APPLICATION NOTE FOR LTE BAND-13 2fo IMPROVEMENT

This application note shows an example in order to improve LTE band-13 2fo. The example of electrical characteristics are shown as follows:

■ ELECTRICAL CHARACTERISTICS (DC)

General conditions: T_a=+25°C

PARAMETER	SYMBOL	CONDITIONS	MEASURED DATA	UNITS
Supply Voltage	V_{DD}		2.8	V
Control Voltage (High)	$V_{CTL(H)}$		1.8	V
Control Voltage (Low)	$V_{CTL(L)}$		0	V
Supply Current1 (Active mode)	I_{DD1}	RF OFF, V_{DD}=2.8V, V_{CTL}=1.8V	3.58	mA
Supply Current2 (Stand-by mode)	I_{DD2}	RF OFF, V_{DD}=2.8V, V_{CTL}=0V	0.1	μA
Control Current	I_{CTL}	V_{CTL}=1.8V	5.9	μA

■ ELECTRICAL CHARACTERISTICS (RF)

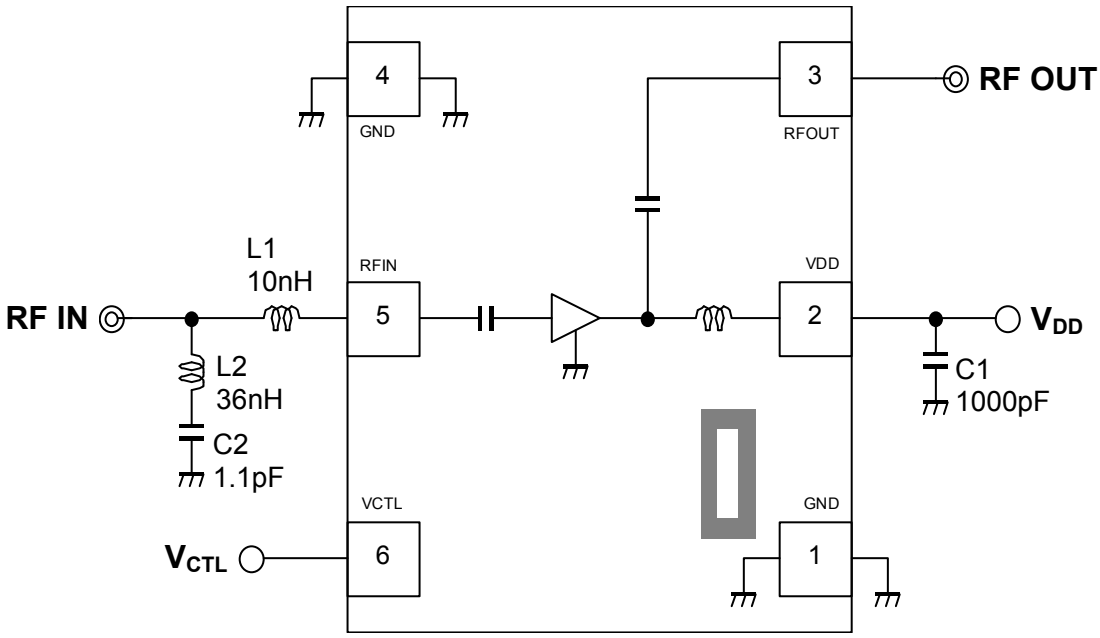
General conditions: V_{DD}=2.8V, V_{CTL}=1.8V, f_{RF}=1575MHz, T_a=+25°C, Z_s=Z_l=50ohm, with application circuit

PARAMETER	SYMBOL	CONDITIONS	MEASURED DATA		UNITS
			Application Circuit 1	Application Circuit 2	
Small Signal Gain	Gain	Exclude PCB and connector Losses (0.18dB)	18.7	18.7	dB
Noise Figure	NF	Exclude PCB and connector Losses (0.08dB)	0.73	1.11	dB
Input Power at 1dB Gain Compression Point	P_{-1dB}(IN)		-12.3	-12.6	dBm
Input 3rd Order Intercept Point	IIP3	f1=$f_{RF,}$ f2=f1+/- 1MHz, Pin=-30dBm	-1.6	-2.1	dBm
Out of Band Input 3rd Order Intercept Point	IIP3_OB	f_1 =1712.7MHz Pin =-20dBm, f_2 =1850MHz Pin =-20dBm	+0.9	+4.2	dBm
700MHz Harmonic	2fo	Input jammer tone: 787.76MHz at –25dBm Measure the harmonic tone at 1575.52MHz	-76.8	-123.3	dBm
RF IN Port Return Loss	RLi		10.7	9.5	dB
RF OUT Port Return Loss	RLo		18.5	10.8	dB

Application Circuit 1

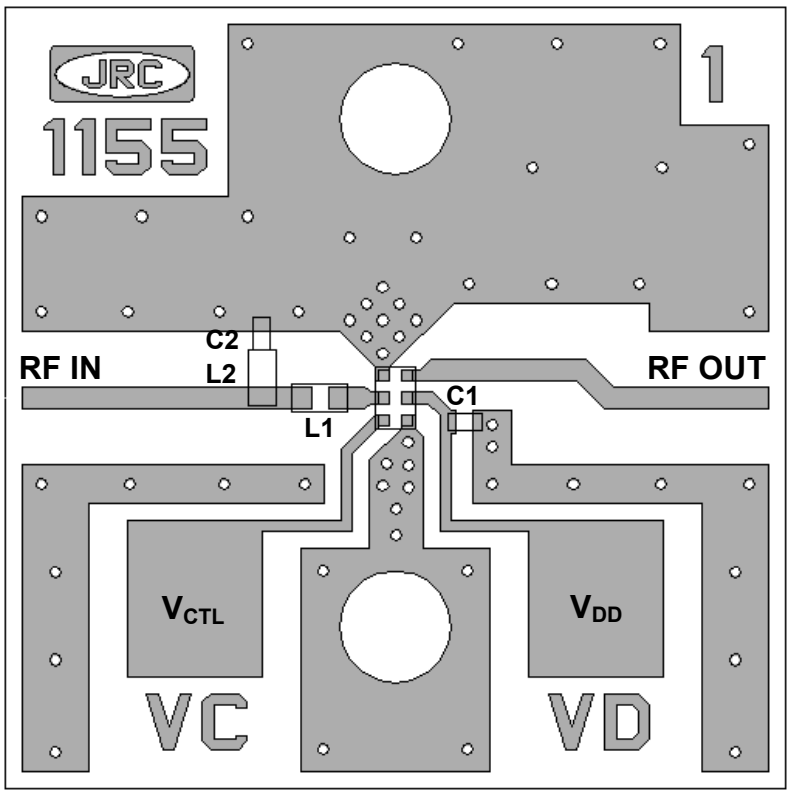
■ BLOCK DIAGRAM

(Top View)



■ EVALUATION BOARD

(Top View)



Parts list

Parts ID	Manufacture
L1	LQG15HS Series (MURATA)
L2	LQW15A Series (MURATA)
C1, C2	GRM03 Series (MURATA)

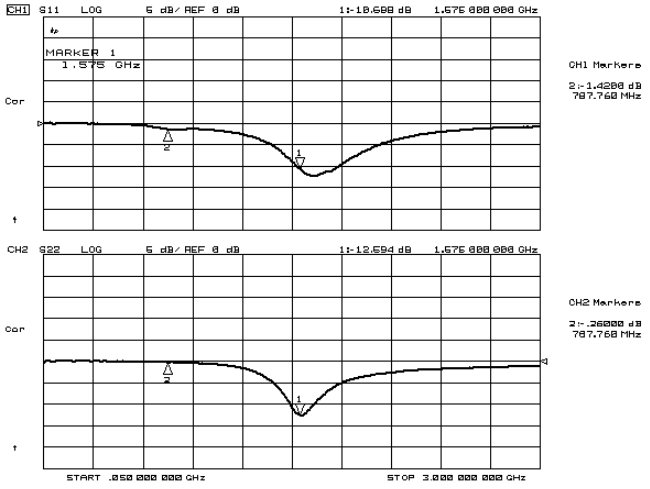
PCB Information

Substrate: FR-4
Thickness: 0.2mm
Microstrip line width:
0.4mm (Z_0=50Ω)
Size: 14.0mm x 14.0mm

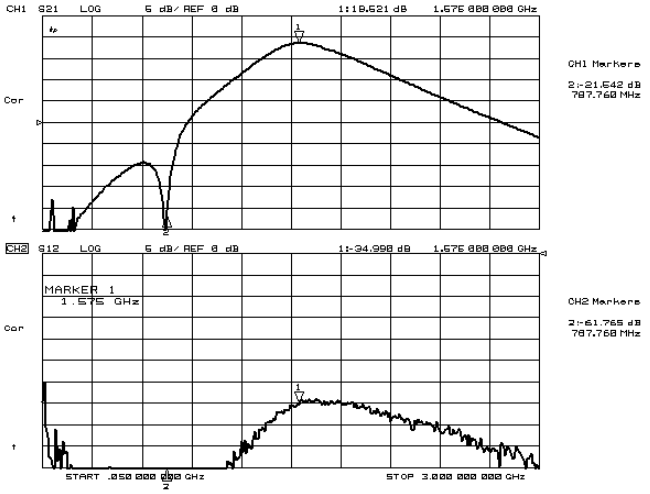
Application Circuit 1

■ ELECTRICAL CHARACTERISTICS

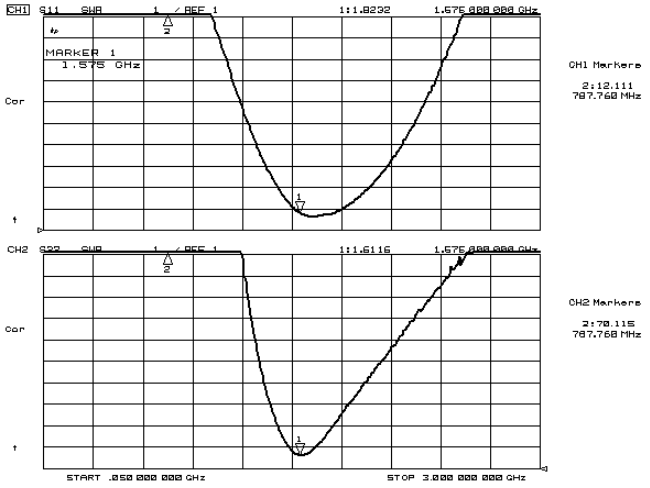
Conditions: V_{DD}=2.8V, V_{CTL}=1.8V, Ta=25°C, Z_s=Z_l=50ohm, with application circuit



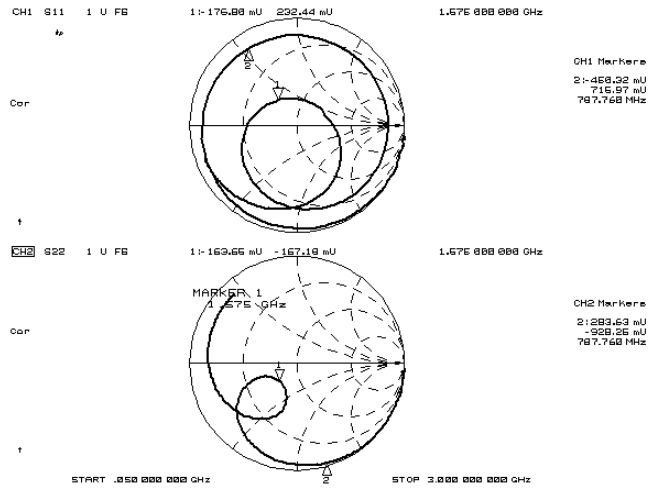
S11, S22



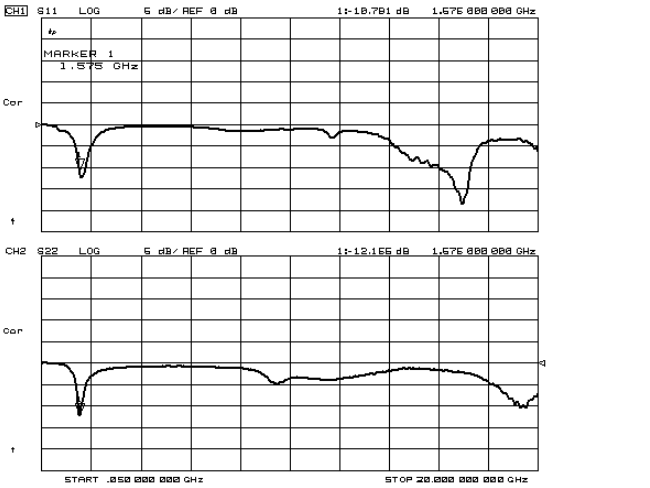
S21, S12



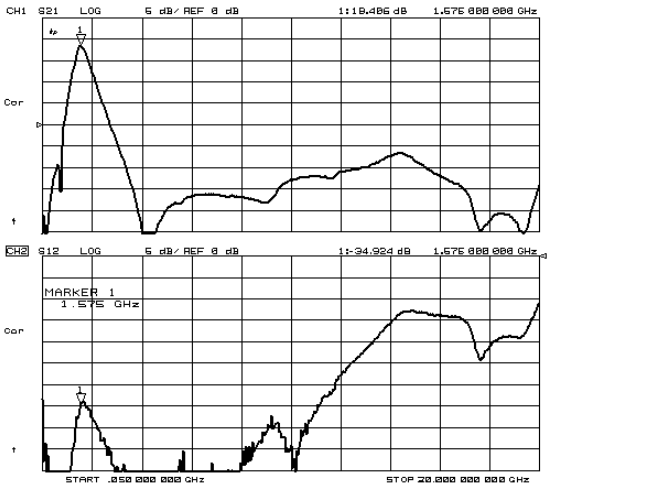
VSWRi, VSWo



Zin, Zout



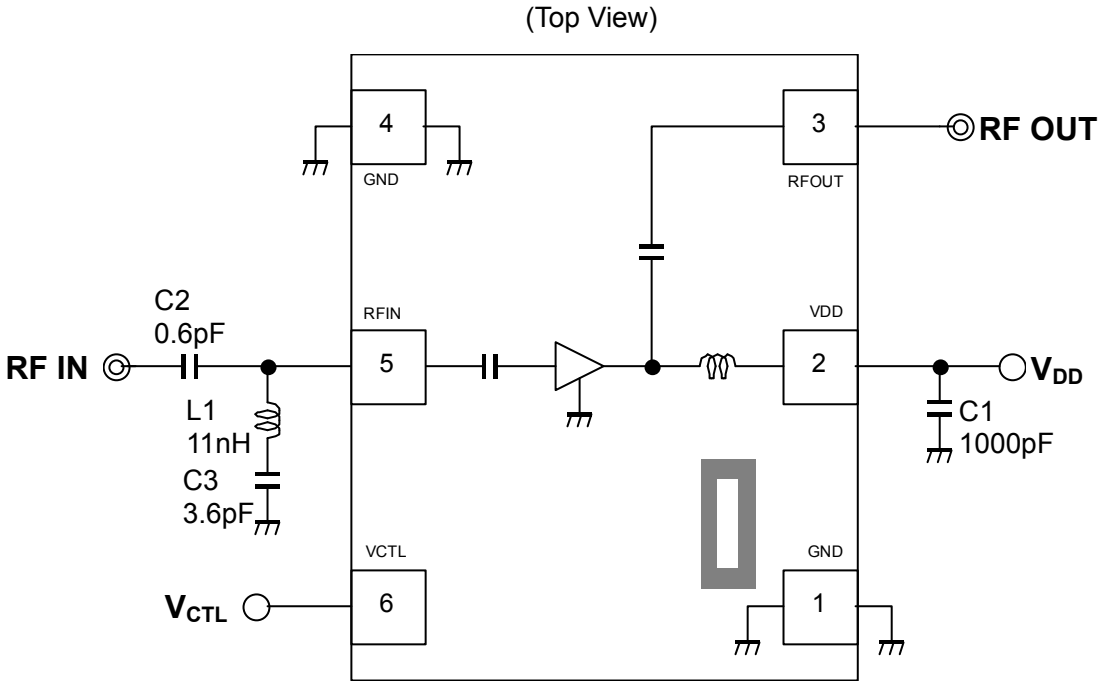
S11, S22 (f=50M~20GHz)



S21, S12 (f=50M~20GHz)

Application Circuit 2

■ BLOCK DIAGRAM



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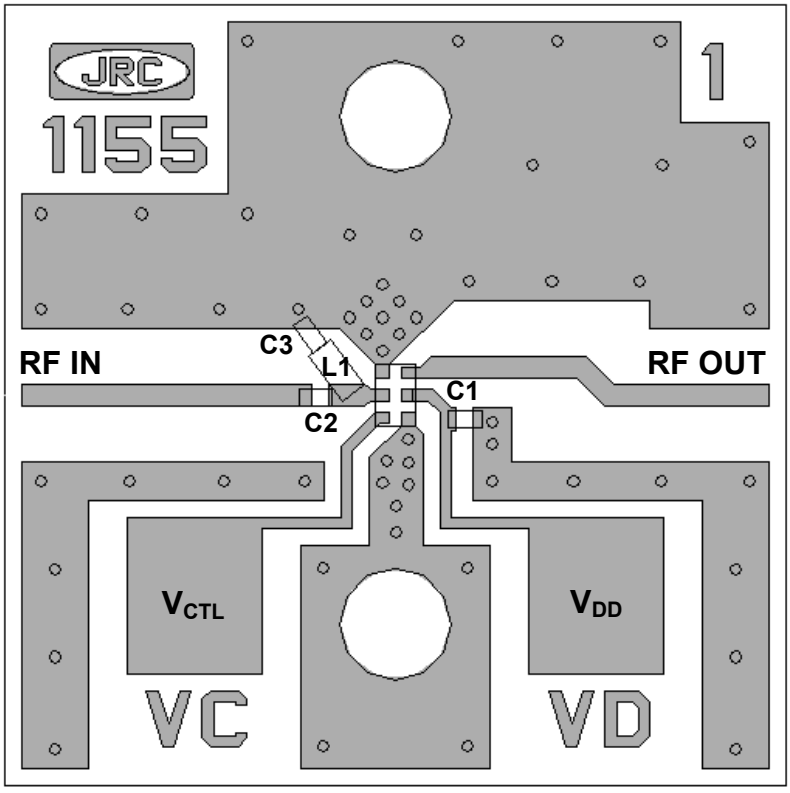

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Application Circuit 2

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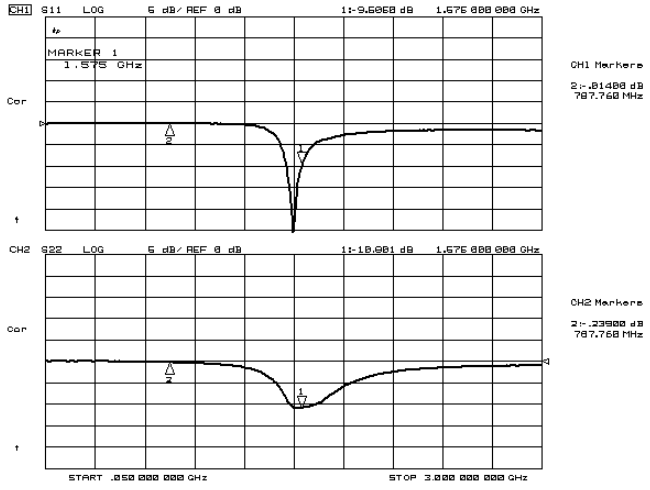
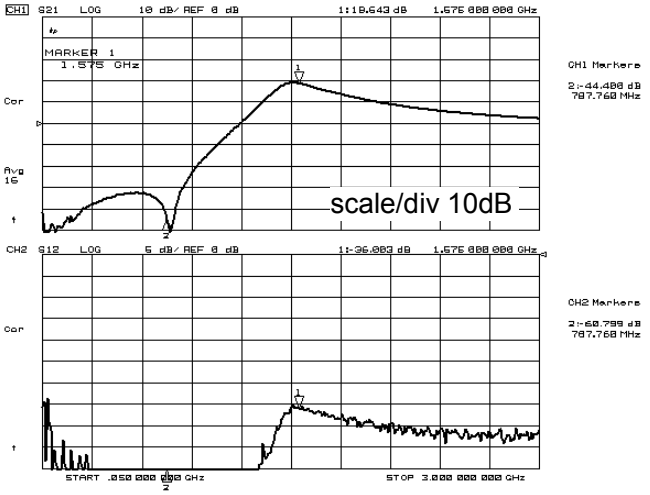
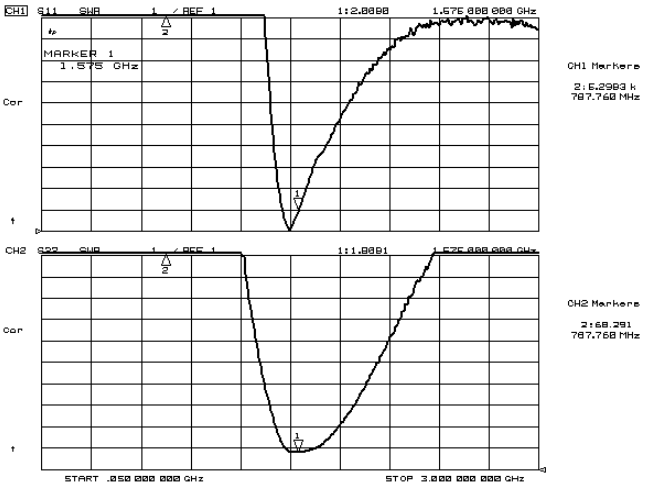


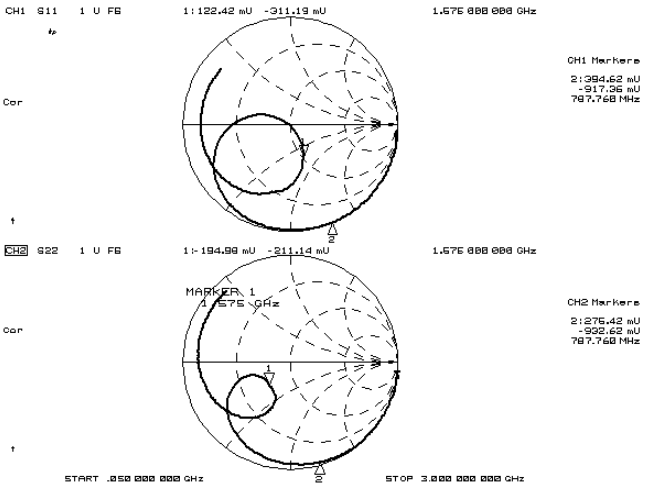
S11, S22



S21, S12



VSWRi, VSWo



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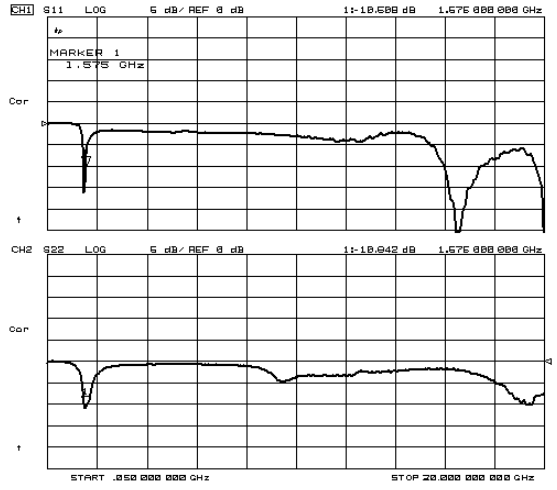

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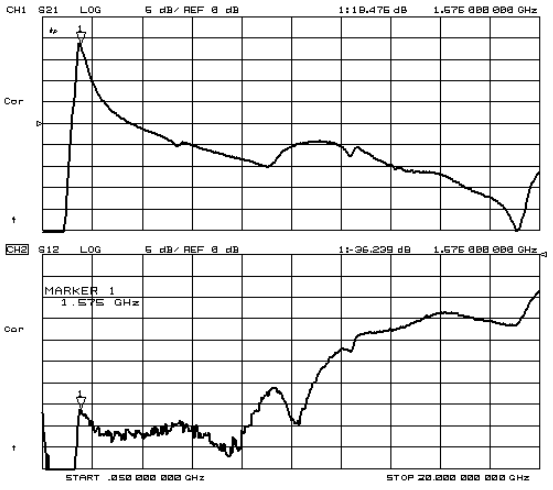

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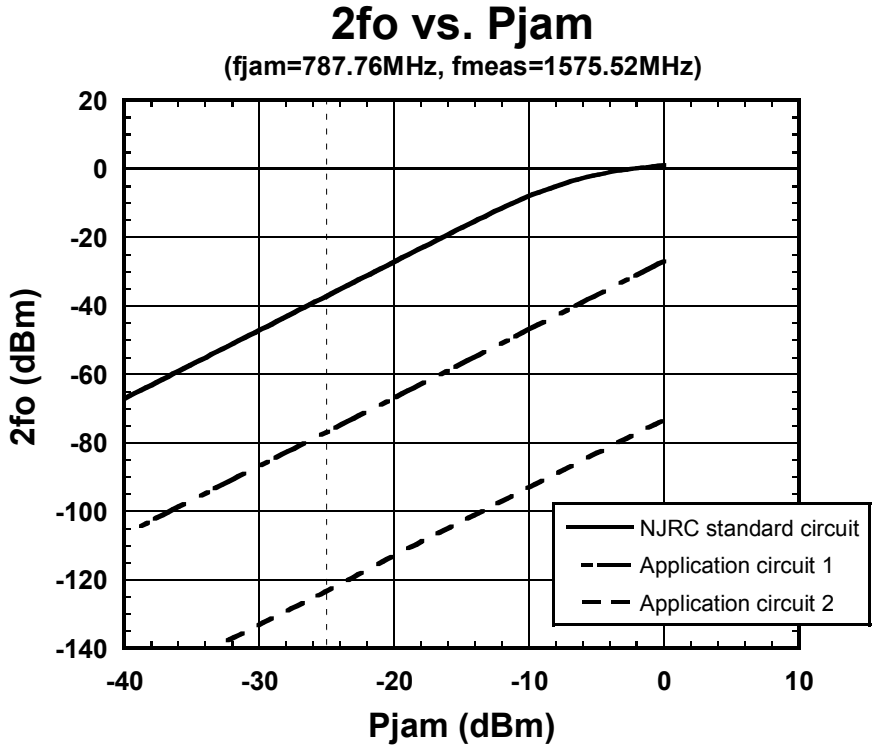

MEASUREMENT BLOCK DIAGRAM