FP2 series

DPDT Low Profile Telecom/Signal PC Board Relays

File E111441
File 169679-1079886
16501-003

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Features

- Through hole PC board terminals.
- Meets FCC Part 68 and ITU-T K20.
- For applications in telecommunications, office automation, consumer electronics, medical equipment, measurement and control equipment.
- Immersion cleanable, plastic sealed case.
- 80mW coil for high sensitivity models, 140mW coil for sensitive types.
- Ultrasonic cleaning not recommended.

Contact Data @ 23°C (except as noted)

Arrangement: 2 Form C (DPDT) bifurcated contacts.
Material: Stationary: Silver-nickel, gold covered.
Ratings: Max. Switched Current: 2A.
Max. Carry Current: 2A (at max ambient temperature.
Max. Switched Voltage: 125VDC, 250VAC.
Max. Switched Power: 30W DC or 62.5VA AC.
UL/CSA Ratings: 500mA @ 50VDC; 1.25A @ 30VDC; 500mA @ 50VAC.
Initial Contact Resistance: <70 milliohms @ 10mA / 20mV.
Expected Mechanical Life: 100 million operations.
Expected Electrical Life: 2.5 million operations @ 10mA / 30mVDC.
2 million operations @ cable load open end.
100,000 operations @ 240mA / 125VDC.
100,000 operations @ 250mA / 250VDC.
100,000 operations @ 1.25A / 24VDC.
Thermoelectric potential: <10µV.

High Frequency Data

Capacitance: Between Open Contacts: 1pF, max.
Between Coil and Contacts: 4pF, max.
Between Poles: 1pF, max.
RF Characteristics: Isolation at 100 / 900 MHz: -40.2 db / -22.3 db.
Insertion loss at 100 / 900 MHz: -0.03 db / -0.25 db.
V. S. W. R. at 100 / 900 MHz: 1.01 / 1.07 .

Initial Dielectric Strength

Between Open Contacts: 700Vrms for 1 minute.
Between Coil and Contacts: 1,000Vrms for 1 minute.
Between Poles: 1,000Vrms for 1 minute.
Surge Voltage Resistance per FCC 68 (10 / 160 µs) and IEC (10 / 700 µs):
Between Open Contacts: 1,500V.
Between Coil and Contacts: 1,500V.
Between Poles: 1,500V.

Initial Insulation Resistance

Between Contact and Coil: 10^9 ohms or more @ 500VDC.

Coil Data @ 23°C

Voltage: 3 to 48VDC.
Nominal Power: 80-300mW depending on models. See coil data tables.
Duty Cycle: Continuous.

Coil Data @ 23°C

Nom. Voltage (VDC)	Operate/Set Range		Minimum Release/Reset Voltage (VDC)	Nom. Power (mW)	Resistance ±10% (Ohms)	Part Number
	Min. Voltage (VDC)	Max. Voltage (VDC)				
Non-latching 1 coil versions						
3	2.1	6.8	0.3	140	64	D3006
4.5	3.15	10.3	0.45	140	145	D3004
5	3.5	11.4	0.5	140	178	D3009
6	4.2	13.7	0.6	140	257	D3005
9	6.3	20.4	0.9	140	574	D3010
12	8.4	27.3	1.2	140	1,028	D3002
24	16.8	45.7	2.4	200	2,880	D3012
48	33.6	67.5	4.8	300	7,680	D3013
Non-latching, sensitive 1 coil versions						
3	2.25	9.0	0.3	80	113	D3021
4.5	3.38	13.5	0.45	80	253	D3022
5	3.75	15.0	0.5	80	313	D3023
6	4.5	18.0	0.6	80	450	D3024
9	6.75	27.1	0.9	80	1,013	D3025
12	9.0	36.1	1.2	80	1,800	D3026
24	18.0	54.7	2.4	140	4,114	D3027
48	36.0	72.5	4.8	260	8,882	D3028
Latching 1 coil versions						
3	2.25	8.1	-2.25	100	90	D3041
4.5	3.375	12.1	-3.375	100	203	D3042
5	3.75	13.5	-3.75	100	250	D3043
6	4.5	16.2	-4.5	100	360	D3044
9	6.75	24.2	-6.75	100	810	D3045
12	9.0	29.0	-9.0	100	1,440	D3046
24	18.0	47.5	-18.0	150	3,840	D3047
Latching 2 coil versions						
3	2.1	5.7	2.1	200	45	D3061
4.5	3.15	8.6	3.15	200	101	D3062
5	3.5	9.5	3.5	200	125	D3063
6	4.2	11.4	4.2	200	180	D3064
9	6.3	17.1	6.3	200	405	D3065
12	8.4	22.6	8.4	200	720	D3066
24	16.8	33.7	16.8	200	1,920	D3067

Operate Data @ 23°C

Operate and Release Voltage: See values in chart above.
Operate Time (at nominal voltage)**:** 3 ms, typ.; 4 ms, max.
Reset Time [latching](at nominal voltage)**:** 3 ms, typ.; 4 ms, max.
Release Time [non-latching](w/o diode in parallel)**:** 1 ms, typ.; 3 ms, max.
Release Time [non-latching](with diode in parallel)**:** 3 ms, typ.; 4 ms, max.
Bounce Time (at contact close)**:** 1 ms, typ.; 5 ms, max.
Maximum Switching Rate (no load)**:** 50 operations/s.

Environmental Data

Temperature Range: -55°C to +85°C.
Maximum Allowable Coil Temperature: 110°C.
Thermal Resistance: < 185K/W.
Shock, half sinus, 11 ms: Functional: 50g.
Shock, half sinus, 11 ms: Destructive: 1,500g.
Vibration, 10-500 Hz.: Functional: 20g.
Needle Flame Test: Application Time 20s.
Resistance to Soldering: 260°C for 10s.

Mechanical Data

Termination: Through-hole printed circuit terminals.
Mounting Position: Any.
Enclosure Type: Immersion cleanable (IP67) plastic case.
Weight: 0.08 oz. (2g) approximately.

U_I = Minimum voltage at 23° C after pre-energizing with nominal voltage without contact current

U_{II} = Maximum continous voltage at 23°

The operating voltage limits U_I and U_{II} depend on the temperature according to the formula:

$U_{I\,tamb} = K_I \cdot U_{I\,23°\,C}$

and

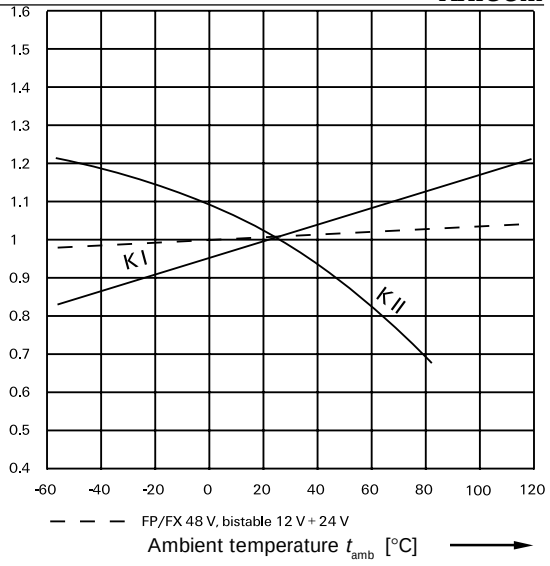
$U_{II\,tamb} = K_{II} \cdot U_{II\,23°\,C}$

t_{amb} = Ambient temperature

$U_{I\,tamb}$ = Minimum voltage at ambient temperature, t_{amb}

$U_{II\,tamb}$ = Maximum voltage at ambient temperature, t_{amb}

k_I, k_{II} = Factors (dependent on temperature), see diagram



Ordering Information

See "Part Number" column in Coil Data chart on previous page for available part numbers in the FP2 series.

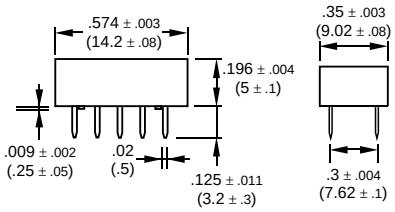
Packaging Information

FP2 series relays are shipped in tubes of 50. There are 1,000 relays in a full carton.

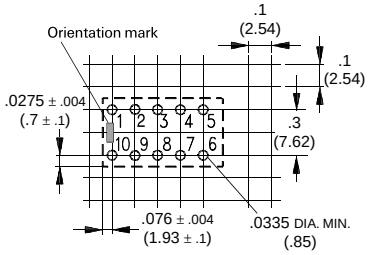
Our authorized distributors are more likely to stock the following items for immediate delivery.

None at present.

Outline Dimensions

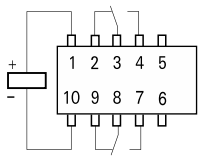


PC Board Layout (Bottom View)

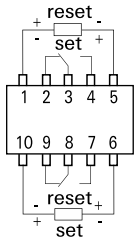


Wiring Diagrams (Bottom Views)

Non-Latching and Latching, 1 Coil Release or Reset Condition



Latching, 2 Coil Reset Condition



Dimensions are shown for reference purposes only.

Dimensions are in inches over (millimeters) unless otherwise specified.

Specifications and availability subject to change.

www.tycoelectronics.com
Technical support:
Refer to inside back cover.