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

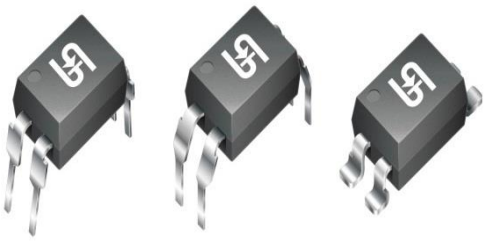
- Programmable controllers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials
  and impedances

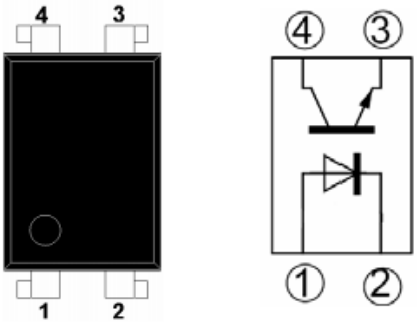
MECHANICAL DATA

- 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	

Pb-Free RoHS COMPLIANT HALOGEN FREE





ABSOLUTE MAXIMUM RATINGS (T_A = 25°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	°C
Storage temperature		T_{stg}	-55 to +125	°C
Soldering temperature (Note 3)		T_{sol}	260	°C

Notes:

1. Pulse width≦100ms，Duty ratio：0.001
2. 40 to 60% RH，AC for 1 minute
3. For 10s

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)								
PARAMETER			**CONDITIONS**	**SYMBOL**	**MIN**	**TYP**	**MAX**	**UNIT**
Input	Forward voltage		I_F=20mA	V_F		1.2	1.4	V
	Peak forward voltage		I_{FM}=0.5A	V_{FM}			3.0	V
	Reverse current		V_R=4V	I_R			10	μA
	Terminal capacitance		V=0, f=1kHz	C_t		30	250	pF
Output	Collector dark current		V_{CE}=20V,I_F=0	I_{CEO}			10^{-7}	A
Transfer Characteristics	Current transfer ration (Note 1)		I_F=5mA, V_{CE}=5V	CTR	80		600	%
	Collector-emitter saturation voltage		I_F=20mA, I_C=1mA	$V_{CE(sat)}$		0.1	0.2	V
	Isolation resistance		DC500V, 40 to 60%RH	R_{ISO}	$5x10^{10}$	10^{11}		Ω
	Floating capacitance		V=0, f=1MHz	C_f		0.6	1.0	pF
	Cut-off frequency		V_{CE}=5V, I_C=2mA, R_L=100Ω, -3dB	f_c		80		KHz
	Response time	Rise time	V_{CE}=2V, I_C=2mA, R_L=100Ω	t_r		4	18	μs
		Fall time		t_f		3	18	μs

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°C unless otherwise noted)

Fig. 1 Forward Current vs. Ambient Temperature

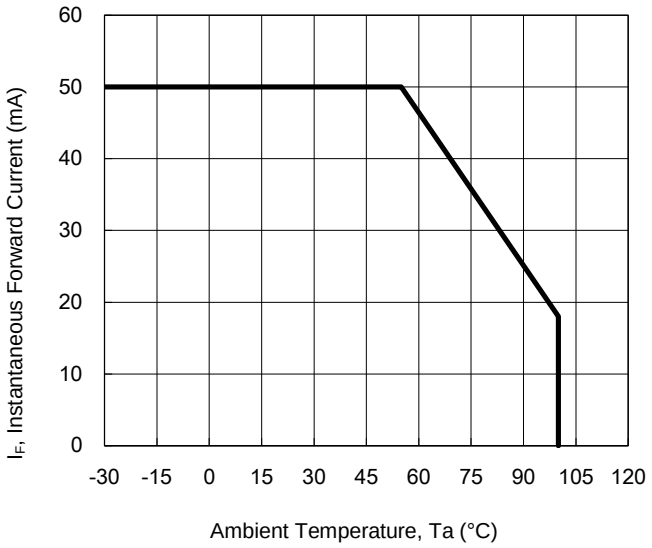


Fig.2 Collector Power Dissipation vs. Ambient Temperature

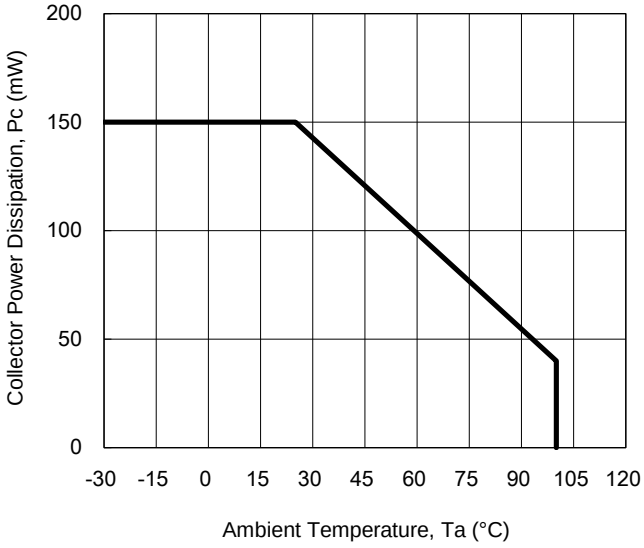


Fig.3 Peak Forward Current vs. Duty Ratio

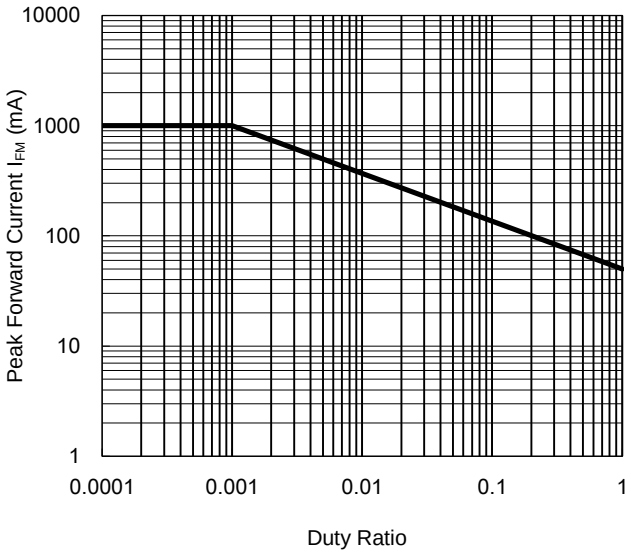
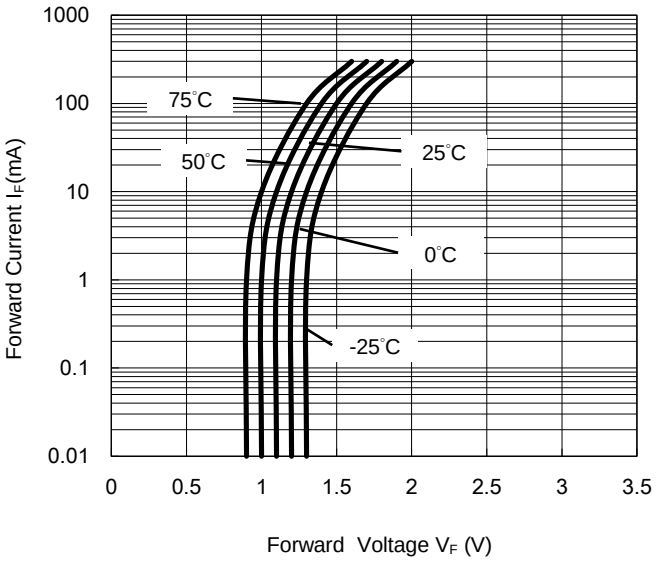


Fig.4 Forward Current vs. Forward Voltage



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig. 5 Current Transfer Ratio vs. Forward Current

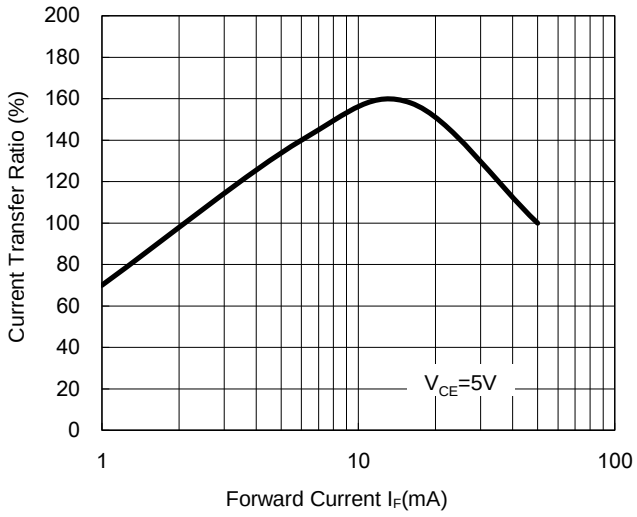


Fig.6 Collector Current vs. Collector-Emitter Voltage

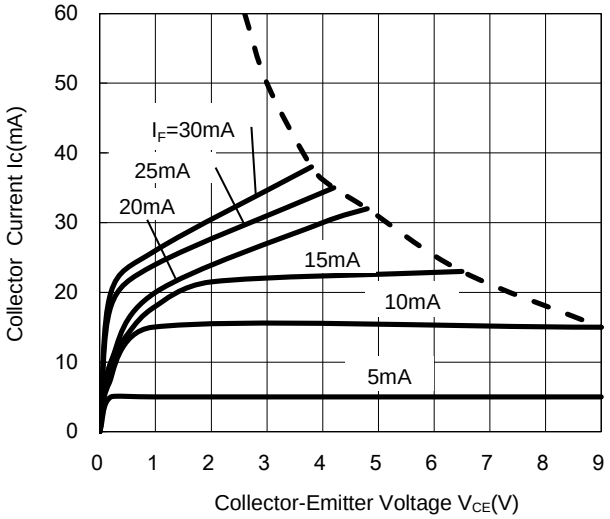


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

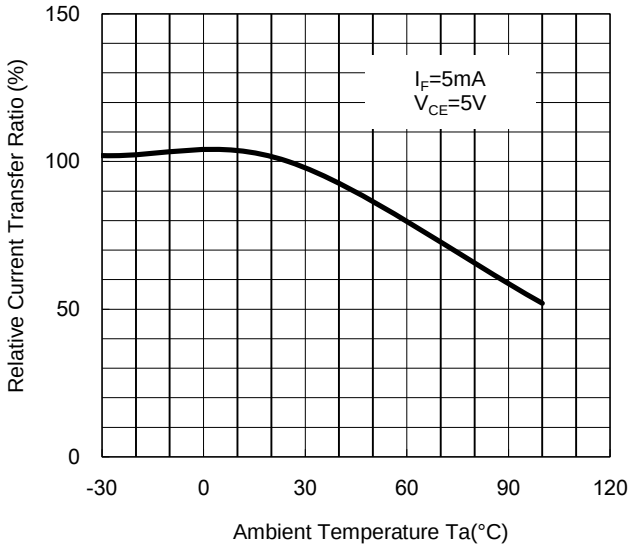
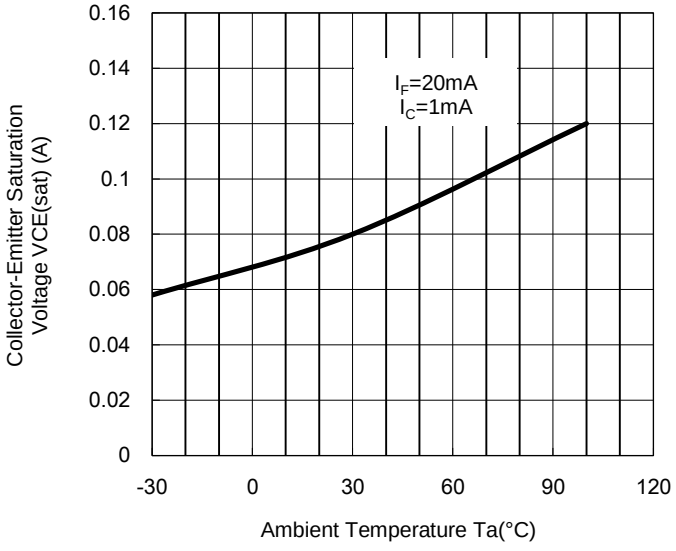


Fig.8 Collector-emitter Saturation Voltage vs Ambient Temperature



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig. 9 Collector Dark Current vs. Ambient Temperature

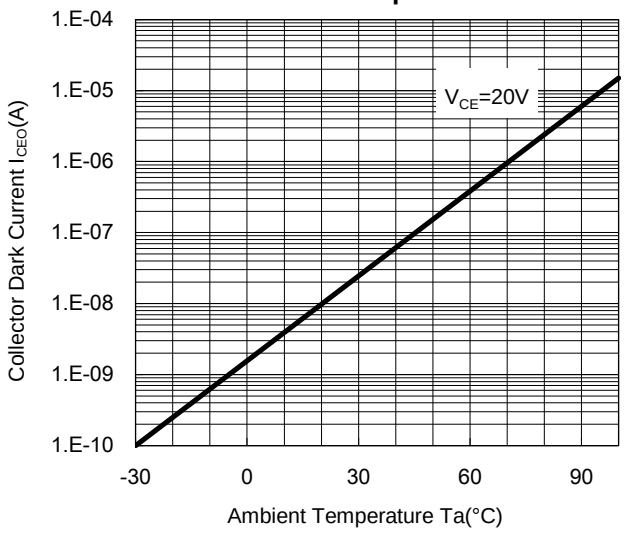


Fig.10 Response Time vs. Load Resistance

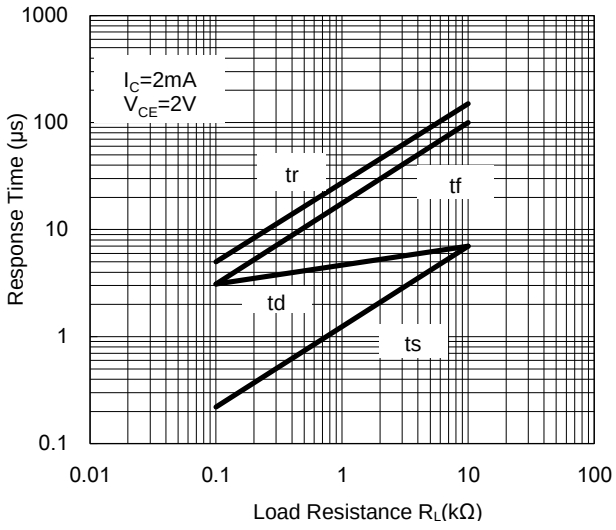


Fig.11 Frequency Response

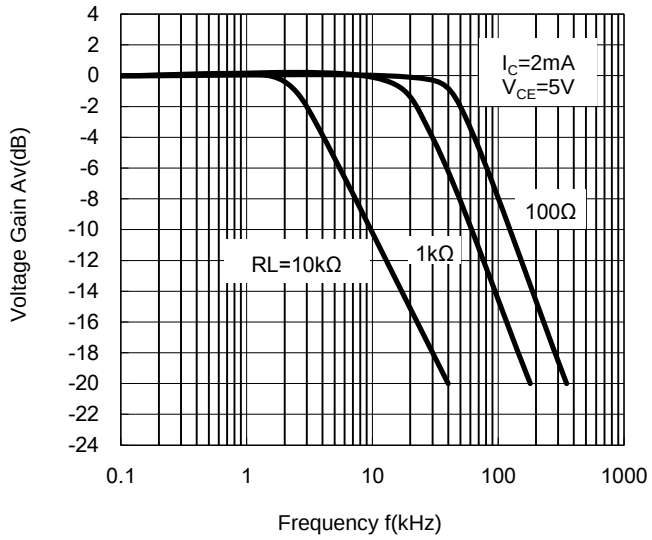
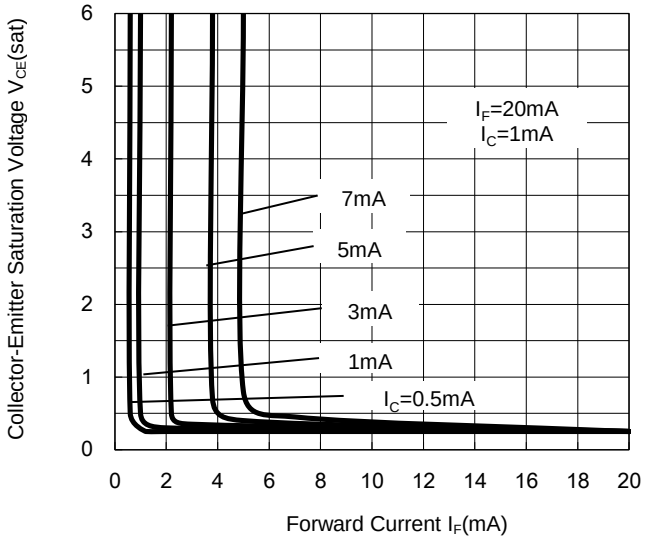
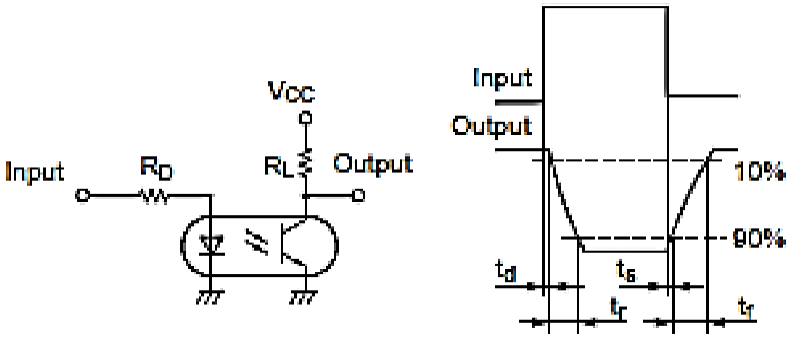


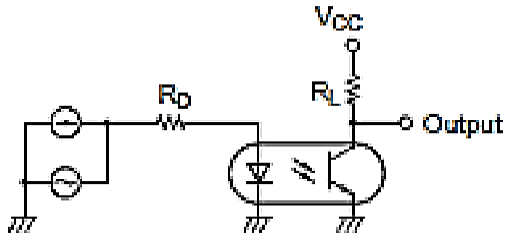
Fig.12 Collector-Emitter Saturation Voltage vs Forward Current



TEST CIRCUIT RESPONSE TIME

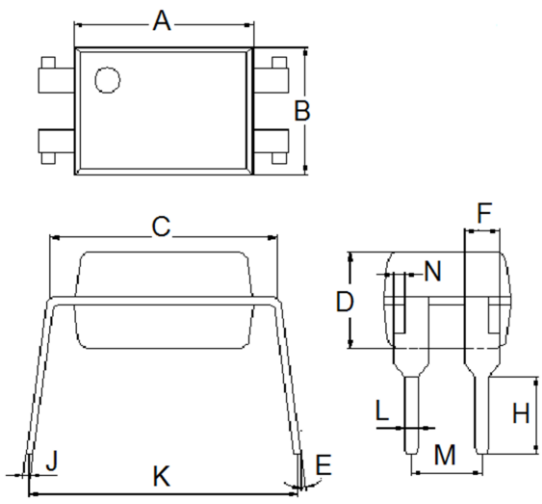


TEST CIRCUIT FOR FREQUENCY RESPONSE



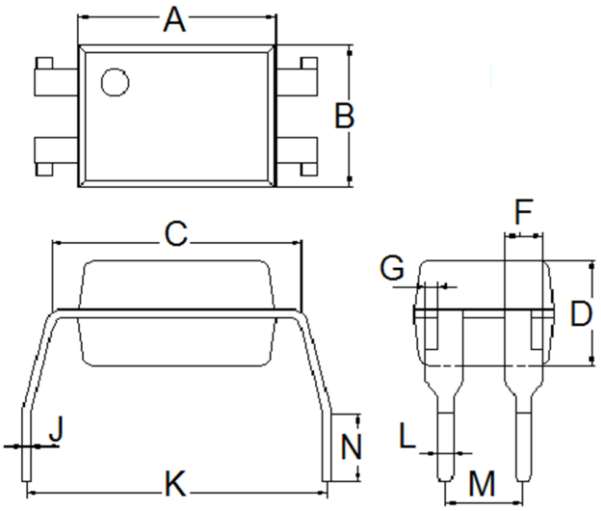
PACKAGE OUTLINE DIMENSION

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.	

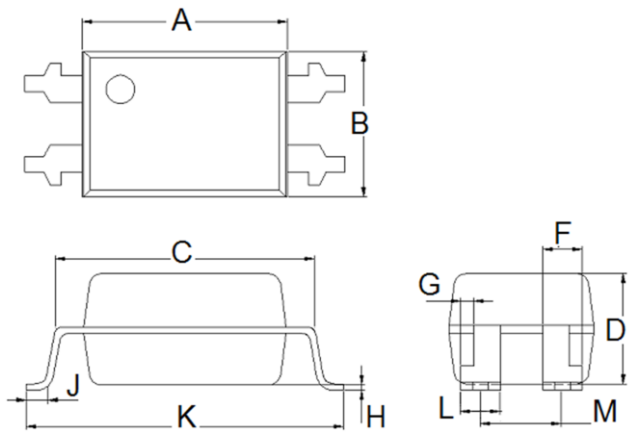
DIP-4M (Leads with 0.4" spacing)



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

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	0.90	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

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