

DESCRIPTION

The PT2581 incorporates the high-performance ARM Cortex™-M0 32-bit RISC core operating at a 48 MHz frequency and high-speed embedded memories (32k-bytes Flash memory, 8k-bytes SRAM and 6k-bytes ROM). The PT2581 is core processor specifically designed for motor control. The PT2581 integrates a configurable processing core and peripheral circuits to perform FOC and Sensor-less motor control. System control, user interface, communication interface and I/O interface can be programmed through the embedded ARM-M0 for different motor applications.

PT2581 offers standard communication interfaces (one I²C, one SPI and one UARTs), one 10-bit ADCs (the 3 channels for Bias-PGA, and the 3 channels for PGA and Comparator), six general-purpose 16-bit/32-bit timers, and six PWM channels. This approach reduces the software burden and simplifies the control system program because complex motor control algorithms are executed in the PT2581.

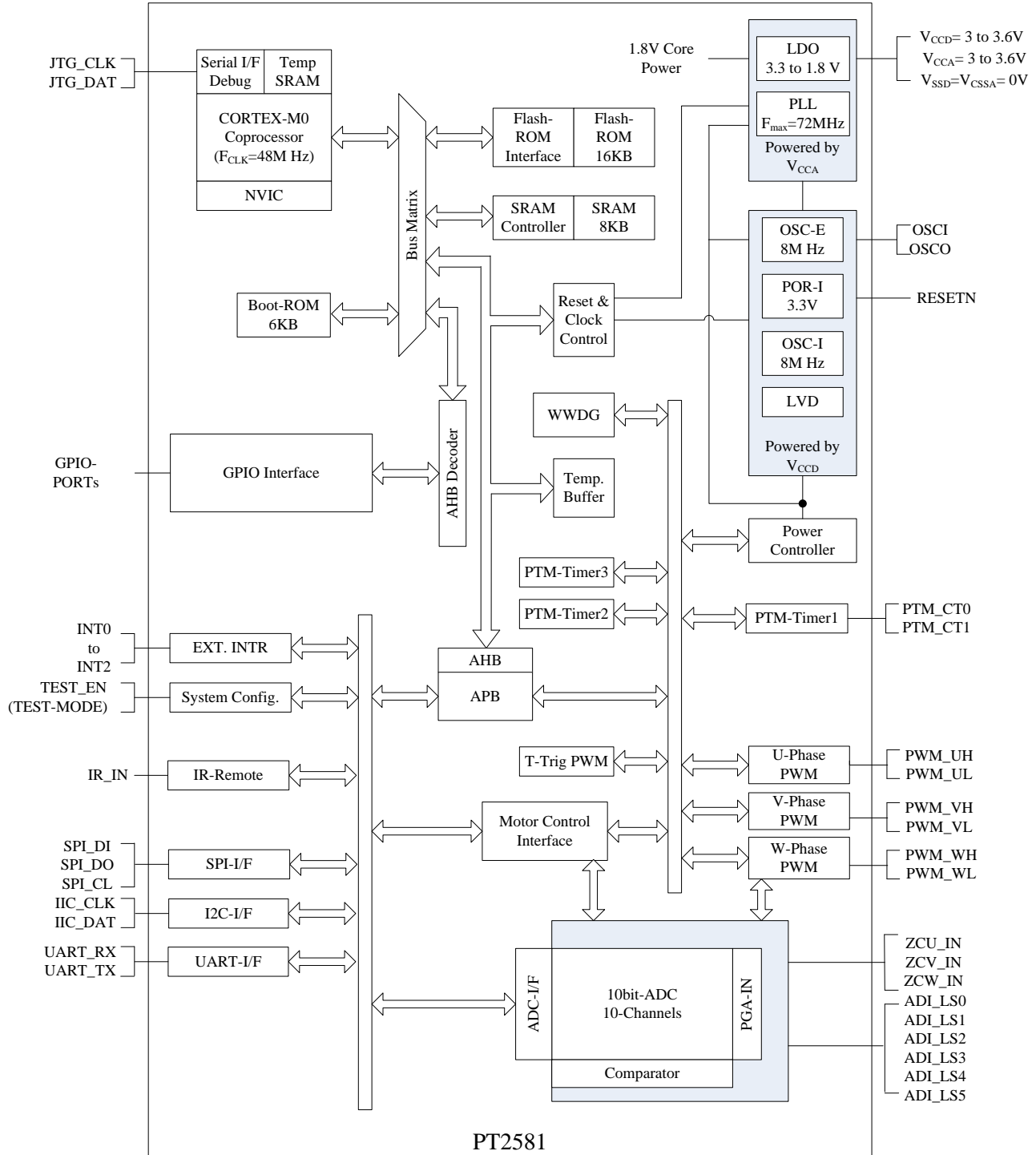
FEATURES

- ARM Cortex™-M0 32-Bits MCU Performance, frequency up to 72 MHz
- Memories
 - 32 Kbytes of Embedded Flash Memory
 - 8 Kbytes of SRAM
 - 6 Kbytes of Mask ROM
- Clock, reset and supply management
 - 8 MHz quartz oscillator
 - Embedded internal 8 MHz RC oscillator
 - PLL for the main system clock (CPU and other peripheral)
 - POR, PDR, and programmable voltage detector (PVD)
- Debug mode
 - Serial Wire Debug(SWD) interfaces
- GPIOs
 - 0~23 GPIOs, depending on configuration
 - Programmable control for GPIO interrupts
- Motor Control Unit
 - 6x8bit Dead-Time Insertion counter, provide the 0 ~ 5 μ s phase delay for PWM signal on operating frequency of 48M Hz
 - 3x16bits ADC synch PWM trigger's counter, provide 0 ~ 26.2ms phase delay time on operating frequency of 48 MHz
 - 3 system-fault flag to control motor stall state, particular pattern for each stall state.
 - Provide the PWM polarity control for 6 PWM channels.
 - Debounce mechanism for external stall and error flag, 2x10bits counter provide 0 ~ 20.48 μ s debounce-time on operating frequency of 48 MHz
- General-Purpose Timers
 - 6 General-Purpose Timer Modules (GPTM), each of which provides two 32-bit timers/counters.
 - 32-bit Timer modes
 - 16-bit Timer modes
 - 16-bit Input Capture modes
 - 16-bit PWM mode
- 1 UART ports
- SPI Serial Interface
- IIC Serial Interface
- WDT / Resume-Wakeup
- 3 channels for Bias-PGA and 3 channels for PGA and Comparator in 10-bit ADC.

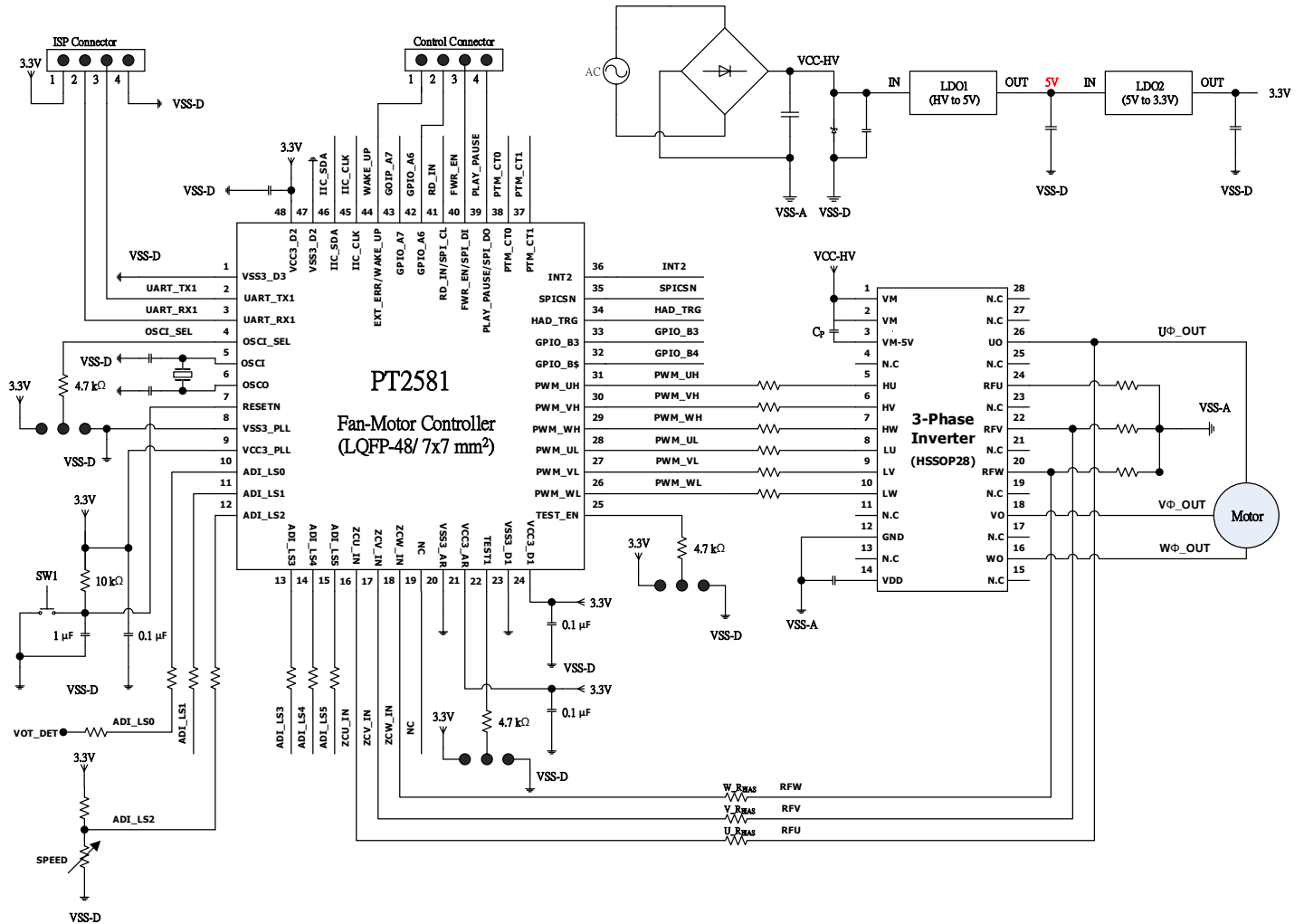
APPLICATIONS

- BLDC/ PMSM Motor
- Fan, Blower, Pump
- Industrial Motor, Compressor, Power Tool

BLOCK DIAGRAM



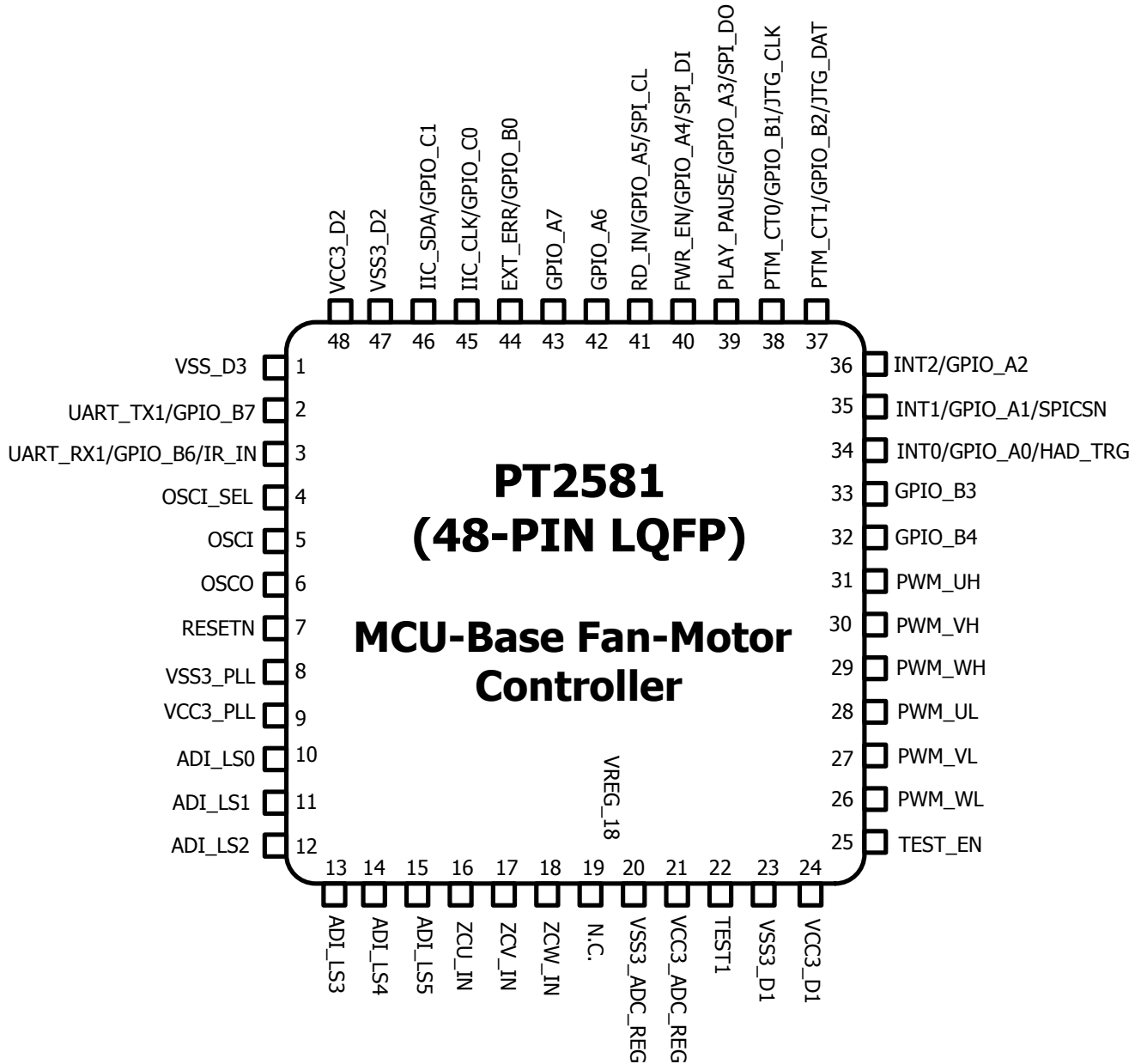
APPLICATION CIRCUIT



ORDER INFORMATION

Valid Part Number	Package Type	Top Code
PT2581-LQ	48 Pins, LQFP	PT2581-LQ

PIN CONFIGURATION



PIN DESCRIPTION

Pin Name	I/O	Type	Description	Pin No.
VSS3_D3	-	Ground	Digital VSS Ground	1
UART_TX1	O	TTL	UART Macro transmit data and download embedded flash.	2
GPIOB7	I/O	TTL	General-purpose B input/output 07	
UART_RX1	I	TTL	UART Macro receive data and download embedded flash	3
GPIOB6	I/O	TTL	General-purpose B input/output 06	
IRIN	I	TTL	IR-remote input signal to control Fan Motor.	
OSCI_SEL	I/O	TTL	Oscillator Clock Input Source Select, Default Clock Select "0"-XTAL8M; "1"-RC8M	4
OSCI	I	Analog	XTAL oscillator input, Freq.=8MHz	5
OSCO	O	Analog	XTAL oscillator output.	6
RESETN	I	TTL	System reset input, low active.	7
VSS3_PLL	-	Ground	Analog VSS Ground for PLL Module.	8
VCC3_PLL	-	Power	Analog VCC 3.3V for PLL Module.	9
ADI_LS0	I	Analog	Analog-to-digital converter input 0 for Low-Speed Signal.	10
ADI_LS1	I	Analog	Analog-to-digital converter input 1 for Low-Speed Signal.	11
ADI_LS2	I	Analog	Analog-to-digital converter input 2 for Low-Speed Signal.	12
ADI_LS3	I	Analog	Analog-to-digital converter input 3 for Low-Speed Signal.	13
ADI_LS4	I	Analog	Analog-to-digital converter input 4 for Low-Speed Signal.	14
ADI_LS5	I	Analog	Analog-to-digital converter input 5 for Low-Speed Signal.	15
ZCU_IN	I	Analog	Analog-to-digital converter input for Motor U-Phase BEMF Signal.	16
ZCV_IN	I	Analog	Analog-to-digital converter input for Motor V-Phase BEMF Signal.	17
ZCW_IN	I	Analog	Analog-to-digital converter input for Motor W-Phase BEMF Signal.	18
N.C	-	None	None	19
VSS3_ADC_REG	-	Ground	Analog VSS Ground.	20
VCC3_ADC_REG	-	Power	Analog VCC 3.3V.	21
TEST1	I	Analog	Test1-Pin Enable for Test Mode Only	22
VSS3_D1	-	Ground	Digital VSS Ground.	23
VCC3_D1	-	Power	Digital VCC 3.3V.	24
TEST_EN	I	TTL	Test0-Pin Enable for Test Mode Only.	25
PWM_WL	O	TTL	W-Phase Low-Side PWM Output.	26
GPIOC7	I/O	TTL	General-purpose C input/output 07.	
PWM_VL	O	TTL	V-Phase Low-Side PWM Output.	27
GPIOC6	I/O	TTL	General-purpose C input/output 06.	
PWM_UL	O	TTL	U-Phase Low-Side PWM Output.	28
GPIOC5	I/O	TTL	General-purpose C input/output 05.	
PWM_WH	O	TTL	W-Phase High-Side PWM Output.	29
GPIOC4	I/O	TTL	General-purpose C input/output 04.	
PWM_VH	O	TTL	V-Phase High-Side PWM Output.	30
GPIOC3	I/O	TTL	General-purpose C input/output 03.	
PWM_UH	O	TTL	U-Phase High-Side PWM Output.	31
GPIOC2	I/O	TTL	General-purpose C input/output 02.	
GPIOB4	I/O	TTL	General-purpose B input/output 4.	32
GPIOB3	I/O	TTL	General-purpose B input/output 3.	33
INT0	I	TTL	External Interrupt 0 Input.	34
GPIOA0	I/O	TTL	General-purpose A input/output 0.	
HADTRG	I	TTL	External Trigger Input for High-Speed ADC operation.	
INT1	I	TTL	External Interrupt 1 Input.	35
GPIOA1	I/O	TTL	General-purpose A input/output 1.	
SPICSN	I	TTL	Enable SPI Serial Interface, Active low.	
INT2	I	TTL	External Interrupt 2 Input.	36
GPIOA2	I/O	TTL	General-purpose A input/output 2.	

Pin Name	I/O	Type	Description	Pin No.
PTMCT1	I/O	TTL	Capture/Compare/PWM/Timer 1.	37
GPIOB2	I/O	TTL	General-purpose B input/output 2.	
JTGDAT	I/O	TTL	JTAG serial debug data.	
PTMCT0	I/O	TTL	Capture/Compare/PWM/Timer 0.	38
GPIOB1	I/O	TTL	General-purpose B input/output 1.	
JTGCLK	I	TTL	JTAG serial debug clock.	
PLAY/PAUSE	I	TTL	Control input signal to drive the Fan Motor to be started or paused.	39
GPIOA3	I/O	TTL	General-purpose A input/output 03.	
SPIDO	O	TTL	Data Output of the SPI Serial Interface.	
FWEN	I	TTL	Control input signal to drive the Fan Motor to be forward or reversed.	40
GPIOA4	I/O	TTL	General-purpose A input/output 04.	
SPIDI	I	TTL	Data input of the SPI Serial Interface.	
RDIN	I	TTL	Input locked signal of the Fan Motor.	41
GPIOA5	I/O	TTL	General-purpose A input/output 05.	
SPICLK	O	TTL	Clock output of the SPI Serial Interface.	
GPIOA6	I/O	TTL	General-purpose A input/output 06.	42
DECODE_A	I	TTL	Decode Phase A Channel	
GPIOA7	I/O	TTL	General-purpose A input/output 07.	43
DECODE_B	I	TTL	Decode Phase B channel	
EXTERR	I	TTL	External error input signal of the Fan Motor system.	44
GPIOB0	I/O	TTL	General-purpose A input/output 07.	
WKUP	I	TTL	Wakeup input signal.	
IICCLK	I	TTL	Clock input of the IIC serial interface.	45
GPIOC0	I/O	TTL	General-purpose C input/output 00.	
IICSDA	I/O	TTL	Transaction data of the IIC serial interface.	46
GPIOC1	I/O	TTL	General-purpose C input/output 01.	
VSS3_D2	-	Ground	Digital VSS Ground.	47
VCC3_D2	-	Power	Digital VCC 3.3V.	48

IMPORTANT NOTICE

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Princeton Technology Corp.
2F, 233-1, Baociao Road,
Sindian Dist., New Taipei City 23145, Taiwan
Tel: 886-2-66296288
Fax: 886-2-29174598
<http://www.princeton.com.tw>