

1.Features

- Current conversion ratio (Min 50% Working condition $I_F=5\text{mA}$, $V_{CE}=5\text{V}$)
- Insulation Voltage = 5,000Vrms
- Response Time (t_r : TYP. $4\mu\text{s}$; t_f : TYP. $5\mu\text{s}$) working condition $V_{CE}=10\text{V}$, $I_C=2\text{mA}$, $R_L=100\ \Omega$)

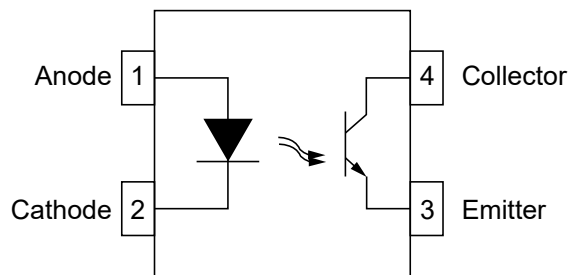
3.Application

- Switching power supply
- Ammeter
- Computer
- Instrumental application, measurement machine

2.Instructions

- 816photocoupler consist of one piece of GaAs emitter and one piece of NPN transistor
- Pin pitch of 816 is 2.54mm
- UL Approved :UL1577,File No. E547318

4.Pinning information



DIP-4/SOP-4



5. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input			
Forward Current	I_F	60	mA
Peak forward current(1us pulse)	I_{FP}	1	A
Reverse Voltage	V_R	6	V
Consume Power	P	100	mW
Output			
Collector and emitter Voltage	V_{CEO}	80	V
Emitter and collector Voltage	V_{ECO}	6	V
Collector Current	I_C	50	mA
Consume Power	P_C	150	mW
Total Consume Power	P_{TOT}	200	mW
*2 Insulation Voltage	V_{ISO}	5000	Vrms
Max Insulation Voltage	V_{IOTM}	10000	V
Rated Impulse Insulation Voltage	V_{IORM}	630	V
Working Temperature	T_{OPR}	-55 to 110	°C
Deposit Temperature	T_{STG}	-55 to 125	°C
*2 Soldering Temperature	T_{SOL}	260	°C

*1. AC Test, 1 minute, humidity = 40~60%

Insulation test method as below:

Short circuit both terminals of photocoupler

No Current when testing insulation voltage

Adding sine wave voltage when testing

*2. soldering time is 10 seconds



6. Opto-Electronic Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input						
Forward Voltage	V_F	$I_F=20\text{mA}$		1.2	1.4	V
Reverse Current	I_R	$V_R=4\text{V}$			10	μA
Collector Capacitance	C_t	$V=0, f=1\text{KHz}$		30	250	pF
Output						
Collector To Emitter Current	I_{CEO}	$V_{CE}=20\text{V}, I_F=0\text{mA}$			100	nA
Collector And Emitter Attenuation Voltage	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0\text{mA}$	80			V
Emitter And Collector Attenuation Voltage	BV_{ECO}	$I_E=0.1\text{mA}, I_F=0\text{mA}$	6			V
Transmission Characteristics						
Current Conversion Ratio	CTR	$I_F=5\text{mA}, V_{CE}=5\text{V}$	50		600	%
Collector Current	I_C	$I_F=5\text{mA}, V_{CE}=5\text{V}$	2.5		50	mA
Collector And Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F=20\text{mA}, I_C=1\text{mA}$		0.1	0.2	V
Insulation Impedance	R_{ISO}	DC500V, 40 ~ 60% R.H.		1×10^{12}		Ω
Capacotance	C_f	$V=0, f=1\text{MHz}$		0.6	1	pF
Transforming Frequency	F_C	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$		80		kHz
Risetime	t_r	$V_{CE}=10\text{V}, I_C=2\text{mA}$		4	18	μs
Descend Time	t_f			3	18	μs

Current Conversion Ratio = $I_C / I_F \times 100\%$



7.Grades of Current Conversion Ratio

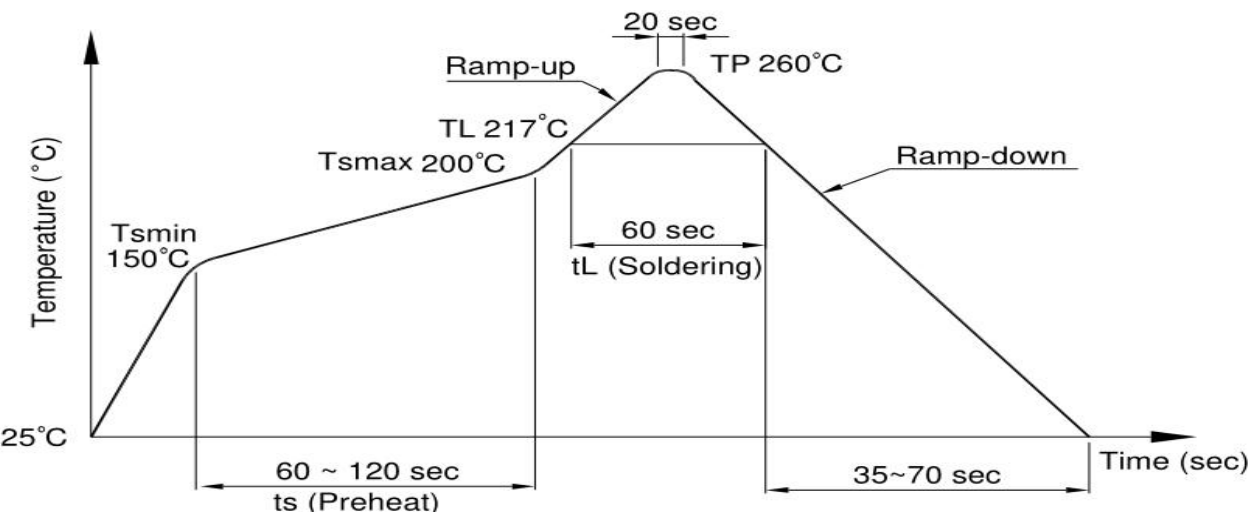
Grade Sign	Min (%)	Max (%)
L	50	100
A	80	160
B	130	260
C	200	400
D	300	600
L or A or B or C or D	50	600

Note: Working condition: $I_F=5mA$, $V_{CE}=5V$, $T_a=25^{\circ}C$.



8. Temperature Profile Of Soldering

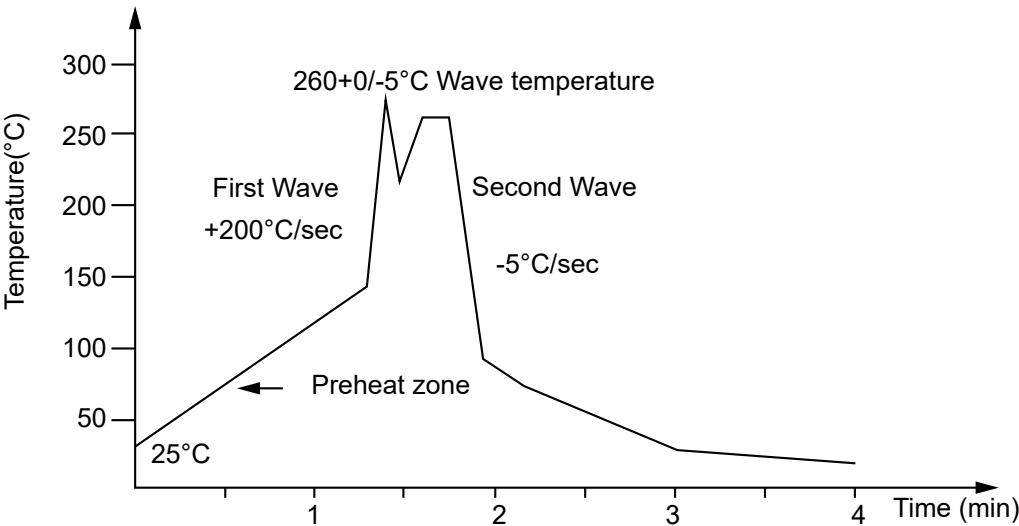
Profile Feature	Pb-Free Assembly Profile
Preheat	
Temperature Min.(T _{min})	150°C
Temperature Max.(T _{max})	200°C
Time (t _s) from (T _{min} to T _{max})	90±30 sec
Soldering zone	
Temperature (T _L)	217°C
Time (t _L)	60 sec
Peak Temperature	260°C
Ramp-up rate	3°C / sec max.
3°C / sec max.	3~6°C / sec





9.Wave soldering (JEDEC22A111 compliant)

Temperature	260+0/-5°C
Time	10 sec
Preheat temperature	5 to 140°C
Preheat time	30 to 80 sec



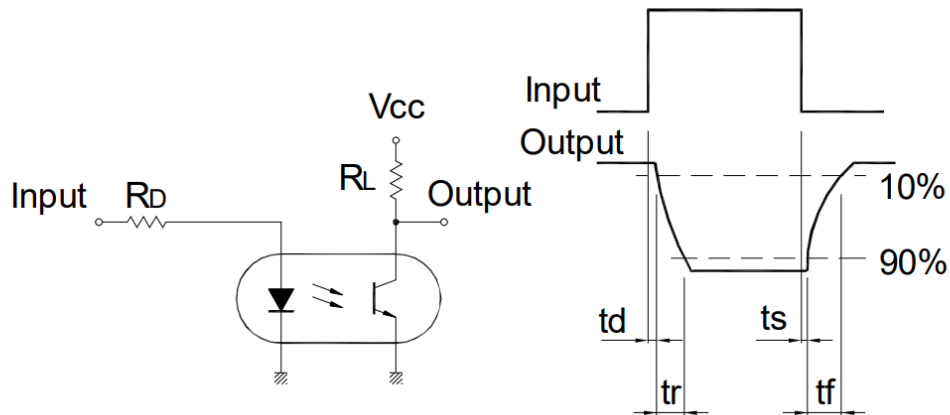
10.Hand soldering by soldering iron

Temperature	380+0/-5°C
Time	3 sec max

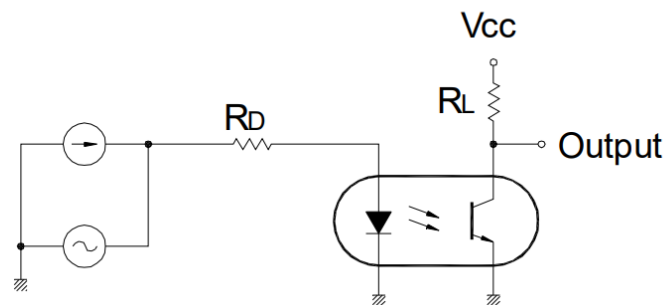


11. Test circuit

Test Circuit for Response Time

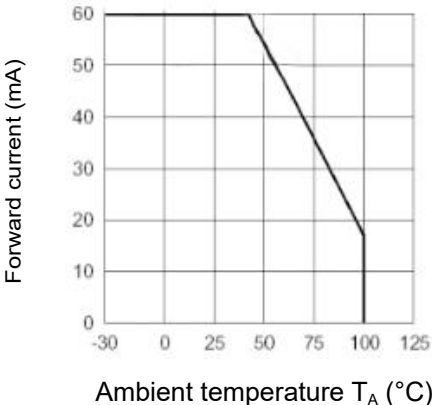
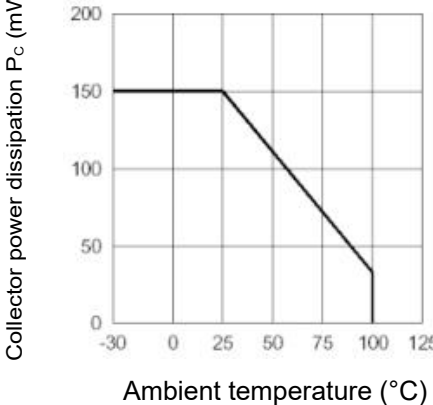
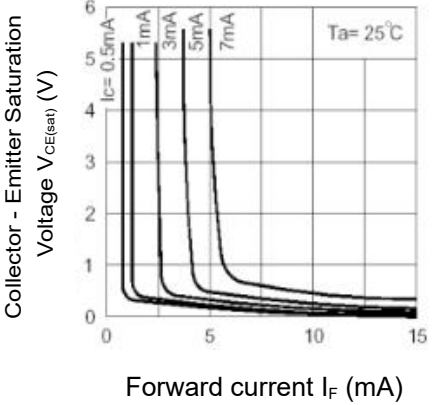
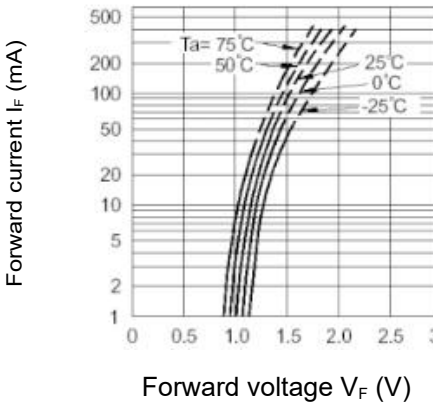
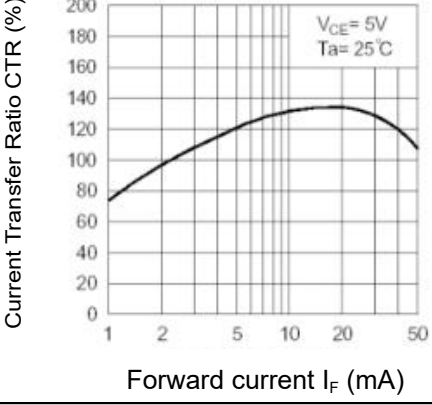
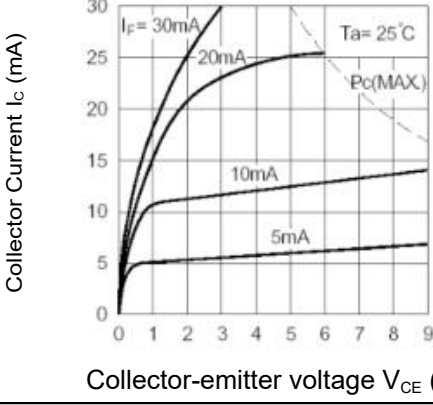


Test Circuit for Frequency Response



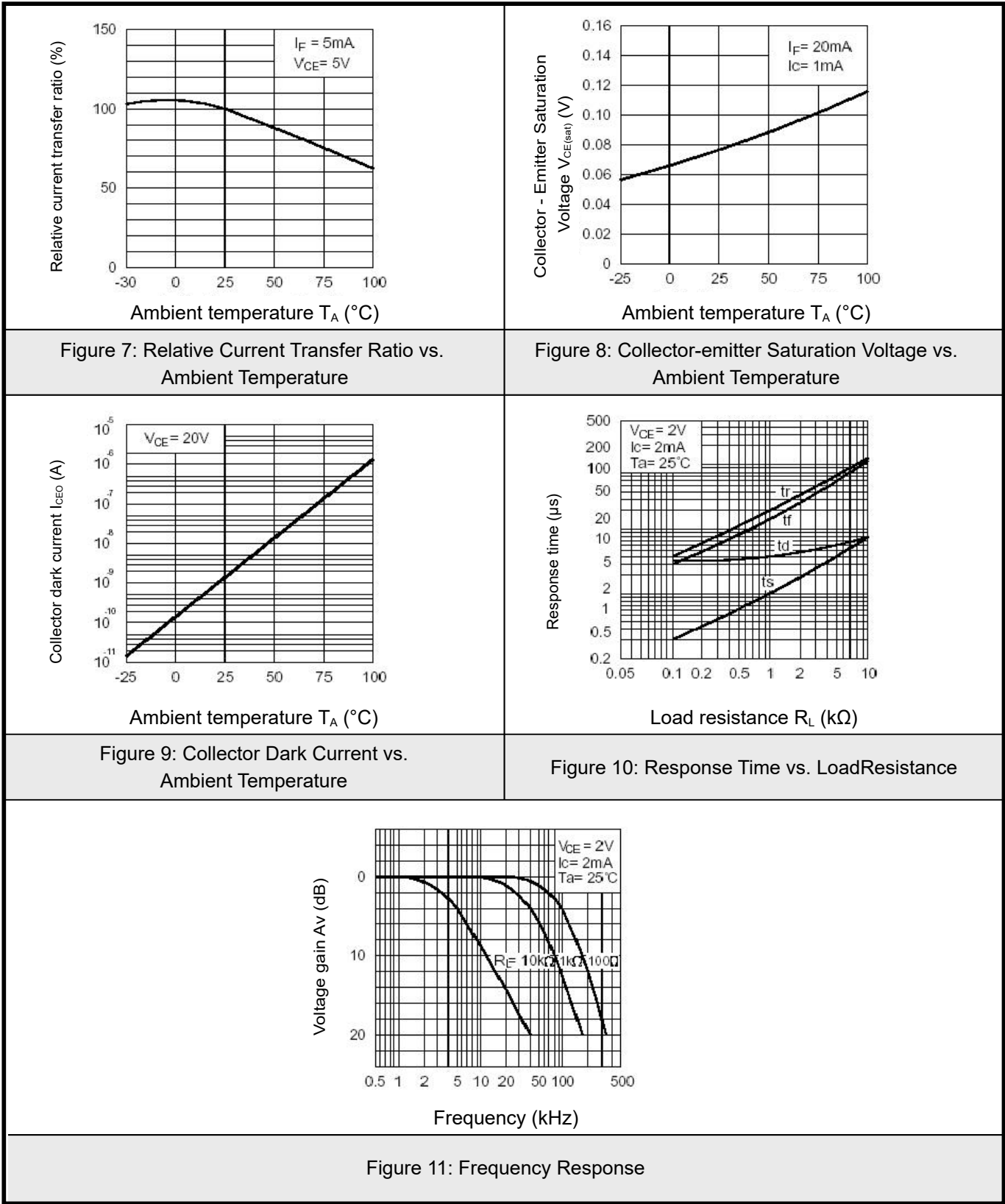


12.1Typical Characteristic

	
Figure 1: Forword Current vs. Ambient Temperature	Figure 2: Collector Power Dissiption vs. Ambient Temperature
	
Figure 3: Collector-emitter SaturationVoltage vs. Forward Current	Figure 4: Forward Current vs. Forward Voltage
	
Figure 5: Current Transfer Ratio vs.Forward Current	Figure 6: Collector Current vs Collector-emitter Voltage

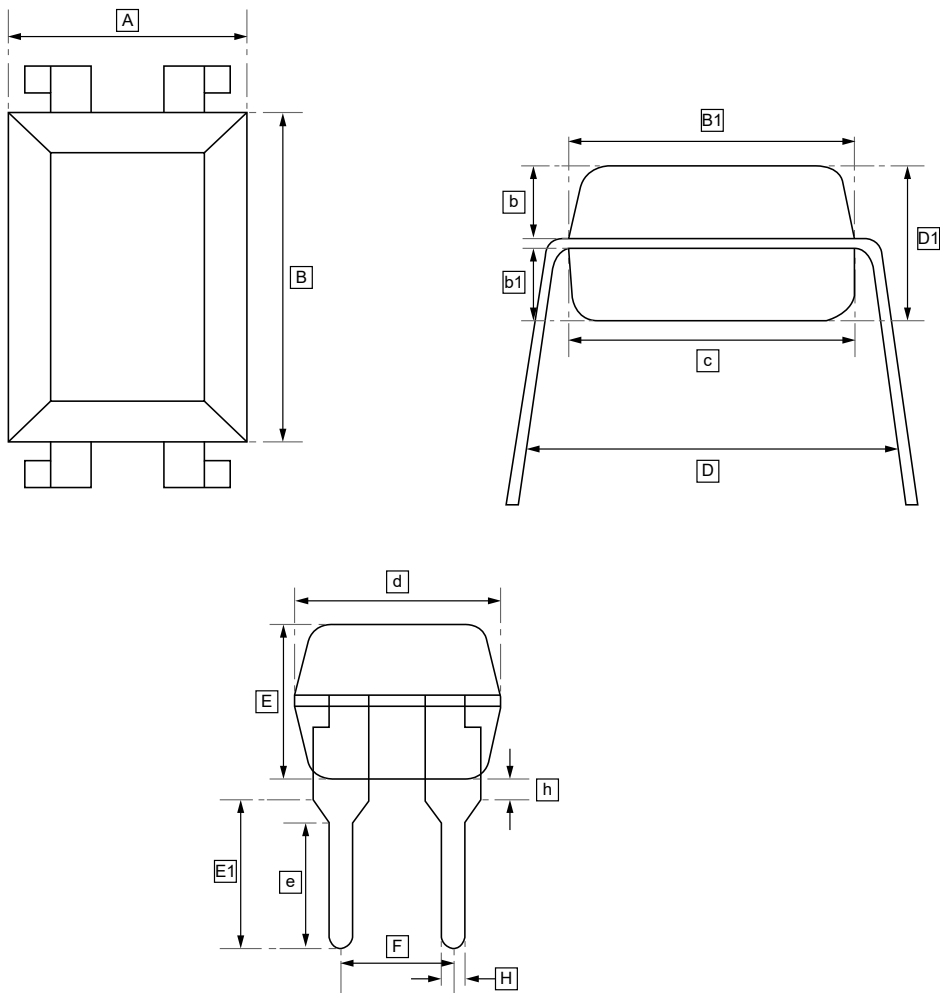


12.2Typical Characteristic





13.1DIP-4 Package Outline Dimensions



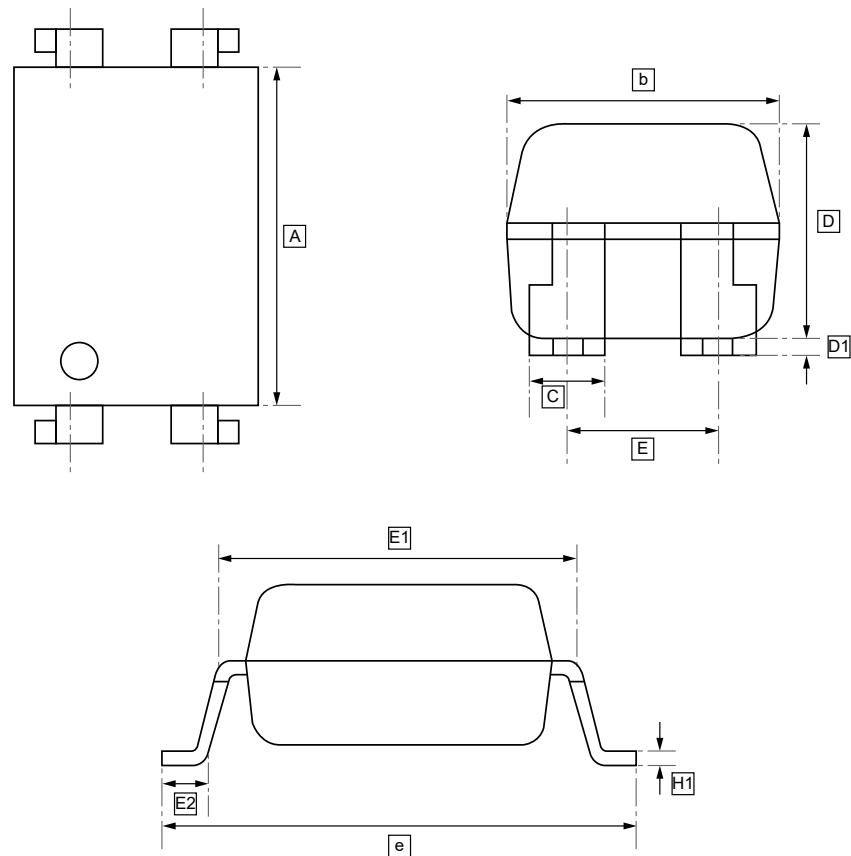
DIMENSIONS (mm are the original dimensions)

Symbol	A	B	B1	b	b1	c	D	D1	d	E	E1	e
Min	4.60	6.40	6.35	1.64	1.60	6.45	8.86	3.43	4.55	3.48	3.05	2.55
Max			6.45			6.55					3.55	3.05

Symbol	F	H	h
Min	2.29	0.50	0.50
Max	2.79		



13.2SOP-4 Package Outline Dimensions

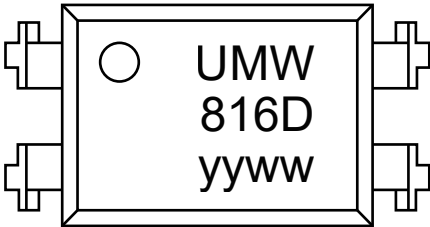


DIMENSIONS (mm are the original dimensions)

Symbol	A	b	C	D	D1	E	E1	E2	e	H1
Min	6.15	4.33	1.1	3.4	0.05	2.29	7.37	0.75	9.85	0.26
Max	6.65	4.83	1.3	3.9	0.6	2.79	7.87	1.25	10.45	



14.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW LTV816D	DIP-4	5000	Tube and box
UMW LTV816D-S	SOP-4	2000	Tape and reel



15.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.