

1/8, 1/9, 1/10 Duty BITMAP LCD DRIVER with KEY SCAN

■ GENERAL DESCRIPTION

The **NJU6539** is a 10-common x 65-segment bitmap LCD driver to display graphics or characters.

It contains 650 bits display data RAM, microprocessor interface circuit, common and segment drivers, key scan circuit, and general output ports.

An image data from MPU through the serial interface is stored into the 650 bits internal displayed on the LCD panel through the commons and segments drivers.

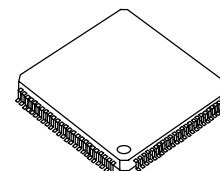
The **NJU6539** displays 10 x 65 dots graphics or 11-character 1-line by 5 x 7 dots character + 3 x 65 dots icons.

It contains key scan circuit transmitting the 25-keys maximum (5 x 5 = 25) to MPU.

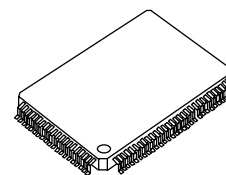
Also it provides 4 general purpose output ports with PWM output function maximum to drive LEDs or others directly.

Furthermore, the NJU6539 can select a LCD driving voltage out of 16 steps voltage by the instruction adjust the display contrast of LCD panel.

■ PACKAGE OUTLINE



NJU6539FG1



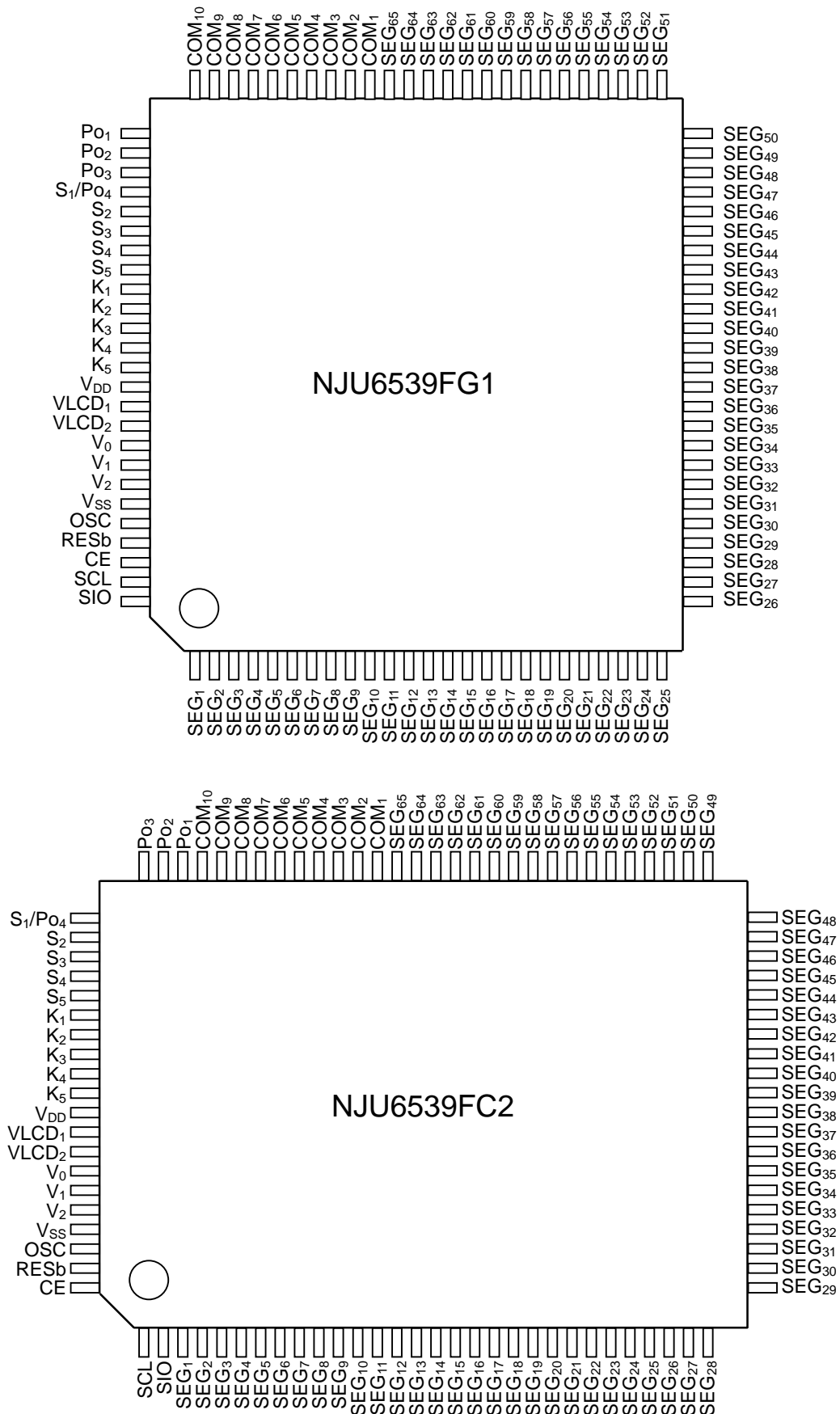
NJU6539FC2

■ FEATURES

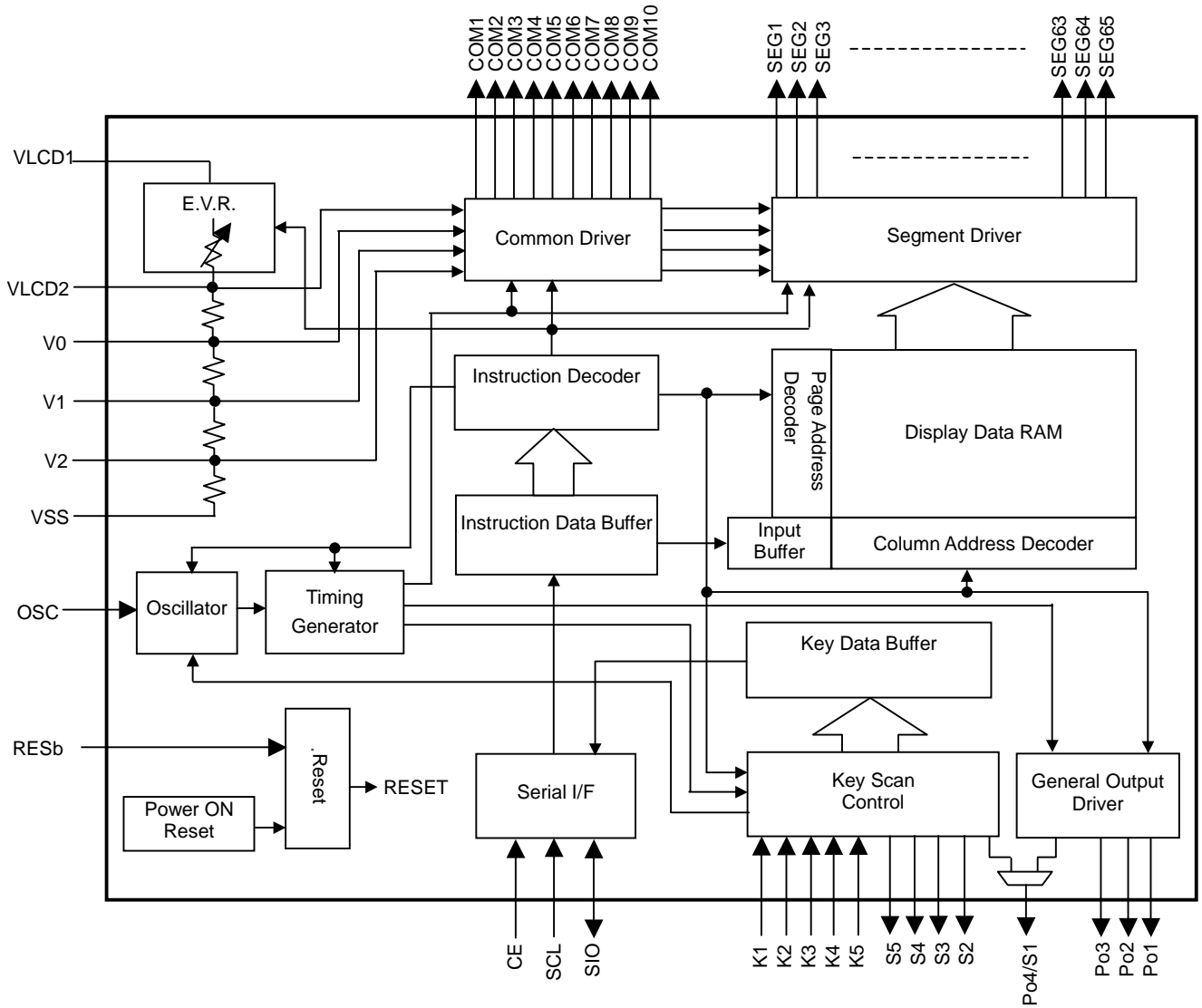
- Direct Correspondence between Display Data RAM and LCD Pixel
- Display Data RAM : 650-bits
- LCD Drivers : 65-seg, 10-com
- Serial interface (SIO, SCL, CS)
- Programmable Duty Ratio
1/8 Duty, 1/9 Duty, 1/10Duty
- Bias Ratio 1/4 bias
- 25-key scan Function (5 x 5 matrix)
Needless for anti-reverse current diodes in key scan
- General Output Ports with 128-steps PWM output (possible LED driving) maximum 4-ports
- Useful Instruction Set
Display ON/OFF, Page Address Set, Column Address Set, ADC Select, Inverse Display ON/OFF, whole display ON/OFF, Reset, EVR Register Set, Duty Select, Power Save mode set, General Output Port set, General Output Port PWM data set, PWM slope set, PWM program Execute, General Output Port / Key scan output select, Display Data write,
- Bleeder Resistance On-chip
- Software Contrast Control (16 steps)
- Operating Voltage
Logic Operating Voltage 2.7 to 5.5V
LCD Driving Voltage 5.0 to 10.0V
- Package Outline QFP100-G1
QFP100-C2
- C-MOS Technology (Substrate: P)

NJU6539

PIN CONFIGURATION



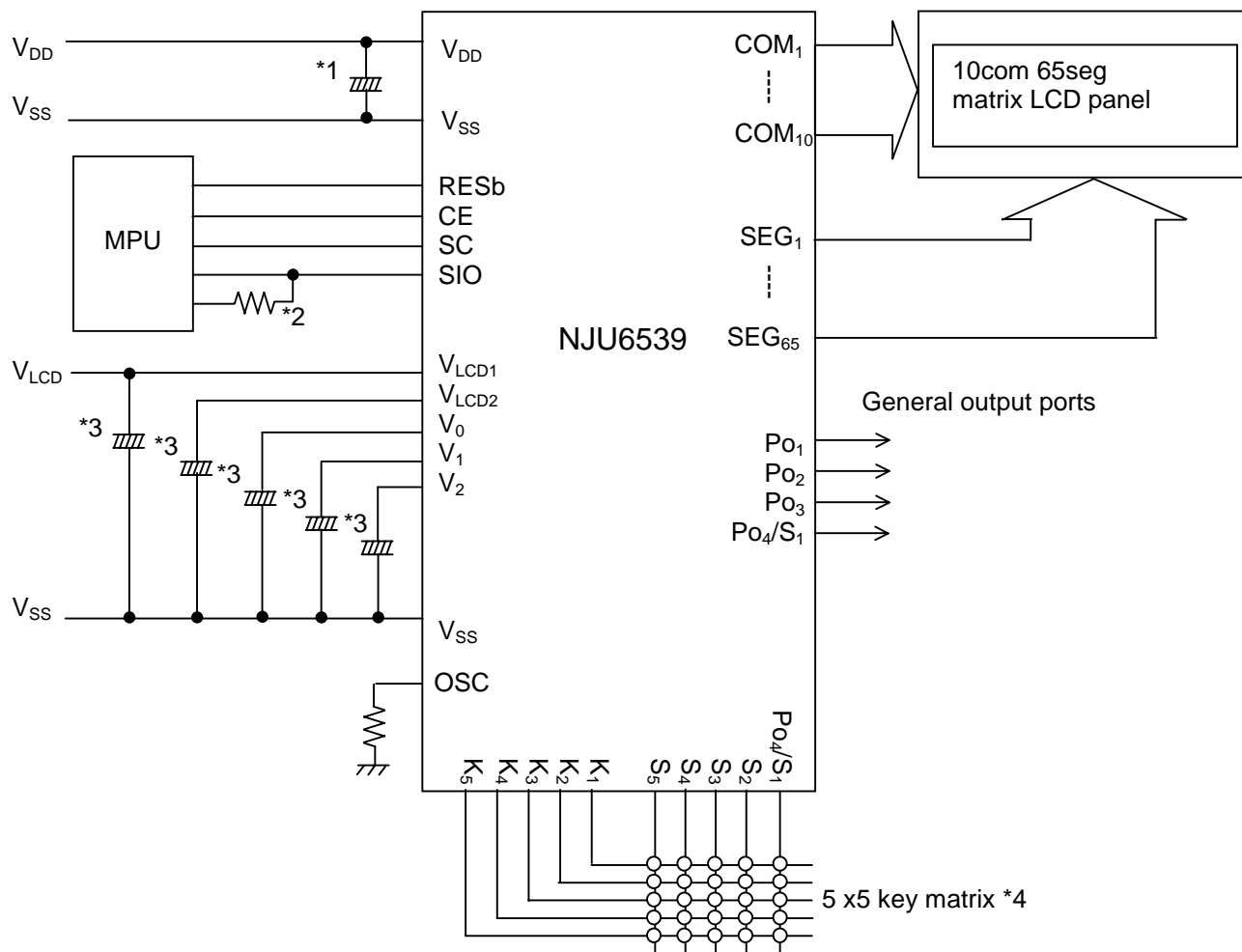
■ BLOCK DIAGRAM



■ TERMINAL DESCRIPTION

No.		Symbol	I/O	Description
FG1	FC2			
1 to 65	3 to 67	SEG ₁ to SEG ₆₅	O	Segment output terminal.
66 to 72	68 to 74	COM ₁ to COM ₇	O	Common output terminal.
73 to 75	75 to 77	COM ₈ to COM ₁₀	O	Icon common output terminal.
76 to 78	78 to 80	Po1 to Po3	O	General output port 128-step PWM waveform output by MPU control.
79	81	Po4/S ₁	O	General output port / Key scanning input terminal Select General output port or Key scanning input terminal by the instruction. A function must be selected either Po3 or S ₀ General output port 128-step PWM waveform output by MPU control. Key scanning input terminals (No need for anti-reverse current diode in key scan)
80 to 83	82 to 85	S ₂ to S ₅	O	Key scanning input terminals. (No need for anti-reverse current diode in key scan)
84 to 88	86 to 90	K ₁ to K ₅	I	Key scanning input terminals. (with internal pull-down resistor)
89	91	V _{DD}	-	Power supply terminal.(2.7V to 5.5V)
90	92	VLCD1	I	LCD driving voltage input terminal.
91	93	VLCD2	I	LCD driving voltage stabilization capacitor terminals. Connect the capacitor between each terminal and V _{SS} .
92	94	V ₀		
93	94	V ₁		
94	96	V ₂		
95	97	V _{SS}	-	Ground terminal.
96	98	OSC	I/O	Oscillator terminal. Connect the external resistor.
97	99	RESb	I	Reset terminal. (with internal pull-up resistor) In case of only Power-on Reset should be open.
98	100	CE	I	Chip enable terminal
99	1	SCL	I	Serial clock input terminal
100	2	SIO	I/O	Serial Data input or output terminal

APPLICATION CIRCUIT



- *1 The rising time of Power source voltage at Power on and the falling time at Power off must keep over than 1ms because of Voltage detection type Reset circuit operation.
- *2 SO terminal requires external pull-up resistor connecting to Power source of external MPU because of Open-drain type output.
- *3 This capacitor for bias voltage stabilization should be connected in accordance with display quality in application.
- *4 P_{O3} / S₀ terminal is general output ports and Key scan signal output duplicated-function terminals. A function must be selected either Segment output or other.

[CAUTION]
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