Power Management Modules


Powertrain Systems


Chassis Systems


Safety


Security


Body


Driver Information


Convenience

Description

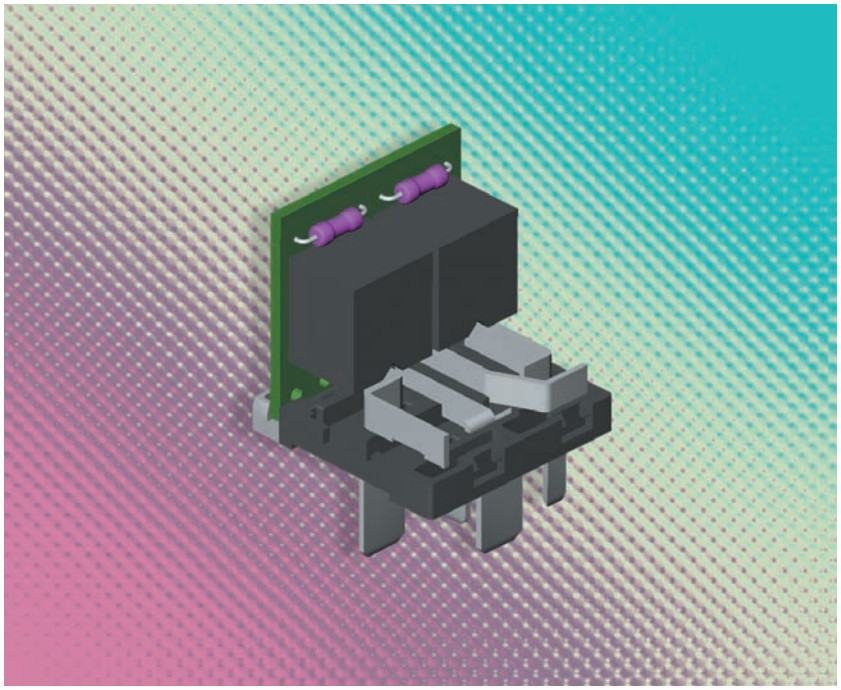
Features

- Up to 20 A load current per path at 85 °C
- No power consumption (latching relay)
- Very compact design
- Two separate load circuits with common control
- Customer specific design on request

Typical applications

Disconnection of two power outlets in a vehicle if the battery voltage drops below a defined level

Please contact Tyco Electronics for relay application support.



141_3d05


Car Industry


Truck Industry


Other Industry

Design

Dustproof;
protection class IP54 to IEC 529 (EN 60 529);
mounting bracket or mounting clip on request.
Delivered with cover.

Weight

Approx.1.2 oz.

Nominal voltage

12 V

Terminals

Quick connect terminals similar to ISO 8092-1 coil and load
6.3 x 0.8 mm, surface tin-pated

Advantages

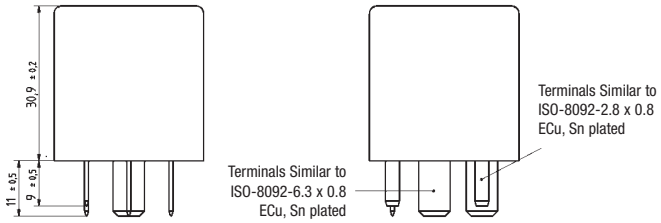
- Active power management
- Protection against complete discharging of the battery
- Improved ability to start the engine

Conditions

All parametric, environmental and endurance tests are performed according to EIA Standard RS-407-A at standard test conditions unless otherwise noted:
23 °C ambient temperature,
20-50% RH, 29.5 ± 1.0" Hg
(998.9 ±33.9 hPa).
Please also refer to the Application Recommendations in this catalog for general precautions.

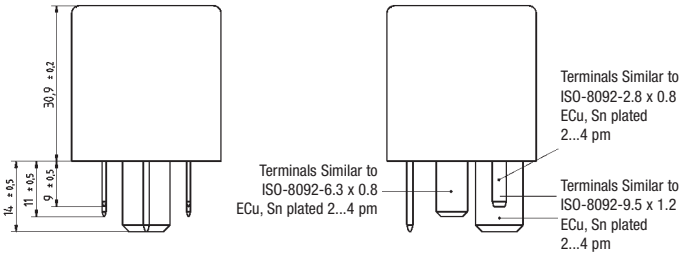
Power Management Modules

Dimensional drawing
V23141-B0001-X030 and X037



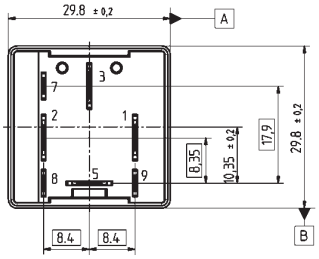
141X30dd1

Dimensional drawing
V23141-B0001-X031 and X038



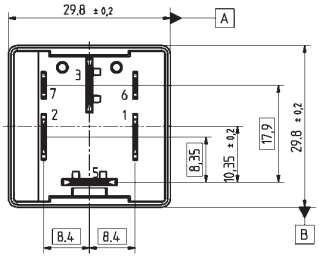
141X31dd1

View of the terminal (bottom view)
V23141-B0001-X030 standard PCB
V23141-B0001-X037 advanced PCB



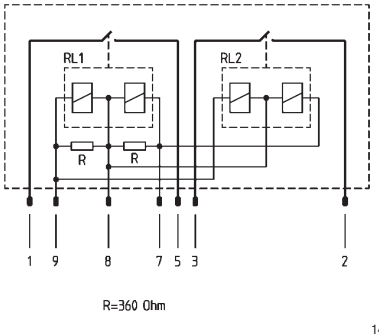
141X30vt1

View of the terminal (bottom view)
V23141-B0001-X031 standard PCB
V23141-B0001-X038 advanced PCB



141X31vt1

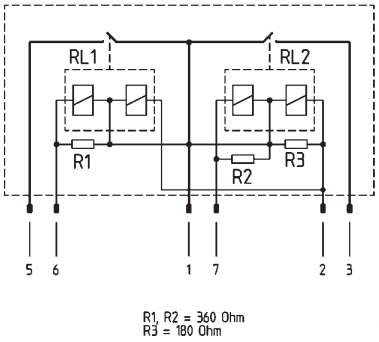
Circuit diagram
V23141-B0001-X030 and X037



141X30cd1

Two separate load circuits (1-5, 2-3) with common control.

Circuit diagram
V23141-B0001-X031 and X038



141X31cd1

Two load circuits (1-5, 3-1) can be switched on separately but have common switch off.

Power Management Modules

Contact data		
Contact configuration	2 Make contacts/ 2 Form A	
Circuit symbol	See circuit diagram	
Rated voltage	12 V	
Rated current at 85 °C	One relay in use	Both relays in use
Standard PCB	15 A	10 A
Advanced PCB	20 A	15 A
Contact material	$AgSnO_2$	
Max. switching current[1]		
On[2]	50 A	
Off	30 A	
Min. recommended load[3]	1 A at 5 V	
Voltage drop at 10 A (initial)	Typ. 15 mV, 200 mV max.	
Mechanical endurance (without load)	> 10^6 operations	
Electrical endurance (tested on relay V23086-L1252-A403 used in this module)	Resistive load: at 13.5 V at +85 °C Inductive load	> 1 x 10^5 operations on 20 A/off 20 A on 120 ms/off 4880 ms > 1 x 10^5 operations
	at 13.5 V at cyclic temperature change-40/+23/+85 °C Lamp load	on 25 A/off 5 A on 120 ms/off 4880 ms L=0.6 mH > 1 x 10^5 operations
	at 13.5 V at cyclic temperature change-40/+23/+85 °C	on 50 A[2]/off 5 A on 120 ms/off 4880 ms

[1] The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V or 27 V for 24 V load voltages.
[2] For a load current duration of maximum 3 s for a make/break ratio of 1:10.
[3] See chapter Diagnostics in our Application Recommendations on page 18 of this catalog or consult the internet at http://relays.tycoelectronics.com/application.asp

Coil data for V23141-B0001-X030 and V23141-B0001-X037 [1]			
Available for nominal voltages	12 V		
Nominal power consumption	Continuous power on coil not allowed		
Test voltage coil/contact	500 VAC_{rms}		
Maximum ambient temperature range	– 40 to + 105 °C		
Set			
Function	Close contacts		
Terminals 1-5 and 2-3	Connected		
Polarity	Terminal 7 Negative potential	Terminal 8 Positive potential	Terminal 9 No current
Must set voltage[2] (ambient temperature 23 °C)	6 V		
Maximum set voltage (coil temperature 23 °C)	22 V		
Minimum set voltage pulse width at 6 V	5 ms		
Maximum set voltage pulse width at 22 V	1 s		
Resistance between 7-8 with coils at 23 °C	34 ± 4 Ω		
Set time (nominal voltage; coil temperature 23 °C)	Typ. 2.5 ms		
Reset			
Function	Open contacts		
Terminals 1-5 and 2-3	Not connected		
Polarity	Terminal 7 No current	Terminal 8 Positive potential	Terminal 9 Negative potential
Must set voltage (ambient temperature 23 °C)	6 V		
Maximum set voltage (coil temperature 23 °C)	22 V		
Minimum set voltage pulse width at 6 V	5 ms		
Maximum set voltage pulse width at 22 V	1 s		
Resistance between 8-9 with coils at 23 °C	34 ± 4 Ω		
Set time (nominal voltage; coil temperature 23 °C	Typ. 2.0 ms		

[1] Verified on single samples from serial tools.

Power Management Modules

Coil data for V23141-B0001-X031 and V23141-B0001-X038 [1]				
Available for nominal voltages	12 V			
Nominal power consumption	Continuous power on coil not allowed			
Test voltage coil/contact	500 VAC_{rms}			
Maximum ambient temperature range	– 40 to + 105 °C			
Set system 1				
Function	Close contacts			
Terminals 1-3	Connected			
Polarity	Terminal 1 Positive potential	Terminal 2 No current	Terminal 7 Negative potential	Terminal 6 No current
Must set voltage (ambient temperature 23 °C)	6 V			
Maximum set voltage (coil temperature 23 °C)	22 V			
Minimum set voltage pulse width at 6 V	5 ms			
Maximum set voltage pulse width at 22 V	1 s			
Resistance between 1-7 with coils at 23 °C	62 ± 6 Ω			
Set time (nominal voltage; coil temperature 23 °C)	Typ. 2.5 ms			
Set system 2				
Function	Close contacts			
Terminals 1-5	Connected			
Polarity	Terminal 1 Positive potential	Terminal 2 No current	Terminal 7 No current	Terminal 6 Negative potential
Must set voltage[2] (ambient temperature 23 °C)	6 V			
Maximum set voltage (coil temperature 23 °C)	22 V			
Minimum set voltage pulse width at 6 V	5 ms			
Maximum set voltage pulse width at 22 V	1 s			
Resistance between 1-6 with coils at 23 °C	62 ± 6 Ω			
Set time (nominal voltage; coil temperature 23 °C)	Typ. 2.0 ms			
Reset both systems				
Function	Open contacts			
Terminals 1-5 and 2-3	Connected			
Polarity	Terminal 1 Positive potential	Terminal 2 Negative potential	Terminal 7 No current	Terminal 6 No current
Must set voltage (ambient temperature 23 °C)	6 V			
Maximum set voltage (coil temperature 23 °C)	22 V			
Minimum set voltage pulse width at 6 V	5 ms			
Maximum set voltage pulse width at 22 V	1 s			
Resistance between 1-2 with coils at 23 °C	31 ± 4 Ω			
Set time (nominal voltage; coil temperature 23 °C)	Typ. 2.0 ms			

[1] Verified on single samples from serial tools.

Power Management Modules

Mechanical data	
Cover retention	
Axial force	150 N (33.7 lbs)
Pull force	200 N (45 lbs)
Push force	200 N (45 lbs)
Terminals	
Pull force	100 N (22.5 lbs)
Push force	100 N (22.5 lbs)
Resistance to bending, force applied to front	10 N (2.25 lbs)[1]
Resistance to bending, force applied to side	10 N (2.25 lbs)[1]
Torsion	0.3 Nm
Enclosures	
Dust cover	Protects relay from dust. For use in passenger compartment or enclosures

[1] Values apply 2 mm from the end of the terminal. When the force is removed, the terminal must not have moved by more than 0.3 mm.

Operating conditions				
Temperature range, storage	Refer to Storage in the “Glossary”			
Test	Relevant standard	Testing as per	Dimension	Comments
Cold storage	IEC 68-2-1		1000 h	– 40 °C
Dry heat	IEC 68-2-2	Ba	1000 h	+ 85 °C
Thermal shock	IEC 68-2-14	Na	100 cycles	– 40 °C/+85 °C Dwell time 15 min
Vibration resistance	IEC 68-2-6 (sine pulse form) contacts 1-5 and 2-3 closed		10-2000 Hz 10 g	No change in the switching state > 10 µs
Vibration resistance	IEC 68-2-6 (sine pulse form) contacts 1-5 and 2-3 open		10-500 Hz 6 g	
Shock resistance	IEC 68-2-27 (half-sine pulse form)		6 ms up to 30 g	
Continuous shock	IEC 68-2-27	Eb	6 ms, 30 g, 1000 shocks in each direction	
Drop test	Capable of meeting specifications after 1.0 m (3.28 foot) drop onto concrete			
Flammability	UL94-HB or better (meets FMVSS 302)[2]			

[1] Verified on separate relay samples produced in series.
[2] FMVSS: Federal Motor Vehicle Safety Standard.

Ordering information

Part numbers		Contact arrangement	Contact material	Enclosure	Special features
Relay part number	Tyco order number				
12 V modules					
V23141-B0001-X030[1]	1-1414255-0	see page 173	AgSnO2	Dust cover	Quick connect, standard printed circuit board
V23141-B0001-X037[1]	1-1414502-0	see page 173	AgSnO2	Dust cover	Quick connect, advanced printed circuit board
V23141-B0001-X031[2]	1-1414233-0	see page 173	AgSnO2	Dust cover	Quick connect, standard printed circuit board
V23141-B0001-X038[2]	1-1414501-0	see page 173	AgSnO2	Dust cover	Quick connect, advanced printed circuit board

[1] 7 terminals, 2 separated load circuits.
[2] 6 terminals, common plus for coil and load side.