Radio Frequency Products

MC33696 PLL Tuned UHF Transceiver for Data Transfer Applications

With more than 50 years of wireless technology experience and semiconductor product leadership, Freescale is qualified to offer a comprehensive range of solutions that include radio frequency (RF), microcontrollers (MCUs), sensors, antenna, software and a flexible development tools suite.

Freescale Semiconductor's MC33696 access and remote control solution can help users streamline existing RF solutions or allow them to add the convenience of wireless control to their products. The MC33596's context switching feature enables it to receive communications from either remote keyless entry (RKE) or tire pressure monitoring systems (TPMS). This helps customers to optimize their TPMS, RKE or passive entry receivers in the car body. In addition, the MC33596 can be used across a voltage range of 2.1–5.5V.

The MC33696 includes a programmable fractional PLL, an RSSI circuit and a periodic wake-up timer. The periodic wake-up timer activates the receiver, while a data manager checks the content of incoming messages and can switch between a TPMS and RKE frame without microcontroller usage.

Automotive Applications

- Remote keyless entry
- Passive entry
- Two-way keyless entry

Home and Building Control Applications

- Lighting management
- Heating and cooling systems
- Security systems

Industrial Automation Applications

- Asset monitoring
- Data logging
- Sensors

Features	Benefits
Periodic Wake-Up Timer	
• Less than 1 mA in reception with strobe ratio = 1/10 • 250 nA in standby and 25 µA with auto wake-up mode	• Extends battery life in portable applications • Strobe Oscillator does not require microcontroller to wake up to listen to radio frequencies
Receiver	

• Up to -108 dBm sensitivity
• Digital and analog received signal strength indicator (RSSI)
• Automatic wake-up function (strobe oscillator)
• Embedded data processor with programmable word recognition
• Image canceling mixer
• 380 kHz IF filter bandwidth
• Fast wake-up time
• 9.2 mA in Receive (Rx) mode
• Configuration Switch
  ○ Frequency: 304 MHz, 315 MHz, 426 MHz, 434 MHz, 868 MHz and 915 MHz ISM bands
  ○ Modulation: OOK and FSK (software selectable)
  ○ Data rate: up to 20 kbps
	• Sensitivity permits the usage of long-range applications
	• Reduces power consumption
	• Reduces microcontroller load for frame decoding, avoids false wake up of the microcontroller
	• Reduced filtering requirements
	• Wide frequency range makes it possible to use only one chip in many countries
	• Allows fast switch from two different configurations using two banks of configurations registers: frequency, data rate, modulation can be different
	• Reduced microcontroller load needed to receive two different kinds of frame

Transmitter	
• +7 dBm output power • Programmable output power -19 to +7 dBm in four steps • FSK frequency done by a Frac'N PLL—allowing a programmable deviation from 6 kHz to 192 kHz • Frac'N resolution of 6 kHz allows manufacturing tuning • Serial peripheral interface • Standard SPI 4 wire required • Frequency: 304 MHz, 315 MHz, 426 MHz, 434 MHz, 868 MHz and 915 MHz ISM bands • Modulation: OOK and FSK (software selectable) • Data rate: up to 20 kbps • 13.5 mA in Transmit (Tx) mode	• Wide frequency range makes it possible to use only one chip in many countries

Development Tools

Description	Web Ref	Frequency
MC33696/MC33596 RF Module designed to work in conjunction with the MC908RG60 Demo Board	MC33696MOD315EV	315 MHz
	MC33696MOD434EV	433.92 MHz
	MC33696MOD868EV	868.3 MHz
MC9S08RG60 Demonstrator Board	DEMO9S08RG60E	

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Package options

Part Number	Package	Temp Range
MC33696FCE	32 QFN	-40°C to +85°C
MC33696FJE	32 LQFP	-40°C to +85°C

Device parameters

Parameter	Typical Value
Temperature range	-40°C to +85°C
Supply voltage	2.1–3.6V or 4.5–5.5V
Output power	+7 dBm
Standby current	250 nA
Transmission current	13.5 mA
Receive current	9.2 mA
Receive sensitivity	Up to -108 dBm

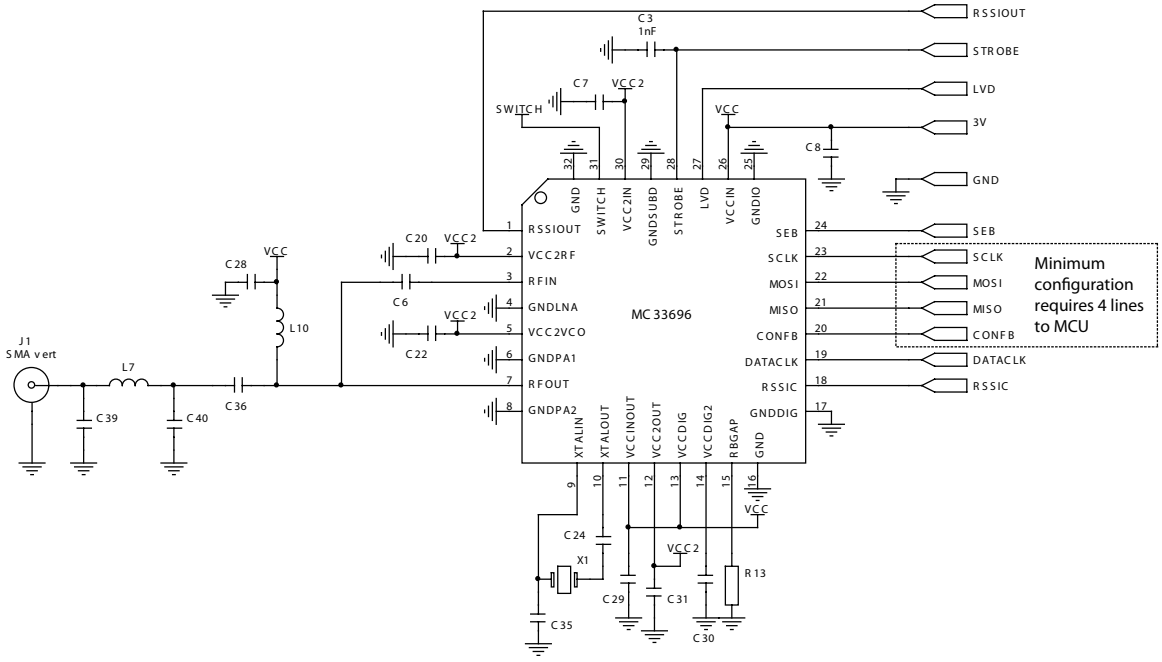
32-pin LQFP

0.5 mm Pitch
5 mm x 5 mm Body or
7 mm x 7 mm pin to pin

32-pin QFN

0.5 mm Pitch
5 mm x 5 mm Body

Diagram



Learn More: For current information about Freescale RF products and documentation, please visit **www.freescale.com/rf.**

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