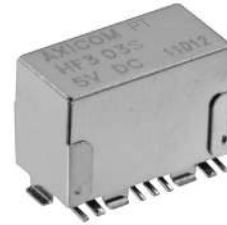


**HF3 S Relay**

- Y-Design
- Frequency range DC to 3GHz
- Impedance 50Ω / 75Ω
- Small dimensions (15x7.6x10.6mm)
- 1 form C contact (1 changeover contact)
- Immersion cleanable
- Low power consumption (≤140mW)

Typical applications

Cable modems and linecards/ CATV, Tabs, measurement and test equipment ATE, satellite / audio / video tuners, wireless base stations and antennas, power stages



| Contact Data                                  |  |
|---|--|
| Contact arrangement                           | 1 form C, 1 CO   |
| Max. switching voltage                        | 220VDC, 250VAC   |
| Rated current                                 | 2A   |
| Limiting continuous current, 23°C             | 2A   |
| Switching power                               | 60W, 62.5VA, 50W (2.5GHz)                              |
| Max. Continuous RF-Power, at 20°C., VSWR <1.2 | 100W @ 3GHz <sup>1)</sup><br>150W @ 2GHz <sup>1)</sup> |
| Breaking capacity max.                        | 300W <sup>1)</sup>                                     |
| Contact material                              | Ag, Au covered   |
| Minimum switching voltage                     | 100μV  |
| Initial contact resistance                    | <100mΩ at 10mA/30mV                                    |
| Operate time                                  | typ. 3ms, max. 5ms                                     |
| Release time                                  |  |
| without diode in parallel                     | typ. 2ms, max. 5ms                                     |
| with diode in parallel                        | typ. 4ms, max. 6ms                                     |
| Bounce time max.                              | typ. 1ms, max. 3ms                                     |
| Duration of set/reset pulse min.              | 20ms   |
| Mechanical endurance                          | 10 <sup>7</sup> operations                             |
| 1) with appropriate cooling only              |  |

| Coil Data          |            |
|--------------------|------------|
| Coil voltage range | 3 to 24VDC |

| Coil versions, monostable              |                   |                     |                      |                     |                       |                     |
|--|-------------------|---------------------|----------------------|---------------------|-----------------------|---------------------|
| Coil code                              | Rated voltage VDC | Operate voltage VDC | Limiting voltage VDC | Release voltage VDC | Coil resistance Ω±10% | Rated coil power mW |
| <b>50Ω version, monostable, 1 coil</b> |                   |                     |                      |                     |                       |                     |
| 51S                                    | 3                 | 2.25                | 6.50                 | 0.30                | 64                    | 140                 |
| 52S                                    | 4.5               | 3.38                | 9.80                 | 0.45                | 145                   | 140                 |
| 53S                                    | 5                 | 3.75                | 10.90                | 0.50                | 178                   | 140                 |
| 55S                                    | 9                 | 6.75                | 19.60                | 0.90                | 574                   | 140                 |
| 56S                                    | 12                | 9.00                | 26.10                | 1.20                | 1028                  | 140                 |
| 57S                                    | 24                | 18.00               | 52.30                | 2.40                | 4114                  | 140                 |
| <b>75Ω version, monostable, 1 coil</b> |                   |                     |                      |                     |                       |                     |
| 01S                                    | 3                 | 2.25                | 6.50                 | 0.30                | 64                    | 140                 |
| 02S                                    | 4.5               | 3.38                | 9.80                 | 0.45                | 145                   | 140                 |
| 03S                                    | 5                 | 3.75                | 10.90                | 0.50                | 178                   | 140                 |
| 05S                                    | 9                 | 6.75                | 19.60                | 0.90                | 574                   | 140                 |
| 06S                                    | 12                | 9.00                | 26.10                | 1.20                | 1028                  | 140                 |

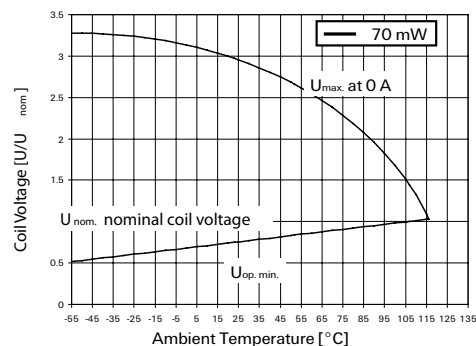
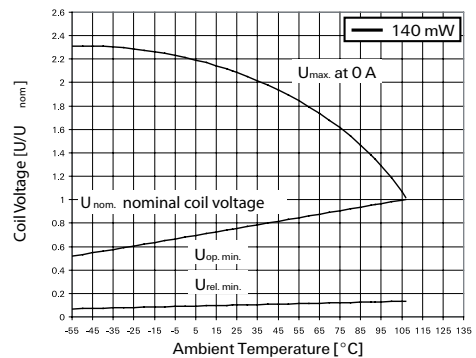
All figures are given for coil without pre-energization, at ambient temperature +23°C.

**Coil Data (continued)**

| Coil versions, bistable               |                   |                 |                      |                   |                       |                     |
|---------------------------------------|-------------------|-----------------|----------------------|-------------------|-----------------------|---------------------|
| Coil code                             | Rated voltage VDC | Set voltage VDC | Limiting voltage VDC | Reset voltage VDC | Coil resistance Ω±10% | Rated coil power mW |
| <b>50Ω version, bistable, 1 coil</b>  |                   |                 |                      |                   |                       |                     |
| 73S                                   | 5                 | 3.75            | 15.30                | -3.75             | 357                   | 70                  |
| <b>50Ω version, bistable, 2 coils</b> |                   |                 |                      |                   |                       |                     |
| 91S                                   | 3                 | 2.25            | 6.50                 | 2.25              | 64                    | 140                 |
| 92S                                   | 4.5               | 3.38            | 9.80                 | 3.38              | 145                   | 140                 |
| 93S                                   | 5                 | 3.75            | 10.90                | 3.75              | 178                   | 140                 |
| 95S                                   | 9                 | 6.75            | 19.60                | 6.75              | 574                   | 140                 |
| 96S                                   | 12                | 9.00            | 26.10                | 9.00              | 1028                  | 140                 |
| <b>75Ω version, bistable, 2 coils</b> |                   |                 |                      |                   |                       |                     |
| 41S                                   | 3                 | 2.25            | 6.50                 | 2.25              | 64                    | 140                 |
| 42S                                   | 4.5               | 3.38            | 9.80                 | 3.38              | 145                   | 140                 |
| 43S                                   | 5                 | 3.75            | 10.90                | 3.75              | 178                   | 140                 |
| 46S                                   | 12                | 9.00            | 26.10                | 9.00              | 1028                  | 140                 |

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

**Coil operating Range**



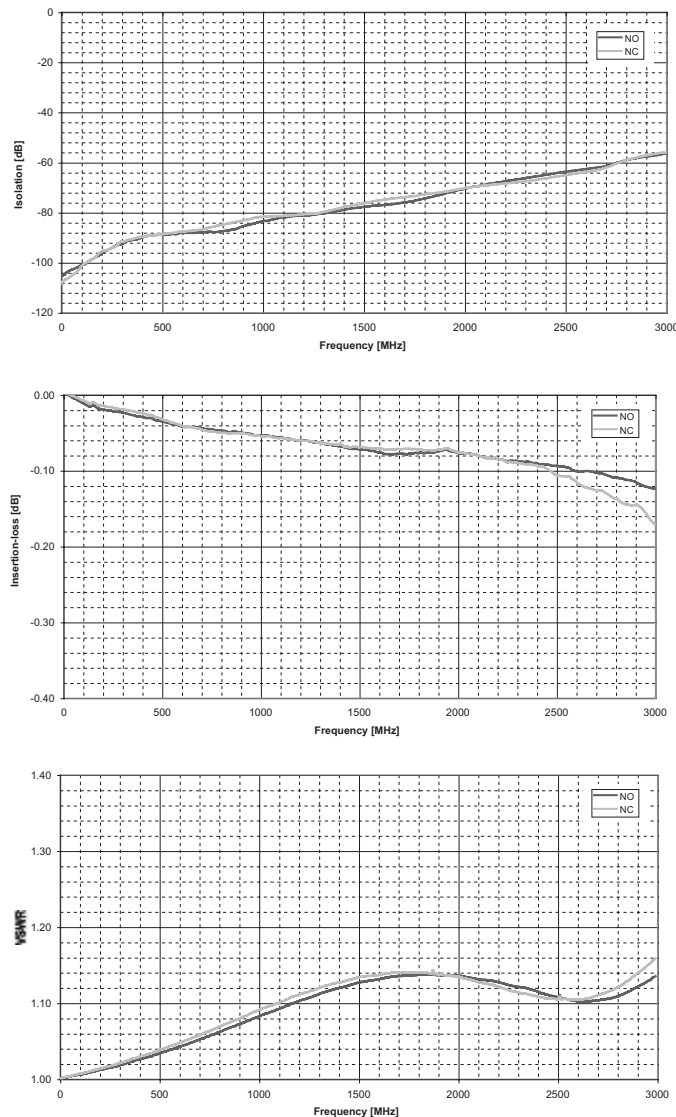
**HF3 S Relay** (Continued)

| Insulation Data                 | 50Ω version | 75Ω version          |
|---------------------------------|-------------|----------------------|
| Initial dielectric strength     |             |                      |
| between open contacts           |             | 600V <sub>rms</sub>  |
| between contact and coil        |             | 1000V <sub>rms</sub> |
| Initial surge withstand voltage |             |                      |
| between open contacts           |             | 1000V                |
| between contact and coil        |             | 1500V                |

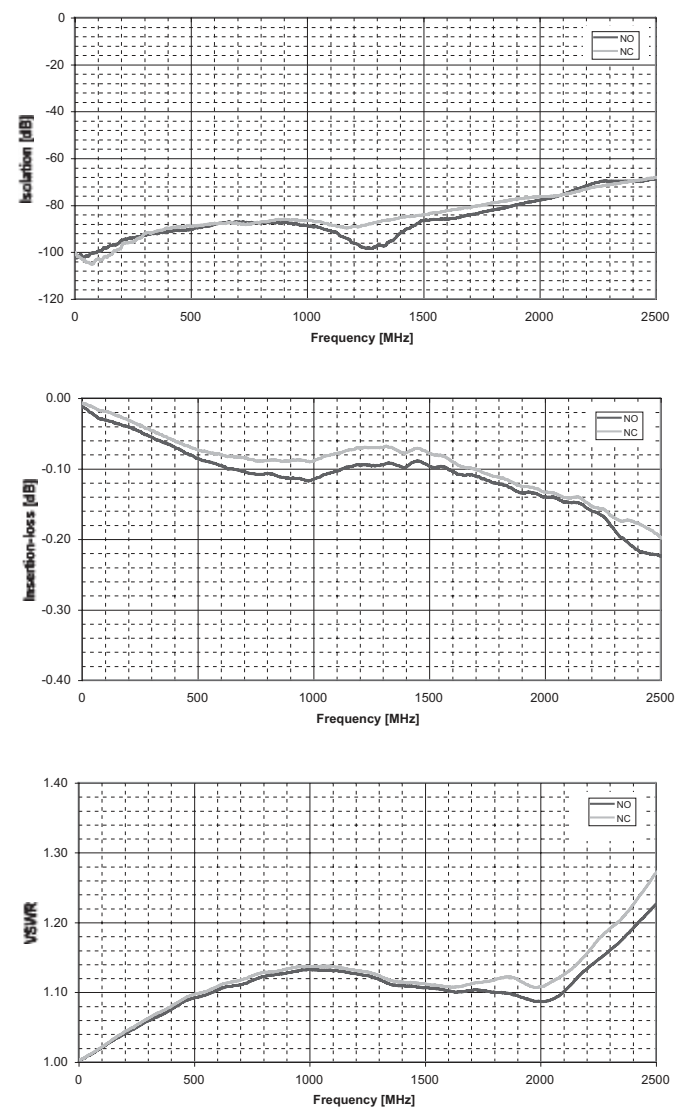
| RF Data                            | 50Ω version    | 75Ω version    |
|------------------------------------|----------------|----------------|
| Isolation                          |                |                |
| at 100MHz/900MHz                   | 95dB/80dB      | 96dB/80dB      |
| at 3GHz                            | 55dB           | 50dB           |
| Insertion loss                     |                |                |
| at 100MHz/900MHz                   | 0.03dB/0.12dB  | 0.03dB/0.12dB  |
| at 3GHz                            | 0.30dB         | 0.30dB         |
| Voltage standing wave ratio (VSWR) |                |                |
| at 100MHz/900MHz/3GHz              | 1.05/1.10/1.25 | 1.05/1.20/1.30 |

| Other Data   |  |
|--|--|
| Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content | refer to the Product Compliance Support Center at <a href="http://www.te.com/customer-support/rohssupportcenter">www.te.com/customer-support/rohssupportcenter</a> |
| Ambient temperature  | -55°C to +85°C   |
| Thermal resistance   | <165K/W  |
| Category of environmental protection                                 | IEC 61810  |
|  | RT III - wash tight  |
| Vibration resistance (functional)                                    | 35g, 10 to 1000Hz  |
| Shock resistance (functional), half sinus 11ms                       | 50g  |
| Shock resistance (destructive), half sinus 0.5ms                     | 150g   |
| Terminal type  | SMT  |
| Weight   | max. 3g  |
| Resistance to soldering heat SMT                                     | Peak Value   |
|  | IEC 60068-2-58   |
|  | 250°C/10s  |
| Moisture sensitive level, JEDEC J-Std-020D                           | MSL3   |
| Ultrasonic cleaning  | not recommended  |
| Packaging/unit, SMT  | reel/400 pcs., box/400 pcs. or 2000 pcs.   |

RF performance, 50Ω version



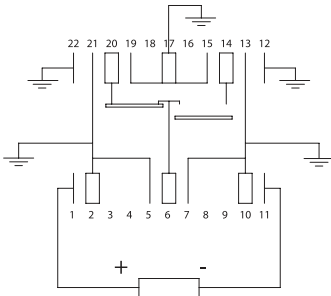
RF performance, 75Ω version



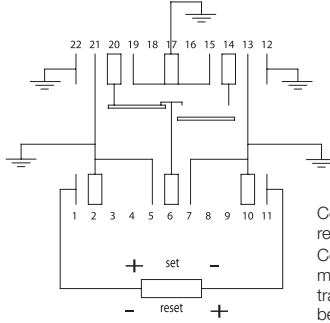
**HF3 S Relay** (Continued)

**Terminal assignment**

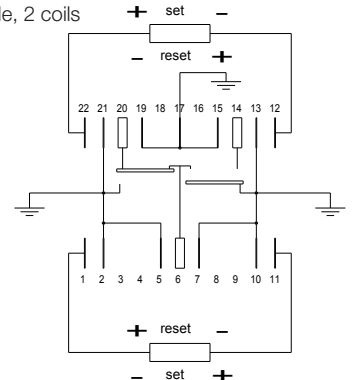
TOP view on component side of PCB  
Monostable



Bistable, 1 coil



Bistable, 2 coils

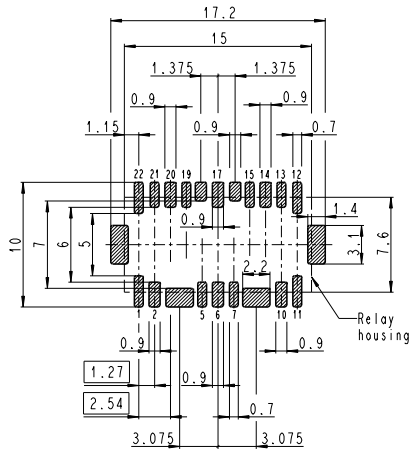


Contacts are shown in reset condition. Contact position might change during transportation and must be reset before use.

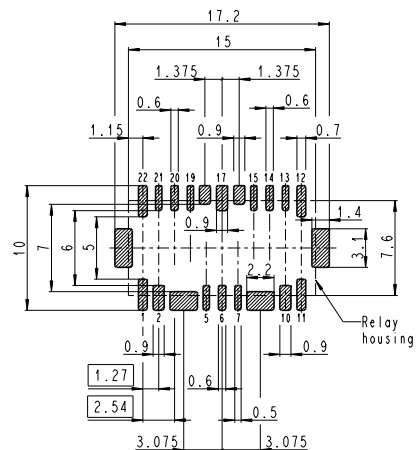
**PCB layout**

TOP view on component side of PCB

50Ω version

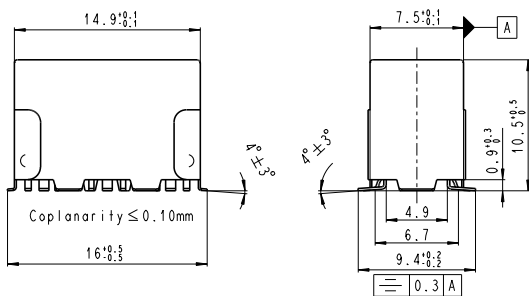


75Ω version

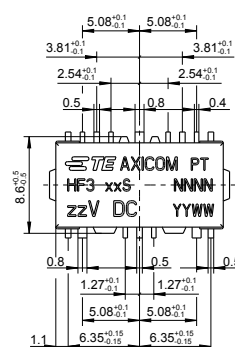
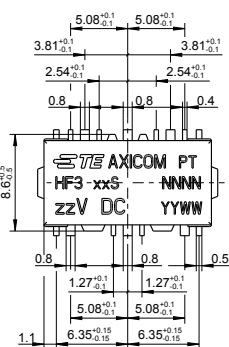
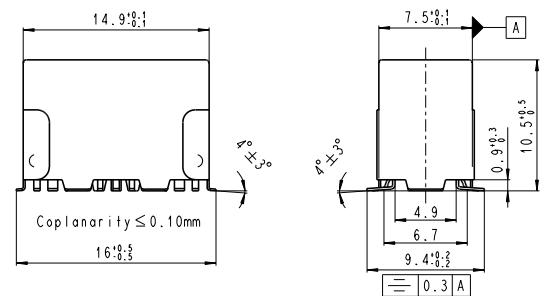


**Dimensions**

50Ω version



75Ω version





**HF3 S Relay** (Continued)

|                               |  |   |            |           |          |
|-------------------------------|--|---|------------|-----------|----------|
| <b>Product code structure</b> |  | Typical product code                    | <b>HF3</b> | <b>53</b> | <b>S</b> |
| <b>Type</b>                   | <b>HF3</b> High Frequency Relays HF3S Series<br>1 form C, 1 CO     |   |            |           |          |
| <b>Coil</b>                   | Coil code: please refer to coil versions table<br>Performance type |   |            |           |          |
|                               | <b>5x</b> 50Ω version, monostable 1coil                            | <b>0x</b> 75Ω version, monostable 1coil |            |           |          |
|                               | <b>7x</b> 50Ω version, bistable 1coil                              | <b>2x</b> 75Ω version, bistable 1coil   |            |           |          |
|                               | <b>9x</b> 50Ω version, bistable 2coils                             | <b>4x</b> 75Ω version, bistable 2coils  |            |           |          |
| <b>Type</b>                   | <b>S</b> High performance / shielded                               |   |            |           |          |

| Product code | Arrangement     | Version | Coil   | Coil Type        | Part number |
|--------------|-----------------|---------|--------|------------------|-------------|
| HF3 53S      | 1 form C (1 CO) | 50ohm   | 5VDC   | Monostable       | 2-1462051-3 |
| HF3 55S      |                 |         | 9VDC   |                  | 4-1462051-0 |
| HF3 56S      |                 |         | 12VDC  |                  | 3-1462051-1 |
| HF3 57S      |                 |         | 24VDC  |                  | 2-1462051-2 |
| HF3 92S      |                 |         | 4.5VDC | Bistable 2 coils | 2-1462051-5 |
| HF3 93S      |                 |         | 5VDC   |                  | 2-1462051-4 |
| HF3 95S      |                 |         | 9VDC   |                  | 4-1462051-1 |
| HF3 95S      |                 |         | 9VDC   |                  | 4-1462051-1 |
| HF3 03S      |                 | 75ohm   | 5VDC   | Monostable       | 2-1462050-2 |
| HF3 05S      |                 |         | 9VDC   |                  | 3-1462050-3 |
| HF3 06S      |                 |         | 12VDC  |                  | 2-1462050-7 |

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