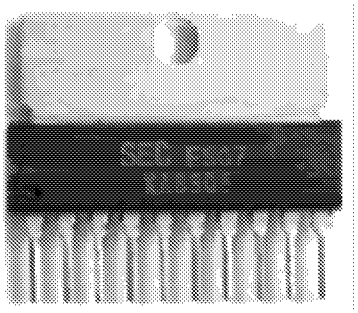
BI-DIRECTIONAL DC MOTOR DRIVER

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.

10-SIPH-B



FEATURES

- 4 modes available (CW/CCW/STOP/BRAKE)
- Output current up to 1.0A (AVE.) and 1.5A (PEAK)
- Wide range of operating voltage
  - — V_{CC} = 4.5 ~ 18V
  - — V_S = 0 ~ 18V
  - — V_{REF} = 0~ 18V
- Build in thermal shutdown, over current protector and punch through current restriction circit.

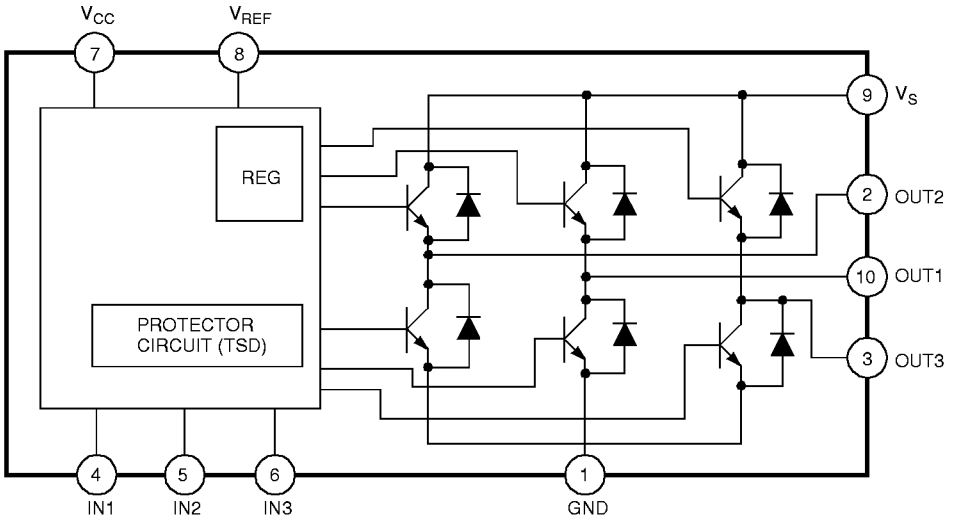
ORDERING INFORMATION

Device	Package	Operating Temperature
KA8306	10-SIPH-B	–25°C ~ +75°C

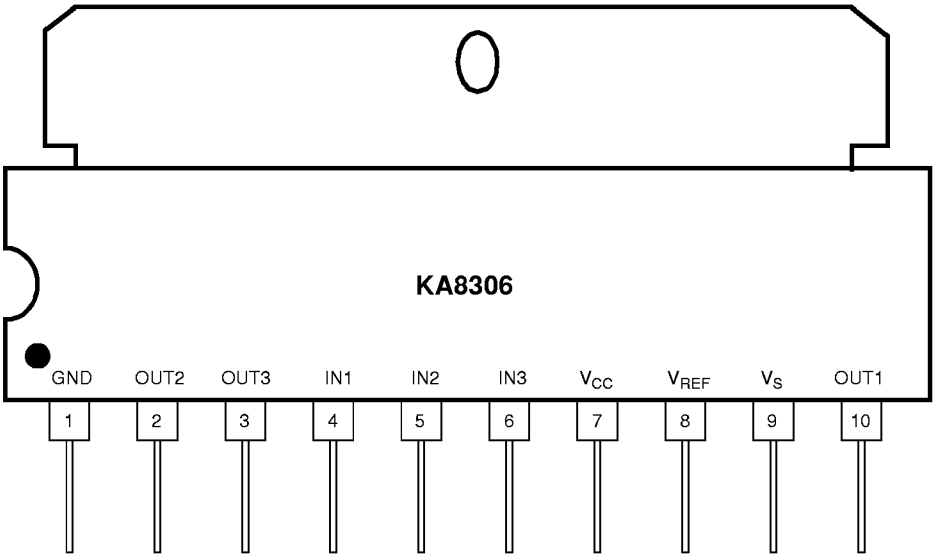
TARGET APPLICATION

- VCR
- Low current DC motor such audio equipment

BLOCK DIAGRAM



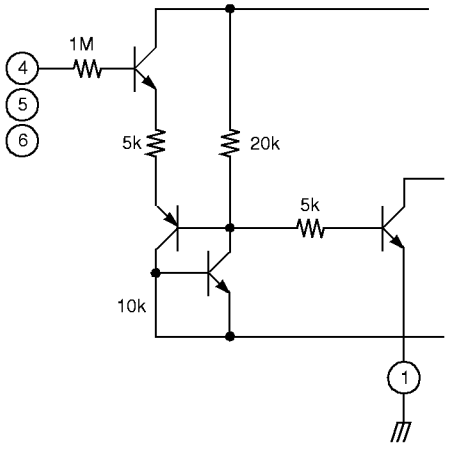
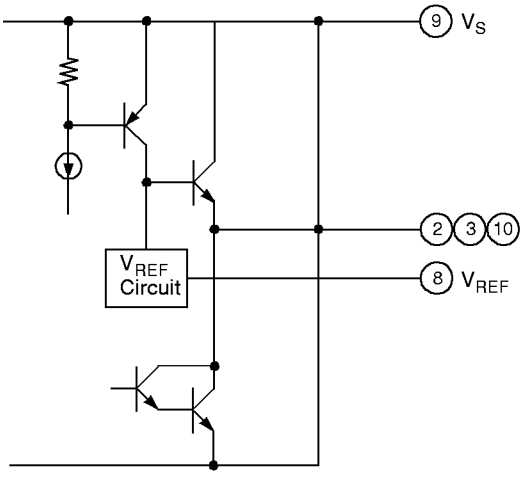
PIN CONFIGURATIONS



PIN DESCRIPTION

Pin No.	Symbol	I/O	Description	Pin No.	Symbol	I/O	Description
1	GND	–	Ground	6	IN3	I	Input 3
2	OUT2	O	Output 2	7	V_{CC}	–	Supply voltage (Signal)
3	OUT3	O	Output 3	8	V_{REF}	I	Motor speed control
4	IN1	I	Input 1	9	V_S	I	Supply voltage (Power)
5	IN2	I	Input 2	10	OUT1	O	Output 1

INTERNAL CIRCUIT

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 V_{REF} voltage relationship between V_{OUT} and V_{REF} is $V_{OUT}=V_{BE}(=0.7)+V_{REF}$ V_{REF} terniani required to connect to V_S terminal for stable operation in case of no requirement of V_{OUT} control.

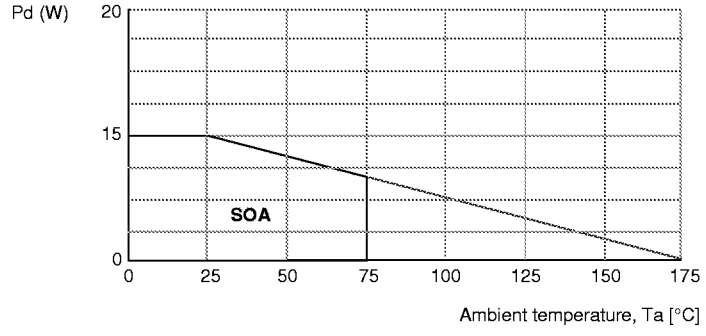
ABSOLUTE MAXIMUM RATING (Ta=25°C)

Characteristics	Symbol	Value	Unit
Supply voltage	V_{CCmax}	25	V
Motor drive voltage	V_{Smax}	25	V
Reference voltage	V_{REFmax}	25	V
Maximum output current	$I_{Omax(PEAK)}$ $I_{Omax(AVE)}$	1.5[note1] 1.0	A A
Power dissipation	P_d	15[note2]	W
Operating temperature	T_{OPR}	−25 ~ +75	°C
Storage temperature	T_{STG}	−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.

PD GRAPH



RECOMMENED OPERATING CONDITIONS (Ta=25°C)

Characteristics	Symbol	Value	Unit
Operating supply voltage	V_{CC}	4.5 ~ 18	V

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C, V_{CC}=8V, R_L=8Ω, f=1kHz)

Characteristics		Symbol	Test circuit	Test conditions	Spec.			Unit
					Min.	Typ.	max.	
Supply current		I_{CC1}	1	Output off CW/CCW mode	–	17	30	mA
		I_{CC2}	1	Output off, stop mode	–	13	25	mA
Input operating voltage	H	V_{IN-H}	2	T_J=25°C	3.5	–	5.5	V
	L	V_{IN-L}	2	T_J=25°C	0	–	0.8	V
Input current		I_{IN}	2	V_{IN}=3.5V, Sink mode	–	5	20	μA
Input hysteresis voltage		V_{HYS}	2	–	–	0.7	–	V
Saturation voltage	Upper	V_{SAT-1U}	3	V_{REF}=V_S, I_O=0.2A	–	1.2	1.5	V
	Lower	V_{SAT-1L}	3	V_{REF}=V_S, I_O=0.2A	–	1.1	1.4	V
	Upper	V_{SAT-2U}	3	V_{REF}=V_S, I_O=1.0A	–	2.7	3.1	V
	Lower	V_{SAT-2L}	3	V_{REF}=V_S, I_O=1.0A	–	2.5	3.0	V
Output voltage		V_{O-1}	3	V_{REF}=10V, I_O=0.5A Output measure	10.3	10.7	11.5	V
		V_{O-2}	3	V_{REF}=10V, I_O=0.5A Output measure	10.1	10.5	11.3	V
Leakage current	Upper	I_{L-U}	–	V_S=25V	–	0	50	μA
	Lower	I_{L-L}	–	V_S=25V	–	0	50	μA
Diode forward voltge	Upper	V_{F-U}	4	I_F=1.0A	–	2.2	–	V
	Lower	V_{F-L}	4	I_F=1.0A	–	1.4	–	V
Reference current		I_{REF}	2	V_{REF}=10V, Source mode	–	20	30	μA

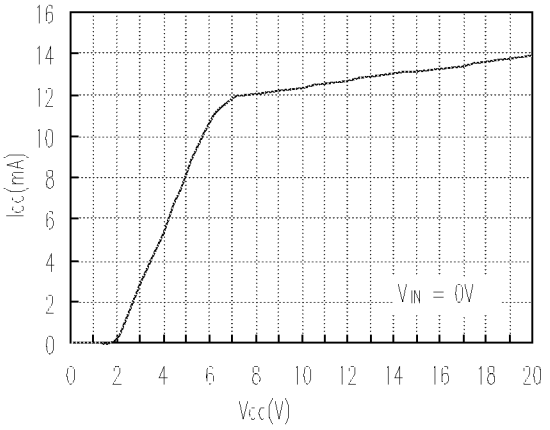
APPLICATION INFORMATIONS

LOGIC INPUT & OUTPUT TABLE

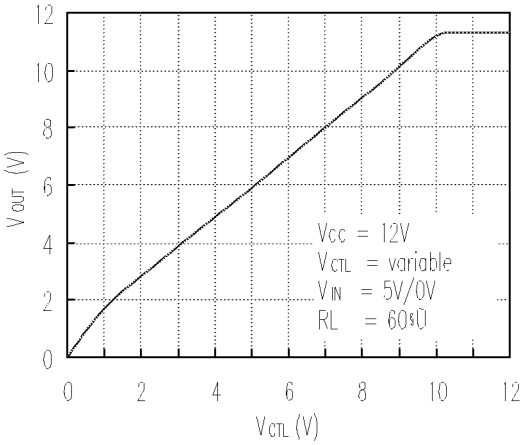
Input[note1]			Output			Motor	
IN_1	IN_2	IN_3	OUT_1	OUT_2	OUT_3	M_1	M_2
0	0	1/0	L	L	L	Brake	Brake
1	0	0	H	L	note2	Pin10→2	Stop
1	0	1	L	H	note2	Pin10→10	Stop
0	1	0	H	note2	L	Stop	Pin10→3
0	1	1	L	note2	H	Stop	Pin3→10
1	1	1/0	L	L	L	Brake	Brake

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

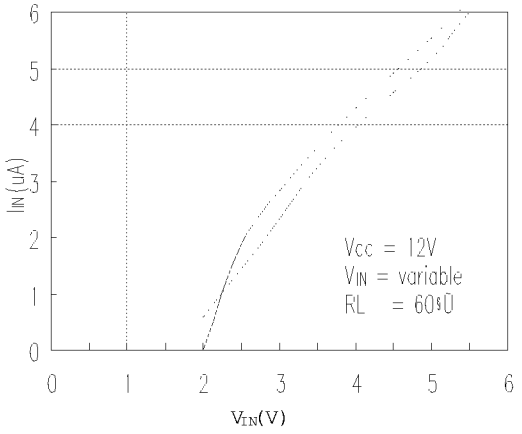
CHARACTERISTIC GRAPHS



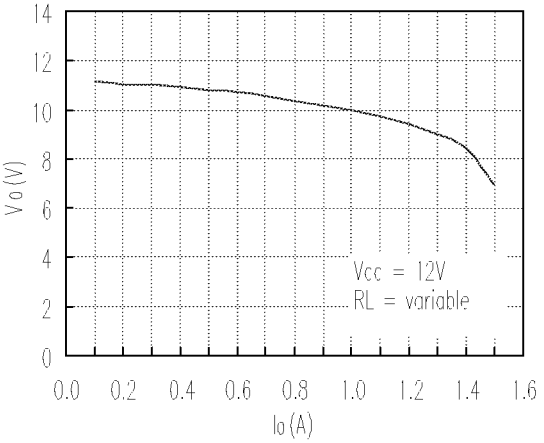
1. V_{CC} vs I_{CC}



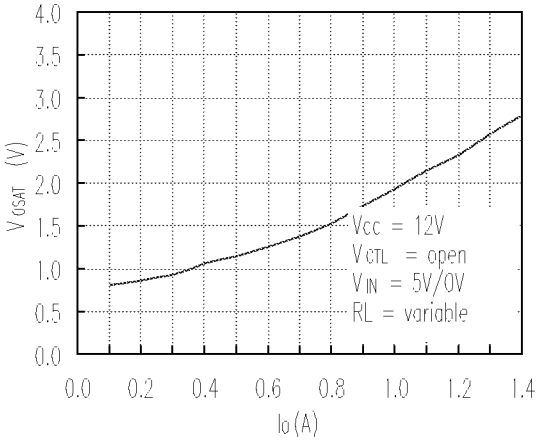
2. V_{CTL} vs V_O



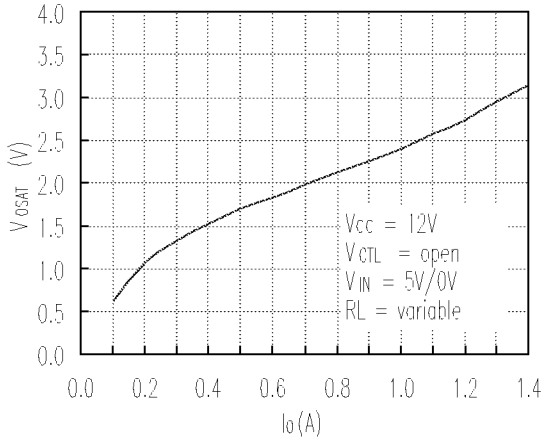
3. V_{IN} vs I_{IN}



4. I_O vs V_O

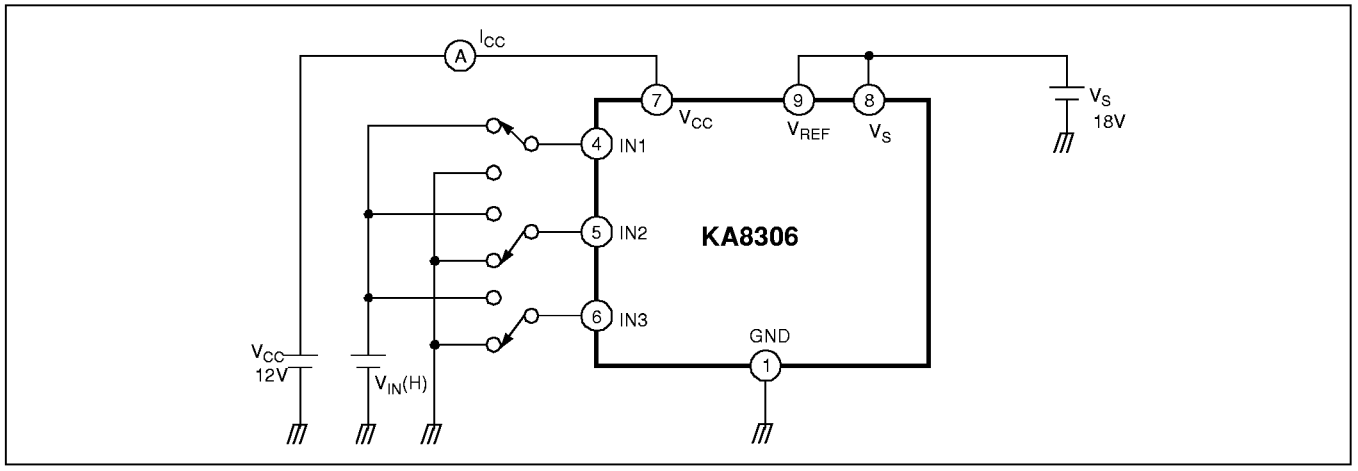


5. I_O vs V_{SAT} (Upper)

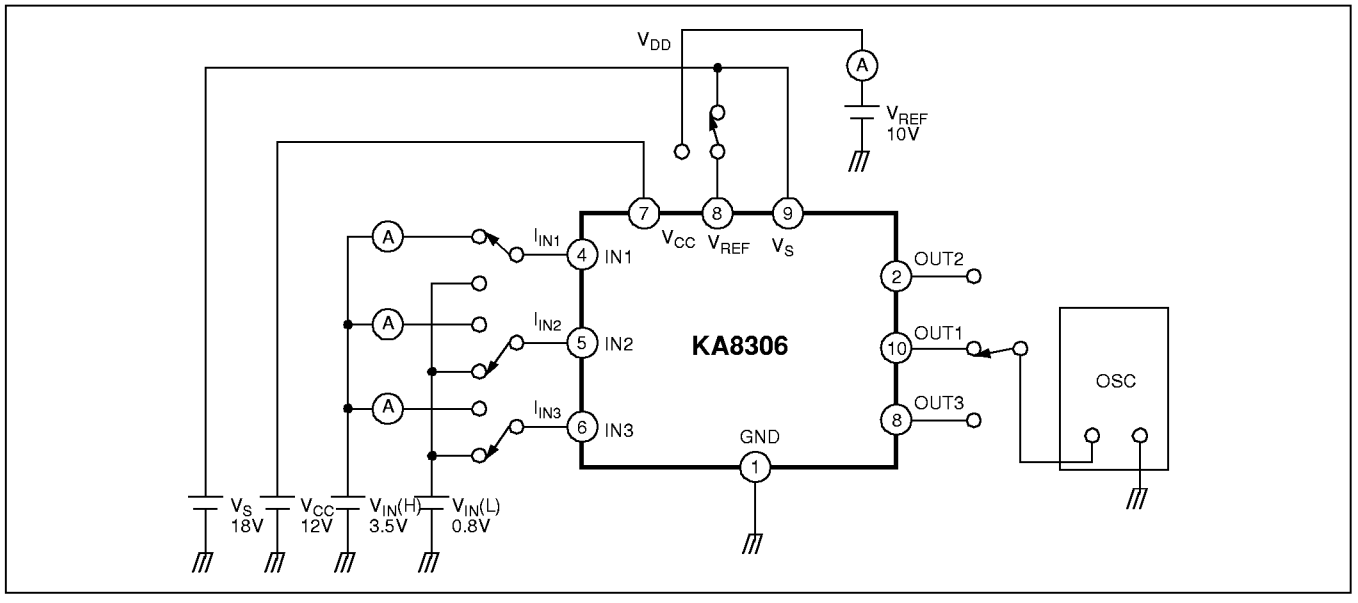


6. I_O vs V_{SAT} (Lower)

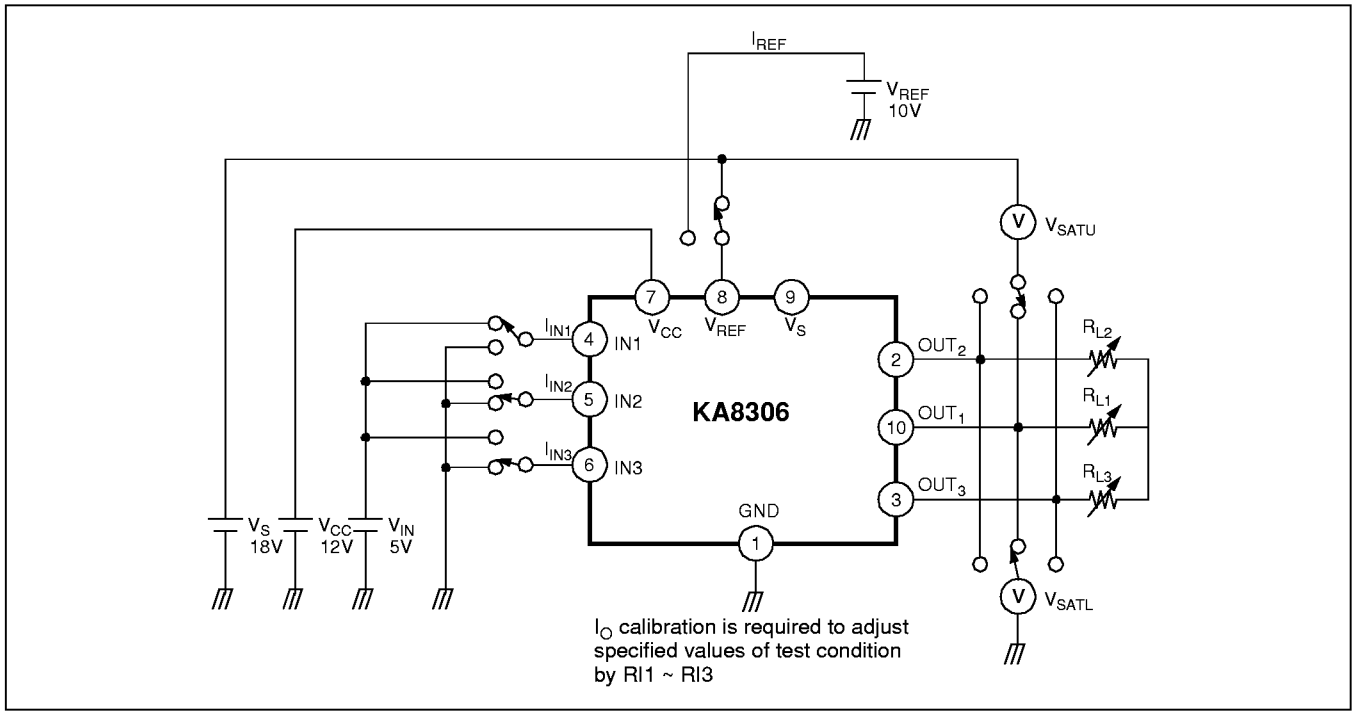
TEST CIRCUIT 1



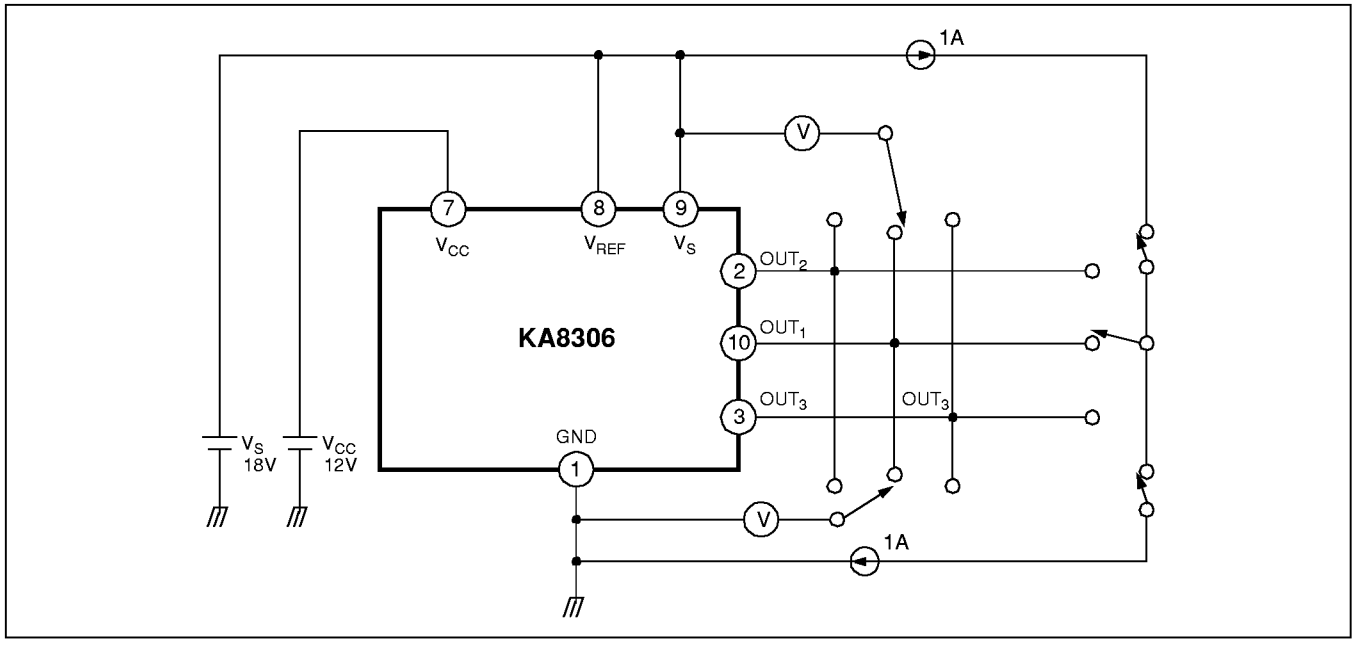
TEST CIRCUIT 2



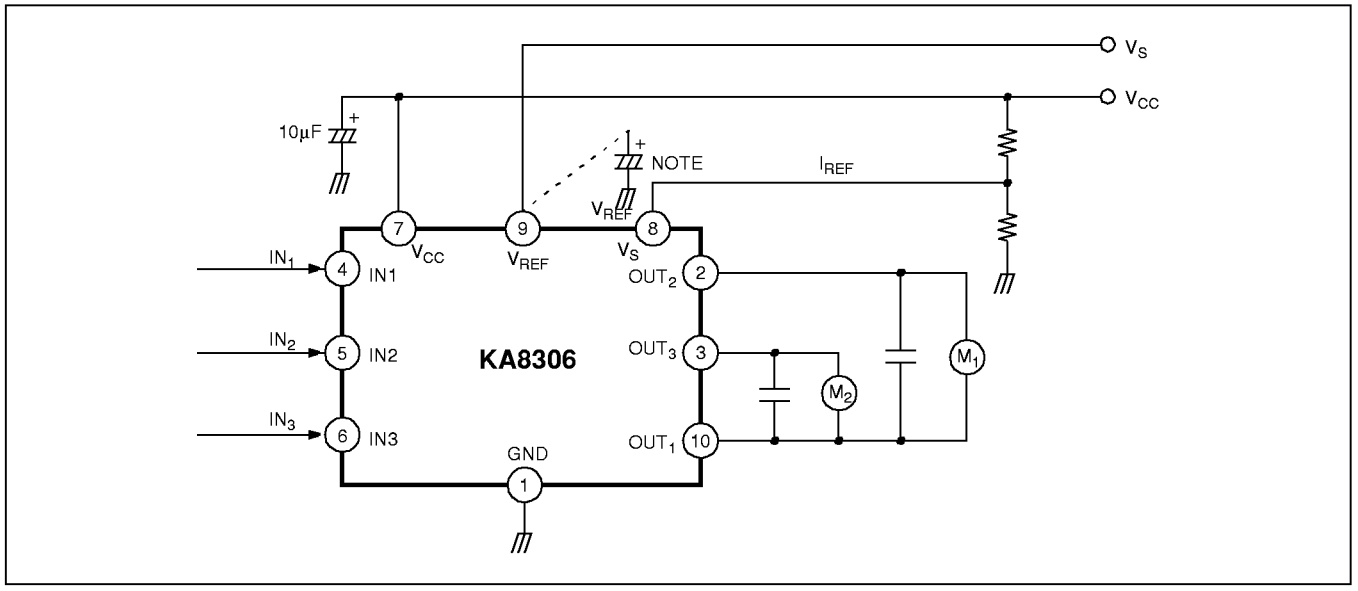
TEST CIRCUIT 3



TEST CIRCUIT 4



APPLICATION CIRCUIT



NOTE: Connect if required

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