



Turning Ideas Into Reality

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KBDP64 IC

Parallel output keyboard encoder for up to 64 keys

General Description

The KBDP64 IC is designed to provide a parallel binary output encoder for keyboards up to 64 keys. The KBDP64 IC contains all the logic necessary to encode a SPST keyboard switch array up to 8 by 8 in size and provide a parallel binary output and a data available strobe. The data available strobe goes high when a key is pressed, and goes low when the key is released. The data outputs keep their states after the key is released. The array can be a 8 x 8 array, but any smaller size may be used. The KBDP64 handles debouncing and encodes the keys with no external parts. All timing is internally generated. No external diodes are required in the array to prevent key ghosting in a two key rollover situation. A .1 uF bypass capacitor is suggested across the VDD and VSS pins. The part uses the standard 28 pin .3 inch width SOIC package.

Features

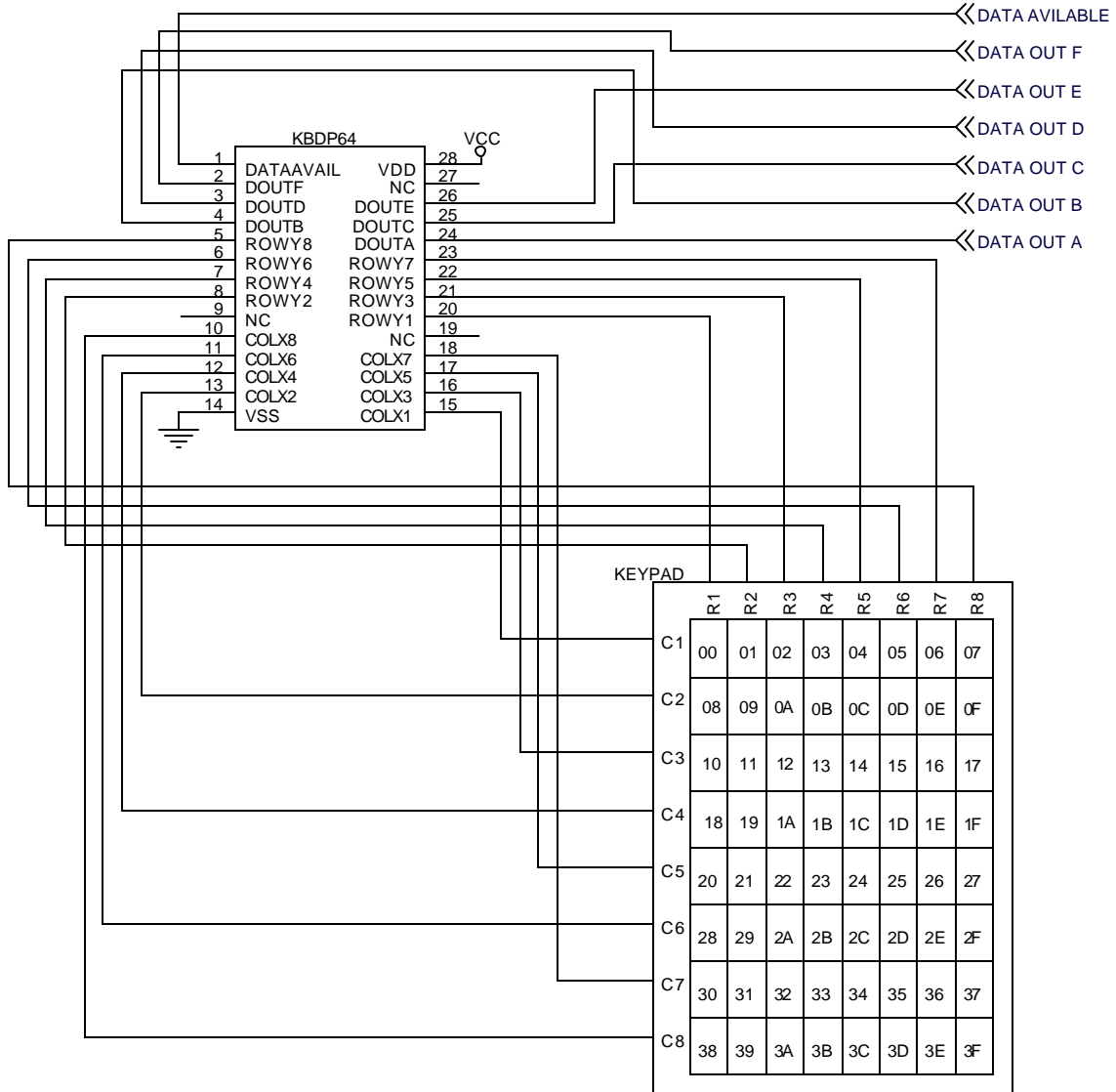
- Parallel data output plus data available strobe.
- Fully encodes a key switch array. (up to 8 x 8)
- No external parts required.
- Low power consumption 2 mA typical.
- Last key pressed retained on outputs
- Supply voltage 2.4 to 5.25 volts.
- All timing internally generated.
- 2 Key rollover.
- On chip row input resistors.
- Internal key bounce elimination.
- TTL and CMOS compatible outputs.
- Part is in full production.
- SOIC 28 Pin Package.
- LOW EMI
- ROHS Compliant

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Example Circuit

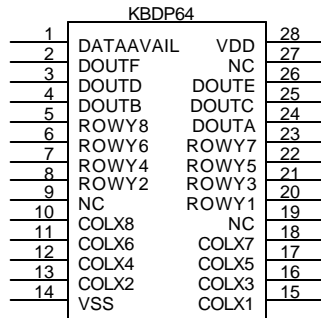


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Connection Diagram



Pin Description

Pin #	Description	Pin #	Description
1	Data Avail	28	VDD
2	DOut F (MSB)	27	NC
3	DOut D	26	DOut E
4	DOut B	25	DOut C
5	Row Y8	24	DOut A (LSB)
6	Row Y6	23	Row Y7
7	Row Y4	22	Row Y5
8	Row Y2	21	Row Y3
9	NC	20	Row Y1
10	Col X8	19	NC
11	Col X6	18	Col X7
12	Col X4	17	Col X5
13	Col X2	16	Col X3
14	VSS	15	Col X1

Col X1 – Col X8

These pins are open drain column driver outputs to the key matrix.

Row Y1 – Row Y8

These pins are the row inputs from the key matrix. These inputs have 5.6K (nominal) pull up resistors on chip.

DOUTA - DOUTF

These are the parallel data outputs. DOut A is the least significant bit. These bits form a binary code for the pressed key. These outputs keep their state even after the key is released.

Data Avail

This pin goes high when a key is pressed, and low when the key is released. In the case of a 2 key rollover, the pin goes low before the DOut bits change, then goes high again.

VSS

Connect to system ground.

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VDD

Connect to supply voltage of 2.4 to 5 volts. A .1 uF decoupling capacitor to ground is recommended.

NOTES:

Make no connection to the NC pins. Pins 9 and 19 must be left unconnected.

Truth Table

The output codes of the KBD64 start at zero, and progress upwards in a binary count. The hex output of the DOut bits is shown in the right column. Custom output codes are available, consult the factory for information.

	ROWY1	ROWY2	ROWY3	ROWY4	ROWY5	ROWY6	ROWY7	ROWY8	HEX
COLX1	X								00
COLX1		X							01
COLX1			X						02
COLX1				X					03
COLX1					X				04
COLX1						X			05
COLX1							X		06
COLX1								X	07
COLX2	X								08
COLX2		X							09
COLX2			X						0A
COLX2				X					0B
COLX2					X				0C
COLX2						X			0D
COLX2							X		0E
COLX2								X	0F
COLX3	X								10
COLX3		X							11
COLX3			X						12
COLX3				X					13
COLX3					X				14
COLX3						X			15
COLX3							X		16
COLX3								X	17
COLX4	X								18
COLX4		X							19
COLX4			X						1A
COLX4				X					1B
COLX4					X				1C
COLX4						X			1D
COLX4							X		1E
COLX4								X	1F
COLX5	X								20
COLX5		X							21
COLX5			X						22
COLX5				X					23
COLX5					X				24

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COLX5						X			25
COLX5							X		26
COLX5								X	27
COLX6	X								28
COLX6		X							29
COLX6			X						2A
COLX6				X					2B
COLX6					X				2C
COLX6						X			2D
COLX6							X		2E
COLX6								X	2F
COLX7	X								30
COLX7		X							31
COLX7			X						32
COLX7				X					33
COLX7					X				34
COLX7						X			35
COLX7							X		36
COLX7								X	37
COLX8	X								38
COLX8		X							39
COLX8			X						3A
COLX8				X					3B
COLX8					X				3C
COLX8						X			3D
COLX8							X		3E
COLX8								X	3F

Absolute Maximum Ratings

Symbol	Description	Min	Typical	Max	Units	Notes
T _{stg}	Storage Temperature	-55	25	+100	°C	
T _a	Operating Temperature	-40		+85	°C	
V _{dd}	V _{dd} - V _{ss} Voltage	-0.5		+6.0	V	
V _{io}	Input Voltage	V _{ss} - 0.5		V _{dd} + 0.5	V	
I _{mio}	Maximum current into any pin	-25		+50	mA	
ESD	Electrostatic Discharge Voltage	2000			V	Human Body Model ESD
LU	Latch up current			200	mA	

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DC Electrical Characteristics

Symbol	Description	Min	Typical	Max	Units	Notes
V_{dd}	Supply Voltage	2.4		5.25	V	
I_{dd}	Supply Current		2	8	mA	$V_{dd} = 5V$
V_{oh}	High Output Level	$V_{dd} - 1.0$			V	$I_{oh} = 10 \text{ mA}$
V_{ol}	Low Output Voltage			0.75	V	$I_{ol} = 25 \text{ mA}$
V_{ih}	Input High Level	2.1			V	
V_{il}	Input Low Level			0.8	V	
I_{oh}	High Level Source Current			10	mA	
I_{ol}	Low Level Sink Current			25	mA	
C_{io}	Capacitive load		3.5	10	pF	
I_i	Input leakage		1		nA	
R_{pu}	Pull Up Resistors On Row Inputs	4	5.6	8	k?	

Theory Of Operation

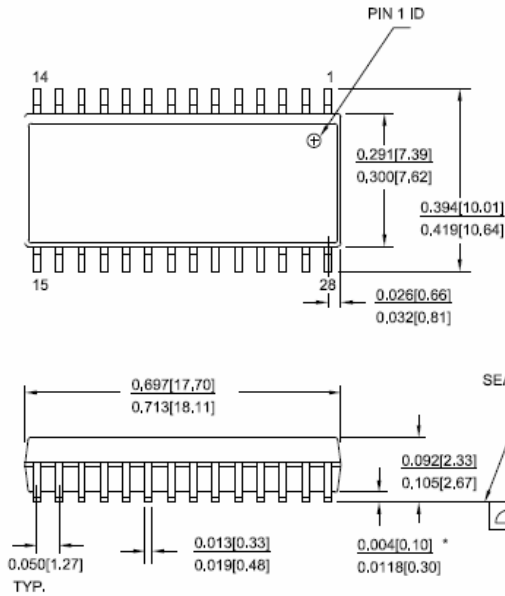
The KBDP64 IC is a custom programmed microprocessor designed to encode keyboards and provide a parallel output. The open drain COL X pins are pulsed low one at a time, and the ROW Y pins are sampled to check for key switch closures. If a key is detected, scanning stops until the key is released. The pressed key is encoded and placed on the DOut pins, and the Data Avail strobe is set high. When the key is released the Data Avail strobe is set low and scanning continues.

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Physical Dimensions

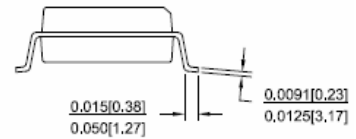


AT THE MOLD PARTING LINE, MOLD PROTRUSION/END FLASH SHALL NOT EXCEED 0.010 in (0.254 mm) PER SIDE

3. DIMENSIONS IN INCHES

MIN.
MAX.

PART #	
S28,3	STANDARD PKG.
SZ28,3	LEAD FREE PKG.
SX28,3	LEAD FREE PKG.



Design Services Available

We can quickly turn your idea into a chip, a pc board, or a finished product. Contact us with your needs and specifications.