

EPR MOS RELAY (4PIN)

1. FEATURES

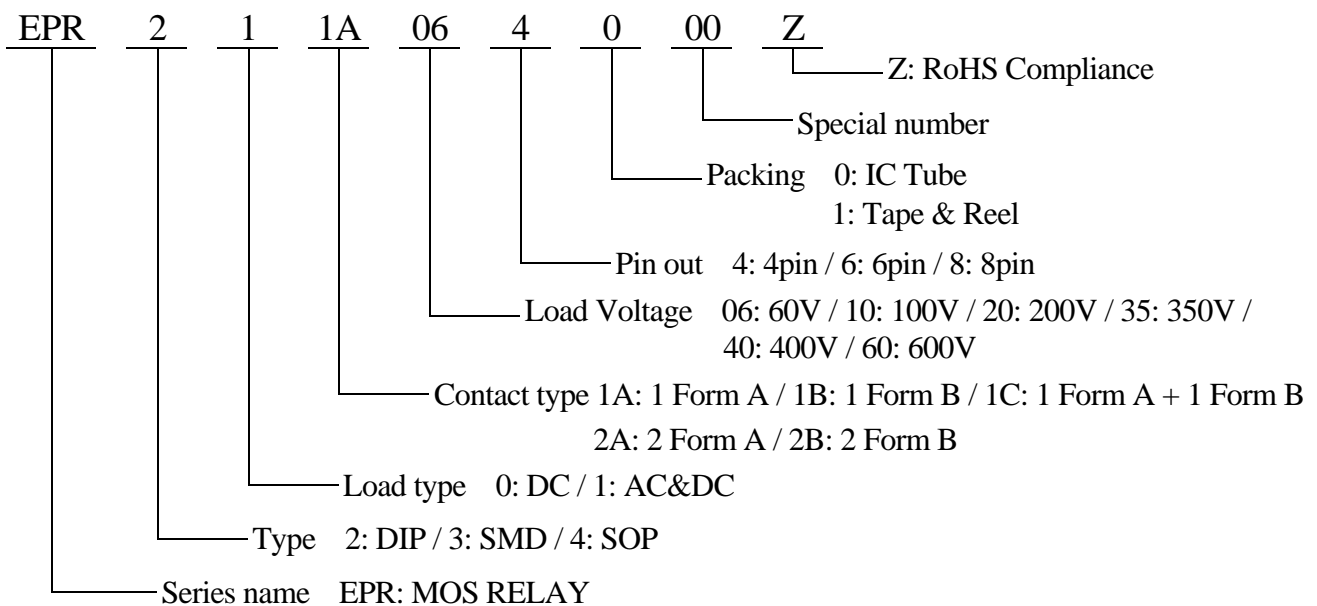
- 1.1 No EMI/RFI Generation
- 1.2 High reliability
- 1.3 No moving parts
- 1.4 Low drive power requirement (TTL/CMOS Compatible)
- 1.5 Low On-state Resistance
- 1.6 3750V isolation input/output (1500V isolation for SO-package)
- 1.7 Arc-free with no snubbing circuits
- 1.8 Machine insertable or wave solderable



2. APPLICATION

- 2.1 Telecommunications
- 2.2 Instrumentation
- 2.3 Medical equipment
- 2.4 Security
- 2.5 Industrial control

3. PART NUMBERING SYSTEM



4. SPECIFICATION

Part Number (4PIN)	Marking	PACKING	Contact Form
EPR211A064000(Z) DIP / 60VAC&DC	41A06T	97 pcs/Tube	1A
EPR311A064000(Z) SMD / 60VAC&DC	41A06M	97 pcs/Tube	
EPR311A064100(Z) SMD / 60VAC&DC	41A06M	1000 pcs/Tape & reel	
EPR411A064000(Z) SOP / 60VAC&DC	41A06S	97 pcs/Tube	
EPR411A064100(Z) SOP / 60VAC&DC	41A06S	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (AC peak or DC)	V _L	60			V	
	Continuous Rated Load Current	SOP	I _L		350	mA	I _F =10mA
		DIP/SMD		400			
	Peak current	SOP	I _{Lpeak}		600	mA	10ms
		DIP/SMD		700			
	On-state resistance	R _{ON}		1.0	1.4	Ohm	I _F =10mA, I _L =rating
	Off-state Leakage current	I _{LK}			1	μA	I _F =0mA, V _L =rating
	Turn-On Time	T _{ON}		0.2	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.03	0.3	ms		
Output Capacitance	C _{OUT}		150		pF	f=1MHz	
Input/ Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

S P E C I F I C A T I O N

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Part Number (4PIN)		Marking	PACKING	Contact Form
EPR211A204000(Z)	DIP / 200VAC&DC	41A20T	97 pcs/Tube	1A
EPR311A204000(Z)	SMD / 200VAC&DC	41A20M	97 pcs/Tube	
EPR311A204100(Z)	SMD / 200VAC&DC	41A20M	1000 pcs/Tape & reel	
EPR411A204000(Z)	SOP / 200VAC&DC	41A20S	97 pcs/Tube	
EPR411A204100(Z)	SOP / 200VAC&DC	41A20S	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (AC peak or DC)	V _L	200			V	
	Continuous Rated Load Current	SOP	I _L		150	mA	I _F =10mA
		DIP/SMD		200			
	Peak current	SOP	I _{Lpeak}		300	mA	10ms
		DIP/SMD		400			
	On-state resistance	R _{ON}		6	10	Ohm	I _F =10mA, I _L =rating
	Off-state Leakage current	I _{LK}			1	μA	I _F =0mA, V _L =rating
	Turn-On Time	T _{ON}		0.2	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.03	0.3	ms		
Output Capacitance	C _{OUT}		100		pF	f=1MHz	
Input/ Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

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Part Number (4PIN)	Marking	PACKING	Contact Form
EPR211A404000(Z) DIP / 400VAC&DC	41A40T	97 pcs/Tube	1A
EPR311A404000(Z) SMD / 400VAC&DC	41A40M	97 pcs/Tube	
EPR311A404100(Z) SMD / 400VAC&DC	41A40M	1000 pcs/Tape & reel	
EPR411A404000(Z) SOP / 400VAC&DC	41A40S	97 pcs/Tube	
EPR411A404100(Z) SOP / 400VAC&DC	41A40S	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (AC peak or DC)	V _L	400			V	
	Continuous Rated Load Current	SOP	I _L		100	mA	I _F =10mA
		DIP/SMD		130			
	Peak current	SOP	I _{Lpeak}		250	mA	10ms
		DIP/SMD		300			
	On-state resistance	R _{ON}		20	30	Ohm	I _F =10mA, I _L =rating
	Off-state Leakage current	I _{LK}			1	μA	I _F =0mA, V _L =rating
	Turn-On Time	T _{ON}		0.2	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.03	0.3	ms		
Output Capacitance	C _{OUT}		70		pF	f=1MHz	
Input/Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

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Part Number (4PIN)	Marking	PACKING	Contact Form
EPR211B204000(Z) DIP / 200VAC&DC	41B20T	97 pcs/Tube	1B
EPR311B204000(Z) SMD / 200VAC&DC	41B20M	97 pcs/Tube	
EPR311B204100(Z) SMD / 200VAC&DC	41B20M	1000 pcs/Tape & reel	
EPR411B204000(Z) SOP / 200VAC&DC	41B20S	97 pcs/Tube	
EPR411B204100(Z) SOP / 200VAC&DC	41B20S	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (AC peak or DC)	V _L	200			V	
	Continuous Rated Load Current	SOP	I _L		80	mA	I _F =0mA
		DIP/SMD		100			
	Peak current	SOP	I _{Lpeak}		200	mA	10ms
		DIP/SMD		250			
	On-state resistance	R _{ON}		17	30	Ohm	I _F =0mA, I _L =rating
	Off-state Leakage current	I _{LK}			10	μA	I _F =5mA, V _L =rating
	Turn-On Time	T _{ON}		0.03	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.4	1.0	ms		
Output Capacitance	C _{OUT}		200		pF	f=1MHz	
Input/ Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

SPECIFICATION

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Part Number (4PIN)		Marking	PACKING	Contact Form
EPR211B404000(Z)	DIP / 400VAC&DC	41B40T	97 pcs/Tube	1B
EPR311B404000(Z)	SMD / 400VAC&DC	41B40M	97 pcs/Tube	
EPR311B404100(Z)	SMD / 400VAC&DC	41B40M	1000 pcs/Tape & reel	
EPR411B404000(Z)	SOP / 400VAC&DC	41B40S	97 pcs/Tube	
EPR411B404100(Z)	SOP / 400VAC&DC	41B40S	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (AC peak or DC)	V _L	400			V	
	Continuous Rated Load Current	SOP	I _L		80	mA	I _F =0mA
		DIP/SMD		100			
	Peak current	SOP	I _{Lpeak}		200	mA	10ms
		DIP/SMD		250			
	On-state resistance	R _{ON}		25	50	Ohm	I _F =0mA, I _L =rating
	Off-state Leakage current	I _{LK}			10	μA	I _F =5mA, V _L =rating
	Turn-On Time	T _{ON}		0.03	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.4	1.0	ms		
Output Capacitance	C _{OUT}		200		pF	f=1MHz	
Input/Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

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Part Number (4PIN)	Marking	PACKING	Contact Form
EPR201A064000(Z) DIP / 60VDC	41A06F	97 pcs/Tube	1A
EPR301A064000(Z) SMD / 60VDC	41A06N	97 pcs/Tube	
EPR301A064100(Z) SMD / 60VDC	41A06N	1000 pcs/Tape & reel	
EPR401A064000(Z) SOP / 60VDC	41A06K	97 pcs/Tube	
EPR401A064100(Z) SOP / 60VDC	41A06K	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	IF=10mA
	Reverse voltage	V _R			5	V	IR=10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (DC)	V _L	60			V	
	Continuous Rated Load Current	SOP	I _L		350	mA	IF=10mA
		DIP/SMD		400			
	Peak current	SOP	I _{Lpeak}		600	mA	10ms
		DIP/SMD		700			
	On-state resistance	R _{ON}		0.5	0.8	Ohm	IF=10mA,IL=rating
	Off-state Leakage current	I _{LK}			1	μA	IF=0mA,VL=rating
	Turn-On Time	T _{ON}		0.2	0.5	ms	IF=10mA,VL=rating, IL=rating
Turn-Off Time	T _{OFF}		0.03	0.3	ms		
Output Capacitance	C _{OUT}		-		pF	f=1MHz	
Input/ Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H.≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

S P E C I F I C A T I O N

Edition

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Part Number (4PIN)	Marking	PACKING	Contact Form
EPR201A204000(Z) DIP / 200VDC	41A20F	97 pcs/Tube	1A
EPR301A204000(Z) SMD / 200VDC	41A20N	97 pcs/Tube	
EPR301A204100(Z) SMD / 200VDC	41A20N	1000 pcs/Tape & reel	
EPR401A204000(Z) SOP / 200VDC	41A20K	97 pcs/Tube	
EPR401A204100(Z) SOP / 200VDC	41A20K	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	IF=10mA
	Reverse voltage	V _R			5	V	IR=10µA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (DC)	V _L	200			V	
	Continuous Rated Load Current	SOP	I _L		150	mA	IF=10mA
		DIP/SMD		200			
	Peak current	SOP	I _{Lpeak}		300	mA	10ms
		DIP/SMD		400			
	On-state resistance	R _{ON}		4	6	Ohm	IF=10mA,IL=rating
	Off-state Leakage current	I _{LK}			1	µA	IF=0mA,VL=rating
	Turn-On Time	T _{ON}		0.2	0.5	ms	IF=10mA,VL=rating, IL=rating
Turn-Off Time	T _{OFF}		0.03	0.3	ms		
Output Capacitance	C _{OUT}		-		pF	f=1MHz	
Input/ Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H.≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

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Edition

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Part Number (4PIN)	Marking	PACKING	Contact Form
EPR201A404000(Z) DIP / 400VDC	41A40F	97 pcs/Tube	1A
EPR301A404000(Z) SMD / 400VDC	41A40N	97 pcs/Tube	
EPR301A404100(Z) SMD / 400VDC	41A40N	1000 pcs/Tape & reel	
EPR401A404000(Z) SOP / 400VDC	41A40K	97 pcs/Tube	
EPR401A404100(Z) SOP / 400VDC	41A40K	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	IF=10mA
	Reverse voltage	V _R			5	V	IR=10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (DC)	V _L	400			V	
	Continuous Rated Load Current	SOP	I _L		100	mA	IF=10mA
		DIP/SMD		130			
	Peak current	SOP	I _{Lpeak}		240	mA	10ms
		DIP/SMD		300			
	On-state resistance	R _{ON}		13	17	Ohm	IF=10mA,IL=rating
	Off-state Leakage current	I _{LK}			1	μA	IF=0mA,VL=rating
	Turn-On Time	T _{ON}		0.2	0.5	ms	IF=10mA,VL=rating, IL=rating
Turn-Off Time	T _{OFF}		0.03	0.3	ms		
Output Capacitance	C _{OUT}		-		pF	f=1MHz	
Input/ Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H.≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

SPECIFICATION

Edition

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Part Number (4PIN)	Marking	PACKING	Contact Form
EPR201B204000(Z) DIP / 200VDC	41B20F	97 pcs/Tube	1B
EPR301B204000(Z) SMD / 200VDC	41B20N	97 pcs/Tube	
EPR301B204100(Z) SMD / 200VDC	41B20N	1000 pcs/Tape & reel	
EPR401B204000(Z) SOP / 200VDC	41B20K	97 pcs/Tube	
EPR401B204100(Z) SOP / 200VDC	41B20K	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (DC)	V _L	200			V	
	Continuous Rated Load Current	SOP	I _L		80	mA	I _F =0mA
		DIP/SMD		100			
	Peak current	SOP	I _{Lpeak}		200	mA	10ms
		DIP/SMD		250			
	On-state resistance	R _{ON}		12	16	Ohm	I _F =0mA, I _L =rating
	Off-state Leakage current	I _{LK}			10	μA	I _F =5mA, V _L =rating
	Turn-On Time	T _{ON}		0.03	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.4	1.0	ms		
Output Capacitance	C _{OUT}		-		pF	f=1MHz	
Input/Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

SPECIFICATION

Edition

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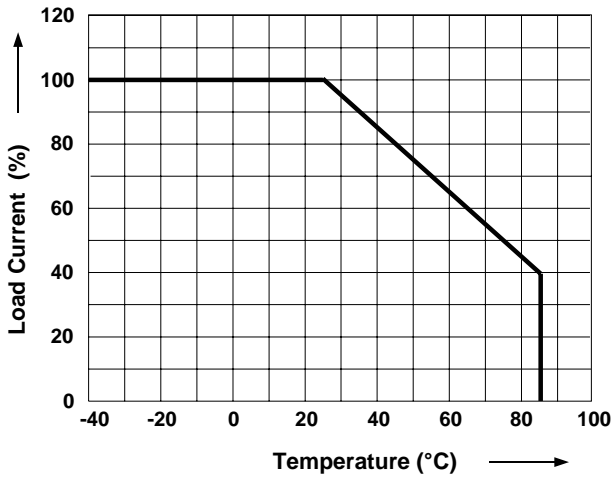
Part Number (4PIN)	Marking	PACKING	Contact Form
EPR201B404000(Z) DIP / 400VDC	41B40F	97 pcs/Tube	1B
EPR301B404000(Z) SMD / 400VDC	41B40N	97 pcs/Tube	
EPR301B404100(Z) SMD / 400VDC	41B40N	1000 pcs/Tape & reel	
EPR401B404000(Z) SOP / 400VDC	41B40K	97 pcs/Tube	
EPR401B404100(Z) SOP / 400VDC	41B40K	2000 pcs/Tape & reel	

Electrical characteristics (Ambient temperature: 25°C)

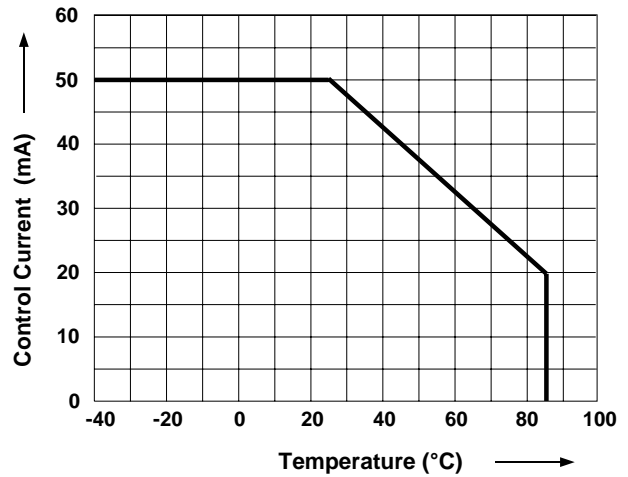
ITEM		Symbol	MIN.	TYP	MAX	UNIT	NOTE
Input	Forward voltage	V _F	1.0		1.4	V	I _F =10mA
	Reverse voltage	V _R			5	V	I _R =10μA
	Control current	I _{Fopr}	5		50	mA	
Output	Load voltage (DC)	V _L	400			V	
	Continuous Rated Load Current	SOP	I _L		80	mA	I _F =0mA
		DIP/SMD		100			
	Peak current	SOP	I _{Lpeak}		200	mA	10ms
		DIP/SMD		250			
	On-state resistance	R _{ON}		15	26	Ohm	I _F =0mA, I _L =rating
	Off-state Leakage current	I _{LK}			10	μA	I _F =5mA, V _L =rating
	Turn-On Time	T _{ON}		0.03	0.5	ms	I _F =10mA, V _L =rating, I _L =rating
Turn-Off Time	T _{OFF}		0.4	1.0	ms		
Output Capacitance	C _{OUT}		-		pF	f=1MHz	
Input/Output	I/O Capacitance	C _{I/O}		1		pF	f=1MHz
	I/O Isolation voltage	SOP	V _{I/O}	1500		VAC	R.H. ≤ 60% 1min
		DIP/SMD		3750			
I/O Isolation resistance	R _{I/O}	5			GΩ	DC=500V delay 2sec	
Temperature limits	Operating	T _{OP}	-40°C to +85°C (-40°F to +185°F)				
	Storage	T _{STG}	-40°C to +100°C (-40°F to +212°F)				

LIMIT CONDITIONS

Load Current vs. Temperature



Control Current vs. Temperature



RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward Current	IF	5	10	25	mA
Operating Temperature	T _{opr}	-20		+65	°C

5. PACKING

5.1 PACKING METHOD

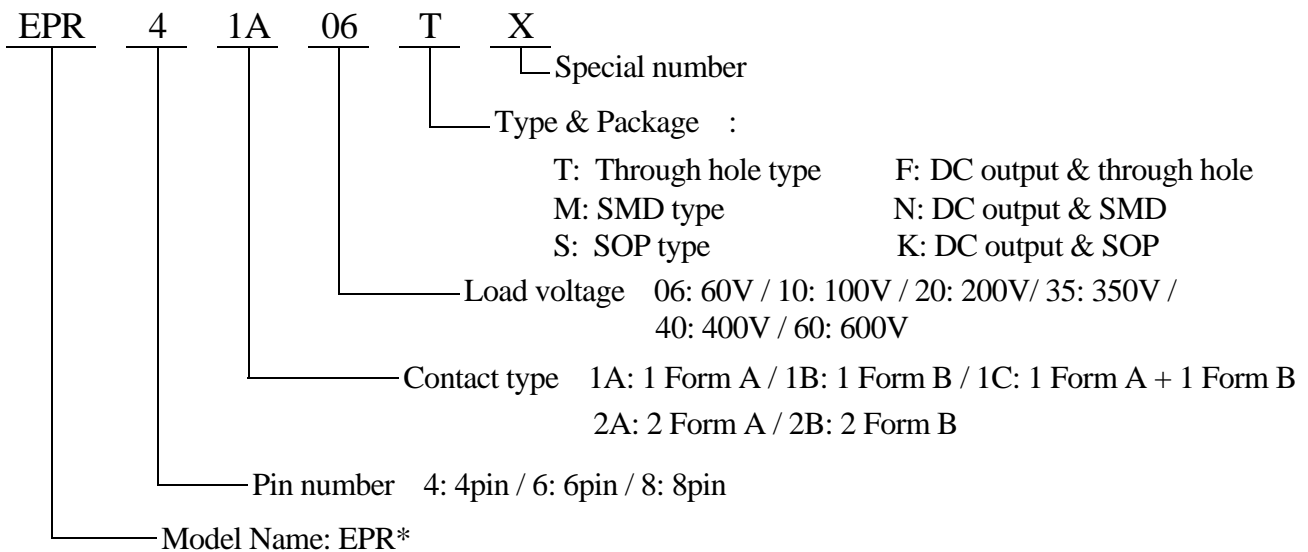
All relays are packed into IC tubes as an inner packing unit, and ten IC tubes bundled together with rubber bands.

5.2 Relays may also be packed using tape & reel methods.

5.3 INFORMATION ON LABEL (stuck to each bundle of IC tubes).

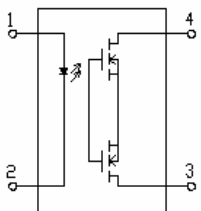
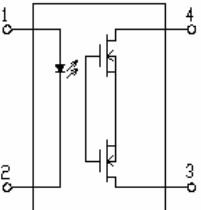
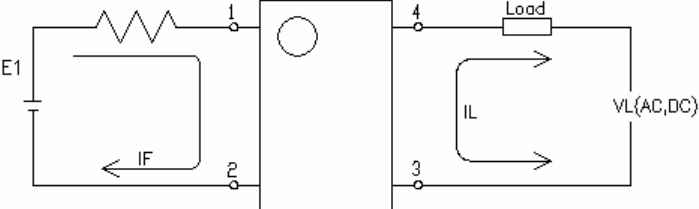
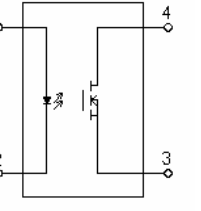
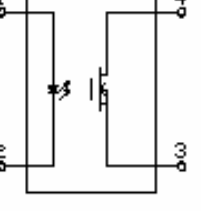
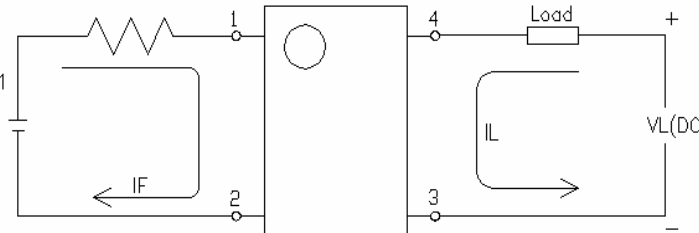
- | | |
|-----------------|--------------|
| (1) DESCRIPTION | (5) ECE MARK |
| (2) LOT NO. | (6) QC STAMP |
| (3) QUANTITY | (7) DATE |
| (4) TESTER NO. | |

6. MARKING SYSTEM



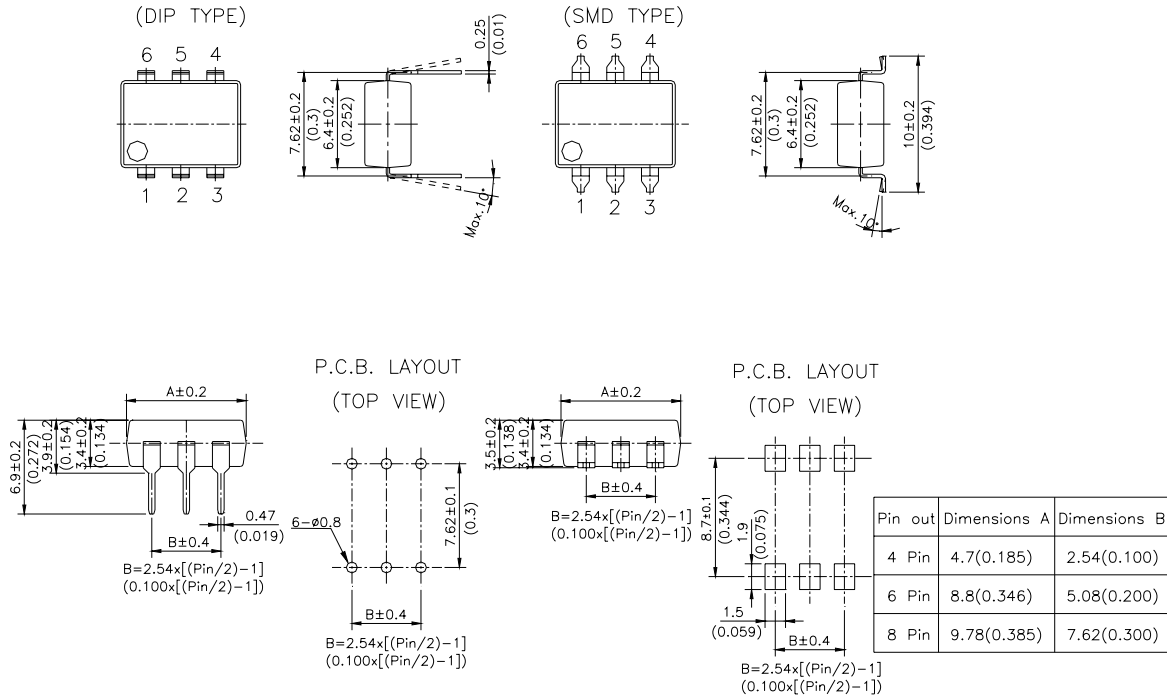
*4pin products without "EPR" mark.

7. CIRCUIT DIAGRAM & APPLICATION

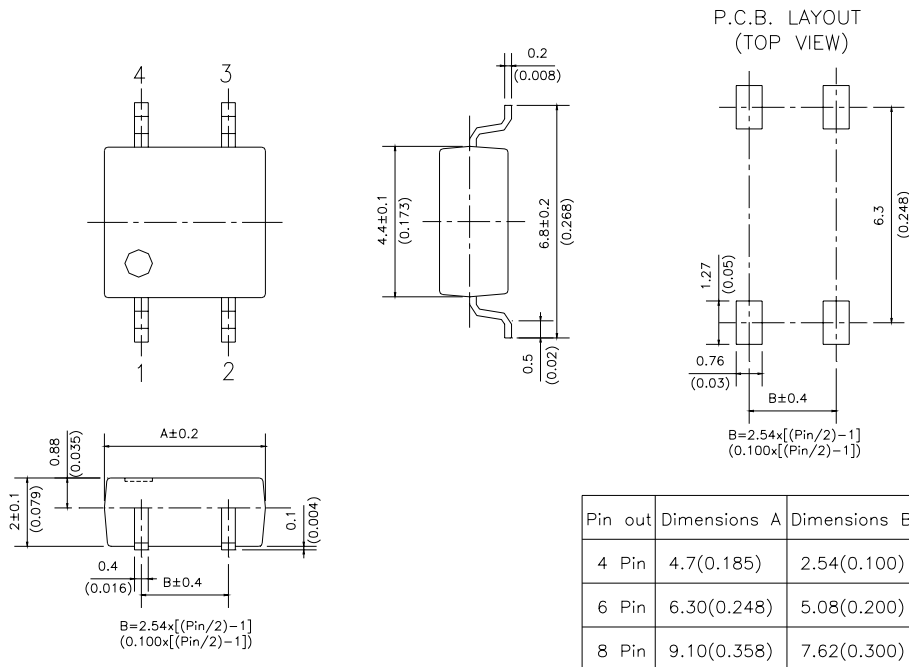
Circuit diagram (4 PIN)	Load type	Application
<p>EPR 4P 1A TYPE (AC/DC)</p>  <p>EPR 4P 1B TYPE (AC/DC)</p> 	<p>AC&DC</p>	
<p>EPR 4P 1A TYPE (DC)</p>  <p>EPR 4P 1B TYPE (DC)</p> 	<p>DC</p>	

8. DRAWINGS

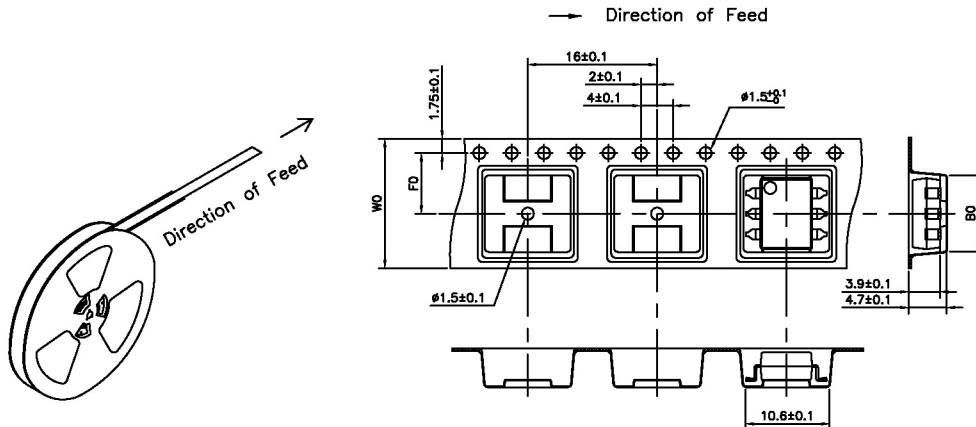
EPR/EPC/EPT/EPV-DIP/SMD SERIES DIMENSIONS Unit:mm(inch)



EPR/EPC/EPT/EPV-SOP SERIES DIMENSIONS Unit:mm(inch)

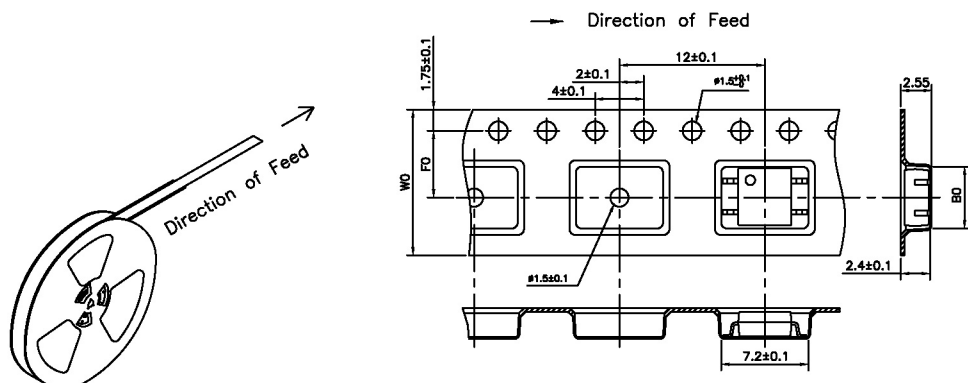


EPR-SMD REEL (Dimensions in mm)



TYPE	B0±0.1	F0±0.1	W0±0.3	15" REEL/PCS
4P	5.3	7.5	16	1000
6P	9.4	7.5	16	1000
8P	10.3	11.5	24	1000

EPR-SOP REEL (Dimensions in mm)



TYPE	B0±0.1	F0±0.1	W0±0.3	13" REEL/PCS
4P	5.1	5.5	12	2000
6P	6.7	7.5	16	2000
8P	9.6	7.5	16	2000