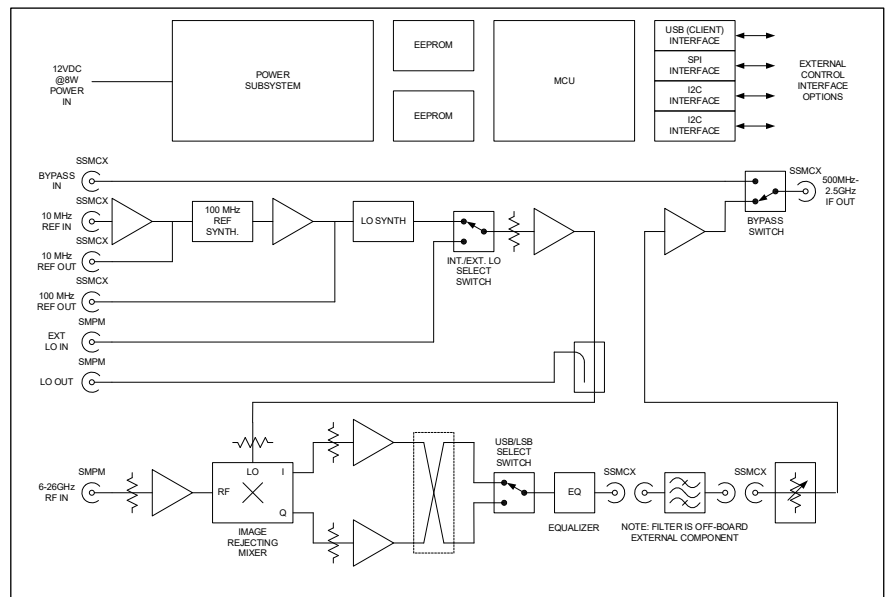


WASP BLOCK DOWNCONVERTER

CONVERTS 2-GHZ BLOCK IN 6-GHZ – 26.5-GHZ TO L-BAND IF

- WASP board downconverts a 2-GHz-wide frequency block in any portion of the 6-GHz to 26.5-GHz frequency range to a 500-MHz to 2500-MHz L-band intermediate frequency (IF)
 - Low phase noise local-oscillator (LO) synthesizer has available LO output
 - Onboard reference conditioning is available for 10-MHz external reference with 10-MHz and 100-MHz reference outputs
 - Onboard power distribution accepts any input voltage between +8 VDC and +34 VDC
 - Onboard microcontroller unit (MCU) provides external USB, serial peripheral interface (SPI), and I2C communication interfaces for communication and control
- HIGH-PERFORMANCE, SELF-CONTAINED UNIT** includes a low phase noise LO synthesizer, reference input conditioning, high-efficiency power conditioning, and a powerful MCU for communications and control
 - IMAGE-REJECTING MIXER DESIGN** has a digital attenuator on the output side of the mixer for adjustment of the conversion gain
 - OFF-BOARD CONNECTORS** break the IF signal path to provide access for an external (off-board) IF filter
 - Unit can be used in conjunction with the WASP Block Upconverter to make phase-coherent frequency translation systems
 - Optimized to work with software-defined radios (SDRs)

DOWNCONVERTER BLOCK DIAGRAM

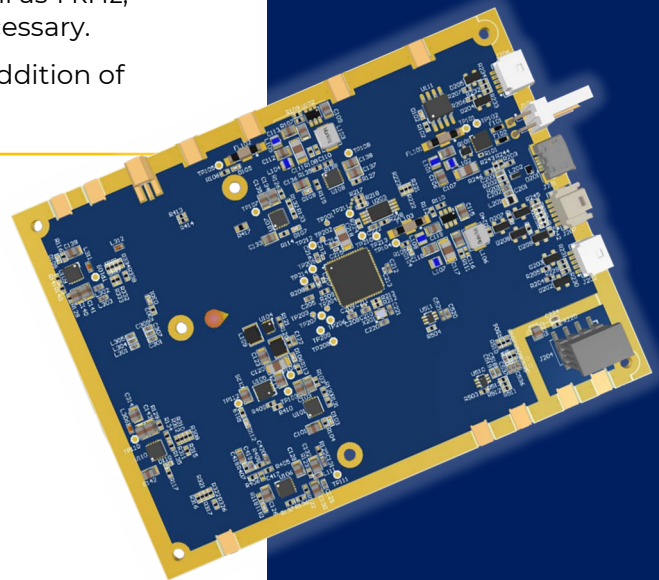


SPECIFICATIONS

- Input frequency range: 6 GHz to 26.5 GHz
- LO tuning range: 8.5 GHz to 24 GHz in TBD steps¹
- Input impedance: 50 Ohms
- Input return loss: 16 dB typical
- LO leakage: -67 dBm
- Output IF: 1500 MHz \pm 1 GHz (500 MHz to 2500 MHz)
- Output impedance: 50 Ohms
- Return loss: 13 dB minimum
- Power output: +4 dBm minimum
- Noise figure: 10 dB typical, 12 dB maximum
- Conversion gain: -0 dB to +30 dB in 0.5 dB steps
- Amplitude flatness: \pm 1.5 dB
- Image rejection: 30 dB typical, 20 dB minimum²
- Group delay: TBD (depends on off-board IF filter)
- Phase noise: TBD
- IP3: +25 dBm (third-order \leq 50 dBc for two tones @ +0 dBm)
- AM/PM conversion: TBD
- Gain slope: TBD (adjusted by choice of onboard equalizer)
- Spurious outputs:
 - Signal related: TBD (target: 60 dBc minimum)
 - Signal independent: TBD (target: -90 dBm max)
- Power: ~8 W @ 7-36 VDC
- Size: 80 mm x 106 mm x 12.8 mm

¹ LO can be commanded to tune from 8 GHz to 32 GHz, but other components limit useful range. Step size can be as small as 1 kHz, but for best phase noise, a larger step size might be necessary.

² Image rejection can be improved to >60 dB with the addition of an optional switched filter bank board.



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