

# EPS Electric Power Steering

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# EPS Electric Power Steering

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## VISHAY COMPONENTS USED:

- o Power MOSFETs
- o Diodes
- o Capacitors
- o Inductors
- o Transient Protection Devices
- o ESD Protection Devices
- o Reverse Polarity Protection Devices
- o Precision Resistors

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## Application Overview

Electric power assisted steering (EPS) uses an electric motor to provide directional control to the driver, without any hydraulic systems. Sensors detect the motion and torque of the steering column and a computer module applies assistive power via an electric motor coupled directly to either the steering gear or steering column. Most EPS systems have variable assist, which provides more assistance as the speed of a vehicle decreases, and less assistance from the system during high-speed situations. This functionality requires a delicate balance of power and control that has only been available in recent years. In the event of a component failure, a mechanical linkage such as a rack and pinion serves as a back-up in a manner similar to that of hydraulic systems. The EPS system is gradually replacing the hydraulic steering system and is likely to soon become mainstream among automotive manufacturers. <br/>VISHAY's broad product line includes components for power supply (SMPS), input signal conditioning, power stage, and vehicle communication functions.

## EPS Electric Power Steering : BLDC Motor, Position Sensor

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### Transmissive Optical Sensor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TCUT1350X01</a>		Dual Channel Transmissive optical Sensor		5.5x4x4	AECQ101

## EPS Electric Power Steering : BLDC Motor, Temperature Sensor

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### NTC Thermistor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">NTCLE...E3...SB</a>		2-Point Mini Chip Sensor, Flexible Lead	Small Diameter High stability over long lifetime		AECQ200

## EPS Electric Power Steering : Input Conditioning, ESD-Protection

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### ESD Diode

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SMF12A</a>		ESD Protection Diode	200W peak pulse Power	'SMF	AECQ101

### MLCC

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31X</a>		Automotive, RoHS qualified MLCC		SMD 0204 to 1812	AECQ200

## EPS Electric Power Steering : Input Conditioning, Filter

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MLCC

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31X</a>		Automotive, RoHS qualified MLCC		SMD 0204 to 1812	AECQ200

## EPS Electric Power Steering : Power Stage, DC Link Current Sensor

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### Resistor Array

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">ACAS 0612 AT</a>		Precision Thin Film Resistor Array	Relative TCR = 5ppm/K Relative Tol = 0.05%	SMD 0612	AECQ200

### Shunt Resistor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">WSLP4026</a>		Power Metal Strip Very High Power	R = 0.0003Ohm P70 = 7W	SMD4026	AEC Q200

## EPS Electric Power Steering : Power Stage, EMI - Filter

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### Aluminum Capacitor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">146CTI</a>		High Temperature, Low Impedance Aluminium Electrolytic Capacitor	220uF...4700uF 6000h@125°C	8x8x10 to 18x18x21	AEC Q200

### Inductor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">IHLP-5050FD-5A</a>		Low Profile, High Current IHLP Inductor	0.22uH to 22uH 68A to 5.5A	13.5x12.9x6x4	AEC Q200

### MLCC

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31X</a>		Automotive, RoHS qualified MLCC		SMD 0204 to SMD 1812	AECQ200



## EPS Electric Power Steering : Power Stage, Low Side Current Sensor

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### Shunt Resistor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">WSL2512...18</a>		High Power Power Metal Strip Resistor	R = 0.0005Ohm P70 = 2W	SMD 2512	AECQ200

## EPS Electric Power Steering : Power Stage, Motor Switch

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### MOSFET

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SQJQ100EL</a>		Automotive N-Channel 40-V (D-S) 175°C MOSFET	RDSon = 1.2mOhm ID = 160A	PowerPAK 8x8L	AECQ101

## EPS Electric Power Steering : Power Stage, Reverse Polarity Protection

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### MOSFET

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SQM120P04-04L</a>		Automotive P-Channel 40-V (D-S) 175°C MOSFET	RDSon = 4.0mOhm ID = 120A	PPAK 8x8L	AECQ101

## EPS Electric Power Steering : Power Stage, Transient Protection

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### TVS Diode

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TPSMP6.8 thru TPSMP43A</a>		SMT PAR Transient Voltage Suppressor	400W	SMP	AECQ101

## EPS Electric Power Steering : Power Supply, EMI-Filter

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MLCC

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31X</a>		Automotive, RoHS qualified MLCC		SMD 0204 to 1812	AECQ200

## EPS Electric Power Steering : Power Supply, Reverse Polarity Protection

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### MOSFET

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SQ3419EV</a>		Automotive P-Channel 40-V (D-S) 175°C MOSFET	RDSon = 0.058Ohm ID = 6.9A	'TSOP-6	AECQ101

### Schottky Diode

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">V8PAL45</a>		Trench MOS Barrier Schottky Rectifier	IF = 8.0A VRR = 45V	'SMPA	AEC Q101

## EPS Electric Power Steering : Power Supply, SMPS buck converter

### Aluminum Capacitor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">146CTI</a>		High Temperature, Low Impedance Aluminium Electrolytic Capacitor	6000h@125°C 220uF...4700uF	8x8x10 to 18x18x21	AEC Q200

### Inductors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">IHLP1616BZ-A1</a>		Low Profile; High Current; IHL P Inductor	0,1µH...2,2µH, Idc=35A...6A	4.45x4.06x2.0	AEC Q200

### MOSFET

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SQ2318AES</a>		Automotive N-Channel 40-V (D-S) 175°C MOSFET	RDSon = 0.0310hm ID = 8A	'SOT-23	AECQ101

### Schottky Diode

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VSSAF3L45</a>		Trench MOS Barrier Schottky Rectifier	IF = 3.0A VRR = 45V	'Slim SMA	AEC Q101

### Shunt Resistor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">RCWE</a>		Thick Film Surface Mount Chip Resistor	R = 0.010hm to 0.9760hm	SMD 0204 to 2512	AECQ200

## EPS Electric Power Steering : Power Supply, Transient Protection

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### TVS Diode

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TPSMP6.8</a> <a href="#">thru TPSMP43A</a>		SMT PAR Transient Voltage Suppressor	400W	SMP	AECQ101



## EPS Electric Power Steering : Steering Wheel, Position Sensor

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### Transmissive Optical Sensor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TCUT1350X01</a>		Dual Channel Transmissive Optical Sensor		5.5x4x4	AECQ101