

PC813 Series

AC Input Type & High Noise Reduction Type Photocoupler

■ Features

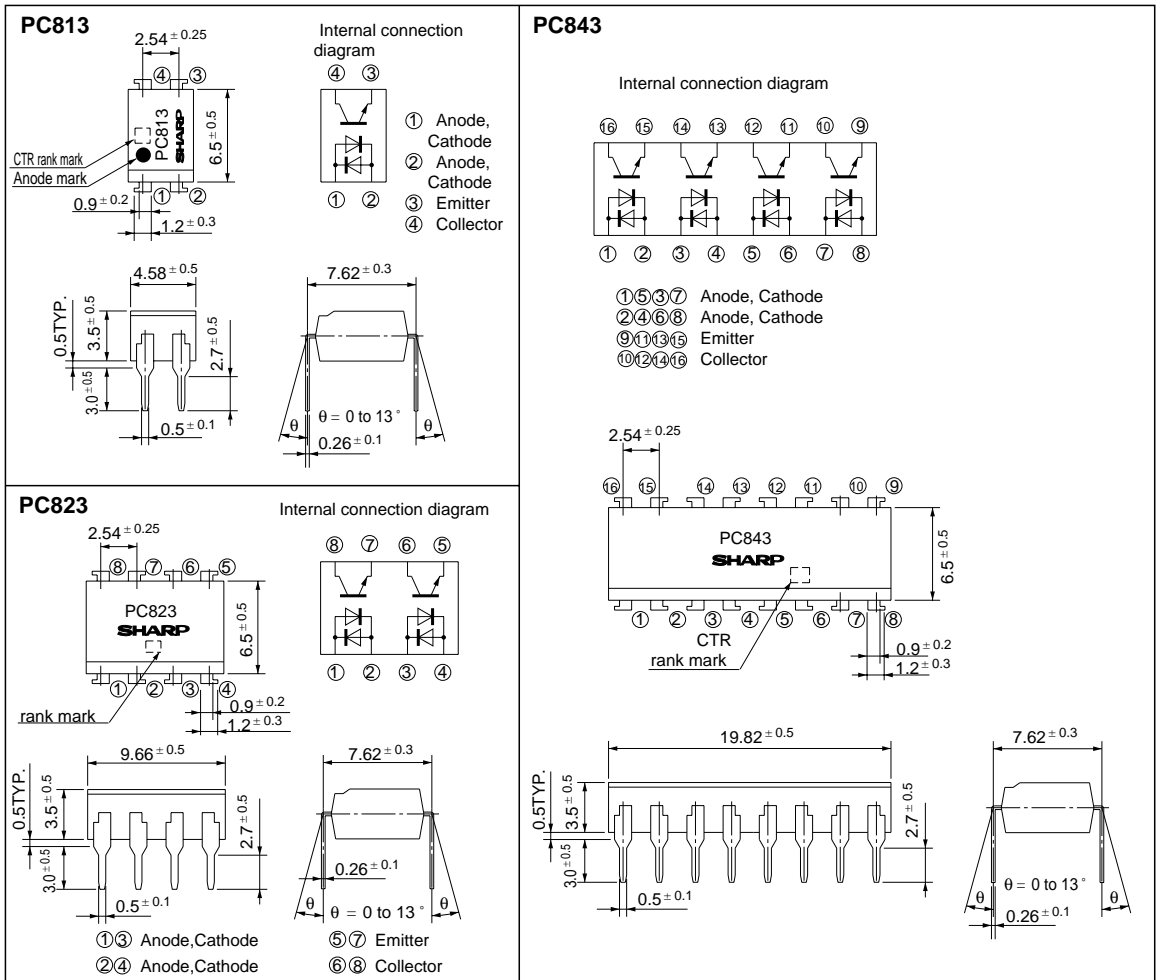
1. High instantaneous common mode rejection voltage
(CM_H : TYP.2kV/ μ s)
2. AC input response
3. Compact dual-in-line package
PC813 (1ch), **PC823** (2ch), **PC843** (4ch)
4. High isolation voltage between input and output
(V_{iso} : 5 000V_{rms})
5. Recognized by UL, file No. E64380

■ Applications

1. Telephones (**PC813**)
2. Programmable controllers
(**PC823/PC843**)
3. System appliances, measuring instruments
4. Signal transmission between circuits of different potentials and impedances

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	± 50	mA
	*1Peak forward current	I _{FM}	± 1	A
	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}	200	mW
*2Isolation voltage		V _{iso}	5 000	V _{rms}
Operating temperature		T _{opr}	- 30 to + 100	°C
Storage temperature		T _{stg}	- 55 to + 125	°C
*3Soldering temperature		T _{sol}	260	°C

*1 Pulse width ≤ 100 μs, Duty ratio : 0.001

*2 40 to 60% RH, AC for 1 minute

*3 For 10 seconds

■ 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	
	Terminal capacitance	C _t	V = 0, f = 1kHz	-	50	250	pF	
Output	Collector dark current	I _{CEO}	V _{CE} = 20V, I _F = 0	-	-	10 ⁻⁷	A	
Transfer characteristics	*4Current transfer ratio	CTR	I _F = ± 1mA, V _{CE} = 5V	20	-	200	%	
	Collector-emitter saturation voltage	V _{CE(sat)}	I _F = ± 20mA, I _C = 1mA	-	0.1	0.2	V	
	Isolation voltage	R _{ISO}	DC500V, 40 to 60% RH	5 x 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, -3dB	15	80	-	kHz	
	Response time	Rise time	t _r	V _{CE} = 2V, I _C = 2mA R _L = 100Ω	-	4	18	μs
		Fall time	t _f		-	5	20	μs
	*5Instantaneous common mode rejection voltage "Output : high level"		CM _H	V _{CM} = 600V, I _F = 0 V _O = 2V, R _L = 1.9kΩ, V _{CC} = 5V	-	2	-	kV/μs
*5Instantaneous common mode rejection voltage "Output : low level"		CM _L	V _{CM} = 600V, I _F = 16mA V _O = 0.8V, R _L = 1.9kΩ, V _{CC} = 5V	-	2	-	kV/μs	

*4 Classification table of current transfer ratio is shown below

Model No.	Rank Mark	CTR (%)
PC813A	A	50 to 150%
PC823A		
PC843A		
PC813	A or no mark	20 to 200%
PC823		
PC843		

*5 Test Circuit for instantaneous common mode rejection voltage

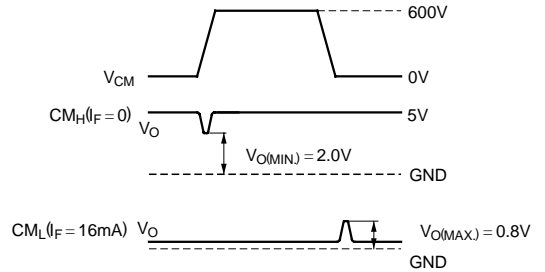
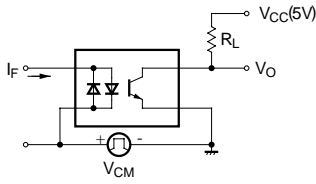


Fig. 1 Forward Current vs. Ambient Temperature

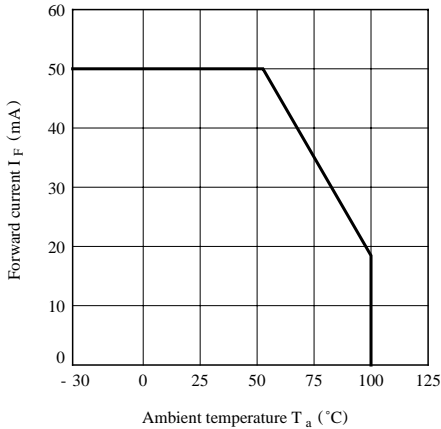


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

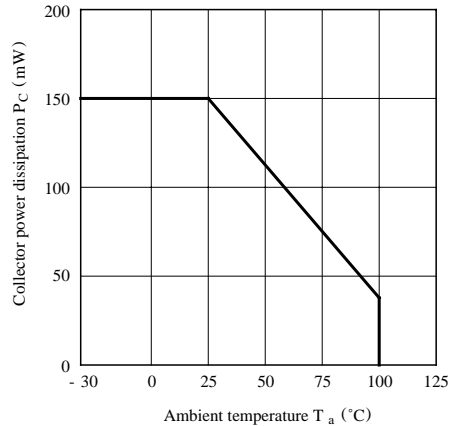


Fig. 3 Peak Forward Current vs. Duty Ratio

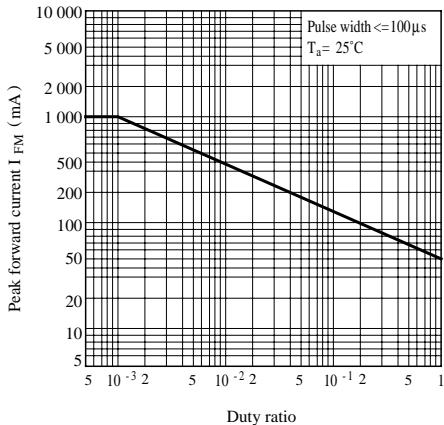


Fig. 4 Forward Current vs. Forward Voltage

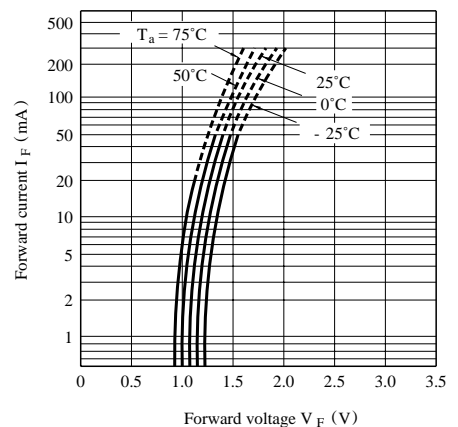


Fig. 5 Current Transfer Ratio vs. Forward Current

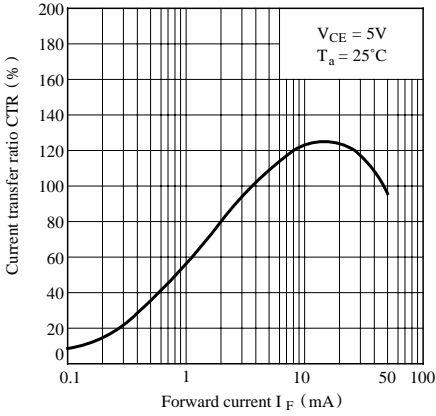


Fig. 6 Collector Current vs. Collector-emitter Voltage

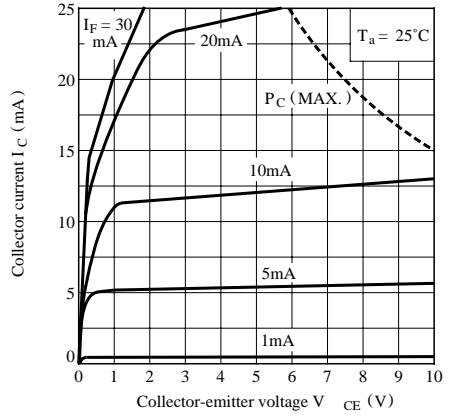


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

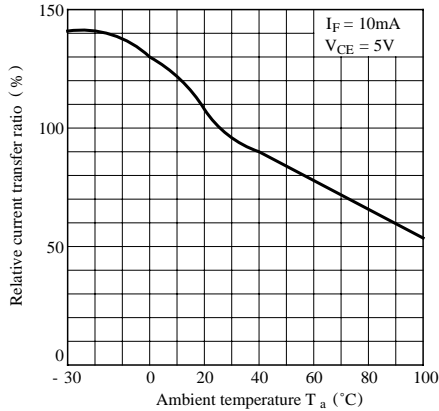


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

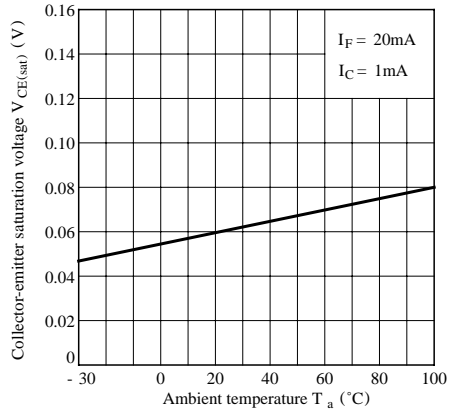


Fig. 9 Collector Dark Current vs. Ambient Temperature

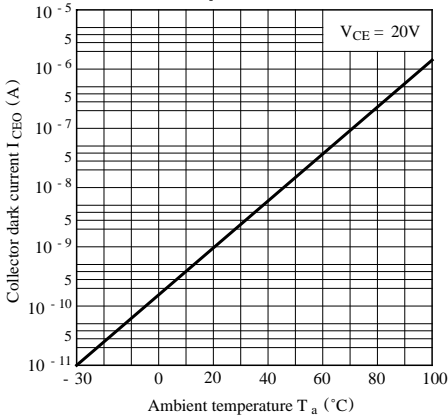


Fig.10 Response Time vs. Load Resistance

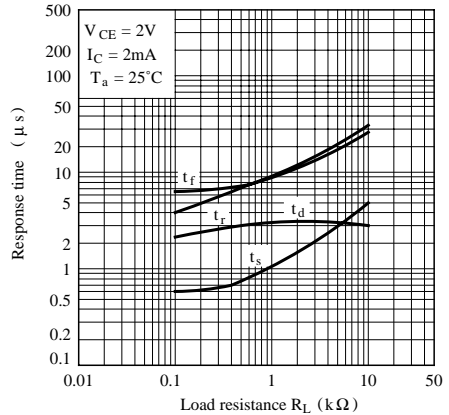
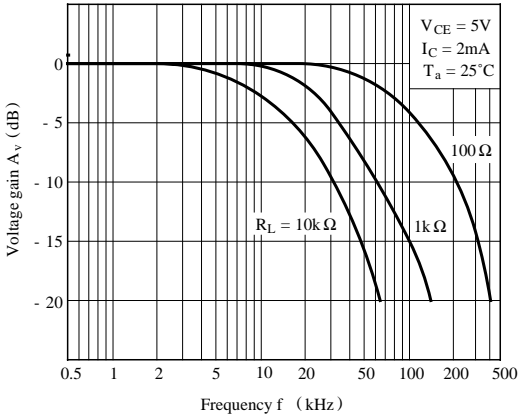


Fig.11 Frequency Response



Test Circuit for Response Time

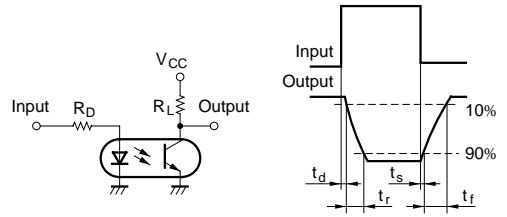
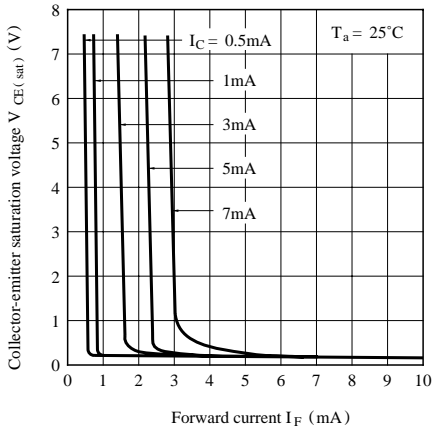
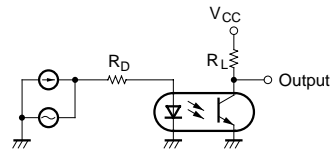


Fig.12 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Frequency Response



● Please refer to the chapter “Precautions for Use”

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Datasheets for electronics components.