Product Datasheet 55

Features

- Two 10A, 240V, DPDT relays with EMI/EMC reduction and driver protection
- Low cost, high density, small profile, stackable
- Available with 5V, 6V, 12V or 24V operating relays
- Relays are DPDT, Form 2C, changeover type, with dual N/O, COM and N/C contacts
- Edge mounted screw terminal block access to N/O COM & N/C relay contacts
- Terminal block and pin header relay input terminals allow for easy prototyping using the pin headers and permanent wiring using the terminals
- LED status indicators for relay activation status
- The PCB tracking and relays are designed to handle 10 amps @ 240V AC, or 8A @ 30V DC (switched or continuous)
- Supplied with nylon feet which can also be used with M3 or self-tapping screws to mount the board permanently
- CE, RoHS compliant

Description

Basic, Low cost, Dual DPDT relay card with driver protection.

The driver protections is designed to eliminate voltage spikes when the relays are de-energised and inhibit high currents if the relay is energised with reversed polarity.

Relays are double pole changeover type, capable of switching 240VAC @ 10Amps. PCB tracking is designed to handle 10 Amps. Fitted with relay LED status indicators.

The screw terminal blocks give access to N/O, COM & N/C relay contacts, the channel input control signals and the 0V/5V DC supply terminals.

These cards do not require any external power supply.

BAS2PR-DPDT

Specifications

Operating temp range
0-70^{0}C

Relays
See: *Specifications: Relays* table

Dimensions
64mm x 60mm x 35mm (including 7mm high feet)
Weight 60g

Specifications: Relays	For full details see HongFa HF140FF series relays			
Parameter	**5V Power relays**	**6V Power relays**	**12V Power relays**	**24V Power relays**
Rated voltage/current	5VDC/106mA each	6VDC/88mA each (73mA at 5V)	12VDC/43mA each	24VDC/21mA each
Must operate/release voltage	3.75V/0.5V	4.5V/0.6V	9V/1.2V	18v/2.4V
Max coil voltage	6.5V	7.8V	15.6V	31.2V
Contact ratings	10A/240VAC or 8A 30VDC			
Contact resistance	50mΩ max at 1A, 24VDC			
Operate/release time	15mS/5mS			
Contact material	$AgSnO_2$			
Operational life (min)	Mechanical 10^7 / Electrical 10^5			
Contact arrangement	SPDT, Form 2C			

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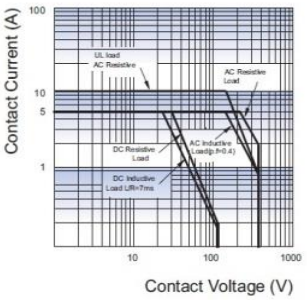
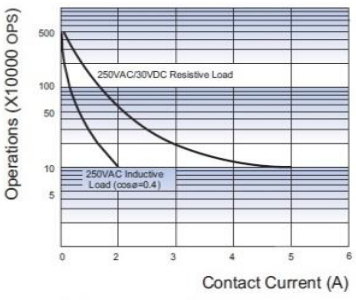
MAXIMUM SWITCHING POWER



ENDURANCE CURVE

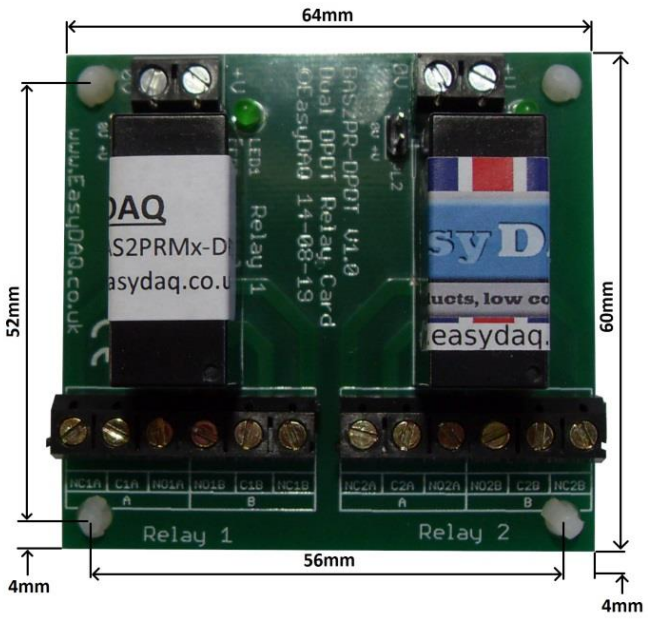


Test conditions:
NO, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

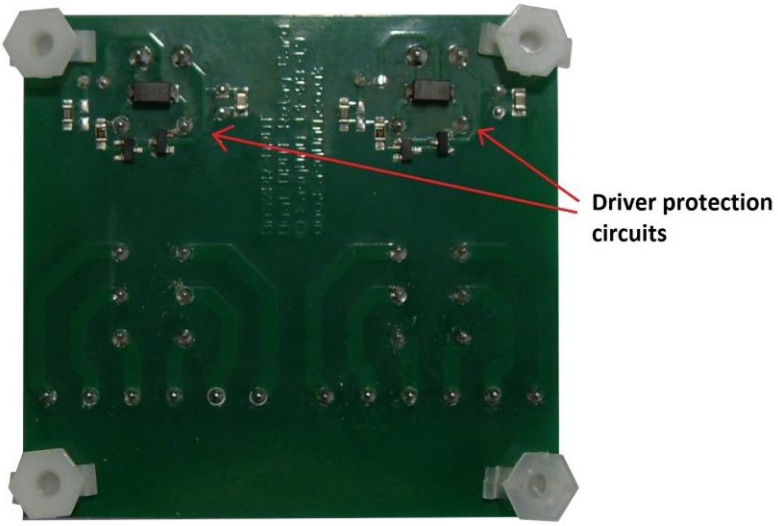
Order codes

BAS2PR-DPDT-5V = 2 x 5V relays
BAS2PR-DPDT-6V = 2 x 6V relays
BAS2PR-DPDT-12V = 2 x 12V relays
BAS2PR-DPDT-24V = 2 x 24V relays

Please contact us if different relays or relay combinations are required.

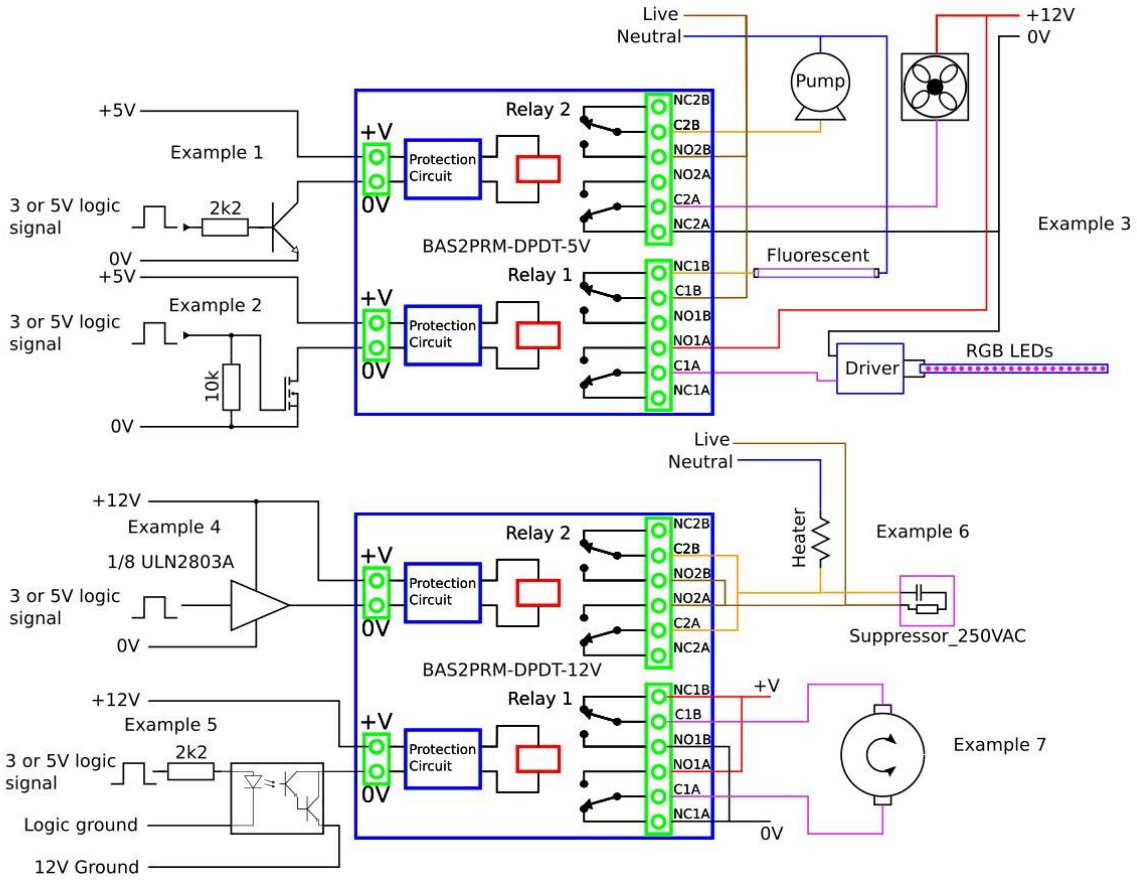


BAS2PR-DPDT top view + dimensions



BAS2PR-DPDT bottom view showing EMI and driver protection circuits

BAS2PR-DPDT application examples



Example 1: Control using a NPN Transistor

The relays on the BAS2PR-DPDT-5V require 106mA so the transistor must be capable of handling this continuously. For example a 2N3904 can handle up to 150mA and has a DC gain of at least 100.

When driven from a 3V logic gate or processor the voltage drop across the 2K2 resistor will be around 2.4V so this will result in approximately 2.4/2k2 = 1.1mA.

The 1.1mA base current x the current gain of >100 will give at least 109mA collector current available to operate the relay coil.

Driving the transistor from a 5V logic signal will result in at least 200mA being available but the relay coil will limit this to 106mA.

Example 2: Control using a N-Channel MOSFET

A MOSFET works well to control an input of a BAS2-DPDT-xx ard. For example, the gate threshold of a 2N7000 is around 2V (3V worst case) and has an on resistance of <5R at 4.5V, which is around 1/10th of the 5V relay coil resistance. The MOSFET will not need protection as the BAS2PR-DPDT-5V has this included.

The 10K resistor holds the MOSFET in the off state if the signal to the gate is open circuit or "Tristate" as would be on power up of a microcontroller such as a Raspberry Pi or Arduino.

If 3V logic is being used then a MOSFET with a lower V_{th} will be required and ideally a lower R_{on} such as a TN0702.

Example 3: Large fish tank control

One relay output is controlling a mains powered large pump which is being cooled by a 12V fan.

The other output is controlling 2 different lighting options, a Fluorescent UL lamp or controlled LED lighting.

Example 4: ULN2803A Driver

The outputs of a driver such as the ULN2803A can easily drive all our relay cards. The ULN2803A would control all the relays on 4 BAS2-DPDT-xx relay cards or one of our cards and 6 other things.

Example 5: Belt and braces opto-coupling of the relay control

Opto-couplers not only isolate signals but they can also act as voltage level shifters.

In this case the opto-coupler enables a logic signal to control the 12V relay of the BAS2-DPDT-12V.

Some opto-couplers have quite a small current transfer ratio so care should be taken in selecting the device.

A Darlington transistor opto-coupler as shown in this case, is more useful as they often have a coupling ratio in excess of 300. All that would be required in this case would be to ensure that the Darlington output can handle the 48mA that the 12V relay will require.

Example 6: Doubling up the relay output to increase current handling or reliability

Connecting the output of the two halves of the relay as shown will double the continuous current capacity or increase the reliability of the device.

If high voltages and high currents are being drawn then it is advisable to add a mains rated suppression device such as our "Suppressor_250VAC" across the relay contacts to reduce long term wear of the relay contacts.

Example 7: Reversing of a DC motor

A DPDT relay can be used as a simple method of reversing a DC motor. If you need your fan or robot motor to change direction then the controlling processor can easily reverse the voltage seen by the motor using a double change over arrangement as shown. When the relay is not energised the motor has the drive voltage across the motor in one direction and when the relay is energised the voltage is reversed.

Conclusion

The BAS2-DPDT-xx relay cards are a simple yet useful addition to the EasyDAQ range of products.

Note

Please contact us at EasyDAQ if you need help with our products or have suggestions for future ideas.