

KA8306

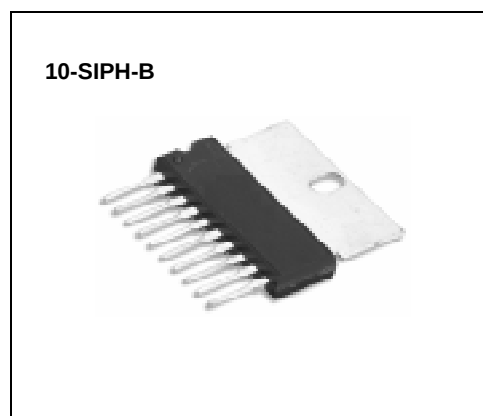
Bi-Directional DC Motor Driver

Features

- 4 modes available (CW/CCW/STOP/BRAKE)
- Output current 1.0A (AVE.) and 1.5A (PEAK)
- Wide range of operating voltage
 - $V_{CC} = 4.5 \sim 18V$
 - $V_S = 0 \sim 18V$
 - $V_{REF} = 0 \sim 18V$
- Built in thermal shutdown, over current protection and short circuit current circuit.

Description

The KA8306 is a monolithic integrated circuit designed for driving bi-directional DC motor with a dual bridge driver, and it is suitable for the cassette and loading motor driver of VCR systems.



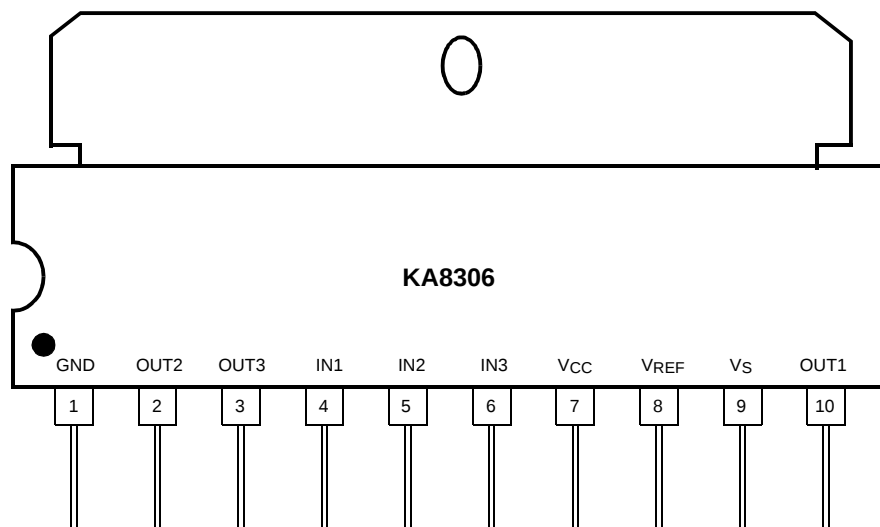
Typical Applications

- Video cassette recorder (VCR) loading motor
- Low current DC motor such audio or video equipment
- General DC motor

Ordering Information

Device	Package	Operating Temp.
KA8306	10-SIPH-B	-25°C ~ +75°C

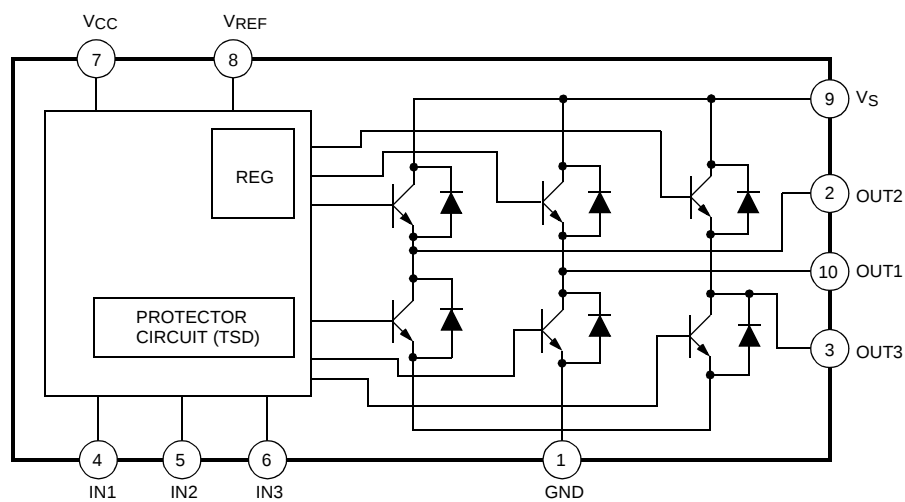
Pin Assignments



Pin Definitions

Pin Number	Pin Name	I/O	Pin Function Description
1	GND	-	Ground
2	OUT2	O	Output 2
3	OUT3	O	Output 3
4	IN1	I	Input 1
5	IN2	I	Input 2
6	IN3	I	Input 3
7	VCC	-	Supply voltage (Signal)
8	VREF	I	Motor speed control
9	Vs	I	Supply voltage (Power)
10	OUT1	O	Output 1

Internal Block Diagram



Equivalent Circuits

Description	Pin No.	Internal circuit
Input	4, 5, 6	Input terminals of pins 4, 5 and 6 are all high active type and have a hysteresis of 0.7V type 5μA type of source mode input current is required.
Output	2, 3, 10	Output voltage is controlled by VREF voltage relationship between VOUT and VREF is $V_{OUT}=V_{BE}(=0.7)+V_{REF}$ VREF terminal required to connect to Vs terminal for stable operation in case of no requirement of VOUT control.

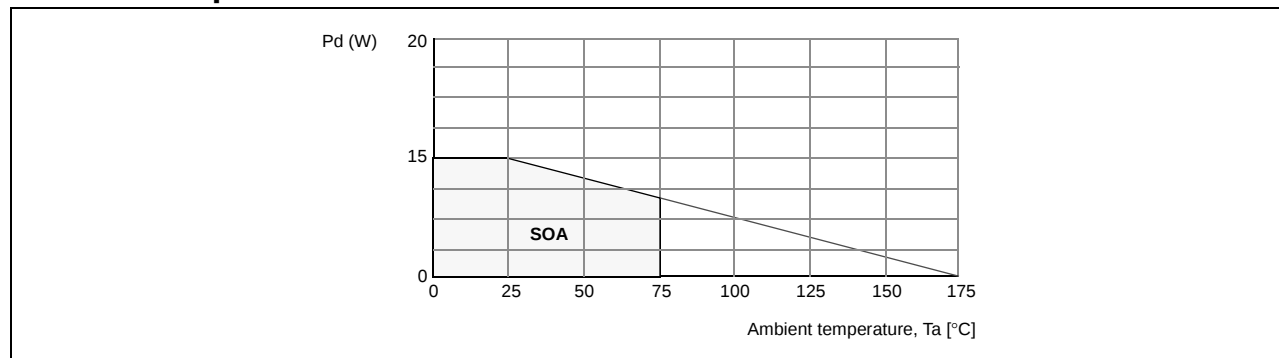
Absolute Maximum Ratings (Ta= 25°C)

Parameter	Symbol	Value	Unit
Supply voltage	VCCmax	25	V
Motor drive voltage	VSmax	25	V
Reference voltage	VREFmax	25	V
Maximum output current	IOmax(PEAK)	1.5 ^{note1}	A
	IOmax(AVE)	1.0	A
Power dissipation	Pd	15 ^{note2}	W
Operating temperature	TOPR	-25 ~ +75	°C
Storage temperature	TSTG	-55 ~ +150	°C

Notes:

1. Duty 1/100, pulse width 500μs
2. 1) When mounted on glass epoxy PCB (76.2 × 114 × 1.57mm)
2) Power dissipation reduces 103.4mW / °C for using above Ta=25°C
3) Do not exceed Pd and SOA(Safe Operating Area).

Power Dissipation Curve



Recommended Operating Conditions (Ta= 25°C)

Parameter	Symbol	Value	Unit
Operating supply voltage	VCC	4.5 ~ 18	V

Electrical Characteristics

(Unless otherwise specified, Ta=25°C, VCC=8V, RL=8Ω, f=1kHz)

Parameter		Symbol	Test Circuit	Conditions	Min.	Typ.	Max.	Units
Supply current		ICC1	1	Output off CW/CCW mode	-	17	30	mA
		ICC2	1	Output off, stop mode	-	13	25	mA
Input operating voltage	H	VIN-H	2	TJ=25°C	3.5	-	5.5	V
	L	VIN-L	2	TJ=25°C	0	-	0.8	V
Input current		IIN	2	VIN=3.5V, Sink mode	-	5	20	μA
Input hysteresis voltage		VHYS	2	-	-	0.7	-	V
Saturation voltage	Upper	VSAT-1U	3	VREF=VS, IO=0.2A	-	1.2	1.5	V
	Lower	VSAT-1L	3	VREF=VS, IO=0.2A	-	1.1	1.4	V
	Upper	VSAT-2U	3	VREF=VS, IO=1.0A	-	2.7	3.1	V
	Lower	VSAT-2L	3	VREF=VS, IO=1.0A	-	2.5	3.0	V
Output voltage		VO-1	3	VREF=10V, IO=0.5A Output measure	10.3	10.7	11.5	V
		VO-2	3	VREF=10V, IO=0.5A Output measure	10.1	10.5	11.3	V
Leakage current	Upper	IL-U	-	VS=25V	-	0	50	μA
	Lower	IL-L	-	VS=25V	-	0	50	μA
Diode forward voltage	Upper	VF-U	4	IF=1.0A	-	2.2	-	V
	Lower	VF-L	4	IF=1.0A	-	1.4	-	V
Reference current		IREF	2	VREF=10V, Source mode	-	20	30	μA

Application Informations

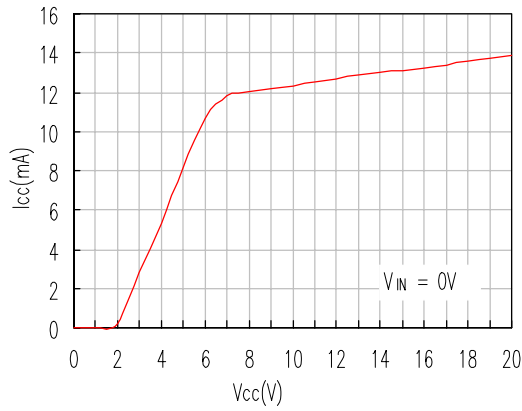
1. LOGIC INPUT & OUTPUT TABLE

Input ^{note1}			Output			Motor	
IN ₁	IN ₂	IN ₃	OUT ₁	OUT ₂	OUT ₃	M ₁	M ₂
0	0	1/0	L	L	L	Brake	Brake
1	0	0	H	L	note2	Pin10→2	Stop
1	0	1	L	H	note2	Pin2→10	Stop
0	1	0	H	note2	L	Stop	Pin10→3
0	1	1	L	note2	H	Stop	Pin3→10
1	1	1/0	L	L	L	Brake	Brake

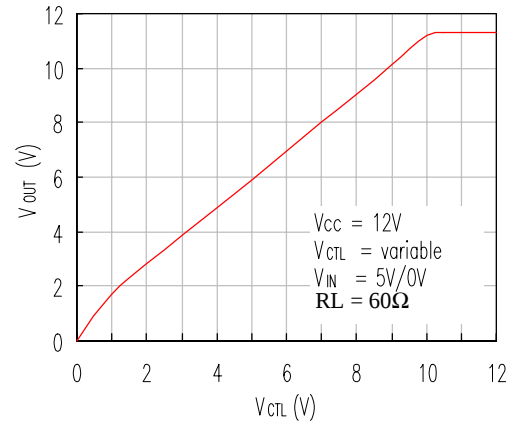
Notes:

1. Inputs are all high active type
2. High impedance

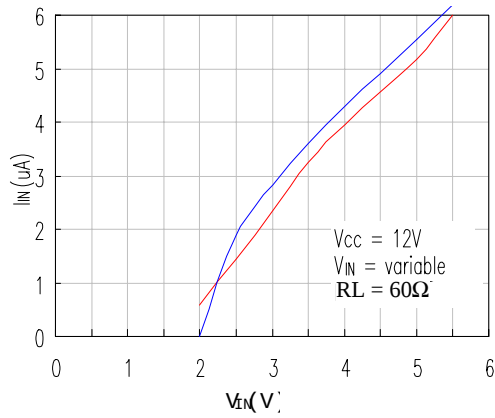
Typical Performance Characteristics



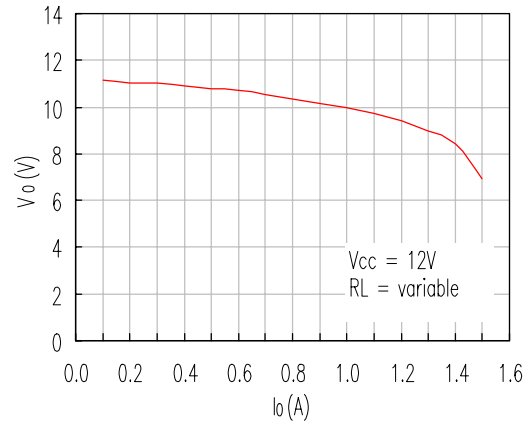
1. V_{CC} vs I_{CC}



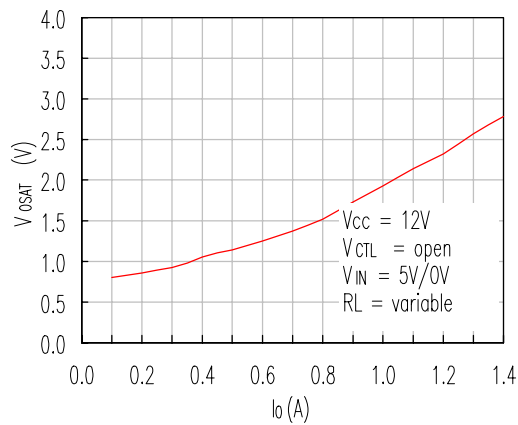
2. V_{CTL} vs V_O



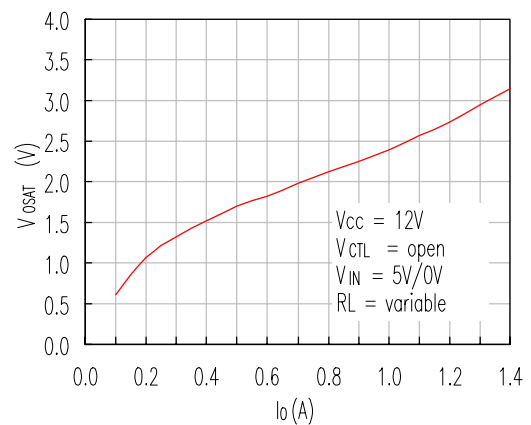
3. V_{IN} vs I_{IN}



4. I_O vs V_O

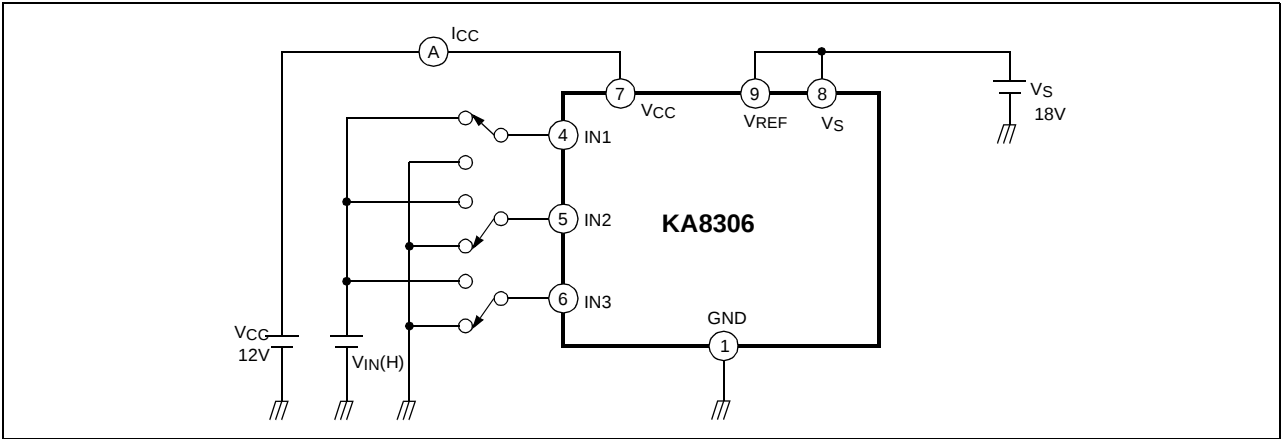


5. I_O vs V_{SAT} (Upper)

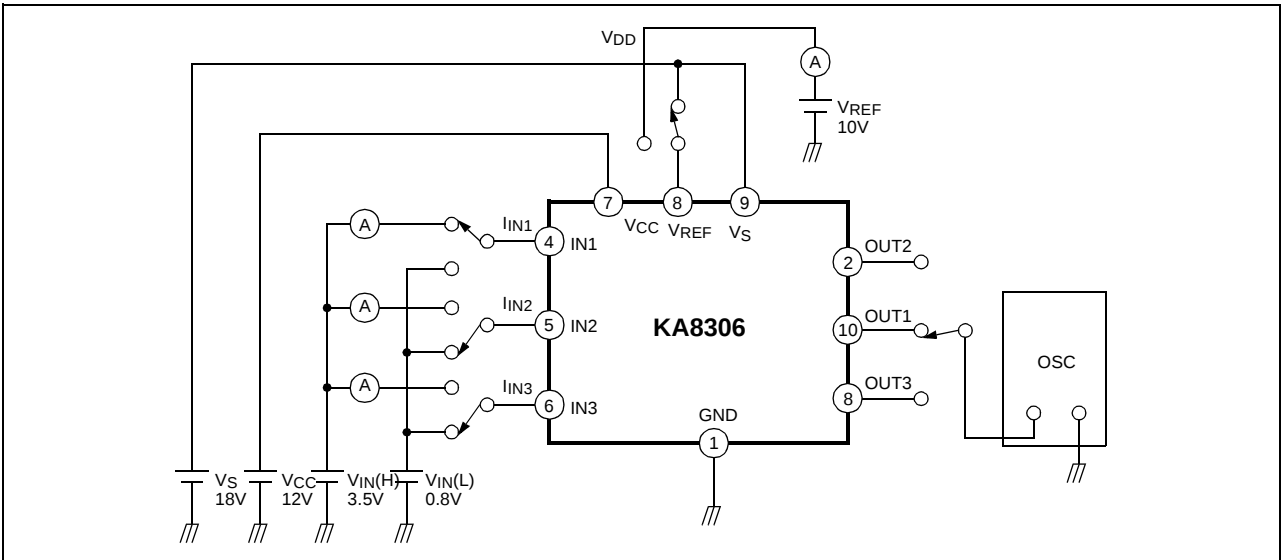


6. I_O vs V_{SAT} (Lower)

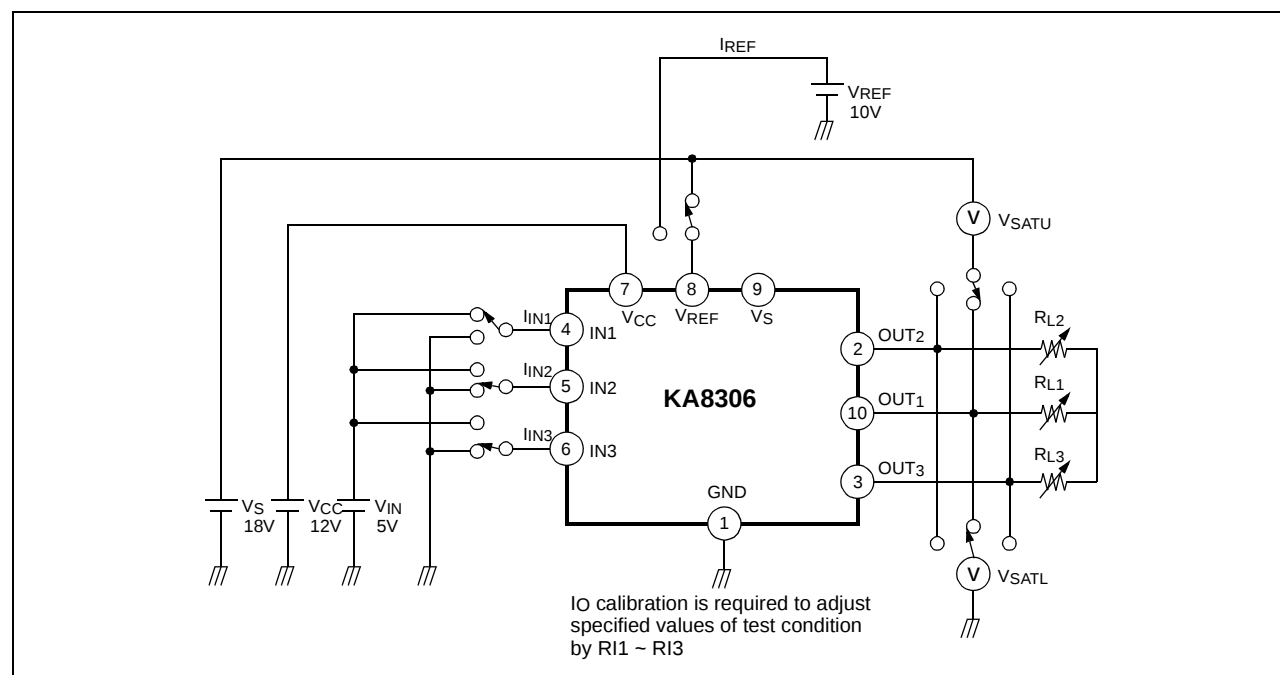
Test Circuits 1



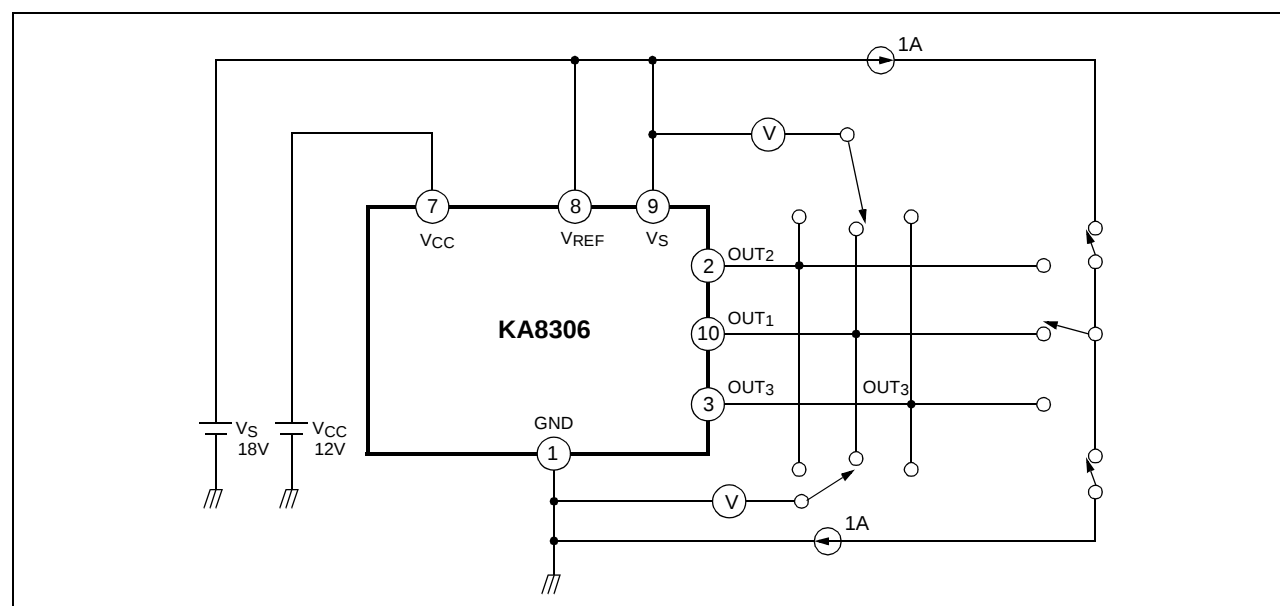
Test Circuits 2



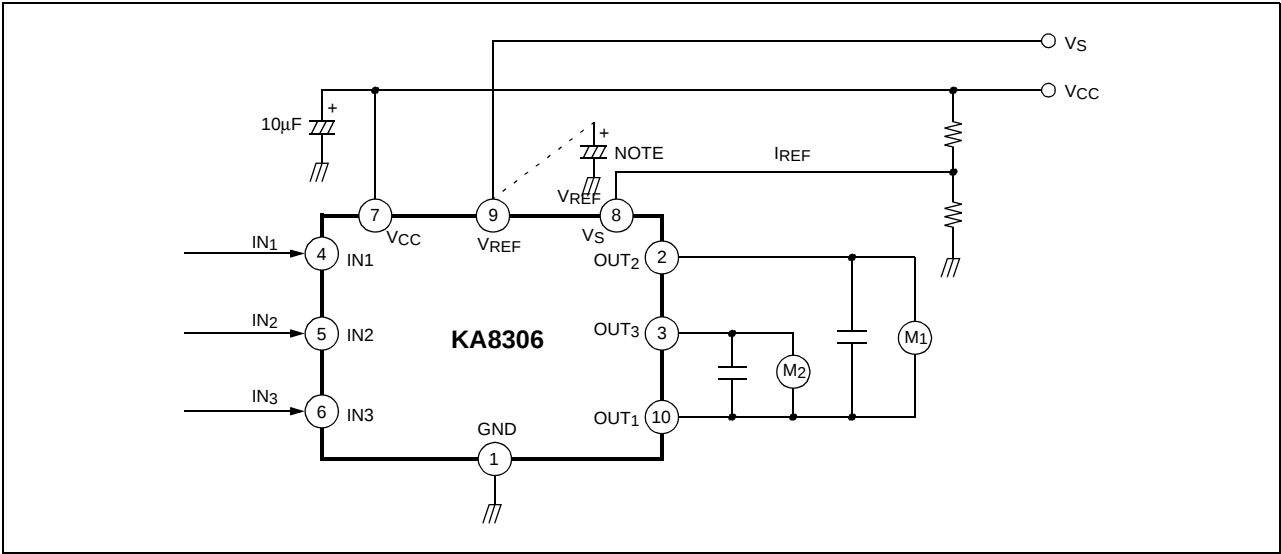
Test Circuits 3



Test Circuits 4

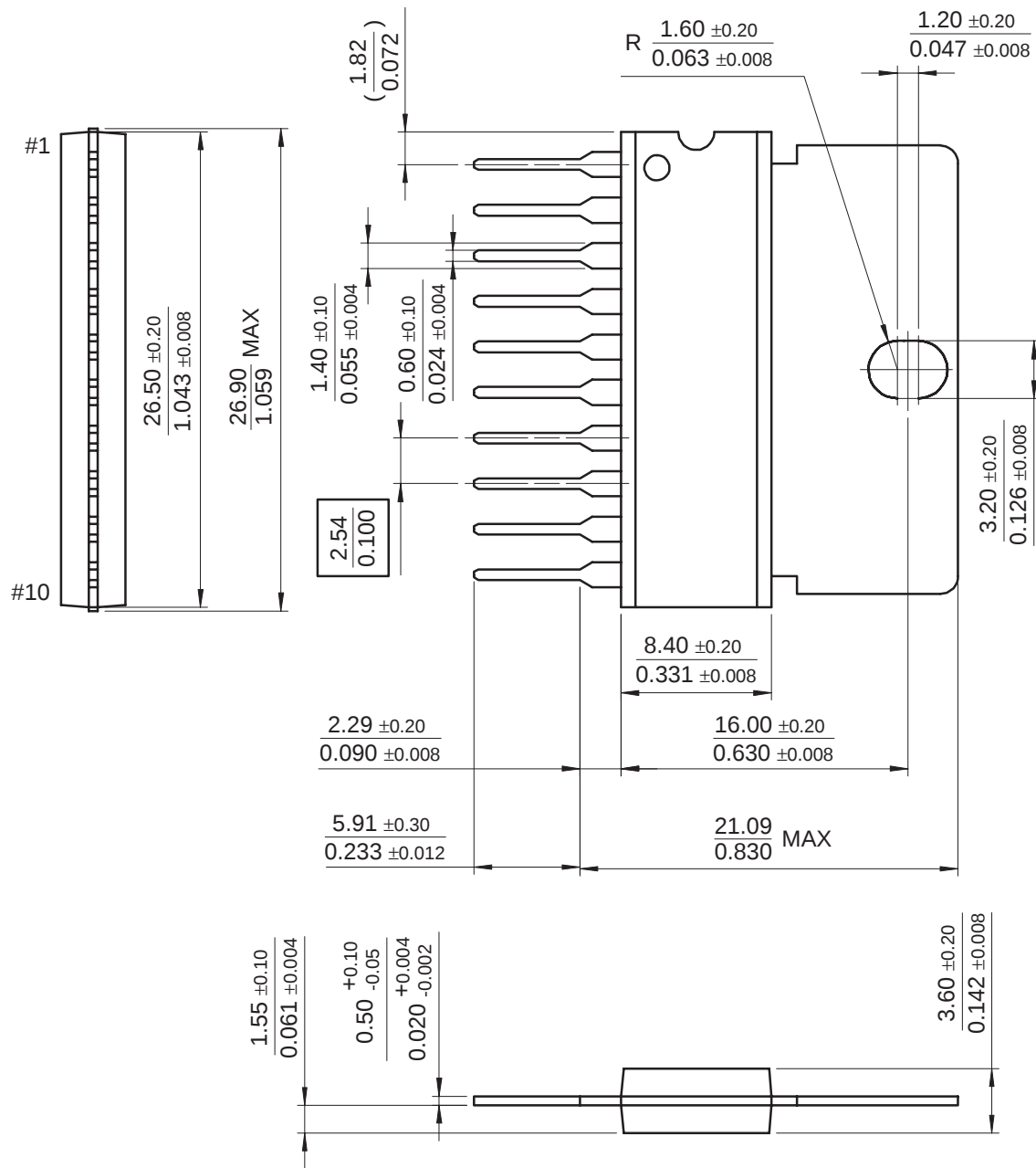


Typical Application Circuits



Notes:
Connect if required

10-SIPH-B



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