

## Threshold Switch

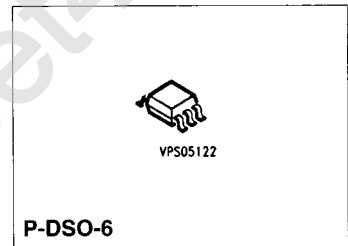
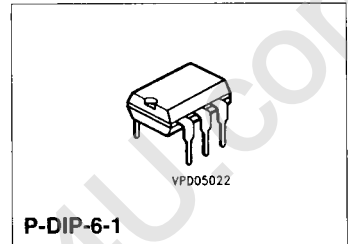
TCA 105

Bipolar IC

3

### Features

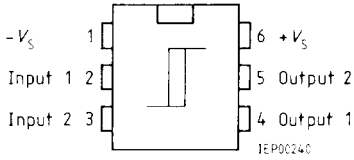
- Wide range of supply voltage, 4.5 to 30 V
- High output current, 50 mA
- TTL-compatible
- Triggerable with DC signal



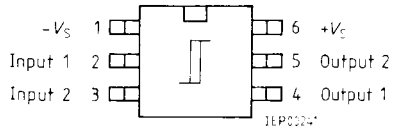
Type	Ordering Code	Package
■ TCA 105	Q67000-A527	P-DIP-6-1
■ TCA 105 B	Q67000-A587	P-DIP-6-1
■ TCA 105 G	Q67000-A988	P-DSO-6 (SMD)

The TCA 105 contains an oscillator stage, a threshold switch, and two anti-valent output stages. The IC is especially suitable for application in proximity switches, light reflection switches, and other contactless switching applications.

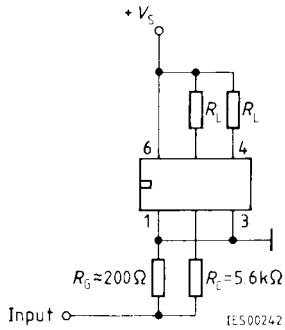
TCA 105, TCA 105 B



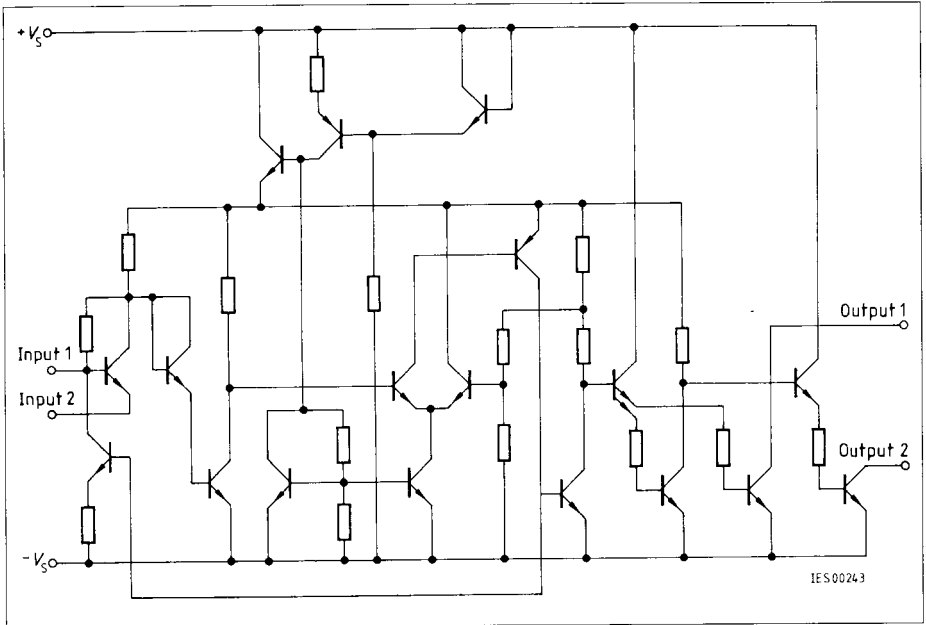
TCA 105 G



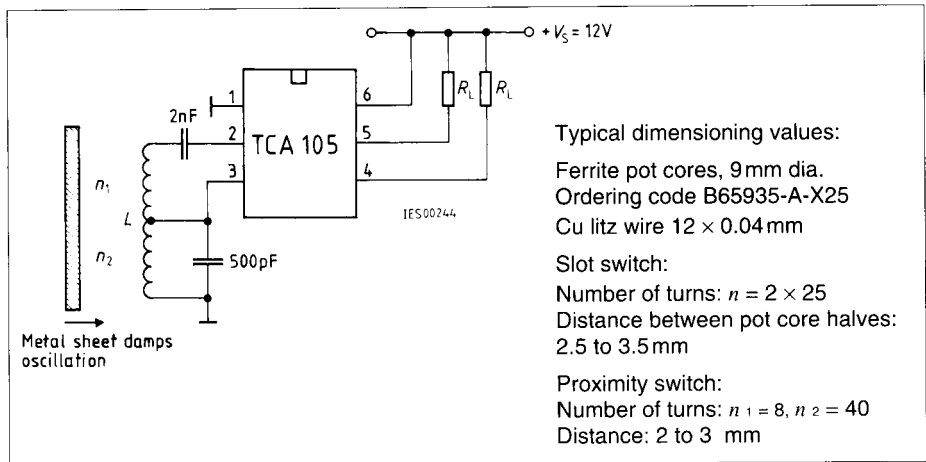
**Pin Configuration**  
(top view)



**Test Circuit**

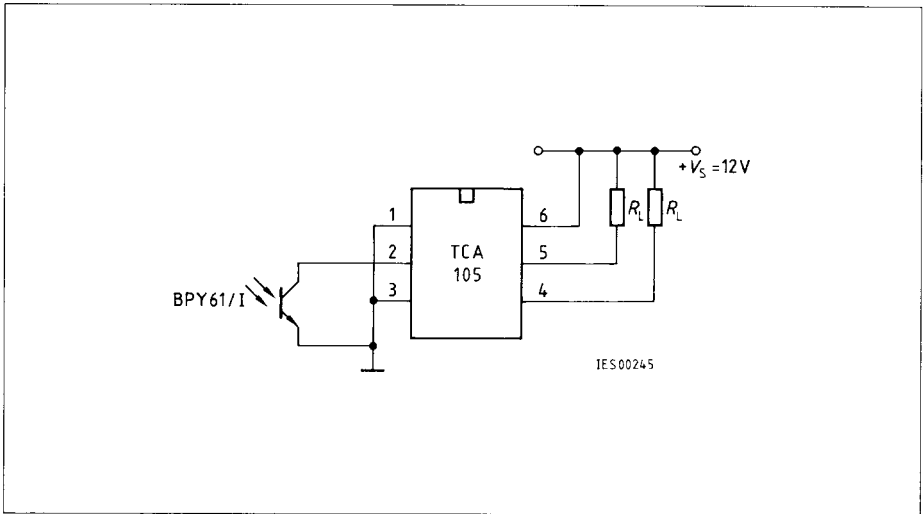


Circuit Diagram

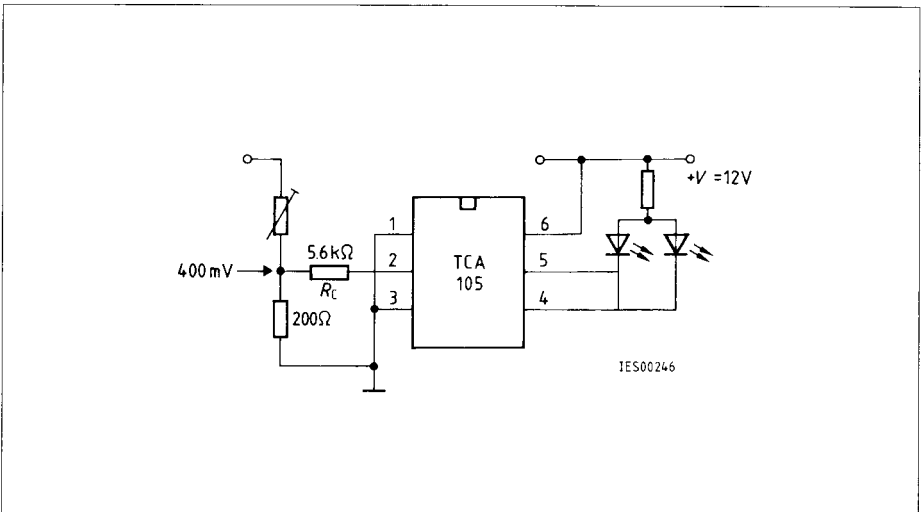


**Application Example**  
**Inductive Slot Switch or Proximity Switch**

Applications Examples



**Light-Operated Switch** (switching amplifier for phototransistor BPY 61)



**Voltage Monitor**

### Absolute Maximum Ratings

Parameters	Symbol	Limit Values		Unit
		TCA 105	TCA 105 B	
Supply voltage	$V_S$	30	20	V
Output voltage (pin 4, pin 5)	$V_O$	30	20	V
Output current	$I_O$	50	50	mA
Switching frequency	$f_S$	40	40	kHz
Input voltage	$V_I$	$\geq 0^{1)}$	$\geq 0^{1)}$	V
Junction temperature	$T_J$	150	150	$^{\circ}\text{C}$
Storage temperature range	$T_{stg}$	- 55 to 125	- 55 to 125	$^{\circ}\text{C}$
Thermal resistance (system – air) TCA 105, TCA 105 B	$R_{th SA}$	115	115	K/W
TCA 105 G	$R_{th SA}$	200		K/W

### Operating Range

Supply voltage	$V_S$	4.75 to 30	4.75 to 20	V
Ambient temperature	$T_A$	- 25 to 85	- 25 to 85	$^{\circ}\text{C}$
Oscillating frequency	$f_{osc}$	1 to 4.5	1 to 4.5	MHz

<sup>1)</sup> Negative input voltages are not permitted

### Characteristics

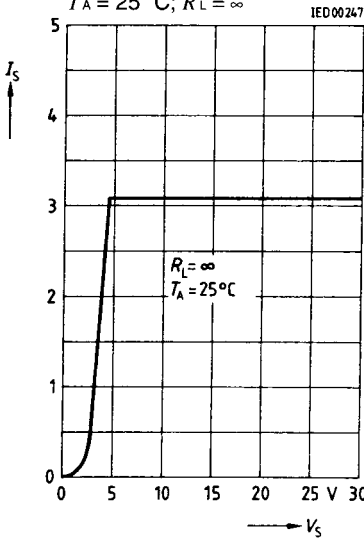
Static measurement, pins 3 and 1 interconnected

$V_S = 12\text{ V}$ ,  $T_A = 25^\circ\text{C}$ ,  $R_C = 5.6\text{ k}\Omega$

Parameters	Symbol	Limit Values			Unit
		min.	typ.	max.	
Supply current	$I_S$		3.4	5	mA
Input threshold voltage with compensation resistor $R_C$	$V_I$	300	400	480	mV
Input threshold current	$I_I$		- 60		$\mu\text{A}$
Hysteresis	$V_{hy}$	20	35	50	mV
L-output voltage $I_O = 16\text{ mA}$	$V_{OL}$		0.25	0.35	V
H-output voltage	$V_{OH}$	corresponds to $V_S$			
Reverse current, $V_S = 30\text{ V}$ and/or $20\text{ V}$	$I_{OH}$			60	$\mu\text{A}$
L-output voltage $I_O = 50\text{ mA}$	$V_{OL}$		0.7	1.15	V
Switching time in TTL operation $I_O = 16\text{ mA}$	$t$		3		$\mu\text{s}$

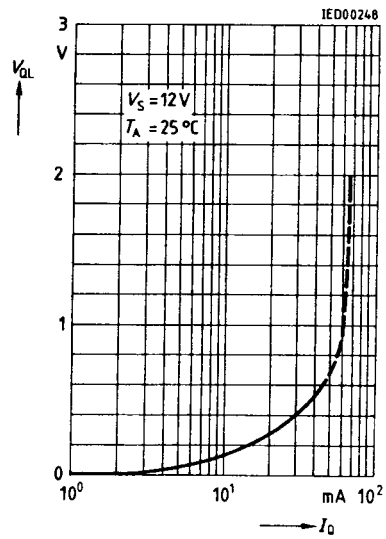
**Current Consumption  
Supply Current versus  
Supply Voltage**

$T_A = 25^\circ\text{C}; R_L = \infty$



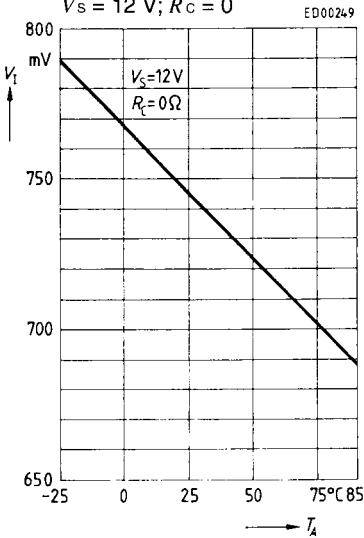
**L-Output Voltage versus  
Output Current**

$T_A = 25^\circ\text{C}; V_S = 12\text{ V}$



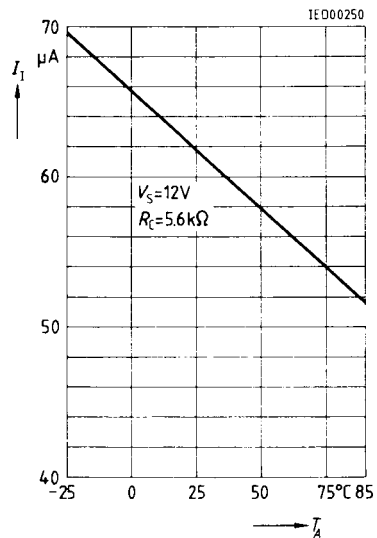
**Switching Threshold  
Input Voltage versus  
Ambient Temperature**

$V_S = 12\text{ V}; R_C = 0$

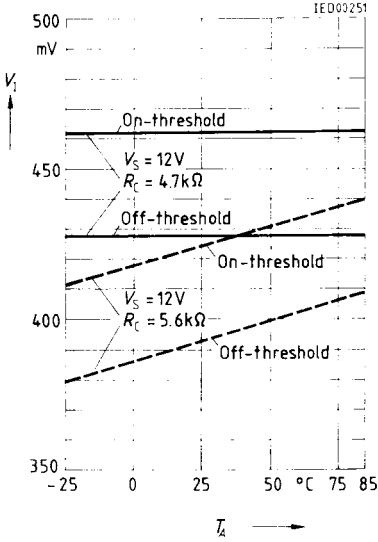


**Input Current versus  
Ambient Temperature**

$V_S = 12\text{ V}; R_C = 5.6\text{ k}\Omega$



**Switching Threshold  
Input Voltage versus  
Ambient Temperature**



**Switching Threshold  
Input Voltage versus  
Supply Voltage**

$T_A = 25^{\circ}\text{C}; R_C = 5.6\text{k}\Omega$

