

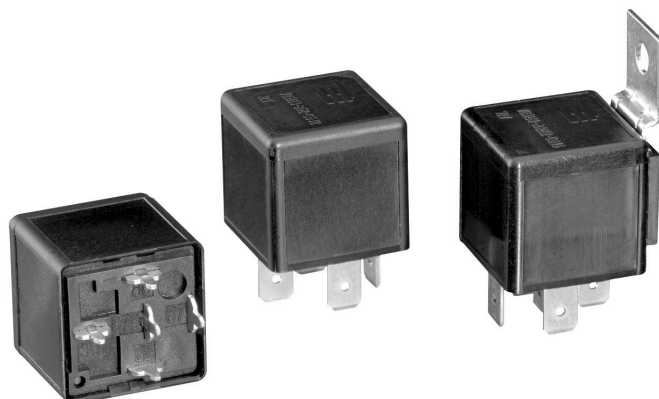
### Power Relay F4

#### ■ Pin assignment similar to ISO 7588 part 1

#### ■ Plug-in or PCB terminals

#### Customized versions on request

- 48VDC version on request
- Integrated components (e.g. resistor, diode)
- Customized marking/color
- Special covers (e.g. notches, release features, brackets)
- Various contact arrangements and materials
- For latching (bistable) version refer to Power Relay F7 A Latching
- For shrouded/weatherproof dust cover versions refer to Shrouded Power Relay F4 A and F4



#### Typical applications

Cross carline up to 40A for example: ABS control, blower fans, car alarm, cooling fan, Electric Power Steering, energy management, engine control, fuel pump, heated front screen, lamps: front, rear, fog light, main switch/supply relay, valves, wiper control.

#### Contact Data

| Contact arrangement             | 1 form A, 1 NO/1 NO (2x87) | 1 form U, 2 NO          | 1 form C, 1 CO          |
|---------------------------------|----------------------------|-------------------------|-------------------------|
| Rated voltage                   | 12VDC/24VDC                | 12VDC/24VDC             | 12VDC/24VDC             |
| Maximum switching voltage       | 16VDC/32VDC                | 16VDC/32VDC             | 16VDC/32VDC             |
| Limiting continuous current     | NO                         | NO                      | NO/NC                   |
| 23°C                            | 60A                        | 2x32A                   | 60/45A                  |
| 85°C                            | 40A                        | 2x25A                   | 40/30A                  |
| 125°C                           | 17A                        | 2x11A                   | 17/12A                  |
| Limiting short-time current     |                            |                         |                         |
| overload current                | 1.35 x 40A, 900s           | 1.35 x 40A, 900s        | 1.35 x 40A/30A, 900s    |
| ISO 8820-3 <sup>1)</sup> (2015) | 2.00 x 40A, 60s            | 2.00 x 40A, 60s         | 2.00 x 40A/30A, 60s     |
|                                 | 3.50 x 40A, 7s             | 3.50 x 40A, 7s          | 3.50 x 40A/30A, 7s      |
|                                 | 6.00 x 40A, 1s             | 6.00 x 40A, 1s          | 6.00 x 40A/30A, 1s      |
| Contact material                | silver alloy               | silver alloy            | silver alloy            |
| Min. contact load <sup>2)</sup> | 1A 5VDC                    | 1A 5VDC                 | 1A 5VDC                 |
| Initial voltage drop            |                            |                         |                         |
| NO contact at 10A, typ./max.    | 15mV/200mV                 | 2x15mV/200mV            | 15mV/200mV              |
| NC contact at 10A, typ./max.    |                            |                         | 20mV/250mV              |
| Operate time <sup>3)</sup>      | typ. 7ms                   | typ. 7ms                | typ. 7ms                |
| Release time <sup>3)</sup>      | typ. 2ms                   | typ. 2ms                | typ. 2ms                |
| Mechanical endurance            | >1x10 <sup>6</sup> ops.    | >1x10 <sup>6</sup> ops. | >1x10 <sup>6</sup> ops. |

#### Electrical Endurance 12VDC Coil

| Load voltage/<br>coil voltage | Load type |       | Load current   |                  |                        |     | On / off ratio | Electrical endurance <sup>4)</sup> |            |
|-------------------------------|-----------|-------|----------------|------------------|------------------------|-----|----------------|------------------------------------|------------|
|                               |           |       | 1 form A<br>NO | 1 form U<br>2 NO | 1 form C <sup>5)</sup> |     |                | Coil supression <sup>6)</sup>      |            |
|                               |           |       |                |                  | NO                     | NC  |                | Resistor                           | Diode      |
| 14VDC                         | resistive | make  | 40A            | 2x25A            | 40A                    | 30A | 1s/1s          | >1x10 <sup>5</sup> ops.            | on request |
|                               |           | break | 40A            | 2x25A            | 40A                    | 30A |                |                                    |            |

#### Electrical Endurance 24VDC Coil

|       |           |       |     |       |     |     |       |                         |            |
|-------|-----------|-------|-----|-------|-----|-----|-------|-------------------------|------------|
| 28VDC | resistive | make  | 20A | 2x20A | 20A | 10A | 2s/2s | >1x10 <sup>5</sup> ops. | on request |
|       |           | break | 20A | 2x20A | 20A | 10A |       |                         |            |

All tests performed with cyclic temperature.

1) Current and time are compatible with circuit protection by a typical automotive fuse. Relay will make, carry and break the specified current.

2) See Definitions for automotive relays <https://relays.te.com/definitions/> and chapter Diagnostics of Relays in our Application Notes at <https://relays.te.com/appnotes/>

3) At rated voltage and 23°C for a relay coil with suppression resistor. A suppression diode will influence the switching behaviour and reduce the service life.

4) According Weibull.

5) NO & NC contacts tested independently.

6) Any diode or pn-junction parallel to the coil (internal or external) will significantly decrease the electrical lifetime, especially when used for inductive loads.

### Power Relay F4 (Continued)

#### Coil Data

| Coil code | Rated voltage [VDC] | Must Operate voltage [VDC] | Must Release voltage [VDC] | Coil resist. [ $\Omega$ ] | Suppr. resist. [ $\Omega$ ] | Total resist. [ $\Omega$ ]<br>$\pm 10\%$ | Rated coil power [W] |
|-----------|---------------------|----------------------------|----------------------------|---------------------------|-----------------------------|------------------------------------------|----------------------|
| 052       | 12                  | 7.2                        | 1.6                        | 90                        | --                          | 90                                       | 1.6                  |
| 052       | 12                  | 7.2                        | 1.6                        | 90                        | 560                         | 78                                       | 1.8                  |
| 052       | 12                  | 7.2                        | 1.6                        | 90                        | 680                         | 79                                       | 1.8                  |
| 056       | 24                  | 16.0                       | 4.0                        | 268                       | --                          | 268                                      | 2.1                  |
| 056       | 24                  | 16.0                       | 4.0                        | 268                       | 1200                        | 219                                      | 2.6                  |
| 165       | 24                  | 16.0                       | 2.4                        | 288                       | 1200                        | 232                                      | 2.5                  |

All figures are given for coil without pre-energization, at ambient temperature +23°C.

#### Insulation Data

|                             |                       |
|-----------------------------|-----------------------|
| Initial dielectric strength |                       |
| between open contacts       | 500VAC <sub>rms</sub> |
| between contact and coil    | 500VAC <sub>rms</sub> |

#### Other Data

|                                                                    |                                          |
|--------------------------------------------------------------------|------------------------------------------|
| EU RoHS/ELV compliance                                             | compliant                                |
| Protection to heat and fire                                        | UL94-HB or better <sup>7)</sup>          |
| Ambient temperature                                                |                                          |
| for 12V coil                                                       | -40 to +125°C                            |
| for 24V coil                                                       | -40 to +105°C                            |
| Rapid change of temperature (thermal shock), IEC 60068-2-14 (2009) |                                          |
| Na                                                                 | 100 cycles, -40°C / +125°C               |
| Damp heat cyclic IEC 60068-2-30 (2005)                             |                                          |
| Db, Variant 1                                                      | 6 cycles, upper air temp. 55°C           |
| Degree of protection IEC 60529 (2013)                              | IP54                                     |
| Vibration resistance (functional) ISO 16750-3 (2012)               | 10 to 1000Hz, 2.71g eff. <sup>8)</sup>   |
| Test IV                                                            | No change of switching state >10 $\mu$ s |
| Shock resistance (functional) IEC 60068-2-27 (2008)                | min. 20g 11ms <sup>9)</sup>              |
| half sine                                                          | No change of switching state >10 $\mu$ s |
| Drop test, free fall IEC 60068-2-32 (2008)                         | 1m onto concrete                         |
| Terminal type                                                      | Plug-in, QC/PCB                          |
| Cover retention                                                    |                                          |
| pull                                                               | 150N                                     |
| push                                                               | 200N                                     |
| Terminal retention                                                 |                                          |
| pull                                                               | 100N                                     |
| push                                                               | 100N                                     |
| resistance to bending                                              | 10N <sup>9)</sup>                        |
| Weight                                                             | approx. 35g (1.2oz)                      |
| Packaging unit                                                     |                                          |
| Plug-in/PCB                                                        | 315 pcs.                                 |
| Plug-in with bracket                                               | 200 pcs.                                 |

7) Refers to used materials.

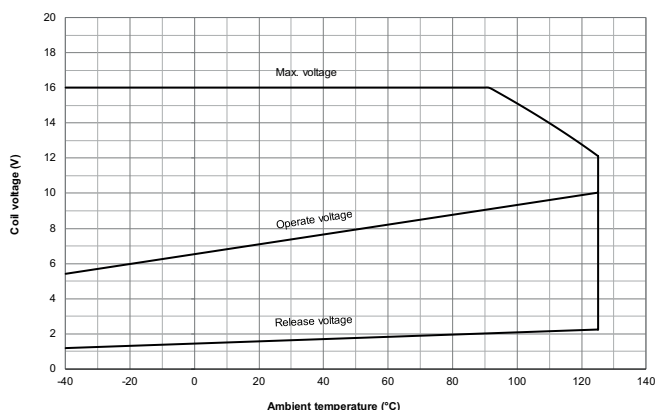
8) Valid for NC contacts, NO contact values significantly higher.

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

#### Accessories

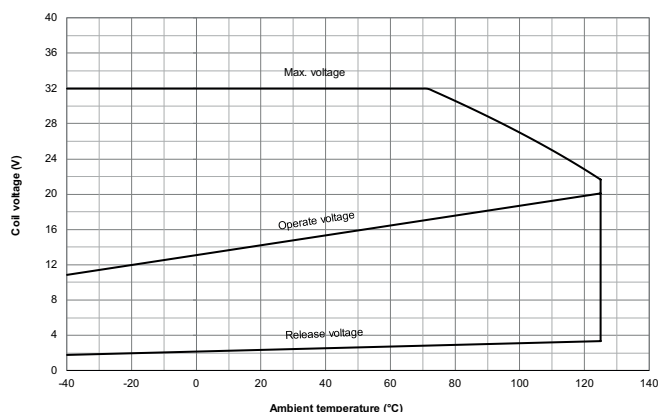
For details see datasheet Connectors for Mini ISO Relays

#### Coil operating range coil 0052



Does not take into account the temperature rise due to the contact current

#### Coil operating range coil 0165

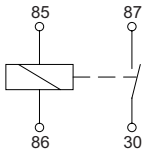


Does not take into account the temperature rise due to the contact current

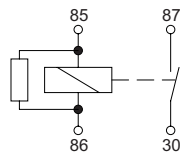
### Power Relay F4 (Continued)

#### Terminal Assignment

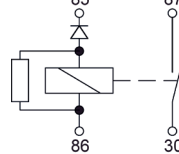
NO  
1 form A, 1 NO



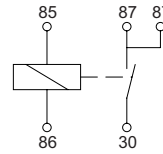
NOR  
1 form A, 1 NO  
with resistor



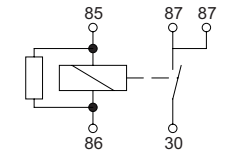
NOR\_SD  
1 form A, 1 NO  
with resistor & serial diode



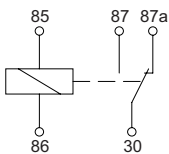
NO\_2x87  
1 form A, 1 NO (2x87)



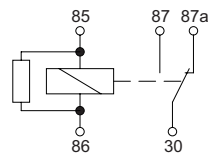
NOR\_2x87  
1 form A, 1 NO (2x87)  
with resistor



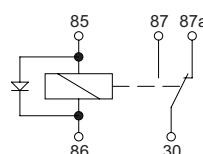
CO  
1 form C, 1 CO



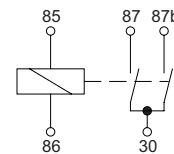
COR  
1 form C, 1 CO  
with resistor



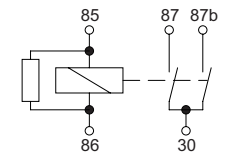
COD  
1 form C, 1 CO  
with diode



DNO  
1 form U, 2 NO



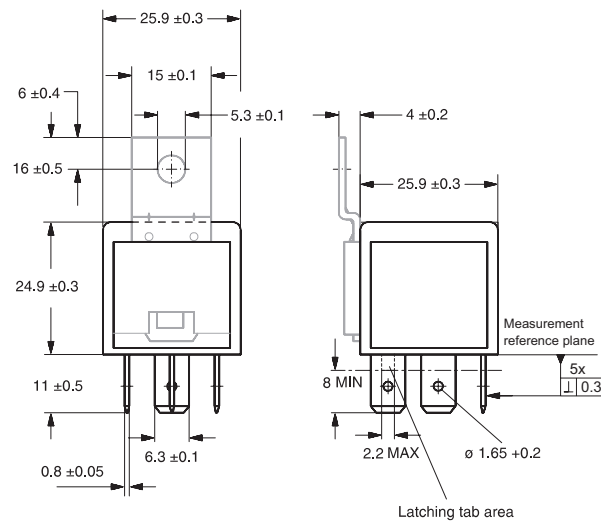
DNOR  
1 form U, 2 NO  
with resistor



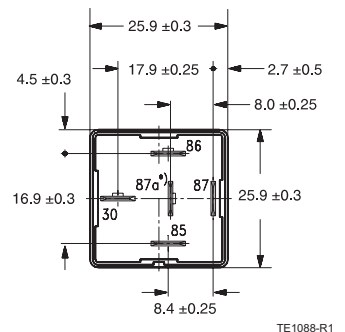
#### Dimensions

##### Power Relay F4 with quick connect (QC) terminals

External dimensions



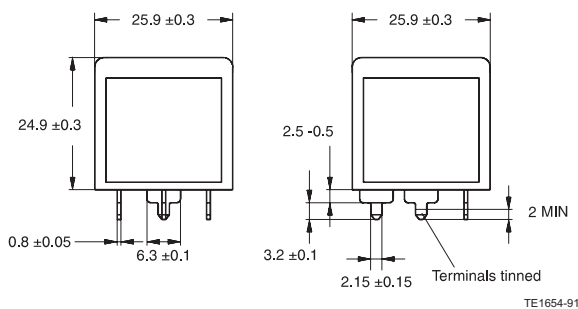
View of the terminals (bottom view)



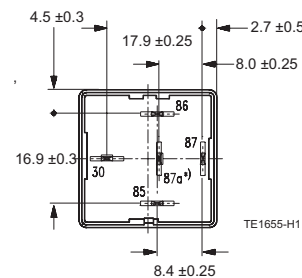
For the make contact (2x87), pin 87a = 87;  
for the double make contact, pin 87a = 87b.

##### Power Relay F4 with PCB terminals

External dimensions

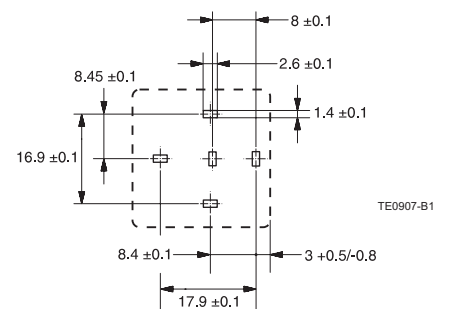


View of the terminals (bottom view)



For the make contact (2x87), pin 87a = 87;  
for the double make contact, pin 87a = 87b.

Mounting hole layout (bottom view)



### Power Relay F4 (Continued)

| Product Code Structure |  |                                  |  | Typical product code |  | V23134                | -A | 0 | 052 | -C643 |
|------------------------|--|----------------------------------|--|----------------------|--|-----------------------|----|---|-----|-------|
| Type                   |  |                                  |  |                      |  |                       |    |   |     |       |
| V23134 Power Relay F4  |  |                                  |  |                      |  |                       |    |   |     |       |
| Contact arrangement    |  |                                  |  |                      |  |                       |    |   |     |       |
| A                      |  | 1 form C, 1 CO                   |  | C                    |  | 1 form A, 1 NO (2x87) |    |   |     |       |
| B                      |  | 1 form A, 1 NO                   |  | M                    |  | 1 form U, 2 NO        |    |   |     |       |
| Cover                  |  |                                  |  |                      |  |                       |    |   |     |       |
| 0                      |  | Standard                         |  | 1                    |  |                       |    |   |     |       |
| Coil                   |  |                                  |  |                      |  |                       |    |   |     |       |
| 052                    |  | 12VDC                            |  | 056                  |  |                       |    |   |     |       |
| 165                    |  | 24VDC                            |  |                      |  |                       |    |   |     |       |
| Terminal arrangement   |  |                                  |  |                      |  |                       |    |   |     |       |
| C642                   |  | Plug-in/NO                       |  | C643                 |  | Plug-in/CO            |    |   |     |       |
| G242                   |  | PCB/NO                           |  | G243                 |  | PCB/CO                |    |   |     |       |
| Xnnn                   |  | Customized (nnn: version number) |  |                      |  |                       |    |   |     |       |

#### Production in Europe (only)

| Product Code                        | Arrangement           | Cover    | Coil Suppr.    | Circuit <sup>10)</sup> | Coil  | Terminals   | Part Number |
|-------------------------------------|-----------------------|----------|----------------|------------------------|-------|-------------|-------------|
| V23134-A0052-C643                   | 1 form C, 1 CO        | Standard | --             | CO                     | 12VDC | Plug-in, QC | 2-1393302-2 |
| V23134-A0052-G243                   | 1 form C, 1 CO        | Standard | --             | CO                     | 12VDC | PCB         | 2-1393302-3 |
| V23134-A0052-X278                   | 1 form C, 1 CO        | Standard | R 560Ω         | COR                    | 12VDC | Plug-in, QC | 4-1393302-1 |
| V23134-A1052-C643                   | 1 form C, 1 CO        | Bracket  | --             | CO                     | 12VDC | Plug-in, QC | 5-1393302-8 |
| V23134-A1052-X131                   | 1 form C, 1 CO        | Bracket  | D (cathode 86) | COD                    | 12VDC | Plug-in, QC | 7-1393306-1 |
| V23134-A1052-X294 <sup>11)</sup>    | 1 form C, 1 CO        | Bracket  | R 560Ω         | COR                    | 12VDC | Plug-in, QC | 6-1393302-0 |
| V23134-B0052-C642                   | 1 form A, 1 NO        | Standard | --             | NO                     | 12VDC | Plug-in, QC | 7-1393302-5 |
| V23134-B0052-G242                   | 1 form A, 1 NO        | Standard | --             | NO                     | 12VDC | PCB         | 7-1393302-7 |
| V23134-B0052-X270 <sup>13)</sup>    | 1 form A, 1 NO        | Standard | R 680Ω         | NOR                    | 12VDC | Plug-in, QC | 1-1414099-0 |
| V23134-B0052-X506                   | 1 form A, 1 NO        | Standard | R 560Ω         | NOR_SD <sup>12)</sup>  | 12VDC | Plug-in, QC | 4-1414992-3 |
| V23134-B1052-C642                   | 1 form A, 1 NO        | Bracket  | --             | NO                     | 12VDC | Plug-in, QC | 3-1393303-4 |
| V23134-C0052-C642                   | 1 form A, 1 NO (2x87) | Standard | --             | NO_2x87                | 12VDC | Plug-in, QC | 3-1393303-9 |
| V23134-C1052-C642                   | 1 form A, 1 NO (2x87) | Bracket  | --             | NO_2x87                | 12VDC | Plug-in, QC | 4-1393303-7 |
| V23134-C1052-X280 <sup>11)12)</sup> | 1 form A, 1 NO (2x87) | Bracket  | R 560Ω         | NOR_2x87               | 12VDC | Plug-in, QC | 4-1393303-8 |
| V23134-M0052-C642                   | 1 form U, 2 NO        | Standard | --             | DNO                    | 12VDC | Plug-in, QC | 5-1393304-6 |
| V23134-M0052-G242                   | 1 form U, 2 NO        | Standard | --             | DNO                    | 12VDC | PCB         | 5-1393304-7 |
| V23134-M1052-C642                   | 1 form U, 2 NO        | Bracket  | --             | DNO                    | 12VDC | Plug-in, QC | 7-1393304-1 |
| V23134-A0056-X432                   | 1 form C, 1 CO        | Standard | D (cathode 86) | COD                    | 24VDC | Plug-in, QC | 1-1414167-0 |
| V23134-A0056-X433                   | 1 form C, 1 CO        | Standard | R 1200Ω        | COR                    | 24VDC | Plug-in, QC | 1-1414168-0 |
| V23134-M0165-X539                   | 1 form U, 2 NO        | Standard | R 1200Ω        | DNOR                   | 24VDC | Plug-in, QC | 3-1904117-6 |

Other types on request.

This list represents the most common types and does not show all variants covered by this datasheet.

#### Production in Asia (only)

| Product Code                     | Arrangement    | Cover    | Coil Suppr. | Circuit <sup>10)</sup> | Coil  | Terminals   | Part Number |
|----------------------------------|----------------|----------|-------------|------------------------|-------|-------------|-------------|
| V23134-B0052-C642                | 1 form A, 1 NO | Standard | --          | NO                     | 12VDC | Plug-in, QC | 7-1904094-0 |
| V23134-B0052-X270 <sup>13)</sup> | 1 form A, 1 NO | Standard | R 680Ω      | NOR                    | 12VDC | Plug-in, QC | 7-1904094-1 |
| V23134-B0165-X589                | 1 form A, 1 NO | Standard | R 1200Ω     | NO                     | 24VDC | Plug-in, QC | 2402652-1   |

Other types on request.

This list represents the most common types and does not show all variants covered by this datasheet.

10) See terminal assignment diagrams.

11) No hole in terminal 30.

12) No hole in terminal 87a.

13) No holes in all terminals.