PC714VxNSZX Series/ PC714VxYSZX Series

High Isolation Voltage Type Photocoupler

■ Features

1. TTL compatible output
2. Isolation voltage (Viso (rms):5kV)
3. Recognized by UL, file No.E64380

   Approved by TÜV (VDE0884)(**PC714VxYSZX Series**)
4. 6-pin DIP package

■ Applications

1. Home appliances
2. Programmable controllers
3. Peripheral equipment of personal computers

■ Model Line-up

Model No.	* Safty Standard Approval	
	UL	TÜV(VDE0884)
PC714VxNSZX Series	○	−
PC714VxYSZX Series	○	○

* Application Model No. PC714V

■ Outline Dimensions   (Unit : mm)

① Anode   ④ Emitter
② Cathode   ⑤ Collector
③ NC   ⑥ NC

■ Absolute Maximum Ratings   (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Collector-emitter voltage	V_{CEO}	35	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	150	mW
	Total power dissipation	P_{tot}	170	mW
	*2 Isolation voltage	$V_{iso (rms)}$	5	kV
	Operating temperature	T_{opr}	−25 to +100	°C
	Storage temperature	T_{stg}	−40 to +125	°C
	*3 Soldering temperature	T_{sol}	260	°C

*1 Pulse width≤100μs, Duty ratio=0.001
*2 40 to 60%RH, AC for 1 min
*3 For 10 s

■ Electro-optical Characteristics

(Ta=25˚C)

	Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=20mA	–	1.2	1.4	V
	Peak forward voltage		V_{FM}	I_{FM}=0.5A	–	–	3.0	V
	Reverse current		I_R	V_R=4V	–	–	10	μA
	Terminal capacitance		C_t	V=0, f=1kHz	–	30	250	pF
Output	Collector dark current		I_{CEO}	V_{CE}=20V, I_F=0	–	–	10^{-7}	A
Transfer charac- teristics	[*4] Collector current		I_C	I_F=5mA, V_{CE}=5V	2.5	–	30.0	mA
	Collector-emitter saturation voltage		$V_{CE(sat)}$	I_F=20mA, I_C=1mA	–	0.1	0.2	V
	Isolation resistance		R_{ISO}	DC500V, 40 to 60%RH	$5×10^{10}$	10^{11}	–	Ω
	Floating capacitance		C_f	V=0, f=1MHz	–	0.6	1.0	pF
	Cut-off frequency		f_C	V_{CE}=5V, I_C=2mA, R_L=100Ω	–	80	–	kHz
	Response time	Rise time	t_r	V_{CE}=2V, I_C=2mA R_L=100Ω	–	4	18	μs
		Fall time	t_f		–	3	18	μs

[*4] Classification table of collector current is shown below.

Model No. [*5]	Rank mark	I_C (mA)
PC714V1NSZX	A	4.0 to 8.0
PC714V2NSZX	B	6.5 to 13.0
PC714V3NSZX	C	10.0 to 20.0
PC714V5NSZX	A or B	4.0 to 13.0
PC714V6NSZX	B or C	6.5 to 20.0
PC714V8NSZX	A, B or C	4.0 to 20.0
PC714V0NSZX	A, B, C or no marking	2.5 to 30.0

Measuring Conditions
   I_F=5mA
   V_{CE}=5V
   T_a=25°C

[*5] **PC714VxYSZX** Series are equivalent.

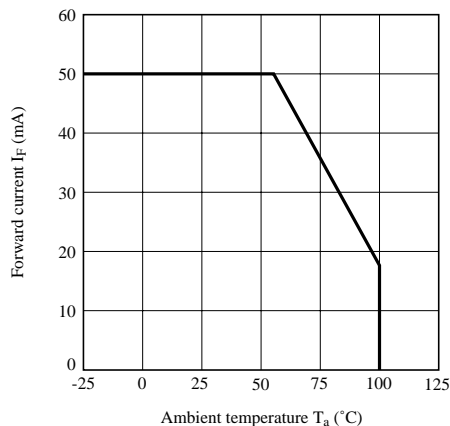### Fig.1 Forward Current vs. Ambient Temperature

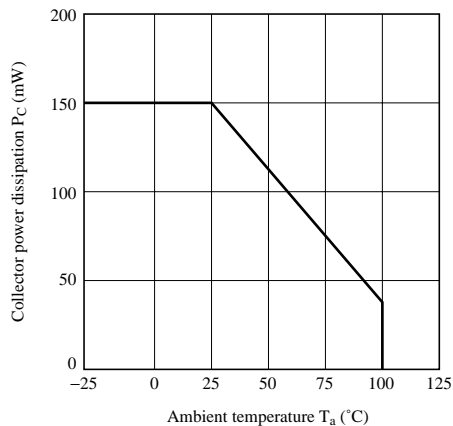### Fig.2 Collector Power Dissipation vs. Ambient Temperature
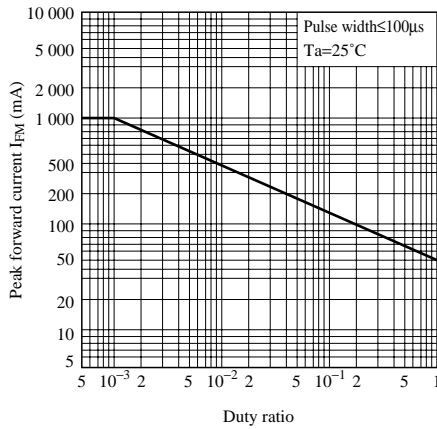
Fig.3 Peak Forward Current vs. Duty Ratio

Pulse width≤100μs
Ta=25°C

Peak forward current I_{FM} (mA)

Duty ratio

Fig.4 Forward Current vs. Forward Voltage

T_a=75°C
50°C
25°C
0°C
−25°C

Forward current I_F (mA)

Forward voltage V_F (V)
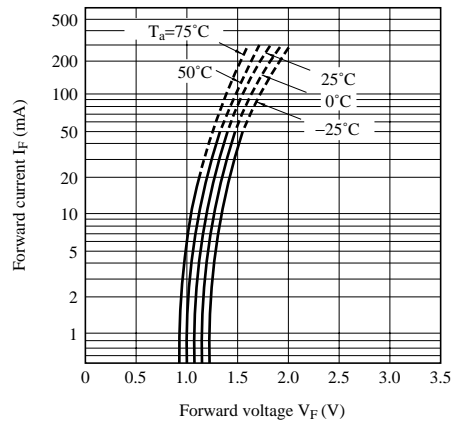
Fig.5 Current Transfer Ratio vs. Forward Current

V_{CE}=5V
T_a=25°C

Current transfer ratio CTR (%)

Forward current I_F (mA)
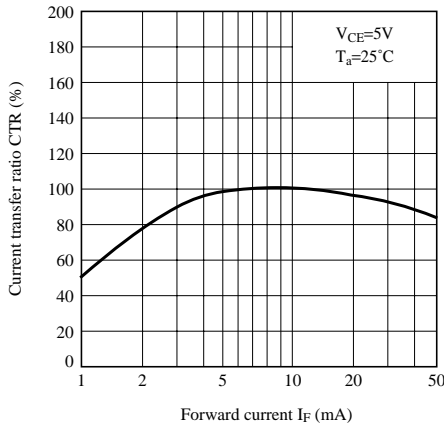
Fig.6 Collector Current vs. Collector-emitter Voltage

I_F=30mA
20mA
10mA
5mA
T_a=25°C
P_C (MAX.)

Collector current I_C (mA)

Collector-emitter voltage V_{CE} (V)
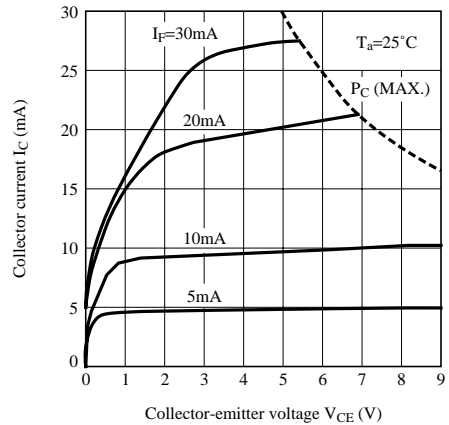
Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

I_F=5mA
V_{CE}=5V

Relative current transfer ratio (%)

Ambient temperature T_a (°C)
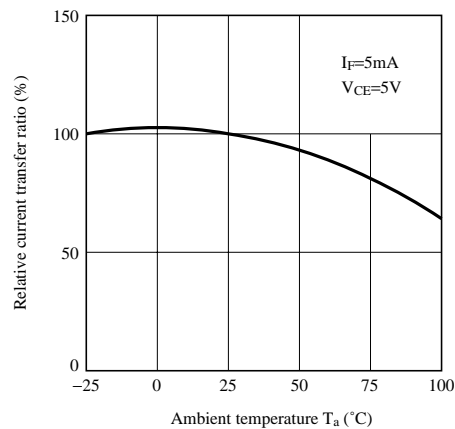
Fig.8 Collector - emitter Saturation Voltage vs. Ambient Temperature
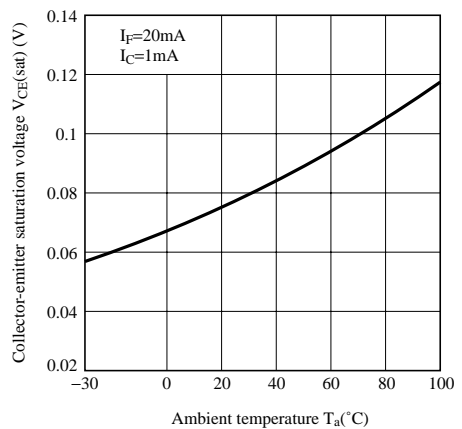
I_F=20mA
I_C=1mA

Collector-emitter saturation voltage V_{CE}(sat) (V)

Ambient temperature T_a(°C)

Fig.9 Collector Dark Current vs. Ambient Temperature

Fig.10 Response Time vs. Load Resistance

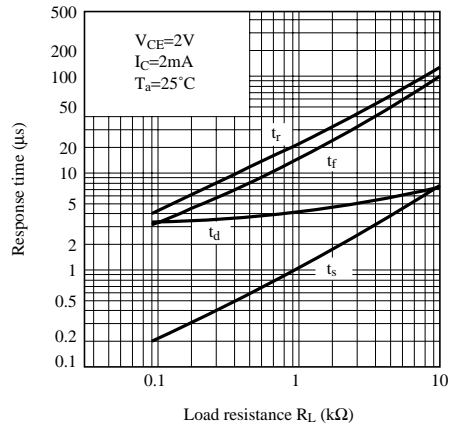**Fig.11 Test Circuit for Response Time**
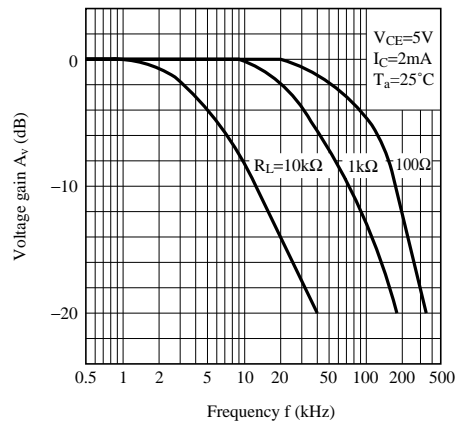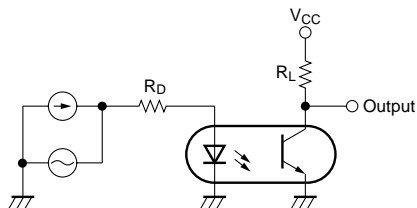

Fig.12 Frequency Response

Fig.13 Test Circuit for Frequency Response

NOTICE

● The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.

● Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.

● Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

(i) The devices in this publication are designed for use in general electronic equipment designs such as:
— Personal computers
— Office automation equipment
— Telecommunication equipment [terminal]
— Test and measurement equipment
— Industrial control
— Audio visual equipment
— Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
— Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
— Traffic signals
— Gas leakage sensor breakers
— Alarm equipment
— Various safety devices, etc.

(iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
— Space applications
— Telecommunication equipment [trunk lines]
— Nuclear power control equipment
— Medical and other life support equipment (e.g., scuba).

● Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.

● If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.

● This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.

● Contact and consult with a SHARP representative if there are any questions about the contents of this publication.