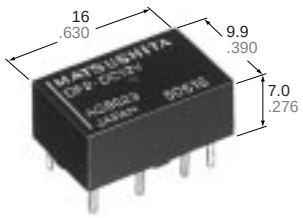
NAiS

HIGHLY SENSITIVE DIP MINIATURE RELAY

DF-RELAYS



mm inch

UL File No.: E43149
CSA File No.: LR26550

- **Smaller than most of 2 Form C relays**
  Header area: 80% of DS2 relay
  Cubic measure: 57% of DS2 relay
- **High sensitivity — 100 mW nominal power for 1 coil latching type**
- **DIP - matching 14 pin IC socket**

SPECIFICATIONS

Contact

Arrangement			2 Form C
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			50 mΩ
Contact material			Gold-clad silver
Nominal switching capacity			1A 30 VDC 0.5A 30 VAC
Rating (resistive)	Max. switching power		30 W, 30 V A
	Max. switching voltage		60 V DC, 125 V AC
	Max. switching current		1 A
	Min. switching capacity		1 mA 1 V DC
UL/CSA rating			1 A 30 V DC 0.3 A 125 V AC 0.3 A 110 V DC
Expected life (min. operations)	Mechanical (at 180 cpm)	Single side stable	5×10^6
		1 coil & 2 coil latching	10^6
	Electrical (at 20 cpm)	1 A 30 V DC resistive	10^5
		0.5 A 30 V AC resistive	10^5

Coil (Polarized) (at 25°C 77°F)

	Nominal	Minimum
Single side stable	200 mW	100 mW
1 coil latching	100 mW	65 mW
2 coil latching	200 mW	130 mW

Characteristics

Max. operating speed		60 cpm
Initial insulation resistance*1		Min. 1,000 MΩ (at 500 V DC)
Initial breakdown voltage*2	Between open contacts	500 Vrms for 1 min.
	Between contact sets	500 Vrms for 1 min.
	Between contacts and coil	1,000 Vrms for 1 min.
Operate time*3 (at nominal voltage)		Max. 5 ms (Approx. 2.5 ms)
Release time(without diode)*3 (at nominal voltage)		Max. 3 ms (Approx. 1 ms)
Set time*3 (latching) (at nominal voltage)		Max. 5 ms (Approx. 2.5 ms)
Reset time*3 (latching) (at nominal voltage)		Max. 3 ms (Approx. 2.5 ms)
Temperature rise (at 20°C)		Max. 65°C with nominal voltage across coil and at nominal switching capacity
Shock resistance	Functional*4	Min. 294 m/s² {30 G}
	Destructive*5	Min. 980 m/s² {100 G}
Vibration resistance	Functional*6	89.6 m/s² {9 G}, 10 to 55 Hz at double amplitude of 1.5 mm
	Destructive	89.6 m/s² {9 G}, 10 to 55 Hz at double amplitude of 1.5 mm
Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature)	Ambient temperature	–40°C to +70°C –40°F to +158°F
	Humidity	5 to 85%R.H.
Unit weight		Approx. 2.4 g .085 oz

Remarks

*1 Measurement at same location as "Intial breakdown voltage" section
*2 Detection current: 10mA
*3 Excluding contact bounce time
*4 Half-wave pulse of sine wave: 6ms; detection time: 10μs
*5 Half-wave pulse of sine wave: 6ms
*6 Detection time: 10μs
*7 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 49)

TYPICAL APPLICATIONS

Signal transmission application requiring high sensitivity and low profile miniature size

- Audio visual equipment
- Telecommunication equipment
- Computer peripherals

ORDERING INFORMATION

Ex. DF2— L —— DC5V

Operating function	Coil voltage
Nil: Single side stable L: 1 coil latching L2: 2 coil latching	DC 1.5, 3, 5, 6, 9, 12, 24 V

(Notes) 1. For UL/CSA recognized type, add suffix UL/CSA.
2. Standard packing: Carton: 50 pcs. Case: 500 pcs.

TYPES AND COIL DATA (at 20°C 68°F)

Single side stable

Part No.	Nominal voltage, V DC	Pick-up voltage, max. V DC	Drop-out voltage, min. DC	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, V DC (70°C 158°F)
DF2-DC1.5V	1.5	1.05	0.15	11.25	133.3	200	1.8
DF2-DC3V	3	2.1	0.3	45	66.7	200	3.6
DF2-DC5V	5	3.5	0.5	125	40.0	200	6.0
DF2-DC6V	6	4.2	0.6	180	33.3	200	7.2
DF2-DC9V	9	6.3	0.9	405	22.2	200	10.8
DF2-DC12V	12	8.4	1.2	720	16.7	200	14.4
DF2-DC24V	24	16.8	2.4	2,880	8.3	200	28.8

1 coil latching

Part No.	Nominal voltage, V DC	Set and Reset voltage, V DC (max.)	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, V DC (70°C 158°F)
DF2-L-DC1.5V	1.5	1.2	22.5	66.7	100	1.8
DF2-L-DC3V	3	2.4	90	33.3	100	3.6
DF2-L-DC5V	5	4.0	250	20.0	100	6.0
DF2-L-DC6V	6	4.8	360	16.7	100	7.2
DF2-L-DC9V	9	7.2	810	11.1	100	10.8
DF2-L-DC12V	12	9.6	1,440	8.3	100	14.4
DF2-L-DC24V	24	19.2	5,760	4.1	100	28.8

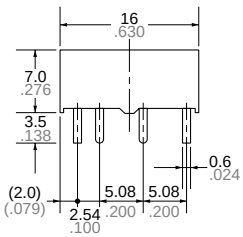
2 coil latching

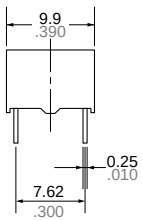
Part No.	Nominal voltage, V DC	Set and Reset voltage, V DC (max.)	Coil resistance, Ω (±10%)		Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, V DC (70°C 158°F)
			Set coil	Reset coil			
DF2-L2-DC1.5V	1.5	1.2	11.25	11.25	133.3	200	1.8
DF2-L2-DC3V	3	2.4	45	45	66.6	200	3.6
DF2-L2-DC5V	5	4.0	125	125	40.0	200	6.0
DF2-L2-DC6V	6	4.8	180	180	33.3	200	7.2
DF2-L2-DC9V	9	7.2	405	405	22.2	200	10.8
DF2-L2-DC12V	12	9.6	720	720	16.7	200	14.4
DF2-L2-DC24V	24	19.2	2,880	2,880	8.3	200	28.8

DIMENSIONS

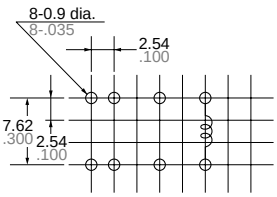
Single side stable

mm inch

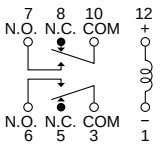




PC board pattern (Copper-side view)

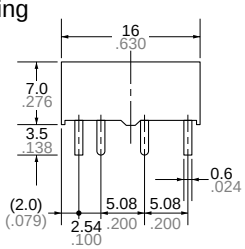


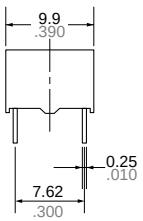
Schematic (Bottom view)



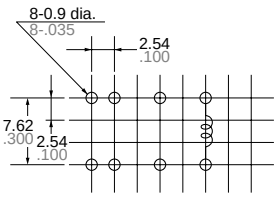
Deenergized condition

1 coil latching

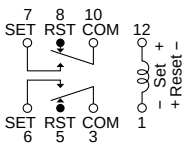




PC board pattern (Copper-side view)

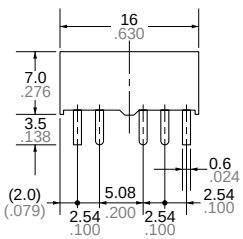


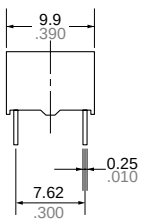
Schematic (Bottom view)



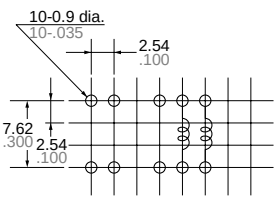
Reset condition

2 coil latching

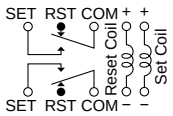




PC board pattern (Copper-side view)



Schematic (Bottom view)

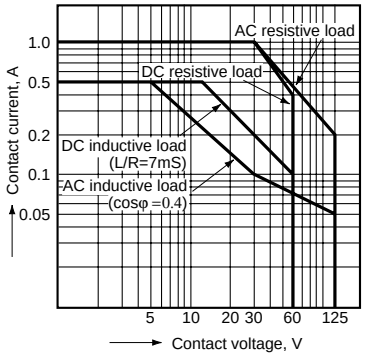


Reset condition

REFERENCE DATA

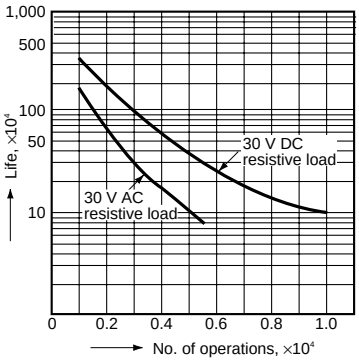
1. Maximum switching power

Tested sample: DF2-DC12V



2. Life curve

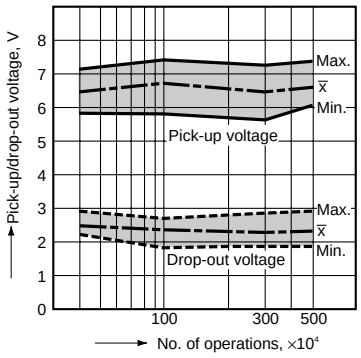
Tested sample: DF2-DC12V



3. Mechanical life

Tested sample: DF2-DC12V, 12 pcs.

Ambient temperature: 15°C to 25°C 59°F to 77°F



4. Electrical life

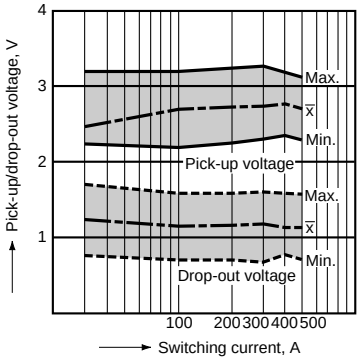
Change of pick-up and drop-out voltage

Tested sample: DF2-DC5V, 8 pcs.

Condition: 1 mA 1 V DC resistive load

Switching frequency: 10 Hz

Ambient temperature: 20°C to 25°C 68°F to 77°F



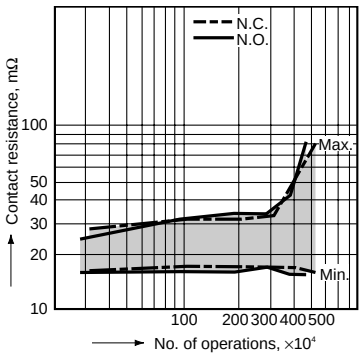
Change of contact resistance

Tested sample: DF2-DC5V, 8 pcs.

Condition: 1 mA 1 V DC resistive load

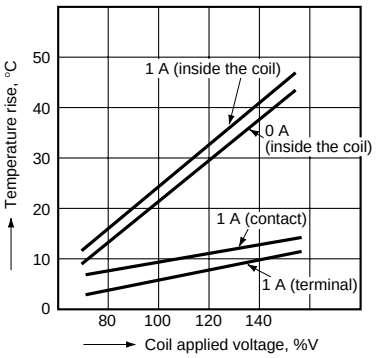
Switching frequency: 10 Hz

Ambient temperature: 20°C to 25°C 68°F to 77°F



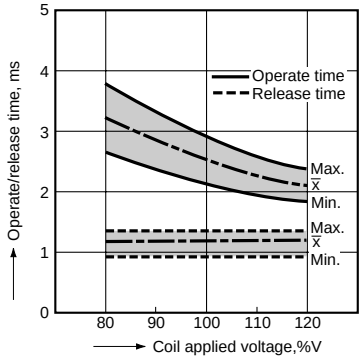
5. Coil temperature rise

Tested sample: DF2-DC12V, 5 pcs.



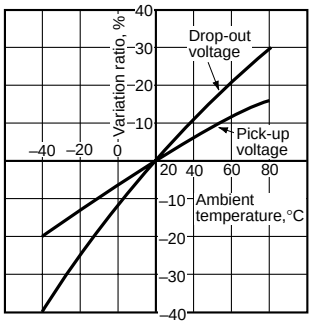
6. Operate/release time characteristics

Tested sample: DF2-DC12V



7. Ambient temperature characteristics

Tested sample: DF2-DC12V

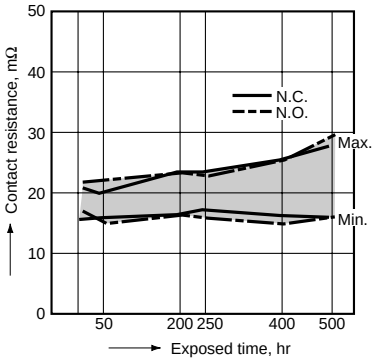


8. H_2S gas test

Gas density: 2 to 5 p.p.m.

Ambient temperature: 20°C to 26°C 68°F to 79°F

Humidity: 35 to 85% R.H.



NOTE

Soldering

When soldering through hole terminals, soldering should be done at 245°C 473°F within 10 s.

For Cautions for Use

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