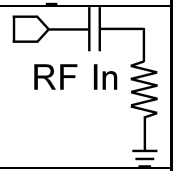
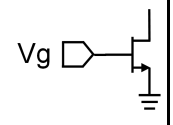
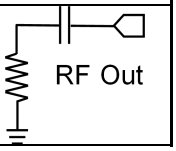
Port Configuration and Functions

Port Diagram

A port diagram of the AMM-10858PSM is shown below (X-ray view).



Port Functions

Port	Function	Description	DC Equivalent Circuit
Ground Paddle	Ground	Ground paddle and non-connected pins must be connected to a DC/RF ground potential with high thermal and electrical conductivity, and low inductance.	
Pin 11	Vd	Pin 11 is the DC bias supply for the amplifier. The voltage at this pin should be set to 4V for normal operation. This part requires an off-chip bypass capacitor of 0.1uF installed at this pin as close to the IC as possible. See applications circuit.	
Pin 2	RF Input	Pin 2 is the amplifier's RF input pin. This port is internally matched to 50 Ohms and is internally DC blocked.	
Pin 5	Vg	This is the negative DC bias voltage for the amplifier IC. The voltage at this pin controls the current draw Id of the part. Higher voltage results in higher current. For normal operation, the voltage at this pin is adjusted to produce an Id of 84mA when Vd=4V. This part requires an off-chip 0.1uF bypass capacitor installed at this pin as close to the IC as possible. See applications circuit.	
Pin 8	RF Output	Pin 8 is the amplifier's RF output pin. This port is internally matched to 50 Ohms and is internally DC blocked.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime. This amplifier is designed and characterized in a 50Ω system, and operation in a reflective environment can cause performance degradation

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	85	°C
Maximum Storage Temperature	150	°C
Max Junction Temperature for MTTF > 1E6 hours	175	°C
Minimum Operating Temperature	-40	°C
Minimum Storage Temperature	-65	°C
Positive Drain Supply Current (with RF Input)	130	mA
Positive Drain Supply Voltage (Vd)	4.5	V
RF Input Power	15	dBm
Gate Supply Voltage (Vg)	0	V
Thermal Resistance, θJC	135	°C/W

Package Information

Parameter	Details	Rating
ESD	< 250 Volts	HBM Class 0
Dimensions	-	3 x 3 mm
Moisture Sensitivity Level	-	MSL 1

Recommended Operating Conditions

The Recommended Operating Conditions indicate the limits, inside which the device should be operated, to guarantee the performance given in Electrical Specifications. Operating outside these limits may not necessarily cause damage to the device, but the performance may degrade outside the limits of the Electrical Specifications. For limits, above which damage may occur, see Absolute Maximum Ratings .

Parameter	Min	Nominal	Max	Unit
Power Supply DC Voltage (Vd)	3	4	4	V
Ambient Temperature	-40	25	85	°C
Gate Bias DC Voltage (Vg)	-0.3	-0.16	-0.05	V
Positive DC Current (Id) (No RF Input)	62	84	100	mA

Sequencing Requirements

Turn-on Procedure:
1. Apply Vg
2. Apply Vd

Turn-off Procedure:
1. Turn off Vd
2. Turn off Vg

Note: RF input power can be injected at any moment in the bias sequencing procedure.

Electrical Specifications

The electrical specifications apply at TA=+25°C in a 50Ω system. QFNs are 100% RF tested.

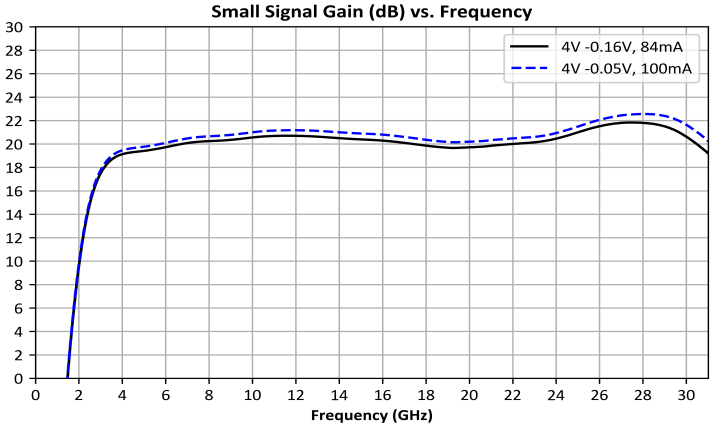
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Small Signal Gain	4V/-0.16V bias, -20 dBm Input Power	3	30	-	20	-	dB
Input Return Loss	4V/-0.16V bias, -20 dBm Input Power	3	30	-	17	-	dB
Output Return Loss	4V/-0.16V bias, -20 dBm Input Power	3	30	-	8	-	dB
Reverse Isolation	4V/-0.16V bias, -20dBm Input Power	3	30	-	47	-	dB
Noise Figure	4V/-0.16V bias, -30 dBm Input Power	3	30	-	6.1	-	dB
Input P1dB	4V/-0.16V bias	3	30	-	-1.2	-	dBm
Output P1dB	4V/-0.16V bias	3	30	-	17.7	-	dBm
Saturated Output Power	4V/-0.16V Bias	3	30	-	20.2	-	dBm
Input IP3	4V/-0.16V bias, -15dBm input, 1 MHz tone spacing	3	30	-	8.4	-	dBm
Output IP3	4V/-0.16V bias, -15dBm input, 1 MHz tone spacing	3	30	-	29	-	dBm
Input IP2	4V/-0.16V bias, -15dBm input, 1 MHz tone spacing	3	15	-	16.9	-	dBm
Output IP2	4V/-0.16V bias, -15dBm input, 1 MHz tone spacing	3	15	-	37	-	dBm
Current Consumption [1]	4V/-0.16V bias	-	-	-	84	-	mA

[1] Bias conditions for Id tested with no RF input power. Bias conditions presented as Vd/Vg

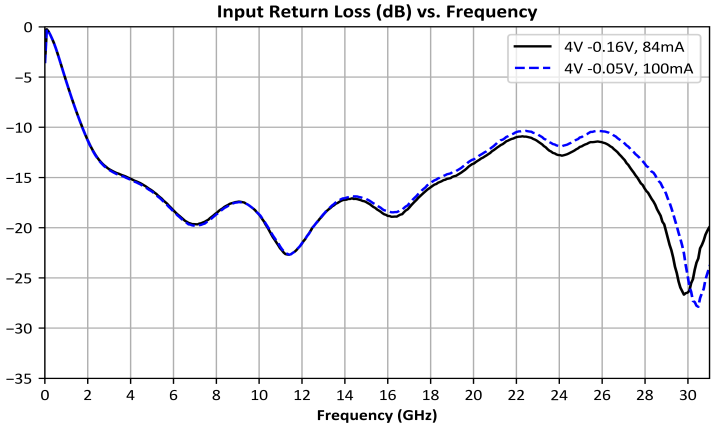
Typical Performance Plots (vs Bias)

Measurement data de-embedded using standard evaluation board.

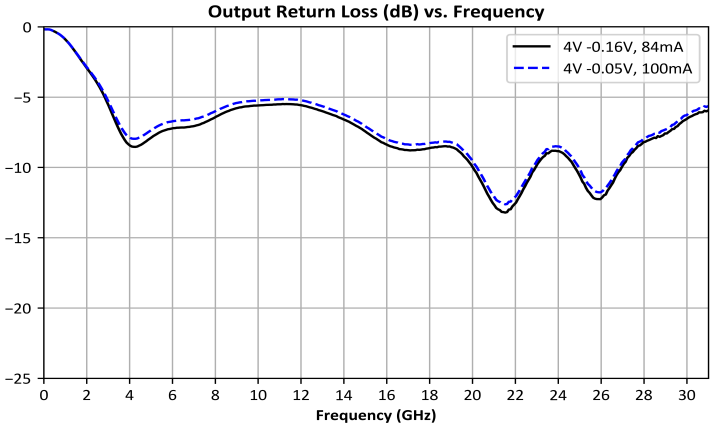
Small Signal Gain (dB) vs. Frequency



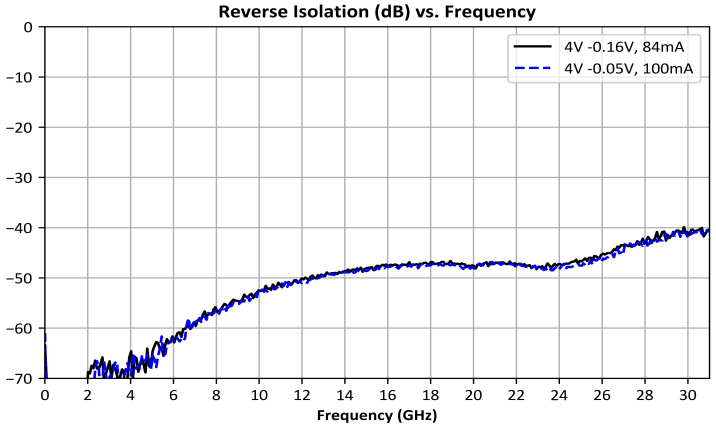
Input Return Loss (dB) vs. Frequency



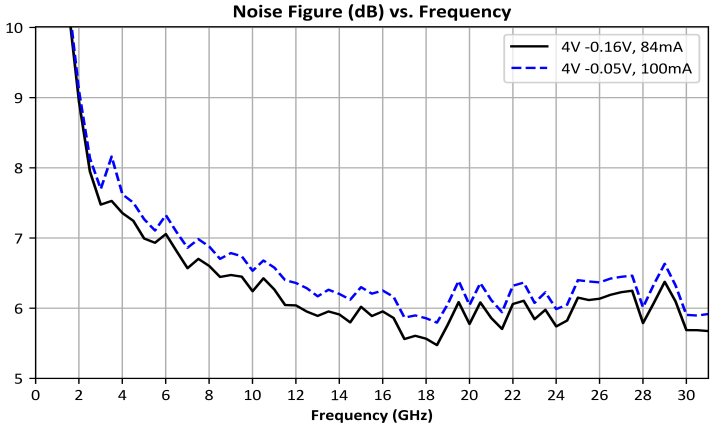
Output Return Loss (dB) vs. Frequency



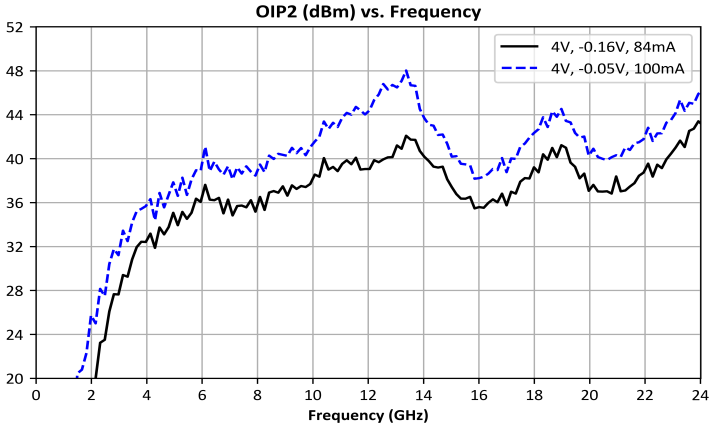
Reverse Isolation (dB) vs. Frequency



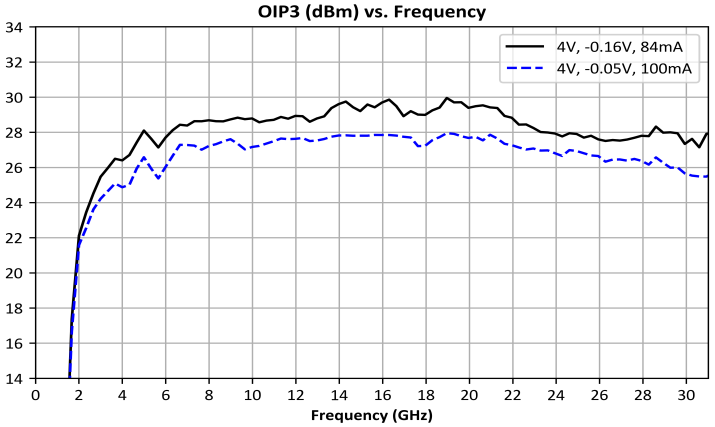
Noise Figure (dB) vs. Frequency



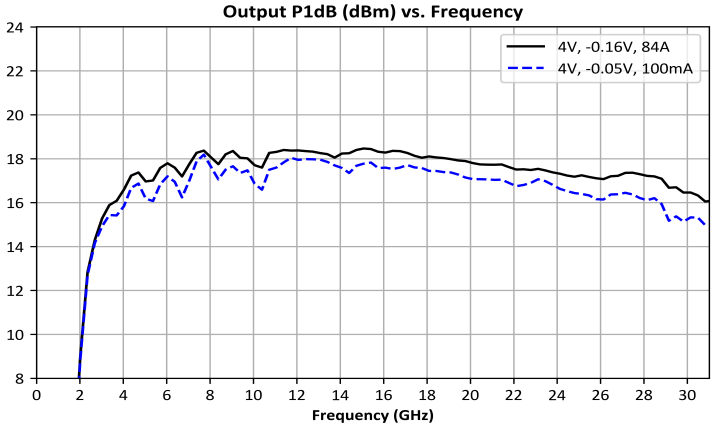
OIP2 (dBm) vs. Frequency

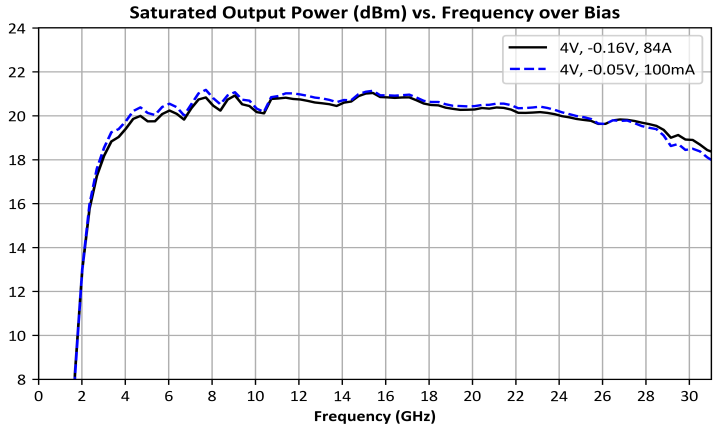


OIP3 (dBm) vs. Frequency



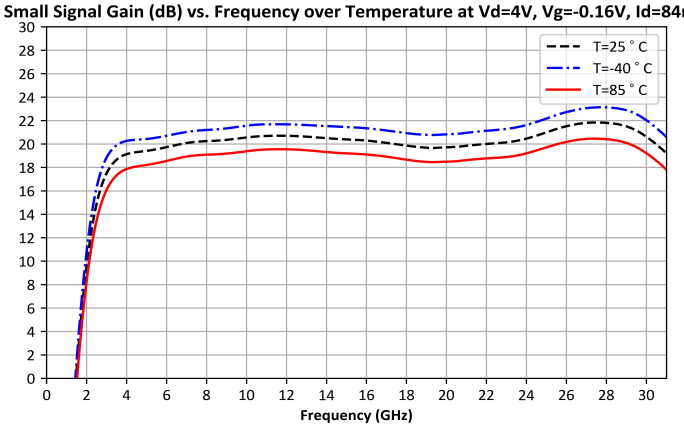
Output P1dB (dBm) vs. Frequency



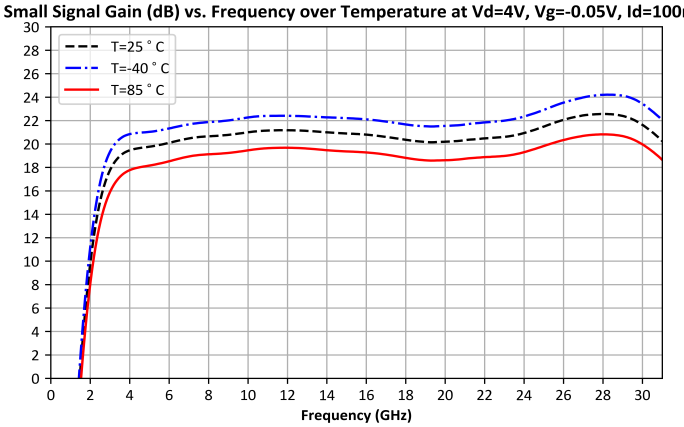


Typical Performance Plots (vs Temperature)

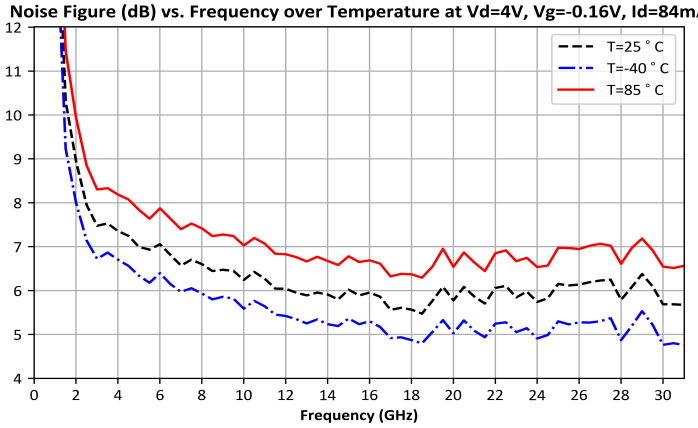
Small Signal Gain (dB) vs. Frequency over Temperature at Vd=4V, Vg=-0.16V, Id=84mA



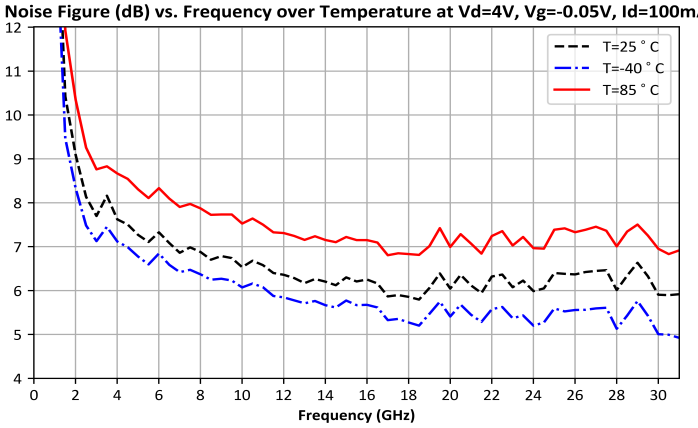
Small Signal Gain (dB) vs. Frequency over Temperature at Vd=4V, Vg=-0.05V, Id=100mA



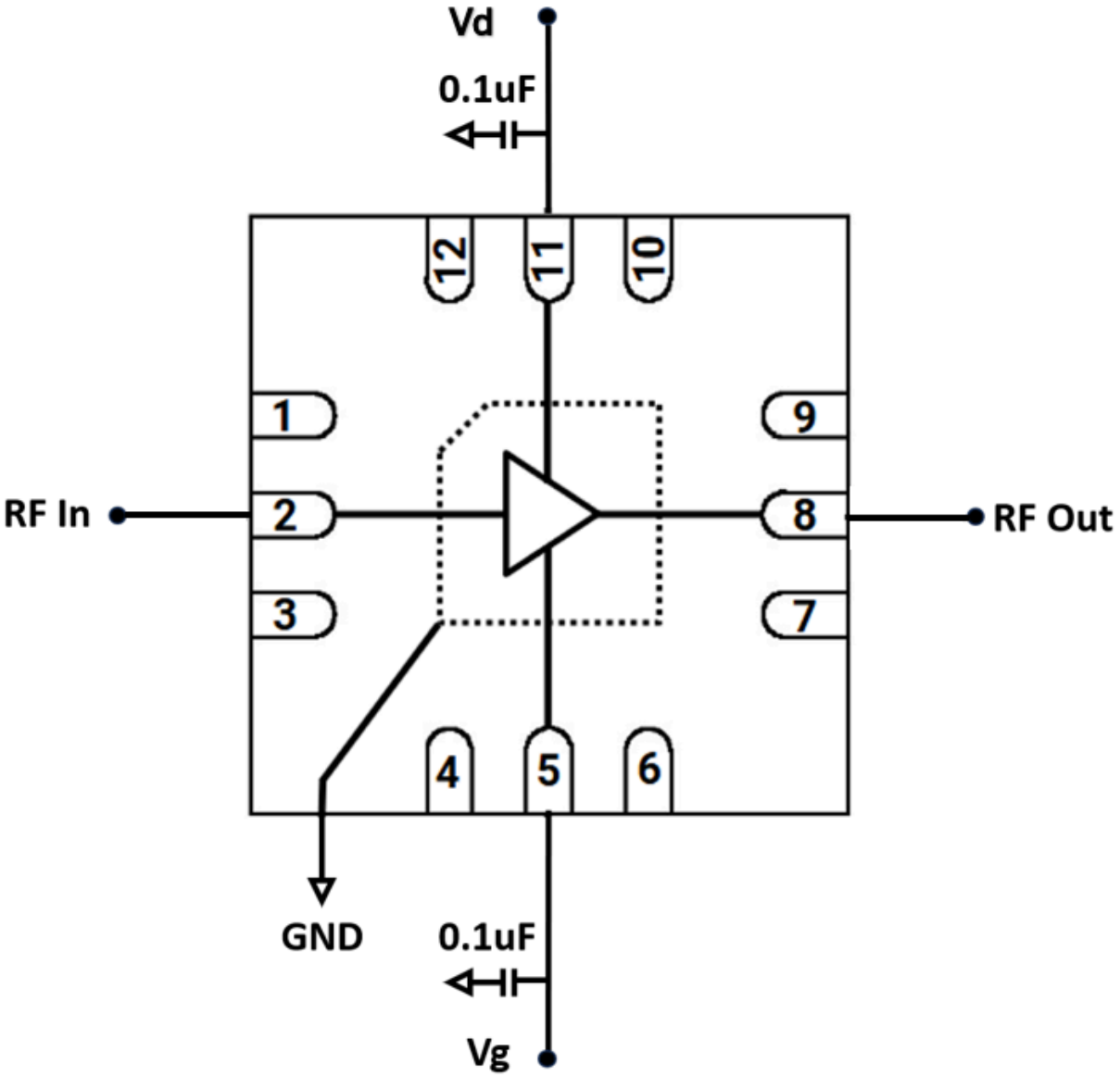
Noise Figure (dB) vs. Frequency over Temperature at Vd=4V, Vg=-0.16V, Id=84mA



Noise Figure (dB) vs. Frequency over Temperature at Vd=4V, Vg=-0.05V, Id=100mA



Application Circuit



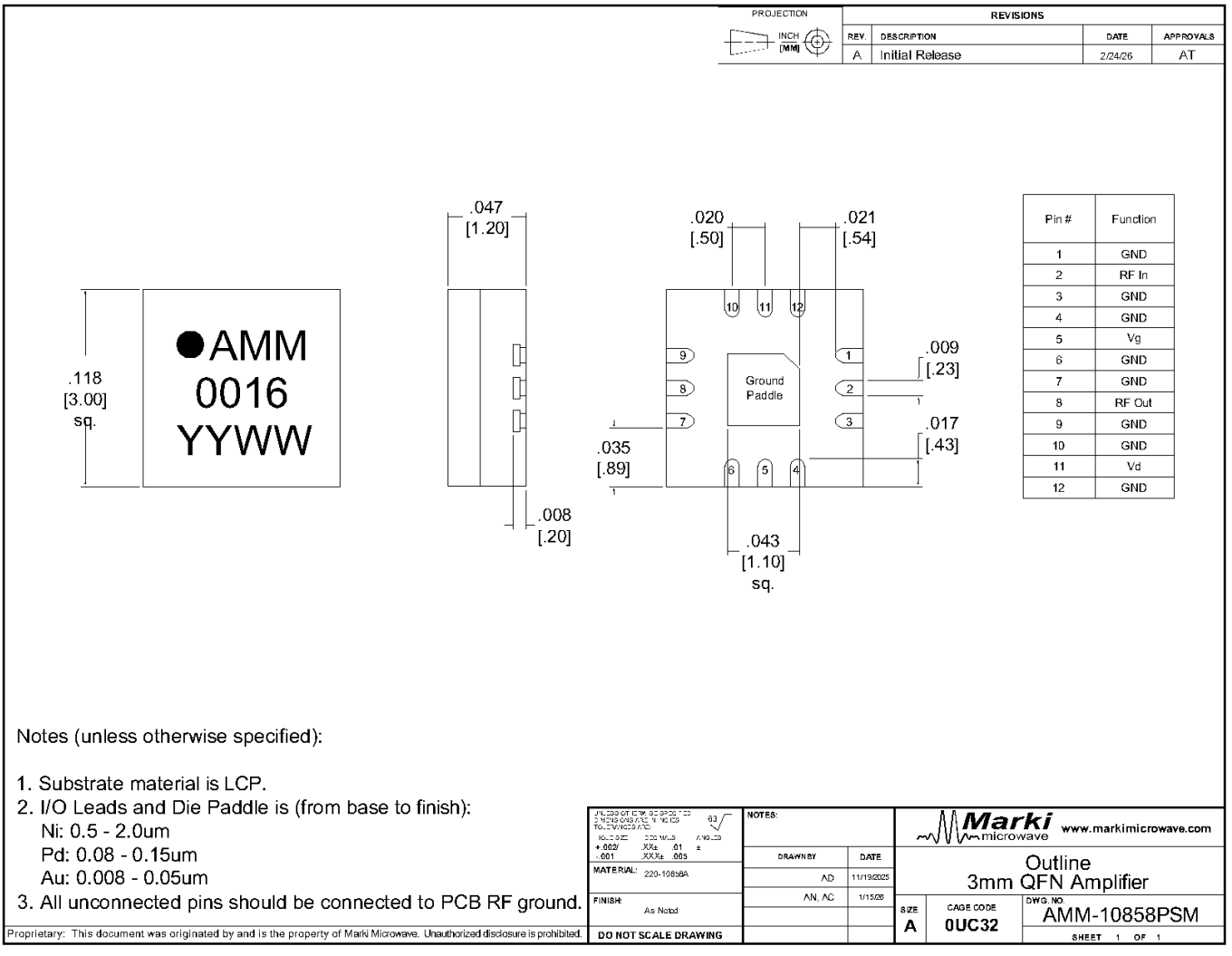
Application Circuit Description

Above is the recommended application circuit for the AMM-10858PSM. DC drain voltage is supplied to the amplifier across a 0.1uF bypass capacitor to the Vd pin. DC gate voltage is supplied to the amplifier across a 0.1uF bypass capacitor to the Vg pin. The RF input and output ports are internally DC blocked.

Mechanical Data

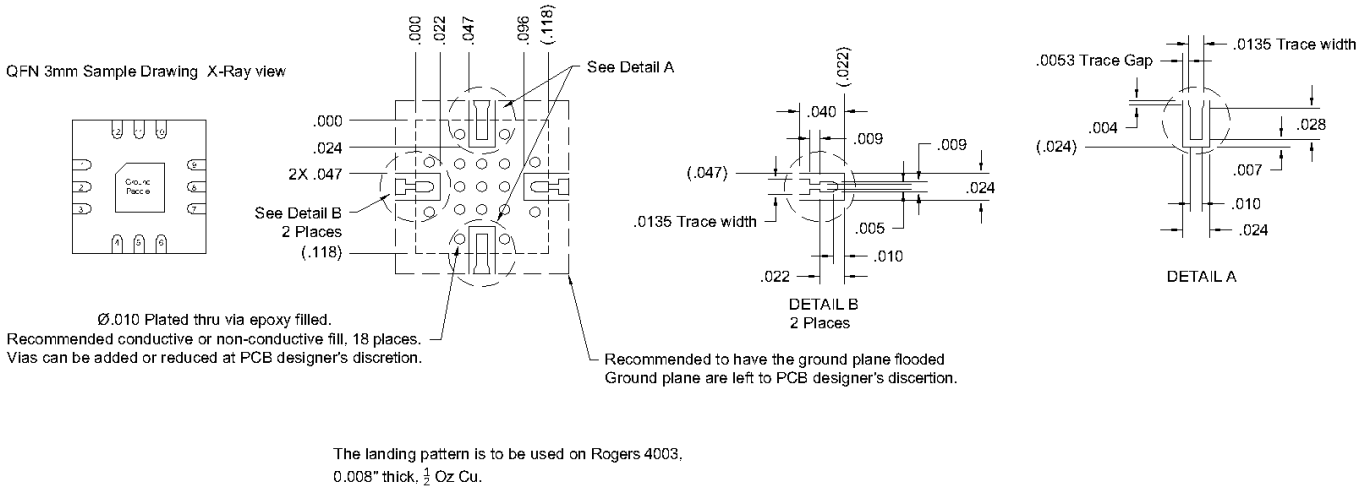
Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



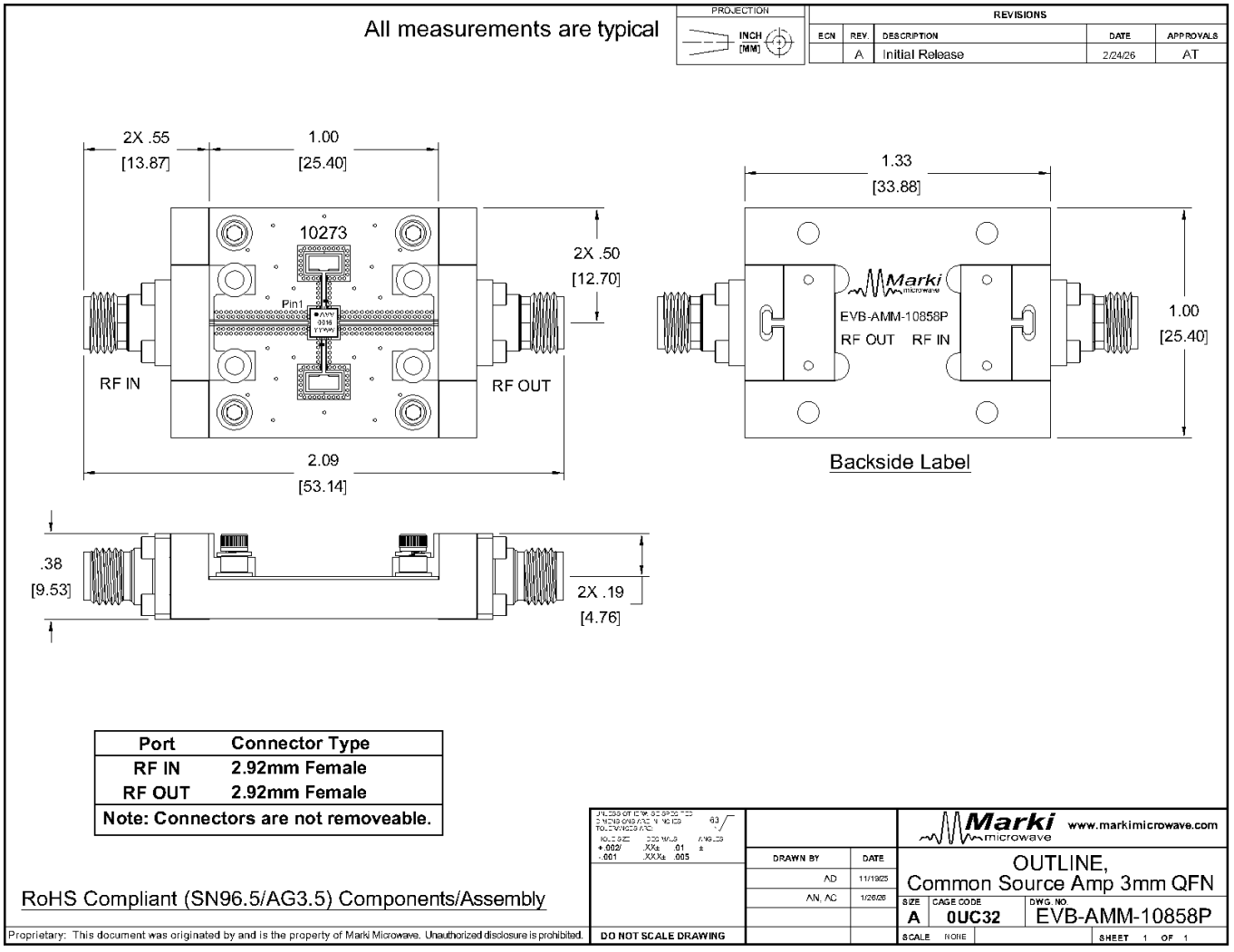
Footprint Image

Download : Footprint Drawing



The landing pattern is to be used on Rogers 4003,
0.008" thick, $\frac{1}{2}$ Oz Cu.

Evaluation Board - Outline Drawing



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