

## Power Relay F7/VF7



### Features

- Limiting continuous current 70 A
- Pin assignment according to ISO 7588 part 1

### Customized Versions on Request

- 24 V versions with contact gap > 0.8 mm
- Plug-in or PCB terminals
- Integrated components (e.g. resistor, diode)
- Customized marking/color
- Special covers (e.g. notches, release features, brackets)
- For shrouded/weatherproof dust cover versions refer to Shrouded Power Relay F7 A and VF7 A

### Typical Applications

- ABS control
- Cooling fan
- Energy management
- Engine control
- Glow plug
- Heated front screen
- Ignition
- Lamps front, rear, fog light
- Main switch/supply relay

Please contact Tyco Electronics for relay application support.



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### Design

- ELV/RoHS/WEEE compliant
- Dustproof: protection class IP 54 to IEC 529 (EN 60 529)
- Sealed: protection class IP67 to IEC 529 (EN 60 529)

### Weight

Approx. 38 g (1.3 oz.)

### Nominal Voltage

12 V or 24 V; other nominal voltages available on request

### Terminals

Quick connect terminals similar to ISO 8092-1, coil 6.3 x 0.8 mm, load 9.5 x 1.2 mm; surfaces tin plated or PCB terminals

### Accessories

Connectors see page 234

### 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, 998.9 ±33.9 hPa.

For general storage and processing recommendations please refer to our Application Notes and especially to *Storage* in the "Glossary" page 23 or at <http://relays.tycoelectronics.com/appnotes/>

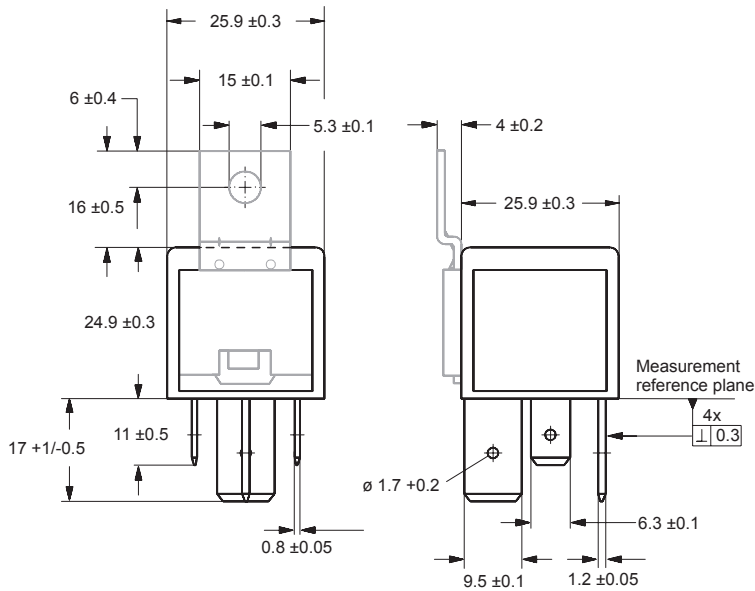
### Disclaimer

All technical performance data apply to the relay as such, specific conditions of the individual application are not considered. Please always check the suitability of the relay for your intended purpose. We do not assume any responsibility or liability for not complying herewith. We recommend to complete our questionnaire and to request our technical service. Any responsibility for the application of the product remains with the customer only. All specifications are subject to change without notification. All rights of Tyco Electronics are reserved.

**Power Relay F7/VF7**

**Dimensional Drawing**

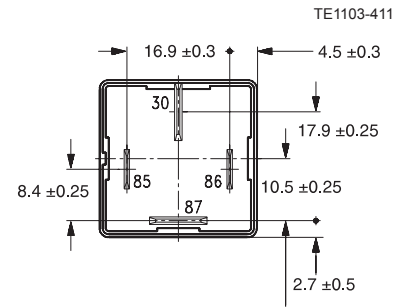
**Power Relay F7/VF7 with Quick Connect Terminals**



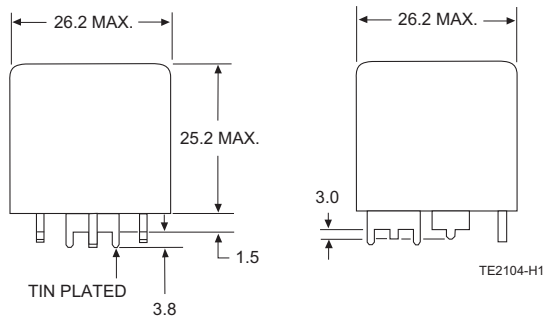
Quick connect terminal similar to ISO 8092-1

TE1098-Y1

**View of the Terminals (bottom view)**

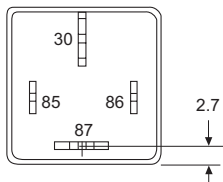


**Power Relay F7/VF7 with PCB Terminals**

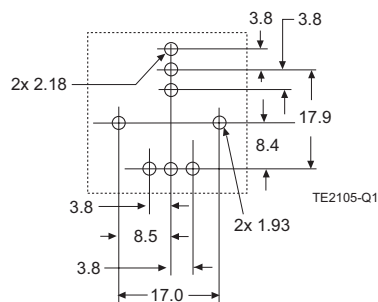


TE2104-H1

**View of the Terminals (bottom view)**




**Mounting Holes (bottom view)**



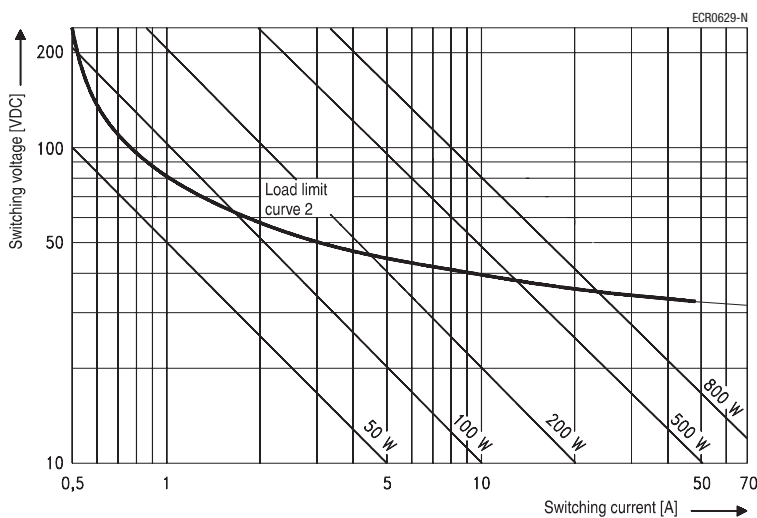
**Power Relay F7/VF7**

**Contact Data**

Contact configuration	1 Make contact/ 1 Form A		
Circuit symbol (see also Pin assignment)			
Rated voltage	12 V	24 V	24 V <sup>3)</sup>
Rated current	50 A	25 A	40 A
Limiting continuous current	23°C: 70 A 85°C: 50 A 125°C: 30 A		
Contact material	AgNi0.15		AgSnO <sub>2</sub>
Max. switching voltage/power	See load limit curve		
Max. switching current <sup>1)</sup>			
On <sup>2)</sup>	240 A	240 A	240 A
Off	70 A	25 A	40 A
Min. recommended load <sup>4)</sup>	1 A at 5 V		
Voltage drop at 10 A (initial NO contact)	Typ. 10 mV, 300 mV max.		
Mechanical endurance (without load)	> 10 <sup>7</sup> operations		
Electrical endurance (example of resistive load, without component in parallel to the coil, further information on request)	> 1 x 10 <sup>5</sup> operations 70 A, 13.5 V > 2 x 10 <sup>5</sup> operations 50 A, 13.5 V	> 1 x 10 <sup>5</sup> operations 25 A, 28 V	> 1 x 10 <sup>5</sup> operations 50 A, 28 V
Max. switching rate at nominal load	6 operations per minute (0.1 Hz)		

- <sup>1)</sup> 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.
- <sup>2)</sup> For a load current duration of maximum 3 s for a make/break ratio of 1:10.
- <sup>3)</sup> Special high performance 24 V version with contact gap > 0.8 mm, part number V23134-J0056-X408 (see ordering information).
- <sup>4)</sup> See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at <http://relays.tycoelectronics.com/appnotes/>

**Load Limit Curve**

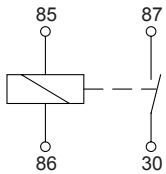


Load limit curve 2 ≙ safe shutdown, no stationary arc (make contact)

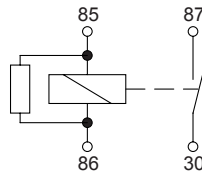
Power Relay F7/VF7

**Circuit Diagram**

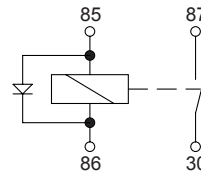
A0  
1 Make contact/1 Form A



AR  
1 Make contact/1 Form A  
with Resistor



AD  
1 Make contact/1 Form A  
with Diode



**Coil Data**

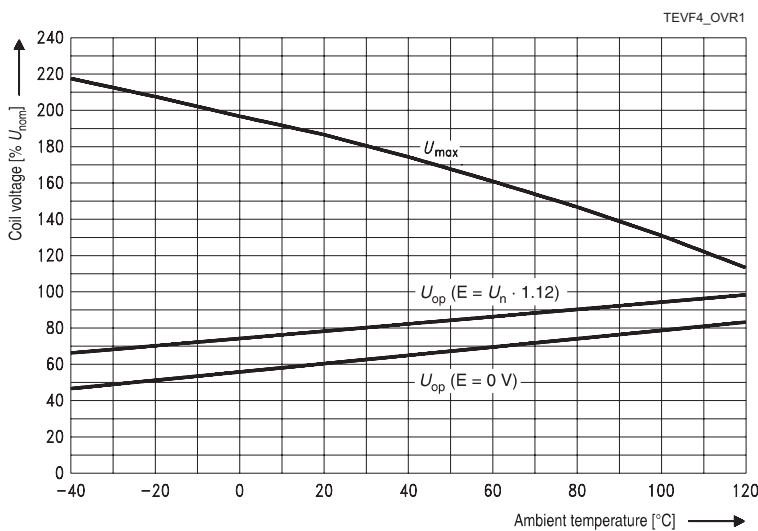
Available for nominal voltages	12 V / 24 V
Nominal power consumption of the unsuppressed coil at nominal voltage	1.6 V / 2.0 W (F7/VF7)
Nominal power consumption at nominal voltage with suppression resistor	1.8 W / 2.2 W / 2.6 W (F7/VF7/high performance 24 V)
Test voltage winding/contact and contact/contact	500 VAC <sub>rms</sub>
Ambient temperature range	-40 to +125°C
Operate time at nominal voltage	Typ. 7 ms
Release time at nominal voltage <sup>1)</sup>	Typ. 2 ms

<sup>1)</sup> For unsuppressed relay coil.

**Note:**

A low resistive suppression device in parallel to the relay coil increases the release time and reduces the lifetime caused by increased erosion and/or higher risk of contact tack welding.

**Operating Voltage Range**



Does not take into account the temperature rise due to the contact current  
E = pre-energization

**Power Relay F7/VF7**

**Mechanical Data**

Cover retention	
Axial force	150 N
Pull force	150 N
Push force	150 N
Terminals	
Pull force	100 N
Push force	100 N
Resistance to bending, force applied to front	10 N <sup>1)</sup>
Resistance to bending, force applied to side	10 N <sup>1)</sup>
Torsion	0.3 Nm
Enclosures	
Dust cover	Protects relay from dust. For use in passenger compartment or enclosures.

<sup>1)</sup> 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.

**Environmental Conditions**

Temperature range, storage	Refer to <i>Storage</i> in the "Glossary" catalog page 23 or <a href="http://relays.tycoelectronics.com/appnotes/">http://relays.tycoelectronics.com/appnotes/</a>			
Test	Relevant standard	Testing as per	Dimension	Comments
Climatic cycling with condensation	EN ISO 6988		6 cycles	Storage 8/16 h
Temperature cycling	IEC 68-2-14	Nb	10 cycles	-40/+85°C (5°C per min)
Damp heat				
cyclic	IEC 68-2-30	Db, Variant 1	6 cycles	Upper air temperature 55°C
constant	IEC 68-2-3	Ca	56 days	
Corrosive gas	IEC 68-2-42	10 ±2 cm <sup>3</sup> /m <sup>3</sup> SO <sub>2</sub>	10 days	
	IEC 68-2-43	1 ±0.3 cm <sup>3</sup> /m <sup>3</sup> H <sub>2</sub> S	10 days	
Vibration resistance	IEC 68-2-6 (sine sweep)		10 - 500 Hz min. 10 g	No change in the switching state > 10 μs
Shock resistance	IEC 68-2-27 (half sine form single pulses)		min. 30 g 6 ms	
Load dump	ISO 7637-1 (12 V) ISO 7637-2 (24 V)	Test pulse 5 Test pulse 5	Vs = +86.5 V Vs = +200 V	
Jump start	24 V for 5 minutes conducting nominal current at 23°C			
Drop test	Capable of meeting specifications after 1.0 m (3.28 ft) drop onto concrete			
Flammability	UL94-HB or better (meets FMVSS 302) <sup>1)</sup>			
Overload current for relays with rated currents as shown in contact data table <sup>2)</sup>			67.5 A, 1800 s 100 A, 5 s 175 A, 0.5 s 300 A, 0.2 s	

<sup>1)</sup> FMVSS: Federal Motor Vehicle Safety Standard.

<sup>2)</sup> Current and time are compatible with circuit protection by a typical 50 A automotive fuse. Relay will make, carry and break the specified current.

**Power Relay F7/VF7**

Ordering Information

Part Numbers (see table below for coil data)		Part Number	Circuit/Contact Arrangement	Contact Material	Enclosure	Coil Suppression	Bracket
Relay Description	Internal Reference						
<b>12 V Plug-In Relays</b>							
V23134-J0052-D642		7-1393303-3	A0/1 Form A	Silver based	Dust cover		
V23134-J1052-D642		1393304-9	A0/1 Form A	Silver based	Dust cover		Yes
V23134-J0052-X429		1-1414147-0	AR/1 Form A	Silver based	Dust cover	Resistor 680 Ω	
V23134-J0052-X439		1-1414286-0	AD/1 Form A	Silver based	Dust cover	Diode (cathode at 86)	
V23134-J0052-X461 <sup>1)</sup>		1-1414469-0	AR/1 Form A	Silver based	Dust cover	Resistor 560 Ω	
<b>12 V PCB Relays</b>							
V23134-J0052-X455		1-1414478-0	AR/1 Form A	Silver based	Dust cover	Resistor 470 Ω	
<b>24 V Plug-In Relays</b>							
V23134-J0053-D642		9-1393303-7	A0/1 Form A	Silver based	Dust cover		
V23134-J1053-D642		1-1393304-1	A0/1 Form A	Silver based	Dust cover		Yes
V23134-J0056-X408 <sup>2)</sup>		1393304-5	AR/1 Form A	Silver based	Dust cover	Resistor 1200 Ω	
<b>12 V Plug-In Relays</b>							
VF7-11F11	V23134-J0055-X834	4-1393306-5	A0/1 Form A	Silver based	Dust cover		
VF7-11F11-S01	V23134-J0055-X836	4-1393306-6	AR/1 Form A	Silver based	Dust cover	Resistor 680 Ω	
VF7-41F11	V23134-J1055-X845	5-1393306-8	A0/1 Form A	Silver based	Dust cover		Yes
VF7-41F11-C05	V23134-J1056-X846	1432055-1	AR/1 Form A	Silver based	Dust cover, sealed	Resistor 680 Ω	Yes
VF7-41F11-S01	V23134-J1055-X849	1-1393302-6	AR/1 Form A	Silver based	Dust cover	Resistor 680 Ω	Yes
<b>12 V PCB Relays</b>							
VF7-11F12	V23134-J0055-X838	1-1393302-3	A0/1 Form A	Silver based	Dust cover		
VF7-11F12-C05	V23134-J0055-X864	1432556-1	AR/1 Form A	Silver based	Dust cover, sealed	Resistor 680 Ω	
<b>24 V Plug-In Relays</b>							
VF7-11H11	V23134-J0065-X839	1-1393302-4	A0/1 Form A	Silver based	Dust cover		
VF7-41H11	V23134-J1065-X853	1-1393302-7	A0/1 Form A	Silver based	Dust cover		Yes
VF7-41H11-S08	V23134-J1065-X855	6-1393306-7	AR/1 Form A	Silver based	Dust cover	Resistor 2700 Ω	Yes
<b>24 V PCB Relays</b>							
VF7-11H12	V23134-J0065-X497	3-1414937-3	A0/1 Form A	Silver based	Dust cover		

<sup>1)</sup> Special feature: 14.5 mm load terminals.

<sup>2)</sup> Special feature: contact gap > 0.8 mm.

**Coil Versions**

Coil Data for Power F7/VF7	Rated Coil Voltage (V)	Coil Resistance ±10% (Ω)	Must Operate Voltage (V)	Must Release Voltage (V)	Allowable Overdrive <sup>1)</sup> Voltage (V)	
					at 23°C	at 85°C
V23134-**052****	12	90	7.2	1.6	22	17
V23134-**053****	24	324	14.4	3.2	41	30
V23134-**056****	24	268	16.0	4.0	38	29
VF7-**F**..**	12	72	7.2	1.2	18	14
VF7-**H**..**	24	288	14.4	2.4	36	28

<sup>1)</sup> Allowable overdrive is stated with no load applied and minimum coil resistance.

**Standard Delivery Packs** (orders in multiples of delivery pack)

Power F7:	Plug-in version:	210 pieces
	Plug-in version with bracket:	208 pieces
	PCB version:	200 pieces
VF7:		300 pieces