

General Description

The MxL1600 is a family of highly integrated and low power consumption multi-port radio frequency (RF) transceivers for wireless infrastructure radios. Their powerful combination of high integration, ultra-low power dissipation, high performance, and software-defined programmability make them optimal solutions for 2G, 3G, 4G, and 5G macro, massive Multiple-Input/Multiple-Output (MIMO), and small cell radio platforms.

The MxL1600 family integrates four transmitters (Tx), four receivers (Rx), and up to two feedback receivers (FBRX). They are tunable to operate over a frequency range from 380 to 6000 MHz. Each Rx is configurable to support wide signal bandwidths of up to 400 MHz. Each Tx and FBRX is configurable to support wider signal bandwidths up to 850 MHz to facilitate digital pre-distortion algorithms.

The MxL1600 series software defined bandwidth and tuning flexibility is power-efficiently delivered using a direct conversion RF architecture. This architecture is underpinned by integrated digital radio processing functions and low-noise, on-chip local oscillators (LO). An optional external Rx LO input is available when supporting Multi-RAT GSM.

The MxL1600 supports a JESD204 system interface, programmable to operate in either JESD204B or JESD204C mode with lane rates up to 32Gbps.

The MxL1600 has an embedded microcontroller subsystem that simplifies configuration, calibration, and management of the device.

The MxL1600 family are pin and software compatible with the MxL1500 series. Users can alternatively choose the MxL1500 for radios which do not support multi-RAT GSM.

Applications

- 2G/3G/4G/5G Macro-cell radios
- Massive MIMO radios
- Small cell radios
- Distributed Antenna Systems (DAS)
- Repeaters

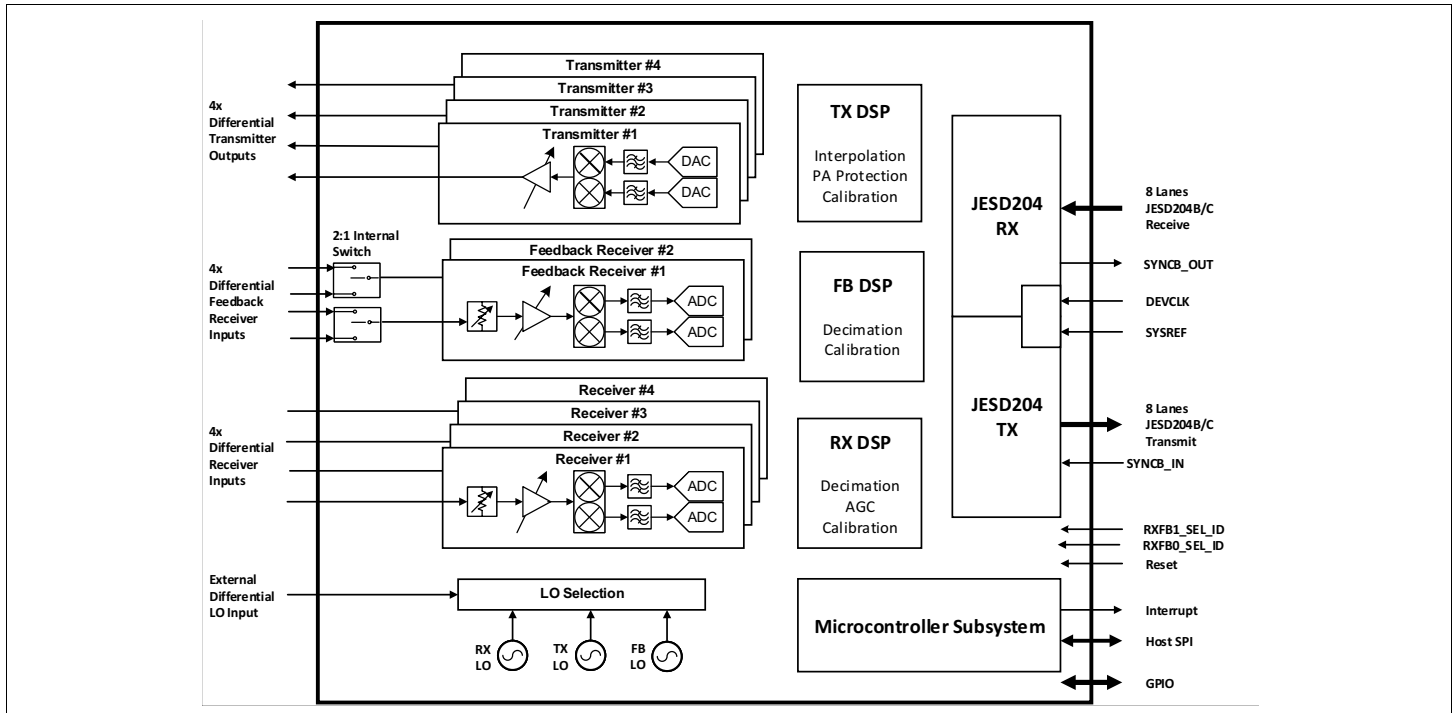
Features

- Four transmitters
- Four receivers
- Up to two feedback receivers
- Integrated dual-input RF switches per FBRX
- RF range from 380 to 6000 MHz
- Rx bandwidth up to 400 MHz
- Tx/FBRX synthesis bandwidth over 850 MHz
- 2G/3G/4G/5G air interface support
- External LO input for multi-RAT GSM mode
- FDD and TDD operation
- Ultra-low power consumption
- Fast power-up and power-down modes
- Deep sleep power saving modes
- Tx power amplifier protection
- Rx gain control
- IQ Imbalance and LO feed-through correction
- JESD204B or JESD204C system interface
- Up to 8 JESD204 TX lanes
- Up to 8 JESD204 RX lanes
- Embedded CPU for control, calibration, and status reporting
- SPI control interface
- GPIO for fast control and status reporting
- JTAG boundary scan including support for AC-coupled differential SERDES interfaces
- 1.8V, 1.2V, 0.8V, and 0.76V power supplies
- 15 x 15 mm, 324 balls, 0.8 mm pitch FCBGA package with exposed die

Supported Standards

- 3GPP Single RAT UTRA and E-UTRA
- 3GPP Multi-RAT GSM, UTRA and E-UTRA
- 3GPP 5G NR Standard
- JEDEC JESD204B, Subclasses 0 and 1
- JEDEC JESD204C, Subclasses 0 and 1
- JTAG IEEE1149.1 and IEEE1149.6

Block Diagram



Ordering Information

Table 1: Ordering Information

| Marketing Part Number | Ordering Part Number | Package | Shipping |
|-----------------------|----------------------|---------|----------|
| MxL1600 | MxL1600-AS-T | FCBGA | Tray |



Corporate Headquarters:
 5966 La Place Court, Suite 100
 Carlsbad, CA 92008
 Tel.: +1 (760) 692-0711
 Fax: +1 (760) 444-8598
www.maxlinear.com

The content of this document is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by MaxLinear, Inc. MaxLinear, Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in the informational content contained in this guide. Complying with all applicable copyright laws is the responsibility of the user. Without limiting the rights under copyright, no part of this document may be reproduced into, stored in, or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the express written permission of MaxLinear, Inc.

MaxLinear, Inc. does not recommend the use of any of its products in life support applications where the failure or malfunction of the product can reasonably be expected to cause failure of the life support system or to significantly affect its safety or effectiveness. Products are not authorized for use in such applications unless MaxLinear, Inc. receives, in writing, assurances to its satisfaction that: (a) the risk of injury or damage has been minimized; (b) the user assumes all such risks; (c) potential liability of MaxLinear, Inc. is adequately protected under the circumstances.

MaxLinear, Inc. may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from MaxLinear, Inc., the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property.

MaxLinear, the MaxLinear logo, any MaxLinear trademarks (MxL, Full-Spectrum Capture, FSC, G.now, AirPHY, Puma, and AnyWAN), and the MaxLinear logo on the products sold are all property of MaxLinear, Inc. or one of MaxLinear's subsidiaries in the U.S.A. and other countries. All rights reserved. Other company trademarks and product names appearing herein are the property of their respective owners.