



**UPC358**

Preliminary

**PHOTOCOUPLER**

**SOP-4 PHOTOTRANSISTOR  
PHOTOCOUPLER**

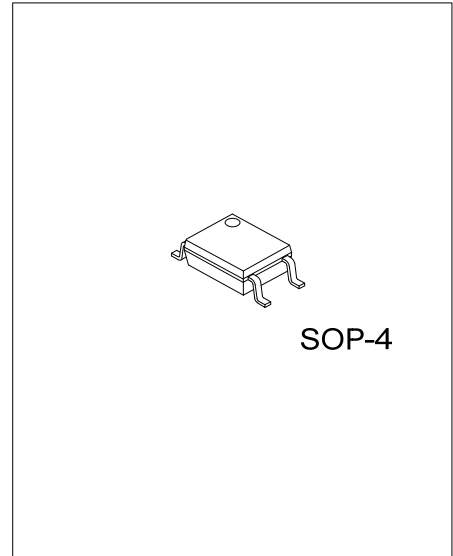
■ DESCRIPTION

The UTC **UPC358** is a phototransistor photocoupler, it uses UTC's advanced technology to provide the customers with high isolation voltage between input and output, etc.

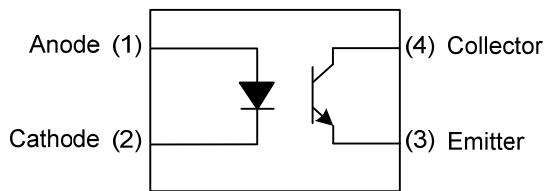
The UTC **UPC358** is suitable for programmable controllers and telecommunication equipments, etc.

■ FEATURES

- \* Current transfer ratio (CTR: MIN. 20% at  $I_F=1mA, V_{CE}=5V$ )
- \* Current transfer ratio (CTR: MIN. 80% at  $I_F=5mA, V_{CE}=5V$ )
- \* Isolation voltage between input and output ( $V_{ISO}=3750 Vrms$ )
- \* High collector-emitter voltage ( $V_{CEO}=120V$ )
- \* Employs double transfer mold technology



■ SYMBOL



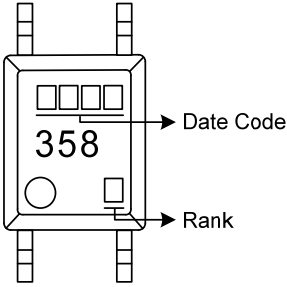
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment				Packing
Lead Free	Halogen Free		1	2	3	4	
UPC358L-S04-R	UPC358G-S04-R	SOP-4	A	K	E	C	Tape Reel
UPC358xL-S04-R	UPC358xG-S04-R	SOP-4	A	K	E	C	Tape Reel

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

<p>UPC358xG-S04-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package (4)Rank</p>	<p>(1) R: Tape Reel (2) S04: SOP-4 (3) G: Halogen Free and Lead Free, L: Lead Free (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	$I_F$	50	mA
	Power Dissipation	$P_D$	70	mW
Output	Collector-Emitter Voltage	$V_{CEO}$	120	V
	Emitter-Collector Voltage	$V_{ECO}$	6	V
	Collector Current	$I_C$	50	mA
	Collector Power Dissipation	$P_C$	150	mW
Power Dissipation		$P_D$	170	mW
Isolation Voltage (Note 2)		$V_{ISO}$	3750	$V_{rms}$
Junction Temperature		$T_J$	+125	$^{\circ}\text{C}$
Operating Temperature		$T_{OPR}$	-55 ~ +100	$^{\circ}\text{C}$
Storage Temperature		$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

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.

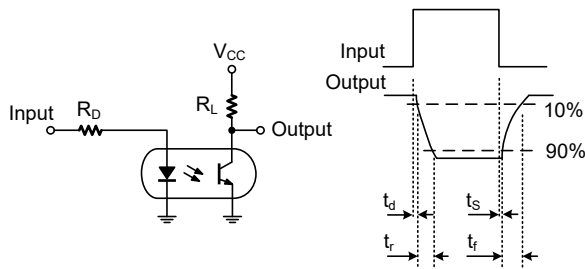
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
Forward Voltage	$V_F$	$I_F=\pm 20\text{mA}$		1.2	1.4	V
Reverse Current	$I_R$	$V_R=4\text{V}$			10	$\mu\text{A}$
Terminal Capacitance	$C_t$	$V=0, f=1\text{kHz}$			250	pF
<b>OUTPUT</b>						
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE}=40\text{V}, I_F=0$			100	nA
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=0.1\text{mA}, I_F=0$	120			V
Emitter-Collector Breakdown Voltage	$BV_{ECO}$	$I_E=10\mu\text{A}, I_F=0$	6			V

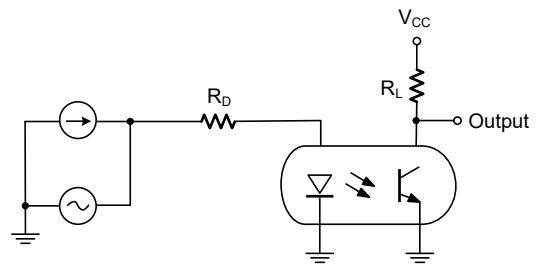
■ TRANSFER CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Collector Current	$I_C$	$I_F=5\text{mA}, V_{CE}=5\text{V}$	4		20	mA	
		$I_F=1\text{mA}, V_{CE}=5\text{V}$	0.2			mA	
Current Transfer Ratio	CTR	$I_F=5\text{mA}, V_{CE}=5\text{V}$	UPC358	80			%
			UPC358A	80		160	%
			UPC358B	130		260	%
			UPC358C	200		400	%
		$I_F=1\text{mA}, V_{CE}=5\text{V}$	UPC358	20			%
			UPC358A	20			%
			UPC358B	45			%
			UPC358C	70			%
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_F=20\text{mA}, I_C=1\text{mA}$			0.2	V	
Isolation Resistance	$R_{IO}$	$V_{IO}=500\text{Vdc}, 40\sim 60\% \text{ R.H.}$	$5 \times 10^{10}$	$1 \times 10^{11}$		$\Omega$	
Floating Capacitance	$C_{IO}$	$V=0, f=1\text{MHz}$		0.6	1.0	pF	
Rise Time	$t_R$	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$		4	18	$\mu\text{s}$	
Fall Time	$t_F$			3	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.