MT2050 SINGLE-CHIP BROADBAND TUNER

CABLE MODEM TUNER AND DIGITAL SET-TOP BOX APPLICATIONS

APPLICATIONS

- Cable modems / voice-enabled cable modems
- Digital set-top boxes (STB)
- Home gateways

MT2050 Tuner

FEATURES

- 48 MHz to 860 MHz input frequency range
- Works seamlessly with all analog and digital demodulators
- Low power dual-conversion architecture
- Minimal external components
- No manually tunable parts required
- Simple interface to external filters
- Integrated IF variable gain amplifier for direct connection to digital demodulators
- Fully compatible with NTSC, PAL, SECAM, DAVIC, DVB-C, DOCSIS 1.0, 1.1 and 2.0, EuroDOCSIS and other standards
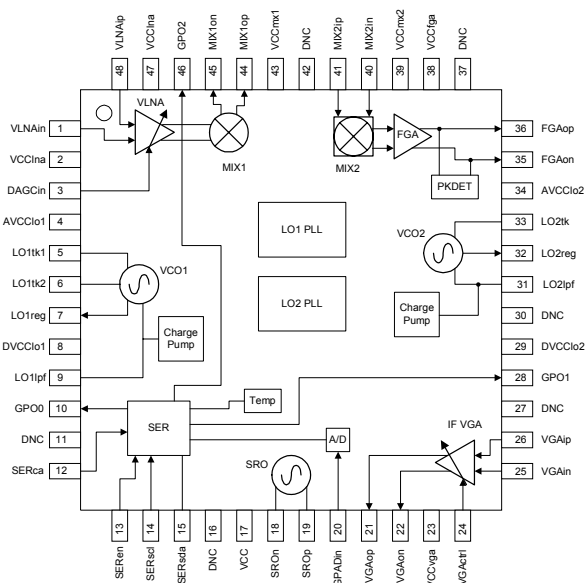
The MT2050 is an advanced single-chip broadband tuner that has been optimized for high performance cable modems and digital cable STBs that require low composite distortion and noise under digital cable environments. The MT2050 includes all active circuitry required to implement total RF functionality, making it the world's first complete RF/amplifier silicon front end. It is capable of receiving frequencies in the 48 MHz to 860 MHz range and converting a selected channel to a standard intermediate frequency (IF). Supported IF frequencies include NTSC, PAL, and digital standards including DOCSIS, EuroDOCSIS, DVB-C, and ITU J83, A, B, C.

The MT2050's low close-in phase noise allows it to be used for both digital and analog video signals including video, high speed data, and voice. Its dual-conversion architecture, with no requirement for tracking filters, yields the desirable characteristics of traditional cable television tuners: controlled input impedance across the entire input band, low in-band emissions, and outstanding image rejection.

broadband media access for the new century

Product Brief

PIN DIAGRAM

Preliminary and Confidential

RECOMMENDED OPERATING CONDITIONS

PARAMETER	MIN	TYP	MAX	UNIT
Input frequency range	48		860	MHz
First intermediate center frequency		1220		MHz
Second intermediate center frequency (programmable)	30		60	MHz
Supply voltage	4.75	5	5.25	V
Supply voltage ripple			15	mV
Operating junction temperature			100	°C
VGA output load impedance	300			Ω
Serial control clock			400	kHz

ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN	MAX	UNIT
Supply voltage		6	V
Storage temperature range	-40	+150	°C
Lead temperature (soldering, 4 seconds)		+245	°C
Input voltage	-0.3	VCC +0.3	V

ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Power Supply				
Active current		325		mA
Shut-down current		40		mA
Upconversion				
Input frequency range	48		860	MHz
Return loss		9.5		dB
First IF center frequency		1220		MHz
Noise figure, max gain		7		dB
Terminal voltage gain		18		dB
AGC range	30			dB
Gain variation at any frequency	-3		+3	dB
OIP3	68	72		dBmV
Downconversion				
Input frequency range		1220		MHz
Noise figure		10		dB
Terminal voltage gain		29		dB
Image rejection	28	33		dBc
OIP3	77	79		dBmV
LO1				
LO frequency	1268		2080	MHz
LO step size		1		kHz
Phase noise (10 kHz)		-86		dBc/Hz
Phase noise (100 kHz)		-109		dBc/Hz
Spurious			-60	dBc
LO2				
LO frequency	1160		1190	MHz
LO step size		50		kHz
Phase noise (10 kHz)		-94		dBc/Hz
Phase noise (100 kHz)		-114		dBc/Hz
Spurious			-60	dBc
IF VGA				
Frequency range	30		60	MHz
Output voltage		1.0		Vp-p
Terminal voltage gain	12.5		51.5	dB
Noise figure, max gain		12.5		dB
OIP3	76			dBmV
Serial Interface				
Serial clock frequency			400	kHz
V_{IH}	2.3			V
V_{IL}			1.5	V