

### Features

- Wide Operating Voltage Range: 3V~8V
- Low noise output without external capacitor filtering
- Linearity  $\pm 5\%$
- Temperature Grade 1:  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$   
Ambient Operating Temperature Range
- Device HBM ESD Classification Level Class3B
- SOT23-3 package

### Applications

- Potential Control
- Precise Position Detection
- Game Handle
- Flow Meter

### General Description

The XL596 is a linear Hall sensor optimized for wide voltage and temperature ranges, with an output voltage that varies proportionally to the supply voltage, and proportional to the strength of the magnetic field it senses. The XL596's output voltage without magnetic field defaults to half of the supply voltage, the chip's typical operating voltage is 5.0V, with an ultimate withstand voltage of up to 50V, and a typical value of sensitivity of 2.8mV/Gs. The operating temperature range supports  $-40^{\circ}\text{C}$ ~ $125^{\circ}\text{C}$ . It is widely used in consumer and industrial control applications.

The XL596 integrates high precision current source, temperature compensation module, Hall array, amplifier, driver module and other circuit modules, which provides high linearity and strong immunity to electromagnetic interference over the full voltage range and full temperature range.

### Typical application schematic

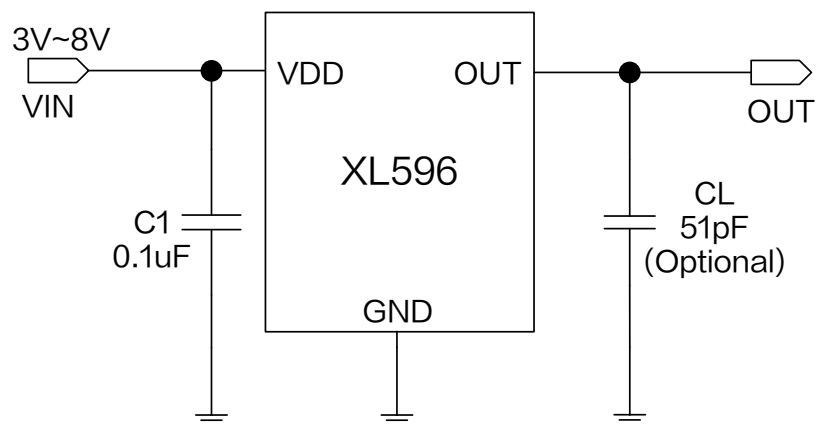


Figure1. XL596 Typical application schematic

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## Pin Configurations

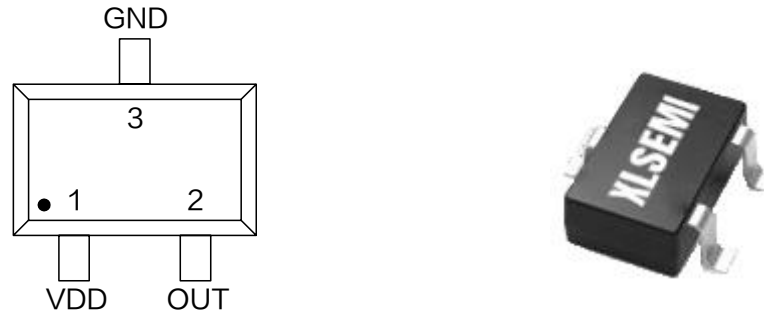


Figure2. Pin Configuration of XL596

Table 1 Pin Description

Pin Number	Pin Name	Description
1	VDD	Supply Voltage Input Pin. XL596 operates from 3V to 8V DC voltage.
2	OUT	Open Collector Output Pin, requires a resistor pull-up.
3	GND	Ground pin.

## Ordering Information

Order Information	Marking ID	Package Type	Eco Plan	Packing Type Supplied As
XL596	XL596	SOT23-3	RoHS & HF	3000 Units Per Reel

### Function Block

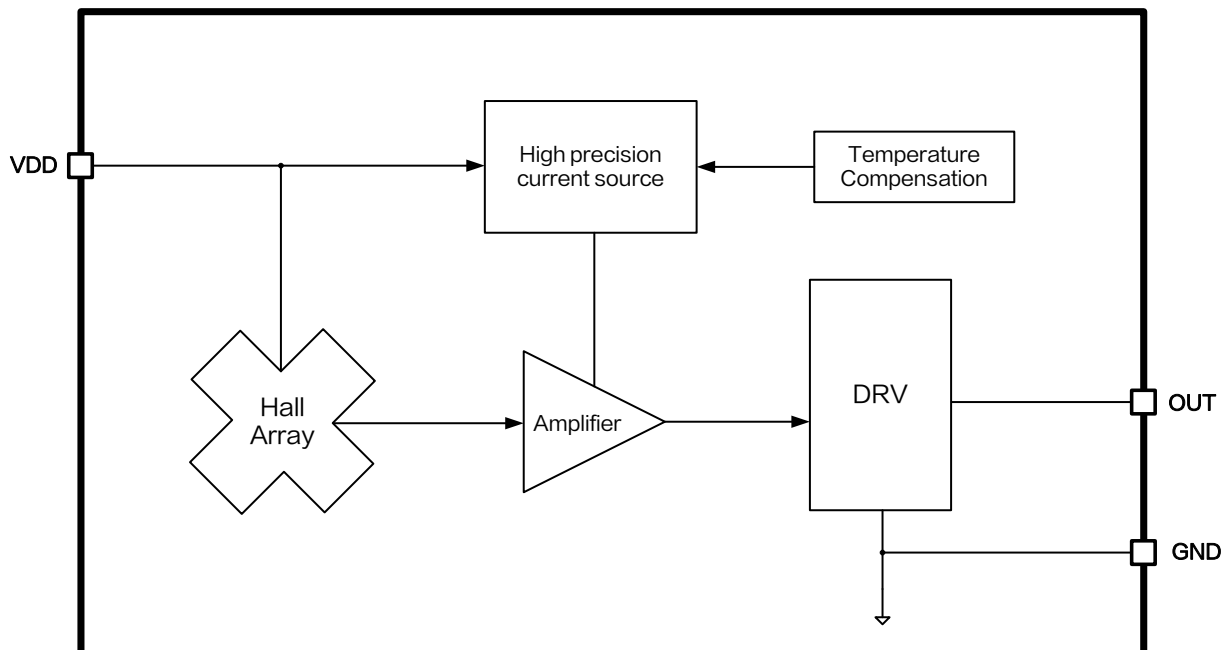


Figure3. Function Block Diagram of XL596

### Absolute Maximum Ratings ( Note1 )

Parameter	Symbol	Value	Unit
Input Voltage	$V_{DD}$	-0.3 ~ 50	V
Output Pin Voltage	$V_{OUT}$	-0.3 ~ 40	V
Output Current	$I_{OUT}$	1	mA
Thermal Resistance (SOT23-3) (Junction to Ambient, No Heatsink, Free Air)	$R_{JA}$	200	°C/W
Operating Temperature	$T_A$	-40 ~ 125	°C
Operating Junction Temperature	$T_J$	-40 ~ 150	°C
Storage Temperature	$T_{STG}$	-65 ~ 150	°C
Lead Temperature (Soldering, 10 sec)	$T_{LEAD}$	260	°C
ESD (HBM)		>8000	V

**Note1:** Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

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### XL596 Electrical Characteristics ( Note2 )

$T_A = 25^\circ\text{C}$ ,  $V_{DD} = 5\text{V}$ ; system parameters test circuit figure1, unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operation Voltage	$V_{DD}$		3		8	V
Operation Current	$I_{DD}$			6.5	10	mA
Output Load Resistance	$R_L$		2.5			k $\Omega$
Output Voltage Range	$V_{OUT(H)}$		4.0	4.2		V
	$V_{OUT(L)}$			0.8	1.0	V
Static Output Voltage	$V_{OUT(Q)}$	$B=0\text{Gs}$ , $R_L=10\text{k}\Omega$	2.4	2.5	2.6	V
Sensitivity	SENS		2.4	2.8	3.2	mV/Gs
Linearity	Lin		-5		5	%
Response Time	$t_r$			1		$\mu\text{s}$

**Note2 :** A south pole near the marked side of the package is a positive magnetic field.

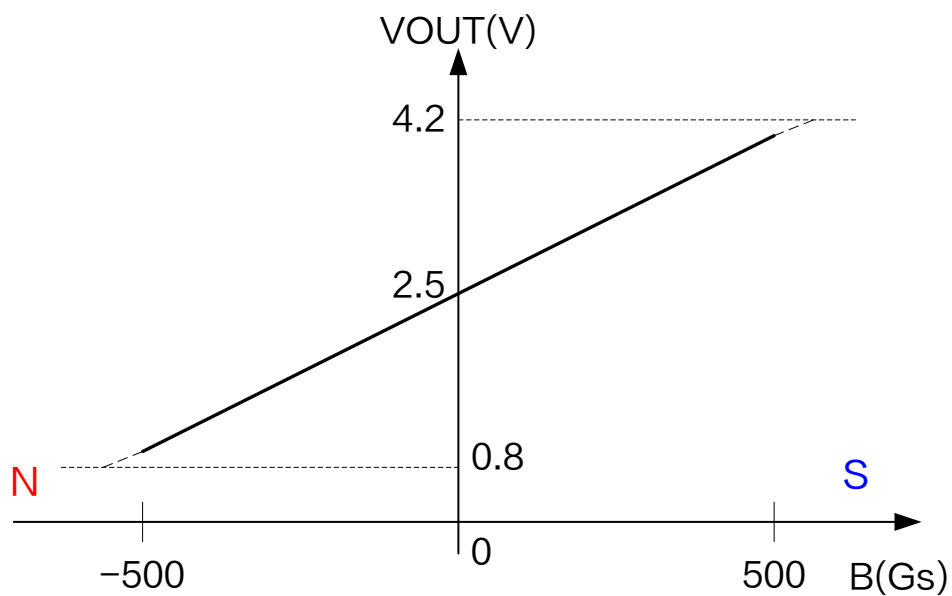


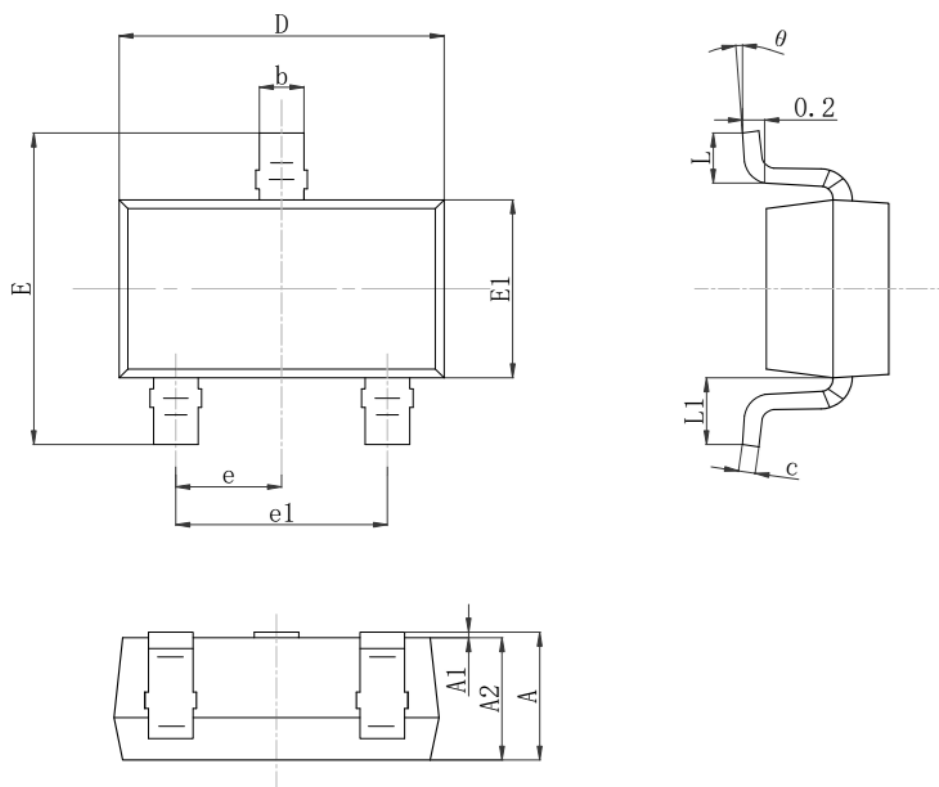
Figure4. XL596 Output characteristic curve

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### Package Information

SOT23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.05	1.25	0.041	0.049
A1	0.00	0.10	0.000	0.004
A2	1.05	1.15	0.041	0.045
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.82	3.05	0.111	0.120
E1	1.50	1.70	0.059	0.067
E	2.65	2.95	0.104	0.116
e	0.95 REF.		0.037 REF.	
e1	1.80	2.00	0.071	0.079
L	0.30	0.60	0.012	0.024
L1	0.57	0.63	0.022	0.025
$\theta$	0°	8°	0°	8°

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