



## UPC814

Preliminary

PHOTOCOUPLER

### 4 PIN LSOP PHOTOTRANSISTOR PHOTOCOUPLER

#### DESCRIPTION

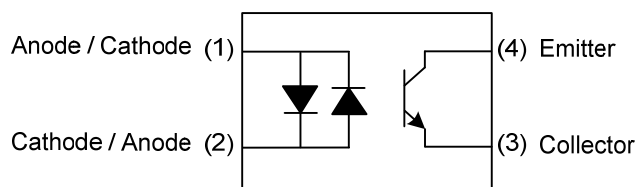
The UTC **UPC814** is a 4 pin phototransistor photocoupler, it uses UTC's advanced technology to provide the customers with high isolation voltage between input and output, etc.

The UTC **UPC814** is suitable for programmable controllers and telecommunication equipments, etc.

#### FEATURES

- \* Current transfer ratio (CTR: MIN. 20% at  $I_F = \pm 1\text{mA}$ ,  $V_{CE} = 5\text{V}$ )
- \* High input-output isolation voltage ( $V_{ISO} = 5,000\text{Vrms}$ )
- \* Response time ( $t_r$ : MAX.  $18\mu\text{s}$  at  $V_{CE} = 2\text{V}$ ,  $I_C = 2\text{mA}$ ,  $R_L = 1000\Omega$ )
- \* Low collector dark current ( $I_{CEO}$ : MAX.  $10^{-7}\text{A}$  at  $V_{CE} = 20\text{V}$ )
- \* AC input response
- \* Green Package

#### SYMBOL

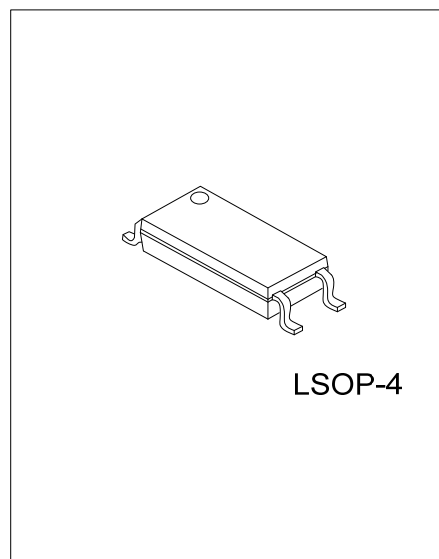


#### ORDERING INFORMATION

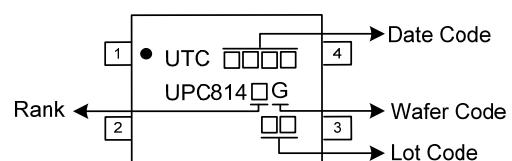
Ordering Number	Package	Pin Assignment				Packing
		1	2	3	4	
UPC814G-LS04-R	LSOP-4	A / K	K / A	C	E	Tape Reel
UPC814xG-LS04-R	LSOP-4	A / K	K / A	C	E	Tape Reel

Note: Pin Assignment: A: Anode K: Cathode E: Emitter C: Collector

<p>UPC814xG-LS04-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Wafer Code</p> <p>(4) Rank</p>	<p>(1) R: Tape Reel</p> <p>(2) LS04: LSOP-4</p> <p>(3) Wafer Code</p> <p>(4) Refer to TRANSFER CHARACTERISTICS</p>
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## ■ MARKING



■ ABSOLUTE MAXIMUM RATING ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

	PARAMETER	SYMBOL	RATINGS	UNIT
Input	Forward Current	$I_F$	$\pm 60$	mA
	Power Dissipation	$P_D$	100	mW
Output	Collector-Emitter Voltage	$V_{CEO}$	80	V
	Emitter-Collector Voltage	$V_{ECO}$	6	V
	Collector Current	$I_C$	50	mA
	Collector Power Dissipation	$P_C$	160	mW
Total Power Dissipation		$P_{tot}$	200	mW
Isolation Voltage (Note 2)		$V_{ISO}$	5000	Vrms
Operating Temperature		$T_{OPR}$	$-30 \sim +110$	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	$-55 \sim +125$	$^\circ\text{C}$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. AC for 1 minute, R.H. = 40~60%.

Isolation voltage shall be measured using the following method.

(1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side.

(2) The isolation voltage tester with zero-cross circuit shall be used.

(3) The waveform of applied voltage shall be a sine wave.

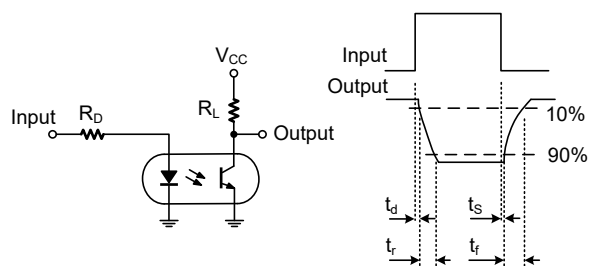
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
Forward Voltage	$V_F$	$I_F=\pm 20\text{mA}$			1.4	V
Input Capacitance	$C_{IN}$	$V=0, f=1\text{kHz}$			250	pF
<b>OUTPUT</b>						
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE}=20\text{V}, I_F=0$			100	nA
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=0.1\text{mA}, I_F=0$	80			V
Emitter-Collector Breakdown Voltage	$BV_{ECO}$	$I_E=10\mu\text{A}, I_F=0$	6			V

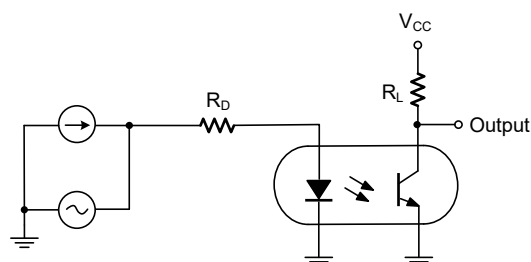
■ TRANSFER CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Current	$I_C$	$I_F=\pm 1\text{mA}, V_{CE}=5\text{V}$	0.2		3.0	mA
Current Transfer Ratio	CTR	$I_F=\pm 1\text{mA}, V_{CE}=5\text{V}$	UPC814	20	300	%
			UPC814A	50	150	%
			UPC814B	100	300	%
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_F=\pm 20\text{mA}, I_C=1\text{mA}$			0.2	V
Isolation Resistance	$R_{IO}$	$V_{IO}=500\text{Vdc}, 40\sim 60\% \text{ R.H.}$	$5 \times 10^{10}$			$\Omega$
Rise Time	$t_r$	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=1000\Omega$			18	$\mu\text{s}$
Fall Time	$t_f$				18	$\mu\text{s}$

## ■ TEST CIRCUITS AND WAVEFORMS



Test Circuit for Response Time



Test Circuit for Frequency Response

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.