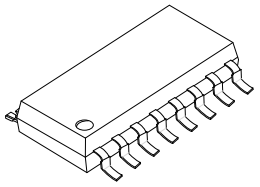
PHOTOCOUPLER IRED & PHOTO-TRANSISTOR



SSOP-16-4

■ DESCRIPTION

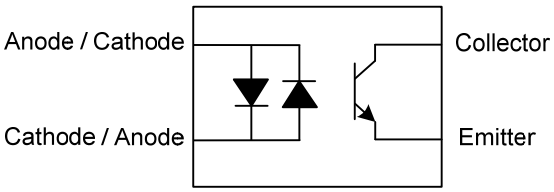
The UTC **UPC290-4** consists of phototransistors optically coupled to an infrared LED.

Since UTC **UPC290-4** is guaranteed over a wide operating temperature range (T_A = -55 to 110°C), it is suitable for high-density surface mount applications such as programmable controllers.

■ FEATURES

* Collector-Emitter Voltage : 80 V (min)
* Current Transfer Ratio : 50% (min)
  Rank GB: 100 %(min)
* Isolation Voltage: 2500 Vrms (min)
* Operation temperature range: -55 to 110 ˚C

■ SYMBOL

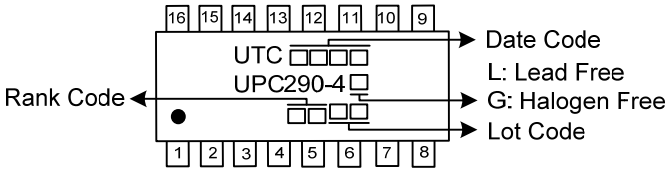


■ ORDERING INFORMATION

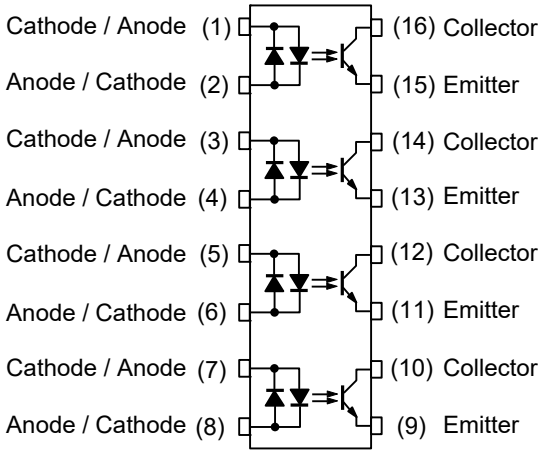
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UPC290-4L-xx-RGN-R	UPC290-4G-xx-RGN-R	SSOP-16-4	Tape Reel

UPC290-4G-xx-RGN-R (1)Packing Type (2)Package Type (3)Rank (4)Green Package	(1) R: Tape Reel (2) RGN: SSOP-16-4 (3) Refer to TRANSFER CHARACTERISTICS (4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Input	Forward Current	I_F	±60	mA
	Power Dissipation	P_D	70	mW
Output	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter-Collector Voltage	V_{ECO}	7	V
	Collector Current	I_C	50	mA
	Collector Power Dissipation	P_C	100	mW
Total Power Dissipation		P_{tot}	170	mW
Isolation Voltage (Note 2)	(AC, 60 s, R.H.≤ 60 %)	V_{ISO}	2500	Vrms
Operating Temperature		T_{OPR}	-30 ~ +110	°C
Storage Temperature		T_{STG}	-55 ~ +125	°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.<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°C, nless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT(LED)						
Input Forward Voltage	V_F	I_F=±10mA	1.0		1.4	V
Input Capacitance	C_t	V=0V, f=1kHz		30	250	pF
OUTPUT						
Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C=0.5mA	80			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E=0.1mA	7			V
Collector-Emitter Dark Current	I_{CEO}	V_{CE}=48V			0.1	μA
		V_{CE}=48V, T_A = 85°C			50	μA

■ COUPLED ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

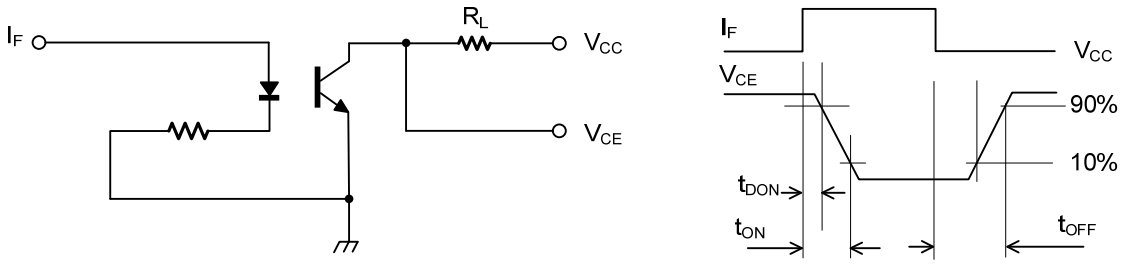
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Collector Current	I_C	I_F=±5mA, V_{CE}=5V		2.5		20	mA
Current Transfer Ratio	CTR	I_F=±5mA, V_{CE}=5V	UPC290-4	50		400	%
			UPC290-4GB	100		400	%
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	I_F=±8mA , I_C=2.4mA				0.4	V
		I_F=±1mA , I_C=0.2mA			0.2		V
		I_F=±1mA , I_C=0.2mA	UPC290-4GB			0.4	V

Note: This device is considered as a two-terminal device: All pins on the LED side are shorted together, and all pin on the photodetector side are shorted together.

■ SWITCHING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Rise Time	t_r	V_{CE}=10V, I_C=2mA		5		μs
Fall Time	t_f			5		μs
Turn-On Time	td_{ON}			3		μs
Turn-Off Time	t_{OFF}			5		μs
Turn-On Time	t_{ON}			8		μs

■ TEST CIRCUITS



Switchin Time Test Circuit