

1. DESCRIPTION

XD54563 is an eight-circuit output-sourcing Darlington transistor array. The circuits are made of PNP and NPN transistors. This semiconductor integrated circuit performs highcurrent driving with extremely low input-current supply.

2. FEATURES

- High breakdown voltage ($BV_{CEO} \geq 50V$)
- High-current driving ($I_o(max) = -500mA$) With clamping diodes
- Driving available with PMOS IC output of 6 ~ 16V or with TTL output
- Wide operating temperature range ($T_a = -40$ to $+85^{\circ}C$)
- Output current-sourcing type

3. APPLICATION

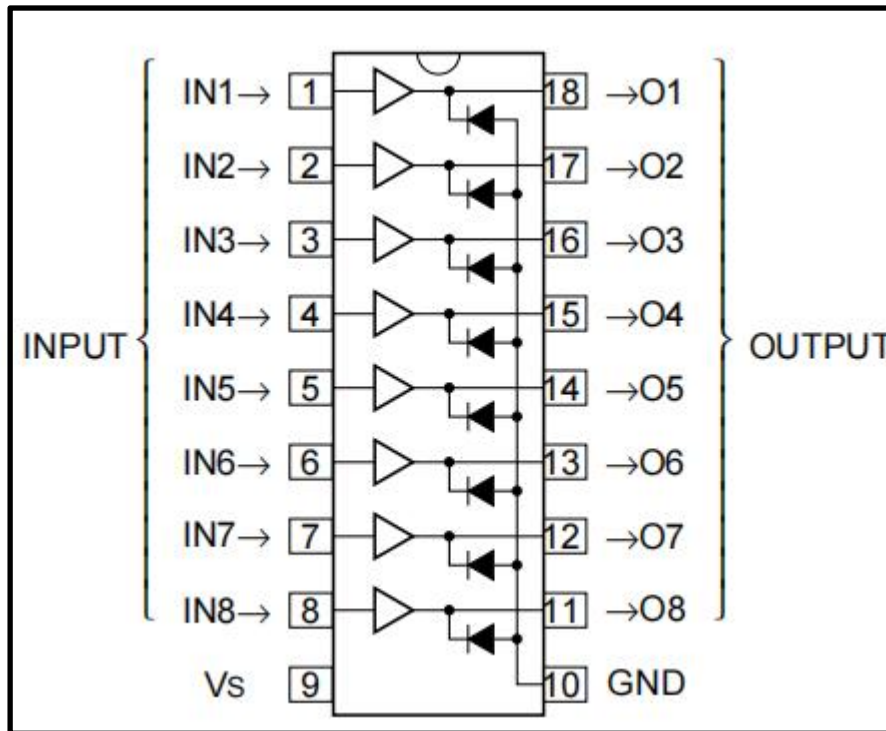
Drives of relays, printers, LEDs, fluorescent display tubes and lamps, and interfaces between MOS-bipolar logic systems and relays, solenoids, or small motors

4. FUNCTION

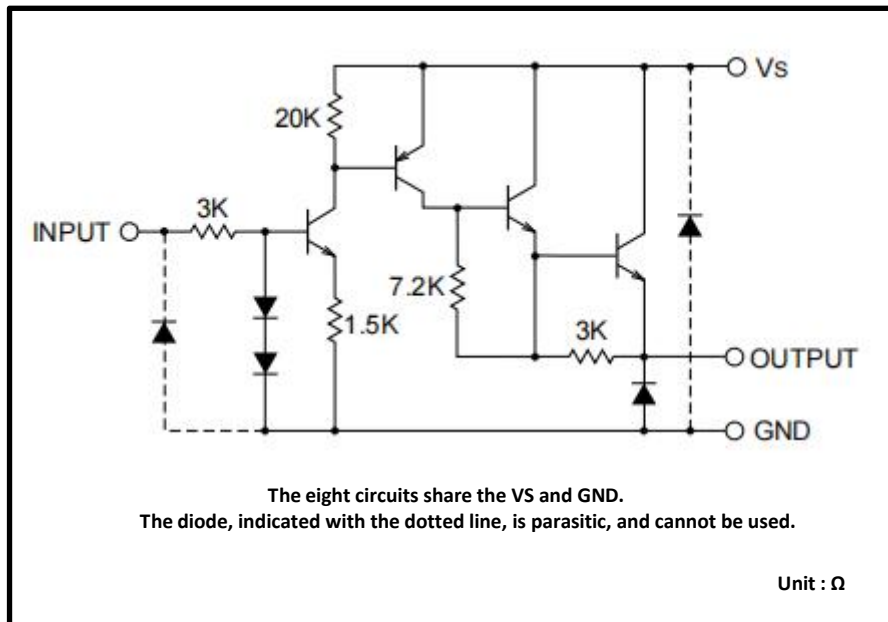
The XD54563 have eight circuits, which are made of input inverters and current-sourcing outputs. The outputs are made of PNP transistors and NPN Darlington transistors. The PNP transistor base current is constant. A clamping diode is provided between each output and GND. V_s and GND are used commonly among the eight circuits.

The inputs have resistance of $3k\Omega$, and voltage of up to 10V is applicable. Output current is 500 mA maximum. Supply voltage V_s is 50V maximum.

5. PIN CONFIGURATION



6. CIRCUIT DIAGRAM



7. ABSOLUTE MAXIMUM RATINGS

(Unless otherwise noted, Ta = -20 ~ +75°C)

Symbol	Parameter	Conditions	Ratings	Unit
V _{CEO}	Collector-emitter voltage	Output, L	-0.5 ~ +50	V
V _S	Supply voltage		50	V
V _I	Input voltage		-0.5 ~ +10	V
I _O	Output current	Current per circuit output, H	-500	mA
I _F	Clamping diode forward current		-500	mA
V _R	Clamping diode reverse voltage		50	V
P _d	Power dissipation	Ta = 25°C, when mounted on board	1.79(P)/1.10(FP)	W
T _{opr}	Operating temperature		-40 ~ +85	°C
T _{stg}	Storage temperature		-55 ~ +125	°C

Note: Unused I/O pins must be connected to GND.

8. RECOMMENDED OPERATING CONDITIONS

(Unless otherwise noted, Ta = -20 ~ +75°C)

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V _S	Supply voltage		0	—	50	V
I _O	Output current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 8%	0	—	-350	mA
		Duty Cycle no more than 55%	0	—	-100	
V _{IH}	“H” input voltage		2.4	—	10	V
V _{IL}	“L” input voltage		0	—	0.2	V

9. ELECTRICAL CHARACTERISTICS

(Unless otherwise noted, Ta = -20 ~ +75°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I _{S (leak)}	Supply leak current	V _S = 50V, V _I = 0.2V	—	—	100	μA
V _{CE (sat)}	Collector-emitter saturation voltage	V _S = 10V, V _I = 2.4V, I _O = -350mA	—	1.6	2.4	V
		V _S = 10V, V _I = 2.4V, I _O = -100mA	—	1.45	2.0	
I _I	Input current	V _I = 3V	—	0.6	1.0	mA
		V _I = 10V	—	2.9	5.0	
I _S	Supply current	V _S = 50V, V _I = 3V (all input)	—	5.6	15.0	mA
V _F	Clamping diode forward voltage	I _F = -350mA	—	-1.2	-2.4	V
I _R	Clamping diode reverse current	V _R = 50V	—	—	100	μA

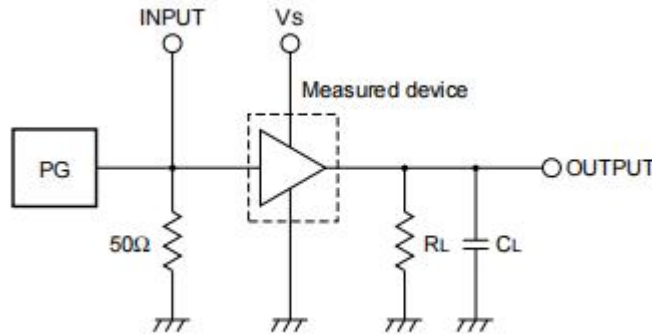
Note 1: The typical values are those measured under ambient temperature (Ta) of 25°C. There is no guarantee that these values are obtained under any conditions.

Note 2: Unused I/O pins must be connected to GND.

10. SWITCHING CHARACTERISTICS

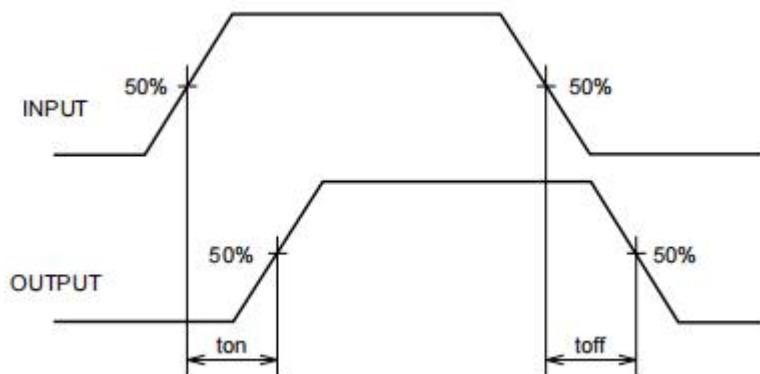
(Unless otherwise noted, $T_a = 25^\circ\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
ton	Turn-on time	$C_L = 15\text{pF}$ (note1)	—	100	—	ns
toff	Turn-off time		—	4800	—	ns



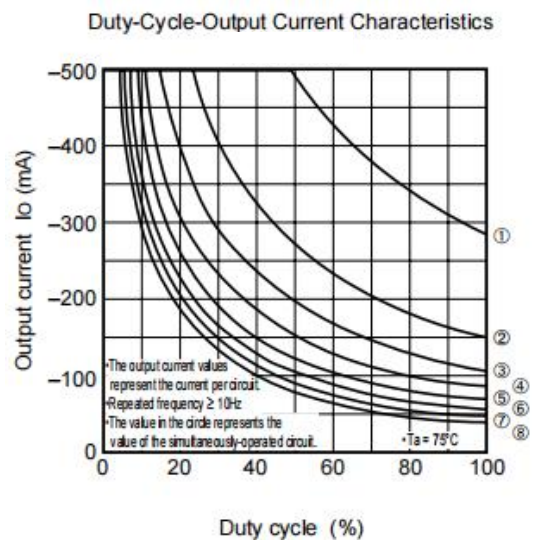
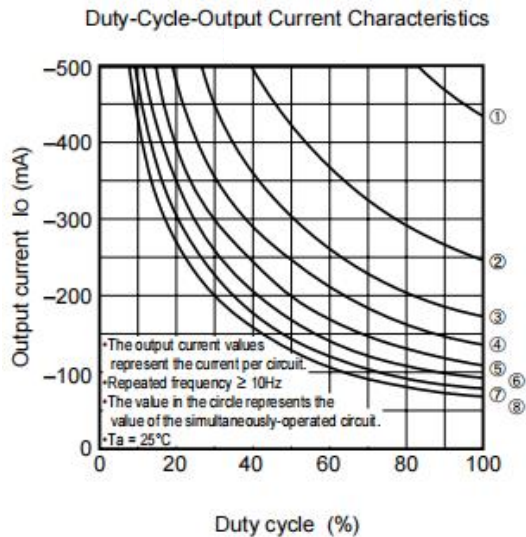
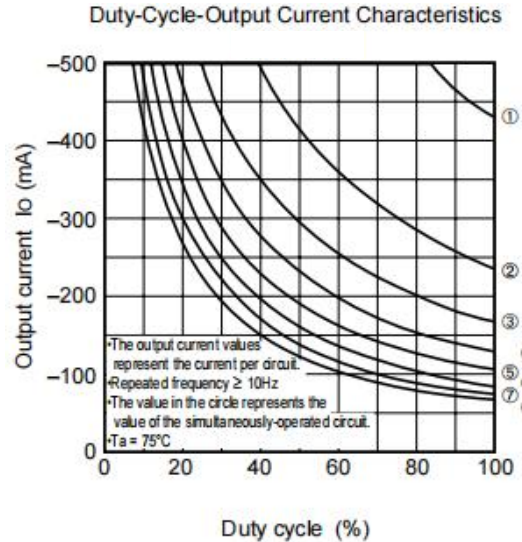
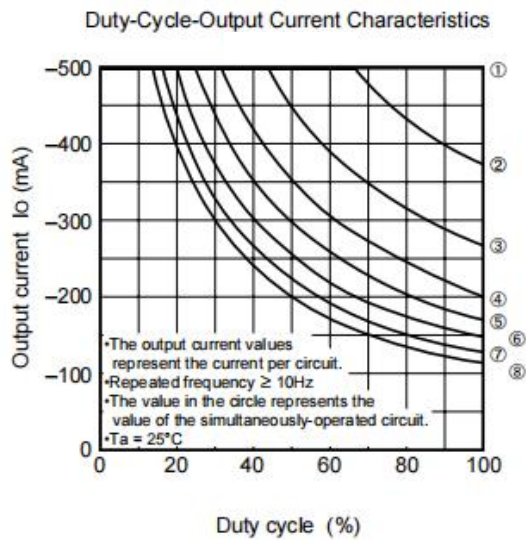
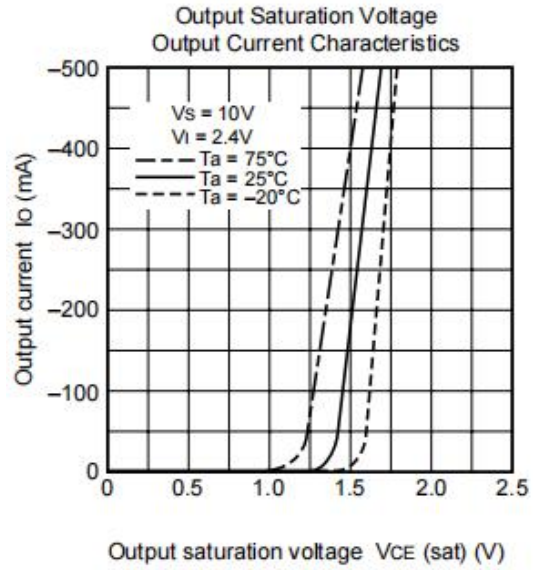
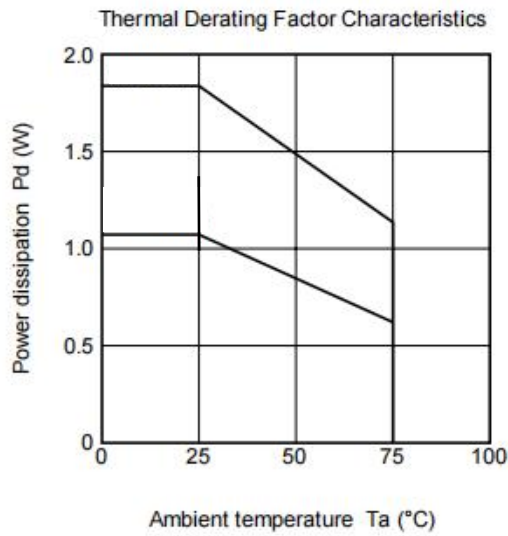
NOTE 1 TEST CIRCUIT

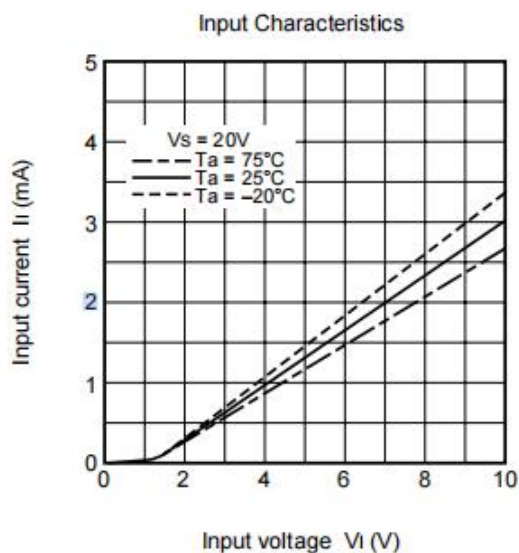
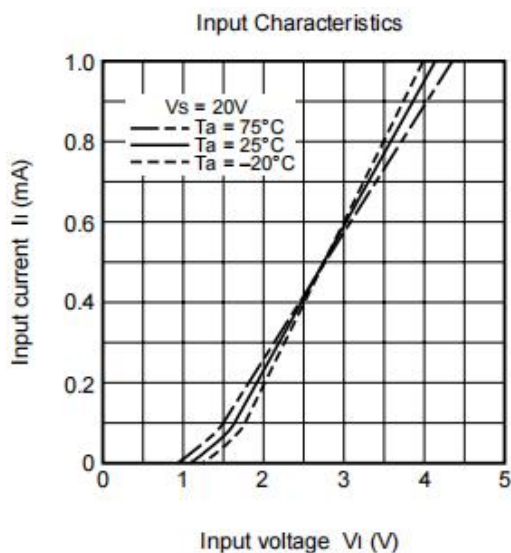
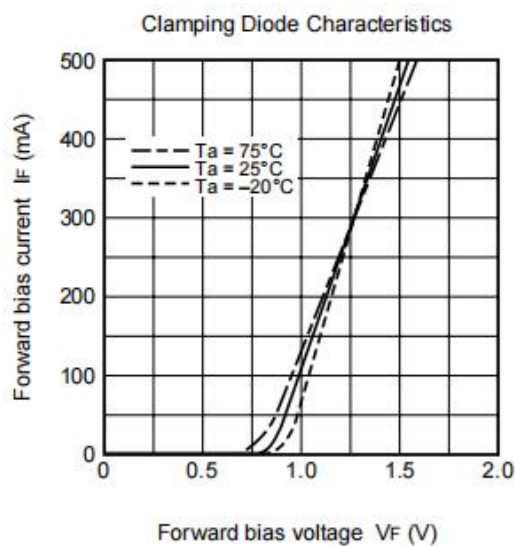
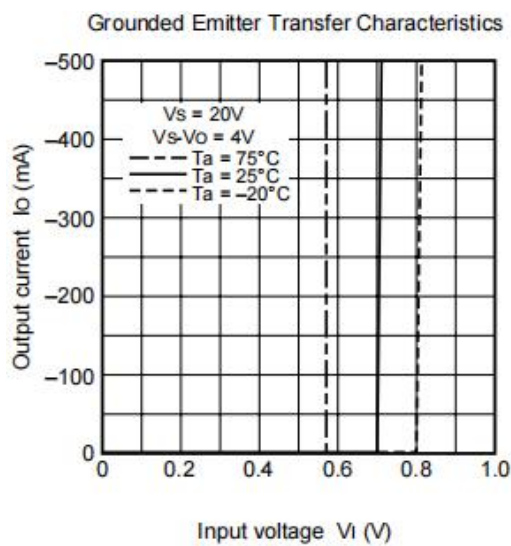
- (1) Pulse generator (PG) characteristics : $\text{PRR} = 1\text{kHz}$, $t_w = 10\mu\text{s}$, $t_r = 6\text{ns}$, $t_f = 6\text{ns}$, $Z_o = 50\Omega$, $V_i = 0$ to 2.4V
- (2) Input-output conditions : $R_L = 30\Omega$, $V_s = 10\text{V}$
- (3) Electrostatic capacity C_L includes floating capacitance at connections and input capacitance at probes



TIMING DIAGRAM

11. TYPICAL CHARACTERISTICS





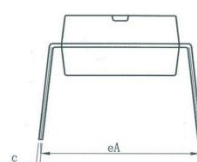
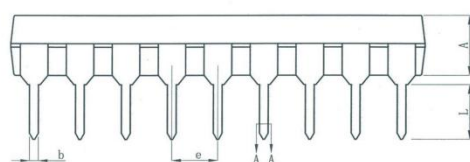
12. ORDERING INFORMATION

Ordering Information

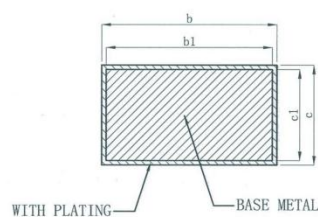
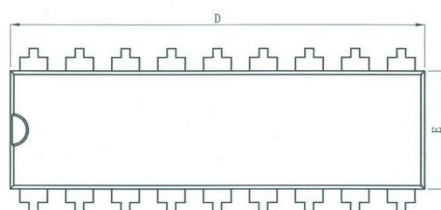
Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XD54563	XL54563	DIP18	22.90*6.50	- 40 to 85	MSL3	Tube 20	800

13. DIMENSIONAL DRAWINGS

DIP18



symbol	millimeter		
	Min	Nom	Max
A	3.20	3.30	3.40
b	0.44	—	0.53
bl	0.43	0.46	0.49
c	0.25	—	0.30
cl	0.24	0.25	0.26
D	22.80	22.90	23.00
E	6.40	6.50	6.60
e	2.54BSC		
eA	8.30	8.80	9.30
L	3.00	—	—



SECTION A-A