

BK3231 Bluetooth HID SoC Datasheet

Objective Specification

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Disclaimer: Descriptions of specific implementations are for illustrative purpose only, actual hardware implementation may differ.



Revision History

Version	Date	Author(s)	Description
0.1	23/Mar/2012	Weifeng	Initial Draft
	17/Oct/2012	Weifeng	Update for MP pin assignment for keyboard, with additional JTAG at cost of 5 less GPIOs
	29/Nov/2012	LiangHuang	Update pin description



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1 General Description

The BK3231 chip is a highly integrated single-chip Bluetooth HID device. It integrates the high-performance transceiver, rich features baseband processor, and Bluetooth HID profile.

2 Features

- Operation voltage from 2.8 V to 3.6 V
- Bluetooth 2.1 compliant
- -88dBm sensitivity for 1 Mbps mode and 2 dBm transmit power
- HID v1.0
- 16 MHz crystal reference clock
- 56-pin QFN 7mmx7mm package for keyboard
- I2C, SPI and UART interface

3 Block Diagram

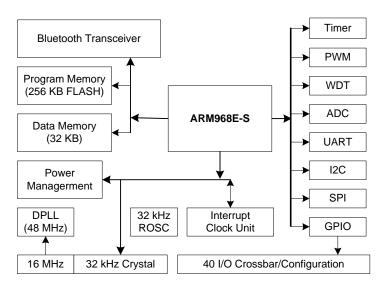


Figure 1BK3231 Block Diagram

4 PIN information

The next diagram shows QFN56 format for the full functions usage. It can be used as keyboard TX part and total 35 GPIO available.

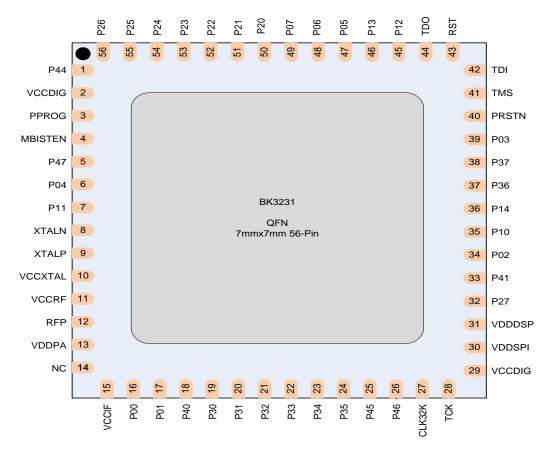


Figure 2BK3231QFN56Pin Assignment

Table1BK3231 OFN56 pin description

PIN	PIN Name Pin Function Description					
111	1 (dille	1 III 1 unicolon	Description			
1	P44	Digital I/O	General I/O			
2	VCCDIG	Power supply	3 V supply			
3	PPROG	Digital I/O	FLASH programming selection			
4	MBISTEN	Digital I/O	Test enable			
5	P47	Digital I/O	General I/O			
6	P04	Digital I/O	General I/O, or MOSI for SPI			
7	P11	Digital I/O	General I/O, or input for external active low			
			interrupt			
8	XTALN	Analog output	Oscillator output			
9	XTALP	Analog input	Oscillator input			
10	VCCXTAL	Power supply	3 V supply			
11	VCCRF	Power supply	3 V supply			



13	12	RFP	RF port	RF input and output
NC			-	· ·
15				***
17	15	VCCIF	Power supply	3 V supply
18	16	P00	Digital I/O	General I/O
P30	17	P01	Digital I/O	General I/O
P31 Digital I/O or analog input General I/O, or input of ADC1	18	P40	Digital I/O	General I/O
P31 Digital I/O or analog input General I/O, or input of ADC1	19	P30	Digital I/O or analog	General I/O
P32 Digital I/O or analog input General I/O, or input of ADC2				
21 P32 Digital I/O or analog input General I/O, or input of ADC2 22 P33 Digital I/O or analog input General I/O, or input of ADC4 23 P34 Digital I/O or analog input General I/O, or input of ADC4 24 P35 Digital I/O General I/O 25 P45 Digital I/O General I/O 26 P46 Digital I/O General I/O 27 CLK32K Analog input Clock 32 kHz input 28 TCK Digital I/O JTAG pin 29 VCCDIG Power supply 3 V supply 30 VDDSPI Analog output Power output, connected with decoupling CAP 31 VDDDSP Analog output Power output, connected with decoupling CAP 32 P27 Digital I/O General I/O, or enable for PWM1 33 P41 Digital I/O General I/O, or input of ADC6 35 P10 Digital I/O General I/O, or input of ADC6 36 P14 Digital I/O General I/O, or input of ADC7	20	P31		General I/O, or input of ADC1
Input				
P33	21	P32		General I/O, or input of ADC2
Input		D22		0 11/0
P34	22	P33		General I/O
Input	22	D24		C IVO : CARCA
Digital I/O or analog input	23	F34		General I/O, or input of ADC4
Input	24	P35		General I/O or input of ADC5
25 P45 Digital I/O General I/O 26 P46 Digital I/O General I/O 27 CLK32K Analog input Clock 32 kHz input 28 TCK Digital I/O JTAG pin 29 VCCDIG Power supply 3 V supply 30 VDDSPI Analog output Power output, connected with decoupling CAP 31 VDDDSP Analog output Power output, connected with decoupling CAP 32 P27 Digital I/O General I/O, or enable for PWM1 33 P41 Digital I/O General I/O 34 P02 Digital I/O General I/O, or input for external interrupt 0, active low 35 P10 Digital I/O General I/O, or input of ADC6 37 P36 Digital I/O General I/O, or input of ADC6 38 P37 Digital I/O General I/O, or input of ADC7 39 P03 Digital I/O General I/O, or input of ADC7 40 PRSTN Digital I/O JTAG pin 41 TMS	2 7	1 33		General 1/O, of hiput of ADC3
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	51	P21	ŭ	•
53 P23 Digital I/O General I/O, or clock for SMBUS (I2C)	521	P22	Digital I/O	•
	53	P23		



54	P24	Digital I/O	General I/O, or data I/O for SMBUS (I2C)
55	P25	Digital I/O	General I/O
56	P26	Digital I/O	General I/O, or enable for PWM0



5 Electrical Specifications

Table 1 RF Characteristics

Name	Parameter (Condition)	Min	Турі	Max	Unit	Com
			cal			ment
	Operating Condition		1	T	1	
VCC	Voltage	1.7	3.0	3.6	V	
TEMP	Temperature	-40	+27	+85	°C	
	Digital input Pin	1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	T	
VIH	High level	VCC-0.3		VCC+0.3	V	
VIL	Low level	VSS		VSS+0.3	V	
	Digital output Pin	T		T	T	
VOH	High level (IOH=-0.25mA)	VCC- 0.3		VCC	V	
VOL	Low level(IOL=0.25mA)	VSS		VSS+0.3	V	
	Normal condition		1	,	1 -	
IVDD	Power Off		-	2	uA	
IVDD	Sleep current (RF OFF, 32 kHz clock)			10	uA	
IVDD	Active RX			26	mA	
IVDD	Active TX @ 2 dBm output power			24	mA	
	Normal RF condition					
FOP	Operating frequency	2400		2480	MHz	
FXTAL	Crystal frequency		16		MHz	
RFSK	Air data rate		1		Mbps	
	Transmitter					
PRF	Output power	-40	0	5	dBm	
PBW	Modulation 20 dB bandwidth			1	MHz	
PRF1	Out of band emission 2 MHz		-20		dBm	
PRF2	Out of band emission 3 MHz		-40		dBm	
IVDD	Current at -40dBm output power				mA	
IVDD	Current at -30dBm output power				mA	
IVDD	Current at -25dBm output power				mA	
IVDD	Current at -10dBm output power				mA	
IVDD	Current at -5dBm output power				mA	
IVDD	Current at 0dBm output power				mA	
IVDD	Current at 2dBm output power		24		mA	
	Receiver					
Max Input	1 E-3 BER	-20		10	dBm	
RXSENS	1 E-3 BER sensitivity		-88		dBm	
IIP3	IIP3, Pin=-63 dBm; Punwant=-39	-21	-16		dBm	
	dBm; f0=2f1-f2, f2-f1=3 MHz or 4					
	MHz or 5 MHz					
C/ICO	Co-channel C/I			11	dB	
C/I1ST	ACS C/I 1MHz			0	dB	
C/I2ND	ACS C/I 2MHz			-30	dB	
C/I3RD	ACS C/I 3MHz			-40	dB	
C/I1STI	ACS C/I Image channel			-9	dB	
C/I2NDI	ACS C/I 1 MHz adjacnet to image			-20	dB	
	channel			l		



Table 2MCU Characteristics

Name	Parameter (Condition)	Min	Typi cal	Max	Unit	Comm ent
	Core functions					
	Deep sleep mode		2		uA	
	Sleep mode (RCOSC 32k)		6		uA	
	Idle mode at 16 MHz		1		mA	
	Idle mode at 8MHz		0.8		mA	
	Idle mode at XOSC32k (16 MHz running)		0.15		mA	
	Active mode (16 M)		4.9		mA	
	Active mode (8M)		3.9		mA	