

## 4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

## PC817 Series

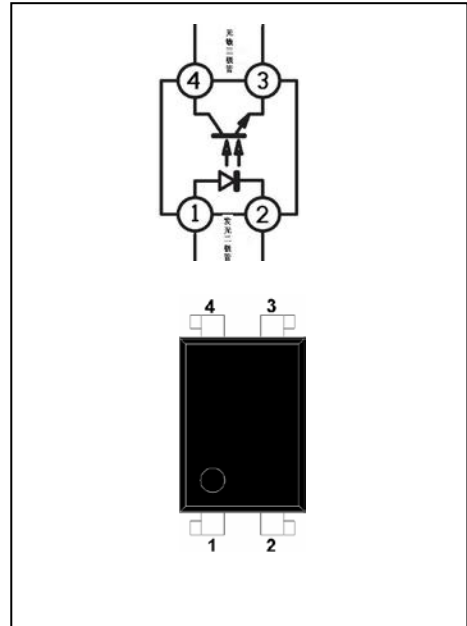
### FEATURES

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

HF

### 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

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MAXIMUM RATING @ Ta=25°C unless otherwise specified

Parameter		Symbol	Rating	Unit
Input	Forward voltage	$I_F$	50	mA
	Reverse Voltage	$V_R$	6	V
	Power dissipation	$P$	70	mW
Output	Collector-Emitter voltage	$V_{CEO}$	80	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
Isolation voltage		$V_{iso}$	5000	V rms
Rated impulse isolation voltage		$V_{IOTM}$	6000	V
Rated repetitive peak isolation voltage		$V_{IORM}$	630	V
Thermal resistance, junction to ambient air		$R_{\theta JA}$	430	°C/W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	350	°C/W
Operating temperature		$T_{opr}$	-30~+100	°C
Storage temperature		$T_{stg}$	-55~+125	°C
Soldering temperature		$T_{sol}$	260	°C
Junction temperature		$T_j$	125	°C

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### ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
INPUT	Forward current	$V_F$	$I_F=20\text{mA}$	-	1.2	1.4	V
	Reverse Current	$I_R$	$V_R=4\text{V}$	-	-	10	$\mu\text{A}$
	Terminal capacitance	$C_t$	$V=0, f=1\text{KHz}$	-	30	250	pF
OUTPUT	Collector Dark Current	$I_{CEO}$	$V_{CE}=20\text{V}, I_F=0$	-	-	100	nA
	Collector-Emitter breakdown voltage	$BV_{CEO}$	$I_C=0.1\text{mA}, I_F=0$	80	-	-	V
	Emitter-Collector breakdown voltage	$BV_{ECO}$	$I_E=10\mu\text{A}, I_F=0$	6	-	-	V
TRANSFER CHARACTERISTICS	Collector Current	$I_C$	$I_F=5\text{mA}, V_{CE}=5\text{V}$	2.5	-	30	mA
	Current Transfer ratio	CTR		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	$5 \times 10^{10}$	$1 \times 10^{11}$	-	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1\text{MHz}$	-	0.6	1	pF
	Cut-off frequency	$f_c$	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$	-	80	-	KHz
	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	$\mu\text{s}$	

### 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

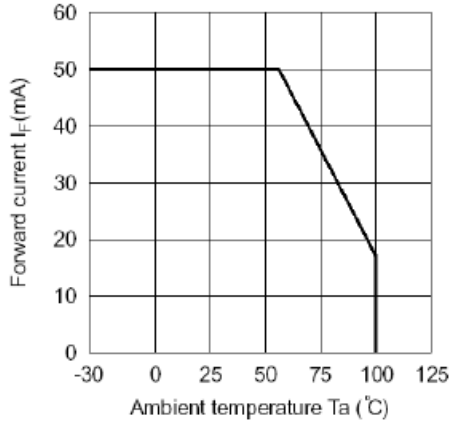


Fig.2 Collector Power Dissipation vs. Ambient Temperature

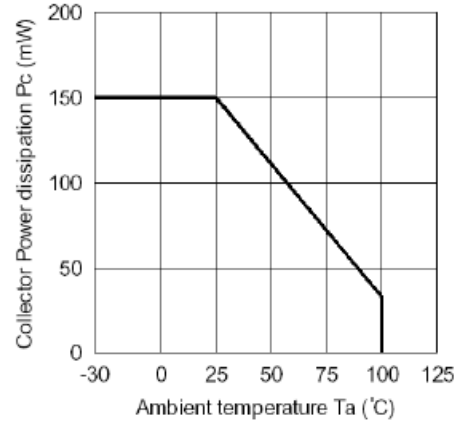


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

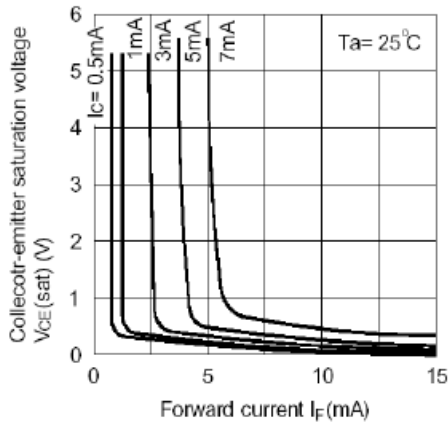


Fig.4 Forward Current vs. Forward Voltage

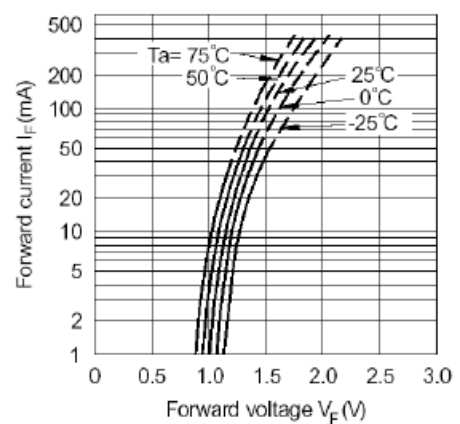


Fig.5 Current Transfer Ratio vs. Forward Current

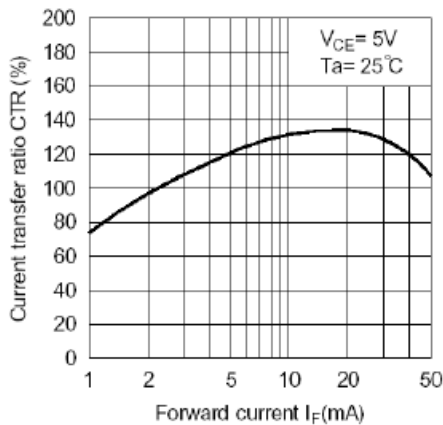
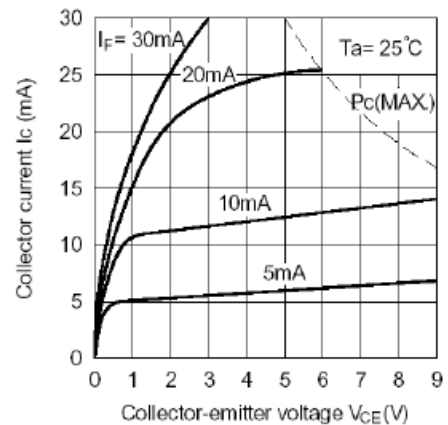


Fig.6 Collector Current vs. Collector-emitter Voltage



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Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

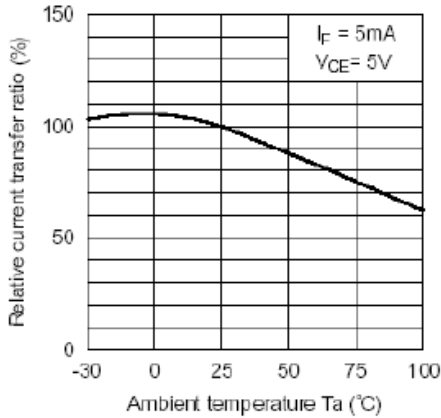


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

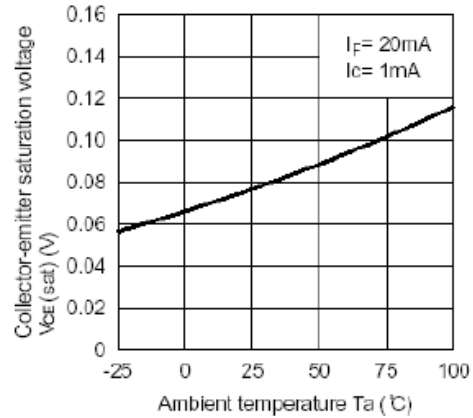


Fig.9 Collector Dark Current vs. Ambient Temperature

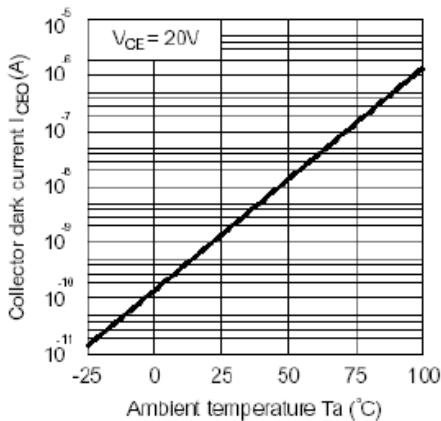


Fig.10 Response Time vs. Load Resistance

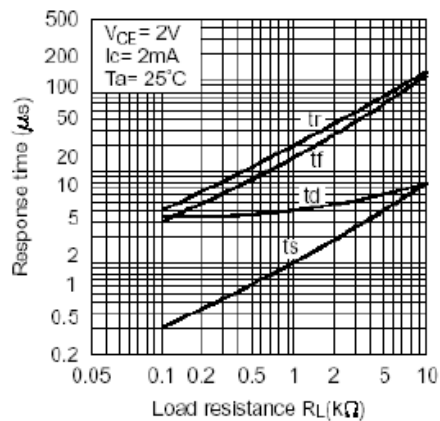
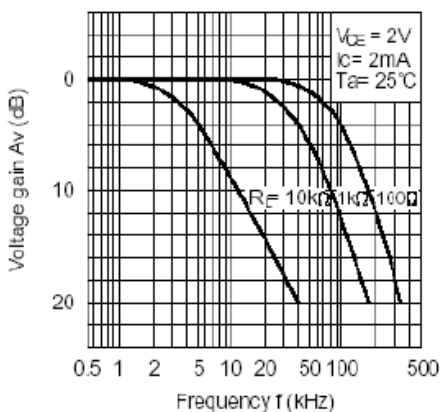
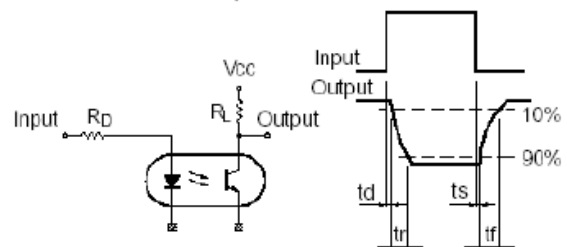


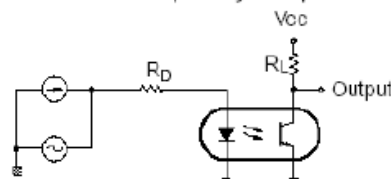
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

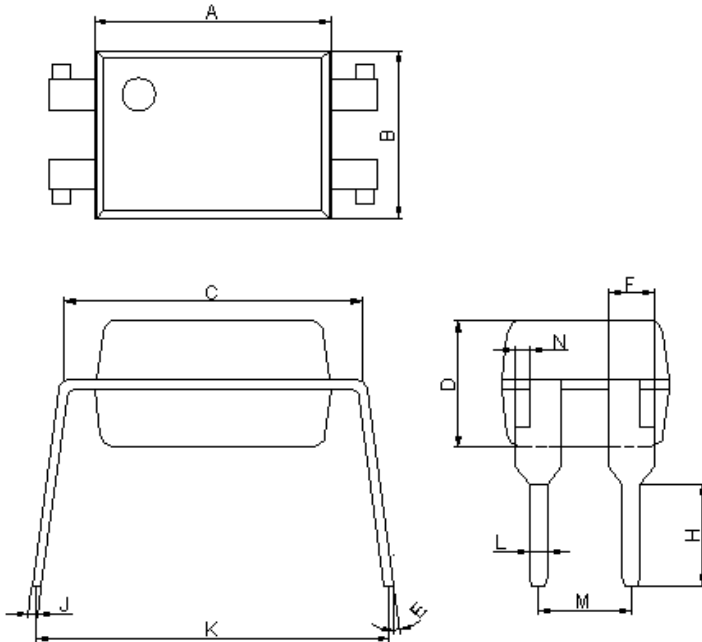


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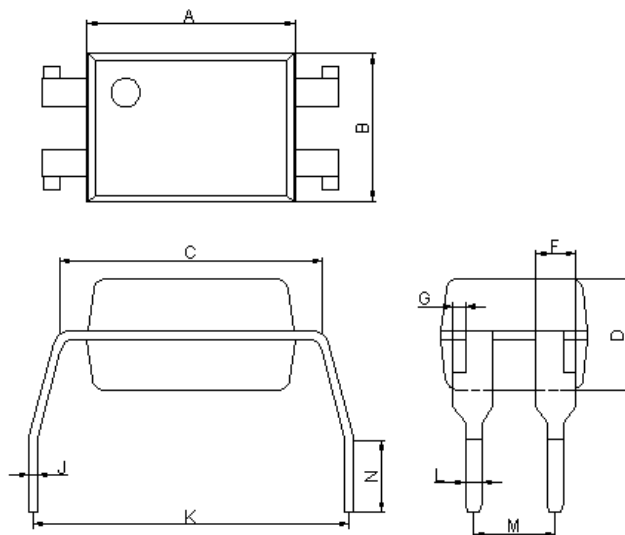
**Package Dimensions (All Dimensions in mm)**

**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	1.15	1.35
H	2.70	2.90
J	0.20	0.30
K	8.86	9.31
L	0.40	0.60
M	2.44	2.64
N	0.30	0.50

**PC817M**

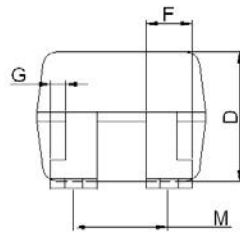
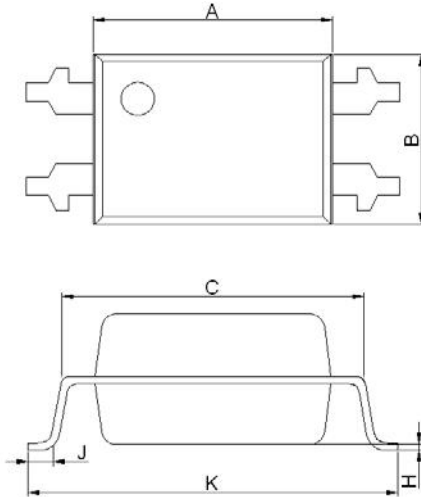


Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
F	1.15	1.35
G	0.30	0.50
J	0.20	0.30
K	9.86	10.46
L	0.40	0.60
M	2.44	2.64
N	2.40	2.90

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**PC817 Series**

**PC817S**

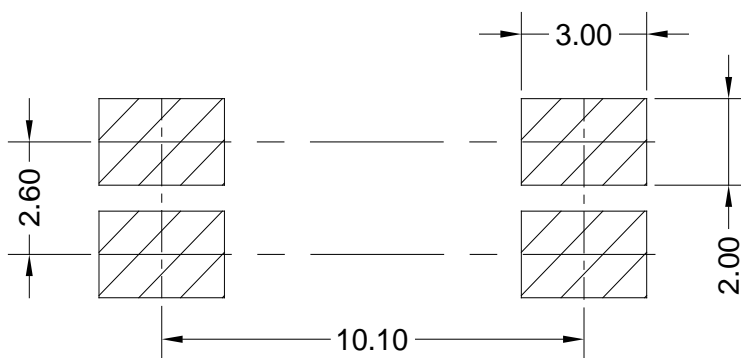


Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
F	1.15	1.35
G	0.30	0.50
H	0.00	0.20
J	0.9	1.2
K	9.80	10.30
M	2.49	2.69

**Ordering Information**

Part Number	Package	Application part number
PC817	4-pin DIP	PC817
PC817M	4-pin (leads with 0.4" spacing)	
PC817S	4-pin (tape and reel packaging)	

**SOLDERING FOOTPRINT**



UNIT:mm