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EVALUATION KIT AVAILABLE

MAX2828/MAX2829

Single-/Dual-Band 802.11a/b/g World-Band Transceiver ICs

General Description

The MAX2828/MAX2829 single-chip, RF transceiver ICs are designed specifically for OFDM 802.11 WLAN applications. The MAX2828 is designed for single-band 802.11a applications covering world-band frequencies of 4.9GHz to 5.875GHz. The MAX2829 is designed for dual-band 802.11a/g applications covering world-bands of 2.4GHz to 2.5GHz and 4.9GHz to 5.875GHz. The ICs include all circuitry required to implement the RF transceiver function, providing a fully integrated receive path, transmit path, VCO, frequency synthesizer, and baseband/control interface. Only the PA, RF switches, RF bandpass filters (BPF), RF baluns, and a small number of passive components are needed to form the complete RF front-end solution.

Each IC completely eliminates the need for external SAW filters by implementing on-chip monolithic filters for both the receiver and transmitter. The baseband filtering and the Rx/Tx signal paths are optimized to meet the 802.11a/g IEEE standards and cover the full range of the required data rates (6, 9, 12, 18, 24, 36, 48, and 54Mbps for OFDM; 1, 2, 5.5, and 11Mbps for CCK/DSSS), at receiver sensitivity levels up to 10dB better than 802.11a/g standards. The MAX2828/MAX2829 transceivers are available in the small 56-pin, exposed paddle thin QFN package.

Applications

Single-/Dual-Band 802.11a/b/g Radios

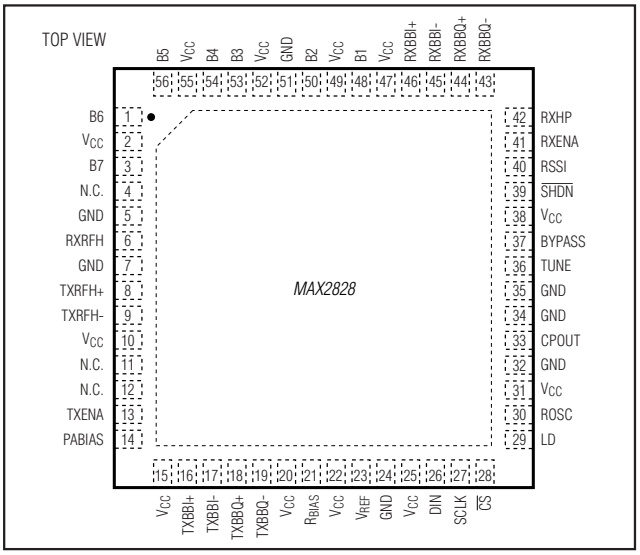
4.9GHz Public Safety Radios

2.4GHz/5GHz MIMO and Smart Antenna Systems

Features

- **World-Band Operation**
  - **MAX2828: 4.9GHz to 5.875GHz (802.11a)**
  - **MAX2829: 2.4GHz to 2.5GHz and 4.9GHz to 5.875GHz (802.11a/b/g)**
- **Best-In-Class Transceiver Performance**
  - **-75dBm Rx Sensitivity at 54Mbps (802.11g)**
  - **-46dB (802.11g)/-51dB (802.11a) Tx Sideband Suppression**
  - **1.5% (802.11g) and 2% (802.11a) Tx EVM**
  - **-100dBc/Hz (802.11g)/-95dBc/Hz (802.11a) LO Phase Noise**
  - **Programmable Baseband Lowpass Filters**
  - **Integrated PLL with 3-Wire Serial Interface**
  - **93dB (802.11g)/97dB (802.11a) Receiver Gain-Control Range**
  - **200ns Rx I/Q DC Settling**
  - **60dB Dynamic Range Rx RSSI**
  - **30dB Tx Power-Control Range**
  - **Tx/Rx I/Q Error Detection**
  - **I/Q Analog Baseband Interface for Tx and Rx Digital Mode Selection (Tx, Rx, Standby, and Power Down)**
  - **Supports Both Serial and Parallel Gain Control**
- **MIMO and Smart Antenna Compatibility**
  - **Coherent LO Phase Among Multiple Transceivers**
- **Support 40MHz Channel Bandwidth (Turbo Mode)**
- **Single +2.7V to +3.6V Supply**
- **1µA Low-Power Shutdown Mode**
- **Small 56-Pin TQFN Package (8mm x 8mm)**

Pin Configurations



Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX2828 ETN	-40°C to +85°C	56 TQFN-EP* (T5688-2)
MAX2829 ETN	-40°C to +85°C	56 TQFN-EP* (T5688-2)

**EP = Exposed paddle.*

Pin Configurations continued at end of data sheet.

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim's website at www.maximintegrated.com.

19-3455; Rev 0; 10/04

ABSOLUTE MAXIMUM RATINGS

V_{CC}, TXRFH_, TXRFL_ to GND.....-0.3V to +4.2V
RXRFH, RXRFL, TXBBI_, TXBBQ_, ROSC, RXBBI_, RXBBQ_, RSSI, PABIAS, V_{REF}, CPOUT, RXENA, TXENA, SHDN, CS, SCLK, DIN, B_, RXHP, LD, R_{BIAS}, BYPASS to GND.....-0.3V to (V_{CC} + 0.3V)
RXBBI_, RXBBQ_, RSSI, PABIAS, V_{REF}, CPOUT, LD Short-Circuit Duration.....10s
RF Input Power.....+10dBm
Continuous Power Dissipation (T_A = +70°C)
56-Pin Thin QFN (derate 31.3mW/°C above +70°C)....2500mW
Operating Temperature Range .....-40°C to +85°C
Junction Temperature.....+150°C
Storage Temperature Range .....-65°C to +160°C
Lead Temperature (soldering, 10s) .....+300°C

CAUTION! ESD SENSITIVE DEVICE

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.

DC ELECTRICAL CHARACTERISTICS

(MAX2828/MAX2829 evaluation kits: V_{CC} = 2.7V to 3.6V, Rx/Tx set to maximum gain, R_{BIAS} = 11kΩ, no signal at RF inputs, all RF inputs and outputs terminated into 50Ω, receiver baseband outputs are open, no signal applied to Tx I/Q BB inputs in Tx mode, f_{REFOSC} = 40MHz, registers set to default settings and corresponding test mode, T_A = -40°C to +85°C, unless otherwise noted. Typical values are at V_{CC} = +2.7V and T_A = +25°C, unless otherwise noted.) (Note 1)

PARAMETERS	CONDITIONS			MIN	TYP	MAX	UNITS
Supply Voltage				2.7		3.6	V
Supply Current	Shutdown mode, reference oscillator not applied, V_{IL} = 0				1	100	µA
	Standby mode	802.11g MAX2829	T_A = +25°C		37	47	mA
			T_A = -40°C to +85°C			51	
		802.11a MAX2828/MAX2829	T_A = +25°C		44	51	
			T_A = -40°C to +85°C			55	
	Rx mode	802.11g MAX2829	T_A = +25°C		118	151	
			T_A = -40°C to +85°C			158	
		802.11a MAX2828/MAX2829	T_A = +25°C		135	180	
			T_A = -40°C to +85°C			188	
	Tx mode	802.11g MAX2829	T_A = +25°C		124	164	
			T_A = -40°C to +85°C			175	
		802.11a MAX2828/MAX2829	T_A = +25°C		142	184	
			T_A = -40°C to +85°C			197	
	Standby mode (MIMO) (Note 2)	802.11g MAX2829	T_A = +25°C		65		
		802.11a MAX2828/MAX2829	T_A = +25°C		70		
	Rx mode (MIMO) (Note 2)	802.11g MAX2829	T_A = +25°C		136		
		802.11a MAX2828/MAX2829	T_A = +25°C		154		
	Tx mode (MIMO) (Note 2)	802.11g MAX2829	T_A = +25°C		139		
		802.11a MAX2828/MAX2829	T_A = +25°C		157		
	Tx calibration mode, T_A = +25°C	802.11g MAX2829			129		
		802.11a MAX2828/MAX2829			147		
	RX calibration mode, T_A = +25°C	802.11g MAX2829			188		
		802.11a MAX2828/MAX2829			210		
Rx I/Q Output Common-Mode Voltage	T_A = +25°C			0.80	0.9	1.05	V

DC ELECTRICAL CHARACTERISTICS (continued)

(MAX2828/MAX2829 evaluation kits: V_{CC} = 2.7V to 3.6V, Rx/Tx set to maximum gain, R_{BIAS} = 11kΩ, no signal at RF inputs, all RF inputs and outputs terminated into 50Ω, receiver baseband outputs are open, no signal applied to Tx I/Q BB inputs in Tx mode, f_{REFOSC} = 40MHz, registers set to default settings and corresponding test mode, T_A = -40°C to +85°C, unless otherwise noted. Typical values are at V_{CC} = +2.7V and T_A = +25°C, unless otherwise noted.) (Note 1)

PARAMETERS	CONDITIONS	MIN	TYP	MAX	UNITS
Rx I/Q Output Common-Mode Voltage Variation	T_A = -40°C (relative to +25°C)		-25		mV
	T_A = +85°C (relative to +25°C)		20		
Tx Baseband Input Common-Mode Voltage Operating Range		0.9		1.3	V
Tx Baseband Input Bias Current				13	µA
Reference Voltage Output	-1mA < I_{OUT} < +1mA		1.2		V
Digital Input-Voltage High, V_{IH}		V_{CC} - 0.4			V
Digital Input-Voltage Low, V_{IL}				0.4	V
Digital Input-Current High, I_{IH}		-1		+1	µA
Digital Input-Current Low, I_{IL}		-1		+1	µA
LD Output-Voltage High, V_{OH}	Sourcing 100µA	V_{CC} - 0.4			V
LD Output-Voltage Low, V_{OL}	Sinking 100µA			0.4	V

AC ELECTRICAL CHARACTERISTICS—802.11g Rx Mode (MAX2829)

(MAX2829 evaluation kit: V_{CC} = +2.7V, f_{IN} = 2.437GHz; receiver baseband I/Q outputs at 112mV_{RMS} (-19dBV), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = RXENA = $\overline{CS}$ = high, RXHP = TXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted. Unmodulated single-tone RF input signal is used, unless otherwise indicated.) (Tables 1, 2, 3)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
RECEIVER SECTION: LNA RF INPUT TO BASEBAND I/Q OUTPUTS						
RF Input Frequency Range			2.412		2.500	GHz
RF Input Return Loss	With 50Ω external match	LNA high-gain mode (B7:B6 = 11)		-22		dB
		LNA medium-gain mode (B7:B6 = 10)		-24		
		LNA low-gain mode (B7:B6 = 0X)		-12		
Total Voltage Gain	Maximum gain, B7:B1 = 1111111	T_A = +25°C	87	94		dB
		T_A = -40°C to +85°C (Note 1)	85			
	Minimum gain, B7:B1 = 0000000	T_A = +25°C		1	5.5	
RF Gain Steps	From high-gain mode (B7:B6 = 11) to medium-gain mode (B7:B6 = 10) (Note 3)			-15.5		dB
	From high-gain mode (B7:B6 = 11) to low-gain mode (B7:B6 = 0X) (Note 3)			-30.5		
Gain Variation Over RF Band	f_{RF} = 2.412GHz to 2.5GHz				3	dB
Baseband Gain Range	From maximum baseband gain (B5:B1 = 11111) to minimum baseband gain (B5:B1 = 00000)			62		dB

AC ELECTRICAL CHARACTERISTICS—802.11g Rx Mode (MAX2829) (continued)

(MAX2829 evaluation kit: V_{CC} = +2.7V, f_{IN} = 2.437GHz; receiver baseband I/Q outputs at 112mV$_{RMS}$ (-19dBV), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = RXENA = $\overline{CS}$ = high, RXHP = TXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted. Unmodulated single-tone RF input signal is used, unless otherwise indicated.) (Tables 1, 2, 3)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
DSB Noise Figure	Voltage gain ≥ 65dB, with B7:B6 = 11			3.5		dB
	Voltage gain = 50dB, with B7:B6 = 11			4		
	Voltage gain = 45dB, with B7:B6 = 10			16		
	Voltage gain = 15dB, with B7:B6 = 0X			36		
Output P-1$_{dB}$	Voltage gain = 90dB, with B7:B6 = 11			3.2		V_{P-P}
Out-of-Band Input IP3	-35dBm jammers at 40MHz and 78MHz offset; based on IM3 at 2MHz	Voltage gain = 60dB, with B7:B6 = 11		-10		dBm
		Voltage gain = 45dB, with B7:B6 = 10		-2		
		Voltage gain = 40dB, with B7:B6 = 0X		21		
In-Band Input P-1$_{dB}$	Voltage gain = 40dB, with B7:B6 = 11			-29		dBm
	Voltage gain = 25dB, with B7:B6 = 10			-14		
	Voltage gain = 5dB, with B7:B6 = 0X			2		
In-Band Input IP3	Tones at 7MHz and 8MHz, IM3 at 6MHz and 9MHz, P_{IN} = -40dBm per tone	Voltage gain = 40dB, with B7:B6 = 11		-17		dBm
		Voltage gain = 25dB, with B7:B6 = 10		-5		
		Voltage gain = 5dB, with B7:B6 = 0X		14		
I/Q Phase Error	B7:B1 = 1101110, 1σ variation			±0.5		degrees
I/Q Gain Imbalance	B7:B1 = 1101110, 1σ variation			±0.1		dB
Tx-to-Rx Conversion Gain for Rx I/Q Calibration	B7:B1 = 0010101 (Note 4)			-4		dB
I/Q Static DC Offset	RXHP = 1, B7:B1 = 1101110, 1σ variation			±2		mV
I/Q DC Droop	After switching RXHP to 0, D2 = 0 (see the *RX Control/RSSI Register Definition* section)			±1		mV/ms
RF Gain-Change Settling Time	Gain change from high gain to medium gain, high gain to low gain, or medium gain to low gain; gain settling to within ±2dB of steady state			0.4		µs
Baseband VGA Settling Time	Gain change from B5:B1 = 10111 to B5:B1 = 00111; gain settling to within ±2dB of steady state			0.1		µs
Rx I/Q Output Load Impedance	Minimum differential resistance			10		kΩ
	Maximum differential capacitance			8		pF
Spurious Signal Emissions at LNA Input	RF = 1GHz to 26.5GHz			-67		dBm

AC ELECTRICAL CHARACTERISTICS—802.11g Rx Mode (MAX2829) (continued)

(MAX2829 evaluation kit: V_{CC} = +2.7V, f_{IN} = 2.437GHz; receiver baseband I/Q outputs at 112mV$_{RMS}$ (-19dBV), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = RXENA = $\overline{CS}$ = high, RXHP = TXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted. Unmodulated single-tone RF input signal is used, unless otherwise indicated.) (Tables 1, 2, 3)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
RECEIVER BASEBAND FILTERS						
Baseband -3dB Corner Frequency	(See the *Lowpass Filter Register* section)	Narrowband mode		7.5		MHz
		Nominal mode		9.5		
		Turbo mode 1		14		
		Turbo mode 2		18		
Baseband Filter Rejection (Nominal Mode)	$f_{BASEBAND}$ = 15MHz			20		dB
	$f_{BASEBAND}$ = 20MHz			39		
	$f_{BASEBAND}$ > 40MHz			84		
RSSI						
RSSI Minimum Output Voltage	RXHP = 1, low range (D11 = 0, see the *Rx Control/RSSI Register Definition* section)			0.5		V
	RXHP = 1, high range (D11 = 1, see the *Rx Control/RSSI Register Definition* section)			0.52		
RSSI Maximum Output Voltage	RXHP = 1, low range (D11 = 0, see the *Rx Control/RSSI Register Definition* section)			2		V
	RXHP = 1, high range (D11 = 1, see the *Rx Control/RSSI Register Definition* section)			2.5		
RSSI Slope	RXHP = 1, low range (D11 = 0, see the *Rx Control/RSSI Register Definition* section)			22.5		mV/dB
	RXHP = 1, high range (D11 = 1, see the *Rx Control/RSSI Register Definition* section)			30		
RSSI Output Settling Time	To within 3dB of steady state	+40dB signal step		0.2		µs
		-40dB signal step		0.7		

AC ELECTRICAL CHARACTERISTICS—802.11a Rx Mode (MAX2828/MAX2829)

(MAX2828/MAX2829 evaluation kits: V_{CC} = +2.7V, f_{IN} = 5.25GHz; receiver baseband I/Q outputs at 112mV_{RMS} (-19dBV), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = RXENA = $\overline{CS}$ = high, RXHP = TXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted. Unmodulated single-tone RF input signal is used, unless otherwise indicated.) (Tables 1, 2, 3)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
RECEIVER SECTION: LNA RF INPUT TO BASEBAND I/Q OUTPUTS						
RF Input Frequency Range	802.11a low-band mode		4.900		5.350	GHz
	802.11a high-band mode		5.470		5.875	
RF Input Return Loss	With 50Ω external match	LNA high-gain mode (B7:B6 = 11)		-15		dB
		LNA medium-gain mode (B7:B6 = 10)		-11		
		LNA low-gain mode (B7:B6 = 0X)		-7		
Total Voltage Gain	Maximum gain, B7:B1 = 1111111	T_A = +25°C	91	97		dB
		T_A = -40°C to +85°C (Note 1)	88			
	Minimum gain, B7:B1 = 0000000	T_A = +25°C		0	3	
RF Gain Steps	From high-gain mode (B7:B6 = 11) to medium-gain mode (B7:B6 = 10) (Note 3)			-19		dB
	From high-gain mode (B7:B6 = 11) to low-gain mode (B7:B6 = 0X) (Note 3)			-34.5		
Gain Variation Relative to 5.25GHz	f_{RF} = 4.9GHz			-0.3		dB
	f_{RF} = 5.35GHz			0.4		
	f_{RF} = 5.875GHz			-4		
Baseband Gain Range	From maximum baseband gain (B5:B1 = 11111) to minimum baseband gain (B5:B1 = 00000)			62		dB
DSB Noise Figure	Voltage gain ≥ 65dB, with B7:B6 = 11			4.5		dB
	Voltage gain = 50dB, with B7:B6 = 11			4.8		
	Voltage gain = 45dB, with B7:B6 = 10			15		
	Voltage gain = 15dB, with B7:B6 = 0X			36		
Output P-1_{dB}	Voltage gain = 90dB, with B7:B6 = 11			3.2		V_{P-P}
Out-of-Band Input IP3	-35dBm jammers at 40MHz and 78MHz offset; based on IM3 at 2MHz	Voltage gain = 60dB, with B7:B6 = 11		-15		dBm
		Voltage gain = 45dB, with B7:B6 = 10		0.5		
		Voltage gain = 40dB, with B7:B6 = 0X		20		
In-Band Input P-1_{dB}	Voltage gain = 35dB, with B7:B6 = 11			-32		dBm
	Voltage gain = 20dB, with B7:B6 = 10			-12		
	Voltage gain = 5dB, with B7:B6 = 0X			3		

AC ELECTRICAL CHARACTERISTICS—802.11a Rx Mode (MAX2828/MAX2829) (continued)

(MAX2828/MAX2829 evaluation kits: V_{CC} = +2.7V, f_{IN} = 5.25GHz; receiver baseband I/Q outputs at 112mV_{RMS} (-19dBV), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = RXENA = $\overline{CS}$ = high, RXHP = TXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted. Unmodulated single-tone RF input signal is used, unless otherwise indicated.) (Tables 1, 2, 3)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
In-Band Input IP3	Tones at 7MHz and 8MHz, IM3 at 6MHz and 9MHz, P_{IN} = -40dBm per tone	Voltage gain = 35dB, with B7:B6 = 11		-24		dBm
		Voltage gain = 20dB, with B7:B6 = 10		-5		
		Voltage gain = 5dB, with B7:B6 = 0X		13		
I/Q Phase Error	B7:B1 = 1101110, 1σ variation			±0.4		degrees
I/Q Gain Imbalance	B7:B1 = 1101110, 1σ variation			±0.1		dB
Tx-to-Rx Conversion Gain for Rx I/Q Calibration	B7:B1 = 0001111 (Note 4)			0		dB
I/Q Static DC Offset	RXHP = 1, B7:B1 = 1101110, 1σ variation			±2		mV
I/Q DC Droop	After switching RXHP to 0, D2 = 0 (see the *Rx Control/RSSI Register Definition* section)			±1		mV/ms
RF Gain-Change Settling Time	Gain change from high gain to medium gain, high gain to low gain, or medium gain to low gain; gain settling to within ±2dB of steady state			0.4		µs
Baseband VGA Settling Time	Gain change from B5:B1 = 10111 to B5:B1 = 00111; gain settling to within ±2dB of steady state			0.1		µs
Rx I/Q Output Load Impedance	Minimum differential resistance			10		kΩ
	Maximum differential capacitance			8		pF
Spurious Signal Emissions at LNA input	RF = 1GHz to 26.5GHz			-50		dBm
RECEIVER BASEBAND FILTERS						
Baseband -3dB Corner Frequency	(See the *Lowpass Filter Register Definition* section)	Narrow-band mode		7.5		MHz
		Nominal mode		9.5		
		Turbo mode 1		14		
		Turbo mode 2		18		
Baseband Filter Rejection (Nominal Mode)	$f_{BASEBAND}$ = 15MHz			20		dB
	$f_{BASEBAND}$ = 20MHz			39		
	$f_{BASEBAND}$ > 40MHz			80		

AC ELECTRICAL CHARACTERISTICS—802.11a Rx Mode (MAX2828/MAX2829) (continued)

(MAX2828/MAX2829 evaluation kits: V_{CC} = +2.7V, f_{IN} = 5.25GHz; receiver baseband I/Q outputs at 112mV_{RMS} (-19dBV), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = RXENA = $\overline{CS}$ = high, RXHP = TXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted. Unmodulated single-tone RF input signal is used, unless otherwise indicated.) (Tables 1, 2, 3)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
RSSI						
RSSI Minimum Output Voltage	RXHP = 1, low range (D11 = 0, see the *Rx Control/RSSI Register Definition* section)			0.5		V
	RXHP = 1, high range (D11 = 1, see the *Rx Control/RSSI Register Definition* section)			0.52		
RSSI Maximum Output Voltage	RXHP = 1, low range (D11 = 0, see the *Rx Control/RSSI Register Definition* section)			2		V
	RXHP = 1, high range (D11 = 1, see the *Rx Control/RSSI Register Definition* section)			2.5		
RSSI Slope	RXHP = 1, low range (D11 = 0, see the *Rx Control/RSSI Register Definition* section)			22.5		mV/dB
	RXHP = 1, high range (D11 = 1, see the *Rx Control/RSSI Register Definition* section)			30		
RSSI Output Settling Time	To within 3dB of steady state	+40dB signal step		0.2		µs
		-40dB signal step		0.7		

AC ELECTRICAL CHARACTERISTICS—802.11g Tx Mode (MAX2829)

(MAX2829 evaluation kit: V_{CC} = +2.7V, f_{OUT} = 2.437GHz, f_{REFOSC} = 40MHz, $\overline{SHDN}$ = TXENA = $\overline{CS}$ = high, RXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, 100mV_{RMS} sine and cosine signal (or 100mV_{RMS}, 54Mbps IEEE 802.11g I/Q signals wherever OFDM is mentioned) applied to baseband I/Q inputs of transmitter, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted.) (Table 4)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
TRANSMIT SECTION: Tx BASEBAND I/Q INPUTS TO RF OUTPUTS						
RF Output Frequency Range, f_{RF}			2.412		2.500	GHz
Output Power	54Mbps 802.11g OFDM signal	1.5% EVM		-2.5		dBm
		B6:B1 = 111011		-4.5		
Output Power (CW)	V_{IN} = 100mV_{RMS} at 1MHz I/Q CW signal, B6:B1 = 111111			-2		dBm
Output Power Range	B6:B1 = 111111 to B6:B1 = 000000			30		dB
Carrier Leakage	Without DC offset cancellation			-27		dBc
Unwanted Sideband Suppression	Uncalibrated			-46		dBc
Tx Output ACP	Measured with 1MHz resolution bandwidth at 22MHz offset from channel center (B6:B1 = 111011), OFDM signal			-69		dBm/MHz
RF Output Return Loss	With external 50Ω match			-14		dB

AC ELECTRICAL CHARACTERISTICS—802.11g Tx Mode (MAX2829) (continued)

(MAX2829 evaluation kit: V_{CC} = +2.7V, f_{OUT} = 2.437GHz, f_{REFOSC} = 40MHz, $\overline{SHDN}$ = TXENA = $\overline{CS}$ = high, RXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, 100mV_{RMS} sine and cosine signal (or 100mV_{RMS}, 54Mbps IEEE 802.11g I/Q signals wherever OFDM is mentioned) applied to baseband I/Q inputs of transmitter, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted.) (Table 4)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
RF Spurious Signal Emissions	B6:B1 = 111011, OFDM signal	2/3 x f_{RF}		-64		dBm/MHz
		4/3 x f_{RF}		-61		
		5/3 x f_{RF}		-63		
		8/3 x f_{RF}		-52		
Baseband -3dB Corner Frequency	(See the *Lowpass Filter Register Definition* section)	Nominal mode		12		MHz
		Turbo mode 1		18		
		Turbo mode 2		24		
Baseband Filter Rejection	At 30MHz, in nominal mode (see the *Lowpass Filter Register Definition* section)			60		dB
Tx Baseband Input Impedance	Minimum differential resistance			60		kΩ
	Maximum differential capacitance			0.7		pF
TRANSMITTER LO LEAKAGE AND I/Q CALIBRATION USING LO LEAKAGE AND SIDEBAND DETECTOR (SEE THE Tx/Rx CALIBRATION MODE SECTION)						
Tx BASEBAND I/Q INPUTS TO RECEIVER OUTPUTS						
LO Leakage and Sideband-Detector Output	Calibration register, D12:D11 = 11, A3:A0 = 0110	Output at 1 x f_{TONE} (for LO leakage = -29dBc), f_{TONE} = 2MHz, 100mV_{RMS}		-3		dBV_{RMS}
		Output at 2 x f_{TONE} (for sideband suppression = -40dBc), f_{TONE} = 2MHz, 100mV_{RMS}		-13		
Amplifier Gain Range	D12:D11 = 00 to D12:D11 = 11, A3:A0 = 0110			26		dB
Lower -3dB Corner Frequency				1		MHz

AC ELECTRICAL CHARACTERISTICS—802.11a Tx Mode (MAX2828/MAX2829)

(MAX2828/MAX2829 evaluation kits: V_{CC} = +2.7V, f_{OUT} = 5.25GHz, f_{REFOSC} = 40MHz, $\overline{SHDN}$ = TXENA = $\overline{CS}$ = high, RXENA = SCLK = DIN = low, R_{BIAS} = 11kΩ, 100mV_{RMS} sine and cosine signal (or 100mV_{RMS}, 54Mbps IEEE 802.11a I/Q signals wherever OFDM is mentioned) applied to baseband I/Q inputs of transmitter, registers set to default settings and corresponding test mode, T_A = +25°C, unless otherwise noted.) (Table 4)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
TRANSMIT SECTION: Tx BASEBAND I/Q INPUTS TO RF OUTPUTS						
RF Output Frequency Range, f_{RF}	802.11a low-band mode		4.900		5.350	GHz
	802.11a high-band mode		5.470		5.875	
Output Power	54Mbps 802.11a OFDM signal	2% EVM		-5		dBm
		B6:B1 = 111100		-6.5		
Output Power (CW)	V_{IN} = 100mV_{RMS} at 1MHz I/Q CW signal, B6:B1 = 111111			-4.5		dBm
Output Power Variation Relative to 5.25GHz	f_{RF} = 4.9GHz			-6		dB
	f_{RF} = 5.35GHz			-0.5		
	f_{RF} = 5.875GHz			-1		
Output Power Range	B6:B1 = 111111 to B6:B1 = 000000			30		dB
Carrier Leakage	Without DC offset cancellation			-27		dBc
Unwanted Sideband Suppression	Uncalibrated			-51		dBc
Tx Output ACP	Measured with 1MHz resolution bandwidth at 30MHz offset from channel center (B6:B1 = 111100), OFDM signal			-80		dBm/ MHz
RF Output Return Loss	With external 50Ω match			-16		dB
RF Spurious Signal Emissions	B6:B1 = 111100, OFDM signal	4/5 x f_{RF}		-55		dBm/ MHz
		6/5 x f_{RF}		-64		
		7/5 x f_{RF}		-65		
		8/5 x f_{RF}		-49		
Baseband -3dB Corner Frequency	(see the *Lowpass Filter Register Definition* section)	Nominal mode		12		MHz
		Turbo mode 1		18		
		Turbo mode 2		24		
Baseband Filter Rejection	At 30MHz, in nominal mode (see the *Lowpass Filter Register Definition* section)			60		dB
Tx Baseband Input Impedance	Minimum differential resistance			60		kΩ
	Maximum differential capacitance			0.7		pF
TRANSMITTER LO LEAKAGE AND I/Q CALIBRATION USING LO LEAKAGE AND SIDEBAND DETECTOR (SEE THE Tx/Rx CALIBRATION MODE SECTION)						
Tx BASEBAND I/Q INPUTS TO RECEIVER OUTPUTS						
LO Leakage and Sideband-Detector Output	Calibration register, D12:D11 = 1, A3:A0 = 0110	Output at 1 x f_{TONE} (for LO leakage = -29dBc), f_{TONE} = 2MHz, 100mV_{RMS}		-4.5		dBV_{RMS}
		Output at 2 x f_{TONE} (for sideband suppression = -40dBc), f_{TONE} = 2MHz, 100mV_{RMS}		-14.5		
Amplifier Gain Range	D12:D11 = 00 to D12:D11 = 11, A3:A0 = 0110			26		dB
Lower -3dB Corner Frequency				1		MHz

AC ELECTRICAL CHARACTERISTICS—Frequency Synthesis

(MAX2828/MAX2829 evaluation kits: V_{CC} = +2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, SCLK = DIN = low, PLL loop bandwidth = 150kHz, R_{BIAS} = 11kΩ, T_A = +25°C, unless otherwise noted.)

PARAMETER	CONDITIONS			MIN	TYP	MAX	UNITS
FREQUENCY SYNTHESIZER							
RF Channel Center Frequency	802.11g mode			2412		2500	MHz
	802.11a low-band mode			4900		5350	
	802.11a high-band mode			5470		5875	
Charge-Pump Comparison Frequency					20		MHz
f_{REFOSC} Input Frequency				20		44	MHz
Reference-Divider Ratio				1		4	
f_{REFOSC} Input Levels	AC-coupled			800			mV_{P-P}
f_{REFOSC} Input Impedance					10		kΩ
Closed-Loop Phase Noise	802.11g		f_{OFFSET} = 1kHz		-87		dBc/Hz
			f_{OFFSET} = 10kHz		-103		
			f_{OFFSET} = 100kHz		-99		
			f_{OFFSET} = 1MHz		-112		
			f_{OFFSET} = 10MHz		-125		
	802.11a		f_{OFFSET} = 1kHz		-84		
			f_{OFFSET} = 10kHz		-95		
			f_{OFFSET} = 100kHz		-92		
			f_{OFFSET} = 1MHz		-108		
			f_{OFFSET} = 10MHz		-124		
Closed-Loop Integrated Phase Noise	RMS phase jitter, integrate from 10kHz to 10MHz offset		802.11g		0.6		degrees
			802.11a		1		
Charge-Pump Output Current					4		mA
Charge-Pump Output Voltage	>70% of I_{CP}			0.5		V_{CC} - 0.5V	V
Reference Spurs	20MHz offset		802.11g		-65		dBc
			802.11a		-58		
VOLTAGE-CONTROLLED OSCILLATOR							
VCO Tuning Voltage Range				0.4		2.3	V
LO Tuning Gain	802.11g		V_{TUNE} = 0.4V		135		MHz/V
			V_{TUNE} = 2.3V		62		
	802.11a	Low band	V_{TUNE} = 0.3V		324		
			V_{TUNE} = 2.2V		167		
		High band	V_{TUNE} = 0.3V		330		
			V_{TUNE} = 2.2V		175		

AC ELECTRICAL CHARACTERISTICS—Miscellaneous Blocks

(MAX2828/MAX2829 evaluation kits: V_{CC} = +2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C, unless otherwise noted.)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
PA BIAS DAC						
Number of Programmable Bits				6		Bits
Minimum Output Sink Current	D5:D0 = 000000 (see the *PA Bias DAC Register Definition* section)			0		µA
Maximum Output Sink Current	D5:D0 = 111111 (see the *PA Bias DAC Register Definition* section), output voltage = 0.8V			313		µA
Turn-On Time	D9:D6 = 0000 (see the *PA Bias DAC Register Definition* section)			0.2		µs
DNL				1		LSB
ON-CHIP TEMPERATURE SENSOR						
Output Voltage	D11 = 1 (see the *Rx Control/RSSI Register Definition* section)	T_A = -40°C		0.5		V
		T_A = +25°C		1.05		
		T_A = +85°C		1.6		

AC ELECTRICAL CHARACTERISTICS—Timing

(MAX2828/MAX2829 evaluation kits: V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, SCLK = DIN = low, PLL loop bandwidth = 150kHz, R_{BIAS} = 11kΩ, T_A = +25°C, unless otherwise noted.)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
SYSTEM TIMING (See Figure 1)						
Turn-On Time	From $\overline{SHDN}$ rising edge (PLL locked)			50		µs
Shutdown Time				2		µs
Channel Switching Time	f_{RF} = 2.412GHz to 2.5GHz			25		µs
	f_{RF} = 5.15GHz to 5.35GHz			35		
	f_{RF} = 5.45GHz to 5.875GHz			130		
	f_{RF} = 4.9GHz to 5.875GHz			130		
Rx/Tx Turnaround Time	Measured from Tx or Rx enable rising edge; signal settling to within ±2dB of steady state	Rx to Tx		1		µs
		Tx to Rx, RXHP = 1		1.2		
Tx Turn-On Time (From Standby Mode)	From Tx enable rising edge; signal settling to within ±2dB of steady state			1		µs
Rx Turn-On Time (From Standby Mode)	From Rx enable rising edge; signal settling to within ±2dB of steady state			1.2		µs

AC ELECTRICAL CHARACTERISTICS—Timing (continued)

(MAX2828/MAX2829 evaluation kits: V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, SCLK = DIN = low, PLL loop bandwidth = 150kHz, R_{BIAS} = 11kΩ, T_A = +25°C, unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
3-WIRE SERIAL INTERFACE TIMING (SEE FIGURE 2)					
SCLK-Rising-Edge to $\overline{CS}$-Falling-Edge Wait Time, t_{CSO}			6		ns
Falling Edge of $\overline{CS}$ to Rising Edge of First SCLK Time, t_{CSS}			6		ns
DIN-to-SCLK Setup Time, t_{DS}			6		ns
DIN-to-SCLK Hold Time, t_{DH}			6		ns
SCLK Pulse-Width High, t_{CH}			6		ns
SCLK Pulse-Width Low, t_{CL}			6		ns
Last Rising Edge of SCLK to Rising Edge of $\overline{CS}$ or Clock to Load Enable Setup Time, t_{CSH}			6		ns
$\overline{CS}$ High Pulse Width, t_{CSW}			20		ns
Time Between the Rising Edge of $\overline{CS}$ and the Next Rising Edge of SCLK, t_{CS1}			6		ns
Clock Frequency, f_{CLK}			40		MHz
Rise Time, t_R			2		ns
Fall Time, t_F			2		ns

Note 1: Devices are production tested at +85°C only. Min and max limits at temperatures other than +85°C are guaranteed by design and characterization.
Note 2: Register settings for MIMO mode. A3:A0 = 0101 and A3:A0 = 0010, D13 = 1.
Note 3: The expected part-to-part variation of the RF gain step is ±1dB.
Note 4: Tx I/Q inputs = 100mV_{RMS}. Set Tx VGA gain to max.

Table 1. Receiver Front-End Gain-Control Settings

B7	B6	GAIN
1	1	High
1	0	Medium
0	X	Low

Table 2. Receiver Baseband VGA Gain Settings

B5:B1	GAIN
11111	Max
11110	Max - 2dB
11101	Max - 4dB
:	:
00000	Min

Table 3. Receiver Baseband VGA Gain Step Control

BIT	GAIN STEP (typ)
B1	2dB
B2	4dB
B3	8dB
B4	16dB
B5	32dB

Table 4. Tx VGA Gain Control Settings

NUMBER	B6:B1	OUTPUT SIGNAL POWER
63	111111	Max
62	111110	Max - 0.5dB
61	111101	Max - 1.0dB
:	:	:
49	110001	Max - 7dB
48	110000	Max - 7.5dB
47	101111	Max - 8dB
46	101110	Max - 8dB
45	101101	Max - 9dB
44	101100	Max - 9dB
:	:	:
5	000101	Max - 29dB
4	000100	Max - 29dB
3	000011	Max - 30dB
2	000010	Max - 30dB
1	000001	Max - 30dB
0	000000	Max - 30dB

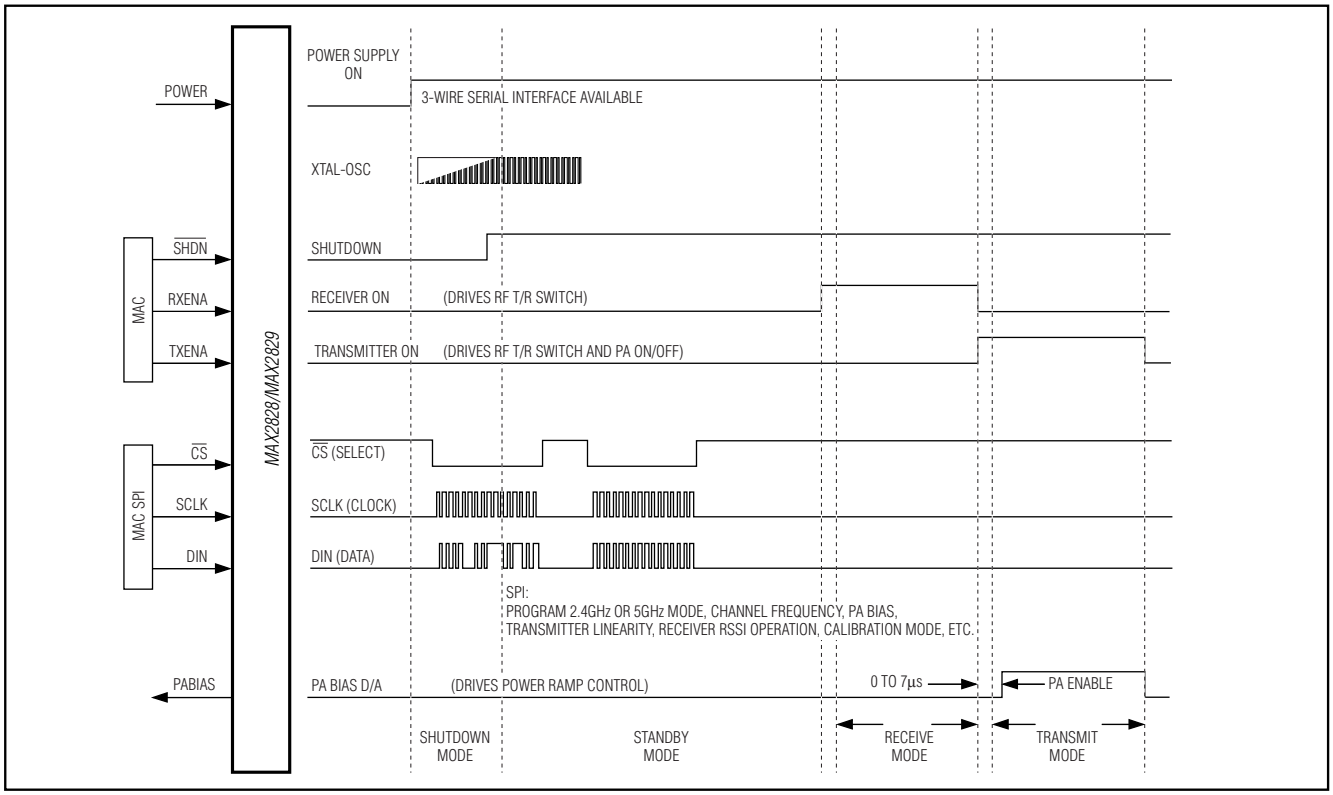


Figure 1. System Timing Diagram

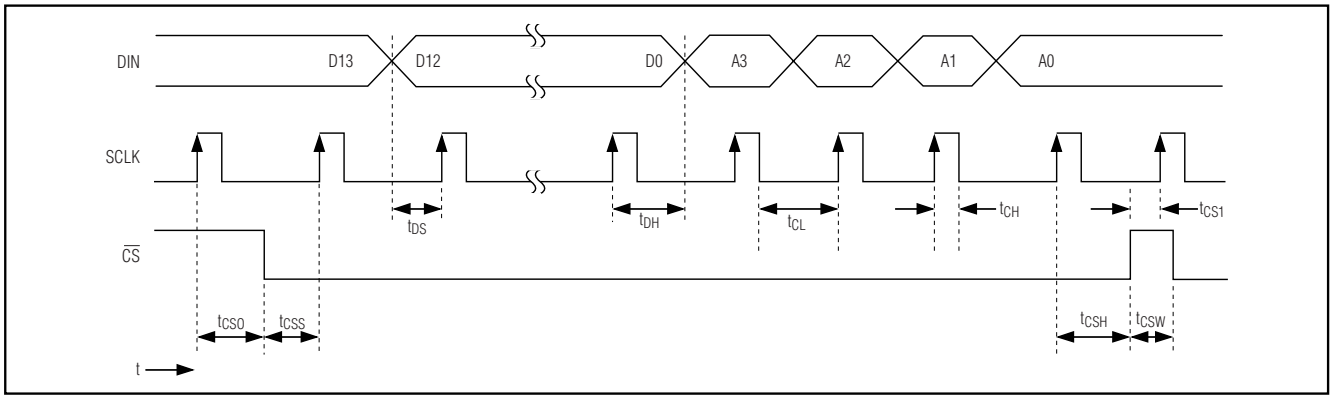


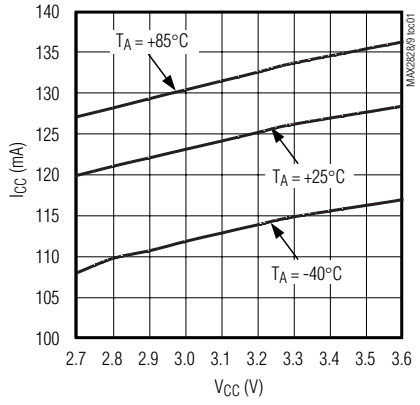
Figure 2. 3-Wire Serial-Interface Timing Diagram

Typical Operating Characteristics

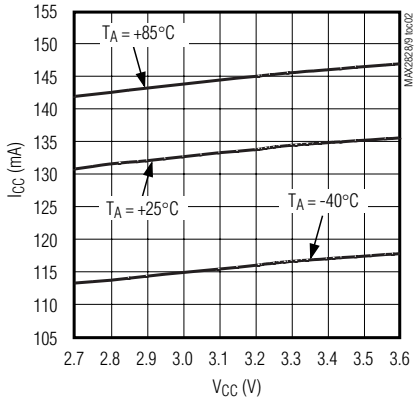
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11g

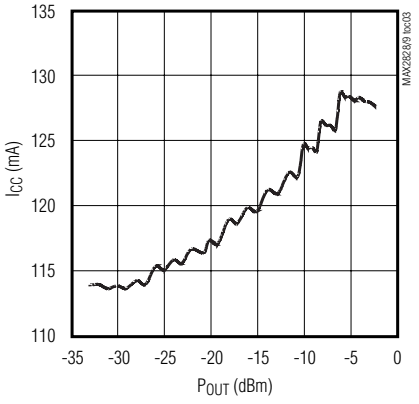
RX I_{CC} vs. V_{CC}



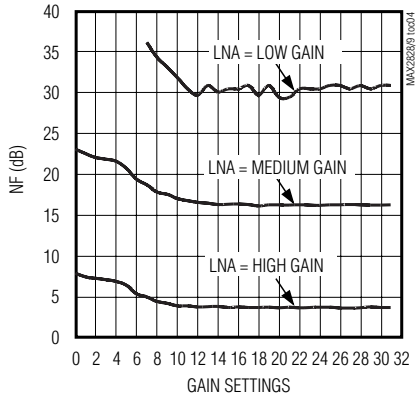
TX I_{CC} vs. V_{CC}



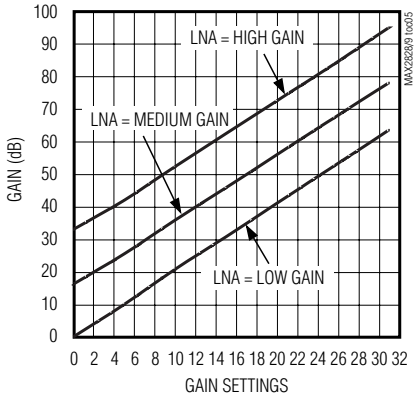
TX I_{CC} vs. P_{OUT}



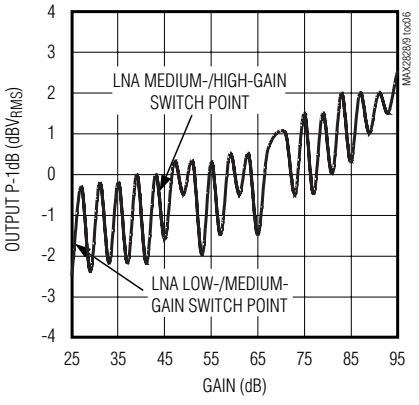
NOISE FIGURE vs. BASEBAND GAIN SETTINGS



RX VOLTAGE GAIN vs. BASEBAND GAIN SETTINGS



RX IN-BAND OUTPUT P-1dB vs. GAIN

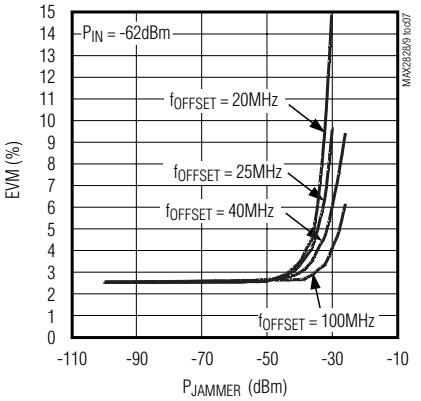


Typical Operating Characteristics (continued)

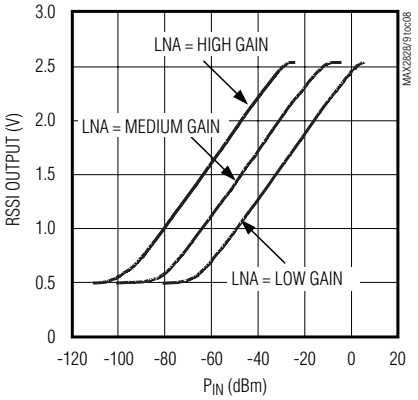
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11g

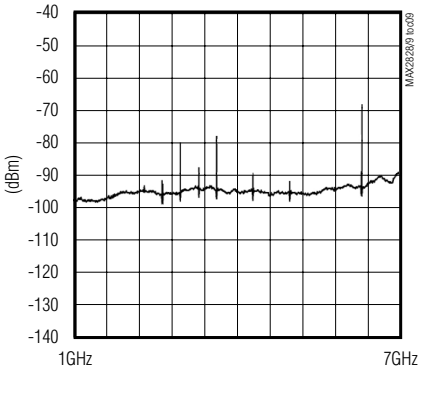
OFDM EVM WITH OFDM JAMMER vs. OFDM JAMMER LEVEL WITH JAMMER OFFSET FREQUENCY



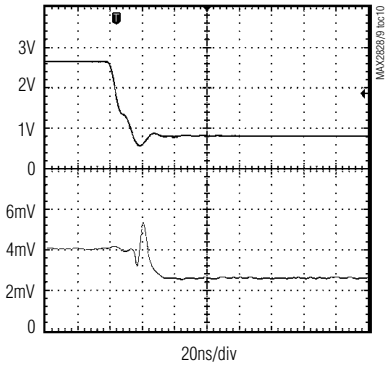
RX RSSI OUTPUT vs. INPUT POWER



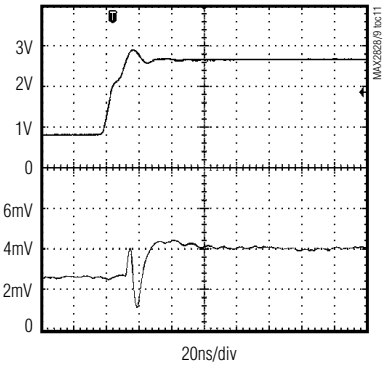
RX EMISSION SPECTRUM, LNA INPUT (TX OFF, LNA = LOW GAIN)



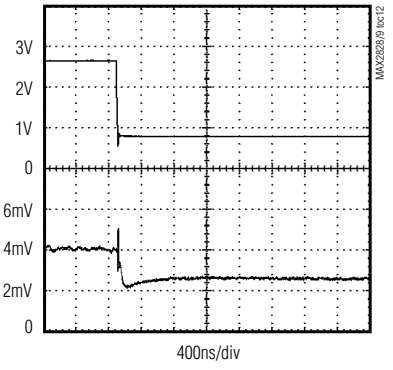
RX I/Q DC OFFSET SETTLING RESPONSE (-8dB BB VGA GAIN STEP)



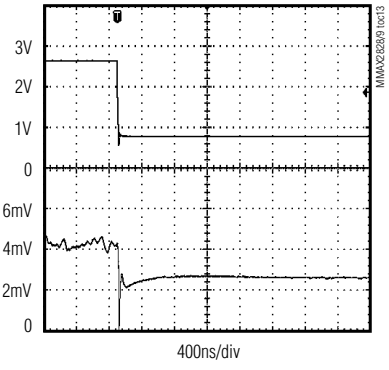
RX I/Q DC OFFSET SETTLING RESPONSE (+8dB BB VGA GAIN STEP)



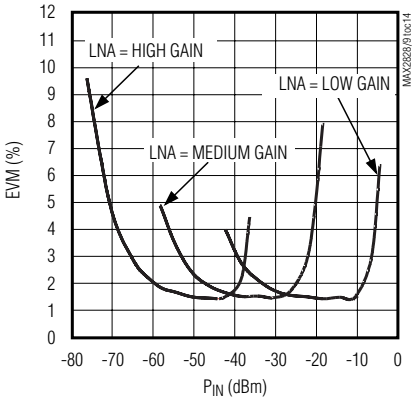
RX I/Q DC OFFSET SETTLING RESPONSE (-16dB BB VGA GAIN STEP)



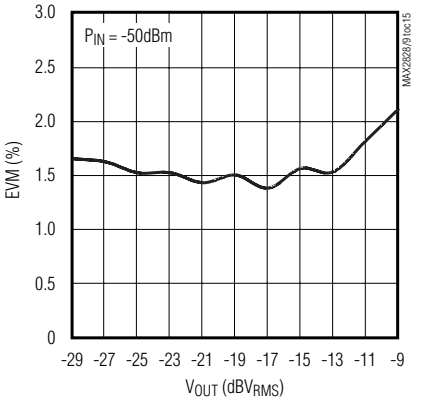
RX I/Q DC OFFSET SETTLING RESPONSE (-32dB BB VGA GAIN STEP)



RX EVM vs. P_{IN}



RX EVM vs. V_{OUT}

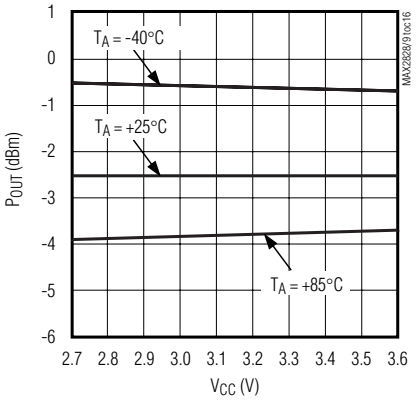


Typical Operating Characteristics (continued)

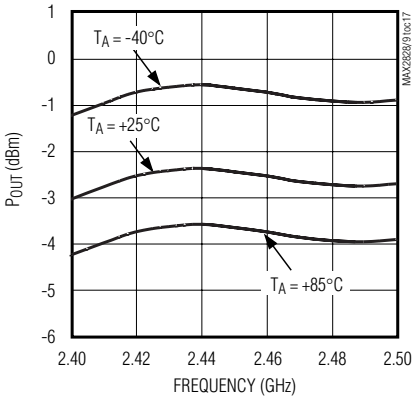
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11g

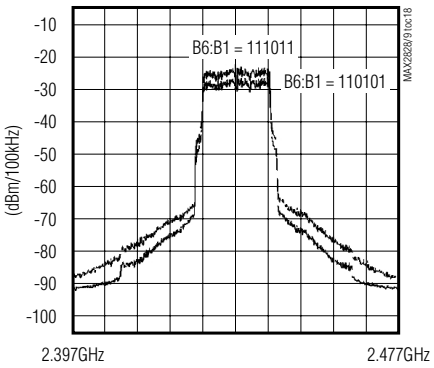
TX OUTPUT POWER vs. V_{CC} (B6:B1 = 111111)



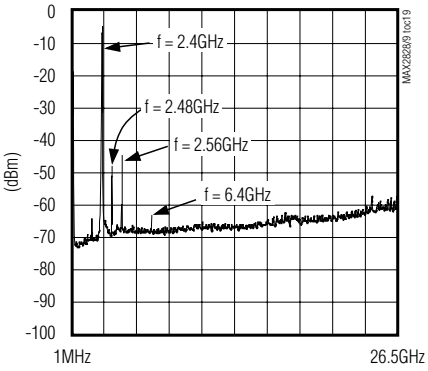
TX OUTPUT POWER vs. FREQUENCY (B6:B1 = 111111)



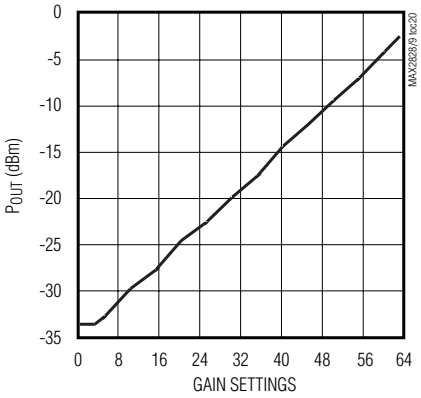
TX OUTPUT SPECTRUM (54Mbps OFDM SIGNAL)



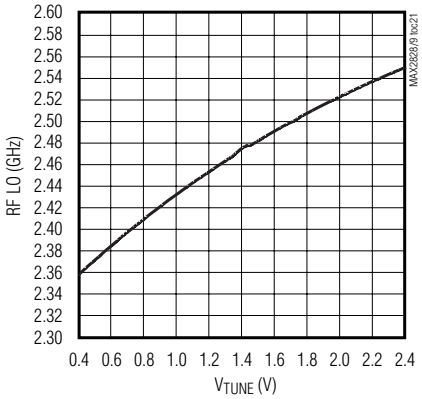
TX OUTPUT SPECTRUM



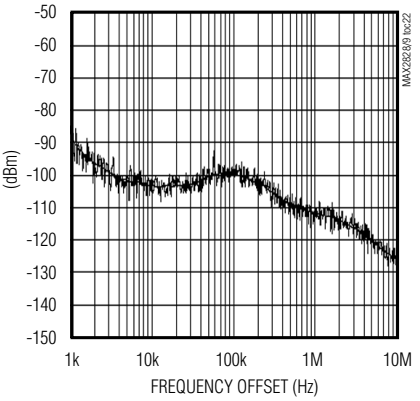
TX OUTPUT POWER vs. GAIN SETTINGS



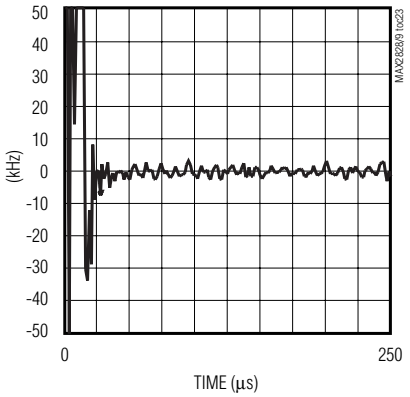
LO FREQUENCY vs. V_{TUNE}



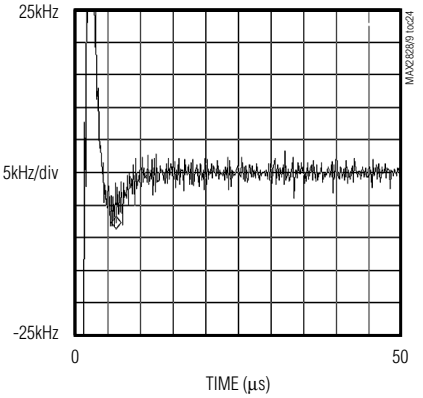
CLOSED-LOOP PHASE NOISE



CHANNEL-SWITCHING FREQUENCY SETTLING (2500MHz TO 2400MHz)



TX-RX TURNAROUND FREQUENCY SETTLING

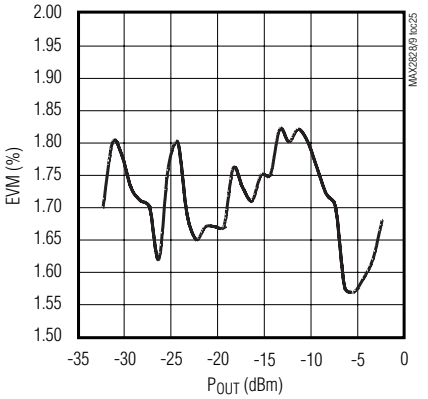


Typical Operating Characteristics (continued)

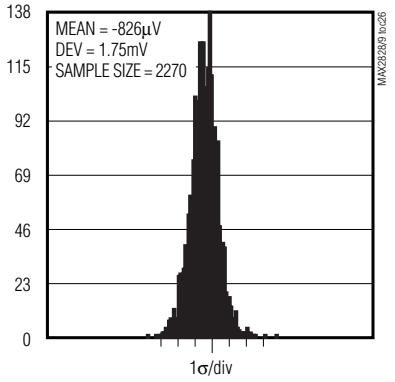
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11g

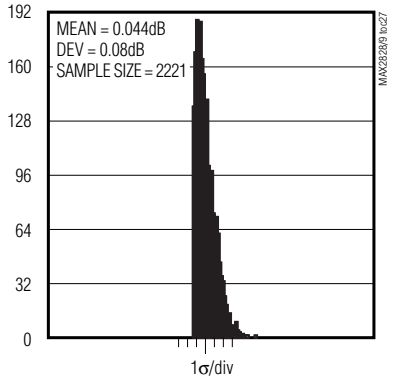
TX EVM vs. P_{OUT}



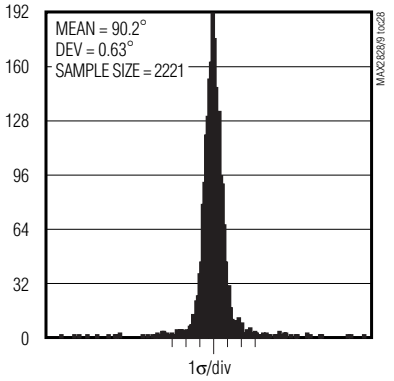
RX STATIC DC OFFSET



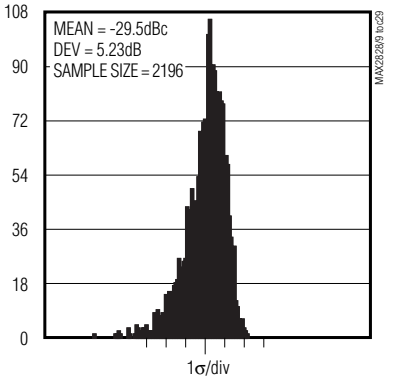
RX GAIN IMBALANCE



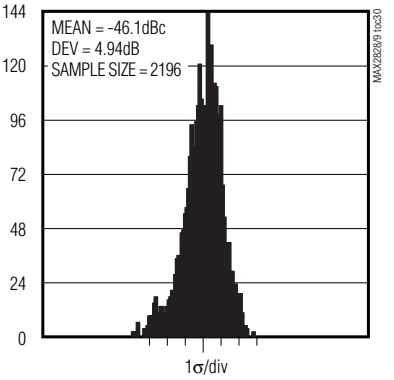
RX PHASE IMBALANCE



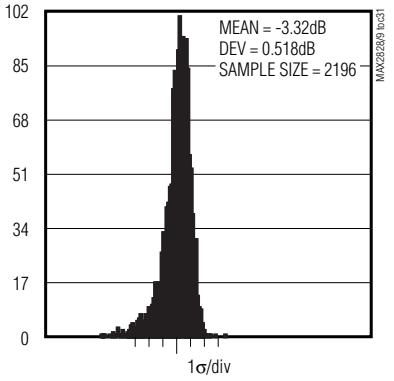
TX LO LEAKAGE



TX SIDEBAND SUPPRESSION



802.11g TX P_{OUT} AT 2.4GHz

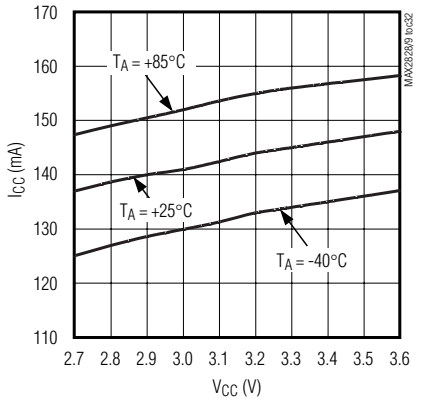


Typical Operating Characteristics (continued)

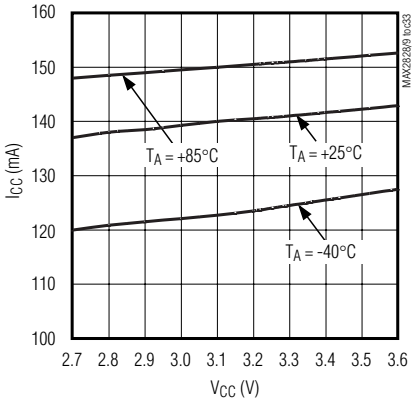
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11a

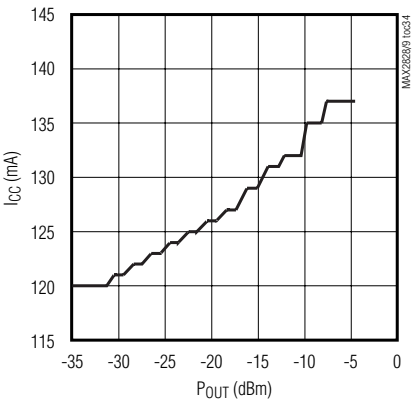
RX I_{CC} vs. V_{CC}



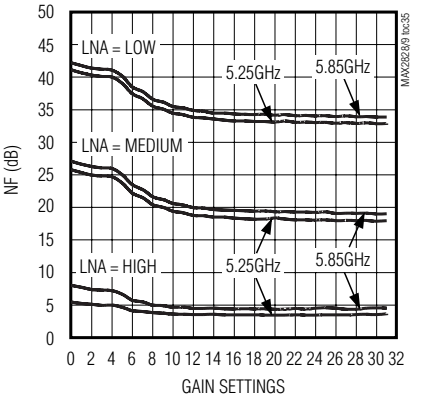
TX I_{CC} vs. V_{CC}



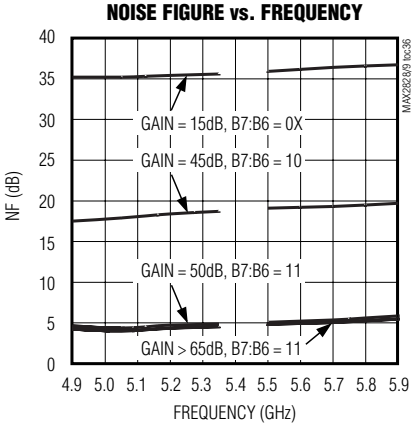
TX I_{CC} vs. P_{OUT}



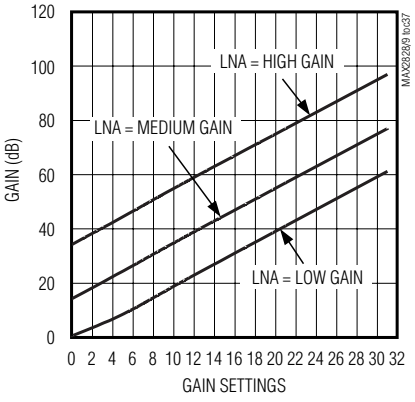
NOISE FIGURE vs. BASEBAND GAIN SETTINGS



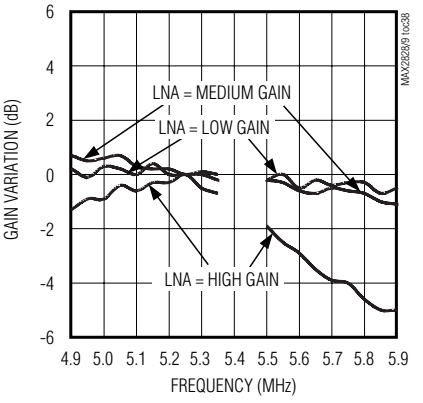
NOISE FIGURE vs. FREQUENCY



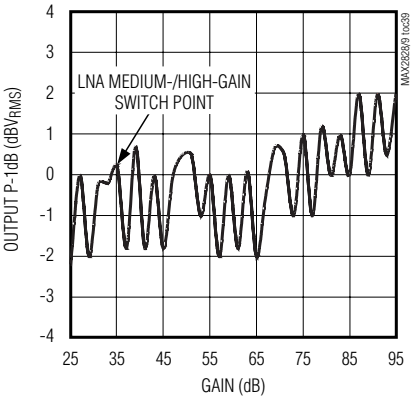
RX VOLTAGE GAIN vs. BASEBAND GAIN SETTING



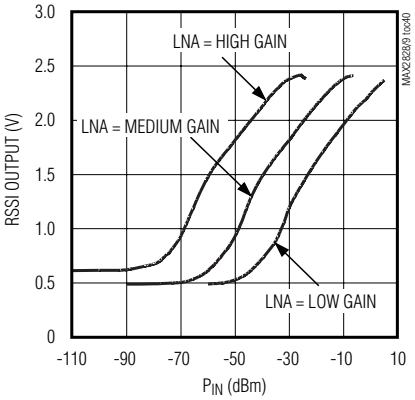
RX VOLTAGE GAIN VARIATION vs. FREQUENCY



RX IN-BAND OUTPUT P-1dB vs. GAIN



RX RSSI OUTPUT vs. INPUT POWER

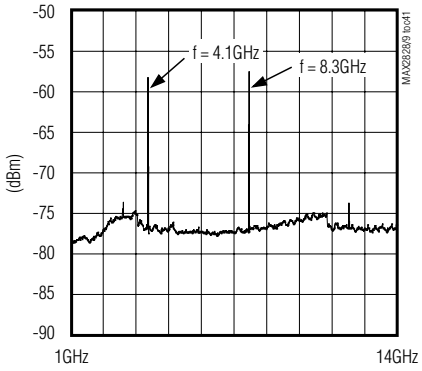


Typical Operating Characteristics (continued)

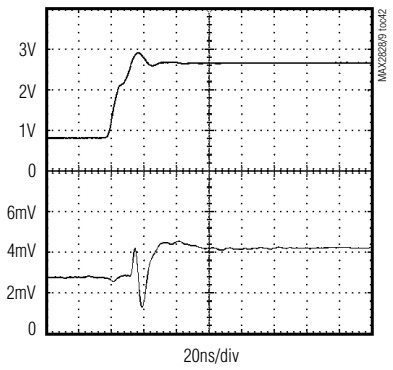
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11a

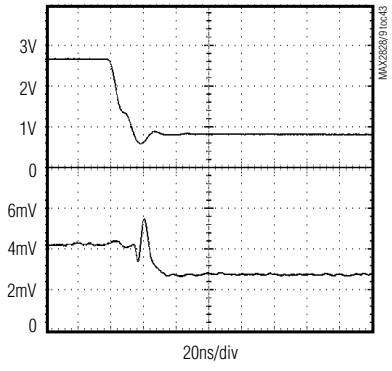
RX EMISSION SPECTRUM, LNA INPUT (TX OFF, LNA = LOW GAIN)



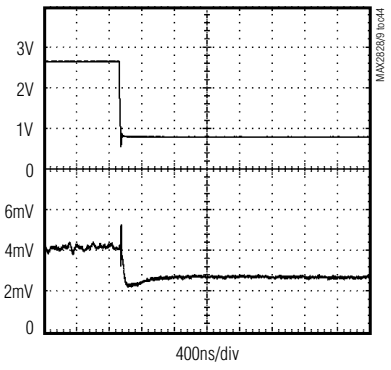
RX I/Q DC OFFSET SETTLING RESPONSE (+8dB BB VGA GAIN STEP)



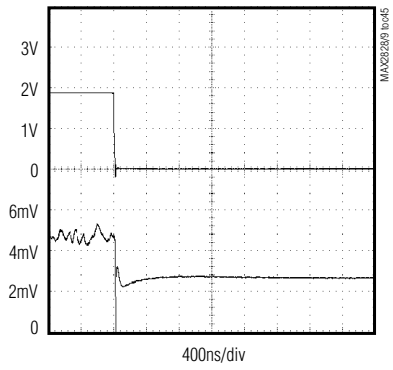
RX I/Q DC OFFSET SETTLING RESPONSE (-8dB BB VGA GAIN STEP)



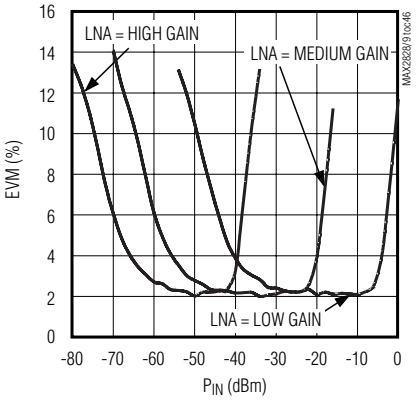
RX I/Q DC OFFSET SETTLING RESPONSE (-16dB BB VGA GAIN STEP)



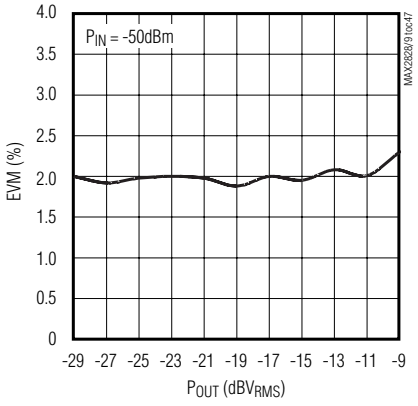
RX I/Q DC OFFSET SETTLING RESPONSE (-32dB BB VGA GAIN STEP)



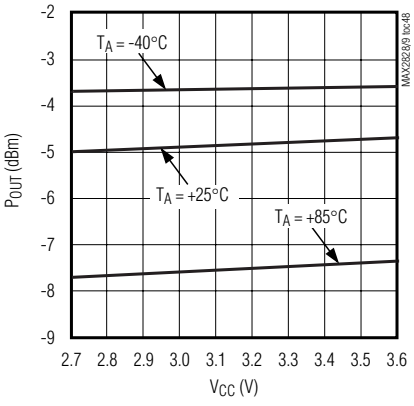
RX EVM vs. P_{IN}



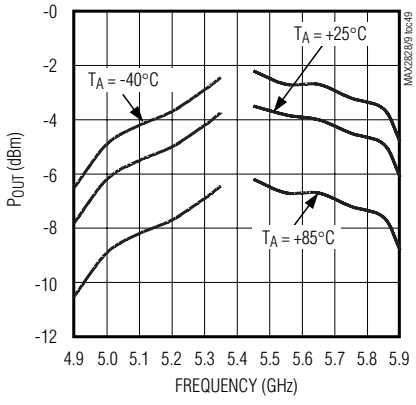
RX EVM vs. V_{OUT}



TX OUTPUT POWER vs. V_{CC} (B6:B1 = 111111)



TX OUTPUT POWER vs. FREQUENCY (B6:B1 = 111111)

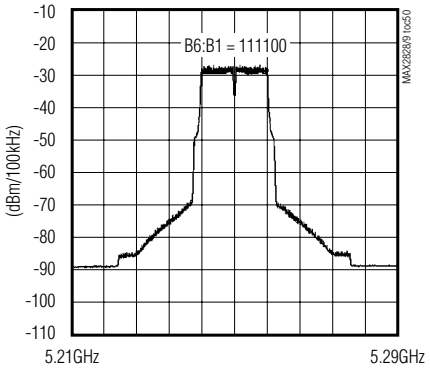


Typical Operating Characteristics (continued)

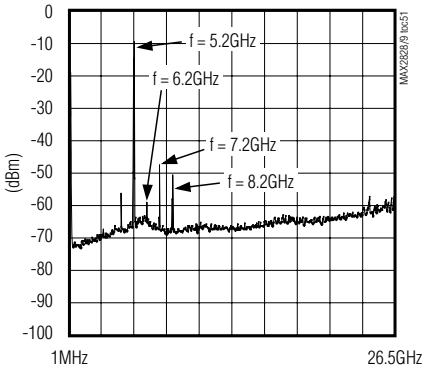
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11a

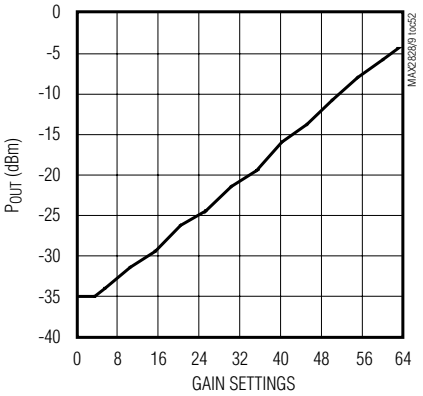
TX OUTPUT SPECTRUM (54Mbps OFDM SIGNAL)



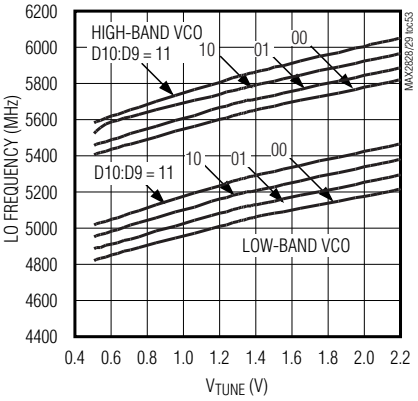
TX OUTPUT SPECTRUM



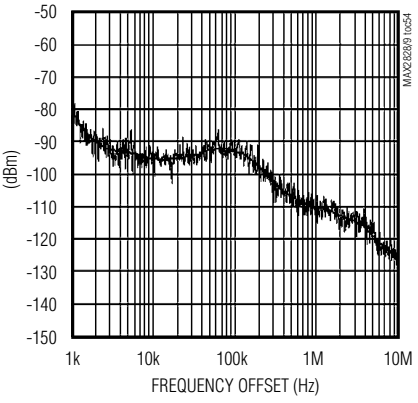
TX OUTPUT POWER vs. GAIN SETTINGS



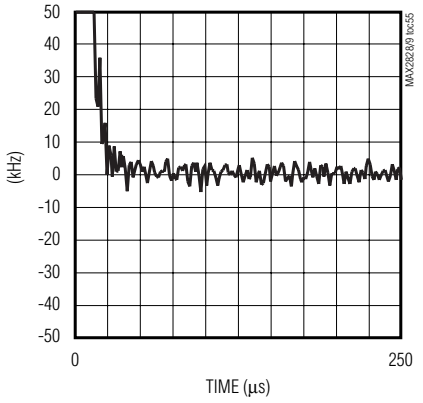
LO FREQUENCY vs. V_{TUNE}



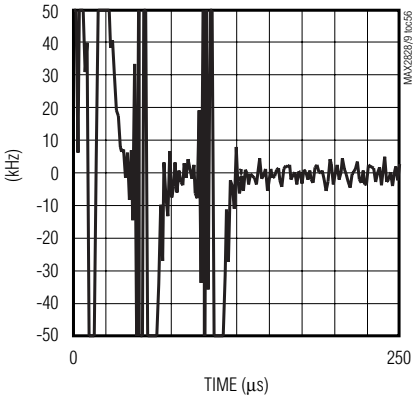
CLOSED-LOOP PHASE NOISE



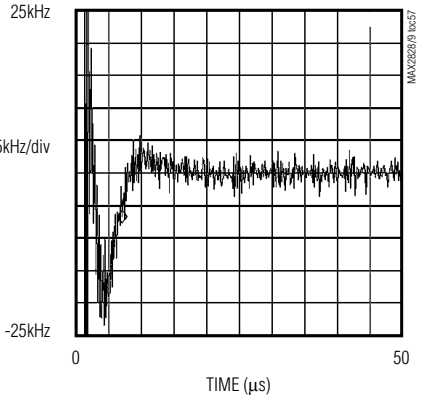
CHANNEL-SWITCHING FREQUENCY SETTLING (5.35GHz TO 5.15GHz)



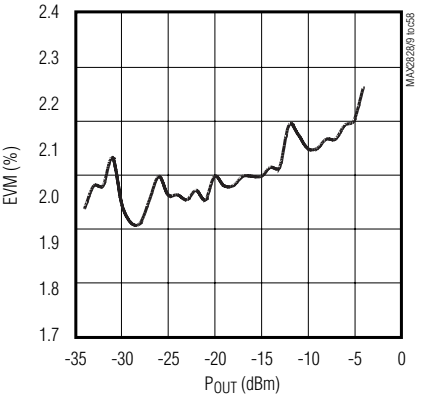
CHANNEL-SWITCHING FREQUENCY SETTLING (5.875GHz TO 4.9GHz)



TX-RX TURNAROUND FREQUENCY SETTLING



TX EVM vs. POUT

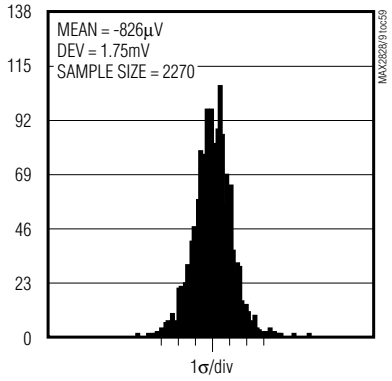


Typical Operating Characteristics (continued)

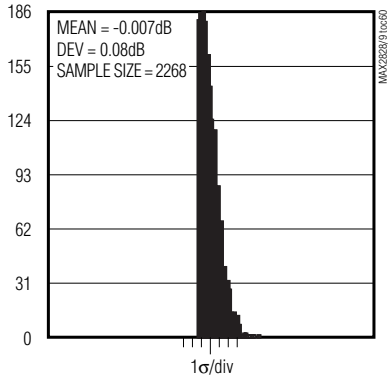
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11a

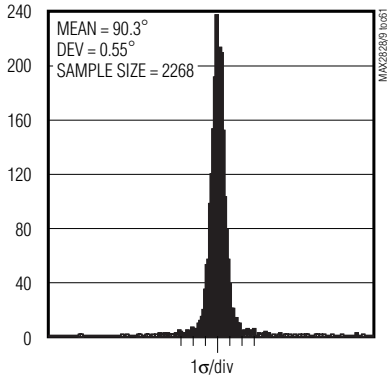
RX STATIC DC OFFSET



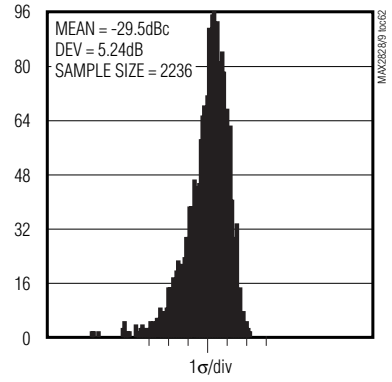
RX GAIN IMBALANCE



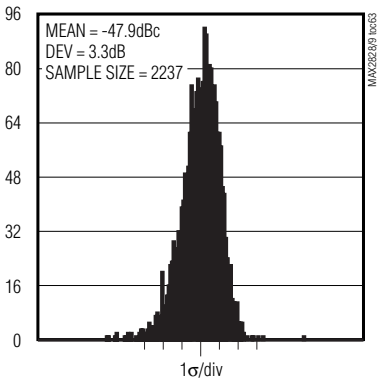
RX PHASE IMBALANCE



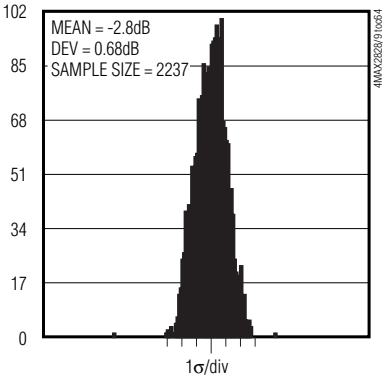
TX LO LEAKAGE



TX SIDEBAND SUPPRESSION

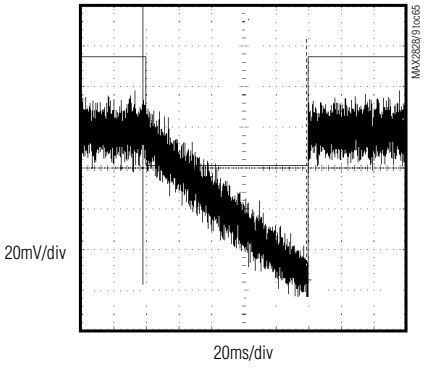


802.11a TX P_{OUT} AT 5.25GHz

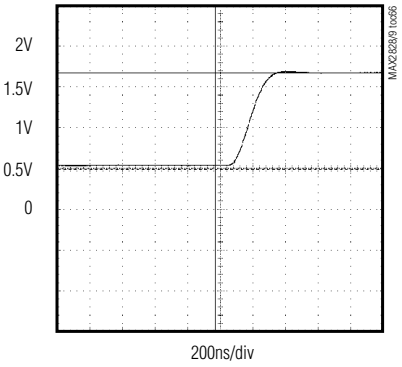


802.11g/802.11a

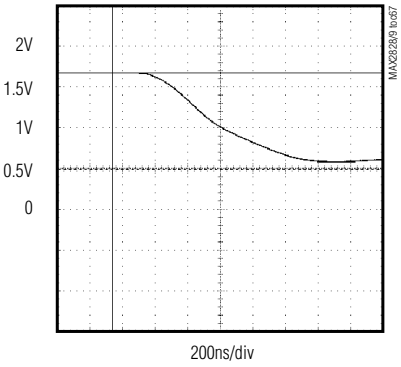
I/Q OUTPUT DC ERROR DROOP (RXHP = 1–0; A3:A1 = 1000, D2 = 0)



RX RSSI STEP RESPONSE (+40dB SIGNAL STEP)



RX RSSI STEP RESPONSE (-40dB SIGNAL STEP)

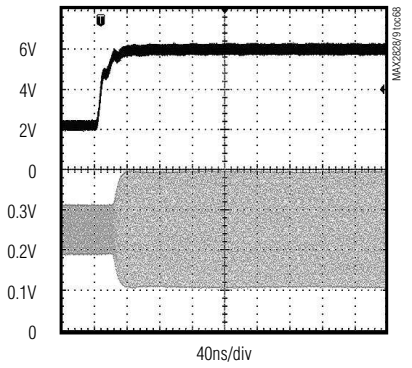


Typical Operating Characteristics (continued)

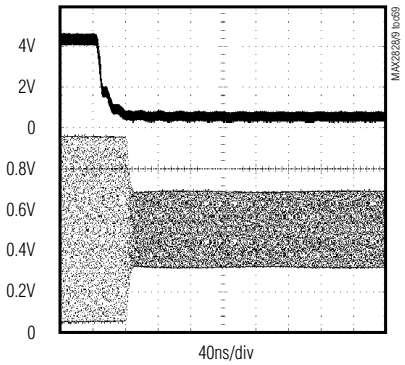
(V_{CC} = 2.7V, f_{RF} = 2.437GHz (802.11g) or f_{RF} = 5.25GHz (802.11a), f_{REFOSC} = 40MHz, $\overline{SHDN}$ = $\overline{CS}$ = high, RXHP = SCLK = DIN = low, R_{BIAS} = 11kΩ, T_A = +25°C using the MAX2828/MAX2829 evaluation kits.)

802.11g/802.11a

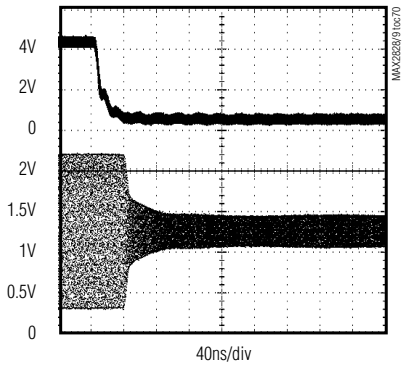
RX BB VGA SETTLING RESPONSE (+8dB GAIN STEP)



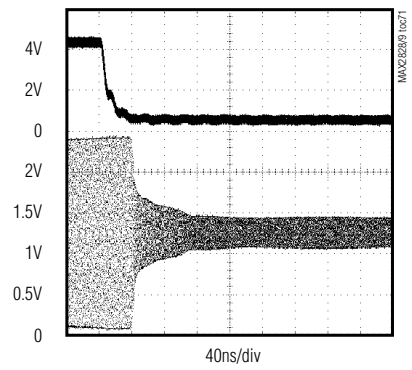
RX BB VGA SETTLING RESPONSE (-8dB GAIN STEP)



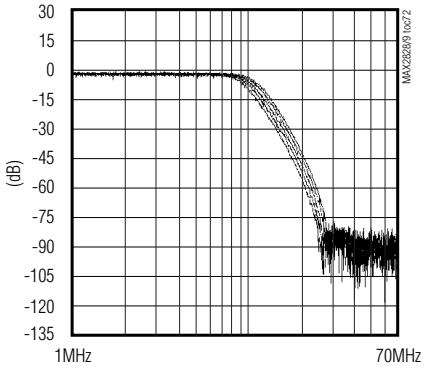
RX BB VGA SETTLING RESPONSE (-16dB GAIN STEP)



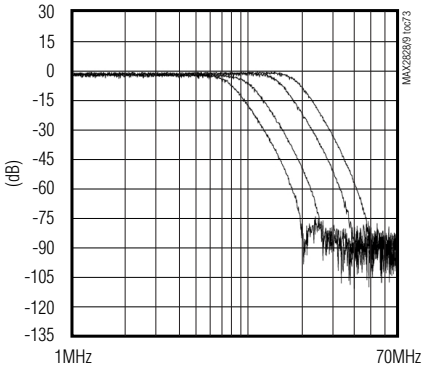
RX BB VGA SETTLING RESPONSE (-32dB GAIN STEP)



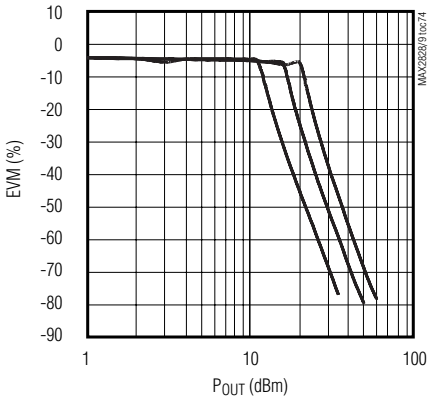
RX BB FREQUENCY RESPONSE vs. FINE SETTING (COARSE SETTING = 9.5MHz)



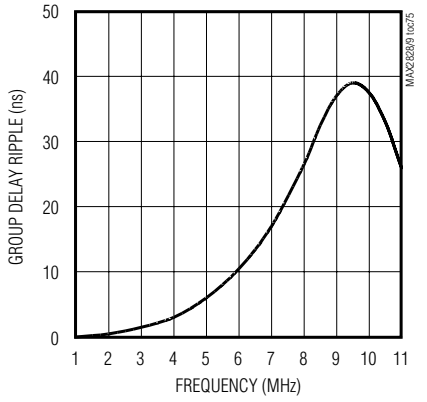
RX BB FREQUENCY RESPONSE vs. COARSE SETTING (FINE SETTING = 010)



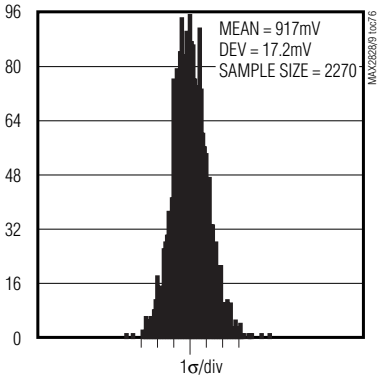
TX BASEBAND FREQUENCY RESPONSE



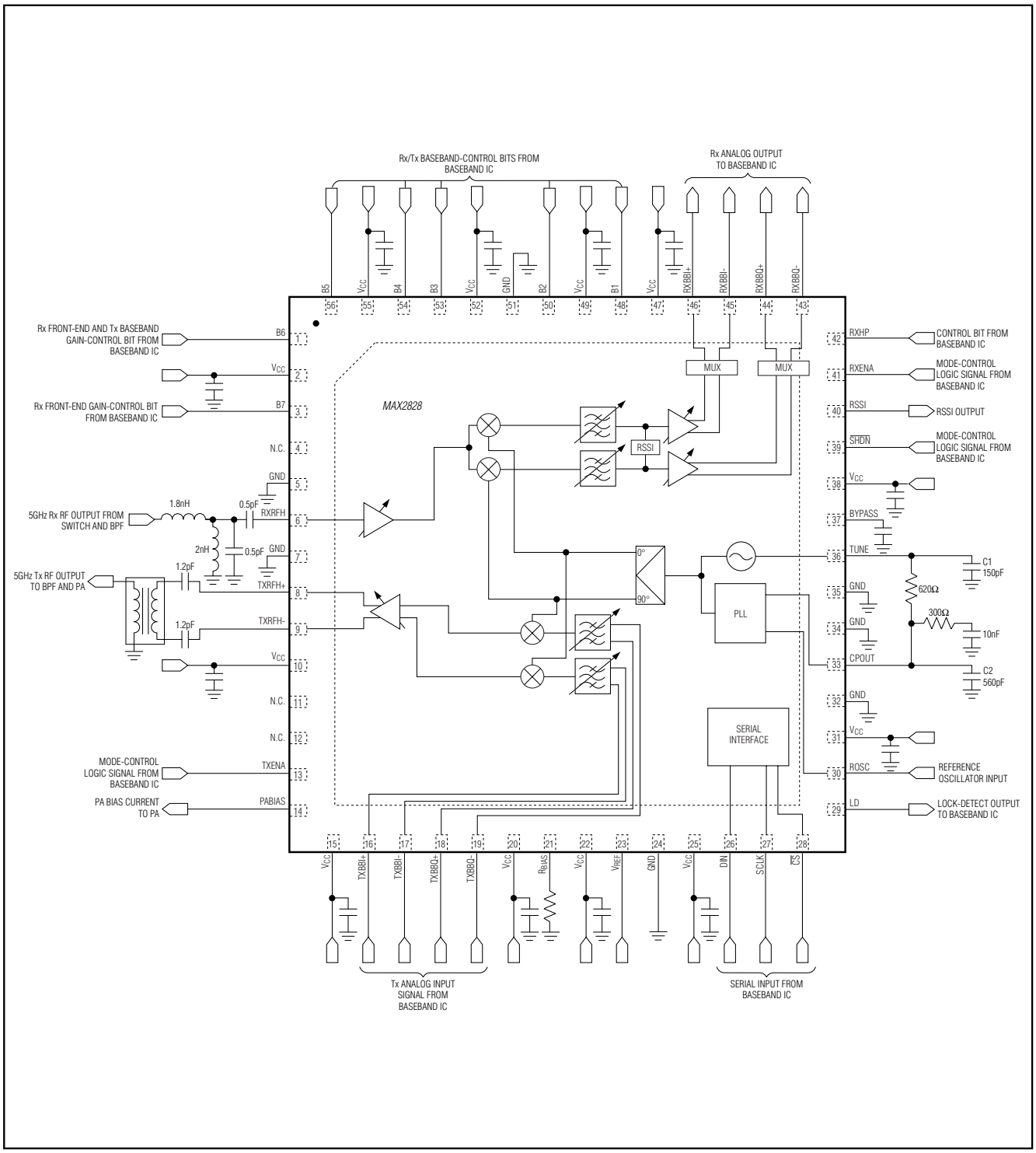
GROUP DELAY RIPLE vs. FREQUENCY (COARSE SETTING = 9.5MHz)



RX I/Q COMMON-MODE VOLTAGE SPREAD



Block Diagrams/Typical Operating Circuits



Block Diagrams/Typical Operating Circuits (continued)