1384 SERIES AM/FM TUNER MODULES

AUTOMOTIVE APPLICATIONS

APPLICATIONS

- High-end car radios

FEATURES

AM

- Up/down conversion
- Excellent sensitivity
- Superior selectivity due to highly sophisticated filter technology
- Noise blanker at second IF
- High AGC dynamic range
- AM Stereo output available
- AGC-threshold programmable

FM

- Double down-conversion
- Selective prefilter circuit
- Image reject mixers
- Keyed AGC selectable, AGC-threshold programmable
- Dynamic threshold extension for superior sensitivity selectable
- Outstanding selectivity due to fixed and variable IF filters with hardware “closed-loop” control
- Supports inaudible RDS updating
- Weather band optional

GENERAL

- Available for US, European, and Japanese markets
- I^2C bus controlled
- Very fast PLL
- On-board EEPROM supports digital alignment for AM and FM
- IF Counter information available via I^2C bus
- Programmable switching output (open collector)

1384 AM/FM Tuner Module

The 1384 Series AM/FM Tuner Modules are high-end custom and semi-custom products specifically designed to meet the demanding performance, market, and pricing targets of automotive customers. The 1384 Series AM/FM Tuners combine the low system integration effort of a standard “plug and play” module with outstanding features and absolute high-end performance.

These tuner modules are designed for different standards in the US, Europe, and Japan, giving them “world” tuner functionality.

The AM section contains an up/down conversion system with an active prestage and an audio output. Features such as sensitivity and large signal performance, together with the functionality of the implemented noise blanker, help ensure that the 1384 Series Tuner Modules produce clear AM reception even in critical situations.

The FM section contains a double down-conversion system with a selective prefilter circuit and MPX signal as well as RDS-MPX signal output. Using appropriate external signal processing, the stereo signal and the RDS/RBDS data can be derived from these outputs. The dynamic selectivity function evaluates the current receiving situation and the current modulation continuously and controls the optimum IF bandwidth (25 kHz to 155 kHz) automatically. The dynamic threshold extension automatically improves the S/N ratio at low RF input levels. Using these features, the 1384 Series Tuner Modules produce audible signals where standard tuners produce only noise and interference.

The integrated RDS update algorithm controls the down-lined audio processor (special models only) and supports the control of alternative frequency evaluations so that they are absolutely inaudible.

Band selection, tuning, and several tuner functions are controlled via I^2C serial bus.

OPERATING CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
5V Power supply voltage				
Current AM mode	41	42	54	mA
Current FM mode	30	32	40	mA
Voltage	4.75	5	5.25	V
8.5V Power supply voltage				
Current AM mode		62		mA
Current FM mode		62		mA
Voltage	8	8.5	9	V
Operating temperature				
Operating temperature in slowly moving air	-40		+85	°C
Parametric temperature range	-30		+70	°C
Storage temperature	-40		+95	°C

INPUT/OUTPUT CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
AF Hold (maximum sink current)	1	1.2	1.4	mA
AF Sample (maximum sink current)	1	1.2	1.4	mA
AM AF Output				
AM Mono load impedance	100			kΩ
AM Mono output resistance			500	Ω
AM Stereo load impedance	10			kΩ
AM Stereo output resistance			500	Ω
Antenna Input				
AM Mode		150		kΩ
FM Mode		50		Ω
Field strength (level) output				
Voltage	0		7	V
FM MPX Output				
Bandwidth	200			kHz
Load capacitance			50	pF
Load resistance	20			Ω
Output resistance			500	Ω
IF Bandwidth flag output				
AM Mode (open collector with 56 kΩ pull-up resistance)	0		5	V
FM Alignment mode	3	3.1	3.4	V
RDS MPX Output				
Bandwidth	200	300		kHz
Load capacitance			50	pF
Load resistance	20			kΩ
Output resistance			500	Ω
Software flag output				
Open collector with 10 kΩ pull-up resistance	0.1		5	V

AM ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Receiving frequency range				
AM Mode USA	520		1720	kHz
AM Mode Europe	153		6295	kHz
AM Mode Japan	522		1629	kHz
Sensitivity for S/N = 10 dB		4.0		µV
S + N/N at high RF input		50		dB
4 kHz Audio roll-off		2.1		dB
THD + N				
Normal condition		0.35		%
RF Input = 104 dBµV		0.6		%
Image rejection		81		dB
IF Rejection		86		dB
Selectivity		12.5		kHz
Cross modulation		104		dBµV
In-band mixing		68		dBµV
Wideband AGC		94		dBµV
Field strength output (RF In = 60 dBµV)		2.7		V

FM ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Receiving frequency range				
FM Mode USA	87.5		108.1	MHz
FM Mode Europe	87.5		108	MHz
FM Mode Japan	76		90	MHz
Sensitivity for S/N = 30 dB		1.4		µV
S + N/N (Deviation = 75 kHz)		74		dB
THD + N				
Deviation = 75 kHz		0.1		%
RF Input = 4 µV, deviation = 75 kHz		1.1		%
Image rejection		58		dB
IF Rejection		108		dB
Channel selectivity (200 kHz)		73		dB
Channel selectivity (400 kHz)		80		dB
Three-signal intermodulation		64		dB
AM Suppression		58		dB
Field strength output (RF In = 60 dBµV)		2.8		V

MECHANICAL CHARACTERISTICS

PARAMETER	MEASUREMENT	UNIT
Length	56.9	mm
Width	41.9	mm
Height	17.4	mm

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