

1.Description

UMW PS2701-1-L is a small patch optoelectronic coupling device, suitable for surface mount production.

UMW PS2701-1-L is a optocoupler composed of a gallium arsenide led and a phototransistor. Its volume is smaller than dip. It is suitable for high-density surface mount applications, such as programmable controllers.

3.Features

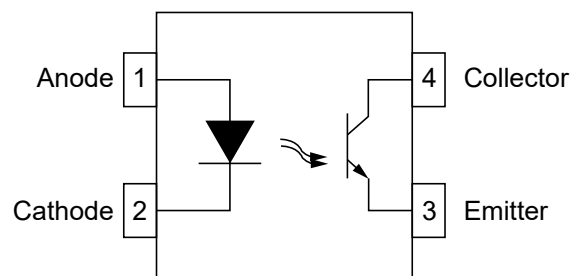
- Current conversion ratio (CTR) range: 50~300%
($I_F=5\text{mA}$, $V_{CE}=5\text{V}$)
- Input output isolation voltage ($V_{iso}=3750\text{ Vrms}$)
- Collector Emitter Breakdown Voltage $BV_{CEO}\geq 80\text{V}$

2.Application

- Switching power supply, smart meter
- Industrial control, measuring instruments
- Office equipment, such as photocopiers
- Household appliances, such as air conditioners, fans, water heaters, etc

- Working temperature: $-55\sim 110^{\circ}\text{C}$
- UL -approved : UL 1577, File No.E547318
- Accord with REACH and RoHS

4.Pinning information



SOP-4



5.Limit parameter (Ta=25°C)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Forward Pulse Current ⁽¹⁾	I_{FP}	1	A
	Reverse Voltage	V_R	6	V
	Power Derating	$\Delta P_D/^\circ\text{C}$	0.8	mW/°C
	Power Waste	P_D	80	mW/ch
	Junction Temperature	T_J	125	°C
Output	Collector Power Consumption	P_C	150	mW
	Collector Current	I_C	80	mA
	Collector Emitter Voltage	V_{CEO}	80	V
	Emitter Collector Voltage	V_{ECO}	7	V
	Junction Temperature	T_J	125	°C
Total Power Consumption		P_{TOT}	200	mW
Isolation Voltage ⁽²⁾		V_{ISO}	3750	Vrms
Working Temperature		T_{OPR}	-55 to 110	°C
Storage Temperature		T_{STG}	-55 to 150	°C
Welding Temperature		T_{SOL}	260(10s)	°C

(1) PW=100μs, Duty Cycle =1%

(2) AC voltage for 1 minute at $T_A=25^\circ\text{C}$, RH=60% between input and output Pins 1-2 shorted together, 3-4 shorted together.



6. Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input						
Forward Voltage	V_F	$I_F=5\text{mA}$		1.1	1.4	V
Reverse Current	I_R	$V_R=5\text{V}$			5	μA
Input Capacitance	C_{in}	$V=0, f=1\text{MHz}$		30		pF
Output						
Collector Dark Current	I_{CEO}	$V_{CE}=70\text{V}$			100	nA
Collector Emitter Breakdown Voltage	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	80			V
Emitter Collector Breakdown Voltage	BV_{ECO}	$I_C=0.1\text{mA}, I_F=0$	7			V
Transmission Characteristics						
Current Conversion Ratio	CTR	$I_F=5\text{mA}, V_{CE}=5\text{V}$	50	100	300	%
Collector Emitter Saturation Voltage Drop	$V_{CE(sat)}$	$I_F=10\text{mA}, I_C=2\text{mA}$			0.3	V
Isolation Resistance	R_{ISO}	DC1000V, 40~60%R.H.	1×10^{11}			Ω
Isolation Capacitance	C_f	$V=0\text{V}, f=1\text{MHz}$		0.6	1	pF
Collector Emitter Capacitance	C_{CE}	$V=0\text{V}, f=1\text{MHz}$		10		pF
Input Output Capacitance	C_S	$V=0\text{V}, f=1\text{MHz}$		0.8		pF
Cut-off Frequency	F_C	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$		80		kHz
Switching Time						
Rise Time	t_r	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega$		3		μs
Descent Time	t_f			5		μs

Notes:

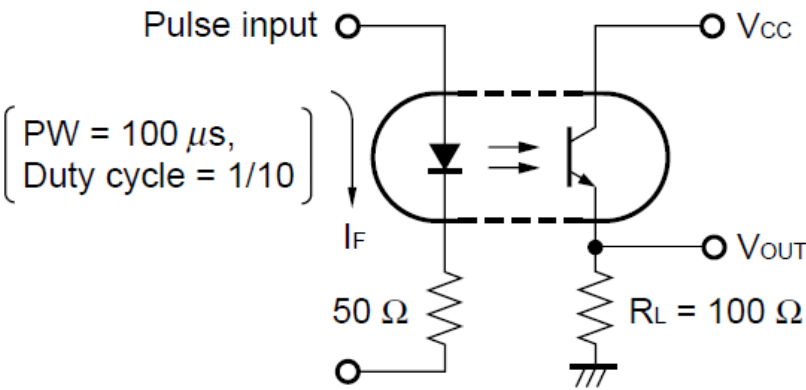
* $\text{CTR} = I_C / I_F \times 100\%$



7.Current Transfer Ratio

Type	Grading standard	Current Transfer Ratio (%) (I_C/I_F)		
		$I_F=5mA, V_{CE}=5V, T_a=25^{\circ}C$		
		Min	Type	Max
UMW PS2701-1-L	M	50	-	150
	P	150	-	300
	L	200	-	350
	K	300	-	450
	LK	400	-	600

8.Test circuit





9.1 Typical characteristic

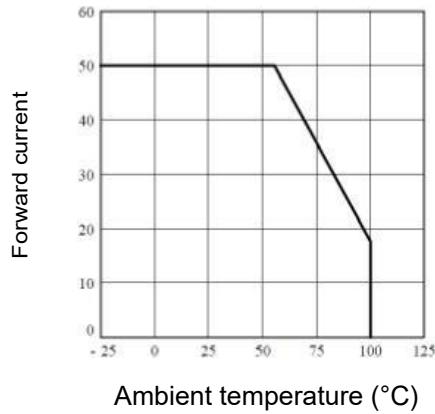
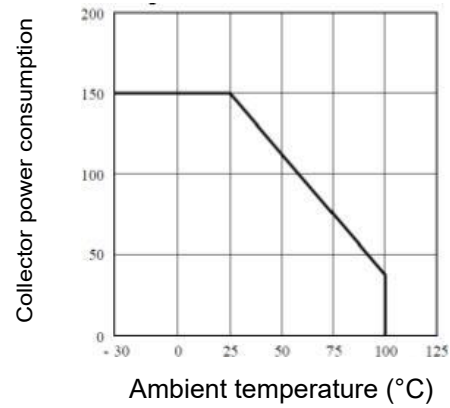
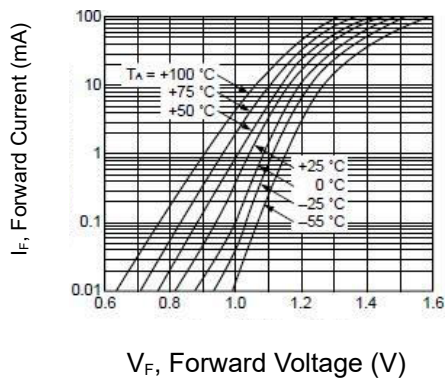
Figure 1: I_F - T_a Figure 2: P_C - T_a 

Figure 3: Forward Current vs. Forward Voltage

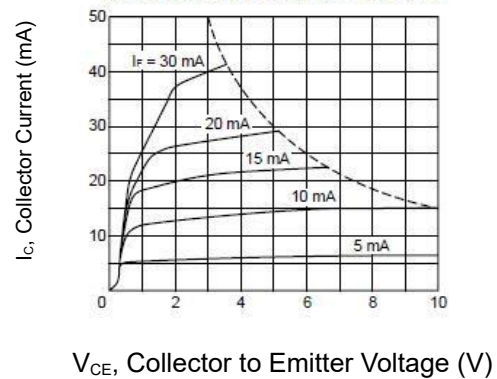


Figure 4: Collector Current vs. Collector To Emitter Voltage

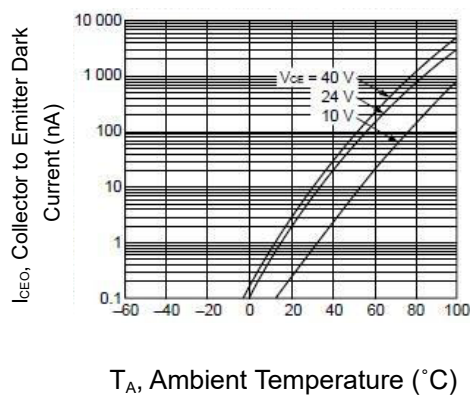


Figure 5: Collector To Emitter Dark Current vs. Ambient Temperature

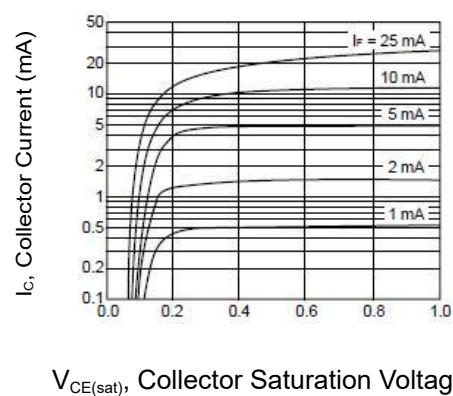


Figure 6: Collector Current vs. Collector Saturation Voltage



9.2 Typical characteristic

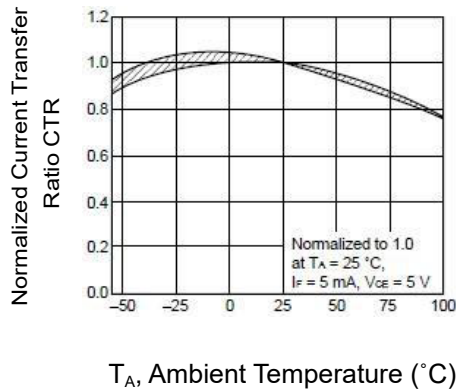


Figure 7: Normalized Current Transfer Ratio vs. Ambient Temperature

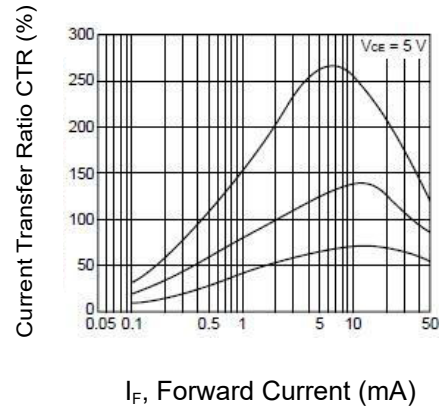


Figure 8: Current Transfer Ratio vs. Forward Current

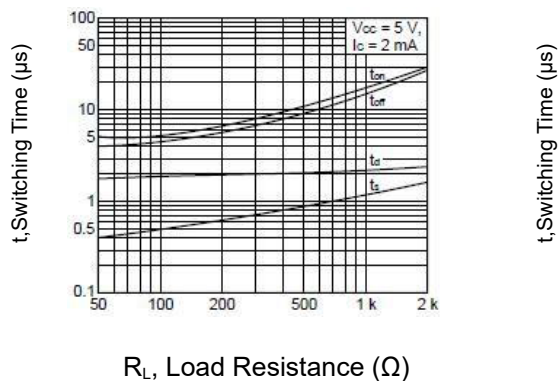


Figure 9: Switching Time vs. Load Resistance

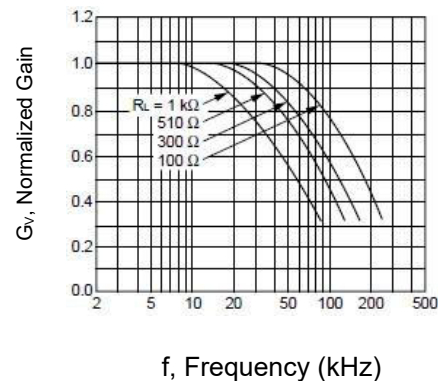


Figure 10: Frequency Response

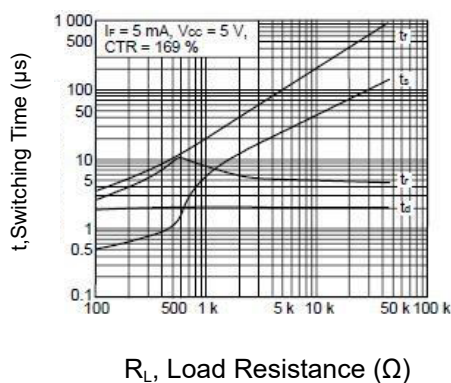


Figure 11: Switching Time vs. Load Resistance

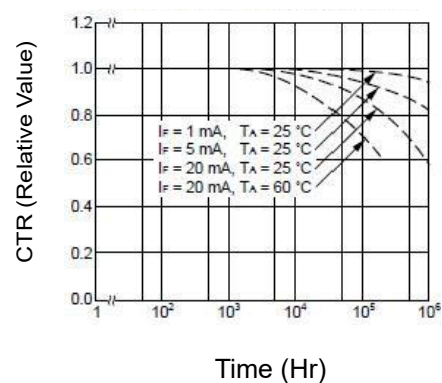
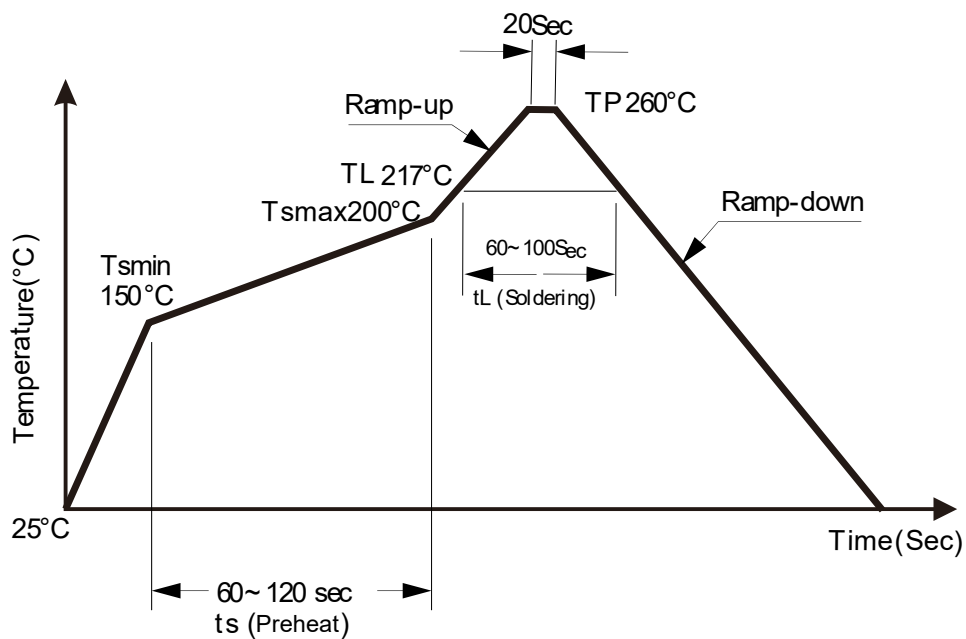


Figure 12: Long Term CTR Degradation

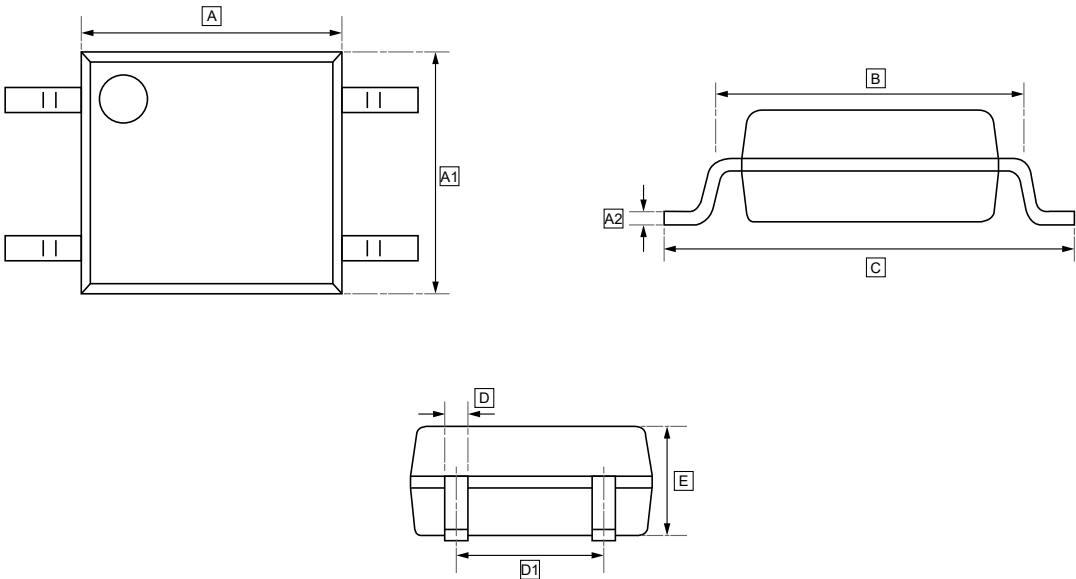


10.Reflow soldering temperature curve





11.SOP-4 Package Outline Dimensions

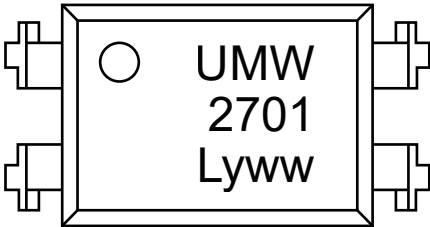


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	B	C	D	D1	E
Min	4.40	3.60	0.15	5.00	6.70	0.30	2.54	1.82
Max	4.80	4.10		5.40	7.30	0.50	TYP	2.02



12.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW PS2701-1-L	SOP-4	2000	Tape and reel



13.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.

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