

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER PC817 Series

FEATURES

- Current transfer ratio
(CTR: 50%-600% at $I_F=5\text{mA}$, $V_{CE}=5\text{V}$)
- High isolation voltage between input and output (Viso=5000V rms)
- Creepage distance > 7.62mm
- Pb free and ROHS compliant
- UL/CUL Approved (File No. E340048)

Description

The PC817 series of devices each consist of an infrared Emitting diodes, optically coupled to a phototransistor detector. They are packaged in a 4-pin DIP package and available in Wide-lead spacing and SMD option.

APPLICATIONS

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan heaters, etc
- Signal transmission between circuits of different potentials
And impedances

MAXIMUM RATING @ $T_a=25^\circ\text{C}$ unless otherwise specified

Parameter		Symbol	Rating	Unit
INPUT	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	70	mW
OUTPUT	Collector-Emitter Voltage	V_{CEO}	70	V
	Emitter- Collector Voltage	V_{ECO}	6	
	Collector Current	I_C	50	mA
	Collector Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
*1 Isolation Voltage		V_{iso}	5,000	Vrms
Rated impulse isolation voltage		V_{IOTM}	6,000	V
Rated repetitive peak isolation voltage		V_{IORM}	630	V
Operating Temperature		T_{opr}	-30 to + 100	°C
Storage Temperature		T_{stg}	-55 to + 125	
*2 Soldering Temperature		T_{sol}	260	

*1. AC For 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.

*2. For 10 Seconds

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ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Parameter		Symbol	Conditions	MIN.	TYP.	MAX	Unit
INPUT	Forward Voltage	V_F	$I_F=20\text{mA}$	---	1.2	1.4	V
	Reverse Current	I_R	$V_R=4\text{V}$	---	---	10	μA
	Terminal Capacitance	C_t	$V=0, f=1\text{KHz}$	---	30	250	pF
OUTPUT	Collector Dark Current	I_{CEO}	$V_{CE}=20\text{V}, I_F=0$	---	---	100	nA
	Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=0.1\text{mA}$ $I_F=0$	35	---	---	V
	Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E=10\mu\text{A}$ $I_F=0$	6	---	---	V
TRANSFER CHARACTERISTICS	Collector Current	I_C	$I_F=5\text{mA}$	2.5	---	30	mA
	*1 Current Transfer Ratio	CTR	$V_{CE}=5\text{V}$	50	---	600	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F=20\text{mA}$ $I_C=1\text{mA}$	---	0.1	0.2	V
	Isolation Resistance	R_{iso}	DC500V 40~60%R.H.	5×10^{10}	1×10^{11}	---	Ω
	Floating Capacitance	C_f	$V=0, f=1\text{MHz}$	---	0.6	1	pF
	Cut-Off Frequency	f_c	$V_{CE}=5\text{V},$ $I_C=2\text{mA}$ $R_L=100\Omega,$ -3dB	---	80	---	kHz
	Response Time(Rise)	t_r	$V_{CE}=2\text{V},$ $I_C=2\text{mA}$	---	4	18	μs
	Response Time(Fall)	t_f	$R_L=100\Omega$	---	3	18	μs

*1 CTR= $I_C / I_F \times 100\%$

Rank Table of Current Transfer Ratio CTR

RANK MARK	Min. (%)	Max. (%)
L	50	100
A	80	160
B	130	260
C	200	400
D	300	600
L or A or B or C or D	50	600

Notes:

- Conditions: $I_F=5\text{mA}, V_{CE}=5\text{V}, T_a=25^\circ\text{C}$.

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TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Fig.1 Forward Current vs. Ambient Temperature

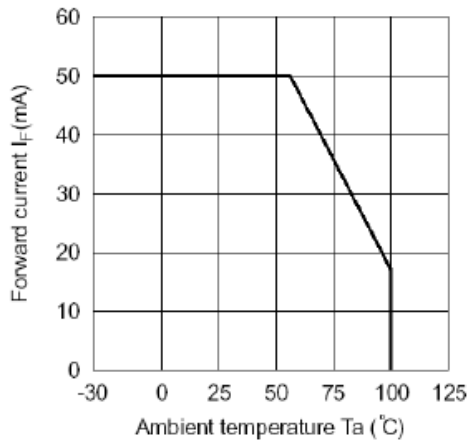


Fig.2 Collector Power Dissipation vs. Ambient Temperature

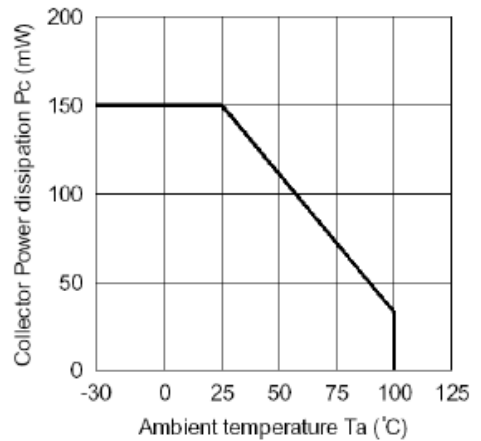


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

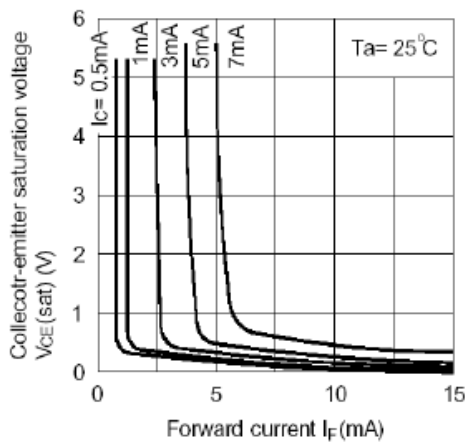


Fig.4 Forward Current vs. Forward Voltage

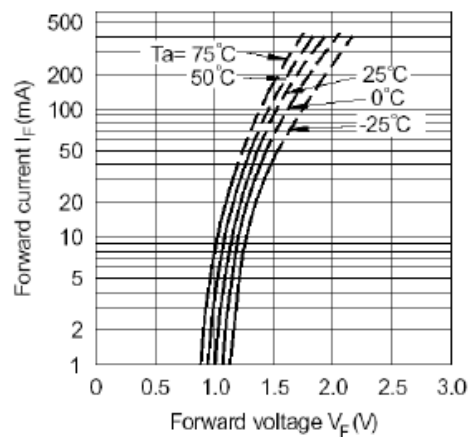


Fig.5 Current Transfer Ratio vs. Forward Current

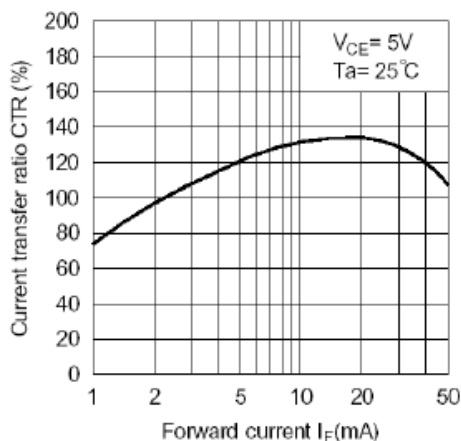
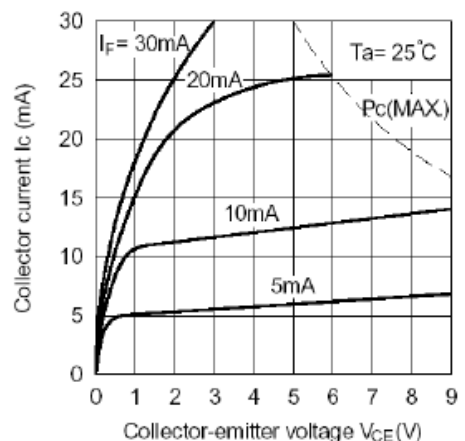


Fig.6 Collector Current vs. Collector-emitter Voltage



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Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

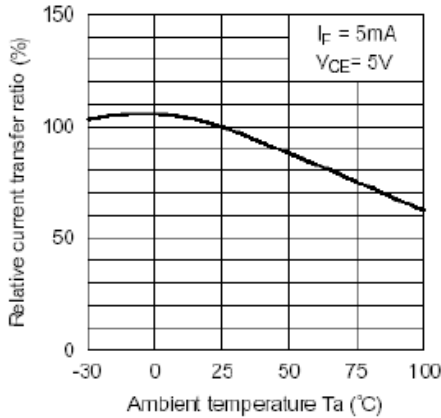


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

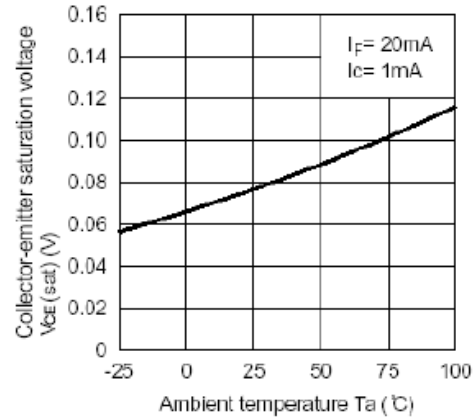


Fig.9 Collector Dark Current vs. Ambient Temperature

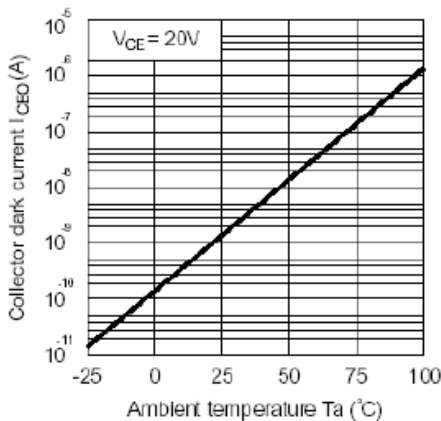


Fig.10 Response Time vs. Load Resistance

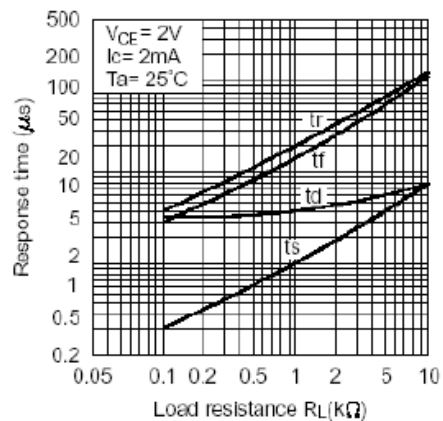
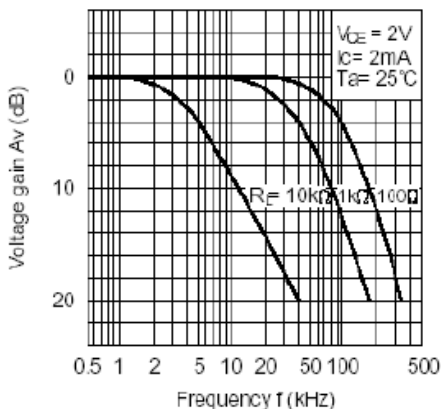
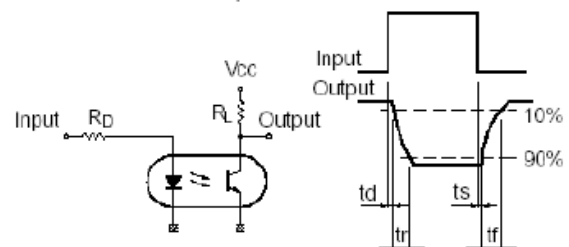


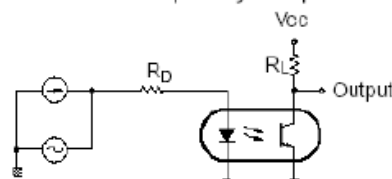
Fig.11 Frequency Response



Test Circuit for Response Time



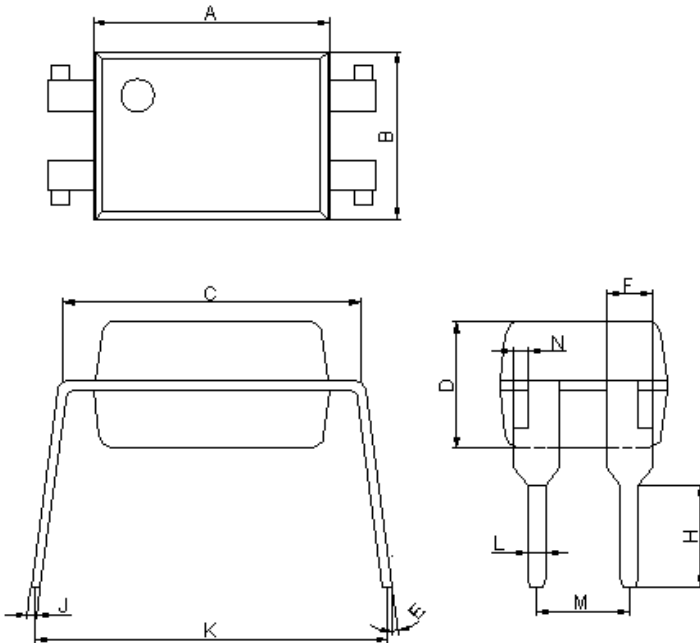
Test Circuit for Frequency Response



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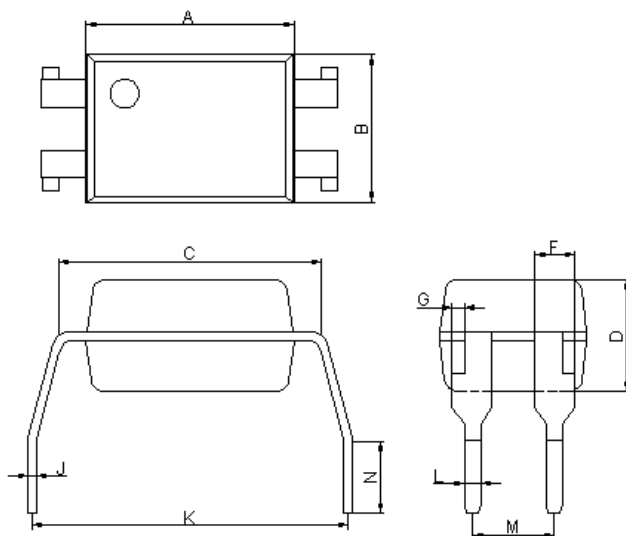
Package Dimensions (All Dimensions in mm)

PC817



Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
E	2°	8°
F	1.25 typ.	
H	2.70	2.90
J	0.23	0.26
K	8.86	9.31
L	0.50 typ.	
M	2.44	2.64
N	0.40 typ.	

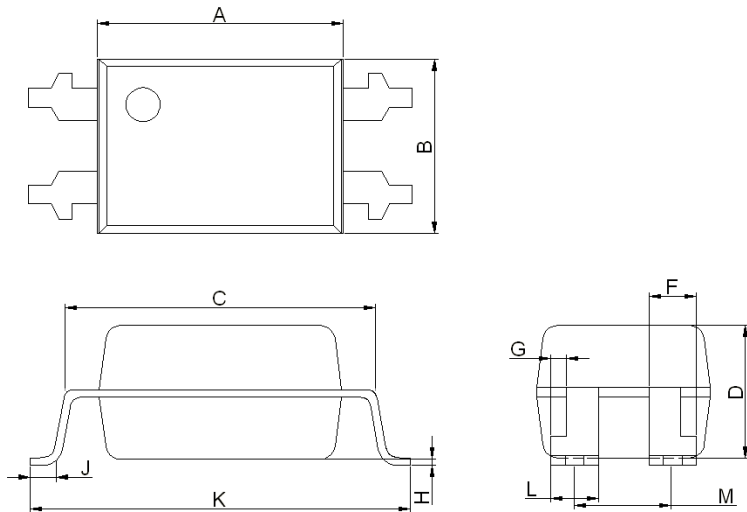
PC817M



Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
F	1.25 typ.	
G	0.40 typ.	
J	0.23	0.26
K	9.86	10.46
L	0.50 typ.	
M	2.44	2.64
N	2.08	2.48

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PC817S1



Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
F	1.25 typ.	
G	0.40 typ.	
H	0.00	0.20
J	0.50	0.70
K	9.80	10.30
M	2.49	2.69

Ordering Information

Part Number	Package	Application part number
PC817	4-pin DIP	PC817
PC817M	4-pin (leads with 0.4" spacing)	
PC817S1	4-pin (tape and reel packaging)	