

DATA SHEET

ET30X210C PS2 Game Pad

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1. Descriptions

ET30X210C is an ASIC designed for PLAY STATION 2 game pad controller. It's not only inherited all the advantages from older version, ET30X210, but also add the most popular functions in it, for instance Turbo, Slow, Function Clear, Auto Centering, 12 Built-in AD buttons' resistors.... All its standard functions are fully compatible with original pad. It can also work with standard PS one, dual shock and dual shock 2 types.

2. Feature

- Operating voltage: 3.3volts ~ 3.6volts.
- Available in temperature range: 0°C~70°C.
- Oscillation: 12 MHz Oscillation with only one 25K Ohm external resister, ERIC.
- Built-in power-on reset.
- 16 analog buttons inputs with 8-bits A/D resolution.
- PWM motor control function
- Anti-noise SPI interface.
- Support DIGITAL mode, ANALOG mode and NEGCON mode.
- Four special functions: TURBO, SLOW, and FUNCTION CLEAR.
- Total 44 pins.
- Package: 44-Lead QFP (10 x 10 x 2.0 mm)

3. PIN

■ Pin Descriptions

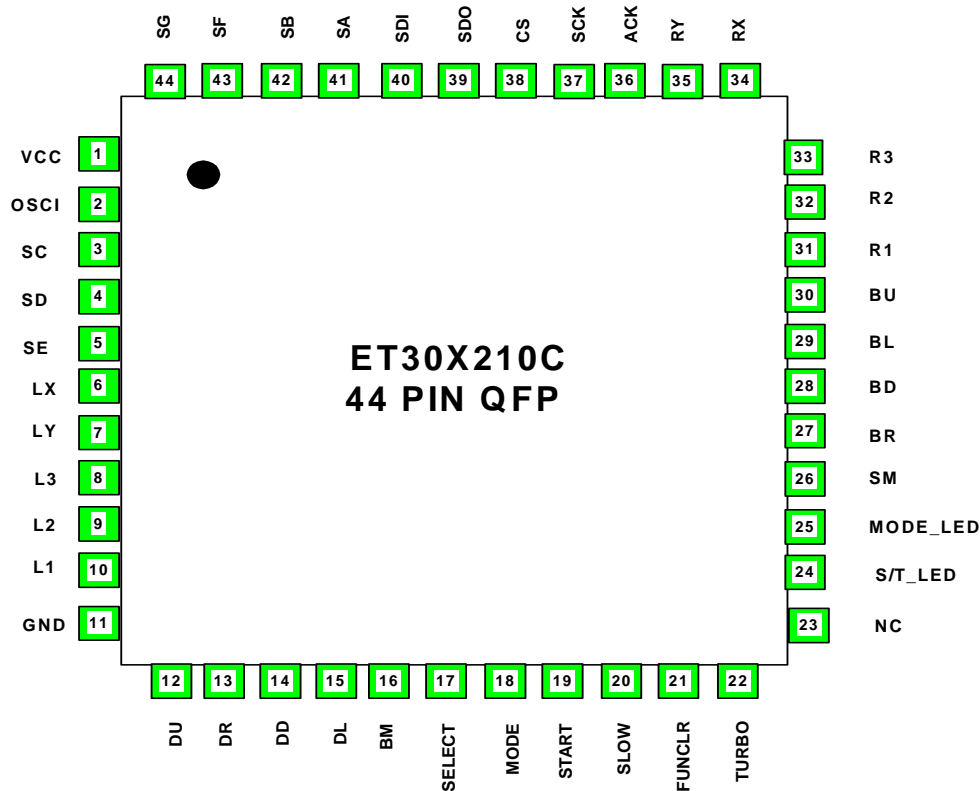
Table1: ET30X210C pin assignment

No.	Name	I/O	Function
1	VDD		VDD
2	OSCI	I	Oscillation clock input. Connect Rclk = 24 kohm to Vcc
3	SC	I	Auto Centering Enable / Disable pin. Tie to GND: Disable center dead zone (Output original AD value, true AD value) Tie to VCC: Enable center dead zone
4	SD	I	Opposite Polarity Type En/Dis pin. Tie to GND: Normal Type Tie to VCC: Invert the functions of R-Stick y-axis polarity
5	SE	I	Negcon mode Enable / Disable pin. Tie to GND: Enable Negcon mode Tie to VCC: Disable Negcon mode
6	LX	I	Left Stick's X-axis analog signal input pin.
7	LY	I	Left Stick's Y-axis analog signal input pin.
8	L3	I (internally pull-high)	L3 button digital signal input pin.
9	L2	I	L2 button analog signal input pin.
10	L1	I	L1 button analog signal input pin.
11	GND		Ground
12	DU	I	Direction UP button analog signal input pin.
13	DR	I	Direction RIGHT button analog signal input pin.
14	DD	I	Direction DOWN button analog signal input pin.
15	DL	I	Direction LEFT button analog signal input pin.
16	BM	O	Big Motor PWM control signal output pin
17	SELECT	I (internally pull-high)	Select button digital signal input pin.
18	MODE	I (internally pull-high)	Mode change button digital signal input pin (Dig -> Ana -> Dig...). Press Mode button for 3 seconds to enable Negcon mode. (2 sec. press) Neg. -> (1 press) Dig. -> (1 press) Ana.
19	START	I (internally pull-high)	Start button digital signal input pin.
20	SLOW	I (internally pull-high)	SLOW function Enable / Disable digital signal input pin
21	FUNCLR	I (internally pull-high)	TURBO function clear pin.
22	TURBO	I (internally pull-high)	TURBO function setting digital signal input pin
23	NC		



No.	Name	I/O	Function
24	S/T_LED	O	SLOW and TURBO LED signal output pin
25	MODE_LED	O	Analog mode LED signal output pin
26	SM	O	Small motor control signal output pin (Digital control)
27	BR	I	CIRCLE button analog signal input pin.
28	BD	I	CROSS button analog signal input pin.
29	BL	I	SQUARE button analog signal input pin.
30	BU	I	TRIANGLE button analog signal input pin.
31	R1	I	R1 button analog signal input pin.
32	R2	I	R2 button analog signal input pin.
33	R3	I (internally pull-high)	R3 button analog signal input pin.
34	RX	I	Right Stick's X-axis analog signal input pin.
35	RY	I	Right Stick's Y-axis analog signal input pin.
36	ACK	O (open-drain)	SPI Output ACK
37	SCK	I	SPI Clock input from PS console
38	CS	I	SPI CS signal from PS console
39	SDO	O (open-drain)	SPI Output data
40	SDI	I	SPI Command from PS console
41	SA	I	Mapping Function Enable / Disable pin. Direction buttons (↑,↓,←,→) maps to LJ; function buttons (Δ,□,×,○) Buttons maps to RJ. Tie to GND: Disable Mapping function Tie to VCC: Enable Mapping function
42	SB	I	Center Dead Zone range select pin. (The option is valid only if center dead zone function is enabled. SC ties to GND) Tie to GND: ±15 scales equals to "0x80" Tie to VCC: ±8 scales equals to "0x80"
43	SF	I	SSM (Select + Start = Mode) Key Function Tie to GND: Disable SSM key function Tie to VCC: Enable SSM key function
44	SG	I	(Dual shock1 or Dual shock) select pin. (The option can choose the Dual shock1 or Dual shock2) Tie to GND: Dual shock1 Tie to VCC: Dual shock2

■ Pin Assignment



4. Function Description

- **Turbo Function** – The turbo function allows to set 2 button as “Rapid Fire”.

How many keys can be set with Turbo function.

- (1) DR, DL, DU, DD, BR, BL, BU, BD, L1, L2, R1, and R2.

How to set up Turbo function

- (1) Push and hold the turbo button
- (2) Push the specific button, which requires the rapid fire.
- (3) Release this specific button first then release the Turbo button. The Turbo function is set into this specific button.
- (4) As the Turbo function is set, the S/T LED will blink as the related speed as Turbo signal is sent out.

How to clear Turbo function

- (1) If want to clear single Turbo function button has been set: Execute the same procedure as how to set Turbo function.
- (2) If want to clear all Turbo functions have been set: Simply press Function clear button if available.

How to Play Turbo function

- (1) After Turbo function has been set on specific button, press and hold this button, then the Turbo signal will be send out as long as players hold this button.

How to adjust the speed of Turbo function

There are 4 speed for Turbo function, 75m second, 100m seconds, 150m seconds, and 200m seconds. The default will be 100m seconds.

- (1) Press the R3 button and hold it
- (2) Then press DU/DD to select faster/slower speed. At the mean time, the S/T LED will blink at the speed related to different Turbo speed as below. 100m seconds is the default setting.

Turbo Speed	S/T LED Speed
75m second	150m second
100m second	200m second
150m second	300m second
200m second	400m second

- **Slow Function** –Slow Action function is to slow down the game in order to supply players more time to react to fast events.

How to set up / erase Slow function

- (1) Push the slow button to enable the slow function.
- (2) Push the slow button again to disable slow function

Once the Slow function is enable, the S/T LED will blink as the related speed as Slow signal sending out.

- **Function Clear Function**– Turbo function clear pin

How to clear Turbo function

Simply press Turbo function clear button, and all the turbo functions have been set are reset.

- **Pin Option Selection**

SA: Mapping Function En/Disable pin.

Direction buttons (↑,↓,←,→) map to left joystick; function buttons (Δ,□,×,O) map to right joystick.

Tie to GND: Disable Mapping function

Tie to VCC: Enable Mapping function

SB: Center Dead Zone range select pin.

(The option is valid only if center dead zone function is enabled. SC ties to GND)

Tie to GND: ±15 scales equals to “0x80”. For worst 3D-VR.

Tie to VCC: ±8 scales equals to “0x80”

SC: Auto Centering Enable / Disable pin.

Tie to GND: Disable center dead zone (Output original AD value, true AD value)

Tie to VCC: Enable center dead zone

SD: Opposite Polarity Type En/Dis pin

Tie to GND: Normal Type

Tie to VCC: Invert the functions of R-Stick y-axis polarity

SE: Negcon mode Enable / Disable pin.

Tie to GND: Enable Negcon mode

Tie to VCC: Disable Negcon mode

SF: Start + Select = Mode key Function En/Disable pin.

Press Select and Start keys together 6 seconds, system will change Mode (Digital \leftrightarrow Analog).

Tie to GND: Disable SSM key function

Tie to VCC: Enable SSM key function

SG: Dual shock1 or Dual shock2 select pin.

The option can select the Dual shock1 mode or Dual shock2 mode.

Tie to GND: The GamePad type become the Dual shock1

■ **MODE SELECT**

The mode can be changed by pressing the mode button

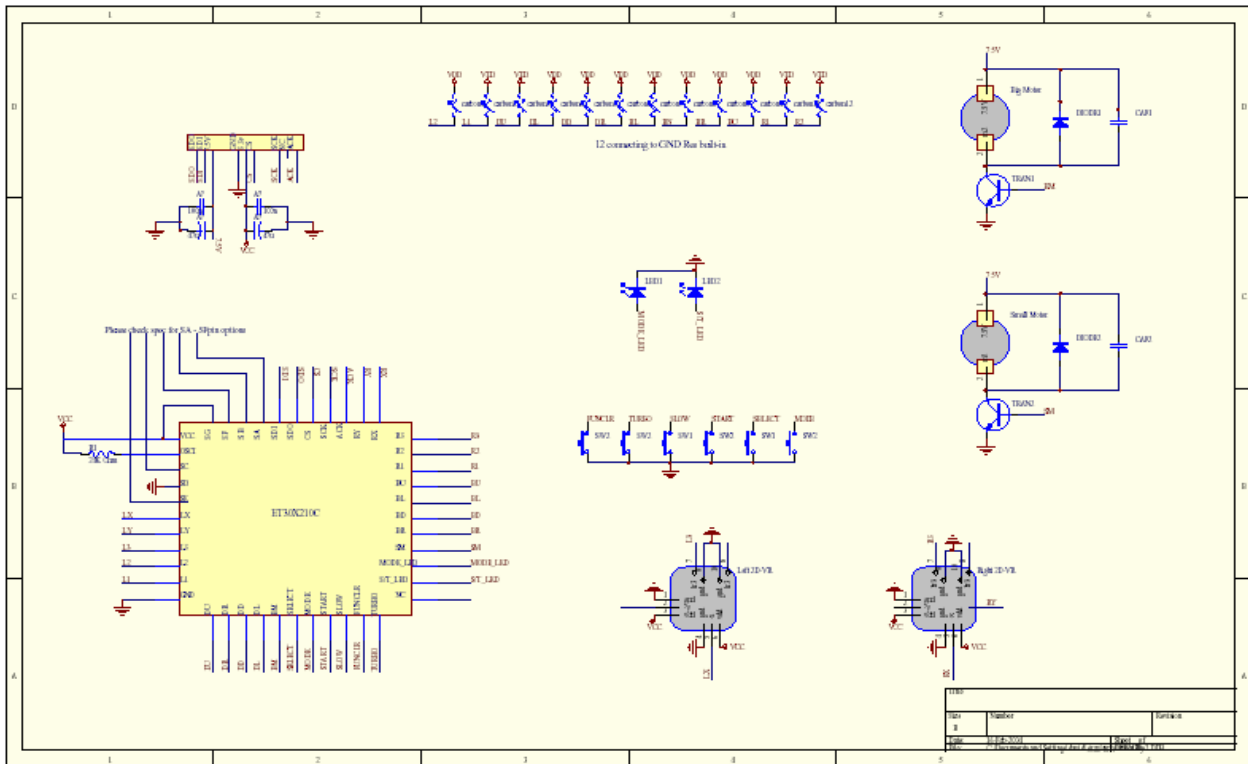
- 1) Without Negcon mode support: Mode changes as DIGITAL -> ANALOG -> DIGITAL ->.....
- 2) With Negcon mode support: As power up, the Negcon mode is disable. Only press and hold mode button for 3 second is allowed to enter NEGCON mode. One press of mode button again will jump out and disable Negcon mode and back to normal mode as above

■ **LED Display**

Table 7.1 LED display

LED	Explanation
Analog LED	On: Analog mode Off: not analog mode Blinks once every 250ms: Negcon mode
S/T LED	* Blinks as Turbo function is activated. The blinking speeds is related to Turbo function's speeds. * Blinks as Slow motion is activated Off: Other time

5. Application Circuit



■ Appendix

Carbon Bridge value:

Built-in resistors' value is 1.8K Ohm. If consider the process $\pm 30\%$ tolerance, which is worst case, the minimum value for carbon bridge has to be bigger than 15K.

6. Component List

ET30X210C PAD Application BOM List (Reference only)

Circuit Element	Quantity
Resistor 25k ohm (R1k)	1
LED	1 (mode)
Carbon VR Rv (R)	12
Motor	2
Transistor (8050)	2
Diode (4148)	2
Capacitor (100n)	4
Capacitor (47u)	2



7. Revision History

Version	Date	Description
V1	2004/02/18	New Creation