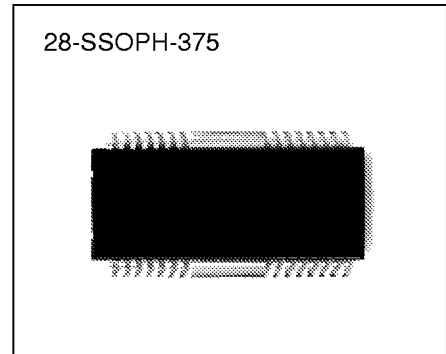


4-CH MOTOR DRIVER

The KA3022D is a monolithic integrated circuit, suitable for a 1-ch (forward.reverse) control DC motor driver and a 3-ch motor driver which drives the focus actuator, tracking actuator, and sled motor of a CD system.

FEATURES

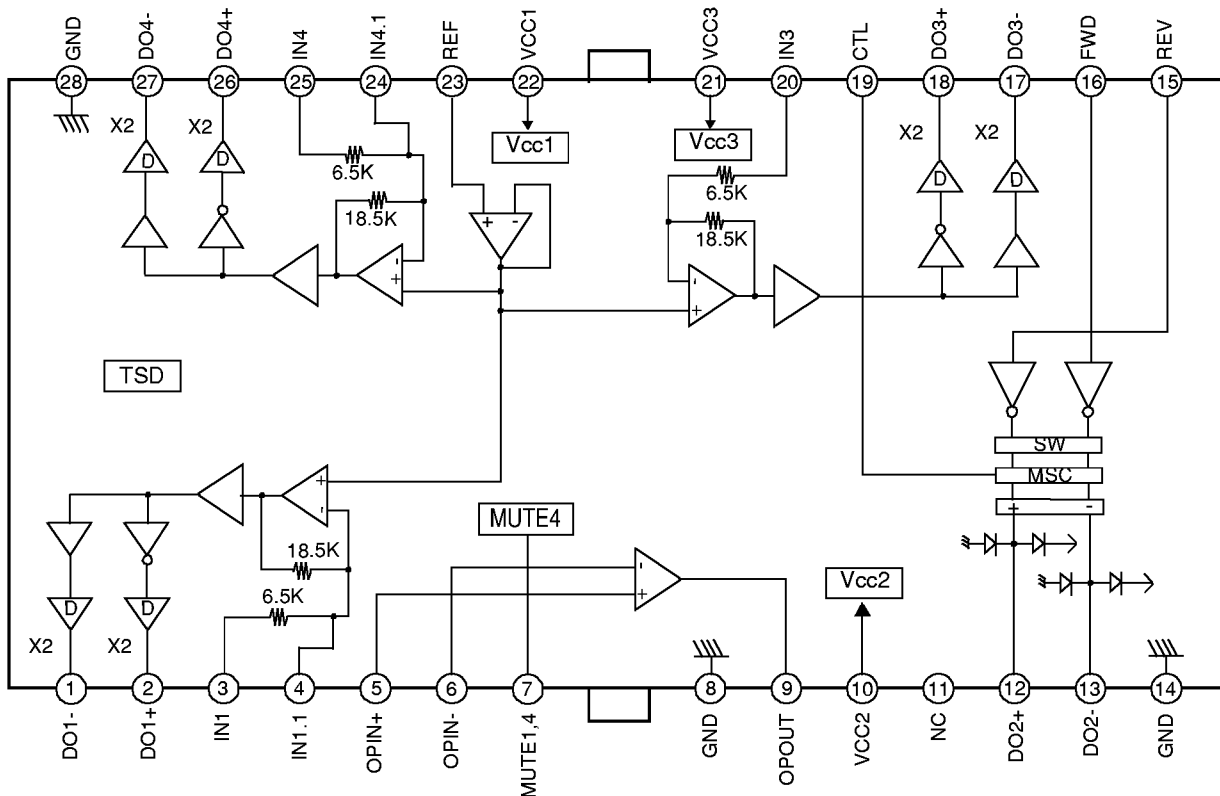
- 3-Channel BTL driver
- 1-Channel forward-Reverse control DC motor driver
- Built-in thermal shutdown circuit
- Built-in mute circuit
- Operating supply voltage: 4.5~13.2V
- Corresponds to 3.3V or 5V DSP



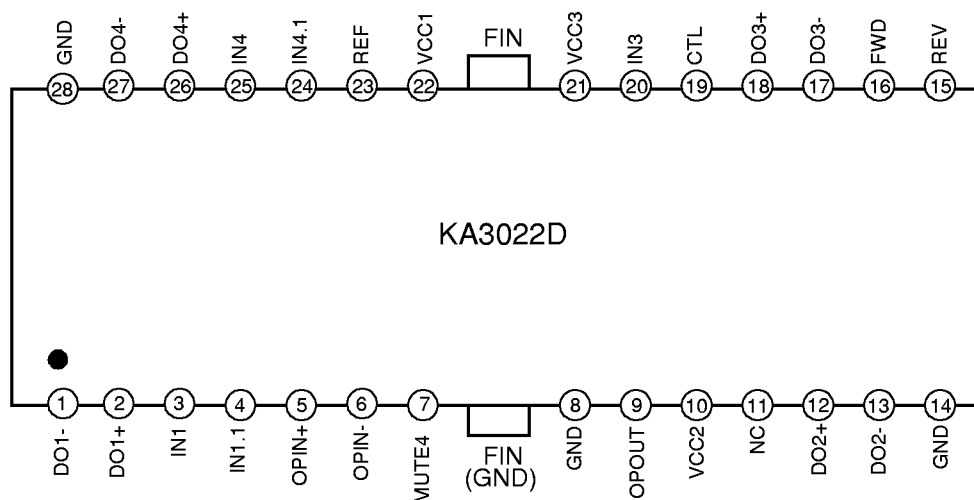
ORDERING INFORMATION

| Device | Package | Operating Temperature |
|---------|--------------|-----------------------|
| KA3022D | 28-SSOPH-375 | -35 °C ~ 85 °C |

BLOCK DIAGRAM



PIN CONFIGURATION



PIN DESCRIPTION

| Pin No. | Symbol | I/O | Description | Pin No. | Symbol | I/O | Description |
|---------|---------|-----|----------------------------|---------|--------|-----|----------------------------|
| 1 | DO1- | O | Drive1 Output (-) | 15 | REV | I | CH2 Reverse |
| 2 | DO1+ | O | Drive1 Output (+) | 16 | FWD | I | CH2 Forward |
| 3 | IN1 | I | Drive1 Input | 17 | DO3- | O | Drive3 Output (-) |
| 4 | IN1.1 | I | Drive1 Input, gain adjust. | 18 | DO3+ | O | Drive3 Output (+) |
| 5 | OPIN+ | I | OP-AMP Input (+) | 19 | CTL | I | CH2 Motor Speed Control |
| 6 | OPIN- | I | OP-AMP Input (-) | 20 | IN3 | I | CH3 Input |
| 7 | MUTE1,4 | I | CH4 Mute | 21 | VCC3 | I | Power Supply for CH3 |
| 8 | GND | - | Ground | 22 | VCC1 | I | Power Supply for CH1 |
| 9 | OPOUT | O | OP-Amp Output | 23 | REF | I | Bias Voltage Input |
| 10 | VCC2 | I | Power Supply for CH2 | 24 | IN4.1 | I | Drive4 Input, gain adjust. |
| 11 | NC | - | No Connection | 25 | IN4 | I | Drive4 Input |
| 12 | DO2+ | O | Drive2 Output (+) | 26 | DO4+ | O | Drive4 Output (+) |
| 13 | DO2- | O | Drive2 Output (-) | 27 | DO4- | O | Drive4 Output (-) |
| 14 | GND | - | Ground | 28 | GND | - | Ground |

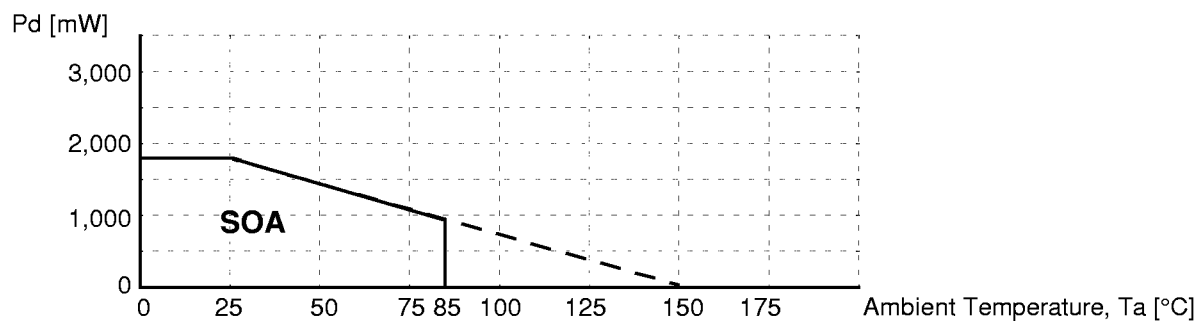
EQUIVALENT CIRCUITS

| MUTE INPUT | POWER OUTPUT |
|------------------------|-----------------------|
| | |
| SIGNAL REFERENCE INPUT | LOADING CONTROL INPUT |
| | |
| LOADING LOGIC INPUT | |
| | |

ABSOLUTE MAXIMUM RATINGS (TA = 25 °C)

| Characteristics | Symbol | Value | Unit |
|-----------------------------|-------------|------------|------|
| Maximum supply voltage | V_{CCmax} | 15 | V |
| Power dissipation | P_d | @1.7 | W |
| Operating temperature range | T_{opr} | -35 ~ +85 | °C |
| Storage temperature range | T_{stg} | -55 ~ +150 | °C |

- @ 1. When mounted on a 50mm × 50mm × 1mm PCB (Phenolic resin material).
 2. Power dissipation reduces 13.6mW/°C for using above Ta = 25°C
 3. Do not exceed PD and SOA(Safe operating area).



RECOMMENDED OPERATING CONDITIONS

| Characteristics | Symbol | Value | | | Unit |
|-----------------|--------|-------|-----|------|------|
| | | Min | Typ | Max | |
| Supply Voltage | Vcc | 4.5 | - | 13.2 | V |

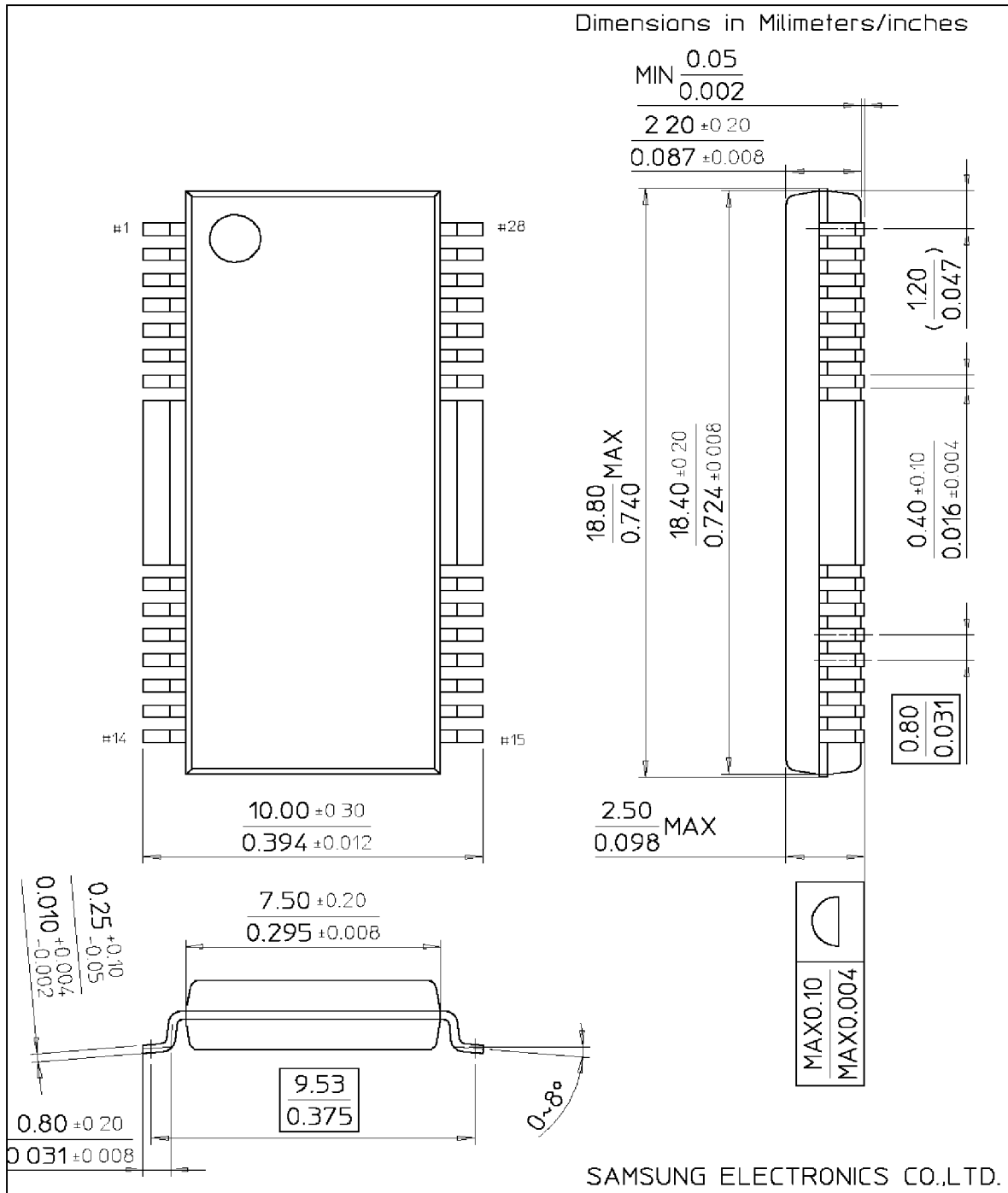
ELECTRICAL CHARACTERISTICS(Unless otherwise specified, $T_a = 25\text{ }^\circ\text{C}$, $V_{CC} = V_{M12} = V_{M3,4} = 5\text{V}$)

| Characteristics | Symbol | Conditions | Spec | | | Unit |
|--|-----------------|---|------|------|------|------|
| | | | Min | Typ | Max | |
| Quiescent Current | I_{CC} | $V_{in} = 0\text{V}$ | - | 9.3 | 15 | mA |
| Mute On Current | I_{mute} | Mute Pin = V_{CC} | - | 7.9 | 9.5 | mA |
| Mute On Voltage | V_{mon} | | 2.0 | - | - | V |
| Mute Off Voltage | V_{moff} | | - | - | 0.5 | V |
| DRIVE PART | | | | | | |
| Output Offset Voltage | V_{oo} | $V_{in} = 2.5\text{V}$ | -50 | - | +50 | mV |
| Maximum Output Voltage1 | V_{om1} | $V_{CC} = 8\text{V}$, $R_L = 8\Omega$ | 5.4 | 6.0 | - | V |
| Closed Loop Voltage Gain | G_{vc} | $f = 1\text{KHz}$, $V_{in} = 0.1\text{V}_{rms}$ (CH1,3, 4) | 19.5 | 21.0 | 22.5 | dB |
| Ripple Rejection Ratio | RR | $V_{in} = 0.1\text{V}_{rms}$, $f = 120\text{Hz}$ | - | 60 | - | dB |
| Slew Rate | SR | $V_o = 2\text{V}_{p-p}$, $f = 120\text{KHz}$ | - | 0.8 | - | V/us |
| TRAY DRIVE PART ($V_{CC} = V_{M34} = 8\text{V}$, $R_L = 45\Omega$) | | | | | | |
| Input High Level Voltage | V_{ih} | | 2 | - | - | V |
| Input Low Level Voltage | V_{il} | | - | - | 0.5 | V |
| Output Voltage1 | V_{o1} | $V_{CC} = 8\text{V}$, $V_{ctl} = 4.0\text{V}$ | 5.2 | 6 | 6.8 | V |
| Output Voltage2 | V_{o2} | $V_{CC} = 13\text{V}$, $V_{ctl} = 5.7\text{V}$ | 7.5 | 8.5 | 9.5 | V |
| Output Load Regulation | ΔV_{RL} | $V_{CC} = 8\text{V}$, $V_{ctl} = 3.0\text{V}$ | - | 300 | 700 | mV |
| Output Offset Voltage1 | V_{oo1} | $V_{in} = 5\text{V}$, 5V | -10 | - | +10 | mV |
| Output Offset Voltage1 | V_{oo2} | $V_{in} = 0\text{V}$, 0V | -10 | - | +10 | mV |
| GENERAL OP AMP PART | | | | | | |
| Input Offset Voltage | V_{ofop} | | -15 | - | +15 | mV |
| Input Bias Current | I_{bop} | | - | - | 300 | nA |
| High Level Output Voltage | V_{ohop} | $V_{CC} = 5\text{V}$, $R_L = 1\text{K}\Omega$ | 3 | 4 | - | V |
| Low Level Output Voltage | V_{olop} | $V_{CC} = 5\text{V}$, $R_L = 1\text{K}\Omega$ | 0.7 | 1 | 1.3 | V |
| Output Sink Current | I_{sink} | $V_{CC} = 5\text{V}$, $R_L = 30\Omega$ | 10 | 20 | - | mA |
| Output Source Current | I_{source} | $V_{CC} = 5\text{V}$, $R_L = 30\Omega$ | 10 | 20 | - | mA |
| Open Loop Voltage Gain | G_{vo} | $V_{in} = -75\text{dB}$, $f = 1\text{KHz}$ | - | 75 | - | dB |
| Ripple Rejection Ratio | RR_{op} | $V_{in} = -20\text{dB}$, $f = 120\text{Hz}$ | - | 65 | - | dB |

| Characteristics | Symbol | Conditions | Spec | | | Unit |
|-----------------------------|--------|-----------------------|------|-----|-----|------|
| | | | Min | Typ | Max | |
| Slew Rate | SRop | f = 120KHz, 2Vp-p | - | 1 | - | V/us |
| Common Mode Rejection Ratio | CMRR | Vin = -20dB, f = 1KHz | - | 80 | - | dB |
| Common Mode Input Range | Vicm | Vcc = 8V | -0.3 | - | 6.8 | V |

PACKAGE DIMENSIONS

28-SSOPH-375



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