

DESCRIPTION

M54585KP is eight-circuit Darlington transistor arrays with clamping diodes. The circuits are made of NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

FEATURES

- High breakdown voltage ($BV_{CEO} \geq 50V$)
- High-current driving ($I_{C(max)} = 500mA$)
- With clamping diodes
- Driving available with TTL output or with PMOS IC output
- With shrink small outline package

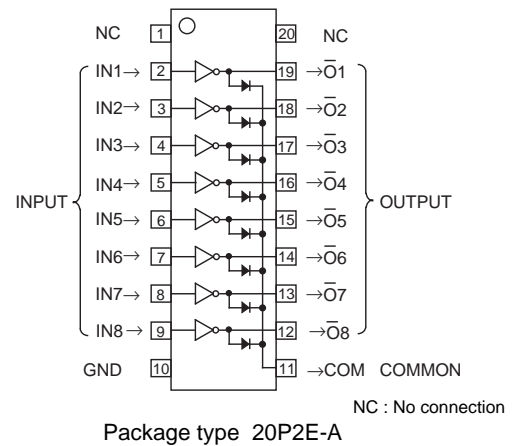
APPLICATION

Drives of relays and printers, digit drives of indication elements such as LEDs and lamps, and MOS-bipolar logic IC interfaces

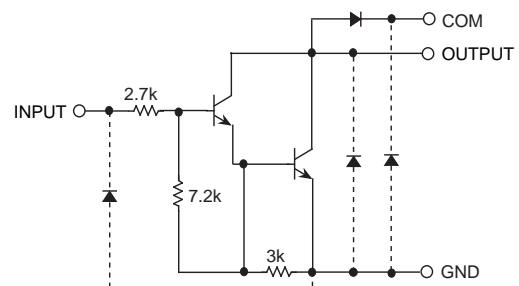
FUNCTION

The M54585KP has eight circuits, which are NPN Darlington transistors. Input transistors have resistance of $2.7k\Omega$ between the base and input pin. A spike-killer clamping diode is provided between each output pin and GND. Output transistor emitters are all connected to the GND pin. Collector current is 500mA maximum. The maximum collector-emitter voltage is 50V.

PIN CONFIGURATION



CIRCUIT DIAGRAM



The eight circuits share the COM and GND.

The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit : Ω

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_a = -20 \sim +75^\circ C$)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CEO}	Collector-emitter voltage	Output, H	-0.5 ~ +50	V
I_C	Collector current	Current per circuit output, L	500	mA
V_I	Input voltage		-0.5 ~ +30	V
I_F	Clamping diode forward current		500	mA
V_R	Clamping diode reverse voltage		50	V
P_d	Power dissipation	$T_a = 25^\circ C$, when mounted on board	0.68	W
T_{opr}	Operating temperature		-20 ~ +75	$^\circ C$
T_{stg}	Storage temperature		-55 ~ +125	$^\circ C$

8-UNIT 500mA DARLINGTON TRANSISTOR-ARRAY WITH CLAMP DIODE

RECOMMENDED OPERATING CONDITIONS (Unless otherwise noted, $T_a = -20 \sim +75^\circ\text{C}$)

Symbol	Parameter	Limits			Unit	
		min	typ	max		
V_o	Output voltage	0	—	50	V	
I_c	Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle $\leq 10\%$	0	—	200	mA
		Duty Cycle $\leq 50\%$	0	—	70	
V_{IH}	"H" input voltage	$I_c \leq 400\text{mA}$	3.85	—	30	V
		$I_c \leq 200\text{mA}$	3.4	—	30	V
V_{IL}	"L" input voltage		0	—	0.6	V

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $T_a = -20 \sim +75^\circ\text{C}$)

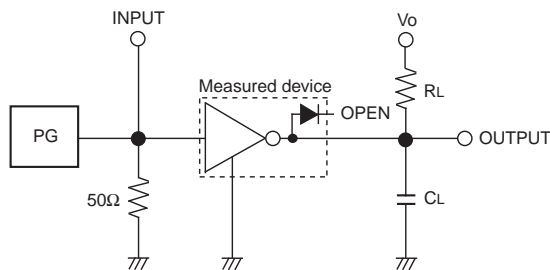
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_{CEO} = 100\mu\text{A}$	50	—	—	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_I = 3.85\text{V}, I_c = 400\text{mA}$	—	1.3	2.4	V
		$V_I = 3.4\text{V}, I_c = 200\text{mA}$	—	1.0	1.6	
I_i	Input current	$V_I = 3.85\text{V}$	—	0.95	1.8	mA
		$V_I = 25\text{V}$	—	8.7	18	
V_F	Clamping diode forward voltage	$I_F = 400\text{mA}$	—	1.5	2.4	V
I_R	Clamping diode reverse current	$V_R = 50\text{V}$	—	—	100	μA
h_{FE}	DC amplification factor	$V_{CE} = 4\text{V}, I_c = 350\text{mA}, T_a = 25^\circ\text{C}$	1000	2500	—	—

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

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

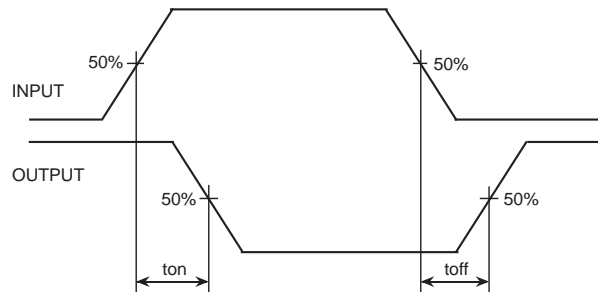
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t_{on}	Turn-on time	$C_L = 15\text{pF}$ (note 1)	—	12	—	ns
t_{off}	Turn-off time		—	240	—	ns

NOTE 1 TEST CIRCUIT

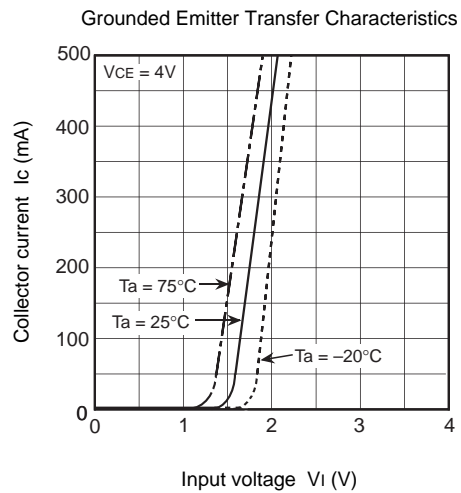
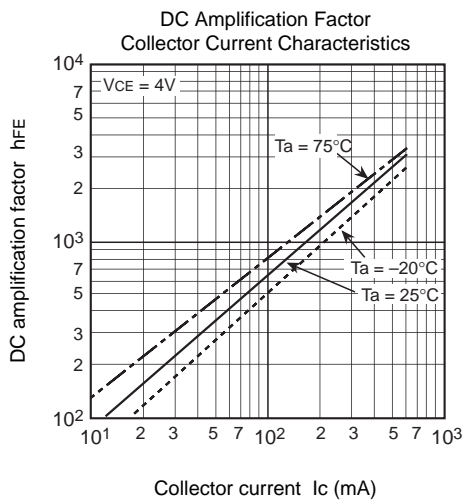
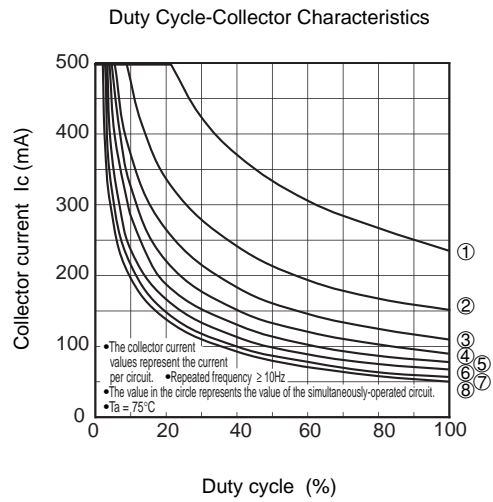
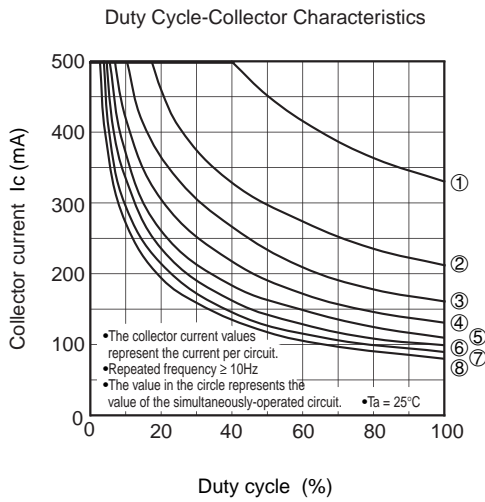
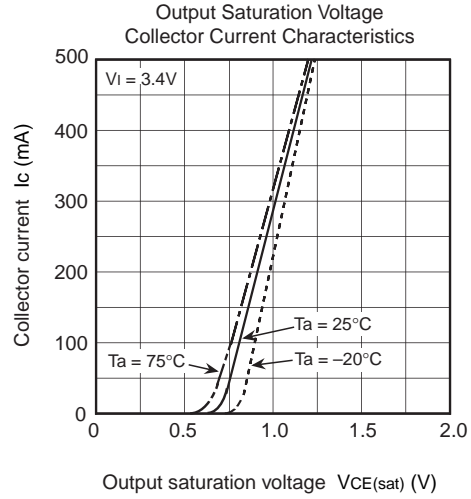
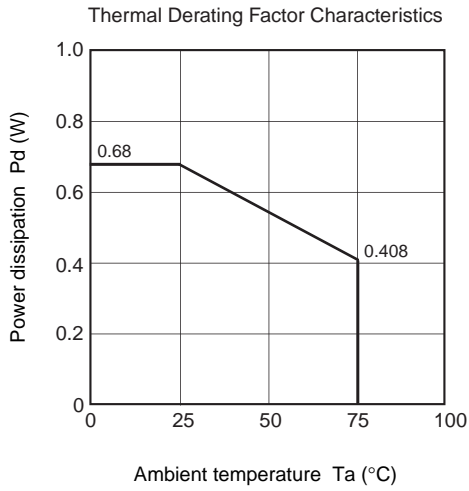


- (1) Pulse generator (PG) characteristics : PRR = 1kHz,
 $t_w = 10\mu\text{s}$, $t_r = 6\text{ns}$, $t_f = 6\text{ns}$, $Z_o = 50\Omega$,
 $V_I = 3.85\text{V}$
- (2) Input-output conditions : $R_L = 25\Omega$, $V_o = 10\text{V}$
- (3) Electrostatic capacity C_L includes floating capacitance at connections and input capacitance at probes

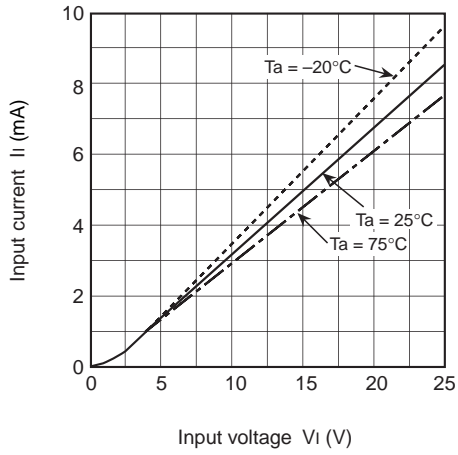
TIMING DIAGRAM



TYPICAL CHARACTERISTICS



Input Characteristics



Clamping Diode Characteristics

