



ORIENT

Photocoupler

Product Data Sheet

Name: OR-6N135/ OR-6N136

Customer: _____

Date: _____

SHENZHEN ORIENT TECHNOLOGY CO.,LTD.

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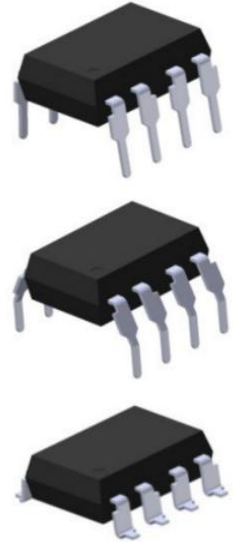
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www.orient-opto.com

1、 Features

- (1). High speed - 1MBd model
- (2). Adapted to the dual-in-line, lead spacing width, surface installation.
- (3). Store output.
- (4). UL, VDE approval.



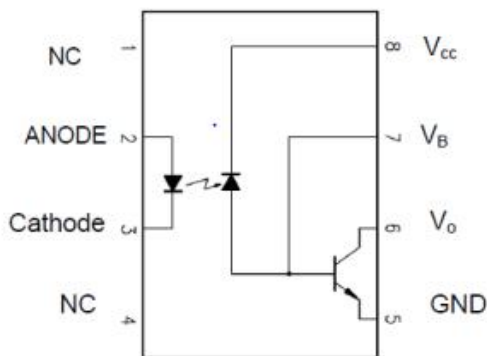
2、 Instructions

6N135/6N136 consists of highly efficient AlGaAs light-emitting diodes and high-speed optical detectors. The design provides good ac and dc isolation at the input and output ends of the photoelectric coupler. Connections related to photodiode biasing can improve the speed of conventional phototransistor couplers by reducing the capacitance of the matrix collector. Internal shielding ensures high transient immunity in general mode. Ensure the common-mode transient immunity to 1 kv/μsec.

3、 Application Range

- line receiver isolation
- A/ D, D/A converted digital signal isolation
- eliminate noise from the ground loop
- switching power supply
- alternative pulse transformers
- motor control system
- interface of microprocessor system, computer and peripheral equipment

4、 Functional Diagram



Truth table

Input (LED)	Output
ON	L
OFF	H

0.1 capacitor F bypass capacitance needs to be connected between A Pin8 and Pin5

5、Absolute Maximum Ratings (Ta=25°C) *1

Parameter		Symbol	Rated Value	Unit
Input	Average Forward Input Current	I_F	25	mA
	Reverse Input Voltage	V_R	5	V
	Power Dissipation	P_I	45	mW
Output	Output Collector Current	I_O	8	mA
	Output Collector Voltage	V_O	20	V
	Output Collector Power Dissipation	P_O	100	mW
Supply Voltage		V_{CC}	15	V
Insulation Voltage		V_{iso}	5000	Vrms
Working Temperature		T_{opr}	-40 ~ + 85	°C
Storage Temperature		T_{stg}	-55 ~ + 125	
*2 Soldering Temperature		T_{sol}	260	

*1. Room temperature = 25 °C. Exceeding the maximum absolute rating can permanently damage the device.

Working long hours at the maximum absolute rating can affect reliability.

*2. soldering time is 10 seconds

6、Electrical optical characteristics at TA=25°C

Parameter	Symbol	Condition	Device	Min	Typ	Max	Unit
Input							
Forward voltage	V_F	$I_F = 16\text{mA}$	6N135	—	1.4	1.7	V
Reverse voltage	BV_R	$I_R = 10\mu\text{A}$	6N136	5	—	—	V
Detector							
Current transfer ratio	CTR	$I_F = 16\text{mA}, V_O = 0.4\text{V}, V_{CC} = 4.5\text{V}$	6N135	7	18	50	%
			6N136	19	24	50	
Low Level Output Voltage	V_{OL}	$V_{CC} = 4.5\text{V}, I_F = 16\text{mA}, I_O = 1.1\text{mA}$	6N135	—	0.18	0.4	V
		$V_{CC} = 4.5\text{V}, I_F = 16\text{mA}, I_O = 1.1\text{mA}$	6N136	—	0.25	0.4	
High Level Output Current	IOH	$V_{CC} = 5.5\text{V}, V_O = 5.5\text{V}, I_F = 0\text{mA}$	6N135	—	—	0.5	uA
		$V_{CC} = 15\text{V}, V_O = 15\text{V}, I_F = 0\text{mA}$	6N136	—	—	1	
High Level Supply Current	I_{CCL}	$I_F = 16\text{mA}, V_O = \text{open}, (V_{CC} = 15\text{V})$	6N135 6N136	—	400	—	uA
Low Level Supply Current	I_{CCH}	$I_F = 0\text{mA}, V_O = \text{open}, (V_{CC} = 15\text{V})$	6N135 6N136	—	—	1	uA

7. Switching Characteristics at TA=25°C

Parameter	Symbol	Condition	Device	Min	Typ	Max	Unit
Propagation delay time to output Low level	t_{PHL}	$R_L=4.1k\Omega$ $I_F=16mA$	6N135	—	0.09	1.5	us
		$R_L=1.9k\Omega$ $I_F=16mA$	6N136	—	0.1	0.8	us
Propagation delay time to output High level	t_{PLH}	$R_L=4.1k\Omega$ $I_F=16mA$	6N135	—	0.8	1.5	us
		$R_L=1.9k\Omega$ $I_F=16mA$	6N136	—	0.4	0.8	us
Logic High Common Mode Transient Immunity	$ CM_H $	$V_{CM}=10Vp-p, R_L=4.1k\Omega, I_F=0mA$	6N135	1	10	—	kV/ μs
		$V_{CM}=10Vp-p, R_L=1.9k\Omega, I_F=0mA$	6N136				
Logic Low Common Mode Transient Immunity)	$ CM_L $	$V_{CM}=10Vp-p, R_L=4.1k\Omega, I_F=0mA$	6N135	1	10	—	kV/ μs
		$V_{CM}=10Vp-p, R_L=1.9k\Omega, I_F=0mA$	6N136				

Recommended temperature range (TA = 0 °C -- 70 °C), unless otherwise specified power supply for 5 v.

Typical values of TA = 25 °C.

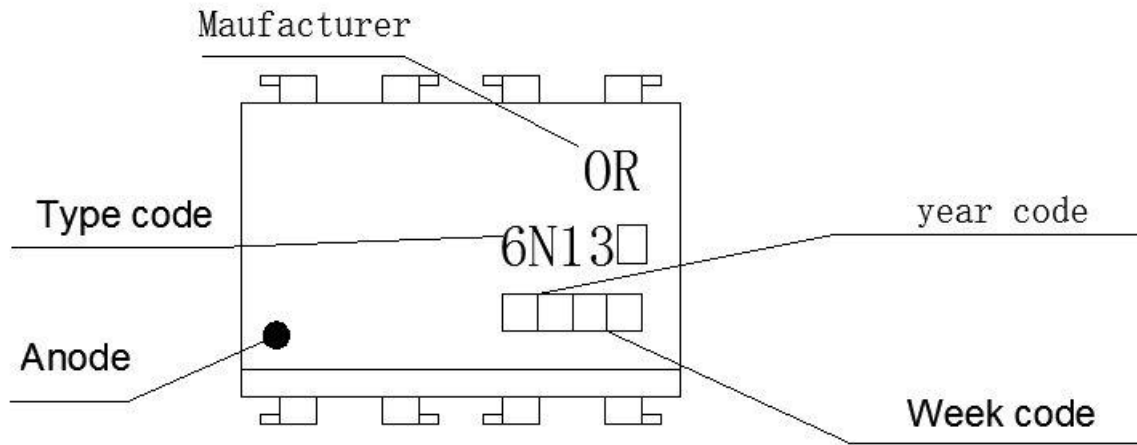


8、 Isolation characteristics at TA=25°C

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Input-Output Insulation Leakage Current	I_{I-O}	45% RH, t=5s, $V_{I-O} = 3kV DC, T_A = 25 C$	—	—	1	μA
Withstand Insulation Test Voltage	V_{ISO}	$RH \leq 50\%, t = 1min, T_A = 25^\circ C$	5000	—	—	V_{RMS}
Input-Output Resistance	R_{I-O}	$V_{I-O} = 5000V DC$	—	10^{12}	—	Ω

Typical values of TA = 25 °C

9、 Naming Rule



NOTE :

(1) year Code : '08' means' 2008 ', '09' means' 2009 'and so on.

(2) Week Code : 01 represents the first week, 02 represents the second week, and so on.

(3) OR : Manufacturer name, representing manufacturer Shenzhen Orient Components Co., Ltd.

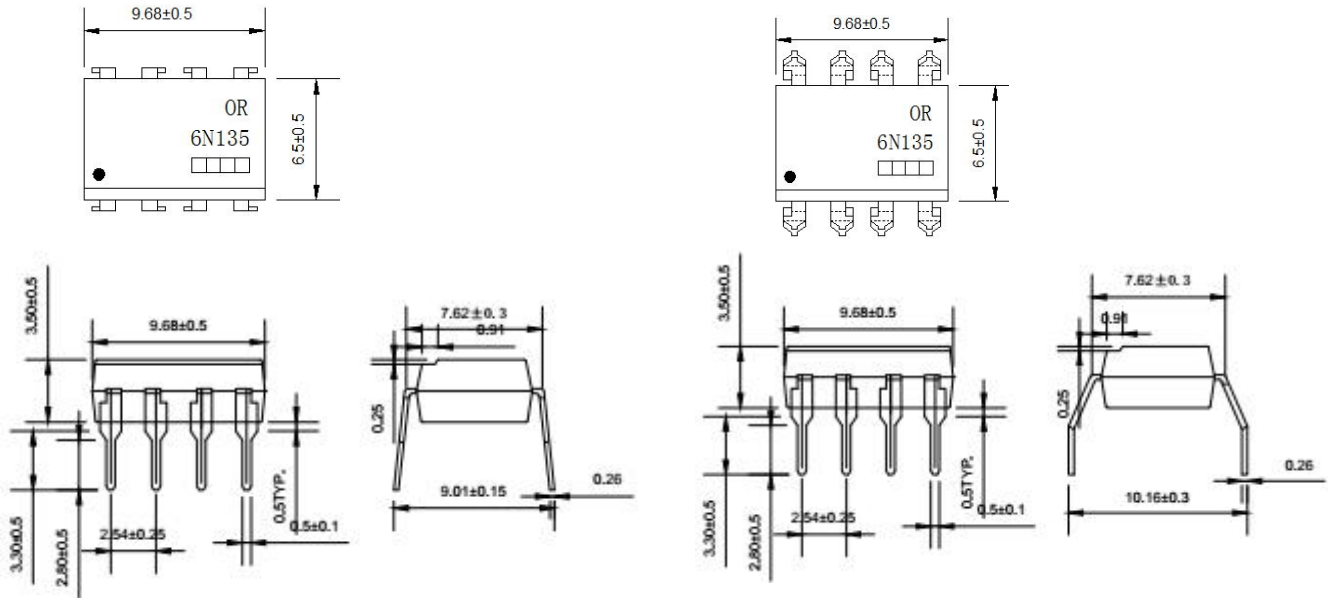
(4) Type code: '5' representing Type 6N135, '6' representing Type 6N136.

(5) Anode

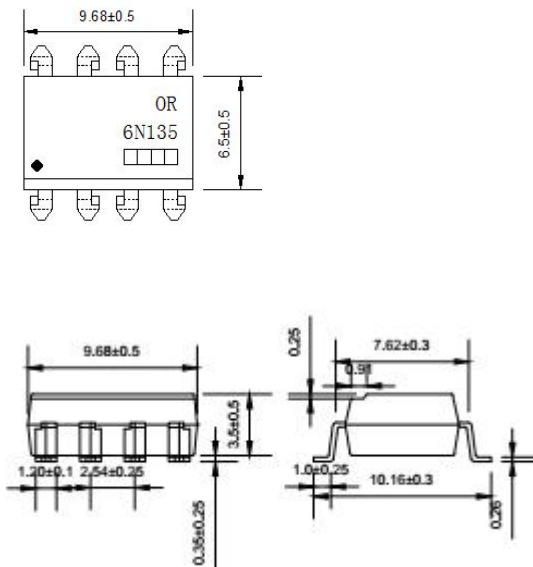
10、 Outer Dimension

(1) OR-6N135

(2) OR-6N135M

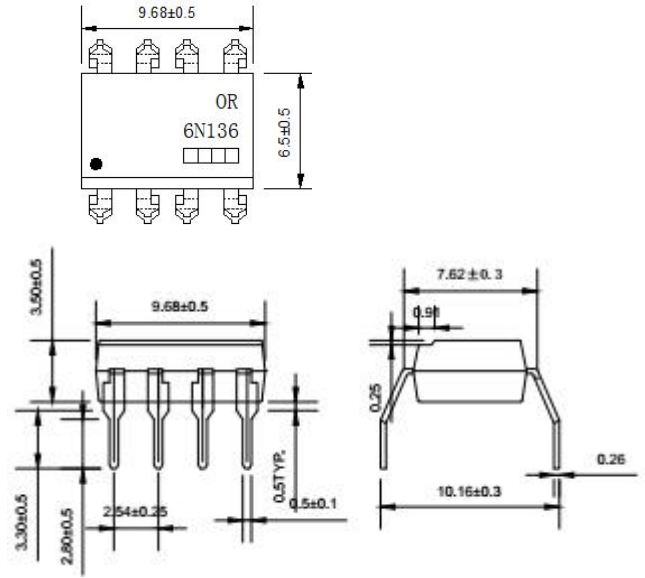
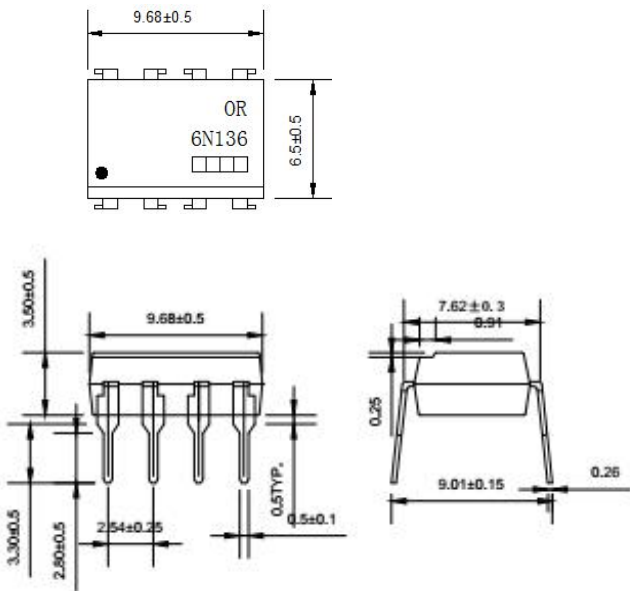


(3) OR-6N135S

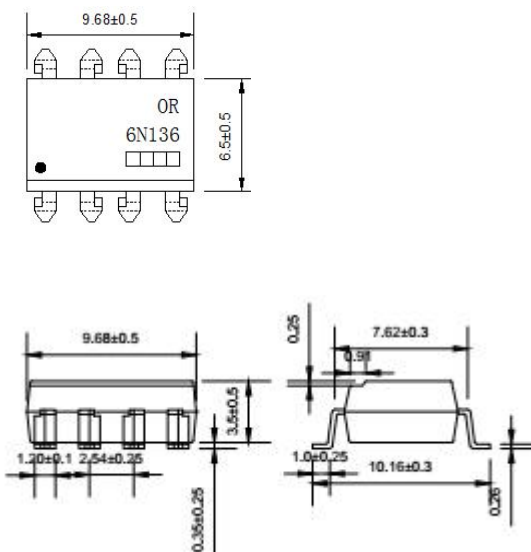


(1)OR-6N136

(2)OR-6N136M

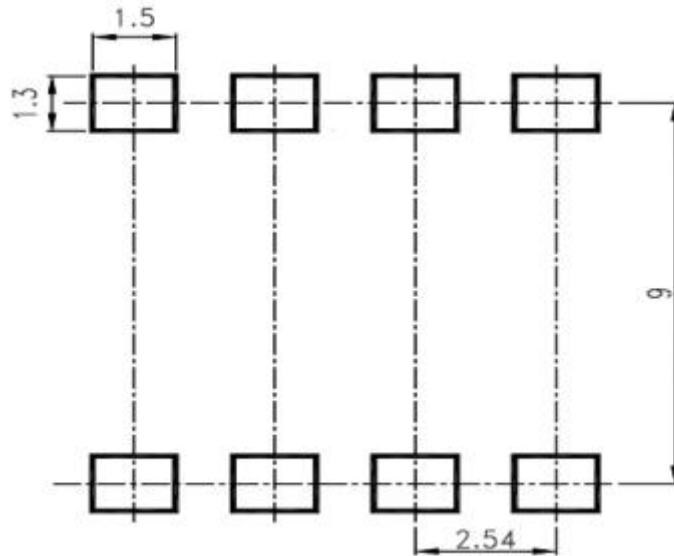


(3)OR-6N136S



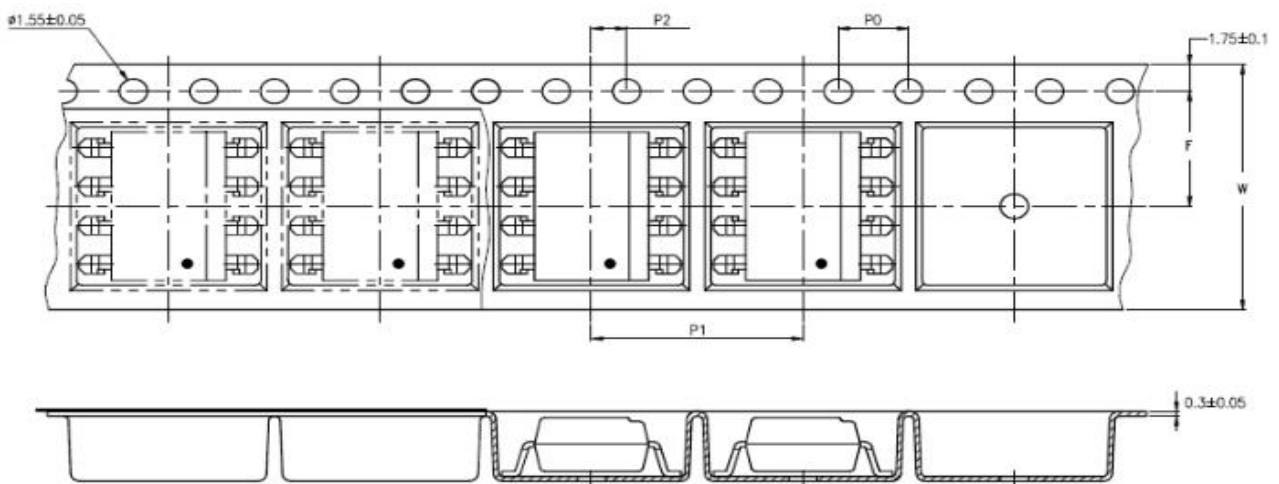
11、 Recommended Foot Print Patterns (Mount Pad)

(unit : mm)

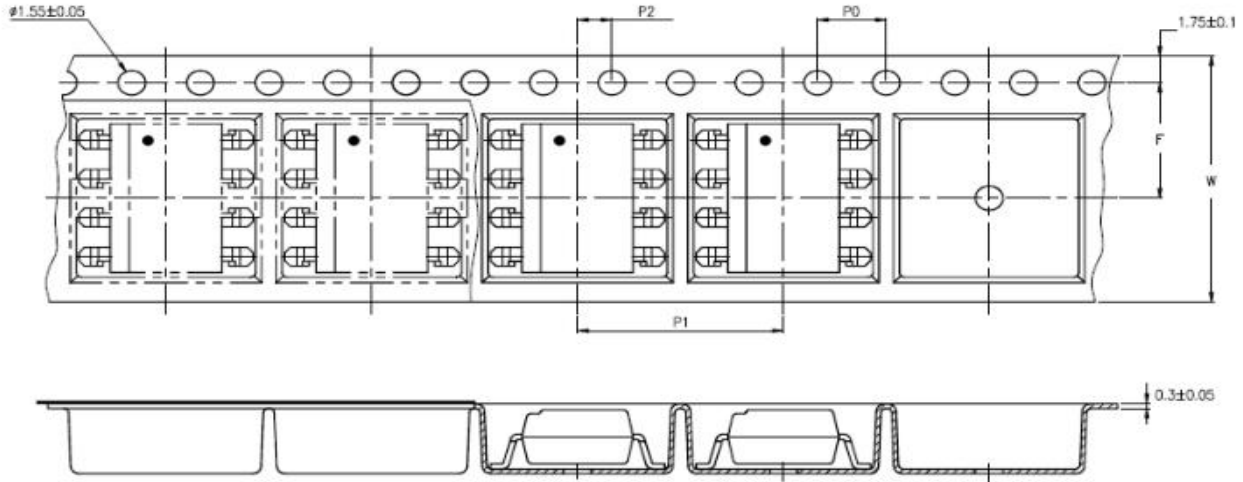


12、 Taping Dimensions

(1)OR-6N135-TA/OR-6N136-TA



(2)OR-6N135-TA1/OR-6N136-TA1



type	symbol	Dimensions: mm (inches)
bandwidth	W	16±0.3 (0.63)
pitch	P0	4±0.1 (0.15)
pitch	F	7.5±0.1 (0.295)
	P2	2±0.1 (0.079)
interval	P1	12±0.1 (0.472)

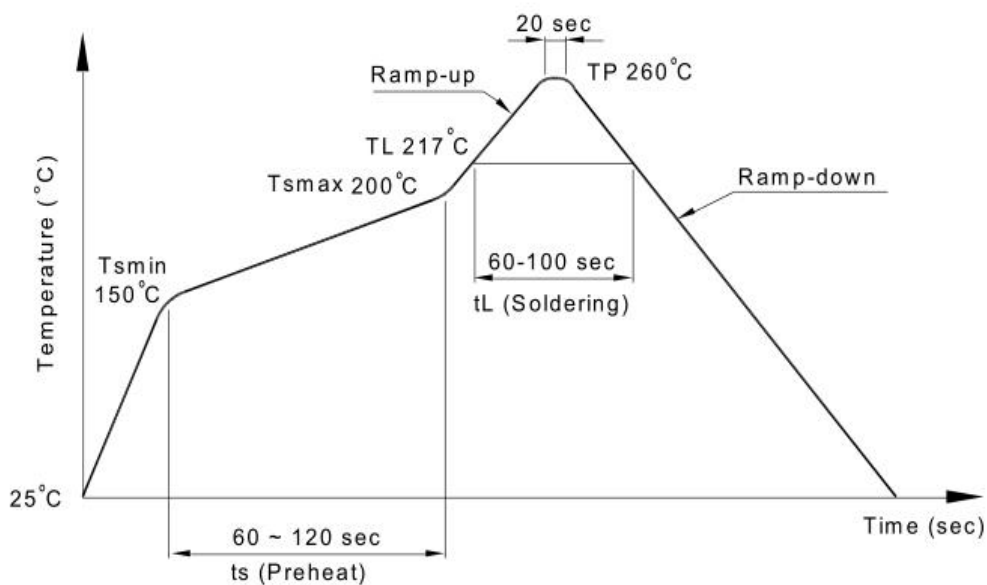
Encapsulation type	TA/TA1
amount (pcs)	1000

13、 Temperature Profile Of Soldering

(1) IR Reflow soldering (JEDEC-STD-020C compliant)

Note: one solder backflow is recommended under the conditions described below in the temperature and time profile. Do not weld more than three times.

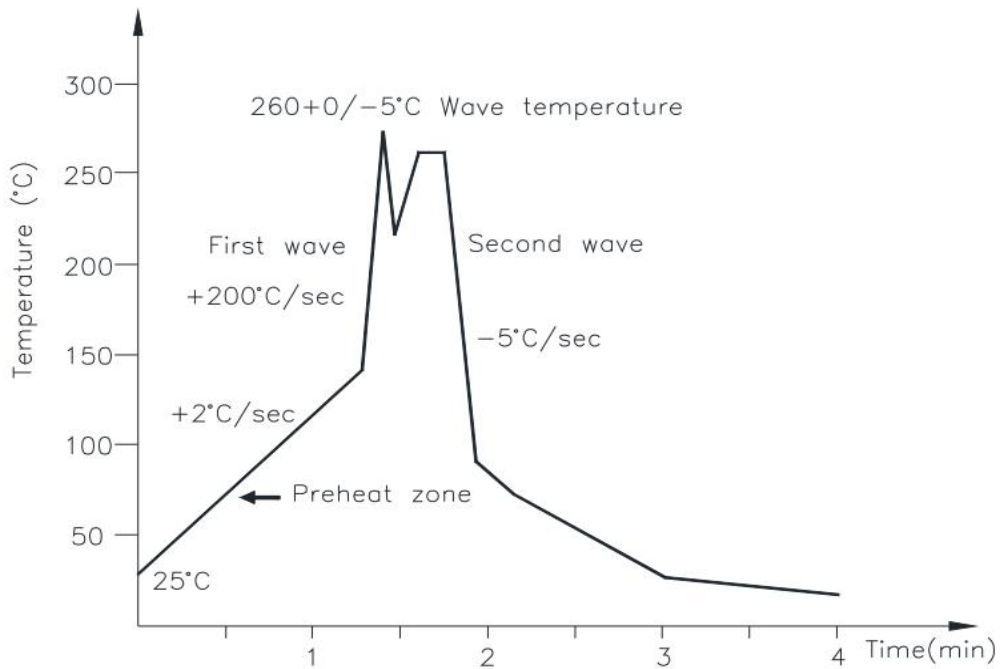
Configuration items	conditions
Preheat	
- The lowest temperature (TSmin)	150°C
- The highest temperature (TSmax)	200°C
- Time (min to Max (TS))	90±30 sec
Soldering zone	
- Temperature (TL)	217°C
- Time (tL)	60 ~ 100 sec
Peak Temperature	260°C
Ramp-up rate	3°C / sec max.
Drop rate (3°C / sec max.)	3 ~ 6°C / sec



(2) Wave soldering (JEDEC22A111 compliant)

One-time welding is recommended under the temperature condition.

Temperature	260+0/-5°C
Time	10 sec
Preheat temperature	5 to 140°C
Preheat time	30 to 80 sec



(3) Hand soldering by soldering iron

Single lead welding is allowed in each process and one-time welding is recommended.

Temperature	380+0/-5°C
Time	3 sec max

14、 Switching time test circuit

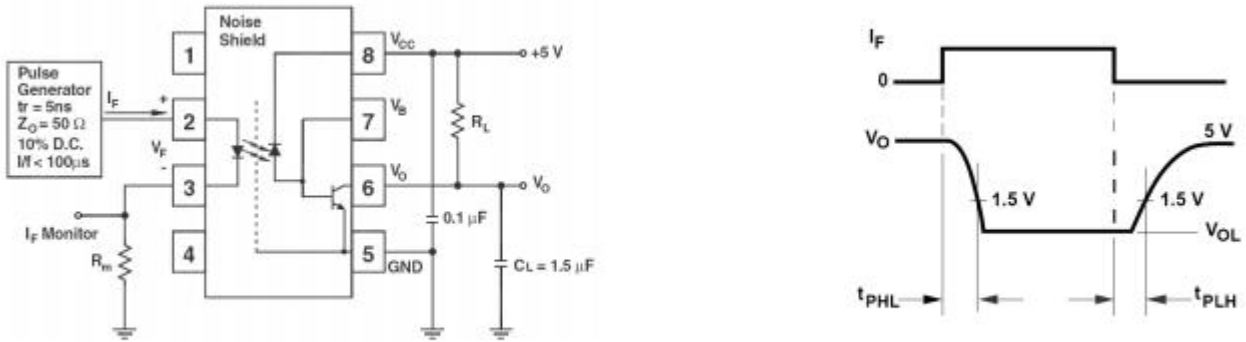


Figure 1: Test Circuit for t_{PHL} and t_{PLH}

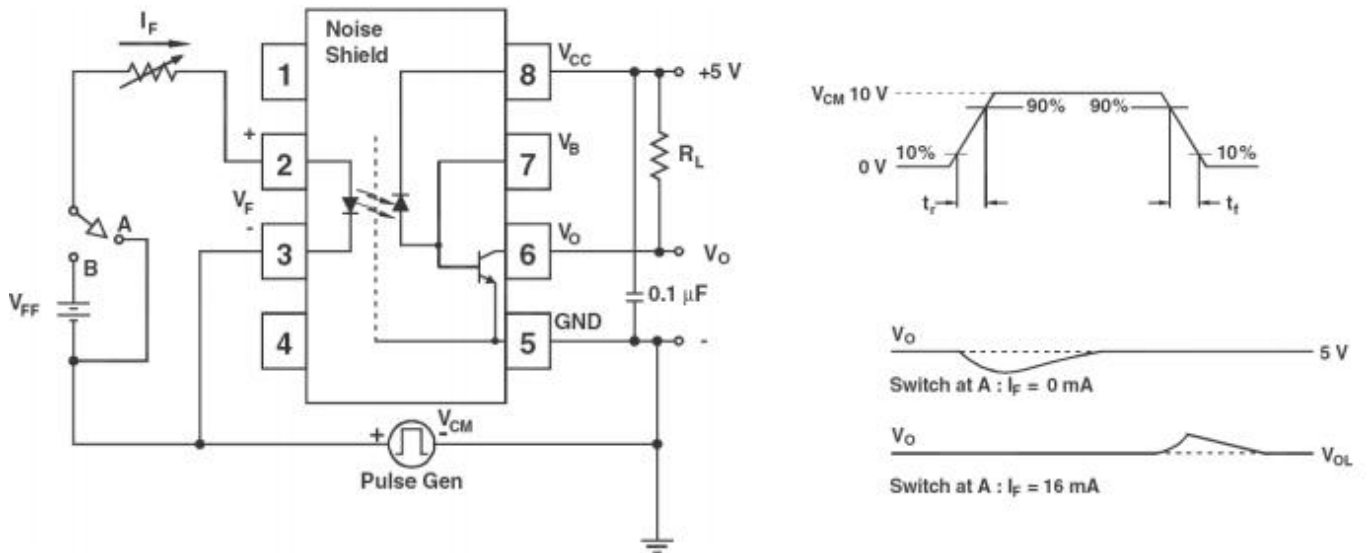


Figure 2: Single Channel Test Circuit for Common Mode Transient Immunity

15、Characteristics Curve

Figure 3: DC and pulsed transfer characteristics

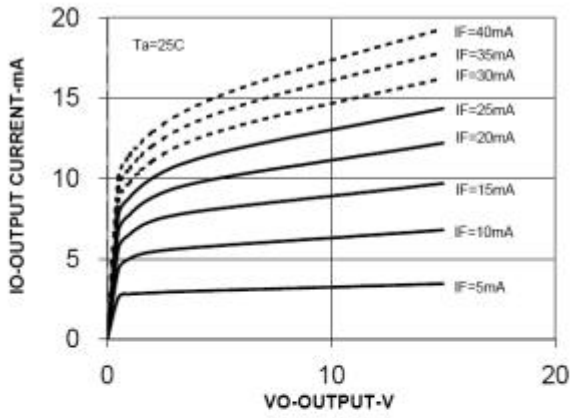


Figure 6: Current transfer ratio vs. input current

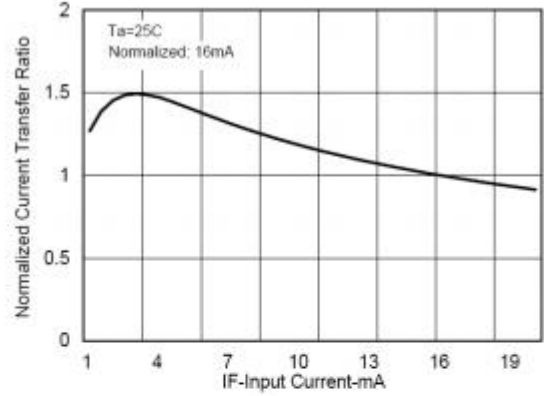


Figure 4: Input current vs. forward voltage

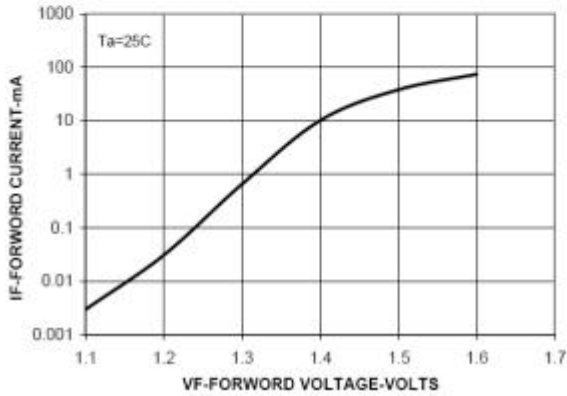


Figure 7: Current transfer ratio vs. temperature

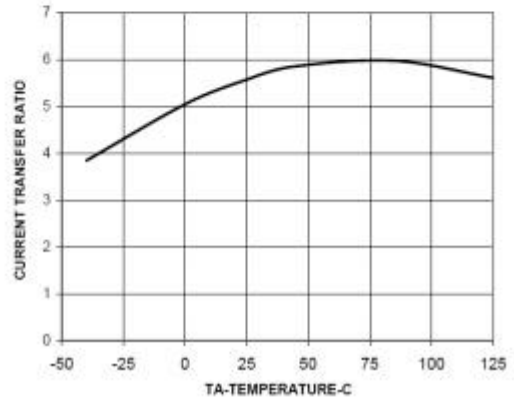


Figure 5: Logic high output current vs. temperature

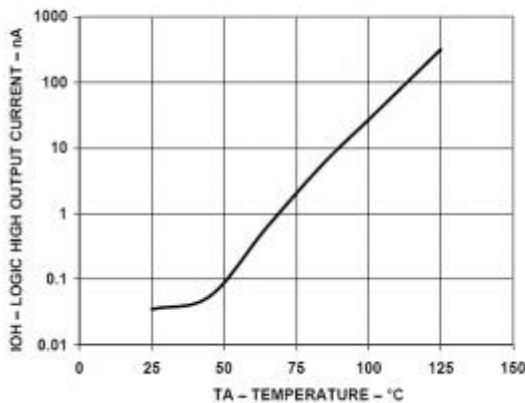


Figure 8: Small-signal current transfer ratio vs. quiescent current

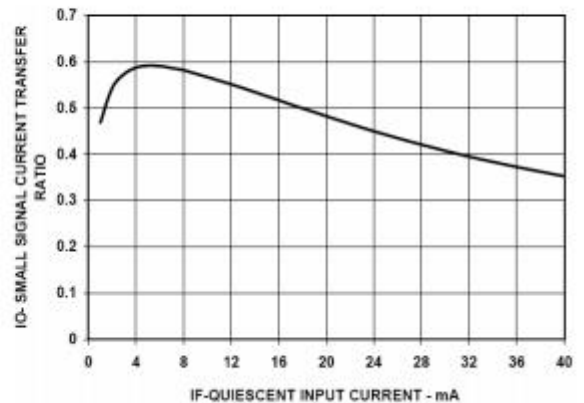


Figure 9: Propagation delay time vs. temperature

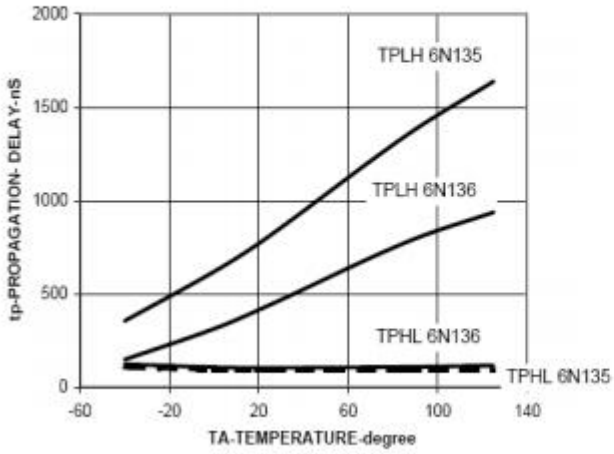
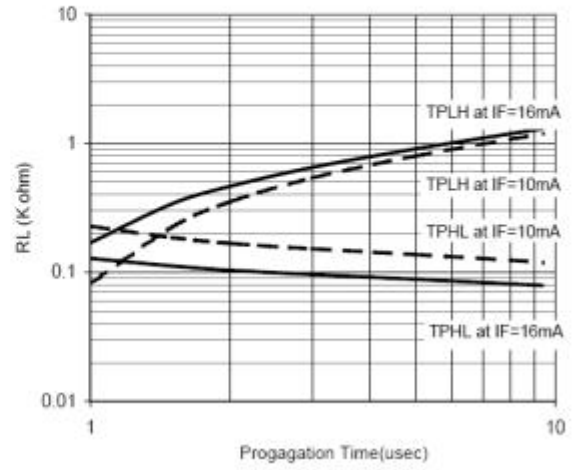


Figure 10: Propagation delay time vs. load resistance



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