



## UPC815

Preliminary

PHOTOCOUPLER

### 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

#### DESCRIPTION

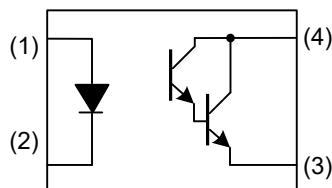
The UTC **UPC815** is a 4 pin phototransistor photocoupler, it uses UTC's advanced technology to provide the customers with high isolation voltage between input and output, etc.

The UTC **UPC815** is suitable for programmable controllers and telecommunication equipments, etc.

#### FEATURES

- \* Current transfer ratio (CTR: MIN. 600% at  $I_F=1mA$ ,  $V_{CE}=2V$ )
- \* High input-output isolation voltage ( $V_{ISO}=5,000V_{rms}$ )
- \* Response time ( $t_r$ : TYP. 60 $\mu s$  at  $V_{CE}=2V$ ,  $I_C=10mA$ ,  $R_L=100\Omega$ )
- \* Green Package

#### SYMBOL



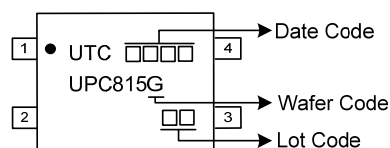
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment				Packing
		1	2	3	4	
UPC815G-D04-T	DIP-4	A	K	E	C	Tape Reel

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

<p>UPC815G-D04-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Wafer Code</p>	<p>(1) R: Tape Reel</p> <p>(2) D04: DIP-4</p> <p>(3) Wafer Code</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	$I_F$	50	mA
	Reverse Voltage	$V_R$	6	V
	Power Dissipation	$P_D$	70	mW
Output	Collector-Emitter Voltage	$V_{CEO}$	35	V
	Emitter-Collector Voltage	$V_{ECO}$	6	V
	Collector Current	$I_C$	80	mA
	Collector Power Dissipation	$P_C$	150	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% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

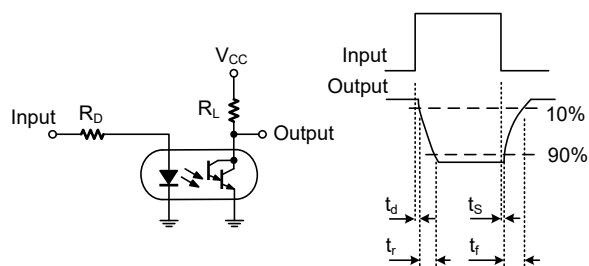
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
Forward Voltage	$V_F$	$I_F=20\text{mA}$		1.2	1.4	V
Reverse Current	$I_R$	$V_R=4\text{V}$			10	$\mu\text{A}$
Input Capacitance	$C_{IN}$	$V=0, f=1\text{kHz}$			250	pF
<b>OUTPUT</b>						
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE}=35\text{V}, I_F=0$			1	$\mu\text{A}$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=0.1\text{mA}, I_F=0$	35			V
Emitter-Collector Breakdown Voltage	$BV_{ECO}$	$I_E=0.1\mu\text{A}, I_F=0$	6			V

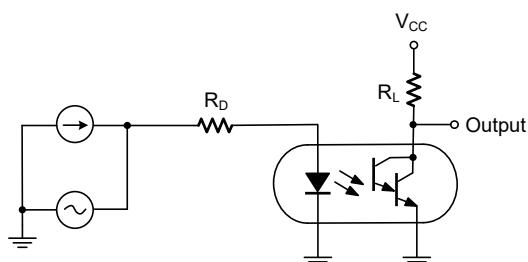
■ TRANSFER CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Current	$I_C$	$I_F=1\text{mA}, V_{CE}=2\text{V}$	6		75	mA
Current Transfer Ratio	CTR	$I_F=1\text{mA}, V_{CE}=2\text{V}$	600		7500	%
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_F=20\text{mA}, I_C=5\text{mA}$			1.0	V
Isolation Resistance	$R_{IO}$	DC500V, 40~60% R.H.	$5 \times 10^{10}$	$1 \times 10^{11}$		$\Omega$
Floating Capacitance	$C_{IO}$	$V_{IO}=0, f=1\text{MHz}$			1.0	pF
Cut-Off Frequency	$f_c$	$V_{CE}=5\text{V}, I_C=2\text{Ma}$ $R_L=100\Omega, -3\text{dB}$	1.0	6.0		kHz
Rise Time	$t_r$	$V_{CE}=2\text{V}, I_C=10\text{mA}, R_L=100\Omega$			300	$\mu\text{s}$
Fall Time	$t_f$				250	$\mu\text{s}$

## ■ TEST CIRCUITS AND WAVEFORMS



Test Circuit for Response Time



Test Circuit for Frequency Response

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