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LM628/LM629 Precision Motion Controller
 Check for Sample: LM628, LM629

FEATURES

- 32-bit Position, Velocity, And Acceleration Registers
- Programmable Digital PID Filter with 16-bit Coefficients
- Programmable Derivative Sampling Interval 8- or 12-bit DAC Output Data (LM628)
- 8-bit Sign-magnitude PWM Output Data (LM629)
- Internal Trapezoidal Velocity Profile Generator
- Velocity, Target Position, and Filter Parameters may be Changed During Motion
- Position and Velocity Modes of Operation
- Real-time Programmable Host Interrupts
- 8-bit Parallel Asynchronous Host Interface
- Quadrature Incremental Encoder Interface with Index Pulse Input
- Available in a 28-pin Dual In-line Package or a SOIC-24 Package (LM629 Only)

DESCRIPTION

The LM628/LM629 are dedicated motion-control processors designed for use with a variety of DC and brushless DC servo motors, and other servomechanisms which provide a quadrature incremental position feedback signal. The parts perform the intensive, real-time computational tasks required for high performance digital motion control. The host control software interface is facilitated by a high-level command set. The LM628 has an 8-bit output which can drive either an 8-bit or a 12-bit DAC. The components required to build a servo system are reduced to the DC motor/actuator, an incremental encoder, a DAC, a power amplifier, and the LM628. An LM629-based system is similar, except that it provides an 8-bit PWM output for directly driving H-bridges. The parts are fabricated in NMOS and packaged in a 28-pin dual in-line package or a SOIC-24 package (LM629 only). Both 6 MHz and 8 MHz maximum frequency versions are available with the suffixes -6 and -8, respectively, used to designate the versions. They incorporate an SDA core processor and cells designed by SDA.

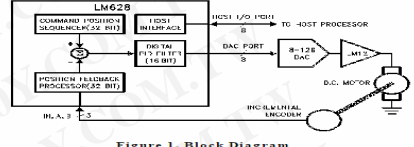


Figure 1. Block Diagram

LM628, LM629

LM628C, LM629C, REVISED MARCH 2011
 CONNECTION DIAGRAMS

LM628N			LM629N			LM629M		
1	28	V _{DD}	1	28	V _{DD}	1	24	V _{DD}
2	27	RD	2	27	RD	2	20	RD
3	26	CS	3	26	CS	3	19	RD
4	25	DC0	4	25	DC0	4	18	RD
5	24	DC1	5	24	DC1	5	17	RD
6	23	DC2	6	23	DC2	6	16	RD
7	22	DC3	7	22	DC3	7	15	RD
8	21	DC4	8	21	DC4	8	14	RD
9	20	DC5	9	20	DC5	9	13	RD
10	19	DC6	10	19	DC6	10	12	RD
11	18	DC7	11	18	DC7	11	11	RD
12	17	DC8	12	17	DC8	12	10	RD
13	16	PS	13	16	PS	13	9	RD
14	15	WR	14	15	WR	14	8	RD
15	14	RD	15	14	RD	15	7	RD
16	13	RD	16	13	RD	16	6	RD
17	12	RD	17	12	RD	17	5	RD
18	11	RD	18	11	RD	18	4	RD
19	10	RD	19	10	RD	19	3	RD
20	9	RD	20	9	RD	20	2	RD
21	8	RD	21	8	RD	21	1	RD
22	7	RD	22	7	RD			
23	6	RD	23	6	RD			
24	5	RD	24	5	RD			
25	4	RD	25	4	RD			
26	3	RD	26	3	RD			
27	2	RD	27	2	RD			
28	1	RD	28	1	RD			

Figure 2. See Package Number DW or X

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.
Absolute Maximum Ratings (1) (2)
 Voltage at Any Pin with Respect to GND: -0.5V to +7.0V
 Ambient Storage Temperature: -65°C to +150°C
 Lead Temperature (Soldering, 35°C): 260°C
 Maximum Power Dissipation (TA = 85°C): 600 mW
 ESD Tolerance: IEC 61000-4-2 (ESD) = 1.5kV

(1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications do not apply when operating the device beyond the above operating limits. For more information on this topic, see the Absolute Maximum Ratings section of the LM628/LM629 datasheet.
 (2) For more information on this topic, see the Absolute Maximum Ratings section of the LM628/LM629 datasheet.

Operating Ratings
 Temperature Range: -40°C to +85°C
 Clock Frequency: LM628N-6, LM629N-6, LM629M-6: 1.0 MHz - FCLK = 6.0 MHz
 LM628N-8, LM629N-8, LM629M-8: 1.0 MHz - FCLK = 8.0 MHz
 V_{DD} Range: 4.5V - V_{DD} = 5.5V

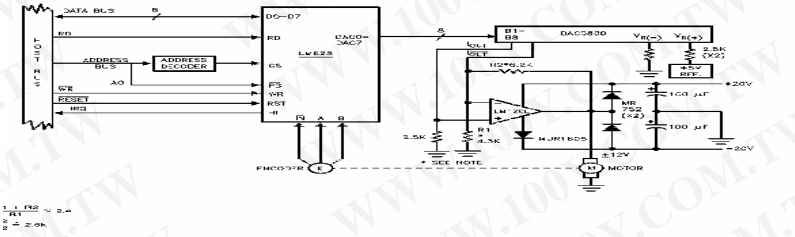


Figure 13. Host Interface and Minimum System Configuration

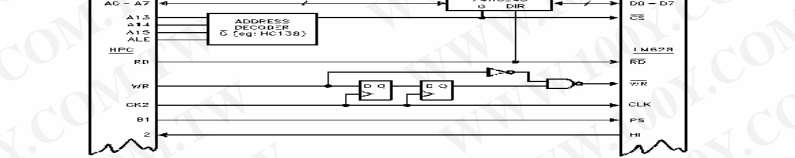


Figure 14. LM628 and HPC Interface

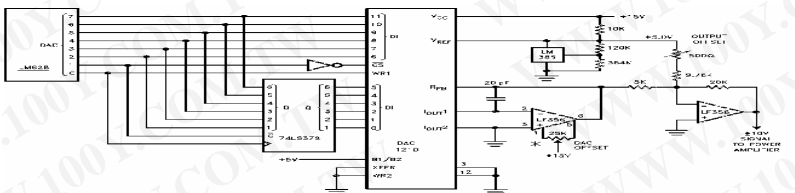


Figure 15. Interfacing a 12-Bit DAC and LM628

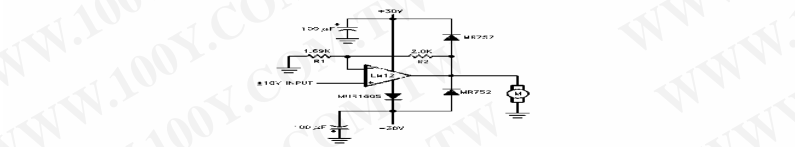


Figure 16. Driving a Motor with the LM12 Power Op Amp

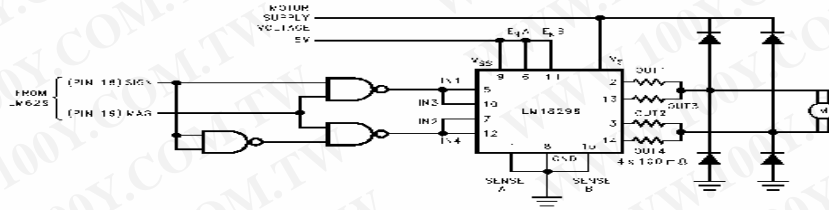
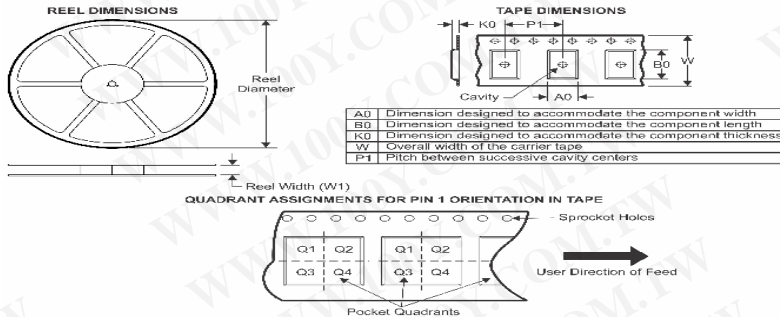


Figure 17. PWM Drive for Brush/Commutator Motors



Figure 18. Typical Balanced-Line Encoder Input Circuit

TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
LM629MX-SNOPB	SOIC	DW	24	1000	330.0	24.4	10.8	15.9	3.2	12.0	24.0	Q1