

Small Signal Product

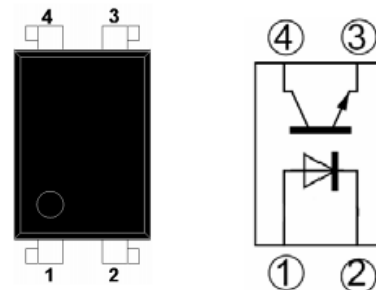
4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

FEATURES

- Current transfer ratio
(CTR: MIN.80% at $I_F=5mA$, $V_{CE}=5V$)
- High isolation voltage between input and output ($V_{iso}=5000V$ rms)
- High collector-emitter voltage ($V_{CEO}:70V$)
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21
- Packing code with suffix "G" means green compound (halogen-free)



DIP-4 DIP-4M SOP-4



APPLICATION

- Programmable controllers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials
And impedances

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}C$ unless otherwise noted)				
PARAMETER		SYMBOL	RATING	UNIT
Input	Forward current	I_F	50	mA
	Peak forward current (Note 1)	I_{FM}	1	A
	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	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		P_{tot}	200	mW
Isolation voltage (Note 2)		V_{iso}	5000	Vrms
Operating temperature		T_{opr}	-30 to +100	$^{\circ}C$
Storage temperature		T_{stg}	-55 to +125	$^{\circ}C$
Soldering temperature (Note 3)		T_{sol}	260	$^{\circ}C$

Note 1: Pulse width $\leq 100ms$, Duty ratio: 0.001

Note 2: 40 to 60% RH, AC for 1 minute

Note 3: For 10s

Small Signal Product

ELECTRICAL CHARACTERISTICS (T _A =25°C unless otherwise noted)							
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 Characteristics	Current transfer ration (Note 4)	CTR	I _F =5mA, V _{CE} =5V	80	-	600	%
	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	5x10 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	-	80	-	KHz
	Response time	Rise time	t _r	V _{CE} =2V, I _C =2mA, R _L =100Ω	-	4	18
Fall time		t _f	-		3	18	μs

Note 4: Classification table of current transfer ratio is shown below

RANK TABLE OF CURRENT TRANSFER RATIO, CTR

RANK MARK	MIN (%)	MAX (%)
A	80	160
B	130	260
C	200	400
D	300	600

ORDERING INFORMATION

PART NO. (Note 1, 2)	PACKING CODE	PACKING CODE SUFFIX	PACKAGE	PACKING
TPC816x	C9	G	DIP-4	100 / TUBE
TPC816Mx	C9		DIP-4M (Leads with 0.4" spacing)	100 / TUBE
TPC816S1x	RA		SOP-4	2K / 13" Reel

Note 1: "x" defines CTR rank from "A" to "D"

Note 2: Whole series with green compound

EXAMPLE

PREFERRED P/N	PART NO.	PACKING CODE	PACKING CODE SUFFIX	DESCRIPTION
TPC816A C9G	TPC816A	C9	G	Green compound

MARKING



Note:
816: Product type
B: CTR rank mark
YWW: Date code

Small Signal Product

RATINGS AND CHARACTERISTICS CURVES

($T_A=25^\circ\text{C}$ unless otherwise noted)

Fig. 1 Forward Current vs. Ambient Temperature

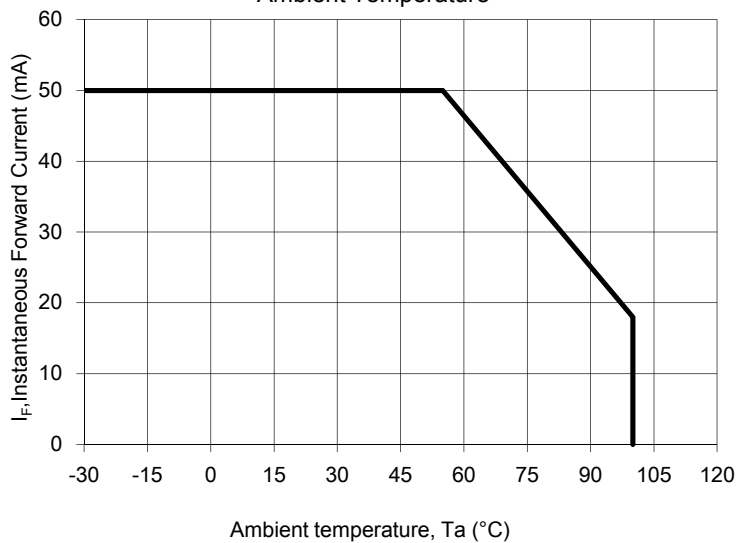


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

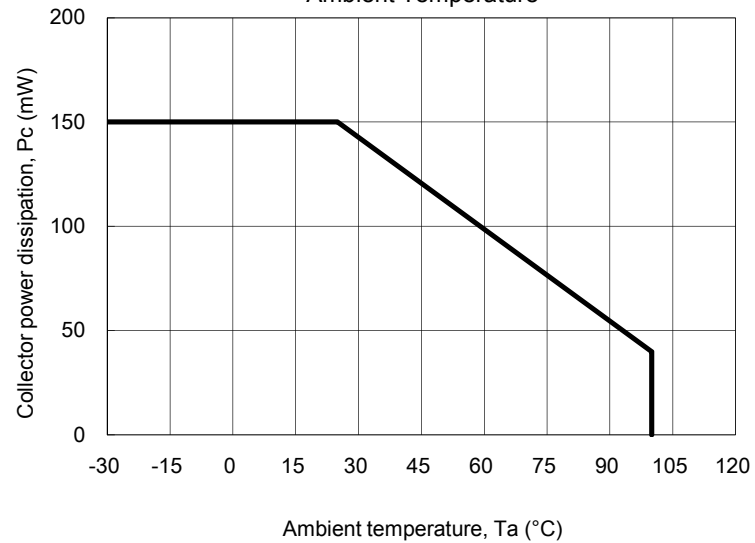


Fig. 3 Peak Forward Current vs. Duty Ratio

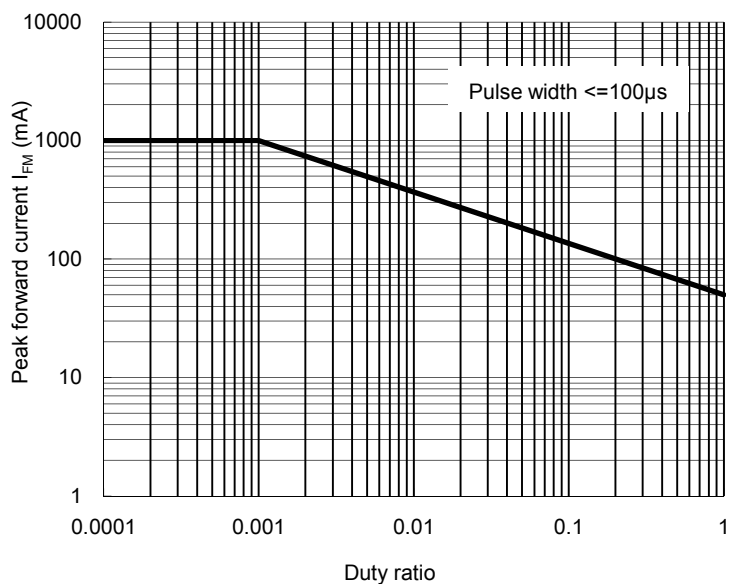
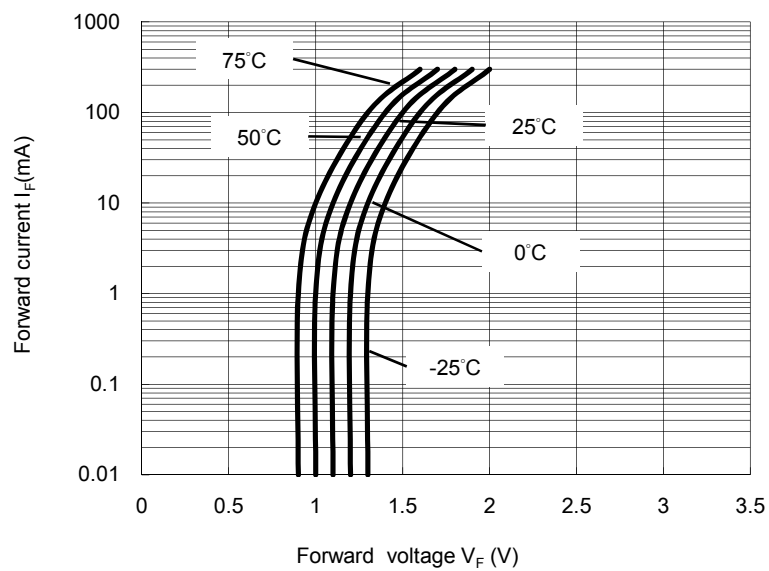


Fig. 4 Forward Current vs. Forward Voltage



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Fig. 5 Current Transfer Ratio vs. Forward Current

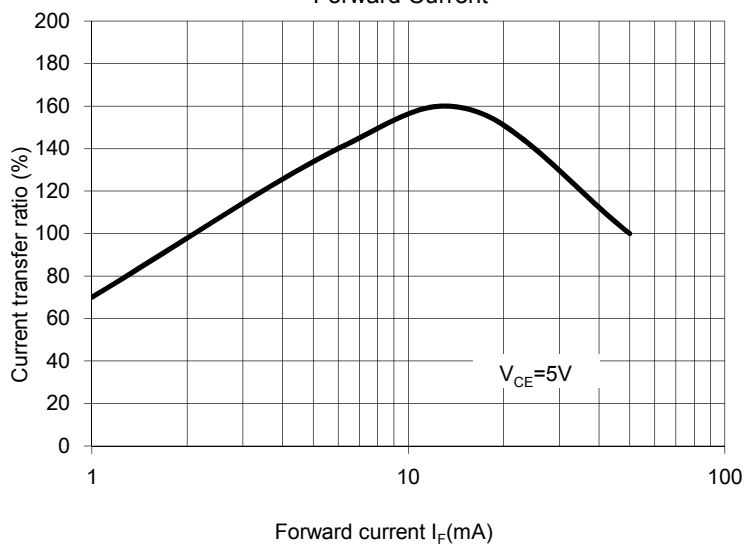


Fig. 6 Collector Current vs. Collector-emitter Voltage

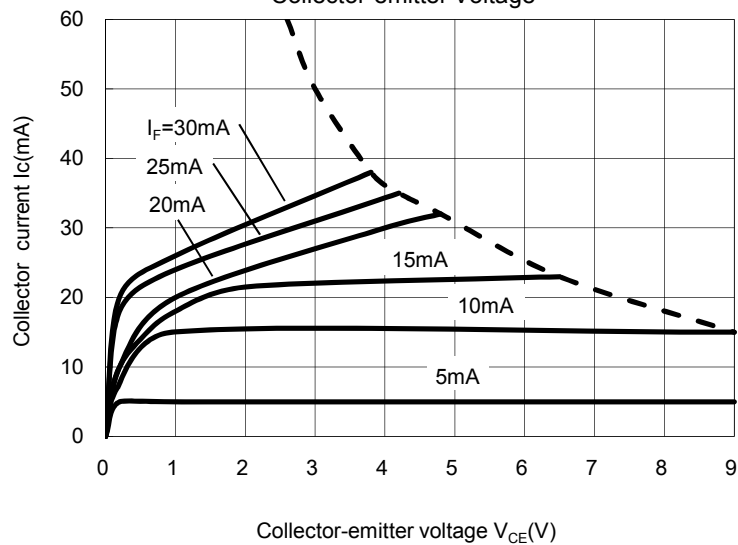


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

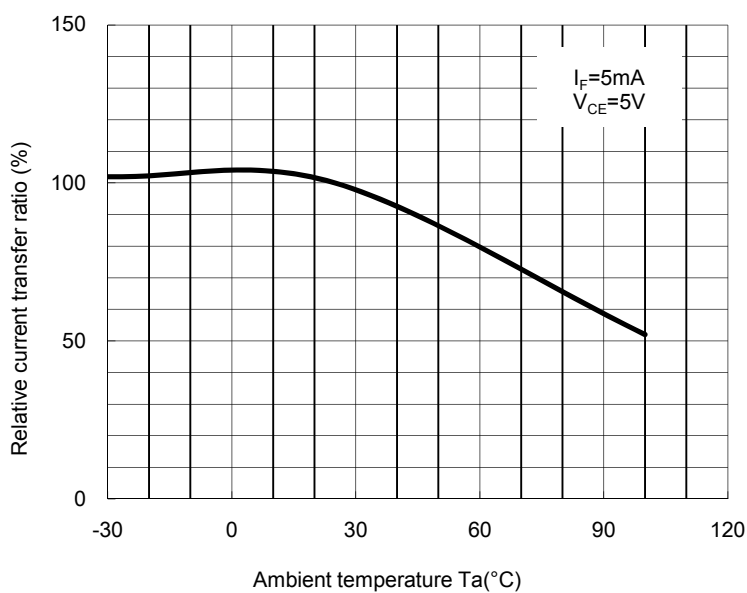
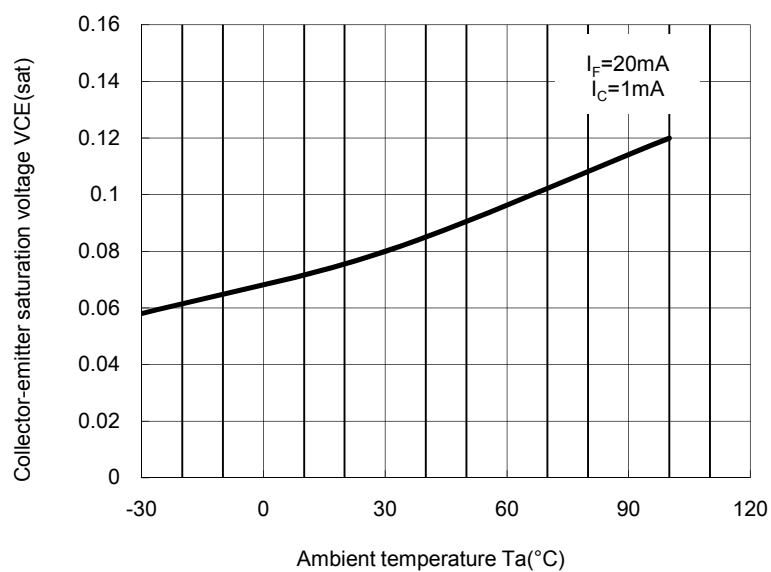


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature



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Fig. 9 Collector Dark Current vs. Ambient temperature

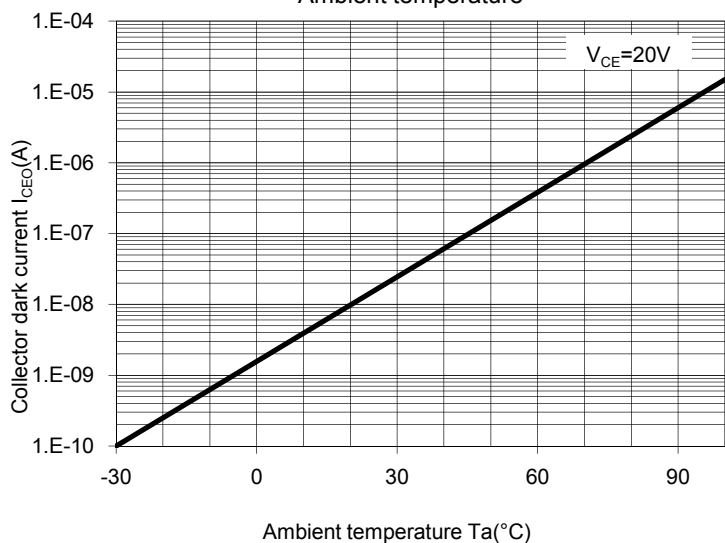


Fig. 10 Response Time vs. Load Resistance

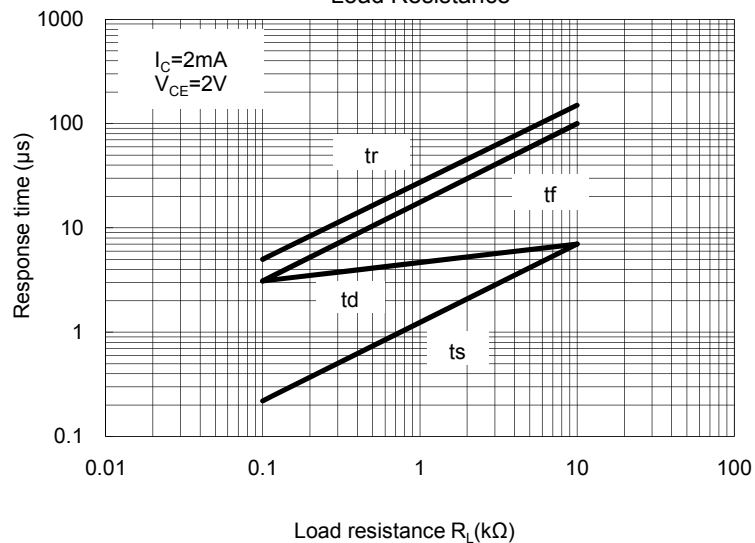


Fig. 11 Frequency Response

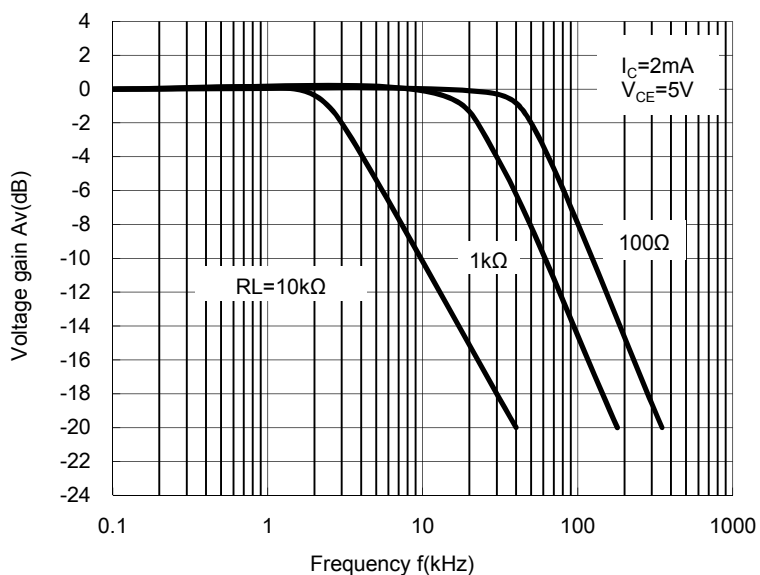
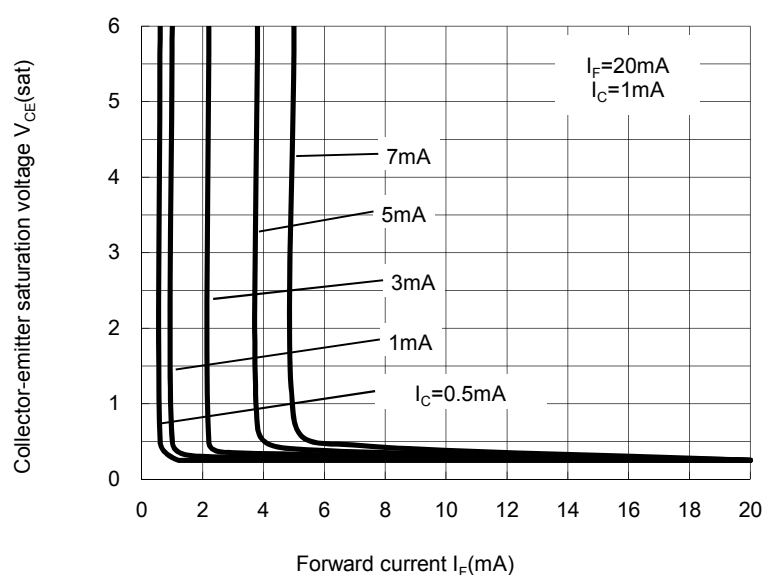
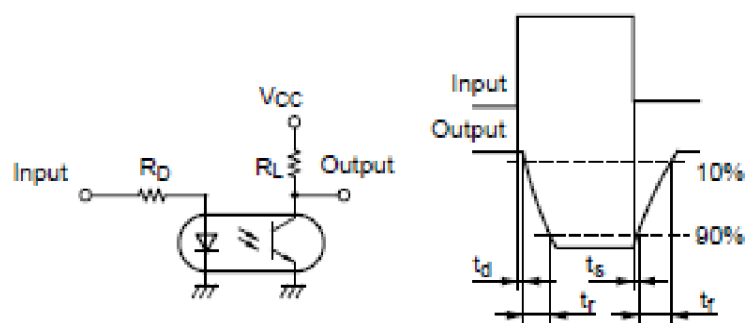


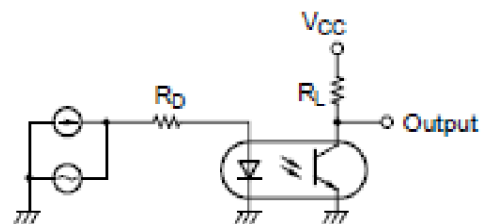
Fig. 12 Collector-emitter Saturation Voltage vs



Test Circuit Response Time



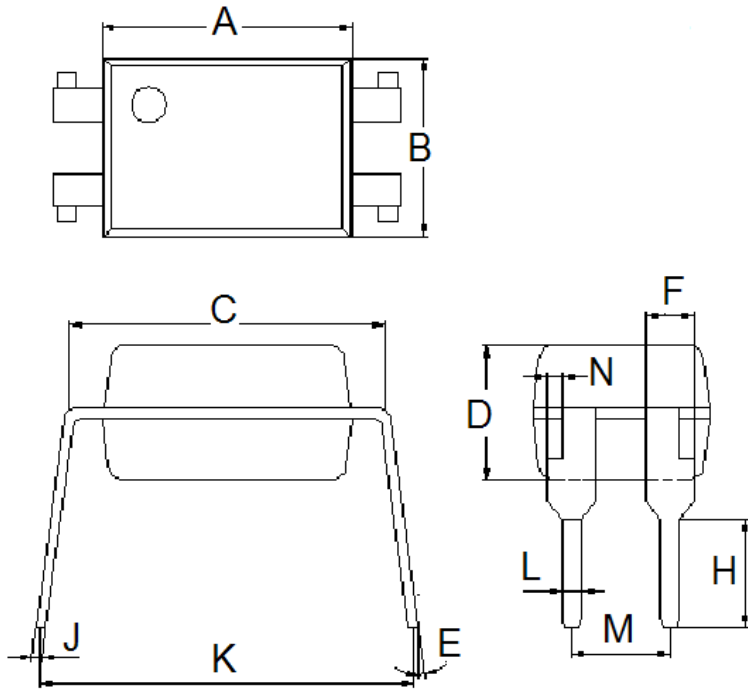
Test Circuit for Frequency Response



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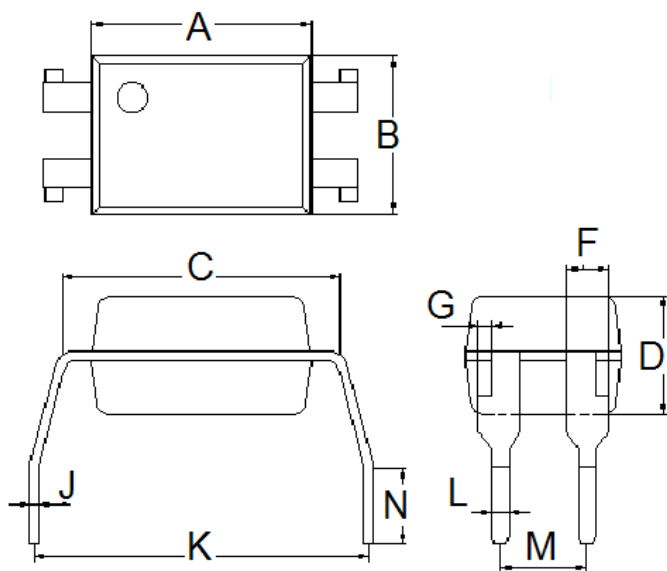
DIMENSIONS

DIP-4



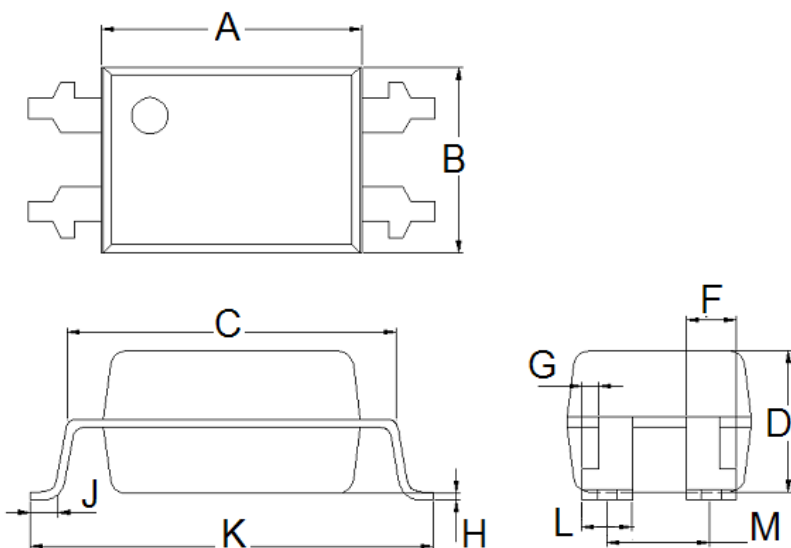
DIM.	Unit (mm)	
	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
E	2°	8°
F	1.25 typ.	
H	2.70	2.90
J	0.23	0.26
K	8.86	9.31
L	0.50 typ.	
M	2.44	2.64
N	0.40 typ.	

DIP-4M (Leads with 0.4" spacing)



DIM.	Unit (mm)	
	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

SOP-4



DIM.	Unit (mm)	
	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
L	1.25 typ.	
M	2.49	2.69

Small Signal Product

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