UMW EL357

SOP4, DC Input Photo Transistor Coupler

1.Description

The UMW EL357 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic SOP4 package.

With the robust coplanar double mold structure, UMW EL357 series provide the most stable isolation feature.

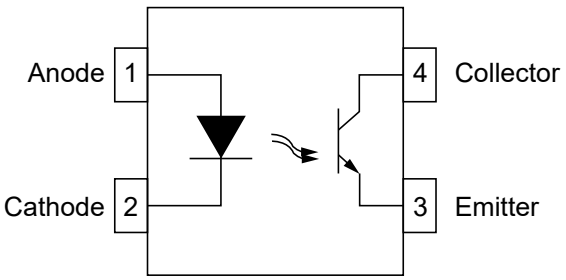
2.Applications

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment

3.Features

- High isolation 3750 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55°C to 110°C
- REACH compliance
- Halogen free
- MSL class 1
- UL Recognized: UL1577, File No.E547318

4.Pinning information



SOP-4

5.Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Note
INPUT				
Forward Current	I_F	60	mA	
Peak Forward Current	I_{FP}	1	A	1
Reverse Voltage	V_R	6	V	
Power Dissipation	P_I	100	mW	
OUTPUT				
Collector - Emitter Voltage	V_{CEO}	80	V	
Emitter -Collector Voltage	V_{ECO}	7	V	
Collector Current	I_C	50	mA	
Output Power Dissipation	P_O	150	mW	
COMMON				
Total Power Dissipation	P_{TOT}	200	mW	
Isolation Voltage	V_{ISO}	3750	Vrms	2
Operating Temperature	T_{OPR}	-55 to 110	°C	
Storage Temperature	T_{STG}	-55 to 125	°C	
Soldering Temperature	T_{SOL}	260	°C	

Note 1. 100μs pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%

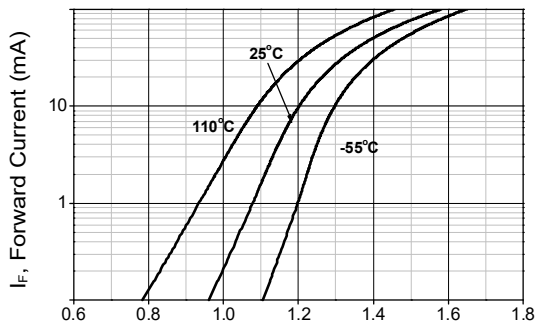
6.Electrical Characteristics

Parameter		Symbol	Conditions	Min	Typ	Max	Units
INPUT							
Forward Voltage		V_F	I_F=10mA		1.24	1.4	V
Reverse Current		I_R	V_R=6V			10	μA
Input Capacitance		C_{IN}	V=0, f=1kHZ		10		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=0.1mA, I_F=0	7			V
TRANSFER CHARACTERISTICS							
Current Transfer Ratio	UMW EL357	CTR	I_F=5mA, V_{CE}=5V	50		600	%
	UMW EL357A			80		160	
	UMW EL357B			130		260	
	UMW EL357C			200		400	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_F=20mA, I_C=1mA		0.06		V
Isolation Resistance		R_{ISO}	DC500V, 40 ~ 60% R.H.	10^12	10^14		Ω
Floating Capacitance		C_{IO}	V=0, f=1kHZ		0.4	1	pF
Cut-off Frequency (Note4)		F_C	V_{CE}=2V, I_C=2mA, R_L=100Ω,-3dB		80		kHz
Response Time (Rise) (Note3)		T_r	V_{CE}=2V, I_C=2mA		3	18	μs
Response Time (Fall) (Note3)		T_f	R_L=100Ω		4	18	μs

Note 3. Fig.12&13

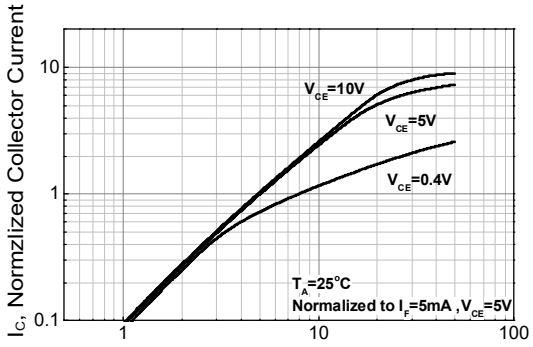
Note 4. Fig.14

7.1 Typical Characteristic



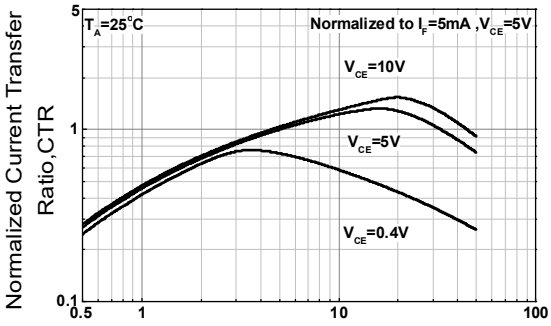
V_F, Forward Voltage (V)

Figure 1: Forward Current vs Forward Voltage



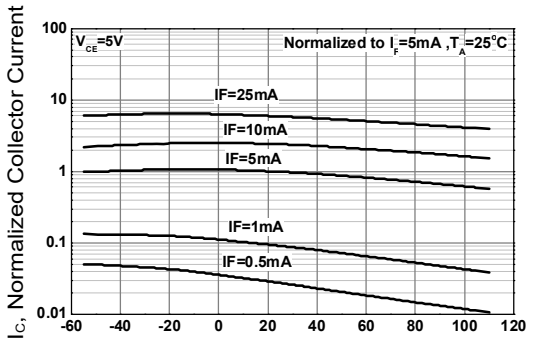
I_F, Forward Current (mA)

Figure 2: Normalized Collector Current vs Forward Current



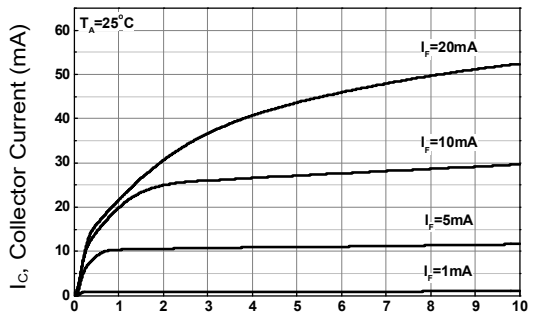
I_F, Forward Current (mA)

Figure 3: Normalized Collector Current vs Forward Current



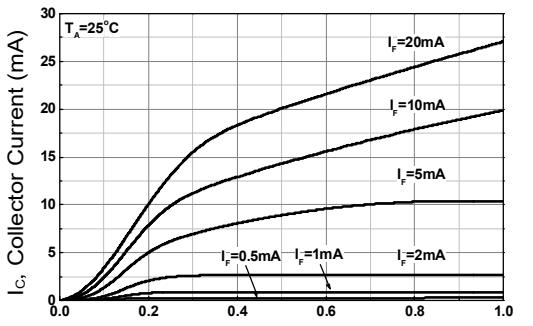
T_A, Ambient Temperature (°C)

Figure 4: Normalized Collector Current vs Ambient Temperature



V_{CE}, Collector - Emitter Voltage (V)

Figure 5: Collector Current vs Collector - Emitter Voltage



V_{CE}, Collector - Emitter Voltage (V)

Figure 6: Collector Current vs Collector - Emitter Voltage

7.2 Typical Characteristic

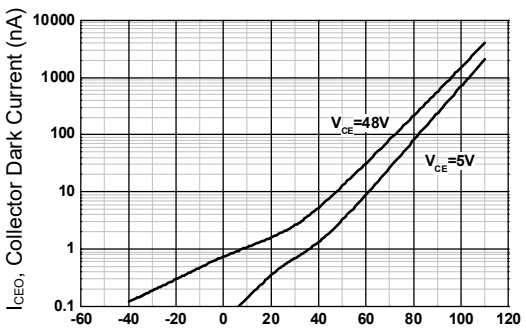


Figure 7: Collector Dark Current vs Ambient Temperature

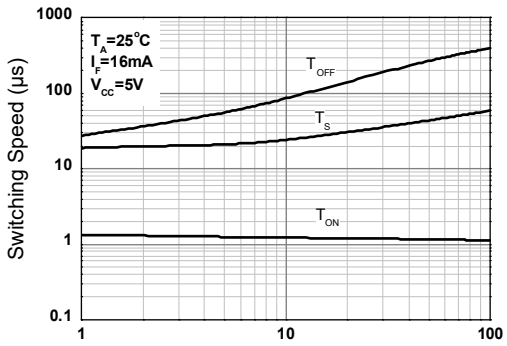


Figure 8: Switching Time vs Load Resistance

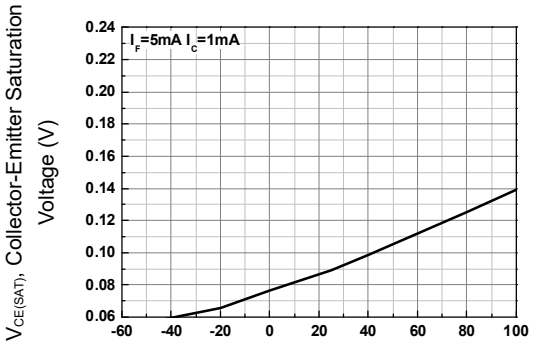


Figure 9: Collector Emitter Saturation Voltage Ambient Temperature,°C

8.Test Circuits

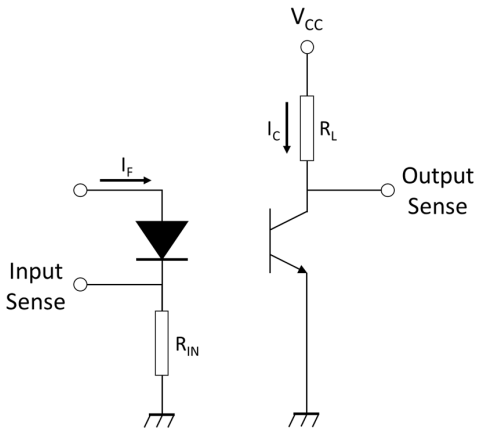


Figure 12: Test Circuits of Response Time

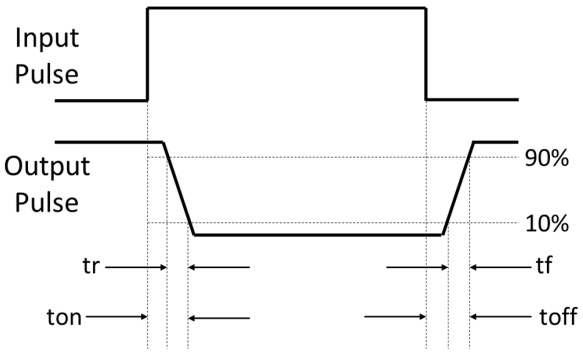


Figure 13: Curves of Response Time

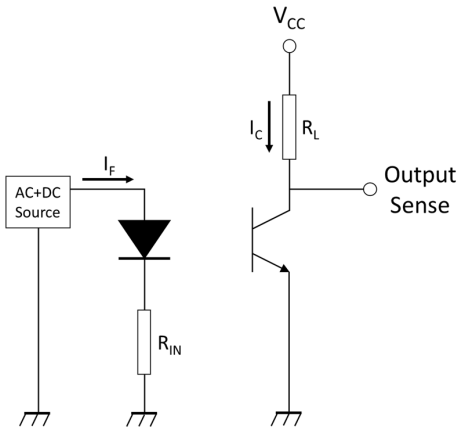
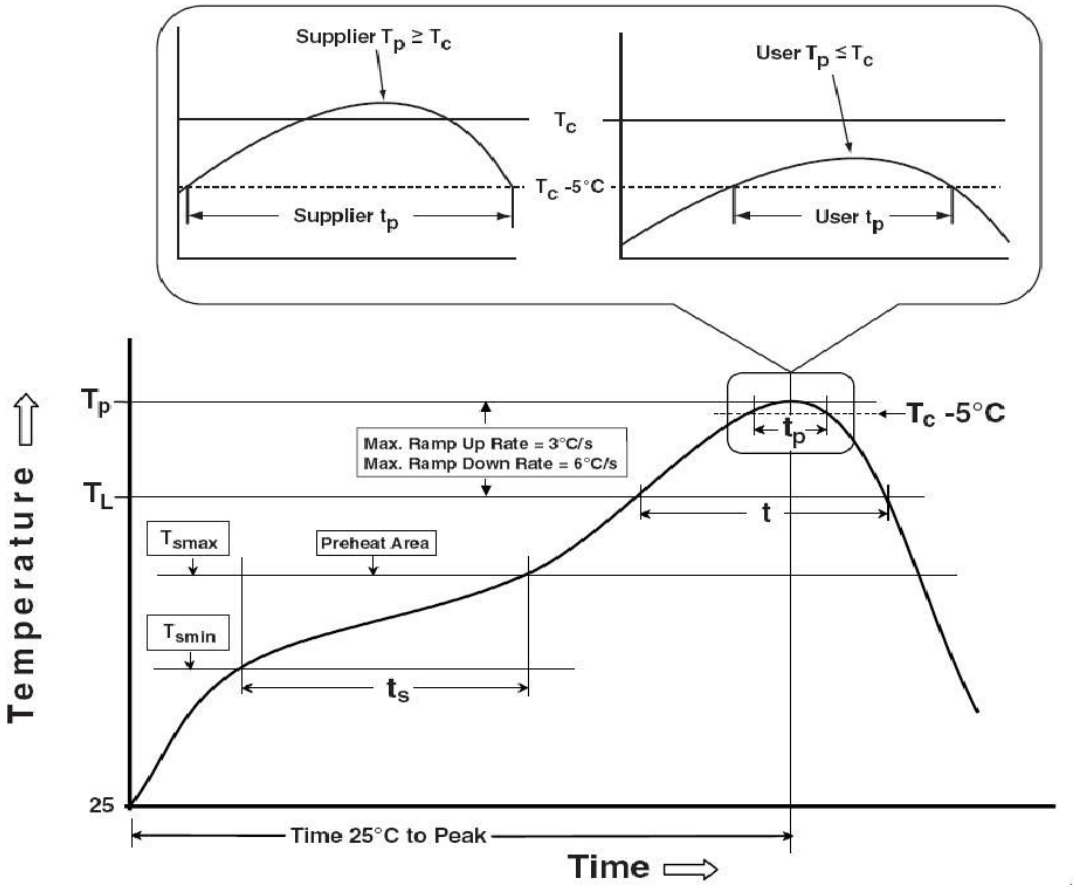


Figure 14: Test Circuits of Frequency Response

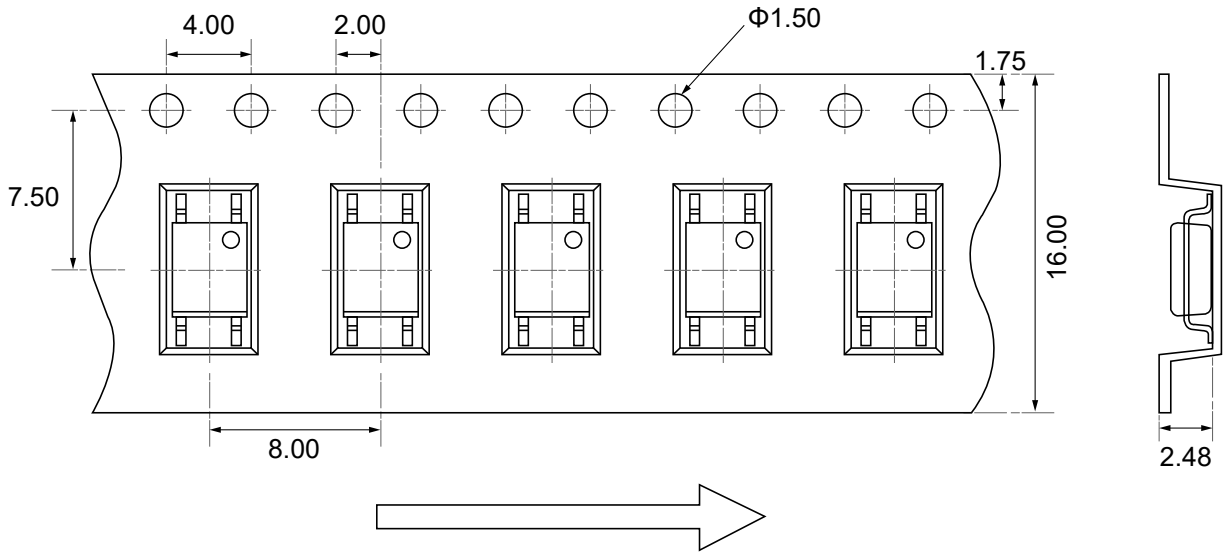
9.Reflow Information

REFLOW PROFILE

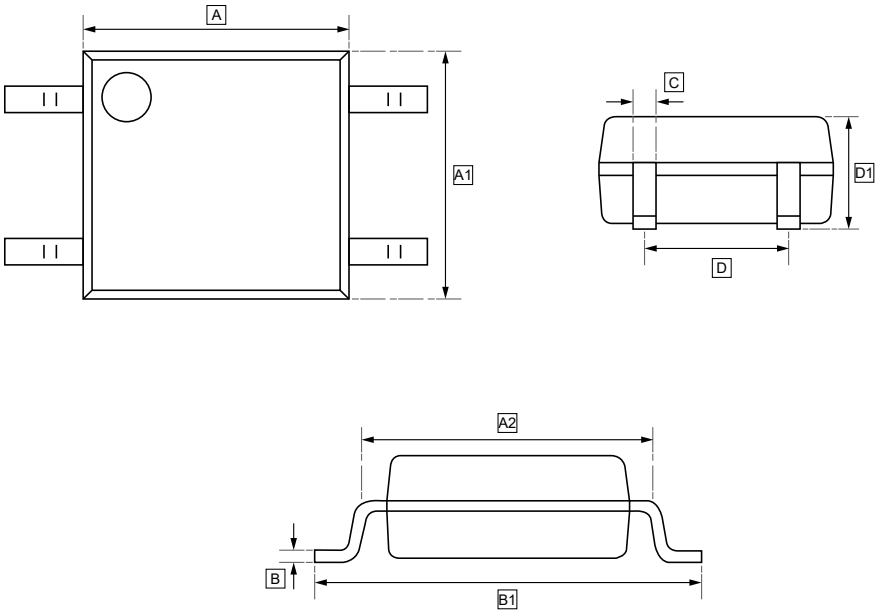


Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min.(Tsmin)	100	150°C
Temperature Max.(Tsmax)	150	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (tL) Maintained Above (TL)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235°C +0°C/-5°C	260°C +0°C/-5°C
Time (tP) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6minutes max.	8 minutes max.

10.Taping Direction



11.SOP-4 Package Outline Dimensions

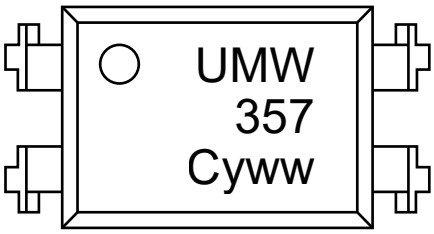


The Tolerances Unless Mentioned is : ±0.1mm

DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	B	B1	C	D	D1
Min	4.40	3.90	5.00	0.20	6.70	0.30	2.54	-
Max	TYP	4.30	5.40		7.30	0.50	TYP	2.0

12.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW EL357	SOP-4	3000	Tape and reel
UMW EL357A	SOP-4	3000	Tape and reel
UMW EL357B	SOP-4	3000	Tape and reel
UMW EL357C	SOP-4	3000	Tape and reel

13.Disclaimer

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