

DESCRIPTION

The PT5130 is a single 10-bit DAC with 120mA output current sink capability. It features an internal reference and operates from a single 2.3V to 5.5V supply. The DAC is controlled via a 2-wire (I²C compatible) serial interface that operates at clock rates up to 400KHz.

The PT5130's unique and proprietary Slope Control Modes allow the user to customize the output transient response thereby overcoming mechanical ringing associated with reduced form factor voice coil motors (VCMs).

The PT5130 incorporates a power-on reset circuit, which ensures that DAC output powers up to 0V and remains there until a valid write takes place. It has a power-down feature that reduces the current consumption of the device to 1 μ A maximum.

The PT5130 is designed for autofocus, image stabilization, and optical zoom applications in camera phones, digital still cameras, and camcorders.

The PT5130 also has many industrial applications, such as controlling temperature, light, and movement, over the range -40 $^{\circ}$ C to +85 $^{\circ}$ C without derating.

The I²C address for the PT5130 is 0 x 18h.

Xshutdown pin about PT5130:

XShutdown pin is active low. (Hard Shutdown mode at V_{XSHUTDOWN}=0V)

STRUCTURE

- Silicon CMOS IC

FEATURES

- 120mA current sink
- 2-wire (I²C -compatible) 1.8V serial interface
- 10-bit resolution DAC
- Integrated current sense resistor
- Selectable output slope control
- 2.3V to 5.5V power supply
- Guaranteed monotonic over all codes
- Power-down to 0.5 μ A typical
- Internal reference
- Built-in UVLO shutdown circuit
- Power-down function
- Power-on reset
- Available in 2 x 3 array, 0.809mm x 1.367mm x 0.395mm WLCSP-6 packages

APPLICATIONS

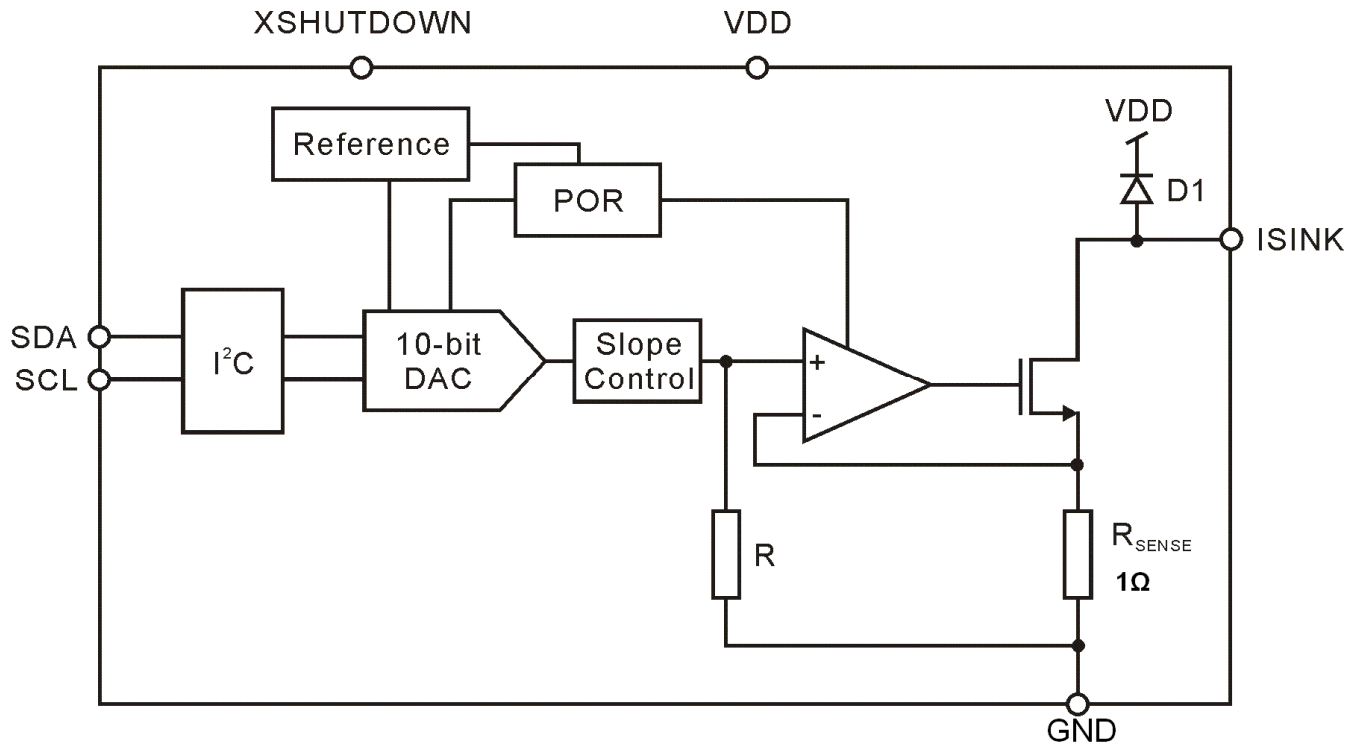
CONSUMER APPLICATIONS

- Lens autofocus
- Image stabilization
- Optical zoom
- Shutters
- Iris/exposure
- Neutral density (ND) filters
- Lens covers
- Camera phones
- Digital still cameras
- Camera modules
- Digital video cameras/camcorders
- Camera-enabled devices
- Security cameras
- Web/PC cameras

INDUSTRIAL APPLICATIONS

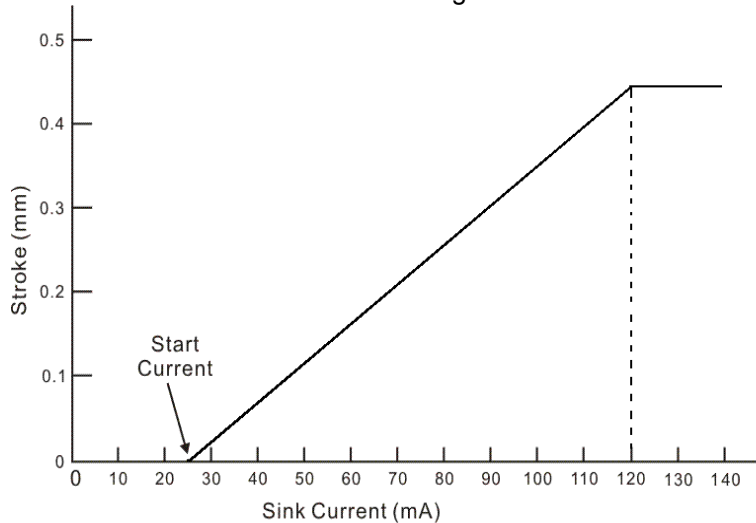
- Heater controls
- Fan controls
- Cooler (Peltier) controls
- Solenoid controls
- Valve controls
- Linear actuator controls
- Light controls
- Current loop controls

BLOCK DIAGRAM



APPLICATIONS NOTE

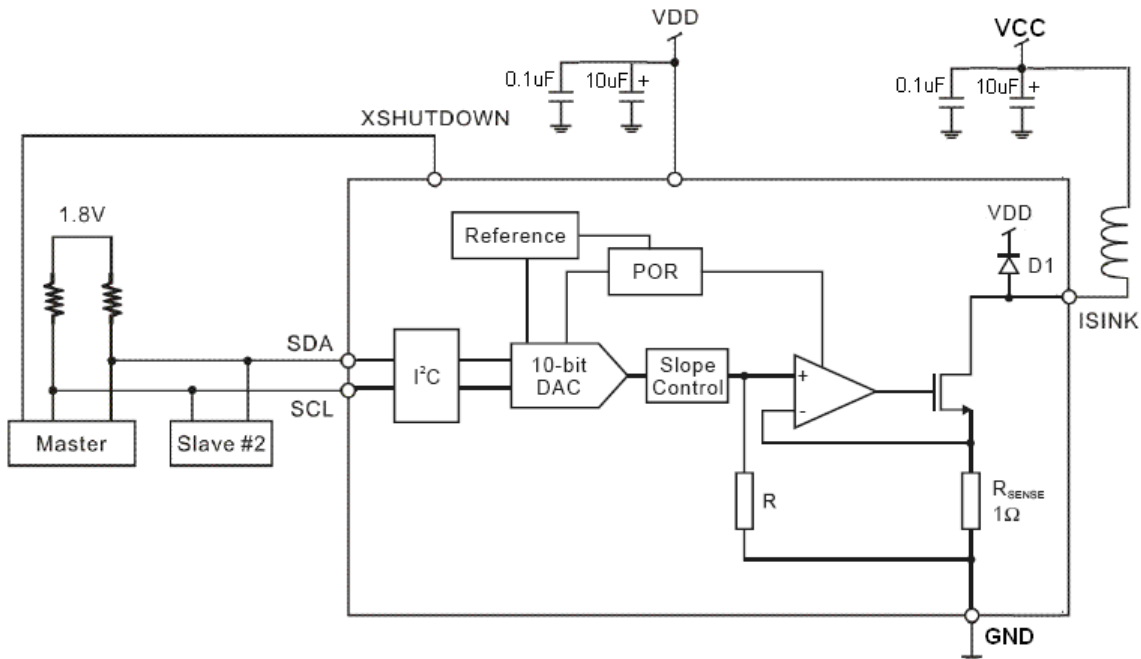
The PT5130 is designed to drive both spring-preloaded and nonspring linear motors used in applications such as lens autofocus, image stabilization, or optical zoom. The operation principle of the spring-preloaded motor is that the lens position is controlled by the balancing of a voice coil and spring. Following figure shows the transfer curve of a typical spring-preloaded linear motor for autofocus. The key points of this transfer function are displacement or stroke, which is the actual distance the lens moves in mm and the current through the motor in mA.



A start current is associated with spring-preloaded linear motors, which is effectively a threshold current that must be exceeded for any displacement in the lens to occur. The start current is usually 20mA or greater, the rated stroke or displacement is usually 0.25mm to 0.4mm, and the slope of the transfer curve is approximately 10 μ m/mA or less.

The PT5130 is designed to sink up to 120mA, which is more than adequate for available commercial linear motors or voice coils. Another factor that makes the PT5130 the ideal solution for these applications is the monotonicity of the device, which ensures that lens positioning is repeatable for the application of a given digital word.

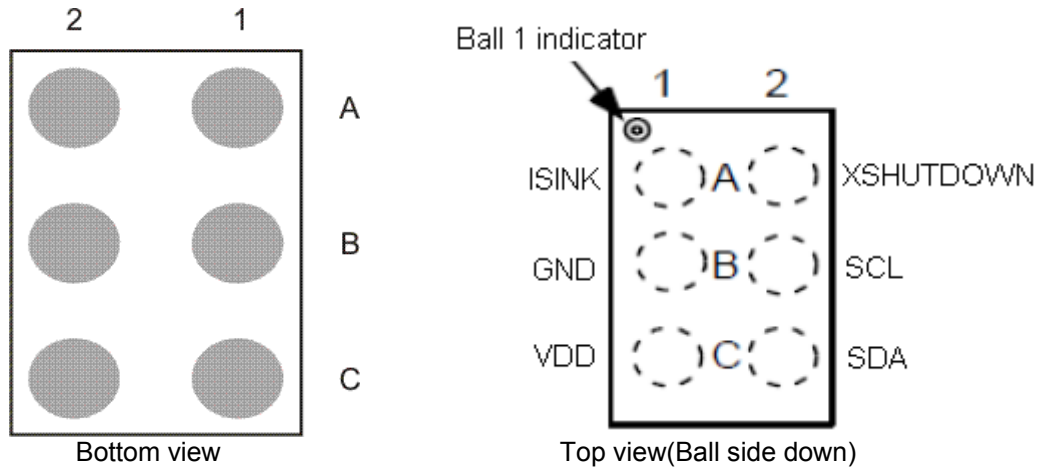
Following figure shows a typical application circuit for the PT5130.



ORDER INFORMATION

Valid Part No.	Package Type	Top Code
PT5130	WLCSP	-

PIN CONFIGURATION



PIN DESCRIPTION

Ball Name	Description	Ball No.
I _{SINK}	Output current sink	A1
Xshutdown	Power down, asynchronous power down signal	A2
GND	Ground pin (Power/Analog/Digital ground)	B1
SCL	I ² C interface signal	B2
VDD	Power supply	C1
SDA	I ² C interface signal	C2

IMPORTANT NOTICE

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