M I C R O T U N E ®

RF SILICON AND SUBSYSTEMS SOLUTIONS
FOR BROADBAND COMMUNICATIONS AND AUTOMOTIVE ELECTRONICS

MT1120 AUTOMOTIVE AM/FM ANTENNA AMPLIFIER SUBSYSTEM

PRODUCT BRIEF

The MT1120 is a highly integrated and complete RF amplifier subsystem for active AM/FM antennas

MT1120 High Performance Automotive AM/FM Amplifier Subsystem

The MT1120 is an advanced, low-power, highly integrated single-chip amplifier IC specifically designed for automotive AM/FM antenna systems requiring low noise and very low distortion. Additionally, the MT1120 integrates two true-RMS power detectors and two uncommitted op-amps in order to realize an AGC function for AM and FM by simply adding external PIN diodes. The thresholds of the AM and FM AGC function are variable and can be set according to the application requirements. The on-chip 2.5V temperature compensated reference generator and high output voltage op-amp combine to form a low-cost reliable, automotive-qualified power supply which can be directly derived from the car battery.

The MT1120 is capable of amplifying signals with frequencies in the 0.15 MHz to 6.2 MHz range for AM and 76 MHz to 162.4 MHz range for FM. External components determine the gain of the AM and FM amplifiers and can also be modified to extend the operating frequency of the MT1120.

The AM amplifier uses a highly sophisticated design technology in order to reach low noise, very low distortion, high input impedance and its capability to drive very low output impedance. The FM amplifier is matched to 50 ohms and it's especially designed for very low noise and distortion. These characteristics are essentially important to achieve a high-end AM/FM system performance particularly in critical receiving situations.

The small 32-pin QFN package of the MT1120 and its requirement for minimal external components enables a compact, cost-effective solution fulfilling automotive requirements.

APPLICATIONS

- In-glass antennas
- Active roof antennas
- Other active AM/FM antenna systems

FEATURES

- AM input frequency range 0.15 MHz to 6.2 MHz
- FM input frequency range 76 MHz to 162.4 MHz
- Fully integrated amplifiers for AM and FM
- Fully integrated RMS level detectors and general purpose op-amps (PIN-diode drivers) for easy implementation of an AGC function for AM and FM
- On-chip reference voltage generator and high output voltage op-amp builds a reliable low-cost voltage regulator function
- Low noise
- Low power consumption
- Ultra low distortion
- Very high AM input impedance
- Very small package
- Highly sophisticated temperature compensation design technology to support the extended automotive temperature range
- Integrated ESD protection
- Minimal external components
- 32-pin QFN package

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RECOMMENDED OPERATING CONDITIONS

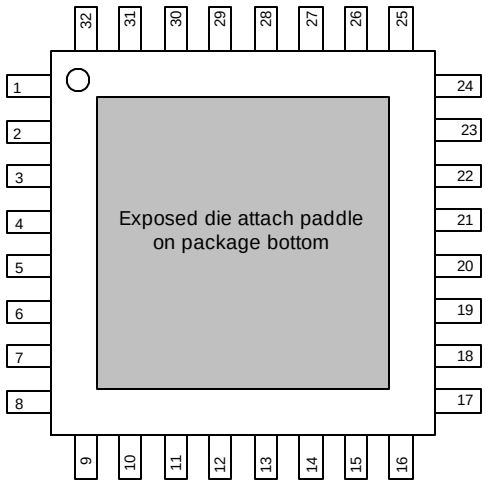
Parameter	Min	Typ	Max	Unit
Input frequency range AM	0.15		6.2	MHz
Input frequency range FM	76		162.4	MHz
Supply voltage	4.75	5	5.25	V
Supply voltage ripple			15	mV

ABSOLUTE MAXIMUM RATINGS

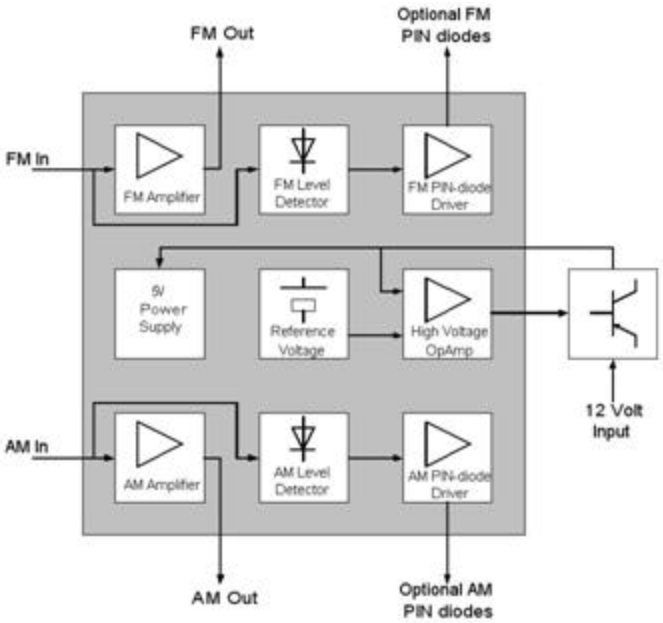
Parameter	Min	Max	Unit
Supply voltage		5.5	V
Storage temperature range	-40	+150	°C
Operating Junction Temperature		+125	°C
Lead temperature (soldering 4 seconds)		+245	°C
Input voltage	-0.3	VCC +0.3	V

AMPLIFIER ELECTRICAL CHARACTERISTICS

Parameter	Min	Typ	Max	Unit
Power Supply				
Active current		100		mA
RF Signal Path				
Input frequency range AM	0.15		6.2	MHz
Input frequency range FM	20		250	MHz
Return loss FM		8		dB
FM gain	3		12	dB
AM gain	0		10	dB
AM input resistance		1		MΩ
AM input capacitance		15		pF
FM input impedance		50		Ω
FM output noise at 6dB gain (BW=120KHz)		-5		dBµV
AM output noise at 6dB gain (BW=9KHz) @ 1 MHz		-6.5		dBµV
OIP3 FM		140		dBµV
OIP3 AM		140		dBµV
OIP2 AM		170		dBµV
Opamps				
Input voltage range	0		Vcc	V
Output voltage range	0		Vcc	V
HV-amp input voltage range	0		Vcc	V
HV-amp output voltage range	0		24	V
Output current		20		mA
Reference				
Output voltage		2.5		V



MT1120 Pin Diagram



MT1120 Block Diagram

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