

# AN3370K

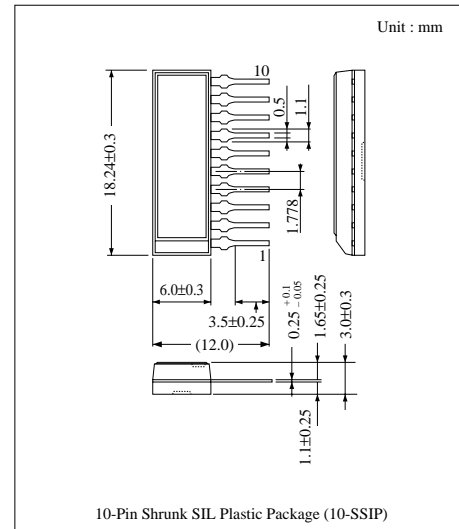
## Flying-Erase IC

### ■ Overview

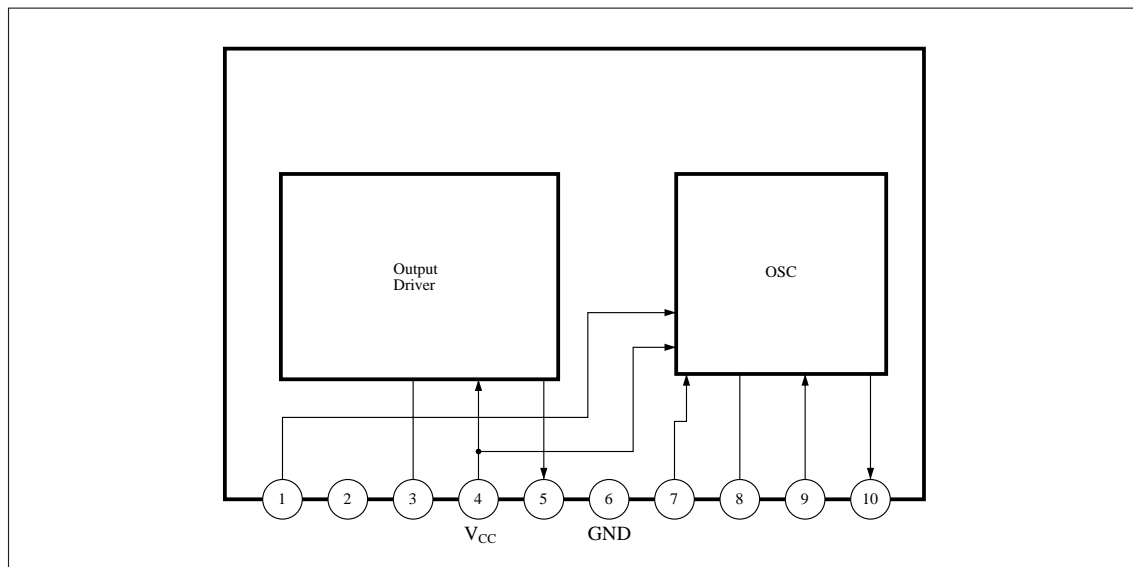
The AN3370K can amplify high-frequency current generated by the built-in oscillator and drive the Flying-erase head. This IC also allows to set an oscillation frequency and an output current optionally with external constants according to the erase head.

### ■ Features

- Built-in high-accuracy, stable oscillator.
- Capable of varying output current value and an oscillation frequency with external constants.



### ■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V <sub>CC</sub>	12.6	V
Power dissipation	P <sub>D</sub>	500	mW
Operating ambient temperature	T <sub>opr</sub>	- 20 to + 70	°C
Storage temperature	T <sub>stg</sub>	- 55 to +150	°C

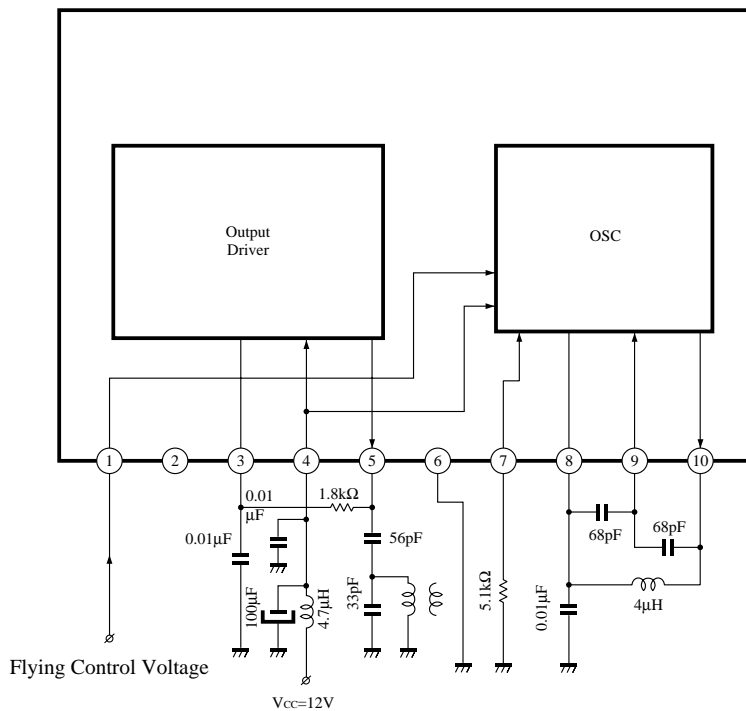
■ Recommended Operating Range (Ta = 25°C)

Parameter	Symbol	Range
Operating supply voltage range	V <sub>CC</sub>	10.5V to 12.5V

■ Electrical Characteristics (V<sub>CC</sub>=12V, Ta=25°C)

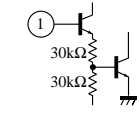
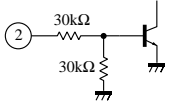
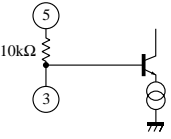
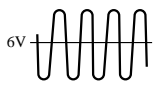
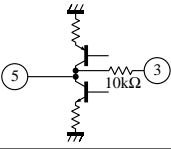
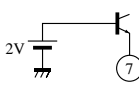
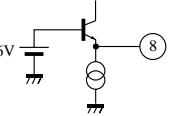
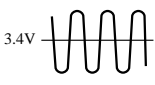
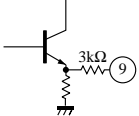
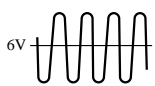
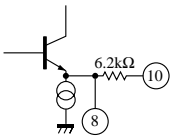
Parameter	Symbol	Condition	min	typ	max	Unit
Supply current	I <sub>CC</sub>	V <sub>I</sub> = 5V	20	28	36	mA
Oscillation output amplitude	V <sub>O1</sub>	V <sub>I</sub> = 5V, R <sub>L</sub> = 300Ω	8	9	—	V <sub>PP</sub>
Oscillation frequency	f <sub>o</sub>	V <sub>I</sub> = 5V, R <sub>L</sub> = 300Ω	11	11.55	12.1	MHz
Oscillation output amplitude	V <sub>O2</sub>	V <sub>I</sub> = 0V, R <sub>L</sub> = 300Ω	—	—	10	mV <sub>PP</sub>
Flying ON	V <sub>IH</sub>		3.5	—	—	V
Flying OFF	V <sub>IL</sub>		—	—	0.8	V

■ Application Circuit

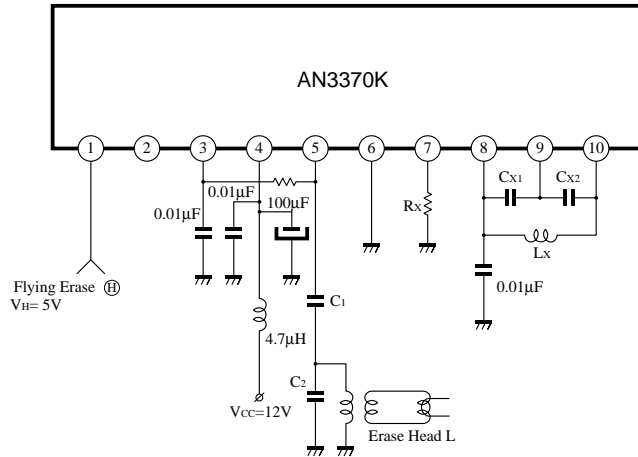


Note) Do not apply a voltage (0V included) to the Pin2 from the external.

### ■ Pin Descriptions

Pin No.	Pin name	Typ. waveform	Description	I/O impedance	Equivalent circuit
1	Flying erase control pin	_____	Flying erase ON/OFF control pin. ON when 3.5V or more is applied, and OFF when 0.8V or less is applied.	3M $\Omega$	
2	_____	_____	Do not apply a voltage from the external.	60k $\Omega$	
3	Feedback pin	_____	Feedback pin to obtain a DC voltage by filtering an output signal via an external capacitor	—	
4	Power supply	_____	Power supply pin. Apply 12V typically from the external.	—	_____
5	Output pin		High-frequency current	10k $\Omega$	
6	GND	_____	_____	—	_____
7	Oscillation input pin	_____	It is possible to change the current which can be taken out of an output, by varying the resistor between this pin and GND.	NPN T <sub>r</sub> emitter	
8	Reference voltage pin	_____	Generates a reference voltage of 1/2 V <sub>CC</sub> (approx. 6V)	NPN T <sub>r</sub> emitter	
9	Oscillation feedback pin		A signal from Pin10 oscillation output is divided by the capacitor and is fed back.	3k $\Omega$	
10	Oscillation output pin		Oscillates at the frequency determined by L, C of the Pins8, 9, 10	6.2k $\Omega$	

■ Supplementary Explanation



1) Internal Oscillation Frequency

An internal oscillation frequency is determined by the following expression. Set  $C_{X1}$ ,  $C_{X2}$ , and  $L_X$  according to a frequency.

$$f_{osc} = \frac{1}{2\pi \sqrt{L_X \cdot \frac{C_{X1} \cdot C_{X2}}{C_{X1} + C_{X2}}}} \dots \dots \dots (1)$$

In order to obtain stable oscillation, set  $C_{X1}/C_{X2}$  near 1 and absolute value of  $C_{X1}$ ,  $C_{X2}$  to such a considerable extent that an internal IC capacitance (approx. 5pF) and an external PCB capacitance can be ignored.

2)  $R_X$

Output current amplitude from the IC is determined by the external resistor  $R_X$  of the Pin7 ; it is approximately as shown in Fig. 1. Therefore, use within the following range.

$$I_5 = 20\text{mA}_{pp} \text{ to } 65\text{mA}_{pp}$$

- 3) Do not apply the Pin1 voltage when  $V_{CC}$  is off.  
Use the Pin2 voltage open.

4) Output Dynamic Range

Since the output pin (5) dynamic range of the AN3370K is 8V<sub>PP</sub> (at  $V_{CC}=12\text{V}$ ), set a combination of  $C_1$ ,  $C_2$ , and erase head inductance ( $L$ ) so that the following will be ensured.

$$I_5 (\text{mA}_{pp}) \times \text{load impedance} < 8V_{pp}$$

5) Serial and Parallel Resonance Points

- Serial resonance frequency  $f_1 = \frac{1}{2\pi \sqrt{L (C_1 + C_2)}} \dots \dots \dots (2)$

Since Pin5 amplitude is minimized at a point of  $f_1$ , set  $f_1$  so that it will almost coincide with  $f_{osc}$ .

- Parallel resonance frequency  
Suppose the internal capacitance of the Pin5 is  $C_5$ , then parallel resonance frequency is

$$f_2 = \frac{L}{2\pi \sqrt{L \left( C_2 + \frac{C_5 \cdot C_1}{C_5 + C_1} \right)}} \dots \dots (3)$$

Although an erase head current is maximized at this point, set  $f_2/f_{osc} \doteq 1.25$  to 1.4

• Characteristic Curve

