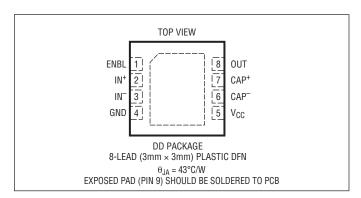
ABSOLUTE MAXIMUM RATINGS

(Note 1)

Power Supply Voltage	5.5V
Enable Voltage	-0.3 V, $V_{CC} + 0.3$ V
RF Input Power	15dBm
Operating Ambient Temperature	40°C to +85°C
Storage Temperature Range	65°C to +125°C
Maximum Junction Temperature	150°C

PIN CONFIGURATION



ORDER INFORMATION

LEAD FREE FINISH	TAPE AND REEL	PART MARKING	PACKAGE DESCRIPTION	TEMPERATURE RANGE
LT5538IDD#PBF	LT5538IDD#TRPBF	LCVG	8-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 \bullet denotes the specifications which apply over the full operating temperature range, otherwise specifications are at $T_A = 25^{\circ}C$, $V_{CC} = 5V$, ENBL = 5V. (Note 2)

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
RF Input							
	Input Frequency Range				40 to 3800		MHz
	DC Common Mode Voltage				V _{CC} −0.5		V
	Input Resistance				394		Ω
f _{RF} = 40 MHZ							
	RF Input Power Range				-75 to 10		dBm
	Linear Dynamic Range	±1dB Linearity Error (Note 3)		·	76		dB
	Output Slope			·	19.9		mV/dB
	Logarithmic Intercept	(Note 5)			-87.5		dBm
	Sensitivity				-72		dBm
	Output Variation vs Temperature	Normalized to Output at 25°C $P_{IN} = -50 dBm; -40°C < T_A < 85°C$ $P_{IN} = -30 dBm; -40°C < T_A < 85°C$ $P_{IN} = -10 dBm; -40°C < T_A < 85°C$	•		0.1/0.6 -0.1/0.6 -0.2/0.6		dB dB dB

LINEAR TECHNOLOGY

ELECTRICAL CHARACTERISTICS The \bullet denotes the specifications which apply over the full operating temperature range, otherwise specifications are at $T_A = 25^{\circ}C$, $V_{CC} = 5V$, ENBL = 5V. (Note 2)

SYMBOL	PARAMETER	CONDITIONS		MIN TYP	MAX	UNITS
	2nd Order Harmonic Distortion	Pin = -10dBm; At RF Input		-62		dBc
	3rd Order Harmonic Distortion	Pin = -10dBm; At RF Input		-61		dBc
f _{RF} = 450 MHz	'	,				
	RF Input Power Range			-75 to 10		dBm
	Linear Dynamic Range	±1 dB Linearity Error (Note 3)		75		dB
	Output Slope			19.6		mV/dE
	Logarithmic Intercept	(Note 5)		-87.3		dBm
	Sensitivity			-71.5		dBm
	Output Variation vs Temperature	Normalized to Output at 25°C $P_{IN} = -50 dBm; -40$ °C $< T_A < 85$ °C $P_{IN} = -30 dBm; -40$ °C $< T_A < 85$ °C $P_{IN} = -10 dBm; -40$ °C $< T_A < 85$ °C	•	0.1/0.6 0.1/0.5 -0.1/0.5		dB dB dB
	2nd Order Harmonic Distortion	Pin = -10dBm; At RF Input		-43		dBo
	3rd Order Harmonic Distortion	Pin = −10dBm; At RF Input		-44		dBo
f _{RF} = 880 MHz						
	RF Input Power Range			-75 to 10		dBm
	Linear Dynamic Range	±1 dB Linearity Error (Note 3)		75		dB
	Output Slope			19.0		mV/dB
	Logarithmic Intercept	(Note 5)		-88.8		dBm
	Sensitivity			-71.5		dBm
	Output Variation vs Temperature	Normalized to Output at 25°C $P_{IN} = -50 dBm; -40°C < T_A < 85°C$ $P_{IN} = -30 dBm; -40°C < T_A < 85°C$ $P_{IN} = -10 dBm; -40°C < T_A < 85°C$	•	0.1/0.7 0.1/0.4 0.1/0.4		dB dB dB
	2nd Order Harmonic Distortion	Pin = -10dBm; At RF Input		-37		dBc
	3rd Order Harmonic Distortion	Pin = -10dBm; At RF Input		-40		dBo
f _{RF} = 2140 MHz	Z		'			
	RF Input Power Range			-72 to 10		dBm
	Linear Dynamic Range	±1 dB Linearity Error (Note 3)		70		dB
	Output Slope			17.7		mV/dB
	Logarithmic Intercept	(Note 5)		-89.0		dBm
	Sensitivity			-69.0		dBm
	Output Variation vs Temperature	Normalized to Output at 25°C $P_{IN} = -50 dBm; -40°C < T_A < 85°C$ $P_{IN} = -30 dBm; -40°C < T_A < 85°C$ $P_{IN} = -10 dBm; -40°C < T_A < 85°C$	•	0.3/0.4 0.4/0.1 0.7/0.5		dB dB dB
f _{RF} = 2700 MHz	2	.				
	RF Input Power Range			-72 to 10		dBm
	Linear Dynamic Range	±1 dB Linearity Error (Note 3)		65		dB
	Output Slope			17.6		mV/dB
	Logarithmic Intercept	(Note 5)		-87.5		dBm



ELECTRICAL CHARACTERISTICS The \bullet denotes the specifications which apply over the full operating temperature range, otherwise specifications are at $T_A = 25^{\circ}C$, $V_{CC} = 5V$, ENBL = 5V. (Note 2)

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
	Sensitivity				-69.5		dBm
	Output Variation vs Temperature	Normalized to Output at 25°C $P_{IN} = -50 dBm; -40°C < T_A < 85°C$ $P_{IN} = -30 dBm; -40°C < T_A < 85°C$ $P_{IN} = -10 dBm; -40°C < T_A < 85°C$	•		0.3/0.3 0.7/-0.3 1.1/-0.9		dB dB dB
f _{RF} = 3600 MH	Z						
	RF Input Power Range				-65 to 10		dBm
	Linear Dynamic Range	±1 dB Linearity Error (Note 3)			57		dB
	Output Slope				18		mV/dB
	Logarithmic Intercept	(Note 5)			-81.4		dBm
	Sensitivity				-63		dBm
	Output Variation vs Temperature	Normalized to Output at 25°C $P_{IN} = -45 \text{dBm}; -40^{\circ}\text{C} < T_A < 85^{\circ}\text{C}$ $P_{IN} = -25 \text{dBm}; -40^{\circ}\text{C} < T_A < 85^{\circ}\text{C}$ $P_{IN} = -5 \text{dBm}; -40^{\circ}\text{C} < T_A < 85^{\circ}\text{C}$	•		0.6/-0.3 0.9/-0.6 1.4/-1.2		dB dB dB
Output Interfac	e						
	Output DC Voltage	No RF Signal Present			0.350		V
	Output Impedance				150		Ω
	Source Current				10		mA
	Sink Current				200		μА
	Rise Time	0.5V to 1.6V, 10% to 90%, f _{RF} = 880 MHz			100		ns
	Fall Time	1.6V to 0.5V, 10% to 90%, f _{RF} = 880 MHz			180		ns
Power Up/Dow	'n						
	ENBL = High (On)		•	1			V
	ENBL = Low (Off)		•			0.3	V
	ENBL Input Current	VENBL = 5V			205		μА
	Turn ON time				300		ns
	Turn OFF Time				1		μs
Power Supply							
	Supply Voltage			3		5.25	V
	Supply Current				29	36	mA
<u> </u>	Shutdown Current	ENBL = Low			1	100	μА

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 -40° C to 85°C temperature range are assured by design, characterization and correlation with statistical process control.

Note 3: The linearity error is calculated by the difference between the incremental slope of the output and the average slope from -50dBm

to $-20 \mbox{dBm}$. The dynamic range is defined as the range over which the linearity error is within $\pm 1 \mbox{dB}$.

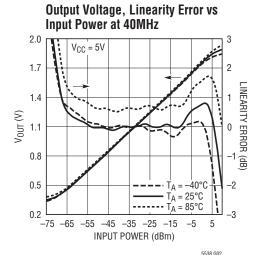
Note 4: Sensitivity is defined as the minimum input power required for the linearity error within 3dB of the ideal log-linear transfer curve.

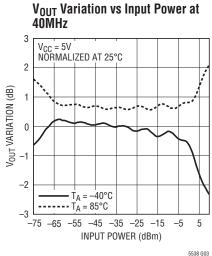
Note 5: Logarithmic Intercept is an extrapolated input power level from the best-fitted log-linear straight line, where the output voltage is OV.

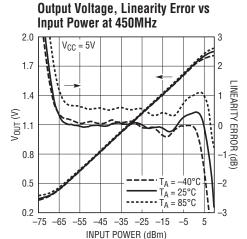
LINEAD TECHNOLOGY

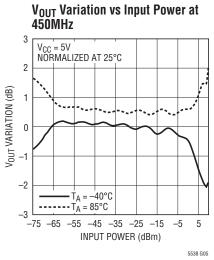
TYPICAL PERFORMANCE CHARACTERISTICS (Test Circuit shown in Figure 5)

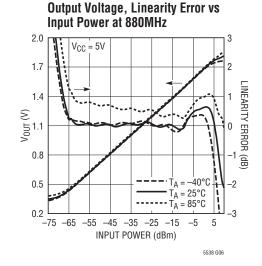
Supply Current vs Supply Voltage 40 35 SUPPLY CURRENT I_{CC} (mA) 30 25 20 15 -40°C $\Gamma_A = 25^{\circ}C$ $T_A = 85^{\circ}C$ 10 3.5 4 4.5 5 5.5 25 SUPPLY VOLTAGE V_{CC} (V)

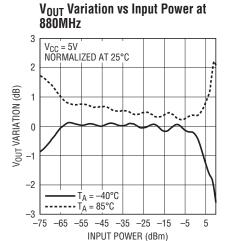




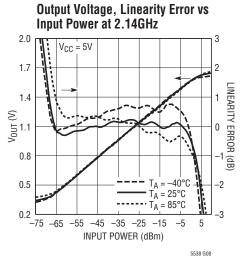


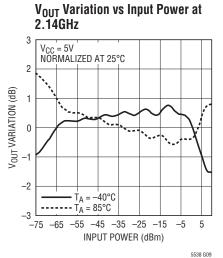






5538 G07

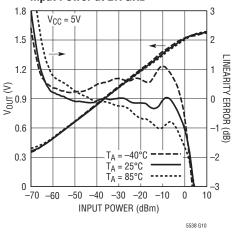




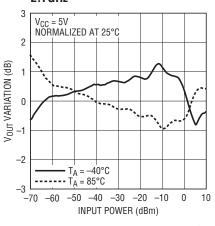
55381

TYPICAL PERFORMANCE CHARACTERISTICS (Test Circuit shown in Figure 5)

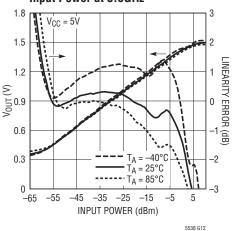
Output Voltage, Linearity Error vs Input Power at 2.7GHz



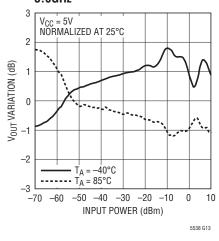
V_{OUT} Variation vs Input Power at 2.7GHz



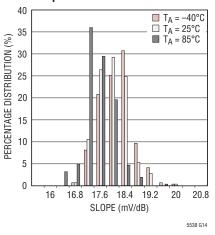
Output Voltage, Linearity Error vs Input Power at 3.6GHz



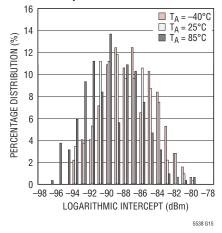
 V_{OUT} Variation vs Input Power at 3.6GHz



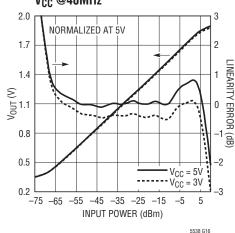
Slope Distribution vs Temperature at 2.14GHz



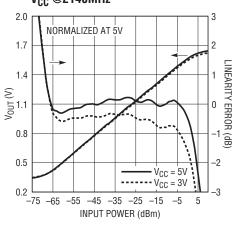
Logarithmic Intercept Distribution vs Temperature at 2.14GHz



Output Voltage, Linearity Error vs V_{CC} @40MHz

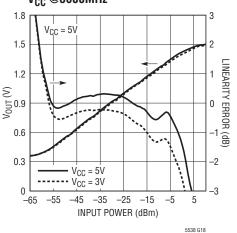


Output Voltage, Linearity Error vs V_{CC} @2140MHz



5538 G17

Output Voltage, Linearity Error vs V_{CC} @3600MHz



5538f



PIN FUNCTIONS

ENBL (Pin 1): Enable Pin. An applied voltage above 1V will activate the bias for the IC. For an applied voltage below 0.3V, 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 can be connected to V_{CC} . Typical enable pin input currents are $100\mu A$ for EN = 3V and $200\mu A$ for EN = 5V, respectively. Note that at no time should the ENBL pin voltage be allowed to exceed V_{CC} by more than 0.3V.

IN⁺ (**Pin 2**): RF Input Pin. The pin is internally biased to V_{CC} –0.5V and should be DC blocked externally. The input is connected via internal 394 Ω resistor to the IN⁻ pin which should be connected to ground with an ac-decoupling capacitor.

IN⁻ (**Pin 3**): AC Ground Pin. The pin is internally biased to V_{CC} –0.5V and coupled to ground via internal 20pF capacitor.

This pin should be connected to ground with an external ac-decoupling capacitor for low frequency operation.

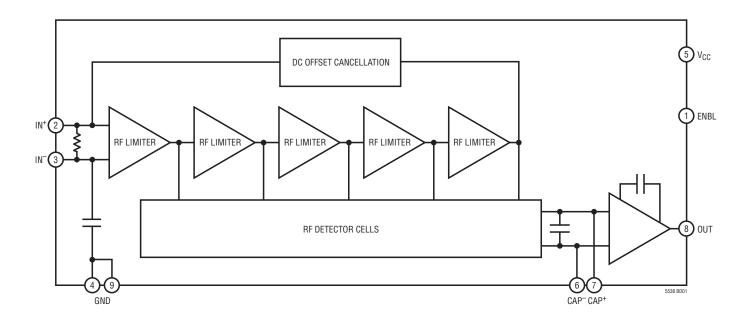
GND (Pin 4, Exposed Pad Pin 9): Circuit Ground Return for the entire IC. This pin must be soldered to the printed circuit board ground plane.

 V_{CC} (Pin 5): Power Supply Pin. This pin should be decoupled using 100pF and $0.1\mu F$ capacitors.

CAP⁻, **CAP**⁺ (**Pins 6**, **7**): Optional Filter Capacitor Pins. These pins are internally connected to the detector outputs in front of the output buffer amplifier. An external low-pass filtering can be formed by connecting a capacitor to Vcc from each pin for filtering a low frequency modulation signal. See the Applications Information section for detail.

OUT (Pin 8): Detector DC Output Pin.

BLOCK DIAGRAM





APPLICATIONS INFORMATION

The LT5538 is a 40MHz to 3.8 GHz logarithmic RF power detector. It consists of cascaded limiting amplifiers and RF detectors. The output currents from every RF detector are combined and low-pass filtered before applied to the output buffer amplifier. As a result, the final DC output voltage approximates the logarithm of the amplitude of the input signal. The LT5538 is able to accurately measure an RF signal over a 70dB dynamic range (-68dBm to 2dBm at 2.1GHz) with 50Ω single-ended input impedance. The slope of linear to log transfer function is about 17.7mV/dB at 2.1GHz. Within the linear dynamic range, very stable output is achieved over the full temperature range from -40°C to 85°C and over the full operating frequency range from 40MHz to 3.8GHz. The absolute variation over temperature is typically within ±1dB over 65dB dynamic range at 2.1GHz.

RF INPUT

The simplified schematic of the input circuit is shown in Figure 1. The IN+ and IN- pins are internally biased to V_{CC} –0.5V. The IN- pin is internally coupled to ground via 20pF capacitor. An external capacitor of 1nF is needed to connect this pin to ground for low frequency operation. The impedance between IN+ and IN- is about 394 Ω . The RF input pin IN+ should be DC blocked when connected to ground or other matching components. A 56Ω resistor (R1) connected to ground will provide better than 10dB input return loss over the operating frequency range up to 1.5GHz. At higher operating frequency, additional LC

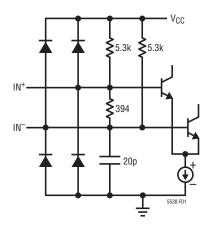


Figure 1. Simplified Schematic of the Input Circuit

matching elements are needed for a proper impedance matching to a 50Ω source as shown in Figure 2. Refer to Figure 6 for the circuit schematic of the input matching network. The input impedance vs frequency of the RF input port IN⁺ is detailed in Table 1.

Table 1. RF Input Impedance

FREQUENCY	RF INPUT	\$11			
(MHz)	IMPEDANCE (Ω)	MAG	ANGLE(°)		
40	47.3 + j129.7	0.800	38.5		
100	246.6 + j210.7	0.790	11.5		
200	408.7 – j37.8	0.785	-1.5		
400	192.9 – j190.9	0.772	-14.9		
600	105.6 – j158.4	0.756	-25.3		
800	69.3 – j127.4	0.737	-34.4		
1000	51.8 – j106.2	0.720	-42.7		
1200	41.5 – j90.9	0.707	-50.6		
1400	34.2 – j78.7	0.697	-58.2		
1600	29.2 - j60.0	0.687	-65.6		
1800	25.4 - j60.7	0.678	-73.1		
2000	22.6 - j53.8	0.669	-80.4		
2200	20.5 - j47.7	0.659	-87.7		
2400	18.9 – j42.4	0.649	-94.6		
2600	17.9 – j37.6	0.638	-101.5		
2800	17.1 – j33.4	0.627	-108.2		
3000	16.4 – j29.5	0.615	-114.7		
3200	16.1 – j26.0	0.602	-121.0		
3400	15.9 – j22.8	0.589	-127.0		
3600	15.9 – j20.0	0.574	-132.8		
3800	15.9 – j17.5	0.560	-137.9		

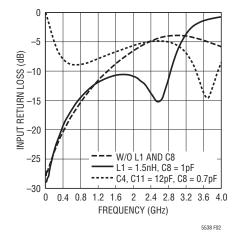


Figure 2. Input Return Loss with Additional LC Matching Network

5538f



APPLICATIONS INFORMATION

OUTPUT INTERFACE

The output interface of the LT5538 is shown in Figure 3. This output buffer circuit can source 10mA current to the load and sink 200 μ A current from the load. The small-signal output bandwidth is approximately 4MHz when the output is resistively terminated or open. The full-scaled 10% to 90% rise and fall times are 100nS and 180nS, respectively. The output transient responses at varied input power levels are shown in Figure 4.

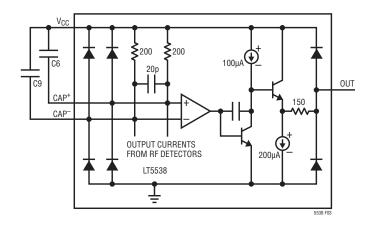


Figure 3. Simplified Schematic of the Output Interface

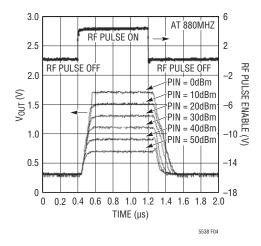


Figure 4. Simplified Circuit Schematic of the Output Interface

When the part is enabled, the output impedance is about 150Ω . When it is disabled, the output impedance is about $29.5k\Omega$ referenced to ground.

EXTERNAL FILTERING AT CAP+, CAP-

The CAP⁺ and CAP⁻ Pins are internally biased at V_{CC} –0.36V via a 200 Ω resistor from voltage supply V_{CC} as shown in Figure 3. These two pins are connected to the differential outputs of the internal RF detector cells. In combination with the 20pF in parallel, a low-pass filter is formed with -3dB corner frequency of 20MHz. The high frequency rectified signals (particularly second-order harmonic of the RF signal) from the detector cells are filtered and then the DC output is amplified by the output buffer amplifier. In some applications, the LT5538 may be used to measure a modulated RF signal with low frequency AM content (lower than 20MHz), a large modulation signal may be present at these two pins due to insufficient low-pass filtering, resulting in output voltage fluctuation at the LT5538's output. Its DC content may also vary depending upon the modulation frequency. To assure stable DC output of the LT5538, external capacitors C6 and C9 can be connected from CAP⁺ and CAP⁻ to V_{CC} to filter out this low frequency AM modulation signal. Assume the modulation frequency of the RF signal is f_{MOD}, the capacitor value in Farads of C6 and C9 can be chosen by the following formula:

C6 (or C9)
$$\geq 10/(2\pi \cdot 200 \cdot f_{MOD})$$

Do not connect these two filtering capacitors to ground or any other low voltage reference at any time to avoid an abnormal start-up condition.



APPLICATIONS INFORMATION

ENBL (ENABLE) PIN OPERATION

A simplified circuit schematic of the ENBL Pin is shown in Figure 5. The enable voltage necessary to turn on the LT5538 is 1V. The current drawn by the ENBL pin varies with the voltage applied at the pin. When the ENBL voltage is 3V, the ENBL current is typically 100 μ A. When the ENBL voltage is 5V, the ENBL current is increased to 200

 μA . To disable or turn off the chip, this voltage should be below 0.3V. It is important that the voltage applied to the ENBL 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 ENBL pin. Under no circumstances should voltage be applied to the ENBL Pin before the supply voltage is applied to the V_{CC} pin. If this occurs, damage to the IC may result.

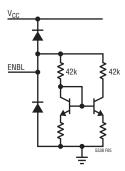


Figure 5. Simplified Schematic of the Enable Circuit

TEST CIRCUIT

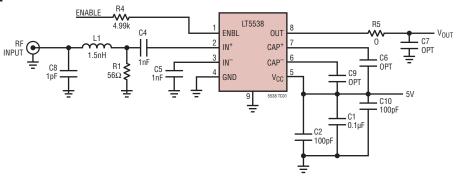


Figure 6. Evaluation Board Circuit Schematic

40MHz to 2.7GHz

REF DES	VALUE	SIZE	PART NUMBER
C1	0.1µF	0603	AVX 0603ZC104KAT
C2, C10	100pF	0402	AVX 0402YC101KAT
C4, C5	1nF	0603	AVX 0402ZC102K
C8	1pF	0402	AVX 0402YA1R0CAT
R1	56	0402	VISHAY, CRCW040256R0FKED
R4	4.99k	0402	VISHAY, CRCW04024K99FKED
L1	1.5nH	0402	TOKO, LL1005-FH2IN5S

3.6GHz to 3.8GHz

REF DES	VALUE	SIZE	PART NUMBER
C4, C11	12pF	0402	MURATA, GRM155C1H120JZ01B
C8	0.7pF	0402	MURATA, GJR155C1HR70BB01
C5	OPEN		

NOTE: Replace L₁ with C₁₁.

LINEAD

TEST CIRCUIT

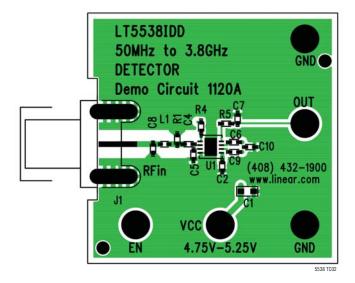
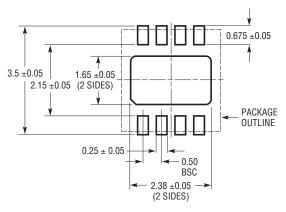


Figure 7. Component Side of Evalution Board

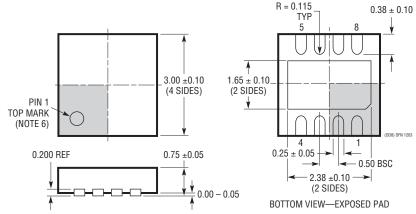
PACKAGE DESCRIPTION

$\begin{array}{c} \textbf{DD Package} \\ \textbf{8-Lead Plastic DFN (3mm} \times 3mm) \end{array}$

(Reference LTC DWG # 05-08-1698)



RECOMMENDED SOLDER PAD PITCH AND DIMENSIONS



- NOTE:
 1. DRAWING TO BE MADE A JEDEC PACKAGE OUTLINE M0-229 VARIATION OF (WEED-1)
- 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 TOP AND BOTTOM OF PACKAGE



RELATED PARTS

Controlled Gain 1.5516 1.56Hz to 2.56Hz Direct Conversion Quadrature Demodulator 1.5516 1.56Hz to 2.56Hz Direct Conversion Quadrature Demodulator 1.5517 4.00MHz to 900MHz Quadrature Demodulator 1.5518 1.56Hz to 2.46Hz High Linearity Direct Quadrature 1.5518 1.56Hz to 2.46Hz High Linearity Direct Quadrature 1.5519 0.76Hz to 1.46Hz High Linearity Direct Quadrature 1.5519 0.76Hz to 1.46Hz High Linearity Direct Quadrature 1.5520 1.36Hz to 2.36Hz High Linearity Upconverting Mixer 1.5521 1.00MHz to 3.700MHz High Linearity Upconverting Mixer 1.5522 1.00MHz to 3.700MHz High Linearity Upconverting Mixer 1.5523 1.00MHz to 3.700MHz High Linearity Upconverting Mixer 1.5524 1.00MHz to 3.700MHz High Linearity Upconverting Mixer 1.5525 1.00MHz to 2.76Hz High Signal Level Downconverting Mixer 1.5526 1.10MHz to 3.700MHz High Linearity Upconverting Mixer 1.5527 1.10MHz to 3.700MHz High Linearity Upconverting Mixer 1.5528 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Linearity Direct Quadrature 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Signal Level Downconverting Mixer 1.5529 1.10MHz to 3.76Hz High Linearity Direct Quadrature 1.15529 1.15520	PART NUMBER	DESCRIPTION	COMMENTS
Controlled Gain Range	Infrastructure		
IT5516 0.8GHz to 1.5GHz Direct Conversion Quadrature Demodulator 21.5dBm IIP3, Integrated LO Quadrature Generator IT5517 40MHz to 900MHz Quadrature Demodulator 21.5dBm IIP3, Integrated LO Quadrature Generator IT5518 1,5GHz to 2.4GHz High Linearity Direct Quadrature 22.5dBm IIP3 at 2GHz, -158, 2dBm-Hz Noise Floor, 50Ω Single-Ended LO Ports, 4-Channel W-CDMA ACPR = -6466b at 2.14GHz IT5519 0.7GHz to 1.4GHz High Linearity Upconverting Mixer 17.1dBm IIP3 at 16Hz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO and RF Ports Operation IT5520 1.3GHz to 2.3GHz High Linearity Upconverting Mixer 15.9dBm IIP3 at 19GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO Port Operation IT5521 10MHz to 3700MHz High Linearity Upconverting Mixer 24.2dBm IIP3 at 19GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO Ports IT5522 600 MHz to 2.7GHz High Signal Level Downconverting Mixer 4.5V to 5.25V Supply, 25dBm IIP3 at 900MHz, NF = 12.5dB, 50Ω Single-Ended SoΩ RF and LO Ports IT5525 High Linearity, Low Power Downconverting Mixer 3V to 5.3V Supply, 15.5dBm IIP3, 100Mtz to 2GHz RF, NF = 11dB, Loc-2-8mA, -65dBm LO-RF Leakage IT5527 400MHz to 3.7GHz High Linearity Direct Quadrature 3V to 5.3V Supply, 15.5dBm at 1900MHz, 4.5V to 5.25V Supply Loc-2-8mA, -65dBm LO-RF Leakage IT5528 Ling Linearity Direct Quadrature	LT5514	Ultralow Distortion, IF Amplifier/ADC Driver with Digitally Controlled Gain	850MHz Bandwidth, 47 dBm OIP3 at 100MHz, 10.5dB to 33dB Gain Control Range
175517 40MHz to 900MHz Quadrature Demodulator 21dBm IIP3, Integrated LO Quadrature Generator 175518 1.56Hz to 2.46Hz High Linearity Direct Quadrature 22 8dBm QIP3 at 26Hz158 2dBm/tx Noise Floor, 50Q Single-Ended and LO Ports, 4-Channel W-CDMA ACPR = 64dBc at 2.146Hz 175519 0.76Hz to 1.46Hz High Linearity Upconverting Mixer 17.4dBm IIP3 at 1.56Hz, Integrated RF Qutput Transformer with 50Q Matching, Single-Ended LO and RF Ports Operation 17.4dBm IIP3 at 1.56Hz, Integrated RF Qutput Transformer with 50Q Matching, Single-Ended LO and RF Ports Operation 17.5521 10MHz to 3700MHz High Linearity Upconverting Mixer 17.4dBm IIP3 at 1.56Hz, Integrated RF Qutput Transformer with 50Q Matching, Single-Ended LO and RF Ports Operation 17.5522 600 MHz to 2.76Hz High Signal Level Downconverting Mixer 17.5524 Low Power, Low Distortion ADC Driver with Digitally 45 Mto 5.26V Supply, 25dBm IIP3 at 1.90EHz, INF = 12.5dB, 5.0Q Sing Ended RF and LO Ports 17.5524 Low Power, Low Distortion ADC Driver with Digitally 450MHz Bandwotth, 40dBm QIP3, 4.5dB to 27dB Gain Control 17.5525 High Linearity, Low Power Downconverting Mixer 17.5526 High Linearity, Low Power Downconverting Mixer 30 to 5.3V Supply, 16.5dBm IIP3, 100MHz to 2.6Hz RF, NF = 11dB, Log = 28mA, -85dBm LO-RF Leakage 17.5642 17.5645	LT5515	1.5GHz to 2.5GHz Direct Conversion Quadrature Demodulator	20dBm IIP3, Integrated LO Quadrature Generator
1.5518	LT5516	0.8GHz to 1.5GHz Direct Conversion Quadrature Demodulator	21.5dBm IIP3, Integrated LO Quadrature Generator
Modulator Modulator Modulator Modulator Modulator To GRZ to 1.4GHz High Linearity Upconverting Mixer To GRZ Matching, Single-Ended LO and RF Ports Operation To GRZ Matching, Single-Ended Sou RF and LO Ports To GRZ Matching, Single-Ended Sou RF and LO Individual To GRZ Matching, Single-Ended Sou RF and LO Individual To GRZ Matching, Single-Ended Sou RF and LO Individual To GRZ Matching, Single-Ended Sou RF and LO Individual To GRZ Matching, Single-En	LT5517	40MHz to 900MHz Quadrature Demodulator	21dBm IIP3, Integrated LO Quadrature Generator
Matching, Single-Ended LO and RF Ports Operation 15.9dBm IP3 at 1.9GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO and RF Ports Operation 15.9dBm IP3 at 1.9GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO and RF Ports Operation 15.9dBm IP3 at 1.9GHz, Integrated RF Output Transformer with 50Ω Matching, Single-Ended LO and RF Ports Operation 15.9dBm IP3 at 1.9GHz, IP	LT5518	1.5GHz to 2.4GHz High Linearity Direct Quadrature Modulator	22.8dBm OIP3 at 2GHz, -158.2 dBm/Hz Noise Floor, 50Ω Single-Ended RF and LO Ports, 4-Channel W-CDMA ACPR = -64 dBc at 2.14GHz
Matching, Single-Ended LO and RF Ports Operation 24,2dBm IIP3 at 1,95GHz, NF = 12.5dB, 3.15V to 5.25V Supply, Single Ended LO Port Operation 24,2dBm IIP3 at 1,95GHz, NF = 12.5dB, 3.15V to 5.25V Supply, Single Ended LO Port Operation 24,5V to 5.25V Supply, Single Ended LO Port Operation 24,5V to 5.25V Supply, Single Ended RF and LO Ports 24,5V to 5.25V Supply, Single Ended RF and LO Ports 24,5V to 5.25V Supply, Single Ended RF and LO Ports 24,5V to 5.25V Supply, Single Ended RF and LO Ports 24,5V to 5.25V Supply, Single Ended RF and LO Ports 27,5V to 9V Supply 25,5V to	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
Ended LD Port Operation Ended LD Port Operation Ended LD Port Operation Ended R and LD Ports Ended R an	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
Mixer Ended RF and LO Ports	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
Programmable Gain IT5525 High Linearity, Low Power Downconverting Mixer Single-Ended 50Ω RF and LO Ports, 17.6dBm IIP3 at 1900MHz, 1 _{CC} = IT5526 High Linearity, Low Power Downconverting Mixer 3V to 5.3V Supply, 16.5dBm IIP3, 100kHz to 2GHz RF, NF = 11dB, 1 _{CC} = 28mÅ, -85dBm LO-RF Leakage 400MHz to 3.7GHz High Signal Level Downconverting Mixer IIP3 = 23.5dBm and NF = 12.5dBm at 1900MHz, 4.5V to 5.25V Supply 1 _{CC} = 78mÅ, Conversion Gain = 2dB IT5528 1.5GHz to 2.4GHz High Linearity Direct Quadrature 21.8dBm OIP3 at 2GHz, -159.3dBm/Hz Noise Floor, 50Ω, 0.5V0 _{CC} Base Modulator IIP3 = 23.7dBm at 2600MHz, 23.5dBm at 3600MHz, 1 _{CC} = 82mA at 3.3 Downconverting Mixer 10mA Supply Current, 10dBm IIP3, 10dB NF, Usable as Up- or Down-Cord Downconverting Mixer 10mA Supply Current, 10dBm IIP3, 10dB NF, Usable as Up- or Down-Cord Modulator 22.9dBm OIP3 at 3550MHz, -160.3dBm/Hz Noise Floor, 50Ω, 0.5V0 _{CC} Base Baseband Interface, 4-Ch W-CDMA ACPR = -71.4dBc at 850MHz IT5572 1.5GHz to 2.5GHz High Linearity Direct Quadrature 21.6dBm OIP3 at 2GHz, -158.6dBm/Hz Noise Floor, High-Ohmic 0.5V _{CC} Baseband Interface, 3-Ch W-CDMA ACPR = -67.7dBc at 2.14GHz IT5575 800MHz to 2.7GHz High Linearity Direct Conversion I/Q 29.9dBm OIP3 at 2GHz, -158.6dBm/Hz Noise Floor, High-Ohmic 0.5V _{CC} Baseband Interface, 4-Ch W-CDMA ACPR = -67.7dBc at 2.14GHz IT5575 800MHz to 2.7GHz High Linearity Direct Conversion I/Q 21.6dBm OIP3 at 2GHz, -158.6dBm/Hz Noise Floor, High-Ohmic 0.5V _{CC} Baseband Interface, 3-Ch W-CDMA ACPR = -67.7dBc at 2.14GHz IT5575 300MHz to 7.5GHz High Linearity Direct Conversion I/Q 21.6dBm OIP3 at 2GHz, -158.6dBm/Hz Noise Floor, High-Ohmic 0.5V _{CC} Baseband Interface, 3-Ch W-CDMA ACPR = -67.7dBc at 2.14GHz IT5575 300MHz to 7.5GHz High Linearity Direct Conversion I/Q 1.60Bm OIP3 at 2GHz, -158.6dBm/Hz Noise Floor, High-Ohmic 0.5V _{CC} Baseband Interface, 4-Ch W-CDMA ACPR = -67.7dBc at 2.14GHz IT5575 1.5GHz To Power Detector 100kHz to 3GHz, Temperature Compensated, 2.	LT5522		4.5V to 5.25V Supply, 25dBm IIP3 at 900MHz, NF = 12.5dB, 50Ω Single-Ended RF and LO Ports
LT5526	LT5524		450MHz Bandwidth, 40dBm OIP3, 4.5dB to 27dB Gain Control
LT5527 400MHz to 3.7GHz High Signal Level Downconverting IIP3 = 23.5dBm and NF = 12.5dBm at 1900MHz, 4.5V to 5.25V Supply ICC = 78mA, Conversion Gain = 2dB	LT5525	High Linearity, Low Power Downconverting Mixer	Single-Ended 50Ω RF and LO Ports, 17.6dBm IIP3 at 1900MHz, I_{CC} = 28mA
Mixer I _{CC} = 78mA, Conversion Gain = 2dB	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
Interface, 4-Channel W-CDMA ACPR = -66dBc at 2.14GHz	LT5527		IIP3 = 23.5dBm and NF = 12.5dBm at 1900MHz, 4.5V to 5.25V Supply, I_{CC} = 78mA, Conversion Gain = 2dB
Downconverting Mixer LT5560 Ultra-Low Power Active Mixer 10mA Supply Current, 10dBm IIP3, 10dB NF, Usable as Up- or Down-Cor T5568 700MHz to 1050MHz High Linearity Direct Quadrature Modulator LT5572 1.5GHz High Linearity Direct Quadrature Modulator LT5573 800MHz to 2.5GHz High Linearity Direct Quadrature Modulator LT5575 800MHz to 2.7GHz High Linearity Direct Conversion I/Q Demodulator RF Power Detectors LTC°5505 RF Power Detectors with >40dB Dynamic Range LTC5570 100kHz to 1000MHz RF Power Detector LTC5508 300MHz to 7GHz RF Power Detector LTC5509 300MHz to 3GHz RF Power Detector LTC5530 300MHz to 7GHz Precision RF Power Detector LTC5531 300MHz to 7GHz Precision RF Power Detector LTC5532 300MHz to 7GHz Precision RF Power Detector LTC5534 500MHz to 7GHz Precision RF Power Detector LTC5536 Precision G00Mhz to 7GHz RF Power Detector LTC5536 Precision G00Mhz to 7GHz RF Power Detector LTC5537 Wide Dynamic Range LTC5538 Precision G00Mhz to 7GHz RF Power Detector LTC5534 S0MHz to 7GHz Precision RF Power Detector LTC5536 Precision G00Mhz to 7GHz RF Power Detector LTC5537 Wide Dynamic Range Log RF/IF Detector LTC5537 Wide Dynamic Range Log RF/IF Detector LTC5537 Wide Dynamic Range Log RF/IF Detector LTC5537 Low Frequency to 1GHz, 8adB Log Linear Dynamic Range LTC5570 Low Frequency to 1GHz, 8adB Log Linear Dynamic Range LTC5570 Low Frequency to 1GHz, 8adB Log Linear Dynamic Range LTC5570 Low Frequency to 1GHz, 8adB Log Linear Dynamic Range LTC5570 Low Frequency to 1GHz, 8adB Log Linear Dynamic Range	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
Topic	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
Modulator Baseband Interface, 3-Ch CDMA2000 ACPR = -71.4dBc at 850MHz	LT5560	Ultra-Low Power Active Mixer	10mA Supply Current, 10dBm IIP3, 10dB NF, Usable as Up- or Down-Converter.
Modulator Baseband Interface, 4-Ch W-CDMA ACPR = -67.7dBc at 2.14GHz	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
Demodulator P1dB, 0.04dB I/Q Gain Mismatch, 0.4° I/Q Phase Mismatch	LT5572		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
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, 2.7 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 ±1dB Output Variation over Temperature, 38ns Response Time, Log Line Dynamic Range Response Time, Comparator Reference Input, Latch Enable Input —26dBm to +12dBm Input Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over Legicon Comparator Reference Log Supply Supply Supply Supply Responding and the Supply Responding and the Supply Responding Responding and the Supply Responding Respond	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
LTC5507 100kHz to 1000MHz RF Power Detector 100kHz to 1GHz, Temperature Compensated, 2.7 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 LTC5534 50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range 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 LTC5537 Wide Dynamic Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range LTC5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	RF Power Detec	etors	
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 LTC5534 50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range LTC5536 Precision 600Mhz to 7GHz RF Power Detector with Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector with Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector With Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Unit Fast Precision 600Mhz to 7GHz RF Power Detector Precision 600Mhz to 7GHz	LTC®5505	RF Power Detectors with >40dB Dynamic Range	300MHz to 3GHz, Temperature Compensated, 2.7V to 6V Supply
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 LTC5534 50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range Precision 600Mhz to 7GHz RF Power Detector with Fast Comparator Reference Input, Latch Enable Input Comparator Output LTC5536 Precision 600Mhz to 7GHz RF Power Detector with Fast Comparator Output Variation over Temperature, 38ns Response Time, Log Light Comparator Output Response LTC5537 Wide Dynamic Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range LTC5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LTC5507	100kHz to 1000MHz RF Power Detector	100kHz to 1GHz, Temperature Compensated, 2.7 to 6V Supply
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 LTC5534 50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range LTC5536 Precision 600Mhz to 7GHz RF Power Detector with Fast Comparator Output Precision 600Mhz to 7GHz RF Power Detector with Fast Comparator Reference Input, Latch Enable Input -26dBm to +12dBm Input Range LTC5537 Wide Dynamic Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range LTC5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LTC5508	300MHz to 7GHz RF Power Detector	44dB Dynamic Range, Temperature Compensated, SC70 Package
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 LTC5534 50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range LTC5534 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 LTC5537 Wide Dynamic Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range LTC5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LTC5509	300MHz to 3GHz RF Power Detector	36dB Dynamic Range, Low Power Consumption, SC70 Package
LTC5532 300MHz to 7GHz Precision RF Power Detector Precision V _{OUT} Offset Control, Adjustable Gain and Offset LTC5534 50MHz to 3GHz Log RF Power Detector with 60dB Dynamic Range	LTC5530	300MHz to 7GHz Precision RF Power Detector	Precision V _{OUT} Offset Control, Shutdown, Adjustable Gain
LT5534 50MHz to 3GHz Log RF Power Detector with 60dB bynamic Range	LTC5531	300MHz to 7GHz Precision RF Power Detector	Precision V _{OUT} Offset Control, Shutdown, Adjustable Offset
Dynamic Range ETC5536 Dynamic Range Response 25ns Response Time, Comparator Reference Input, Latch Enable Input —26dBm to +12dBm Input Range ETS537 Wide Dynamic Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range ETS570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LTC5532	300MHz to 7GHz Precision RF Power Detector	Precision V _{OUT} Offset Control, Adjustable Gain and Offset
Comparator Output -26dBm to +12dBm Input Range LT5537 Wide Dynamic Range Log RF/IF Detector Low Frequency to 1GHz, 83dB Log Linear Dynamic Range LT5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LT5534		±1dB Output Variation over Temperature, 38ns Response Time, Log Linear Response
LT5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LTC5536		25ns Response Time, Comparator Reference Input, Latch Enable Input, -26dBm to +12dBm Input Range
LT5570 2.7GHz RMS Power Detector Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over	LT5537	Wide Dynamic Range Log RF/IF Detector	Low Frequency to 1GHz, 83dB Log Linear Dynamic Range
Temperature and Dynamic Range	LT5570	2.7GHz RMS Power Detector	Fast Responding, up to 60dB Dynamic Range, ±0.3dB Accuracy Over Temperature and Dynamic Range

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