



M I C R O T U N E ®

RF SILICON AND SUBSYSTEMS SOLUTIONS
FOR BROADBAND COMMUNICATIONS AND AUTOMOTIVE ELECTRONICS

MT2122 SINGLE-CHIP BROADBAND TUNER

PRODUCT BRIEF

The MT2122 is a fully integrated broadband tuner for analog and digital OpenCable™ set-top boxes and home gateways.



MT2122 Single-Chip Broadband Tuner

The MicroTuner™ MT2122 is a fully integrated single-chip tuner, with functional blocks specifically designed to ease implementation of high-performance analog and digital OpenCable™ set-top boxes. It supports advanced analog/digital set-top boxes (STB) including OpenCable, and home gateway applications.

The MT2122 has been developed to give manufacturers design flexibility at low cost without compromising high performance.

The MT2122 receives signals from 48 – 1100 MHz. It features integrated filter components and controls that allow for a simple, alignment-free pre-select filter. This provides excellent end-to-end linearity performance in severely sloped input conditions. MT2122 greatly reduces complexity for Multimedia over Coax Alliance (MoCA®) applications.

Its dual-conversion architecture ensures consistent OpenCable compliant performance with no manual alignment. The on-chip buffer amplifier for Forward Data Channel (FDC) reduces bill of material (BOM) cost while improving performance compared to solutions using a directional coupler.

The MT2122 includes a PIN diode attenuator linearizer circuit that can drive a PI-network pin diode attenuator in the signal path. The MT2122 also supports multi-tuner front-end implementations and is programmable through a serial bus interface.

APPLICATIONS

- Advanced analog and digital set-top boxes (STB) including OpenCable.
- Home gateways

FEATURES

- Output fully compatible with demodulators for NTSC, PAL, SECAM, DAVIC, DVB-C, DOCSIS®, Euro-DOCSIS™, OpenCable and other standards
- On-chip amplifier for Forward Data Channel (FDC)
- Ease of multi-tuner front-end implementations
- Dual-conversion architecture for consistent OpenCable compliant performance
- Serial control interface
- One general purpose output controllable via serial control interface
- On-chip frequency synthesis system integrating PLL, VCOs and varactors.
- 1.1 GHz bandwidth
- No need for the 28 V to 33 V supplies typically required by traditional cable tuners
- Automatic frequency control (AFC) voltage detector for frequency fine-tuning
- Integrated temperature sensor for thermally sensitive systems
- 3.3 V and 5 V serial bus compatible
- No tunable parts required
- Simple interface to external filters
- Software shutdown mode
- Small 8 mm x 8 mm 56-pin QFN package

M I C R O T U N E

RECOMMENDED OPERATING CONDITIONS

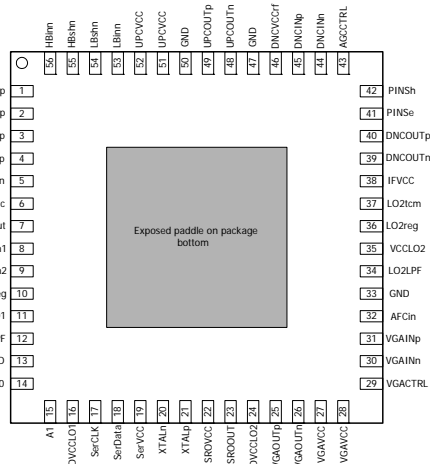
PARAMETER	MIN	TYP	MAX	UNIT
Input frequency range	48		1100	MHz
First intermediate center frequency		1690		MHz
Second intermediate frequency (programmable)	30		57	MHz
Supply voltage, +5 V	4.75	5.0	5.25	V
Supply voltage, +3.3 V	3.15	3.3	3.45	V
Supply voltage ripple			15	mV
Operating junction temperature			125	°C
VGA differential output load impedance	300			Ω
Serial control clock			400	kHz
DNC differential load impedance	800			Ω

ABSOLUTE MAXIMUM RATINGS

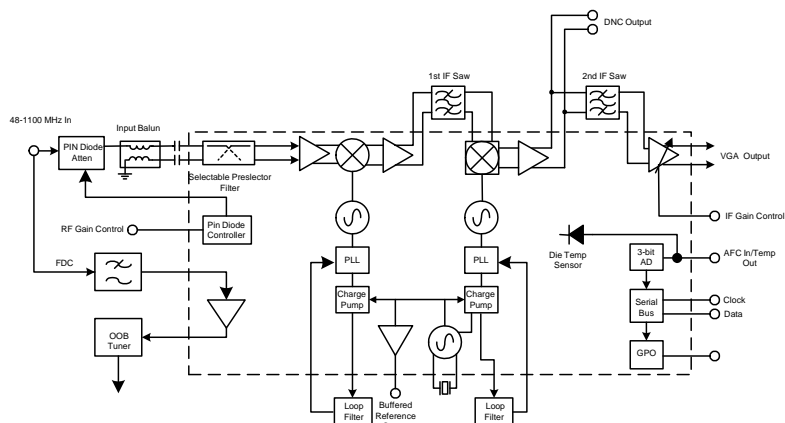
PARAMETER	MIN	MAX	UNIT
Supply voltage, +5 V		6	V
Supply voltage, +3.3 V		3.6	V
Junction temperature		125	°C
Storage temperature	-50	150	°C
Lead-free solder temperature for 5 seconds, x3		260	°C
Relative humidity		85	%
Input voltage	-0.3	V _{CC} +0.3	V

TUNER ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Power Supply				
Active current, +5 V		270	301	mA
Active current, +3.3 V		82		mA
RF Signal Path (See block diagram)				
Input frequency range	48		1100	MHz
Noise figure (DNC Out), 48-1100 MHz		10.5	11.5	dB
Noise figure, max RF gain and IF gain, at VGA output 48-11000 MHz		10.8	11.7	dB
Terminal voltage gain (DNC Out)		29		dB
RF AGC range		30		dB
Image rejection		70		dB
LO phase noise (10 kHz)		-85		dBc/Hz
LO phase noise (100 kHz) 50-855 MHz		-105		dBc/Hz
LO1 step size		250		kHz
LO2 step size		2		kHz
IF VGA				
Frequency range	30		57	MHz
Output voltage swing		1.0		Vp-p
Terminal voltage gain, VGACTRL = 0.7			12.5	dB
Terminal voltage gain, VGACTRL = 3.3V	51.5			dB
IF AGC range		30		dB
FDC				
Frequency range	70		130	MHz
Gain	-2.5	1.0	2.0	dB
Noise figure		12		dB



MT2122 Pin Diagram



MT2122 Block Diagram



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