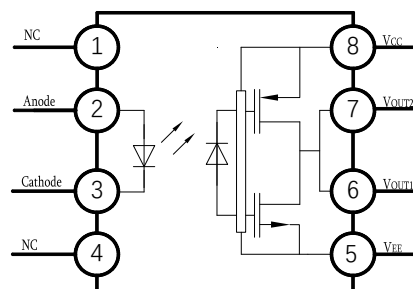


Features

- 3.0 A maximum peak output current
- Rail-to-rail output voltage
- 110 ns maximum propagation delay
- Under Voltage Lock-Out protection (U_{VLO}) with hysteresis
- Wide operating range: 15 to 30 Volts (V_{CC})
- High isolation voltage between input and output ($V_{iso} = 5000V_{rms}$)
- Operating Temperature: $-40^{\circ}C \sim 110^{\circ}C$

HF



Applications

- Plasma Display Panel
- IGBT/MOSFET gate drive
- Industrial Inverter
- Induction heating
- Uninterruptible power supply (UPS)

Mechanical Data

- Case: DIP-8L、SMD-8L(S)、SMD-8L(S1)、SMD-8L(S2)
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



Truth Table (Positive Logic) :

LED	VO
ON	H
OFF	L

Ordering Information

BL 3120 (M) (G) (X) - (U) (N) (Y)

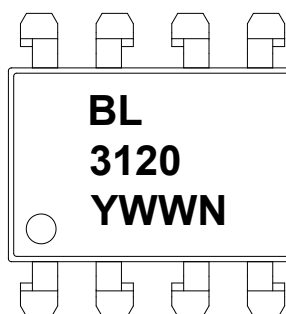
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Brand(BL)
- ② Product series(3120)
- ③ Package type(DIP-8L:None, ,SMD-8L(S):S, SMD-8L(S1):S1, SMD-8L(S2):S2)
- ④ Halogen option(None :Halogen free)
- ⑤ Package expansion (0-9 or none)
- ⑥ Lead frame (None: Copper)
- ⑦ Customer option 1 (0-9 or A-Z or none)
- ⑧ Customer option 2 (0-9 or A-Z or none)

Part Number	Package	Shipping Quantity	Marking Code
BL3120	DIP-8L	45 pcs / Tube	BL3120
BL3120S	SMD-8L(S)	1000 pcs / Tape & Reel	BL3120
BL3120S1	SMD-8L(S1)	1000 pcs / Tape & Reel	BL3120

Marking Information

- "BL" denotes brand
- "3120" denotes Product series.
- "Y" denotes Year : A(2024), B(2025), C(2026)
- "WW" denotes Week's number
- "N" denotes the day of Week.



Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Min.	Max.	Unit
Emitter	Forward Current	I _F	-	20	mA
	Reverse Voltage	V _R	-	5	V
	Power Dissipation	P _I	-	45	mW
Detector	Output IC Power Dissipation	P _O	-	250	mW
	"High" Peak Output Current *1	I _{OH} (PEAK)	-	3	A
	"Low" Peak Output Current*1	I _{OL} (PEAK)	-	3	A
	Total Output Supply Voltage	(V _{CC} -V _{SS})	0	35	V
	Output Voltage	V _O (PEAK)	-0.5	V _{CC}	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage ^{*2}	V _{ISO}	5000	V _{rms}
Operating Temperature	T _{OPR}	-40 ~ +110	°C
Storage Temperature Range	T _{STG}	-55 ~ +125	°C
Output IC Junction Temperature	T _J	125	°C
Soldering Temperature ^{*3}	T _{SOL}	260	°C

Notes:

1. Exponential waveform. Pulse width ≤ 10 μs, f ≤ 15 kHz

2. 40 to 60% RH, AC for 1 minute

3. For 10 seconds

Electrical Characteristics (@ T_A = 25°C and V_{CC} – V_{EE} = 30 V, unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V _F	I _F = 10mA	1.6	2	2.4	V
	Reverse Breakdown Voltage	B _{VR}	I _R = 10μA	5	-	-	V
	Threshold Current (Low to High)	I _{FLH}	V _{CC} = 30 V, V _O > 5V	-	1.0	5	mA
	Threshold Voltage (High to Low)	V _{FHL}	V _{CC} = 30 V, V _O < 5V	0.8	-	-	V
	Capacitance	C _{IN}	V _F = 0V, f = 1MHz	-	60	-	pF
Output	High Level Supply Current	I _{CCH}	V _{CC} =30V, I _F =10mA V _O =Open	-	1.6	3.0	mA
	Low Level Supply Current	I _{CCL}	V _{CC} =30V, I _F =0mA V _O =Open	-	2.0	3.0	mA
	High Level Output Current	I _{OH} ^{*1}	V _O = (V _{CC} – 1.5 V) ^{*1}	-	-	-1.0	A
			V _O = (V _{CC} – 4 V) ^{*2}	-	-	-3.0	
	Low Level Output Current	I _{OL}	V _O = (V _{EE} + 1.5 V) ^{*1}	1.0	-	-	A
			V _O = (V _{EE} + 4 V) ^{*2}	3.0	-	-	
	High Level Output Voltage	V _{OH}	I _F =10mA, I _O = -100mA	V _{CC} - 0.3	V _{CC} - 0.15	-	V
	Low Level Output Voltage	V _{OL}	I _F = 0mA, I _O = 100mA	-	V _{EE} + 0.1	V _{EE} + 0.25	V
	U _{VLO} Threshold	V _{UVLO+}	V _O > 5V, I _F = 10 mA	11.0	12.5	13.5	V
		V _{UVLO-}	V _O < 5V, I _F = 10 mA	9.5	11.1	12.0	V
	U _{VLO} Hysteresis	U _{VLOHYS}	-	-	1.4	-	V

Notes:

1: Maximum pulse width = 50 μ s.

2: Maximum pulse width = 10 μ s.

Switching Characteristics (@ $T_A = 25^\circ\text{C}$, $V_{CC} - V_{EE} = 30\text{ V}$, unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to Output HIGH Level	T_{PLH}	$R_g = 10\Omega$, $C_g = 25\text{nF}$, $f = 10\text{ kHz}$, Duty Cycle = 50% $I_F = 7\text{ to }16\text{ mA}$, $V_{CC} = 10\text{ to }30\text{ V}$ $V_{EE} = \text{ground}$	-	60	110	ns
Propagation Delay Time to Output Low Level	T_{PHL}		-	70	110	ns
Pulse Width Distortion	P_{WD}		-	5	100	ns
Propagation delay difference between any two parts or channels	P_{DD}^{*1}		-100	-	100	ns
Output Rise Time (10–90%)	t_r		-	5	-	ns
Output Rise Time (90–10%)	t_f		-	5	-	ns
Common Mode Transient Immunity (at Output HIGH Level)	$ CM_H ^{*2}$	$T_A = 25^\circ\text{C}$, $I_F = 10\text{ to }16\text{ mA}$, $V_{CM} = 1500\text{ V}$, $V_{CC} = 30\text{ V}$	35	-	-	KV/us
Common Mode Transient Immunity (at Output LOW Level)	$ CM_L ^{*3}$	$T_A = 25^\circ\text{C}$, $V_F = 0\text{ V}$, $V_{CM} = 1500\text{ V}$, $V_{CC} = 30\text{ V}$	35	-	-	KV/us

Notes:

1: The difference between t_{PHL} and t_{PLH} between any two parts under same test conditions.

2: CM_H is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic high state ($V_O > 15\text{ V}$).

3: CM_L is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic low state ($V_O < 1\text{ V}$).

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Fig.1 High Output Rail Voltage vs. Temperature

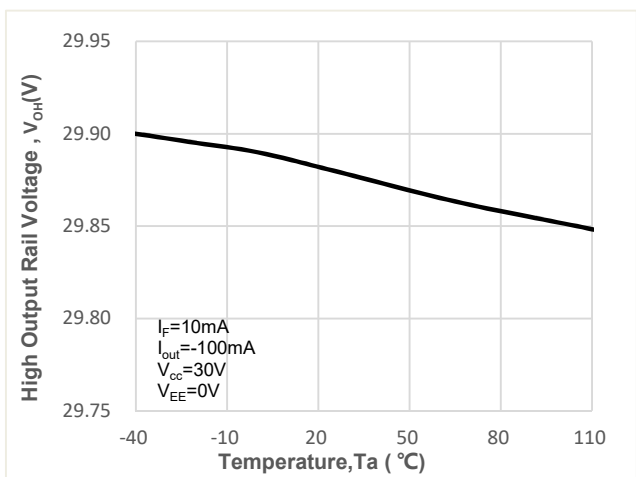


Fig.2 High Output Voltage Drop vs. Ambient Temperature

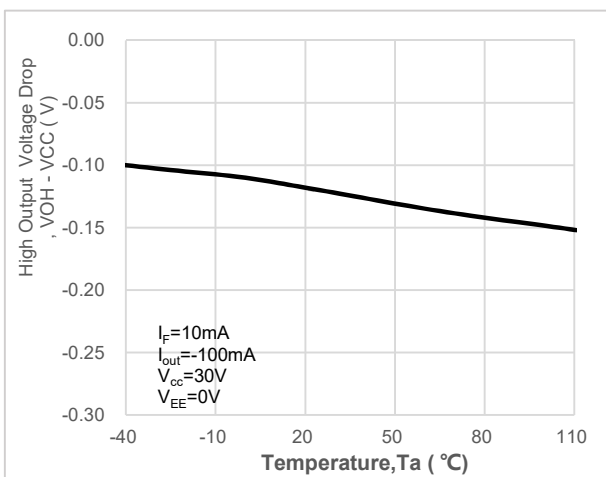


Fig.3 Output Low Voltage vs. Ambient Temperature

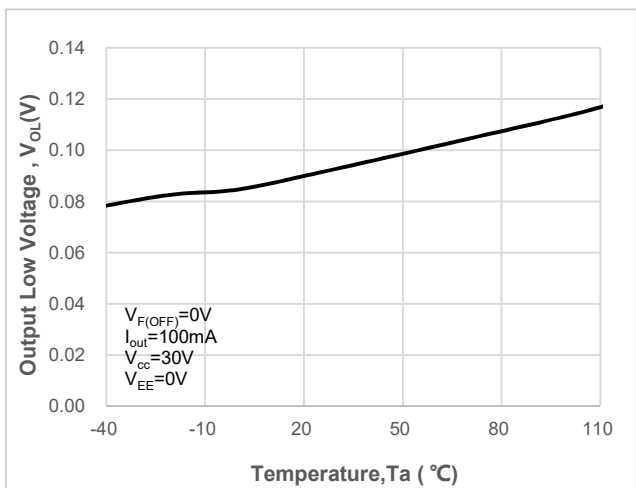


Fig.4 Supply Current vs. Ambient Temperature

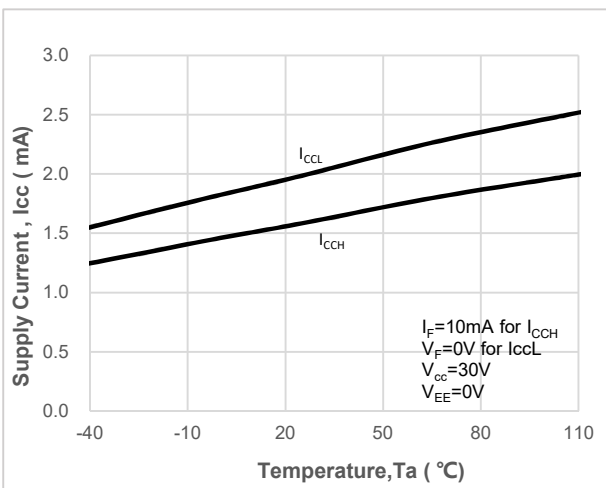


Fig.5 Supply Current vs. Supply Voltage

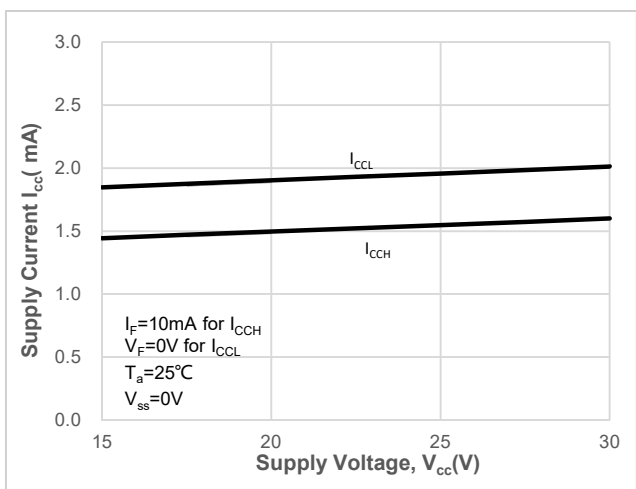


Fig.6 I_{FLH} vs. Hysteresis

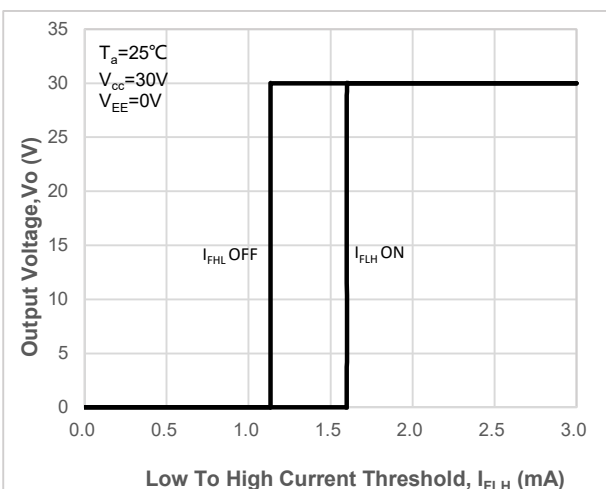


Fig.7 I_{FLH} vs. Ambient Temperature

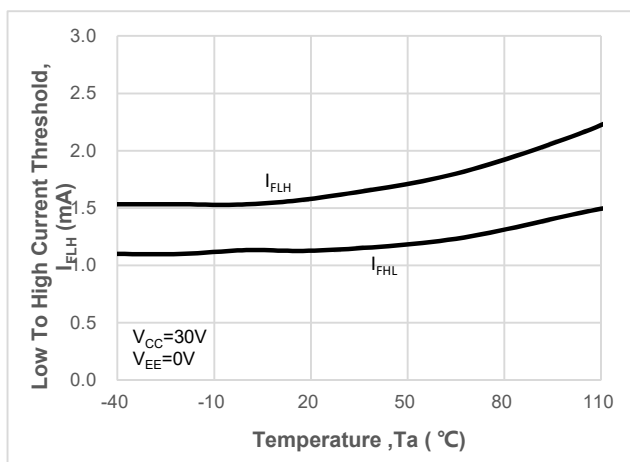


Fig.8 Propagation Delays vs. Supply Voltage

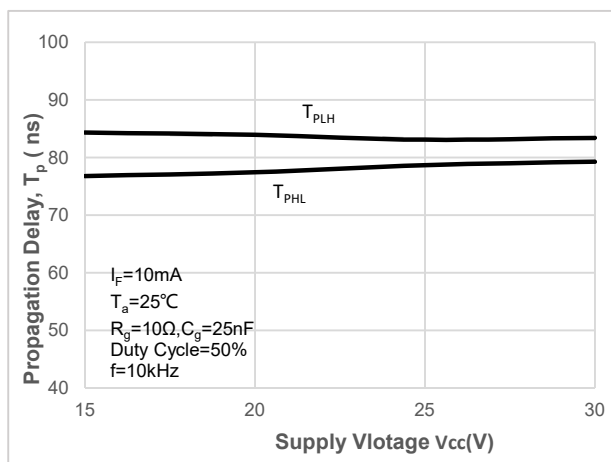


Fig.9 Propagation Delays vs. Supply Current

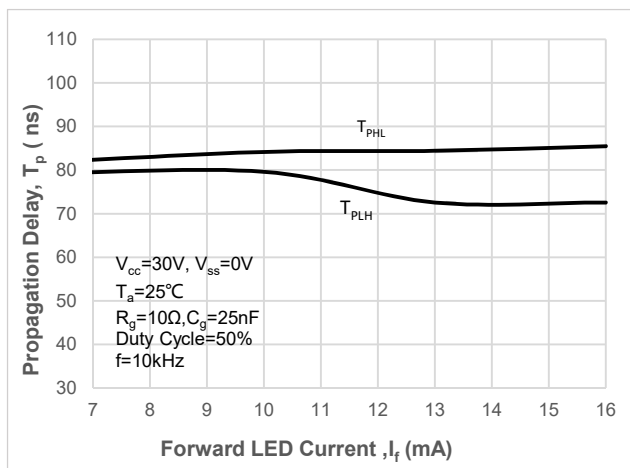


Fig.10 Propagation Delays vs. Ambient Temperature

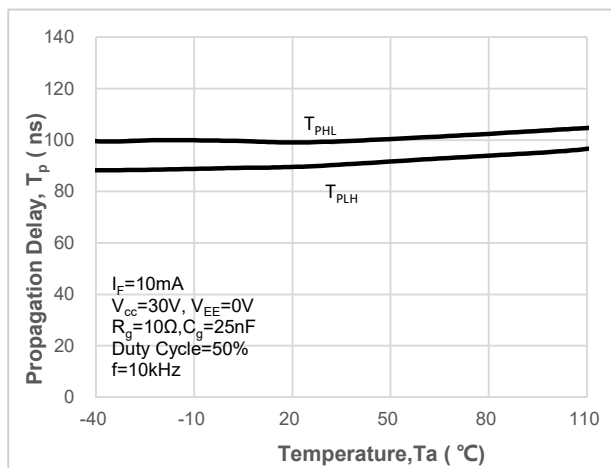


Fig.11 Propagation Delays vs. Load Resistance

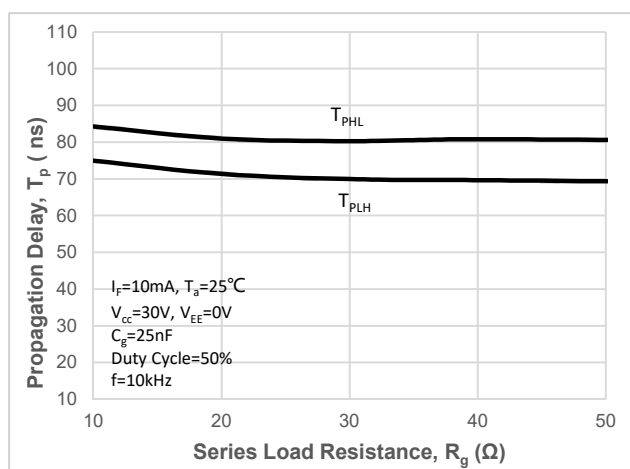


Fig.12 Propagation Delays vs. Load Capacitance

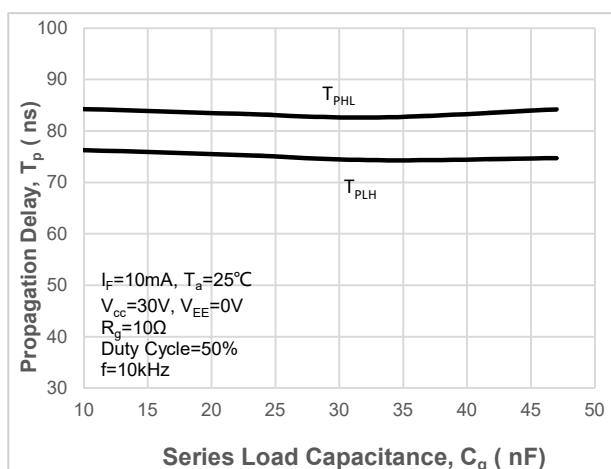


Fig.13 Forward Current vs. Forward Voltage

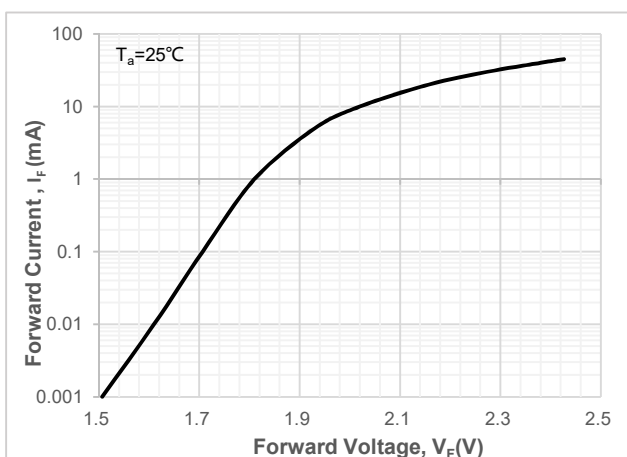


Fig.14 I_{OH} Test Circuit

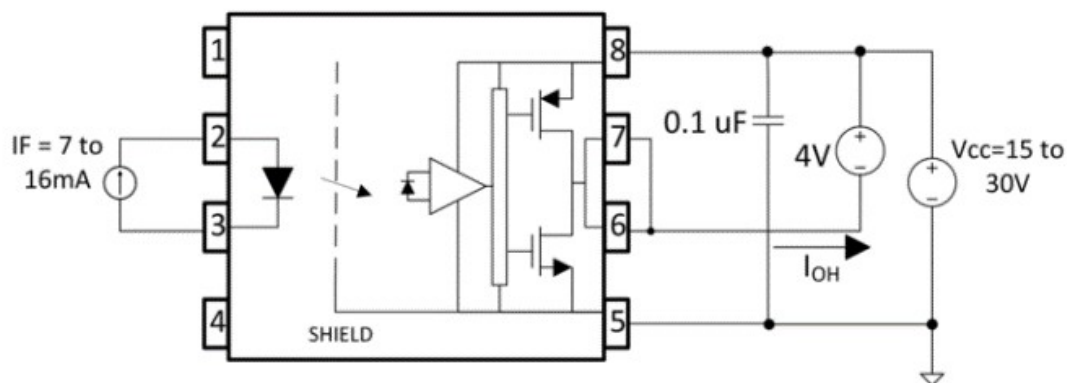


Fig.15 I_{OL} Test Circuit

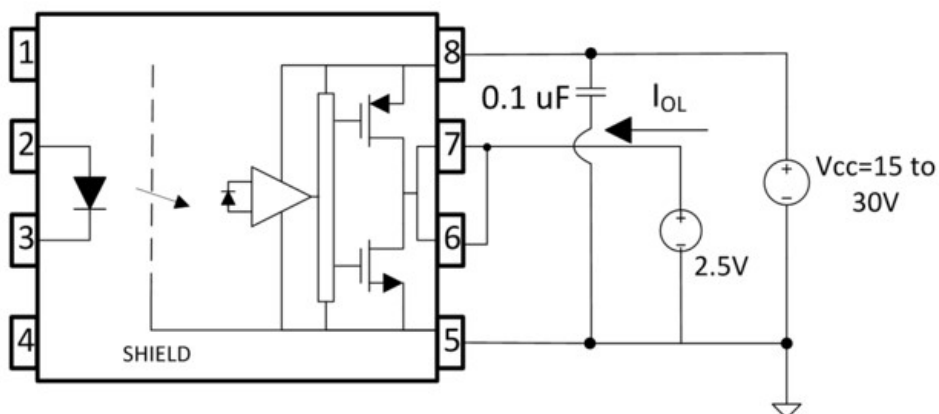


Fig.16 t_{PHL} , t_{PLH} , t_r and t_f Test Circuit and Waveforms

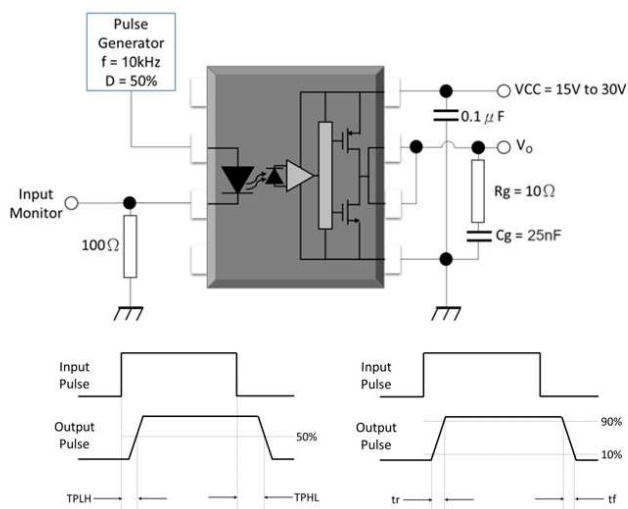
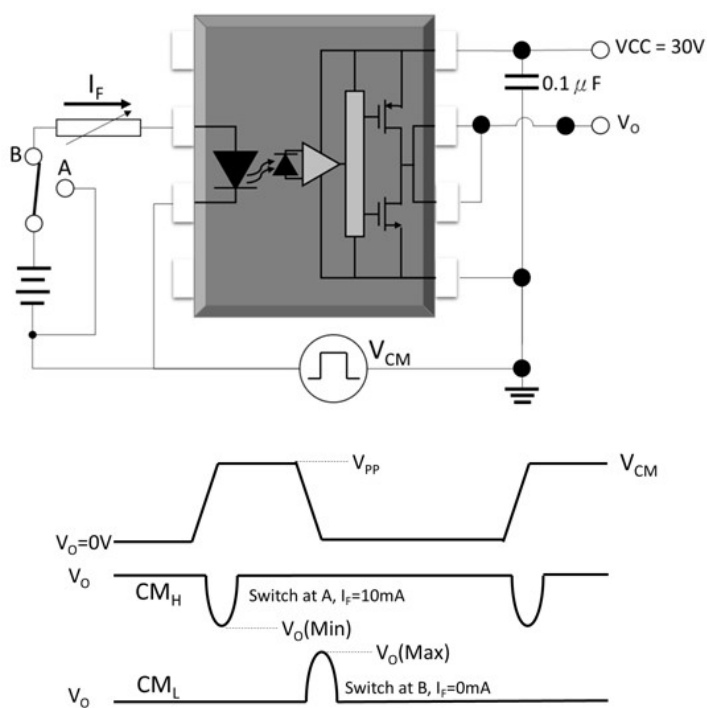
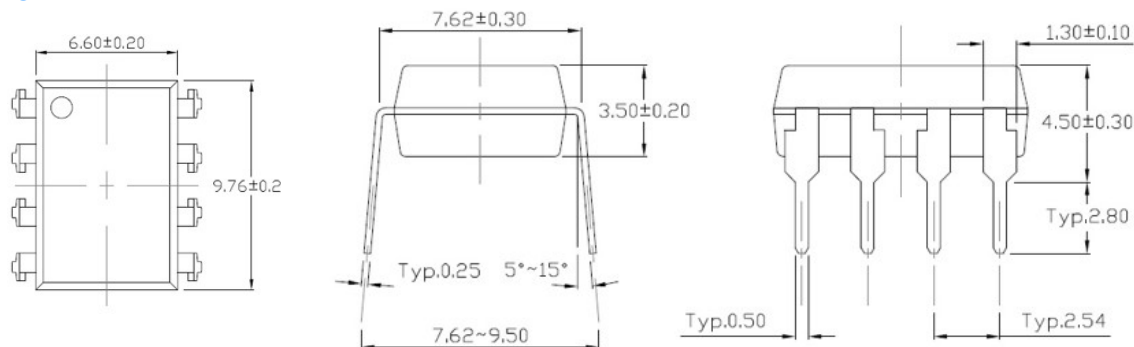


Fig.17 CMR Test Circuit with Split Resistors Network and Waveforms

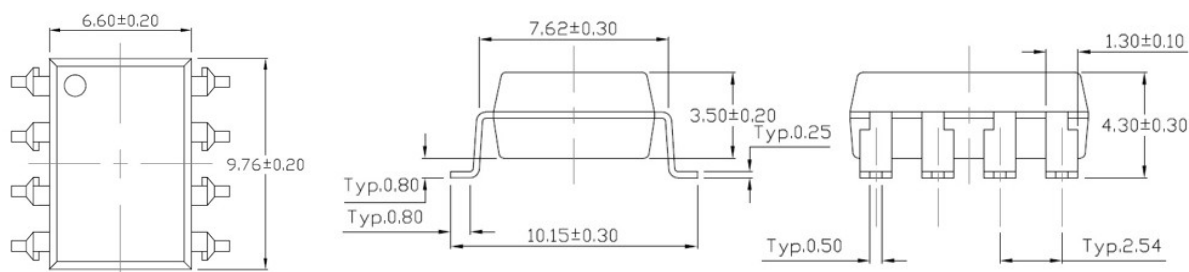


Package Outline Dimensions (unit: mm)

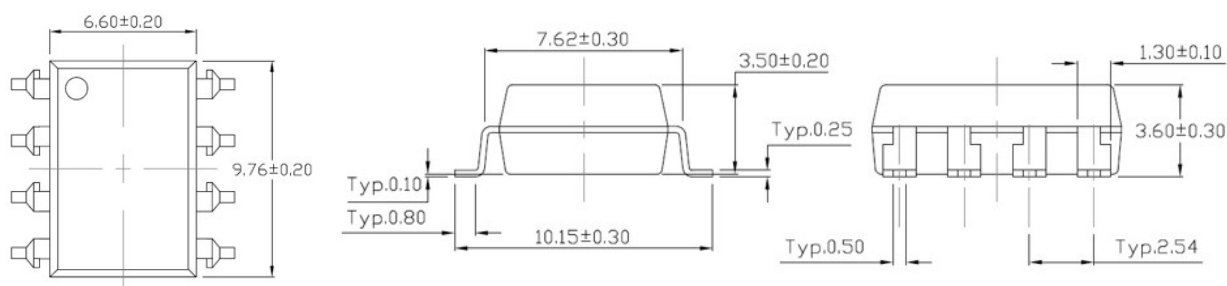
DIP-8L



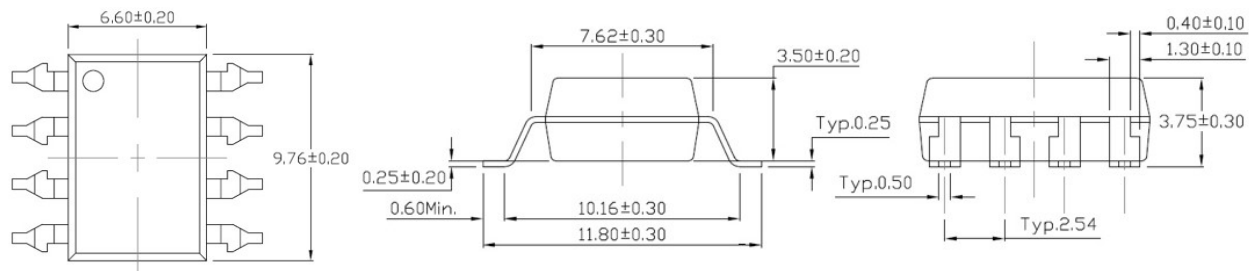
SMD-8L(S)



SMD-8L(S1)

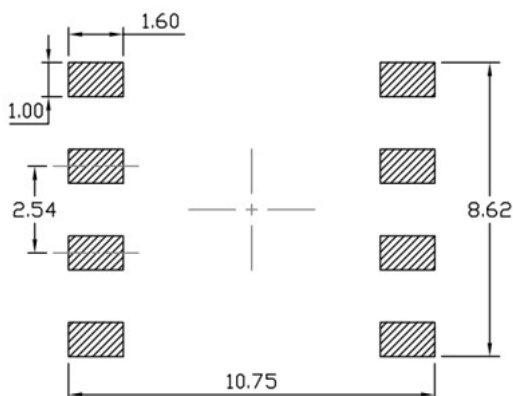


SMD-8L(S2)

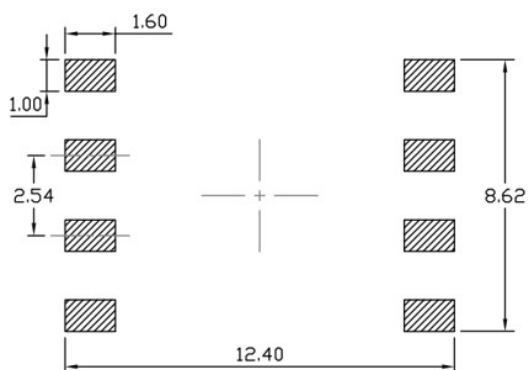


SOLDERING FOOTPRINT (unit: mm)

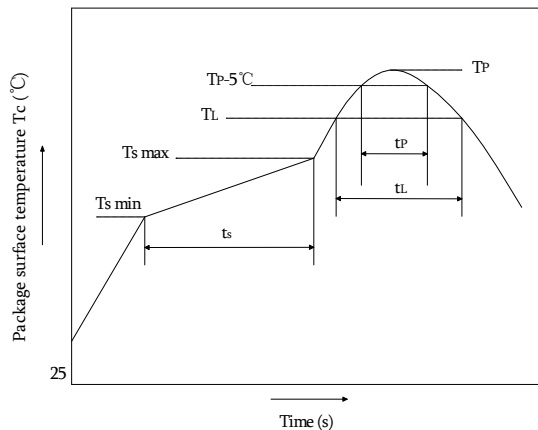
SMD-8L(S) / SMD-8L(S1)



SMD-8L(S2)



Reflow soldering

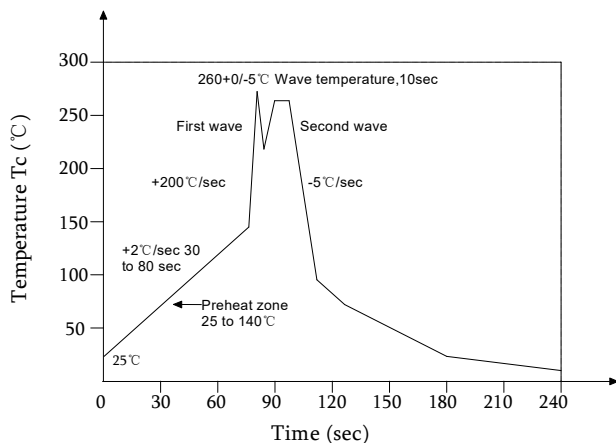


	Symbol	Min	Max	Unit
Preheat temperature	T_s	150	200	$^\circ\text{C}$
Preheat time	t_s	60	120	s
Ramp-up rate(T_L to T_P)			3	$^\circ\text{C/s}$
Liquidus temperature	T_L	217		$^\circ\text{C}$
Time above T_L	t_L	60	150	s
Peak temperature	T_p		260	$^\circ\text{C}$
Time during which T_c is between ($T_P - 5$) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	$^\circ\text{C/s}$

Note:

Reflow soldering is recommended at the temperatures and times shown, no more than three times.

Wave soldering



Profile feature	
Average ramp-up rate	$\sim 200^\circ\text{C/s}$
Heating rate during preheat	1°C/s to 2°C/s typical; 4°C/s maximum
Final preheat temperature T_s	$\sim 130^\circ\text{C}$
Preheat time (25°C to T_s)	$> 60\text{s}$
Peak temperature T_p	260°C
Time within peak temperature t_p	10s
Ramp-down rate	5°C/s maximum

Soldering with hand soldering iron

- Hand soldering iron is only used for product rework or sample testing.
- Hand soldering iron requirements: Temperature: $360^\circ\text{C} \pm 5^\circ\text{C}$ within 3s.

Packing

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
DIP-8L	Tube(500mm)	45 pcs/tube	25 tubes /box	12 boxes /ctn	190*670mm	520*105*50mm	545*372*235mm	Straight insert type material tube
SMD-8L(S)/ SMD-8L(S1)/ SMD-8L(S2)	Reel(φ330mm)	1000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Guard band 200mm /min.

■Summary table

■DIP-8L (Tube)

Qty/ tube : 45 pcs. Qty/box: 1.125 pcs.

Qty/ctn : 13500 pcs.

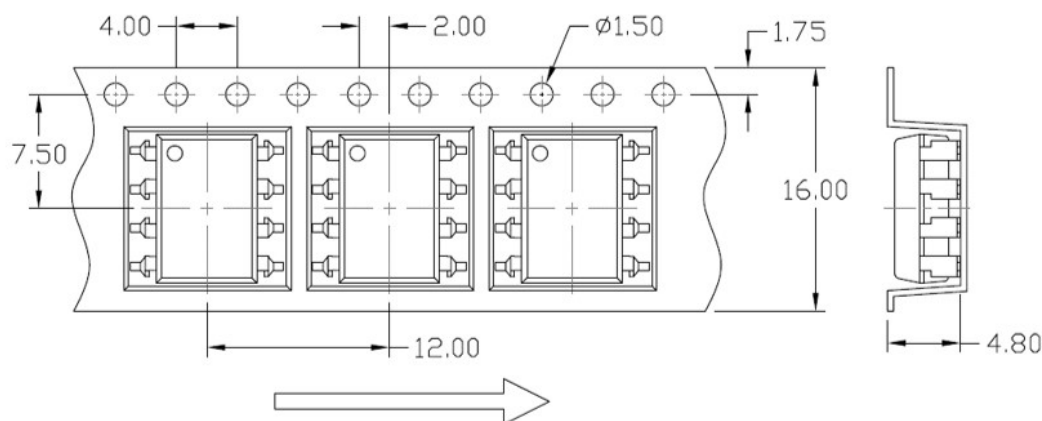
Schematic: (unit:mm)

■SMD-8L(S)/ SMD-8L(S1)/ SMD-8L(S2) (Reel)

Qty/reel: 1000 pcs. Qty/box: 2000 pcs.

Qty/ctn : 10000 pcs.

Schematic: (unit:mm)



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