2–18 GHz Up/Downconverter with 1.8 GHz IF

LCMIXUD-2000-18000A supports downconversion from 2–18 GHz RF to 1.8±0.5 GHz IF and an independent upconversion channel from that IF band to 2–18 GHz RF. Downconversion LNA/through-path gains are 65/28 dB typical, with 4/14 dB typical noise figures. Downconversion output P1dB is ≥12 dBm; upconversion small-signal gain is ≥15 dB and output P1dB ≥5 dBm.



The J30J-15ZKP interface defines +12 V input, ground, SPI and EN1/EN2 contacts. Enable polarity and channel assignment are not specified. Phase-noise values are design targets; preliminary dimensions are 145 × 100 × 40 mm excluding mounting lugs.

Conflicting LO1 ranges and the upconversion spurious reference-port condition are withheld. Independent channels do not establish a simultaneous full-duplex rating.

Electrical specifications

Parameter	Value	Unit
RF input frequency	2–18	GHz
IF output frequency	1.8±0.5	GHz
LNA-path gain	65 (Typical)	dB
Through-path gain	28 (Typical)	dB
Gain variation	±1	dB
LNA-path noise figure	4 (Typical)	dB
Through-path noise figure	14 (Typical)	dB
Output P1dB	≥12	dBm
Output OIP3	≥25	dBm
RF attenuation range [1]	31.5	dB
RF attenuation step	0.5	dB
RF attenuator bit count	6	-
IF attenuation span [1]	31.5	dB
IF attenuation step	0.5	dB
Calibration attenuation range [1]	15.5	dB
Calibration attenuation step	0.5	dB
Calibration attenuator bit count	5	-
RF-input-equivalent spurious level [2]	≤−90	dBm
Single-tone SFDR [3]	≥55	dB
Harmonic rejection [4]	≥45	dB
Image rejection	≥70	dB

Electrical specifications

Parameter	Value	Unit
Gain flatness [5]	≤5	dB
IF filter rejection [6]	≥50	dBc

[1] Attenuation span as stated; an unstated zero state is not inferred.
[2] Equivalent RF input, bandwidth: 1000 MHz.
[3] RF input power: −25 dBm. Through-path test.
[4] RF input power: −28 dBm. Through-path test.
[5] Specified operating range.
[6] IF frequency: 1.8 GHz; Offset: ±700 MHz.

Upconversion specifications

Parameter	Value	Unit
Upconversion — IF input frequency	1.8±0.5	GHz
Upconversion — RF output frequency	2–18	GHz
Upconversion gain	≥15	dB
Upconversion — Output P1dB	≥5	dBm
Upconversion — attenuation range	15.5 (Attenuation span as stated; an unstated zero state is not inferred.)	dB
Upconversion — Attenuation step	0.5	dB
Upconversion — Attenuator bit count	5	-
Upconversion — Harmonic rejection	≥30	dBc

Filter-bank passbands

Parameter	Value	Unit
Filter 1 passband [1]	1.9–3.2	GHz
Filter 2 passband [1]	2.2–3.7	GHz
Filter 3 passband [1]	2.7–4.6	GHz
Filter 4 passband [1]	3.6–6.1	GHz
Filter 5 passband [1]	5.1–8.9	GHz
Filter 6 passband [1]	7.9–13.8	GHz
Filter 7 passband [1]	12.8–18	GHz
Intermediate filter passband	22±0.5	GHz

[1] The RF operating range is 2–18 GHz. Confirm the filter selection for the intended configuration.

Interfaces and contacts

Interface	Specification	Unit
Receive RF input	RFD: SMA	-
Receive IF output	IFD: SMA	-
Transmit RF output	RFU: SMA	-
Transmit IF input	IFU: SMA	-
BITE calibration input	BITE: SMA	-
Reference output	REF: 100	MHz
Power and control connector	J30J-15ZKP	-
Supply contacts	1, 2 → +12 V	-
Ground contacts	3, 4 → GND	-
SPI clock contact	5 → SCK	-
SPI select contact	6 → CSB	-
SPI data contact	7 → MOSI	-
SPI data output contact	8 → MISO	-
Channel enable 1	9 → EN1 (Enable polarity and channel assignment are unspecified.)	-
Channel enable 2	10 → EN2 (Enable polarity and channel assignment are unspecified.)	-
SPI NC contact	11–15 → NC (Reserved contact.)	-
RF connector count	6 (See the outline drawing for the connector layout.)	-

Oscillator specifications

Parameter	Value	Unit
LO1 frequency step	10	MHz
LO1 switching response	≤100 (Design specification. Maximum: 100 µs.)	µs
LO2 frequency	20.2 (Design specification.)	GHz

Phase-noise design targets

Design target.

Parameter	Value	Unit
LO1 phase noise at 100 Hz	≤-65	dBc/Hz
LO1 phase noise at 1 kHz	≤-80	dBc/Hz
LO1 phase noise at 10 kHz	≤-88	dBc/Hz

Phase-noise design targets

Design target.

Parameter	Value	Unit
LO1 phase noise at 100 kHz	≤-90	dBc/Hz
LO1 phase noise at 1 MHz	≤-100	dBc/Hz
LO2 phase noise at 100 Hz	≤-75	dBc/Hz
LO2 phase noise at 1 kHz	≤-85	dBc/Hz
LO2 phase noise at 10 kHz	≤-92	dBc/Hz
LO2 phase noise at 100 kHz	≤-95	dBc/Hz
LO2 phase noise at 1 MHz	≤-105	dBc/Hz

Mechanical specifications

Parameter	Value	Unit
Outline dimensions [1]	145 × 100 × 40	mm
Mounting-hole center spacing [2]	106 × 139	mm
Mounting holes [2]	4 × Φ2.7	mm

[1] Reference dimensions exclude the mounting lugs.

[2] Mounting reference dimensions. See the outline drawing.

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Document notice

Specifications are subject to revision. Before design release, confirm the current document revision and product-specific requirements with LCRF. The approved quotation and order documentation define the supplied configuration.