



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## 200mW, 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 (Viso=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

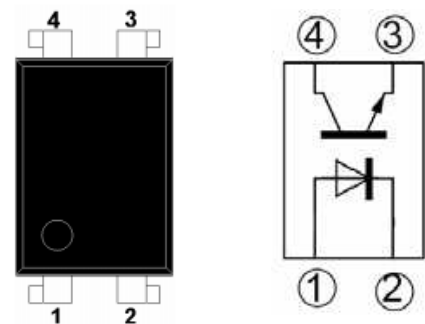
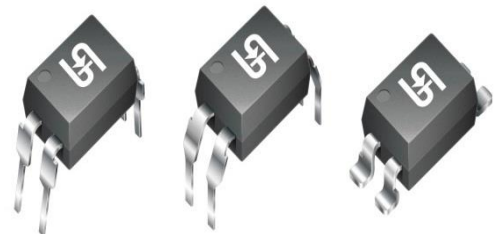
### APPLICATIONS

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

### MECHANICAL DATA

- Case: DIP-4 , DIP-4M , SOP-4
- Molding compound: UL flammability classification rating 94V-0
- Moisture sensitivity level: level 1, per J-STD-020
- Packing code with suffix "G" means green compound (halogen-free)
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: Indicated by cathode band

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
CTR	80-600	%
$V_{CEO}$	70	V
$P_{tot}$	200	mW
$I_C$	50	mA
$V_{iso}$	5000	Vrms
Package	DIP-4 DIP-4M SOP-4	
Configuration	Single Dice	



<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)				
PARAMETER		SYMBOL	PART NUMBER	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	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-55 to +125	$^\circ\text{C}$
Soldering temperature (Note 3)		$T_{sol}$	260	$^\circ\text{C}$

**Notes:**

1. Pulse width  $\leq 100\text{ms}$  , Duty ratio : 0.001
2. 40 to 60% RH , AC for 1 minute
3. For 10s

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER		CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Input	Forward voltage	$I_F=20\text{mA}$	$V_F$		1.2	1.4	V
	Peak forward voltage	$I_{FM}=0.5\text{A}$	$V_{FM}$			3.0	V
	Reverse current	$V_R=4\text{V}$	$I_R$			10	$\mu\text{A}$
	Terminal capacitance	$V=0, f=1\text{kHz}$	$C_t$		30	250	pF
Output	Collector dark current	$V_{CE}=20\text{V}, I_F=0$	$I_{CEO}$			$10^{-7}$	A
Transfer Characteristics	Current transfer ration (Note 1)	$I_F=5\text{mA}, V_{CE}=5\text{V}$	CTR	80		600	%
	Collector-emitter saturation voltage	$I_F=20\text{mA}, I_C=1\text{mA}$	$V_{CE(sat)}$		0.1	0.2	V
	Isolation resistance	DC500V, 40 to 60%RH	$R_{ISO}$	$5 \times 10^{10}$	$10^{11}$		$\Omega$
	Floating capacitance	$V=0, f=1\text{MHz}$	$C_f$		0.6	1.0	pF
	Cut-off frequency	$V_{CE}=5\text{V}, I_C=2\text{mA},$ $R_L=100\Omega, -3\text{dB}$	$f_c$		80		KHz
	Response time	Rise time	$V_{CE}=2\text{V}, I_C=2\text{mA},$ $R_L=100\Omega$	$t_r$		4	18
Fall time			$t_f$		3	18	$\mu\text{s}$

**Notes:**

1. 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

**Notes:**

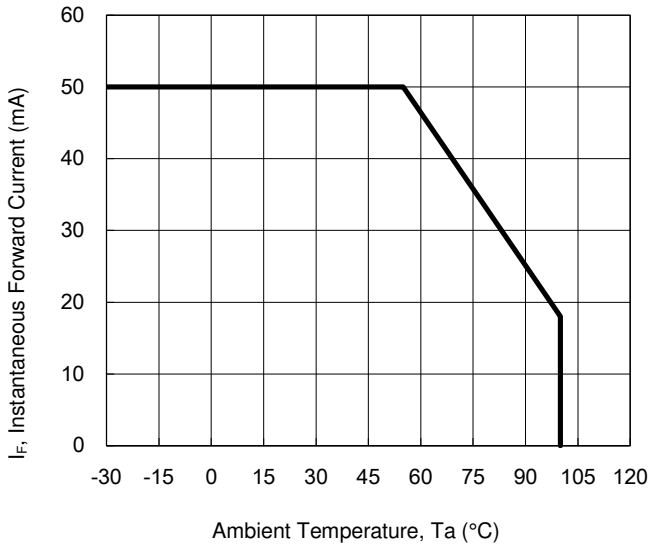
1. "x" defines CTR rank from "A" to "D"
2. Whole series with green compound

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

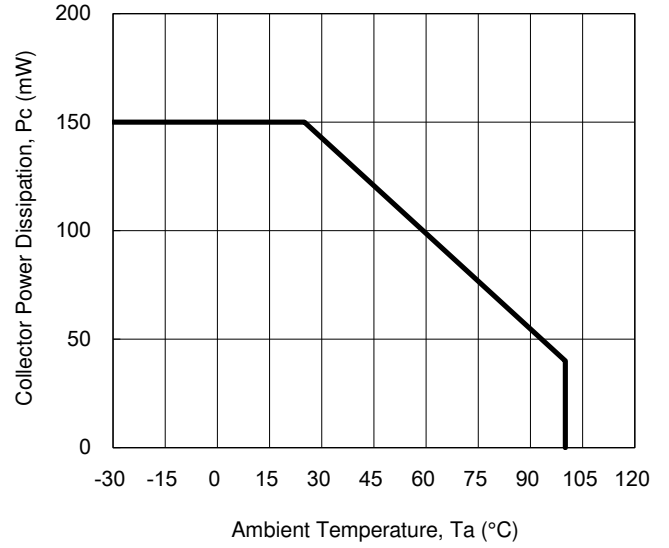
**CHARACTERISTICS CURVES**

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

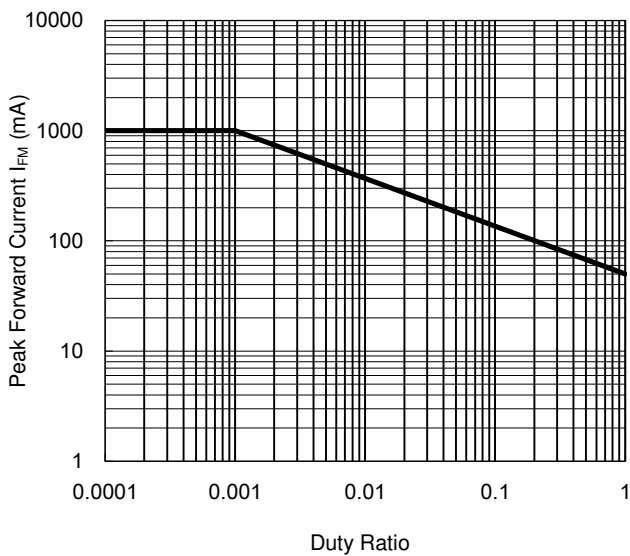
**Fig. 1 Forward Current vs. Ambient Temperature**



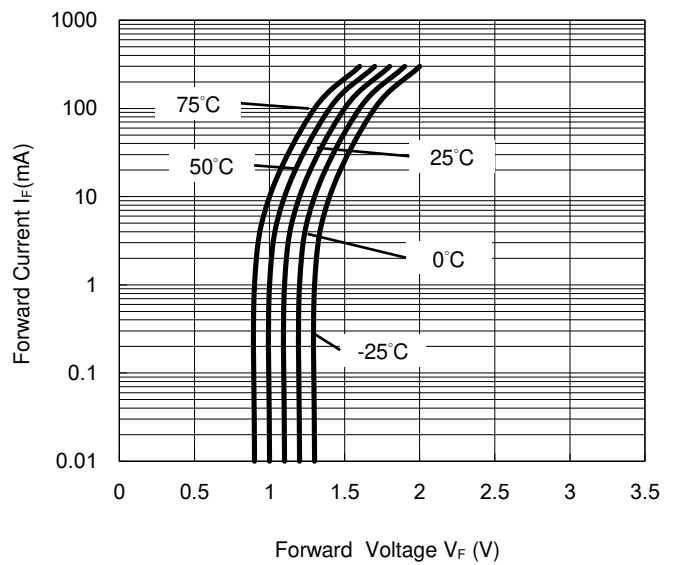
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



**Fig.3 Peak Forward Current vs. Duty Ratio**



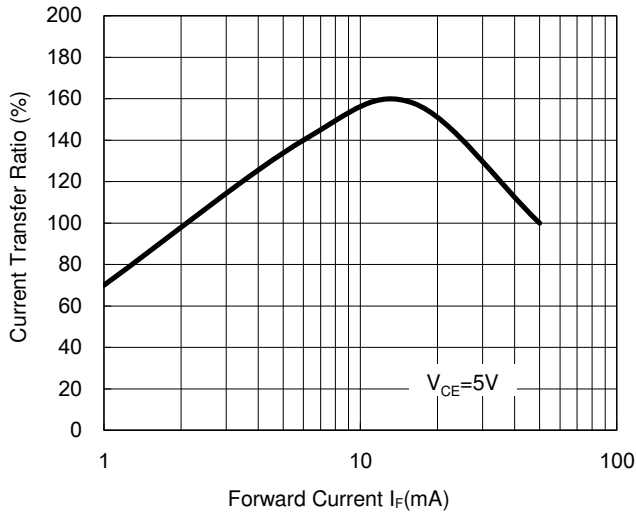
**Fig.4 Forward Current vs. Forward Voltage**



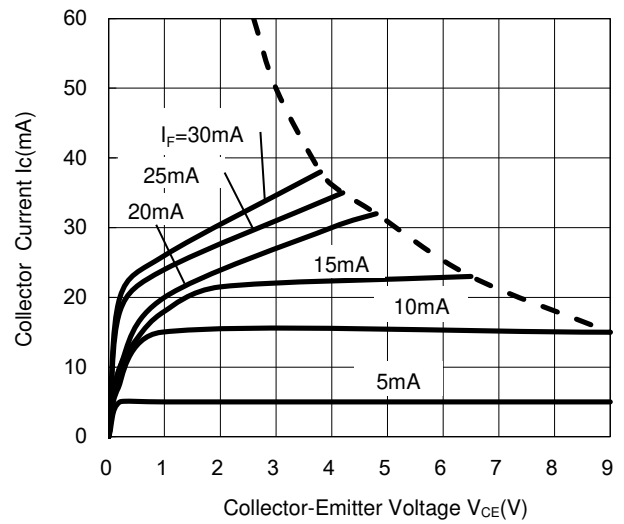
**CHARACTERISTICS CURVES**

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

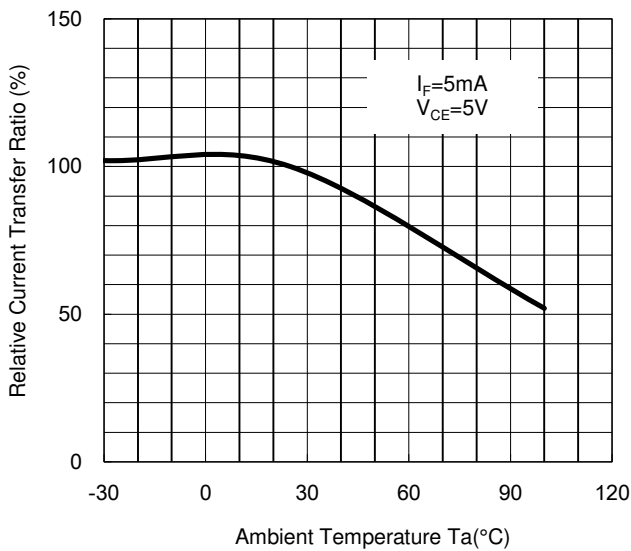
**Fig. 5 Current Transfer Ratio vs. Forward Current**



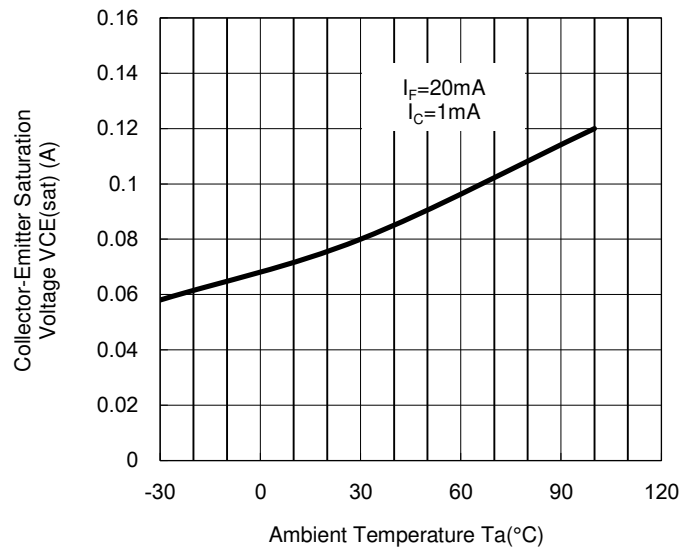
**Fig. 6 Collector Current vs. Collector-Emitter Voltage**



**Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature**



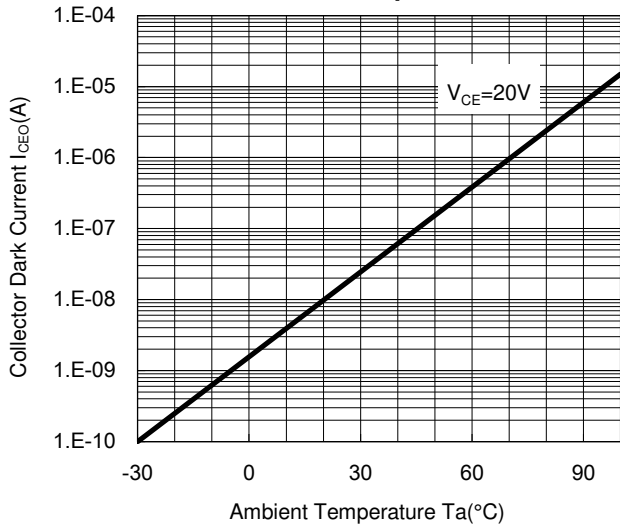
**Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature**



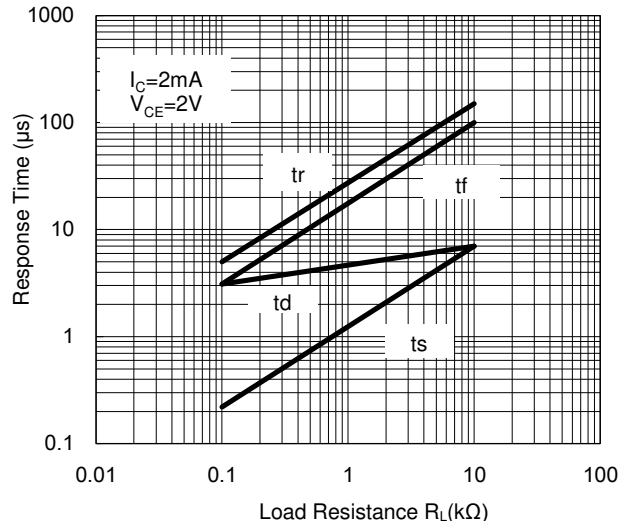
**CHARACTERISTICS CURVES**

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

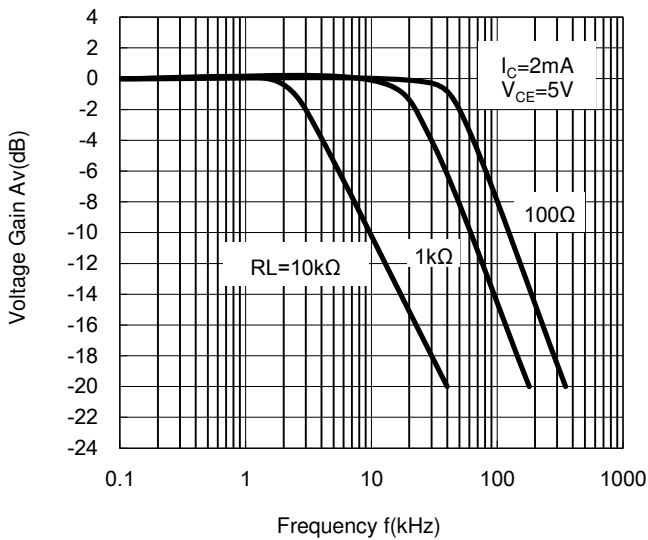
**Fig. 9 Collector Dark Current vs. Ambient Temperature**



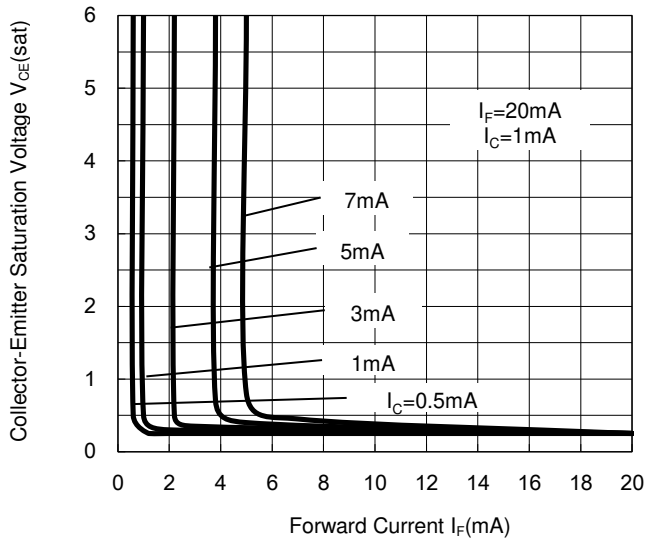
**Fig.10 Response Time vs. Load Resistance**



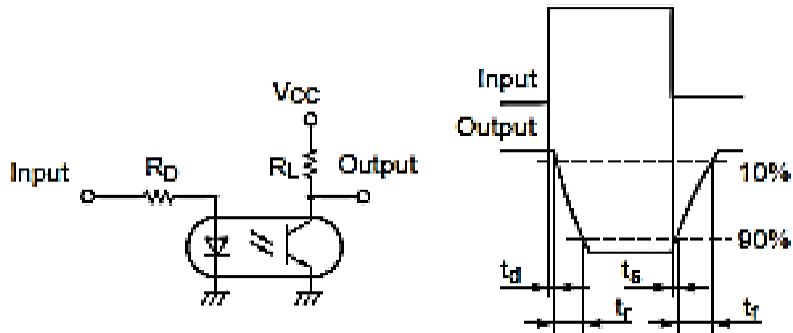
**Fig.11 Frequency Response**



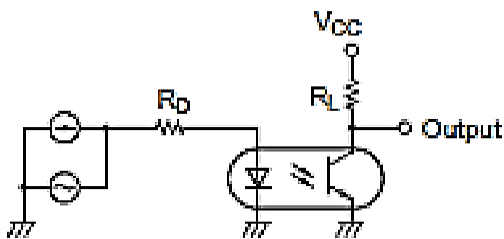
**Fig.12 Collector-Emitter Saturation Voltage vs Forward Current**



**TEST CIRCUIT RESPONSE TIME**



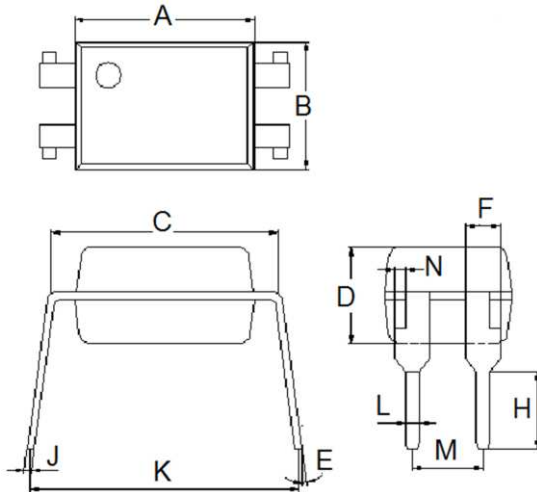
**TEST CIRCUIT FOR FREQUENCY RESPONSE**





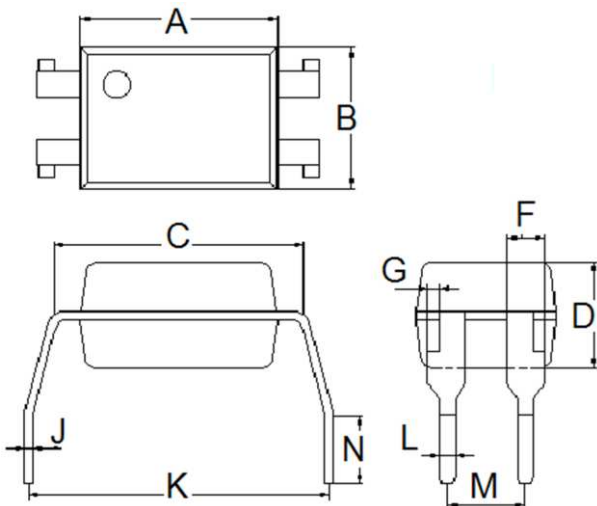
**PACKAGE OUTLINE DIMENSION**

DIP-4



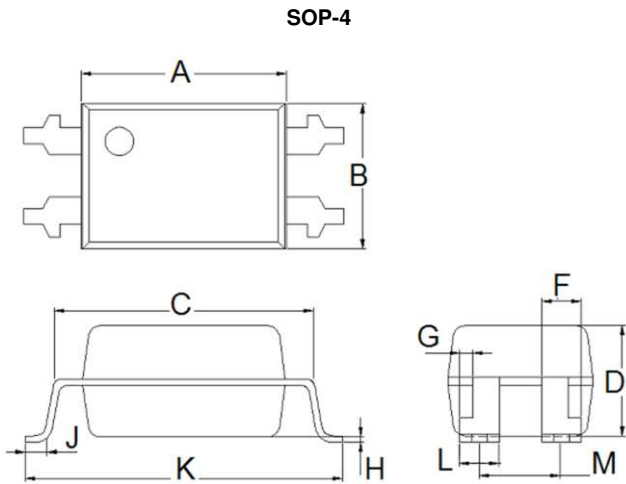
DIM.	Unit(mm)	
	Min	Max
A	6.40	6.60
B	4.50	4.70
C	7.90	8.30
D	3.28	3.68
E	2°	8°
F	1.25 typ.	
H	2.70	2.90
J	0.23	0.26
K	8.86	9.31
L	0.50 typ.	
M	2.44	2.64
N	0.40 typ.	

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	2.40	2.90

**PACKAGE OUTLINE DIMENSION**



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	0.90	1.20
K	9.80	10.30
L	1.25 typ.	
M	2.49	2.69

**MARKING**



**Notes :**

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

## Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.