

AN8320NFA

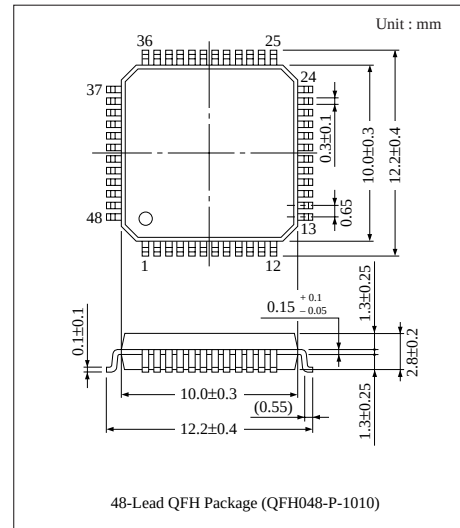
Servo Interface IC for DAT

Overview

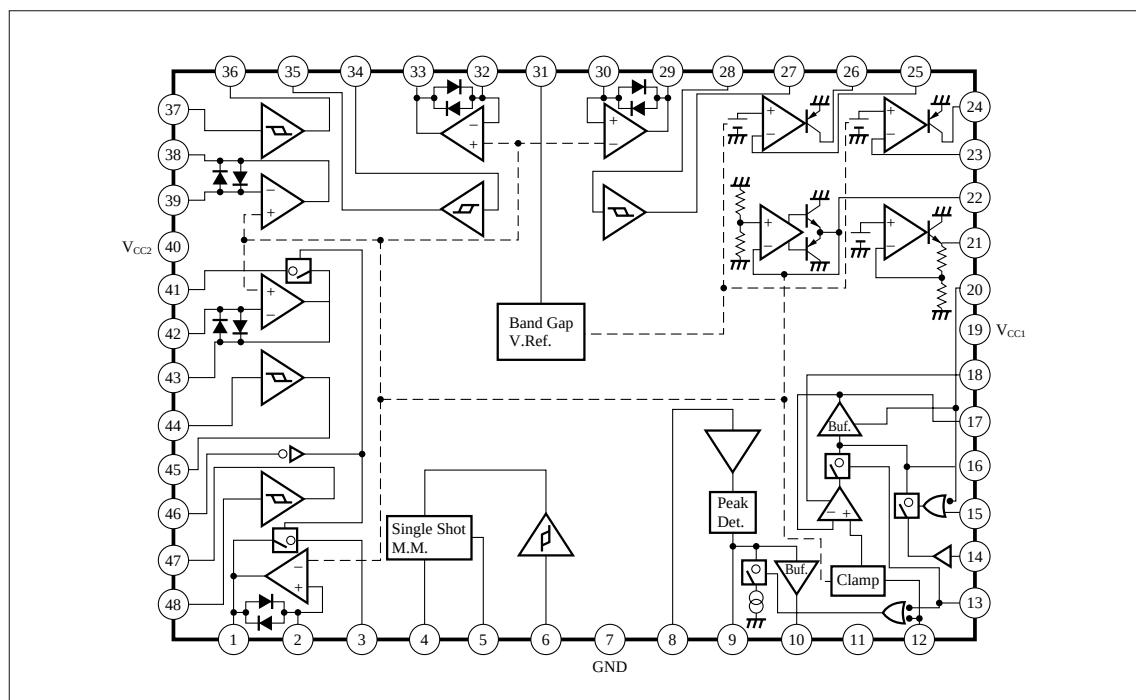
The AN8320NFA is an IC with servo interface function.

Features

- Cylinder FG waveform processing
- Capstan FG waveform processing
- Reel FG waveform processing
- PG signal processing
- LED bias power supply for optical FG
- Photo-transistor bias power supply for optical FG.
- Servo reference voltage source
- ATF sample hold circuit



Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{CC}	8	V
Supply Current	I _{CC}	50	mA
Power Dissipation (Ta=75°C)	P _D	400	mW
Operating Ambient Temperature	T _{opr}	-20 ~ + 75	°C
Storage Temperature	T _{stg}	-55 ~ + 150	°C

■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating Supply Voltage Range	V _{CC}	4.5V ~ 7.5V

■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
No-load Supply Current	I _{CCCP}	V _{CC} = 5V	5	—	14.5	mA
No-load Supply Current at Stand-by	I _{CCSTB}	V _{CC} = 5V	0.5	—	3.5	mA
LED Bias Current 1	I _{L24}	V _{CC} = 5V	4	5	6	mA
LED Bias Current 2	I _{L26}	V _{CC} = 5V	4	5	6	mA
V _{REF} Output Voltage	V ₂₂₋₇	V _{CC} = 5V	2.25	2.5	2.75	V
Ph. Tr Bias Voltage	V ₂₁₋₇	V _{CC} = 5V	2.45	3	3.55	V
CYL. FG. OP Amp. Gain	G ₂₉	V _{CC} = 5V, V _{in} = 3mV _{p-p} , f = 1kHz	38	40	42	dB
CYL. FG. Schmitt Level+	+ΔV ₂₈	V _{CC} = 5V, f = 1kHz	43	52	67	mV
CYL. FG. Schmitt Level-	-ΔV ₂₈	V _{CC} = 5V, f = 1kHz	-67	-52	-43	mV
TR. FG. OP Amp. Gain	G ₃₃	V _{CC} = 5V, V _{in} = 1mV _{p-p} , f = 1kHz	47	50	53	dB
TR. FG. Schmitt Level+	+ΔV ₃₄	V _{CC} = 5V, f = 1kHz	205	225	255	mV
TR. FG. Schmitt Level-	-ΔV ₃₄	V _{CC} = 5V, f = 1kHz	-255	-225	-205	mV
SR. FG. OP. Amp. Gain	G ₃₈	V _{CC} = 5V, V _{in} = 1mV _{p-p} , f = 1kHz	47	50	53	dB
SR. FG. Schmitt Level+	+ΔV ₃₇	V _{CC} = 5V, f = 1kHz	205	225	255	mV
SR. FG. Schmitt Level-	-ΔV ₃₇	V _{CC} = 5V, f = 1kHz	-255	-225	-205	mV
CAP. FG1. OP. Amp. Gain	G ₁	V _{CC} = 5V, V _{in} = 5mV _{p-p} , f = 1kHz	33	35	37	dB
CAP. FG1. Schmitt Level+	+ΔV ₄₈	V _{CC} = 5V, f = 1kHz	43	52	67	mV
CAP. FG1. Schmitt Level-	-ΔV ₄₈	V _{CC} = 5V, f = 1kHz	-67	-52	-43	mV
CAP. FG2. OP. Amp. Gain	G ₄₂	V _{CC} = 5V, V _{in} = 5mV _{p-p} , f = 1kHz	33	35	37	dB
CAP. FG2. Schmitt Level+	+ΔV ₄₄	V _{CC} = 5V, f = 1kHz	43	52	67	mV
CAP. FG2. Schmitt Level-	-ΔV ₄₄	V _{CC} = 5V, f = 1kHz	-67	-52	-43	mV
CYL. FG Output H Level	V _{OH27}	V _{CC} = 5V, I ₂₇ = -10μA	4.5	—	5	V
CYL. FG Output L Level	V _{OL27}	V _{CC} = 5V	0	—	0.5	V
TR. FG Output H Level	V _{OH35}	V _{CC} = 5V, I ₃₅ = -10μA	4.5	—	5	V
TR. FG Output L Level	V _{OL35}	V _{CC} = 5V	0	—	0.5	V
SR. FG Output H Level	V _{OH36}	V _{CC} = 5V, I ₃₆ = -10μA	4.5	—	5	V
SR. FG Output L Level	V _{OL36}	V _{CC} = 5V	0	—	0.5	V
CAP. FG1 Output H Level	V _{OH47}	V _{CC} = 5V, I ₄₇ = -10μA	4.5	—	5	V
CAP. FG1 Output L Level	V _{OL47}	V _{CC} = 5V	0	—	0.5	V
CAP. FG2 Output H Level	V _{OH45}	V _{CC} = 5V, I ₄₅ = -10μA	4.5	—	5	V
CAP. FG2 Output L Level	V _{OL45}	V _{CC} = 5V	0	—	0.5	V

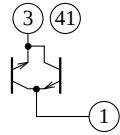
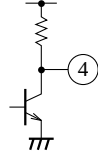
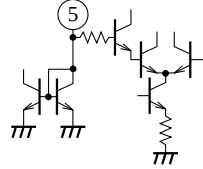
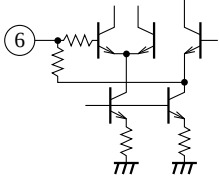
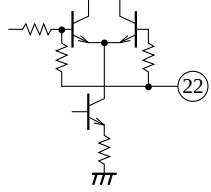
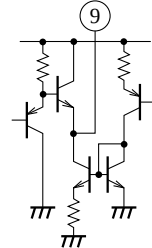
■ Electrical Characteristics (Cont.) (Ta=25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
CYL. FG Output DUTY	D ₂₇	V _{CC} = 5V, V _{in} = 3mV _{P-P} , f= 1kHz	46	50	54	%
TR. FG Output DUTY	D ₃₅	V _{CC} = 5V, V _{in} = 1mV _{P-P} , f= 1kHz	46	50	54	%
SR. FG Output DUTY	D ₃₆	V _{CC} = 5V, V _{in} = 1mV _{P-P} , f= 1kHz	46	50	54	%
CAP. FG1 Output DUTY	D ₄₇	V _{CC} = 5V, V _{in} = 5mV _{P-P} , f= 1kHz	48	50	52	%
CAP. FG2 Output DUTY	D ₄₅	V _{CC} = 5V, V _{in} = 5mV _{P-P} , f= 1kHz	48	50	52	%
FIL Input H Level	V _{1H46}	V _{CC} = 5V	4	—	—	V
FIL Input L Level	V _{1L46}	V _{CC} = 5V	—	—	2	V
CAP. FG1. OP Amp. Gain at FIL	G _{1F}	V _{CC} = 5V, V _{in} = 5mV _{P-P} , f= 1kHz	27	29	31	dB
CAP. FG2. OP Amp. Gain at FIL	G _{42F}	V _{CC} = 5V, V _{in} = 5mV _{P-P} , f= 1kHz	27	29	31	dB
STAND-BY Input H Level	V _{1H31}	V _{CC} = 5V	4	—	—	V
STAND-BY Input L Level	V _{1L31}	V _{CC} = 5V	—	—	2	V
PG Input Schmitt Level +	+ ΔV ₄	V _{CC} = 5V	70	110	145	mV
PG Input Schmitt Level –	– ΔV ₄	V _{CC} = 5V	–145	–110	–70	mV
PG MM Delay Time	T _{d6-4}	V _{CC} = 5V	280	335	375	μs
PG Output H Level	V _{OH6}	V _{CC} = 5V, I ₆ = –10μA	4.5	—	5	V
PG Output L Level	V _{OL6}	V _{CC} = 5V	0	—	0.5	V
ATF Operating Offset Voltage	ΔV ₁₇₋₂₂	V _{CC} = 5V	–30	2	30	mV
ATF Operation (I)	V _{ATF (I)}	V _{CC} = 5V	160	—	335	mV
ATF Operation (II)	V _{ATF (II)}	V _{CC} = 5V	–335	—	–160	mV
ATF Operating Detection Sensitivity (I)	ΔV _{ATF (I)}	V _{CC} = 5V	210	250	290	mV
ATF Operating Detection Sensitivity (II)	ΔV _{ATF (II)}	V _{CC} = 5V	210	250	290	mV

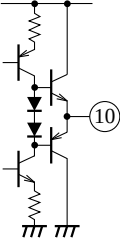
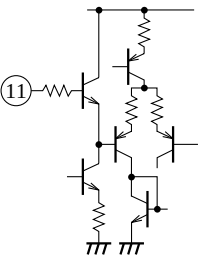
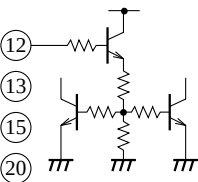
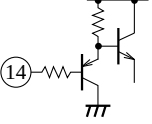
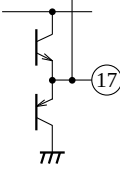
■ Pin Descriptions

Pin No.	Pin Name	Description	Equivalent Circuit
1	CAP. FG1 OUT	Capstan FG1 amp. output pin	
29	CYL. FG OUT	Cylinder FG amp. output pin	
33	TR FG OUT	Tracking FG amp. output pin	
38	SR FG OUT	SR FG amp. output pin	
43	CAP. FG2 OUT	Capstan FG2 amp. output pin	
2	CAP. FG1 IN	Capstan FG1 amp. input pin	
30	CYL. FG IN	Cylinder FG amp. input pin	
32	TR FG IN	Tracking FG amp. input pin	
39	SR FG IN	SR FG amp. input pin	
42	CAP. FG2 IN	Capstan FG2 amp. input pin	

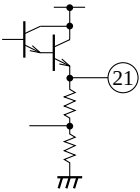
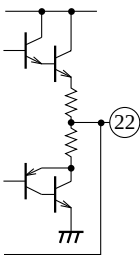
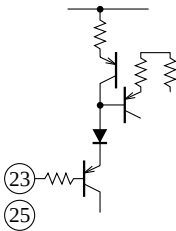
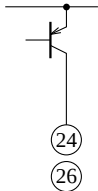
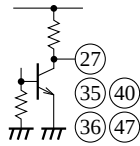
■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Description	Equivalent Circuit
3	CAP. FG1 FA	Capstan FG1 amp. frequency characteristics setting pin	
41	CAP. FG2 FA	Capstan FG2 amp. frequency characteristics setting pin	
4	PG OUT	PG servo output pin	
5	PGT	PG amp. delay time setting pin	
6	PG IN	PG amp. input pin	
7	GND	GND pin	
8	SVRF IN	ATF amp. input pin	
9	C. DAMP	Capacitor connection pin for detecting	

■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Description	Equivalent Circuit
10	BUF OUT	ATF error signal all wave rectification buffer output pin	
11	CL IN	Clamping circuit input pin	
12	SP1	SP1 Input pin	
13	SP2	SP2 Input pin	
15	SPE IN	SPE Input pin	
20	ATF ON	ATF ON signal input pin	
14	SPE OUT	SPE potential setting pin	
16	C. HOLD	Hold capacitance connection pin	_____
17	ATF OUT	ATF error output pin	
18	C. PC	ATF error amp. phase compensation pin	_____
19	V _{CC1}	Supply voltage pin	_____

■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Description	Equivalent Circuit
21	V _{BP}	Photo transistor bias supply output pin	
22	V _{REF}	Servo reference supply output pin	
23	V _{B (1)}	Bias voltage input pin	
25	V _{B (2)}		
24	C OUT1	Optical FG LED bias current output pin	
26	C OUT2		
27	CYL. FG COM OUT	Cylinder FG comparator output pin	
35	TR FG COM OUT	Tracking FG comparator output pin	
36	SR FG COM OUT	SR FG comparator output pin	
45	CAP. FG2 COM OUT	Capstan FG2 comparator output pin	
47	CAP. FG1 COM OUT	Capstan FG1 comparator output pin	

■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Description	Equivalent Circuit
28	CYL. FG COM IN	Cylinder FG comparator input pin	
34	TR FG COM IN	Tracking FG comparator input pin	
37	SR FG COM IN	SR FG comparator input pin	
44	CAP. FG2 COM IN	Capstan FG2 comparator input pin	
48	CAP. FG1 COM IN	Capstan FG1 comparator input pin	
31	STAND-BY IN	Stand-by mode control signal input pin	
46	$\overline{\text{Fi}}$ IN	Capstan FG frequency characteristics selective pin	
40	V _{CC2}	Supply voltage pin	