

Threshold Switch

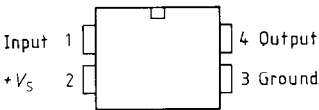
TCA 345 A

Features

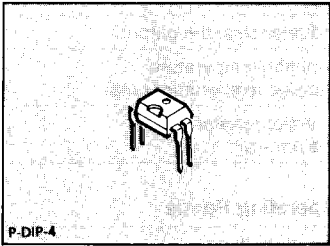
- TTL-compatible
- High output current
- Very high input impedance
- Good stability due to hysteresis
- Few external components

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

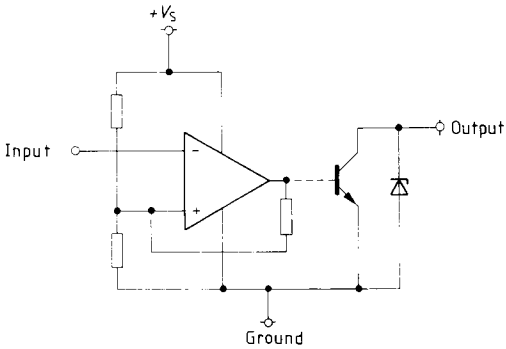
Supply voltage	V_S	2 to 10	V
Ambient temperature	T_A	–25 to 85	°C

Characteristics $T_A = 25\text{ °C}$

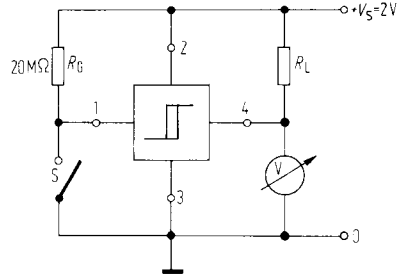
Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Current consumption at output current $I_Q = 0\text{ mA}; V_S = 2\text{ V}$ $= 5\text{ V}$	$I_{S H}$ $I_{S H}$		0.55 1.35	0.80 2.00	mA mA
$I_Q = 40\text{ mA}; V_S = 2\text{ V}$ $= 5\text{ V}$	$I_{S L}$ $I_{S L}$		1.85 7.00	3.00 9.00	mA mA
L output voltage at $I_Q = 40\text{ mA}$ $V_S = 2\text{ V}$	$V_{Q L}$		150	300	mV
Output reverse current $V_Q = 10\text{ V}$	$I_{Q H}$			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) $V_S = 2\text{ V}$	ΔV_I	6.0	10		%
Hysteresis (in % of V_S) $V_S = 5\text{ V}$	ΔV_I	6.0	20		%
Hysteresis (in % of V_S) $V_S = 10\text{ V}$	ΔV_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



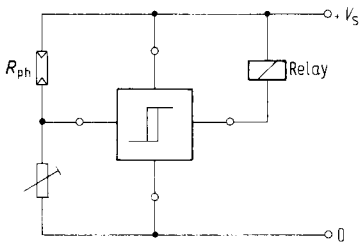
Test Circuit



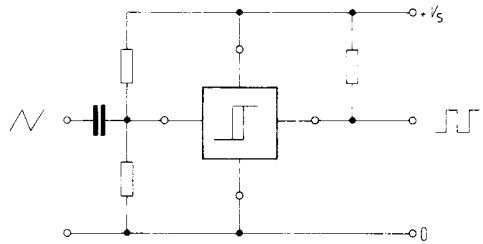
Application Circuits

Twilight Switch

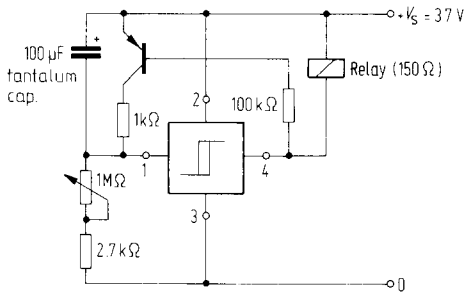
(switches on light at nightfall)



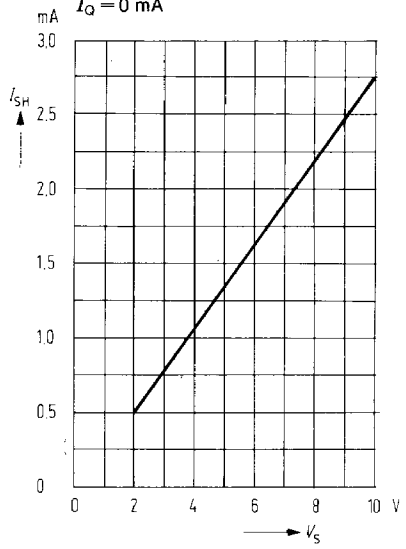
Triangle-square Converter



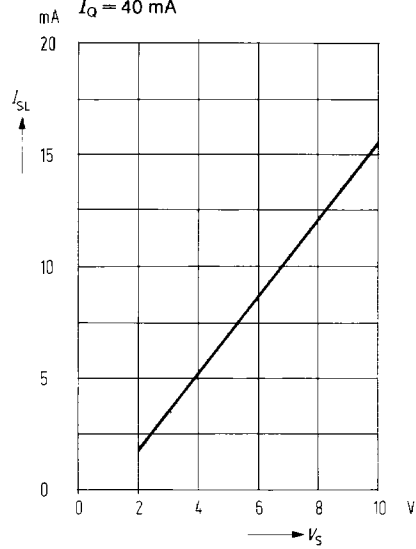
Clock Generator



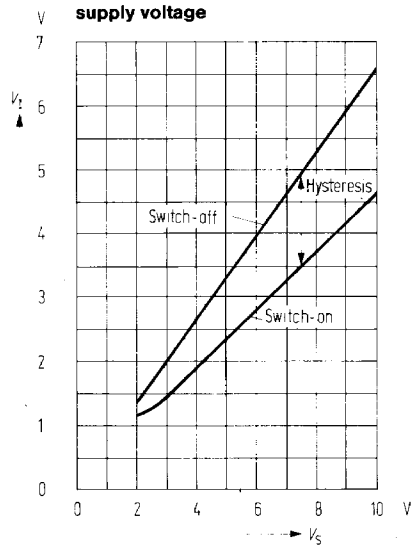
Current consumption I_{SH} versus supply voltage
 $I_Q = 0 \text{ mA}$



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



Switching threshold Input voltage versus supply voltage



Output voltage versus output current

