HiMARK
the wireless IC company

DA2709 Wideband Amplifier

Advance Information

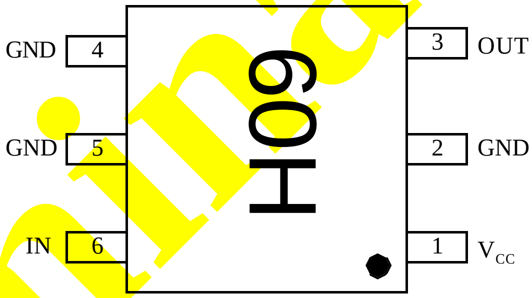
Description

The DA2709 is a general purpose, low-cost RF wideband amplifier IC. The input and output of the IC are internally matched to 50Ω for convenient cascading. Applications include IF and RF amplification in wireless voice and data communication products from DC to 3GHz. The DA2709 requires minimal external components for DC bias.

Features

- DC to 3GHz Operation
- Internally Matched Input and Output
- 22dB Small Signal Gain @2GHz
- P1dB = 8dBm @2GHz
- Single Positive Power Supply
- SOT363 surface-mount package

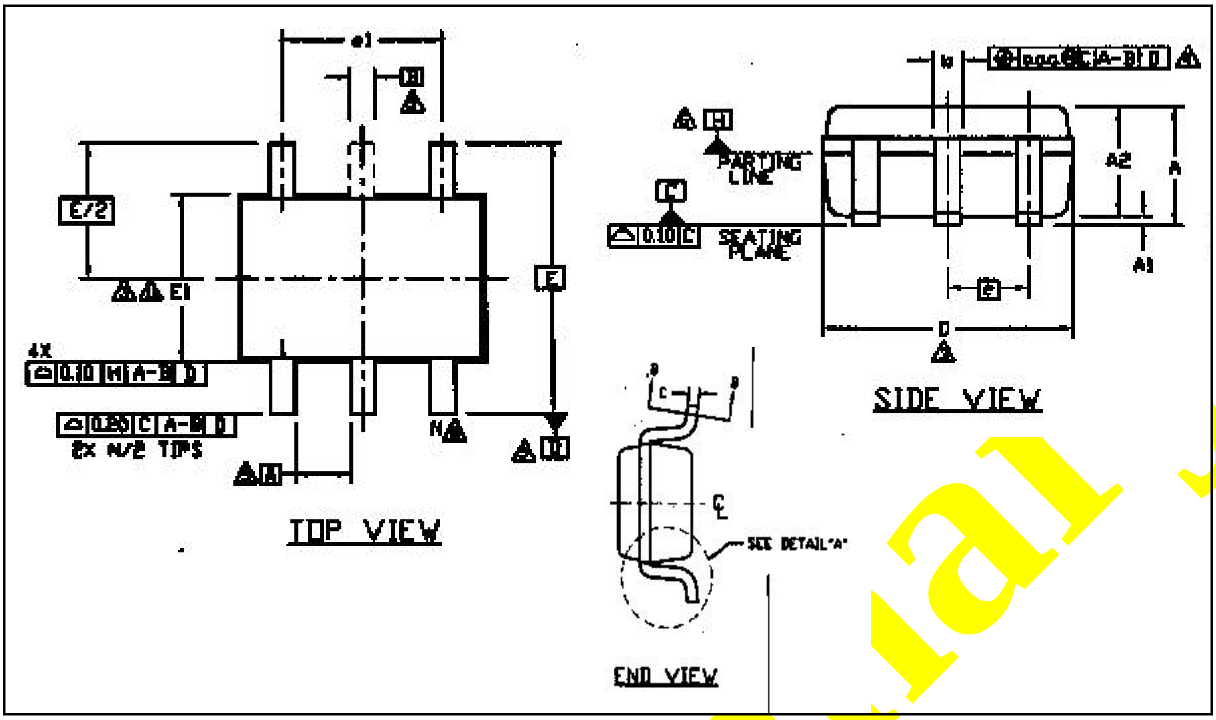
Pin Out Diagram



Pin Descriptions

Number	Name	Description
1	V_{CC}	Power supply pin. An external bypass capacitor is required.
2	GND	Ground connection. Keep PCB traces as short as possible and connect immediately to ground plane for best performance.
3	OUT	Signal output and bias pin. An external choke inductor L to V_{CC} is required for biasing. An external series DC blocking capacitor is also required.
4	GND	Same as pin 2.
5	GND	Same as pin 2.
6	IN	Signal input pin. An external series DC blocking capacitor is required. No DC coupling allowed.

Package and Pin Assignment: 6L, SOT363



Symbols	Dimensions in mm		
	MIN.	NOM.	MAX.
A	--	--	1.00
A1	0.05	0.075	0.10
A2	0.850	0.88	0.90
A3		0.50 BSC	
b	0.15	--	0.30
b1	0.15	0.20	0.25
C	0.10	--	0.20
C1	0.10	0.127	0.15
D	1.90	2.00	2.10
E		2.10 BSC	
E1	1.25	1.30	1.35
L	0.26	0.36	0.46
e1		1.30 BSC	
e		0.65 BSC	
ααα		0.10	

Absolute Maximum Ratings

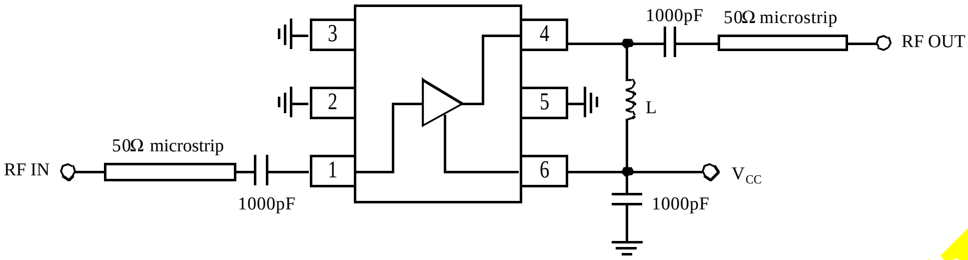
Parameter	Symbol	Rating	Unit
Supply Current	I_{CC}	50	mA
Input RF Power	P_{IN}	5	dBm
Operating Temperature Range	T_A	–40 to 85	°C
Storage Temperature Range		–60 to 150	°C

Electrical Characteristics

(V_{CC} = 5V, I_{CC} = 25mA, and T_A = 25°C unless otherwise noted)

Parameter	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Power Supply						
Supply Voltage	V_{CC}	Applied to pins 4 & 6		5		V
Supply Current	I_{CC}			25		mA
AC Characteristics						
Frequency Range			DC		3	GHz
Gain		Frequency = 1GHz		22		dB
(output connected through bias tee)		Frequency = 2GHz		22		dB
		Frequency = 3GHz		21		dB
Gain Flatness		100MHz to 1.8GHz		± 1		dB
Noise Figure	NF	Frequency = 1GHz		4		dB
Input Return Loss		In a 50Ω system		10		dB
Output Return Loss		In a 50Ω system		10		dB
Output P_{1dB}	P_{1dB}	Frequency = 1GHz		8		dBm
		Frequency = 2GHz		8		dBm
Reverse Isolation		Frequency = 1GHz		31		dB

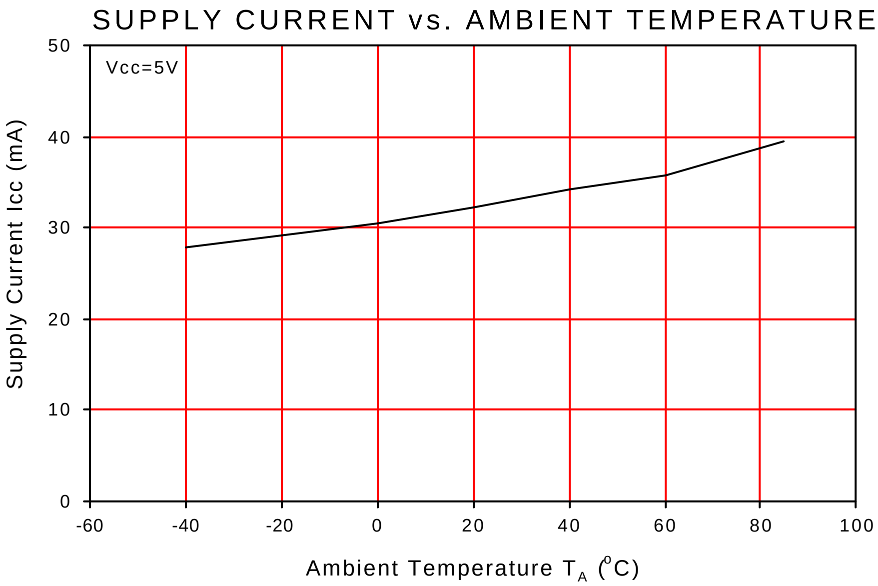
Evaluation Board Schematic

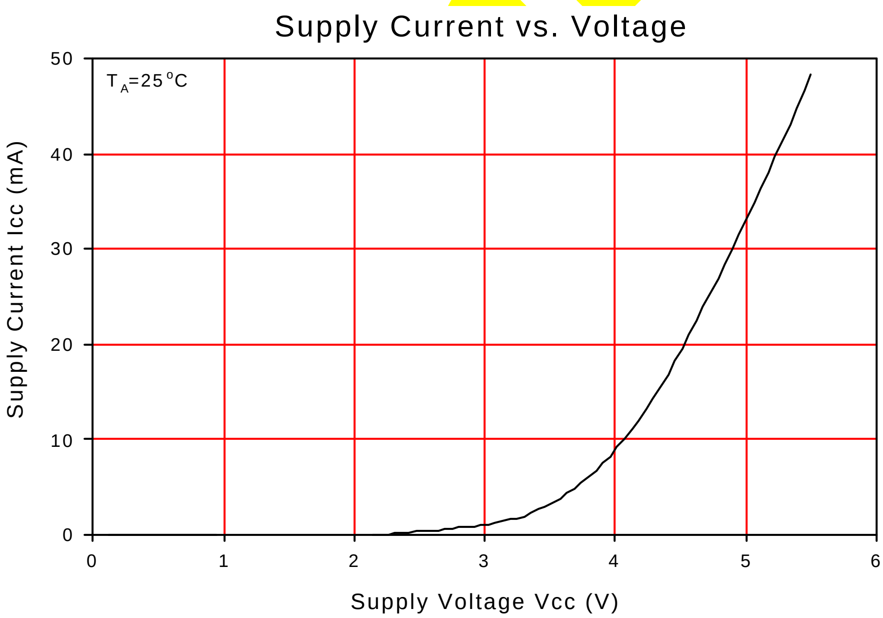


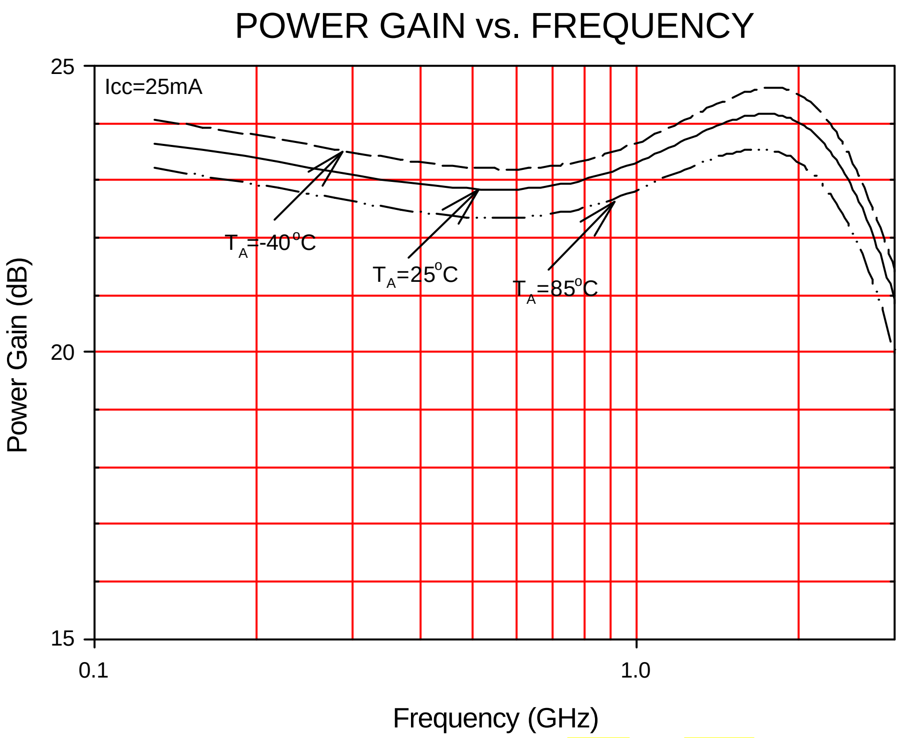
Inductor L Selection Guide

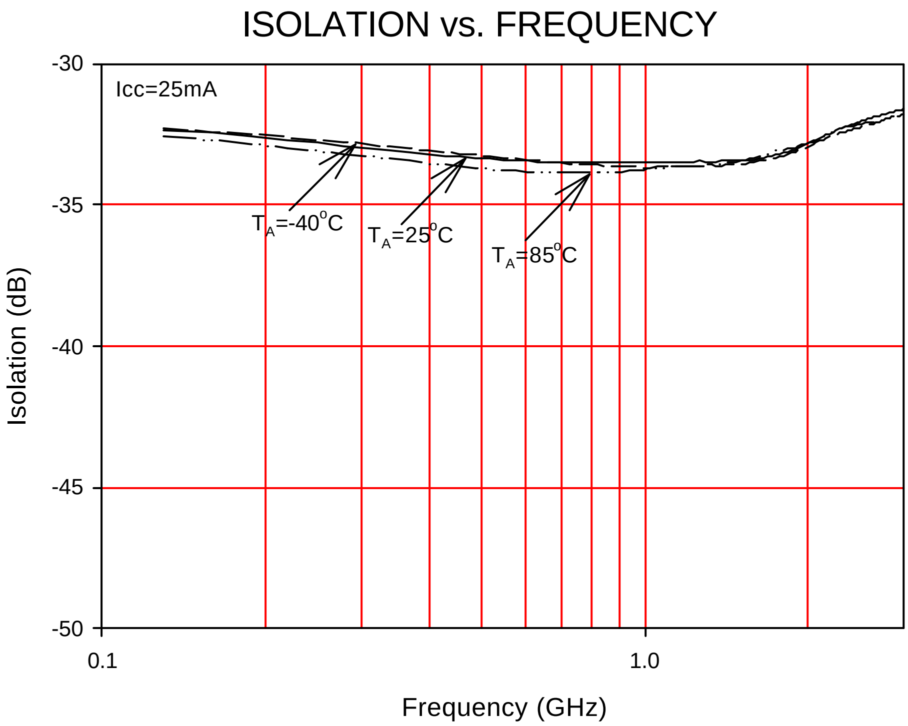
Value	Operating Frequency
300nH	10MHz or higher
100nH	100MHz or higher
10nH	1GHz or higher

Typical Characteristics (T_A = 25°C)

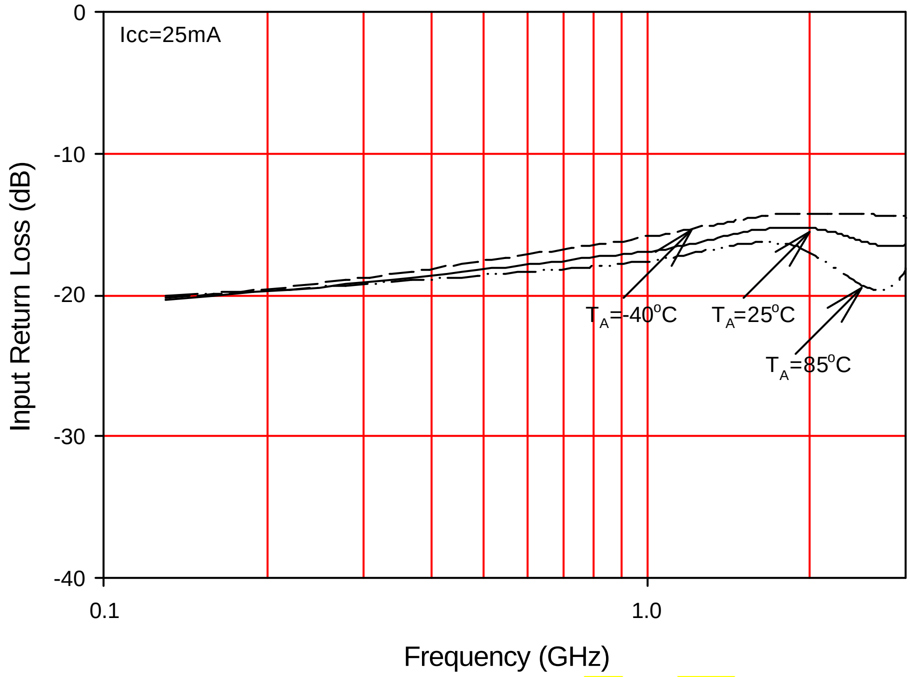





POWER GAIN vs. FREQUENCY
Icc=25mA
25
20
15
0.1
1.0
Power Gain (dB)
Frequency (GHz)
T_A=-40°C
T_A=25°C
T_A=85°C


ISOLATION vs. FREQUENCY
Icc=25mA
-30
-35
-40
-45
-50
0.1
1.0
Isolation (dB)
Frequency (GHz)
T_A=-40°C
T_A=25°C
T_A=85°C

INPUT RETURN LOSS vs. FREQUENCY



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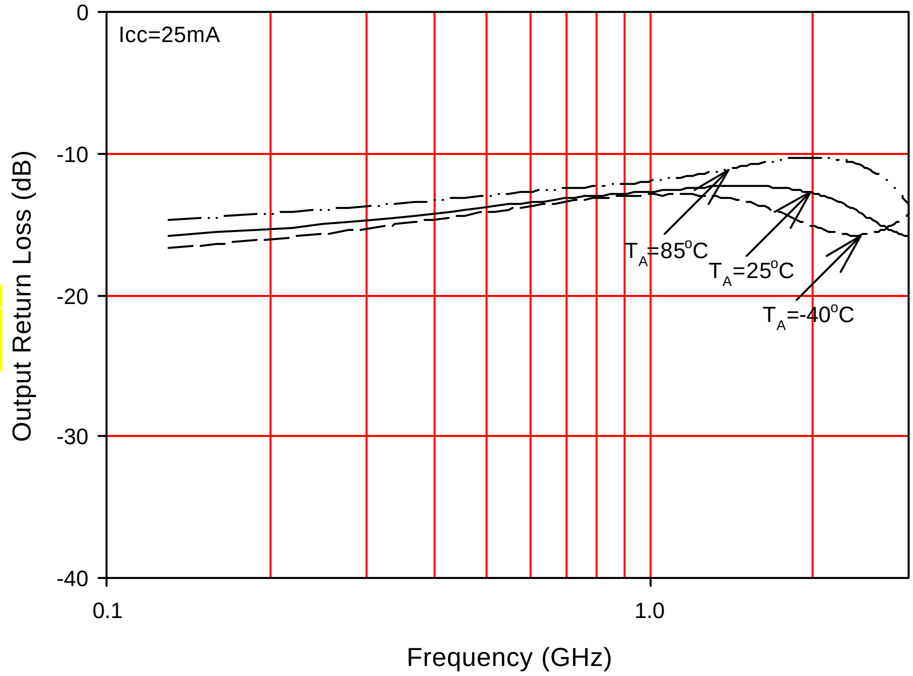
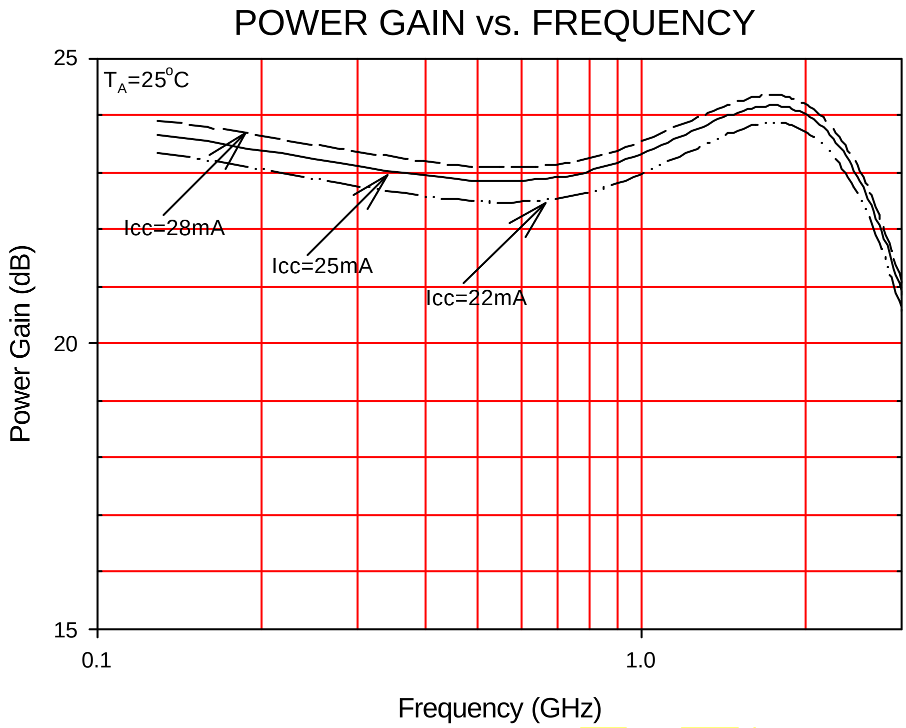
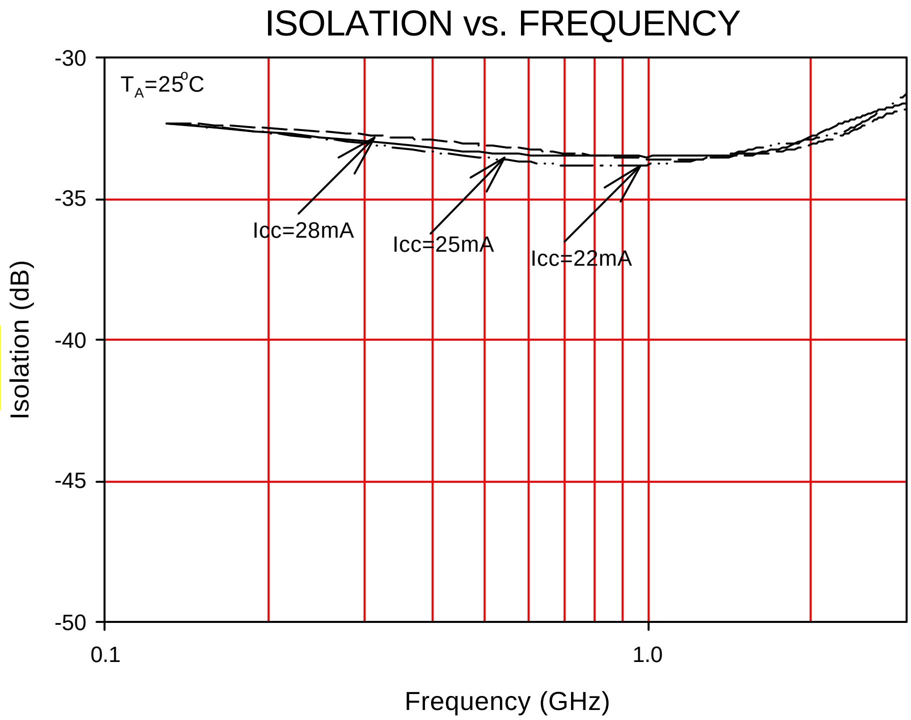



POWER GAIN vs. FREQUENCY
TA=25°C
25
20
15
0.1
1.0
Power Gain (dB)
Frequency (GHz)
Icc=28mA
Icc=25mA
Icc=22mA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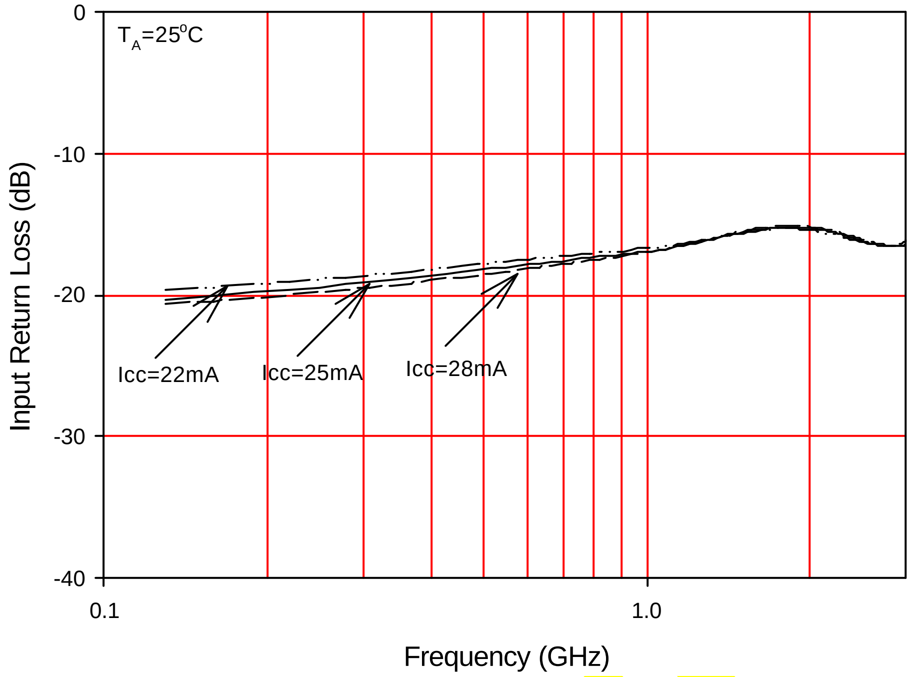

OUTPUT RETURN LOSS vs. FREQUENCY