

2–18 GHz Up/Downconverter with 1.8 GHz IF

Separate conversion channels, 65 dB typical downconversion LNA gain and ≥ 15 dB upconversion gain with programmable attenuation.

Electrical specifications

Parameter	Value	Unit	Notes
RF input frequency	2–18	GHz	-
IF output frequency	1.8 $\pm$ 0.5	GHz	-
LNA-path gain	65	dB	Typical: 65 dB.
Through-path gain	28	dB	Typical: 28 dB.
Gain variation	± 1	dB	-
LNA-path noise figure	4	dB	Typical: 4 dB.
Through-path noise figure	14	dB	Typical: 14 dB.
Output P1dB	≥ 12	dBm	Minimum: 12 dBm.
Output OIP3	≥ 25	dBm	Minimum: 25 dBm.
RF attenuation range	31.5	dB	Attenuation span as stated; an unstated zero state is not inferred.
RF attenuation step	0.5	dB	-
RF attenuator bit count	6	-	-
IF attenuation span	31.5	dB	Attenuation span as stated; an unstated zero state is not inferred.
IF attenuation step	0.5	dB	-
Calibration attenuation range	15.5	dB	Attenuation span as stated; an unstated zero state is not inferred.
Calibration attenuation step	0.5	dB	-
Calibration attenuator bit count	5	-	-
RF-input-equivalent spurious level	≤ -90	dBm	Equivalent RF input, bandwidth: 1000 MHz. Maximum: -90 dBm.
Single-tone SFDR	≥ 55	dB	RF input power: -25 dBm. Through-path test. Minimum: 55 dB.
Harmonic rejection	≥ 45	dB	RF input power: -28 dBm. Through-path test. Minimum: 45 dB.
Image rejection	≥ 70	dB	Minimum: 70 dB.
Gain flatness	≤ 5	dB	Specified operating range. Maximum: 5 dB.
IF filter rejection	≥ 50	dBc	IF frequency: 1.8 GHz; Offset: ± 700 MHz. Minimum: 50 dBc.

Upconversion specifications

Parameter	Value	Unit
Upconversion — IF input frequency	1.8±0.5	GHz
Upconversion — RF output frequency	2–18	GHz
Upconversion gain	≥15 (Minimum: 15 dB.)	dB
Upconversion — Output P1dB	≥5 (Minimum: 5 dBm.)	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 (Minimum: 30 dBc.)	dBc

Filter-bank passbands

Parameter	Value	Unit	Notes
Filter 1 passband	1.9–3.2	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Filter 2 passband	2.2–3.7	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Filter 3 passband	2.7–4.6	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Filter 4 passband	3.6–6.1	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Filter 5 passband	5.1–8.9	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Filter 6 passband	7.9–13.8	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Filter 7 passband	12.8–18	GHz	Native diagrams state this passband; selection code is unspecified and the overall RF operating range remains 2–18 GHz.
Intermediate filter passband	22±0.5	GHz	-

Interfaces and contacts

Parameter	Value	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 (Preliminary source drawing dimensions.)	-

Oscillator specifications

Parameter	Value	Unit
LO1 frequency step	10	MHz
LO1 switching response	≤100 (Source specifies design guarantee; independent measurement evidence is not supplied. Maximum: 100 μs.)	μs
LO2 frequency	20.2 (Source specifies design guarantee; independent measurement evidence is not supplied.)	GHz

Mechanical specifications

Parameter	Value	Unit	Notes
Outline dimensions	145 × 100 × 40	mm	Preliminary source dimensions, excluding mounting lugs.
Mounting-hole center spacing	106 × 139	mm	Preliminary source drawing dimensions.
Mounting holes	4 × Φ2.7	mm	Preliminary source drawing dimensions.

Phase-noise design targets

Parameter	Value	Unit	Notes
LO1 phase noise at 100 Hz	≤-65	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 100 Hz. Maximum: -65 dBc/Hz.
LO1 phase noise at 1 kHz	≤-80	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 1 kHz. Maximum: -80 dBc/Hz.
LO1 phase noise at 10 kHz	≤-88	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 10 kHz. Maximum: -88 dBc/Hz.
LO1 phase noise at 100 kHz	≤-90	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 100 kHz. Maximum: -90 dBc/Hz.
LO1 phase noise at 1 MHz	≤-100	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 1 MHz. Maximum: -100 dBc/Hz.
LO2 phase noise at 100 Hz	≤-75	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 100 Hz. Maximum: -75 dBc/Hz.
LO2 phase noise at 1 kHz	≤-85	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 1 kHz. Maximum: -85 dBc/Hz.
LO2 phase noise at 10 kHz	≤-92	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 10 kHz. Maximum: -92 dBc/Hz.

Phase-noise design targets

Parameter	Value	Unit	Notes
LO2 phase noise at 100 kHz	≤-95	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 100 kHz. Maximum: -95 dBc/Hz.
LO2 phase noise at 1 MHz	≤-105	dBc/Hz	Source design target; not demonstrated measured or qualified phase-noise performance. Offset: 1 MHz. Maximum: -105 dBc/Hz.

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.