GaAs HBT Gain Block
MMIC Amplifier DC-3.5GHz

F452

March 2013
Rev 1

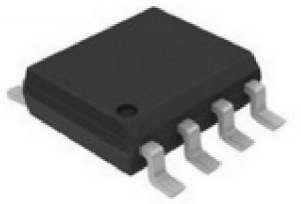
Features

◎ DC - 3.5 GHz
◎ +26dBm P_{-1}dB at 1 GHz
◎ +43dBm OIP3 at 1 GHz
◎ 19.5dB Gain at 1GHz
◎ 3.6 dB Noise Figure at 2GHz
◎ 75 Ohm Input / Output Match
◎ SOIC-8 Package Style

Applications

★ PA Driver Amplifier
★ CATV / FTTX
★ W-LAN / ISM
★ Wideband Intrumentation
★ IF&RF Applications

Functional Diagram



Package style: SOIC-8

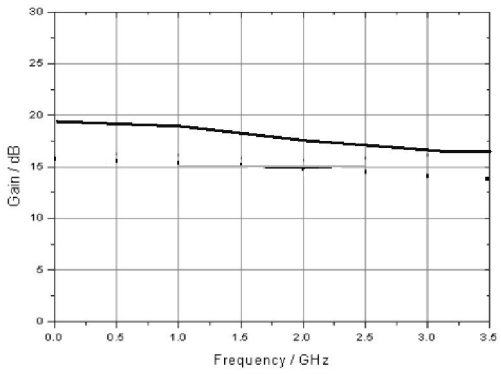
Description

The *F452* is a general-purpose buffer amplifier that offers high dynamic range in a low-cost surface-mount package. at 1000MHz the *F452* typically provides 19.5 dB of gain, +43 dBm Output IP3, and +26dBm P1dB. The *F452* consists of Darlington pair amplifiers using the high reliability InGaP/GaAs HBT process technology and only requires DC-blocking capacitors, a bias resistor, and an inductive RF choke for operation.

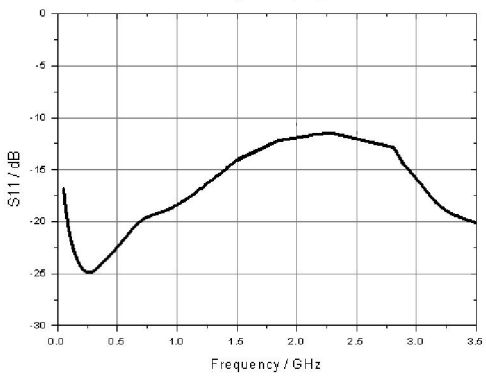
Electrical Characteristics (V_{cc}= 5V, T_A = +25℃)

Parameter		Min.	Typ.	Max.	Units
Gain	DC~1.0GHz		19.5		
	1.0~2.0 GHz		19.0		dB
	2.0~3.5 GHz		16.5		
Input return Loss	DC ~3.5 GHz	11	16		dB
Output return Loss	DC ~3.5 GHz	13	16		dB
Reverse Isolation	DC ~3.5 GHz		24		dB
Output Power for 1 dB Compression (P1dB)	DC~1.0GHz		26		
	1.0~2.0 GHz		25		dBm
	2.0~3.5 GHz		20		
Output Third Order Intercept (IP3)	DC~1.0GHz		43		
	1.0~2.0 GHz		39		dBm
	2.0~3.5 GHz		32		
Noise Figure			3.6		dB
Device Voltage			5.0		V
Supply Current		200	215		mA

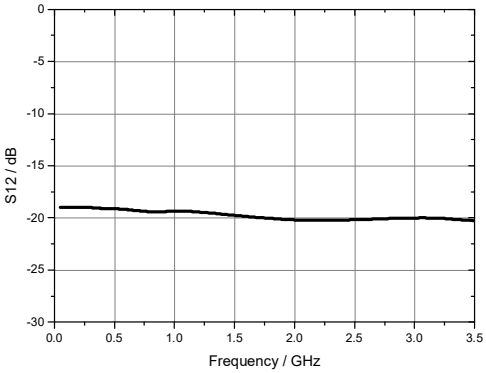
Gain vs. Frequency @ T=+25C



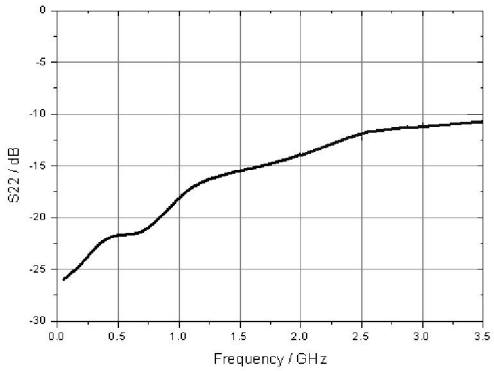
S11 vs. Frequency @ T=+25C



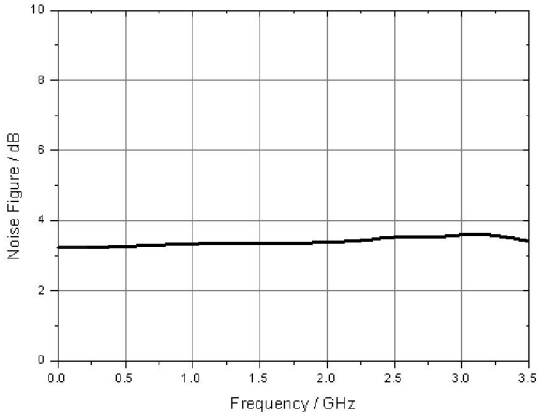
S12 vs. Frequency @ T=+25C



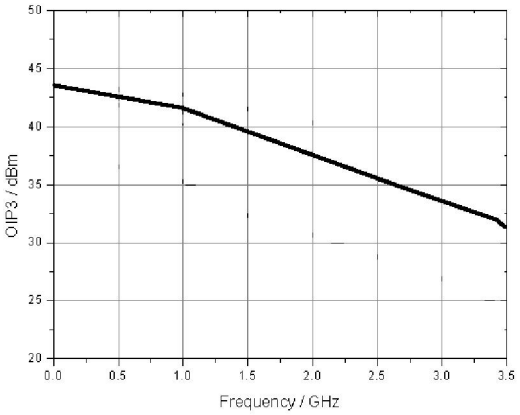
S22 vs. Frequency @ T=+25C



Noise Figure vs. Frequency @ T=+25C



OIP3 vs. Frequency @ T=+25C



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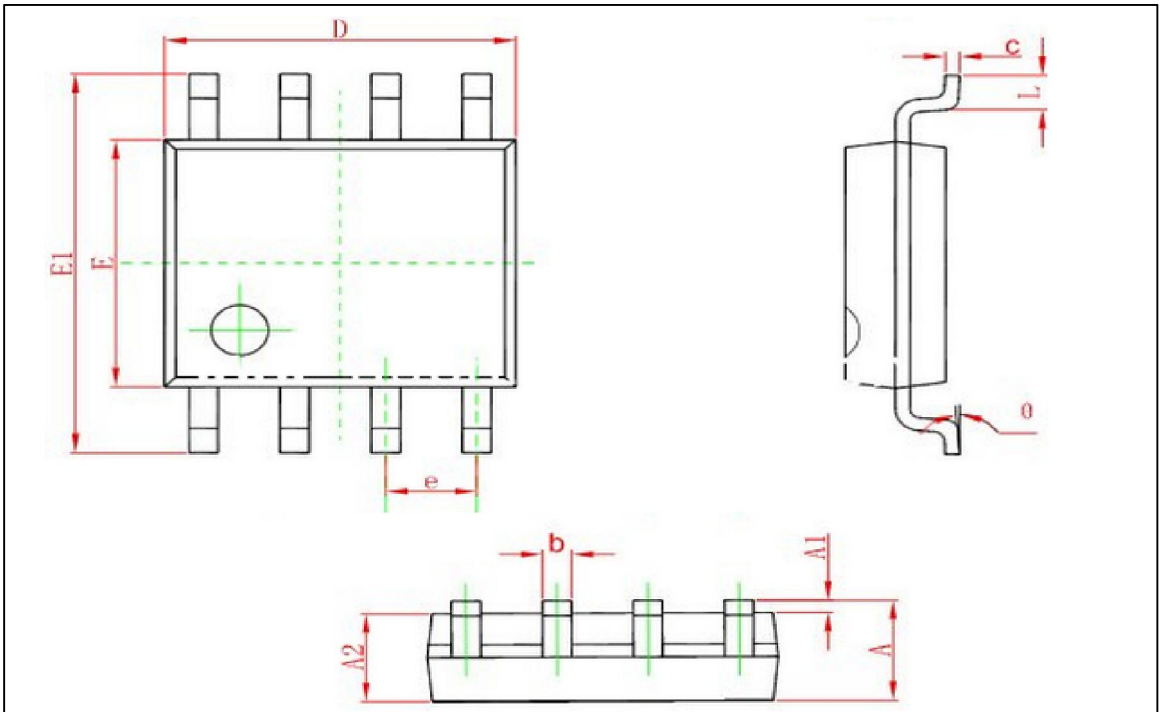
Absolute Maximum Ratings

Device Current	150mA
Storage Temperature	-65 to +150°C
Operating Temperature	-55 to +125°C
ESD Sensitivity (HBM)	Class 1C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

ESD Rating: Class 1C
Value: Passes between 1000 and 2000V
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

Outline Drawing



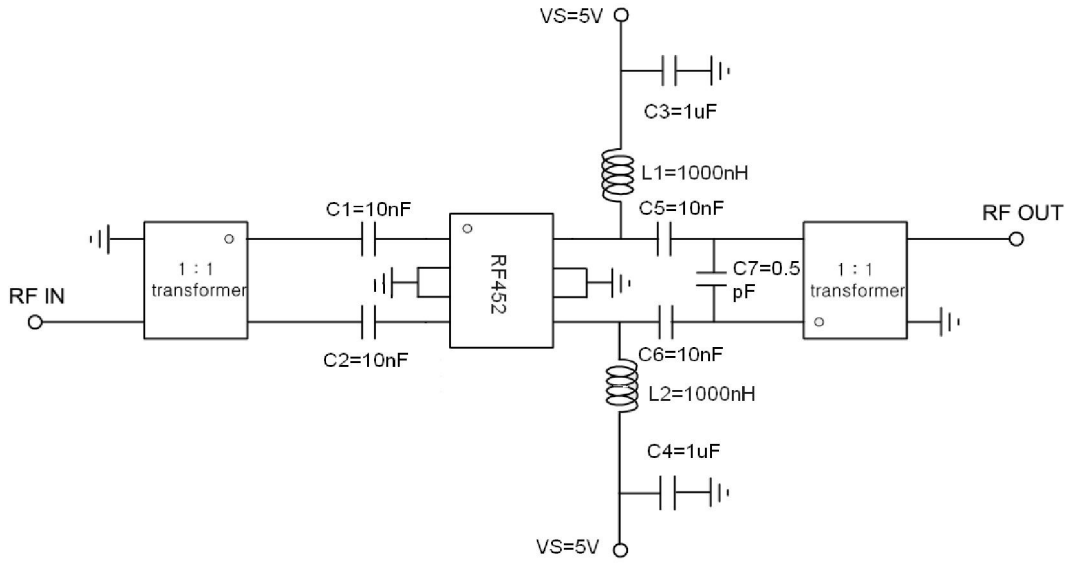
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Pin Descriptions

Pin number	Function	Description
1	RF_{IN1}	This pin is DC coupled;An off chip DC blocking capacitor is required.
4	RF_{IN2}	This pin is DC coupled;An off chip DC blocking capacitor is required.
2、3、6、7	GND	These pins and package bottom must be connected to RF/DC ground.
5	RF_{OUT2}	RF output and DC Bias for the output stage.
8	RF_{OUT1}	RF output and DC Bias for the output stage.

Application Circuit

External blocking capacitors are required on RFIN and RFOUT.



Recommended Component Values

Component	Frequency	
	0.05GHz~1GHz	1GHz~3.5GHz
C1、C2、C5、C6	10nF	100pF
L1、L2	1000nH	33nH
C3、C4	1uF	1uF
C7	0.7pF	-