

Threshold Switch

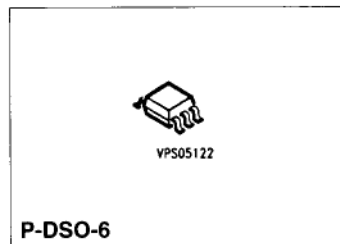
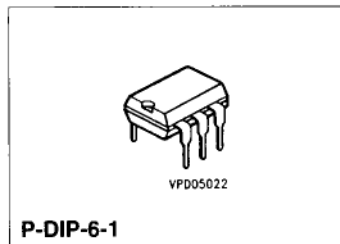
TCA 105

Bipolar IC

3

Features

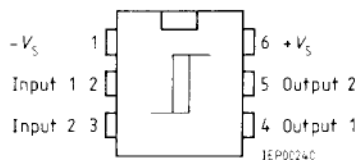
- Wide range of supply voltage, 4.5 to 30 V
- High output current, 50 mA
- TTL-compatible
- Triggerable with DC signal



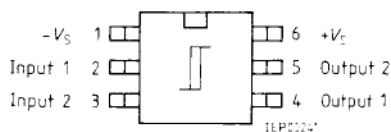
Type	Ordering Code	Package
S TCA 105	Q67000-A527	P-DIP-6-1
S TCA 105 B	Q67000-A587	P-DIP-6-1
S TCA 105 G	Q67000-A988	P-DSO-6 (SMD)

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.

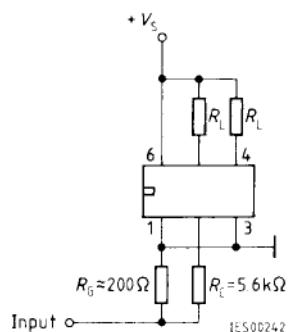
TCA 105, TCA 105 B



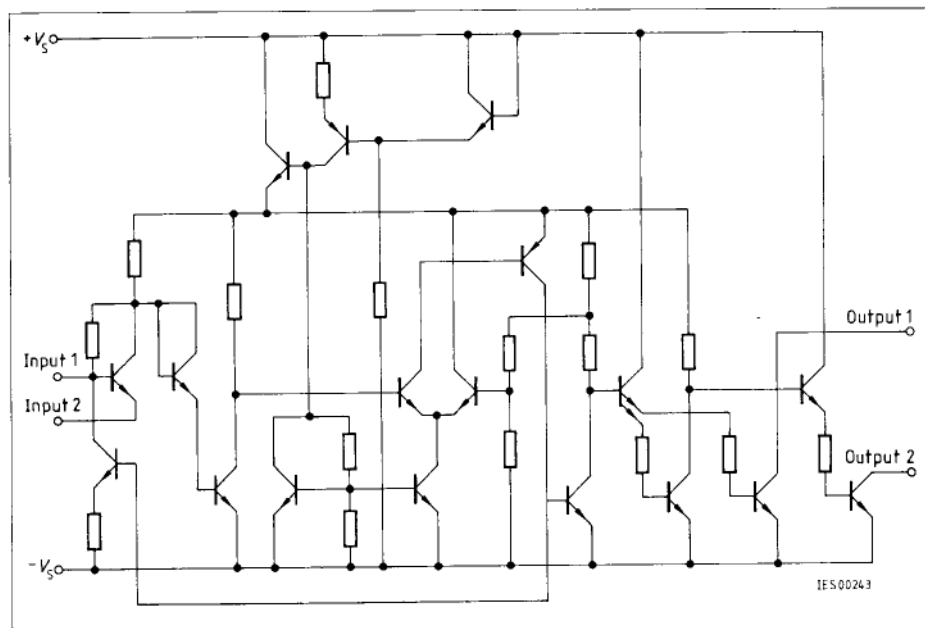
TCA 105 G



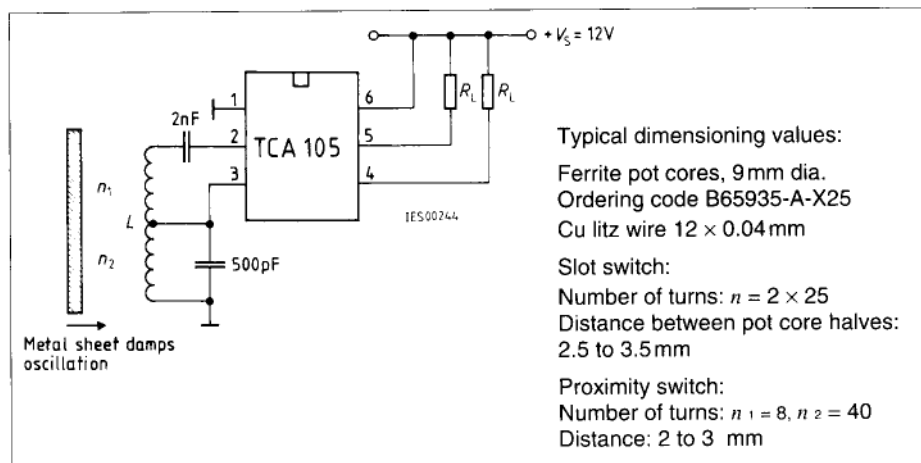
Pin Configuration (top view)



Test Circuit



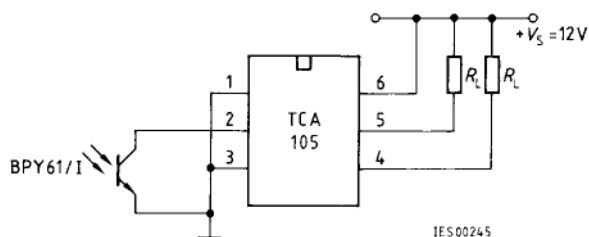
Circuit Diagram



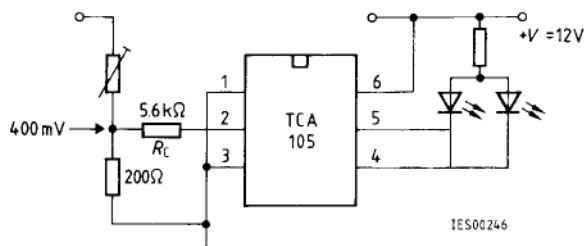
Application Example

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	°C
Storage temperature range	T_{stg}	- 55 to 125	- 55 to 125	°C
Thermal resistance (system – air)	$R_{th SA}$	115	115	K/W
TCA 105, TCA 105 B	$R_{th SA}$	200		K/W
TCA 105 G				

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	°C
Oscillating frequency	f_{osc}	1 to 4.5	1 to 4.5	MHz

¹⁾ Negative input voltages are not permitted

Characteristics

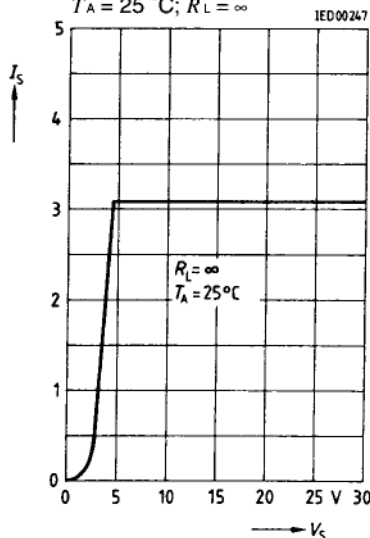
Static measurement, pins 3 and 1 interconnected

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

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		μA
Hysteresis	V_{hy}	20	35	50	mV
L-output voltage	V_{OL}		0.25	0.35	V
$I_O = 16\text{ mA}$					
H-output voltage	V_{OH}		corresponds to V_S		
Reverse current, $V_S = 30\text{ V}$ and/or 20 V	I_{OH}			60	μA
L-output voltage	V_{OL}		0.7	1.15	V
$I_O = 50\text{ mA}$					
Switching time in TTL operation	t		3		μs
$I_O = 16\text{ mA}$					

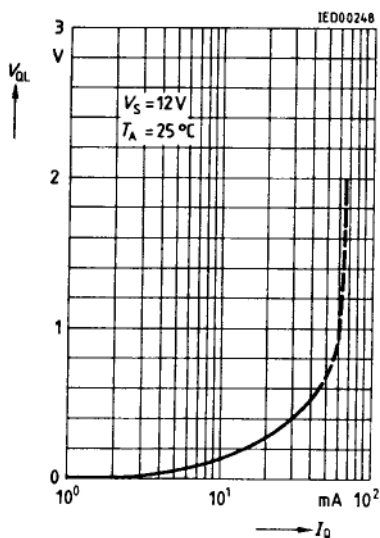
**Current Consumption
Supply Current versus
Supply Voltage**

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



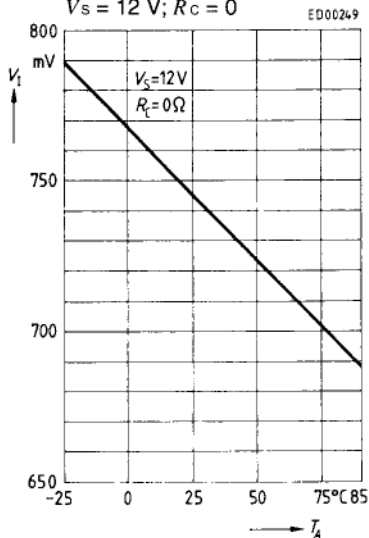
**L-Output Voltage versus
Output Current**

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



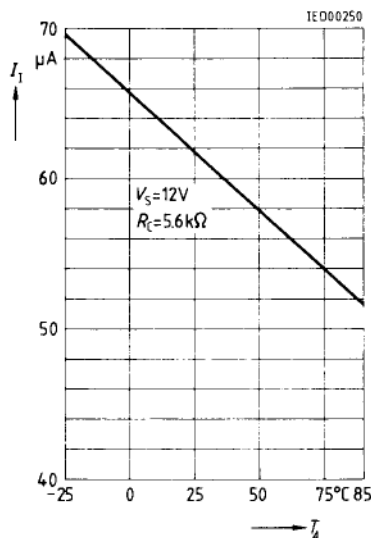
**Switching Threshold
Input Voltage versus
Ambient Temperature**

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

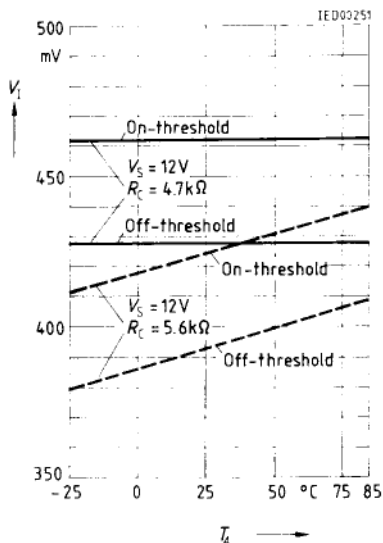


**Input Current versus
Ambient Temperature**

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



**Switching Threshold
Input Voltage versus
Ambient Temperature**



**Switching Threshold
Input Voltage versus
Supply Voltage**

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

