

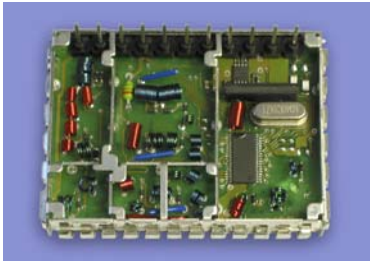


M I C R O T U N E ®

MT7402 HYBRID CAR TV TUNER MODULE FOR AUTOMOTIVE APPLICATIONS

PRODUCT BRIEF

The MT7402 is a high-end tuner for terrestrial analog and digital TV reception. It's designed to meet the stringent requirements of mobile applications.



MT7402 Tuner Module

RF SILICON AND SUBSYSTEMS SOLUTIONS FOR BROADBAND COMMUNICATIONS AND AUTOMOTIVE ELECTRONICS

The MT7402 Hybrid Car TV Tuner Module is specifically designed to meet the demanding performance targets of automotive customers, at an attractive price. This tuner is compatible with both analog TV standards as well as with the digital DVB-T standard, enabling customers to realize a highly integrated, high-performance, cost-effective hybrid car TV receiver solution. The MT7402 Tuner Module converts the RF signal into an IF signal. It combines a low noise figure with high gain and offers an operational frequency of 45 MHz to 860 MHz divided into VHF low, VHF high and UHF bands. Signal paths for the three different bands are realized separately, providing excellent performance. The RF AGC can be controlled either externally via the RF AGC voltage input or automatically via the internal AGC loop control, with programmable parameters for threshold and time constant. The address select function enables the use of up to four MT7402 tuners to realize high performance functions like tuner diversity, frequency diversity, or blending between analog TV and DVB-T reception.

The analog TV section provides a balanced IF output capable of directly driving an external surface acoustical wave (SAW) filter. The external demodulation can cover all analog TV standards, provided that the picture carrier is fixed at 38.9 MHz and the filtering of the tone carrier is done accordingly. The digital TV section contains a switchable (7/8 MHz) SAW filter for excellent adjacent channel performance, an IF amplifier for filter loss compensation, and offers a balanced IF output to directly drive an external DVB-T demodulator. The IF gain can be controlled externally via the IF AGC voltage input.

Band selection, tuning, and several tuner functions are controlled via I²C serial bus. The MT7402 Tuner Module combines very small size with high performance in harsh environments, making them especially suitable for automotive and mobile applications.

APPLICATIONS

- Hybrid (analog and digital) car TV receivers
- Set-top box applications

FEATURES

ANALOG

- Compatible with receiving standards B/G, D/K, L/L, M/N and I (PC fixed at 38.9 MHz)
- Balanced IF output drives an external SAW filter directly

DIGITAL

- Balanced IF output (36 MHz) with integrated switchable (7/8 MHz) SAW filter and integrated IF amplifier
- Excellent phase noise

GENERAL

- Single conversion hyperband tuner
- Input frequency range: 45 MHz to 860 MHz
- Common antenna input via pin
- Excellent large-signal behavior
- Low noise figure
- Very high gain
- Selectable RF AGC (externally or internally controlled)
- Externally controlled IF AGC
- Address select input allows control of up to four MT7402 modules
- Conforms to DBP, EN, and VDE
- Functions controlled by I²C bus
- Horizontal housing with very small form factor
- Designed and qualified according to automotive requirements

M I C R O T U N E

MT7402 HYBRID CAR TV TUNER MODULE

PRODUCT BRIEF

OPERATING CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
5V power supply voltage				
Current			160	mA
Voltage	4.75	5	5.25	V
33V power supply voltage				
Current			2	mA
Voltage	31.35	33	36.65	V
Temperature range				
Operating temperature in slowly moving air	-20		+75	°C
Storage temperature	-40		+85	°C

INPUT/OUTPUT CHARACTERISTICS

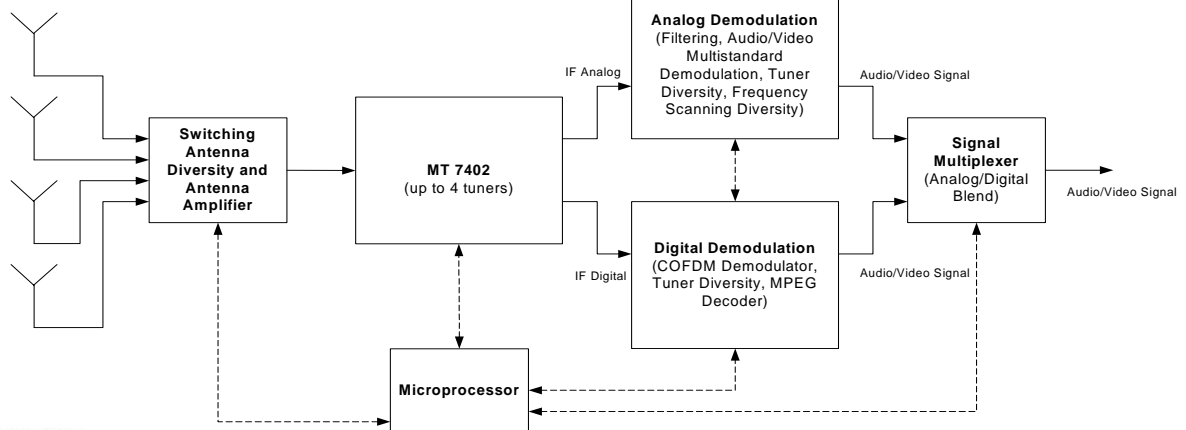
PARAMETER	MIN	TYP	MAX	UNIT
Antenna input (common VHF/UHF)				
Input impedance		75		Ω
RF AGC voltage input				
Control voltage	0.5		4	V
IF AGC voltage input				
Control voltage	0.5		4	V
Address select input (I ² C bus)				
Voltage	0		5	V
Quantity of selections			4	
SCL (I ² C bus)				
Low voltage			1.5	V
High voltage	2.3			V
Frequency		100	400	kHz
SDA (I ² C bus)				
Low voltage			1.5	V
High voltage	2.3			V
IF digital output (balanced)				
Frequency		36.0		MHz
Bandwidth switchable		7 or 8		MHz
IF analog output (balanced)				
Frequency picture carrier		38.9		MHz

MECHANICAL CHARACTERISTICS

PARAMETER	MEASUREMENT	UNIT
Horizontal housing		
Length	53.5	mm
Width	39.8	mm
Height	9.3	mm

ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Analog receiving frequency range (referred to picture carrier)				
VHF low	45.25		154.25	MHz
VHF high	157.25		463.25	MHz
UHF	471.25		863.25	MHz
Digital receiving frequency range (referred to center frequency)				
VHF low	48.5		157.0	MHz
VHF high	160.5		466.0	MHz
UHF	474.0		866.0	MHz
Tuning resolution				
Analog mode		62.5		kHz
Digital mode		166.67		kHz
Voltage gain				
Analog mode (VHF / UHF)		48 / 47		dB
Digital mode (VHF / UHF)		87 / 87		dB
Noise figure				
VHF low / VHF high		5.5 / 4.5		dB
UHF		6		dB
VSWR		2		
RF AGC dynamic range				
VHF low		55		dB
VHF high		50		dB
UHF		45		dB
IF AGC dynamic range		50		dB
IF rejection	60			dB
Image rejection				
VHF low / VHF high		70 / 70		dB
UHF		60		dB
Phase noise ($\Delta f = 1$ kHz)				
VHF low		87		-dBc/Hz
VHF high		83		-dBc/Hz
UHF		80		-dBc/Hz



MT7402 Block Diagram



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