MICROTUNE

RF SILICON AND SYSTEMS SOLUTIONS
FOR BROADBAND COMMUNICATIONS, AUTOMOTIVE ELECTRONICS AND WIRELESS CONNECTIVITY

MT1560 UPSTREAM AMPLIFIER

PRODUCT BRIEF

The MT1560 is a 3.3V programmable gain upstream amplifier.

MT1560 Upstream Amplifier

The Microtune® MT1560 is a low-cost programmable-gain power amplifier IC for use in CATV upstream applications. The MT1560 is a 3.3 volt part optimized for the DOCSIS 2.0 upstream standard.

The device's specified frequency range is from 5MHz to 65MHz, and can output 67dBmV through a 1:1 impedance-ratio transformer. A 3-wire digital serial bus controls the variable gain, with gain control available in 1dB steps and a nominal 59dB gain range.

The MT1560 may be disabled via an external control pin. The transmit-disable mode not only minimizes output noise by shutting off the output stage, but also maintains its output impedance at nominal levels. Output transients are nominally less than 16mVp-p at 61dBmV output level during transmit enable/disable switching.

Operating from a single +3.3V supply, the amplifier's typical current draw at maximum gain, or minimum attenuation, is 212mA. Additional internal circuitry reduces the amplifier's power consumption depending on gain setting. Transmit-disable mode power supply current is reduced to a nominal of 18mA. A shutdown mode further reduces current to a nominal of 80µA.

The MT1560 is available in a 20-pin MicroLeadFrame™ package with an exposed pad for the extended industrial temperature range of -40°C to +85°C.

MT1560 APPLICATIONS

- Cable modems
- Telephony over cable
- Set-top box CATV

FEATURES

- Maximum output level of 67dBmV
- Low power-up/down transients of 16mV$_{p-p}$ typical at 61dBmV output
- Ultra low third harmonic distortion
- Single +3.3V supply
- 59dB gain range
- Gain programmable in 1dB steps
- Low transmit output noise floor: -51dBmV in 160kHz
- Low transmit-disable output noise: -68dBmV
- Two power-down modes
- DOCSIS 2.0 compatible

MICROTUNE

DC ELECTRICAL CHARACTERISTICS

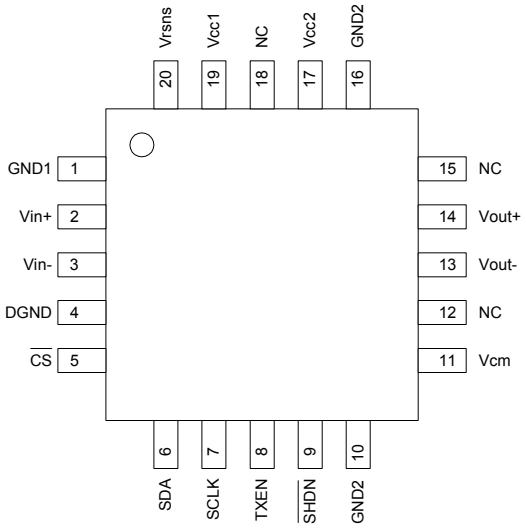
PARAMETER	MIN	TYP	MAX	UNIT
Supply voltage	3.15		3.45	V
Supply current, shutdown mode		80	125	µA
SUPPLY CURRENT, TRANSMIT MODE				
Gain code = 52 to 63		212		mA
DIGITAL INPUT				
High voltage	2.0			V
Low voltage			0.7	V
Current		0		µA

AC ELECTRICAL CHARACTERISTICS

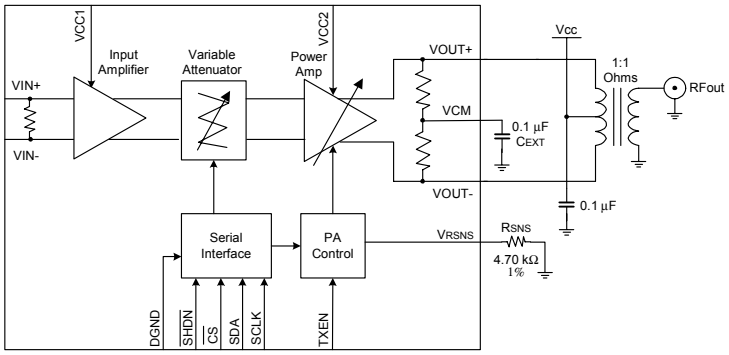
PARAMETER	MIN	TYP	MAX	UNIT
Output 1dB compression point		70		dBmV
Output step size		1		dB
Gain accuracy		59		dB
VOLTAGE GAIN				
Gain code = 4		-29.5		dB
Gain code = 63		29.5		dB
GAIN RESPONSE				
Fin = 42MHz		0.0		dB
Fin = 65MHz		0.1		dB
TXEN				
TXEN enable/disable time			5	µs
TXEN transient duration		1.5		µs
TXEN transient step size, V_{OUT} = 61dBmV		16	64	mVp-p
TXEN transient step size, min gain			7	mVp-p
INPUT/OUTPUT				
Input impedance		1.55		kΩ
Output return loss, Z_0 = 75Ω		16		dB

STRESS RATINGS

PARAMETER	MIN	MAX	UNIT
V_{CC} (V_{CC1}, V_{CC2})	-0.7	5	V
V_{OUT+}, V_{OUT-}	-0.7	5.5	V
Input voltage levels (all inputs), VCM	–0.7	V_{CC} + 0.7	V
Junction temperature		+125	°C
Storage temperature range	-40	+150	°C
Lead temperature (soldering, 4 seconds)		+245	°C



MT1560 Pin Diagram



MT1560 Block Diagram

MICROTUNE

Microtune, Inc., 2201 Tenth Street, Plano, TX 75074, USA

Tel: +1-972-673-1600, Fax: +1-972-673-1602, E-mail: sales@microtune.com, Web site: www.microtune.com

For a detailed list of design centers, sales offices, and sales representatives, visit our Web site at www.microtune.com.