

Thick Film Hybrid IC

STK6713AMK3

SANYO

No.4351A

Stepping Motor Fixed-current Driver

Overview

The STK6713AMK3 is a unipolar fixed-current chopper-type 4-phase stepping motor driver hybrid IC (HIC) which uses a MOSFET power device. The excitation sequence signal is active High.

Applications

- Serial printer, line printer, PPC, laser beam printer (LBP) paper feed and carriage motor drivers

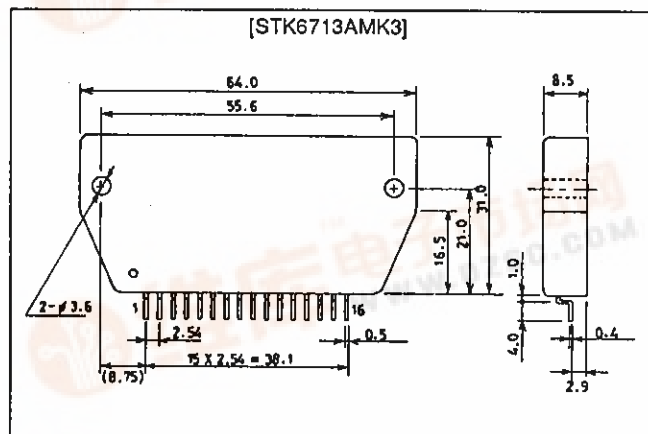
Features

- Fixed-current driver device which uses MOSFET
- Input signal supporting TTL level (Active High drive type)
- On-chip current detection resistor

Package Dimensions

unit: mm

4131



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage 1	V _{CC1max}	No input signal	52	V
Maximum supply voltage 2	V _{CC2max}	No input signal	7	V
Maximum phase current	I _{OH max}	per phase, R/L = 5Ω/10mH, 0.5 s 1 pulse, V _{CC} input	3.9	A
Repeated avalanche handling capability	E _{ar max}		42	mJ
Storage temperature	T _{stg}		-40 to +125	°C
Junction temperature	T _{j max}		150	°C
Operating substrate temperature	T _{c max}		105	°C

Allowable Operating Conditions at Ta = 25°C

			min	typ	max	Unit
Supply voltage 1	V _{CC1}	With input signal	18		42	V
Supply voltage 2	V _{CC2}	With input signal	4.75	5.0	5.25	V
Phase driver withstand voltage	V _{DSS}		100			V
Phase current	I _{OH max}	Duty 50%			3.0	A

Electrical Characteristics at Ta = 25°C, V_{CC1} = 36V, V_{CC2} = 5V

			min	typ	max	Unit
Output saturation voltage	V _{ST}	R _L =14Ω, V _{IN} =2.4V		1.5	2.1	V
Output current (average)	I _{o ave}	Load; R/L=3.5Ω/3.8mH, V _{IN} =2.4V per phase	0.414	0.46	0.506	A
Pin 1 current consumption (average)	I _{CC2}	Load; R/L = 3.5Ω/3.8mH, V _{IN} = 2.4V per phase		10	20	mA
FET diode forward voltage	V _{df}	I _f = 1.0A		1.2	1.8	V
TTL input ON voltage	V _{IH}	Input voltage when F1, 2, 3, 4 ON	2.0			V
TTL input OFF voltage	V _{IL}	Input voltage when F1, 2, 3, 4 OFF			0.8	V
Switching time	t _{ON}	R _L =24Ω, V _{IN} =2.4V		80		ns
	t _{OFF}	R _L =24Ω, V _{IN} =2.4V		0.2		μs

Note: With regulated voltage power supply.

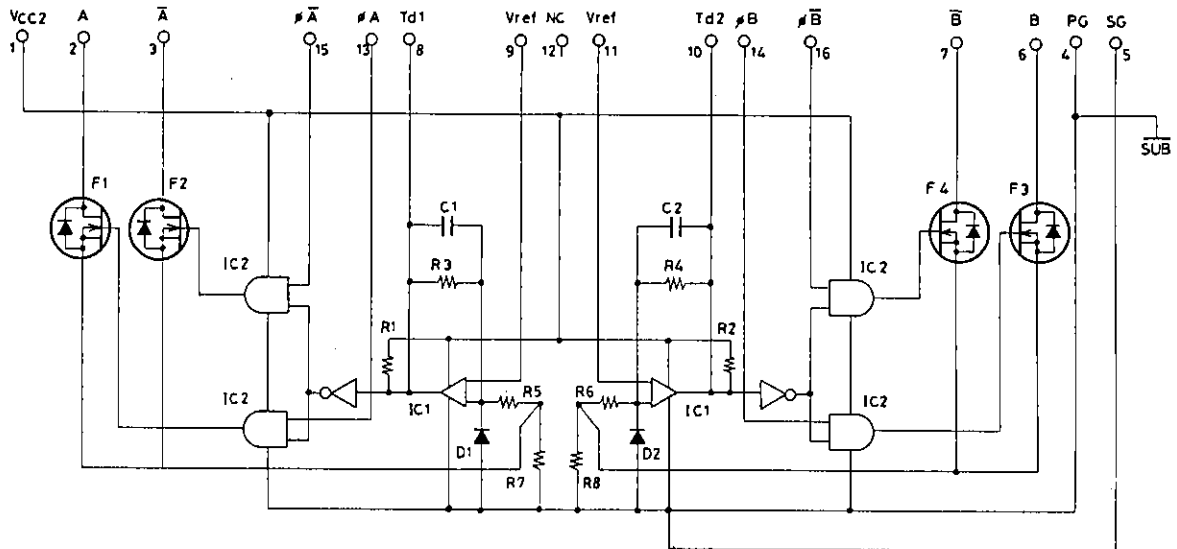


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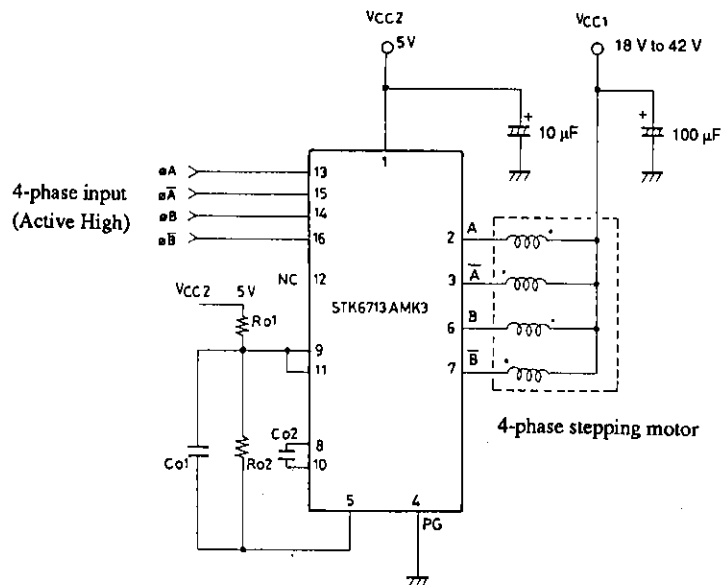
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STK6713AMK3

Equivalent Circuit

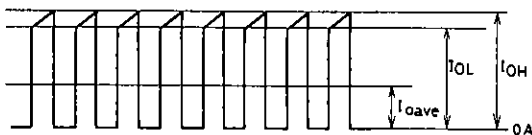


Application Circuit



Note: For reference, when $I_{OH} \approx 1.0A$, $R_{O1} = 6.8k\Omega$ and $R_{O2} = 390\Omega$.

Output current waveform when phases held (locked)



Measure output current values in this state.

$$I_{OH} = K \times \frac{R_{O2}}{R_{O1} + R_{O2}} \times V_{CC2}/R_7$$

$$K \approx 1.2$$

$$R_7 = R_8 = 0.33\Omega \pm 3\%$$

To reduce noise during motor hold, it is possible to mount $C_{O1} \approx 0.01 \mu F$ and $C_{O2} \approx 100-200 pF$. Normally these are not required.

Note: Both input signals cannot be H at the same time.

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