

### EASY-TO-USE, LOW-CURRENT OOK/(G)FSK SUB-GHz TRANSCEIVER

#### **Description**

Silicon Laboratories' Si4455 is an easy-to-use, low current, sub-GHz EZRadio® transceiver. Covering all major bands, it combines plug-and-play simplicity with the flexibility needed to handle a wide variety of applications. The compact 3x3 mm package size combined with a low external BOM count makes the Si4455 both space efficient and cost effective. The +13 dBm output power and excellent sensitivity of -116 dBm allows for a longer operating range, while the low current consumption of 18 mA TX (at 10 dBm), 10 mA RX, and 50 nA standby. provides for superior battery life. By fully integrating all components from the antenna to the GPIO or SPI interface to the MCU, the Si4455 makes realizing this performance in an application easy. Design simplicity is further exemplified in the Wireless Development Suite (WDS) user interface module. This configuration module provides simplified programming options for a broad range of applications in an easy to use format that results in both a faster and lower risk development. Like all Silicon Laboratories' EZRadio devices, the Si4455 is fully compliant with most worldwide regulatory standards such as FCC, ETSI, and ARIB.

#### **Features**

- Frequency range = 283–960 MHz
- Receive sensitivity = -116 dBm
- Modulation
  - (G)FSK
  - OOK
- Max output power = +13 dBm
- Low active power consumption
  - 10 mA RX
  - 18 mA TX @ +10 dBm
- Low standby current = 50 nA
- Max data rate = 500 kbps
- Power supply = 1.8 to 3.6 V
- TX and RX 64 byte FIFOs
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Integrated battery voltage sensor
- Packet handling including preamble, sync word detection, and CRC

Aux ADC

GPIO0

- Low BOM
- 20-Pin 3x3 mm QFN package

#### **Applications**

- Remote control
- Home security and alarm
- Telemetry
- Garage and gate openers
- Remote keyless entry
- Home automation
- Industrial control
- Sensor networks
  Health monitors
- GPIO3 GPIO2 XIN XOUT Synthesizer SDN 25-32MHz XO Rx Chain nSEL SPI Interface SDI Controller **RXp** Rx/Tx LNA **PGA** ADC SDO Modem RXn **SCLK** nIRQ Battery

TX

PA

**VDD** 

Voltage

Sensor

GPI01



## EASY-TO-USE, LOW-CURRENT OOK/(G)FSK SUB-GHZ TRANSCEIVER

#### **Selected Electrical Specification**

Parameter	Symbol	Test Condition	Min	Тур	Max	Unit
Supply Voltage	$V_{DD}$		1.8	3.3	3.6	V
Frequency Range	F <sub>TX/RX</sub>		283	_	350	MHz
			425	_	525	MHz
			850	_	960	MHz
Current Consumption	I <sub>Shutdown</sub>		_	30	_	nA
	I <sub>Standby</sub>		_	50	_	nA
	I <sub>RX</sub>		_	10	_	mA
	I <sub>TX</sub>	+10 dBm output power, 868 MHz	_	18	_	mA
Rx Sensitivity	P <sub>RX2</sub>	BER <0.1%, 2.4 kbps, GFSK, BT = 0.5, ΔF = 25kHz, 114 kHz Rx BW	_	-116	_	dBm
	P <sub>RXOOK</sub>	BER < 0.1%, 1 kbps, 185 kHz Rx BW, OOK, PN15 data	_	-113	_	dBm
Selectivity <sup>2</sup>	C/I <sub>1-CH</sub>	±1 Channel Offset	_	-56	_	dB
	C/I <sub>2-CH</sub>	±2 Channel Offset	_	-59	_	dB
Blocking <sup>2</sup>	200k <sub>BLOCK</sub>	200 kHz-1 MHz Offset	_	-58	_	dB
	1M <sub>BLOCK</sub>	1 MHz Offset	_	<del>-</del> 61	_	dB
	8M <sub>BLOCK</sub>	8 MHz Offset	_	<del>-</del> 79	_	dB
Image Rejection	Im <sub>REJ</sub>	Rejection at the image frequency IF=468kHz	_	-40	_	dB
Data Rate	DR <sub>FSK</sub>	(G)FSK Modulation	1.0	_	500	kbps
	DR <sub>OOK</sub>	OOK Modulation	0.5	_	120	kbps
Output Power	P <sub>TX</sub>		-40	_	+13	dBm

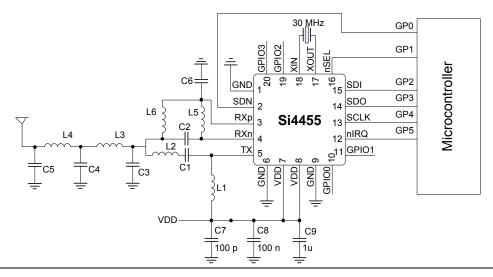
#### Notes:

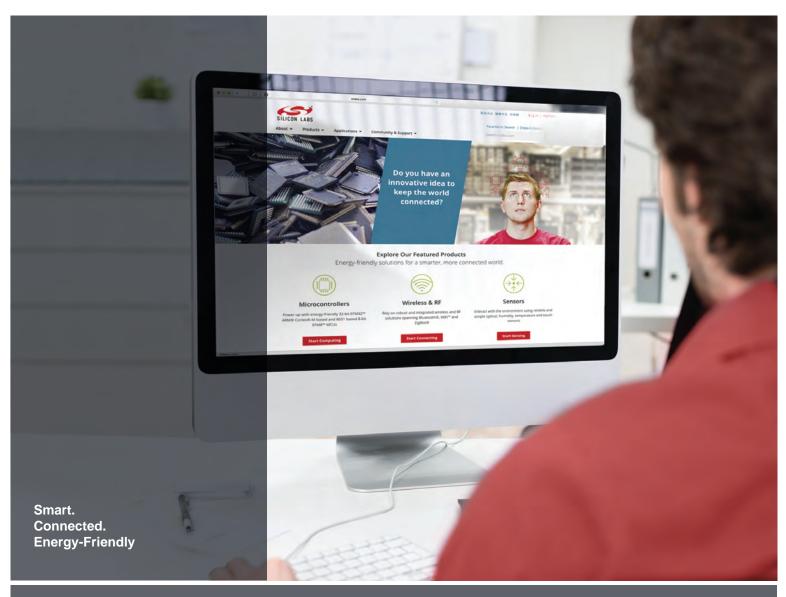
- Test Conditions: 3.3 VDC V<sub>DD</sub>, 25 °C, external reference signal (X<sub>IN</sub>) = 1.0 V<sub>PP</sub> at 30 MHz, centered around 0.8 VDC. Sensitivity measured at 434 MHz.
- 2. Desired reference signal 3 dB above sensitivity, BER<0.1%, Interferer is CW and desired modulation with 1.2 kbps, ΔF = 5.2 kHz, GFSK with BT = 0.5, Rx BW = 58 kHz, 100 kHz channel spacing.

#### **Ordering Guide**

Part Number*	Part Number* Description		Operating Temperature				
Si4455-B1A-FM	EZRadio Transceiver	3x3 QFN-20 Pb-free	–40 to 85 °C				
*Note: Add an "R" at the end of the device part number to denote tape and reel option.							

## **Application Circuit**











#### Disclaimer

Silicon Laboratories intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Laboratories products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Laboratories reserves the right to make changes without further notice and limitation to product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Silicon Laboratories shall have no liability for the consequences of use of the information supplied herein. This document does not imply or express copyright licenses granted hereunder to design or fabricate any integrated circuits. The products must not be used within any Life Support System without the specific written consent of Silicon Laboratories. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Laboratories products are generally not intended for military applications. Silicon Laboratories products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons.

#### **Trademark Information**

Silicon Laboratories Inc., Silicon Laboratories, Silicon Labs, SiLabs and the Silicon Labs logo, CMEMS®, EFM, EFM32, EFR, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Ember®, EZLink®, EZMac®, EZRadio®, EZRadioPRO®, DSPLL®, ISOmodem ®, Precision32®, ProSLIC®, SiPHY®, USBXpress® and others are trademarks or registered trademarks of Silicon Laboratories Inc. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Keil is a registered trademark of ARM Limited. All other products or brand names mentioned herein are trademarks of their respective holders.



Silicon Laboratories Inc. 400 West Cesar Chavez Austin, TX 78701 USA

# **Mouser Electronics**

**Authorized Distributor** 

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

# Silicon Laboratories:

SI4455-C2A-ZM1 SI4455-C2A-ZM1R SI4455-C2A-AM SI4455-C2A-AMR