TP6837

USB RF 2.4G Presenter Device

Data Sheet

AMENDMENT HISTORY

Version	Date	Description
V1.0	Feb, 2011	New release

CONTENTS

1. GENERAL DESCRIPTION

The TP6837 is a wireless presenter device. It uses tenx motion sensing technology and can control the windows cursor in the air to free you from desk. It is provided with presenter functions such as laser, magnifier, and marker pen.

2. FEATURES

(1). Operation Frequency

- FAST mode: 24MHz crystal oscillation with internal 48MHz PLL at 5.0V for USB mode
- SLOW mode: Adjustable ext. R/C, RC oscillator at 2.0V~3.6V for battery system (optional)
- STOP mode

(2). On-Chip Memory

- Internal RAM 256bytes and external XRAM up to 384bytes

(3). PWM

- Support 2 channels of Pulse Width Modulation (PWM) function with 8-bit resolution

(5). Reset Controller

- Power On Reset, Low Voltage Reset, Watch-Dog Timer, USB Plug-out Reset

(6). SPI interface

- Support Mode0, 1, 2, 3
- 1x Master/Slave (Tx FIFO 8*8 bytes, Rx FIFO 8*8 bytes)
- Clock rate up to 6Mbps

(7). Support 32768Hz Crystal pin for Accuracy timing in low power mode (optional)

(8). Keep SRAM data when USB un-plug (need battery)

(9). I/O Ports

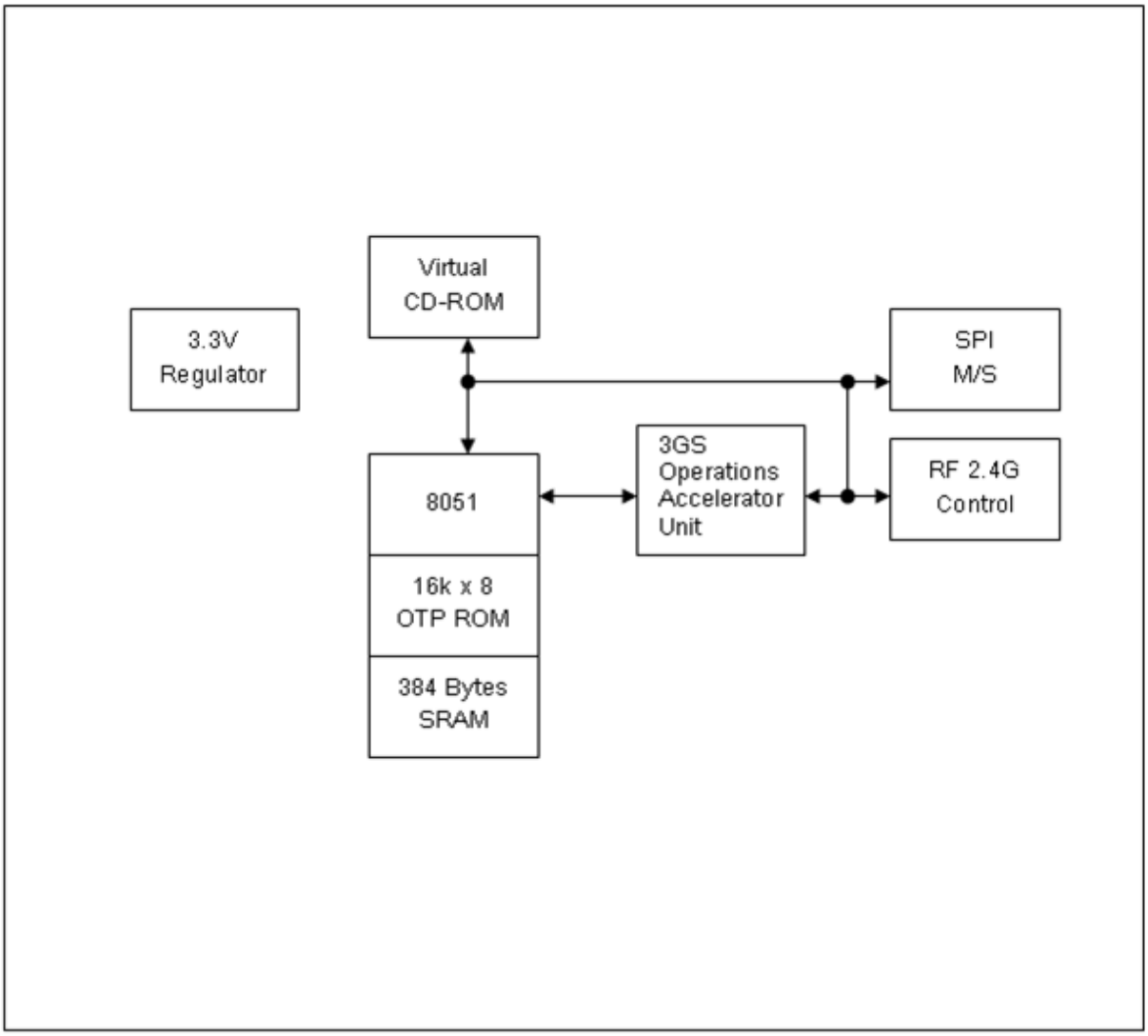
- 4 external Interrupts with wakeup function

(10). LQFP48/ Die Form

(11). Application

1. Mice
2. Presenter Functions
3. Remote Controls
4. Virtual Reality

3. Functional Block Diagram

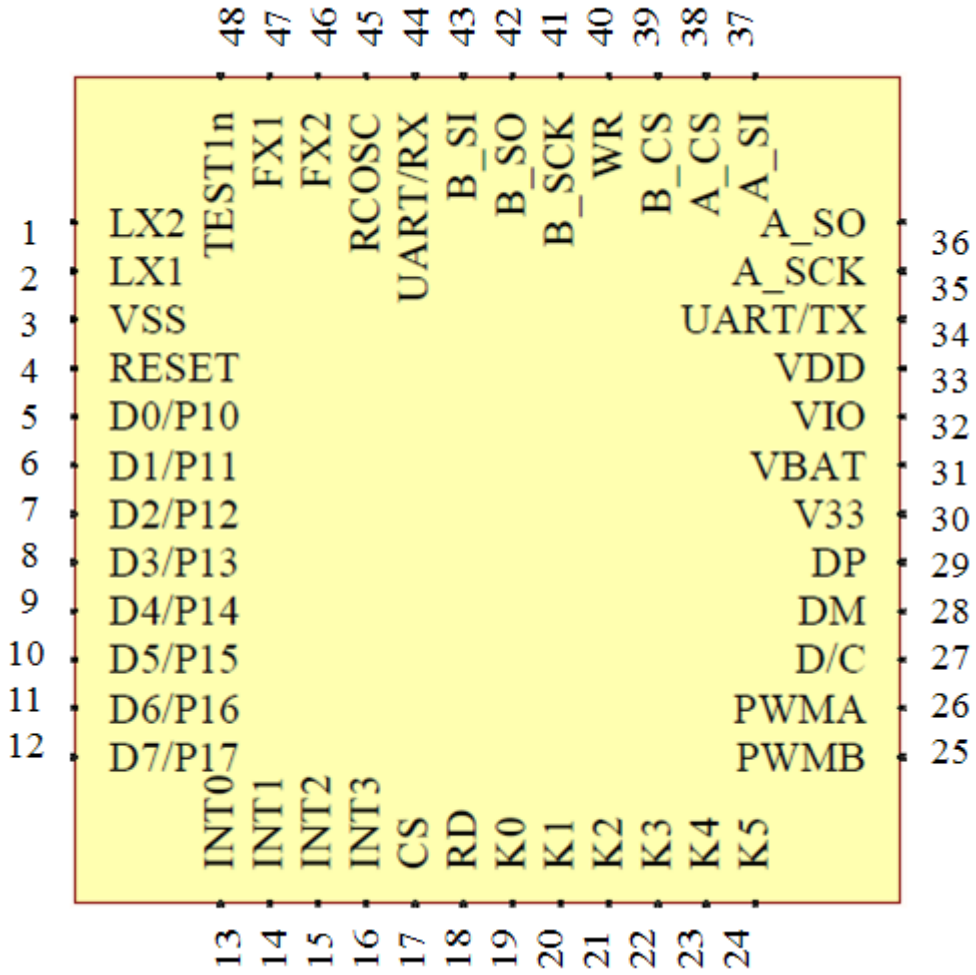


4. Pin Description

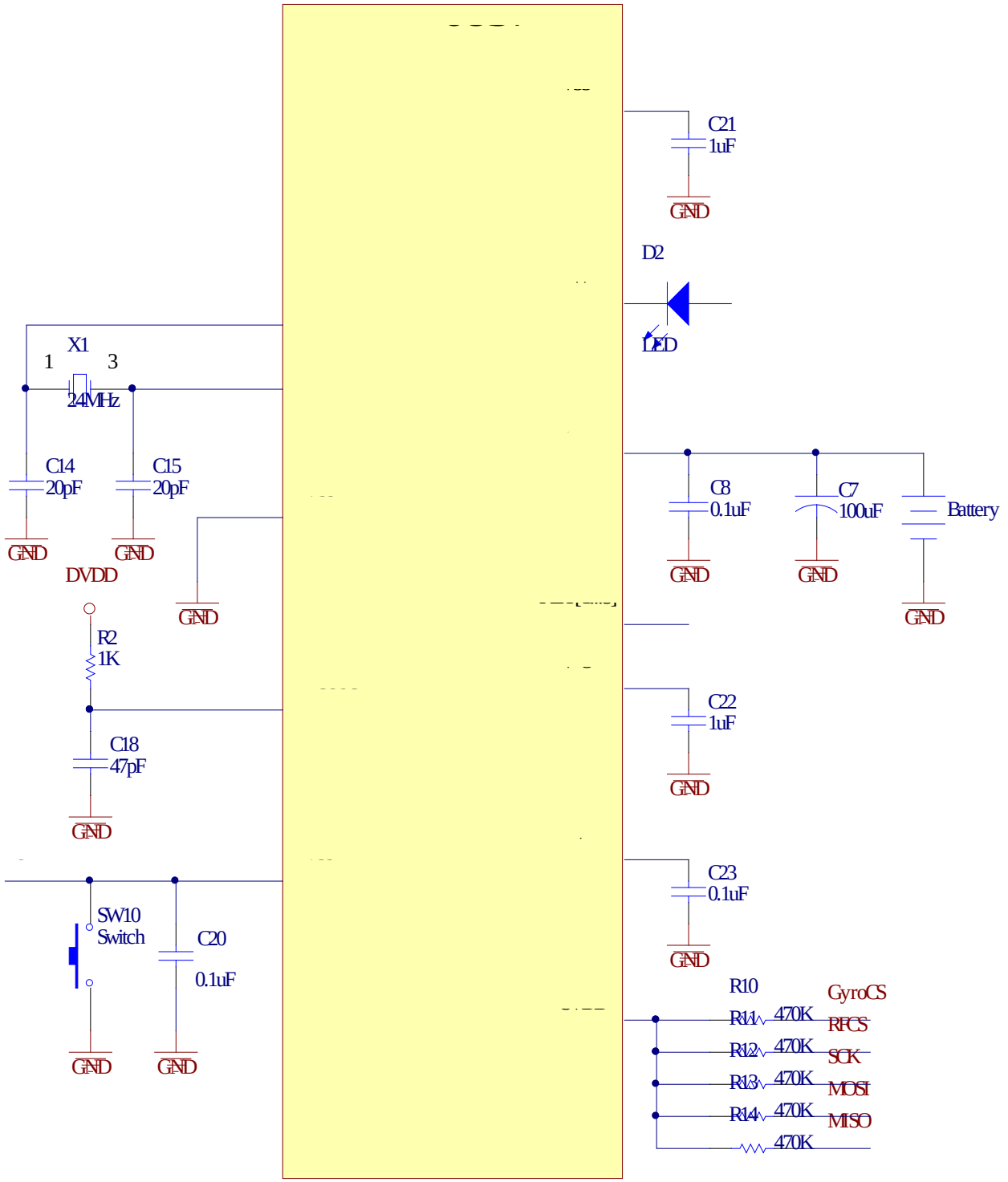
Name	I/O	Description
VDD	P	5V Power from USB cable
VSS	P	Ground
VBAT	P	Battery power
VIO	O	Chip I/O voltage, (1.8V/3.0V/3.3V/5V/VBAT by chip configuration)
FX1	I	Crystal in (24MHz)
FX2	O	Crystal out
RCOSC	I	RC clock, external capacitor and resistor
V33	O	3.3V regulator output
D[7:0]	I/O	8051's D[0..7]
	I/O	KEY[1..5] Keys
PKT	I	RF Packet flag
RESET	O	RF Reset
A_CS	O	RF Chip enable(RFCS)
B_SCK	O	SPI DATA Clock
B_SO	O	SPI DATA Output (MISO)
B_SI	I	SPI DATA In (MOSI)
CS	O	SPI MASTER BUSY
WR	O	Gyro enable(GyroCS)
PWMA	O	LED2 and PWMA Output

All I/O ports are pseudo-open drain type.
I/O voltage fixes 3.3V, unless otherwise specified.

5. Package


1 LX2
2 LX1
3 VSS
4 RESET
5 D0/P10
6 D1/P11
7 D2/P12
8 D3/P13
9 D4/P14
10 D5/P15
11 D6/P16
12 D7/P17
13 INT0
14 INT1
15 INT2
16 INT3
17 CS
18 RD
19 K0
20 K1
21 K2
22 K3
23 K4
24 K5
25 PWMB
26 PWMA
27 D/C
28 DM
29 DP
30 V33
31 VBAT
32 VIO
33 VDD
34 UART/TX
35 A_SCK
36 A_SO
37 A_SI
38 A_CS
39 B_CS
40 WR
41 B_SCK
42 B_SO
43 B_SI
44 UART/RX
45 RCOSC
46 FX2
47 FX1
48 TEST1n

6. Application Circuit



7. Electrical Characteristics

(1). ABSOLOUTE MAXIMUM RATINGS (GND = 0V)

Name	Symbol	Range	Unit
Maximum Supply Voltage	VDD	-0.3 to 5.5	V
Maximum Input Voltage	Vin	-0.3 to VDD +0.3	V
Maximum output Voltage	Vout	-0.3 to VDD +0.3	V
Maximum Operating Temperature	Topg	-5 to +70	℃
Maximum Storage Temperature	Tstg	-25 to +125	℃

(2). RECOMMEND OPERATING CONDITION (at Ta = -20℃ to 70℃, GND = 0V)

Name	Symb.	Min.	Max.	Unit
Supply Voltage(USB mode)	VDD	4.5	5.5	V
Battery Voltage(battery mode)	Vbat	2.1	4.1	V
Chip I/O Voltage	Vio	1.8	5.5	V
Input “L” Voltage	Vil1	0	0.3xVio	V

(3). DC CHARACTERISTICS (at Ta = 25 ℃, VDD = 5.0V, VSS = 0V, Fosc = 24MHz)

Name	Symb.	Min.	Typ.	Max.	Unit	Condition	Note
FAST clock	fclk		24		MHz		
SLOW clock	sclk	-30%	1	+30%	MHz	VBAT=3.0V, VDD=NC ExtC=750pF, ExtR=1K	
Threshold voltage of USB detection	Vdet		4.2		V		
Operating current	Icc1	-	16	-	mA	Fosc=24MHz	No load
	Icc2		1.4		mA	24MHz off, Fosc=1MHz VBAT=3.0V, VDD=N.C.	No load
Suspend current	Isus	-	340	500	uA	USB mode	No load
Power down current	Ipd1			1	uA	RC mode, no 32KHz	No load
	Ipd2		3	5	uA	RC mode with 0.5s wakeup, disable Wakeup Int	No load
Port Output High Current	Ioh1	6			mA	Voh=Vio-0.4V, Vio>=3.0V	One clk time
	Ioh2	8			uA		
	Ioh3	2.6			mA	Voh=Vio-0.4V, Vio =1.8V	One clk time
	Ioh4	4			uA		
Port Output Low Current	Iol1	8			mA	Vol=VSS+0.2V, Vio >=3.0V	
	Iol2	4			mA	Vol=VSS+0.06V, Vio =1.8V	
VIO pin voltage	Vio1	1.7		1.9	V	I=40mA	Vio set 1.8V
	Vio2	2.9		3.1	V	I=80mA	Vio set 3V
	Vio3	3.2		3.4	V	I=120mA	Vio tie to V33
	Vio4	VDD-0.1		VDD	V		Vio set 5V
	Vio5	Vbat-0.1		Vbat	V	No PC5V, battery only	
Port Input High Voltage	Vih	0.55Vio			V	Schmitt trigger	

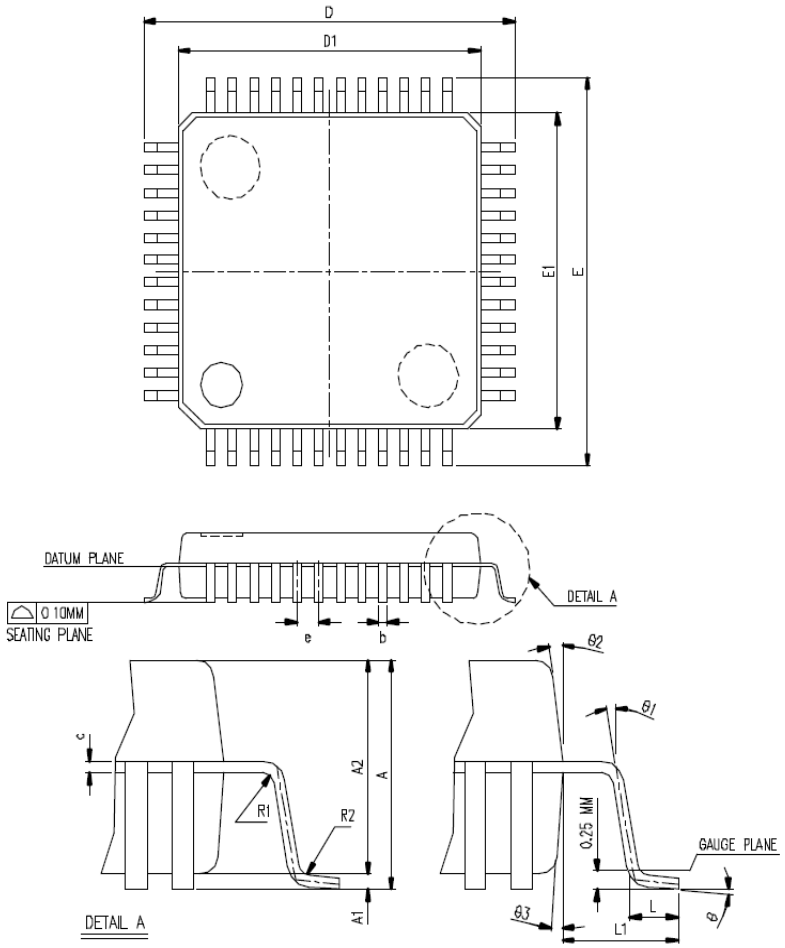
(4). AC CHARACTERISTICS (at Ta = 25 ℃, VDD5V = 5.0V, VSS = 0V, Fosc = 24MHz)

Name	Symb.	Min.	Typ.	Max.	Unit	Note
DP/DM rising time	Trise	4		20	ns	
DP/DM falling time	Tfall	4		20	ns	
DP,DM cross point	Vx	1.3		2.0	V	
V33 output voltage	Vreg	3.2	3.3	3.4	V	
V33 output current	IV33		20	30	mA	

Note: All USB transceiver characteristics can meet USB1.1 spec.

8. Package Information

(1). LQFP48:



SYMBOL	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM	MAX.	MIN	NOM	MAX
A			1.60			0.063
A1	0.05		0.15	0.001		0.006
A2	1.35	1.40	1.45	0.053	0.055	0.057
⚠ b	0.17	0.22	0.27	0.007	0.009	0.011
⚠ c	0.09		0.20	0.004		0.008
e	0.50 BASIC			0.020 BASIC		
D	9.00 BASIC			0.354 BASIC		
D1	7.00 BASIC			0.276 BASIC		
E	9.00 BASIC			0.354 BASIC		
E1	7.00 BASIC			0.276 BASIC		
L	0.45	0.60	0.75	0.018	0.024	0.030
L1	1.00 REF.			0.039 REF.		
R1	0.08			0.003		
R2	0.08		0.20	0.003		0.008
θ	0°	3.5°	7°	0°	3.5°	7°
θ1	0°			0°		
θ2	11°	12°	13°	11°	12°	13°
θ3	11°	12°	13°	11°	12°	13°
JEDEC	MS-026 (BBC)					

*NOTES : DIMENSIONS " D1 " AND " E1 " DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS 0.25 mm PER SIDE. " D1 " AND " E1 " ARE MAXIMUM PLASTIC BODY SIZE DIMENSIONS INCLUDING MOLD MISMATCH.