

AN8290S

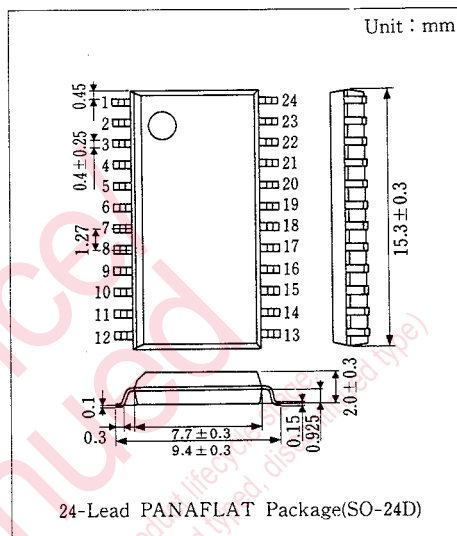
IC for Spindle Motor Control

■ Outline

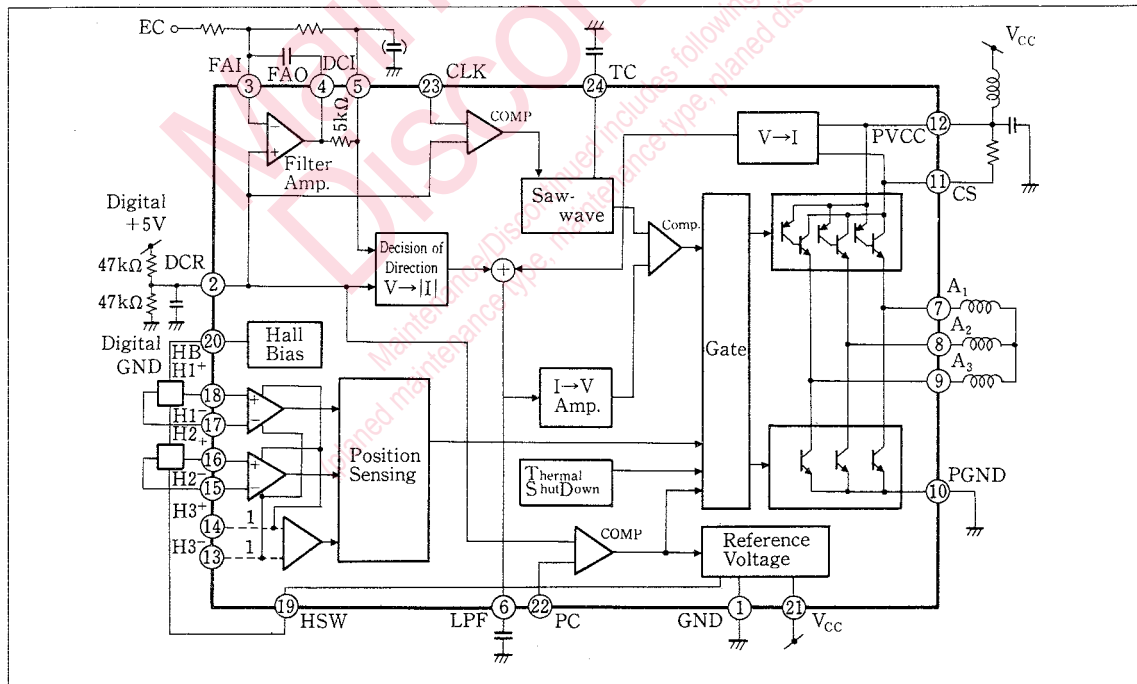
The AN8290S is an integrated circuit designed for the spindle motor control of a compact disc player. Because of the PWM 3-phase full-wave drive method, efficiency becomes high. The power-down circuit is built in, realizing the low power consumption.

■ Features

- Operating power supply voltage: $V_{CC(OPR)} = 4.5 \sim 20V$
- PWM 3-phase full-wave drive
(with built-in power transistor)
- Thermal protector and power-down circuit built-in



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

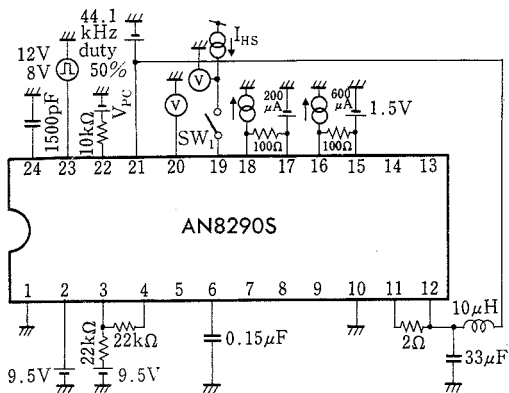
Item	Symbol	Rating	Unit
Supply Voltage	V _{CC}	21	V
Supply Current	I _{CC}	20	mA
Power Dissipation	P _D	560	mW
Operating Ambient Temperature	T _{opr}	-20 ~ +75	°C
Storage Temperature	T _{stg}	-55 ~ +125	°C

■ Electrical Characteristics (V_{CC}=12V, Ta=25°C)

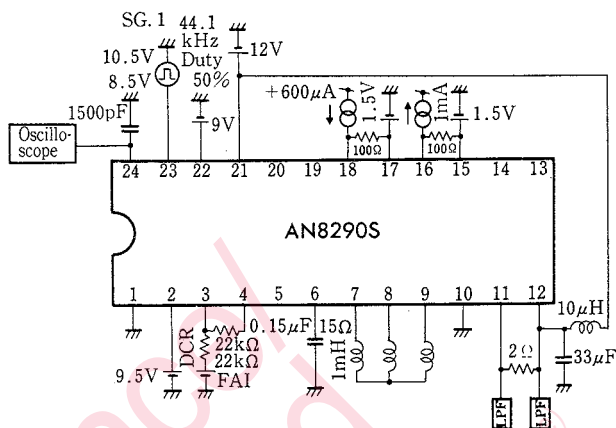
Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
No-Load Total Current	I _{tot}	1	V _{CC} =12V, SW ₁ OFF, V _{PC} =9V	7.0	9.0	11.0	mA
Power-Down Mode Total Current	I _{tot(PD)}	1	V _{CC} =12V			1	mA
Output Amplitude (1-1)	v ₀₁₋₁	2	V _{CC} =12V	8.5			V
Output Amplitude (1-2)	v ₀₁₋₂	2	V _{CC} =12V	8.5			V
Output Amplitude (1-3)	v ₀₁₋₃	2	V _{CC} =12V	8.5			V
Output Amplitude (1-4)	v ₀₁₋₄	2	V _{CC} =12V	8.5			V
Output Amplitude (1-5)	v ₀₁₋₅	2	V _{CC} =12V	8.5			V
Output Amplitude (1-6)	v ₀₁₋₆	2	V _{CC} =12V	8.5			V
Output Amplitude (1-7)	v ₀₁₋₇	2	V _{CC} =12V	8.5			V
Output Amplitude (1-8)	v ₀₁₋₈	2	V _{CC} =12V	8.5			V
Output Amplitude (1-9)	v ₀₁₋₉	2	V _{CC} =12V	8.5			V
Output Amplitude(1-10)	v ₀₁₋₁₀	2	V _{CC} =12V	8.5			V
Output Amplitude(1-11)	v ₀₁₋₁₁	2	V _{CC} =12V	8.5			V
Output Amplitude(1-12)	v ₀₁₋₁₂	2	V _{CC} =12V	8.5			V
Output Amplitude (2-1)	v ₀₂₋₁	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-2)	v ₀₂₋₂	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-3)	v ₀₂₋₃	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-4)	v ₀₂₋₄	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-5)	v ₀₂₋₅	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-6)	v ₀₂₋₆	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-7)	v ₀₂₋₇	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-8)	v ₀₂₋₈	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude (2-9)	v ₀₂₋₉	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude(2-10)	v ₀₂₋₁₀	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude(2-11)	v ₀₂₋₁₁	2	V _{CC} =12V	-0.05		0.05	V
Output Amplitude(2-12)	v ₀₂₋₁₂	2	V _{CC} =12V	-0.05		0.05	V
Limit Voltage (I)	V _{LF}	3	V _{CC} =12V	0.5	0.05	0.7	V
Limit Voltage (II)	V _{LD}	3	V _{CC} =12V	0.5	0.53	0.7	V
Idle Voltage	V _{ido1}	3	V _{CC} =12V			20	mV
Drive Offset Voltage (I)	V _{OF}	3	V _{CC} =12V			100	mV
Drive Offset Voltage(II)	V _{OR}	3	V _{CC} =12V			100	mV
PWM Output (1)	T _{P(1)}	3	V _{CC} =12V, FAI=9.9V	140	200	260	mV
PWM Output (2)	T _{P(2)}	3	V _{CC} =12V, FAI=9.1V	140	200	260	mV
Sawtooth Wave Offset Voltage	V _{KA}	3	V _{CC} =12V	0.70	0.90	1.10	V
Sawtooth Wave Offset Voltage	V _{KO}	3	V _{CC} =12V	1.80	1.95	2.10	V
Hall Bias Voltage	V _{HB}	1	V _{CC} =12V, SW ₁ OFF, I _{HR} =0mA	1.7	2.20	2.5	V
Hall Switch Saturation Voltage	V _{HS}	1	V _{CC} =12V, SW ₁ ON, I _{HS} =10mA			1.2	V

(Note) Operating Supply Voltage Range : V_{CC(oper)}=4.5~20V

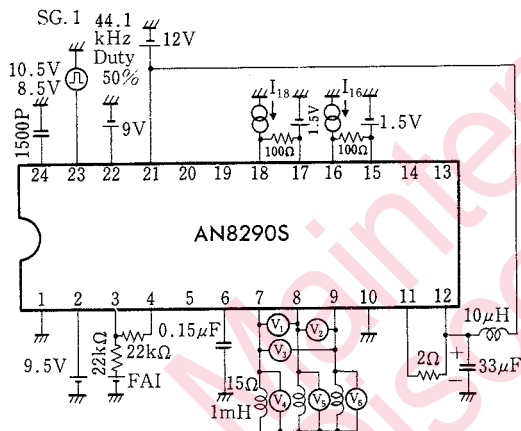
Test Circuit 1 (I_{tot} , $I_{tot(PD)}$, V_{HB} , V_{HS})



Test Circuit 3 (V_{LF} , V_{LR} , V_{Idol} , V_{OF} , V_{OR} , $T_{PD(1)-(2)}$, V_{KA} , V_{KO})



Test Circuit 2 ($v_{01-1-12}$, $v_{02-1-12}$)

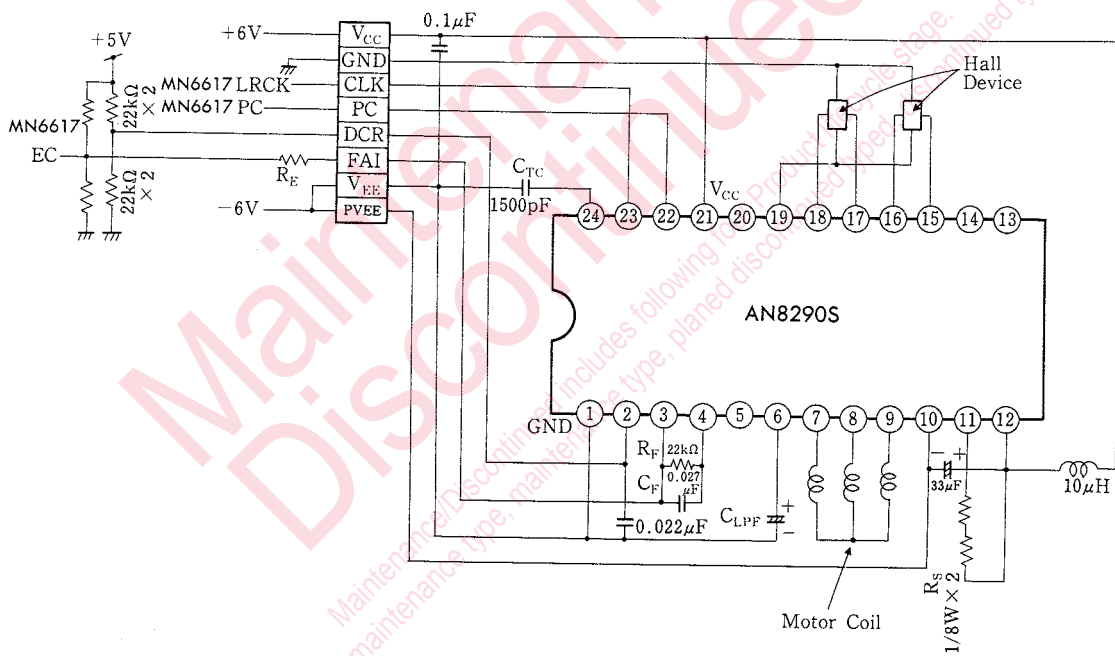


Item	FAI	I_{16}	I_{18}	Test Pin No. (Digital Voltmeter)	Item	FAI	I_{16}	I_{18}	Test Pin No. (Digital Voltmeter)
Output Amplitude(1-1)	8V	-600μA	-200μA	V_{7-9} (V_3)	Output Amplitude(2-1)	8V	-600μA	-200μA	(V_5)
Output Amplitude(1-2)	8V	-600μA	-200μA	V_{8-9} (V_2)	Output Amplitude(2-2)	8V	-600μA	+200μA	(V_4)
Output Amplitude(1-3)	8V	-200μA	+600μA	V_{8-7} (V_1)	Output Amplitude(2-3)	8V	-200μA	+600μA	(V_6)
Output Amplitude(1-4)	8V	+200μA	+200μA	V_{9-7} (V_3)	Output Amplitude(2-4)	8V	+200μA	+200μA	(V_5)
Output Amplitude(1-5)	8V	+600μA	-200μA	V_{9-8} (V_2)	Output Amplitude(2-5)	8V	+600μA	-200μA	(V_4)
Output Amplitude(1-6)	8V	+600μA	-1mA	V_{7-8} (V_1)	Output Amplitude(2-6)	8V	+600μA	-1mA	(V_6)
Output Amplitude(1-7)	11V	-600μA	-200μA	V_{8-7} (V_3)	Output Amplitude(2-7)	11V	-600μA	-200μA	(V_5)
Output Amplitude(1-8)	11V	-600μA	+200μA	V_{8-8} (V_2)	Output Amplitude(2-8)	11V	-600μA	+200μA	(V_4)
Output Amplitude(1-9)	11V	-200μA	+600μA	V_{7-8} (V_1)	Output Amplitude(2-9)	11V	-200μA	+600μA	(V_6)
Output Amplitude(1-10)	11V	+200μA	+200μA	V_{7-9} (V_3)	Output Amplitude(2-10)	11V	+200μA	+200μA	(V_5)
Output Amplitude(1-11)	11V	+600μA	-200μA	V_{8-9} (V_2)	Output Amplitude(2-11)	11V	+600μA	-200μA	(V_4)
Output Amplitude(1-12)	11V	+600μA	-1mA	V_{8-7} (V_1)	Output Amplitude(2-12)	11V	+600μA	-1mA	(V_6)

■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	Signal GND	13	H3 ⁻ Output
2	Logic Reference	14	H3 ⁺ Output
3	Filter Amp. Input	15	H2 ⁻ Input
4	Filter Amp. Output	16	H2 ⁺ Input
5	Absolute Circuit Input	17	H1 ⁻ Input
6	Loop Filter	18	H1 ⁺ Input
7	Power Output (1)	19	Hall Switch
8	Power Output (2)	20	Hall Bias Output
9	Power Output (3)	21	V _{CC}
10	Power GND	22	Power Down Control
11	Detector of Current	23	Clock Input
12	Power V _{CC}	24	Sawtooth-Wave Output

■ Application Circuit



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