

**SANYO**

No.4351A

**STK6713AMK3****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**

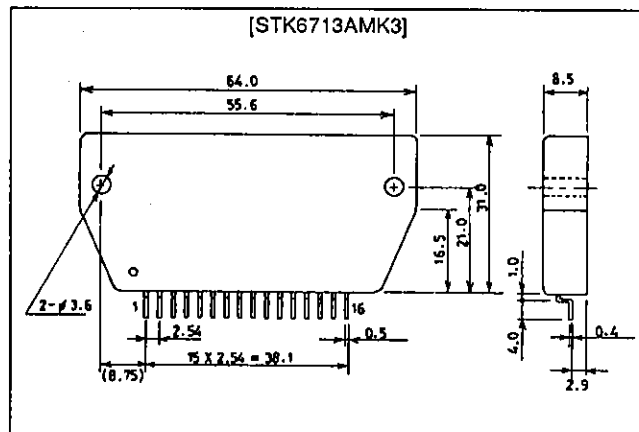
- Serial printer, line printer, PPC, laser beam printer (LBP) paper feed and carriage motor drivers

**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 <sub>CC1</sub> max	No input signal	52	V
Maximum supply voltage 2	V <sub>CC2</sub> max	No input signal	7	V
Maximum phase current	I <sub>OH</sub> max	per phase, R/L = 5Ω/10mH, 0.5 s 1 pulse, V <sub>CC</sub> input	3.9	A
Repeated avalanche handling capability	E <sub>ar</sub> max		42	mJ
Storage temperature	T <sub>stg</sub>		-40 to +125	°C
Junction temperature	T <sub>j</sub> max		150	°C
Operating substrate temperature	T <sub>c</sub> max		105	°C

**Allowable Operating Conditions at Ta = 25°C**

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

**Electrical Characteristics at Ta = 25°C, V<sub>CC1</sub> = 36V, V<sub>CC2</sub> = 5V**

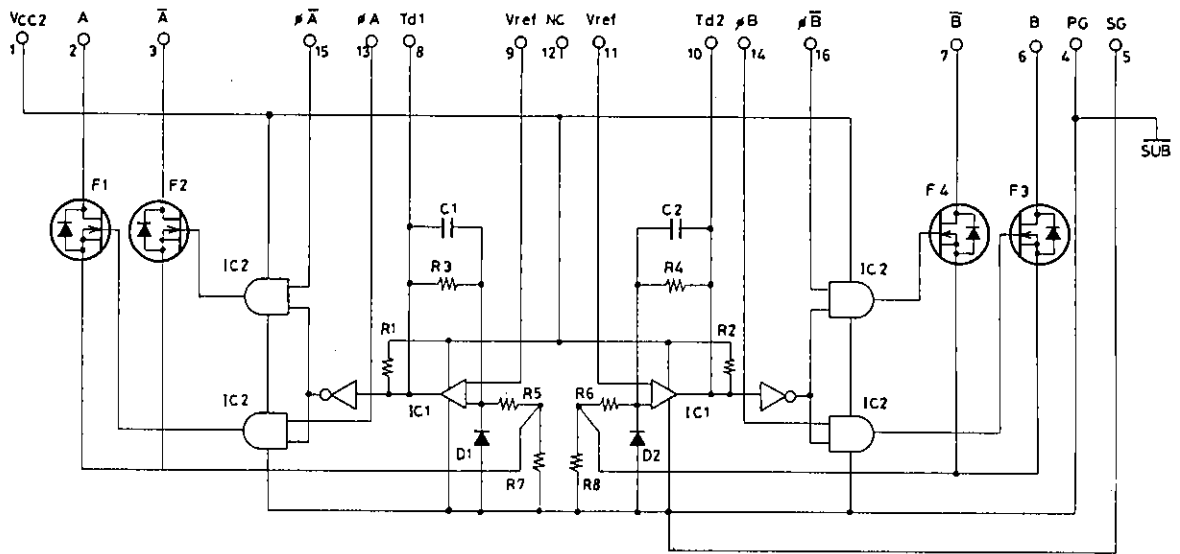
			min	typ	max	Unit
Output saturation voltage	V <sub>ST</sub>	R <sub>L</sub> =14Ω, V <sub>IN</sub> =2.4V		1.5	2.1	V
Output current (average)	I <sub>O</sub> ave	Load; R/L=3.5Ω/3.8mH, V <sub>IN</sub> =2.4V per phase	0.414	0.46	0.506	A
Pin 1 current consumption (average)	I <sub>CC2</sub>	Load; R/L = 3.5Ω/3.8mH,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

Note: With regulated voltage power supply.

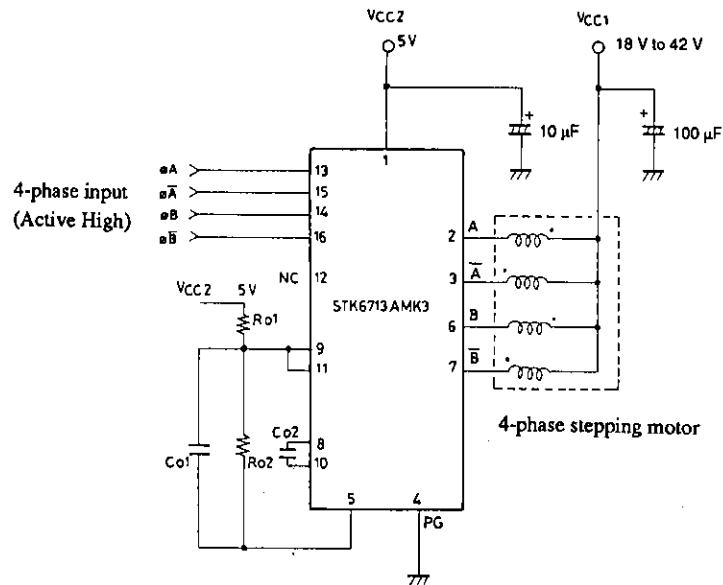
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### Equivalent Circuit

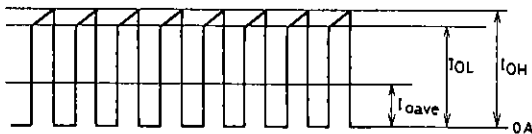


### Application Circuit



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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