

Threshold Switch

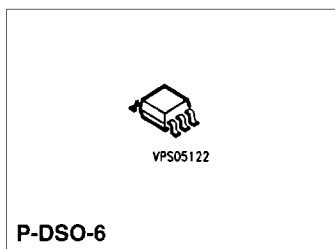
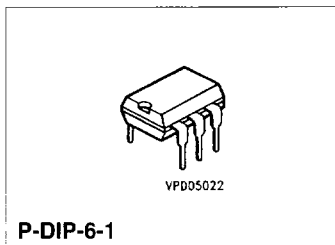
TCA 105

Bipolar IC

3

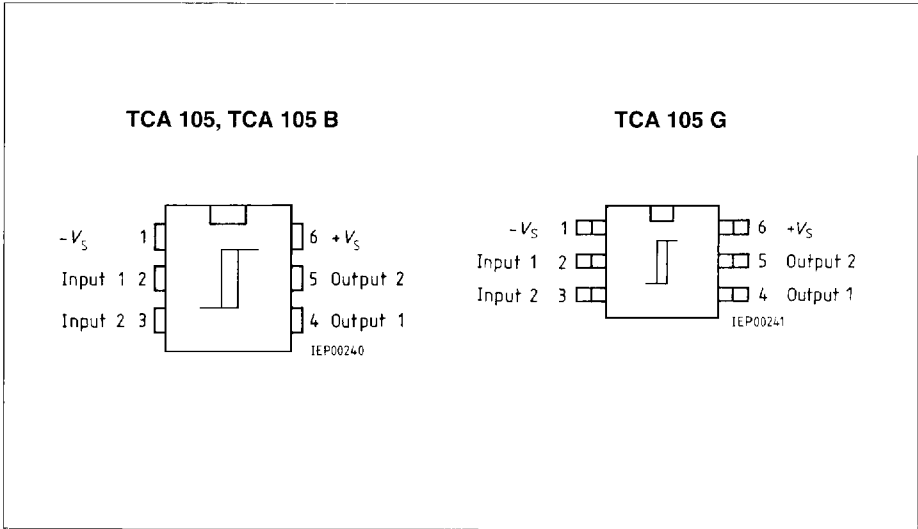
Features

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

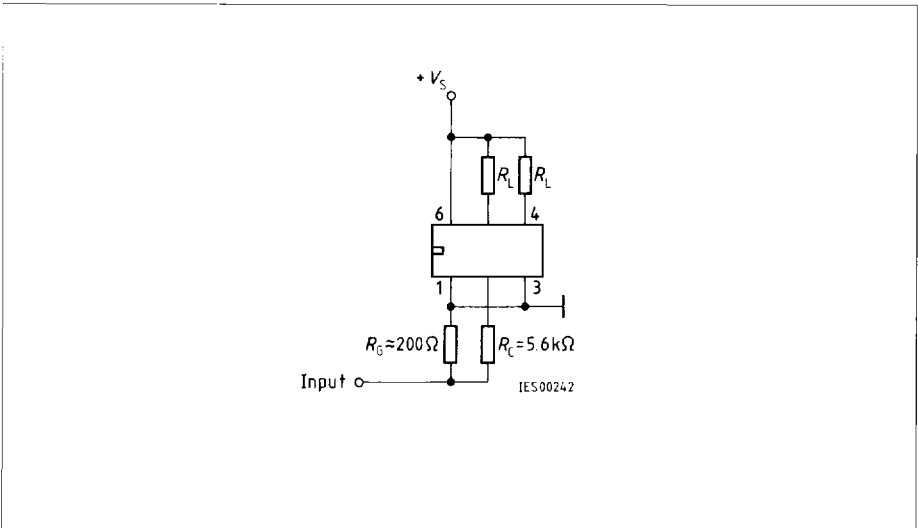


Type	Ordering Code	Package
☒ TCA 105	Q67000-A527	P-DIP-6-1
☒ TCA 105 B	Q67000-A587	P-DIP-6-1
☒ TCA 105 G	Q67000-A988	P-DSO-6 (SMD)

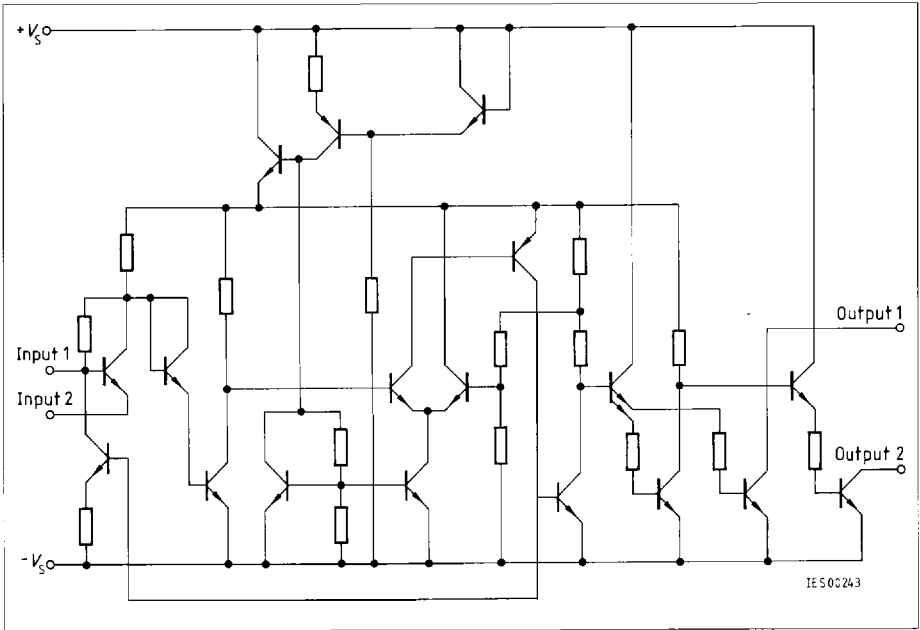
The TCA 105 contains an oscillator stage, a threshold switch, and two anti-valent output stages. The IC is especially suitable for application in proximity switches, light reflection switches, and other contactless switching applications.



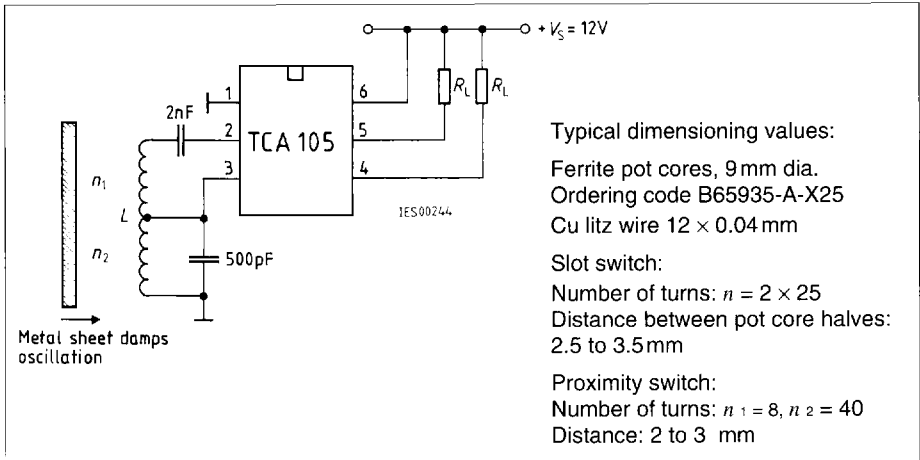
Pin Configuration
(top view)



Test Circuit

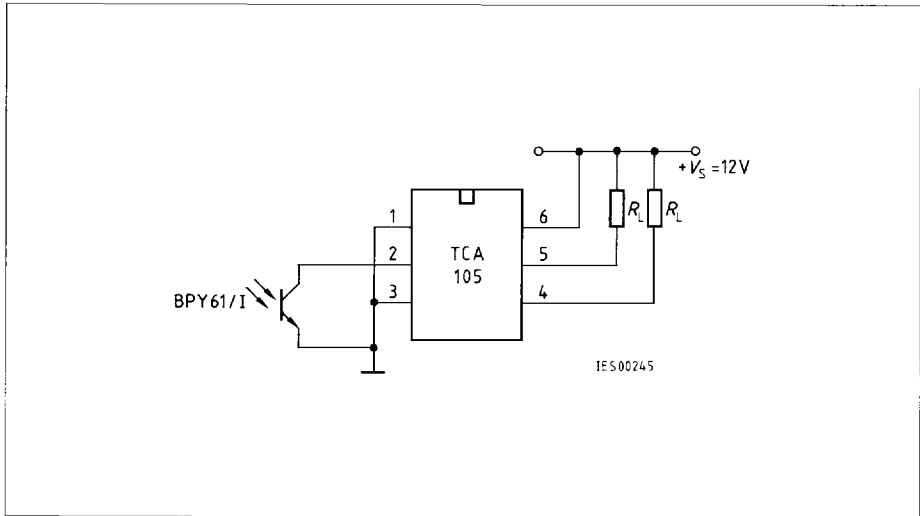


Circuit Diagram

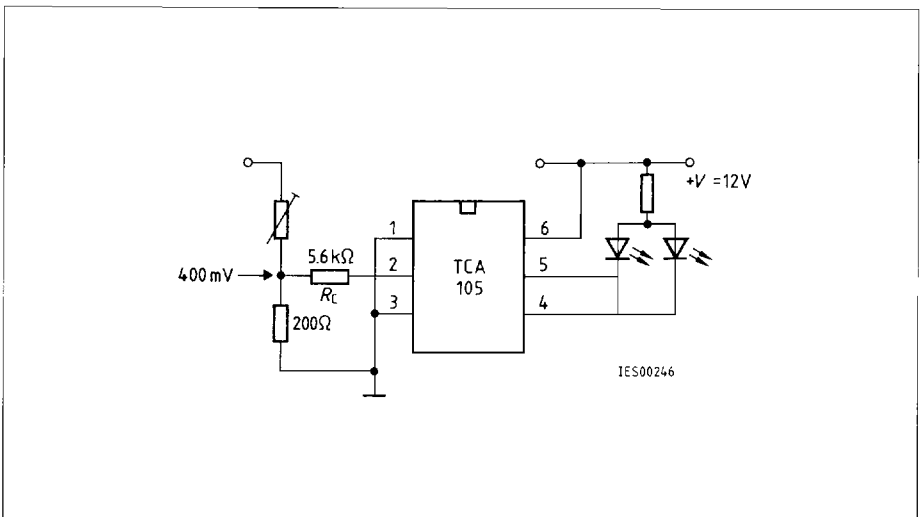


Application Example
Inductive Slot Switch or Proximity Switch

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 TCA 105 G	$R_{th SA}$ $R_{th SA}$	115 200	115	K/W 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

¹⁾ Negative input voltages are not permitted

Characteristics

Static measurement, pins 3 and 1 interconnected

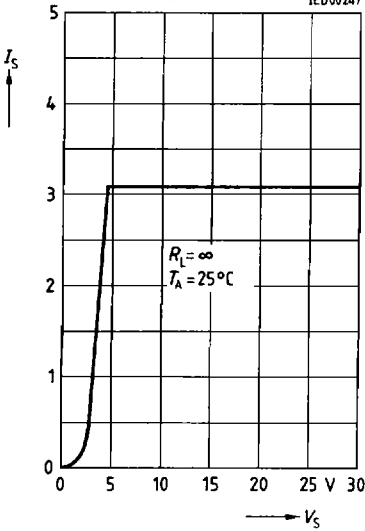
$V_S = 12\text{ V}$, $T_A = 25^\circ\text{C}$, $R_C = 5.6\text{ k}\Omega$

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 $I_O = 16\text{ mA}$	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 V	I_{OH}			60	μA
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		μs

**Current Consumption
Supply Current versus
Supply Voltage**

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

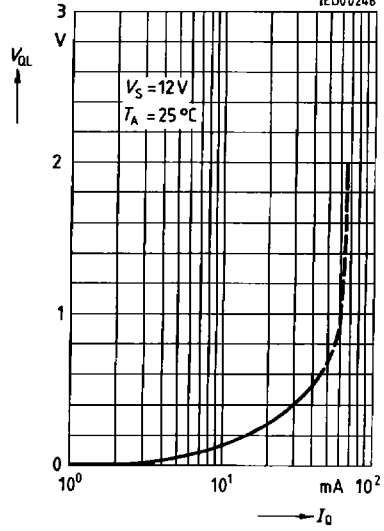
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**L-Output Voltage versus
Output Current**

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

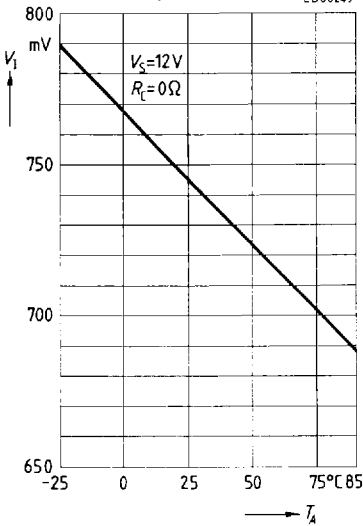
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**Switching Threshold
Input Voltage versus
Ambient Temperature**

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

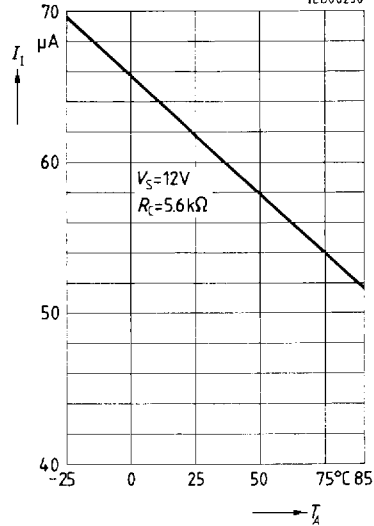
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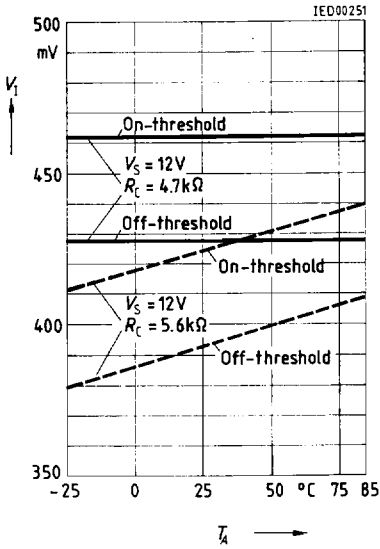
**Input Current versus
Ambient Temperature**

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

IED00250



**Switching Threshold
Input Voltage versus
Ambient Temperature**



**Switching Threshold
Input Voltage versus
Supply Voltage**

