



**THE DATASHEET OF
TPC817S1B RAG**



Small Signal Product

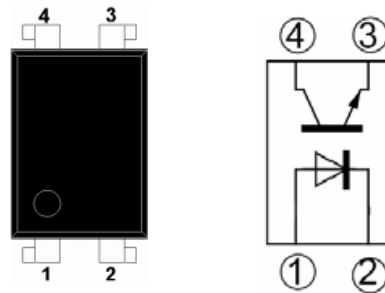
4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER

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)
- Creepage distance $> 7.62mm$
- UL Recognized File # E478892
- 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



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 RATINGS AND ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}C$ unless otherwise noted) | | | | |
|--|-----------------------------|------------|-------------|-------------|
| 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} | 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 | Vrms |
| Rated impulse isolation voltage | | V_{IOTM} | 6000 | V |
| Rated repetitive peak isolation voltage | | V_{IORM} | 630 | V |
| Operating temperature | | T_{opr} | -40 to +125 | $^{\circ}C$ |
| Storage temperature | | T_{stg} | -55 to +125 | $^{\circ}C$ |
| Soldering temperature | | T_{sol} | 260 | $^{\circ}C$ |

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| 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 |
| | 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 | - | - | 100 | nA |
| | Collector-emitter breakdown voltage | BV _{CEO} | I _C =0.1mA, I _F =0 | 80 | - | - | V |
| | Emitter-collector breakdown voltage | BV _{ECO} | I _E =10μA, I _F =0 | 6 | - | - | V |
| Transfer Characteristics | Collector current | I _C | I _F =5mA, V _{CE} =5V | 2.5 | - | 30 | mA |
| | Current transfer ration | CTR | | 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 |
|-------------------------|--------------|---------------------|----------------------------------|---------------|
| TPC817x | C9 | G | DIP-4 | 100 / TUBE |
| TPC817Mx | C9 | | DIP-4M (Leads with 0.4" spacing) | 100 / TUBE |
| TPC817S1x | RA | | SOP-4 | 2K / 13" Reel |

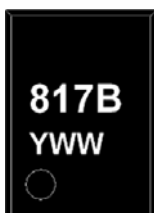
Note 1: "x" defines CTR rank from "A" to "D"

Note 2: Whole series with green compound

EXAMPLE

| PREFERRED P/N | PART NO. | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION |
|---------------|----------|--------------|---------------------|----------------|
| TPC817A C9G | TPC817A | C9 | G | Green compound |

MARKING



Note:

817: Product type

B: CTR rank mark

YWW: Date code

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RATINGS AND CHARACTERISTICS CURVES

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

Fig. 1 Forward Current vs. Ambient Temperature

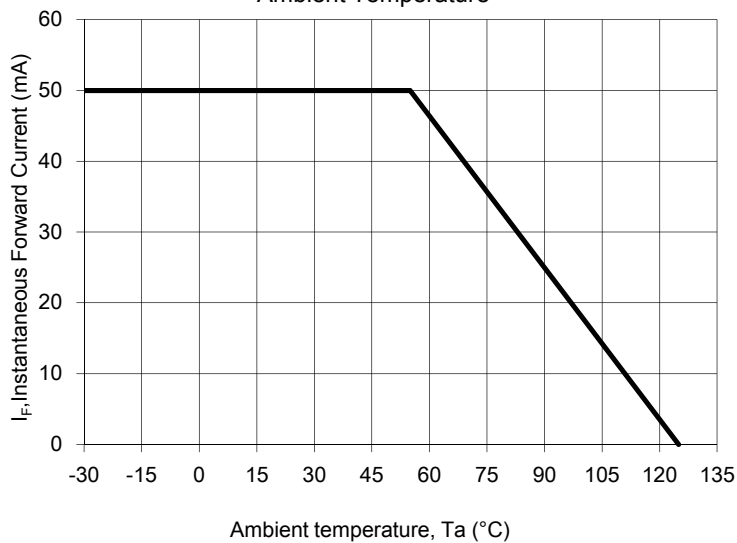


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

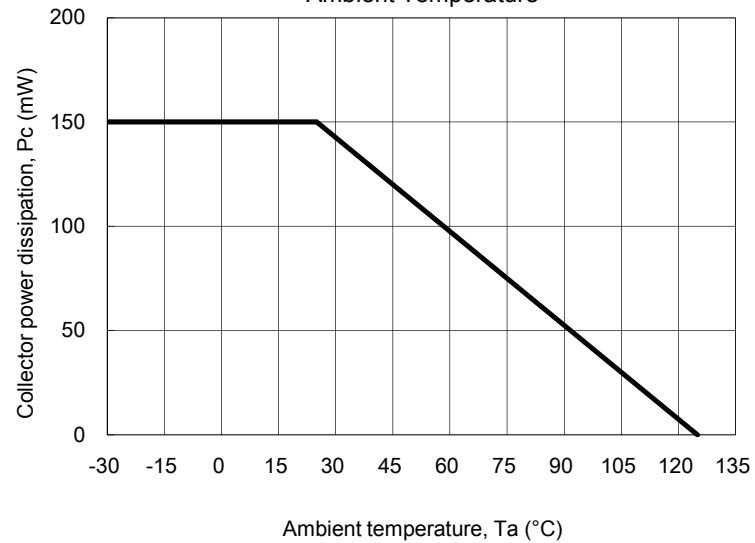


Fig. 3 Collector-emitter Saturation Voltage vs

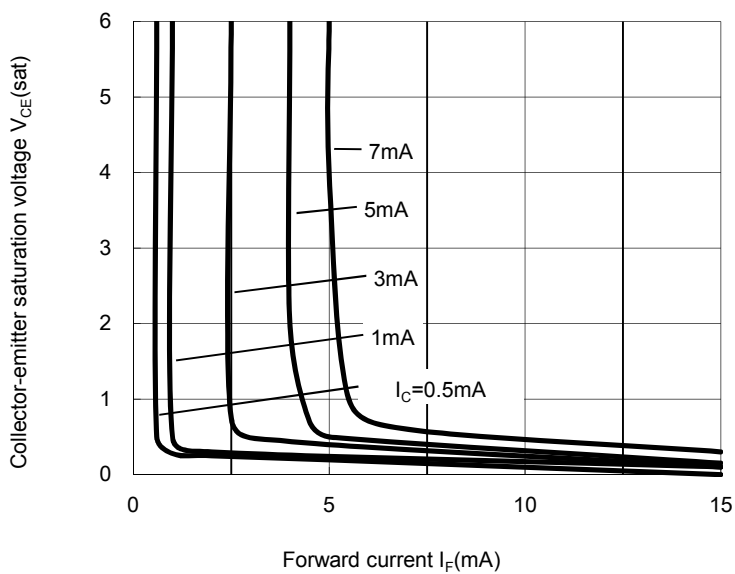
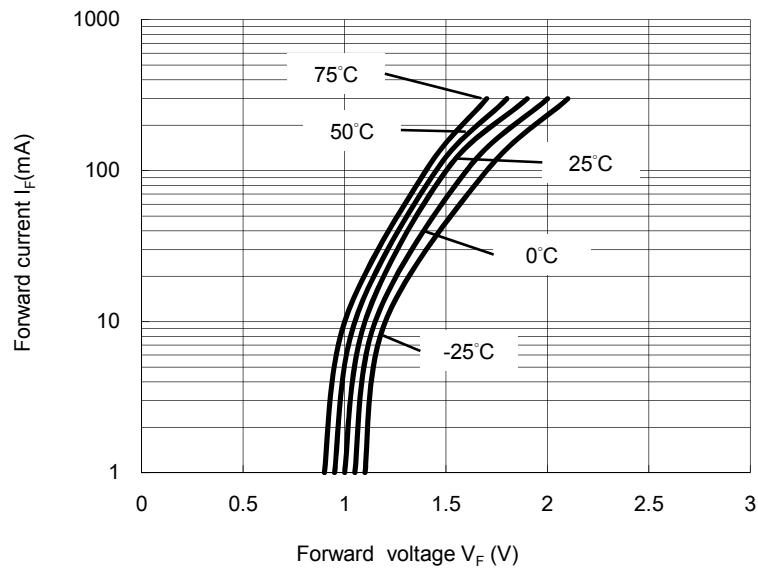


Fig. 4 Forward Current vs. Forward Voltage



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Fig. 5 Current Transfer Ratio vs. Forward Current

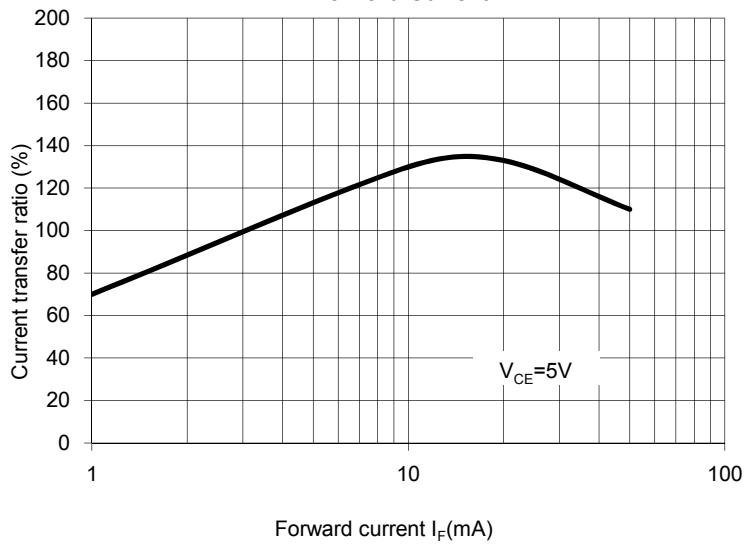


Fig. 6 Collector Current vs. Collector-emitter Voltage

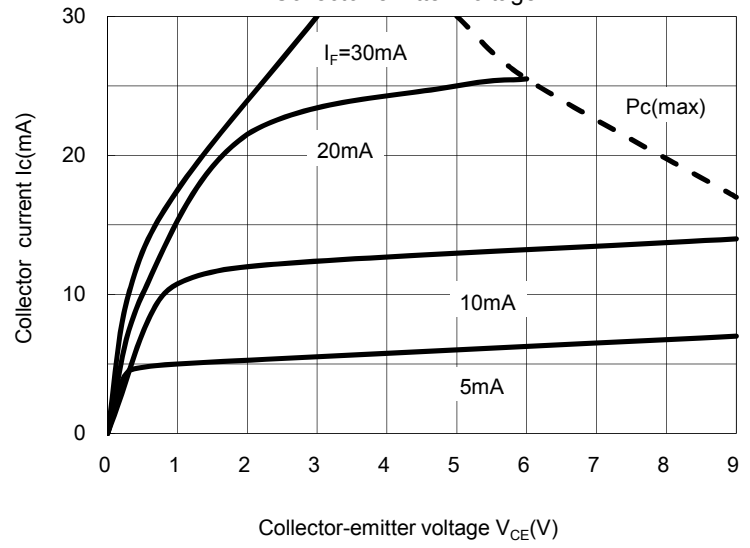


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

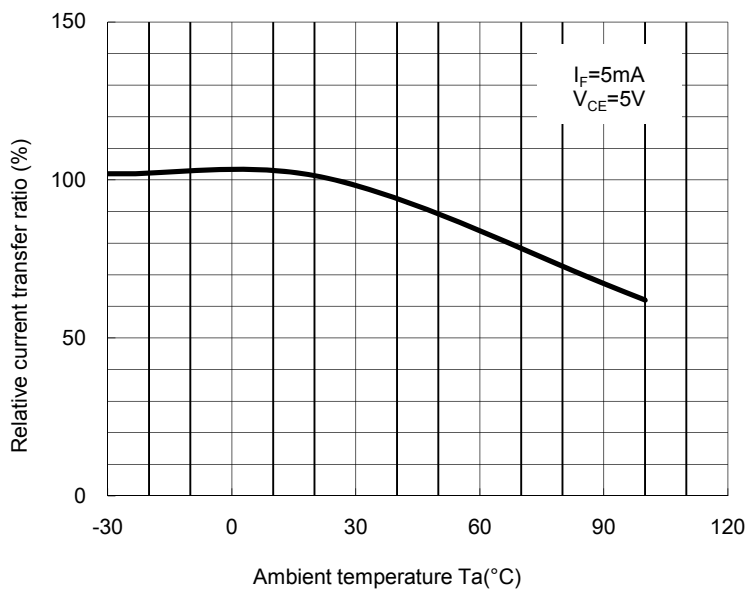
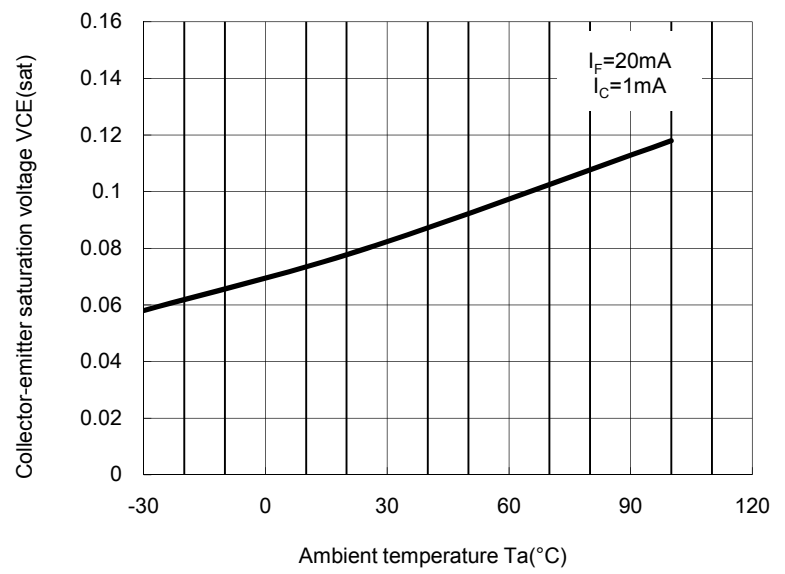


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature



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Fig. 9 Collector Dark Current vs. Ambient temperature

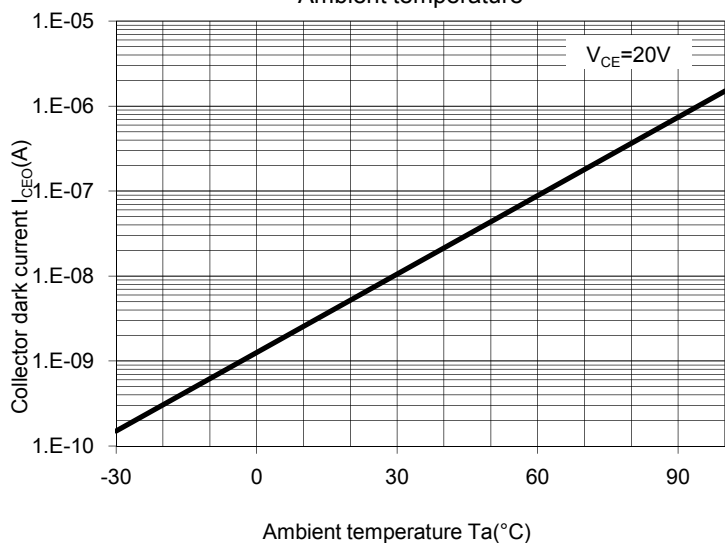


Fig. 10 Response Time vs. Load Resistance

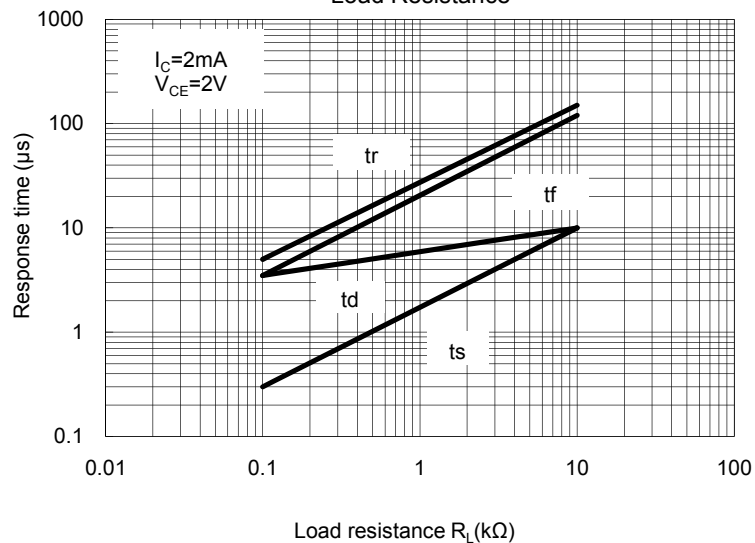
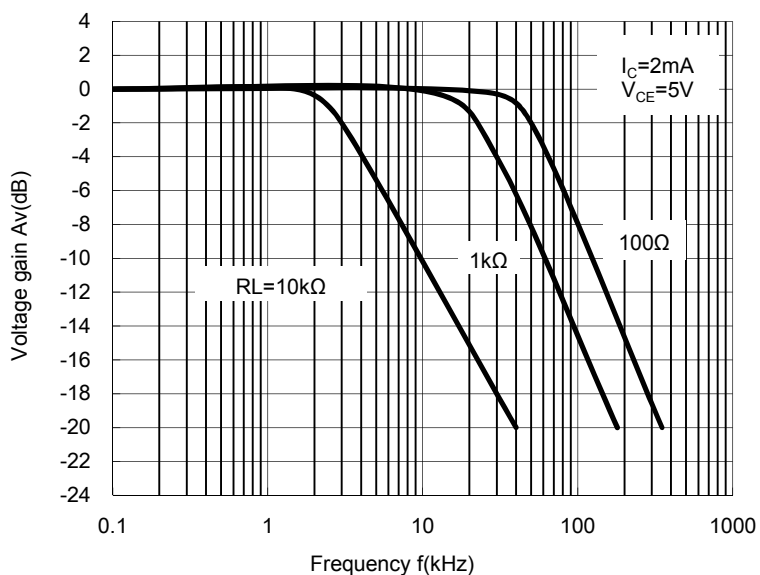
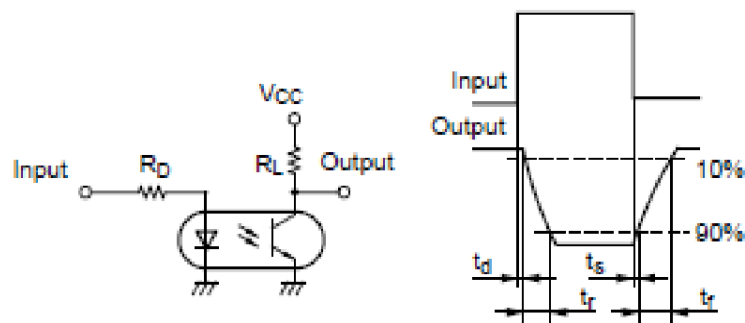


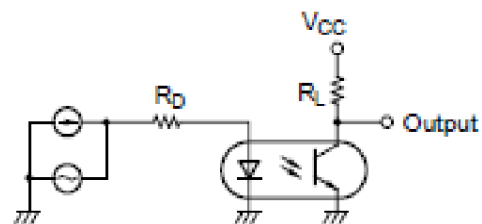
Fig. 11 Frequency Response



Test Circuit Response Time



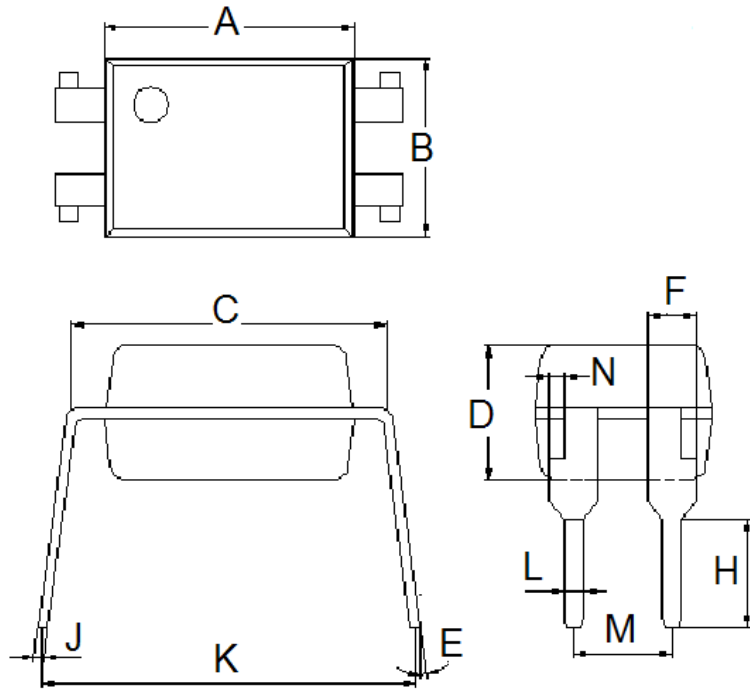
Test Circuit for Frequency Response



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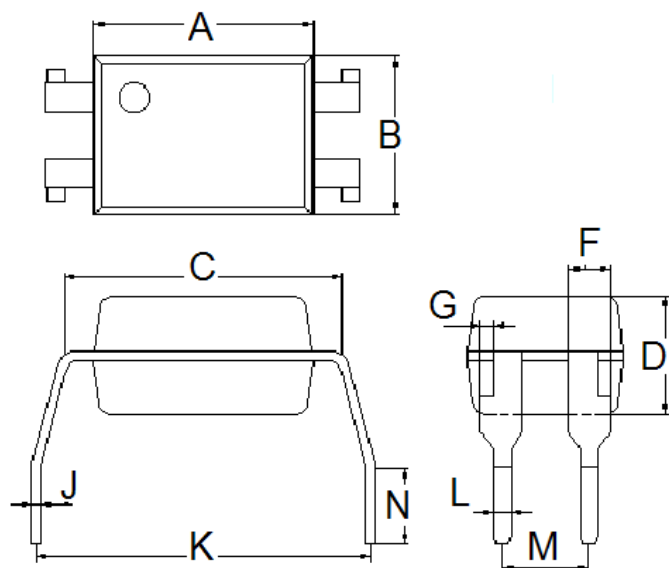
DIMENSIONS

DIP-4



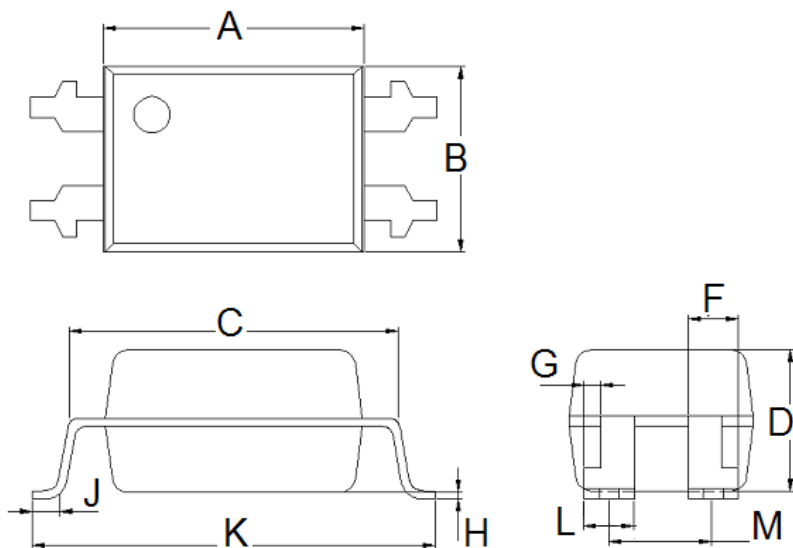
| DIM. | Unit (mm) | |
|------|-----------|------|
| | Min | Max |
| A | 6.40 | 6.60 |
| B | 4.50 | 4.70 |
| C | 7.90 | 8.30 |
| D | 3.28 | 3.68 |
| E | 2° | 8° |
| F | 1.25 typ. | |
| H | 2.70 | 2.90 |
| J | 0.23 | 0.26 |
| K | 8.86 | 9.31 |
| L | 0.50 typ. | |
| M | 2.44 | 2.64 |
| N | 0.40 typ. |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

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 |

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