

DESCRIPTION

The Microsemi LX5511 is a power amplifier that is optimized for WLAN applications in the 2.3GHz - 2.5GHz frequency range. The LX5511 Power Amplifier is implemented as a two-stage monolithic microwave integrated circuit (MMIC) with active bias and output pre-matching.

The device is manufactured with an InGaP/GaAs Heterojunction Bipolar Transistor (HBT) IC process (MOCVD). With single low voltage supply of 3.3V 26 dB power gain between 2.3-2.5GHz, at a low quiescent current of 90mA.

For 20dBm OFDM output power (64QAM, 54Mbps), the PA provides a low EVM (Error-Vector Magnitude) of less than 3.0%, and consumes 170 mA total DC current..

The LX5511 is available in a 16-pin 3mmx3mm micro-lead quad package (MLPQ). The compact footprint, low profile, and thermal capability of the MLPQ package makes the LX5511 an ideal solution for medium-gain power amplifier requirements for IEEE 802.11b/g applications

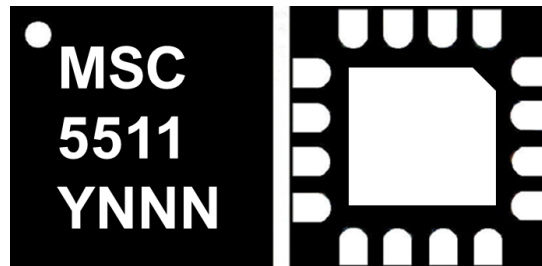
IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

KEY FEATURES

- Advanced InGaP HBT
- 2.3-2.5GHz Operation
- Single-Polarity 3.3V Supply
- Quiescent Current 90mA
- Power Gain 26 dB
- Total Current 150 mA for Pout=18 dBm OFDM
- EVM<3 %, 2.4% Typical 54Mbps/64QAM
- Small Footprint: 3mmx3mm
- Height 0.9mm

APPLICATIONS

- IEEE 802.11b/g

PRODUCT HIGHLIGHT


(YNNN : Trace code)

PACKAGE ORDER INFO
LQ
Plastic MLPQ
16-pin

RoHS Compliant / Pb free

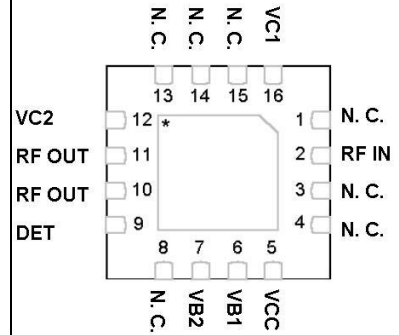
LX5511LQ

Note: Available in Tape & Reel.
Append the letter "TR" to the part number.
(i.e. LX5511LQ-TR)

ABSOLUTE MAXIMUM RATINGS

DC Supply Voltage, RF off.....	5.5V
Collector Current.....	400mA
Total Power Dissipation.....	TBD
RF Input Power.....	+10 dBm
Operation Ambient Temperature.....	-40°C to +85°C
Storage Temperature.....	-65°C to +150°C
Peak Package Solder reflow Temp. (40 second max exposure).....	260°C (+0,-5)

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

PACKAGE PIN OUT


LQ PACKAGE
(Bottom View)

N.C. – Not Connected

RoHS / Pb-free 100% Matte Tin Lead Finish

THERMAL DATA
LQ Plastic MLPQ 16-Pin

THERMAL RESISTANCE-JUNCTION TO CASE, θ_{JC}	10°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	50°C/W

Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$.

The θ_{JA} numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

FUNCTIONAL PIN DESCRIPTION

Name	Description
RF IN	RF input.
VB1	Bias current control voltage for the first stage.
VB2	Bias current control voltage for the second stage. The VB2 pin is connected with the first stage control voltage (VB1) into a single reference voltage (referred to as Vref) through an external resistor bridge.
VCC	Supply voltage for the bias reference and control circuits. This pin can be combined with both VC1 and VC2 pins, resulting in a single supply voltage (referred to as Vc).
RF OUT	RF output.
VC1	Power supply for first stage amplifier.
VC2	Power supply for second stage amplifier.
DET	Power detector output.
GND	The center metal base of the MLP package provides both DC and RF ground as well as heat sink for the power amplifier.

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, the following specifications apply over the operating ambient temperature $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$ except where otherwise noted and the following test conditions: $V_c = 3.3\text{V}$, $V_{ref} = 2.94\text{V}$, $I_{cq} = 90\text{mA}$, $T_A = 25^{\circ}\text{C}$

Parameter	Symbol	Test Conditions	LX5511			Units
			Min	Typ	Max	
SECTION HEADER						
Frequency Range	f		2.3		2.5	GHz
Power Gain at Pout = 20dBm	Gp			26		dB
EVM at Pout < 20dBm		64QAM / 54Mbps, freq=2.412 GHz		2.4	3.0	%
Total Current at Pout = 20dBm	Ic_total			170		mA
ACPR compliant power		64QAM / 54Mbps		26		dBm
Quiescent Current	Icq			90		mA
Bias Control Reference Current	Iref	For Icq = 90mA		2		mA
Small-Signal Gain	S21		24	26	29	dB
Gain Flatness	ΔS_{21}	Over 200MHz		0.5		dB
Gain Variation Over Temperature	ΔS_{21}	0°C to +85°C		1		dB
Input Return Loss				10		dB
Output Return Loss				10		dB
Reverse Isolation				45		dB
Second Harmonic		Pout = 20dBm		-50		dBc
Third Harmonic		Pout = 20dbm		-50		dBc
Total Current at Pout=23dBm		1 Mbps DSSS		240		mA
2 nd side lobe at 23 dBm		1 Mbps DSSS		-52		dBc
Ramp-On Time	t _{ON}	10 ~ 90%		120		ns

Note: All measured data was obtained on a 10 mil GETEK evaluation board without heat sink.

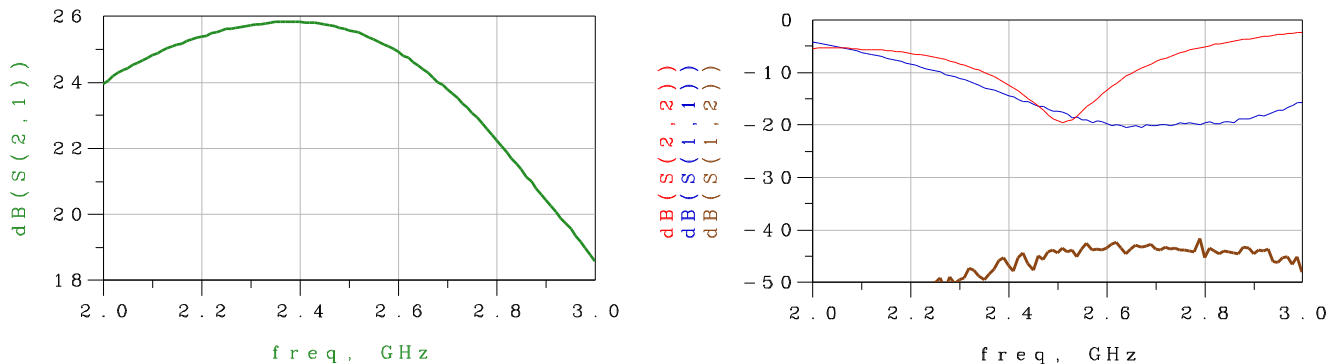
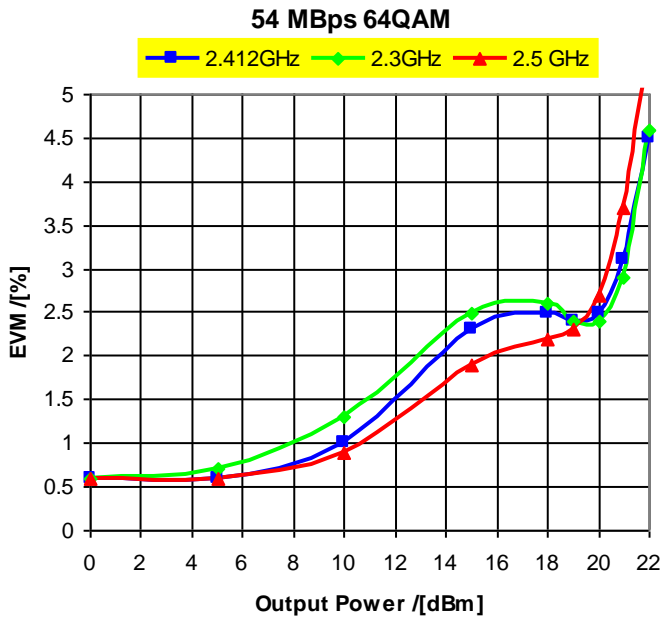
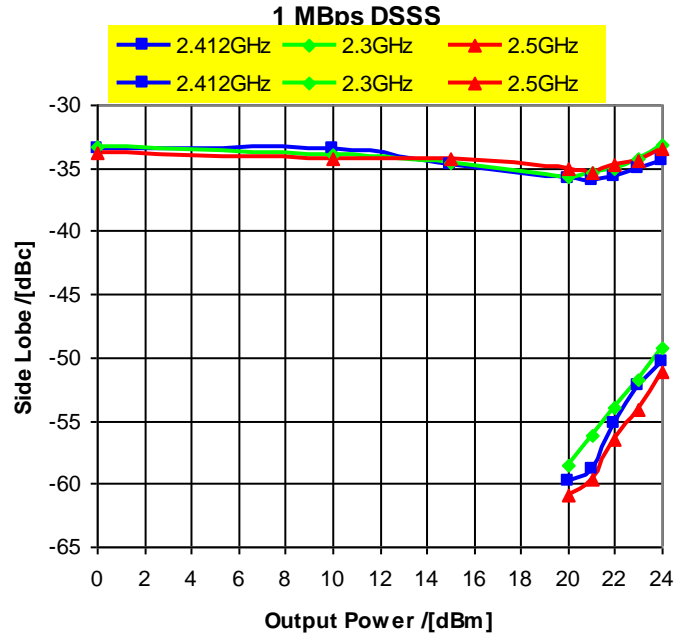
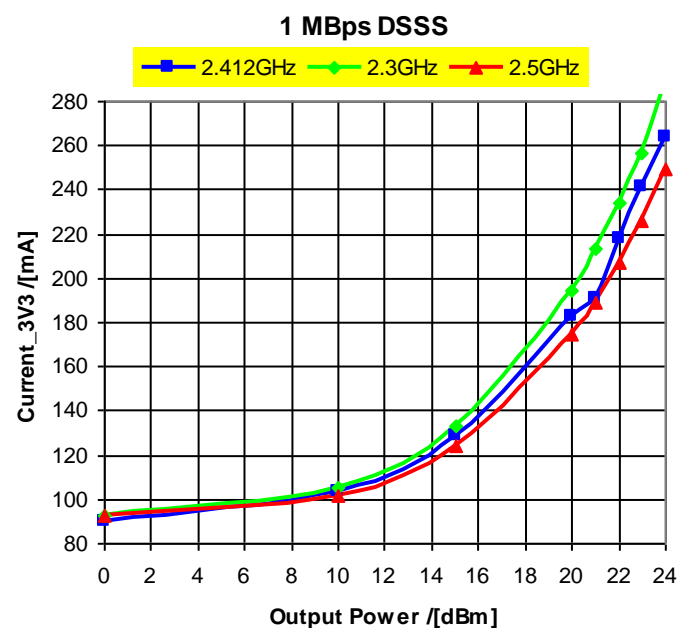
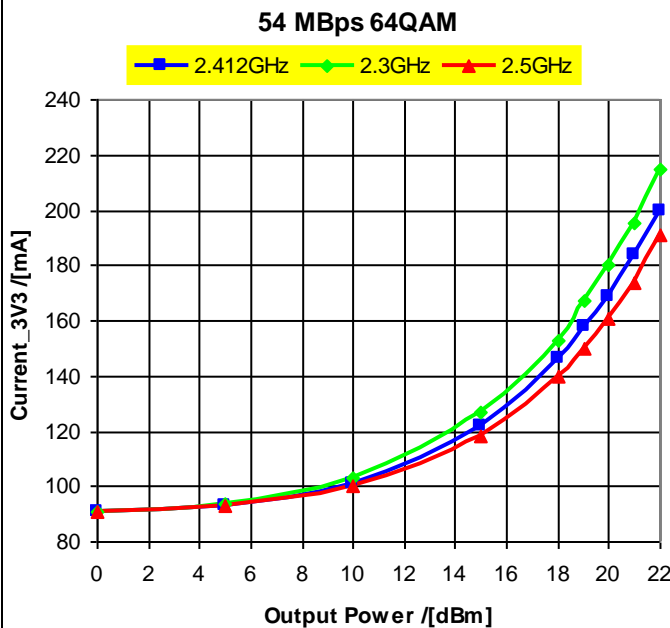
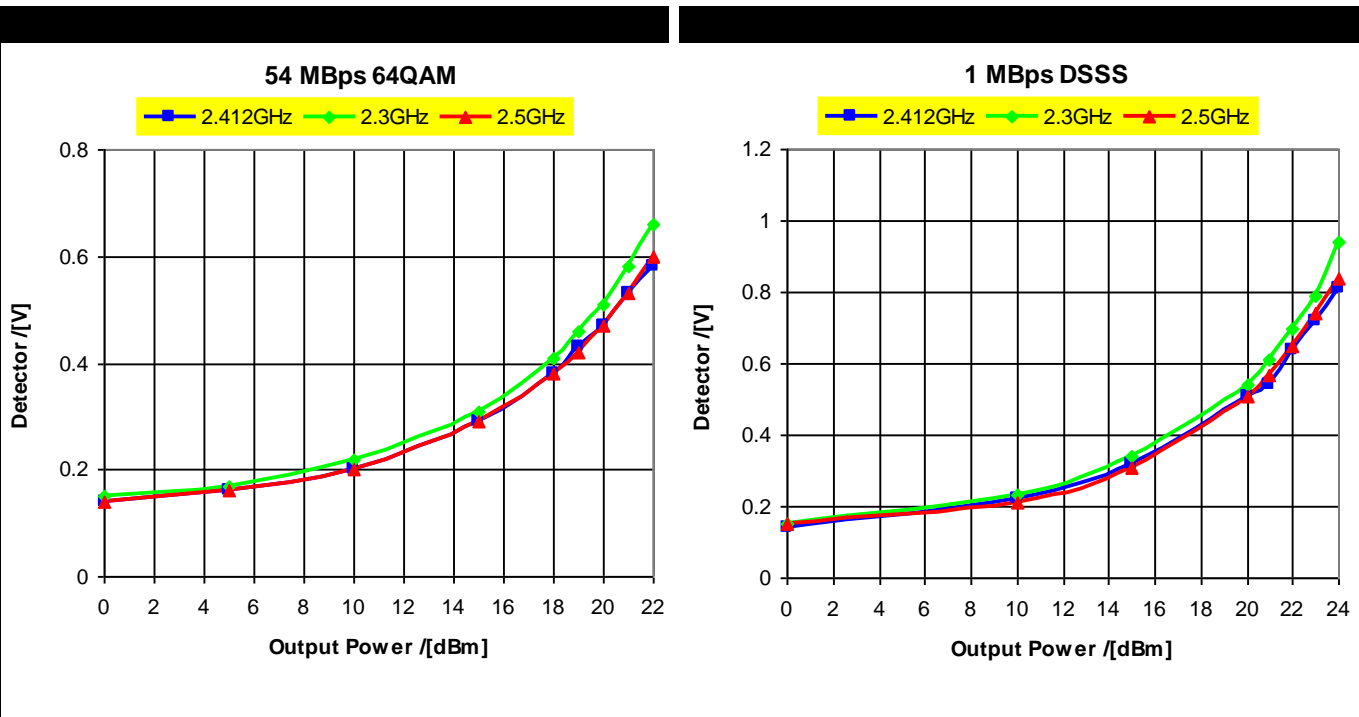
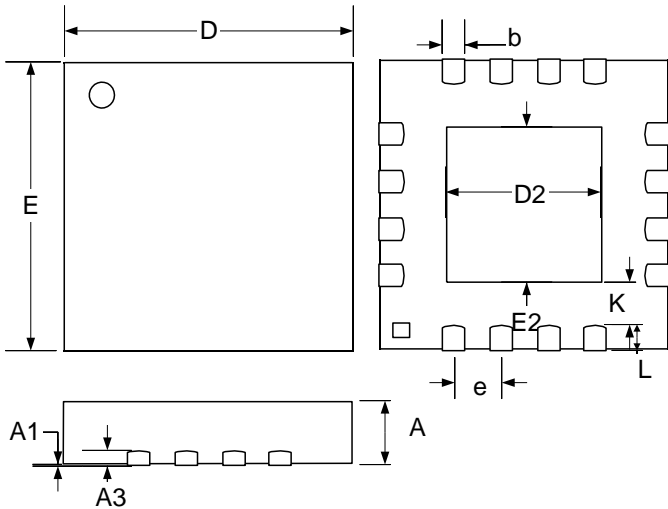


Figure 1 – S-Parameter (VC=3.3V, Vref=2.94V, Icq=90 mA)


Figure 2 – EVM

Figure 3 – Side Lobes

Figure 4 & 5 – Supply Current


Figure 6 & 7 – Detector Voltage

PACKAGE DIMENSIONS
LQ 16-Pin MLPQ 3mm x 3mm


Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0	0.05	0	0.002
A3	0.20 REF		0.008 REF	
b	0.18	0.30	0.007	0.012
D	3.00 BSC		0.118 BSC	
E	3.00 BSC		0.118 BSC	
e	0.50 BSC		0.020 BSC	
D2	1.30	1.55	0.051	0.061
E2	1.30	1.55	0.051	0.061
K	0.2	-	0.008	-
L	0.35	0.50	0.012	0.020

Note:

1. Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.
2. Due to multiple qualified assembly sub-contractors either package (with different pin one indicators) may be shipped. Package type will be consistent within the smallest individual container.



a  MICROCHIP company

LX5511

InGaP HBT 2.3 – 2.5 GHz Power Amplifier

PRODUCTION DATA SHEET

NOTES

PRODUCTION DATA “Information contained in this document is proprietary to Microsemi and is current as of publication date. This document may not be modified in any way without the express written consent of Microsemi. Product processing does not necessarily include testing of all parameters. Microsemi reserves the right to change the configuration and performance of the product and to discontinue product at any time.”