

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

TPC817 Series

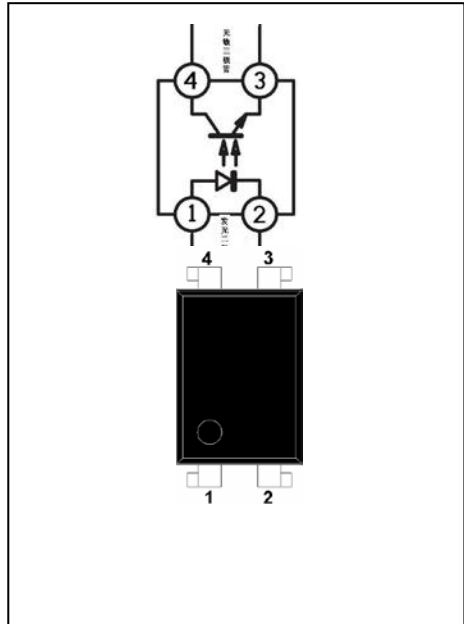
FEATURES

- 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
- UL/CUL Approved (File No. E340048)
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF

Description

The TPC817 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	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}	$I_C=0.1\text{mA}, I_F=0$	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	5×10^{10}	1×10^{11}	-	Ω
	Floating capacitance	C_f	$V=0, f=1\text{MHz}$	-	0.6	1	pF
	Cut-off frequency	f_c	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$	-	80	-	KHz
	Rise time	T_r	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$	-	4	18	μs
	Fall Time	T_f		-	3	18	μs

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

Fig.1 Forward Current
vs. Ambient Temperature

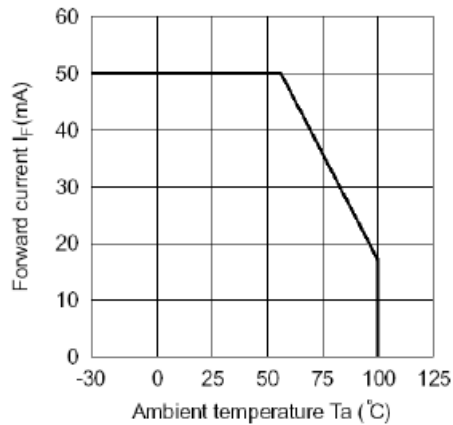


Fig.2 Collector Power Dissipation
vs. Ambient Temperature

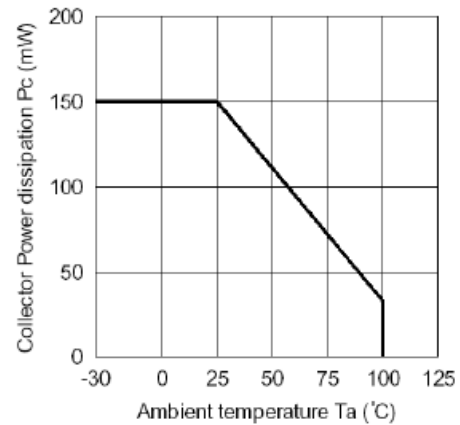


Fig.3 Collector-emitter Saturation
Voltage vs. Forward Current

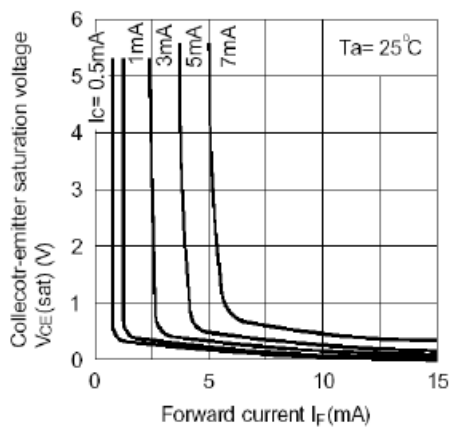


Fig.4 Forward Current vs. Forward
Voltage

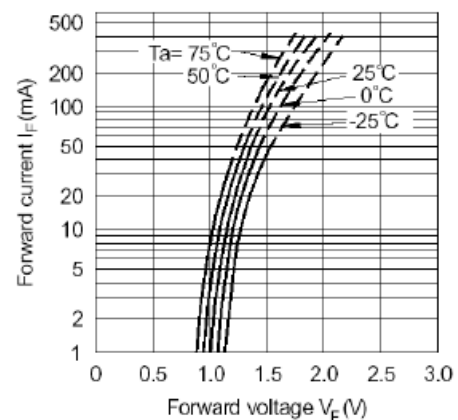


Fig.5 Current Transfer Ratio vs.
Forward Current

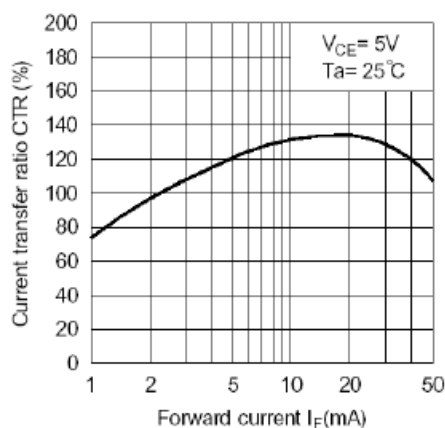
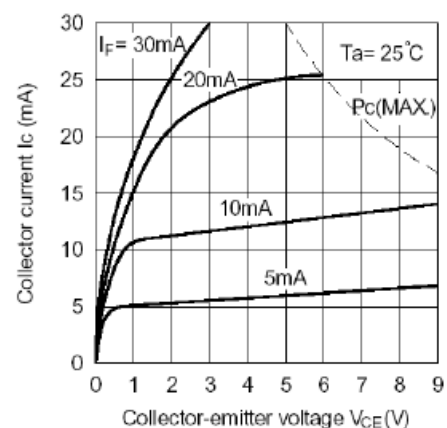


Fig.6 Collector Current vs.
Collector-emitter Voltage



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TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

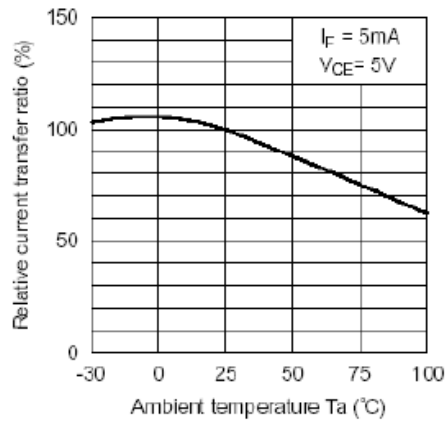


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

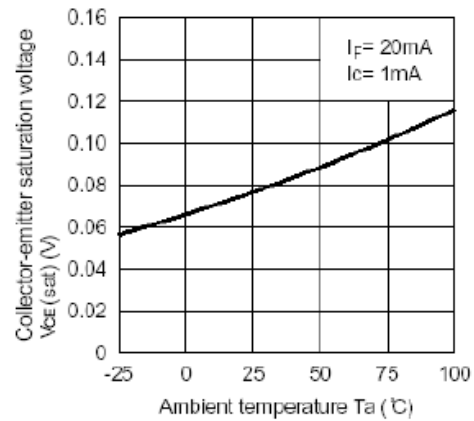


Fig.9 Collector Dark Current vs. Ambient Temperature

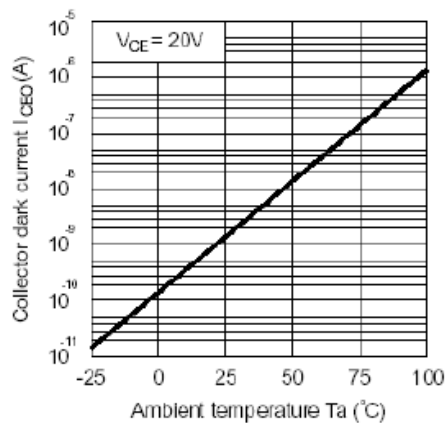


Fig.10 Response Time vs. Load Resistance

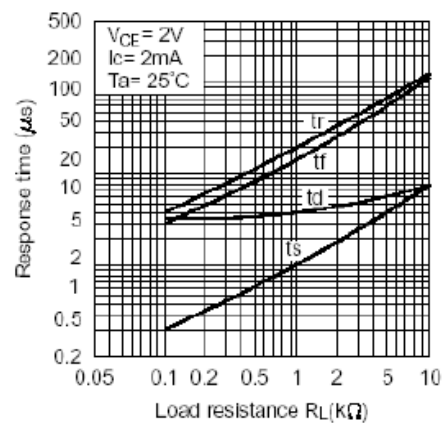
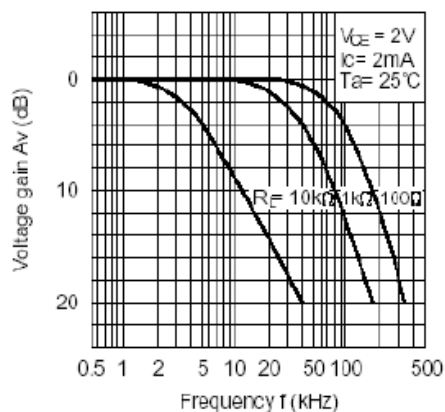
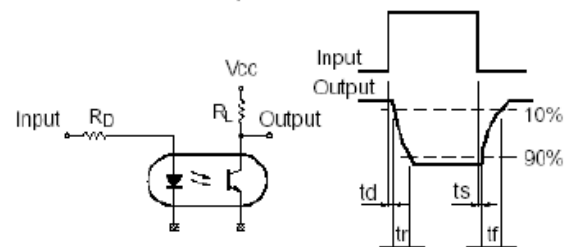


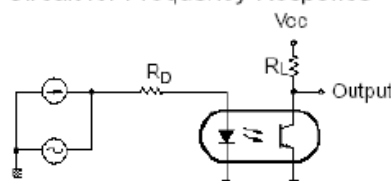
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

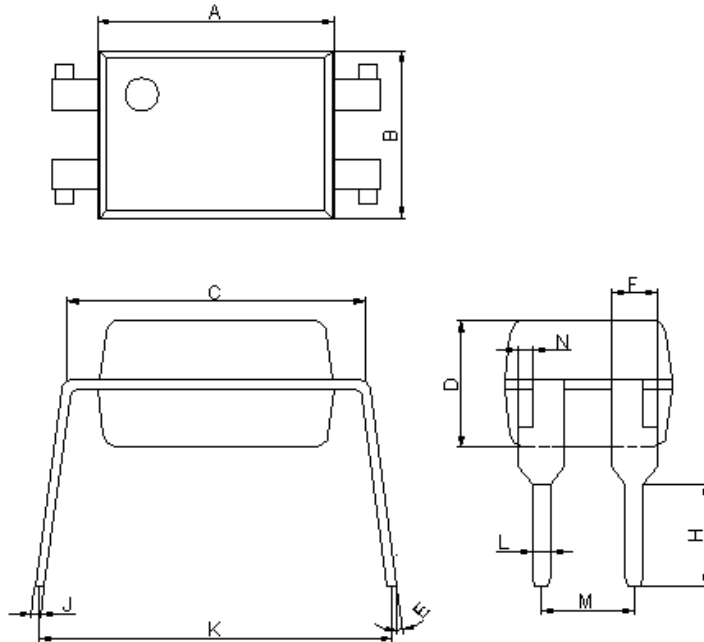


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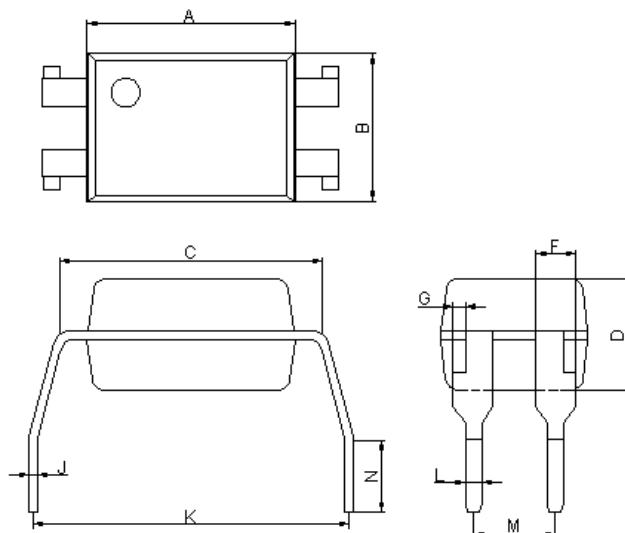
Package Dimensions (All Dimensions in mm)

TPC817



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

TPC817M

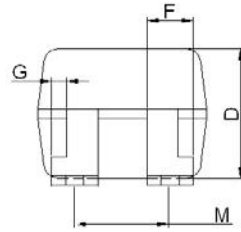
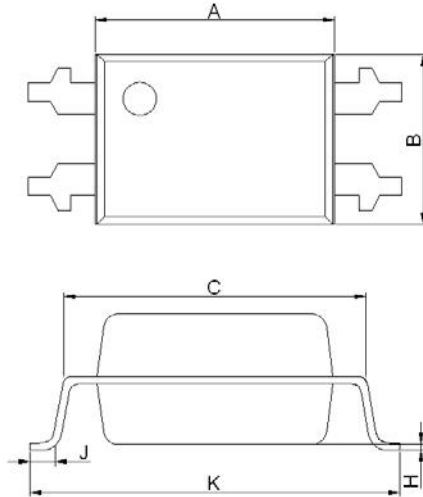


Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
F	1.15	1.35
G	0.30	0.50
J	0.20	0.30
K	9.86	10.46
L	0.40	0.60
M	2.44	2.64
N	2.40	2.90

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TPC817S

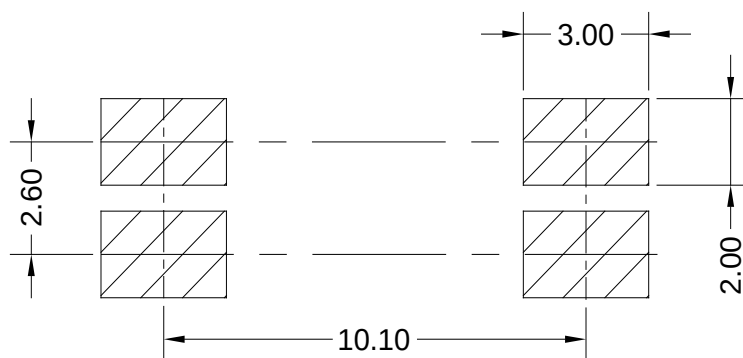


Dim	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
F	1.15	1.35
G	0.30	0.50
H	0.00	0.20
J	0.9	1.2
K	9.80	10.30
M	2.49	2.69

Ordering Information

Part Number	Package	Application part number
TPC817	4-pin DIP	PC817
TPC817M	4-pin (leads with 0.4" spacing)	
TPC817S	4-pin (tape and reel packaging)	

SOLDERING FOOTPRINT



UNIT:mm