

## FEATURES

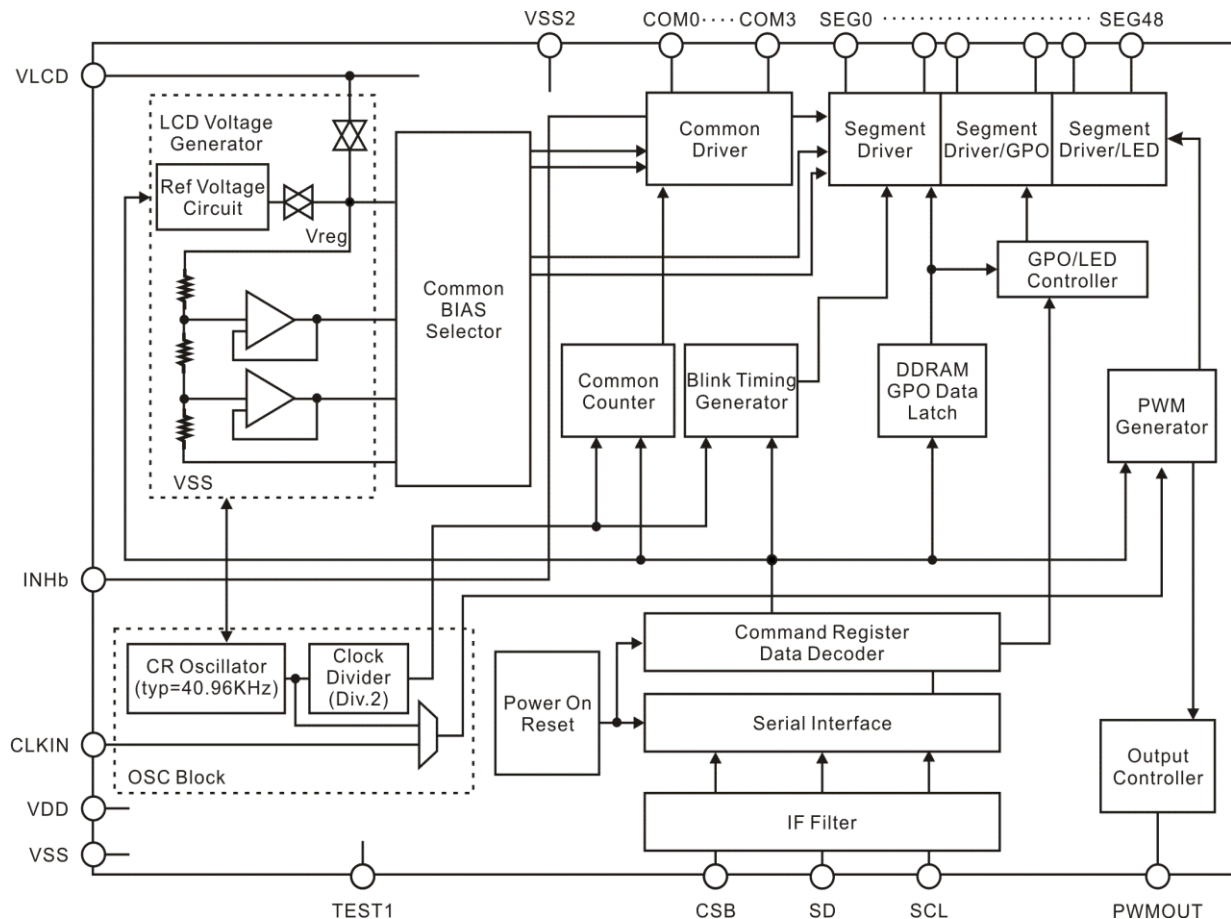
- LCD drive output: Common output: 4, Segment output : 49
- Integrated Display data RAM (DDRAM): RAM:49x4 bit
- Integrated 3ch LED driver circuit
- 3-wire Serial interface (SD, SCL, CSB)
- Segment/LED (Max 3 ports) output mode selectable
- Segment/GPO (Max 31 ports) output mode selectable
- Support PWM generation from ext. or internal clock (Resolution: 8 bits mode/12 bits mode selectable)
- Integrated Oscillator circuit
- Integrated LCD Voltage generator circuit
- Support: 1/3 Bias, 1/3 or 1/4 Duty
- Support: 1/1 Bias, 1/1Duty (Static Driving)
- Bias: Static, 1/3
- Integrated regulator for LCD driver: 3.2, 3.3, 3.4, 4.4, 4.5, 4.6, 5.0V selectable

- Integrated buffer amp
- Support separate power supply for Logic (VDD) and LCD (VLCD)
- Low power consumption
- Support standby mode
- Integrated Power-On-Reset circuit (POR)
- No external components
- Support Blink function (Blink frequency 1.6, 2.0, 2.6, 4.0Hz selectable)
- Operating power supply: 1.8 ~ 3.6V
- LCD drive power supply: 3.3 ~ 5.5V

## APPLICATIONS

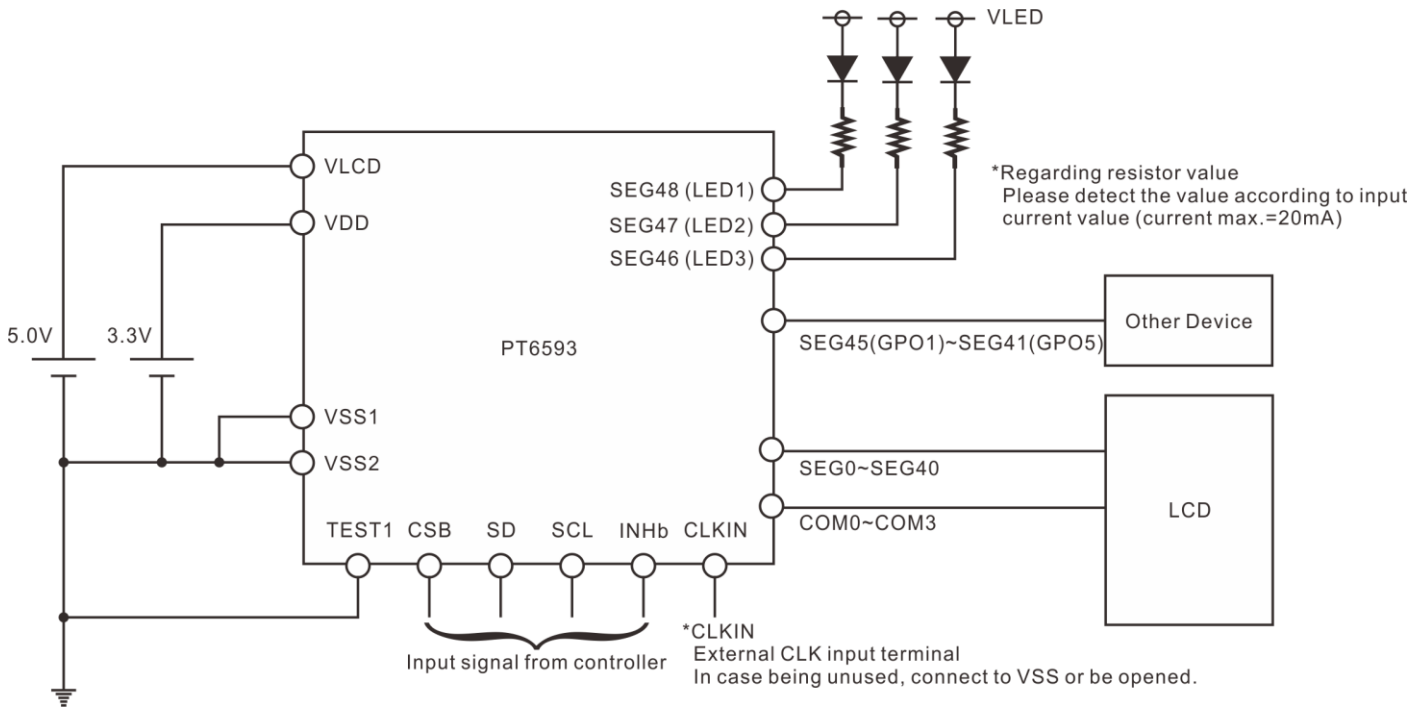
- Telephone, FAX, Portable equipment (POS, ECR, PDA etc.)
- DSC, DVC, Car audio, Home electrical appliance, Meter equipment etc.

## BLOCK DIAGRAM

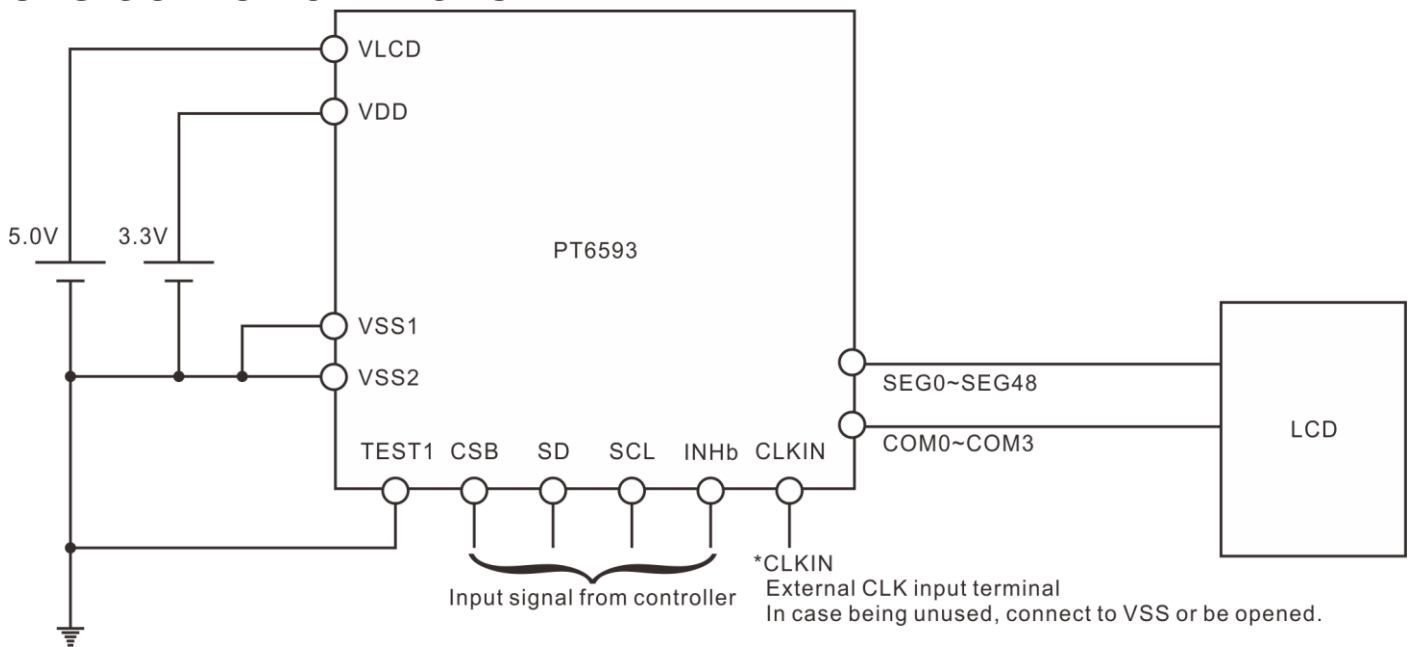


# APPLICATION CIRCUIT

## LED/GPO USING CASE



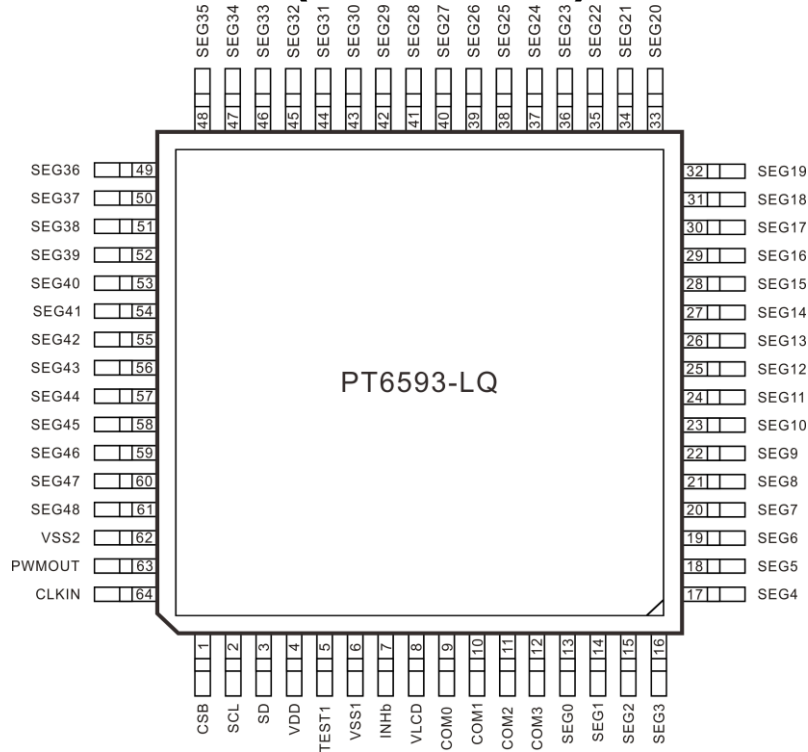
## SEG OUTPUT ONLY CASE



## ORDER INFORMATION

Valid Part Number	Package Type	Top Code
PT6593-LQ	64 Pins, LQFP	PT6593-LQ

## PIN CONFIGURATION (TOP VIEW)



## PIN DESCRIPTION

Pin Name	I/O	Unused case	Description	Pin No.
CSB	I	-	Chip select: "L" active	1
SCL	I	-	Serial data transfer clock	2
SD	I	-	Input serial data	3
VDD	-	-	Power supply for LOGIC	4
TEST1	I	-	Test terminal (Please connect VSS terminal)	5
VSS1	-	GND	GND	6
INHb	I	VDD	Display turning on/off select terminal H: turning on display, L: turning off display INHb="L": All SEG/COM terminal: output VSS level GPO terminal: output VSS level LED drive terminal: output Hi-Z	7
VLCD	-	-	Power supply for LCD	8
COM0~COM3	O	OPEN	COMMON output for LCD	9~12
SEG0~SEG14	O	OPEN	SEGMENT output for LCD	13~27
SEG15~SEG45	O	OPEN	SEGMENT output for LCD/GPO	28~58
SEG46~SEG48	O	OPEN	SEGMENT output for LCD/LED driver	59~61
VSS2	-	GND	GND(for SEG46~48/LED driver)	62
PWMOUT	O	OPEN	PWM Output for LED2 group	63
CLKIN	I	OPEN/VSS	External clock input terminal (for display/PWM using selectable) The internal pull down resistor is activated at internal clock mode	64

## **IMPORTANT NOTICE**

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