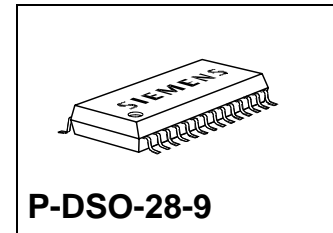
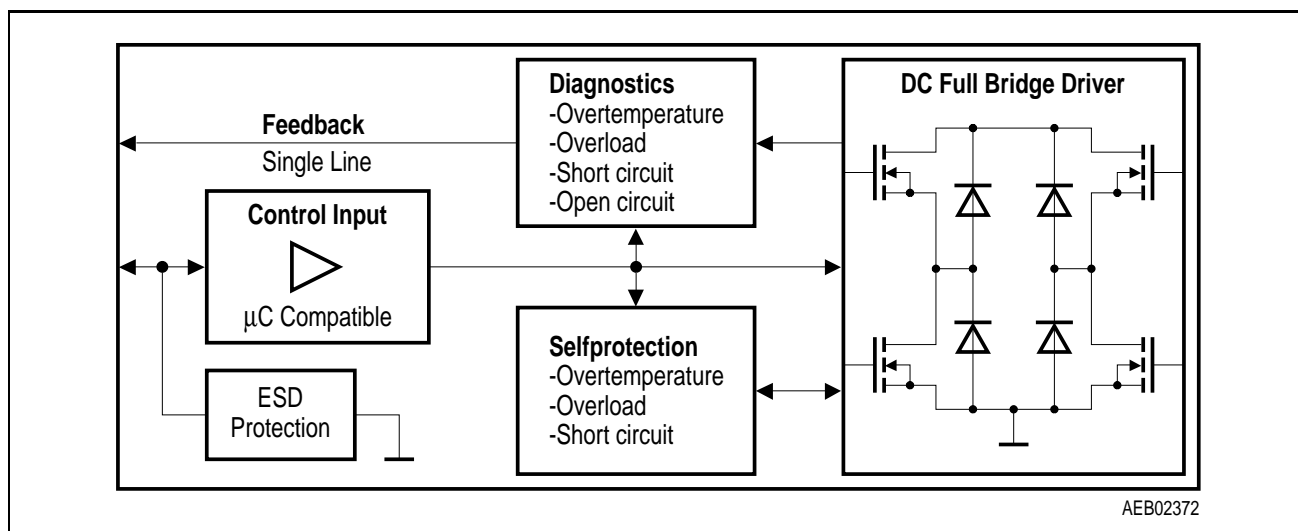


### Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low  $R_{DS(ON)}$  @ 25 °C :  
High-side switch: typ. 165 mΩ  
Low-side switch: typ. 55 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- Load/GND-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



### Block Diagram



Type	Ordering Code	Package
BTS 770	Q67007-A9254	P-DSO-28-9

■ SMD = Surface Mounted Device

### Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	$V_{UVOFF}$	36	V

### Absolute Maximum Ratings

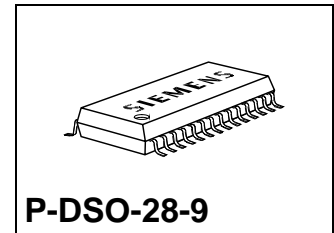
Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	43	V
Junction temperature	$T_j$	- 40	150	°C

### Electrical Characteristics

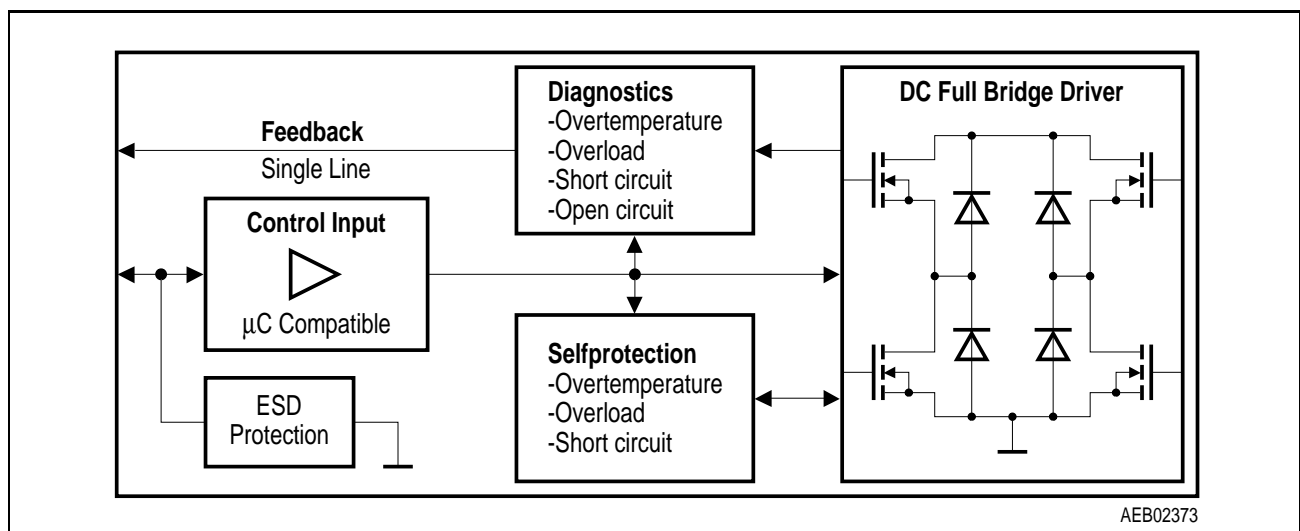
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	35	$\mu\text{A}$	$V_S = 13.2 \text{ V}$
$R_{DSO}$ ; Bridge in Path	$R_{DSOP}$	-	200	500	$\text{m}\Omega$	-
$R_{DSON}$ ; High-Side-Switch	$R_{DSONH}$	-	165	220	$\text{m}\Omega$	$T_j = 25 \text{ }^\circ\text{C}$
$R_{DSON}$ ; Low-Side-Switch	$R_{DSONL}$	-	45	65	$\text{m}\Omega$	$T_j = 25 \text{ }^\circ\text{C}$
Short circuit output current	$I_{SCP}$	5.5	-	9	A	$T_j = 85 \text{ }^\circ\text{C}$
Open load detection current	$I_{OCD}$	10	-	200	$\text{mA}$	-
Pull-down resistance	$R_{O1,2}$	4	-	30	$\text{k}\Omega$	-
Undervolt. switch ON voltage	$V_{UVON}$	-	-	7	V	$V_S$ increasing
Undervolt. switch OFF voltage	$V_{UVOFF}$	3.5	-	-	V	$V_S$ decreasing

### Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low  $R_{\text{DS(ON)}}$  @ 25 °C :  
High-side switch: typ. 85 mΩ  
Low-side switch: typ. 40 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- Load/GND-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



### Block Diagram



Type	Ordering Code	Package
BTS 771	Q67007-A9274	P-DSO-28-9

■ SMD = Surface Mounted Device

### Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	$V_{UVOFF}$	36	V

### Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	43	V
Junction temperature	$T_j$	- 40	150	°C

### Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	35	μA	$V_S = 13.2$ V
$R_{DSON}$ ; Bridge in Path	$R_{DSONP}$	-	-	300	mΩ	-
$R_{DSON}$ ; High-Side-Switch	$R_{DSONH}$	-	85	110	mΩ	$T_j = 25$ °C
$R_{DSON}$ ; Low-Side-Switch	$R_{DSONL}$	-	40	55	mΩ	$T_j = 25$ °C
Short circuit output current	$I_{SCP}$	7	-	18	A	$T_j = 85$ °C
Open load detection current	$I_{OCD}$	20	-	400	mA	-
Pull-down resistance	$R_{O1,2}$	4	-	30	kΩ	-
Undervolt. switch ON voltage	$V_{UVON}$	-	-	7	V	$V_S$ increasing
Undervolt. switch OFF voltage	$V_{UVOFF}$	3.5	-	-	V	$V_S$ decreasing

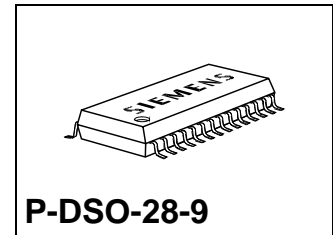
## TRILITHIC™

BTS 774

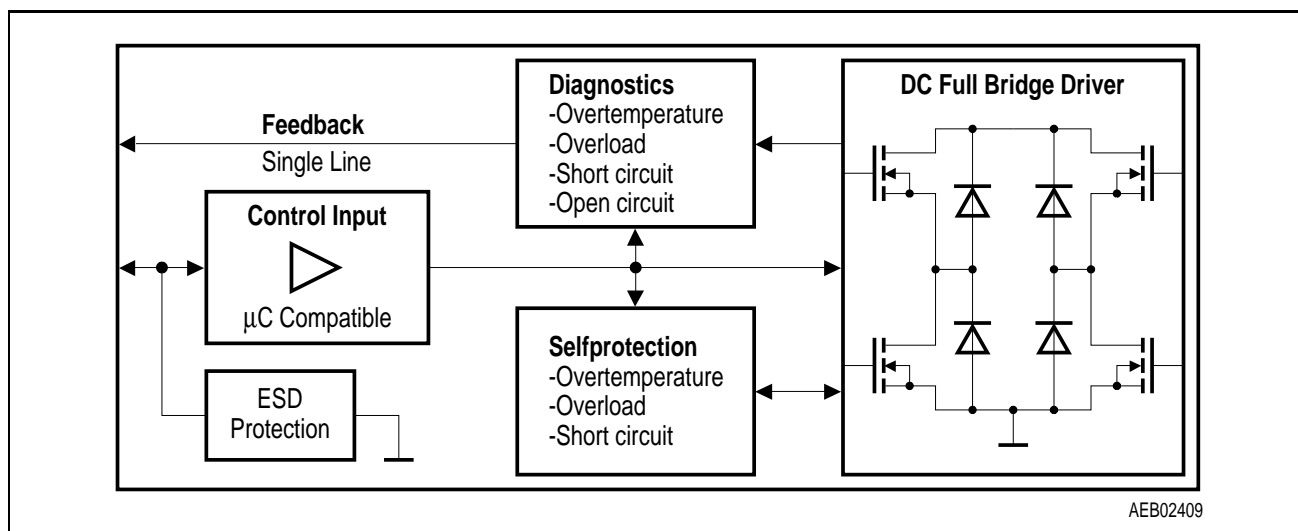
### Preliminary Data

#### Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low  $R_{DS(ON)}$  @ 25 °C :  
High-side switch: typ. 165 mΩ  
Low-side switch: typ. 55 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- **FULL**-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



#### Block Diagram



Type	Ordering Code	Package
BTS 774	on request	P-DSO-28-9

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	$V_{UVOFF}$	36	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	43	V
Junction temperature	$T_j$	- 40	150	°C

## Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	50	μA	$V_S = 13.2$ V
$R_{DSON}$ ; Path in Bridge Config.	$R_{DSONP}$	-	200	500	mΩ	-
$R_{DSON}$ ; High-Side-Switch	$R_{DSONH}$	-	165	220	mΩ	$T_j = 25$ °C
$R_{DSON}$ ; Low-Side-Switch	$R_{DSONL}$	-	45	60	mΩ	$T_j = 25$ °C
Short circuit output current	$I_{SCP}$	5.5	-	9	A	$T_j = 85$ °C
Pull-down resistance	$R_{O1,2}$	4	-	30	kΩ	-
Undervolt. switch ON voltage	$V_{UVON}$	-	-	7	V	$V_S$ increasing
Undervolt. switch OFF voltage	$V_{UVOFF}$	3.5	-	-	V	$V_S$ decreasing

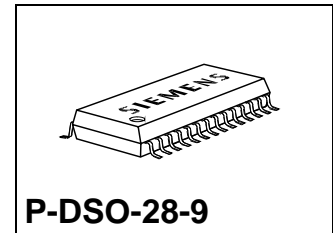
## TRILITHIC™

BTS 775

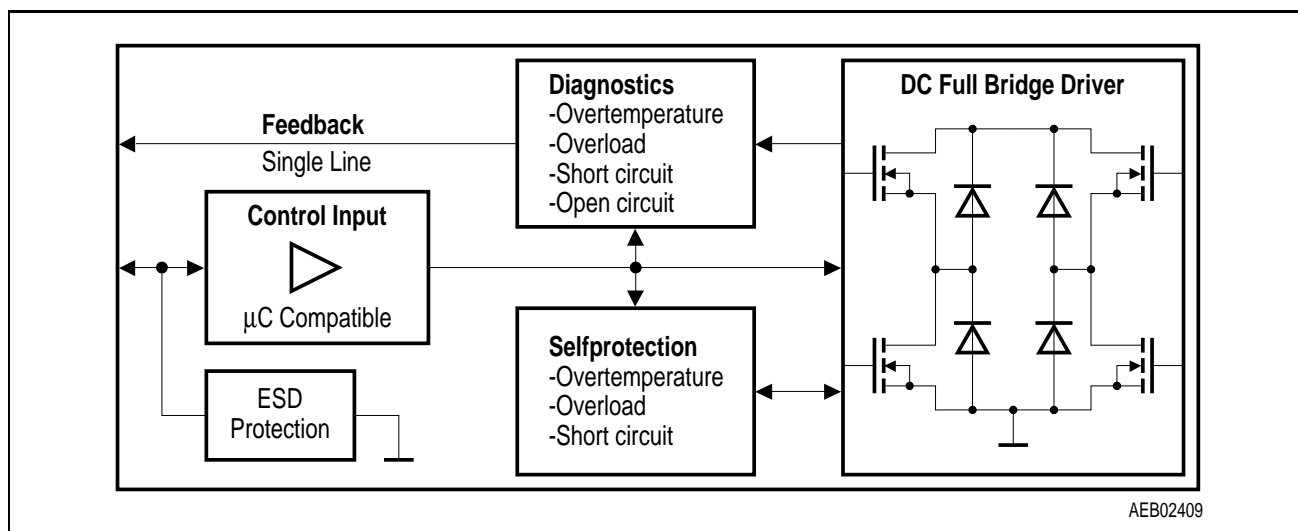
### Preliminary Data

#### Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low  $R_{\text{DS(on)}}$  @ 25 °C :  
High-side switch: typ. 85 mΩ  
Low-side switch: typ. 45 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- **FULL**-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



#### Block Diagram



Type	Ordering Code	Package
BTS 775	on request	P-DSO-28-9

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	$V_{UVOFF}$	36	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	43	V
Output current	$I_Q$			A
Junction temperature	$T_j$	- 40	150	°C

## Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	50	$\mu$ A	$V_S = 13.2$ V
$R_{DSON}$ ; Path in Bridge Config.	$R_{DSONP}$	-	-	320	m $\Omega$	-
$R_{DSON}$ ; High-Side-Switch	$R_{DSONH}$	-	85	110	m $\Omega$	$T_j = 25$ °C
$R_{DSON}$ ; Low-Side-Switch	$R_{DSONL}$	-	45	60	m $\Omega$	$T_j = 25$ °C
Short circuit output current	$I_{SCP}$	7	-	18	A	$T_j = 85$ °C
Pull-down resistance	$R_{O1,2}$	4	-	30	$\Omega$	-
Undervolt. switch ON voltage	$V_{UVON}$	-	-	7	V	$V_S$ increasing
Undervolt. switch OFF voltage	$V_{UVOFF}$	3.5	-	-	V	$V_S$ decreasing



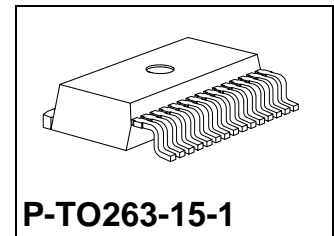
## TRILITHIC™

**BTS 780**

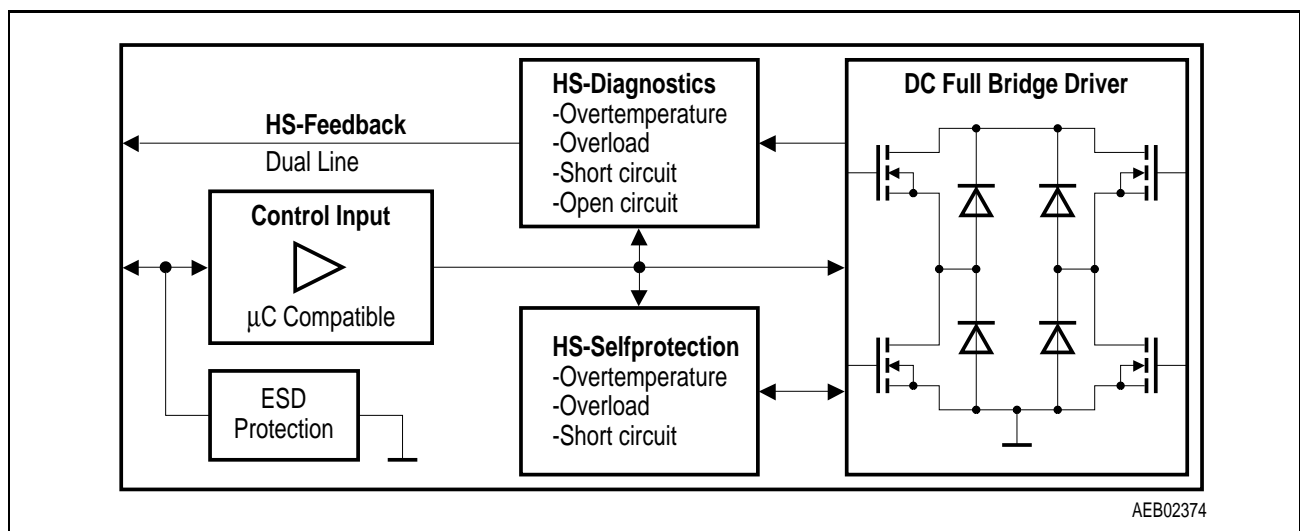
### Target Data

### Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low  $R_{DS(ON)}$  @ 25 °C :  
High-side switch: typ. 35 mΩ  
Low-side switch: typ. 15 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power SMD-Package
- Load/GND-short-circuit-protected
- Operates up to 40 V
- 2-Bit status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



### Block Diagram



Type	Ordering Code	Package
BTS 780	on request	P-TO263-15-1

■ SMD = Surface Mounted Device

### Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	$V_{UVOFF}$	36	V

### Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	43	V
Output current	$I_Q$	- 30	30	A
Junction temperature	$T_j$	- 40	150	°C

### Electrical Characteristics

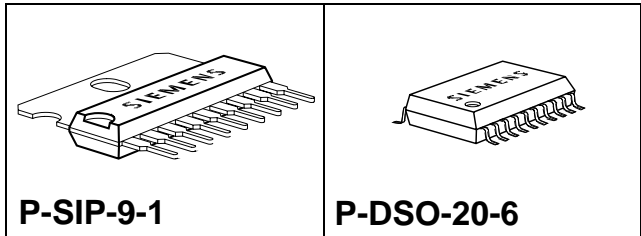
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	50	$\mu\text{A}$	$V_S = 13.2 \text{ V}$
$R_{DSON}$ ; High-Side-Switch	$R_{DSONH}$	-	35	75	$\text{m}\Omega$	-
$R_{DSON}$ ; Low-Side-Switch	$R_{DSONL}$	-	15	35	$\text{m}\Omega$	-
Short circuit output current	$I_{SCP}$	28	-	54	A	$25 \text{ }^\circ\text{C} < T_j < 85 \text{ }^\circ\text{C}$
Pull-down resistance	$R_{O1,2}$	4	-	30	$\text{k}\Omega$	-
Undervolt. switch ON voltage	$V_{UVON}$	-	-	7	V	$V_S$ increasing
Undervolt. switch OFF voltage	$V_{UVOFF}$	3.5	-	-	V	$V_S$ decreasing

## Dual Power Operational Amplifier

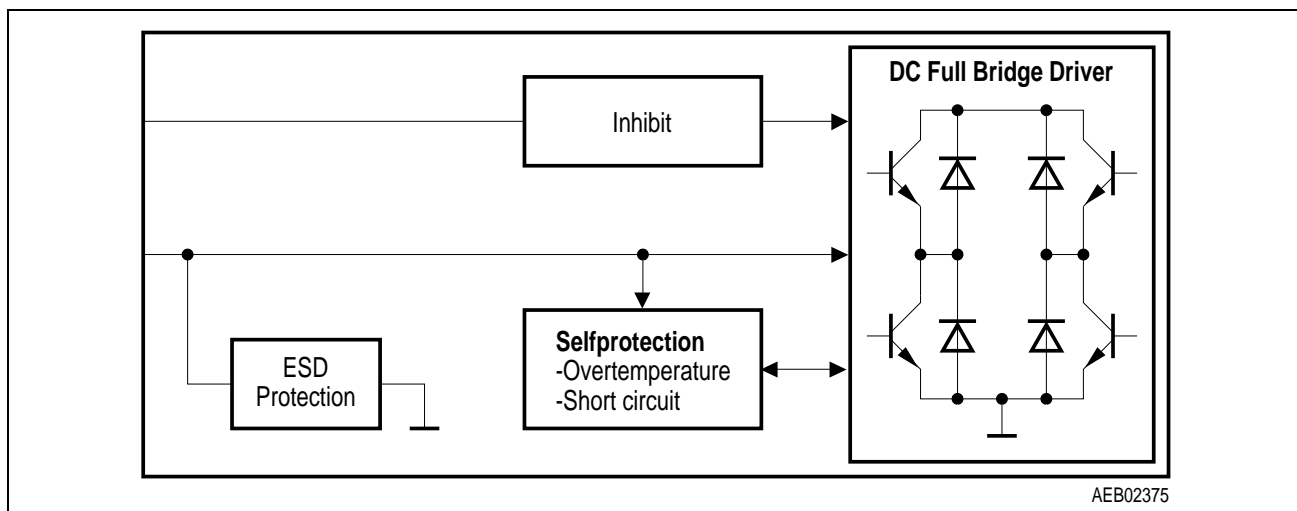
TCA 2465

### Features

- 2 A dual power operational amplifier
- Wide operating range from 6 to 40 V
- Over temperature protection
- Short circuit protection to +  $V_S$  and GND
- Free wheeling diodes
- Inhibit enables tristate outputs



### Block Diagram



Type	Ordering Code	Package
TCA 2465	Q67000-A8109	P-SIP-9-1
TCA 2465 G <sup>1)</sup>	Q67006-A8334	P-DSO-20-6

<sup>1)</sup> Maximum Output Current  $I_Q = 1.4$  A

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	–	42	V
Output current	$I_Q$	– 2.5	2.5	A
Junction temperature	$T_j$	– 40	150	°C

## Electrical Characteristics

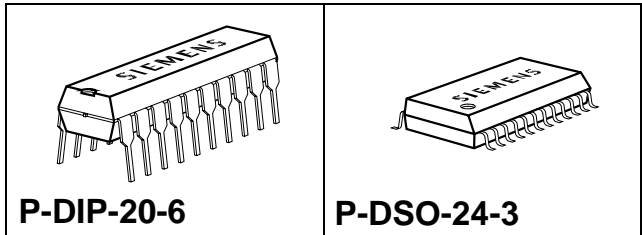
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Saturation voltage	$V_{Qsat}$	–	–	3.2	V	in path
High slew rate	$SR$	–	2	–	V/μs	–
Fully protected outputs	–	–	–	–	–	DC short-circuit proof

## 2-Phase Stepper-Motor Driver

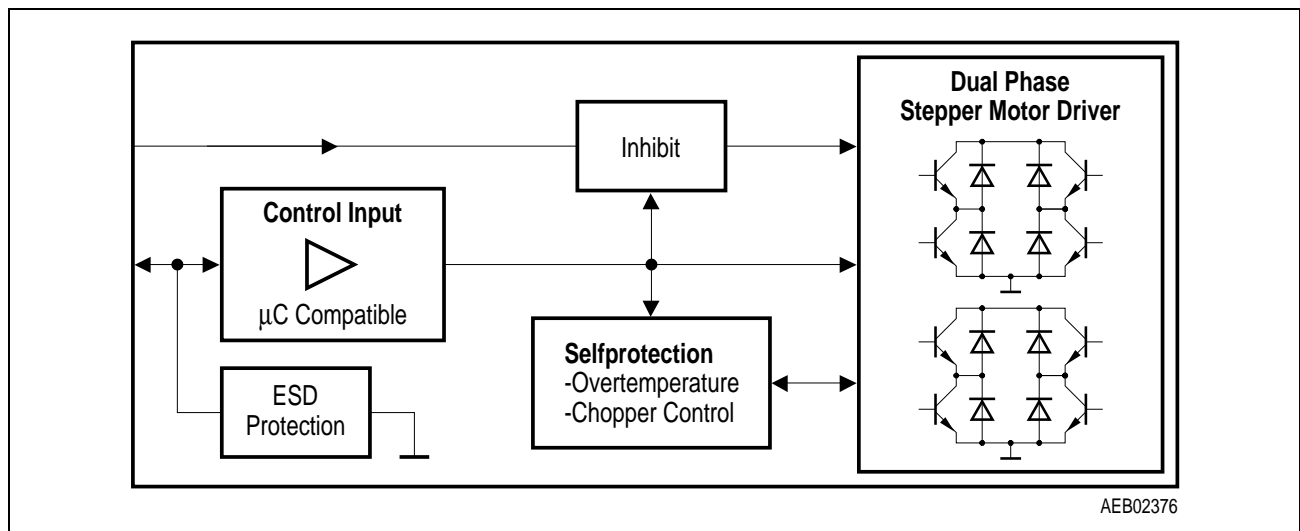
TCA 3727

### Features

- $2 \times 0.75$  A dual phase stepper motor driver full, half, quarter, mini, quasi-sine step
- Integrated driver, control logic and current control
- Wide operating range from 5 to 50 V
- Wide temperature range
- Over temperature protection
- Inhibit
- Low standby-current
- Free wheeling diodes



### Block Diagram



Type	Ordering Code	Package
TCA 3727	Q67000-A8302	P-DIP-20-6
TCA 3727 G	Q67006-A8335	P-DSO-24-3

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	5	50	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	–	52	V
Output current	$I_Q$	–	$2 \times 1$	A
Junction temperature	$T_j$	– 40	150	°C

## Electrical Characteristics

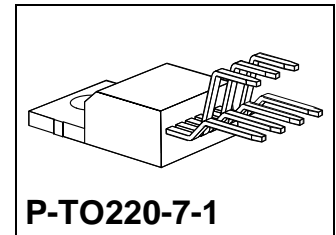
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	–	0.2	0.5	mA	–
Saturation voltage	$V_{Qsat}$	–	1.4	1.9	V	total
Logic supply voltage	$V_L$	–	4.5	6.5	V	–
Standby output threshold	$V_{inh}$ (L→H)	–	3	4	V	$V_L = 5\text{ V}$
Standby output threshold	$V_{inh}$ (H→L)	–	2.3	2.9	V	$V_L = 5\text{ V}$
Hysteresis	$V_{inhhy}$	–	0.7	1.1	V	$V_L = 5\text{ V}$

## 2-A DC Motor Driver

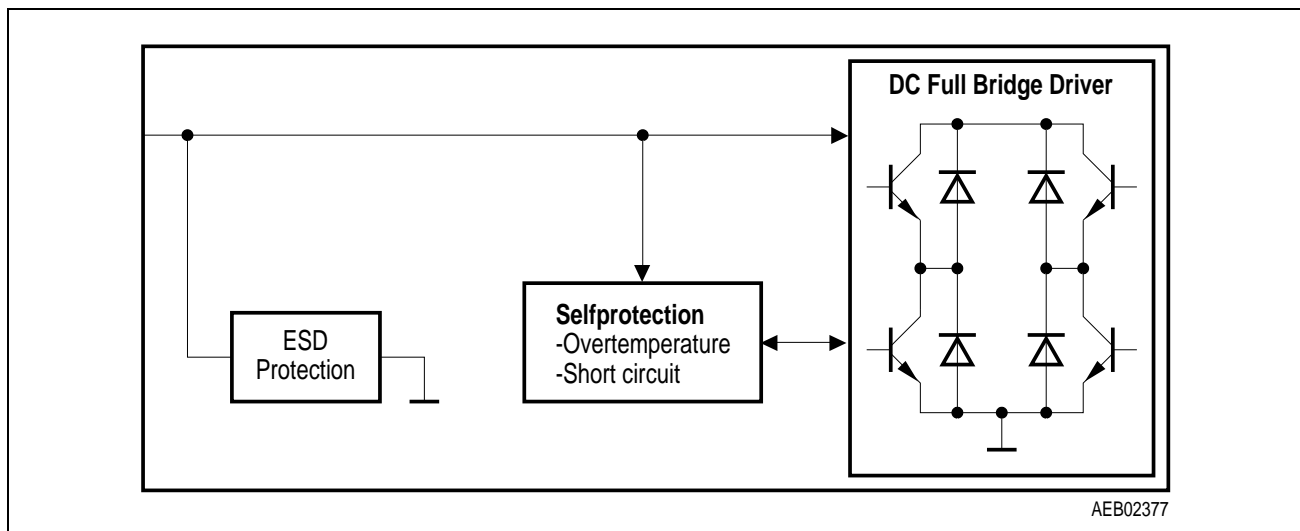
TLE 4202 B

### Features

- 2 A full bridge driver
- Wide operating range from 3.5 to 17 V
- Wide temperature range
- Over temperature protection
- Short circuit protection to GND
- Free wheeling diodes
- Low saturation voltage



### Block Diagram



Type	Ordering Code	Package
TLE 4202 B	Q67000-A8225	P-TO220-7-1

**Operating Range**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	3.5	17	V

**Absolute Maximum Ratings**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	–	40	V
Output current	$I_Q$	–	2.5	A
Junction temperature	$T_j$	– 40	150	°C

The two power comparators can switch magnets, motors or other loads either by being sepersted from each other or being combined to a full-bridge circuit.

The IC contains two amplifiers featuring a typical open-loop voltage gain of 80 dB at 500 Hz.

**Electrical Characteristics**

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	–	15	25	mA	–
Saturation voltage	$V_{Qsat}$	–	–	2.5	V	total
Short circuit current	ISC	–	1.25	1.6	A	$V_Q = 0 V$
Switch-ON delay	$t_{ON}$	–	3	–	μs	–
Switch-OFF delay	$t_{OFF}$	–	1.5	–	μs	–

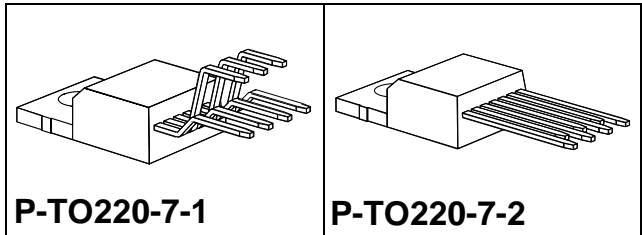


## 4-A DC Motor Driver

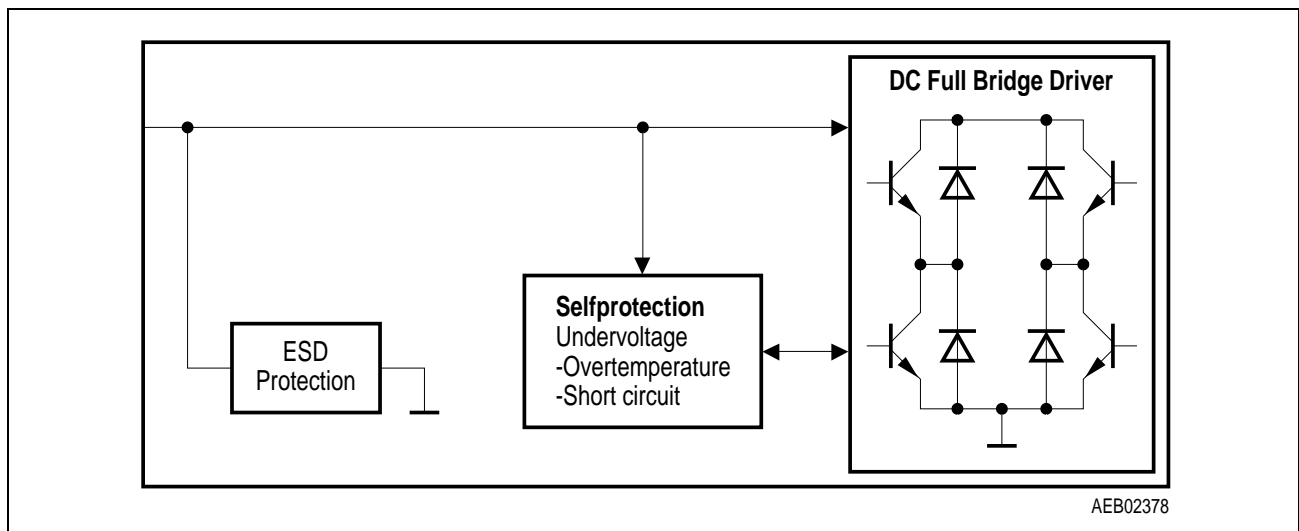
TLE 4203

### Features

- 4 A full bridge driver
- Final push-pull stage free of cross-over currents
- Wide temperature range
- Over temperature protection
- Short circuit protection to +  $V_S$  and GND
- Free wheeling diodes
- Undervoltage protection



### Block Diagram



Type	Ordering Code	Package
TLE 4203	Q67000-A8121	P-TO220-7-1
TLE 4203 S	Q67000-A9101	P-TO220-7-2

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	5	20	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	–	45	V
Output current	$I_Q$	–	4	A
Junction temperature	$T_j$	– 40	150	°C

The TLE 4203 is a versatile double power driver of up to 4 A output current which is particularly suitable as a driver for DC motors in reversible operation. The push-pull power output stage operates in the switching mode and can be combined to a full-bridge configuration.

## Electrical Characteristics

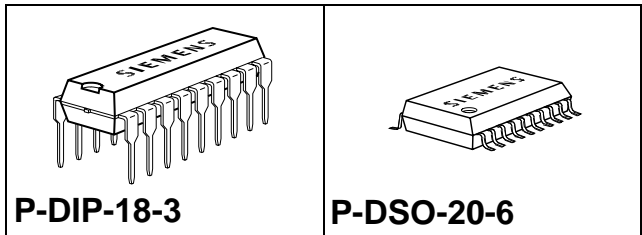
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	–	20	25	mA	–
Saturation voltage	$V_{Qsat}$	–	–	2.5	V	total
Short circuit current	$I_{SC}$	–	3	3.8	A	–

## 1-A DC Motor Driver

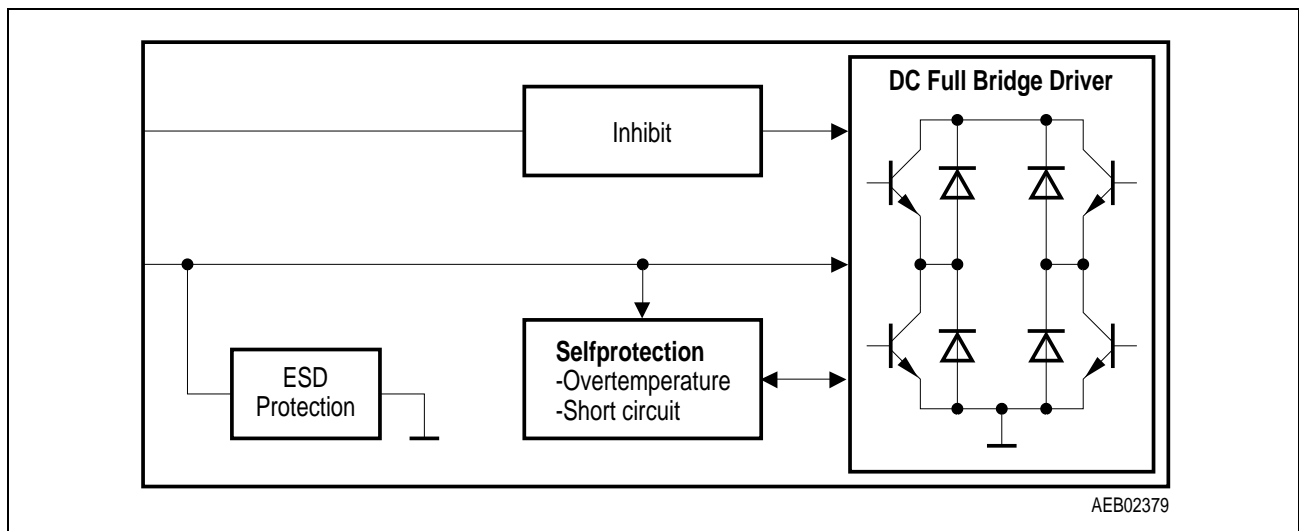
TLE 4205

### Features

- 1 A full bridge driver
- Wide operating range from 6 to 32 V
- Over temperature protection
- Short circuit protection to GND
- Free wheeling diodes
- Inhibit
- ESD protected inputs



### Block Diagram



Type	Ordering Code	Package
TLE 4205	Q67000-A9025	P-DIP-18-3
TLE 4205 G	Q67006-A9114	P-DSO-20-6

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	32	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	–	45	V
Output current	$I_Q$	– 1	1	A
Junction temperature	$T_j$	– 40	150	°C

The circuit contains two power comparators that can be combined to a full-bridge circuit. The TLE 4205 is particularly suitable as a driver for DC motors in reversible operation.

## Electrical Characteristics

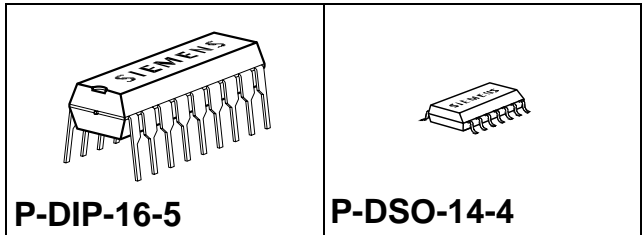
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	–	10	100	μA	inhibit
Saturation voltage	$V_{Qsat}$	–	–	1.9	V	total
Inhibit voltage	$V_g$	– 15	–	+ $V_S$	V	–
Switch-ON delay	$t_{ON}$	–	10	20	μs	–
Switch-OFF delay	$t_{OFF}$	–	10	20	μs	–

## 1-A DC Motor Driver for Servo Driver Applications

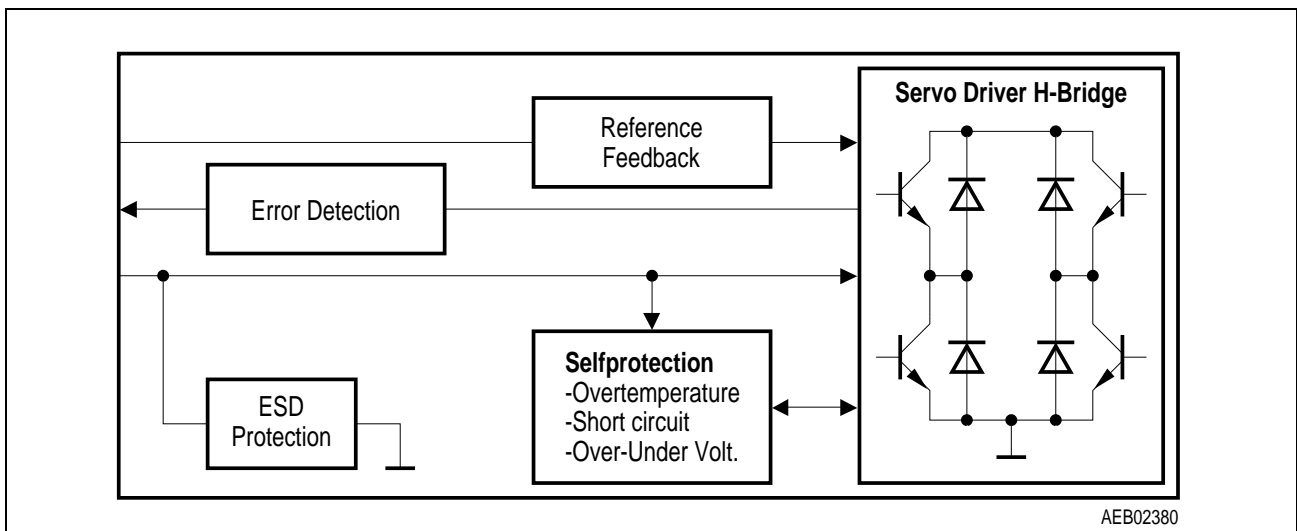
TLE 4206

### Features

- 0.8 A servo motor driver
- Very low stand by current consumption
- Low saturation voltage
- Full short circuit protected outputs
- Overtemperature protection with diagnosis
- Over- and under-voltage lockout
- Error flag diagnosis
- Enhanced power P-DSO package



### Block Diagram



Type	Ordering Code	Package
TLE 4206	Q67000-A9303	P-DIP-16-5
TLE 4206 G	Q67006-A9299	P-DSO-14-4

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	7	18	V
Logic input voltages	$V_{IN}$	- 2	18	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	- 1	1	A
Junction temperature	$T_j$	- 40	150	°C

The circuit contains one power full bridges for servo driver optimized control inputs. The TLE 4206 G is particularly suitable as a driver for DC motors in reversible operation.

## Electrical Characteristics

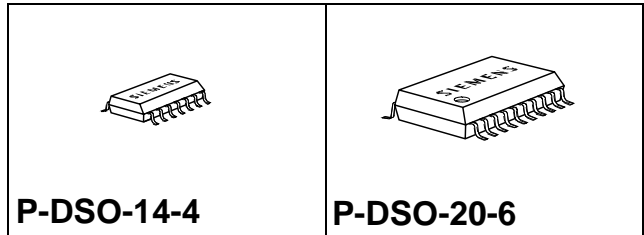
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	20	50	μA	inhibit
Saturation voltage	$V_{Qsat}$	-	1.2	1.7	V	total 0.4 A
0 V Switch OFF voltage	$V_{0V OFF}$	-	20.2	24	V	-
0 V Switch ON voltage	$V_{0V ON}$	18	19.5	-	V	-

## 1-A Dual-HBD (Dual-Half-Bridge Driver)

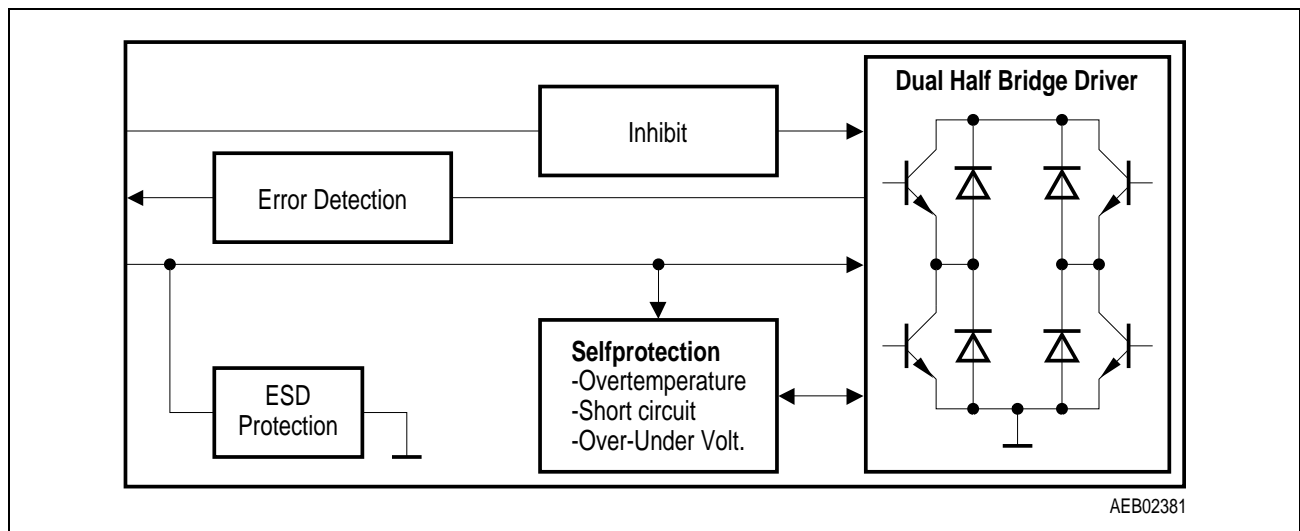
TLE 4207

### Features

- 0.8 A dual half bridge driver
- Very low stand by current consumption
- Very low saturation voltage
- Full short circuit protected outputs
- Overtemperature protection with diagnosis
- Over- and under-voltage lockout
- Error flag diagnosis
- Enhanced power P-DSO package



### Block Diagram



Type	Ordering Code	Package
TLE 4207 G	Q67006-A9275	P-DSO-14-4
TLE 4207 GL	on request	P-DSO-20-6

■ SMD = Surface Mounted Device

### Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	7	18	V
Logic input voltages	$V_{IN}$	- 2	18	V

### Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	- 1	1	A
Junction temperature	$T_j$	- 40	150	°C

The circuit contains two power half bridges which can be combined to a full-bridge circuit. The TLE 4207G is particularly suitable as a driver for DC motors in reversible operation.

### Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	20	50	μA	inhibit
Saturation voltage	$V_{Qsat}$	-	1.2	1.7	V	total 0.4 A
0 V Switch OFF voltage	$V_{0V OFF}$	-	20.2	24	V	-
0 V Switch ON voltage	$V_{0V ON}$	18	19.5	-	V	-

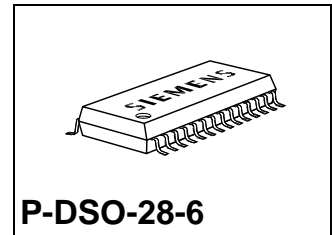


## 1-A Quad-HBD (Quad-Half-Bridge Driver)

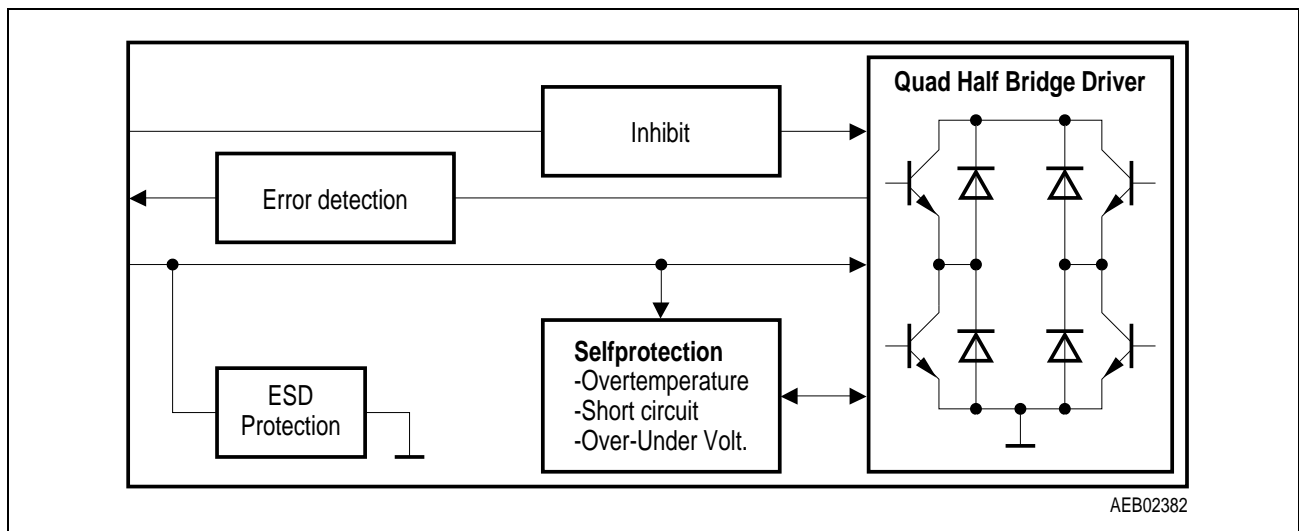
TLE 4208

### Features

- 0.8 A quad half bridge driver
- Very low stand by current consumption
- Very low saturation voltage
- Full short circuit protected outputs
- Overtemperature protection with diagnosis
- Over- and under-voltage lockout
- Error flag diagnosis
- Enhanced power P-DSO package



### Block Diagram



Type	Ordering Code	Package
TLE 4208 G	on request	P-DSO-28-6

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	7	18	V
Logic input voltages	$V_{IN}$	- 2	18	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	- 1	1	A
Junction temperature	$T_j$	- 40	150	°C

The circuit contains four power half bridges which can be combined to two full-bridge circuits.

The TLE 4208 G is particularly suitable as a driver for DC motors in reversible operation.

## Electrical Characteristics

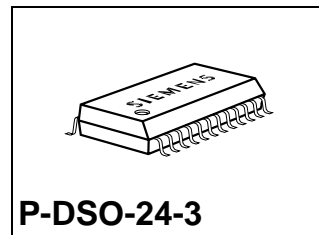
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	20	50	μA	inhibit
Saturation voltage	$V_{Qsat}$	-	1.2	1.7	V	total 0.4 A
Switch-ON delay	$V_{OVON}$	18	19.5	-	V	-
Switch-OFF delay	$V_{OVOFF}$	-	20.2	24	V	-

## 2-Phase Stepper-Motor Driver

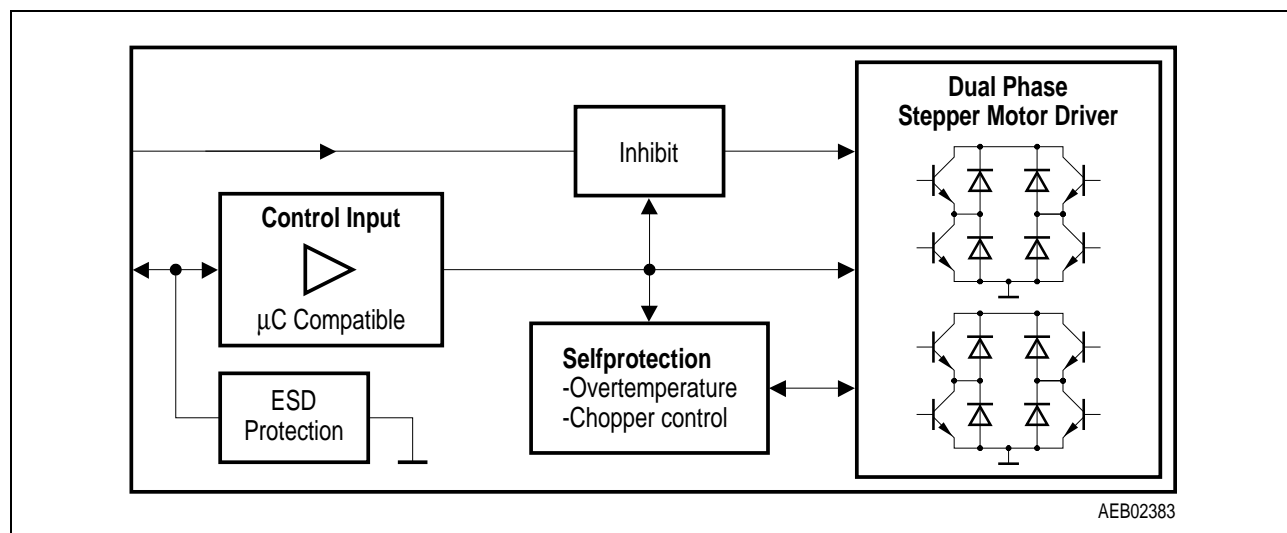
TLE 4726

### Features

- $2 \times 0.75$  A dual phase stepper motor driver full, half, quarter, mini, quasi-sine step
- Integrated driver, control logic and current control
- Wide operating range from 5 to 50 V
- Wide temperature range
- Over temperature protection
- Inhibit
- Low standby-current
- Free wheeling diodes



### Block Diagram



Type	Ordering Code	Package
TLE 4726 G	Q67006-A9297	P-DSO-24-3

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	5	50	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	–	52	V
Output current	$I_Q$	–	$2 \times 0.8$	A
Junction temperature	$T_j$	– 40	150	°C

## Electrical Characteristics

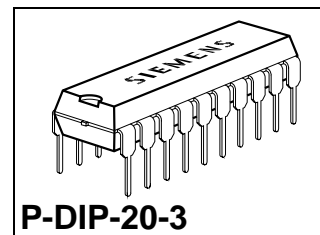
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	–	0.2	0.5	mA	–
Saturation voltage	$V_{Qsat}$	–	1.4	1.9	V	total
Logic supply voltage	$V_L$	–	4.5	6.5	V	–
Standby output threshold	$V_{inh}$ (L→H)	–	3	4	V	$V_L = 5\text{ V}$
Standby output threshold	$V_{inh}$ (H→L)	–	2.3	2.9	V	$V_L = 5\text{ V}$
Hysteresis	$V_{inhhy}$	–	0.7	1.1	V	$V_L = 5\text{ V}$

## 2-Phase Stepper-Motor Driver

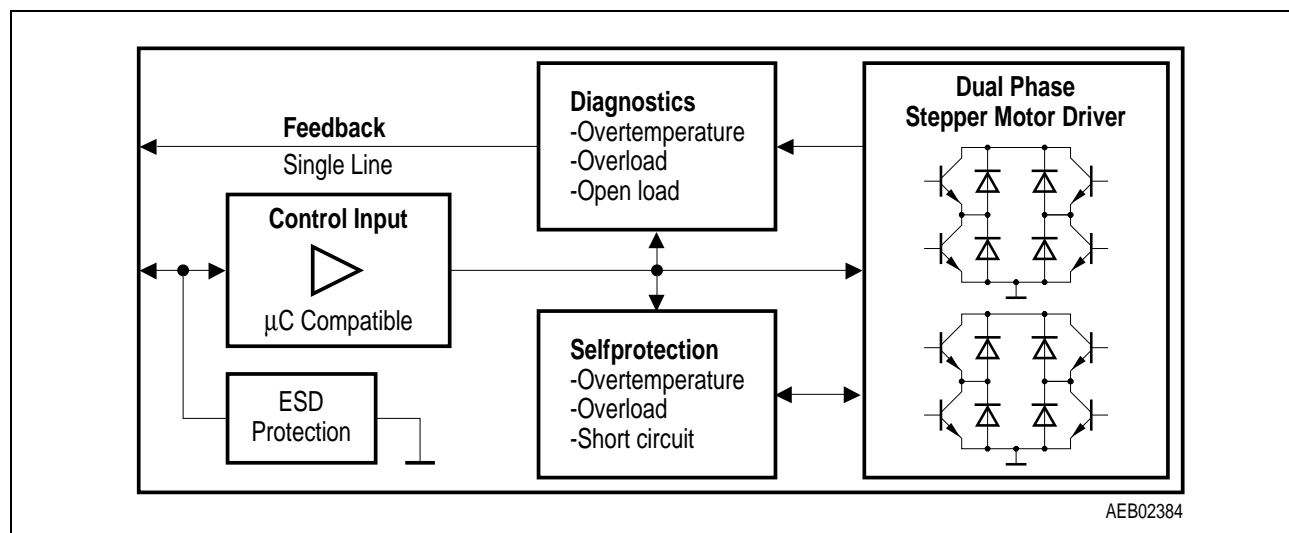
TLE 4727

### Features

- $2 \times 0.7$  A dual phase stepper motor driver
- Wide temperature range
- Short circuit protection to  $+V_S$  and GND
- Over temperature protection
- 5 V TTL logic supply
- Current control
- Free wheeling diodes
- Low saturation voltage



### Block Diagram



Type	Ordering Code	Package
TLE 4727	Q67000-A9099	P-DIP-20-3

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	5	16	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	$2 \times - 1$	$2 \times 1$	A
Junction temperature	$T_j$	- 40	150	°C

The TLE 4727 is a bipolar monolithic IC for driving bipolar stepper motors, DC motors and other inductive loads that operate on constant current. The control logic and power output stages for two bipolar windings are integrated on a single chip. The direction and value of current are programmable for each phase via separate control inputs. The two output stages in full bridge configuration include fast integrated free-wheeling diodes and are free of crossover current.

## Electrical Characteristics

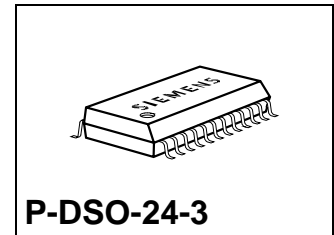
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	30	50	mA	-
Saturation voltage	$V_{Qsat}$	-	1.5	1.7	V	total
Logic supply voltage	$V_L$	-	4.5	6	V	-
Error output	$V_{Err}$	-	-	25	V	operating range
	$I_{Err}$	-	-	1	mA	operating range
Logic input hysteresis	$V_{lhy}$	-	50	-	mV	-

## 2-Phase Stepper-Motor Driver

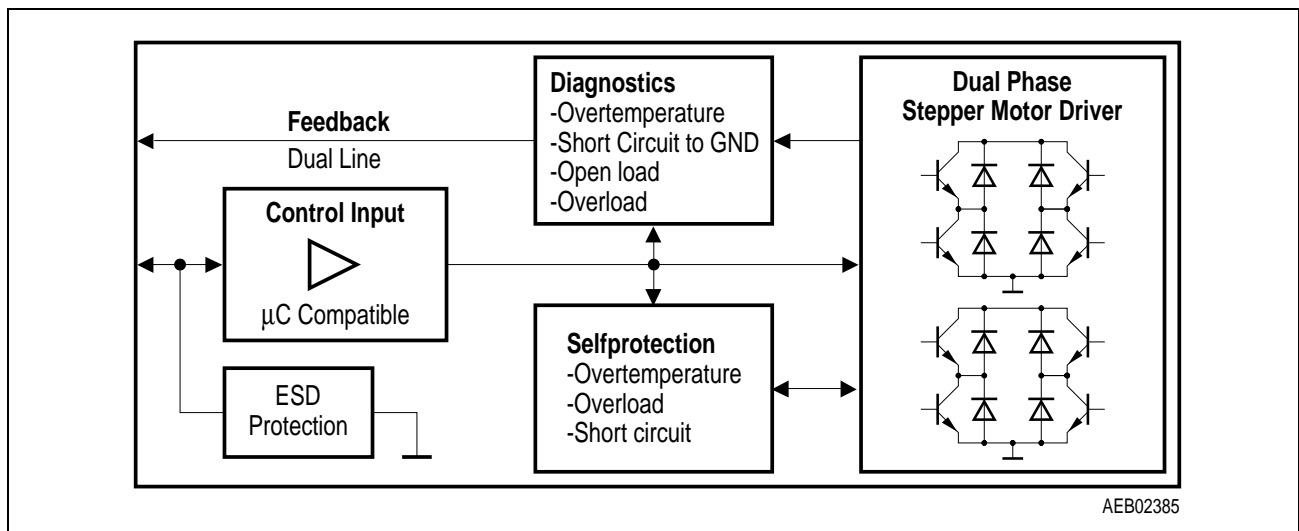
TLE 4728

### Features

- $2 \times 0.7$  A dual phase stepper motor driver
- Wide temperature range
- Short circuit protection to +  $V_S$  and GND
- Over temperature protection
- Output stages free of cross over current
- Free wheeling diodes
- Low saturation voltage



### Block Diagram



Type	Ordering Code	Package
TLE 4728 G	Q67006-A9077	P-DSO-24-3

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	5	16	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	$2 \times - 1$	$2 \times 1$	A
Junction temperature	$T_j$	- 40	150	°C

The TLE 4728 is a bipolar monolithic IC for driving bipolar stepper motors, DC motors and other inductive loads that operate on constant current. The control logic and power output stages for two bipolar windings are integrated on a single chip.

The direction and value of current are programmable for each phase via separate control inputs. The two output stages in full bridge configuration include fast integrated free-wheeling diodes and are free of crossover current.

## Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	30	50	mA	-
Saturation voltage	$V_{Qsat}$	-	1.5	1.7	V	total
Logic supply voltage	$V_{lxx}$	- 5	-	6	V	operating range
Error output	$V_{Err}$	-	-	25	V	operating range
	$I_{Err}$	-	-	1	mA	operating range
Logic input hysteresis	$V_{lhy}$	-	50	-	mV	-

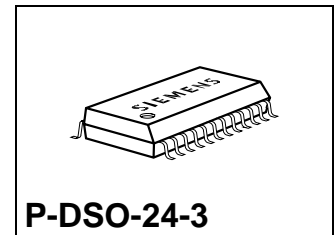


## 2-Phase Stepper-Motor Driver

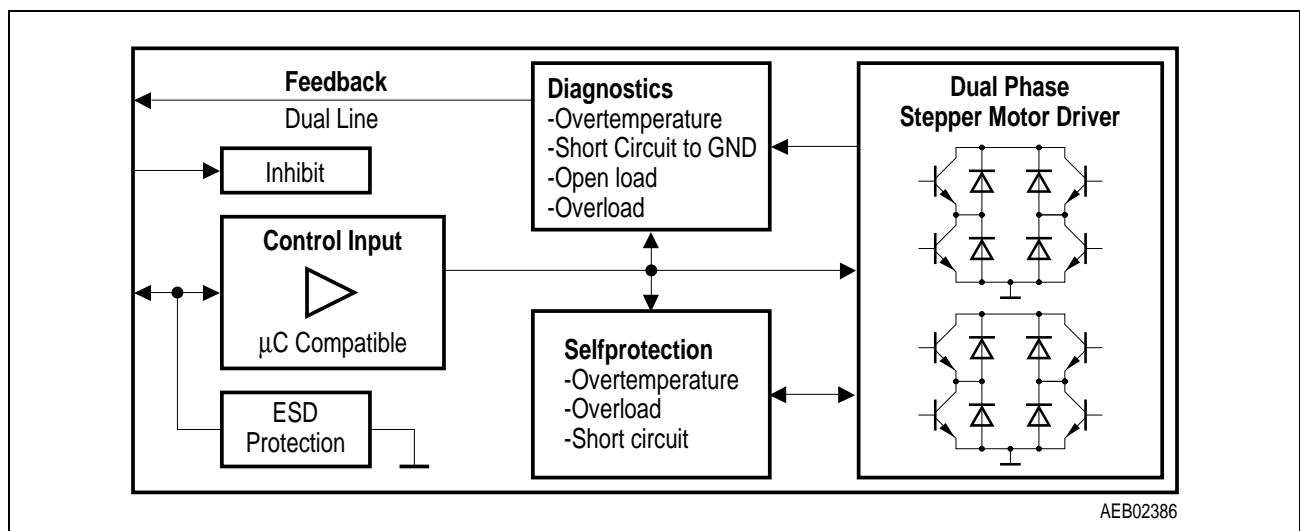
TLE 4729

### Features

- $2 \times 0.7$  A dual phase integrated stepper motor driver with control logic and current control
- Low quiescent current in INHIBIT mode
- Wide temperature range
- Short circuit protection to  $+V_S$  and GND
- Over temperature protection
- Output stages free of cross over current
- Free wheeling diodes
- Low saturation voltage



### Block Diagram



Type	Ordering Code	Package
TLE 4729 G	on request	P-DSO-24-3

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	5	16	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	$2 \times - 1$	$2 \times 1$	A
Junction temperature	$T_j$	- 40	150	°C

The TLE 4729 is a bipolar monolithic IC for driving bipolar stepper motors, DC motors and other inductive loads that operate on constant current. The control logic and power output stages for two bipolar windings are integrated on a single chip.

The direction and value of current are programmable for each phase via separate control inputs. The two output stages in full bridge configuration include fast integrated free-wheeling diodes and are free of crossover current.

## Electrical Characteristics

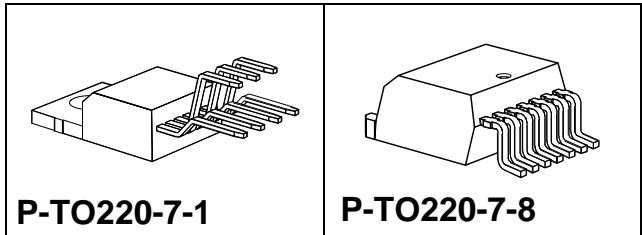
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	30	50	mA	-
Saturation voltage	$V_{Qsat}$	-	1.5	1.7	V	total
Logic supply voltage	$V_{lxx}$	- 5	-	6	V	operating range
Error output	$V_{Err}$	-	-	25	V	operating range
	$I_{Err}$	-	-	1	mA	operating range
Logic input hysteresis	$V_{lhy}$	-	50	-	mV	-

## 3-A DC Motor Driver

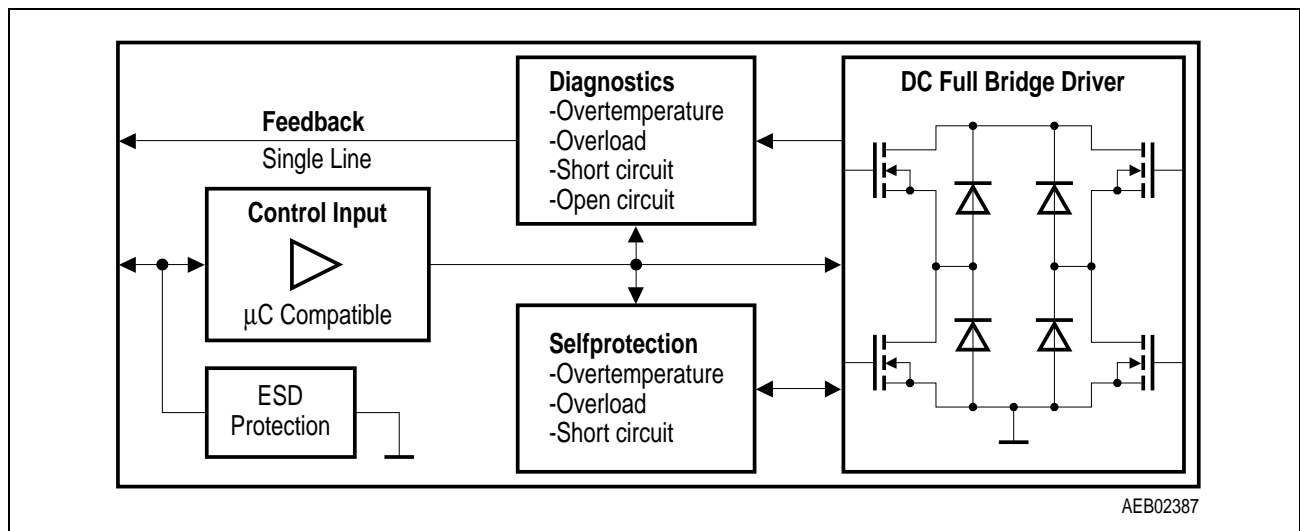
TLE 5203

### Features

- 3 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Over temperature protection
- Overload detection
- Open load detection
- Short circuit protection to +  $V_S$  and GND
- Free wheeling diodes
- I/O error diagnostic
- Low  $R_{DS(on)}$



### Block Diagram



Type	Ordering Code	Package
TLE 5203	Q67000-A9096	P-TO220-7-1
TLE 5203 G	Q67006-A9242	P-TO220-7-8

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current	$I_Q$	- 4	4	A
Junction temperature	$T_j$	- 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

## Electrical Characteristics

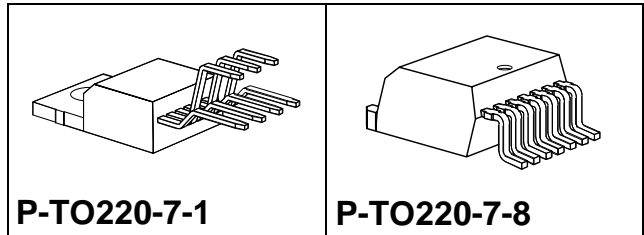
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	10	mA	-
$R_{DSON}$	-	-	0.6	1.2	$\Omega$	total
Logic input voltage	$V_{11,2}$	- 0.3	-	7	V	-
Diagnostic output voltage	$V_{EF}$	- 0.3	-	7	V	-
Pull up/pull down resistance	$R$	5	-	25	k $\Omega$	-
Turn-ON delay	td1	-	-	10	$\mu$ s	-
Turn-OFF delay	td2	-	-	10	$\mu$ s	-

## 3-A DC Motor Driver

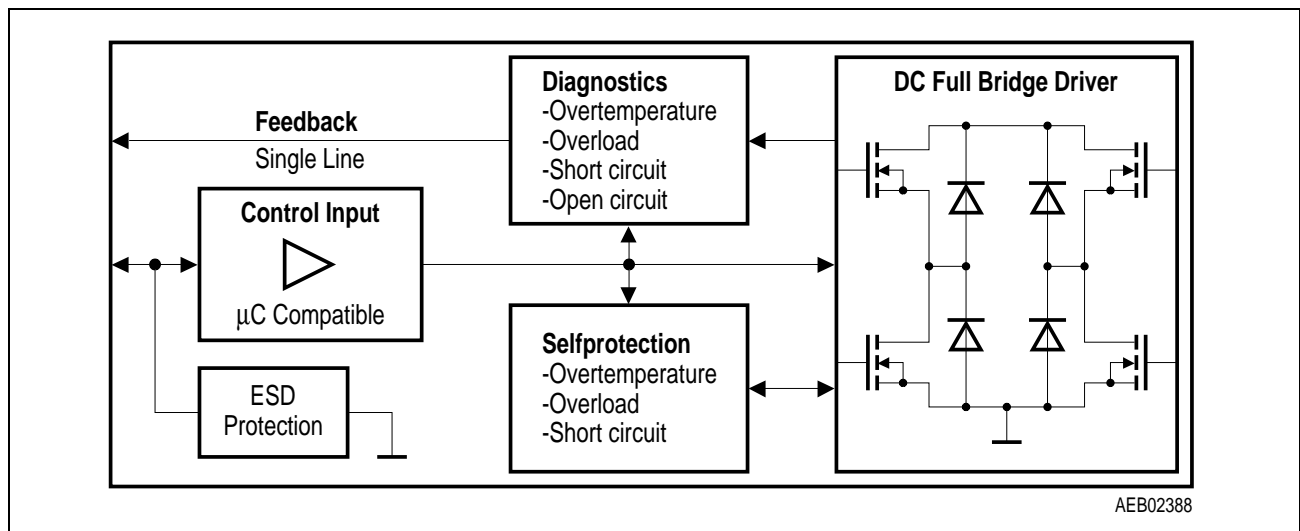
TLE 5204

### Features

- 3 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Break Low **and** break High
- Over temperature protection
- Overload detection
- Open load detection
- Short circuit protection to +  $V_S$  and GND
- Free wheeling diodes
- I/O error diagnostic
- LOW  $R_{DS(ON)}$



### Block Diagram



Type	Ordering Code	Package
TLE 5204	Q67000-A9177	P-TO220-7-1
TLE 5204 G	Q67006-A9234	P-TO220-7-8

■ SMD = Surface Mounted Device

### Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

### Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current	$I_Q$	- 4	4	A
Junction temperature	$T_j$	- 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

### Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	10	mA	-
$R_{DSON}$	-	-	0.6	1.2	$\Omega$	total
Logic input voltage	$V_{11,2}$	- 0.3	-	7	V	-
Diagnostic output voltage	$V_{EF}$	- 0.3	-	7	V	-
Pull up/pull down resistance	$R$	5	-	25	k $\Omega$	-
Turn-ON delay	td1	-	-	10	$\mu$ s	-
Turn-OFF delay	td2	-	-	10	$\mu$ s	-

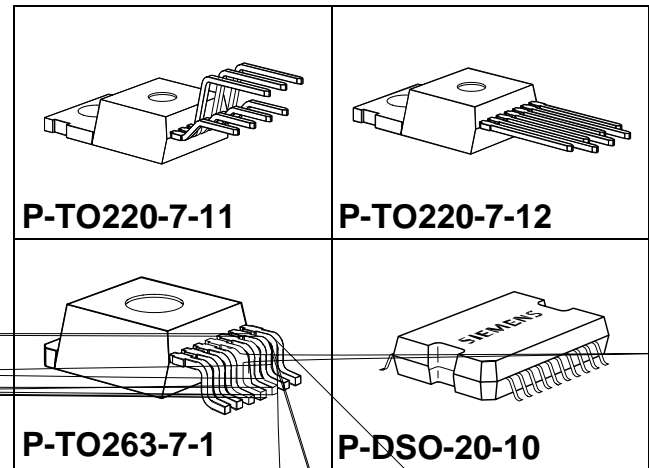
## 5-A H-Bridge for DC-Motor Applications

TLE 5205-2

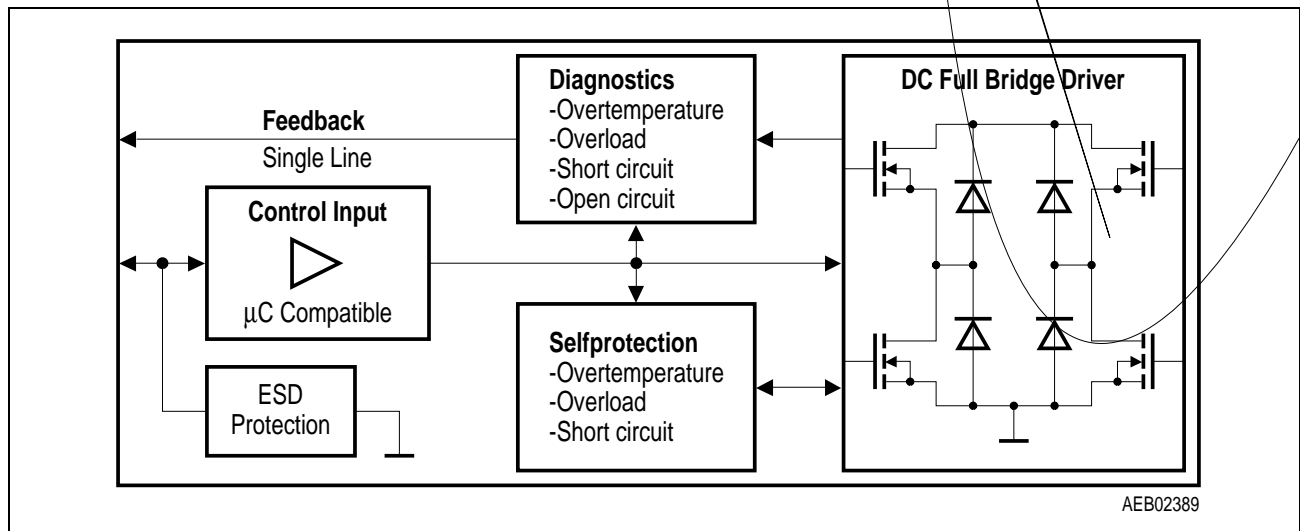
### Preliminary Data

#### Features

- 5.0 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Over temperature protection
- Overload detection
- Open load detection
- Open load diagnosis
- Full short circuit protection
- Integrated free wheeling diodes
- I/O error diagnostic
- Low  $R_{\text{DS(on)}}$  typ. 200 m $\Omega$  @ 25 °C



### Block Diagram



Type	Ordering Code	Package
TLE 5205-2	Q67000-A9283	P-TO220-7-11
TLE 5205-2S	Q67000-A9324	P-TO220-7-12
TLE 5205-2G	Q67006-A9325	P-TO263-7-1
TLE 5205-2GP	Q67006-A9237	P-DSO-20-10

■ SMD = Surface Mounted Device

**Operating Range**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

**Absolute Maximum Ratings**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current	$I_Q$	- 6	6	A
Junction temperature	$T_j$	- 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

**Electrical Characteristics**

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	10	mA	-
$R_{DSON}$	-	-	-	1.3	$\Omega$	total $T_j = 150\text{ °C}$
Logic input voltage	$V_{11,2}$	- 0.3	-	7	V	-
Diagnostic output voltage	$V_{EF}$	- 0.3	-	7	V	-
Turn-ON delay	td1	-	-	20	$\mu\text{s}$	-
Turn-OFF delay	td2	-	-	20	$\mu\text{s}$	-



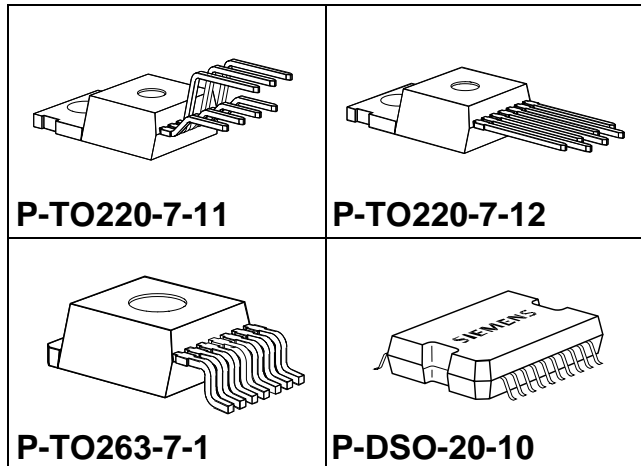
## 5-A H-Bridge for DC-Motor Applications

TLE 5206-2

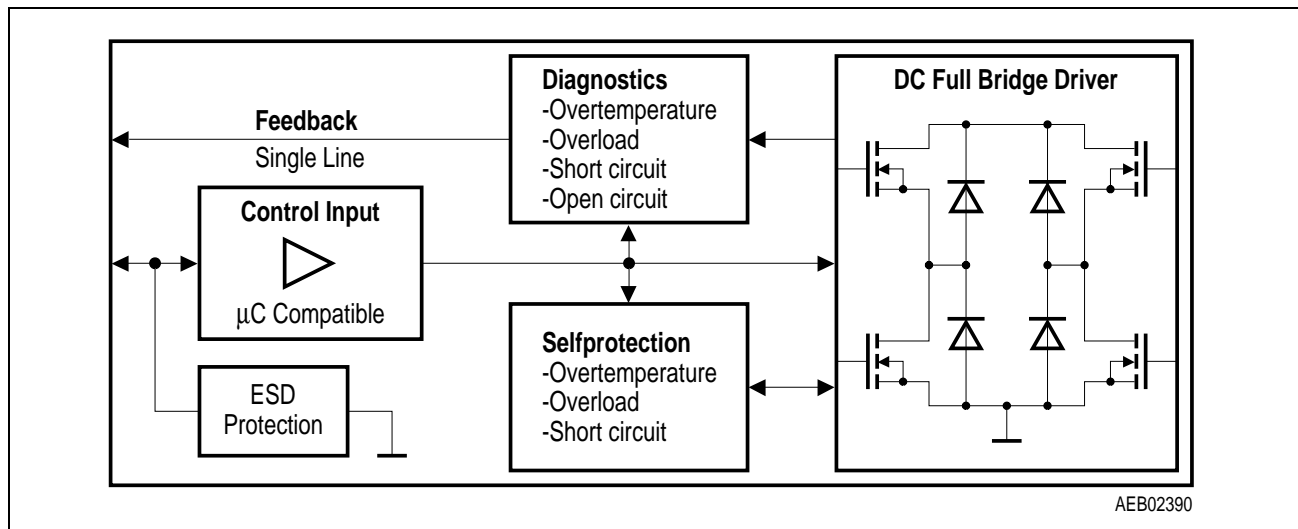
### Preliminary Data

#### Features

- 5.0 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Break Low **and** break High
- Over temperature protection
- Overload detection
- Full short circuit protection
- Integrated free wheeling diodes
- I/O error diagnostic
- Low  $R_{DS(ON)}$  typ. 200 m $\Omega$  @ 25 °C



### Block Diagram



Type	Ordering Code	Package
TLE 5206-2	Q67000-A9290	P-TO220-7-11
TLE 5206-2S	Q67000-A9326	P-TO220-7-12
TLE 5206-2G	Q67006-A9323	P-TO263-7-1
TLE 5206-2GP	Q67006-A9239	P-DSO-20-10

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current	$I_Q$	- 6	6	A
Junction temperature	$T_j$	- 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

## Electrical Characteristics

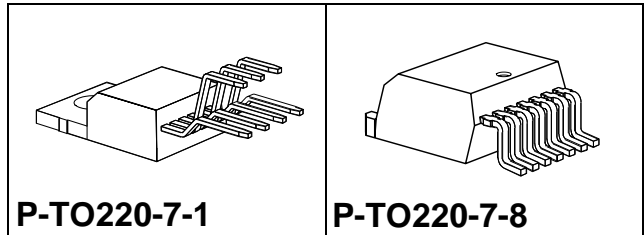
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	10	mA	-
$R_{DSON}$	-	-	-	1.3	$\Omega$	total $T_j = 150\text{ °C}$
Logic input voltage	$V_{11,2}$	- 0.3	-	7	V	-
Diagnostic output voltage	$V_{EF}$	- 0.3	-	7	V	-
Turn-ON delay	td1	-	-	20	$\mu\text{s}$	-
Turn-OFF delay	td2	-	-	20	$\mu\text{s}$	-

## 6-A DC Motor Driver with Inhibit

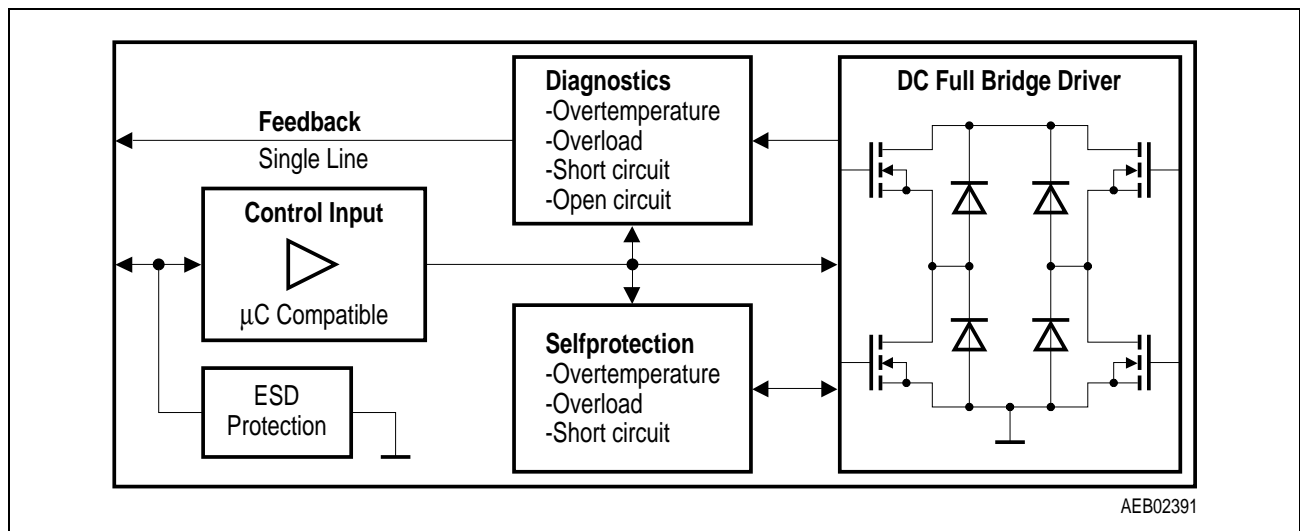
TLE 5207

### Features

- 6 A full bridge driver
- Wide operating range from 6 to 40 V
- Over temperature protection
- Low quiescent current
- Overload detection
- Short circuit protection to +  $V_S$  and GND
- Free wheeling diodes
- I/O error diagnostic
- Low  $R_{DS(on)}$



### Block Diagram



Type	Ordering Code	Package
TLE 5207	Q67000-A9295	P-TO220-7-1
TLE 5207 G	Q67006-A9296	P-TO220-7-8

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current	$I_Q$	- 6	6	A
Junction temperature	$T_j$	- 40	150	°C

## Electrical Characteristics

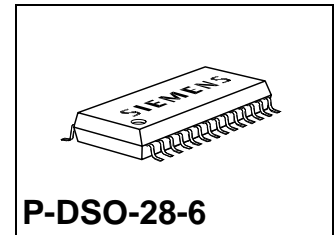
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	100	$\mu$ A	$V_S = 12$ V stand by mode
$R_{DSON}$	-	-	0.6	1.2	$\Omega$	total
Logic input voltage	$V_{1,2}$	- 0.3	-	6	V	$V_S = 0-40$ V
Diagnostic output voltage	$V_{EF}$	- 0.3	-	40	V	-
Pull up/pull down resistance	$R$	5	-	25	k $\Omega$	-
Turn-ON delay	td1	-	-	20	$\mu$ s	-
Turn-OFF delay	td2	-	-	20	$\mu$ s	-

## Hex-Half-Bridge / Double Six-Driver

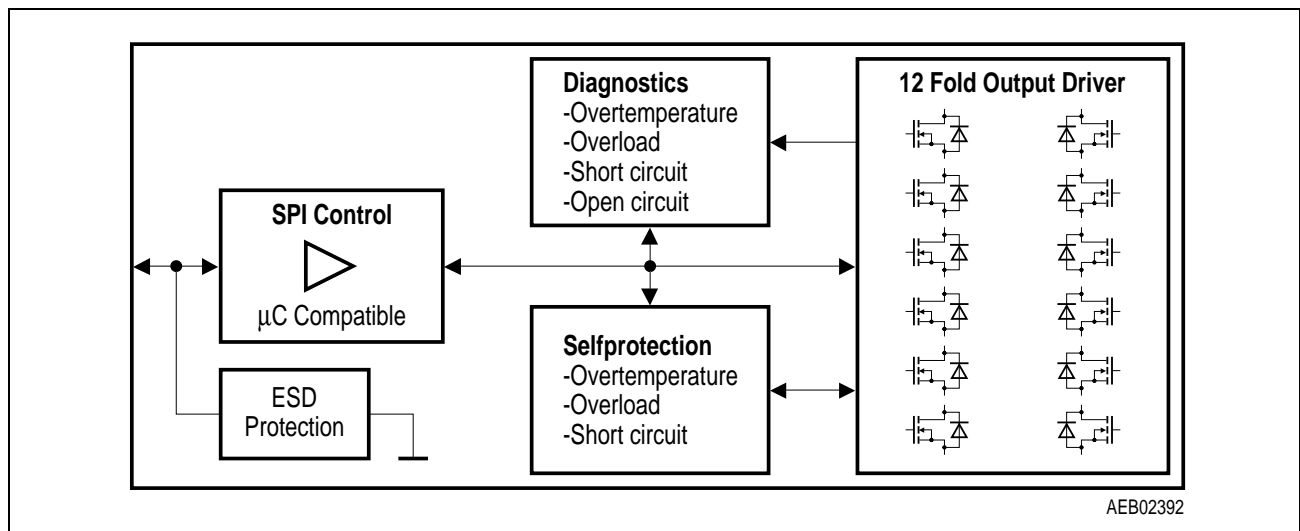
TLE 5208-6

### Features

- Multifunctional 6 fold 1.0 A half bridge driver for motors, inductive loads and lamps
- $R_{\text{DS(on)}}$  typ. 1.0  $\Omega$  @ 25 °C
- Individual configurable with 16 bit SPI
- Full diagnostic with 16 bit SPI
- Wide operating range from 6 to 32 V
- Over temperature protection with prewarning
- Very low quiescent current
- Overload detection (maskable)
- Open load and under load detection
- Over- and under voltage lockout
- Full short circuit protected
- Free wheeling diodes



### Block Diagram



Type	Ordering Code	Package
TLE 5208-6 G	Q67007-A9282	P-DSO-28-6

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	$V_{UV\ OFF}$	40	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current (overload detection activ)	$I_Q$	- 2	2	A
Output current (overload detection not activ)	$I_Q$	- 5	5	A
Junction temperature	$T_j$	- 40	150	°C

## Electrical Characteristics

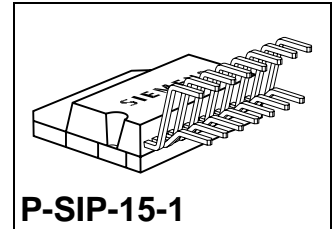
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	50	µA	stand-by mode
$R_{DSON}$		-	1.0	2.5	Ω	-
SPI clock frequency	$f_{CLK}$	-	-	2.0	MHz	-
Setup delay time	$t_{set\ d}$	-	-	300	µs	stand-by to activ
Output delay time source	-	-	5	20	µs	-
Output delay time sink	-	-	7	30	µs	-
Thermal prewarning	-	120	145	170	°C	-
Thermal shutdown	-	150	175	200	°C	-
Thermal switch on	-	120	-	170	°C	after thermal shutdown

## High Performance Smart Power Stepper Motor Driver with Diagnostic Interface

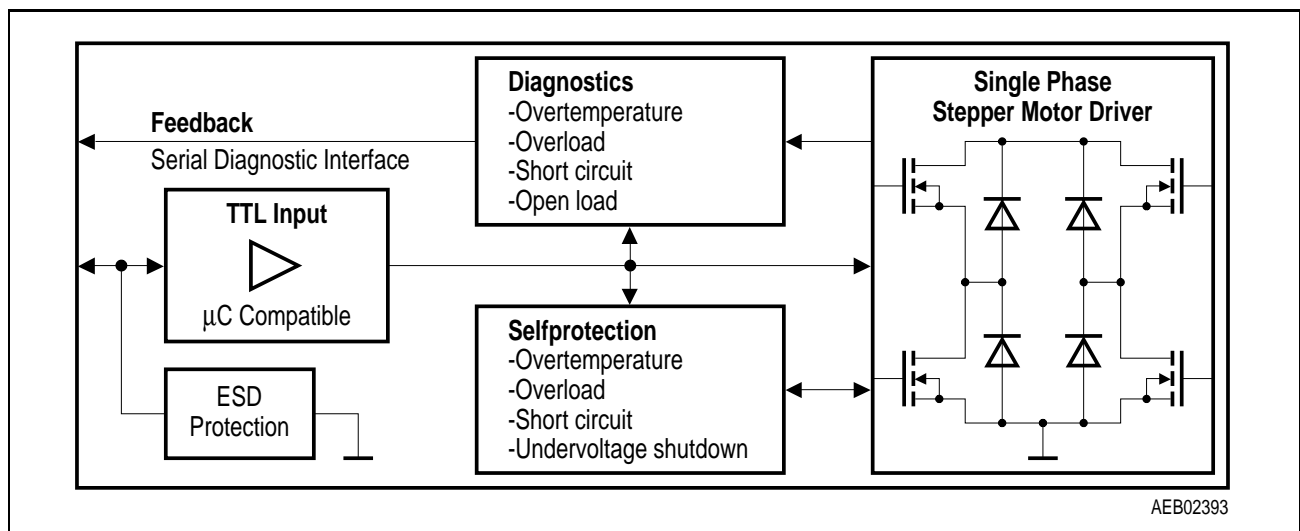
TLE 5250

### Features

- 1 × 2.5 A single phase stepper motor driver
- Fast nominal/actual comparator for micro stepper mode
- Short circuit protection to +  $V_S$  and GND
- Over temperature protection
- Undervoltage shutdown
- Dynamic current control
- Free wheeling diodes
- Serial 16-Bit diagnostic interface



### Block Diagram



Type	Ordering Code	Package
TLE 5250	Q67000-A9103	P-SIP-15-1

**Operating Range**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	40	V

**Absolute Maximum Ratings**

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	45	V
Output current	$I_Q$	0	3	A
Junction temperature	$T_j$	- 40	150	°C

The TLE 5250 has TTL-compatible logic inputs, includes a H-bridge with integrated fast free-wheeling diodes plus dynamic limiting of the motor current by chopper mode. The nominal current can be set continuously by a control voltage. Microstep mode can be produced by applying a sinoidal control voltage.

Two TLE 5250 with a minimum of external circuitry and a single supply voltage form a complete system that can be driven direct by a  $\mu$ C for two-phase bipolar stepping motors with output current of up to 2.5 A per phase.

**Electrical Characteristics**

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Supply current	$I_S$	-	-	11	mA	-
$R_{DSON}$	-	-	0.35	0.6	$\Omega$	total
Logic input	$V_I$	- 0.3	-	5.5	V	operating range
Output current	$I_Q$	- 2.5	-	2.5	A	operating range
RC/Sync, frequency	$f$	-	20	100	kHz	-



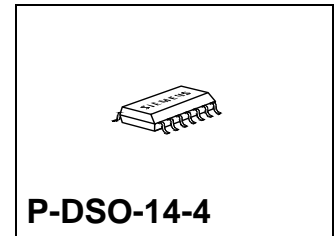
## Triple-Half-Bridge Driver

TLE 6208-3

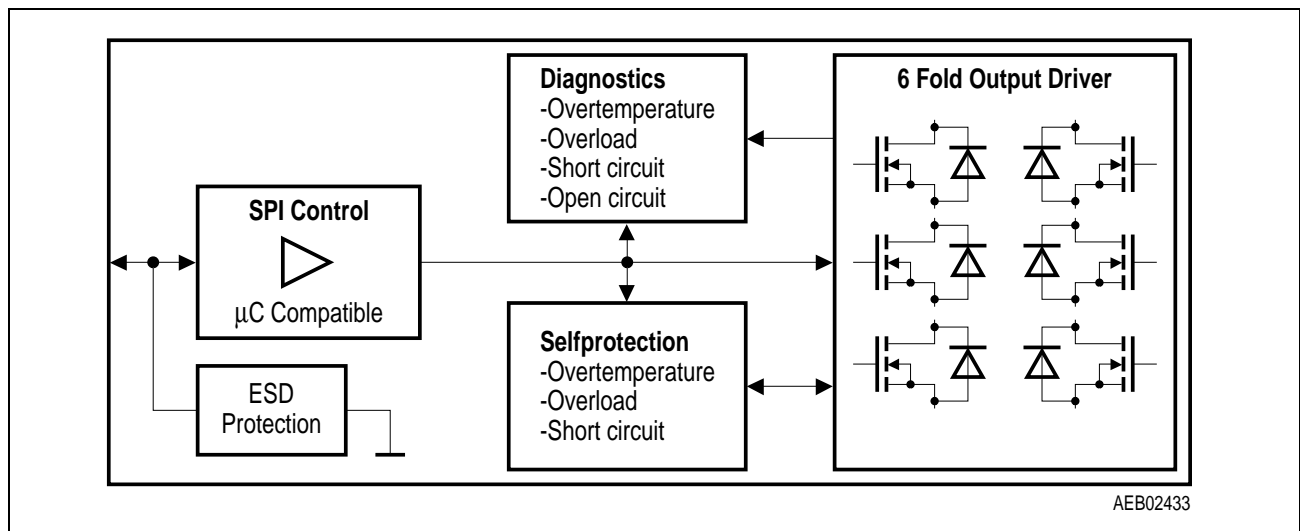
### Target Data

### Features

- Multifunctional 3 fold 1.0 A half bridge driver for motors, inductive loads and lamps
- $R_{\text{DS(on)}}$  typ.  $0.8 \Omega @ 25 \text{ }^\circ\text{C}$
- Individual configurable with 16 bit SPI
- Full diagnostic with 16 bit SPI
- Wide operating range from 6 to 32 V
- Over temperature protection with prewarning
- Very low quiescent current
- Overload detection (maskable)
- Open load and under load detection
- Over- and under voltage lockout
- Full short circuit protected
- Free wheeling diodes



### Block Diagram



Type	Ordering Code	Package
TLE 6208-3 G	on request	P-DSO-14-4

■ SMD = Surface Mounted Device

## Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	6	32	V

## Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	$V_S$	- 0.3	40	V
Output current (overload detection activ)	$I_Q$	- 2	2	A
Output current (overload detection not activ)	$I_Q$	- 5	5	A
Junction temperature	$T_j$	- 40	150	°C

## Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	$I_S$	-	-	50	μA	stand-by mode
$R_{DSON}$	-	-	0.8	2.5	Ω	-
SPI clock frequency	-	-	-	2	MHz	-
Setup delay time	-	-	-	300	μs	stand-by to activ
Output delay time source	-	-	5	20	μs	-
Output delay time sink	-	-	7	30	μs	-
Thermal prewarning	-	120	145	170	°C	-
Thermal shutdown	-	150	175	200	°C	-