

## Threshold Switch

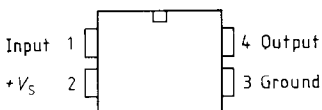
**TCA 345 A**

### Features

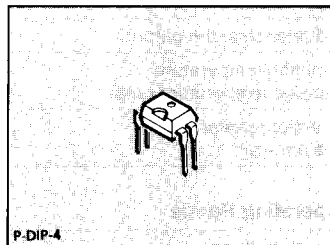
- TTL-compatible
- High output current
- Very high input impedance
- Good stability due to hysteresis
- Few external components

### Pin Configuration

(top view)



**Bipolar IC**



Type	Ordering Code	Package
■ □ TCA 345 A	Q67000-A564	P-DIP-4

■ = Not for new design

Threshold switches featuring linear, supply voltage-dependent threshold value. Inductive loads may be switched at the output without protective diode.

**Absolute Maximum Ratings**

Parameter	Symbol	Limit Values	Unit
Supply voltage	$V_S$	10	V
Output current	$I_Q$	70	mA
Input voltage	$V_I$	0 to $V_S$	V
Inductance at the output	$L_Q$	500	mH
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 125	°C
Thermal resistance system – air	$R_{th SA}$	140	K/W

**Operating Range**

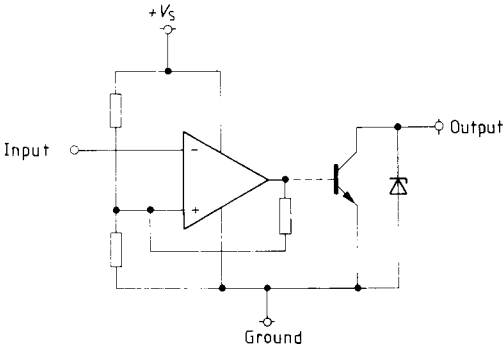
Supply voltage	$V_S$	2 to 10	V
Ambient temperature	$T_A$	-25 to 85	°C

**Characteristics** $T_A = 25\text{ °C}$ 

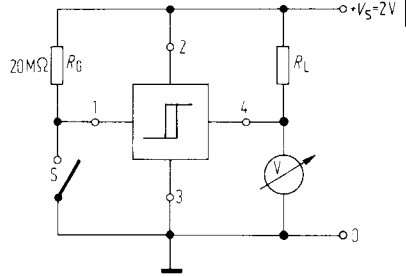
Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Current consumption at output current $I_Q = 0\text{ mA}; V_S = 2\text{ V}$ $= 5\text{ V}$	$I_{SH}$		0.55 1.35	0.80 2.00	mA mA
$I_Q = 40\text{ mA}; V_S = 2\text{ V}$ $= 5\text{ V}$	$I_{SL}$		1.85 7.00	3.00 9.00	mA mA
L output voltage at $I_Q = 40\text{ mA}$ $V_S = 2\text{ V}$	$V_{QL}$		150	300	mV
Output reverse current $V_Q = 10\text{ V}$	$I_{QH}$			30	μA
Switching threshold $V_S = 2\text{ to }10\text{ V}^1)$	$V_I$	$0.63 \times V_S$	$0.66 \times V_S$	$0.69 \times V_S$	V
Linearity error of the switching threshold (referred to $V_S = 2\text{ V}$ )				3.0	%
Hysteresis (in % of $V_S$ ) $V_S = 2\text{ V}$	$\Delta V_I$	6.0	10	15	%
Hysteresis (in % of $V_S$ ) $V_S = 5\text{ V}$	$\Delta V_I$	6.0	20		%
Hysteresis (in % of $V_S$ ) $V_S = 10\text{ V}$	$\Delta V_I$	6.0	20		%
Input current	$I_I$		10	30	nA
Z voltage via output	$V$	11.0	13.6	15.0	V
Temperature response of switching threshold			30		ppm/K

1) measured with increasing input voltage

**Circuit Diagram**

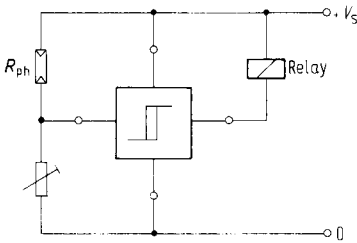


**Test Circuit**

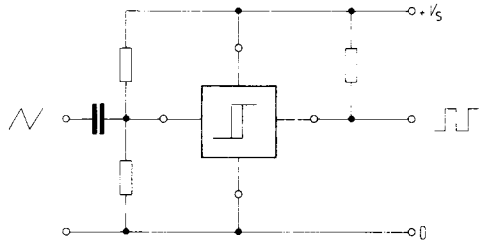


**Application Circuits**

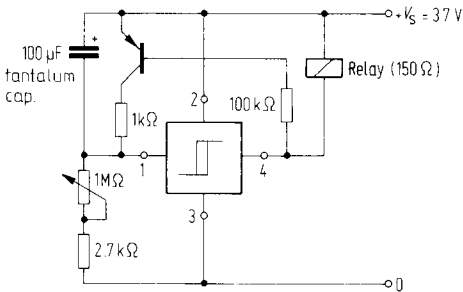
**Twilight Switch**  
(switches on light at nightfall)



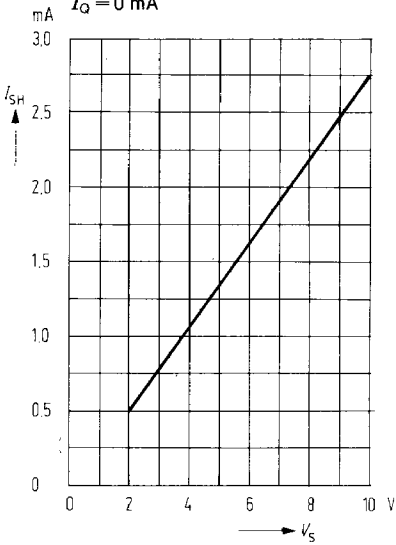
**Triangle-square Converter**



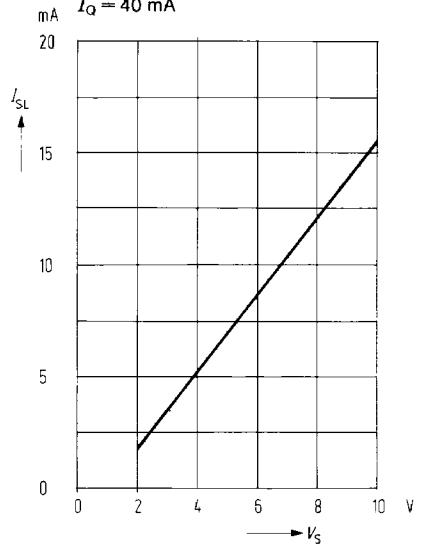
**Clock Generator**



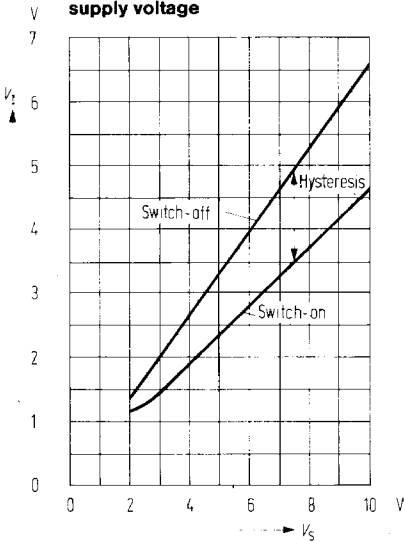
**Current consumption  $I_{SH}$  versus supply voltage**  
 $I_Q = 0 \text{ mA}$



**Current consumption  $I_{SL}$  versus supply voltage**  
 $I_Q = 40 \text{ mA}$



**Switching threshold input voltage versus supply voltage**



**Output voltage versus output current**

