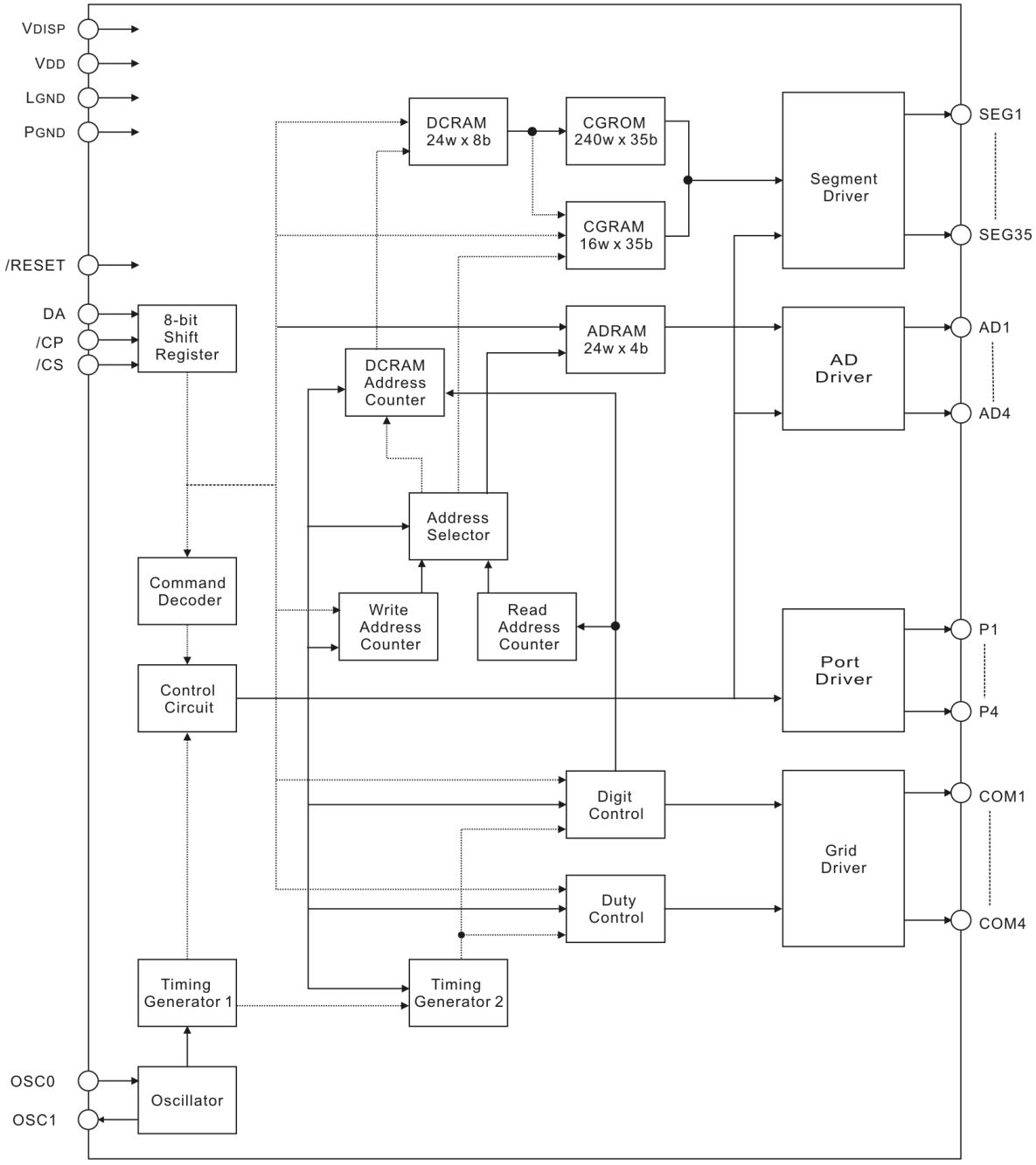
DESCRIPTION

The PT6321 is a dot matrix fluorescent display tube controller driver IC which displays characters, numerics and symbols. Dot matrix fluorescent display tube drive signals are generated by serial data sent from a microcontroller. A display system is easily realized by internal ROM and RAM for character display.

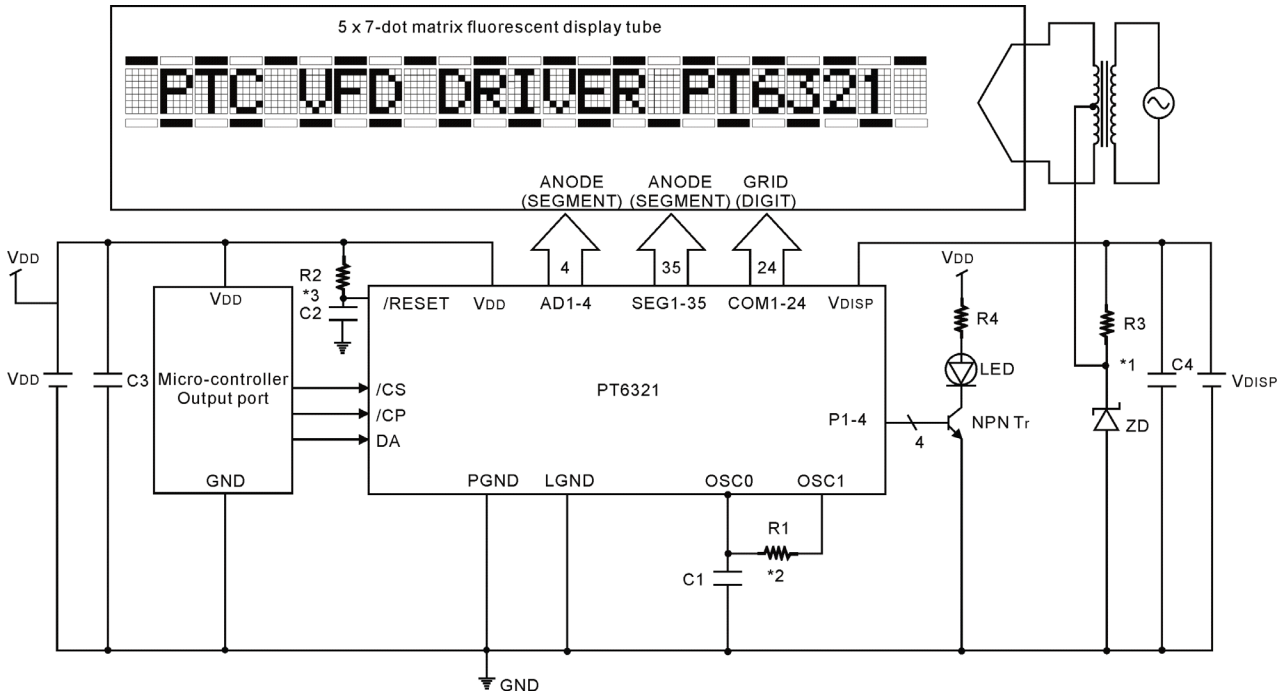
FEATURES

- Logic power supply(V_{DD}): 3.3V±10% / 5.0V±10%
- Fluorescent display tube drive power supply (V_{DISP}): 20V~60V
- VFD driver output current (VFD driver output can directly be connected to the fluorescent display tube. No pull-down resistor is required.)
  - Segment driver (SEG1 to SEG35): -5.0mA (V_{DISP}=60V)
  - Segment driver (AD1 to AD4): -10.0mA (V_{DISP}=60V)
  - Grid driver (COM1 to COM24): -20.0mA (V_{DISP}=60V)
- General output port output current
  - Output driver (P1-4): ±1.0mA (V_{DD}=3.3V±10%)
    ±2.0mA (V_{DD}=5.0V±10%)
- Content of display
  - CGROM: 5x7 dots, 240 types (character data)
  - CGRAM: 5x7 dots, 16 types (character data)
  - ADRAM: 24 (display digit) x 4 bits (symbol data)
  - DCRAM: 24 (display digit) x 8 bits (register for character data display)
  - General output port: 4 bits (static mode)
- Display control function
  - Display digit: 9 to 24 digits
  - Display duty (contrast adjustment): 8 stages
  - All lights ON/OFF
- 3 interfaces with microcontroller: DA, /CS, /CP(4 interfaces if /RESET is added)
- 1-byte instruction execution (excluding data write to RAM)
- Built-in oscillation circuit (external C and R)
  80-pin plastic LQFP (LQFP80-P-1414-0.65-K)

BLOCK DIAGRAM



APPLICATION CIRCUIT

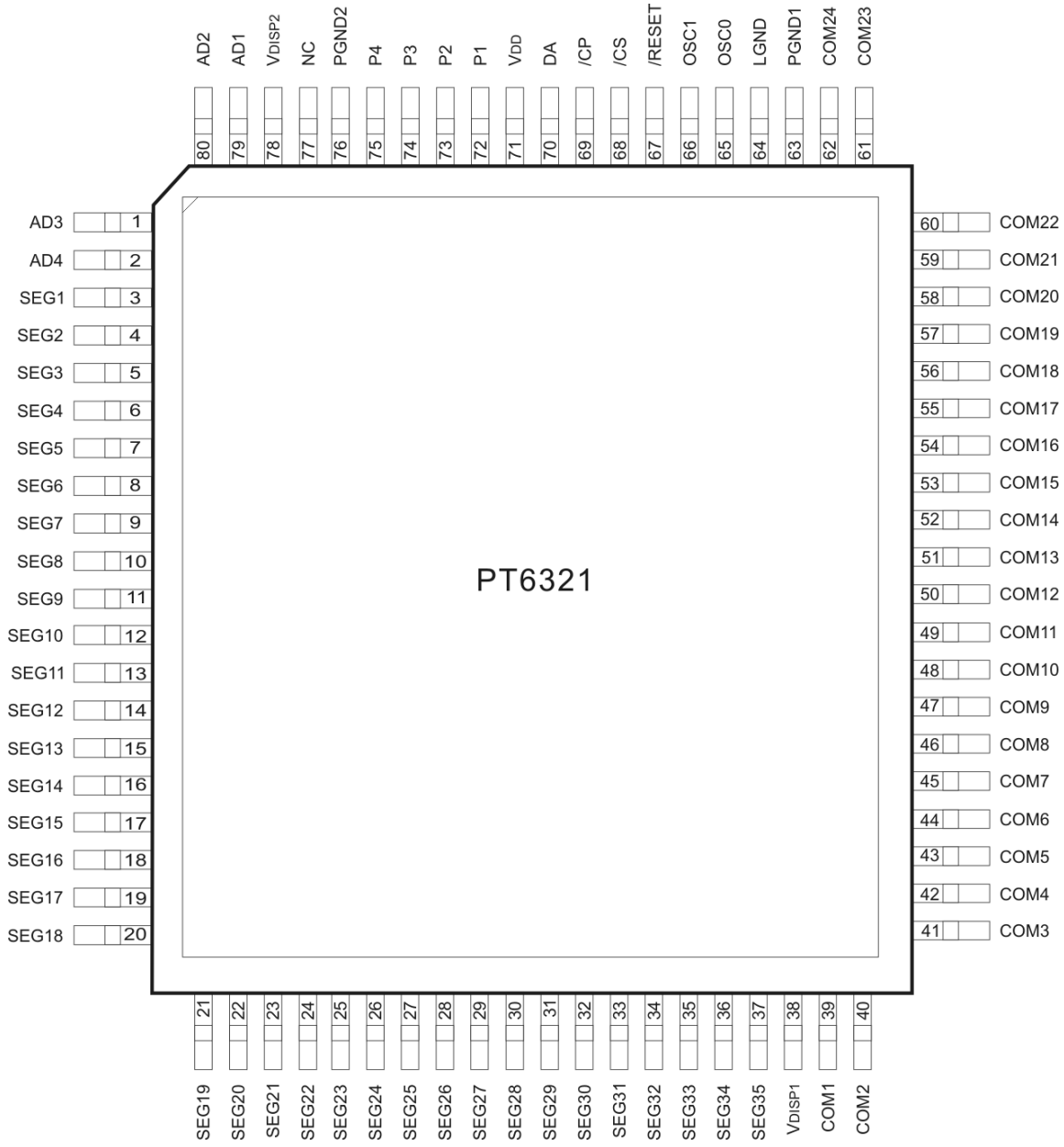


Notes:
*1. The V_{DISP} voltage depends on the fluorescent display tube used. Adjust the value of the constants R3 and ZD to the V_{DISP} voltage used.
*2. The value of R1 & C1 depend on PT6321 supply voltage of V_{DD} (V_{DD}=5V: R1=3.3KΩ, C1=47pF; V_{DD}=3.3V: R1=3.3KΩ, C1=39pF)
*3. R2=1KΩ, C2=0.1μF

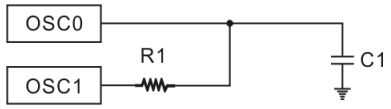
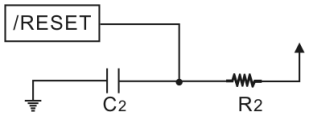
ORDER INFORMATION

Valid Part Number	Package Type	Top Code
PT6321-LQ	80 Pins, LQFP	PT6321-LQ

PIN CONFIGURATION



PIN DESCRIPTION

Pin Name	I/O	Connects to	Description	Pin No
AD1~4	O	Fluorescent tube anode electrode	Fluorescent display tube anode electrode drives output. Directly connected to fluorescent display tube. No pull-down resistor is required. I_{OH}>–10.0mA	1,2,79,80
SEG1~35	O	Fluorescent tube anode electrode	Fluorescent display tube anode electrode drives output. Directly connected to fluorescent display tube. No pull-down resistor is required. I_{OH}>–5.0mA	3-37
$V_{DISP1~2}$		Power supply	V_{DISP}-PGND are power supplies for driving fluorescent tubes	38,78
COM1~24	O	Fluorescent tube grid electrode	Fluorescent display tube grid electrode drives output. Directly connected to fluorescent display tube. No pull-down resistor is required. I_{OH}>–20.0mA	39-62
PGND1~2		Power supply	High Voltage GND pin	63,76
LGND		Power supply	Logic GND pin	64
OSC0	I	C_1, R_1	Connect R and C externally. The RC time constant depends on the VDD voltage used. Set the target oscillation frequency to 2 MHz.	65
OSC1	O		 (RC oscillation circuit) See Application Circuit)	66
/RESET	I	Microcontroller or C_2, R_2	Reset input. Setting this pin to "Low" initializes all the functions. The initial status is as follows. • Address of each RAM….. address "00"H • Data of each RAM….. Content is undefined • Number of display digits….. 24 digits • Contrast adjustment….. 8/16 • All lights ON or OFF….OFF mode • All outputs….. "Low" level	67
			 (Circuit when R and C are connected externally) See application Circuit	
/CS	I	Microcontroller	Chip select input Setting this pin to "H" disables serial data transfer.	68
/CP	I	Microcontroller	Shift clock input. Serial data is shifted on the rising edge of /CP.	69
DA	I	Microcontroller	Serial data input (positive logic). Input from LSB.	70
V_{DD}		Power supply	Logic Voltage Pin	71
P1~4	O	LED drive control terminals	General port output. Output of these pins in static operation, so these pins can drive the LED. I_{OH}>–2.0mA	72-75

IMPORTANT NOTICE

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