



M I C R O T U N E ®

RF SILICON AND SUBSYSTEMS SOLUTIONS
FOR BROADBAND COMMUNICATIONS AND AUTOMOTIVE ELECTRONICS

MT1570 DOCSIS® 3.0 UPSTREAM AMPLIFIER

PRODUCT BRIEF

Designed for DOCSIS 3.0 and
DOCSIS 2.0 modems requiring
high transmit power.



MT1570 Upstream Amplifier

The MicroStreamer™ MT1570 is a low-cost, programmable power amplifier IC that has been developed specifically for use in CATV upstream applications. This amplifier can be combined with the MT2170 tuner to create a complete RF front end for DOCSIS 3.0-compatible cable modems and gateways. The MT1570 supports four bonded upstream data channels to be simultaneously transmitted in accordance with DOCSIS 3.0 requirements.

The MT1570 meets all DOCSIS requirements with outputs as high as 64 dBmV for a QPSK modulated signal. A 3-wire digital serial bus is used to program the variable gain in 1 dB steps over a nominal range of 63 dB.

The IC operates from a nominal supply voltage of 5.0 V and dissipates a maximum of 2.2 W at the highest gain setting and power settings. The MT1570 has programmable current modes that can be used to adjust the bias current of the output stage resulting in reduced power consumption. This is useful in applications that can tolerate reduced linearity.

The MT1570 can be shutdown via an external control pin or via the 3-wire serial bus. In this mode the IC draws less than 150 μ A while retaining its previously programmed gain and current mode state. A Transmit Disable mode turns off the output stage while maintaining the nominal output impedance. Current draw is less than 30 mA in this mode.

The MT1570 is housed in a 20-pin Quad Flat No-Lead (QFN) package with an exposed paddle for improved thermal dissipation. This allows it to be used in applications with a temperature range of -40 °C to +85 °C. The MT1570 is compliant with the RoHS directive for the restriction of the use of certain hazardous substances in electrical and electronic equipment.

APPLICATIONS

- DOCSIS 3.0 Cable modems and gateways
- High-power DOCSIS 2.0 cable modems
- Telephony over CATV
- CATV Set-top boxes

FEATURES

- High impedance input
- 5 Volts power operation
- 64dBmV output power
- High gain greater than 32 dB
- Large gain range of 63 dB
- 1 dB step size
- Low transmit NF
- Low output noise in disable mode
- Temperature range of -40°C to +85°C
- DOCSIS 1.0, 1.1, 2.0, 3.0, and Euro-DOCSIS™ compatible
- 20-pin, 5 mm x 5 mm QFN package

ABSOLUTE MAXIMUM RATINGS

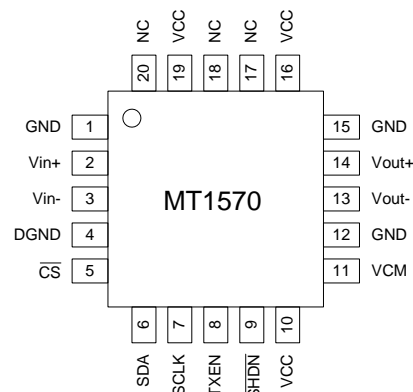
PARAMETER	MIN	MAX	UNIT
V _{CC}	-0.7	6.0	V
Input common mode voltage levels (all inputs)	-0.7	V _{CC} + 0.7	V
Junction temperature		125	°C
Storage Temperature range	-40	150	°C
Lead free solder temperature for 5 seconds, x3		260	°C
Relative humidity		85	%

ENVIRONMENTAL REQUIREMENTS

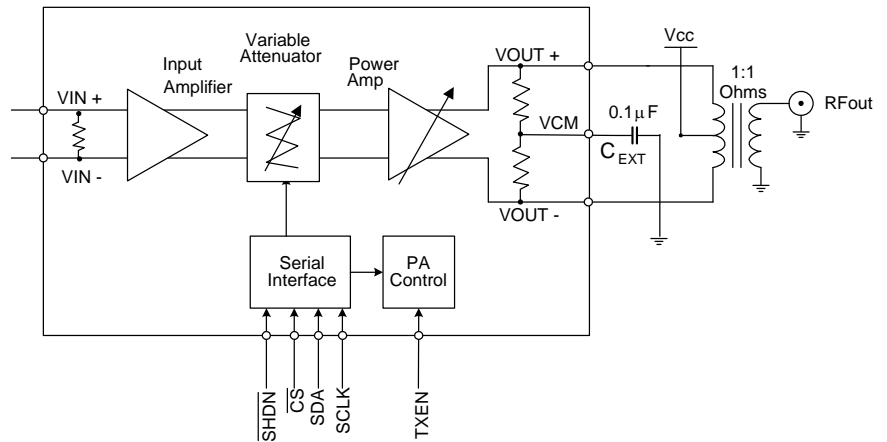
PARAMETER	MIN	MAX	UNIT
Ambient operating temperature		85	°C
Die temperature		125	°C
Relative humidity @ 40 °C ambient		85	%

AMPLIFIER ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Power supply voltage	4.75	5.0	5.25	V
Power supply ripple, DC-500 KHz			25	mV _{p-p}
Power dissipation; gain code 63, current mode 3		1.9	2.2	W
Power dissipation; gain code 0, current mode 3		0.5		W
Supply current: transmit-disable mode		25	30	mA
Supply current: shutdown mode		60	150	µA
Voltage Gain, gain code 63	32	33.5	35	dB
Digital input high voltage	1.5		3.6	V
Digital input low voltage			0.8	V
Digital input current		0		µA



MT1570 Pin Diagram



MT1570 Block Diagram

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United Kingdom: 1225700; 1532732; Germany: 602298894 A; 603136214; Netherlands: 1225700; 1532732; France: 1225700; 1532732; and additional patents pending or filed