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Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

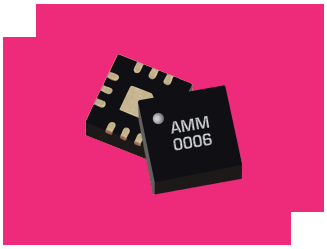
ADM-11980PSM

ADM-11980PSM

DEVICE OVERVIEW

General Description

The ADM-11980PSM is a wideband low noise amplifier capable of providing 14dB gain and +33 dBm OIP3 with a low 2 dB typical noise figure. The ADM-11980PSM is an ideal linear signal amplifier for applications requiring low power consumption and small form-factors. This amplifier has exceptionally flat response across its entire operating bandwidth.



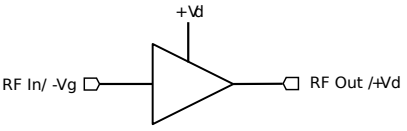
Features

- Broadband DC to 18GHz Operation
- Low Noise Figure
- Exceptionally Flat RF Performance Across Frequency
- Excellent Return Losses

Applications

- Mobile test and measurement equipment
- Radar and satellite communications
- 5G Transceivers
- LO driver for Marki L-, H-, and S-diode mixers

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
ADM-11980PSM	ADM-11980PSM	QFN	REACH RoHS	Pre-release	EAR99

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Revision History

Revision Code	Revision Date	Comment
G1	2026-11-02	Initial Draft

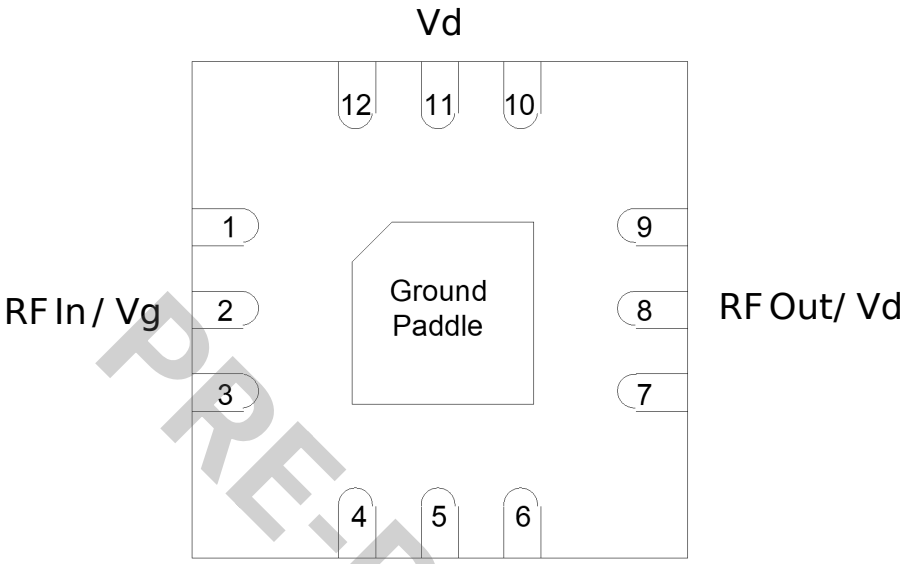
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Port Configuration and Functions

Port Diagram

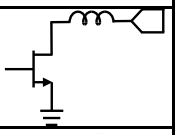
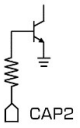
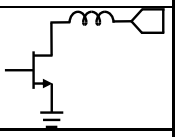
A port diagram of the ADM-11980PSM's QFN package is shown below. The diagram is shown as a top down x-ray view.



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Port Functions

Port	Function	Description	DC Equivalent Circuit
GND	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. This pin should be connected to the same supply voltage being used to supply the pin 8 "RF Out / Vd" bias-tee.	
Pin 2	RF Input	Pin 2 is the RF input of the amplifier and also provides DC bias to the amplifier. This input in internally RF matched to 50 Ohms and requires a bias-tee to Pin 5. Pin 5 is a current mirror that generates a stable bias for the amplifier across temperature and process. Current Ig will flow out of this port.	
Pin 5	Vg	Pin 5 is a current mirror that generates the bias voltage for the circuit when connected to Pin 2 through a bias tee.	-
Pin 8	RF Out / Vd	Pin 8 is the RF output and primary DC power supply of the amplifier. This pin is internally RF matched to 50 ohms and requires an external bias-tee connected to a positive DC supply voltage.	
Pins 1,3,4,6,7,9,10,12	Ground	ADJUST THESE PINS ARE GROUND These pins are not internally connected to the amplifier die. It is recommended to connect these pins to ground to provide RF isolation and mechanical stability. See the recommended landing pattern for details. Datasheet performance was measured with these pins connected to GND.	-

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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 Storage Temperature	150	°C
Max Junction Temperature for MTTF > 1E6 hours	175	°C
Thermal Resistance, θJC	**TBD**	°C/W
Minimum Operating Temperature	-40	°C
Positive Drain Supply Current (with RF Input)	80	mA
Maximum Operating Temperature	85	°C
Minimum Storage Temperature	-65	°C
Positive Drain Supply Voltage (Pin 8, 11)	8	V
RF Input Power	20	dBm

FIT and MTTF Table

T (°C)	λ (TIF)	MTTF (hr)	MTTF (yr)
105	2,441.45	4.10E+05	47
85	310.48	3.22E+06	368
55	8.79	1.14E+08	12,992
25	0.12	8.24E+09	941,063

Package Information

Parameter	Details	Rating
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
Ambient Temperature	-40	25	85	°C
Power Supply DC Voltage	3	5	5.5	V
Positive DC Current (Id) (No RF Input)	35	60	70	mA

Sequencing Requirements

Turn-on Procedure:
1. Apply Vd (Pin 8, 11)

Turn-off Procedure:
1. Turn off Vd (Pin 8, 11)

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

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Electrical Specifications

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

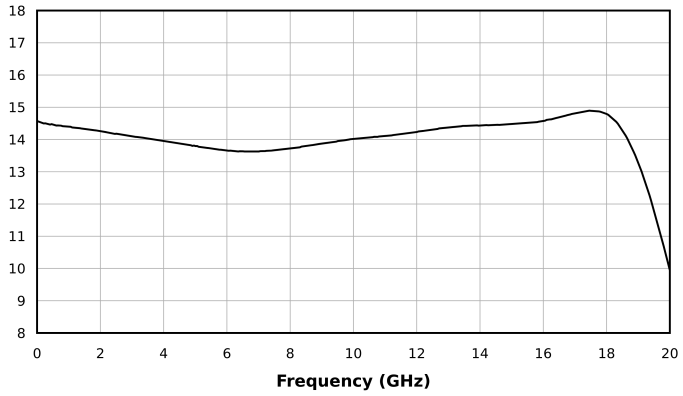
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Small Signal Gain	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	14.2	-	dB
Input Return Loss	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	14	-	dB
Output Return Loss	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	14	-	dB
Reverse Isolation	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	19	-	dB
Output P1dB	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	12.5	-	dBm
Input IP3	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	10	-	dBm
Output IP3	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	24	-	dBm
Noise Figure	Temp = 25°C, Vb1=4V, Id1=40mA	0	18	-	2.1	-	dB

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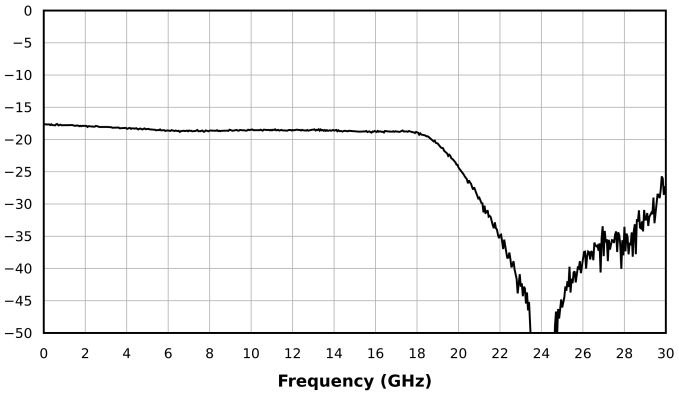
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Typical Performance

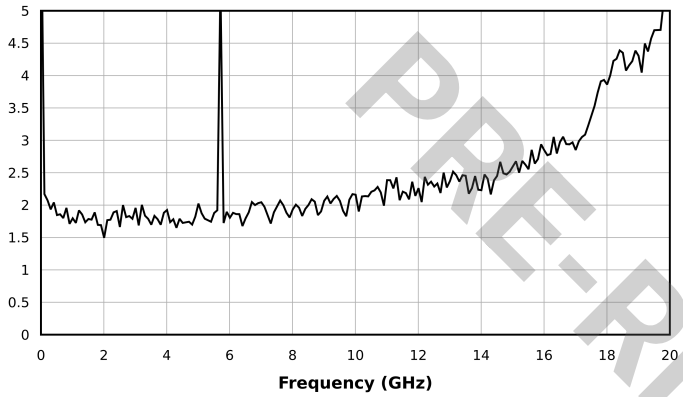
Small Signal Gain (dB)



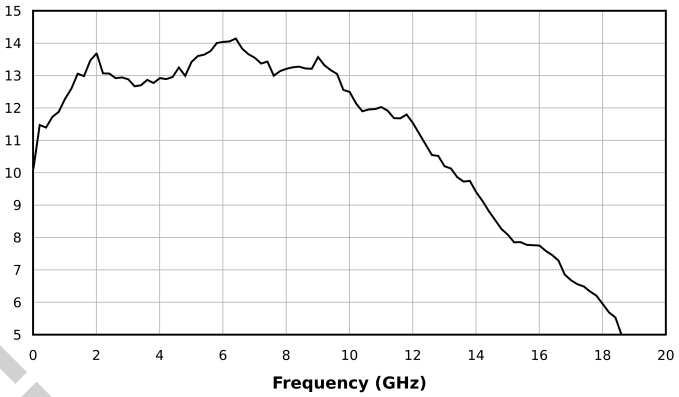
Reverse Isolation (dB)



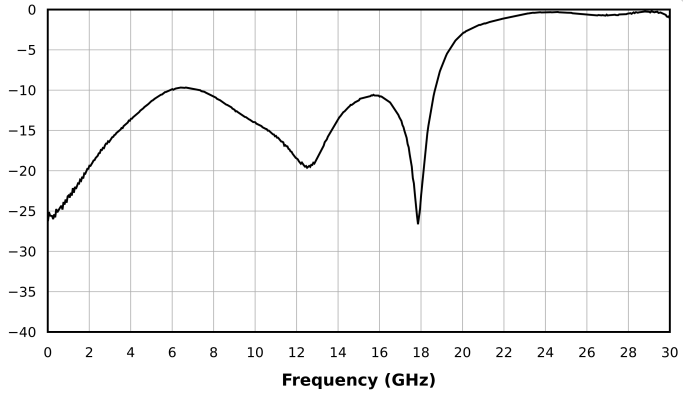
Noise Figure (dB)



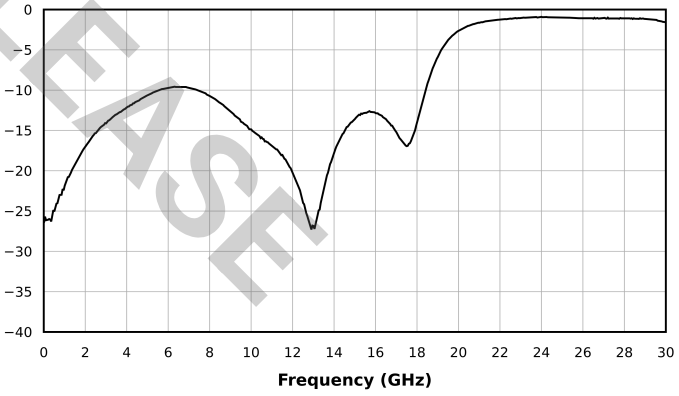
Output P1dB (dBm)



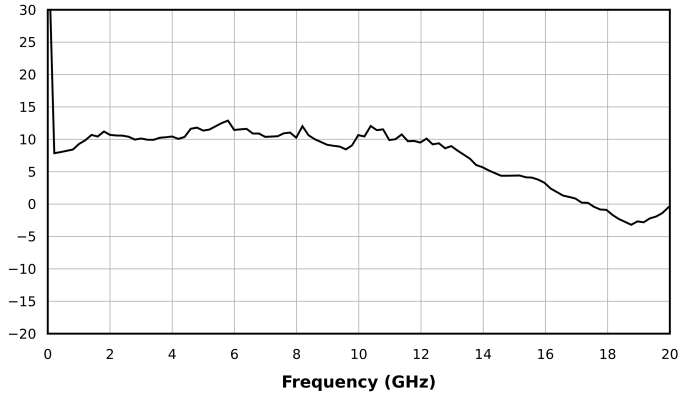
Input Return Loss (dB)



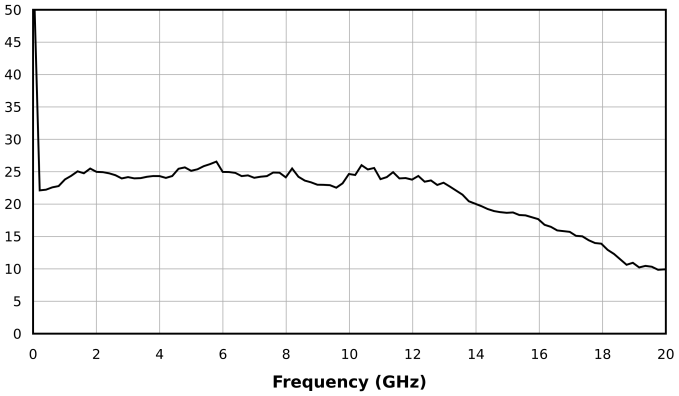
Output Return Loss (dB)



Input IP3 (dBm)



Output IP3 (dBm)



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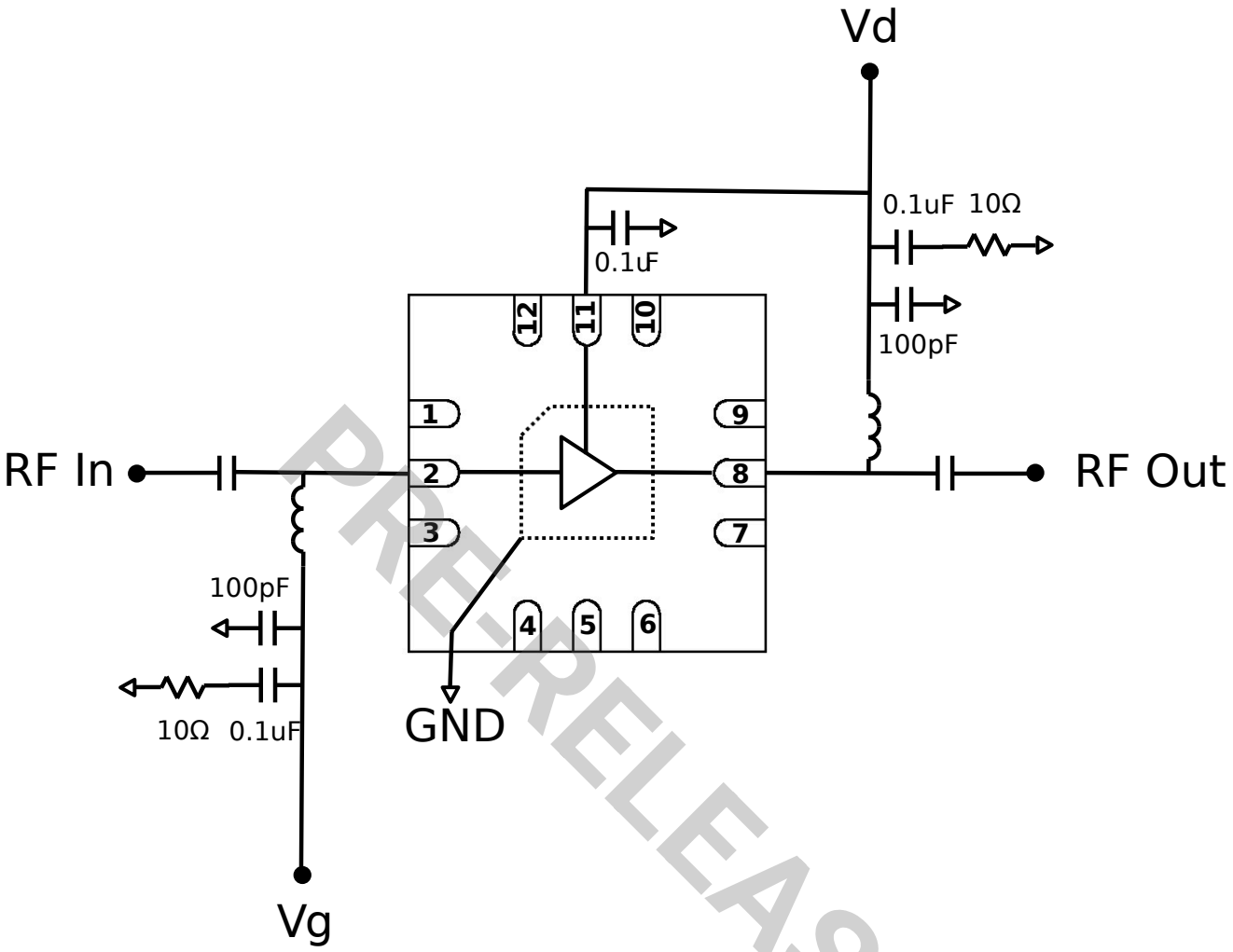
Application Information

Below is the recommended application circuit for the ADM-11980PSM. This is the configuration that is used to characterize this device. However, each PCB layout and environment are different which may require minor modifications of the biasing network. Please contact support@markimicrowave.com for more information.

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Application Circuit



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Application Circuit Description

The ADM-11980PSM requires biasing through the RF input and output ports as well as the dedicated Vd port. This requires the use of DC blocking capacitors and RF choke inductors at both the input and output. Single placement modular bias tees, such as the Marki BTL-0035SMG-2, could also be used in place of discrete SMD components. It is possible to extend low-frequency performance by using “stacked” choke inductors and sufficiently large DC blocking caps to not impede RF signal at the frequency of interest. The general tradeoff is external parts count vs low frequency performance. Contact Marki technical support if you need assistance with a low-frequency application circuit for this part. Datasheet performance was measured using external wideband test equipment bias tees.

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Current Mirror Operation

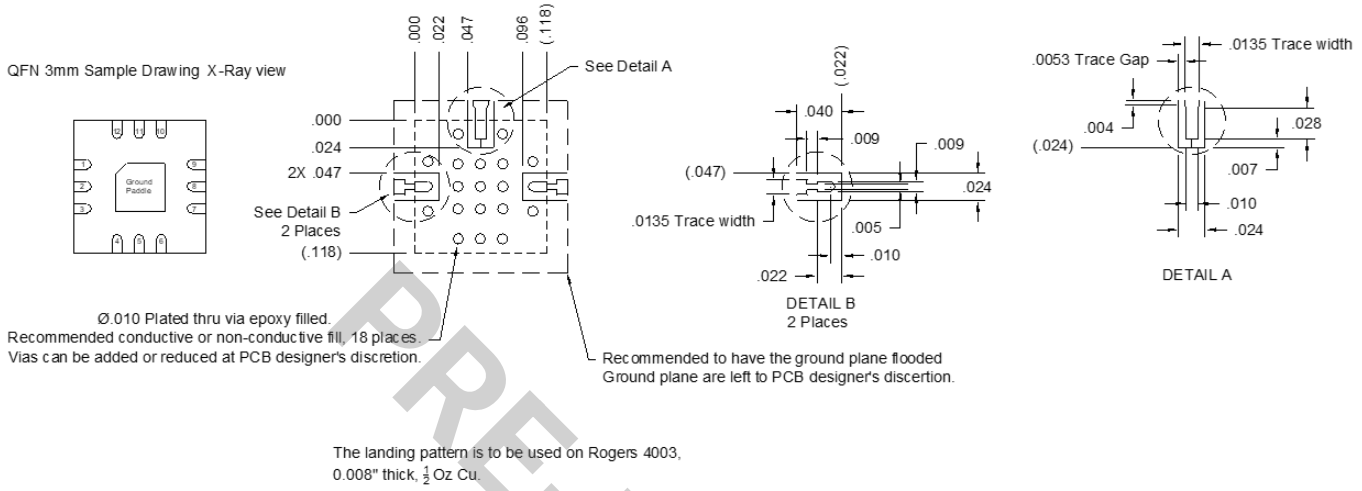
The ADM-11980PSM uses enhancement-mode pHEMT technology, allowing the amplifier to function off a single positive supply voltage. E-mode processes support current mirrors, which generate bias voltages for the gate that track threshold voltage variation over process and temperature. To operate the current mirror located on Pin 5, connect Pin 5 to the bias tee of Pin 2.

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Footprint Image

Download : Footprint Drawing



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

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