UMW PC814A

1.Description

The PC814A is a photoelectric coupler composed of two light-emitting diode and phototransistor. It is packaged in a 4-pin package, two forms (DIP, SMD)

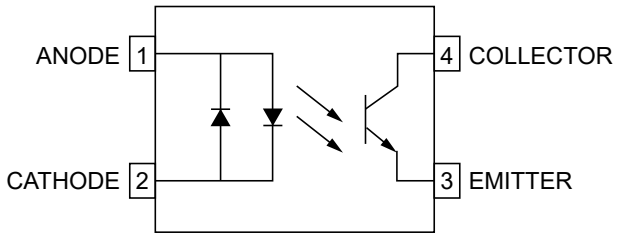
2.Features

- Current transfer ratio:
  20~300%(I_F=5mA, V_{CE}=5V)
- High isolation voltage between input and output
  (V_{ISO}=5000Vrms)
- Collector-emitter breakdown voltage BV_{CEO}≥80V
- Meet safety standard approval:EU REACH and RoHS

3.Applications

- Switching power supply, intelligent meter
- Industrial control, measuring instruments
- Office equipment such as copiers
- Household appliances: such as air conditioners, fans , water heaters, etc.

4.Pinning Information



DIP-4

SOP-4

5.Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	±50	mA
	Power Dissipation	P	70	mW
	PowerdissipationDerating factor (above T_A=100°C)	P_{DD}	2.9	mW/°C
	Thermal Resistance Junction-Ambient	R_{thJ-A}	325	°C/W
	Thermal Resistance Junction-Case	R_{thJ-C}	200	°C/W
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter - Collector Voltage	V_{ECO}	6	V
Total Power Dissipation		P_{TOT}	200	mW
Isolation Voltage		V_{ISO}	5000	Vrms
Operating Temperature		T_{OPR}	-55 to 110	°C
Storage Temperature		T_{STG}	-55 to 125	°C
Soldering Temperature		T_{SOL}	260 (10s)	°C

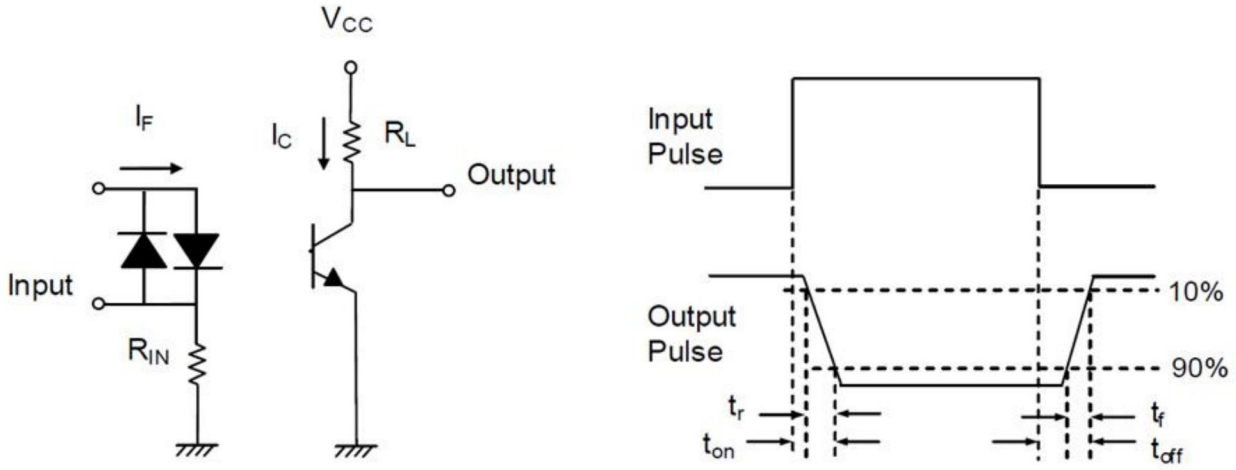
6.Electrical Characteristics (T_A=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input						
Forward Voltage	V_F	I_F=±20mA		1.2	1.4	V
Terminal Capacitance	C_t	V=0, f=1kHz		30	250	pF
Output						
Collector Dark Current	I_{CEO}	V_{CE}=20V			100	nA
Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C=0.1mA, I_F=0	80			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E=0.1mA, I_F=0	6			V
Transfer Characteristics						
Current Transfer Ratio	CTR	I_F=5mA, V_{CE}=5V	20		300	%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=20mA, I_C=1mA		0.1	0.2	V
Isolation Resistance	R_{ISO}	DC500V, 40~60%R.H.	$5x10^{10}$	$1x10^{11}$		Ω
Isolation Capacitance	C_f	V=0, f=1MHz		0.6	1	pF
Cut-off Frequency	F_C	V_{CE}=5V, I_C=2mA, R_L=100Ω,-3dB		80		kHz
Switching Characteristics						
Rise Time	T_r	V_{CE}=2V, I_C=2mA		4	18	μs
Fall Time	T_f	R_L=100Ω		3	18	μs

7.Rank Table of CTR

Type	Classification	Current Transfer Ratio (%)(I_C/I_F)		
		I_F=±5mA, V_{CE}=5V, T_A=25°C		
		Min	Typ	Max
PC814	A	50	-	150
	B	100	-	300
	None	20	-	300

8.Switching Time Test Circuit



9.1 Typical Characteristic

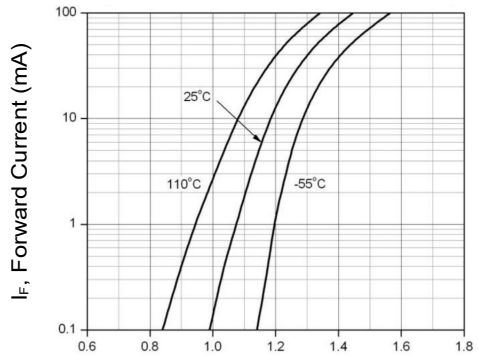


Figure 1: Forward Current vs Forward Voltage

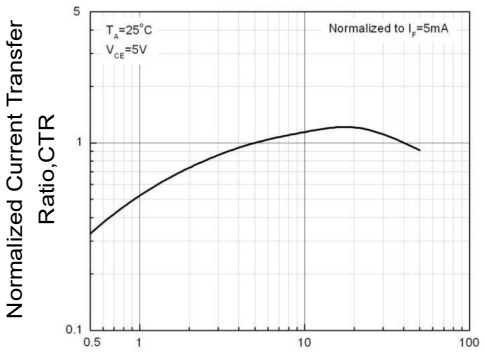


Figure 2: Normalized Current Transfer Ratio vs Forward Current

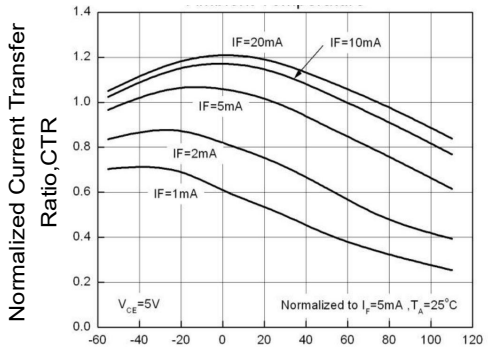


Figure 3: Current Transfer Ratio vs Ambient Temperature

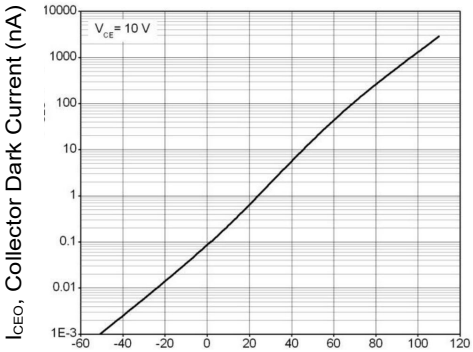


Figure 4: Dark Current vs Ambient Temperature

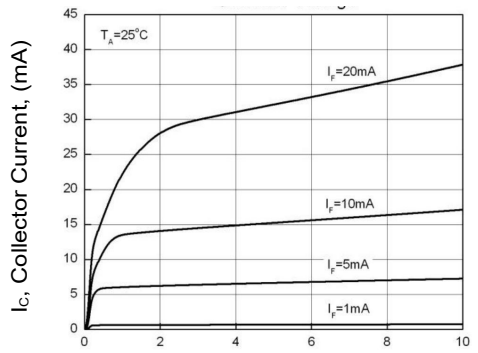


Figure 5: Collector Current vs Collector Voltage

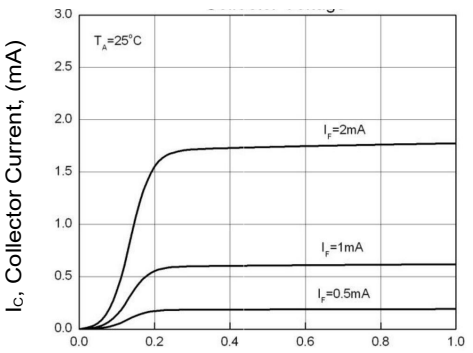


Figure 6: Collector Current vs Collector Voltage

9.2 Typical Characteristic

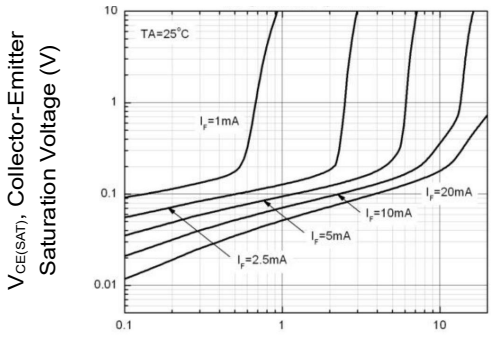


Figure 7: Collector-Emitter Saturation Voltage vs Collector Current

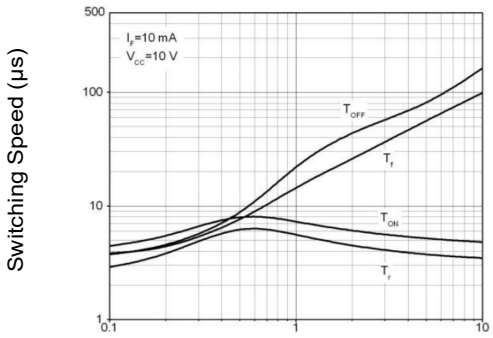


Figure 8: Switching Time vs Load Resistance

10.Solder Reflow Profile

Soldering Precautions

Whether using a soldering iron or reflow soldering, the soldering temperature should be as close as possible to the conditions shown below.

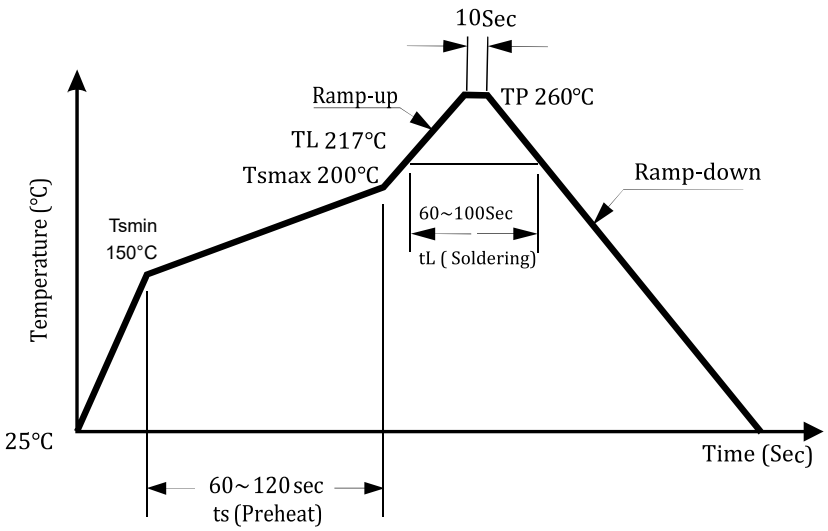
• When reflow soldering Reflow

soldering should be completed within 10 seconds if reflow

soldering does not exceed 260°C. The soldering temperature profile is based on the surface temperature of the plastisol (see the chart below, based on the surface temperature of the plastisol).

Reflow soldering is limited to one or two passes.

It must be used within 2 weeks after unpacking

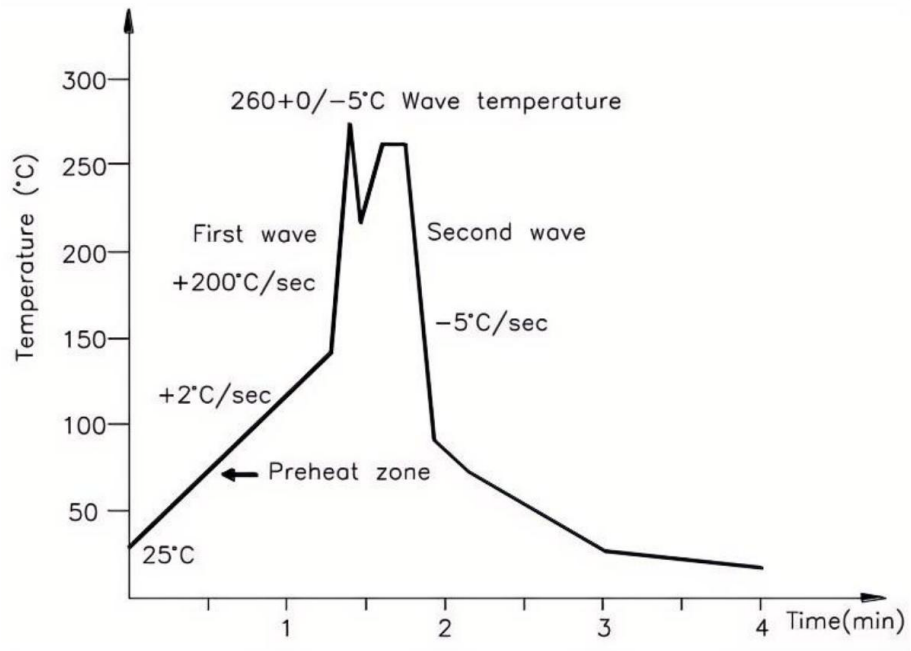


• Wave soldering

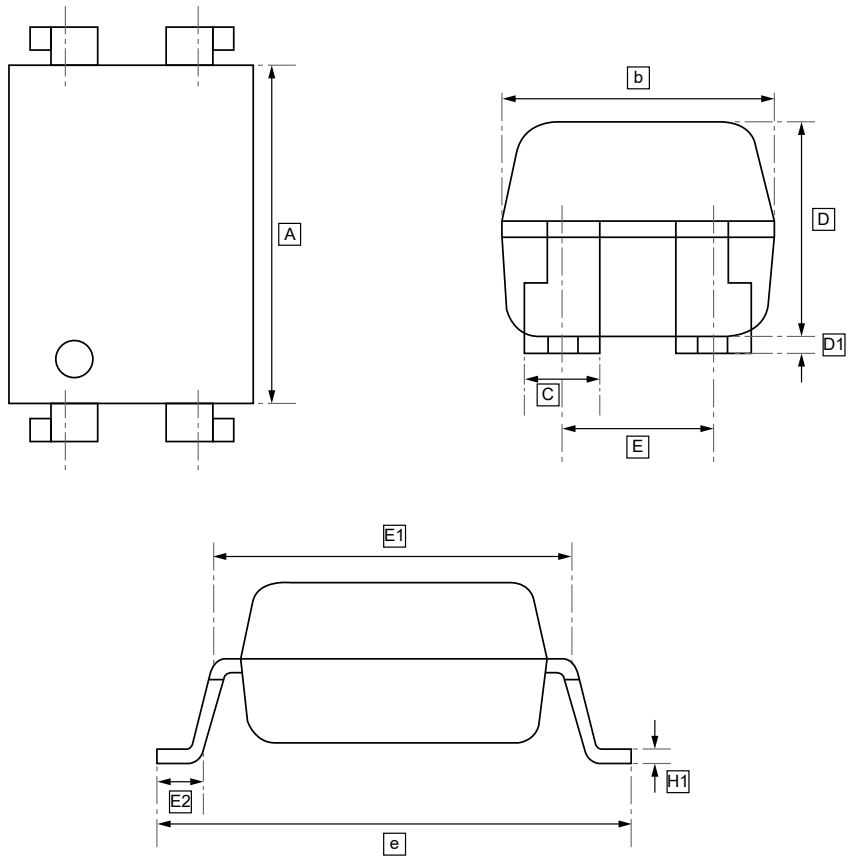
It is recommended to perform one-time soldering under temperature conditions.

Temperature: 260+0/-5°C Time: 10 sec.

Preheat temperature: 25 to 140°C Preheat time: 30 to 80 seconds.


300
250
200
150
100
50
Temperature (°C)
260+0/−5°C Wave temperature
First wave
+200°C/sec
Second wave
−5°C/sec
+2°C/sec
Preheat zone
25°C
1
2
3
4
Time(min)

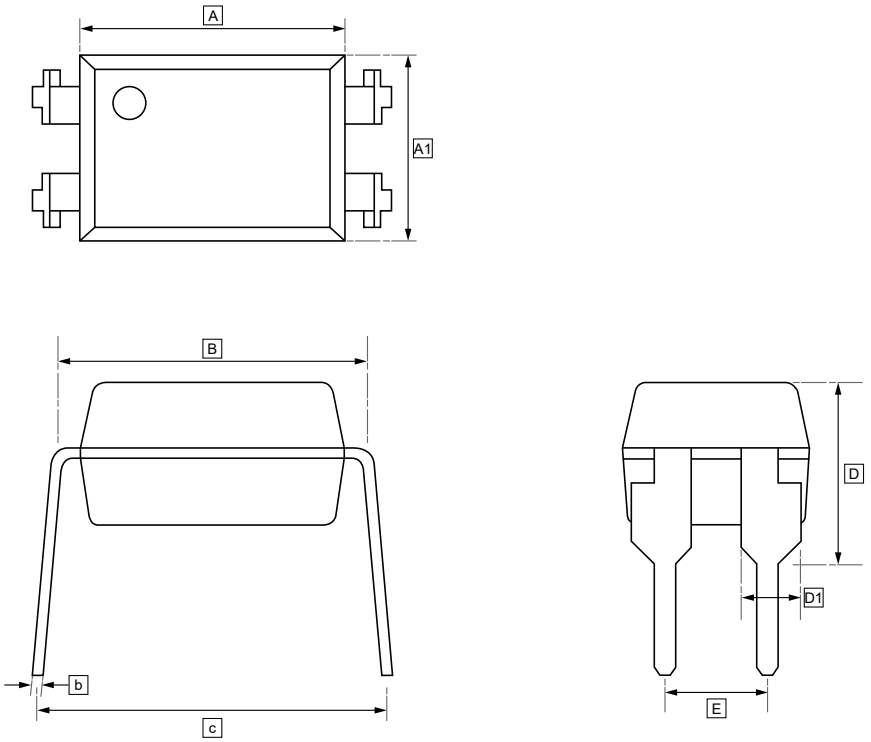
11.1 SOP-4 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	b	C	D	D1	E	E1	E2	e	H1
Min	6.15	4.33	1.25	3.4	0.05	2.29	7.37	0.75	10.0	0.26
Max	6.65	4.83	1.45	3.9	0.6	2.79	7.87	1.25	10.6	

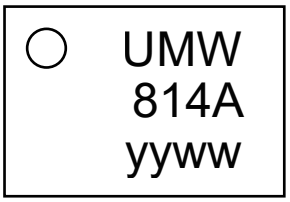
11.2 DIP-4 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	B	b	c	D	D1	E
Min	6.15	4.33	7.37	0.26	7.85	3.40	1.25	2.54
Max	6.65	4.83	7.87		8.80	3.90	1.45	TYP

12.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW PC814A-S	814A	SOP-4	2000	Tape and reel
UMW PC814A	814A	DIP-4	5000	Tube and box

13.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

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