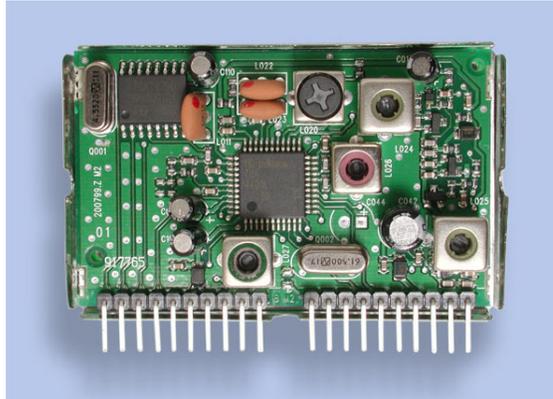


1390 FM RDS TUNER MODULE**AUTOMOTIVE APPLICATIONS****APPLICATIONS**

- High-end car radios (FM audio tuner or background RDS tuner)
- Navigation systems (TMC data tuner)

FEATURES

- Single down-conversion
- Excellent sensitivity
- Selective prefilter circuit
- Image reject circuit
- Bus controlled AGC threshold and IF gain
- Superior selectivity due to use of three ceramic filters
- Special background tuner technology minimizes interference with the main tuner
- Integrated radio data system (RDS) demodulator with serial output (clock and data) supports European RDS and US RBDS
- RDS quality detector output
- Multipath detector output
- Field strength detector output
- Integrated ADC for field strength and multipath
- Stop signal output with evaluation of IF counter, IF window, field strength, and multipath
- Multiplex signal output
- Integrated PLL with short response time
- I²C bus controlled
- Two programmable switching outputs (open drain)

**1390 FM RDS Tuner Module**

The 1390 FM RDS Tuner Module is a high-end product designed to meet the demanding performance, market, and pricing targets of automotive customers.

This tuner module is specifically designed to be used as an FM audio tuner and/or RDS data tuner. Its special background tuner technology minimizes interference with the main tuner and supports high-end double tuner systems. Its excellent sensitivity and large signal performance produces clear sound and reliable RDS data even in weak receiving situations. Additionally, the tuner module is environmentally hardened to operate under an extended temperature range and adverse climatic conditions.

The FM section contains a single down-conversion system with a selective prefilter circuit and state-of-the-art three-stage ceramic IF filtering. Using appropriate external signal

processing, the stereo audio signal can be derived from the MPX signal. The integrated RDS demodulator provides a serial clock and data output. Decoding this data with an external microprocessor enables use of the RDS for numerous applications, including alternative frequencies and traffic messaging channels. Monitoring the RDS quality output provides a simple method of evaluating the current block error rate. Analog outputs for field strength and multipath allow optimization of tuner performance. The sensitivity of the seek stop mode can be adjusted via I²C bus.

The 1390 FM RDS Tuner Module provides two software-controlled switching outputs (open drain). Frequency setting and multiple tuner functions are controlled via I²C serial bus. This control is intended to be handled by an external microprocessor.



OPERATING CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
8.5V Power Supply Voltage				
Current		150		mA
Voltage	8.2	8.5	8.8	V
5V Power Supply Voltage				
Current		8		mA
Voltage	4.75	5	5.25	V
Operating Temperature				
Parametric temperature range	-30		+70	°C
Operating temperature range (in slowly moving air)	-40		+85	°C
Storage Temperature	-40		+95	°C

INPUT/OUTPUT CHARACTERISTICS

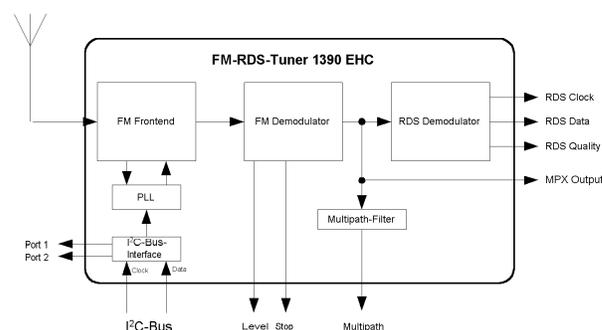
PARAMETER	MIN	TYP	MAX	UNIT
Antenna Input				
Impedance		50		Ω
IIC Bus Data SDA				
Input voltage low	-0.5		0.9	V
Input voltage high	2.1		5.5	V
IIC Bus Clock SCL				
Input voltage low	-0.5		0.9	V
Input voltage high	2.1		5.5	V
Frequency			400	kHz
MPX Output				
Impedance		4		kΩ
RDS Clock Output				
Voltage	0		5	V
RDS Data Output				
Voltage	0		5	V
RDS Quality Output				
Voltage	0		5	V
Field strength (level) Output				
Voltage	0		5	V
Multipath Output				
Voltage	0		5	V
Stop Signal Output				
Voltage	0		5	V
Switching Output 1				
Open drain with internal 10 kΩ pull-up resistance	0		5	V
Switching Output 2				
Open drain with internal 10 kΩ pull-up resistance	0		5	V

ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT
Receiving Frequency Range	87.5		108.1	MHz
Sensitivity for S/N=30dB		1.8		μV
S + N/N at high RF input		57		dB
Interstation noise		-10		dB
SINAD		50		dB
THD + N				
Normal condition		0.2		%
RF Input = 4μV, Deviation = 75 kHz		1.0		%
Image rejection		60		dB
IF Rejection		100		dB
Adjacent channel selectivity (100kHz)		6		dB
Alternate channel selectivity (200kHz)		57		dB
Three-signal intermodulation		62		dB
AM Suppression		57		dB
Audio output voltage (R _{load} = 200 kΩ)				
Deviation = 22.5 kHz		160		mV
Deviation = 50 kHz		300		mV
Field strength output				
RF Input = 20 dBμV		2.4		V
RF Input = 60 dBμV		4.4		V
RF Input = 100 dBμV		4.7		V
Multipath output (AM=50%, 19kHz)		3.0		V
RDS sensitivity for 80% correct blocks		18		dBμV

MECHANICAL CHARACTERISTICS

PARAMETER	MEASUREMENT	UNIT
Length	64.8	mm
Width	16.0	mm
Height	42.0	mm



1390 FM RDS Tuner Block Diagram

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