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## Read Statement

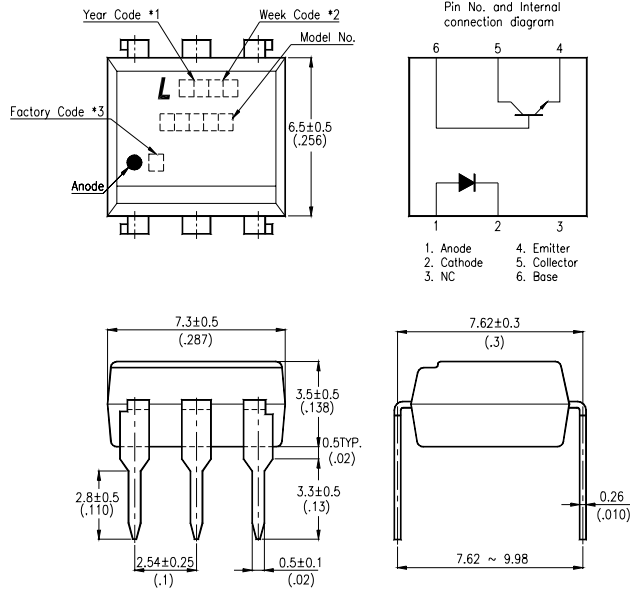
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## FEATURES

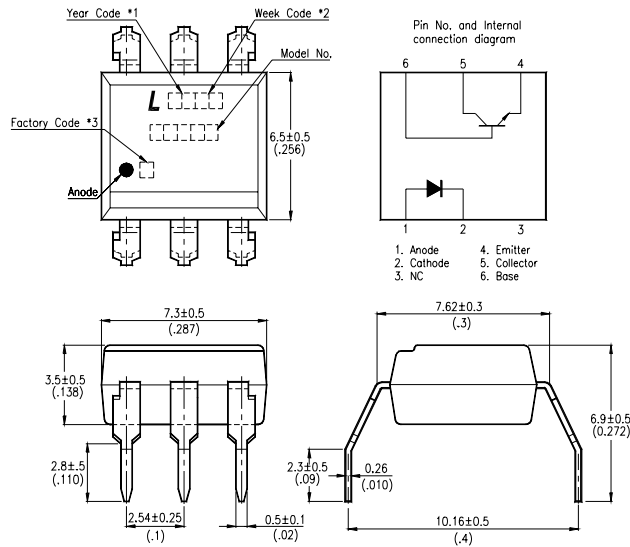
- \* High input-output isolation voltage  
(  $V_{iso} = 5,000V_{rms}$  )
- \* Current transfer ratio  
( CTR : MIN. 10% at  $I_F = 10mA$ ,  $V_{CE} = 10V$  )
- \* Dual-in-line package :  
H11A1, H11A2, H11A3, H11A4, H11A5
- \* Wide lead spacing package :  
H11A1M, H11A2M, H11A3M, H11A4M, H11A5M
- \* Surface mounting package :  
H11A1S, H11A2S, H11A3S, H11A4S, H11A5S
- \* Tape and reel packaging :  
(TYPE I) H11A1S-TA, H11A2S-TA, H11A3S-TA, H11A4S-TA, H11A5S-TA  
(TYPE II) H11A1S-TA1, H11A2S-TA1, H11A3S-TA1, H11A4S-TA1, H11A5S-TA1
- \* UL approved ( No. E113898 )
- \* FIMKO approved ( No. 209049 )
- \* NEMKO approved ( No. P99102464 )
- \* DEMKO approved ( No. 99-04182 )
- \* SEMKO approved ( No. 9943380 / 01-20 )
- \* VDE approved ( No. 094722 )
- \* CSA approve in progress

## OUTLINE DIMENSIONS

### Dual-in-line package:



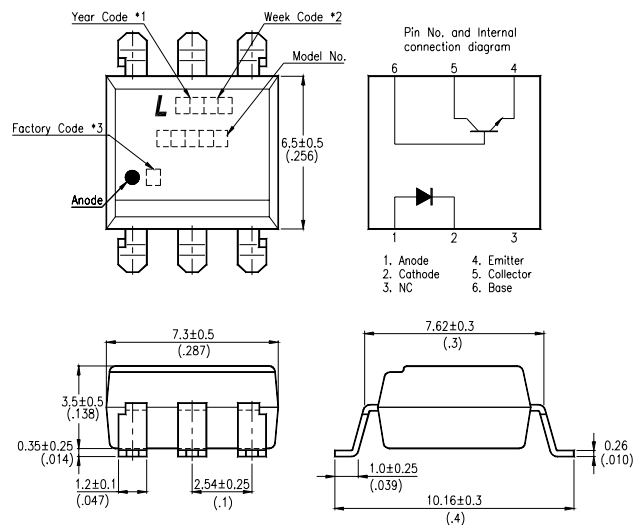
### Wide lead spacing package :



- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked (Z : Taiwan, Y : Thailand).
- \*4. Model No.: H11A1, H11A2, H11A3, H11A4, H11A5

## OUTLINE DIMENSIONS

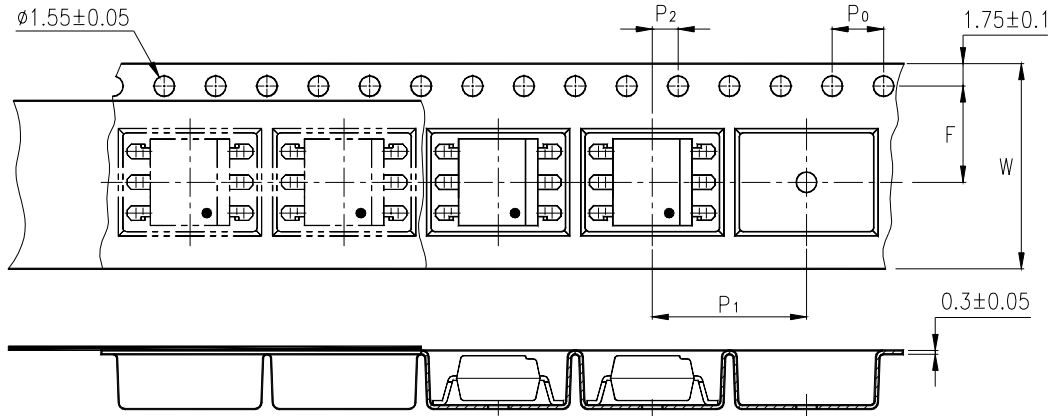
Surface mounting package :



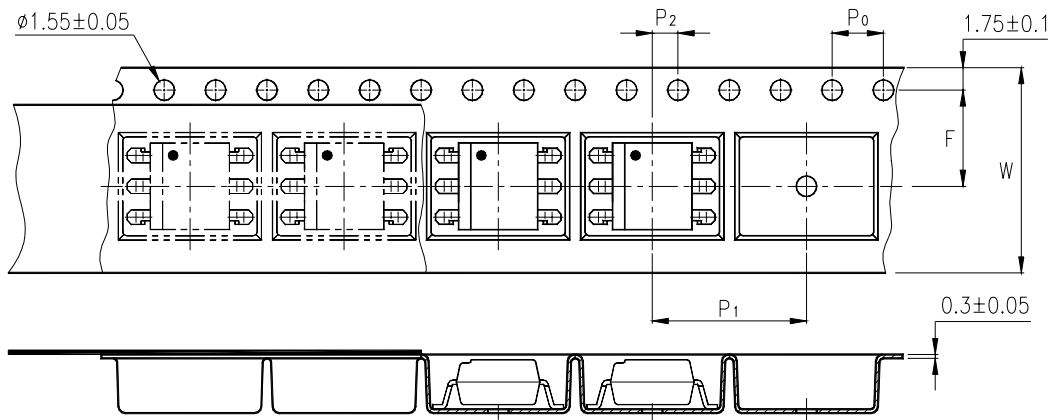
- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked (Z : Taiwan, Y : Thailand).
- \*4. Model No.: H11A1, H11A2, H11A3, H11A4, H11A5

## TAPING DIMENSIONS

### Tape and reel packaging ( TYPE I ):



### Tape and reel packaging ( TYPE II ):



Description	Symbol	Dimensions in mm ( inches )
Tape wide	W	16 ± 0.3 ( .63 )
Pitch of sprocket holes	P <sub>0</sub>	4 ± 0.1 ( .15 )
Distance of compartment	F	7.5 ± 0.1 ( .295 )
Distance of compartment to compartment	P <sub>2</sub>	2 ± 0.1 ( .079 )
Distance of compartment to compartment	P <sub>1</sub>	12 ± 0.1 ( .472 )

## ABSOLUTE MAXIMUM RATING

( Ta = 25°C )

PARAMETER		SYMBOL	RATING	UNIT
INPUT	Forward Current	I <sub>F</sub>	60	mA
	Reverse Voltage	V <sub>R</sub>	6	V
	Power Dissipation	P	100	mW
OUTPUT	Collector - Emitter Voltage	V <sub>CEO</sub>	30	V
	Emitter - Collector Voltage	V <sub>ECO</sub>	7	V
	Collector - Base Voltage	V <sub>CBO</sub>	70	V
	Collector Current	I <sub>C</sub>	150	mA
	Collector Power Dissipation	P <sub>C</sub>	150	mW
Total Power Dissipation		P <sub>tot</sub>	250	mW
*1	Isolation Voltage	V <sub>iso</sub>	5,000	V <sub>rms</sub>
Operating Temperature		T <sub>opr</sub>	-55 ~ +100	°C
Storage Temperature		T <sub>stg</sub>	-55 ~ +150	°C
*2	Soldering Temperature	T <sub>sol</sub>	260	°C

\*1. AC For 1 Minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

- (1) Short between anode and cathode on the primary side and between collector, emitter and base on the secondary side.
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave.

\*2. For 10 Seconds

### ELECTRICAL - OPTICAL CHARACTERISTICS

( Ta = 25°C )

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS	
INPUT	Forward Voltage	V <sub>F</sub>	—	1.2	1.5	V	I <sub>F</sub> =10mA	
	Reverse Current	I <sub>R</sub>	—	—	10	μA	V <sub>R</sub> =6V	
	Terminal Capacitance	C <sub>t</sub>	—	18	—	pF	V=0, f=1MHz	
OUTPUT	Collector Dark Current	I <sub>CEO</sub>	—	—	50	nA	V <sub>CE</sub> =10V, I <sub>F</sub> =0	
	Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	30	—	—	V	I <sub>C</sub> =0.1mA I <sub>F</sub> =0	
	Emitter-Collector Breakdown Voltage	BV <sub>ECO</sub>	7	—	—	V	I <sub>E</sub> =10μA I <sub>F</sub> =0	
	Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	70	—	—	V	I <sub>C</sub> =0.1mA I <sub>F</sub> =0	
	Collector-Emitter Capacitance	C <sub>CE</sub>	—	12	—	pF	V=0V, f=1MHz	
	Collector-Base Capacitance	C <sub>CB</sub>	—	17	—	pF	V <sub>CB</sub> =0V, f=1MHz	
	Emitter-Base Capacitance	C <sub>EB</sub>	—	25	—	pF	V <sub>EB</sub> =0V, f=1MHz	
TRANSFER CHARACTERISTICS	* Current Transfer Ratio	H11A1	CTR	50	—	—	%	I <sub>F</sub> =10mA V <sub>CE</sub> =10V
		H11A2		20	—	—		
		H11A3		20	—	—		
		H11A4		10	—	—		
		H11A5		30	—	—		
	Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	0.15	0.4	V	I <sub>F</sub> =10mA I <sub>C</sub> =0.5mA	
	Isolation Resistance	R <sub>iso</sub>	100	—	—	GΩ	DC500V 40 ~ 60% R.H.	
	Floating Capacitance	C <sub>f</sub>	—	0.3	—	pF	V=0, f=1MHz	
	Response Time (Rise)	t <sub>r</sub>	—	2.8	—	μs	V <sub>CC</sub> =10V, I <sub>F</sub> =10mA R <sub>L</sub> =100Ω	
	Response Time (Fall)	t <sub>f</sub>	—	4.5	—	μs		

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

## CHARACTERISTICS CURVES

Fig.1 Forward Current vs. Ambient Temperature

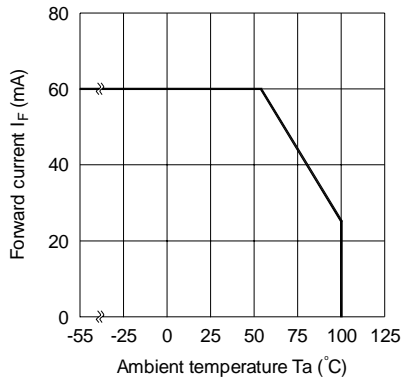


Fig.2 Collector Power Dissipation vs. Ambient Temperature

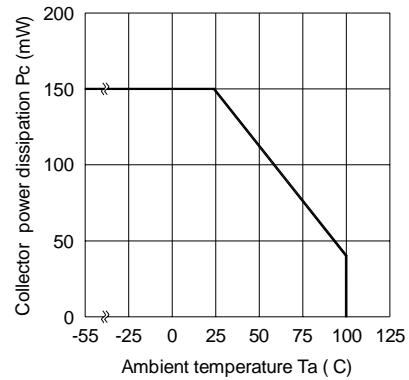


Fig.3 Collector-emitter saturation Voltage vs. Forward current

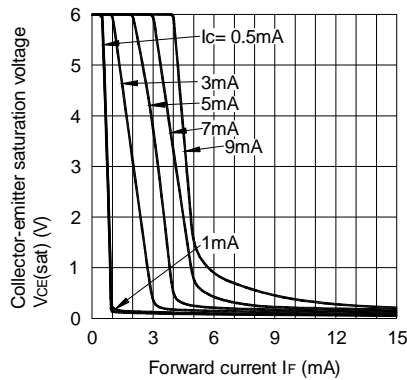


Fig.4 Turn-On Switching Times

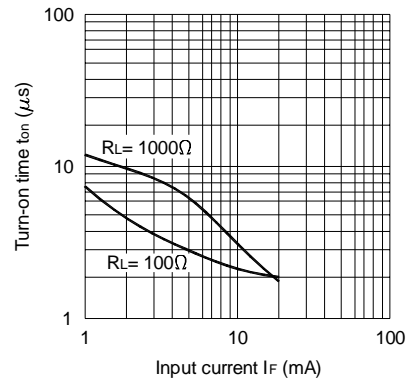


Fig.5 Current Transfer Ratio vs. Forward Current

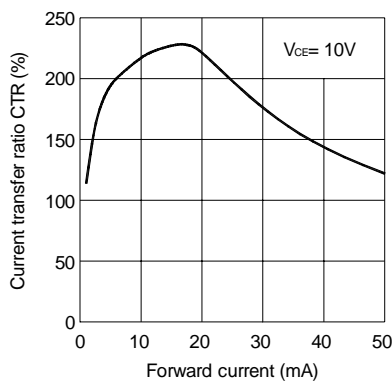
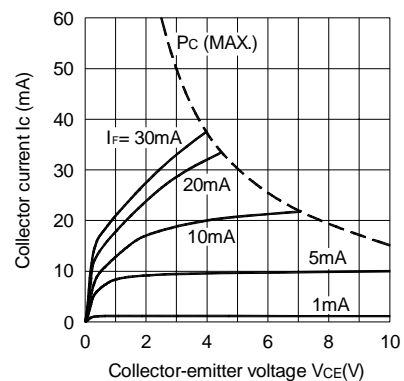


Fig.6 Collector Current vs. Collector-emitter Voltage





## CHARACTERISTICS CURVES

Fig.7 Rise and Fall Times

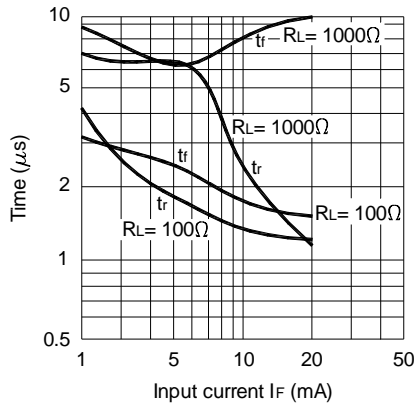
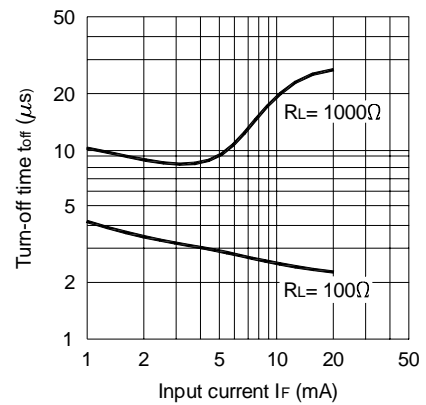
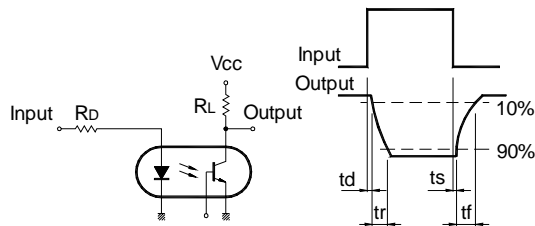


Fig.8 Turn-off Switching Times



Test Circuit for Response Time



Test Circuit for Frequency Response

