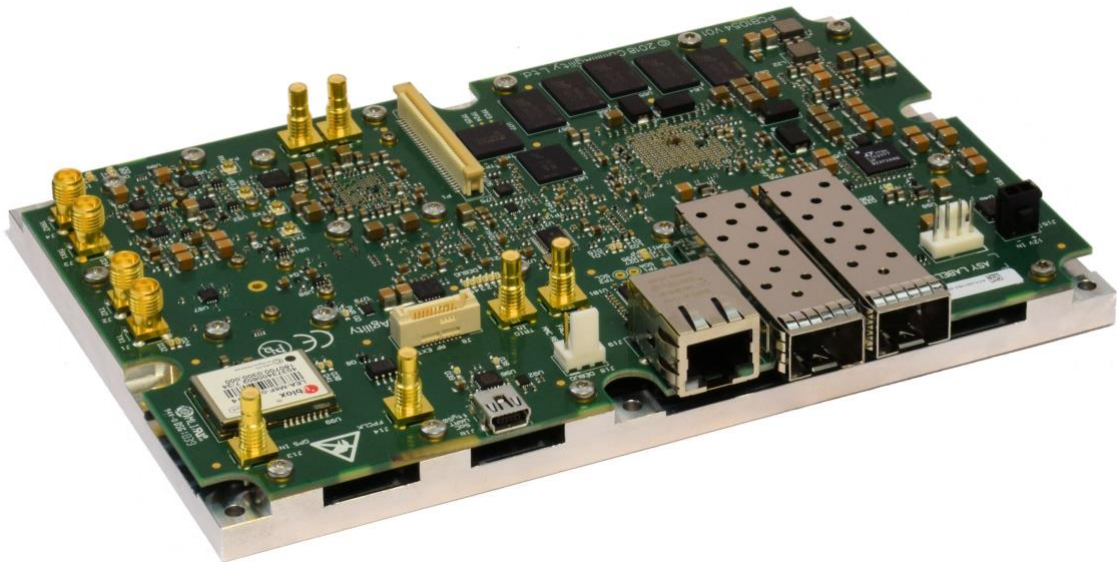


CA-K2L-RF2

Standalone baseband processing and RF module



- A highly integrated standalone module based on TI's TCI6630K2L DSP SoC and AFE7500 RF front end
- A low cost, flexible module, usable as a full small cell solution
- RF output power up to 24dBm average, RF bandwidth up to 20MHz, and frequencies from 700MHz to 4GHz
- Flexible, high bandwidth off-board communications via electrical and optical Ethernet and CPRI

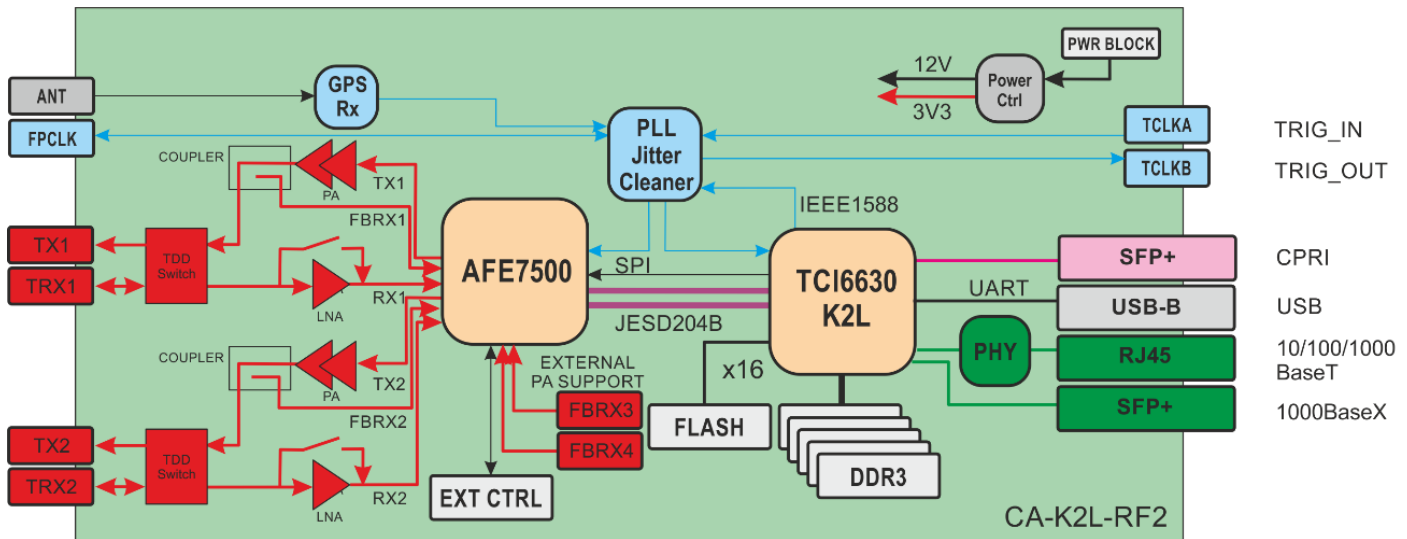
The CA-K2L-RF2 is a high performance ARM and DSP based processing module with two integrated RF transceiver channels. It can be used as a complete baseband and RF small cell solution.

It supports wireless baseband processing and a 2x2 MIMO air interface in radio test systems and eNodeBs. The module is available with CommAgility's industry-leading SmallCellPHY-TI and SmallCellSTACK software, pre-integrated and tested to reduce risk and effort.

The main processor is the TCI6630K2L, part of TI's KeyStone II generation of DSP/ARM

SoCs. It includes four C66x DSP cores and two ARM® Cortex®-A15 MPCore™ processors, all operating at up to 1.2 GHz.

I/O includes Gigabit Ethernet, via RJ45 and SFP+, and CPRI, giving connectivity to networks, host processors and additional RF. Flexible RF capabilities include Tx output power up to 24dBm average, RF bandwidth up to 20MHz, and FDD/TDD support. Build options cover most LTE bands, with others possible with additional customization. Using external cavity filters, the module can be directly deployed as an LTE small cell.



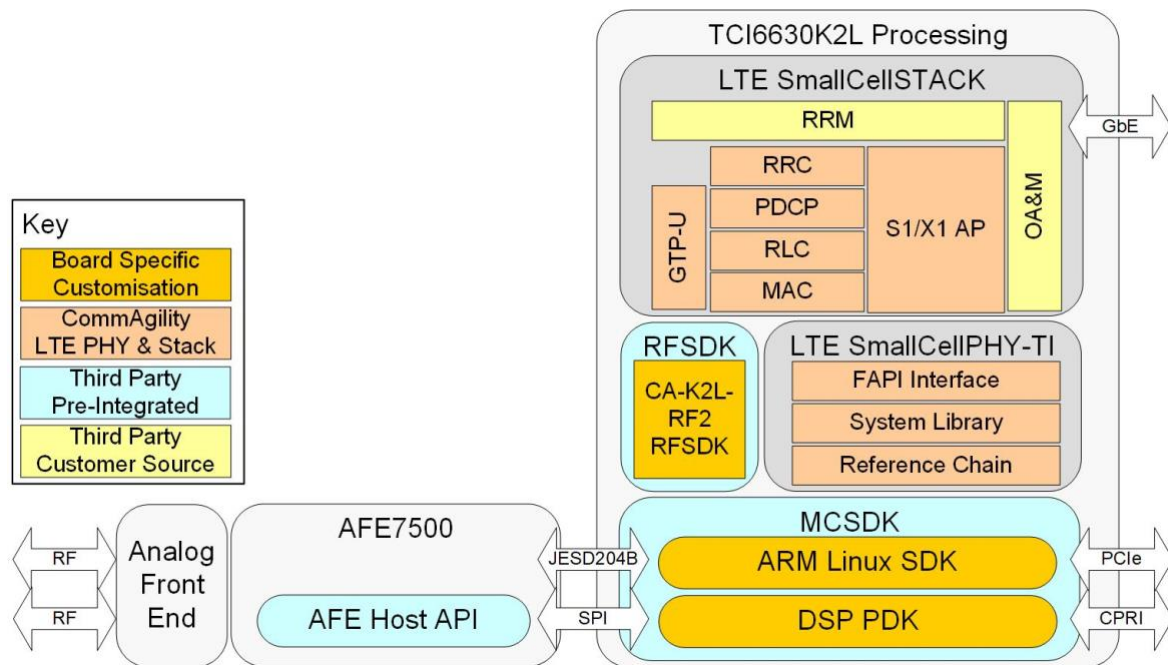
Key Features

- Two flexible, wideband RF channels
- Texas Instruments TCI6630K2L DSP SoC
- Texas Instruments AFE7500 family analog front end
- Pre-integrated LTE PHY and stack available, tested by tier 1 equipment vendors
- Compact module with I/O and power connections
- Extended temperature range with conduction cooling
- Fan attachment for development
- RF suitable for deployment
- +21dBm average Tx power per channel giving +24dBm total
- Multiple modules can be synchronised
- CPRI port supporting master operation
- Gigabit Ethernet optical and electrical interfaces
- Unparalleled support team

Resulting Benefits

- Supports 2x2 MIMO systems natively
- High performance TI device
- Flexible, high quality RF SoC
- Reduced cost, effort and risk
- Minimal external hardware required for deployment, saving system cost
- Suitable for outdoor and rugged deployments
- Easy desktop operation
- Connects via cavity filters direct to an antenna for an LTE eNodeB
- RF output power sufficient for small cells
- To create more complex LTE systems with multiple sectors and carriers
- Can support a Remote Radio Head
- Standard connections to packet core and for control and management
- Faster and easier project development





Software

The CA-K2L-RF2 supports CommAgility's pre-integrated LTE eNodeB PHY (SmallCellPHY-TI) and protocol stack (SmallCellSTACK) as optional licensable deliverables.

The LTE software is used by Tier 1 equipment vendors and is highly integrated with the Texas Instruments TCI6630K2L SoC for maximum performance.

Both software components are 3GPP Rel. 10 today, with roadmap to later 3GPP releases. CommAgility's engineers can also tailor the software to meet special application or processing needs. A variety of licensing models are available to meet customers' specific needs, including source code licensing.

Hardware Specifications

DSP0: TCI6630K2L KeyStone II SoC:

- 4x C66x DSP cores @ 1.2 GHz
- 2x ARM A15 cores @ up to 1.2 GHz
- Accelerators and packet processors
- 2Gbytes x64 DDR3 SDRAM with ECC
- 256Mbytes x16 boot FLASH
- 1x AIL CPRI connection to Port 2, at up to x16 rate
- 2x Gigabit Ethernet

Timing:

- Timing can be from CPRI, external clock or on-board GPS

I/O:

- 2x SMA for RF Tx (FDD mode)
- 2x SMA for RF Rx (FDD) or TRx (TDD)
- SMBs for GPS antenna and clock/sync
- 2x SMBs for RF feedback ports
- External RF control connector
- LEDs

Form Factor:

- 175mm (L) x 122mm (W) x 28mm (H)
- Power input from single 12V connector
- Fan control (for fan cooled applications)
- 1000BaseT Ethernet on RJ-45
- 1000BaseX Ethernet on SFP+
- CPRI SFP+ socket
- USB UART for Linux console

Debug:

- Breakout board for emulation, RS-232
- LEDs for TCI6630K2L

Module Management Controller:

- FRU EEPROM data
- Power & reset, health monitoring

RF Specifications

RFIC: TI AFE7500 family part providing flexible, high bandwidth RF interface with Tx, Rx and feedback ports, closely coupled to TCI6630 SoC via JESD ports, SPI, GPIO.

RF Channels:

- Two RF channels for both Tx and Rx
- Tx and Rx can be the same (TDD) or different (FDD) frequencies and ports

RF Frequency Build Options:

Build	Tx (MHz)	Rx (MHz)
B1A	700-800	700-2700
B1B	800-900	700-2700
B1C	900-990	700-2700
B2A	1600-1950	700-2700
B2B	1900-2000	700-2700
B2C	2000-2300	700-2700
B3A	2100-2490	700-2700
B3B	2490-2700	700-2700
B4A	3400-3800	3400-4000

TX Bandwidth:

- 1.4, 3, 5, 10, 15, 20MHz bandwidth at full Tx power

RX Bandwidth:

- 5, 10, 15, 20MHz filtered analogue bandwidth
- 1.4 and 3MHz via digital filtering

TX Ports:

- Maximum Tx power: +24dBm average using CFR/DPD (+22dBm for B4A), +30dBm peak
- Gain Range: >60dB
- EVM: <2% across the usable range (without CFR), lower in many cases

RX Ports:

- Maximum input power (average): +10dBm (normal operation) +16dBm (safety max.)
- Gain range: >65dB
- Sensitivity: to antenna noise floor, with 5dB Noise Figure
- EVM: <2% across the usable range, much lower in many cases

LTE Deployment:

- RF ports will meet the LTE RF specifications for a small cell when connected via suitable cavity filters.

External power amp control:

- Amplifier control connector
- 2x feedback RF ports for external DPD

Environment/EMC/Safety

- Operating temp: -40°C to +70°C
- Conduction cooled, or air cooled by attaching CPU cooler
- Power consumption: 30W typical
- Compliant with relevant EU and FCC legislation in appropriate housing

OEM Partnership Services

IN DEVELOPMENT: Support and training; hardware customisation; software and FPGA development.

IN PRODUCTION: lead-time reduction; extended warranty; and repair; quick turn repairs and/or spares stocking.

EXTENDED LIFE: obsolescence management; guaranteed lifecycle; Escrow.
LICENSING can be offered for high volume projects.



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