Fast Responding, 40MHz to 2.7GHz Mean-Squared Power Detector

FEATURES

- **Frequency Range: 40MHz to 2.7GHz**
- **Accurate RMS Power Measurement of High Crest Factor Modulated Waveforms**
- **Linear DC Output vs Input Power in dBm**
- **Linear Dynamic Range: Up to 60dB**
- **Exceptional Accuracy over Temperature: ±0.3dB**
- **Fast Response Time: 0.5μs Rise Time, 8μs Fall Time**
- Low Supply Current: 26.5mA
- Low Impedance Output Buffer Capable of Driving High Capacitance Load
- Small 3mm × 3mm 10-Lead DFN Package

APPLICATIONS

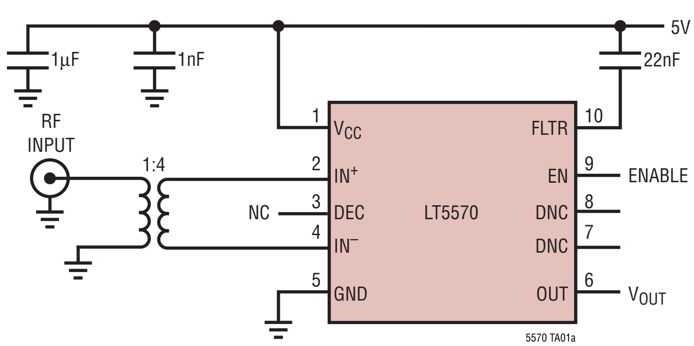
- RMS Power Measurement
- RF Power Control
- Receive and Transmit Gain Control
- W-CDMA, CDMA2000, TD-SCDMA, WiMAX
- RF Instrumentation

DESCRIPTION

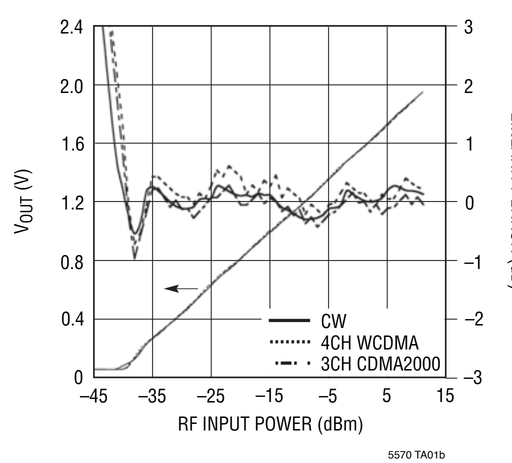
The LT®5570 is a 40MHz to 2.7GHz monolithic Logarithmic Mean-Squared RF power detector. It is capable of RMS measurement of an AC signal with wide dynamic range, from –52dBm to 13dBm depending on frequency. The power of the AC signal in an equivalent decibel-scaled value is precisely converted into DC voltage on a linear scale, independent of the crest factor of the waveforms. The LT5570 is suitable for precision RF power measurement and level control for a wide variety of RF standards, including CDMA, W-CDMA, CDMA2000, TD-SCDMA and WiMAX. The DC output is buffered with a low output impedance amplifier capable of driving a high capacitance load.

TYPICAL APPLICATION

40MHz to 2.7GHz Mean-Squared Power Detector



Output Voltage, Linearity Error vs Input Power, 25°C (2140 MHz)



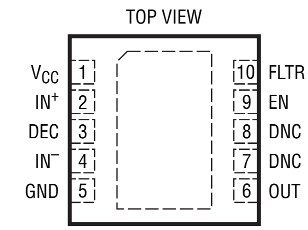
ABSOLUTE MAXIMUM RATINGS

(Note 1)

Supply Voltage 5.5V
Enable Voltage ....–0.3V to V_{CC} + 0.3V
Input Signal Power (Differential)..........................15dBm
T_{JMAX} .... 125°C
Operating Temperature Range.................. –40°C to 85°C
Storage Temperature Range................... –65°C to 125°C

CAUTION: This part is sensitive to electrostatic discharge. It is very important that proper ESD precautions be observed when handling the LT5570.

PIN CONFIGURATION



DD PACKAGE
10-LEAD (3mm × 3mm) PLASTIC DFN
T_{JMAX} = 125°C, θ_{JA} = 43°C/W
EXPOSED PAD (PIN 11) IS GND, MUST BE SOLDERED TO PCB

ORDER INFORMATION

LEAD FREE FINISH	TAPE AND REEL	PART MARKING	PACKAGE DESCRIPTION	TEMPERATURE RANGE
LT5570IDD#PBF	LT5570IDD#TRPBF	LCJQ	10-Lead (3mm × 3mm) Plastic DFN	–40°C to 85°C

Consult LTC Marketing for parts specified with wider operating temperature ranges.
Consult LTC Marketing for information on non-standard lead based finish parts.

For more information on lead free part marking, go to: http://www.linear.com/leadfree/
For more information on tape and reel specifications, go to: http://www.linear.com/tapeandreel/

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C, V_{CC} = 5V, EN = 5V, unless otherwise noted. Test circuits are shown in Figures 1 and 3. (Notes 2 and 3).

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
AC Input						
Input Frequency Range (Note 4)		●		40 to 2700		MHz
Input Impedance				200/1		Ω/pF
f_{RF} = 500MHz						
RF Input Power Range	CW Input; 1:4 Balun Matched into 50Ω Source			–52 to 13		dBm
Linear Dynamic Range (Note 5)	±1dB Linearity Error, T_A = –40°C to 85°C			62		dB
Output Slope				36.9		mV/dB
Logarithmic Intercept				–54.8		dBm
Output Variation vs Temperature	Normalized to Output at 25°C –40°C < T_A < 85°C; P_{IN} = –50dBm to 13dBm			±0.5		dB
Deviation from CW Response	11dB Peak to Average Ratio (3-Carrier CDMA2K) 12dB Peak to Average Ratio (4-Carrier WCDMA)			0.4 0.3		dB dB
2nd Order Harmonic Distortion	At RF Input; CW Input; P_{IN} = 10dBm			61		dBc
3rd Order Harmonic Distortion	At RF Input; CW Input; P_{IN} = 10dBm			66		dBc

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C, V_{CC} = 5V, EN = 5V, unless otherwise noted. Test circuits are shown in Figures 1 and 3. (Notes 2 and 3).

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
f_{RF} = 880MHz						
RF Input Power Range	CW Input; 1:4 Balun Matched into 50Ω Source			–48 to 13		dBm
Linear Dynamic Range (Note 5)	±1dB Linearity Error, T_A = –40°C to 85°C			61		dB
Output Slope				37.7		mV/dB
Logarithmic Intercept				–51.9		dBm
Output Variation vs Temperature	Normalized to Output at 25°C –40°C < T_A < 85°C; P_{IN} = –47dBm to 13dBm			±0.4		dB
Deviation from CW Response	11dB Peak to Average Ratio (3-Carrier CDMA2K) 12dB Peak to Average Ratio (4-Carrier WCDMA)			0.3 0.2		dB
2nd Order Harmonic Distortion	At RF Input; CW Input; P_{IN} = 10dBm			60		dBc
3rd Order Harmonic Distortion	At RF Input; CW Input; P_{IN} = 10dBm			61		dBc
f_{RF} = 2140MHz						
RF Input Power Range	CW Input; 1:4 Balun Matched into 50Ω Source			–38 to 13		dBm
Linear Dynamic Range (Note 5)	±1dB Linearity Error, T_A = –40°C to 85°C		47	51		dB
Output Slope			34.8	36.5	39.0	mV/dB
Logarithmic Intercept			–43.6	–40.6	–37.6	dBm
Output Variation vs Temperature	Normalized to Output at 25°C –40°C < T_A < 85°C; P_{IN} = –36dBm to 13dBm			±0.3		dB
Deviation from CW Response	11dB Peak to Average Ratio (3-Carrier CDMA2K) 12dB Peak to Average Ratio (4-Carrier WCDMA)			0.1 0.2		dB dB
f_{RF} = 2700MHz						
RF Input Power Range	CW Input; 1:4 Balun Matched into 50Ω Source			–35 to 13		dBm
Linear Dynamic Range (Note 5)	±1dB Linearity Error, T_A = –40°C to 85°C			48		dB
Output Slope				36.4		mV/dB
Logarithmic Intercept				–38.5		dBm
Output Variation vs Temperature	Normalized to Output at 25°C –40°C < T_A < 85°C; P_{IN} = –31dBm to 13dBm			±0.2		dB
Deviation from CW Response	11dB Peak to Average Ratio (3-Carrier CDMA2K) 12dB Peak to Average Ratio (4-Carrier WCDMA)			0.1 0.5		dB
Output						
Output DC Voltage	No RF Signal Present			0.1		V
Output Impedance				100		Ω
Sourcing/Sinking				5/2.5		mA
Rise Time	0.2V to 1.6V, 10% to 90%, C1 = 22nF, f_{RF} = 2140MHz			0.5		μS
Fall Time	1.6V to 0.2V, 90% to 10%, C1 = 22nF, f_{RF} = 2140MHz			8		μS

ELECTRICAL CHARACTERISTICS

The ● denotes the specifications which apply over the full operating temperature range, otherwise specifications are at T_A = 25°C, V_{CC} = 5V, EN = 5V, unless otherwise noted. Test circuits are shown in Figures 1 and 3. (Notes 2 and 3).

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Enable (EN) Low = Off, High = On						
EN Input High Voltage (On)		●	2			V
EN Input Low Voltage (Off)		●			1	V
Enable Pin Input Current	EN = 5V	●		68		µA
Turn ON Time	V_{OUT} within 10% of Final Value, C1 = 22nF			1		µs
Turn OFF Time	V_{OUT} < 0.1V, C1 = 22nF			5		µs
Power Supply						
Supply Voltage		●	4.75	5	5.25	V
Supply Current				26.5	32.5	mA
Shutdown Current	EN = 0V, V_{CC} = 5V			0.1	100	µA

Note 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

Note 2: Specifications over the –40ºC to +85ºC temperature range are assured by design, characterization and correlation with statistical process controls.

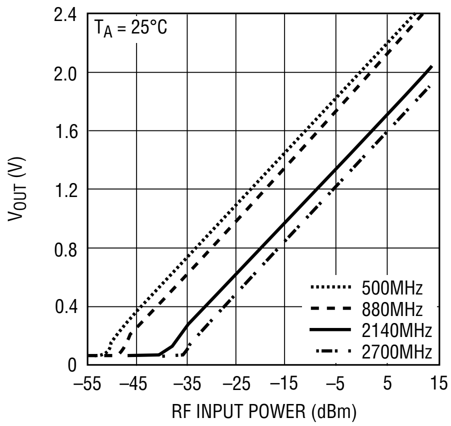
Note 3: A 1:4 input transformer is used for the input matching to 50Ω source.

Note 4: Operation over a wider frequency range is possible with reduced performance. Consult the factory for information and assistance.

Note 5: The linearity error is calculated by the difference between the incremental slope of the output and the average output slope from –30dBm to 2dBm. The dynamic range is defined as the range over which the linearity error is within ±1dB.

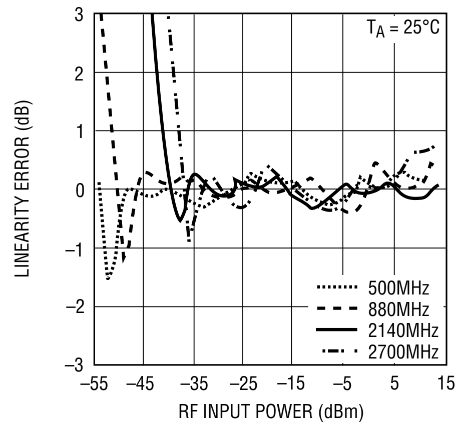
TYPICAL PERFORMANCE CHARACTERISTICS (Test Circuits Shown in Figures 1 and 3)

Output Voltage vs Frequency



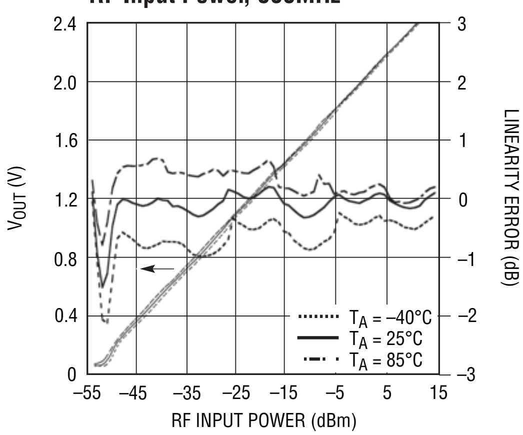
5570 G01

Linearity Error vs Frequency



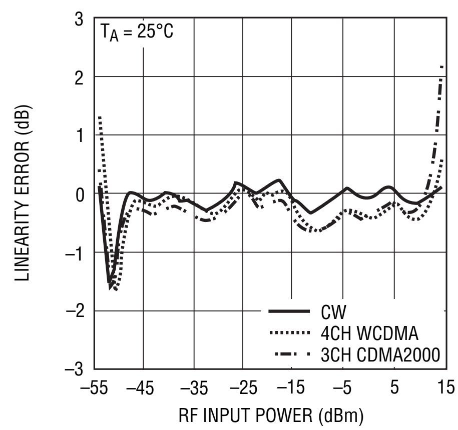
5570 G02

Output Voltage, Linearity Error vs RF Input Power, 500MHz



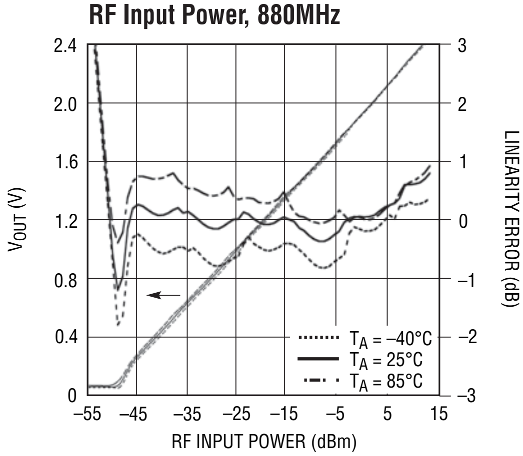
5570 G03

Linearity Error vs RF Input Power, 500MHz Modulated Waveforms



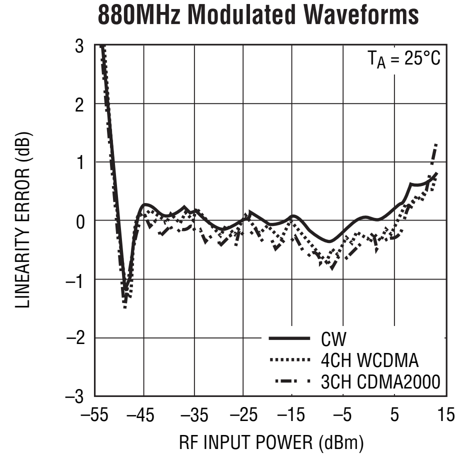
5570 G04

Output Voltage, Linearity Error vs RF Input Power, 880MHz



5570 G05

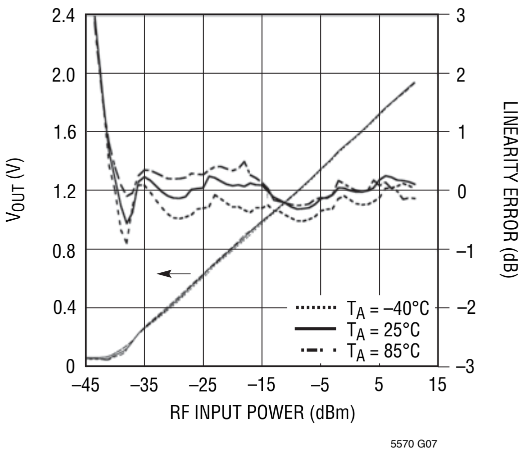
Linearity Error vs RF Input Power, 880MHz Modulated Waveforms



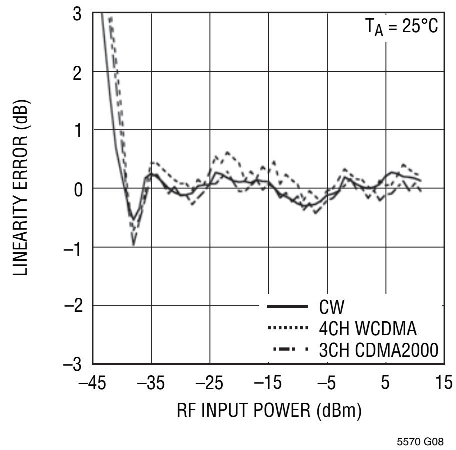
5570 G06

TYPICAL PERFORMANCE CHARACTERISTICS (Test Circuits Shown in Figures 1 and 3)

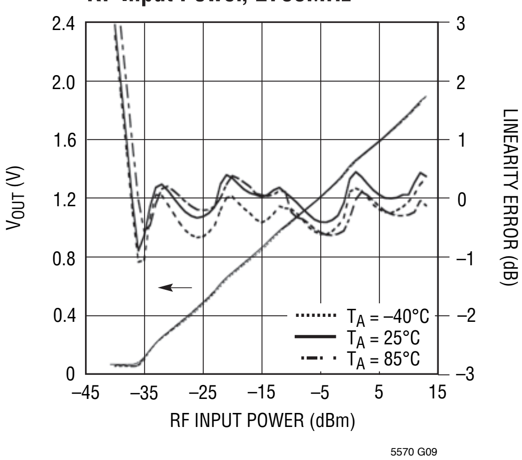
Output Voltage, Linearity Error vs RF Input Power, 2140MHz



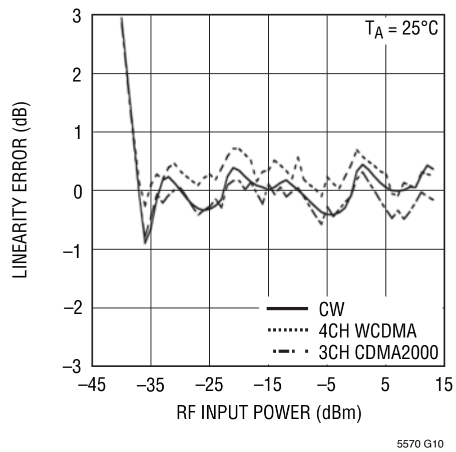
Linearity Error vs RF Input Power, 2140MHz Modulated Waveforms



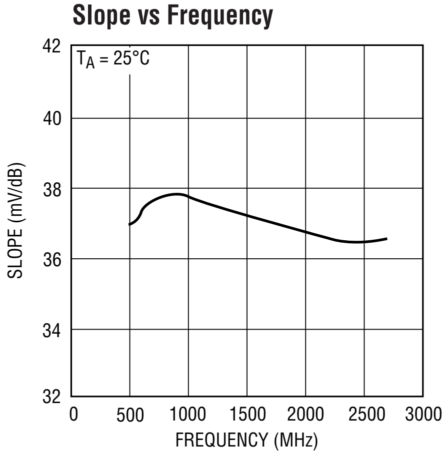
Output Voltage, Linearity Error vs RF Input Power, 2700MHz



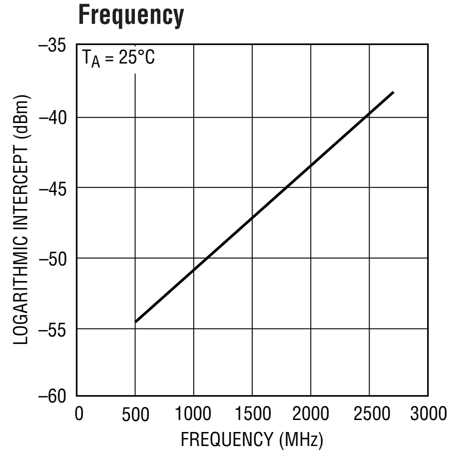
Linearity Error vs RF Input Power, 2700MHz Modulated Waveforms



Slope vs Frequency

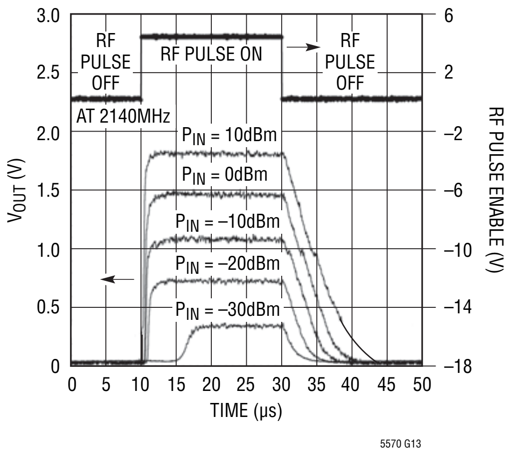


Logarithmic Intercept vs Frequency

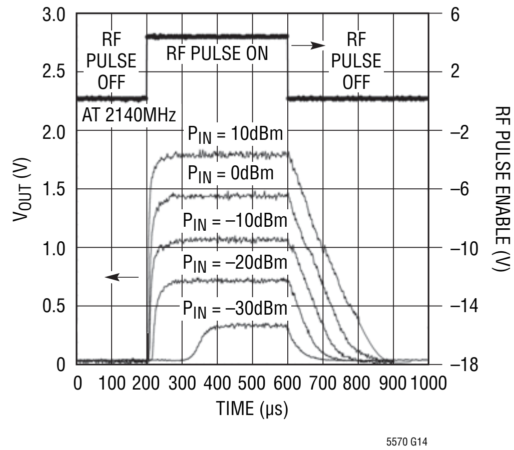


TYPICAL PERFORMANCE CHARACTERISTICS (Test Circuits Shown in Figures 1 and 3)

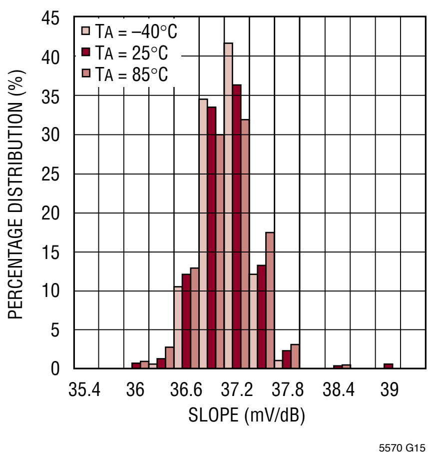
Output Transient Response, C1 = 22nF



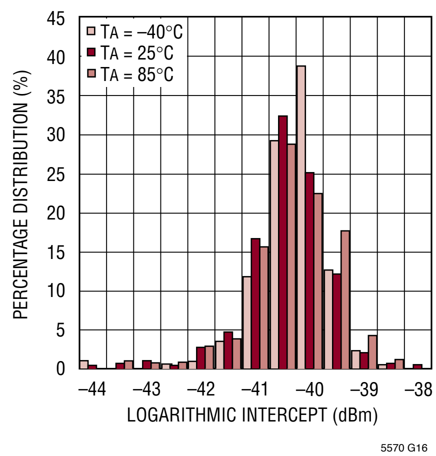
Output Transient Response, C1 = 1µF



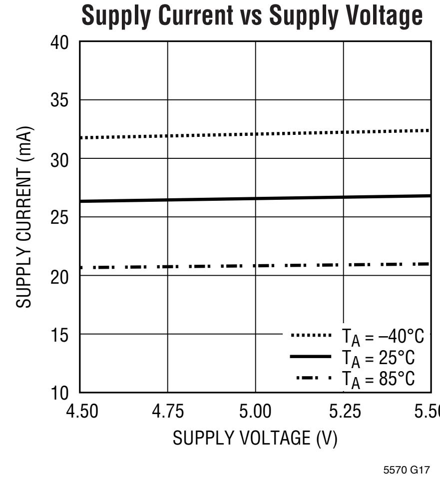
Slope Distribution vs Temperature



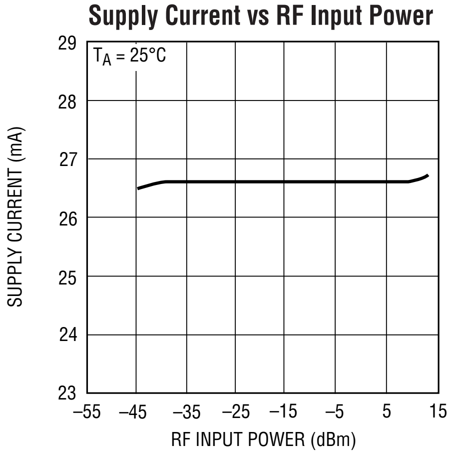
Logarithmic Intercept Distribution vs Temperature



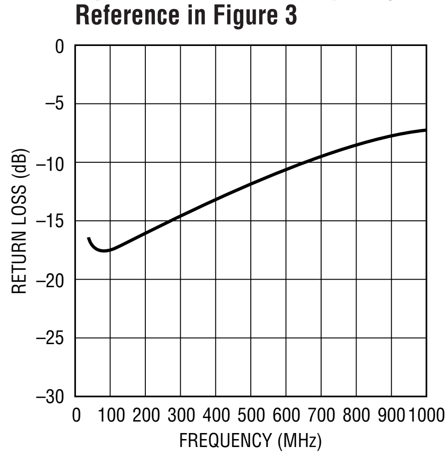
Supply Current vs Supply Voltage



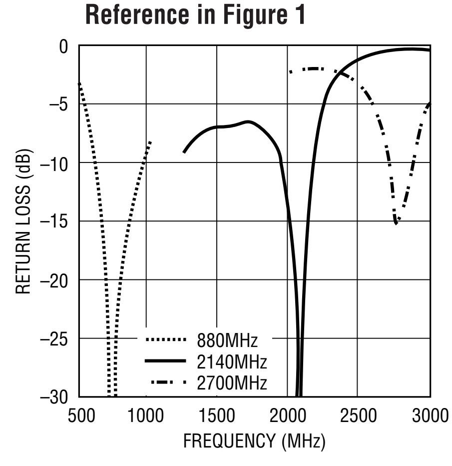
Supply Current vs RF Input Power



Input Return Loss vs Frequency Reference in Figure 3



Input Return Loss vs Frequency Reference in Figure 1



PIN FUNCTIONS

V_{CC} (Pin 1): Power Supply Pin for the Bias Circuits. Typical current consumption is 26.5mA. This pin should be externally bypassed with 1nF and 1µF chip capacitors.

IN^+, IN^- (Pins 2, 4): Differential Input Signal Pins. These pins are preferably driven with a differential signal for optimum performance. The pins are internally biased to V_{CC} – 1.224V and should be DC blocked externally. The differential impedance is about 200Ω.

DEC (Pin 3): Input Common Mode Decoupling Pin. This pin is internally biased to V_{CC} – 1.224V. The input impedance is about 1.75KΩ in parallel with a 10pF internal shunt capacitor to ground. The impedance between DEC and IN^+ (or IN^-) is about 100Ω. The pin can be connected to the center tap of an external balun. An ac-decoupling capacitor may be connected to ground to maintain the IC performance if necessary.

GND (Pin 5, Exposed Pad): Circuit Ground Return for the Entire IC. This must be soldered to the printed circuit board ground plane.

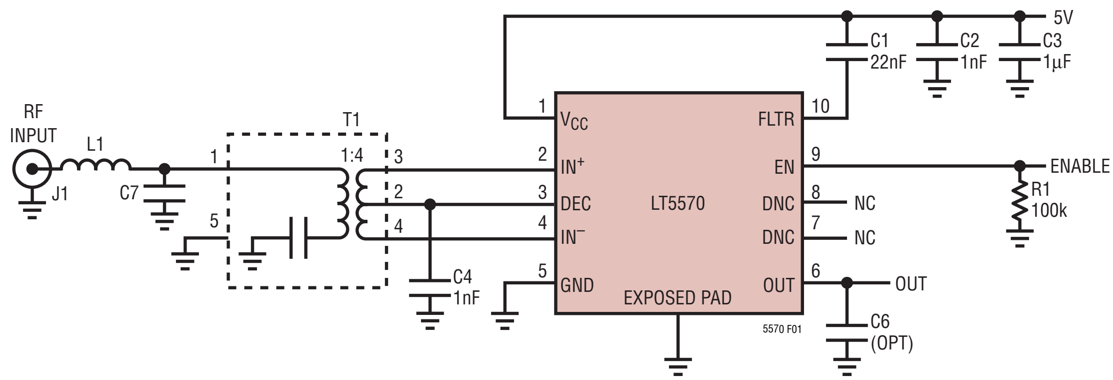
OUT (Pin 6): DC Output Pin. The output impedance is mainly determined by an internal 100Ω series resistance that provides output circuit protection if the output is shorted to ground.

DNC (Pins 7, 8): Do Not Connect. Don't connect any external component at these pins. Avoid a long wire or metal trace on the PCB.

EN (Pin 9): Enable Pin. An applied voltage above 2V will activate the bias for the IC. For an applied voltage below 1V, the circuits will be shut down (disabled) with a corresponding reduction in power supply current. If the enable function is not required, then this pin should be connected to V_{CC}. Typical enable pin input current is 68µA for EN = 5V. Note that at no time should the Enable pin voltage be allowed to exceed V_{CC} by more than 0.3V.

FLTR (Pin 10): Connection for an External Filtering Capacitor C1. A minimum 22nF capacitor is required for stable ac average power measurement. This capacitor should be connected between Pin 10 and V_{CC}.

TEST CIRCUITS



REF DES	VALUE	SIZE	PART NUMBER
C2, C4	1nF	0402	AVX 0402ZC102KAT
C1	22nF	0402	AVX 0402YC223KAT
C3	1µF	0603	Taiyo Yuden LMK107BJ105MA
R1	100k	0402	CRCW0402100KFKED

FREQUENCY	T1	L1	L1 P/N	C7	
880MHz	MURATA LDB21869M20C-001	8.2nH	TOKO LL1005-FH8N25	2.7pF	MURATA GRM1555C1H2R7DZ01
2140MHz	MURATA LDB212G1020-001	3.3nH	TOKO LL1005-FH3N35	0.5pF	MURATA GRM1555C1HR50CZ01
2700MHz	MURATA LDB212G4020-001	1.2nH	TOKO LL1005-FH1N25	1pF	MURATA GRM1555C1H1R0DZ01

Figure 1. Test Schematic for 880MHz, 2140MHz and 2700MHz Applications

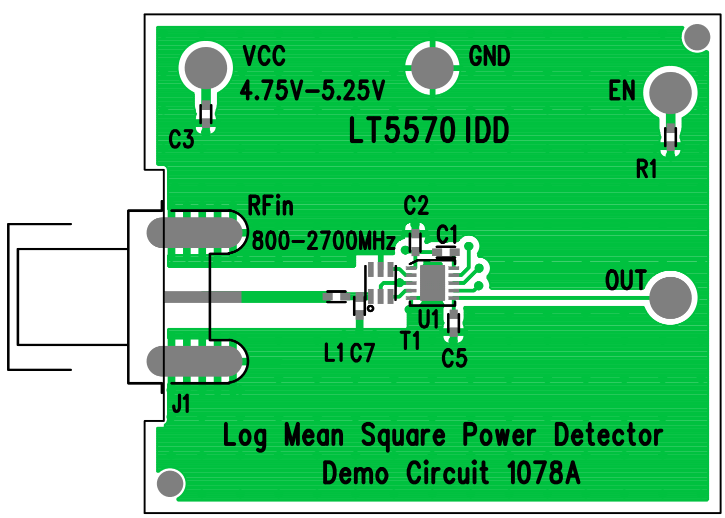
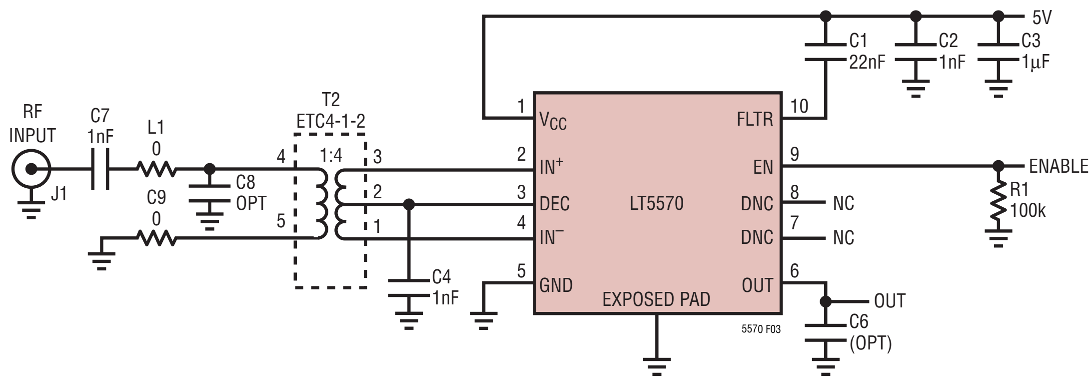


Figure 2. Top Side of Evaluation Board for 880MHz, 2140MHz and 2700MHz Applications

TEST CIRCUITS



REF DES	VALUE	SIZE	PART NUMBER
C2, C4, C7	1nF	0402	AVX 0402ZCI02KAT
C1	22nF	0402	AVX 0402YC223KAT
C3	1µF	0603	Taiyo Yuden LMK107BJ105MA

REF DES	VALUE	SIZE	PART NUMBER
R1	100k	0402	CRCW0402100KFKED
T2	1:4		ETC4-1-2
C8	OPT	0402	
C9, L1	0	0402	CJ05-000M

Figure 3. Test Schematic for 40MHz to 860MHz Applications

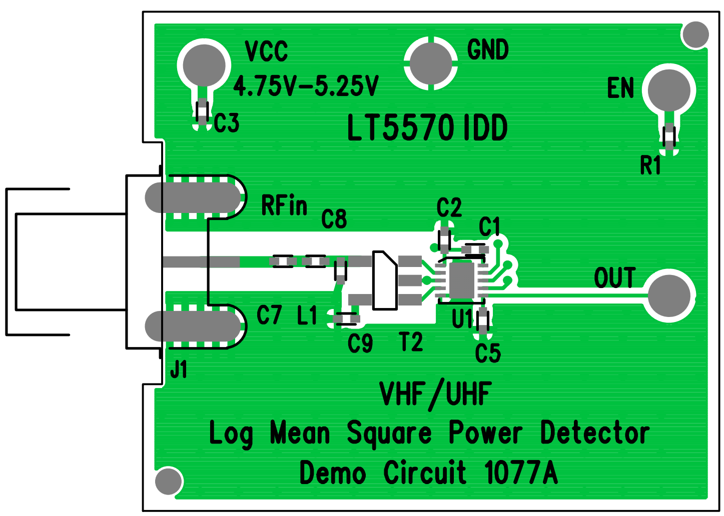


Figure 4. Top Side of Evaluation Board for 40MHz to 860MHz Applications

APPLICATIONS INFORMATION

The LT5570 is a mean-squared RF power detector, capable of measuring an RF signal over the frequency range from 40MHz to 2.7GHz, independent of input waveforms with different crest factors such as CW, CDMA, WCDMA, TD-SCDMA and WiMAX signals. A wide dynamic range is achieved with very stable output within the full temperature range from –40°C to 85°C.

RF Inputs

The differential RF inputs are internally biased at V_{CC} – 1.224V. The differential impedance is about 200Ω. These pins should be DC blocked when connected to ground or other matching components. The impedance vs. frequency of the differential RF input is detailed in the following table.

Table 1. RF Differential Input Impedance

FREQUENCY (MHz)	DIFFERENTIAL INPUT IMPEDANCE (Ω)	S11	
		MAG	ANGLE (°)
40	204 –j 0.6	0.606	–0.1
100	204 –j 1.8	0.606	–0.3
200	204 –j 3.6	0.606	–0.5
400	203.5 –j 7.3	0.606	–1.1
600	202.8 –j 10.9	0.605	–1.6
800	201.8 –j 14.5	0.604	–2.1
1000	200.6 –j17.9	0.603	–2.7
1200	199.1 –j21.3	0.602	–3.2
1400	197.3 –j24.7	0.601	–3.8
1600	195.4 –j27.9	0.599	–4.4
1800	193.2 –j31.1	0.598	–5.0
2000	190.8 –j34.2	0.596	–5.6
2200	188.2 –j37.4	0.593	–6.2
2400	185.3 –j40.4	0.591	–6.9
2600	181.9 –j43.5	0.589	–7.6
2800	178.3 –j46.4	0.586	–8.4
3000	174.4 –j49.3	0.582	–9.2

The LT5570's differential inputs are optimally driven from a fully balanced source. When the signal is from a single-ended 50Ω source, conversion to a differential signal is required to achieve the maximum dynamic range. This is best achieved using a 1:4 balun to match the internal 200Ω input impedance as shown in Figures 1 and 3. This impedance transformation results in 6dB voltage gain. At high frequency, additional LC elements may be needed for input impedance matching due to the parasitics of the transformer and PCB trace.

The approximate RF input power range of the LT5570 is 60dB at frequencies up to 900MHz, even with high crest factor signals such as a 4-carrier W-CDMA waveform. However the minimum detectable RF power level degrades as the input RF frequency increases.

Due to the high RF input impedance of the LT5570, a narrow band L-C matching network can be used for the conversion of a single-ended to balanced signal as well. By this means, the sensitivity and overall linear dynamic range of the detector remain the same, without using an RF balun.

The LT5570 can also be driven in a single-ended configuration. Figure 5 shows the simplified circuit of this single-ended configuration. The DEC Pin is preferably ac-coupled to ground via a capacitor rather than left floating.

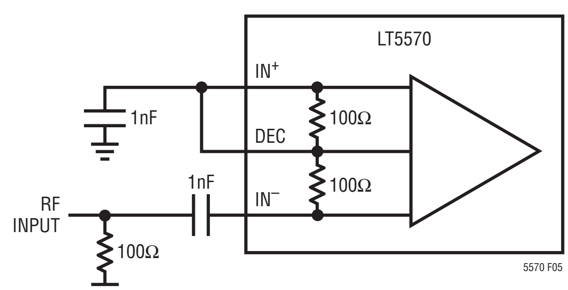


Figure 5. Single-Ended Input Configuration

APPLICATIONS INFORMATION

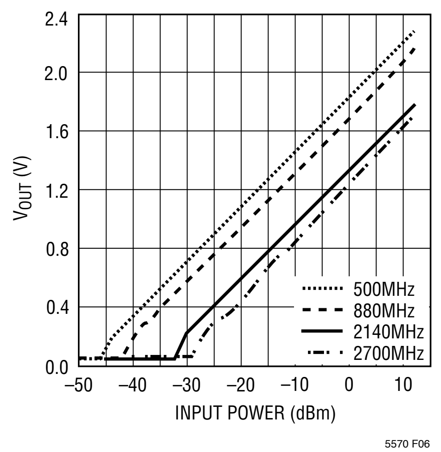


Figure 6. Output Voltage and Linearity Error vs RF Input Power in Single-ended Input Configuration

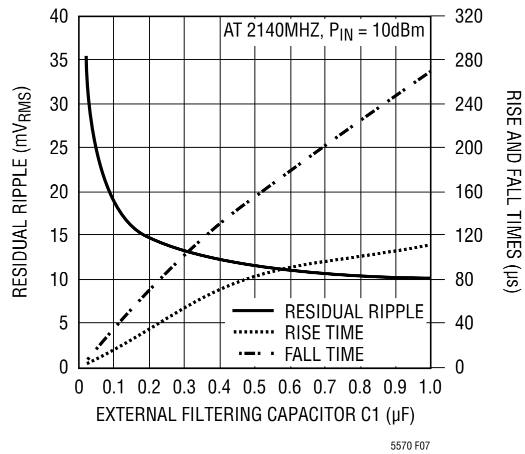


Figure 7. Residual Ripple, Output Transient Times vs. Filtering Capacitor C1

The DEC pin can be tied to the IN^+ (or IN^-) Pin directly and ac-coupled to ground while the RF signal is applied to the IN^- (or IN^+) Pin. By simply terminating the signal side of the inputs with a 100Ω resistor to ground in front of the ac-blocking capacitor and coupling the other side to ground using a 1nF capacitor, a broadband 50Ω input match can be achieved with typical input return loss better than 12dB from 40MHz to 2.7GHz.

Since there is no voltage conversion gain from impedance transformation in this case, the sensitivity of the detector is reduced by 6dB. The linear dynamic range is reduced by the same amount correspondingly as shown in Figure 6.

External Filtering (FLTR) Capacitor C1

This pin is internally biased at V_{CC} – 0.13V via a 2k resistor from voltage supply V_{CC}. To assure stable operation of the LT5570, an external capacitor C1 with a value of 22nF or higher is required to connect the FLTR Pin to V_{CC}. Don't connect this filtering capacitor to ground or any other low voltage reference at any time to avoid an abnormal start-up condition.

C1's value has a dominant effect on the output transient response. The lower the capacitance, the faster the output rise and fall times as illustrated in Figure 7. For signals with AM content such as W-CDMA, ripple can be observed when the loop bandwidth set by C1 is close to the modulation bandwidth of the signal. A 4-carrier W-CDMA RF signal is used as an example in this case. The trade-offs of residual ripple vs. output transient time are also as shown in Figure 7.

In general, the LT5570 output ripple remains relatively constant regardless of the RF input power level for a fixed C1 and modulation format of the RF signal. Typically, C1 must be selected to average out the ripple to achieve the desired accuracy of RF power measurement. For a two-tone RF signal with equal power applied to the LT5570 input, Figure 8 shows the variation of the output dc voltage and its RMS value of the residual ac voltage as a function of the delta frequency. Both values are referred to dB by normalizing them to the output slope (about 37mV/dB). In this measurement, C1 = 22nF. Increasing C1 will shift both curves toward a lower frequency.

APPLICATIONS INFORMATION

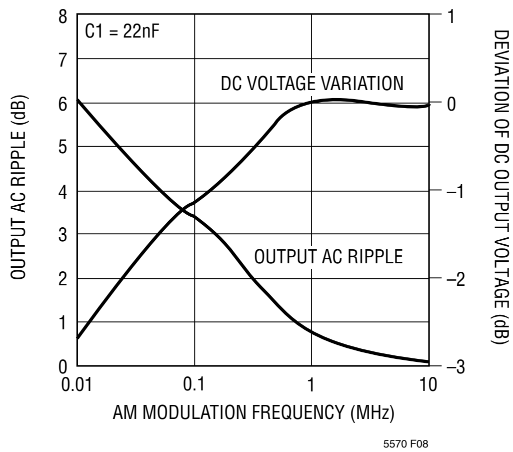


Figure 8. Output DC Voltage Variation and Residual Ripple vs AM Modulation Frequency

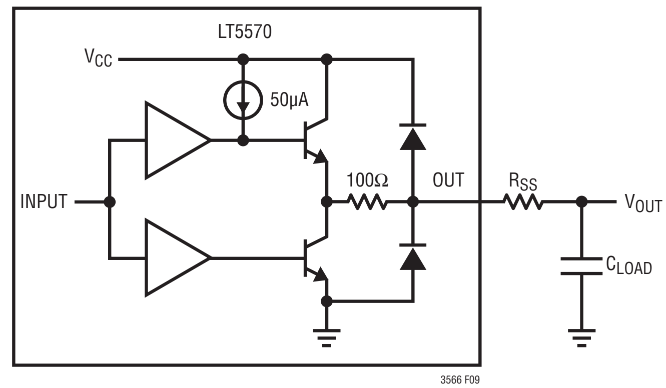


Figure 9. Simplified Circuit Schematic of the Output Interface

The high performance RF circuits inside the LT5570 enable it to handle output ripple as high as 2dB without losing its power detection accuracy. The ripple can be further reduced for optimal transient time with an additional RC lowpass filter at the output as discussed in the next section.

Output Interface

The output buffer amplifier of the LT5570 is shown in Figure 9. This push-pull buffer amplifier can source 5mA current to the load and sink 2.5mA current from the load. The output impedance is determined primarily by the 100Ω series resistor connected to the buffer amplifier. This will prevent any over-stress on the internal devices in case the output is shorted to ground.

The –3dB bandwidth of the buffer amplifier is about 2.4MHz and the full-scale rise/fall time can be as fast as 175ns. When the output is resistively terminated or open, the fastest output transient response is achieved when a large signal is applied to the RF input port. The total rise time of the LT5570 is about 0.5µs and the total fall time is 8µs, respectively, for full-scale pulsed RF input power. The speed of the output transient response is dictated mainly by the filtering capacitor C1 (at least 22nF) at the FLTR pin. See the detailed output transient response in the Typical Performance Characteristics section. When the RF input has AM content, residual ripple may be present at the output depending upon the low frequency content of the modulated RF signal. For example, when 4-carrier WCDMA is applied at the RF input, ±36mV$_{RMS}$ (about ±1dB) ripple is present at the output. This ripple can be reduced with a larger filtering capacitor C1 at the expense of a slower transient response.

APPLICATIONS INFORMATION

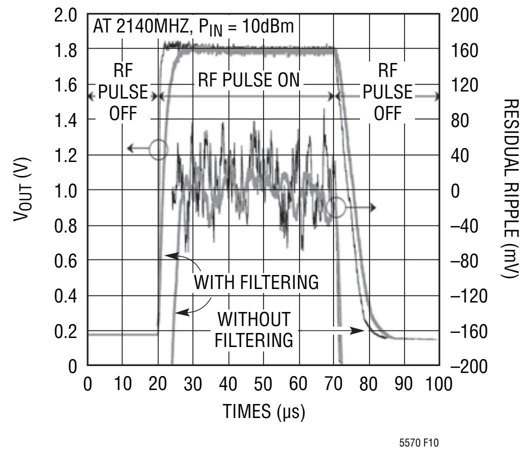


Figure 10. Residual ripple, Output Transient Times with Output Low-pass Filter

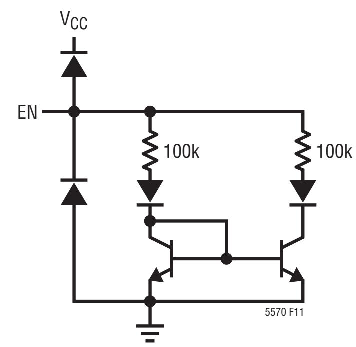


Figure 11. Enable Pin Simplified Circuit

Since the output amplifier of the LT5570 is capable of driving an arbitrary capacitive load, the residual ripple can be filtered at the output with a series resistor R_{SS} and a large shunt capacitor C_{LOAD}. See Figure 9. This lowpass filter also reduces the output noise by limiting the output noise bandwidth. When this RC network is designed properly, a fast output transient response can be maintained with reduced residual ripple. We can estimate C_{LOAD} with an output voltage swing of 1.8V at 2140MHz. In order that the maximum 2.5mA sinking current not limit the fall time (about 8µS), C_{LOAD} can be chosen as follows.

C_{LOAD} = 2.5mA • approximate additional time/1.8V
= 2.5mA • 0.25µs/1.8V = 347pF

Once C_{LOAD} is determined, R_{SS} can be chosen properly to form a RC lowpass filter with a corner frequency of $2\pi/(R_{SS} \cdot C_{LOAD})$. Using 4-carrier W-CDMA as an example, Figure 10 shows the residual ripple is reduced to half from $36mV_{RMS}$ with R_{SS} = 4.7k and C_{LOAD} = 330pF, while the fall time is slightly increased to 8.8µS.

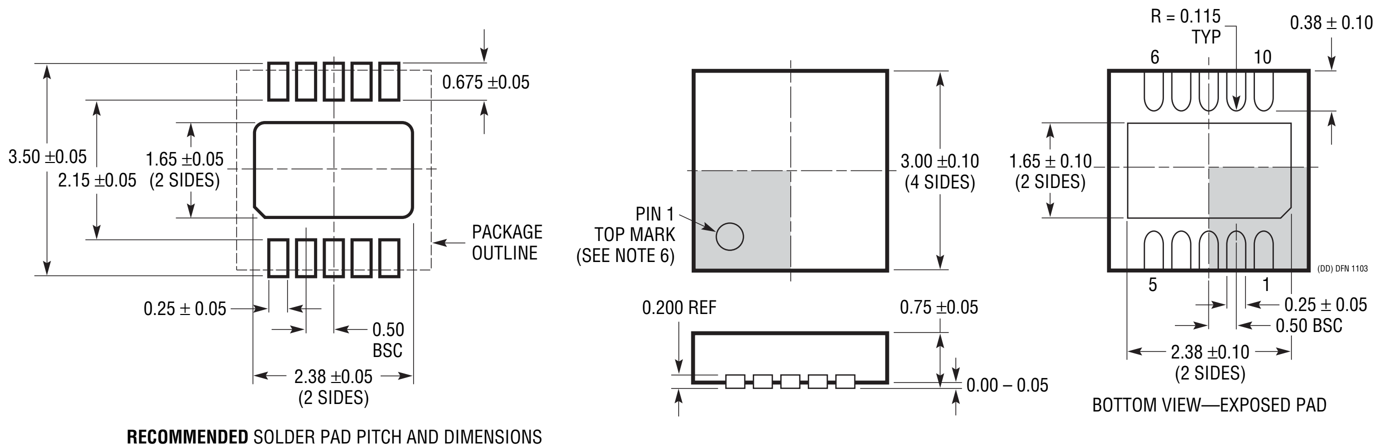
In general, the rise time of the LT5570 is much shorter than the fall time. However, when the output RC filter is used, the rise time is dominated by the time constant of this filter. Accordingly, the rise time becomes very similar to the fall time.

Enable Interface

A simplified schematic of the EN Pin interface is shown in Figure 11. The enable voltage necessary to turn on the LT5570 is 2V. To disable or turn off the chip, this voltage should be below 1V. It is important that the voltage applied to the EN pin should never exceed V_{CC} by more than 0.3V. Otherwise, the supply current may be sourced through the upper ESD protection diode connected at the EN pin. Under no circumstances should voltage be applied to the EN Pin before the supply voltage is applied to the V_{CC} pin. If this occurs, damage to the IC may result.

PACKAGE DESCRIPTION

DD Package
10-Lead Plastic DFN (3mm × 3mm)
(Reference LTC DWG # 05-08-1699)



NOTE:
1. DRAWING TO BE MADE A JEDEC PACKAGE OUTLINE M0-229 VARIATION OF (WEED-2). CHECK THE LTC WEBSITE DATA SHEET FOR CURRENT STATUS OF VARIATION ASSIGNMENT
2. DRAWING NOT TO SCALE
3. ALL DIMENSIONS ARE IN MILLIMETERS
4. DIMENSIONS OF EXPOSED PAD ON BOTTOM OF PACKAGE DO NOT INCLUDE MOLD FLASH. MOLD FLASH, IF PRESENT, SHALL NOT EXCEED 0.15mm ON ANY SIDE
5. EXPOSED PAD SHALL BE SOLDER PLATED
6. SHADED AREA IS ONLY A REFERENCE FOR PIN 1 LOCATION ON THE TOP AND BOTTOM OF PACKAGE

RELATED PARTS

PART NUMBER	DESCRIPTION	COMMENTS
Infrastructure		
LT5514	Ultralow Distortion, IF Amplifier/ADC Driver with Digitally Controlled Gain	850MHz Bandwidth, 47dBm OIP3 at 100MHz, 10.5dB to 33dB Gain Control Range
LT5515	1.5GHz to 2.5GHz Direct Conversion Quadrature Demodulator	20dBm IIP3, Integrated LO Quadrature Generator
LT5516	0.8GHz to 1.5GHz Direct Conversion Quadrature Demodulator	21.5dBm IIP3, Integrated LO Quadrature Generator
LT5517	40MHz to 900MHz Quadrature Demodulator	21dBm IIP3, Integrated LO Quadrature Generator
LT5518	1.5GHz to 2.4GHz High Linearity Direct Quadrature Modulator	22.8dBm OIP3 at 2GHz, –158.2dBm/Hz Noise Floor, 50Ω Single-Ended RF and LO Ports, 4-Channel W-CDMA ACPR = –64dBc at 2.14GHz
LT5519	0.7GHz to 1.4GHz High Linearity Upconverting Mixer	17.1dBm IIP3 at 1GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO and RF Ports Operation
LT5520	1.3GHz to 2.3GHz High Linearity Upconverting Mixer	15.9dBm IIP3 at 1.9GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO and RF Ports Operation
LT5521	10MHz to 3700MHz High Linearity Upconverting Mixer	24.2dBm IIP3 at 1.95GHz, NF = 12.5dB, 3.15V to 5.25V Supply, Single-Ended LO Port Operation
LT5522	600MHz to 2.7GHz High Signal Level Downconverting Mixer	4.5V to 5.25V Supply, 25dBm IIP3 at 900MHz, NF = 12.5dB, 50Ω Single-Ended RF and LO Ports
LT5524	Low Power, Low Distortion ADC Driver with Digitally Programmable Gain	450MHz Bandwidth, 40dBm OIP3, 4.5dB to 27dB Gain Control
LT5525	High Linearity, Low Power Downconverting Mixer	Single-Ended 50Ω RF and LO Ports, 17.6dBm IIP3 at 1900MHz, I_{CC} = 28mA
LT5526	High Linearity, Low Power Downconverting Mixer	3V to 5.3V Supply, 16.5dBm IIP3, 100kHz to 2GHz RF, NF = 11dB, I_{CC} = 28mA, –65dBm LO-RF Leakage
LT5527	400MHz to 3.7GHz High Signal Level Downconverting Mixer	IIP3 = 23.5dBm and NF = 12.5dBm at 1900MHz, 4.5V to 5.25V Supply, I_{CC} = 78mA, Conversion Gain = 2dB
LT5528	1.5GHz to 2.4GHz High Linearity Direct Quadrature Modulator	21.8dBm OIP3 at 2GHz, –159.3dBm/Hz Noise Floor, 50Ω, 0.5V_{DC} Baseband Interface, 4-Channel W-CDMA ACPR = –66dBc at 2.14GHz
LT5557	400MHz to 3.8GHz, 3.3V High Signal Level Downconverting Mixer	IIP3 = 23.7dBm at 2600MHz, 23.5dBm at 3600MHz, I_{CC} = 82mA at 3.3V
LT5560	Ultra-Low Power Active Mixer	10mA Supply Current, 10dBm IIP3, 10dB NF, Usable as Up- or Down-Converter.
LT5568	700MHz to 1050MHz High Linearity Direct Quadrature Modulator	22.9dBm OIP3 at 850MHz, –160.3dBm/Hz Noise Floor, 50Ω, 0.5V_{DC} Baseband Interface, 3-Ch CDMA2000 ACPR = –71.4dBc at 850MHz
LT5572	1.5GHz to 2.5GHz High Linearity Direct Quadrature Modulator	21.6dBm OIP3 at 2GHz, –158.6dBm/Hz Noise Floor, High-Ohmic 0.5V_{DC} Baseband Interface, 4-Ch W-CDMA ACPR = –67.7dBc at 2.14GHz
LT5575	800MHz to 2.7GHz High Linearity Direct Conversion I/Q Demodulator	50Ω, Single-Ended RF and LO Inputs. 28dBm IIP3 at 900MHz, 13.2dBm P1dB, 0.04dB I/Q Gain Mismatch, 0.4° I/Q Phase Mismatch
RF Power Detectors		
LTC®5505	RF Power Detectors with >40dB Dynamic Range	300MHz to 3GHz, Temperature Compensated, 2.7V to 6V Supply
LTC5507	100kHz to 1000MHz RF Power Detector	100kHz to 1GHz, Temperature Compensated, 2.7V to 6V Supply
LTC5508	300MHz to 7GHz RF Power Detector	44dB Dynamic Range, Temperature Compensated, SC70 Package
LTC5509	300MHz to 3GHz RF Power Detector	36dB Dynamic Range, Low Power Consumption, SC70 Package
LTC5530	300MHz to 7GHz Precision RF Power Detector	Precision V_{OUT} Offset Control, Shutdown, Adjustable Gain
LTC5531	300MHz to 7GHz Precision RF Power Detector	Precision V_{OUT} Offset Control, Shutdown, Adjustable Offset
LTC5532	300MHz to 7GHz Precision RF Power Detector	Precision V_{OUT} Offset Control, Adjustable Gain and Offset
LT5534	50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range	±1dB Output Variation over Temperature, 38ns Response Time, Log Linear Response
LTC5536	Precision 600MHz to 7GHz RF Power Detector with Fast Comparator Output	25ns Response Time, Comparator Reference Input, Latch Enable Input, –26dBm to +12dBm Input Range
LT5537	Wide Dynamic Range Log RF/IF Detector	Low Frequency to 1GHz, 83dB Log Linear Dynamic Range

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