恒拓电子
HENGTUO ELECTRONICS

HT series

Photo Coupler
Product Specification

HT-3150

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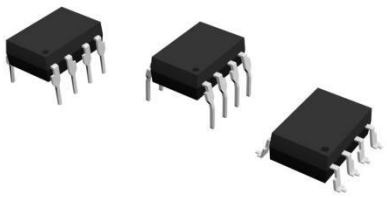
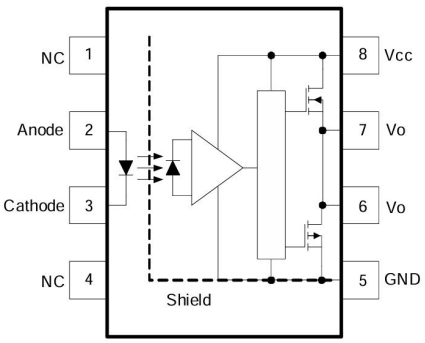
■ Package





A 0.1μF bypass Capacitor must be connected between Pin 5 and 8.

■ Description

The HT-3150 consists of an infrared light emitting diodes and integrated high gain, high-speed photo detectors. The device is housed in a 8 pin DIP package. The photo detector has an internal shield that provides guaranteed common-mode transient immunity of ±15 kV/μs. It is suitable for direct gate driving circuit for IGBTs or power MOSFETs.

■ Features

- Rail-to-rail output voltage
- Guaranteed performance from -40 to 110℃
- Peak Output Current : I_{OP} = 1A (max)
- Threshold Input Current: I_{FLH} = 5 mA (max)
- High isolation voltage between input and output (Viso=5000 V rms.)
- Pb free and RoHS compliant.
- UL and cUL approved
- VDE approved
- CQC approved

■ Applications

- Isolated IGBT/Power MOSFET Gate Driver
- Uninterruptible power supply
- Inverters
- Home appliances, such as fan heaters, etc.

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■ Product Nomenclature

The product name is designated as below:

HT -3150 -X X- X X- XX
① ② ③ ④ ⑤

Designation:

HT =Hengtuo Technology Co.,LTD.
3120= Product Series
① = Lead form option(S1,M,NONE)(1)
② = Tape and Reel option(TP,TP1,NONE)(2)
③ = VDE order option(fixed code "V")
④ = Halogen free option(fixed code"G")
⑤ = Customer code

Notes

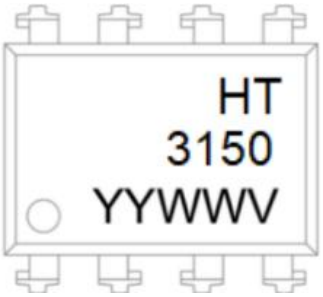
1. Lead form option:

Symbol	Description
S1	DIP8-S1
M	DIP8-M
NONE	DIP8 Normal

2. Tape and Reel option:

Symbol	Description
TA&TA1	Tape and Reel Type
NONE	DIP Type

■ Marking Information



Designation:

HT	denotes Hengtuo
3150	denotes Device
YY	denotes year code
WW	denotes week code
V	denotes VDE

▪ Maximum Ratings

Parameter		Symbol	Values	Unit
Input	Forward Current	I_F	20	mA
	Pulse Forward Current(1)	I_{FP}	1	A
	Reverse voltage	V_R	5	V
Output	“H” Peak Output current	I_{OPH}	1	A
	“L” Peak Output Current	I_{OPL}	1	A
	Pear Output Voltage	V_O	30	V
	Supply Voltage	V_{CC}-V_{EE}	15 to 30	V
Operating frequency		f	50	kHz
Isolation voltage(2)		V_{ISO}	5000	Vrms
Total Power Dissipation		P_T	300	mW
Operating temperature		T_{OPR}	–40 ~110	°C
Storage temperature		T_{STG}	–55 ~ 125	°C
Soldering temperature(3)		T_{SOL}	260	°C

Notes:
(1).Pulse width ≤ 1μs, 300pps.
(2).AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 4 are shorted together, and pins 5, 8 are shorted together.
(3).For 10 seconds.

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■ Electronic Optical Characteristics

(TA = 25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditon
Input	Forward Voltage	V_F	1,2	1.34	1.8	V	I_F=10mA
	Reverse Current	V_R	-	-	5	V	I_R=10uA
	Input Threshold Current	I_{FLH}	-	1.4	5	mA	V_{CC}=30V,V_O> 5V
	Input Threshold Voltage	V_{FHL}	0.8	-	-	V	V_{CC}=30V,V_O< 5V
Output	High level supply current	I_{CCH}	-	1.8	3.0	mA	I_F=10mA, V_{CC}=30V, V_O=Open
	Low level supply current	I_{CCL}	-	2.0	3.0	mA	I_F=0mA, V_{CC}=30V, V_O=Open
	High Level Output Current(4)	I_{OH}	-	-	-0.3	A	V_O=V_{CC}-1.5V
			-	-	-0.8		V_{CC}-V_O≤15V
	Low Level Output Current(4)	I_{OL}	0.3	-	-	A	V_O=V_{CC}+2.5V
			0.8	-	-		V_{CC}-V_{EE}≤ 15V
	High Level Output Voltage	V_{OH}	V_{CC}-0.25	V_{CC}-0.1	-	V	I_F=10mA, V_{CC}=30V, I_O=-100mA
	Low Level Output Voltage	V_{OL}	-	V_{EE}+0.1	V_{EE}+0.25	V	I_F=10mA, V_{CC}=30V, I_O=-100mA
	Under Voltage Lockout Threshold	V_{UVLO+}	11	12.7	13.5	V	I_F=10mA, V_O >5V
	Under Voltage Lockout Threshold	V_{UVLO-}	9	11.3	12.5	V	I_F=10mA, V_O <5V
Transfer Characteristics	Propagation delay time to output High level	t_{PLH}	100	240	400	ns	I_F=7-16mA, V_{CC}=15 or 30V, C_G=10nF, R_G=10Ω, F=10kHz, T_A=25°C Duty Cycle=50%
	Propagation delay time to output Low level	t_{PHL}	100	182	400	ns	
	Pulse width distortion	$\|t_{PHL}-t_{PLH}\|$	-	-	100	ns	
	Propagation Delay Skew(5)	t_{PSK}	-	-	150	ns	

	Output rise time	t_R	-	80	-	ns	
	Output fall time	t_F	-	80	-	ns	
	Common Mode Transient Immunity at Logic High(6)	CM_H	15	-	-	kV/uS	I_F=10 to 16mA, V_{CC}=30V, T_A=25°C V_{CM}=1500V
	Common Mode Transient Immunity at Logic Low(7)	CM_L	15	-	-	kV/uS	I_F=0mA, V_{CC}=30V, T_A=25°C V_{CM}=1500V

Notes:
(4) Max. pulse width=10μs, max. duty cycle =1%
(5)Propagation delay skew is defined as the difference between the largest and smallest propagation delay times (i.e. tP_{HL} or tP_{LH}) of multiple samples. Evaluations of these samples are conducted under identical test conditions (supply voltage, input current, temperature, etc).
(6)Common mode transient immunity at output high is the maximum tolerable negative dv/dt on the trailing edge of the common mode impulse signal, V_{CM}, to assure that the output will remain high (i.e. V_O>15.0V)
(7) Common mode transient immunity at output low is the maximum tolerable positive dv/dt on the leading edge of the common mode pulse signal, V_{CM}, to assure that the output will remain low (i.e. V_O<1.0V)

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■ Characteristics Curves

Fig.1 High Output Rail Voltage vs Ambient Temperature

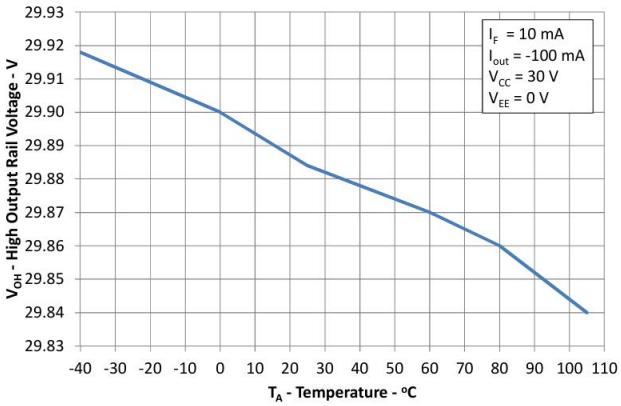


Fig.2 V_{OH} vs Ambient Temperature

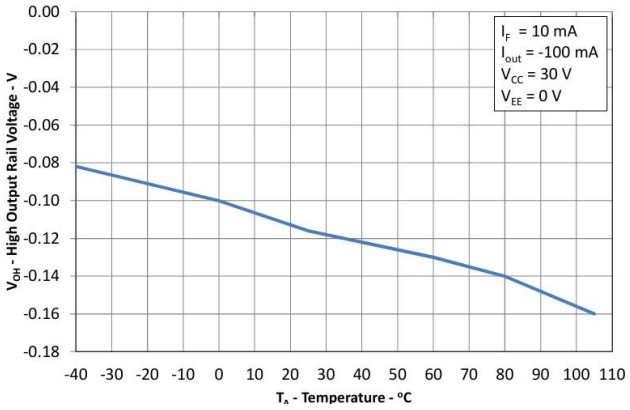


Fig.3 V_{OL} Voltage vs Ambient Temperature

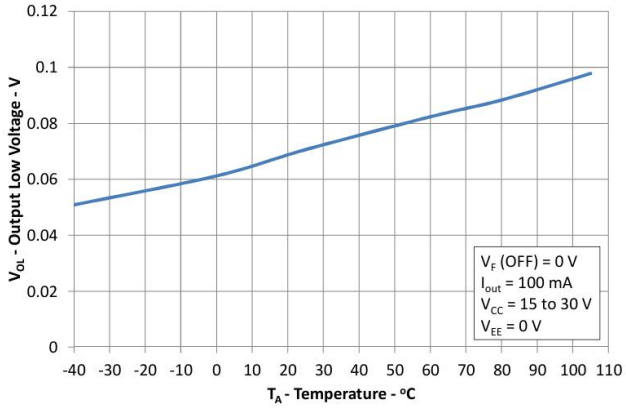


Fig.4 Supply Current vs. Ambient Temperature

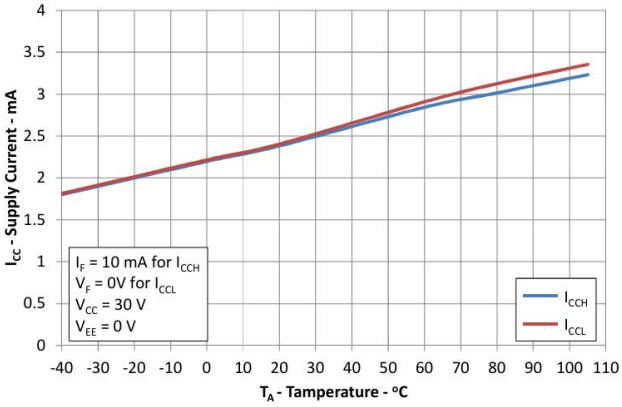


Fig.5 Supply Current vs Supply Voltage

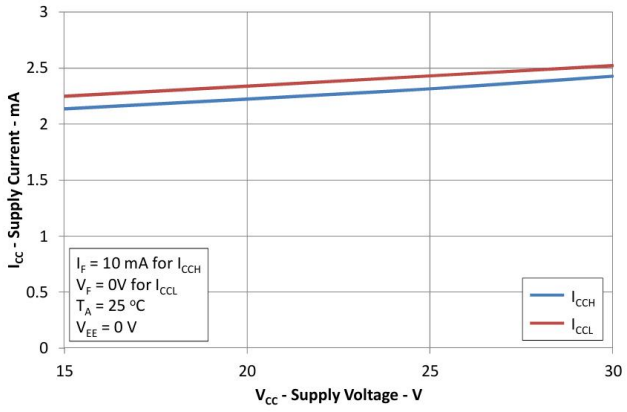


Fig.6 Output Voltage vs Threshold Input Current Low to High

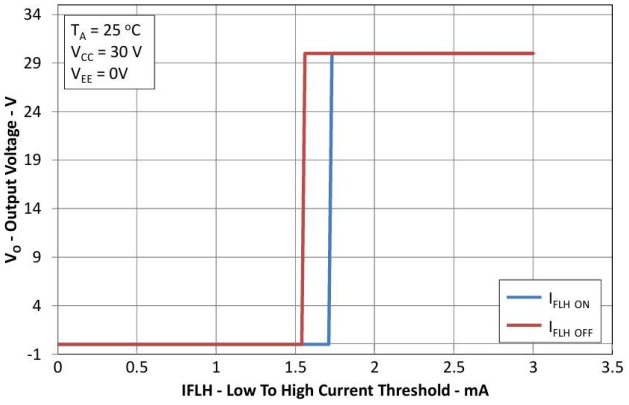


Fig.7 Threshold Input Current Low to High vs Ambient Temperature

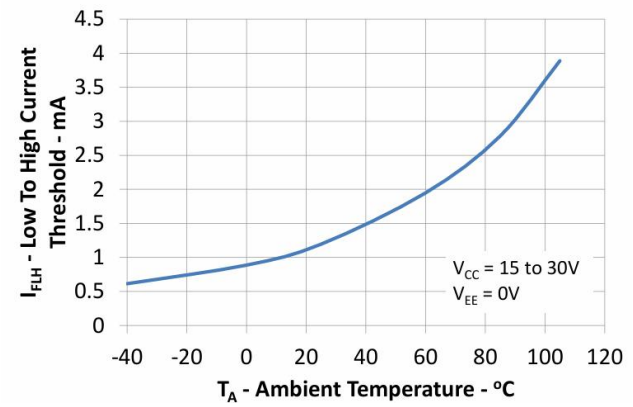


Fig.8 Propagation Delay vs Supply Voltage

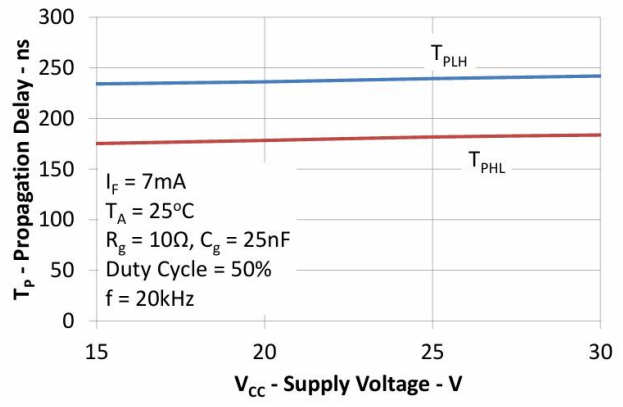


Fig.9 Propagation Delay vs Forward Current

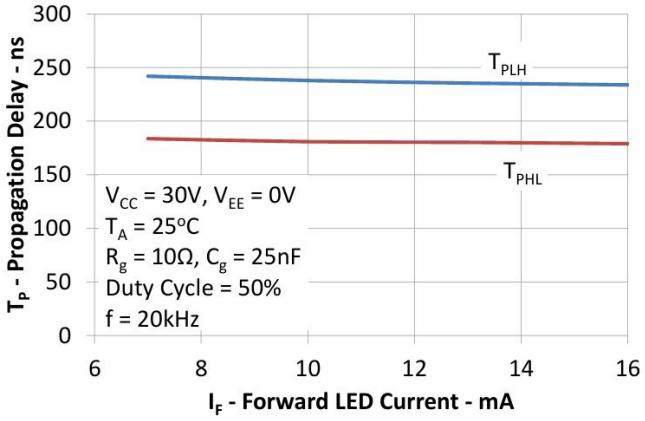


Fig.10 Propagation Delay vs Ambient Temperature

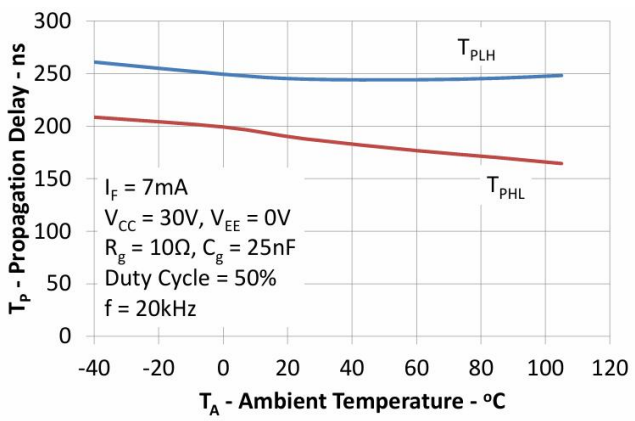
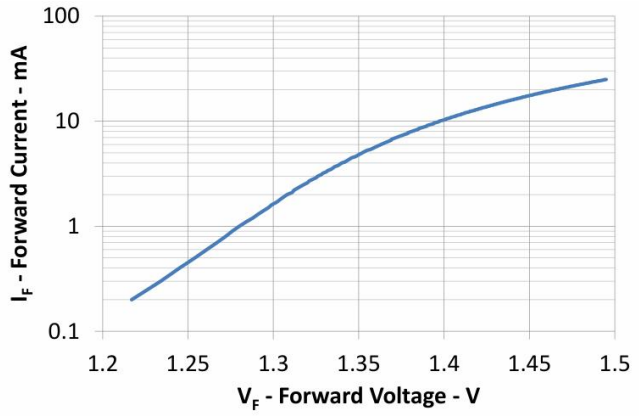


Fig.11 Forward Current vs Forward Voltage



■ Test Circuits Diagrams

Fig.12 I_{OL} Pulsed Test Circuit

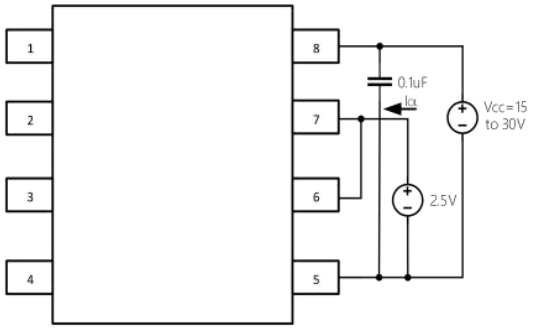


Fig.13 I_{OH} Pulsed Test Circuit

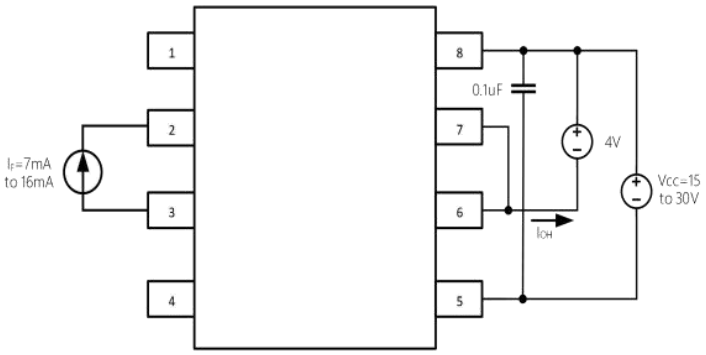


Fig.14 V_{OH} Pulsed Test Circuit

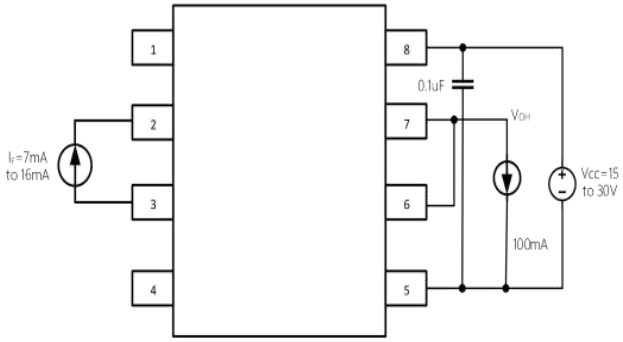


Fig.15 V_{OL} Pulsed Test Circuit

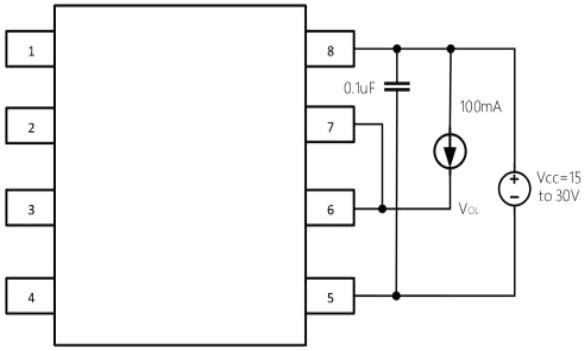


Fig.16 I_{FLH} Test Circuit

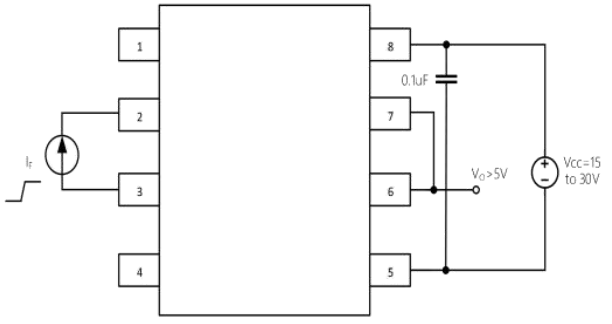


Fig.17 U_{VLO} Test Circuit

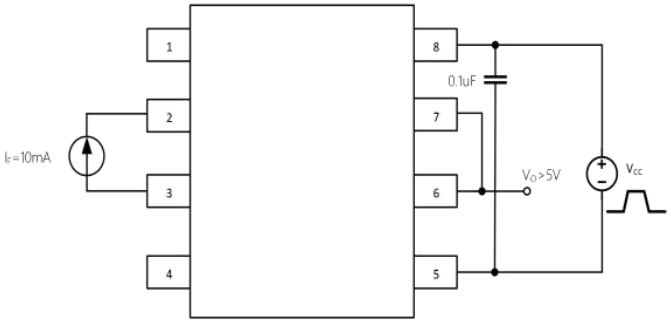


Fig.18 T_{PHL}、T_{PLH}、T_R、T_F Test Circuit

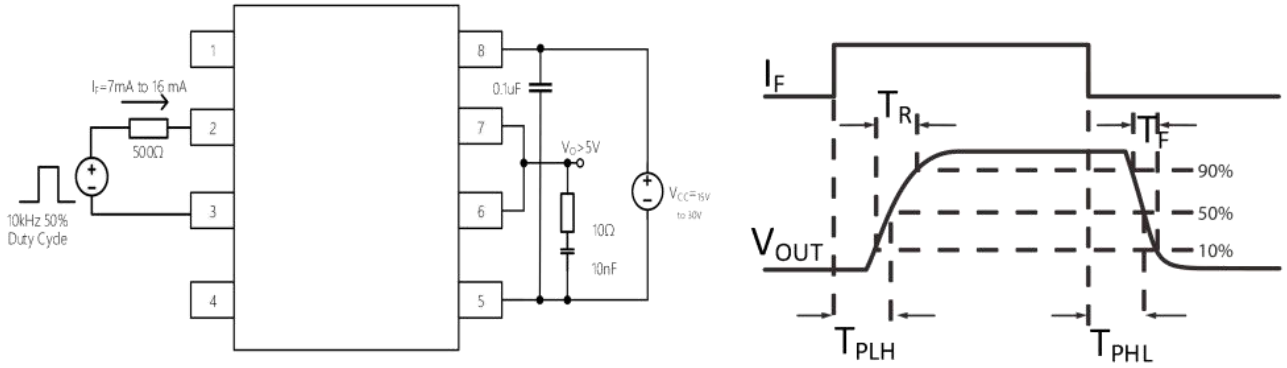
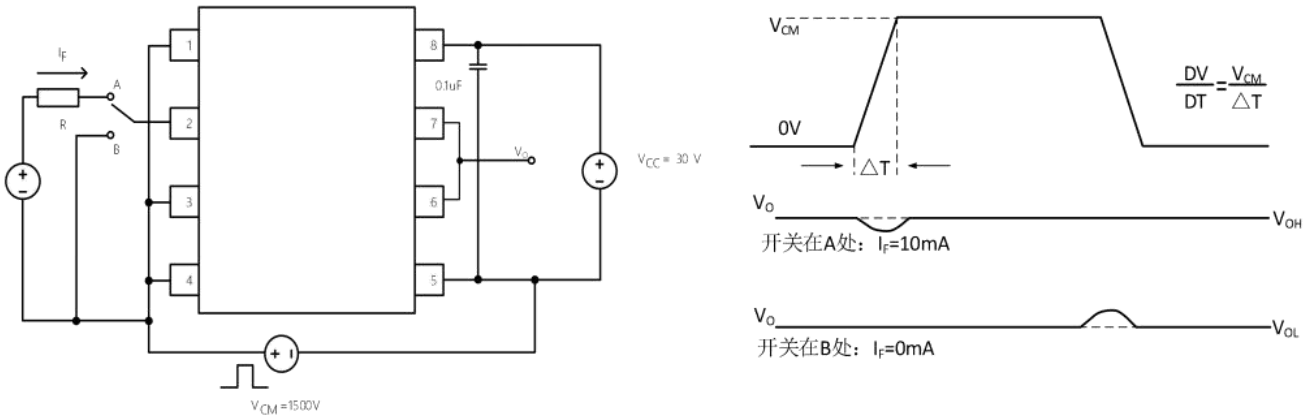


Fig.19 CMR Test Circuit



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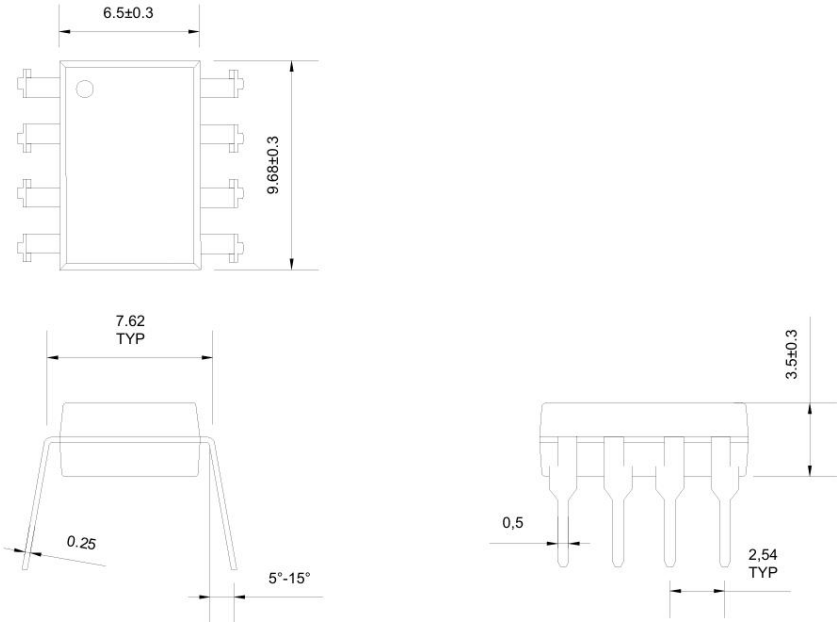
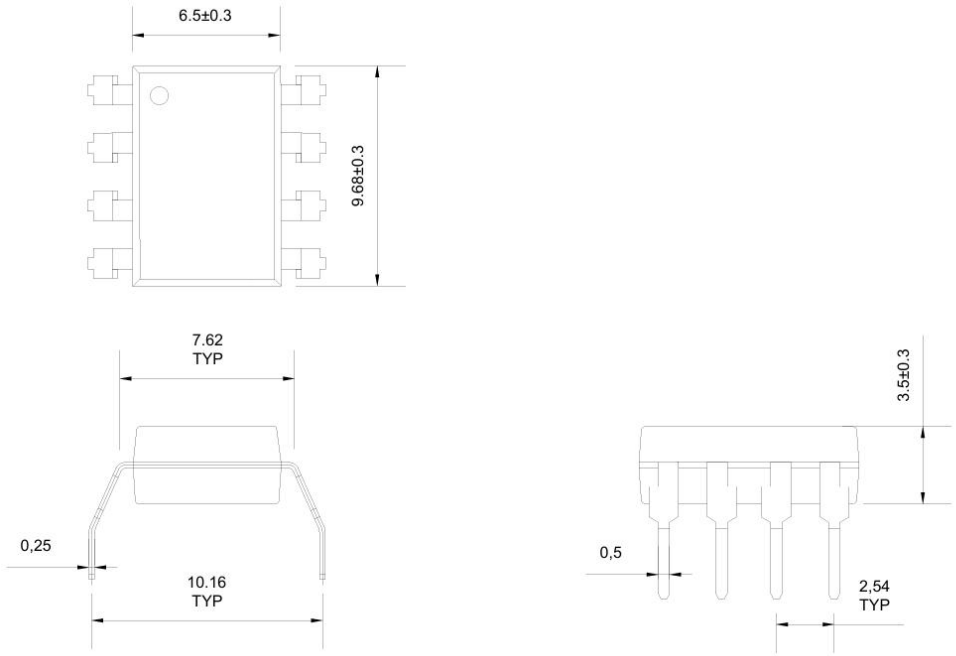
■ Outline Dimension

DIP Normal Type:



DIP M Type:



SMD S1 Type:

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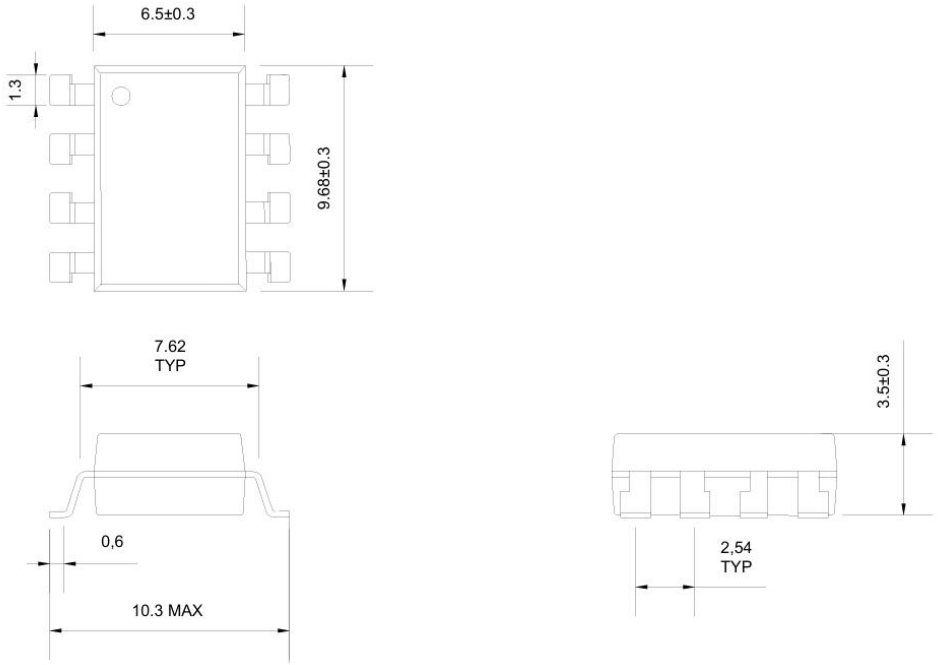
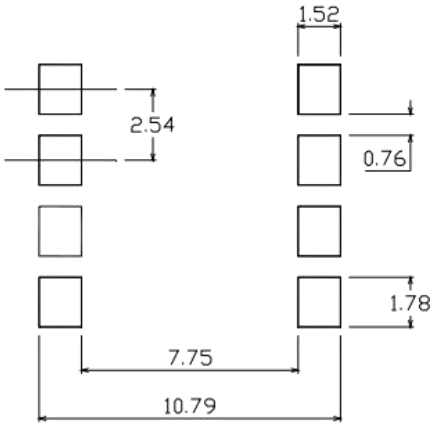


Unit: mm
Tolerance: ±0.1mm

■ Recommended solder pad Design

For S1 type:



Unit: mm
Tolerance: ±0.1mm

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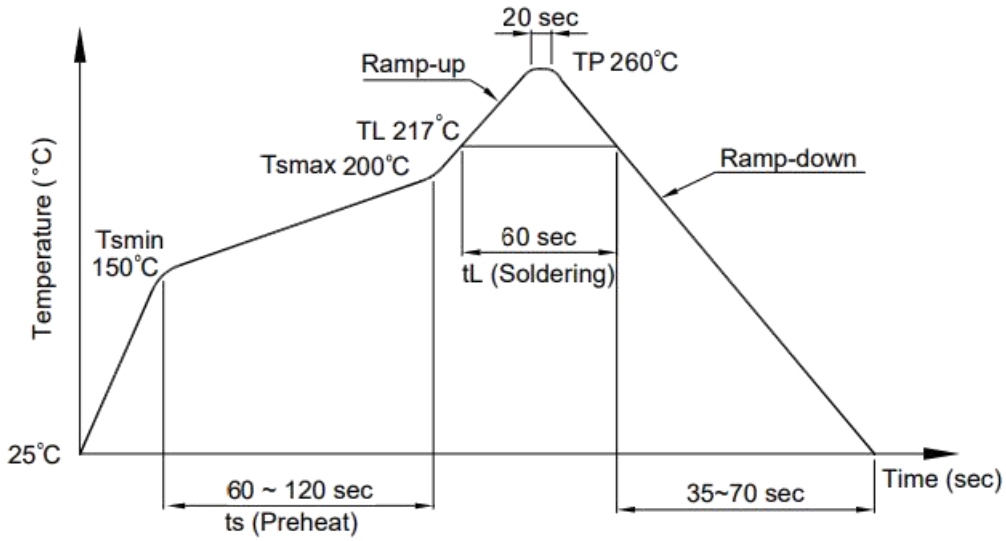
■ Temperature Profile Of Soldering

1. IR Reflow soldering

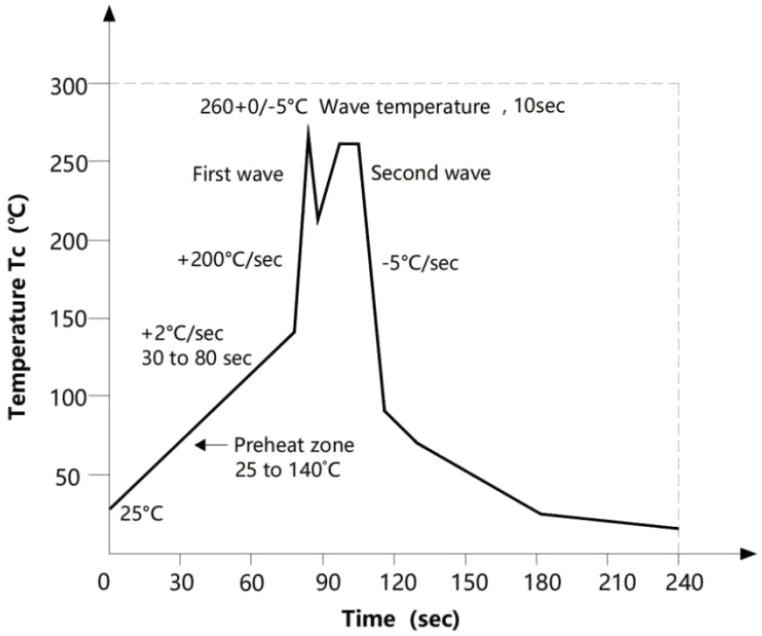
(JEDEC-STD-020 compliant)

Profile item	Conditon
Preheat -Temperature Min (TSmin) -Temperature Max (TSmax) -Time (min to max) (ts)	 150°C 200°C 90±30 sec
Soldering zone -Temperature (TL) -Time (tL)	 217°C 60 sec
Peak Temperature (TP)	260°C
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



Notes:
One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

2. Wave soldering (JEDEC22A111 compliant)



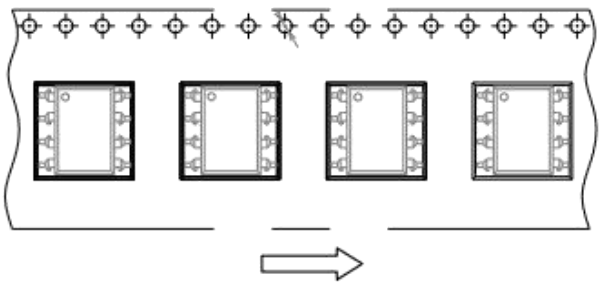
3. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.
Temperature: 380+0/-5˚C
Time: 3 sec max.

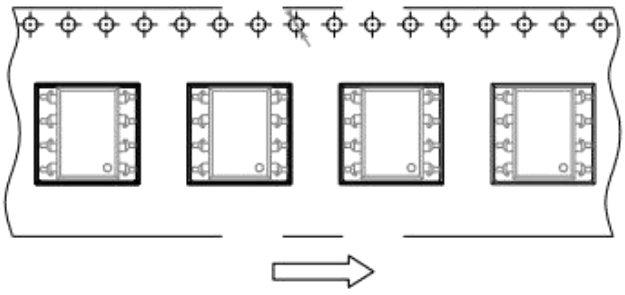
■ Packing

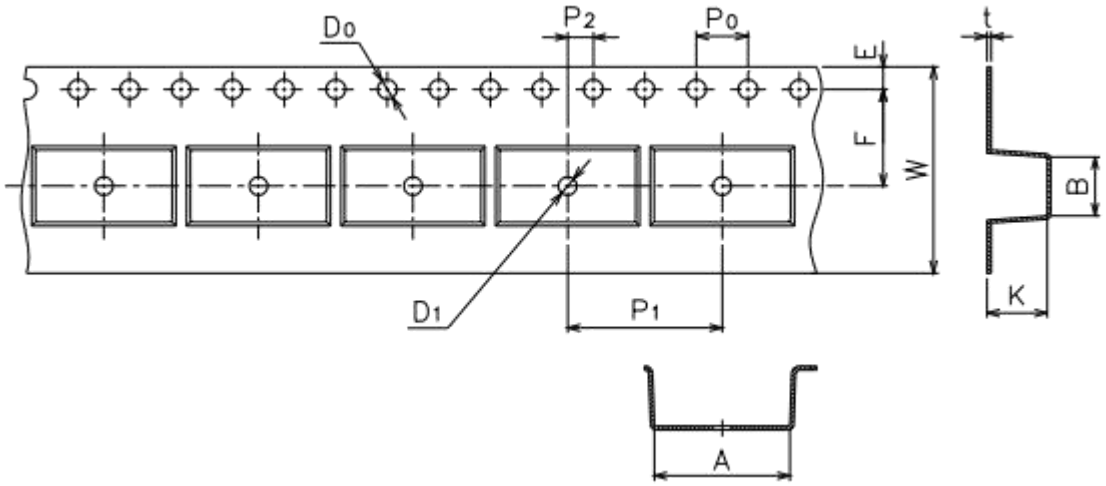
Tape and Reel

Option TA1:



Option TA:





Deminsion/mm	A	B	Do	D1	E	F
Packagetype:S	10.4±0.1	10.0±0.1	1.5+0.1/-0	1.5±0.25/-0	1.75±0.1	7.5±0.1

Deminsion/mm	Po	P1	P2	t	W	K
Packagetype:S	4.0±0.1	12.0±0.1	2.0±0.05	0.4±0.05	16.0±0.3/	4.5±0.1

Part Number	Package Type	Packing Type	Reel	Inner carton	Outer carton
HT-3150-S1TA1/HT-3150-S1TA	DIP-8L-S1	Tape and reel	1K/reel	2K(2 reels)	20K
HT-3150/HT-3150-M	DIP-8L/DIP-8L-M	Tube	45/Tube	2.25K(50 tubes)	22.5K

■ Attention:

- Hengtuo is continually improving the quality, reliability, function or design and Hengtuo reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any ”specific” application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.