Panasonic

AN3834S

VCR Reel Motor Driver IC

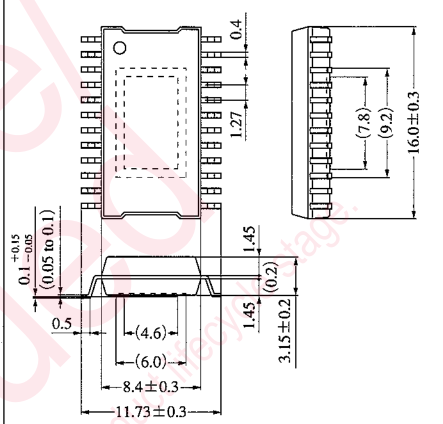
■ Overview

The AN3834S is a VCR reel motor driver IC.

■ Features

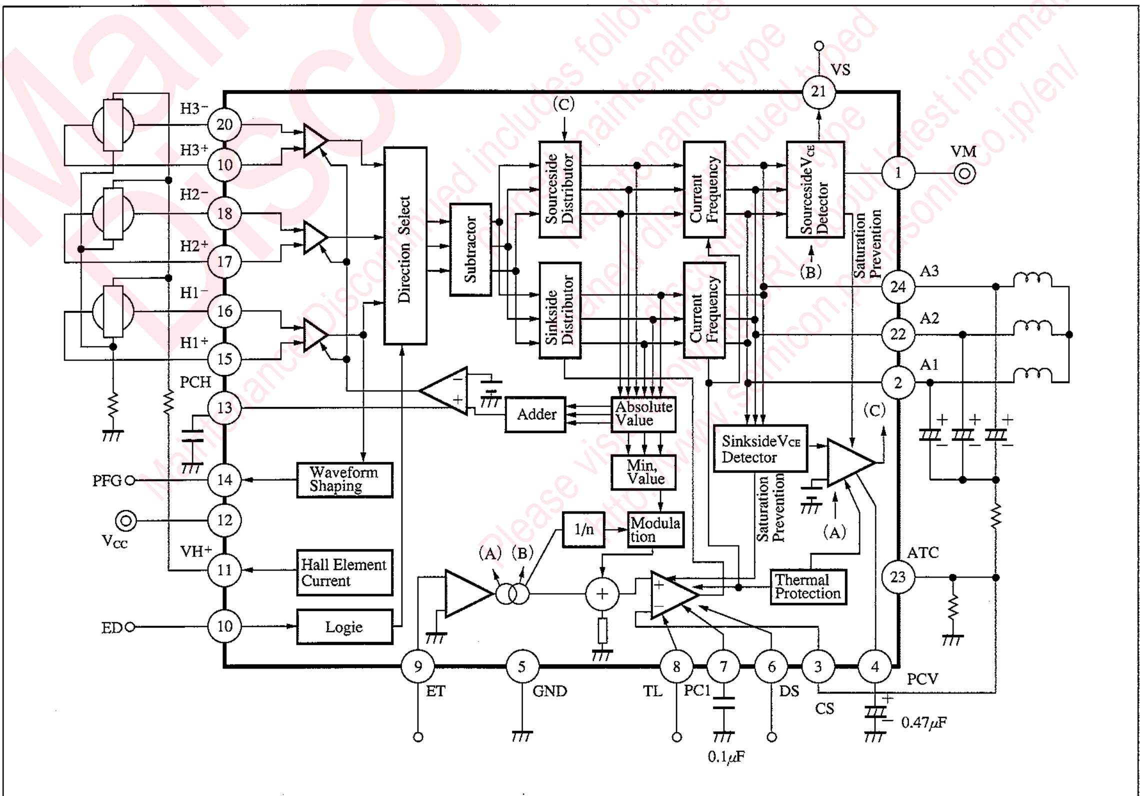
- Operating voltage range : V_{CC} = 4.5 to 5.5V
- Operating motor supply voltage range : VM = 3 to 18V
- 3-phase full-wave forward/reverse-overlapping drive by built-in power transistors
- High-accuracy torque-ripple cancellation circuit
- Built-in hall-sensor-amplifier AGC circuit
- Switching regulator control output
- Built-in overheat protection, and saturation protection circuit

Unit : mm



24-Pin HSOP Package (HSOP024-P-0450)

■ Block Diagram



VS
21
H3−
20
H3+
10
H2−
18
H2+
17
H1−
16
H1+
15
PCH
13
PFG
14
12
V_{CC}
VH+
11
ED
10
Direction Select
Subtractor
Sourceside Distributor
Sinkside Distributor
Current Frequency
Sourceside V_{CE} Detector
Saturation Prevention
VM
1
A3
24
A2
22
A1
2
(C)
(B)
(A)
Adder
Absolute Value
Min. Value
Sinkside V_{CE} Detector
Waveform Shaping
Hall Element Current
Logic
1/n
Modula tion
Thermal Protection
ATC
23
9
ET
5
GND
8
TL
7
PC1
6
DS
3
CS
4
PCV
0.1μF
0.47μF

■ Absolute Maximum Ratings (Ta=25 ℃)

Parameter		Symbol	Rating	Unit
Supply voltage		V_{CC}	6.0	V
Motor supply voltage		V_I	20	V
Motor drive current	n=2, 22, 24	In	±1.5	A
Output terminal voltage	n=2, 22, 24	Vn	20	V
Terminal voltage	m=6, 8, 9, 10, 15, 16, 17, 18, 19, 20	Vm	V_{CC}	V
Terminal 11 current		I_{11}	−100	mA
Power dissipation		P_D	2,000	mW
Operating ambient temperature Note)		T_{opr}	−20 to +70	℃
Storage temperature Note)		T_{stg}	−55 to +125	℃

Note) Ta=25℃ except operating ambient temperature and storage temperature.

■ Recommended Operating Range (Ta=25℃)

Parameter	Symbol	Range
Operating supply voltage range	V_{CC}	4.5V to 5.5V
	V_M	3.0V to 18V

■ Electrical Characteristics (Ta=25±2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Supply current	I_{CC}		5	—	15	mA
Torque command input current	I_{ET}		−4	—	0.5	μA
Torque command voltage	V_{ET}		0	—	1	V
Torque command offset voltage	V_{OFS}		−6	—	4	mV
Output idle voltage	V_{idle}		—	—	4	mV
Input output gain	Gio		0.85	—	1.05	times
TL-CS offset voltage	ΔTL	TL=0.1V, E_T=0.5V	4	—	25	mV
Forward command voltage	ED_F		—	—	2.3	V
Reverse command voltage	ED_R		2.7	—	—	V
DS on voltage	DS_{on}		2.7	—	—	V
DS off voltage	DS_{off}		—	—	2.3	V
PFG output voltage (H)	$PFG_{(H)}$	I_{PFG}=−100 μA	2.8	—	—	V
PFG output voltage (L)	$PFG_{(L)}$	I_{PFG}=500 μA	—	—	0.9	V
Hall element supply voltage	V_H+	I_{VH}+=−20mA	2.6	—	3.2	V
Hall element input Input allowable voltage	H_{in}		1.2	—	4.0	V
Hall element input Input offset voltage	ΔH		−8	—	8	mV
Lower output voltage	V_N	E_T=0.6V	1.5	—	2.5	V
Upper saturation voltage	$V_{p\,(sat)}$	I_O=1A	—	—	2.0	V
Switching power control output	V_S	E_T=0.2V V_M−A1=1.05V	2	—	3	V
Switching power control output gain	GV_S		2.2	—	3.0	times
Ripple cancellation rate	α	ATC=20mV	7	14	21	%

■ Pin Descriptions

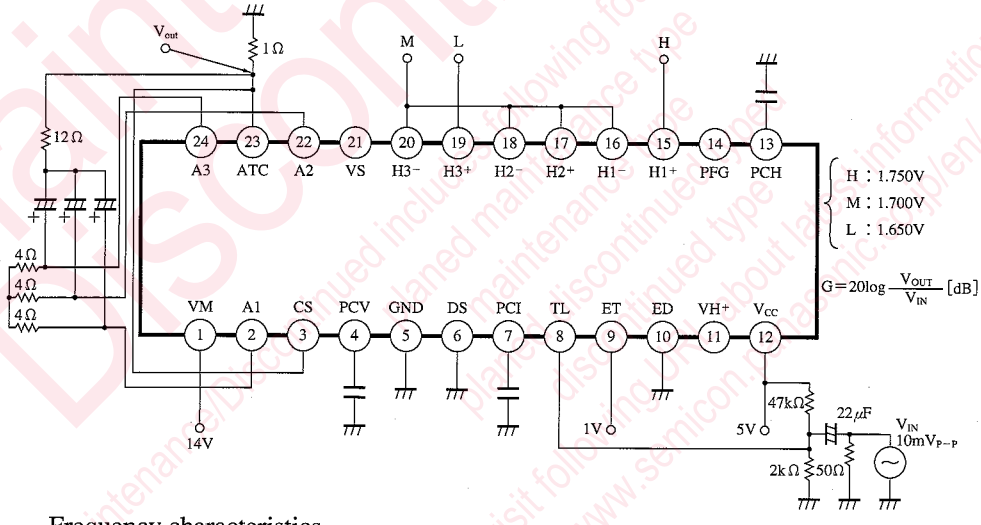
Pin No.	Pin name	Pin No.	Pin name
1	Motor power supply, VM	13	Hall-element amplifier phase correction, PCH
2	Drive output (1), A1	14	Hall-element waveform shaping output, PFG
3	Current sensor, CS	15	Hall-element input, $H1^+$
4	Voltage feedback phase correction, PCV	16	Hall-element input, $H1^-$
5	Ground, GND	17	Hall-element input, $H2^+$
6	Disable input, DS	18	Hall-element input, $H2^-$
7	Current feedback phase correction, PCI	19	Hall-element input, $H3^+$
8	Torque limiter control, TL	20	Hall-element input, $H3^-$
9	Torque command, ET	21	Switching power supply control output, VS
10	Direction reference, ED	22	Drive output (2), A2
11	Hall-element power supply, VH^+	23	Total output current, ATC
12	Power supply, V_{CC}	24	Drive output (3), A3

■ Reference

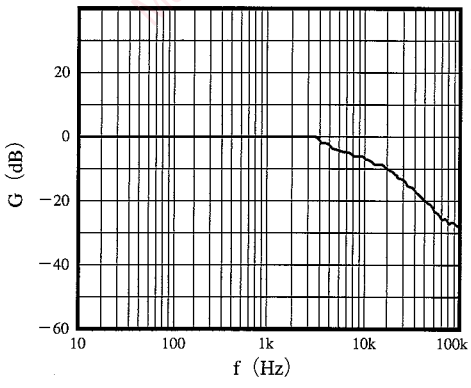
Output current frequency characteristics

Followings are the test circuit and figure of frequency characteristics between input pin of TL and output current pin.

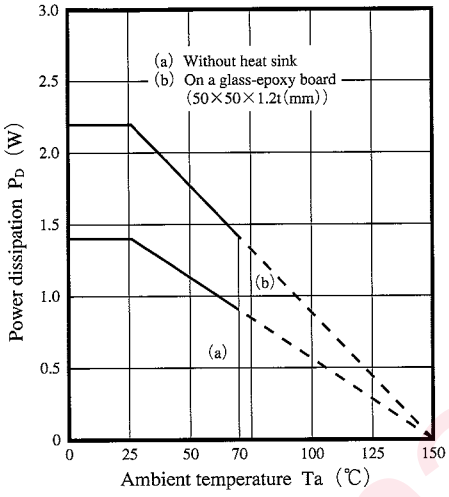
Test circuit of mesuring frequency characteristics



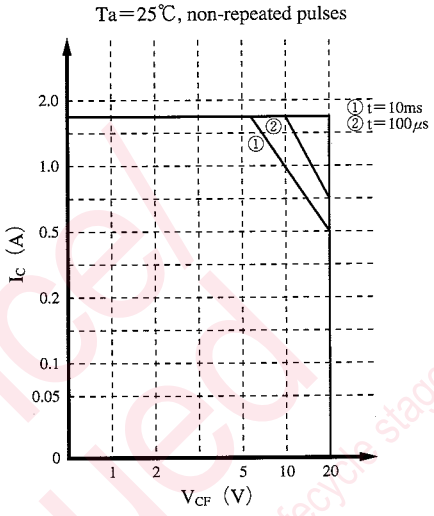
Frequency characteristics



$P_D - Ta$



Area of safety operation (NPN Power Tr)



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