UMW LTV-354

AC Input 4-Pin Mini-Flat Phototransistor Optocoupler

1.Description

These series of AC input optocoupler consists of a photo transistor optically coupled to two gallium arsenide Infrared-emitting diodes in a 4-lead Mini-Flat package.

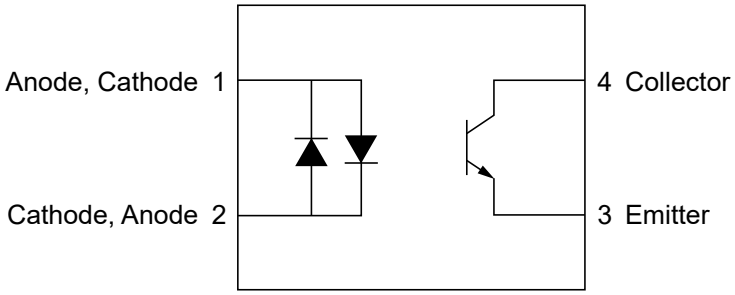
2.Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

3.Features

- High isolation 3750 VRMS
- CTR flexibility available see order information
- AC input with transistor output
- Temperature range - 55°C to 110°C
- Regulatory Approvals
- UL - UL1577(E547318)

4.Pinning information



LSOP-4/SOP-4

5.Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Isolation voltage	V_{ISO}	3750	V_{RMS}
Operating temperature	T_{OPR}	-55 to 110	°C
Storage temperature	T_{STG}	-55 to 150	°C
Soldering temperature	T_{SOL}	260	°C
Total power dissipation	P_{TOT}	200	mW
Emitter			
Forward current	I_F	±50	mA
Peak transient current (≤1μs P.W,300pps)	$I_{F(TRANS)}$	1	A
Power dissipation	P_D	70	mW
Detector			
Power dissipation	P_C	150	mW
Collector-Emitter Breakdown Voltage	B_{VCEO}	80	V
Emitter-Collector Breakdown Voltage	B_{VECO}	7	V
Collector Current	I_C	50	mA

6.Emitter Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Forward Voltage	V_F	I_F=10mA		1.24	1.4	V
Input Capacitance	C_{IN}	f=1kHz		45		pF

7.Detector Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown	B_{VCEO}	I_C=100μA	80			V
Emitter-Collector Breakdown	B_{VECO}	I_E=100μA	7			V
Collector-Emitter Dark Current	I_{CEO}	V_{CE}= 20V, I_F=0mA			100	nA

8.Transfer Characteristics

Parameter		Symbol	Conditions	Min	Typ	Max	Units
Current Transfer Ratio	LTV-354	CTR	I_F=±1mA, V_{CE}=5V	20		300	%
	LTV-354-A			50		150	%
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	I_F=±20mA, I_C=1mA		0.1	0.2	V
Isolation Resistance		R_{IO}	V_{IO}=500V_{DC}	$5x10^{10}$			Ω
Isolation Capacitance		C_{IO}	f=1MHz		0.6	1	pF

9.Switching Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Rise Time	t_r	I_C=2mA, V_{CE}=2V, R_L=100Ω		6	18	μs
Fall Time	t_f			8	18	μs

10.1 Typical Characteristic

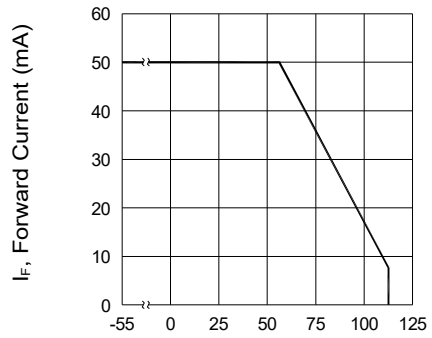


Figure 1: Forward Current vs. Ambient Temperature

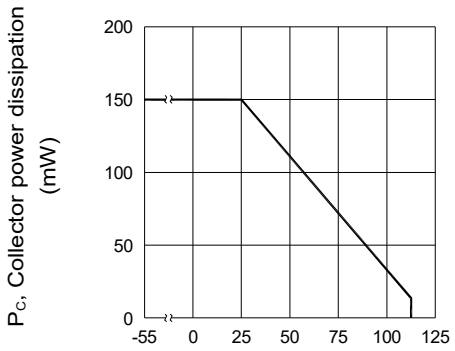


Figure 2: Collector Power Dissipation vs. Ambient Temperature

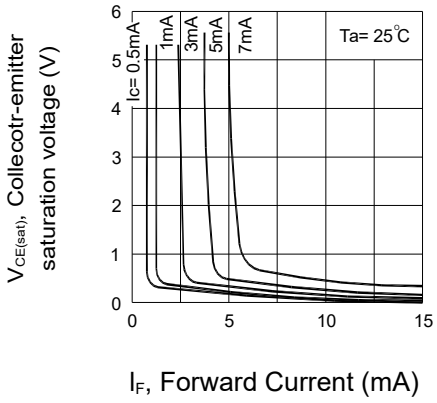


Figure 3: Collector-emitter Saturation Voltage vs. Forward Current

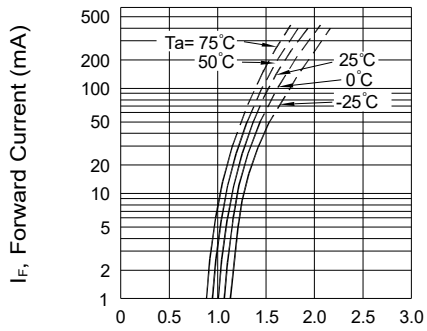


Figure 4: Forward Current vs. Forward Voltage

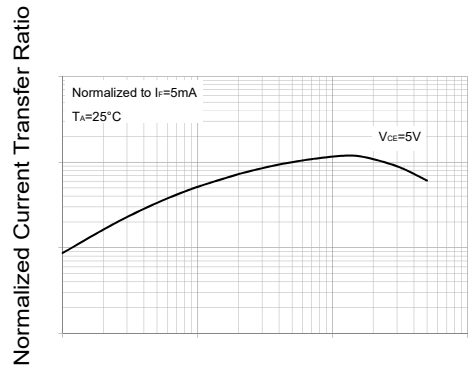


Figure 5: Current Transfer Ratio vs. Forward Current

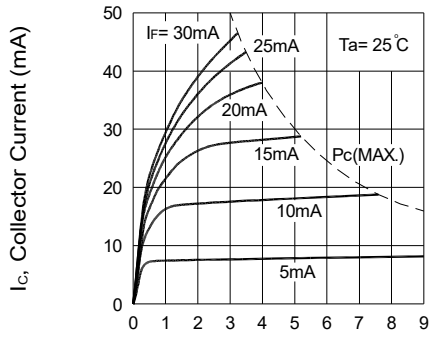


Figure 6: Collector Current vs. Collector-emitter Voltage

10.2 Typical Characteristic

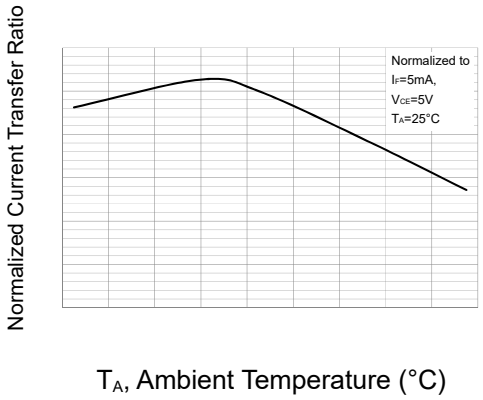


Figure 7: Relative Current Transfer Ratio vs. Ambient Temperature

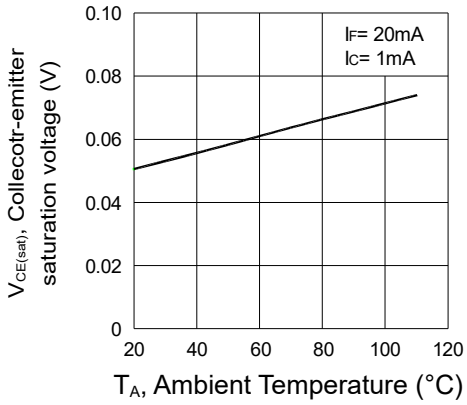


Figure 8: Collector-emitter Saturation Voltage vs. Ambient Temperature

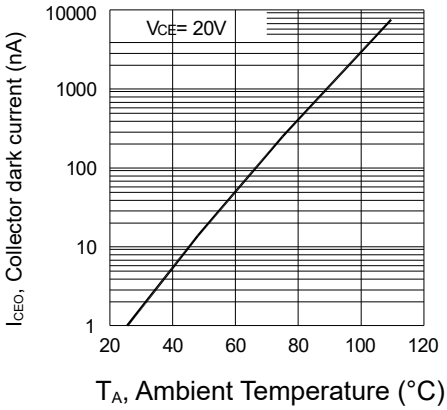


Figure 9: Collector Dark Current vs. Ambient Temperature

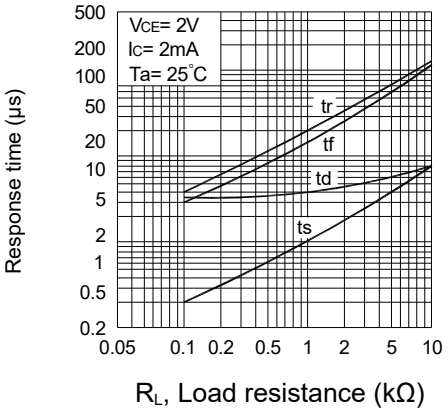


Figure 10: Response Time vs. Load Resistance

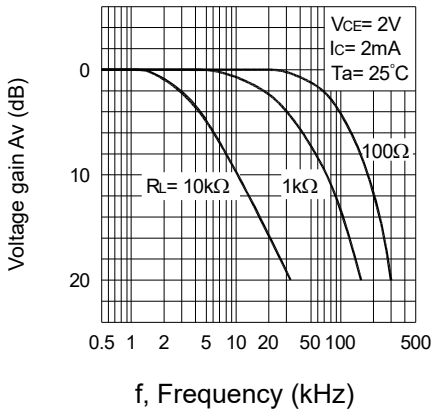
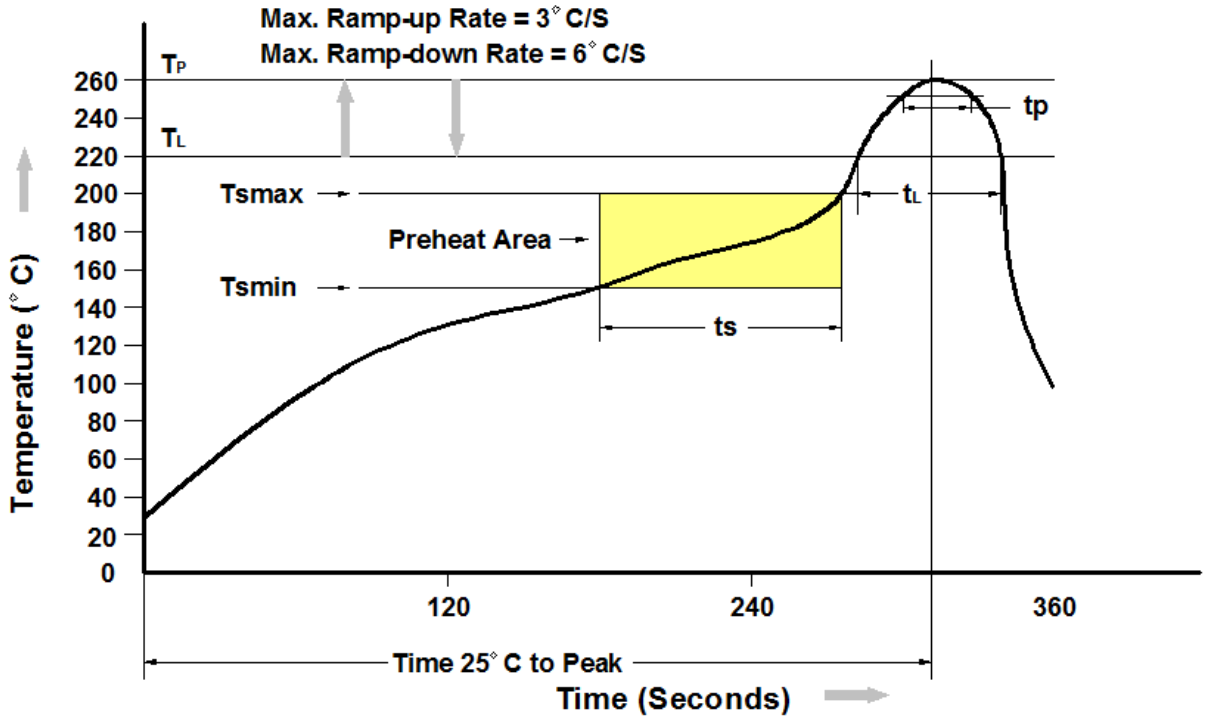


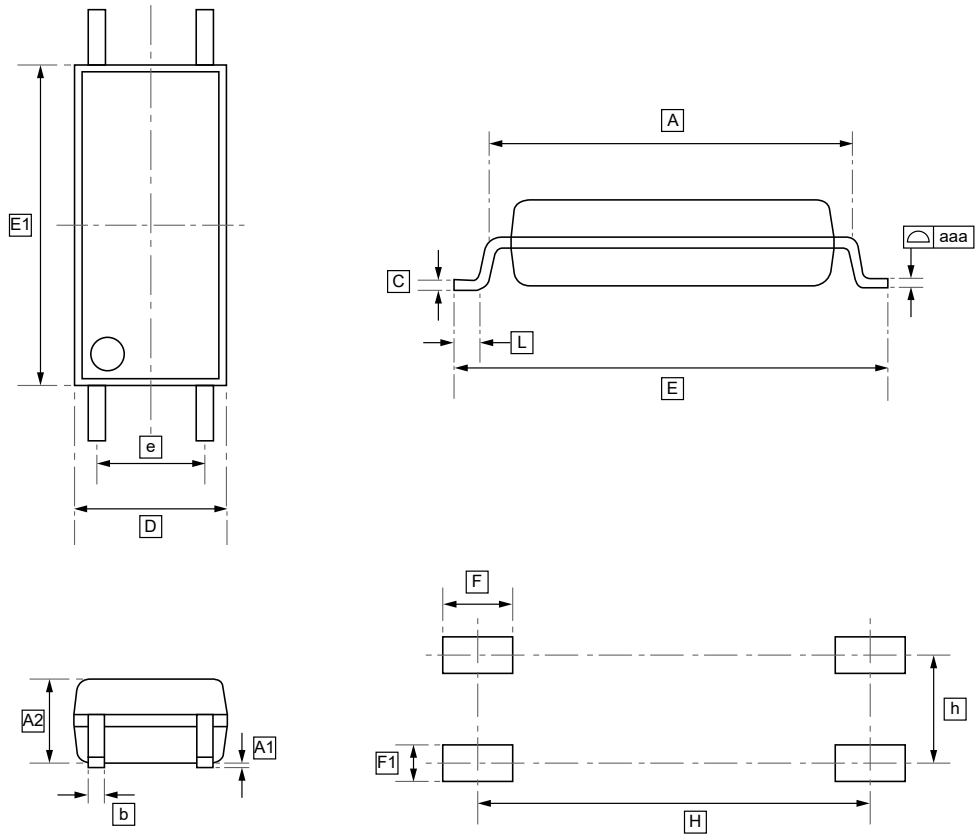
Figure 11: Frequency Response

11.Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min.(Tsmin)	150°C
Temperature Max.(Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60-150 seconds
Peak Body Package Temperature	260°C +0°C/-5°C
Time (t_P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

12.1 LSOP-4 Package Outline Dimensions

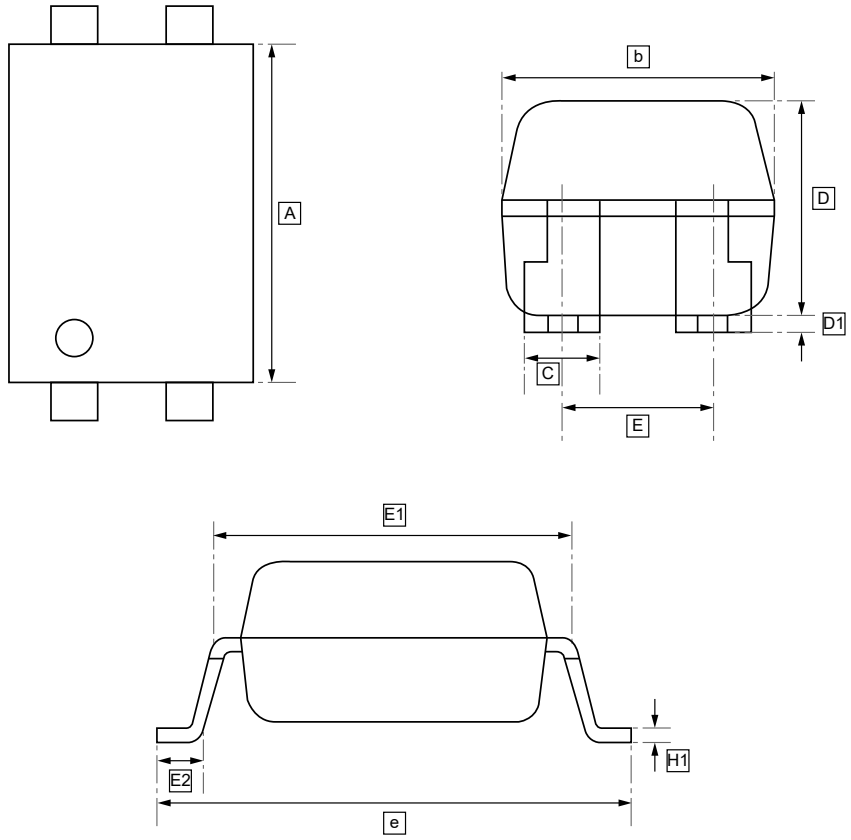


DIMENSIONS (mm are the original dimensions)

Symbol	E1	D	E	A	A2	e	A1	b	C	L	aaa	F
Min	7.32	3.30	9.90	8.35	1.75	2.54	0.00	0.30	0.10	0.40	0.00	1.60
Max	7.92	3.90	10.50	8.95	2.35		0.20	0.50	0.30	-	0.10	

Symbol	F1	H	h
Min	0.80	9.22	2.54
Max			

12.2 SOP-4 Package Outline Dimensions

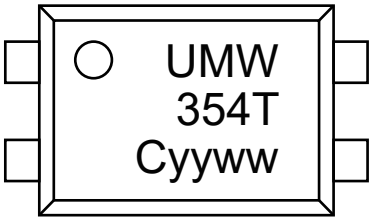


DIMENSIONS (mm are the original dimensions)

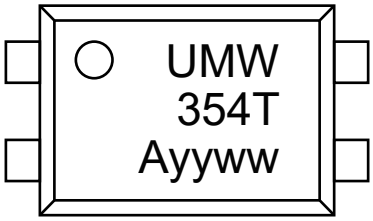
Symbol	A	b	C	D	D1	E	E1	E2	e	H1
Min	6.15	4.33	1.1	3.4	0.05	2.29	7.37	0.75	9.85	0.26
Max	6.65	4.83	1.3	3.9	0.6	2.79	7.87	1.25	10.45	

13.Ordering Information

UMW LTV-354T



UMW LTV-354T-A



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW LTV-354T	354T	SOP-4	3000	Tape and reel
UMW LTV-354T-A	354T	SOP-4	3000	Tape and reel

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