

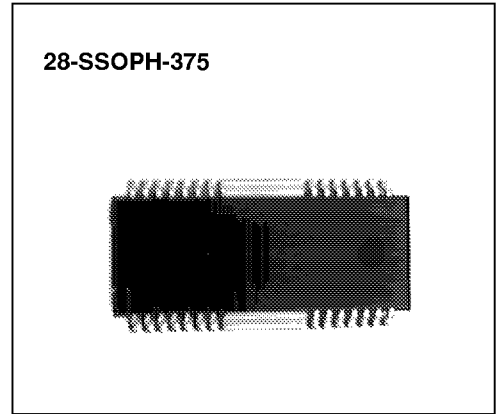
CD-ROM PRODUCTS

4-CH MOTOR DRIVER

The KA3021D 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

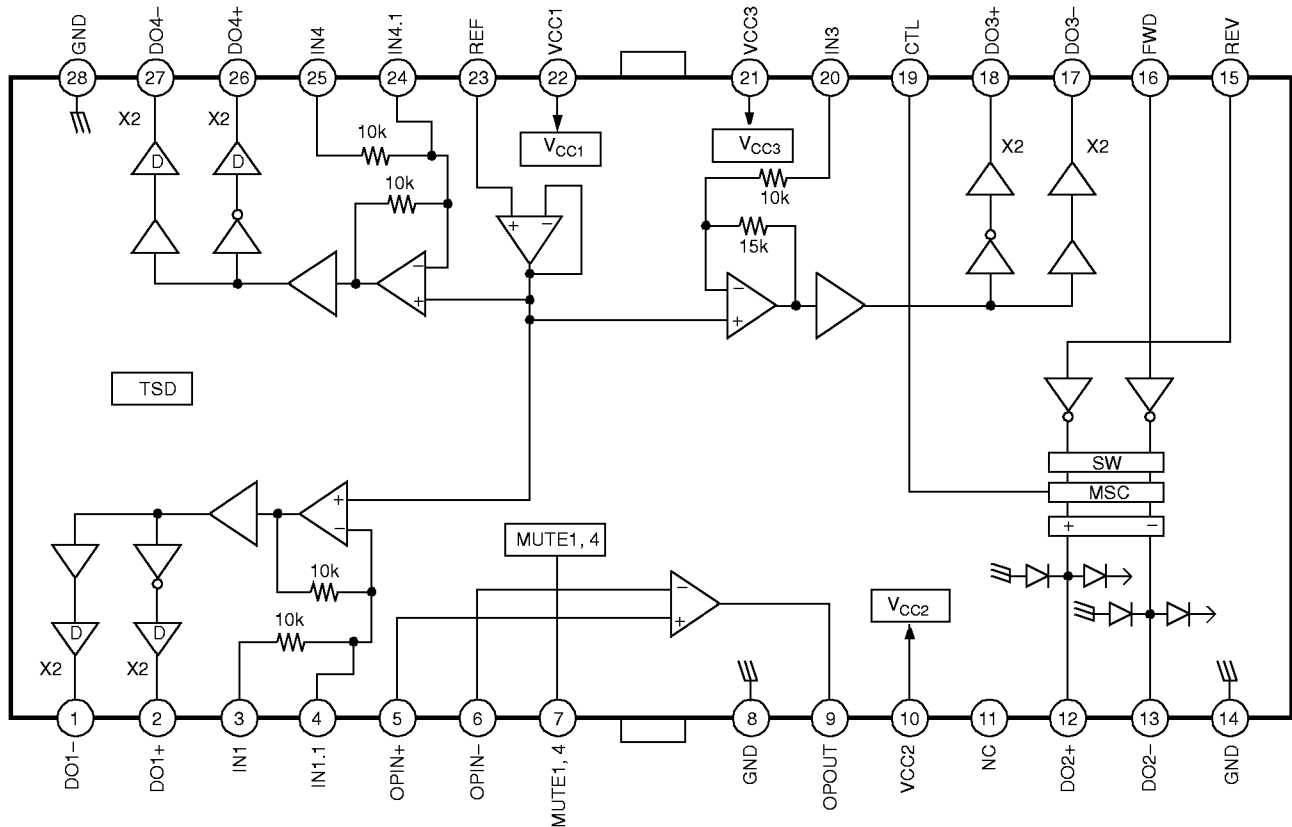
- 3-channel BTL driver
- 1-channel forward-reverse control DC motor driver
- Built-in thermal shutdown circuit
- Built-in mute circuit
- Operating supply voltage: 4.5V ~ 13.2V
- Corresponds to 3.3V or 5V DSP



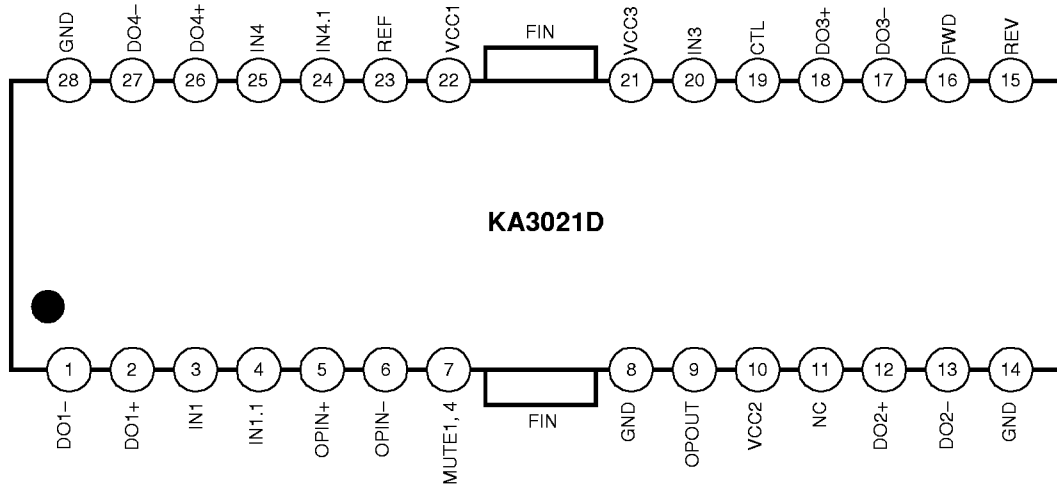
ORDERING INFORMATION

Device	Package	Operating Temperature
KA3021D	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	CH1, 4 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

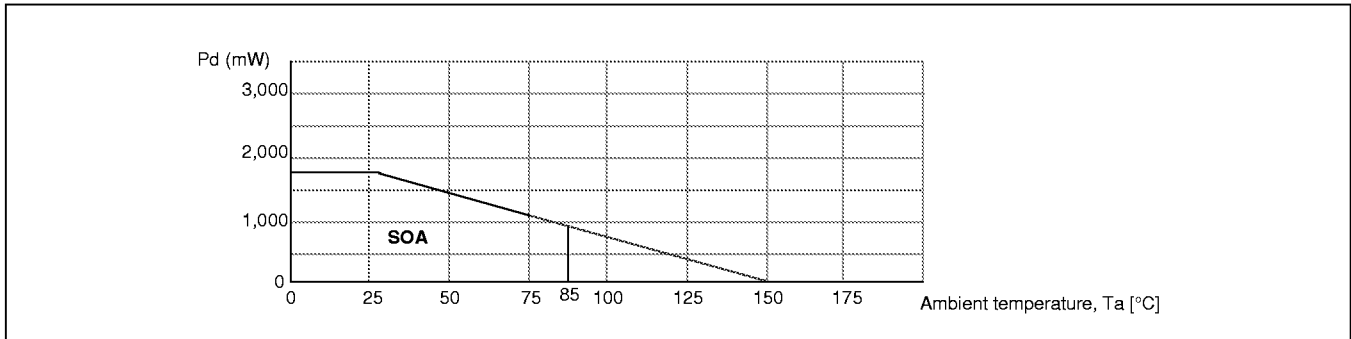
Mute input	Power output
Signal reference input	loading control input
Loading logic input	

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Characteristics	Symbol	Value	Unit
Maximum supply voltage	V _{CCMAX}	18	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	Min.	Typ.	Max.	Unit
Supply voltage	V _{CC}	4.5	–	13.2	V

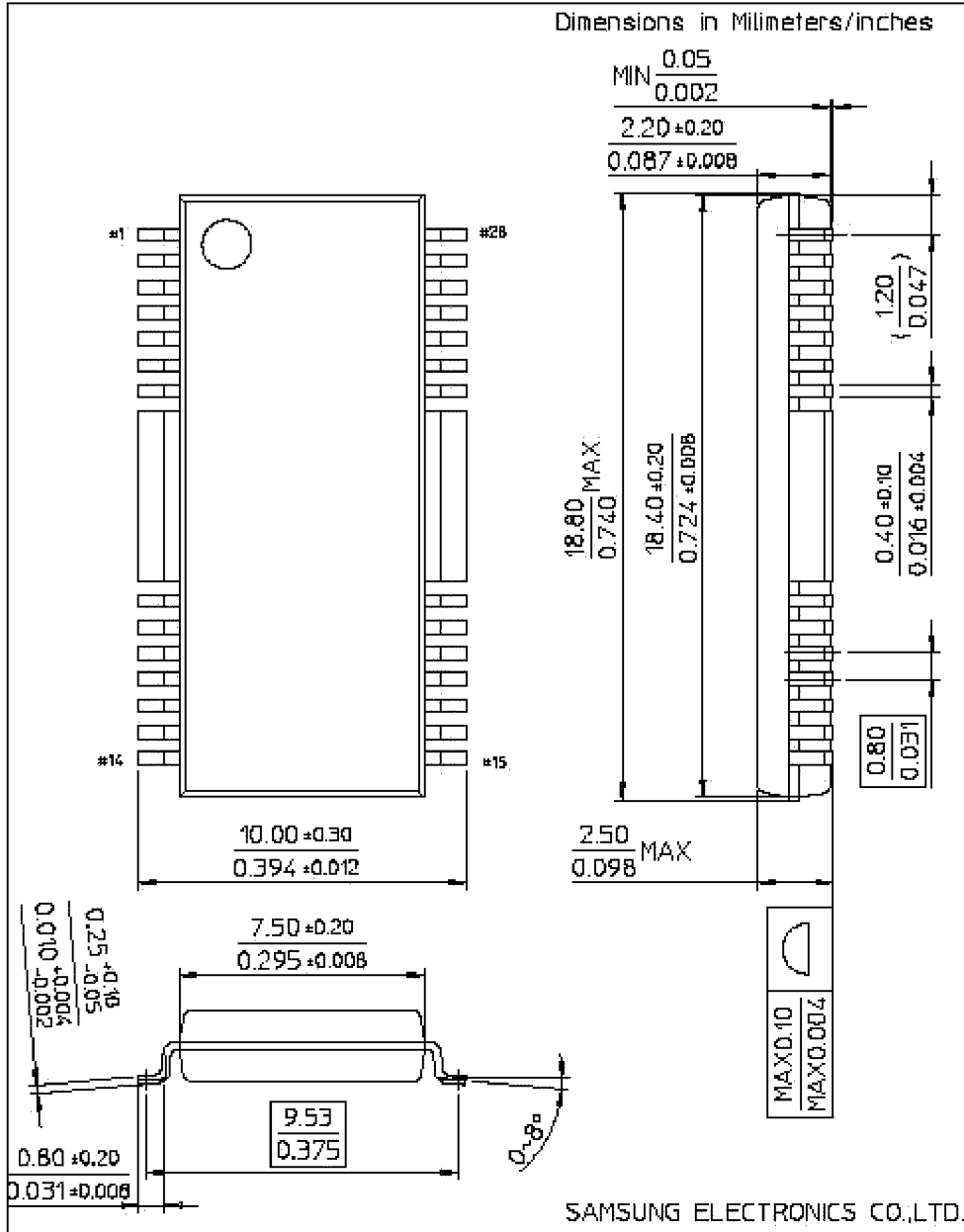
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $T_a=25^\circ\text{C}$, $V_{CC}=5\text{V}$, $V_M=12\text{V}$)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Quiescent current	I_{CC}	$V_{IN}=0\text{V}$	–	8	12	mA
Mute on current	I_{MUTE}	Mute pin=GND	–	1	3	mA
Mute on voltage	V_{MON}	–	–	–	0.5	V
Mute off voltage	V_{MOFF}	–	2	–	–	V
DRIVE PART						
Output offset voltage	V_{OO}	$V_{IN}=2.5\text{V}$	–40	–	+40	mV
Maximum output voltage1 (High level)	V_{OM1}	$V_{CC}=8\text{V}$, $R_L=8\Omega$ (CH1,3,4)	5	5.7	–	V
Maximum output voltage2 (Low level)	V_{OM2}	$V_{CC}=8\text{V}$, $R_L=8\Omega$ (CH1,3,4)	–	–5.7	–5	V
Closed loop voltage gain1	G_{VC1}	$f=1\text{kHz}$, $V_{IN}=0.1\text{V}_{RMS}$ (CH1,4)	9.5	11.5	13.5	dB
Closed loop voltage gain2	G_{VC2}	$f=1\text{kHz}$, $V_{IN}=0.1\text{V}_{RMS}$ (CH3)	13.0	15.0	17.0	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 / μs
TRAY DRIVE PART ($V_{CC} = VM34 = 8\text{V}$, $R_L = 45\Omega$)						
Input high level voltage	V_{IH}	–	2	–	–	V
Input low level voltage	V_{IL}	–	–	–	0.5	V
Output voltage1	V_{O1}	$V_{CC}=8\text{V}$, $V_{CTL}=6.5\text{V}$	5.2	6	6.8	V
Output voltage2	V_{O2}	$V_{CC}=13\text{V}$, $V_{CTL}=4.5\text{V}$	7.5	8.5	9.5	V
Output load regulation	ΔV_{RL}	–	–	300	700	mV
Output offset voltage1	V_{OO1}	$V_{IN}=5\text{V}$	–40	–	+40	mV
Output offset voltage2	V_{OO2}	$V_{IN}=5\text{V}$	–40	–	+40	mV
GENERAL OF AMP PART						
Input offset voltage	V_{OFOP}	–	–20	–	+20	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}	$V_{CC}=5\text{V}$, $R_L=50\Omega$	10	20	–	mA
Output source current	I_{SOURCE}	$V_{CC}=5\text{V}$, $R_L=50\Omega$	10	20	–	mA
Open loop voltage gain	G_{VO}	$V_{IN}=-75\text{dB}$, $f=1\text{kHz}$	–	75	–	dB
Repple rejection ratio	RR_{OP}	$V_{IN}=-20\text{dB}$, $f=120\text{Hz}$	–	65	–	dB
Slew rate	SR_{OP}	$f=120\text{kHz}$, 2V_{p-p}	–	1	–	V / μs
Common mode rejection ratio	CMRR	$V_{IN}=-20\text{dB}$, $f=1\text{kHz}$	–	80	–	dB
Common mode input range	V_{ICM}	$V_{CC}=8\text{V}$	–0.3	–	6.8	V

PACKAGE DIMENSION

28-SSOPH-375



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