



MA6231

Keyboard Controller IC

(Support EEPROM version)

Programming Manual

Preliminary 1.7

2004/08/18

MosArt

SEMICONDUCTOR CORP.

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1. General Description

The MA6231 is a single chip keyboard transmitter. It is developed to achieve a better performance/cost ration for wireless office keyboard system. The MA6231 supports 176 (22*8) keys and 3 rolling wheels, which are either IR/PT or mechanical device.

The MA6231 operates using dual RF channels and PS/2 office keyboard device. The MA6231 senses the key press from keyboard and the rolling wheels motion from keyboard device then send their data via RF. Furthermore, the MA6231 has a DC/DC embedded.

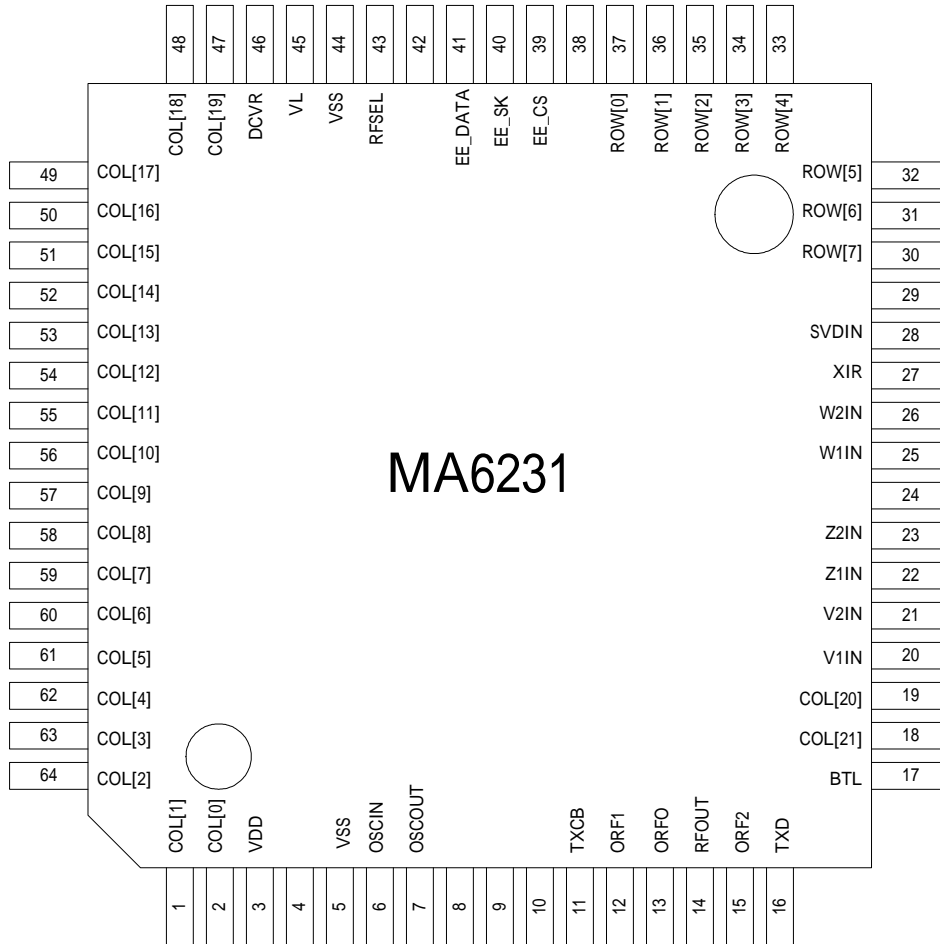
2. Features

- Low power CMOS device technology
- Support office keyboard (22 * 8 keys)
- 2 RF channels are supported
- 3 build-in rolling wheels controller (both mechanical and photo device are supported)
- Phantom key detection
- 32.768KHz clock rate (low power consumption)
- Build-in RF oscillator, modulator and power amplifier
- Low power design in standby mode for keyboard and mouse
- 4k bps Baud rate in air.
- ID change solution to resist the interference from the same device
- DC/DC embedded
- Low Power Detection
- Support EEPROM to reserve ID and channel number

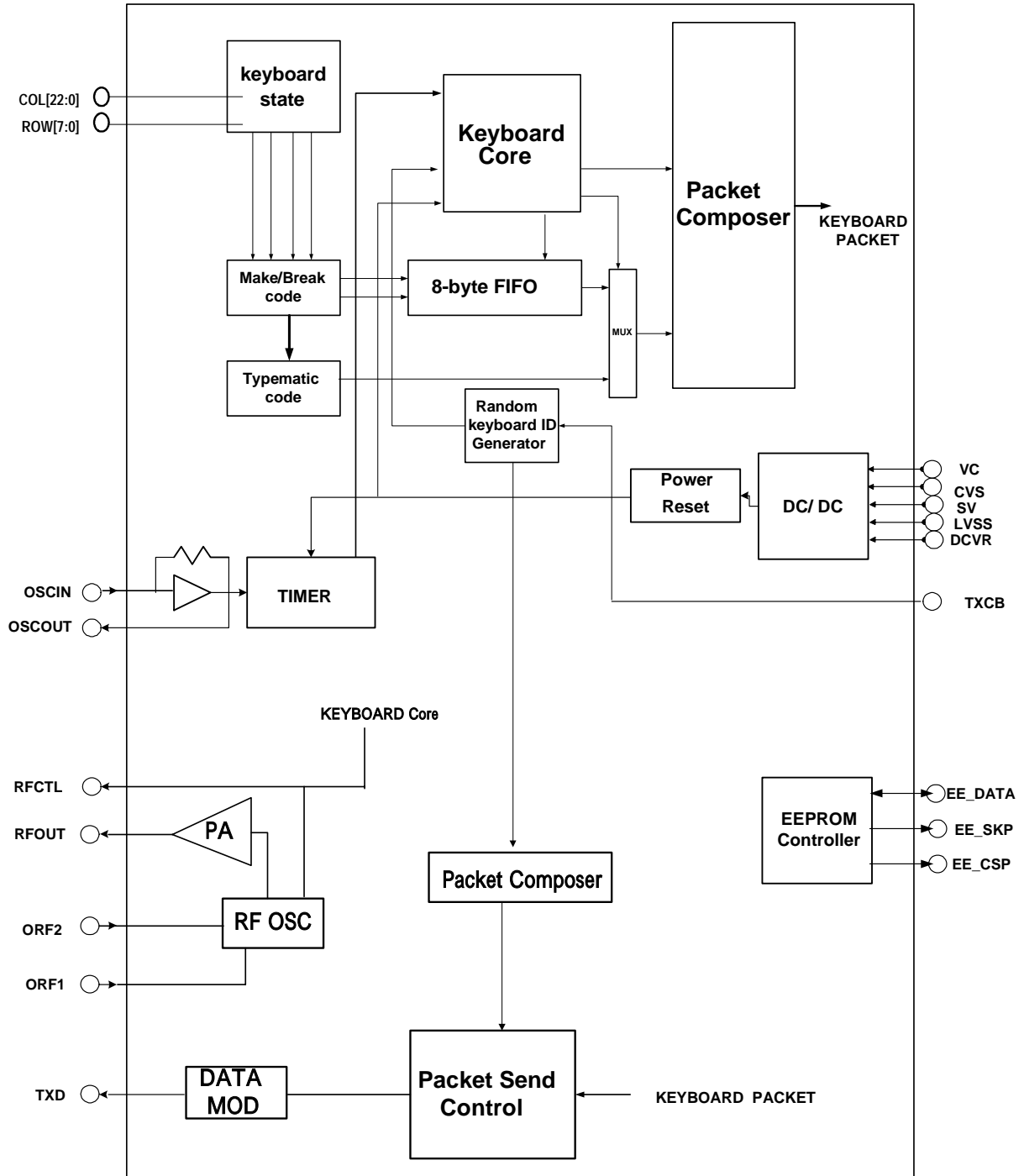
3. Pin Assignments & IC Top Code

(1) 64-pin LQFP Package

Top code: MA6231



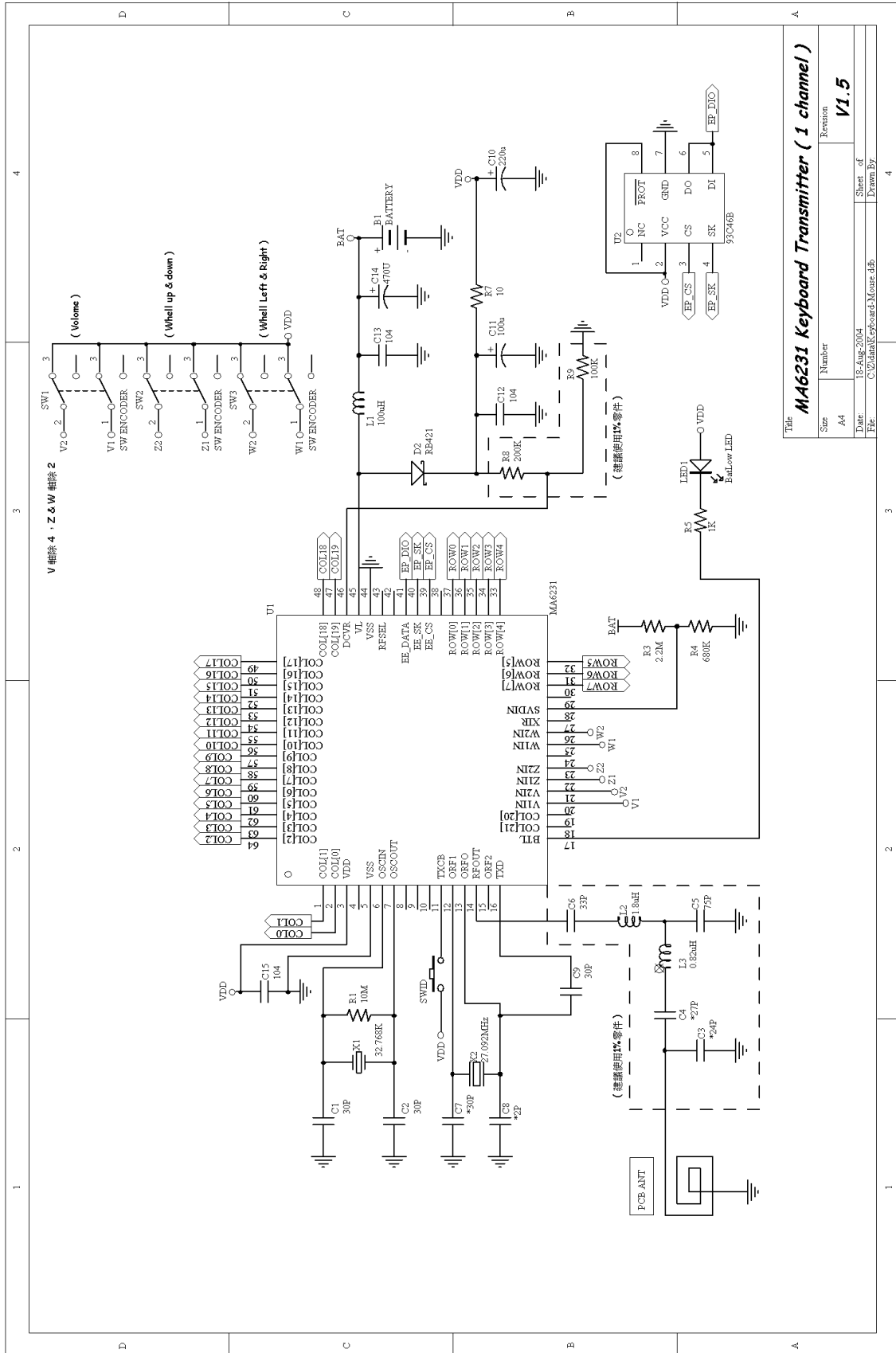
4. Block Diagram

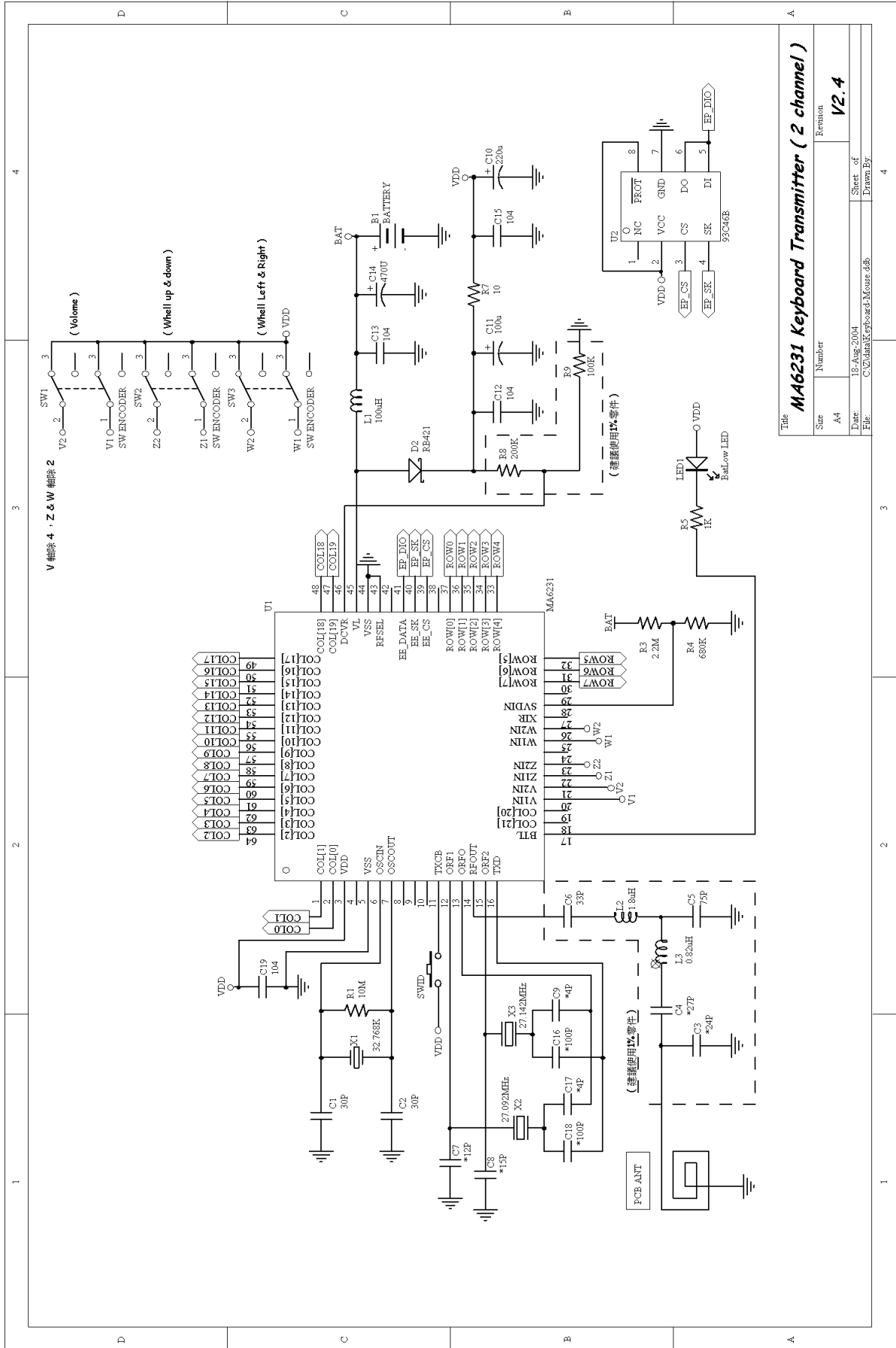


5. Pin Out & Description

Pin No.	Symbol	I/O	Description
1-2	COL [1:0]	I/O	Keyboard output scan line (Internal pull-up)
3	VDD	P	Power
5	VSS	P	Ground
6	OSCIN	I	32.768KHz Oscillator Input
7	OSCOUT	O	32.768KHz Oscillator Output
11	TXCB	I	ID Change Button & RF channel selection
12	ORF1	I	RF Internal Buffer Input (27MHz Oscillator Input)
13	ORFO	O	RF Internal Buffer Out (27MHz Oscillator Output)
14	RFOUT	O	Internal Modulated RF Output
15	ORF2	I	2 nd channel RF Internal Buffer Input
16	TXD	O	Digital Encoded Data
17	BTL	I	Battery Low Output
18	COL[21]	I/O	Keyboard output scan line (Internal pull-up)
19	COL[20]	I/O	Keyboard output scan line (Internal pull-up)
20	V1IN	I	Reserved Input1
21	V2IN	I	Reserved Input2
22	Z1IN	I	Z Axis Input1
23	Z2IN	I	Z Axis Input2
25	W1IN	I	Volume Control Input1
26	W2IN	I	Volume Control Input2
27	XIR	O	IR Emitting Diode Output
28	SVDIN	I	Supply Voltage Detect Input
30-37	ROW [7:0]	I	Keyboard input scan line (Internal pull-up)
38	EE_CSP	O	EEPROM chip select signal
39	EE_SKP	O	EEPROM clock signal
40	EE_DATA	I/O	EEPROM data in/out signal
43	RFSEL	I	Single/dual RF channel selection
44	VSS	P	Ground
45	VL	I	DC/DC Lx Switch
46	DCVR	I	DC/DC Voltage Reference
47-64	COL [19:2]	I/O	Keyboard output scan line (Internal pull-up)

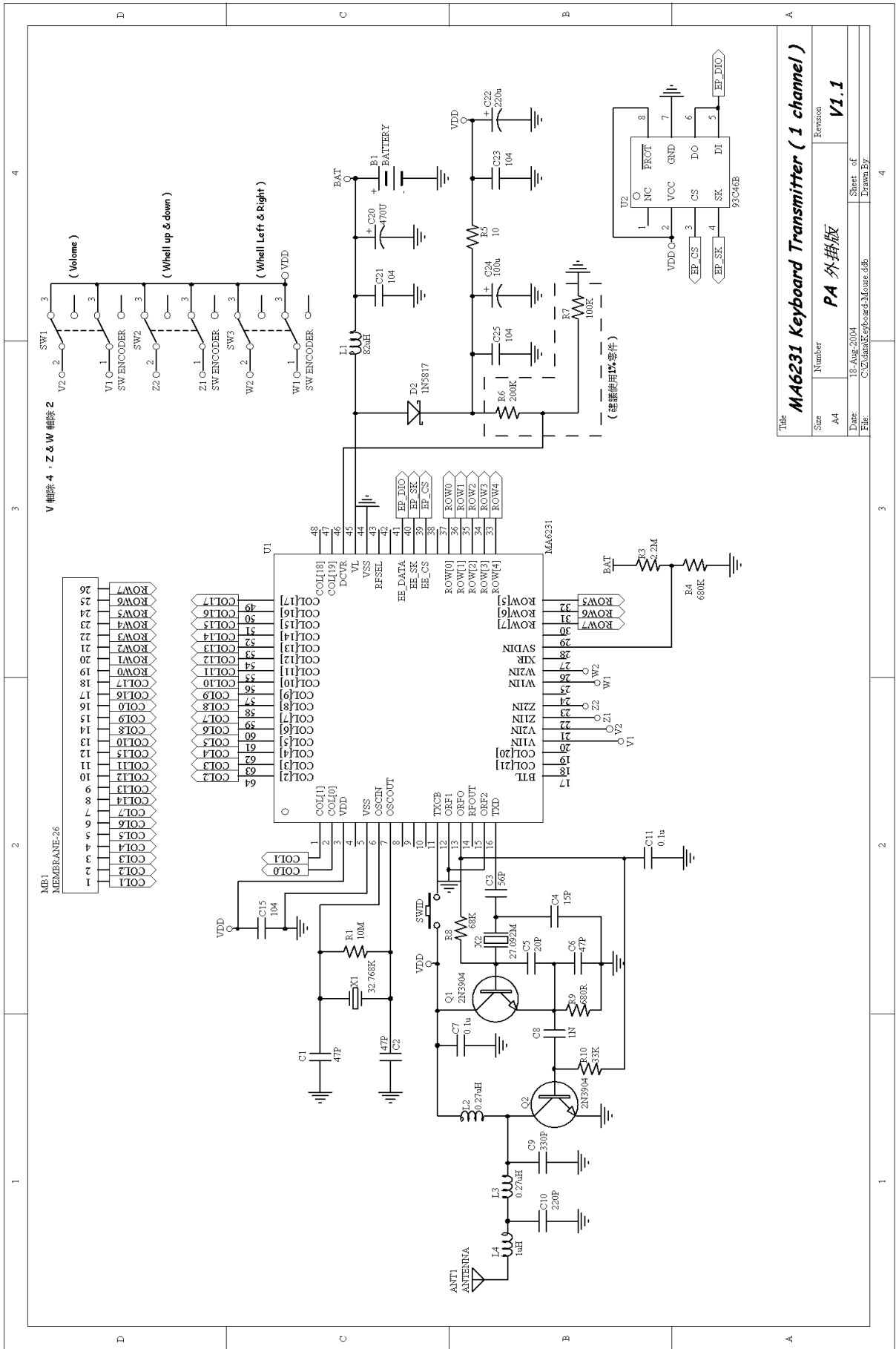
6. Application circuit





Title **MA6231 Keyboard Transmitter (2 channel)**

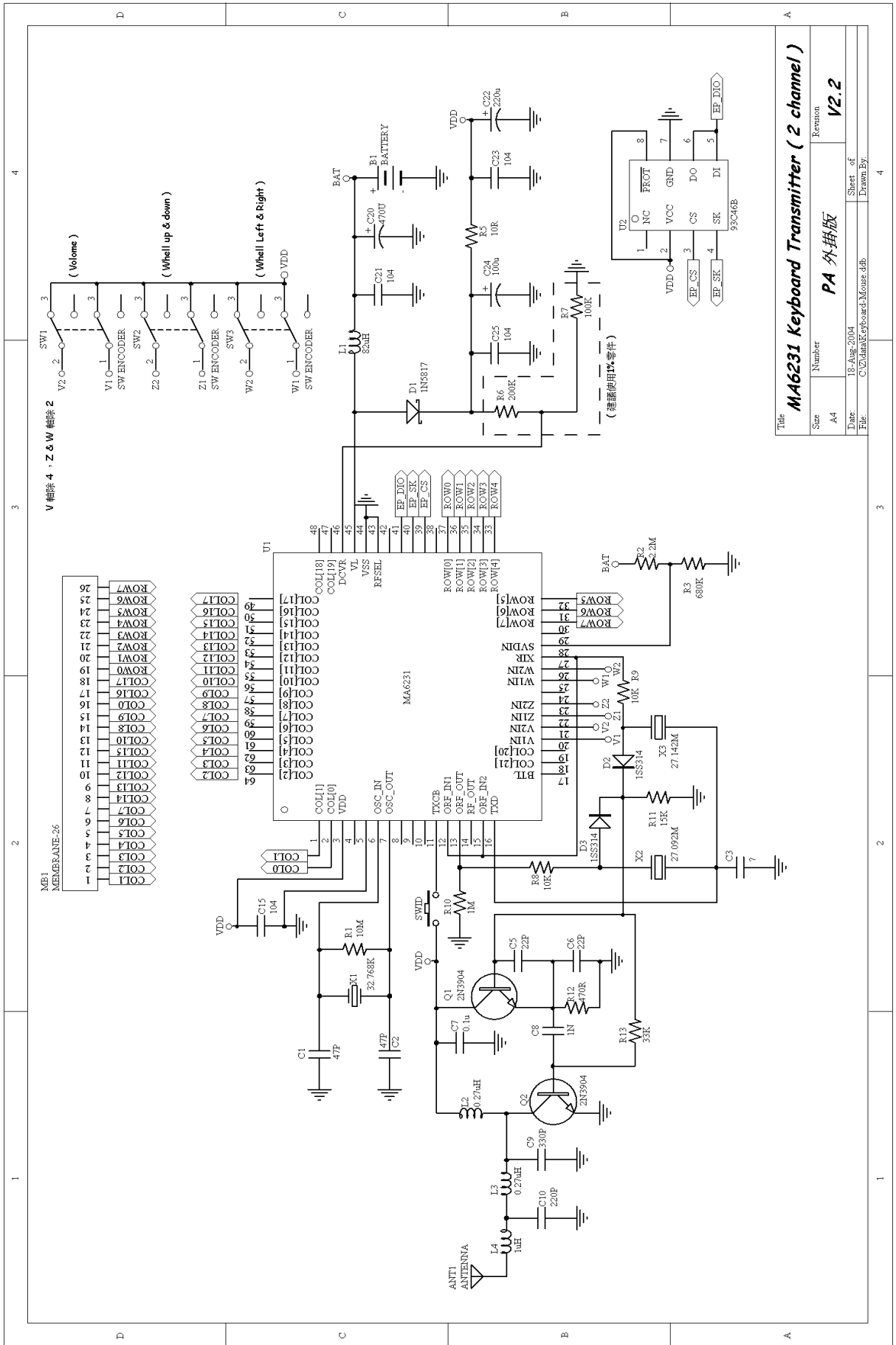
Size	Number	Revision
A4		V2.4
Date	15-Aug-2004	Sheet of
File	C:\Main\Keyboard-Mouse.dtb	Drawn By



V 軸線 4 : Z & W 軸線 2

MEM1 MEMERANE-26

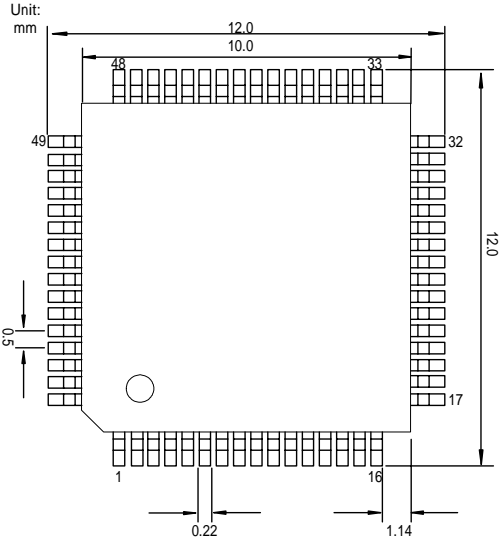
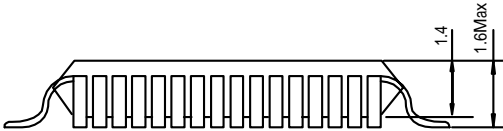
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Title		MA6231 Keyboard Transmitter (2 channel)	
Size	Number	Revision	
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7. Package Type

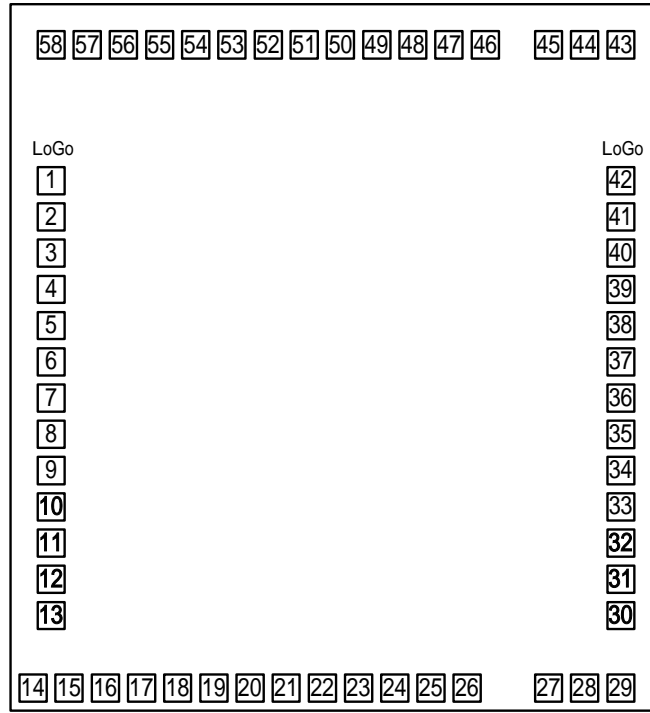
64pin/LQFP



8. DC Characteristics

Symbol	Parameter	Test Condition		Min.	Type	Max.	Unit
		V _{DD}	Condition				
V _{DD}	Operating Voltage	-	-	2.5		3.3	V
	Start up Voltage			1.0		3.3	
	Hold Voltage			0.2		3.3	
I _{DD}	Operating Current	3V	F _{sys} = 32.768KHz, No Load		1.2		mA
I _{DDS}	Standby Current	3V	F _{sys} = 32.768KHz, No Load		40		uA
V _{IL}	Input Low Voltage for I/O ports	3V	-			0.8	V
V _{IH}	Input High Voltage for I/O ports	3V	-	2.0			V
R _{PH}	Pull-High Resistance of SCANIN	3V	-		100		K
R _{PL}	Pull-Low Resistance of TXCB	3V	-		825		K
T _{OP}	Opereating Temperature	3V		0	25	75	°C

9. Pad Diagram



Pad No.	Pad Name	Pin No.	X	Y
1	COL [1]	1	46	1565.275
2	COL [0]	2	46	1465.275
3	VDD	3	46	1365.275
4	EN_SYNC16_ONCE		46	1265.275
5	EN_NEWCRC		46	1165.275
6	VSS	5	46	1065.275
7	OSCIN	6	46	965.275
8	OSCOUT	7	46	865.275
9	TXCB	11	46	765.275
10	ORF1	12	46	665.275
11	ORFO	13	46	565.275
12	RFOUT	14	46	465.275
13	ORF2	15	46	365.275
14	TXD	16	50	46
15	BAT_LOW	17	150	46
16	COL [21]	18	250	46
17	COL [20]	19	350	46
18	V1IN	20	450	46
19	V2IN	21	550	46

20	Z1IN	22	650	46
21	Z2IN	23	750	46
22	W1IN	25	850	46
23	W2IN	26	950	46
24	XIR	27	1050	46
25	SVDIN	28	1150	46
26	ROW [7]	30	1250	46
27	ROW [6]	31	1400	46
28	ROW [5]	32	1500	46
29	ROW [4]	33	1600	46
30	ROW [3]	34	1604	365.3
31	ROW [2]	35	1604	465.3
32	ROW [1]	36	1604	565.3
33	ROW [0]	37	1604	665.3
34	EE_CS	39	1604	765.3
35	EE_SK	40	1604	865.3
36	EE_DATA	41	1604	965.3
37	RFSEL	43	1604	1065.3
38	VSS	44	1604	1165.3
39	VL	45	1604	1265.3
40	DCVR	46	1604	1365.3
41	COL [19]	47	1604	1465.3
42	COL [18]	48	1604	1565.3
43	COL [17]	49	1600	1904
44	COL [16]	50	1500	1904
45	COL [15]	51	1400	1904
46	COL [14]	52	1250	1904
47	COL [13]	53	1150	1904
48	COL [12]	54	1050	1904
49	COL [11]	55	950	1904
50	COL [10]	56	850	1904
51	COL [9]	57	750	1904
52	COL [8]	58	650	1904
53	COL [7]	59	550	1904
54	COL [6]	60	450	1904
55	COL [5]	61	350	1904
56	COL [4]	62	250	1904
57	COL [3]	63	150	1904
58	COL [2]	64	50	1904

Whole Chip Size: 1800*2100 um

Pad Size: 87*87 um

Substrate : GND