AN6660, AN6660K

Forward and Reverse Motor Drive Circuits

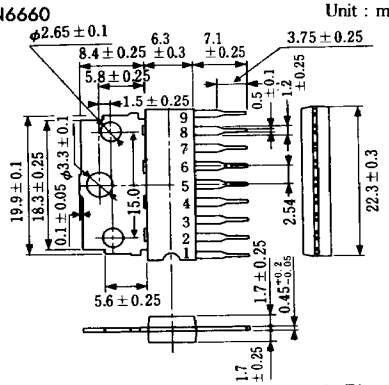
■ Outline

The AN6660 and the AN6660K are integrated circuits designed for forward and reverse direction select driver for a motor with brush. It also assures four types of outputs ; forward, reverse, brake and stop due to input logic and is suitable for VCR loading, reel and cylinder, or a reel driver for tape deck. Since individual power supplies for motor drive and IC are provided, servo can be applied.

■ Features

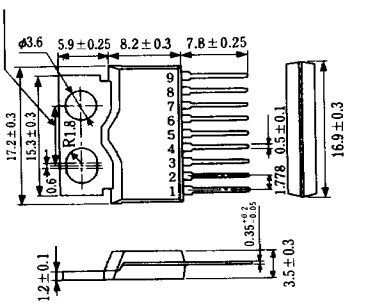
- Wide range of operating supply voltage : $V_{CC(opr)}$=4V～20V
- Individual power supplies can be used for IC and motor drive.
- Low V_C saturation type output transistor built-in
- Diode to absorb counter EMF built-in

AN6660 Unit : mm



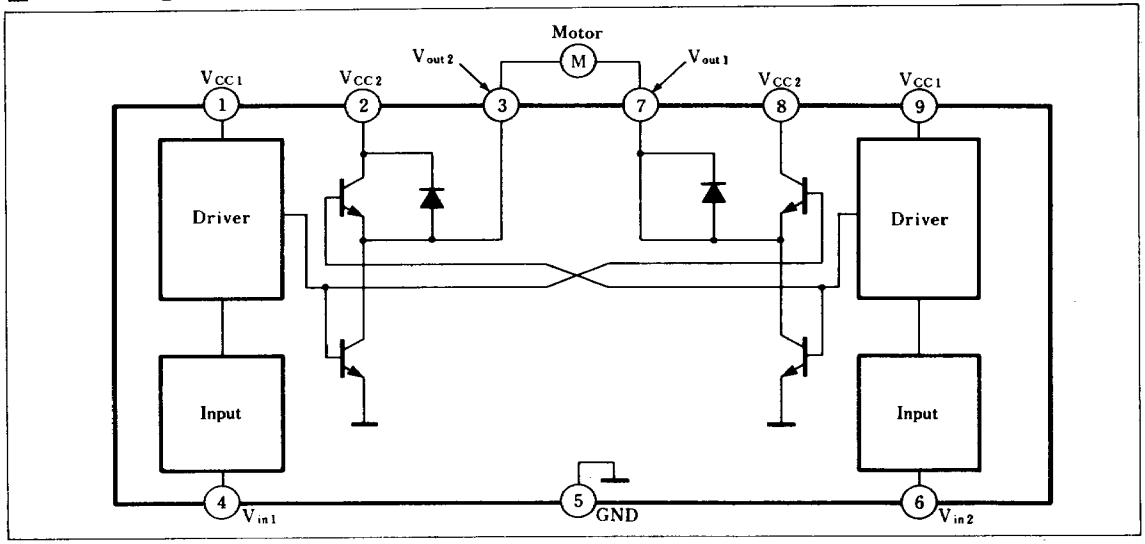
9-Lead SIL Plastic Package with Fin

AN6660K Unit : mm



9-Lead Shrunk SIL Plastic Package with Fin

■ Block Diagram



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■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	Supply Voltage	6	Input(2)
2	Output Supply Voltage	7	Output(1)
3	Output(2)	8	Output Supply Voltage
4	Input(1)	9	Supply Voltage
5	GND	--	

■ Absolute Maximum Ratings (Ta = 25℃)

Item		Symbol	Rating	Unit
Supply Voltage(1)		V_{CC1}	−0.5 ~ +16	V
Supply Voltage(2)*1		V_{CC2}	−0.5 ~ +20	V
Supply Current		I_{CC}	650	mA
Output Supply Voltage		V_{CC}	−0.5 ~ V_{CC}	V
Input Voltage		V_I	0 ~ V_{CC}	V
Motor Rush Allowable Current*2		I_{OP}	2.0	A
Motor Ordinal Current(1)		$I_{O(1)}$	−330 ~ +330	mA
Motor Ordinal Current(2)*1		$I_{O(2)}$	−600 ~ +600	mA
Power Dissipation	AN6660	P_D	10*3	W
	AN6660K		15*3	
Operating Ambient Temperature		T_{opr}	−20 ~ +75	℃
Storage Temperature		T_{stg}	−55 ~ +150	℃

*1 : When a heat sink is in use *2 : t_{op} = 10μs, cycle time > 5s, V_{CC} < 12V *3 : When an infinite heat sink is in use

■ Recommended Operating Conditions (Ta = 25℃)

Item	Symbol	min.	typ.	max.	Unit
Supply Voltage	V_{CC}	4		15	V
Output Current	I_O			±300	mA
High Level Input Voltage	V_{IH}	2		V_{CC}	V
Low Level Input Voltage	V_{IL}			0.5	V
Forward-to-Reverse Inhibiting Time	t_{OFF}	10			μs

■ Truth Table

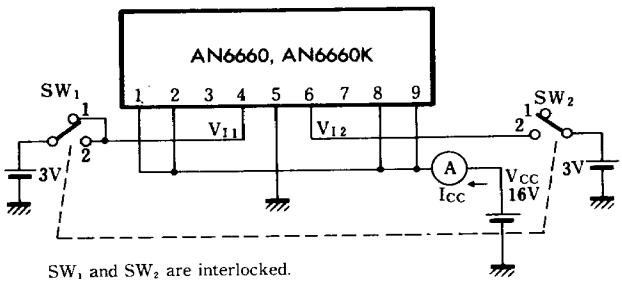
Input		Output		Note
1	2	1	2	
0	0	OFF State	OFF State	IC not operating
1	0	1	0	Motor forward
0	1	0	1	Motor reverse
1	1	0	0	Brake

"0" = "L"
"1" = "H"

■ Electrical Characteristics (Ta=25℃)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Supply Current	I_{CC1}	1	$V_{CC}=V_{CC}'=16V$, $V_{I1}=3V$, $V_{I2}=0V$			40	mA
	I_{CC2}	1	$V_{CC}=V_{CC}'=16V$, $V_{I1}=V_{I1}=3V$			50	
Output Leak Current	$I_{O(Leak)}$	2	$V_{CC}=V_{CC}'=20V$, $V_O=20V$			100	μA
	$-I_{O(Leak)}$	2	$V_{CC}=V_{CC}'=20V$, $V_O=0V$			100	
High Level Output Voltage	V_{OH}	3	$V_{CC}=V_{CC}'=12V$, $I_{OH}=-300mA$	10.8			V
		3	$V_{CC}=V_{CC}'=12V$, $I_{OL}=-500mA$	10.7			
Low Level Output Voltage	V_{OH}	3	$V_{CC}=V_{CC}'=12V$, $I_{OH}=300mA$			0.4	V
		3	$V_{CC}=V_{CC}'=12V$, $I_{OL}=500mA$			0.65	
Output(1)—(2)Voltage	$V_{O1}-V_{O2}$	3	$V_{CC}=V_{CC}'=12V$, $I_O=\pm300mA$	10.3			V
High Level Output Voltage	V_{OH}	4	$V_{CC}=12V$, $V_{CC}'=5V$, $I_{OH}=-300mA$	4.6			V
Input Impedance	Z_I	5	$V_{CC}=16V$, $V_I=2V\rightarrow3V$	.10		20	kΩ

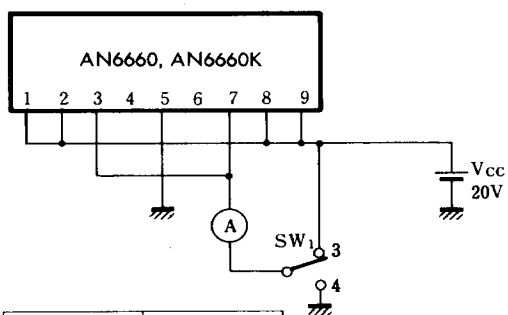
Test Circuit 1 (I_{CC1}, I_{CC2})



SW₁ and SW₂ are interlocked.

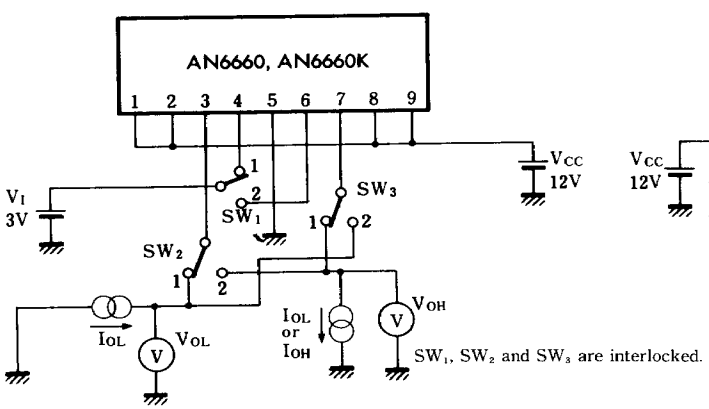
Item	SW_1, SW_2
I_{CC1}	1
I_{CC2}	2

Test Circuit 2 ($I_{O(Leak)}$, $-I_{O(Leak)}$)



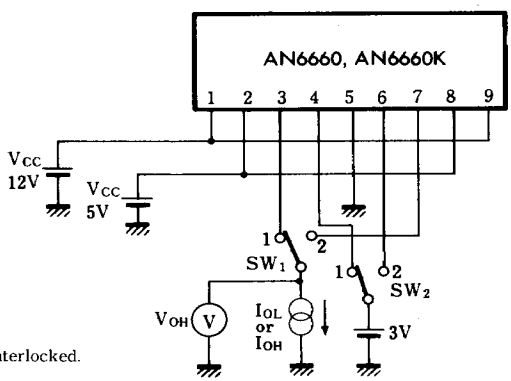
Item	SW_1
$I_{O(Leak)}$	3
$-I_{O(Leak)}$	4

Test Circuit 3 (V_{OH}, V_{OL}, $|V_{O1}-V_{O2}|$)



SW₁, SW₂ and SW₃ are interlocked.

Test Circuit 4 (V_{OH})



SW₁ and SW₂ are interlocked.

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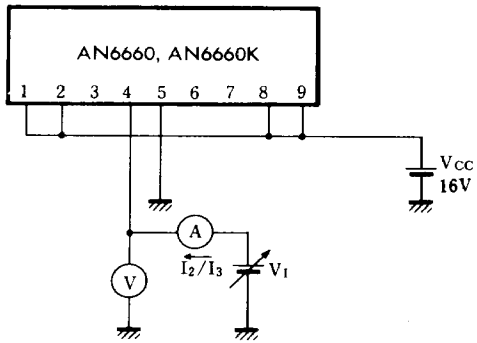
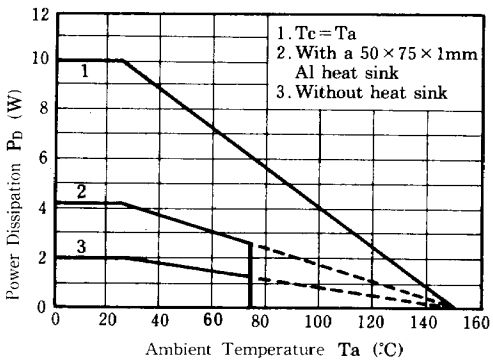
Test Circuit 5 (Z_i)



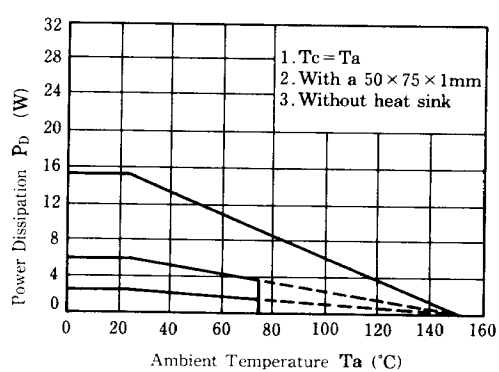
$$R = \frac{3[V] - 2[V]}{I_3 - I_2}$$

I_2 : Input current when $V_I = 2V$
I_3 : Input current when $V_I = 3V$

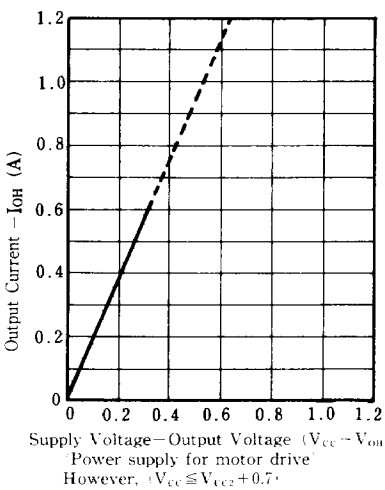
$P_D - T_a$ (AN6660)



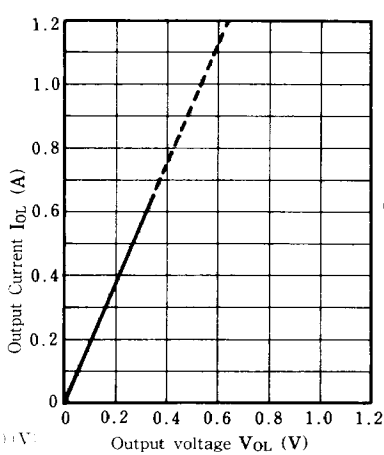
$P_D - T_a$ (AN6660K)



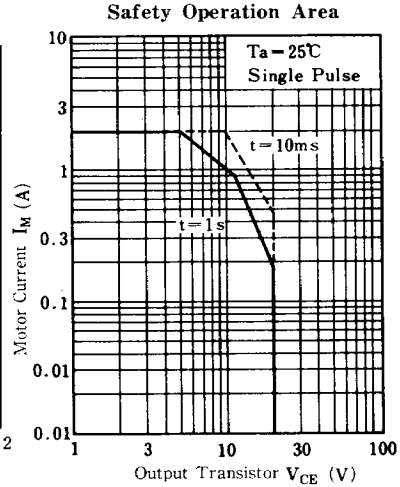
$-I_{OH} - (V_{CC} - V_{OH})$



$I_{OL} - V_{OL}$ (typ.)

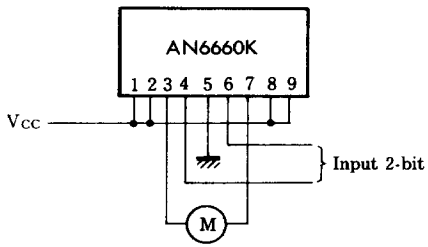


Safety Operation Area

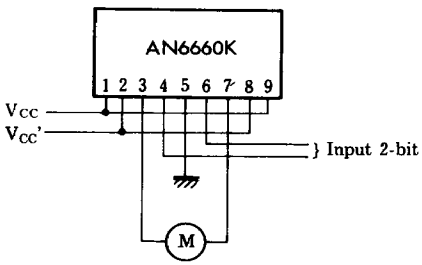


■Basic Circuits

● With single power supply



● With 2 power supplies for IC and Motor drive



V_{CC} : ICs power supply
V_{CC}' : Power supply for motor drive