

POWER LOGIC EIGHT BIT SHIFT REGISTER NC6B595

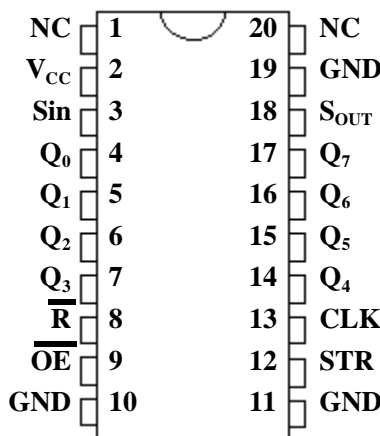
1. description

The NC6B595 is a monolithic, high-voltage, medium-current power 8-bit shift register designed for use in systems that require relatively high load power. The device contains a built-in voltage clamp on the outputs for inductive transient protection. Power driver applications include light-emitting diode, relays, and other medium-current or high-voltage loads.

This device contains an 8-bit serial-in , parallel-out shift register that feeds an 8-bit D-type storage register. Data transfers through both the shift and storage registers on the rising edge of the shift-register clock (CLK) and the register clock (STR), respectively. The storage register transfers data to the output buffer when shift-register clean (/R) is high. When /R is low, the input shift register is cleared. When output enable (/OE) is held high, all data in the output buffers is held low and all drain outputs are off. When /OE is held low, data from the storage register is transparent to the output buffers. When data in the output buffers is low, the TTL-transistor outputs are off. When data is high, the TTL-transistor outputs have sink-current capability. The serial output (Sout) allows for cascading of the data from the shift register to additional devices.

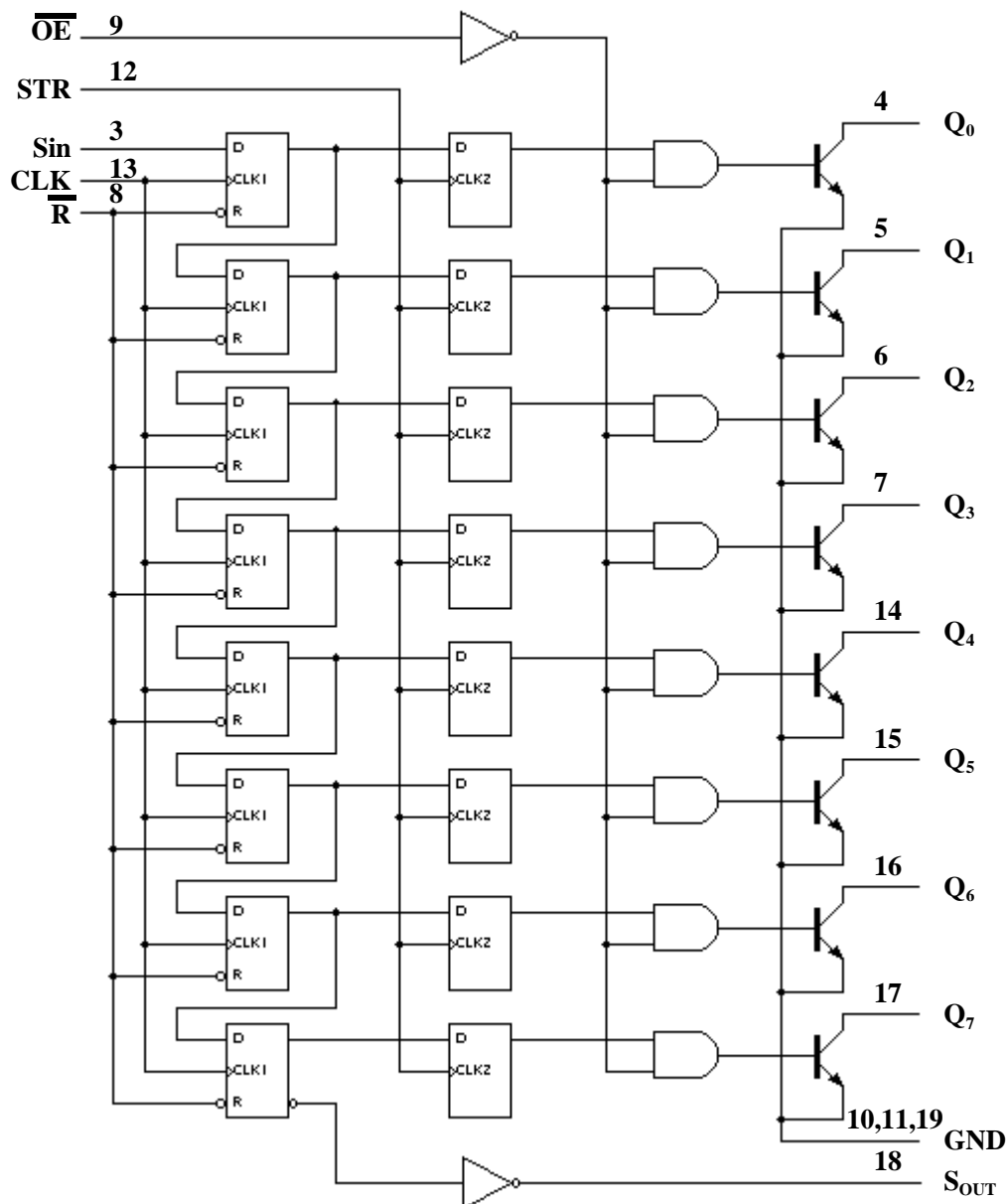
Outputs are low-side, open collector devices TTL-transistors with output ratings of 15V and 200-mA continuous sink-current capability. Each output provides a 400-mA typical current limit at $T_c=25^{\circ}\text{C}$. The current limit decreases as the junction temperature increase for addition device protection.

2. NC6B595 package(top view)

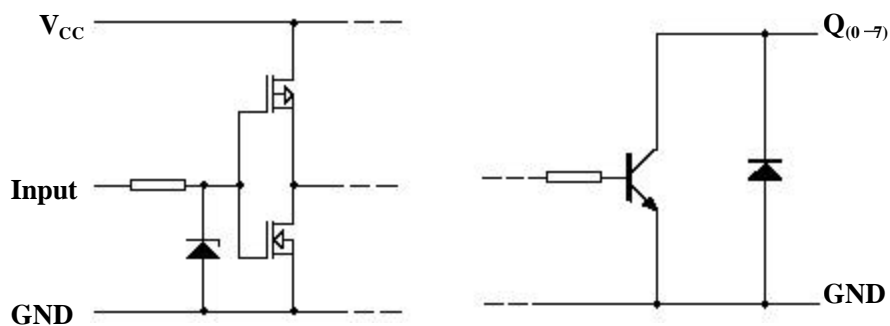


NC —No internal connection

3. logic diagram (positive logic)



4. schematic of inputs and outputs



5. absolute maximum ratings over recommended operating case temperature range

Logic supply voltage, V_{CC}	7V
Logic input voltage range, V_I	-0.3V to 7V
Power TTL collector to emitter voltage, $V_{(BR)CE}$	25V
Continuous collector to emitter diode anode current	400mA
Pulsed collector to emitter diode anode current	1A
Pulsed collector current, each output, all outputs on, I_D , $T_C = 25^\circ\text{C}$	200mA
Peak collector current single output, I_{DM} , $T_C = 25^\circ\text{C}$	400mA
Continuous total dissipation	2.5W
Operating case temperature range, T_C	-40°C to 85°C
Storage temperature range	-55°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

6. recommended operating conditions

Parameter	Min	Max	Unit
Logic supply voltage, V_{CC}	3	7	V
High-level input voltage, V_{IH}	0.5 V_{CC}		V
Low-level input voltage, V_{IL}		0.3 V_{CC}	V
Pulsed drain output current, $T_C = 25^\circ\text{C}$, $V_{CC}=5\text{V}$	-400	400	mA
Setup time, SER IN high before CLK= \uparrow , t_{su}	10	20	ns
Hold time, SER IN high after CLK= \uparrow , t_h	10		ns
Operating case temperature, T_C	-40	85	$^\circ\text{C}$

7. electrical characteristics, $T_C = 25^\circ\text{C}$

Parameter		Test conditions	Min	Max	Unit
High-voltage SER OUT	V_{oh}	$I_{oh}=1\text{mA}$	$V_{CC}-0.2$		V
Low-voltage SER OUT	V_{ol}	$I_{ol}=1\text{mA}$		0.1	V
High-voltage parallel out	V_{oh}	$I_{oh}=1\text{mA}$		$V_{CC}-0.1$	V
Low-voltage parallel out	V_{ol}	$T_a=25^\circ\text{C}$, $I_{ol}=100\text{mA}$	0.3	0.6	V
High-level SER OUT	I_{oh}	$V_{oh}=V_{CC}-0.5\text{V}$	4		mA
Low-level SER OUT	I_{ol}	$V_{ol}=0.5\text{V}$	8		mA
High-level parallel out	I_{oh}	$V_{oh}=15\text{V}$		1	mA
Low-level parallel out	I_{ol}	$R_L=30\text{K}\Omega$ $V_{CC}=15\text{V}$	200		mA
	I_{ol}	$R_L=15\text{K}\Omega$ $V_{CC}=5\text{V}$	250		mA
Logic supply current	I_{CC}	$V_{CC}=5\text{V}$ $ST=1$, $OE=Sin=0$		1	mA
Logic supply current at frequency	$I_{CC(FRG)}$	$V_{CC}=5\text{V}$, $f_{CLK}=1\text{MHz}$		5	mA

8. switching characteristics, $T_a = -30\sim 55^\circ\text{C}$ $V_{CC}=3\sim 6\text{V}$

Parameter	Test conditions	Min	Max	Unit
Propagation delay time, low to high level output t_{PHL}	SER OUT $R_L=2\text{K}\Omega$ $C_L=15\text{pF}$ $f_{CLK}=1\text{MHz}$		30	ns
Propagation delay time, high to low level output t_{PLH}			35	ns
Rise time collector output t_r			25	ns
Fall time collector output t_f			15	ns
High-clock frequency f_{MAX}		10	25	MHz

9. NC6B595 application schematic diagram

