MAX2042A

SiGe、高线性度、1600MHz至3900MHz 上/下变频混频器，带有LO缓冲器

概述

MAX2042A为单路、高线性度上/下变频混频器，能够在1600MHz至3900MHz的GSM/EDGE、CDMA、TD-SCDMA、WCDMA、LTE、TD-LTE、WiMAX™以及MMDS无线基础设施应用中提供+33dBm的输入IP3、7.25dB噪声系数和7.2dB转换损耗等高性能指标。这款IC具有1300MHz至4000MHz超宽LO频率范围，适用于所有1.7GHz至3.5GHz应用中的低边或高边LO注入结构(对于工作在2.5GHz的低边LO注入，请参考MAX2042)。

除具有优异的线性度和噪声性能外，该款IC还具有非常高的集成度。器件包括双平衡无源混频器核、LO缓冲器以及支持单端RF和LO输入的片内非平衡变压器。IC需要标称值为0dBm的LO驱动，V_{CC} = 5.0V时，电源电流典型值为140mA；V_{CC} = 3.3V时，电源电流为122mA。

MAX2042A引脚兼容于MAX2042 2000MHz至3000MHz混频器；MAX2042A的引脚排列与MAX2029/MAX2031/MAX2033 650MHz至1550MHz混频器、MAX2039/MAX2041 1700MHz至3000MHz混频器以及MAX2044 2300MHz至4000MHz混频器非常接近。因此，该系列上/下变频混频器可以采用相同的PCB布局支持多个频段的应用。

MAX2042A采用紧凑的20引脚、TQFN (5mm x 5mm)封装，带有裸焊盘。在T_C = −40℃至+85℃扩展级温度范围内确保电气性能。

应用

1.8GHz/1.9GHz GSM/EDGE/CDMA基站

2.1GHz WCDMA/LTE基站

2.3GHz TD-SCDMA/TD-LTE基站

2.5GHz WiMAX和LTE基站

2.7GHz MMDS基站

3.5GHz WiMAX和LTE基站

固定宽带无线接入

无线本地环路

个人移动无线装置

军用系统

优势和特性

- 覆盖较宽的频带
  - 1600MHz至3900MHz RF频率范围
  - 1300MHz至4000MHz LO频率范围
  - 50MHz至500MHz IF频率范围
- 7.2dB转换损耗
- 7.25dB噪声系数
- 高线性度
  - +33dBm输入IP3
  - +21.7dBm输入1dB压缩点
  - P_{RF} = −10dBm时，具有72dBc (典型值)的2LO − 2RF杂散抑制
- 简单的PCB布局
  - 集成LO缓冲器
  - 内部LO和RF非平衡变压器支持单端输入
- −6dBm至+3dBm低LO驱动
- 引脚兼容于MAX2042 2000MHz至3000MHz混频器
- 引脚相似于MAX2029/MAX2031/MAX2033 650MHz至1550MHz混频器、MAX2039/MAX2041 1700MHz至3000MHz混频器以及MAX2044 2300MHz至4000MHz混频器
- 采用+5.0V或+3.3V单电源供电
- 外部电流设置电阻允许选择混频器的低功耗/低性能工作模式

定购信息在数据资料的最后给出。

*相关型号以及配合该器件使用的推荐产品，请参见：**china.maxim-ic.com/MAX2042A.related**。*

WiMAX是WiMAX论坛的商标。

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ABSOLUTE MAXIMUM RATINGS

V_{CC} to GND..-0.3V to +5.5V
IF+, IF-, LOBIAS to GND .... -0.3V to (V_{CC} + 0.3V)
RF, LO Input Power...+20dBm
IF Input Power (50Ω source)...+18dBm
RF, LO Current (RF and LO are DC shorted to GND through a balun)..50mA
Operating Case Temperature Range (Note 1).......-40°C to +85°C
Continuous Power Dissipation (Note 2)..............................5.0W
Junction Temperature ....+150°C
Storage Temperature Range........................... -65°C to +150°C
Lead Temperature (soldering 10s) ....+300°C
Soldering Temperature (reflow) ....+260°C

Note 1: T_C is the temperature on the exposed pad of the package. T_A is the ambient temperature of the device and PCB.
Note 2: Based on junction temperature $T_J = T_C + (\theta_{JC} \times V_{CC} \times I_{CC})$. This formula can be used when the temperature of the exposed pad is known while the device is soldered down to a PCB. See the *Applications Information* section for details. The junction temperature must not exceed +150°C.

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

PACKAGE THERMAL CHARACTERISTICS

TQFN
Junction-to-Ambient
Thermal Resistance θ_{JA} (Notes 3, 4)....................... +38°C/W
Junction-to-Case
Thermal Resistance θ_{JC} (Notes 2, 4)....................... +13°C/W

Note 3: Junction temperature $T_J = T_A + (\theta_{JA} \times V_{CC} \times I_{CC})$. This formula can be used when the ambient temperature of the PCB is known. The junction temperature must not exceed +150°C.
Note 4: Package thermal resistances were obtained using the method described in JEDEC specification JESD51-7, using a four-layer board. For detailed information on package thermal considerations, refer to **china.maxim-ic.com/thermal-tutorial**.

5.0V SUPPLY DC ELECTRICAL CHARACTERISTICS

(*Typical Application Circuit*, V_{CC} = 4.75V to 5.25V, no input AC signals. T_C = -40°C to +85°C, unless otherwise noted. Typical values are at V_{CC} = 5.0V, T_C = +25°C.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}		4.75	5	5.25	V
Supply Current	I_{CC}			140	162	mA

3.3V SUPPLY DC ELECTRICAL CHARACTERISTICS

(*Typical Application Circuit*, V_{CC} = 3.0V to 3.6V, no input AC applied. T_C = -40°C to +85°C, unless otherwise noted. Typical values are at V_{CC} = 3.3V, T_C = +25°C.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}		3.0	3.3	3.6	V
Supply Current	I_{CC}			122		mA

RECOMMENDED AC OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
RF Frequency Range Without Tuning	f_{RF1}	*Typical Application Circuit* with C1 = 8.2pF (Table 1) (Notes 5, 6)	2000		2900	MHz
RF Frequency Range With Low-Band Tuning	f_{RF2}	*Typical Application Circuit* with C1 = 1.8pF, L1 = 12nH (Table 1) (Notes 5, 6)	1600		2000	MHz
RF Frequency Range With High-Band Tuning	f_{RF3}	*Typical Application Circuit* with C1 = 1.5pF (Table 1) (Notes 5, 6)	3000		3900	MHz
LO Frequency	f_{LO}	(Note 5, 6)	1300		4000	MHz
IF Frequency	f_{IF}	Using M/A-Com MABACT0069 1:1 transformer as defined in the *Typical Application Circuit*, IF matching components affect the IF frequency range (Notes 5, 6)	50		500	MHz
LO Drive	P_{LO}		-6	0	+3	dBm

5.0V Supply, RF = 2000MHz to 2900MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, V_{CC} = 4.75V to 5.25V, RF and LO ports are driven from 50Ω sources, P_{LO} = -6dBm to +3dBm, P_{RF} = 0dBm, f_{RF} = 2000MHz to 2900MHz, f_{LO} = 2300MHz to 3200MHz, f_{IF} = 300MHz, $f_{RF} < f_{LO}$, T_C = -40°C to +85°C. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{LO} = 0dBm, f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{IF} = 300MHz.) (Note 7)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small-Signal Conversion Loss	L_C	f_{RF} = 2600MHz, f_{LO} = 2900MHz		7.2		
		f_{RF} = 2900MHz, f_{LO} = 3200MHz (Note 8)		7.8		
Loss Variation vs. Frequency	ΔL_C	f_{RF} = 2010MHz to 2025MHz		±0.05		dB
		f_{RF} = 2305MHz to 2360MHz		±0.05		dB
		f_{RF} = 2500MHz to 2570MHz		±0.05		dB
		f_{RF} = 2570MHz to 2620MHz		±0.05		dB
		f_{RF} = 2500MHz to 2690MHz		±0.13		dB
		f_{RF} = 2700MHz to 2900MHz		±0.02		dB
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C		0.007		dB/°C
Single Sideband Noise Figure	NF_{SSB}	No blockers present		7.25		dB
Noise Figure Temperature Coefficient	TC_{NF}	f_{RF} = 2600MHz, single sideband, no blockers present, T_C = -40°C to +85°C		0.022		dB/°C
Noise Figure Under Blocking	$NF_{Blocking}$	+8dBm blocker tone applied to RF port, f_{RF} = 2600MHz, f_{LO} = 2900MHz, $f_{BLOCKER}$ = 2400MHz (Note 9)		18		dB

5.0V Supply, RF = 2000MHz to 2900MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION) (continued)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, V_{CC} = 4.75V to 5.25V, RF and LO ports are driven from 50Ω sources, P_{LO} = -6dBm to +3dBm, P_{RF} = 0dBm, f_{RF} = 2000MHz to 2900MHz, f_{LO} = 2300MHz to 3200MHz, f_{IF} = 300MHz, $f_{RF} < f_{LO}$, T_C = -40°C to +85°C. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{LO} = 0dBm, f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{IF} = 300MHz.) (Note 7)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Input 1dB Compression Point	IP_{1dB}	(Note 10)			21.7		dBm
Third-Order Input Intercept Point	IIP3	f_{RF1} - f_{RF2} = 1MHz, P_{RF1} = P_{RF2} = 0dBm (Note 8)			33		dBm
IIP3 Variation with T_C		f_{RF1} - f_{RF2} = 1MHz, P_{RF1} = P_{RF2} = 0dBm, T_C = -40°C to +85°C			±0.3		dB
2LO - 2RF Spur Rejection	2 x 2	f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{SPUR} = 2750MHz	P_{RF} = -10dBm		72		dBc
			P_{RF} = 0dBm		62		
3LO - 3RF Spur Rejection	3 x 3	f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{SPUR} = 2800MHz	P_{RF} = -10dBm		91		dBc
			P_{RF} = 0dBm		71		
RF Input Return Loss	RL_{RF}	LO on and IF terminated into a matched impedance			20		dB
LO Input Return Loss	RL_{LO}	RF and IF terminated into a matched impedance			19		dB
IF Output Impedance	Z_{IF}	Nominal differential impedance at the IC's IF outputs			50		Ω
IF Return Loss	RL_{IF}	RF terminated into 50Ω, LO driven by 50Ω source, IF transformed to single-ended 50Ω using external components shown in the *Typical Application Circuit*			17.5		dB
RF-to-IF Isolation		P_{LO} = +3dBm (Note 8)			38		dB
LO Leakage at RF Port		P_{LO} = +3dBm (Note 8)			-29		dBm
2LO Leakage at RF Port		P_{LO} = +3dBm			-30.1		dBm
LO Leakage at IF Port		P_{LO} = +3dBm (Note 8)			-31		dBm

3.3V Supply, RF = 2000MHz to 2900MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, RF and LO ports are driven from 50Ω sources, Typical values are for T_C = +25°C, V_{CC} = 3.3V, P_{RF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{IF} = 300MHz, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Small-Signal Conversion Loss	L_C	(Note 8)			7.4		dB
Loss Variation vs. Frequency	ΔL_C	f_{RF} = 2000MHz to 2900MHz, any 100MHz band			±0.25		dB
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C			0.0079		dB/°C
Single Sideband Noise Figure	NF_{SSB}	No blockers present			7.4		dB
Noise Figure Temperature Coefficient	TC_{NF}	Single sideband, no blockers present, T_C = -40°C to +85°C			0.022		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)			19.7		dBm
Third-Order Input Intercept Point	IIP3	f_{RF1} = 2600MHz, f_{RF2} = 2601MHz, P_{RF1} = P_{RF2} = 0dBm			31		dBm
IIP3 Variation with T_C		f_{RF1} = 2600MHz, f_{RF2} = 2601MHz, P_{RF1} = P_{RF2} = 0dBm, T_C = -40°C to +85°C			±0.1		dB
2LO - 2RF Spur Rejection	2 x 2	f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{SPUR} = 2750MHz	P_{RF} = -10dBm		72		dBc
			P_{RF} = 0dBm		62		
3LO - 3RF Spur Rejection	3 x 3	f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{SPUR} = 2800MHz	P_{RF} = -10dBm		85		dBc
			P_{RF} = 0dBm		65		
RF Input Return Loss	RL_{RF}	LO on and IF terminated into a matched impedance			16		dB
LO Input Return Loss	RL_{LO}	RF and IF terminated into a matched impedance			32		dB
IF Output Impedance	Z_{IF}	Nominal differential impedance at the IC's IF outputs			50		Ω
IF Return Loss	RL_{IF}	RF terminated into 50Ω, LO driven by 50Ω source, IF transformed to single-ended 50Ω using external components shown in the *Typical Application Circuit*			18		dB
RF-to-IF Isolation		P_{LO} = +3dBm			38		dB
LO Leakage at RF Port		P_{LO} = +3dBm			-31.5		dBm
2LO Leakage at RF Port		P_{LO} = +3dBm			-30		dBm
LO Leakage at IF Port		P_{LO} = +3dBm			-31.4		dBm

5.0V Supply, RF = 3100MHz to 3900MHz, LOW-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{RF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 3500MHz, f_{LO} = 3200MHz, f_{IF} = 300MHz, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Small-Signal Conversion Loss	L_C				8.2		dB
Loss Variation vs. Frequency	ΔL_C	f_{RF} = 3450MHz to 3750MHz, any 100MHz band			±0.085		dB
		f_{RF} = 3450MHz to 3750MHz, any 200MHz band			±0.17		dB
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C			0.0091		dB/°C
Single Sideband Noise Figure	NF_{SSB}	No blockers present			7.6		dB
Noise Figure Temperature Coefficient	TC_{NF}	Single sideband, no blockers present, T_C = -40°C to +85°C			0.025		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)			20.6		dBm
Third-Order Input Intercept Point	IIP3	f_{RF1} - f_{RF2} = 1MHz, P_{RF1} = P_{RF2} = 0dBm			31		dBm
IIP3 Variation with T_C		f_{RF1} - f_{RF2} = 1MHz, P_{RF1} = P_{RF2} = 0dBm, T_C = -40°C to +85°C			±0.5		dB
2RF - 2LO Spur Rejection	2 x 2	f_{RF} = 3500MHz, f_{LO} = 3200MHz, f_{SPUR} = 3350MHz	P_{RF} = -10dBm		71		dBc
			P_{RF} = 0dBm		61		
3RF - 3LO Spur Rejection	3 x 3	f_{RF} = 3500MHz, f_{LO} = 3200MHz, f_{SPUR} = 3300MHz	P_{RF} = -10dBm		87		dBc
			P_{RF} = 0dBm		67		
RF Input Return Loss	RL_{RF}	LO on and IF terminated into a matched impedance			15		dB
LO Input Return Loss	RL_{LO}	RF and IF terminated into a matched impedance			20		dB
IF Output Impedance	Z_{IF}	Nominal differential impedance at the IC's IF outputs			50		Ω
IF Return Loss	RL_{IF}	RF terminated into 50Ω, LO driven by 50Ω source, IF transformed to single-ended 50Ω using external components shown in the *Typical Application Circuit*			16.5		dB
RF-to-IF Isolation		P_{LO} = +3dBm			35		dB
LO Leakage at RF Port		P_{LO} = +3dBm			-29.5		dBm
2LO Leakage at RF Port		P_{LO} = +3dBm			-23		dBm
LO Leakage at IF Port		P_{LO} = +3dBm			-31.5		dBm

5.0V Supply, RF = 3100MHz to 3900MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{RF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 3500MHz, f_{LO} = 3800MHz, f_{IF} = 300MHz, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Small-Signal Conversion Loss	L_C				8.6		dB
Loss Variation vs. Frequency	ΔL_C	f_{RF} = 3450MHz to 3750MHz, any 100MHz band			±0.1		dB
		f_{RF} = 3450MHz to 3750MHz, any 200MHz band			±0.2		dB
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C			0.01		dB/°C
Single Sideband Noise Figure	NF_{SSB}	No blockers present			9		dB
Noise Figure Temperature Coefficient	TC_{NF}	Single sideband, no blockers present, T_C = -40°C to +85°C			0.025		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)			18		dBm
Third-Order Input Intercept Point	IIP3	f_{RF1} = 3500MHz, f_{RF2} = 3501MHz, P_{RF1} = P_{RF2} = 0dBm			28.6		dBm
IIP3 Variation with T_C		f_{RF1} = 3500MHz, f_{RF2} = 3501MHz, P_{RF1} = P_{RF2} = 0dBm, T_C = -40°C to +85°C			±0.5		dB
2LO - 2RF Spur Rejection	2 x 2	f_{RF} = 3500MHz, f_{LO} = 3800MHz, f_{SPUR} = 3650MHz	P_{RF} = -10dBm		70		dBc
			P_{RF} = 0dBm		60		
3LO - 3RF Spur Rejection	3 x 3	f_{RF} = 3500MHz, f_{LO} = 3800MHz, f_{SPUR} = 3700MHz	P_{RF} = -10dBm		83		dBc
			P_{RF} = 0dBm		63		
RF Input Return Loss	RL_{RF}	LO on and IF terminated into a matched impedance			15.5		dB
LO Input Return Loss	RL_{LO}	RF and IF terminated into a matched impedance			18.5		dB
IF Output Impedance	Z_{IF}	Nominal differential impedance at the IC's IF outputs			50		Ω
IF Return Loss	RL_{IF}	RF terminated into 50Ω, LO driven by 50Ω source, IF transformed to single-ended 50Ω using external components shown in the *Typical Application Circuit*			16		dB
RF-to-IF Isolation		P_{LO} = +3dBm			35		dB
LO Leakage at RF Port		P_{LO} = +3dBm			-36.4		dBm
2LO Leakage at RF Port		P_{LO} = +3dBm			-12.8		dBm
LO Leakage at IF Port		P_{LO} = +3dBm			-31		dBm

5.0V Supply, RF = 1650MHz to 2250MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{RF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 1850MHz, f_{LO} = 2150MHz, f_{IF} = 300MHz, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Small-Signal Conversion Loss	L_C				7.5		dB
Loss Variation vs. Frequency	ΔL_C	f_{RF} = 1650MHz to 1850MHz, any 100MHz band			±0.18		dB
		f_{RF} = 1850MHz to 2250MHz, any 100MHz band			±0.15		
		f_{RF} = 1650MHz to 1850MHz, any 200MHz band			±0.36		
		f_{RF} = 1850MHz to 2250MHz, any 200MHz band			±0.3		
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C			0.0067		dB/°C
Single Sideband Noise Figure	NF_{SSB}	No blockers present			7		dB
Noise Figure Temperature Coefficient	TC_{NF}	Single sideband, no blockers present, T_C = -40°C to +85°C			0.021		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)			23		dBm
Third-Order Input Intercept Point	IIP3	f_{RF1} = 1850MHz, f_{RF2} = 1851MHz, P_{RF1} = P_{RF2} = 0dBm			34.8		dBm
IIP3 Variation with T_C		f_{RF1} = 1850MHz, f_{RF2} = 1851MHz, P_{RF1} = P_{RF2} = 0dBm, T_C = -40°C to +85°C			±0.5		dB
2LO - 2RF Spur Rejection	2 x 2	f_{RF} = 1850MHz, f_{LO} = 2150MHz, f_{SPUR} = 2000MHz	P_{RF} = -10dBm		83		dBc
			P_{RF} = 0dBm		73		
3LO - 3RF Spur Rejection	3 x 3	f_{RF} = 1850MHz, f_{LO} = 2150MHz, f_{SPUR} = 2050MHz	P_{RF} = -10dBm		94		dBc
			P_{RF} = 0dBm		74		
RF Input Return Loss	RL_{RF}	LO on and IF terminated into a matched impedance			16.4		dB
LO Input Return Loss	RL_{LO}	RF and IF terminated into a matched impedance			25.2		dB
IF Output Impedance	Z_{IF}	Nominal differential impedance at the IC's IF outputs			50		Ω
IF Return Loss	RL_{IF}	RF terminated into 50Ω, LO driven by 50Ω source, IF transformed to single-ended 50Ω using external components shown in the *Typical Application Circuit*			17		dB
RF-to-IF Isolation		P_{LO} = +3dBm			48.7		dB
LO Leakage at RF Port		P_{LO} = +3dBm			-28.8		dBm
2LO Leakage at RF Port		P_{LO} = +3dBm			-35.3		dBm
LO Leakage at IF Port		P_{LO} = +3dBm			-20.8		dBm

5.0V Supply, RF = 1650MHz to 2250MHz, LOW-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (DOWNCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{RF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 1850MHz, f_{LO} = 1550MHz, f_{IF} = 300MHz, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Small-Signal Conversion Loss	L_C				8.5		dB
Loss Variation vs. Frequency	ΔL_C	f_{RF} = 1650MHz to 1850MHz, any 100MHz band			±0.35		dB
		f_{RF} = 1850MHz to 2250MHz, any 100MHz band			±0.075		
		f_{RF} = 1650MHz to 1850MHz, any 200MHz band			±0.7		
		f_{RF} = 1850MHz to 2250MHz, any 200MHz band			±0.15		
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C			0.0095		dB/°C
Single Sideband Noise Figure	NF_{SSB}	No blockers present			8.95		dB
Noise Figure Temperature Coefficient	TC_{NF}	Single sideband, no blockers present, T_C = -40°C to +85°C			0.024		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)			17.2		dBm
Third-Order Input Intercept Point	IIP3	f_{RF1} = 1850MHz, f_{RF2} = 1851MHz, P_{RF1} = P_{RF2} = 0dBm			26.7		dBm
IIP3 Variation with T_C		f_{RF1} = 1850MHz, f_{RF2} = 1851MHz, P_{RF1} = P_{RF2} = 0dBm, T_C = -40°C to +85°C			±0.5		dB
2RF - 2LO Spur Rejection	2 x 2	f_{RF} = 1850MHz, f_{LO} = 1550MHz, f_{SPUR} = 1700MHz	P_{RF} = -10dBm		71		dBc
			P_{RF} = 0dBm		61		
3RF - 3LO Spur Rejection	3 x 3	f_{RF} = 1850MHz, f_{LO} = 1550MHz, f_{SPUR} = 1650MHz	P_{RF} = -10dBm		83		dBc
			P_{RF} = 0dBm		63		
RF Input Return Loss	RL_{RF}	LO on and IF terminated into a matched impedance			12.4		dB
LO Input Return Loss	RL_{LO}	RF and IF terminated into a matched impedance			17.3		dB
IF Output Impedance	Z_{IF}	Nominal differential impedance at the IC's IF outputs			50		Ω
IF Return Loss	RL_{IF}	RF terminated into 50Ω, LO driven by 50Ω source, IF transformed to single-ended 50Ω using external components shown in the *Typical Application Circuit*			19.3		dB
RF-to-IF Isolation		P_{LO} = +3dBm			44.6		dB
LO Leakage at RF Port		P_{LO} = +3dBm			-29.5		dBm
2LO Leakage at RF Port		P_{LO} = +3dBm			-29.5		dBm
LO Leakage at IF Port		P_{LO} = +3dBm			-29.7		dBm

5.0V Supply, RF = 2000MHz to 2900MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (UPCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 2**. Typical values are for T_C = +25°C, V_{CC} = 5.0V, P_{IF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{IF} = 300MHz, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Conversion Loss	L_C			7.3		dB
Conversion Loss Variation vs. Frequency	ΔL_C	f_{RF} = 2010MHz to 2025MHz		±0.05		dB
		f_{RF} = 2305MHz to 2360MHz		±0.05		
		f_{RF} = 2500MHz to 2570MHz		±0.05		
		f_{RF} = 2570MHz to 2620MHz		±0.05		
		f_{RF} = 2500MHz to 2690MHz		±0.15		
		f_{RF} = 2700MHz to 2900MHz		±0.2		
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C		0.007		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)		22		dBm
Input Third-Order Intercept Point	IIP3	f_{IF1} = 300MHz, f_{IF2} = 301MHz, P_{IF} = 0dBm/tone		32.8		dBm
IIP3 Variation with T_C	IIP3	f_{IF1} = 300MHz, f_{IF2} = 301MHz, P_{IF} = 0dBm/tone, T_C = -40°C to +85°C		±0.5		dB
LO ± 2IF Spur		LO - 2IF		61		dBc
		LO + 2IF		62		
LO ± 3IF Spur		LO - 3IF		72		dBc
		LO + 3IF		85		
Output Noise Floor		P_{OUT} = 0dBm (Note 9)		-163		dBm/Hz

3.3V Supply, RF = 2000MHz to 2900MHz, HIGH-SIDE LO INJECTION AC ELECTRICAL CHARACTERISTICS (UPCONVERTER OPERATION)

(*Typical Application Circuit* with tuning elements outlined in **Table 2**. Typical values are for T_C = +25°C, V_{CC} = 3.3V, P_{IF} = 0dBm, P_{LO} = 0dBm, f_{RF} = 2600MHz, f_{LO} = 2900MHz, f_{IF} = 300MHz, unless otherwise noted.)

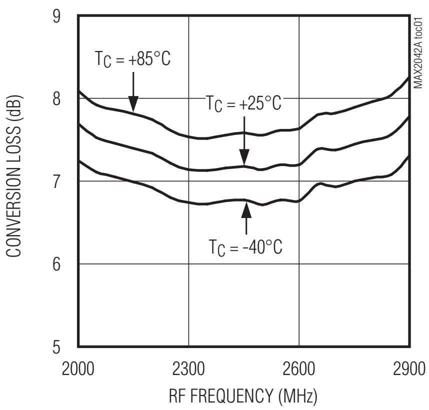
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Conversion Loss	L_C			7.3		dB
Conversion Loss Variation vs. Frequency	ΔL_C	f_{RF} = 2000MHz to 2900MHz, any 100MHz band		±0.25		dB
Conversion Loss Temperature Coefficient	TC_{CL}	T_C = -40°C to +85°C		0.008		dB/°C
Input 1dB Compression Point	IP_{1dB}	(Note 10)		20.5		dBm
Input Third-Order Intercept Point	IIP3	f_{IF1} = 300MHz, f_{IF2} = 301MHz, P_{IF} = 0dBm/tone		30		dBm
IIP3 Variation with T_C	IIP3	f_{IF1} = 300MHz, f_{IF2} = 301MHz, P_{IF} = 0dBm/tone, T_C = -40°C to +85°C		±0.6		dB
LO ± 2IF Spur		LO - 2IF		60		dBc
		LO + 2IF		64		
LO ± 3IF Spur		LO - 3IF		68		dBc
		LO + 3IF		80		
Output Noise Floor		P_{OUT} = 0dBm (Note 9)		-160		dBm/Hz

Note 5: Not production tested.
Note 6: Operation outside this range is possible, but with degraded performance of some parameters. See the *Typical Operating Characteristics*.
Note 7: All limits reflect losses of external components, including a 0.5dB loss at f_{IF} = 300MHz due to the 1:1 impedance transformer. Output measurements were taken at IF outputs of the *Typical Application Circuit*.
Note 8: 100% production tested for functional performance.
Note 9: Measured with external LO source noise filtered so that the noise floor is -174dBm/Hz at 100MHz offset. This specification reflects the effects of all SNR degradations in the mixer including the LO noise, as defined in Application Note 2021: *Specifications and Measurement of Local Oscillator Noise in Integrated Circuit Base Station Mixers*.
Note 10: Maximum reliable continuous input power applied to the RF or IF port of this device is +12dBm from a 50Ω source.

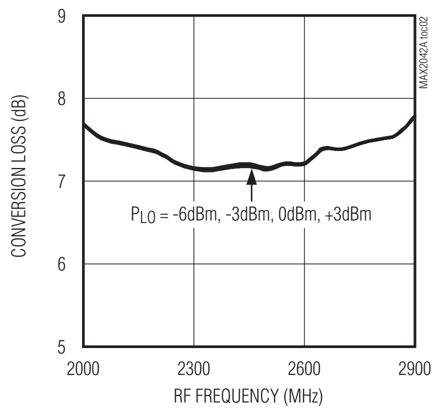
典型工作特性

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

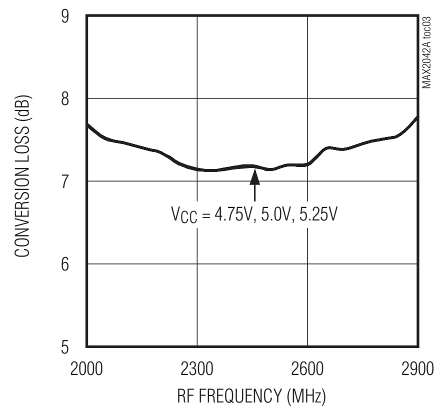
CONVERSION LOSS vs. RF FREQUENCY



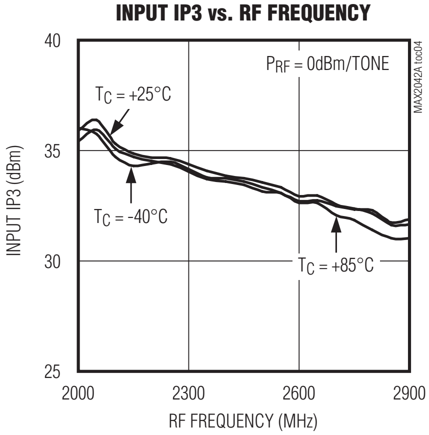
CONVERSION LOSS vs. RF FREQUENCY



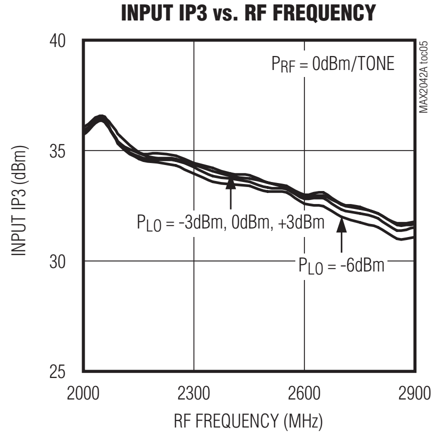
CONVERSION LOSS vs. RF FREQUENCY



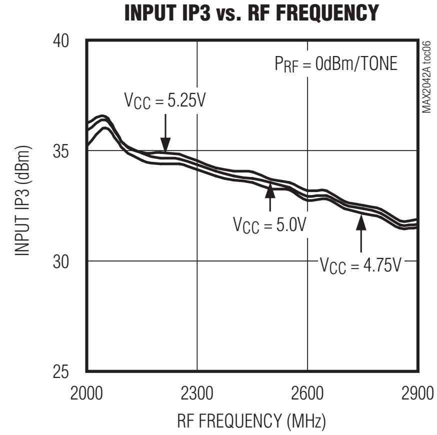
INPUT IP3 vs. RF FREQUENCY



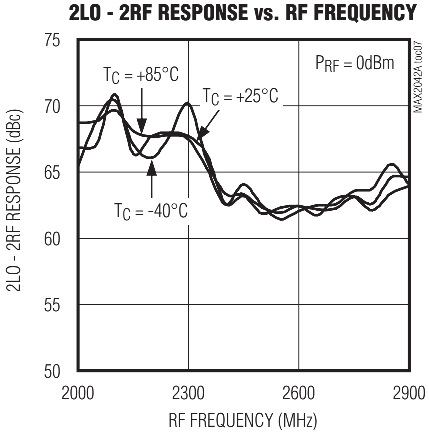
INPUT IP3 vs. RF FREQUENCY



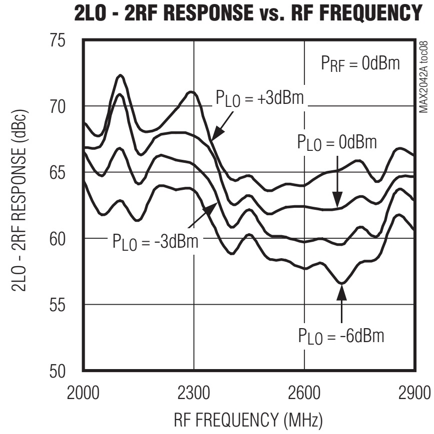
INPUT IP3 vs. RF FREQUENCY



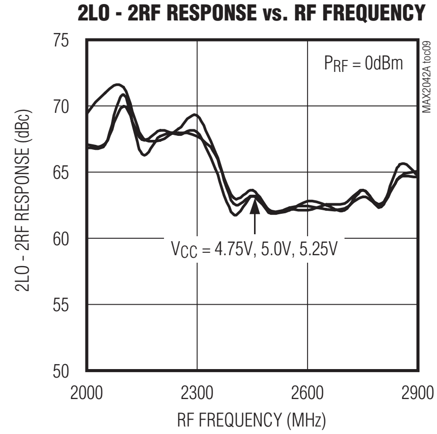
2LO - 2RF RESPONSE vs. RF FREQUENCY



2LO - 2RF RESPONSE vs. RF FREQUENCY



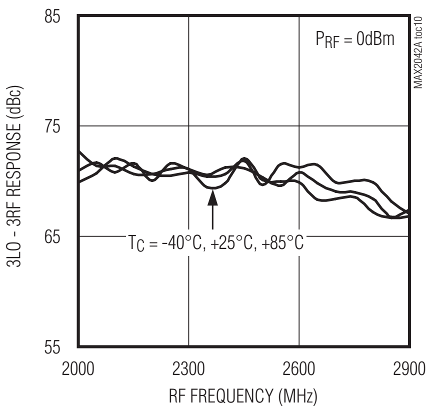
2LO - 2RF RESPONSE vs. RF FREQUENCY



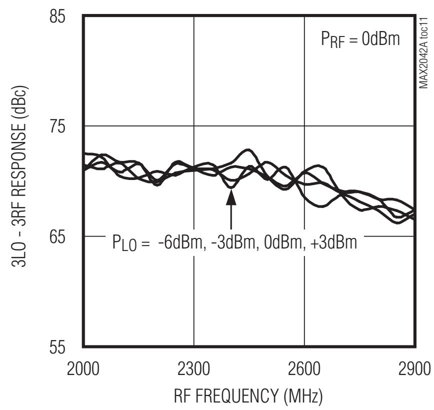
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

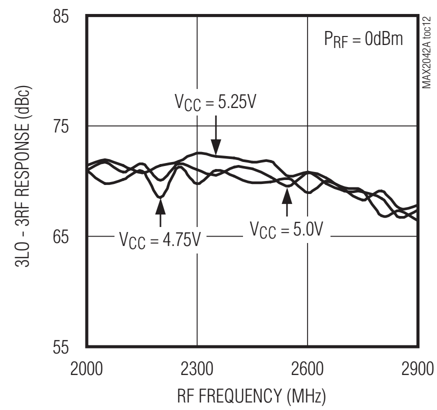
3LO - 3RF RESPONSE vs. RF FREQUENCY



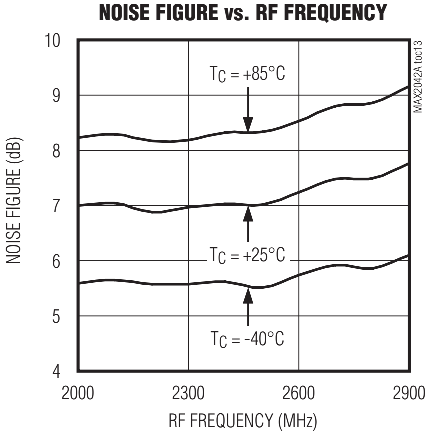
3LO - 3RF RESPONSE vs. RF FREQUENCY



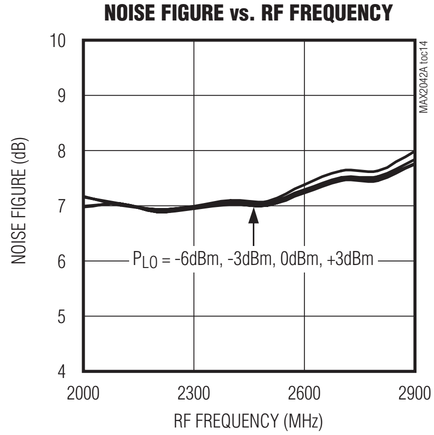
3LO - 3RF RESPONSE vs. RF FREQUENCY



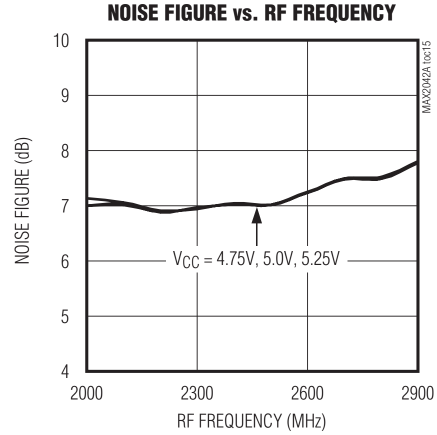
NOISE FIGURE vs. RF FREQUENCY



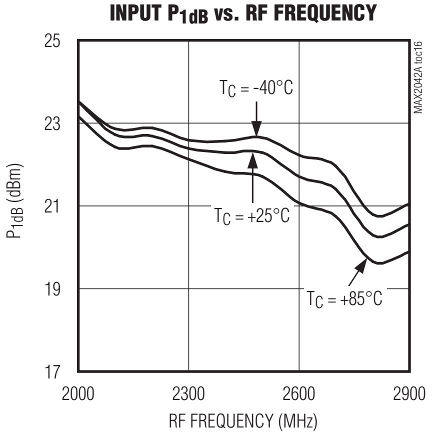
NOISE FIGURE vs. RF FREQUENCY



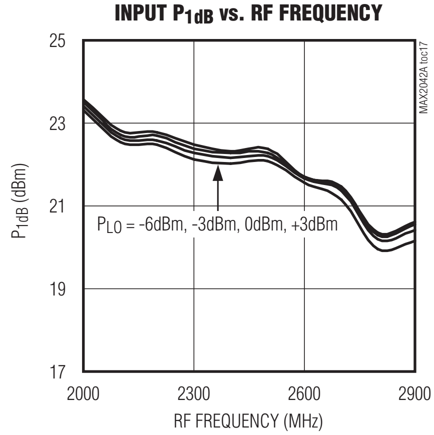
NOISE FIGURE vs. RF FREQUENCY



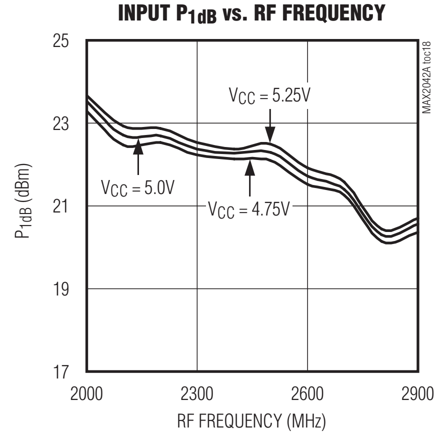
INPUT P_{1dB} vs. RF FREQUENCY



INPUT P_{1dB} vs. RF FREQUENCY



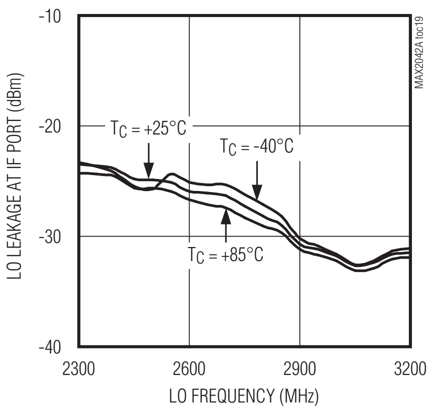
INPUT P_{1dB} vs. RF FREQUENCY



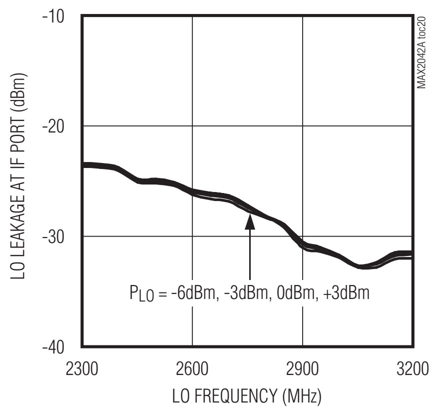
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

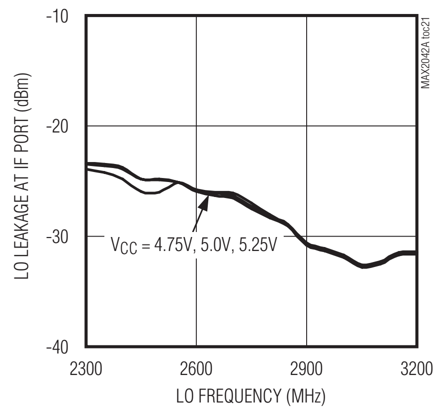
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



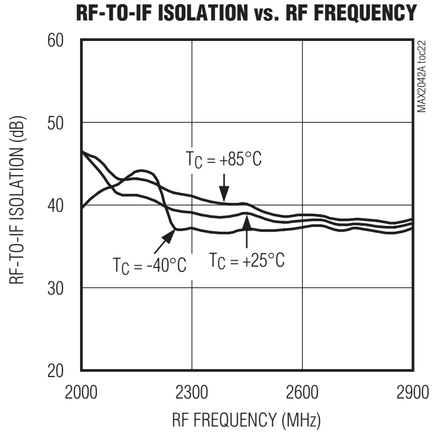
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



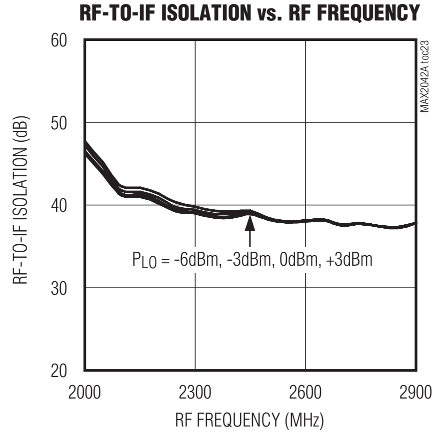
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



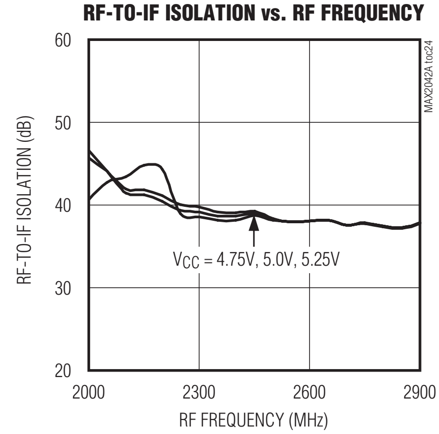
RF-TO-IF ISOLATION vs. RF FREQUENCY



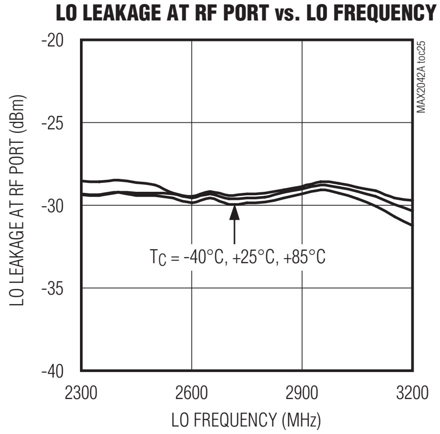
RF-TO-IF ISOLATION vs. RF FREQUENCY



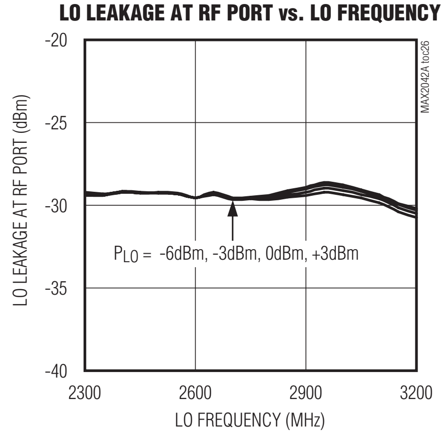
RF-TO-IF ISOLATION vs. RF FREQUENCY



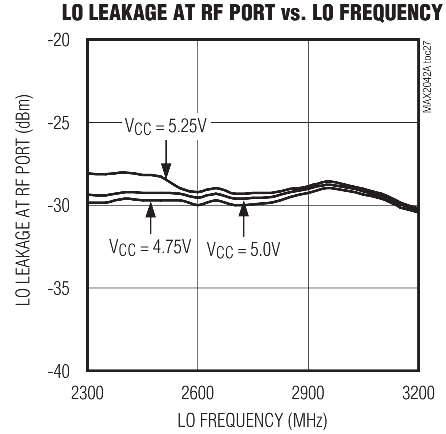
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



LO LEAKAGE AT RF PORT vs. LO FREQUENCY

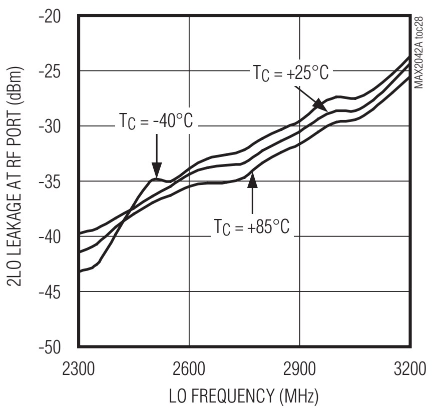


LO LEAKAGE AT RF PORT vs. LO FREQUENCY

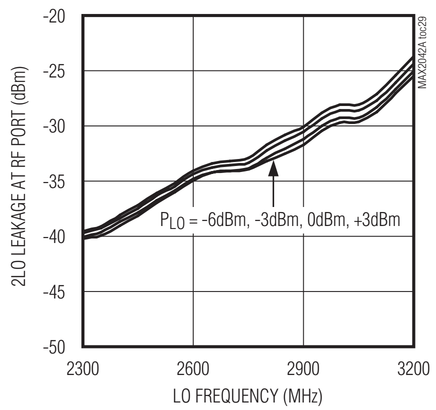


([*Typical Application Circuit*](#) with tuning elements outlined in **[Table 1](#), V_{CC} = 5.0V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

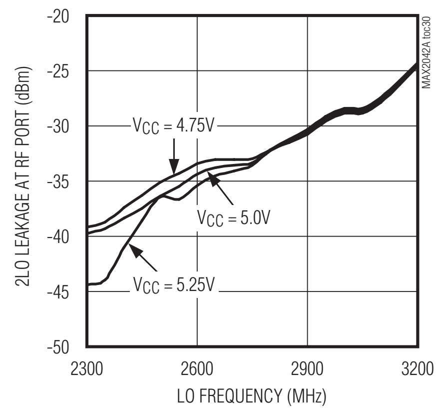
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



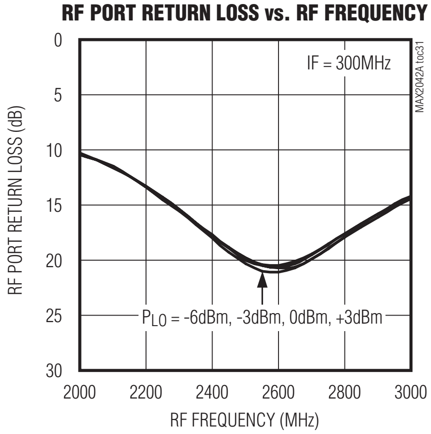
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



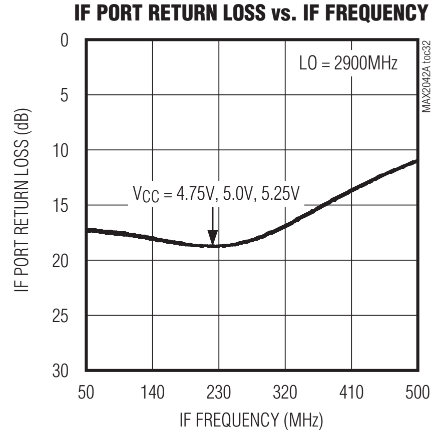
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



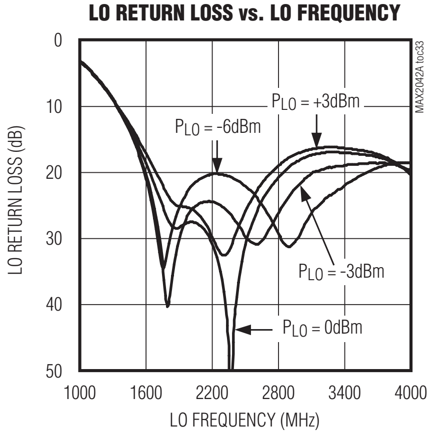
RF PORT RETURN LOSS vs. RF FREQUENCY



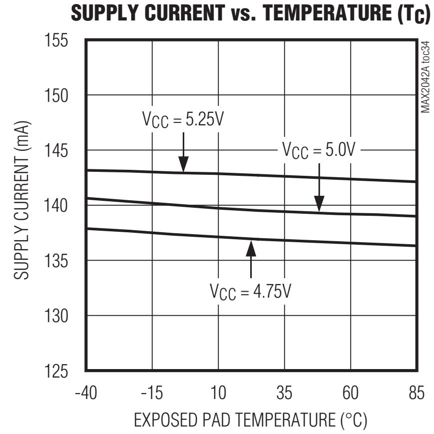
IF PORT RETURN LOSS vs. IF FREQUENCY



LO RETURN LOSS vs. LO FREQUENCY



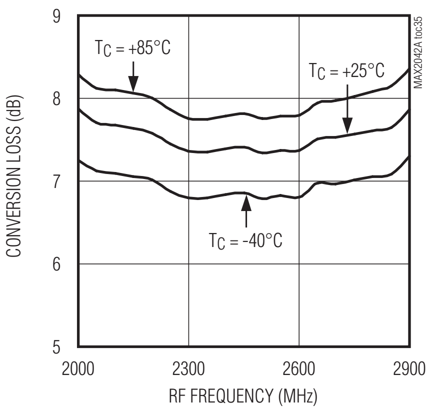
SUPPLY CURRENT vs. TEMPERATURE (T_C)



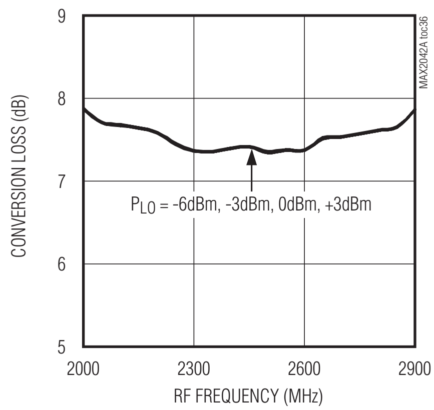
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 3.3V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

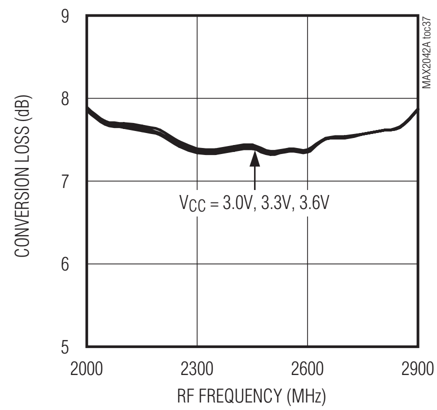
CONVERSION LOSS vs. RF FREQUENCY



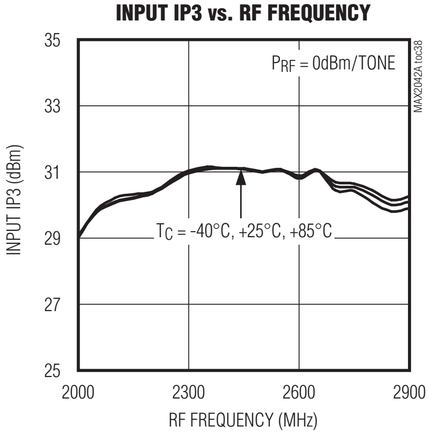
CONVERSION LOSS vs. RF FREQUENCY



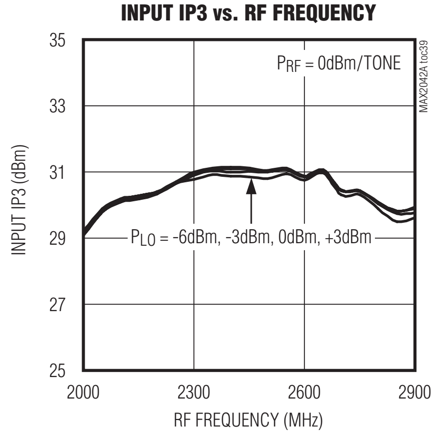
CONVERSION LOSS vs. RF FREQUENCY



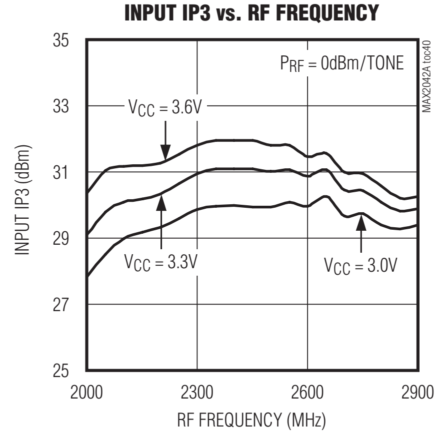
INPUT IP3 vs. RF FREQUENCY



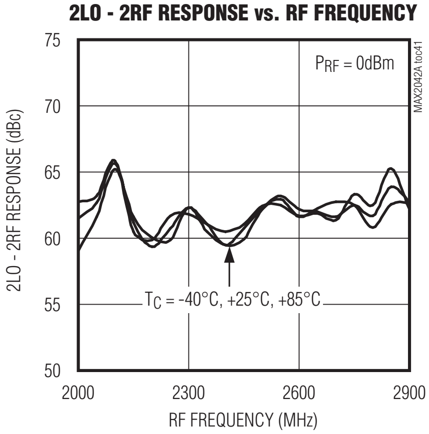
INPUT IP3 vs. RF FREQUENCY



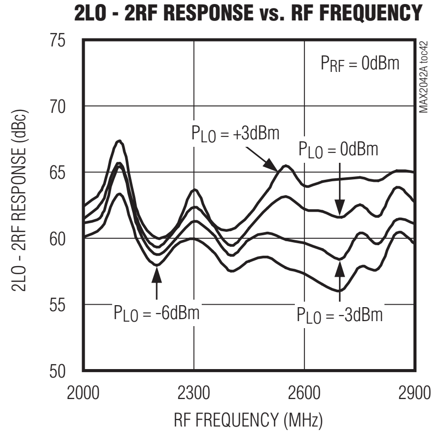
INPUT IP3 vs. RF FREQUENCY



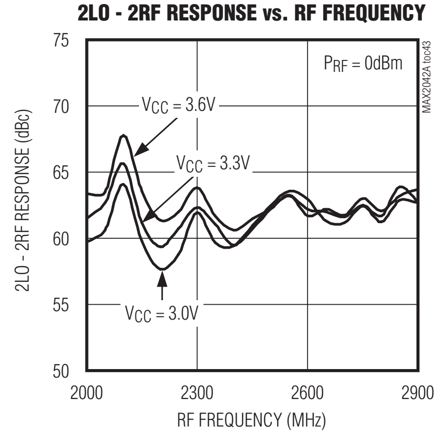
2LO - 2RF RESPONSE vs. RF FREQUENCY



2LO - 2RF RESPONSE vs. RF FREQUENCY



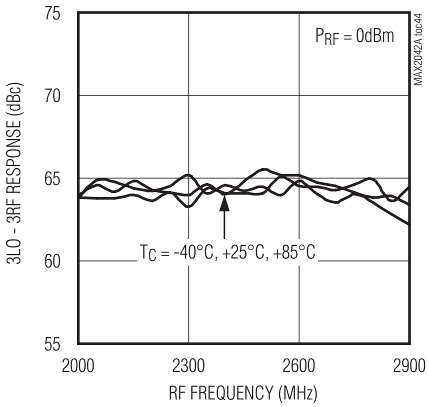
2LO - 2RF RESPONSE vs. RF FREQUENCY



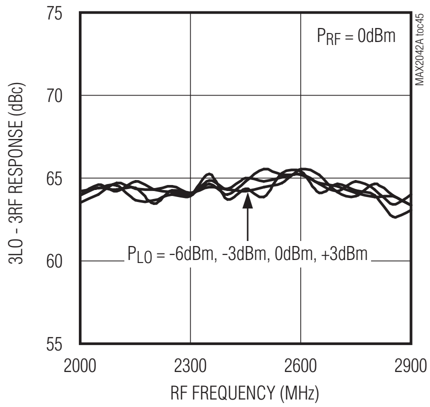
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 3.3V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

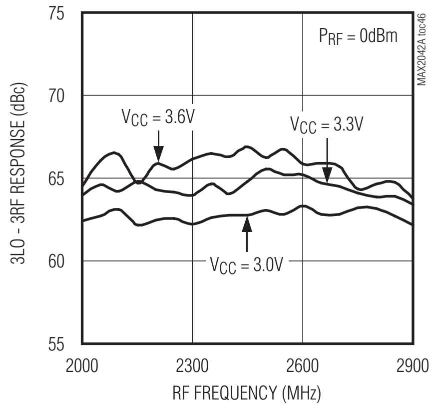
3LO - 3RF RESPONSE vs. RF FREQUENCY



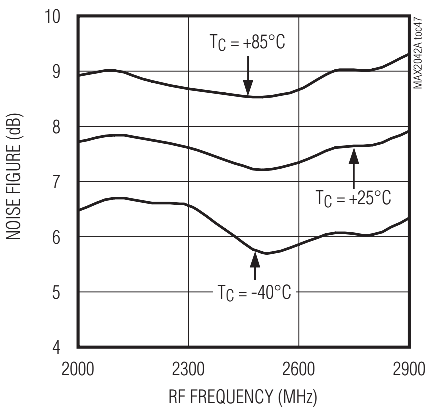
3LO - 3RF RESPONSE vs. RF FREQUENCY



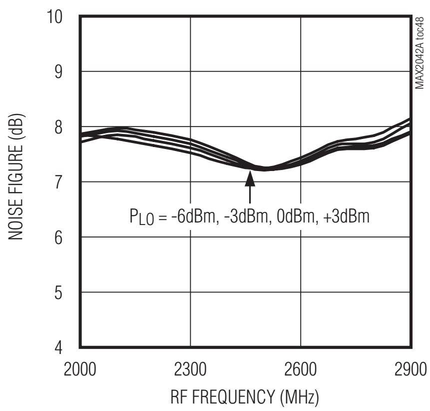
3LO - 3RF RESPONSE vs. RF FREQUENCY



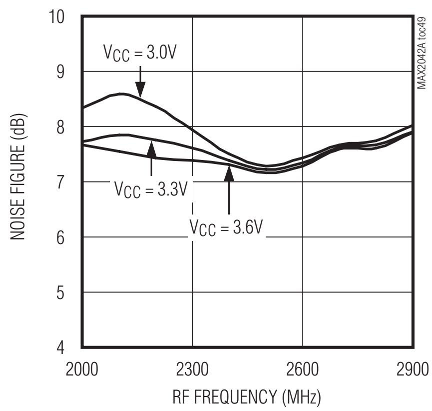
NOISE FIGURE vs. RF FREQUENCY



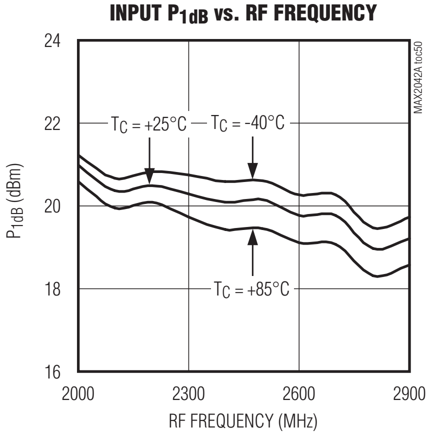
NOISE FIGURE vs. RF FREQUENCY



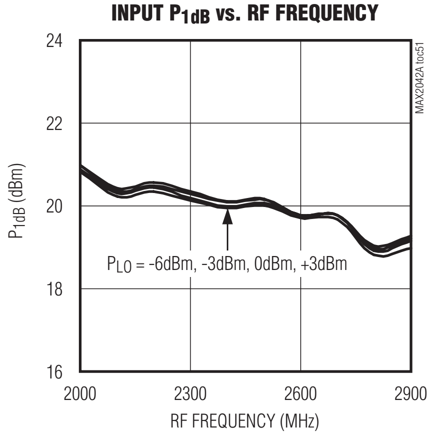
NOISE FIGURE vs. RF FREQUENCY



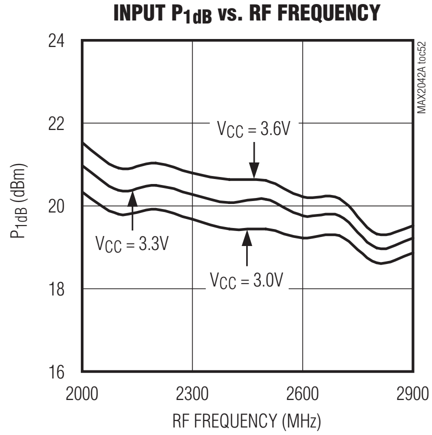
INPUT P_{1dB} vs. RF FREQUENCY



INPUT P_{1dB} vs. RF FREQUENCY



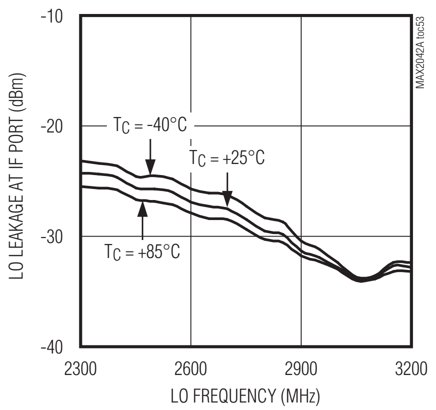
INPUT P_{1dB} vs. RF FREQUENCY



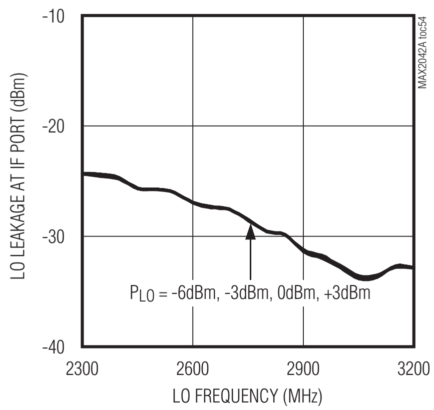
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 3.3V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

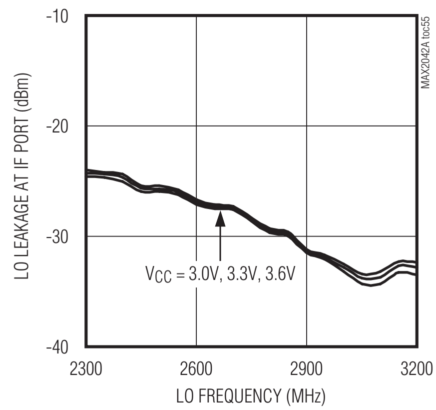
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



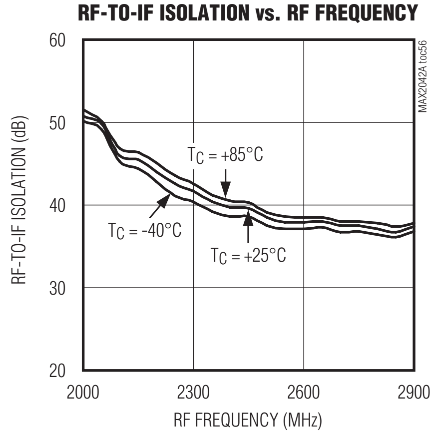
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



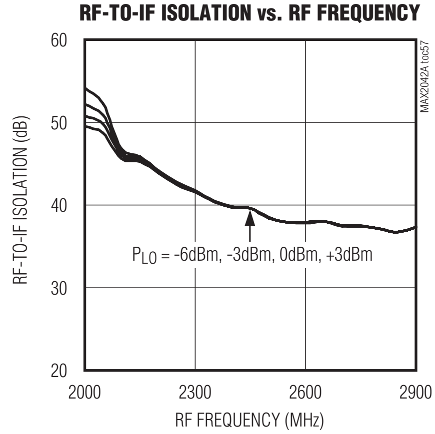
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



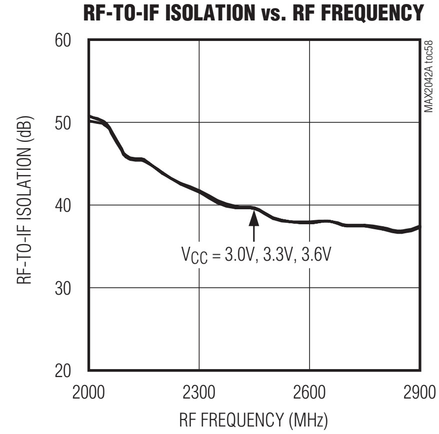
RF-TO-IF ISOLATION vs. RF FREQUENCY



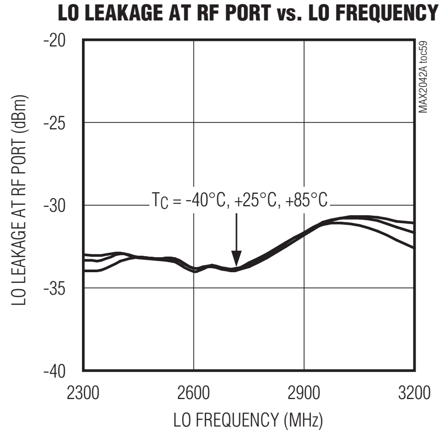
RF-TO-IF ISOLATION vs. RF FREQUENCY



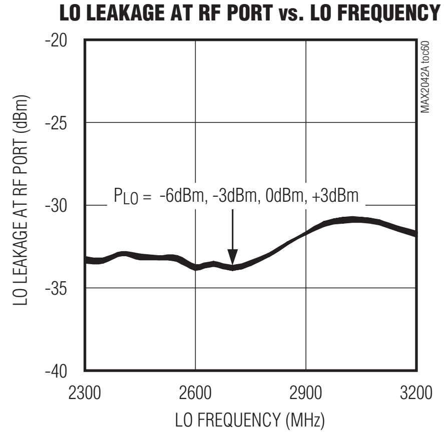
RF-TO-IF ISOLATION vs. RF FREQUENCY



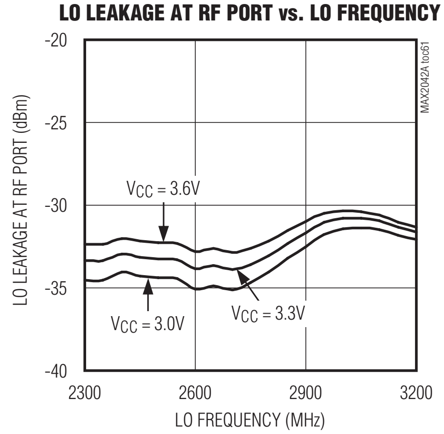
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



LO LEAKAGE AT RF PORT vs. LO FREQUENCY

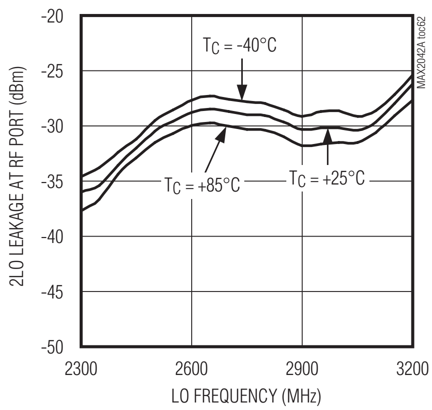


LO LEAKAGE AT RF PORT vs. LO FREQUENCY

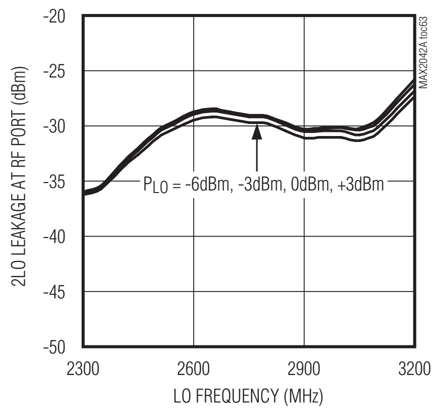


(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 3.3V, f_{RF} = 2000MHz to 2900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

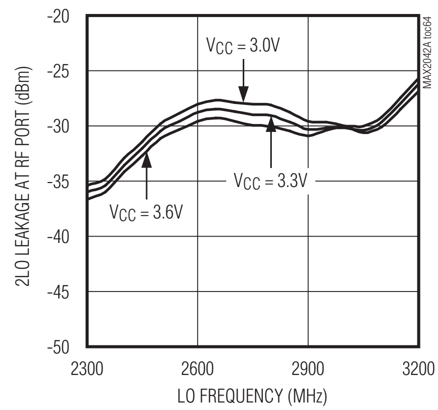
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



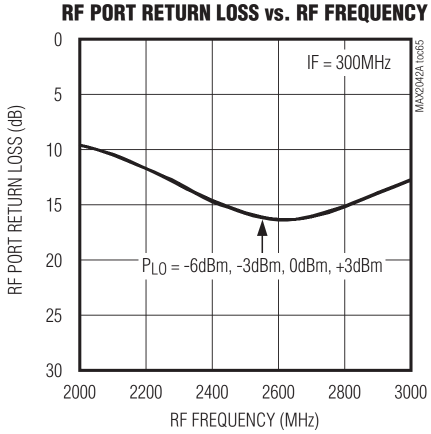
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



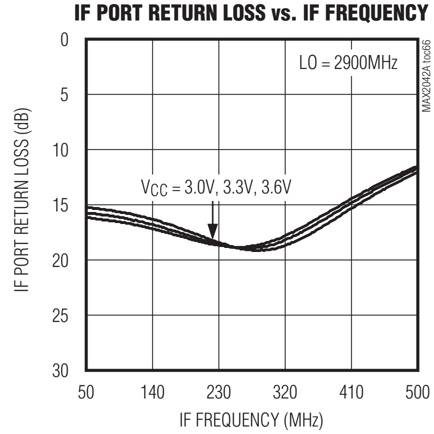
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



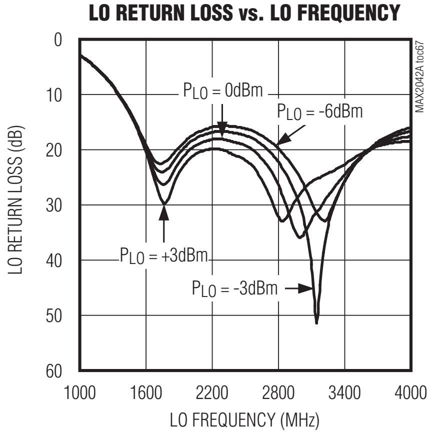
RF PORT RETURN LOSS vs. RF FREQUENCY



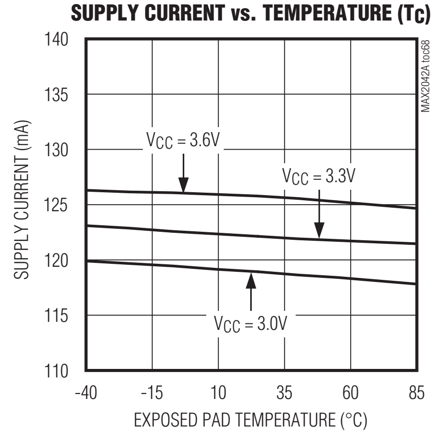
IF PORT RETURN LOSS vs. IF FREQUENCY



LO RETURN LOSS vs. LO FREQUENCY

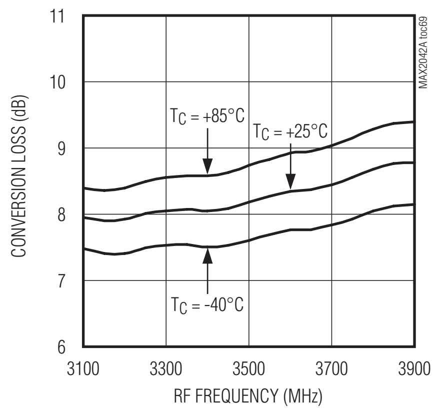


SUPPLY CURRENT vs. TEMPERATURE (T_C)

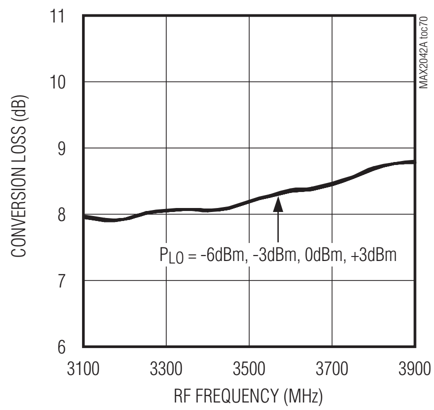


(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 3100MHz to 3900MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

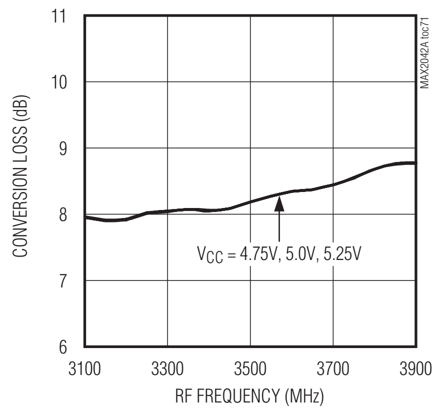
CONVERSION LOSS vs. RF FREQUENCY



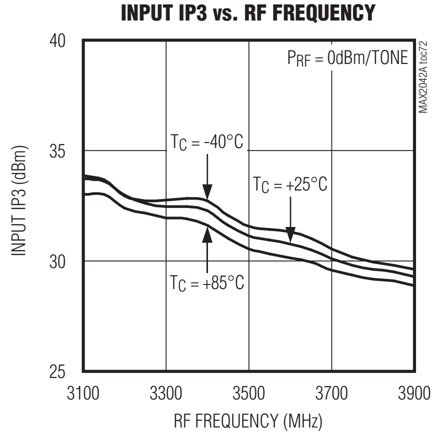
CONVERSION LOSS vs. RF FREQUENCY



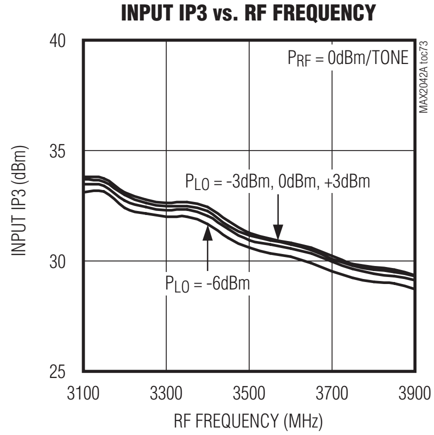
CONVERSION LOSS vs. RF FREQUENCY



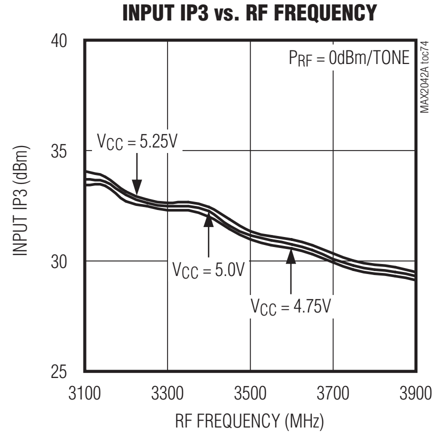
INPUT IP3 vs. RF FREQUENCY



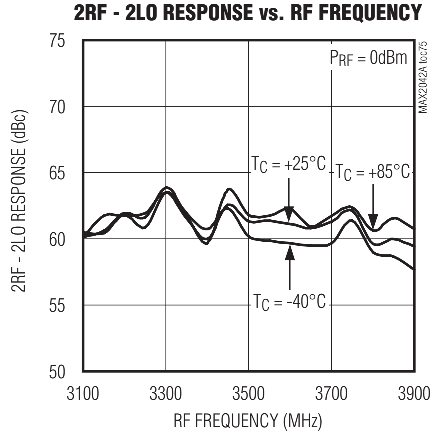
INPUT IP3 vs. RF FREQUENCY



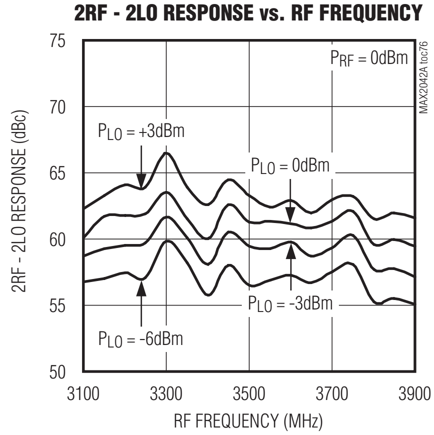
INPUT IP3 vs. RF FREQUENCY



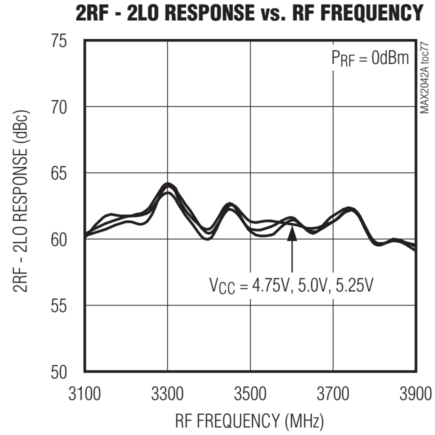
2RF - 2LO RESPONSE vs. RF FREQUENCY



2RF - 2LO RESPONSE vs. RF FREQUENCY



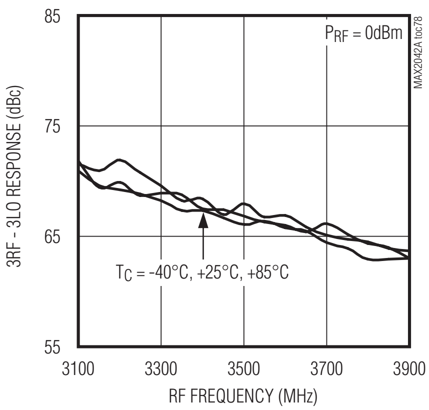
2RF - 2LO RESPONSE vs. RF FREQUENCY



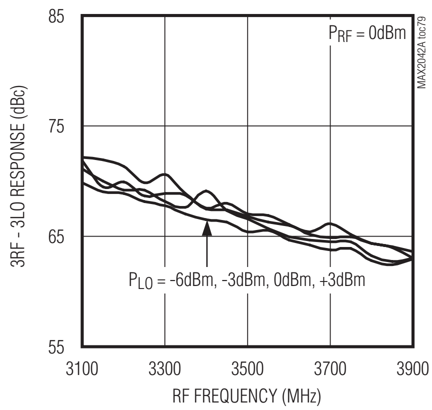
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 3100MHz to 3900MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

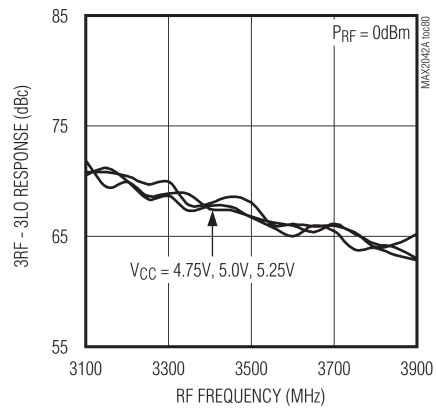
3RF - 3LO RESPONSE vs. RF FREQUENCY



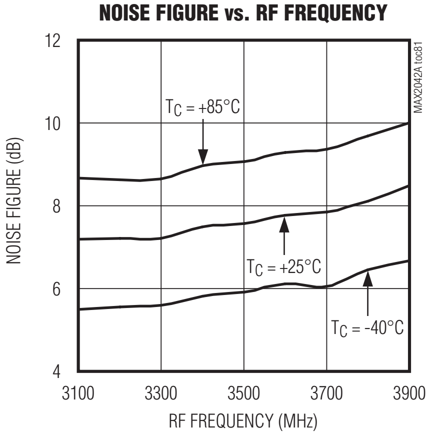
3RF - 3LO RESPONSE vs. RF FREQUENCY



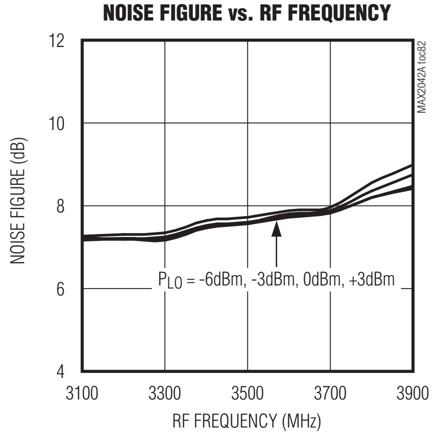
3RF - 3LO RESPONSE vs. RF FREQUENCY



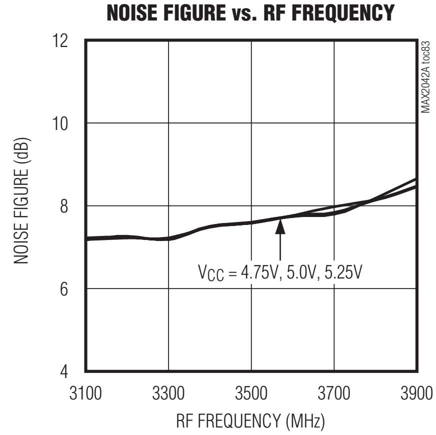
NOISE FIGURE vs. RF FREQUENCY



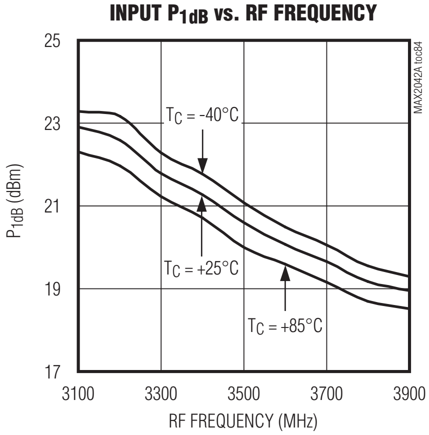
NOISE FIGURE vs. RF FREQUENCY



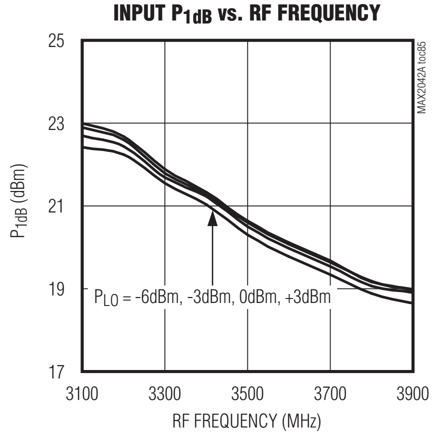
NOISE FIGURE vs. RF FREQUENCY



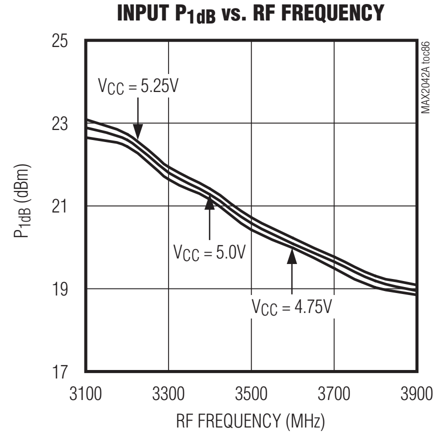
INPUT P_{1dB} vs. RF FREQUENCY



INPUT P_{1dB} vs. RF FREQUENCY

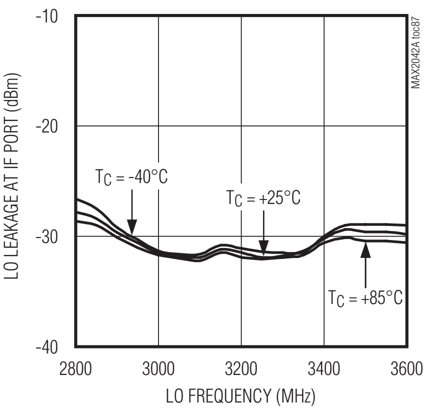


INPUT P_{1dB} vs. RF FREQUENCY

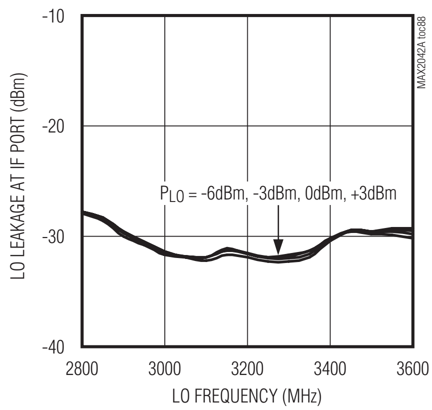


(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 3100MHz to 3900MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

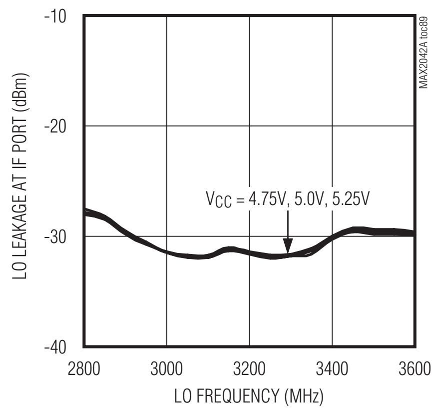
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



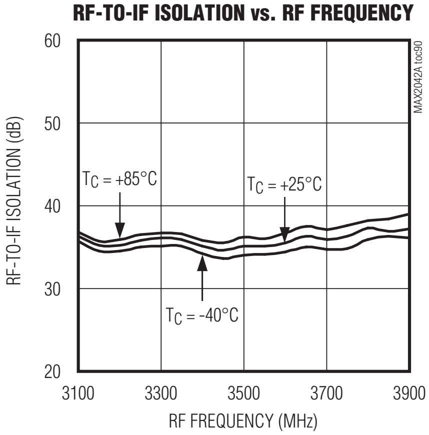
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



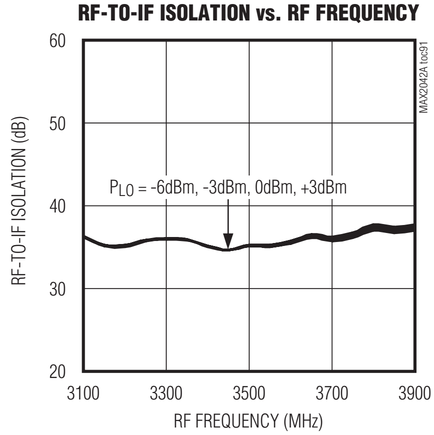
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



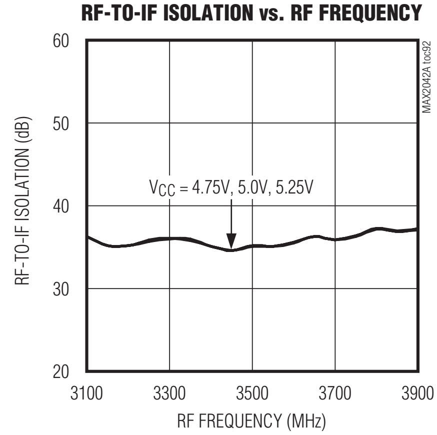
RF-TO-IF ISOLATION vs. RF FREQUENCY



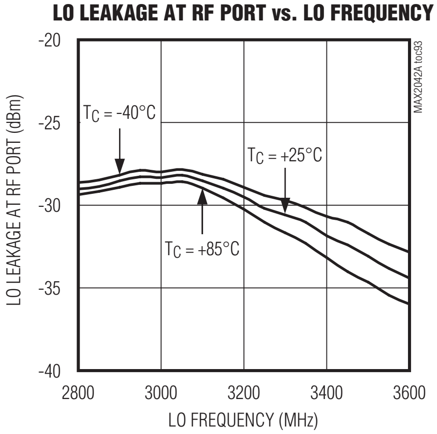
RF-TO-IF ISOLATION vs. RF FREQUENCY



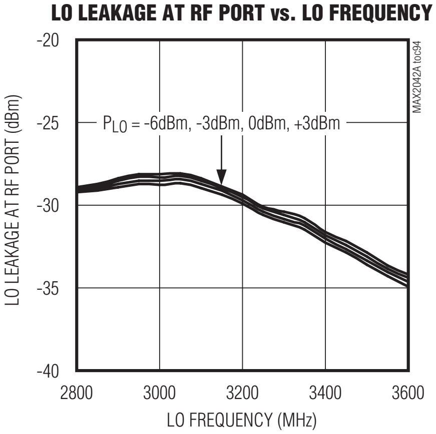
RF-TO-IF ISOLATION vs. RF FREQUENCY



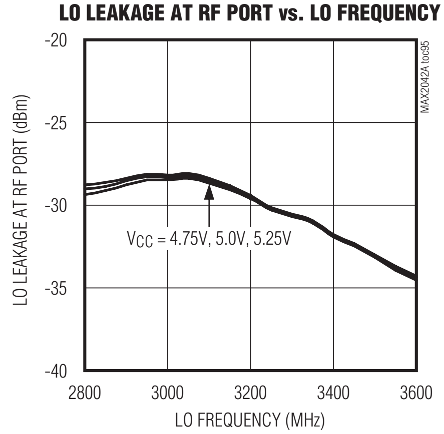
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



LO LEAKAGE AT RF PORT vs. LO FREQUENCY



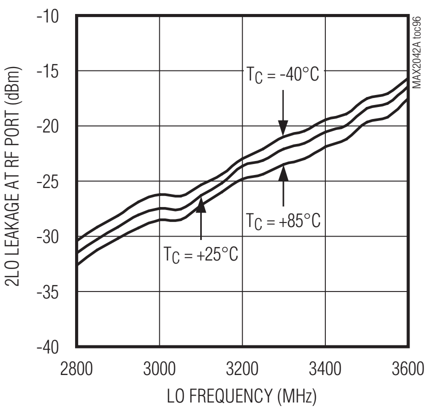
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



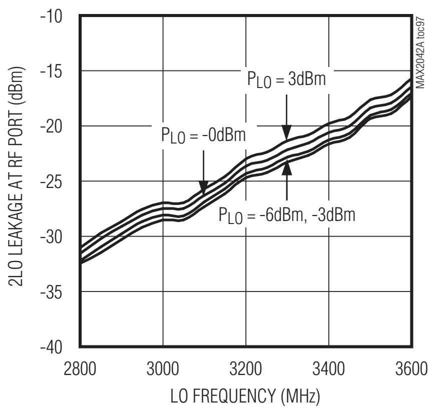
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 1**, **V_{CC} = 5.0V, f_{RF} = 3100MHz to 3900MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

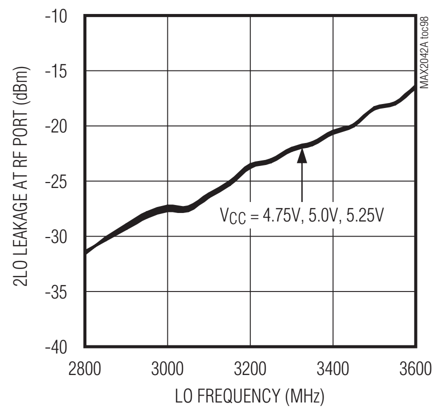
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



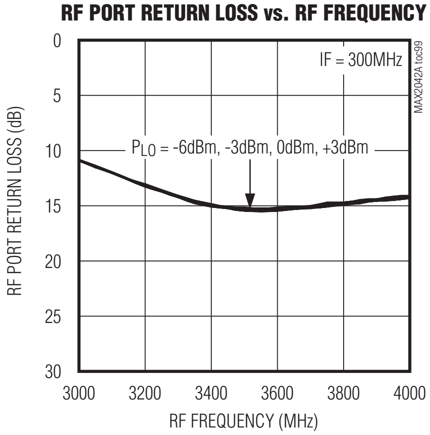
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



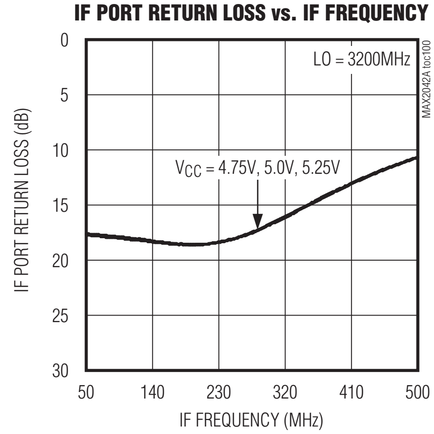
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



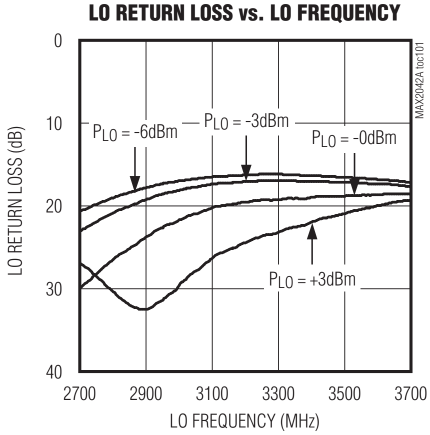
RF PORT RETURN LOSS vs. RF FREQUENCY



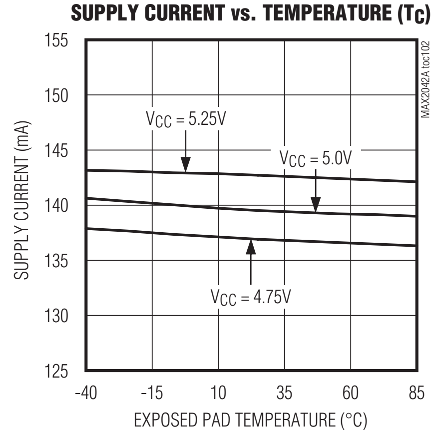
IF PORT RETURN LOSS vs. IF FREQUENCY



LO RETURN LOSS vs. LO FREQUENCY



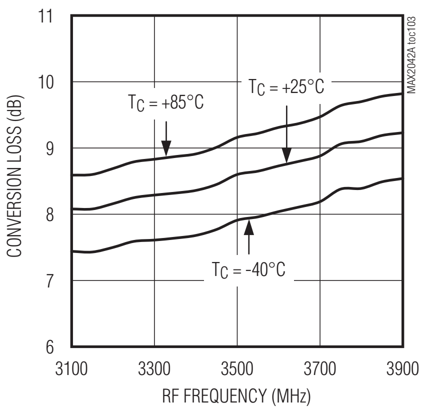
SUPPLY CURRENT vs. TEMPERATURE (T_C)



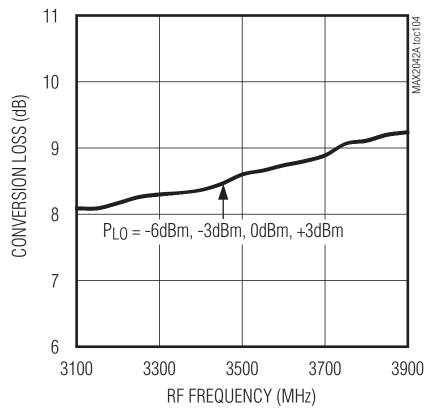
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, f_{RF} = 3100MHz to 3900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

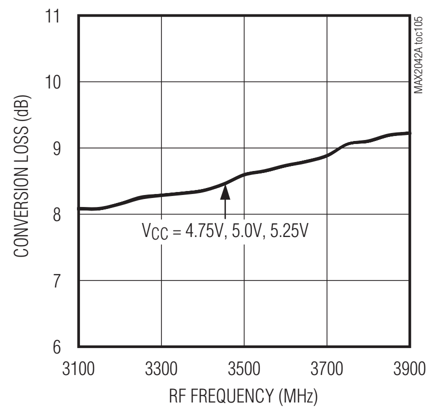
CONVERSION LOSS vs. RF FREQUENCY



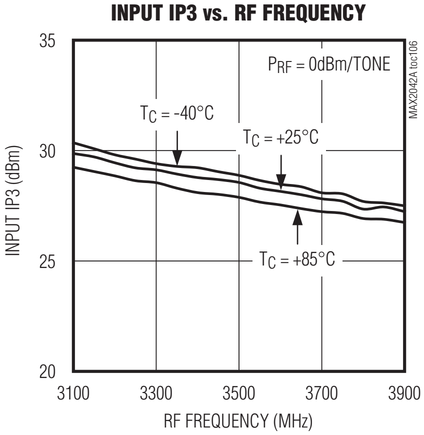
CONVERSION LOSS vs. RF FREQUENCY



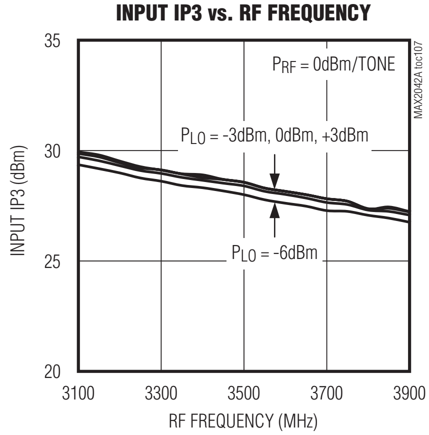
CONVERSION LOSS vs. RF FREQUENCY



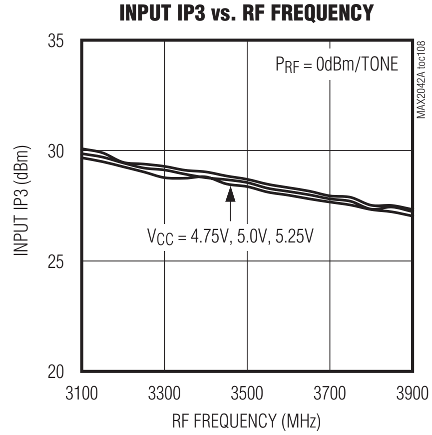
INPUT IP3 vs. RF FREQUENCY



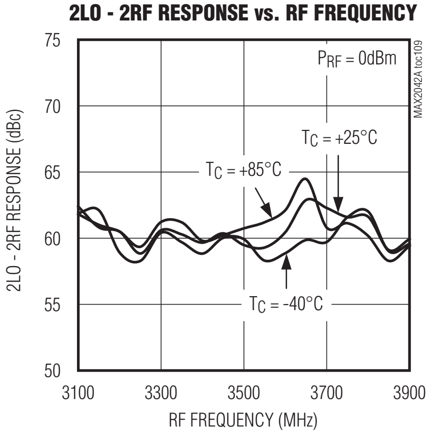
INPUT IP3 vs. RF FREQUENCY



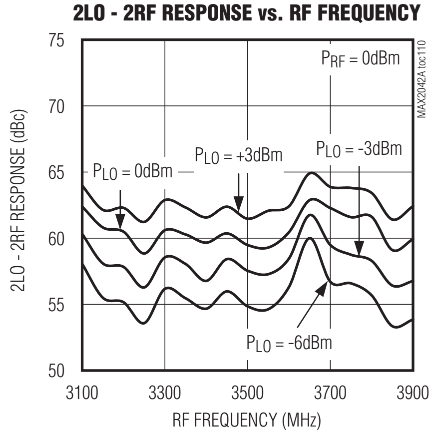
INPUT IP3 vs. RF FREQUENCY



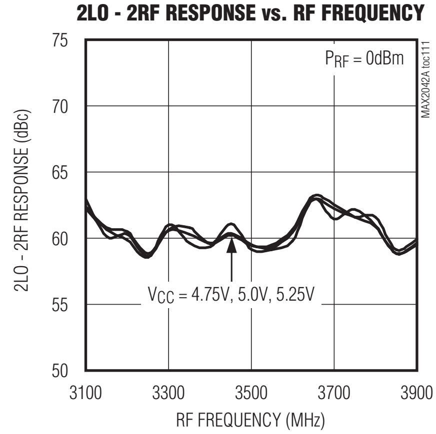
2LO - 2RF RESPONSE vs. RF FREQUENCY



2LO - 2RF RESPONSE vs. RF FREQUENCY



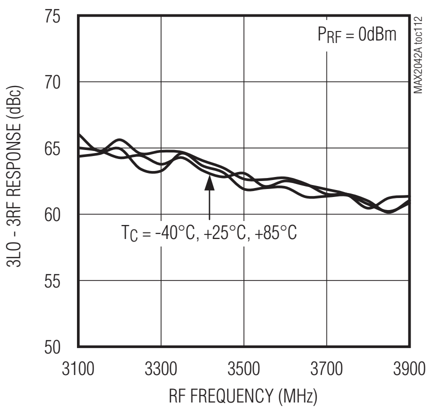
2LO - 2RF RESPONSE vs. RF FREQUENCY



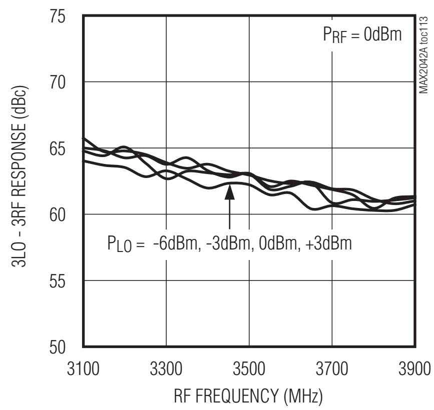
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, fRF = 3100MHz to 3900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

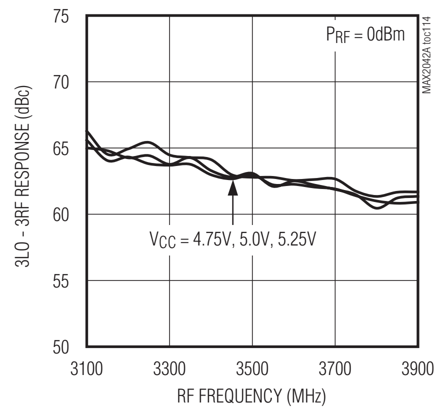
3LO - 3RF RESPONSE vs. RF FREQUENCY



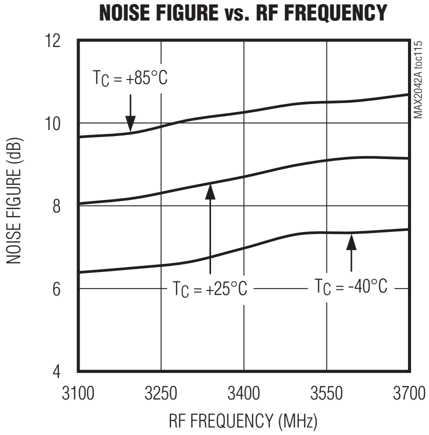
3LO - 3RF RESPONSE vs. RF FREQUENCY



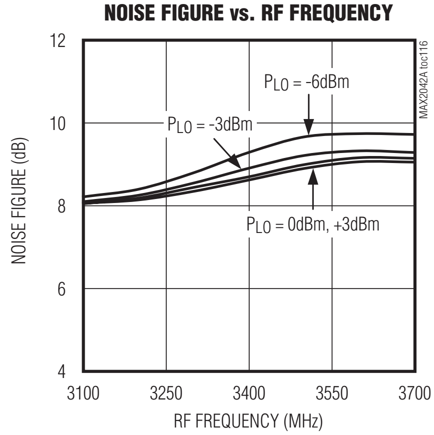
3LO - 3RF RESPONSE vs. RF FREQUENCY



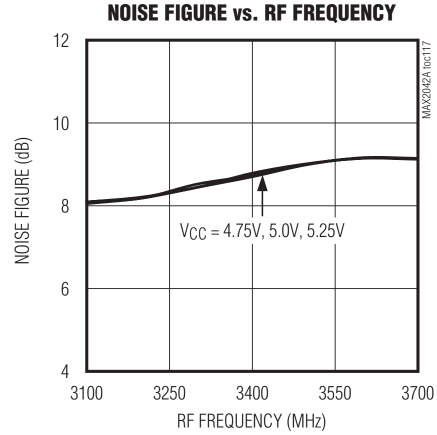
NOISE FIGURE vs. RF FREQUENCY



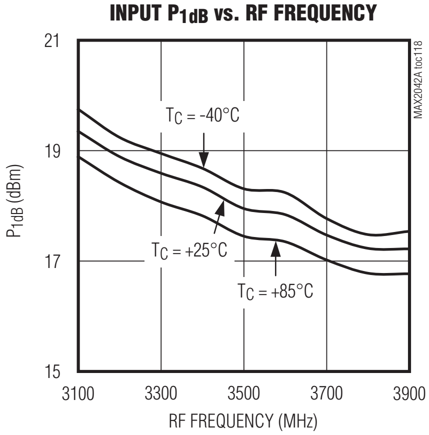
NOISE FIGURE vs. RF FREQUENCY



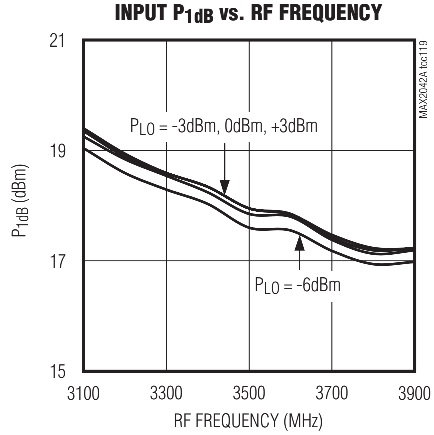
NOISE FIGURE vs. RF FREQUENCY



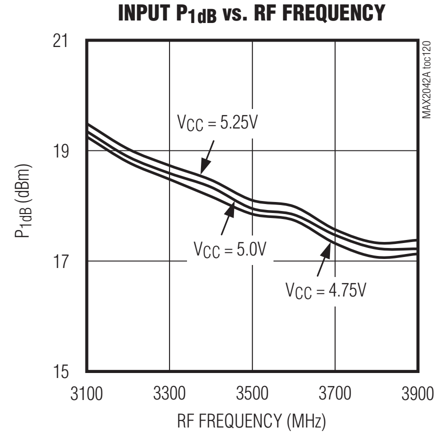
INPUT P_{1dB} vs. RF FREQUENCY



INPUT P_{1dB} vs. RF FREQUENCY

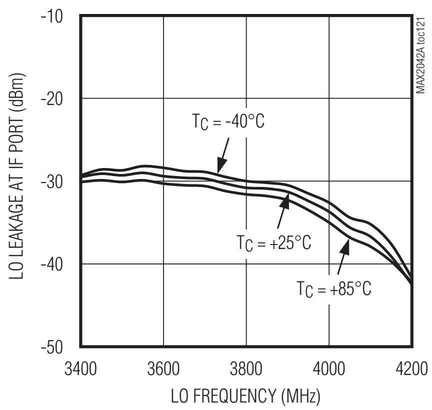


INPUT P_{1dB} vs. RF FREQUENCY

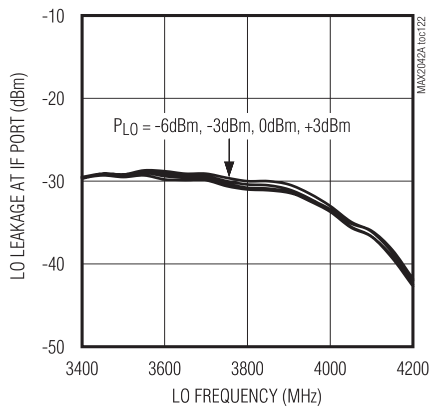


(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, fRF = 3100MHz to 3900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

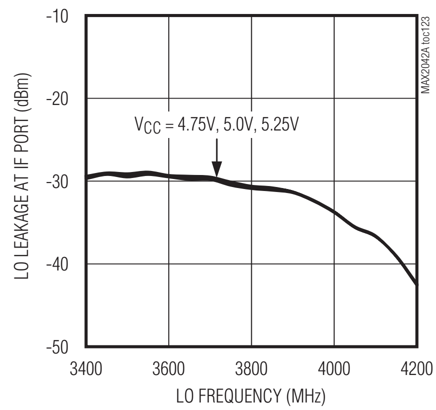
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



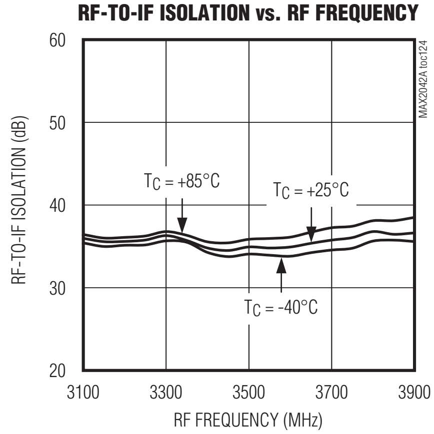
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



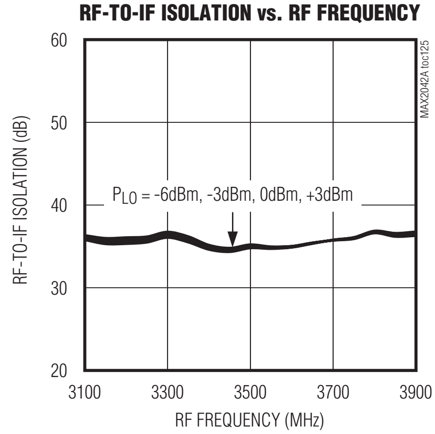
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



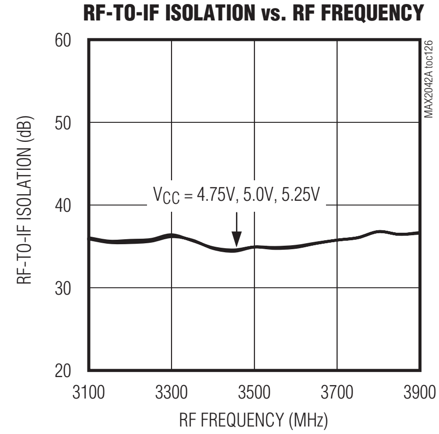
RF-TO-IF ISOLATION vs. RF FREQUENCY



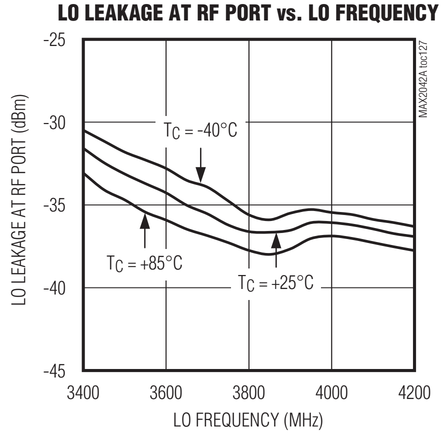
RF-TO-IF ISOLATION vs. RF FREQUENCY



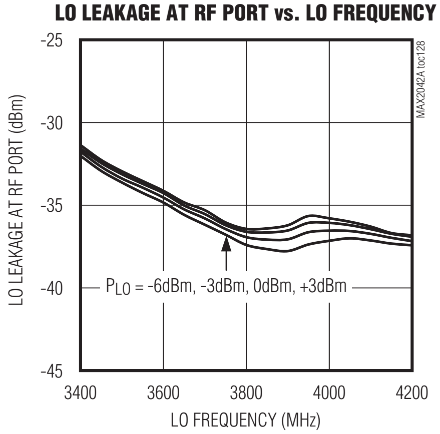
RF-TO-IF ISOLATION vs. RF FREQUENCY



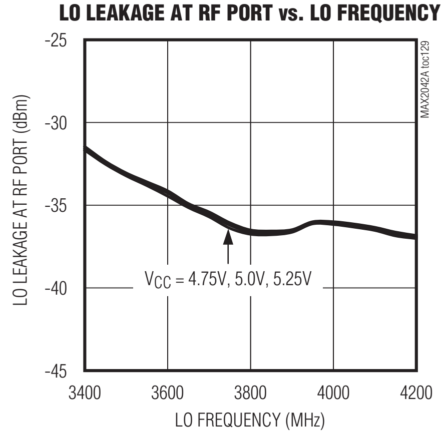
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



LO LEAKAGE AT RF PORT vs. LO FREQUENCY



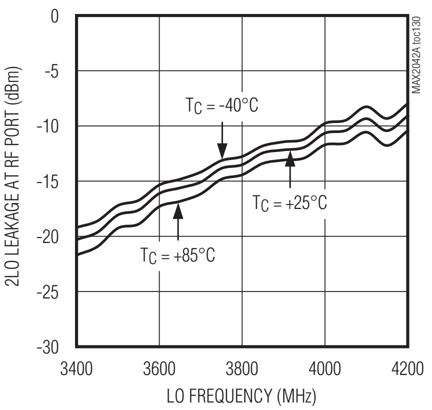
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



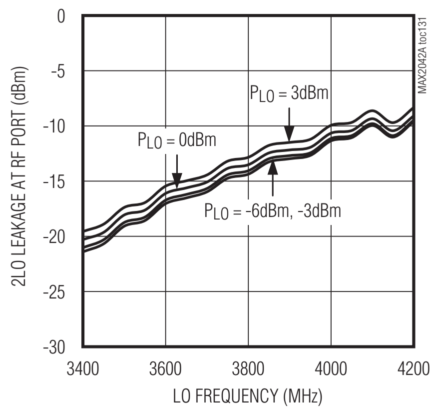
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, fRF = 3100MHz to 3900MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

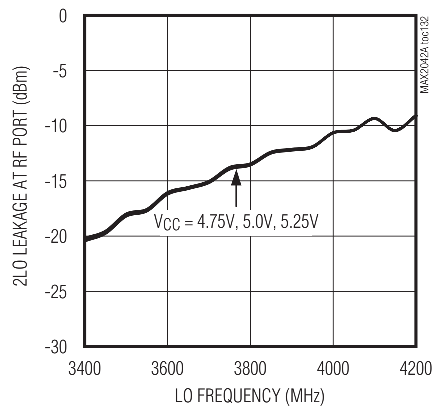
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



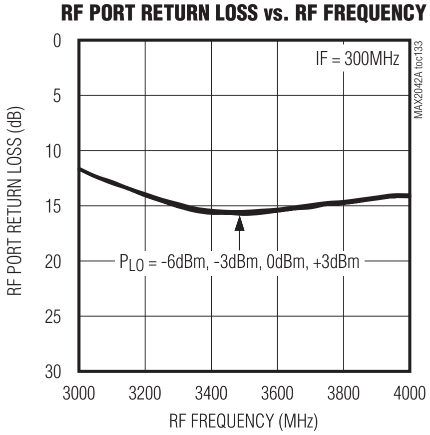
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



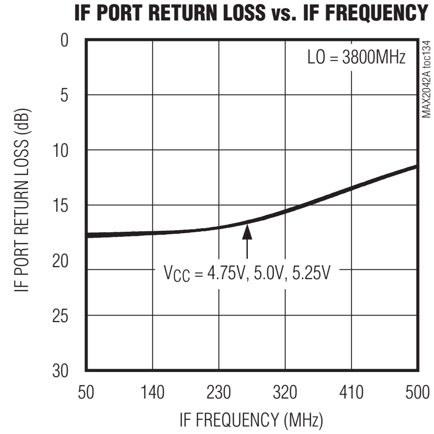
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



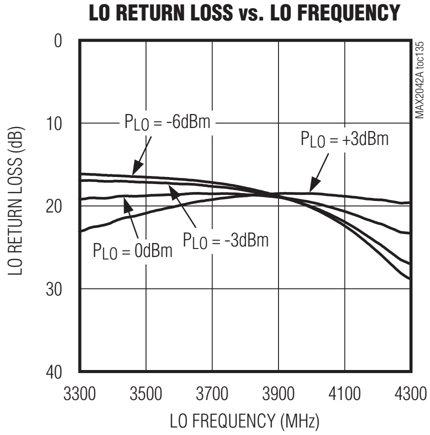
RF PORT RETURN LOSS vs. RF FREQUENCY



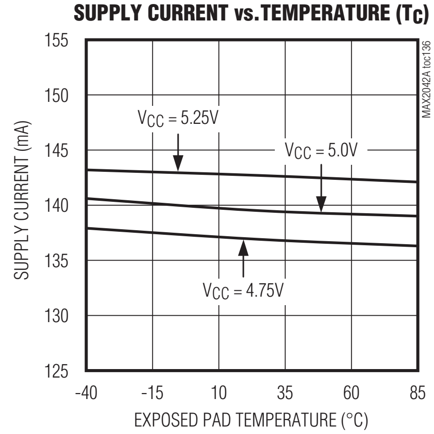
IF PORT RETURN LOSS vs. IF FREQUENCY



LO RETURN LOSS vs. LO FREQUENCY



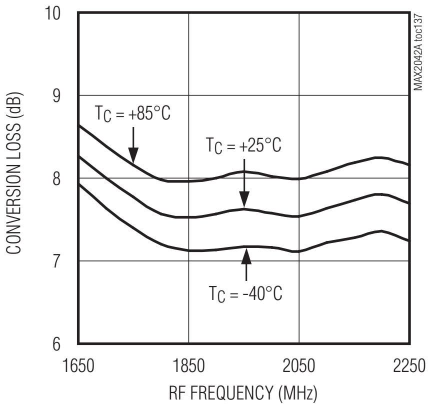
SUPPLY CURRENT vs.TEMPERATURE (T_C)



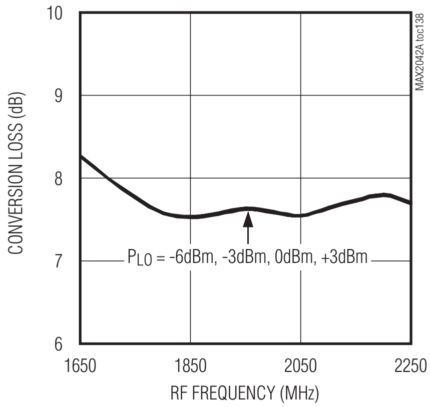
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

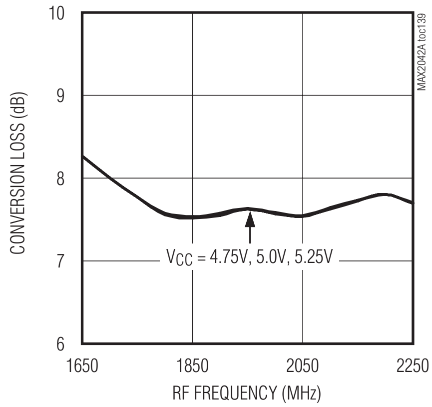
CONVERSION LOSS vs. RF FREQUENCY



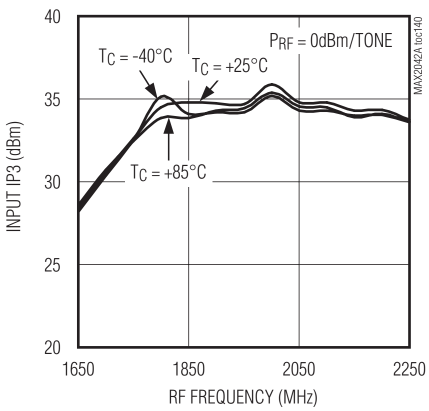
CONVERSION LOSS vs. RF FREQUENCY



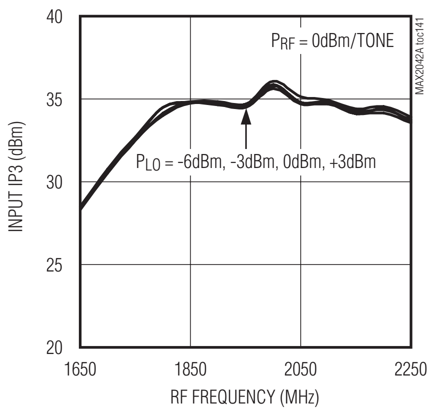
CONVERSION LOSS vs. RF FREQUENCY



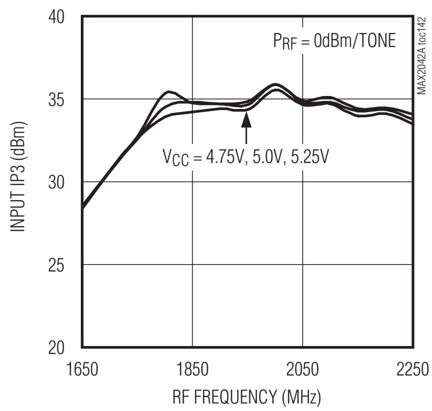
INPUT IP3 vs. RF FREQUENCY



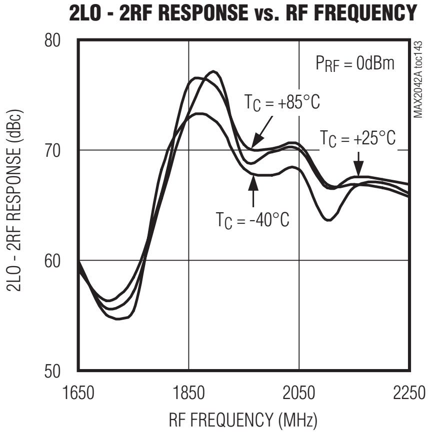
INPUT IP3 vs. RF FREQUENCY



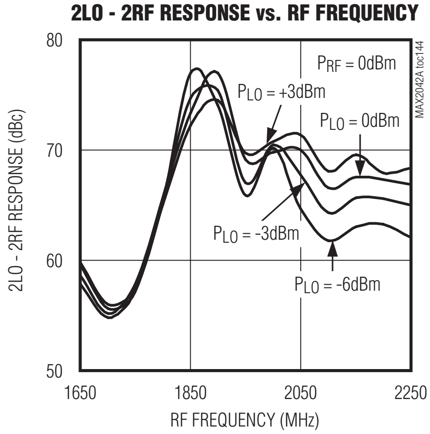
INPUT IP3 vs. RF FREQUENCY



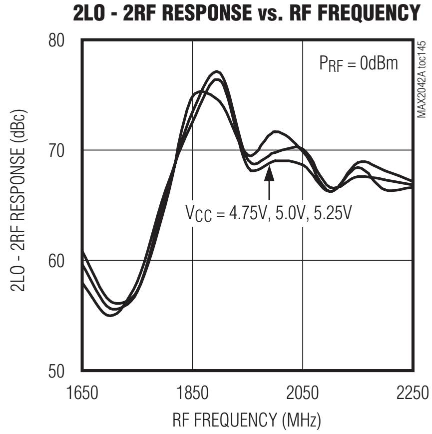
2LO - 2RF RESPONSE vs. RF FREQUENCY



2LO - 2RF RESPONSE vs. RF FREQUENCY



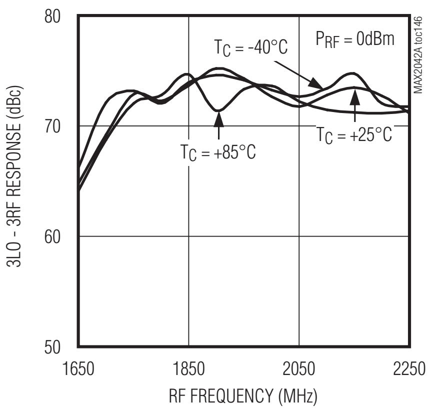
2LO - 2RF RESPONSE vs. RF FREQUENCY



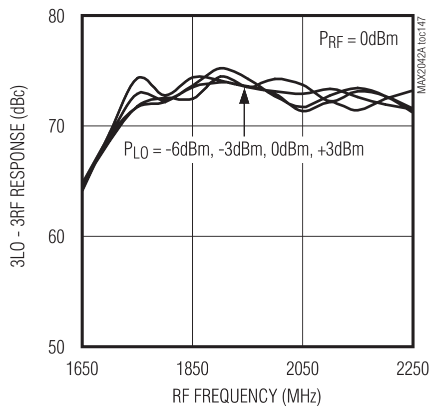
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

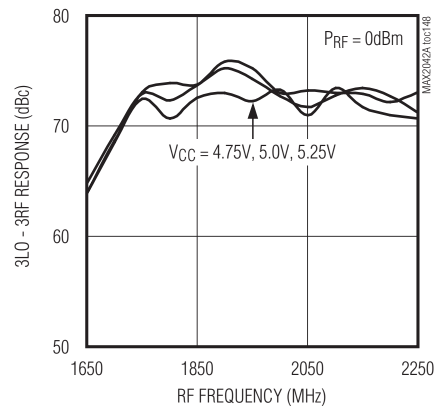
3LO - 3RF RESPONSE vs. RF FREQUENCY



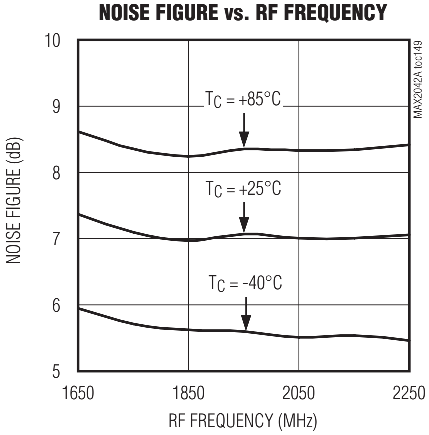
3LO - 3RF RESPONSE vs. RF FREQUENCY



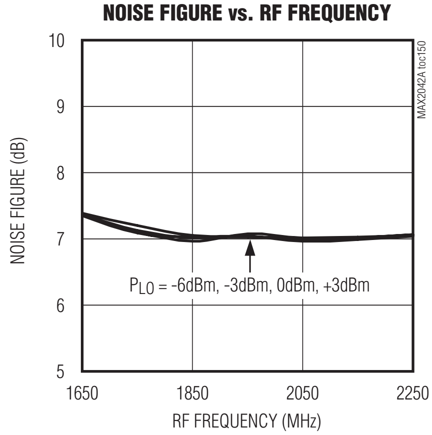
3LO - 3RF RESPONSE vs. RF FREQUENCY



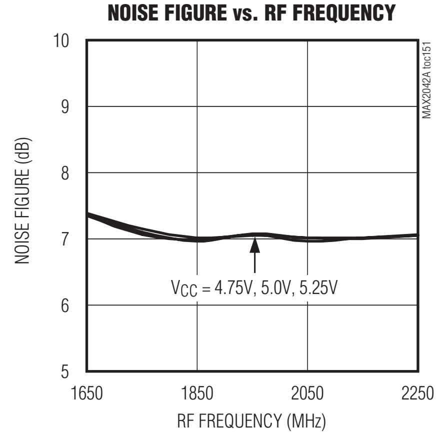
NOISE FIGURE vs. RF FREQUENCY



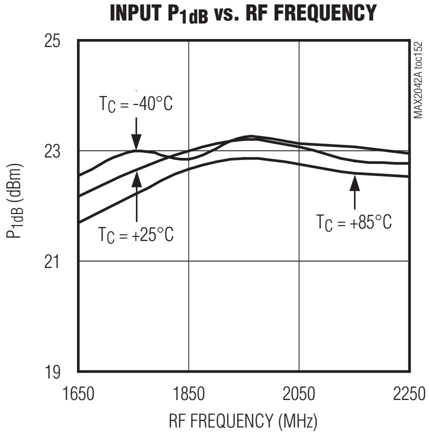
NOISE FIGURE vs. RF FREQUENCY



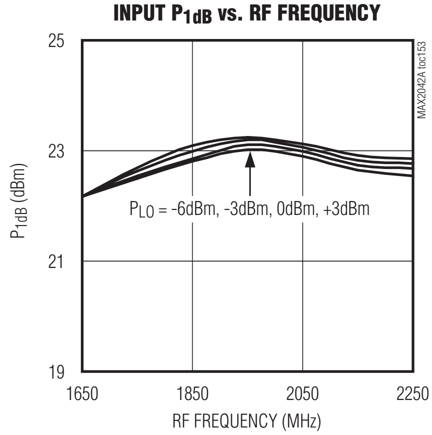
NOISE FIGURE vs. RF FREQUENCY



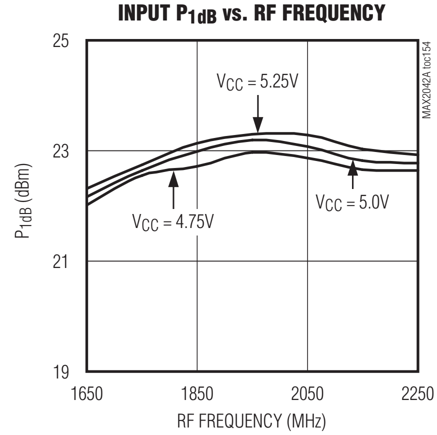
INPUT P_{1dB} vs. RF FREQUENCY



INPUT P_{1dB} vs. RF FREQUENCY

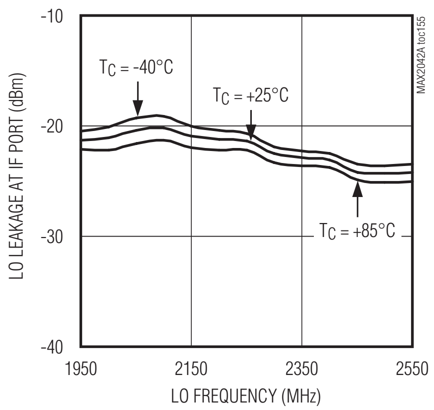


INPUT P_{1dB} vs. RF FREQUENCY

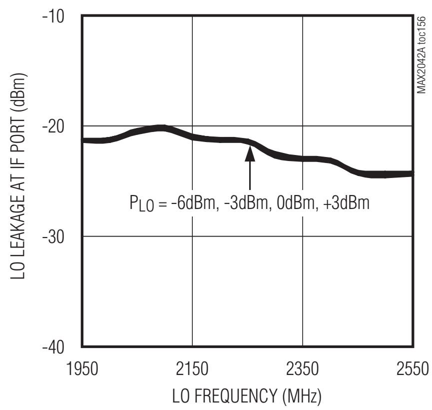


(*Typical Application Circuit* with tuning elements outlined in Table 1**, V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

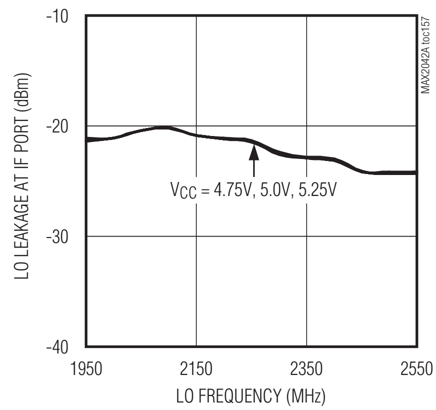
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



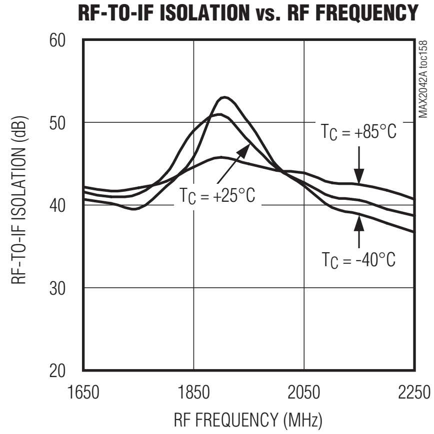
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



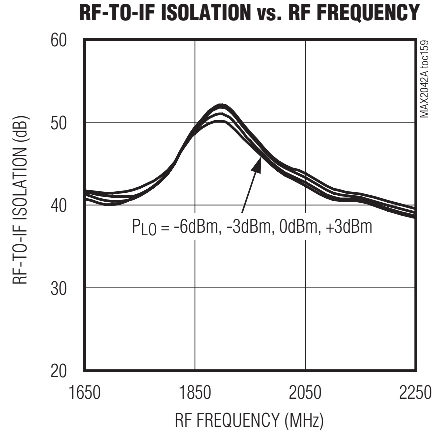
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



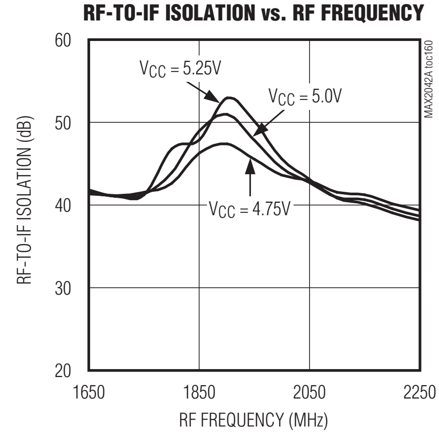
RF-TO-IF ISOLATION vs. RF FREQUENCY



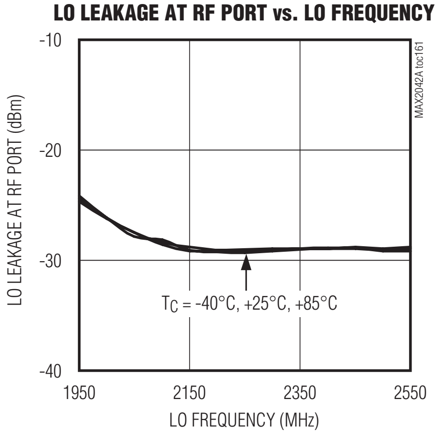
RF-TO-IF ISOLATION vs. RF FREQUENCY



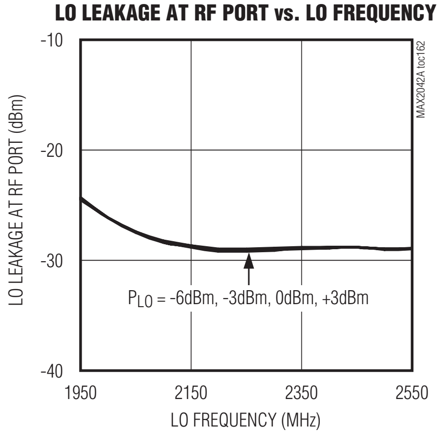
RF-TO-IF ISOLATION vs. RF FREQUENCY



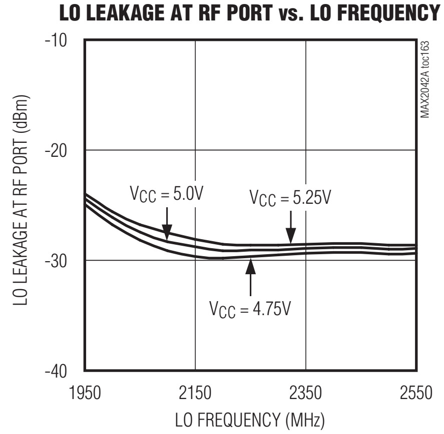
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



LO LEAKAGE AT RF PORT vs. LO FREQUENCY



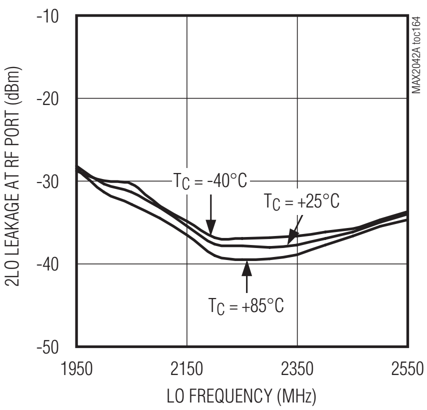
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



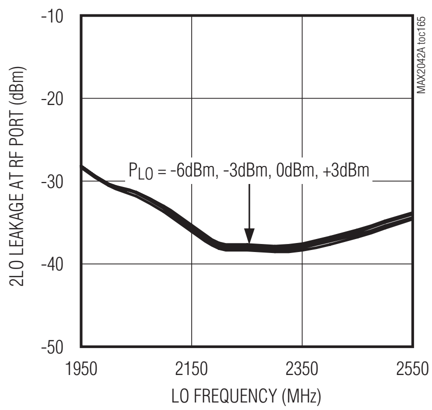
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is high-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

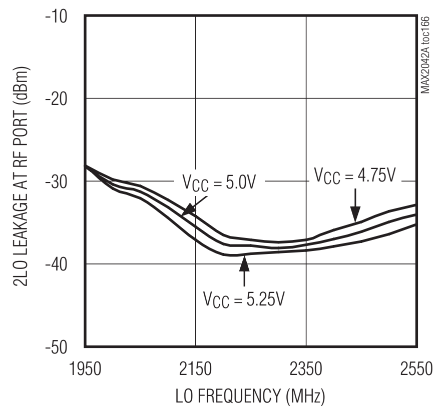
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



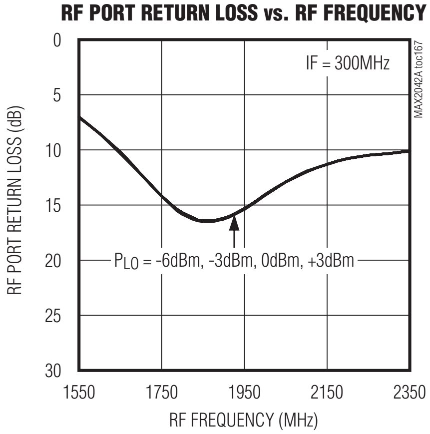
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



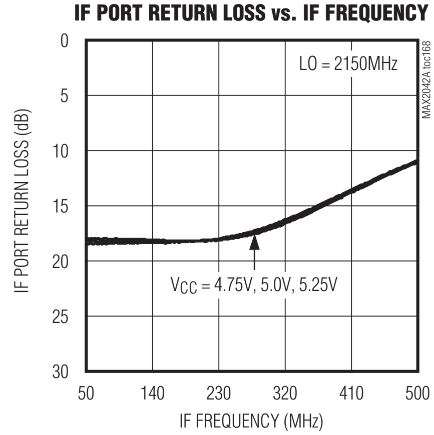
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



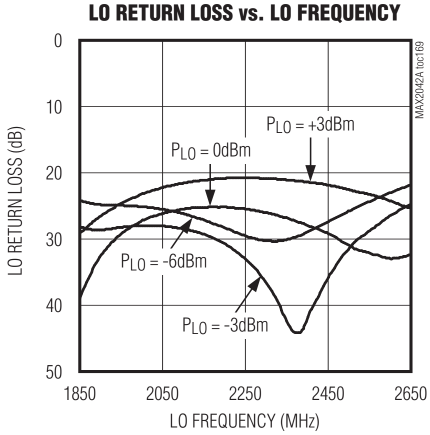
RF PORT RETURN LOSS vs. RF FREQUENCY



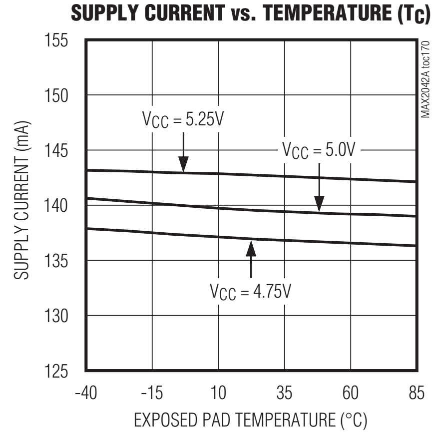
IF PORT RETURN LOSS vs. IF FREQUENCY



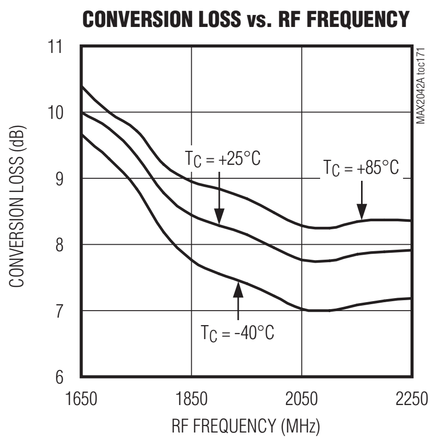
LO RETURN LOSS vs. LO FREQUENCY

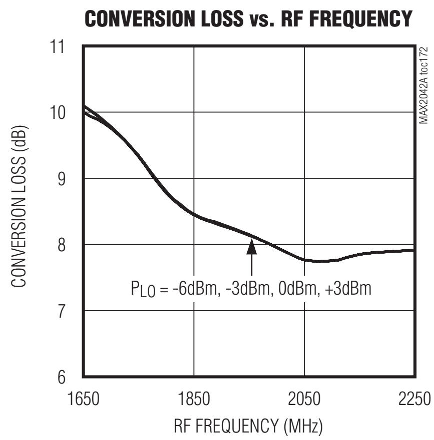


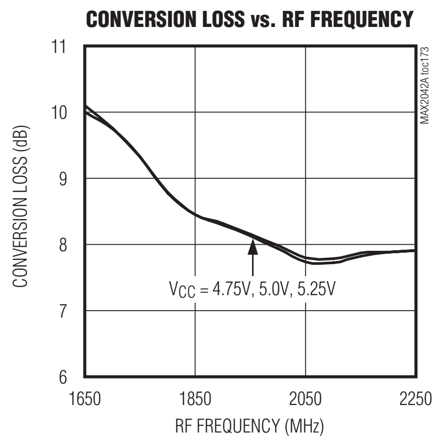
SUPPLY CURRENT vs. TEMPERATURE (T_C)

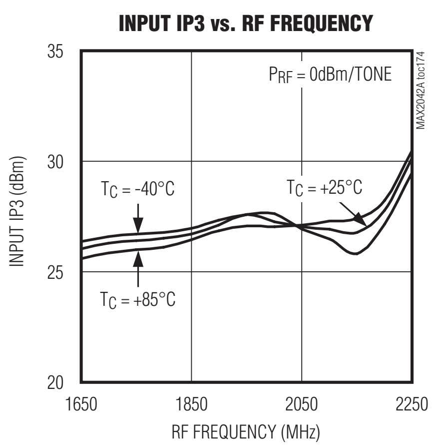


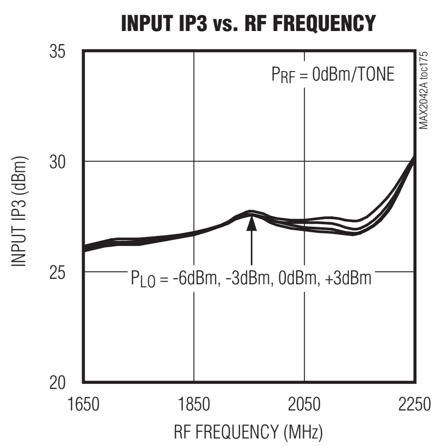
([Typical Application Circuit](#) with tuning elements outlined in [Table 1](#), **V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

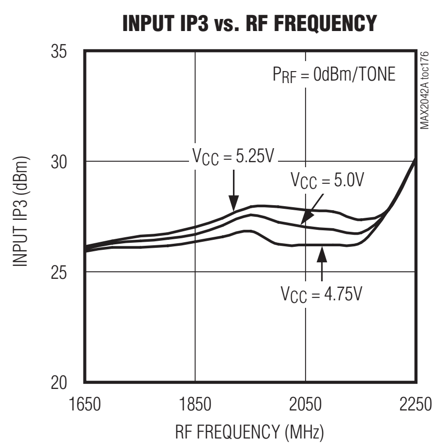


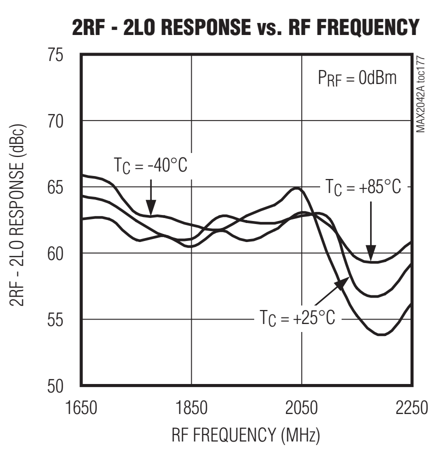


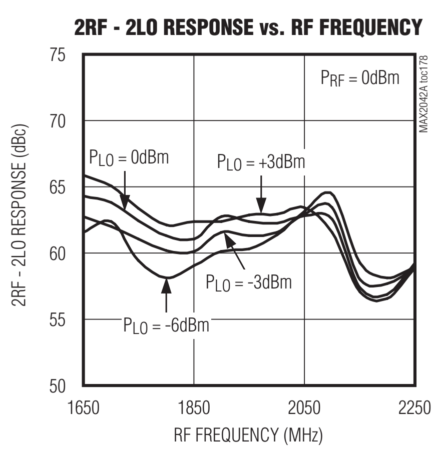


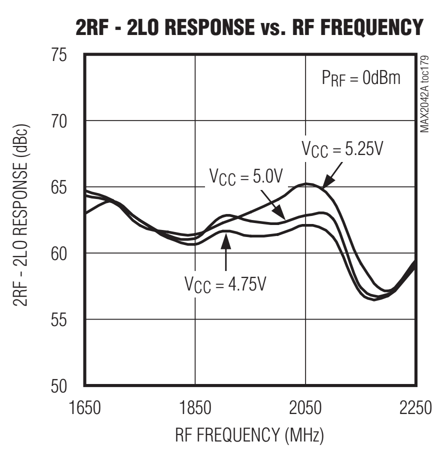






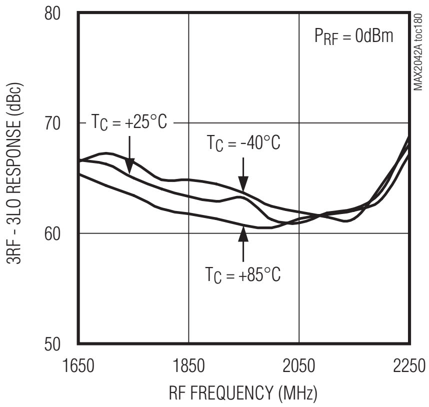




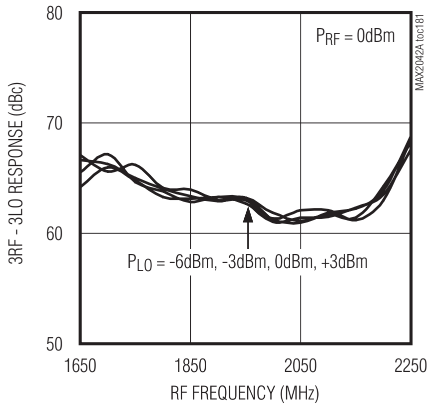


([*Typical Application Circuit*](#) with tuning elements outlined in [Table 1](#), **V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

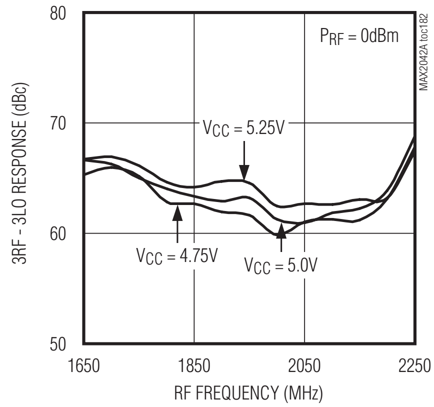
3RF - 3LO RESPONSE vs. RF FREQUENCY



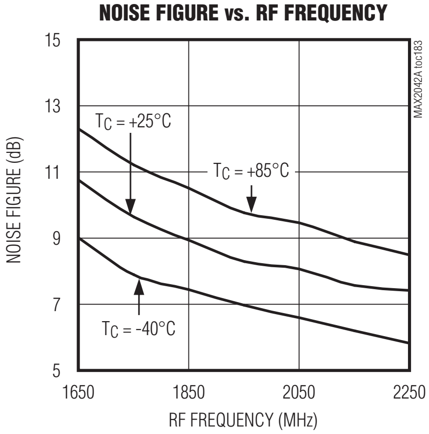
3RF - 3LO RESPONSE vs. RF FREQUENCY



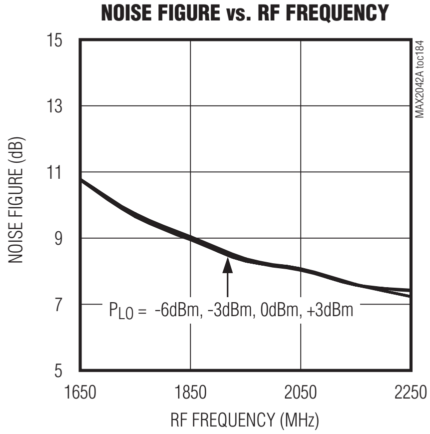
3RF - 3LO RESPONSE vs. RF FREQUENCY



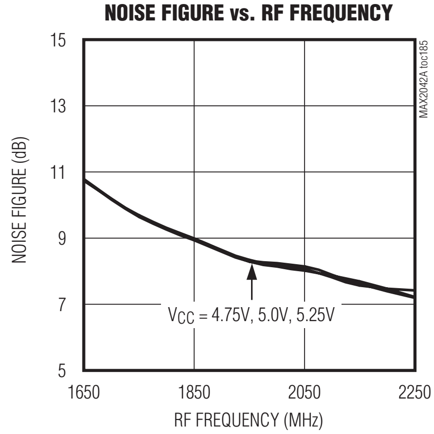
NOISE FIGURE vs. RF FREQUENCY



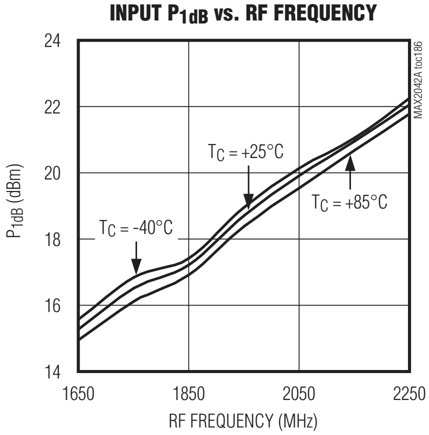
NOISE FIGURE vs. RF FREQUENCY



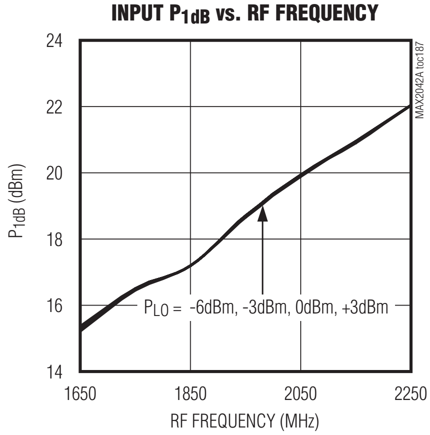
NOISE FIGURE vs. RF FREQUENCY



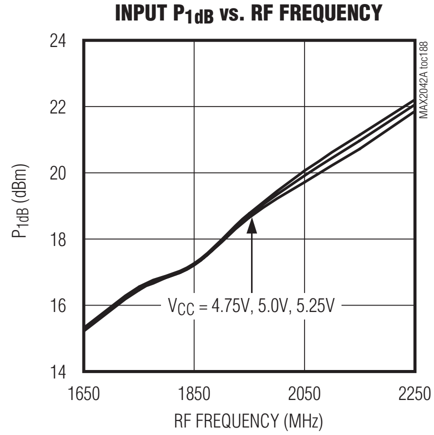
INPUT P_{1dB} vs. RF FREQUENCY



INPUT P_{1dB} vs. RF FREQUENCY

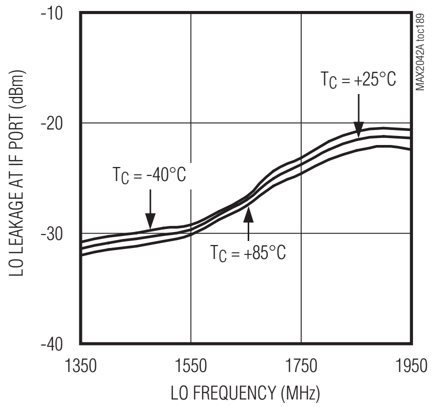


INPUT P_{1dB} vs. RF FREQUENCY

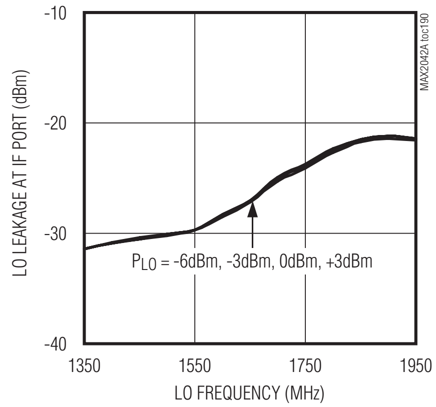


(*Typical Application Circuit* with tuning elements outlined in Table 1, **V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

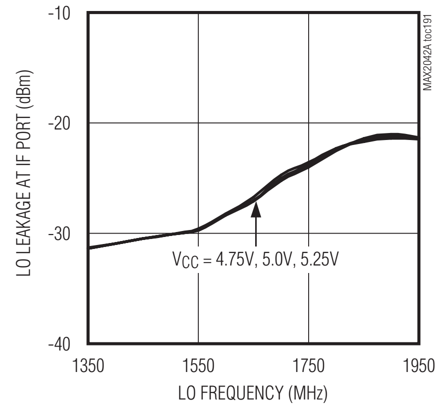
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



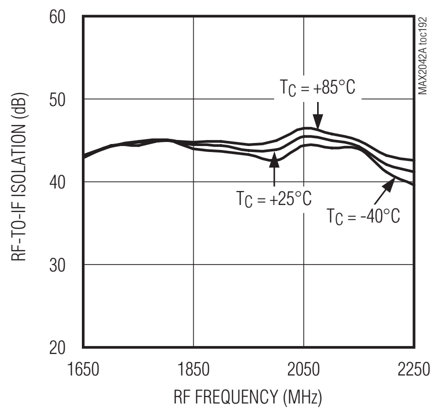
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



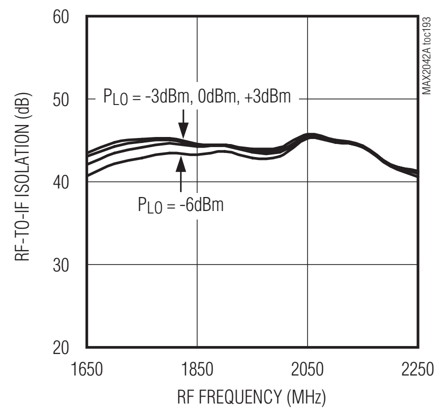
LO LEAKAGE AT IF PORT vs. LO FREQUENCY



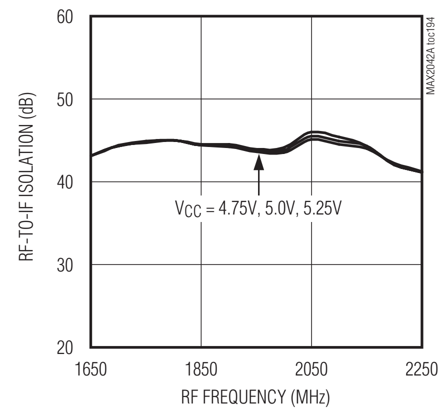
RF-TO-IF ISOLATION vs. RF FREQUENCY



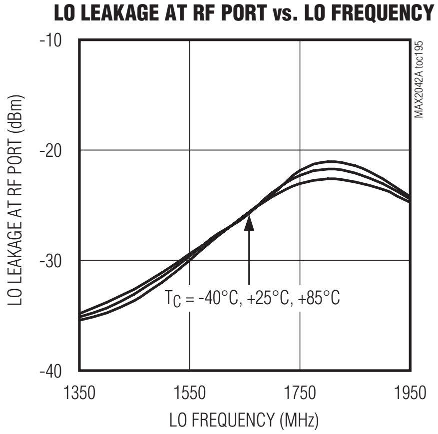
RF-TO-IF ISOLATION vs. RF FREQUENCY



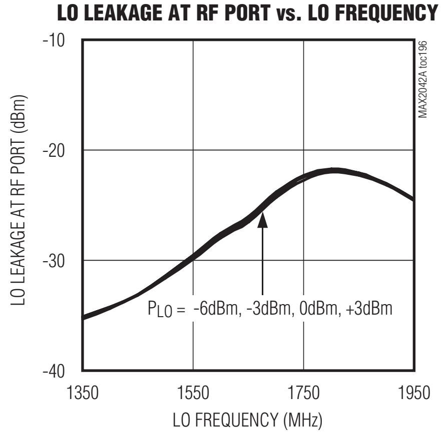
RF-TO-IF ISOLATION vs. RF FREQUENCY



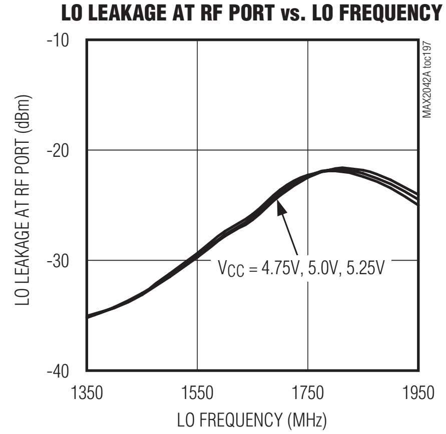
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



LO LEAKAGE AT RF PORT vs. LO FREQUENCY



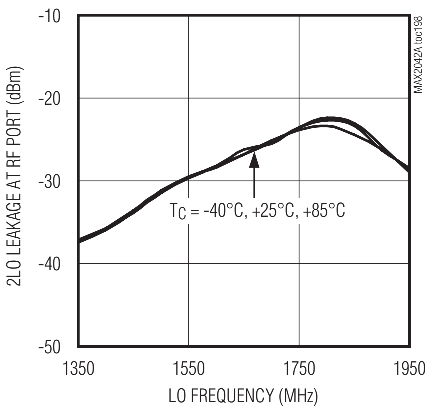
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



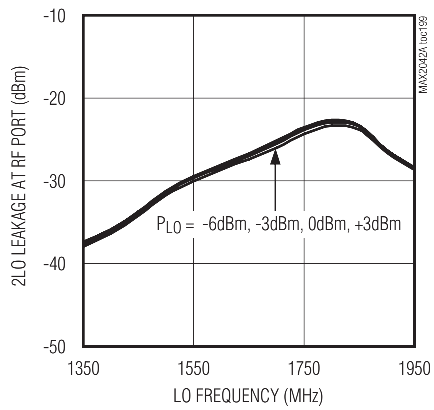
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in Table 1**, V_{CC} = 5.0V, f_{RF} = 1650MHz to 2250MHz, LO is low-side injected** for a 300MHz IF, P_{RF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

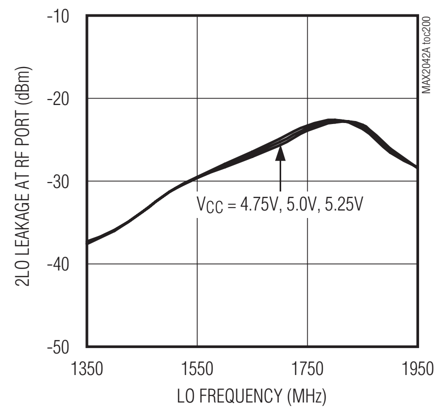
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



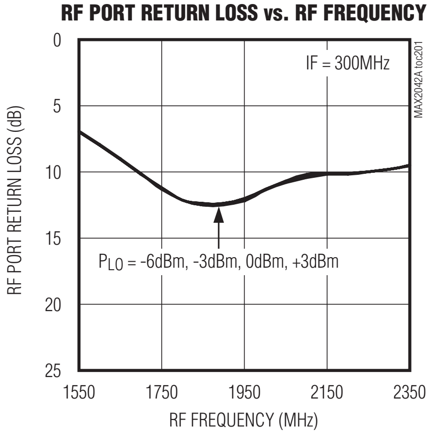
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



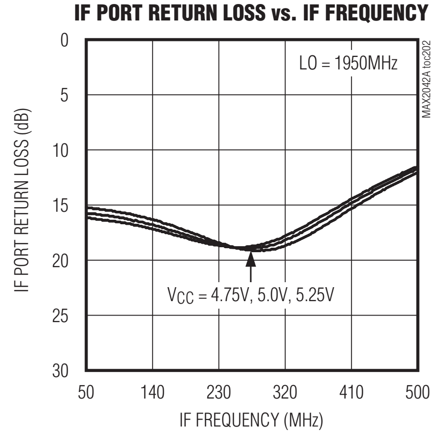
2LO LEAKAGE AT RF PORT vs. LO FREQUENCY



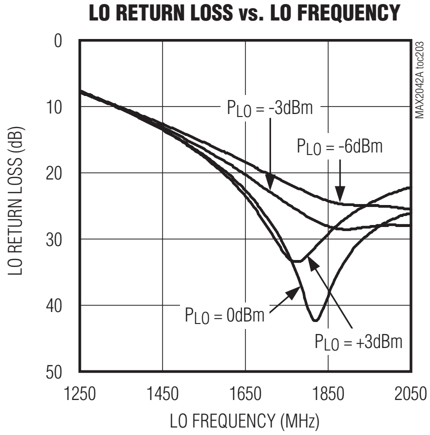
RF PORT RETURN LOSS vs. RF FREQUENCY



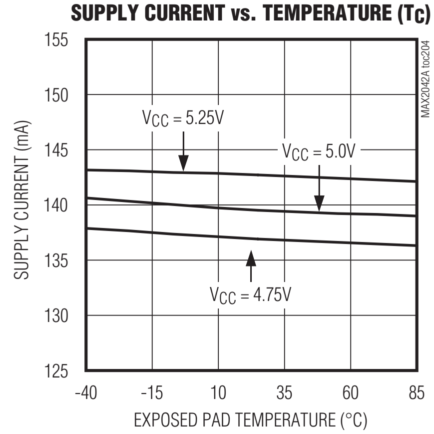
IF PORT RETURN LOSS vs. IF FREQUENCY



LO RETURN LOSS vs. LO FREQUENCY

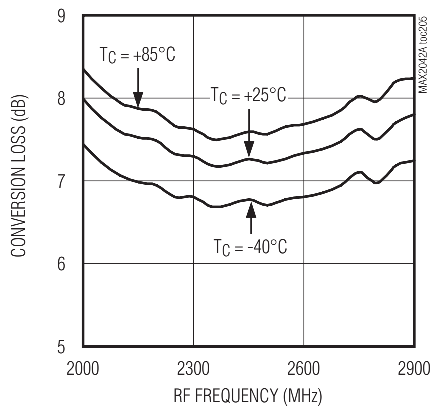


SUPPLY CURRENT vs. TEMPERATURE (T_C)

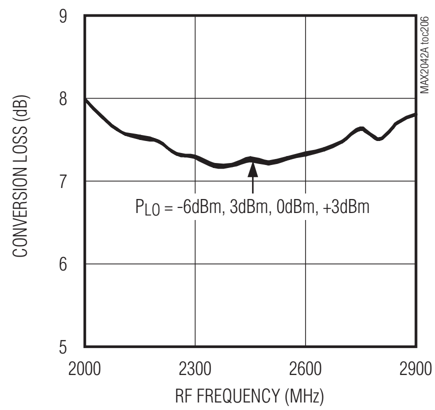


(*Typical Application Circuit* with tuning elements outlined in Table 2, **V_{CC} = +5.0V, f_{RF} = f_{LO} - f_{IF},** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

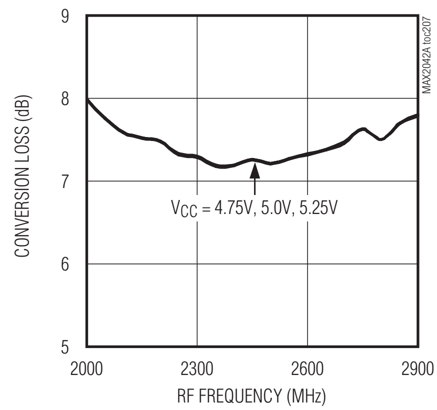
CONVERSION LOSS vs. RF FREQUENCY



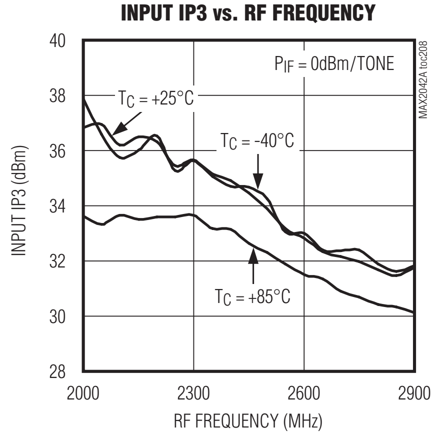
CONVERSION LOSS vs. RF FREQUENCY



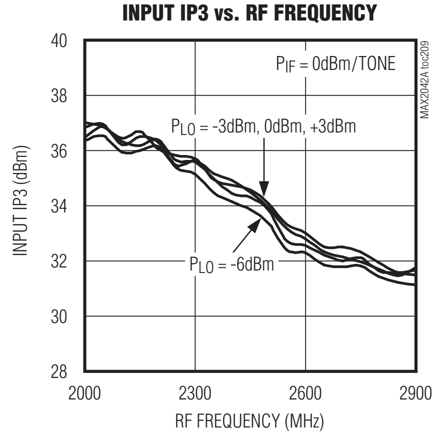
CONVERSION LOSS vs. RF FREQUENCY



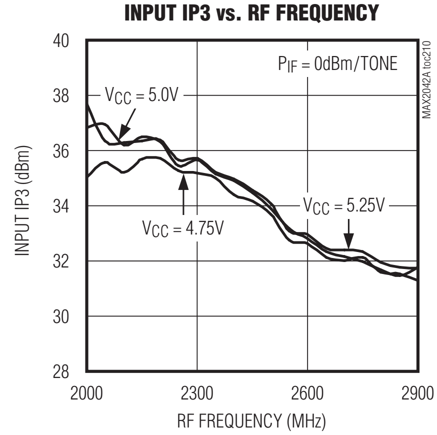
INPUT IP3 vs. RF FREQUENCY



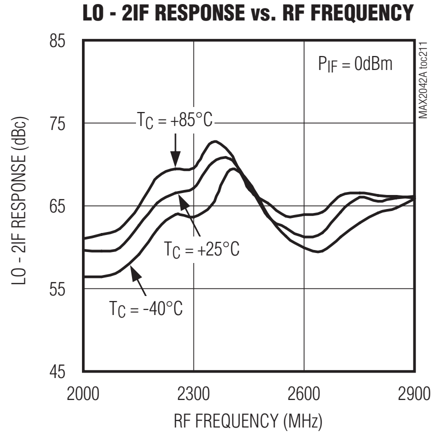
INPUT IP3 vs. RF FREQUENCY



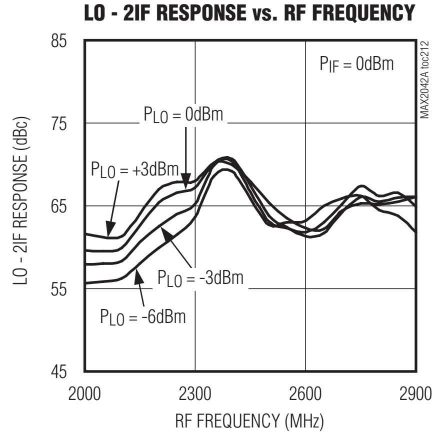
INPUT IP3 vs. RF FREQUENCY



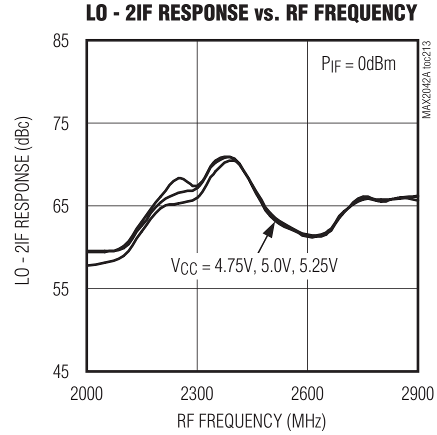
LO - 2IF RESPONSE vs. RF FREQUENCY



LO - 2IF RESPONSE vs. RF FREQUENCY

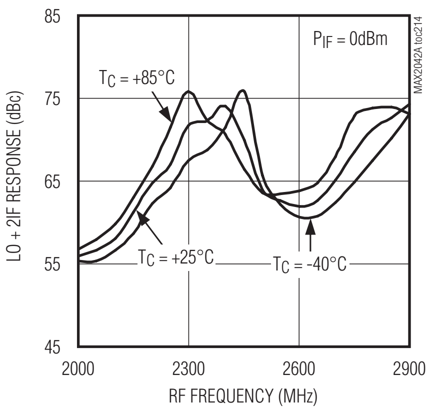


LO - 2IF RESPONSE vs. RF FREQUENCY

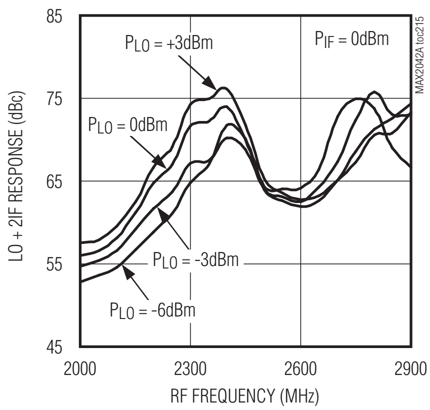


(*Typical Application Circuit* with tuning elements outlined in Table 2, V_{CC} = +5.0V, $f_{RF} = f_{LO} - f_{IF}$, f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

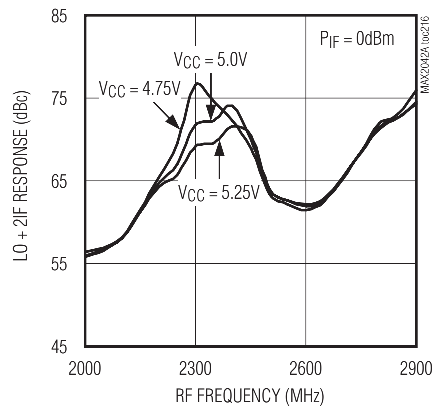
LO + 2IF RESPONSE vs. RF FREQUENCY



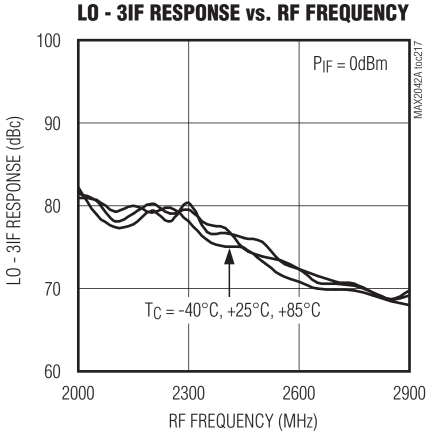
LO + 2IF RESPONSE vs. RF FREQUENCY



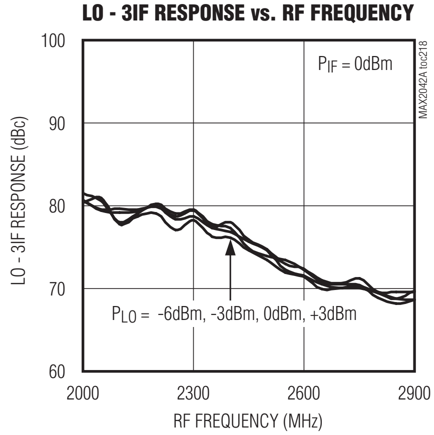
LO + 2IF RESPONSE vs. RF FREQUENCY



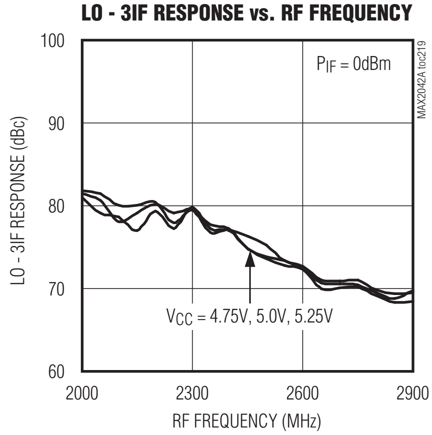
LO - 3IF RESPONSE vs. RF FREQUENCY



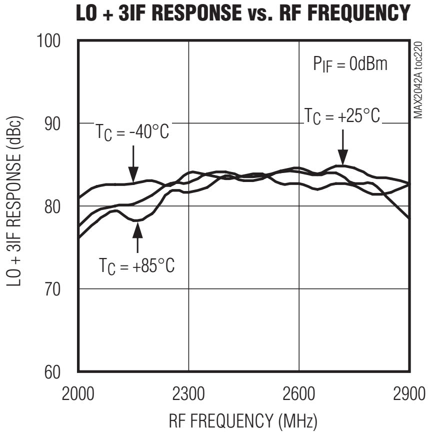
LO - 3IF RESPONSE vs. RF FREQUENCY



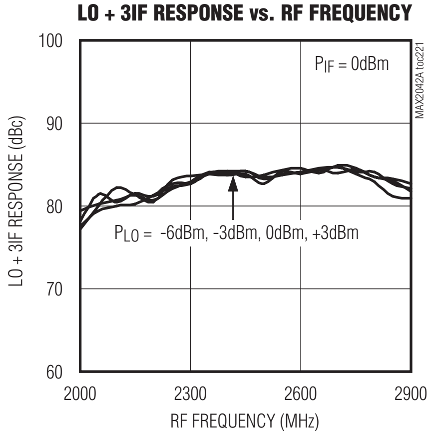
LO - 3IF RESPONSE vs. RF FREQUENCY



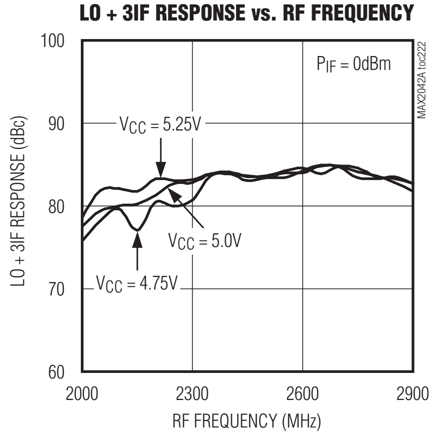
LO + 3IF RESPONSE vs. RF FREQUENCY



LO + 3IF RESPONSE vs. RF FREQUENCY

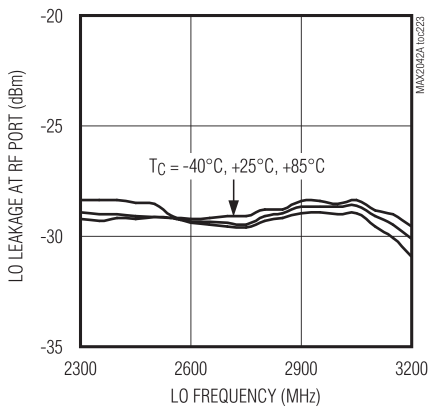


LO + 3IF RESPONSE vs. RF FREQUENCY

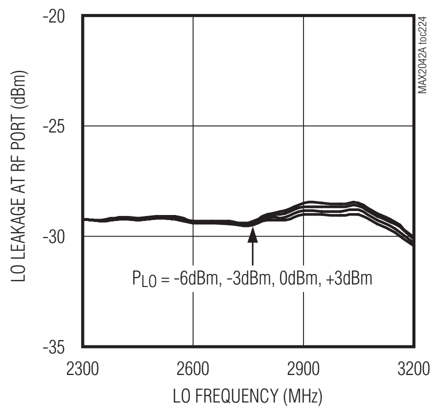


(*Typical Application Circuit* with tuning elements outlined in Table 2**, V_{CC} = +5.0V, $f_{RF} = f_{LO} - f_{IF}$,** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

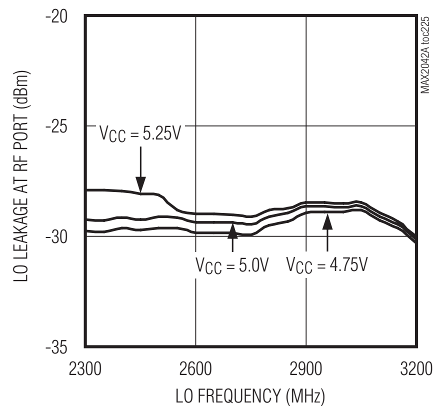
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



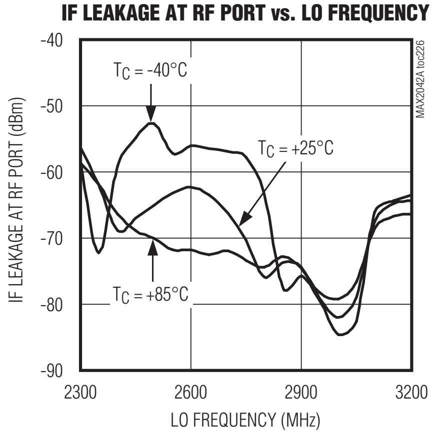
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



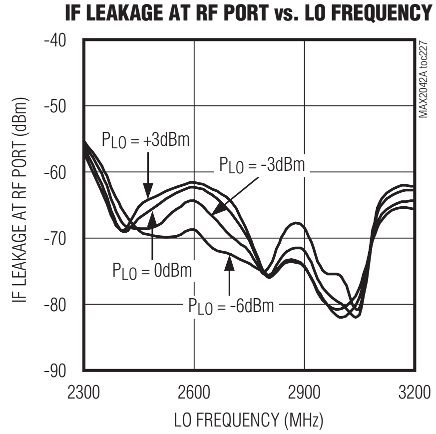
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



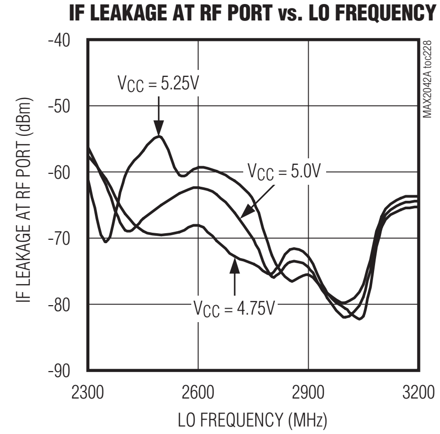
IF LEAKAGE AT RF PORT vs. LO FREQUENCY



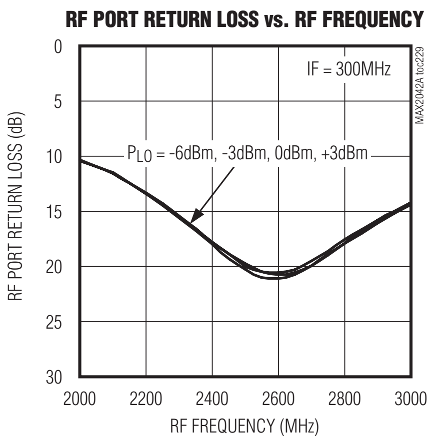
IF LEAKAGE AT RF PORT vs. LO FREQUENCY

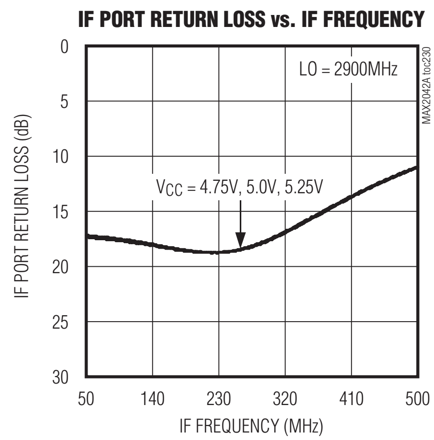


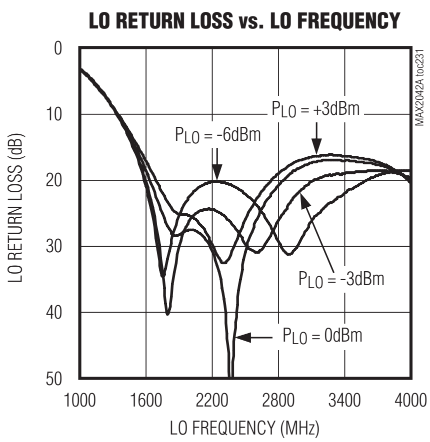
IF LEAKAGE AT RF PORT vs. LO FREQUENCY

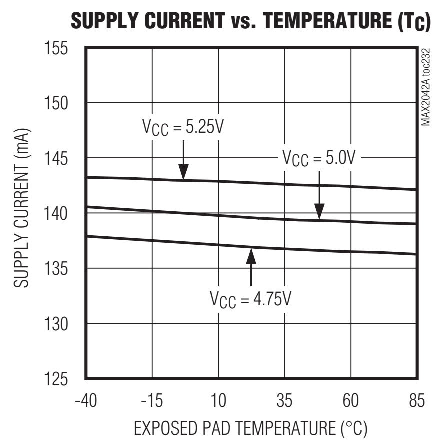


(*Typical Application Circuit* with tuning elements outlined in Table 2, **V_{CC} = +5.0V, f_{RF} = f_{LO} - f_{IF},** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)



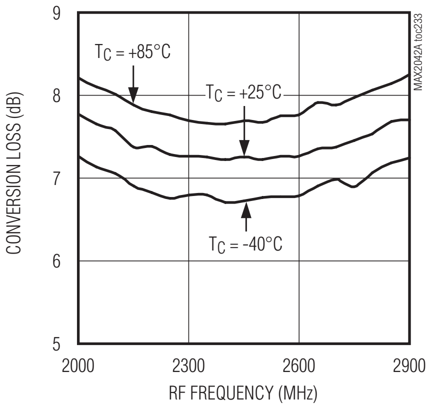




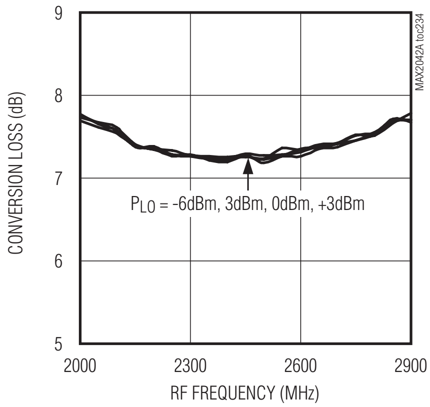


([*Typical Application Circuit*](#) with tuning elements outlined in **Table 2**, **V_{CC} = +3.3V, $f_{RF} = f_{LO} - f_{IF}$,** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

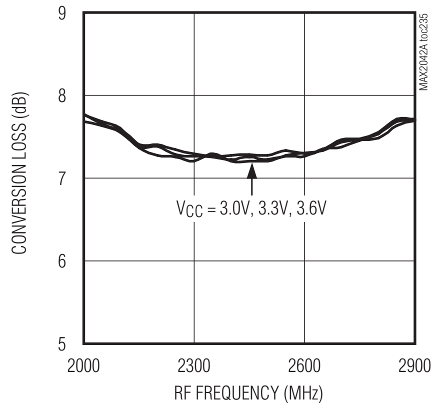
CONVERSION LOSS vs. RF FREQUENCY



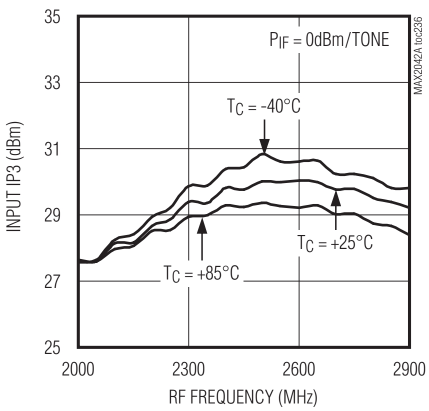
CONVERSION LOSS vs. RF FREQUENCY



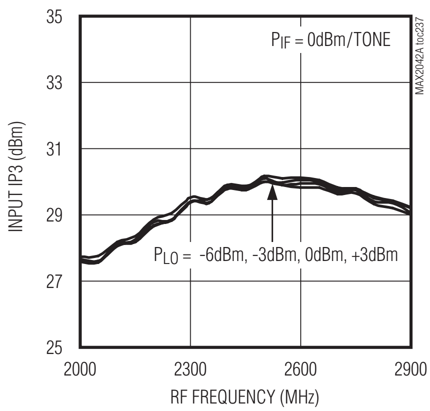
CONVERSION LOSS vs. RF FREQUENCY



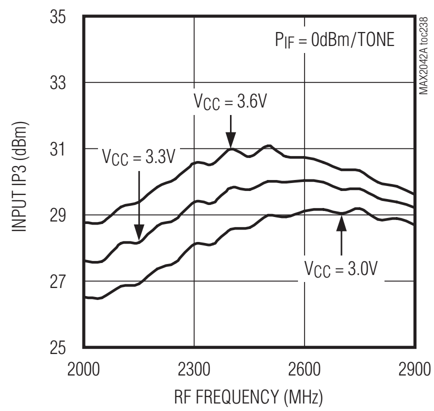
INPUT IP3 vs. RF FREQUENCY



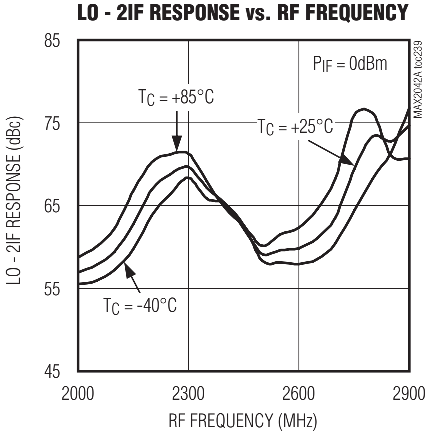
INPUT IP3 vs. RF FREQUENCY



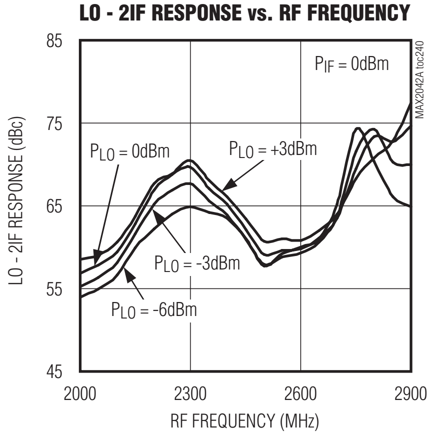
INPUT IP3 vs. RF FREQUENCY



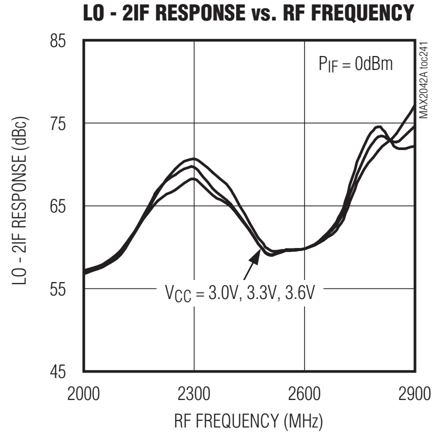
LO - 2IF RESPONSE vs. RF FREQUENCY



LO - 2IF RESPONSE vs. RF FREQUENCY



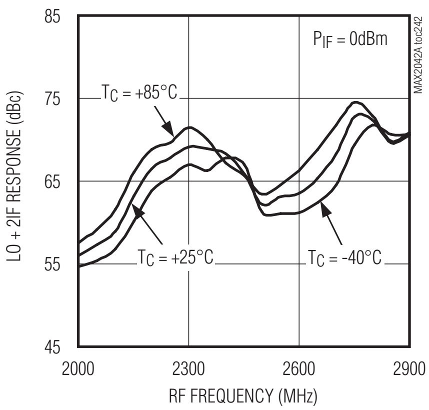
LO - 2IF RESPONSE vs. RF FREQUENCY



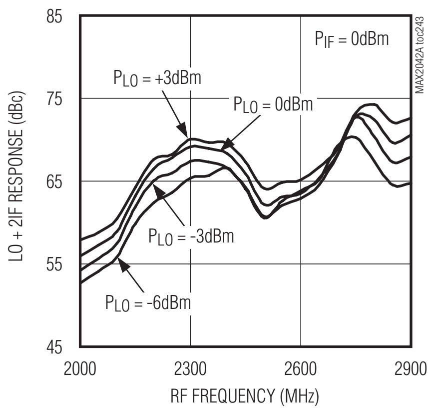
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 2**, **V_{CC} = +3.3V, f_{RF} = f_{LO} - f_{IF},** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

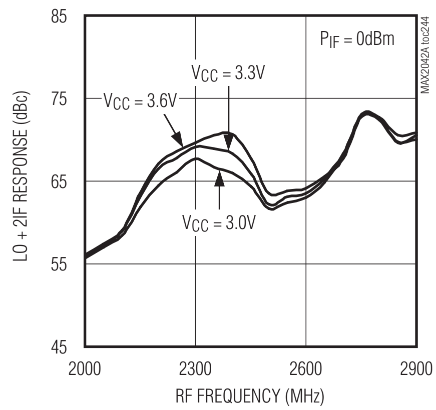
LO + 2IF RESPONSE vs. RF FREQUENCY



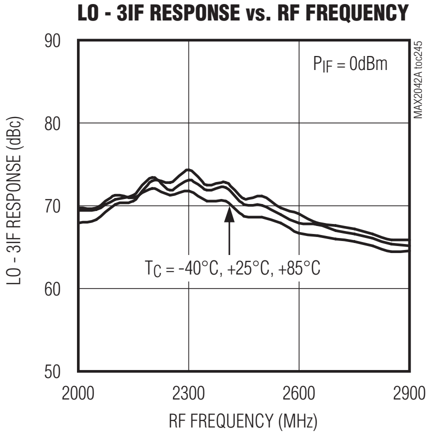
LO + 2IF RESPONSE vs. RF FREQUENCY



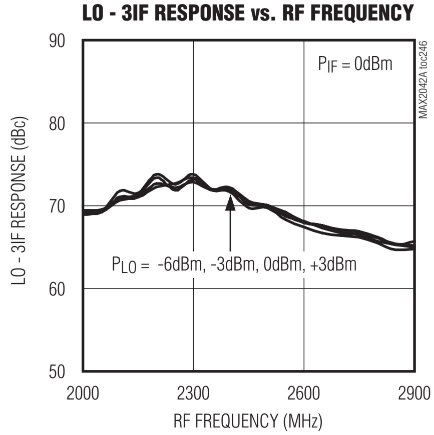
LO + 2IF RESPONSE vs. RF FREQUENCY



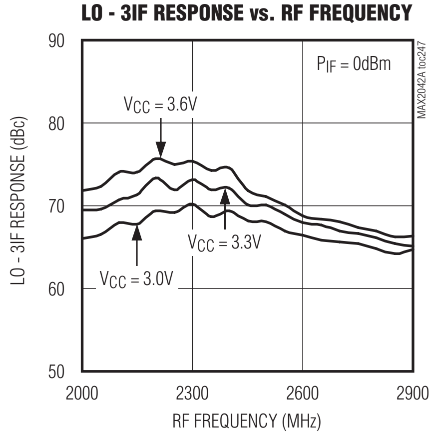
LO - 3IF RESPONSE vs. RF FREQUENCY



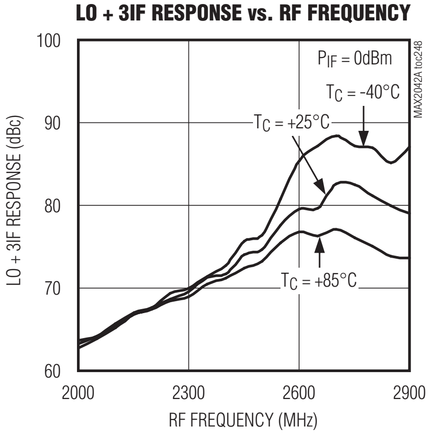
LO - 3IF RESPONSE vs. RF FREQUENCY



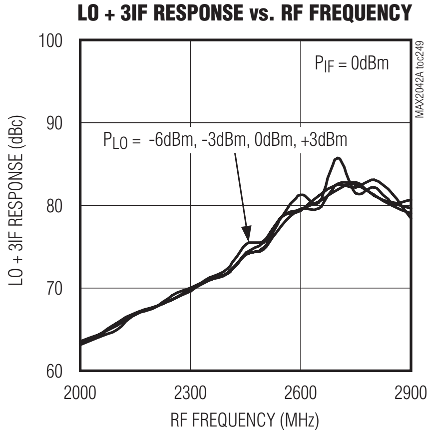
LO - 3IF RESPONSE vs. RF FREQUENCY



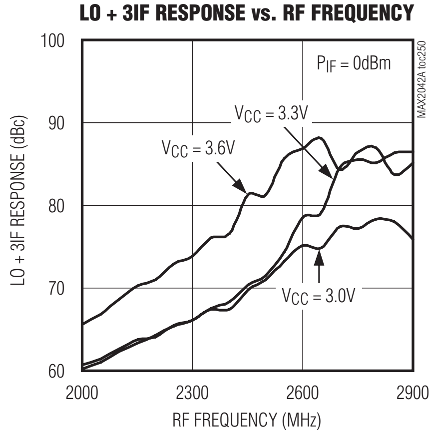
LO + 3IF RESPONSE vs. RF FREQUENCY



LO + 3IF RESPONSE vs. RF FREQUENCY

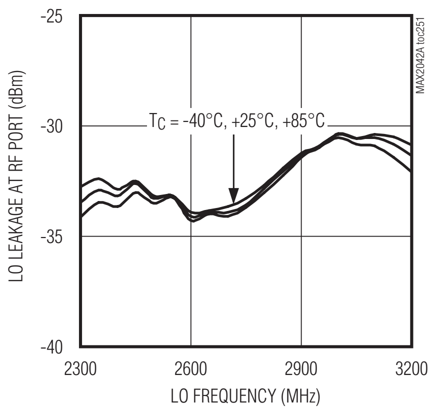


LO + 3IF RESPONSE vs. RF FREQUENCY

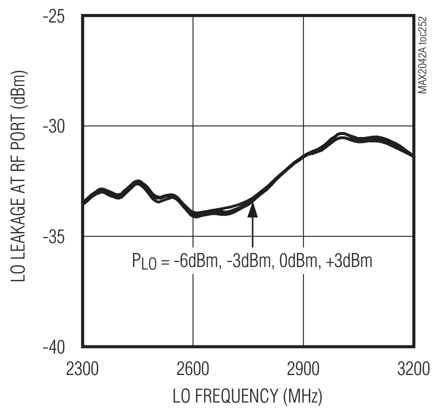


([Typical Application Circuit](#) with tuning elements outlined in **Table 2**, **V_{CC} = +3.3V, f_{RF} = f_{LO} - f_{IF},** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

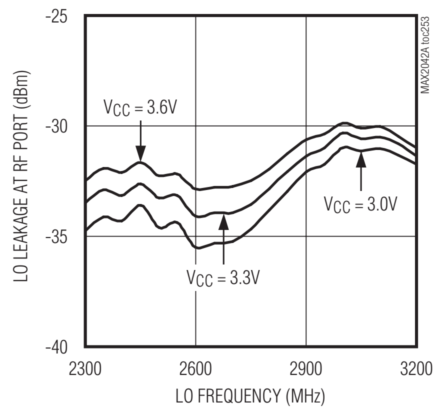
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



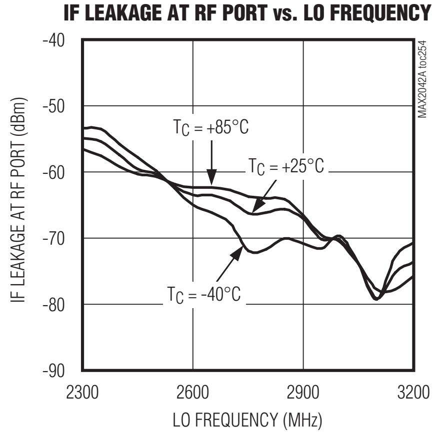
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



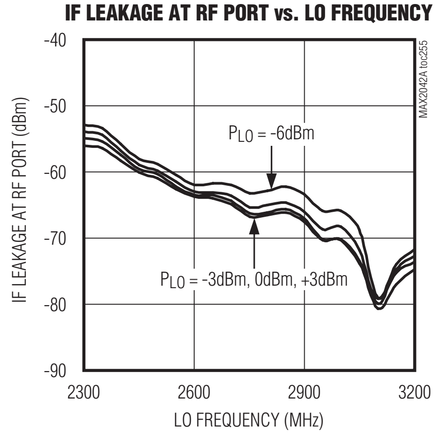
LO LEAKAGE AT RF PORT vs. LO FREQUENCY



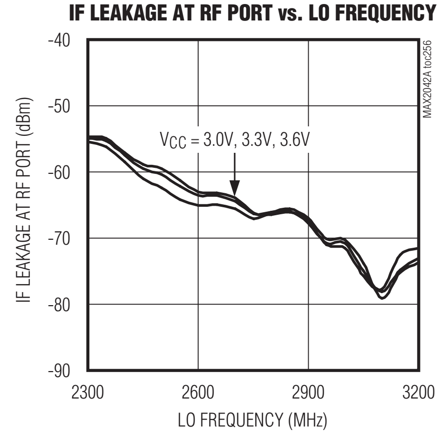
IF LEAKAGE AT RF PORT vs. LO FREQUENCY



IF LEAKAGE AT RF PORT vs. LO FREQUENCY



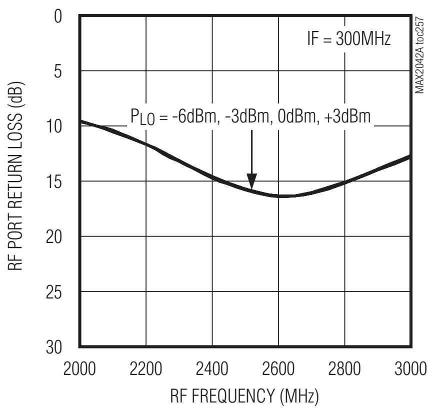
IF LEAKAGE AT RF PORT vs. LO FREQUENCY



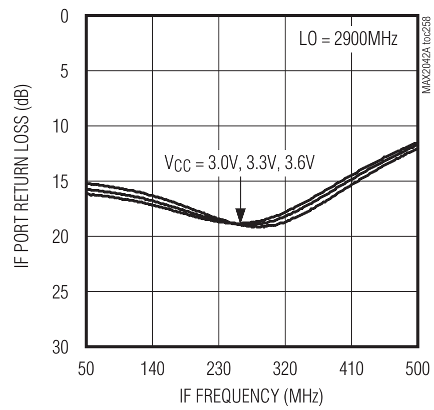
典型工作特性(续)

(*Typical Application Circuit* with tuning elements outlined in **Table 2**, **V_{CC} = +3.3V, f_{RF} = f_{LO} - f_{IF},** f_{IF} = 300MHz, P_{IF} = 0dBm, P_{LO} = 0dBm, T_C = +25°C, unless otherwise noted.)

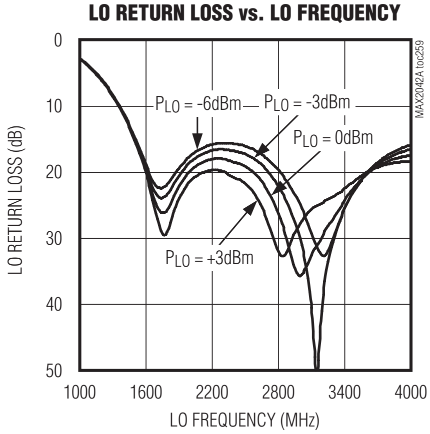
RF PORT RETURN LOSS vs. RF FREQUENCY



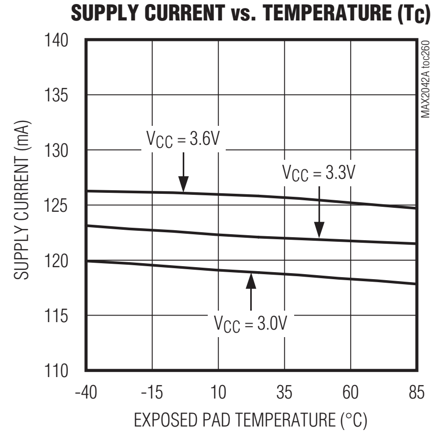
IF PORT RETURN LOSS vs. IF FREQUENCY



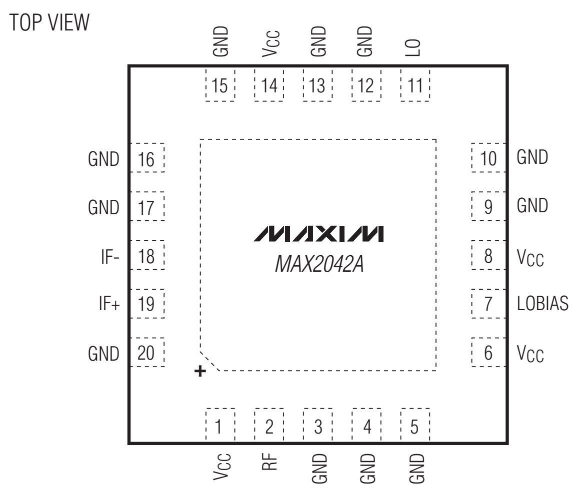
LO RETURN LOSS vs. LO FREQUENCY



SUPPLY CURRENT vs. TEMPERATURE (T_C)



引脚配置

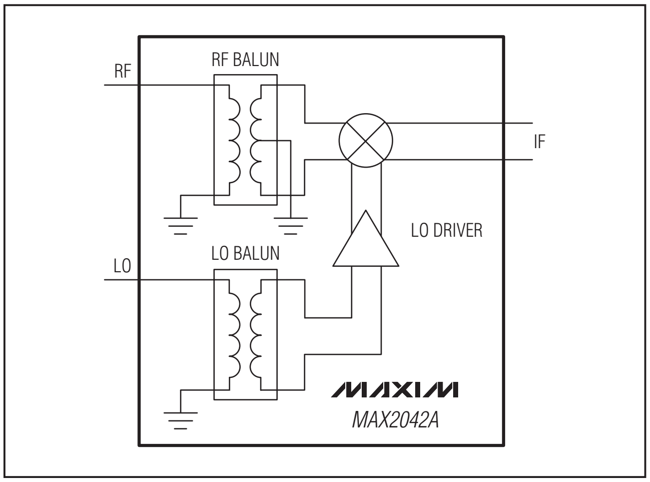


TQFN
5mm x 5mm

引脚说明

引脚	名称	功能
1, 6, 8,14	V_{CC}	电源，使用0.01µF电容旁路至GND，电容应尽可能靠近引脚放置。
2	RF	单端50Ω RF输入端。该端口由内部匹配，并通过非平衡变压器直流短路到GND，必要时连接一个隔直流电容，该电容也用于RF匹配调谐。
3, 4, 5, 10, 12, 13, 17	GND	地，内部连接至裸焊盘，将所有接地引脚与裸焊盘(EP)连接在一起。
7	LOBIAS	LO放大器偏置控制。输出偏置电阻用于LO缓冲器。在LOBIAS与地之间连接一个698Ω ±1%电阻(标称偏置条件)。流过该电阻的最大电流为3mA。
9, 15	GND	地。内部没有连接，将这些引脚接地或悬空。
11	LO	本振输入。该输入端在内部匹配至50Ω，需要连接输入隔直流电容。电容也用于LO匹配调谐。
16, 20	GND	地，将所有接地引脚与裸焊盘(EP)连接在一起。
18, 19	IF-, IF+	混频器差分IF输出/输入端。
—	EP	裸焊盘。内部连接至GND，使用多个接地过孔将该裸焊盘焊接到PCB焊盘，为器件与PCB地层之间提供良好的散热通道。多个接地过孔还有助于改善RF性能(参见*布局考虑*部分)。

功能框图



详细说明

在2300MHz至2900MHz频段用作高端LO注入混频器时，MAX2042A可提供+33dBm的IIP3，变换损耗和噪声系数典型值仅为7.2dB和7.25dB。集成非平衡变压器和匹配电路允许单端连接至RF端口和LO端口(50Ω匹配)。集成LO缓冲器可以为混频器核提供较强的驱动能力，将该器件输入端所需的LO驱动减小到–6dBm至+3dBm。IF端口配合差分输出端，有效改善了2LO – 2RF性能。

该器件可在较宽的频率范围内保证性能，适用于GSM/EDGE、CDMA、TD-SCDMA、WCDMA、LTE、TD-LTE、WiMAX和MMDS基站。器件工作在1600MHz至3900MHz RF输入范围、1300MHz至4000MHz LO范围以及50MHz至500MHz IF范围。外部IF元件用于设置更低的工作频率范围(详细信息请参见*典型工作特性*)，器件还可以工作在上述频率范围以外(详细信息请参见*典型工作特性*)。

RF输入和非平衡变压器

配合隔直流电容使用时，IC的RF输入提供50Ω匹配。由于输入端在内部通过片上非平衡变压器直流短路到地，所以必须使用隔直流电容。使用8.2pF隔直流电容时，在整个2300MHz至2900MHz RF频率范围内，RF端口的输入回波损耗典型值为17dB。将隔直流电容更换成1.5pF，工作在3000MHz至3900MHz频率范围可以得到14dB的回波损耗。工作在1700MHz至2200MHz频率范围时，应提供一个12nH并联电感，连接到1.8pF隔直流电容，此时的回波损耗为12dB。详细信息请参考*典型应用电路*和*表1*。

LO输入、缓冲器和非平衡变压器

器件利用1300MHz至4000MHz较宽频率的LO驱动电路，可支持低端或高端LO注入架构，适用于所有1.7GHz至3.5GHz接收及发射应用。LO输入在内部匹配为50Ω，只需一个2pF隔直电容。两级内部LO缓冲器允许–6dBm至+3dBm的LO输入功率范围。片上低损耗非平衡变压器和LO缓冲器相配合，驱动双平衡混频器。LO输入端与IF输出端之间的所有接口和匹配元件均已集成在芯片内部。

高线性度混频器

该器件的核心是一个双平衡、高性能无源混频器。片上LO缓冲器具有较大的LO摆幅，可提供优异的线性指标。IIP3、2LO – 2RF抑制和噪声系数的典型值分别为33dBm、72dBc和7.25dB。

差分IF端口

该器件具有50MHz至500MHz的IF频率范围，其低端频率取决于外部IF元件的频率响应。

器件的差分IF端口有助于增强2LO – 2RF性能，用户可以在混频器的IF端口使用差分IF放大器或SAW滤波器，但IF+/IF–端口需要隔直流，以防止外部直流进入混频器的IF端口。实际应用中，可以采用外部MABACT0069 1:1变压器，将50Ω差分IF接口转换成50Ω单端接口。该变压器还为芯片内部电路提供一个IF引脚的地返回端。如果在IF引脚不能获得地返回端，则通过片外接地电阻或大的电感值提供返回通道。此时，可以在每个IF引脚对地连接一只1kΩ电阻。另外，IF接口可直接连接单端、交流耦合信号输入或输出IF+引脚，只需把IF–接地并在IF+与地之间连接一个1kΩ电阻。

应用信息

输入和输出匹配

配合串联隔直流电容使用时，RF输入提供50Ω匹配。工作在2000MHz至2900MHz RF频率范围时，连接一个8.2pF隔直流电容；工作在3000MHz至3900MHz频率范围时，连接一个1.5pF隔直电容；RF频率处于1650MHz至2250MHz频率范围时，则采用：C1 = 1.8pF、L1 = 12nH。LO输入内部匹配在50Ω，使用2pF隔直流电容可覆盖1300MHz至4000MHz工作频率范围。IF输出阻抗为50Ω (差分)。为方便评估，通过外部低损耗1:1 (阻抗比)非平衡变压器将该阻抗转换成50Ω单端输出(参见*典型应用电路*)。

降低功耗模式

该器件包含一个引脚(LOBIAS)，允许通过外部电阻设置内部偏置电流。电阻的标称值如表1和表2所示。增大电阻值可降低功耗，但代价是性能有所下降。如果没有±1%精度的电阻，可以采用±5%的电阻替代。

如果采用3.3V电源为混频器供电，可显著降低功耗，整体功耗下降42%，请参考*3.3V Supply AC Electrical Characteristics*表和*典型工作特性*中与3.3V供电相关的特性曲线，以折中考虑功耗和性能。

布局考虑

合理的PCB设计是任何RF/微波电路的一个重要部分。RF信号线应尽可能短，以降低损耗、辐射和电感。为获得最佳性能，接地引脚须直接与封装底部的裸焊盘连接。PCB上的裸焊盘**必须**连接至PCB地层。建议采用多个过孔将该焊盘连接至地层。这种方法能为器件提供一个良好的RF/散热路径。 将器件封装底部的裸焊盘焊接至PCB。

电源旁路

合理的电源旁路对高频电路的稳定性至关重要。如*典型应用电路*所示，对各V_{CC}引脚使用电容旁路，元件值参见表1。

裸焊盘对RF性能/散热的影响

该器件采用20引脚、TQFN封装，其裸焊盘(EP)提供了一个与管芯之间的低热阻通路。安装该器件的PCB与EP之间保持良好的热传递通道非常重要。此外，EP应通过一个低电感路径接地。EP**必须**直接或通过一系列电镀过孔焊接至PCB的地层。

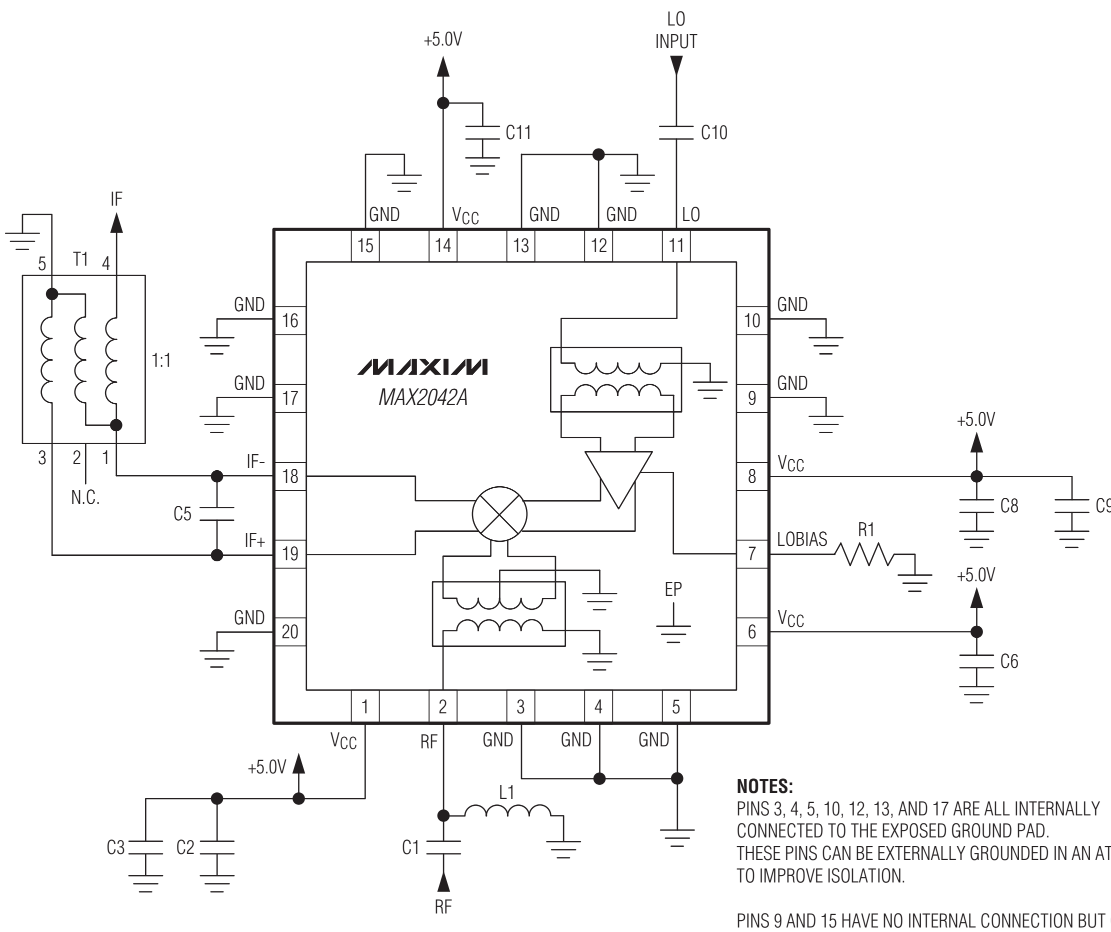
表1. 元件值—下变频模式

DESIGNATION	QTY	DESCRIPTION	COMPONENT SUPPLIER
C1	1	8.2pF microwave capacitor (0402); use for **2000MHz to 2900MHz** RF frequencies	Murata Electronics North America, Inc.
		1.5pF microwave capacitor (0402); use for **3000MHz to 3900MHz** RF frequencies	Murata Electronics North America, Inc.
		1.8pF microwave capacitor (0402); use for **1600MHz to 2000MHz** RF frequencies	Murata Electronics North America, Inc.
C2, C6, C8, C11	4	0.01µF microwave capacitors (0402)	Murata Electronics North America, Inc.
C3, C9	0	Not installed, capacitors	—
C5	0	Not installed, capacitor	—
C10	1	2pF microwave capacitor (0402)	Murata Electronics North America, Inc.
L1	1	12nH microwave inductor (0402); use for **1600MHz to 2000MHz** RF frequencies (this inductor is not used for other RF bands noted above)	TOKO America, Inc.
R1	1	698Ω ±1% resistor (0402)	—
T1	1	1:1 IF balun MABACT0069	M/A-Com, Inc.
U1	1	MAX2042A IC (20 TQFN)	Maxim Integrated Products, Inc.

表2. 元件值—上变频模式

DESIGNATION	QTY	DESCRIPTION	COMPONENT SUPPLIER
C1	1	8.2pF microwave capacitor (0402); use for **2000MHz to 2900MHz** RF frequencies	Murata Electronics North America, Inc.
		1.5pF microwave capacitor (0402); use for **3000MHz to 3900MHz** RF frequencies	Murata Electronics North America, Inc.
		1.8pF microwave capacitor (0402); use for **1600MHz to 2000MHz** RF frequencies	Murata Electronics North America, Inc.
C2, C6, C8, C11	4	0.01µF microwave capacitors (0402)	Murata Electronics North America, Inc.
C3, C9	0	Not installed, capacitors	—
C5	0	Not installed, capacitor	—
C10	1	2pF microwave capacitor (0402)	Murata Electronics North America, Inc.
L1	1	12nH microwave inductor (0402); use for **1600MHz to 2000MHz** RF frequencies (this inductor is not used for other RF bands noted above)	TOKO America, Inc.
R1	1	698Ω ±1% resistor (0402)	—
T1	1	1:1 IF balun MABACT0069	M/A-Com, Inc.
U1	1	MAX2042A IC (20 TQFN)	Maxim Integrated Products, Inc.

典型应用电路



NOTES:
PINS 3, 4, 5, 10, 12, 13, AND 17 ARE ALL INTERNALLY CONNECTED TO THE EXPOSED GROUND PAD.
THESE PINS CAN BE EXTERNALLY GROUNDED IN AN ATTEMPT TO IMPROVE ISOLATION.

PINS 9 AND 15 HAVE NO INTERNAL CONNECTION BUT CAN BE EXTERNALLY GROUNDED IN AN ATTEMPT TO IMPROVE ISOLATION.

MAX2042A

SiGe、高线性度、1600MHz至3900MHz 上/下变频混频器，带有LO缓冲器

定购信息

PART	TEMP RANGE	PIN-PACKAGE
MAX2042AETP+	-40°C to +85°C	20 TQFN-EP*
MAX2042AETP+T	-40°C to +85°C	20 TQFN-EP*

+表示无铅(Pb)/符合RoHS标准的封装。
**EP = 裸焊盘。*
T = 卷带包装。

芯片信息

PROCESS: SiGe BiCMOS

封装信息

如需最近的封装外形信息和焊盘布局(占位面积)，请查询**china.maxim-ic.com/packages**。请注意，封装编码中的"+"、"#"或"-"仅表示RoHS状态。封装图中可能包含不同的尾缀字符，但封装图只与封装有关，与RoHS状态无关。

封装类型	封装编码	外形编号	焊盘布局编号
20 TQFN-EP	T2055+3	**21-0140**	**90-0008**

修订历史

修订号	修订日期	说明	修改页
0	6/11	最初版本。	—

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