

## DIP SERIES REED RELAYS

### Low Power & Current Sensing



#### DESCRIPTION

The DIP Series' efficient packaging offers low input power with industry standard pin configurations. Models are available with 4000V input/output isolation for telecom and industrial applications. A variety of contact materials are available to meet life and load requirements of demanding applications. The sputtered ruthenium contacts are unaffected by polymer buildup and thus maintain low and stable contact resistance. Because the mercury contact replenishes itself with each switching operation, models with wetted contacts offer high or low power switching while maintaining stable contact resistance.

The DIP Series' current sensing models are available for telecom line loop requirements. Standard models can sense currents of up to several amps. They also can sense open or closed circuits, making them useful in industrial, avionic, and automotive applications as well.

#### FEATURES

- High coil resistance capability for low-power applications
- 3750VAC RMS input to output isolation
- Low coil resistance version available for Line Loop applications (Europe)
- Single & dual coil versions available

#### APPROVALS

- IEC950, UL & CSA approvals pending

#### APPLICATIONS

- Telecom
- Current sensing
- Modems
- Industrial
- Avionics
- Automotive

#### RATINGS (@ 25° C)

Parameter	Min	Typ	Max	Unit
Coil Power (some models)	30	-	-	mW
Switching Voltage (some models)	-	-	500	Volts
Switching Current	-	-	1	Amps
Open Contact Isolation	-	-	1000	Volts
Contact/Coil Isolation	3750	-	-	VAC RMS

(See detailed specifications for more information.)

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#### SPECIFICATIONS

All parameters are at 25°C unless otherwise stated.									
			DIP31CXXXX 1-Form-C Standard Ruthenium Contact			DIP41AXXXX 1-Form-A Mini-DYAD® Ruthenium Contact			
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
<b>Contact Ratings</b>									
Switching Voltage	Max DC/Peak Resistive	V <sub>L</sub>	0	-	125	0	-	200	Volts
Switching Current	Max DC/Peak Resistive	I <sub>L</sub>	0	-	0.25	0	-	0.5	Amps
Carry Current	Max DC/Peak Resistive	I <sub>c</sub>	0	-	0.5	0	-	1	Amps
Contact Rating	Max DC/Peak Resistive	-	-	-	3	-	-	10	Watts
Life Expectancy	Signal Level 1.0V, 10mA	-	-	200	-	-	500	-	x10 <sup>6</sup> Ops
	Rated Loads	-	-	5	-	-	10	-	x10 <sup>6</sup> Ops
Static Contact Resistance <sup>(3)</sup>	50mV, 10mA	CR	-	-	150	-	-	150	mΩ
Dynamic Contact Resistance <sup>3</sup>	0.5V, 50mA at 100Hz, 1.5 msec	DCR	-	-	200	-	-	200	mΩ
Contact Material		-	-	Ru	-	-	Ru	-	-
<b>Relay Specifications</b>									
Insulation Resistance	Between all isolated pins at 100V, 25°C, 40%RH	IR	10 <sup>10</sup>	-	-	10 <sup>10</sup>	-	-	Ω
Capacitance Across Open Contacts	1 KHz Test Signal	-	-	1.2	-	-	0.6	-	pF
Capacitance Contact to Coil	1 KHz Test Signal	-	-	2.5	-	-	0.75	-	pF
Dielectric Strength	Between Contacts	-	200	-	-	250	-	-	VDC/Peak AC
	Contacts to Coil (Pin Option 1&3)	I/O	1500	-	-	3750	-	-	VAC RMS
	Contacts to Coil (Pin Option 2)	I/O	1500	-	-	1500	-	-	VAC RMS
Operate Time, including bounce	At Nominal coil voltage, 10Hz Square Wave	T <sub>OP</sub>	-	1.5	-	-	0.4	-	ms
Release Time	Zener-Diode Suppression	T <sub>REL</sub>	-	1.5	-	-	0.2	-	ms
<b>Environmental Ratings</b>									
Storage Temperature		T <sub>A</sub>	-35	-	+100	-35	-	+100	°C
Operating Temperature		T <sub>o</sub>	-20	-	+85	-20	-	+85	°C
Soldering Temperature	Applied to pin, 5 sec. max.	-	-	-	+250	-	-	+250	°C
Vibration Resistance	5Hz - 2000Hz (dry)	G	-	-	20	-	-	20	Gs
Shock Resistance	11±1ms, 1/2 Sine Wave	S	-	-	50	-	-	50	Gs
Weight		-	-	8	-	-	8	-	grams
<b>Schematic Diagrams</b>									
(Top View)									
Option 1									
Option 2 <sup>(1)</sup>									
Option 3 <sup>(2)</sup>									

(1) Optional electrostatic shield is tied to pin #9. On models with diode, pin #2 is positive.

(2) Relay contains mercury wetted contacts and must be mounted vertical. Pin #1 is up.

(3) For pin option 3, the contact resistance will increase by 0.02Ω due to series resistance of internal connections.

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### SPECIFICATIONS

PARAMETER	CONDITIONS	SYMBOL	DIP61AXXXX 1-Form-A High Voltage Ruthenium Contact			DIP81CXXXX 1-Form-C High Voltage - 1 Amp Wetted Contacts <sup>(2)</sup>			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
All parameters are at 25°C unless otherwise stated.									
<b>Contact Ratings</b>									
Switching Voltage	Max DC/Peak Resistive	VL	0	-	400	0	-	500	Volts
Switching Current	Max DC/Peak Resistive	IL	0	-	0.5	0	-	2	Amps
Carry Current	Max DC/Peak Resistive	Ic	0	-	1	0	-	3	Amps
Contact Rating	Max DC/Peak Resistive	-	-	-	10	-	-	50	Watts
Life Expectancy	Signal Level 1.0V, 10mA	-	-	500	-	-	1000	-	x10 <sup>6</sup> Ops
	Rated Loads	-	-	5	-	-	25	-	x10 <sup>6</sup> Ops
Static Contact Resistance <sup>(3)</sup>	50mV, 10mA	CR	-	-	150	-	-	75	mΩ
Dynamic Contact Resistance <sup>(3)</sup>	0.5V, 50mA at 100Hz, 1.5 msec	DCR	-	-	200	-	-	75	mΩ
Contact Material		-	-	Ru	-	-	Hg	-	-
<b>Relay Specifications</b>									
Insulation Resistance	Between all isolated pins at 100V, 25°C, 40%RH	IR	10 <sup>10</sup>	-	-	10 <sup>10</sup>	-	-	Ω
Capacitance Across	Open Contacts	-	-	0.45	-	-	0.9	-	pF
	Contact to Coil	-	-	0.6	-	-	3	-	pF
Dielectric Strength	Between Contacts	-	800	-	-	1000	-	-	VDC/Peak AC
	Contacts to Coil (Pin Options 1&3)	I/O	3750	-	-	1500	-	-	VAC RMS
	Contacts to Coil (Pin Option 2)	I/O	1500	-	-	1500	-	-	VAC RMS
Operate Time, including bounce	At Nominal coil voltage, 30Hz Square Wave	TOP	-	0.6	-	-	2	-	ms
Release Time	Zener-Diode Suppression	TREL	-	0.2	-	-	1.5	-	ms
<b>Environmental Ratings</b>									
Storage Temperature		TA	-35	-	+100	-35	-	+100	°C
Operating Temperature		To	-20	-	+85	-20	-	+85	°C
Soldering Temperature	Applied to pins, 5 sec. max.	-	-	-	+250	-	-	+250	°C
Vibration Resistance	5Hz - 2000Hz (Dry)	G	-	-	20	-	-	-	Gs
	10Hz - 500Hz (Wetted)	-	-	-	-	-	-	20	Gs
Shock Resistance	11 ± 1 ms, 1/2 Sine Wave	S	-	-	50	-	-	50	Gs
Weight		-	-	8	-	-	8	-	grams
<b>Schematic Diagrams</b>									
(Top View) Option 1									
Option 2 <sup>(1)</sup>									
Option 3									

(1) Optional electrostatic shield is tied to pin #9. On models with diode, pin #2 is positive.

(2) Relay contains mercury wetted contacts and must be mounted vertical. Pin #1 is up.

(3) For pin option 3, the contact resistance will increase by 0.02 Ω due to series resistance of internal connections.

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## SPECIFICATIONS

DIP100XX  
1-Form-A  
Mini-DYAD®  
Current Sensing

All parameters are at 25°C unless otherwise stated.

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>Contact Ratings</b>						
Switching Voltage	Max DC/Peak Resistive	VL	0	-	100	Volts
Switching Current	Max DC/Peak Resistive	IL	0	-	0.5	Amps
Carry Current	Max DC/Peak Resistive	IC	0	-	1	Amps
Contact Rating	Max DC/Peak Resistive	-	-	-	10	Watts
Life Expectancy	Signal Level 1.0V, 10mA	-	-	500	-	x10 <sup>6</sup> Ops
	Rated Loads	-	-	10	-	x10 <sup>6</sup> Ops
Static Contact Resistance <sup>(3)</sup>	50mV, 10mA	CR	-	-	150	mΩ
Dynamic Contact Resistance <sup>(3)</sup>	0.5V, 50mA at 100Hz, 1.5 msec	DCR	-	-	200	mΩ
Contact Material		-	-	Ru	-	-
<b>Relay Specifications</b>						
Insulation Resistance	Between all isolated pins at 100V, 25°C, 40%RH	IR	10 <sup>10</sup>	-	-	Ω
Capacitance Across						
Open Contacts	1 KHz Test Signal	-	-	0.6	-	pF
Contact to Coil	1 KHz Test Signal	-	-	0.75	-	pF
Dielectric Strength	Between Contacts	-	200	-	-	VDC/Peak AC
	Contacts to Coil (Pin Options 1&3)	I/O	3750	-	-	VAC RMS
Operate Time, including bounce	At Nominal coil voltage, 30Hz Square Wave	TOP	-	0.75	-	ms
Release Time	Zener-Diode Suppression	TREL	-	0.1	-	ms
<b>Environmental Ratings</b>						
Storage Temperature		TA	-35	-	+100	°C
Operating Temperature		To	-20	-	+85	°C
Soldering Temperature	Applied to pins, 5 sec. max.	-	-	-	+250	°C
Vibration Resistance	5Hz - 2000Hz (Dry)	G	-	-	20	Gs
Shock Resistance	11 ± 1ms, 1/2 Sine Wave	S	-	-	50	Gs
Weight		-	-	8	-	grams
<b>Schematic Diagrams</b>						
(Top View) Option 1 <sup>(1)</sup>						
Option 2						
Option 3						

(1) Optional electrostatic shield is tied to pin #9. On models with diode, pin #2 is positive.

(2) Relay contains mercury wetted contacts and must be mounted vertical. Pin #1 is up.

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#### COIL SPECIFICATIONS

	Contact Form	Coil Voltage			Coil Resistance			Operate Voltage			Release Voltage		
Units		Volts			Ω			Volts			Volts		
Conditions					±10%, 25°C			Must operate by, 25°C			Must release by, 25°C		
Part #		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
DIP31C05XX	1-Form-C		5	11	450	500	550			3.6	0.4		
DIP31C12XX	1-Form-C		12	21	1575	1750	1925			9	1		
DIP31C24XX	1-Form-C		24	32	3600	4000	4400			18	2		
DIP41A05XX	1-Form-A		5	15	810	900	990			3.6	0.4		
DIP41A12XX	1-Form-A		12	26	2520	2800	3080			9	1		
DIP41A24XX	1-Form-A		24	32	3600	4000	4400			18	2		
DIP61A05XX	1-Form-A		5	8.5	270	300	330			3.6	0.4		
DIP61A12XX	1-Form-A		12	21	1575	1750	1925			9	1		
DIP61A24XX	1-Form-A		24	32	3600	4000	4400			18	2		
DIP81C05XX	1-Form-C		5	7	90	100	110			3.6	0.4		
DIP81C12XX	1-Form-C		12	16	450	500	550			9	1		

#### CURRENT SENSING RELAYS

	Contact Form	Nominal Coil Current			Coil Resistance			Operate Current			Release Current		
Units		Amps			W			Current			Current		
Conditions		25°C			25°C, ±10%			Must operate by (25°C)			Must release by (25°C)		
Part #		Min	Typ	Max <sup>1</sup>	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
DIP10001	1-Form-A		0.02	0.23	8.1	9	9.9			0.015	0.004		
DIP10002	1-Form-A		0.02	0.18	13.5	15	16.5			0.015	0.004		
DIP10015	1-Form-A		0.15	1.5		0.2				0.15	0.015		
DIP10025	1-Form-A		0.25	2.3		0.1				0.25	0.025		
DIP10050	1-Form-A		0.5	2.5		0.08				0.5	0.05		
DIP10100	1-Form-A		1	3		0.06				1	0.1		

<sup>1</sup> Continuous duty cycle

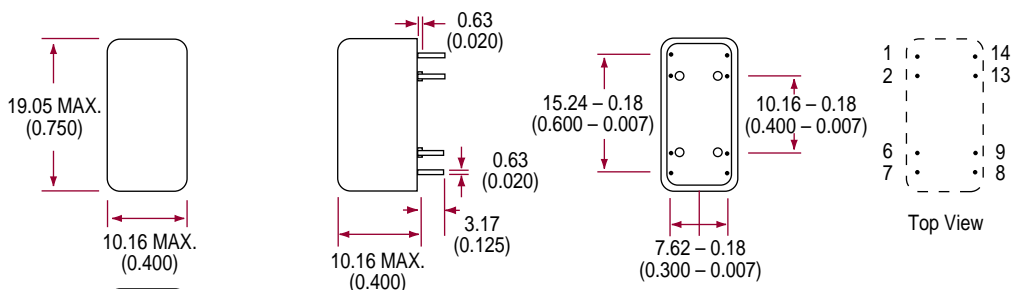
# DIP SERIES REED RELAYS

## Low Power & Current Sensing

### MECHANICAL DIMENSIONS

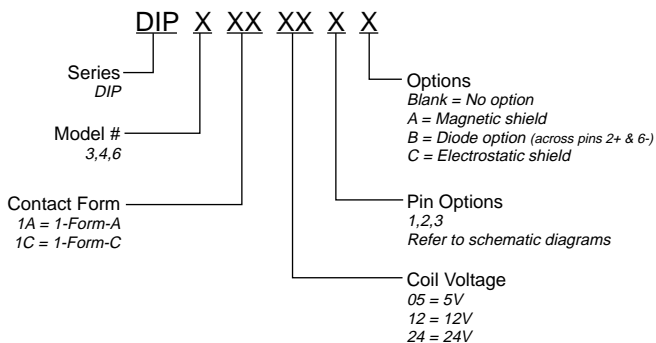
DIMENSIONS  
mm  
(inches)

#### DIP SERIES



### ORDERING INFORMATION

A complete part number is represented by the digits below.



#### Current Sensing Relays

