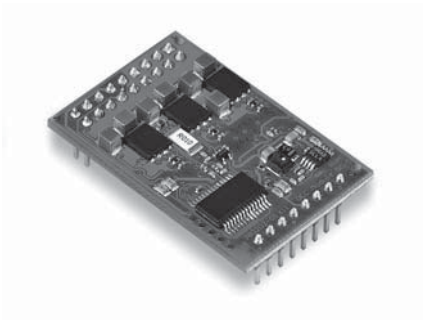
DEC Module 50/5 1-Q-EC Amplifier



Operating modes
Digital speed control or open loop speed control operation can be preset by a digital signal.

Excellent price/performance ratio
Reasonably priced 1-Q-EC amplifier optimised for OEM applications in small appliances.

OEM Module
Miniaturized open electronics board. Connector arrays arranged in a 2.54 mm (0.1“) pattern support easy connectivity and integration into the motherboard.

Functionality
Direction of rotation preset by a digital signal. The motor shaft can be enabled or disabled. Adjustable maximum current limitation. Set value speed input through external analog voltage. Speed can be monitored through the speed monitor output. Status indicator with «Ready»-Output.

Protection circuit
The power amplifier is protected against thermal overload and the control inputs against overvoltage.

The DEC Module 50/5 (Digital EC Controller) is a 1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 250 watts.

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DEC 50/5 1-Q-EC Amplifier

Operating modes
Digital speed control, open loop speed control or current control can be selected with built-in DIP switch.

Small design
Robust and compact modular metallic housing offers various mounting options.

Easy start-up procedure
Plug-in terminal clamp, no extensive adjustment necessary.

All-round functionality
Direction can be set with a logic signal. Motor shaft can be disabled or slowed down as required. Adjustable maximum current limitation. Operating status display with red and green LED.

Flexible set value input
Set value input either through internal potentiometer or external analog voltage. Two preset speeds switchable. Speed ramp can be adjusted.

Protection circuit
The power amplifier is protected against thermal overload and the control inputs against overvoltage.

The DEC 50/5 (Digital EC Controller) is a 1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 250 watts.

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1-Q-EC Amplifier Data

DECS 50/5 1-Q-EC Amplifier
1-quadrant amplifier for controlling sensorless EC motors with a maximum output of 250 watts.

DEC 24/1 1-Q-EC Amplifier
1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 24 watts.

Operating modes		
	Speed controller (sensorless)	**Speed controller, open loop speed controller**
Electrical Data		
Operating voltage V_{CC}	10 - 50 VDC	5 - 24 VDC
Max. output voltage	0.8 x V_{CC}	V_{CC}
Max. output current I_{max}	8 A	2 A
Continuous output current I_{cont}	5 A	1 A
Switching frequency of power stage	50 kHz	39 kHz
Band width current controller		
Max. speed (1 pole pair)	80 000 rpm	120 000 rpm
Built-in motor choke per phase		150 µH / 1 A
Input		
Set value	«Speed» 0 … 5 V (1024 Steps)	«Speed» 0 … 5 V (1024 Steps)
Current limit		
Enable	«Enable» +3.5 ... 50 V	«/Disable» +2.4 ... 24 V
Direction	«Direction» +3.5 ... 50 V	«Direction» +2.4 ... 24 V
Stop / Brake	«Brake» +3.5 ... 50 V	«/Brake» +2.4 ... 24 V
Configurable		
Output		
Monitor	«Monitor n», digital (5 V)	«Monitor n», digital (5 V)
Status reading «Ready»	«Ready» max. +50 V	
Voltage outputs		
Hall sensors supply voltage V_{CC} Hall		+4.5 … 5 VDC, max. 30 mA
Auxiliary voltages	+5 VDC	
Possible adjustments	DIP switch	Jumpers
Trim potentiometer	Speed, I_{max}	Speed, I_{max}
Indicator	Green LED = READY; red LED = ERROR	Green LED
Protective functions		
Blockage protection	Switches off after 5 unsuccessful starting attempts	Motor current limitation if motor shaft is blocked for longer than 1.5 s
Heat monitoring of power stage	T > 90°C	
Dynamic current limit		$I_{max} = 2 \cdot I_{cont}$ is limited to $0.9 \cdot I_{cont}$ after 1 s
Under- / Overvoltage protection	Switches off when V_{CC} < 9.5 V or V_{CC} > 59 V	
Ambient temperature and humidity range		
Operation	-10 … +45°C	-10 … +45°C
Storage	-40 … +85°C	-40 … +85°C
No condensation	20 … 80%	20 … 80%
Mechanical Data		
Weight	Approx. 40 g	Approx. 20 g
Dimensions (L x W x H)	73.4 x 50.8 x 21 mm (see page 292)	57 x 36 x 24 mm (see page 292)
Mounting threads	4 Hexagonal distance pins with M3 inner thread	4 Hexagonal distance pins with M3 inner thread
Connections	See page 292	See page 292
Order Number		
	343253 DECS 50/5 1-Q-EC Amplifier sensorless	DEC 24/1 1-Q-EC Amplifier **318305** DEC 24/1 with FPC pitch 0.5 mm **381510** DEC 24/1 with FPC pitch 0.5 mm **249630** DEC 24/1 with FPC pitch 1.0 mm **249631** DEC 24/1 with a pin con. pitch 2.5 mm **249632** DEC 24/1 with screw type terminal block pitch 2.54 mm
Accessories		
	309687 DSR 50/5 Shunt regulator	

1-Q-EC Amplifier Data

DEC Module 24/2 1-Q-EC Amplifier
1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 48 watts.

DEC 24/3 1-Q-EC Amplifier
1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 72 watts.

Operating modes		
	Speed controller, open loop speed controller	**Speed controller, open loop speed controller**
Electrical Data		
Operating voltage V_{CC}	8 - 24 VDC (optional 5.0 VDC)	5 - 24 VDC
Max. output voltage	V_{CC}	V_{CC}
Max. output current I_{max}	3 A	6 A
Continuous output current I_{cont}	2 A	3 A
Switching frequency of power stage	46.8 kHz	39 kHz
Band width current controller		
Max. speed (1 pole pair)	80 000 rpm	120 000 rpm
Built-in motor choke per phase		
Input		
Set value	«Speed» 0 … +5 V (1024 steps)	«Speed» 0 … +5 V (1024 steps)
Current limit	«Current Limit» external resistor against GND	
Enable	«Enable» +2.4 ... 24 V	«Enable» +2.4 ... 24 V
Direction	«Direction» +2.4 ... 24 V	«Direction» +2.4 ... 24 V
Stop / Brake		«Brake» +2.4 ... 24 V
Configurable		
Output		
Monitor		«Monitor n», digital, (5 V)
Status reading «Ready»	«Ready», digital, (5 V)	
Voltage outputs		
Hall sensors supply voltage V_{CC} Hall	+5 VDC, max. 35 mA	+5 VDC, max. 30 mA
Auxiliary voltages		+5 VDC, max. 10 mA
Possible adjustments	Input «Mode 0» and «Mode 1»	DIP switch
Trim potentiometer		Speed, I_{max}
Indicator		Green LED
Protective functions		
Blockage protection	Motor current limitation if motor shaft is blocked for longer than 1.5 s	Motor current limitation if motor shaft is blocked for longer than 1.5 s
Heat monitoring of power stage	T > 95°C	
Dynamic current limit		$I_{max} = 2 \cdot I_{cont}$ is limited to $0.9 \cdot I_{cont}$ after 1 s
Under- / Overvoltage protection	Switches off when V_{CC} < 6.5 V or V_{CC} > 30 V	Switches off when V_{CC} < 4.5 V
Ambient temperature and humidity range		
Operation	-10 … +45°C	-10 … +45°C
Storage	-40 … +85°C	-40 … +85°C
No condensation	20 … 80 %	20 … 80 %
Mechanical Data		
Weight	Approx. 4 g	Approx. 28 g
Dimensions (L x W x H)	24.2 x 20.38 x 12.7 mm (see page 292)	65 x 58 x 18 mm (see page 293)
Mounting threads	mountable on socket terminal strips pitch 2.54 mm	4 Hexagonal distance pins with M3 inner thread
Connections	See page 292	See page 293
Order Number		
	367661 DEC Module 24/2 1-Q-EC Amplifier	DEC 24/3 1-Q-EC Amplifier **336287** DEC 24/3 with FPC pitch 1.0 mm **336286** DEC 24/3 with a pin connector pitch 2.5 mm
Accessories		
	370652 DEC Module Eva-Board	

DEC Module 50/5 1-Q-EC Amplifier
1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 250 watts.

DEC 50/5 1-Q-EC Amplifier
1-quadrant amplifier for controlling EC motors with Hall sensors with a maximum output of 250 watts.

Operating modes		
	Speed controller, open loop speed controller	**Speed controller, open loop speed controller, current controller**
Electrical Data		
Operating voltage V_{CC}	6 - 50 VDC (optional 5.0 VDC)	10 - 50 VDC
Max. output voltage	0.95 x V_{CC}	0.95 x V_{CC}
Max. output current I_{max}	10 A	10 A
Continuous output current I_{cont}	5 A	5 A
Switching frequency of power stage	46.8 kHz	39 kHz
Band width current controller		15 Hz
Max. speed (1 pole pair)	80 000 rpm	120 000 rpm
Built-in motor choke per phase		
Input		
Set value	«Speed» 0 … +5 V (1024 steps)	«Speed» 0 … +5 V (1024 steps)
Current limit	«Current Limit» external resistor against GND	
Enable	«Enable» +2.4 ... 50 V	«/Disable» +2.4 ... 50 V
Direction	«Direction» +2.4 ... 50 V	«Direction» +2.4 ... 50 V
Stop / Brake		«/Brake» +2.4 ... 50 V
Configurable		«AUX» digital input / 5 VDC output
Output		
Monitor	«Monitor n», digital, (5 V)	
Status reading «Ready»	«Ready», digital, (5 V)	
Voltage outputs		
Hall sensors supply voltage V_{CC} Hall	+5 VDC, max. 35 mA	+7 ... 12 VDC, max. 30 mA
Auxiliary voltages		
Possible adjustments	Input «Mode 0» and «Mode 1»	DIP switch
Trim potentiometer		Speed 1, Speed 2 / Ramp, I_{max}, gain
Indicator		Green LED = READY; red LED = ERROR
Protective functions		
Blockage protection	Motor current limitation if motor shaft is blocked for longer than 1.5 s	Motor current limitation if motor shaft is blocked for longer than 1.5 s
Heat monitoring of power stage	T > 100°C	T > 100°C
Dynamic current limit		
Under- / Overvoltage protection	Switches off when V_{CC} < 6 V or V_{CC} > 56 V	
Ambient temperature and humidity range		
Operation	-10 … +45°C	-10 … +45°C
Storage	-40 … +85°C	-40 … +85°C
No condensation	20 … 80 %	20 … 80 %
Mechanical Data		
Weight	Approx. 9 g	Approx. 155 g
Dimensions (L x W x H)	43.18 x 27.94 x 12.7 mm (see page 293)	95 x 75 x 24 mm (see page 293)
Mounting threads	mountable on socket terminal strips pitch 2.54 mm	Flange for M3-screws
Connections	See page 293	See page 293
Order Number		
	380200 DEC Module 50/5 1-Q-EC Amplifier	**230572** DEC 50/5 1-Q-EC Amplifier

Accessories	
	370652 DEC Module Eva-Board