

1.Description

The UMW100X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic LSOP4 package.

With the robust coplanar double mold structure, UMW100X series provide the most stable isolation feature.

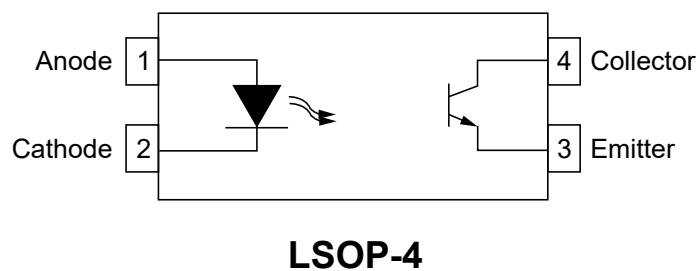
2.Applications

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

3.Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- RoHS & REACH Compliance
- Halogen free
- MSL class 1
- UL Recognized: UL1577, File No.E547318

4.Pinning information





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}	250	mW	
Isolation Voltage	V_{ISO}	5000	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

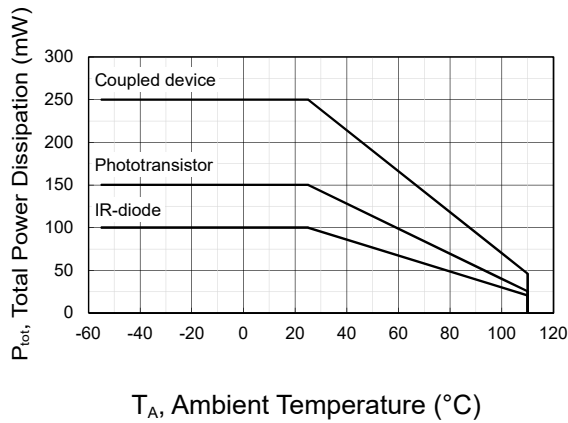
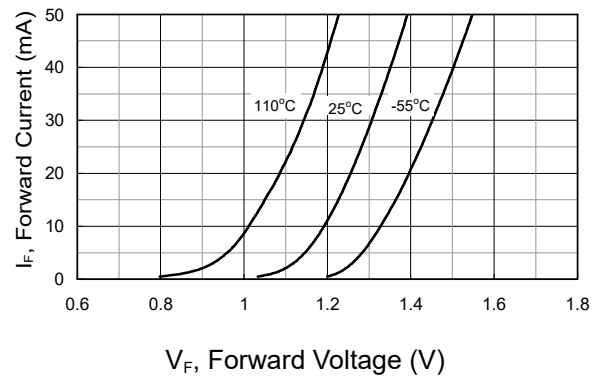
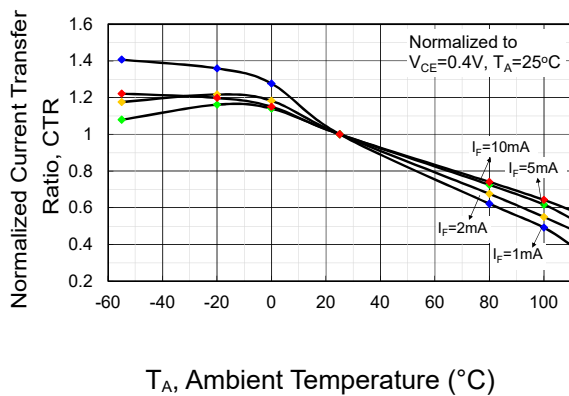
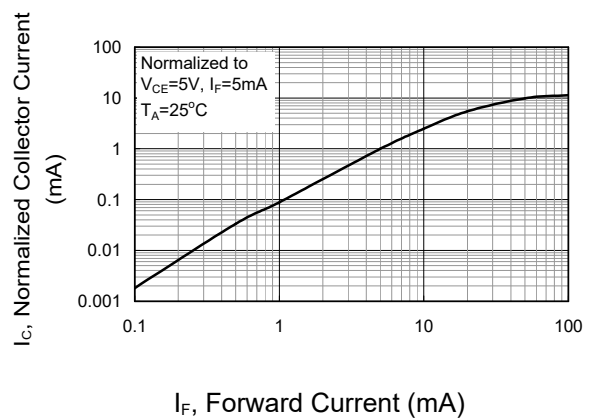
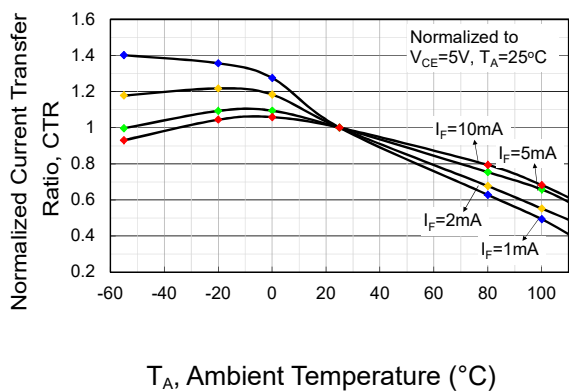
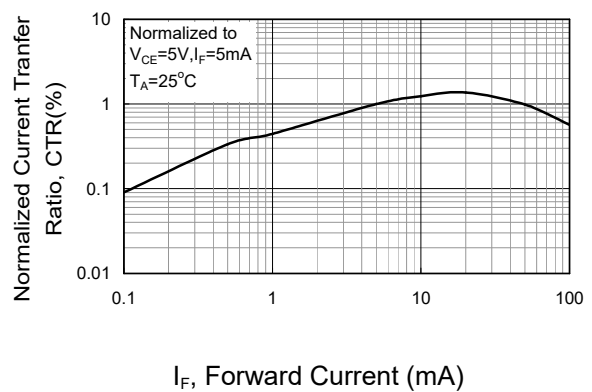
Parameter		Symbol	Conditions	Min	Typ	Max	Units
Input							
Forward Voltage		V_F	$I_F=10\text{mA}$		1.24	1.4	V
Reverse Current		I_R	$V_R=6\text{V}$			10	μA
Input Capacitance		C_{IN}	$V=0, f=1\text{kHz}$		30	250	pF
Output							
Collector Dark Current		I_{CEO}	$V_{CE}=20\text{V}, I_F=0$			100	nA
Collector-emitter Breakdown Voltage		BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	80			V
Emitter-collector Breakdown Voltage		BV_{ECO}	$I_E=0.1\text{mA}, I_F=0$	7			V
Transfer Characteristics							
Current Transfer Ratio	UMW 1007	CTR	$I_F=5\text{mA}, V_{CE}=5\text{V}$	80		160	%
	UMW 1008			130		260	
	UMW 1009			200		400	
Collector-emitter Saturation Voltage		$V_{CE(sat)}$	$I_F=10\text{mA}, I_C=1\text{mA}$		0.1	0.3	V
Isolation Resistance		R_{ISO}	DC500V, 40 ~ 60% R.H.	10^{12}	10^{14}		Ω
Floating Capacitance		C_{IO}	$V=0, f=1\text{kHz}$		0.4	1	pF
Cut-off Frequency (Note3)		F_C	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$		80		kHz
Response Time (Rise) (Note4)		T_r	$V_{CE}=2\text{V}, I_C=2\text{mA}$		5	18	μs
Response Time (Fall) (Note4)		T_f	$R_L=100\Omega$		6	18	μs

Note 3. Fig.12&13

Note 4. Fig.14



7.1 Typical Characteristic

Figure 1: P_{tot} vs. T_A Figure 2: I_F vs. V_F Figure 3: Saturated Normalized CTR vs. T_A Figure 4: Normalized I_C vs. I_F Figure 5: Non-saturated Normalized CTR vs. T_A Figure 6: Normalized CTR vs. I_F



7.2 Typical Characteristic

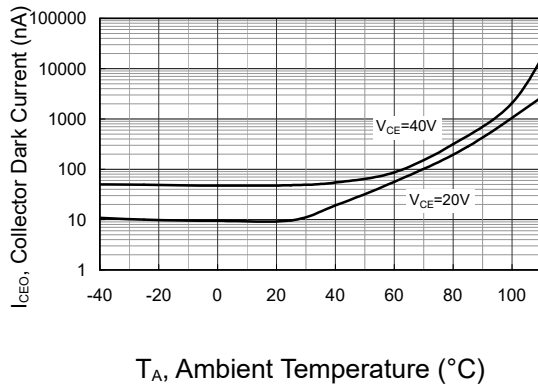
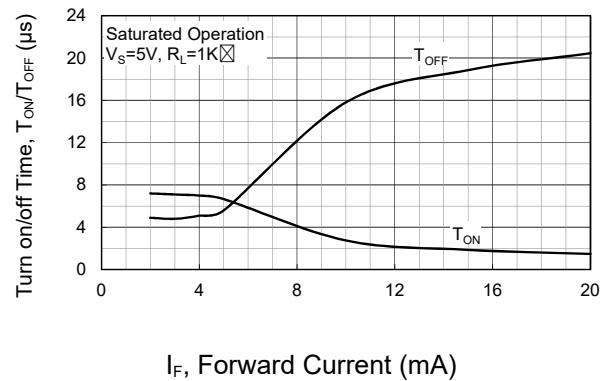
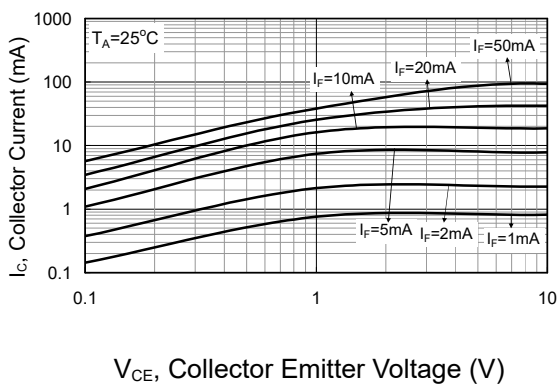
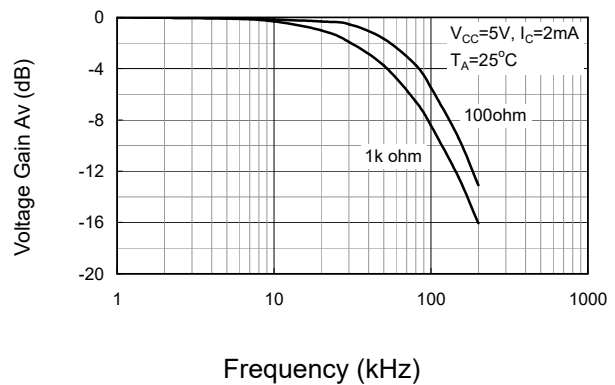
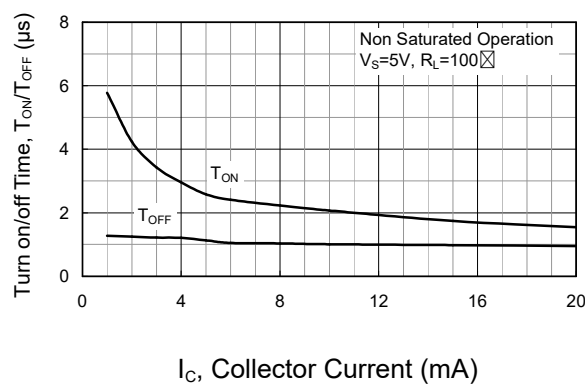
Figure 7: I_{CEO} vs. T_A Figure 8: T_{ON} / T_{OFF} vs. I_F Figure 9: I_C vs. V_{CE} 

Figure 10: Frequency Response

Figure 11: T_{ON} / T_{OFF} vs. I_C



8. Test Circuits

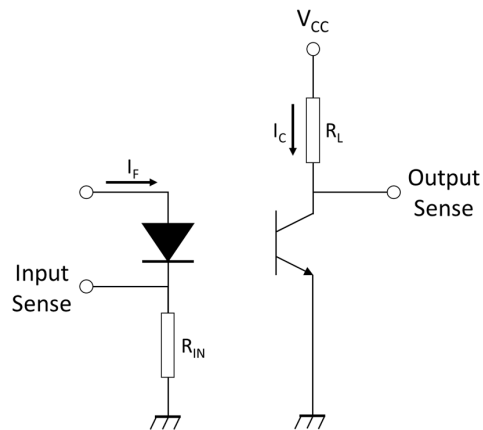


Figure 12: Test Circuits of Response Time

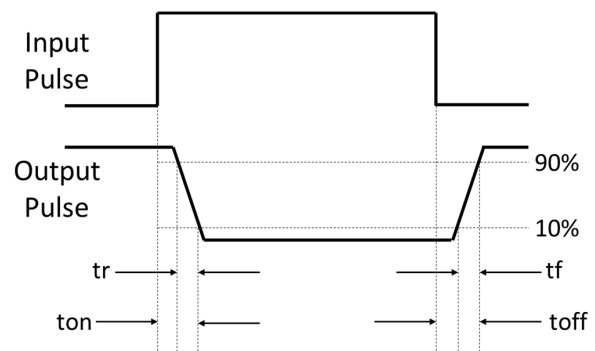


Figure 13: Curves of Response Time

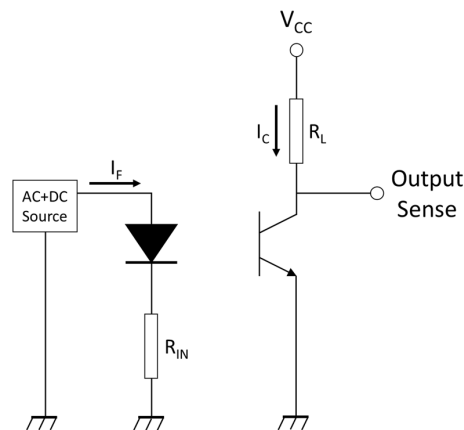
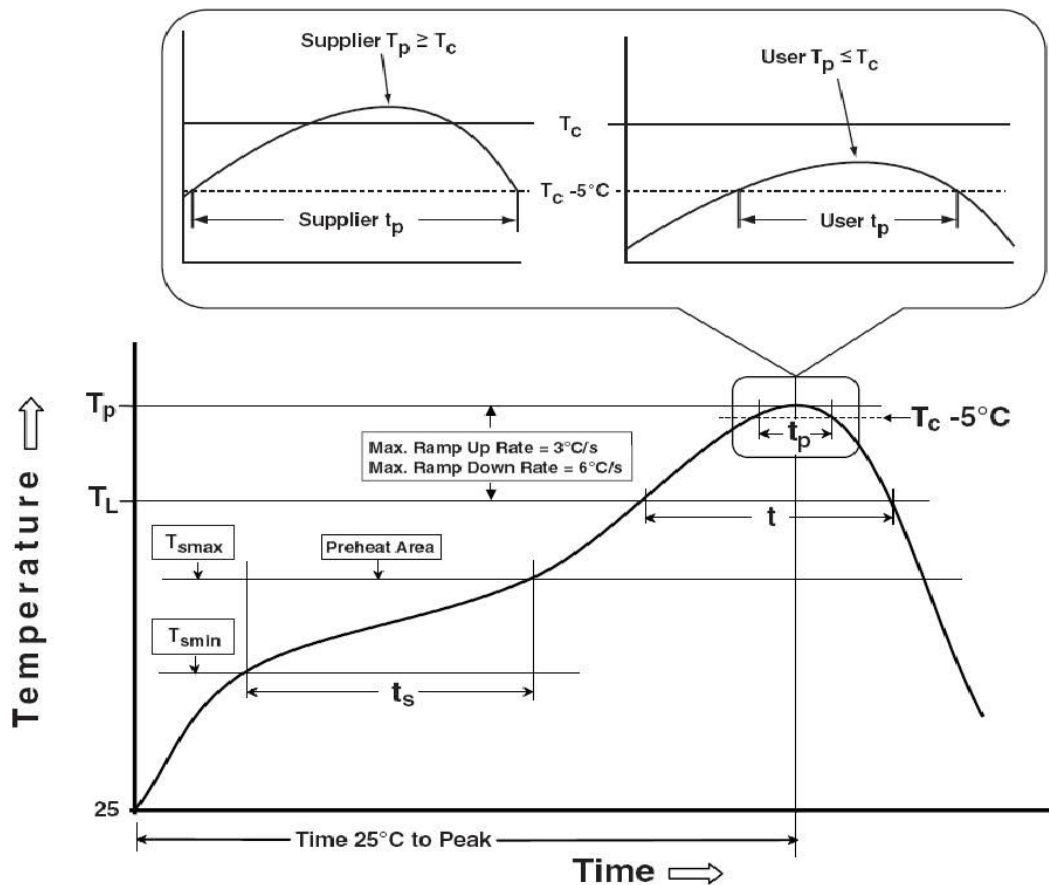


Figure 14: Test Circuits of Frequency Response



9. Temperature Profile of Solderin

IR REFLOW SOLDERING (J-SUMW-020D COMPLIANT)

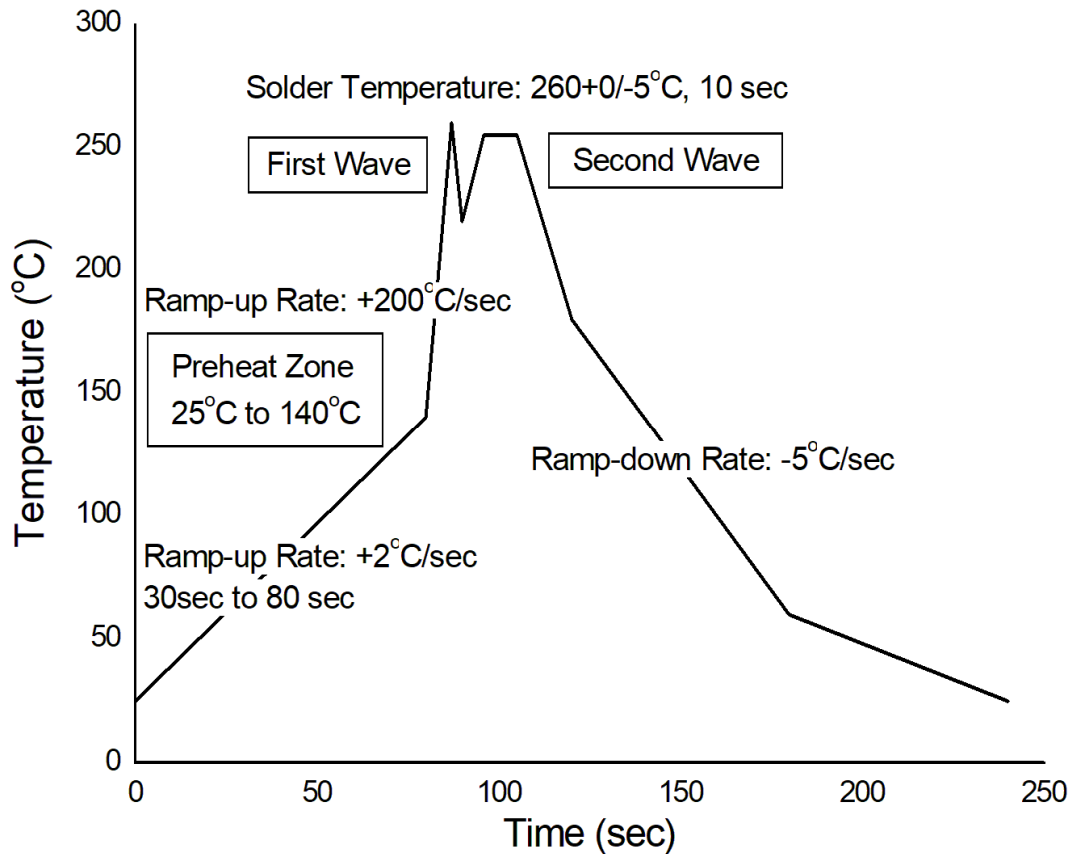




Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min.(T _{min})	100	150°C
Temperature Max.(T _{max})	150	200°C
Time (ts) from (T _{min} to T _{max})	60-120 seconds	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (t _L) 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 (t _P) 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.



IR REFLOW SOLDERING (J-SUMW-020D COMPLIANT)



Hand Soldering By Soldering Iron

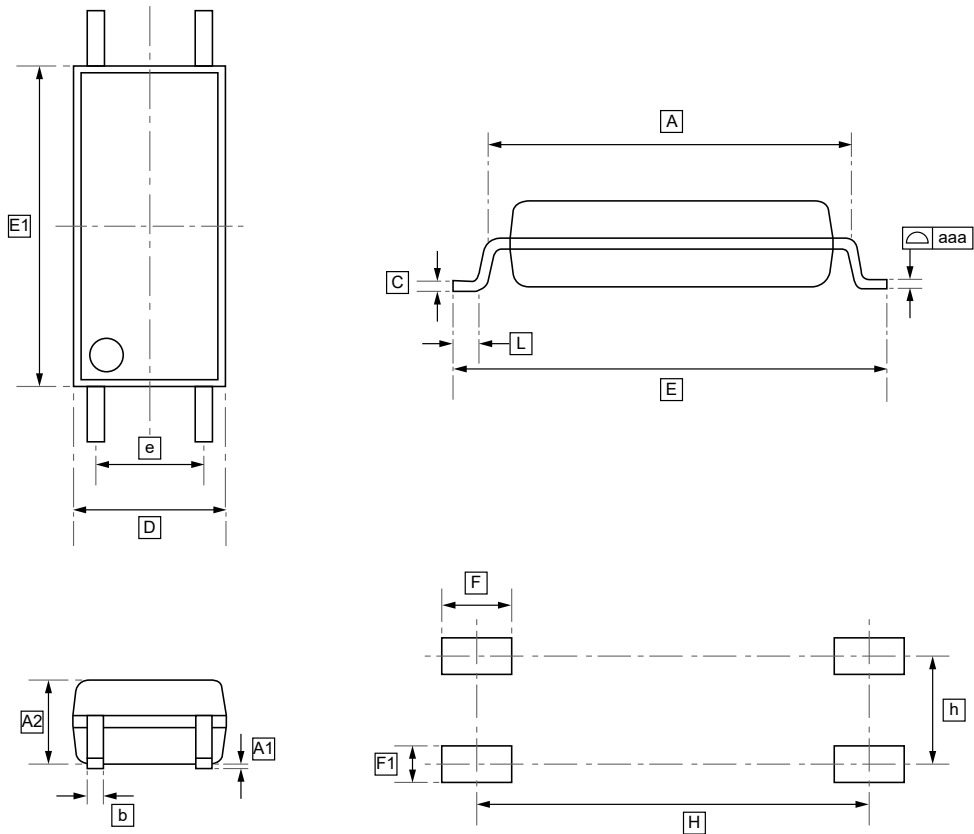
Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.

Note 5. One time soldering is recommended for all soldering method.

Note 6. Do not solder more than three times for IR reflow soldering.



10.LSOP-4 Package Outline Dimensions



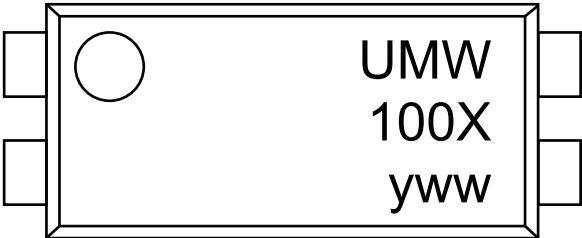
DIMENSIONS (mm are the original dimensions)

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			



11.Ordering information



y: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW LTV-1008	LSOP-4	3000	Tape and reel
UMW LTV-1009	LSOP-4	3000	Tape and reel



12.Disclaimer

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