ORIENT

Photo coupler

Product Data Sheet

MPN: ORPC-844 series

Customer: _____

Date: _____

SHENZHEN ORIENT COMPONENTS CO ., LTD

Block A 3rd Floor No.4 Building,Tian'an Cyber Park,Huangge Rd,LongGang Dist,Shenzhen,GD

TEL：0755-29681816

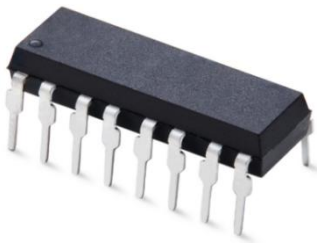
FAX：0755-29681200

www.orient-opto.com

Preliminary

This datasheet is a preliminary design specification, and the formal specifications are subject to the recognition letter with jointly signed

1. Features



(1) AC input response.

(2) Current transfer ratio (CTR : MIN. 20% at IF = ±1mA, VCE = 5V)

(3) Wide Operating temperature range -55~110ºC

(4) High input-output isolation voltage (V_{iso} = 5,000Vrms)

(5) Response time (tr : TYP. 4us at V_{CE} = 2V, I_C = 2mA, R_L = 100Ω)

(6) High collector-emitter voltage (V_{CE} ≧ 80V)

(7) ESD pass HBM 8000V/MM 2000V

(8) Safety approval

UL approved (No.E323844)

VDE approved (No.40029733)

(9) In compliance with RoHS, REACH standards

(10) MSL ClassI

2. Description

(1) The ORPC-844 series of four channel devices each consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a photo transistor detector.

(2) They are packaged in a 4-pin DIP package and available in side-lead spacing and SMD option.

3. Applications

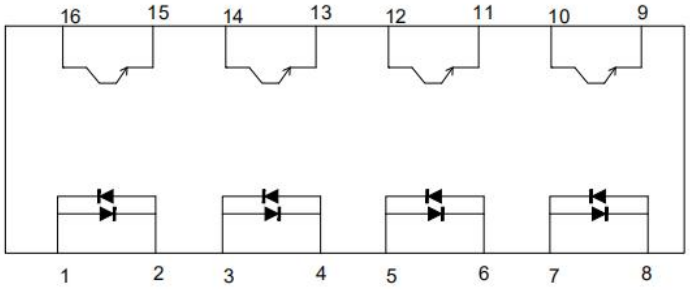
(1)AC line monitor

(2)Programmable controllers

(3)Telephone line interface

(4)Unknown polarity DC sensor

4. Functional Diagram



pin No. and Internal connection diagram

1~8 Anode/Cathode
9.11.13.15 Emitter
10.12.14.16 Collector

5. Absolute Maximum Ratings at Ta=25℃

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	±50	mA
	Peak forward current (100μs pulse, 100Hz frequency)	I_{FP}	1	A
	Reverse Voltage	V_R	6	V
	Consume Power	P	70	mW
Output	Collector and emitter Voltage	V_{CEO}	80	V
	Emitter and collector Voltage	V_{ECO}	7	
	Collector Current	I_C	50	mA
	Consume Power	P_C	150	mW
Total Power Dissipation		P_{tot}	200	mW
*1 Isolation Voltage		V_{iso}	5,000	Vrms
Operating Temperature		T_{opr}	-55 to + 110	℃
Storage Temperature		T_{stg}	-55 to + 125	
*2 Soldering Temperature		T_{sol}	260	

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 and emitter 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

6. Electro-Optical Characteristics (Ta=25℃ unless specified otherwise)

Parameter		Symbol	Min	Typ.*	Max	Unit	Condition
Input	Forward Voltage	V_F	---	1.2	1.4	V	I_F=±20mA
	Collector capacitance	C_t	---	30	250	pF	V=0, f=1KHz
Output	Collector to emitter Current	I_{CEO}	---	---	100	nA	V_{CE}=20V, I_F=0mA
	Collector and Emitter Breakdown Voltage	BV_{CEO}	80	---	---	V	I_C=0.1mA I_F=0mA
	Emitter and Collector Breakdown Voltage	BV_{ECO}	7	---	---	V	I_E=0.1mA I_F=0mA
Transforming Characteristics	*1 Current conversion ratio	CTR	20	---	300	%	I_F=±1mA V_{CE}=5V
	Collector Current	I_C	0.2	---	3	mA	
	Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	---	0.1	0.2	V	I_F=±20mA I_C= 1mA
	Insulation Impedance	R_{iso}	5×10^{10}	1×10^{12}	---	Ω	DC500V 40~60%R.H.
	Floating Capacitance	C_f	---	0.6	1.0	pF	V=0,f=1MHz
	Cut-off Frequency	f_c	---	80	---	kHz	V_{CE}=5V, I_C=2mA R_L=100Ω,-3dB
	Rise Time	t_r	---	4	18	μs	V_{CE}=2V, I_C=2mA R_L=100Ω
	Fall Time	t_f	---	3	18	μs	

*1 Current Conversion Ratio = I_C / I_F × 100%, CTR Tolerance:±3%.

7. Rank Table of Current Transfer Ratio

CTR Rank	Min	Max	Condition	Unit
No mark	20	300	I_F =± 1mA V_{CE} =5V Ta=25 ℃	%

8. Order Information

Part Number

ORPC-844W-X-Y-Z

Note

W = Lead form option (S, M or none)

X = Lead frame option (C:copper)

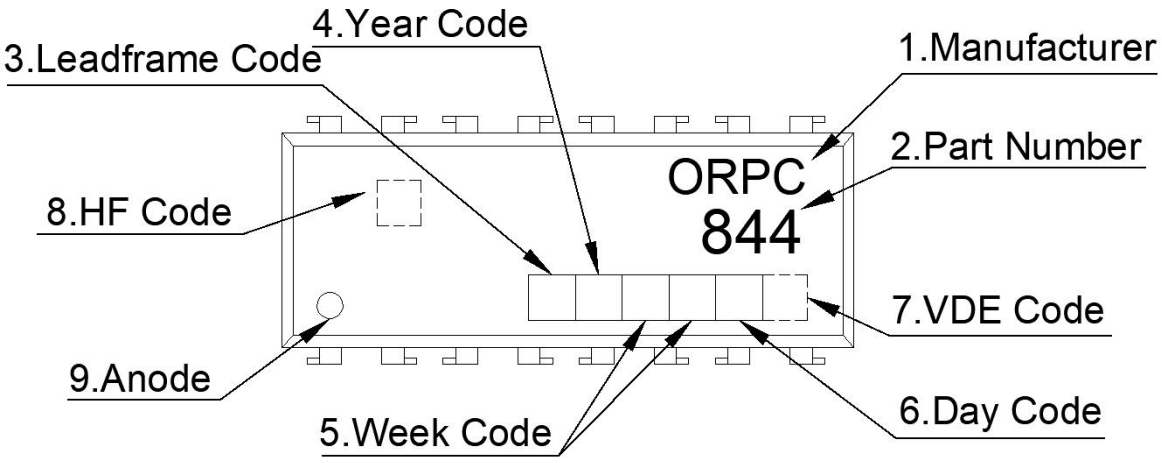
Y = 'V' code for VDE safety (This options is not necessary).

Z = 'G' code for Halogen free.

* VDE Code can be selected.

Option	Description	Packing quantity
None	Standard DIP-16	24 units per tube
M	Wide lead bend (0.4 inch spacing)	24 units per tube
S	Surface mount lead form (low profile)	24 units per tube

9. Naming Rule



(1) Manufacturer : ORIENT.

(2) 844 denotes Part Number.

(3) Lead frame Code □: 'C' means Copper.

(4) Year Code □ : '1' means '2021' and so on.

(5) Week Code □□: 01 means the first week, 02 means the second week and so on.

(6) Day Code □: "A to G" means "Monday to Sunday"

(7) VDE Code ⬚. (Optional)

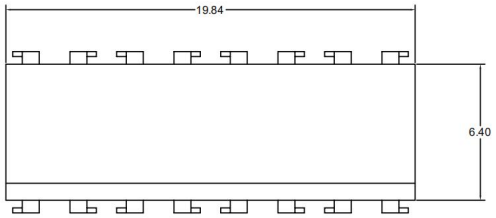
(8) HF Code ⬚: Halogen Free.

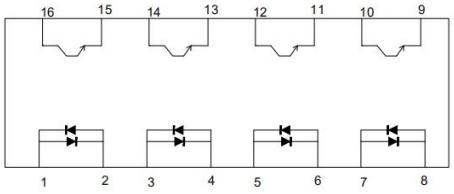
(9) Anode.

* VDE Mark can be selected.

10. Package Dimension (Unit：mm)

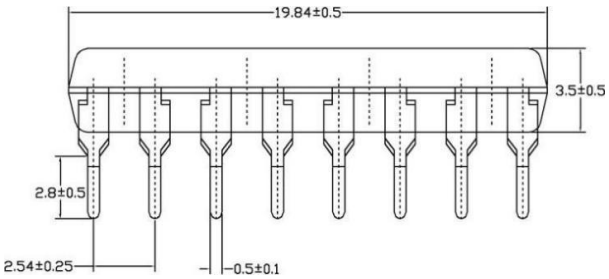
1.ORPC-844

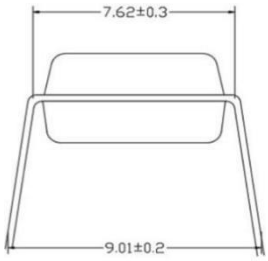




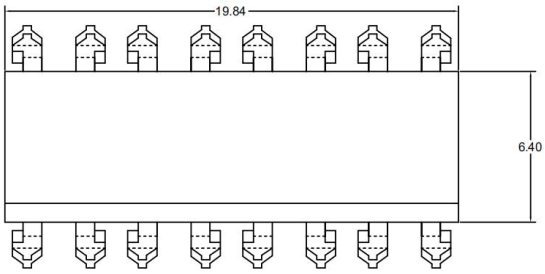
pin No. and Internal connection diagram

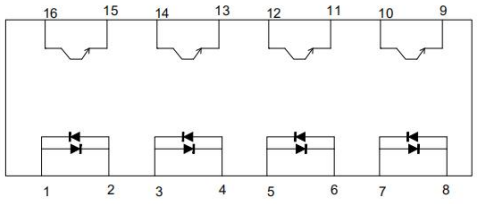
1~8 Anode/Cathode
9.11.13.15 Emitter
10.12.14.16 Collector





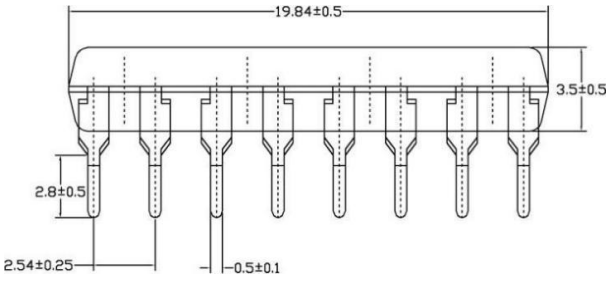
2.ORPC-844M

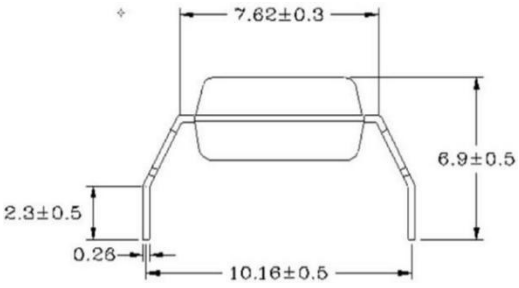




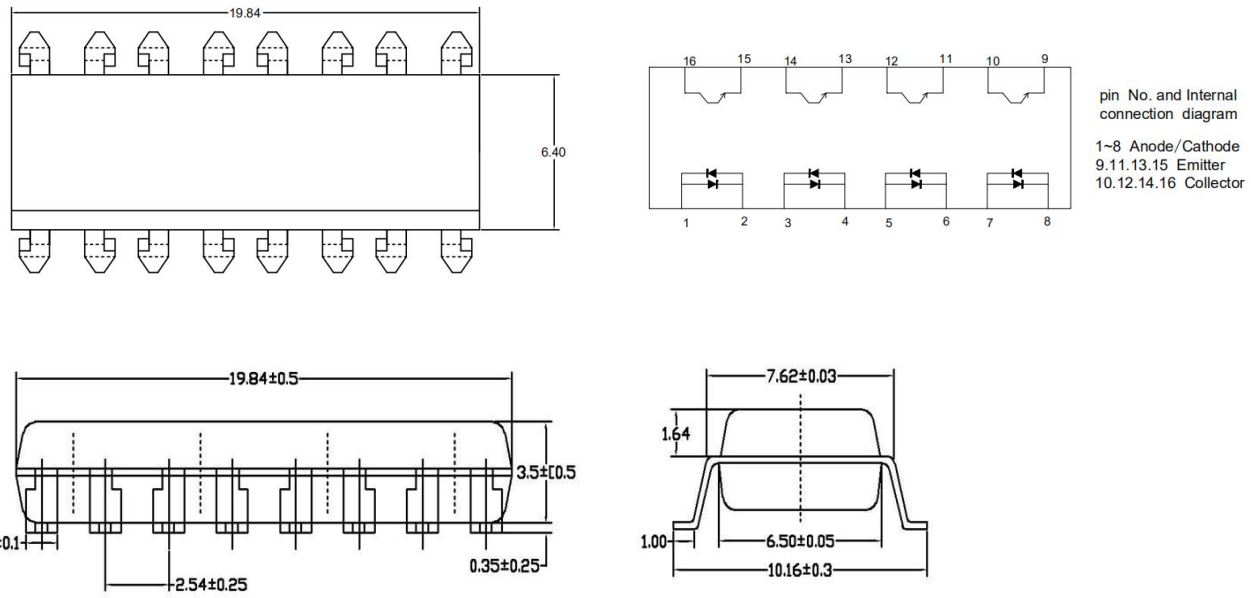
pin No. and Internal connection diagram

1~8 Anode/Cathode
9.11.13.15 Emitter
10.12.14.16 Collector

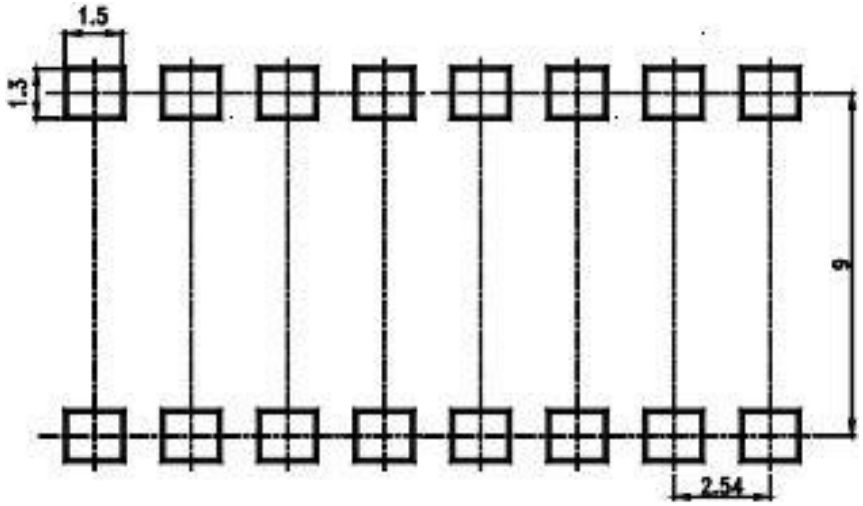




3. ORPC-844S



11. Recommended Foot Print Patterns (Mount Pad) (Unit：mm)



12. Package Dimension

(1) package dimension

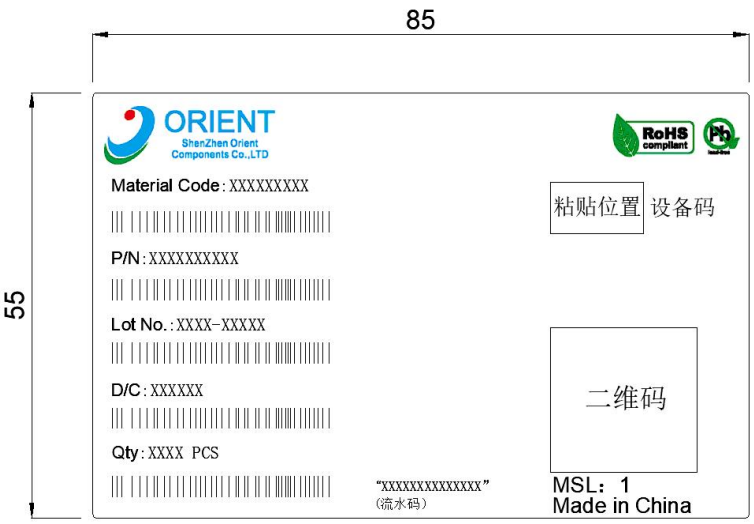
DIP Type

Packing Information	
Packing type	Tube
Qty per Tube	24pcs
Small box (Inner) Dimension	525*128*60mm
Large box (Outer) Dimension	545*290*335mm
The Amount per Inner Box	1,200pcs
The Amount per Outer Box	12,000pcs

SOP Type

Packing Information	
Packing type	Tube
Qty per Tube	24pcs
Small box (Inner) Dimension	525*128*60mm
Large box (Outer) Dimension	545*290*335mm
The Amount per Inner Box	1,000pcs
The Amount per Outer Box	10,000pcs

(2)Packing Label Sample



Note:

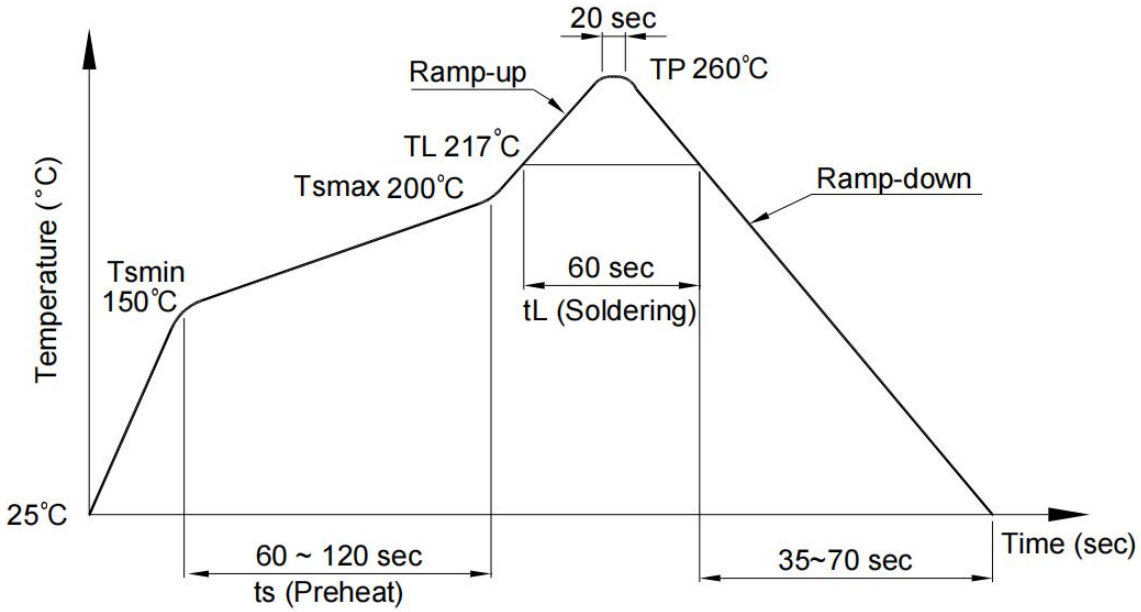
1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product weeks.
4. D/C :Product data.
5. Quantity :Packaging quantity.

13. Temperature Profile Of Soldering

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

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

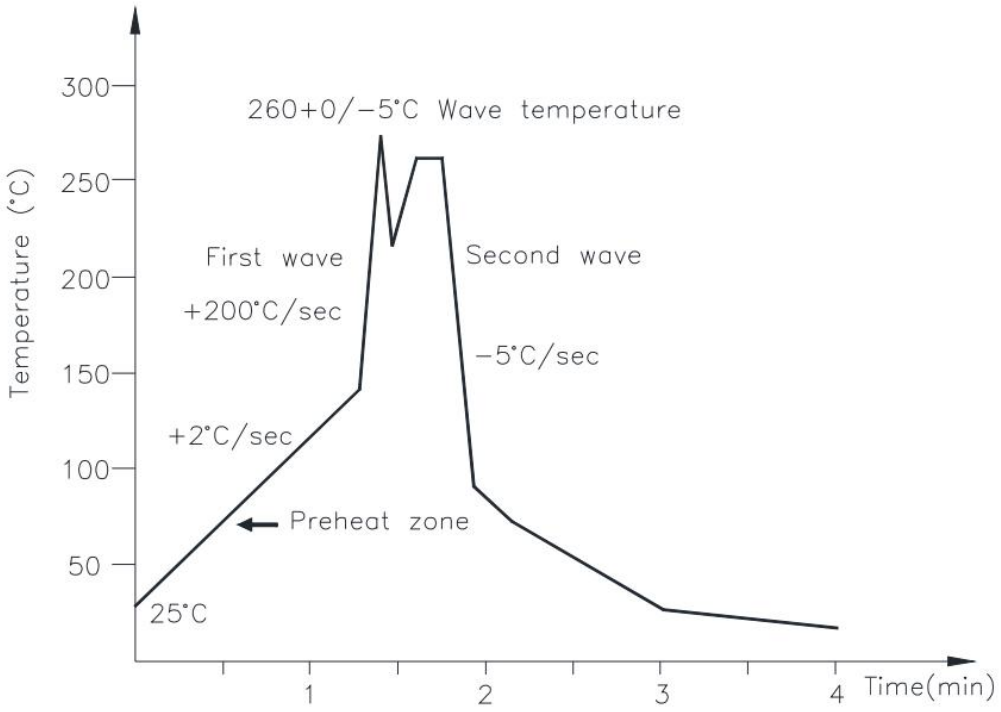
Profile item	Conditions
Preheat - Temperature Min (T Smin) - Temperature Max (T Smax) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (TL) - Time (t L)	 217˚C 60 sec
Peak Temperature	260˚C
Peak Temperature time	20 sec
Ramp-up rate	3˚C / sec max.
Ramp-down rate from peak temperature	3~6˚C / sec
Reflow times	≤3



(2).Wave soldering (JEDEC22 A111 compliant)

One time soldering is recommended within the condition of temperature.

Temperature Time	260+0/-5˚C 10 sec
Preheat temperature Preheat time	25 to 140˚C 30 to 80 sec



(3).Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature Time	380+0/-5˚C 3 sec max

14. Characteristics Curves

Fig.1 Forward current vs Ambient temperature

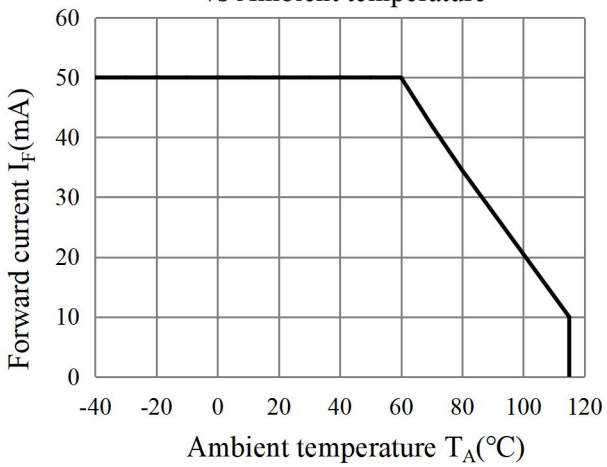


Fig.2 Collector Power Dissipation vs. Ambient temperature

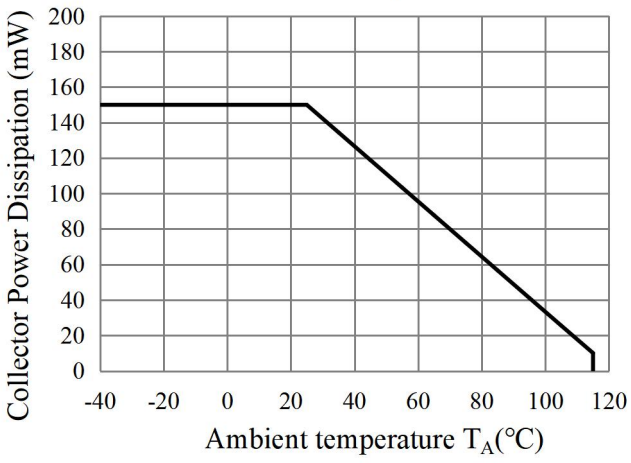


Fig.3 Forward Current vs. Forward Voltage

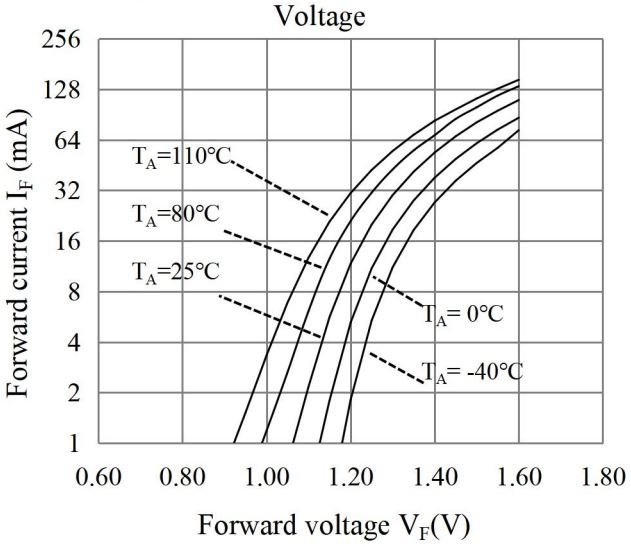


Fig.4 Collector-emitter Saturation Voltage vs. Forward Current

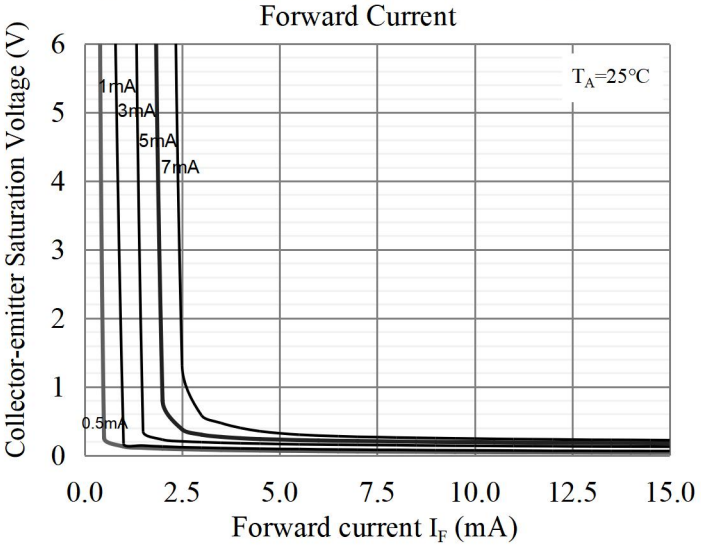


fig.5 Collector Current vs. Non-Saturated Collector Emitter Voltage

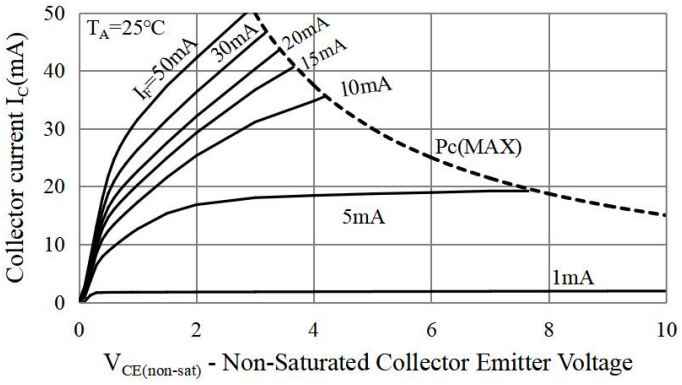


fig.6 Collector Current vs. Non-Saturated Collector Emitter Voltage

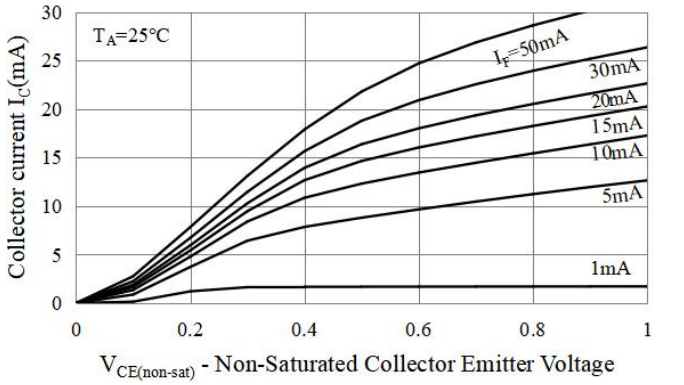


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

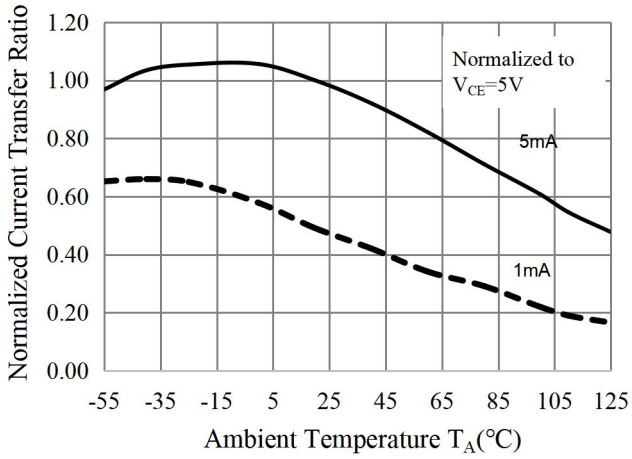


Fig.8 Relative Current Transfer Ratio vs. Ambient Temperature

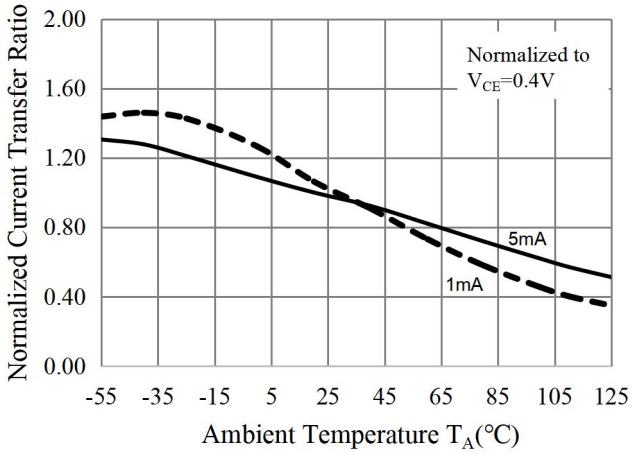


Fig.9 Forward Current vs. Current Transfer Ration

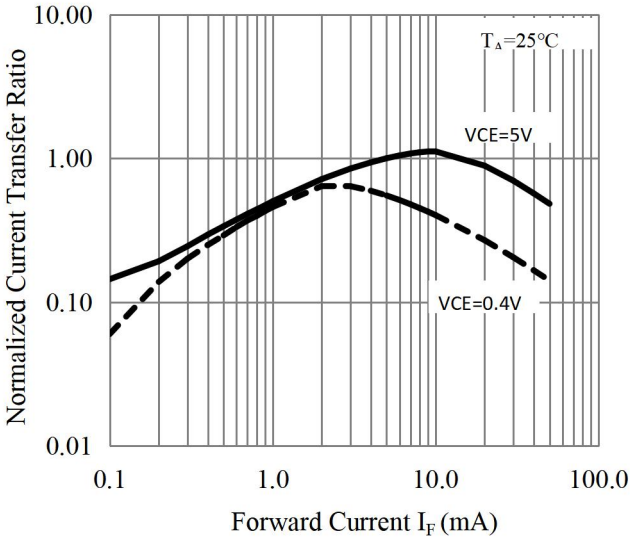


Fig.10 Collector Dark Current vs. Ambient Temperature

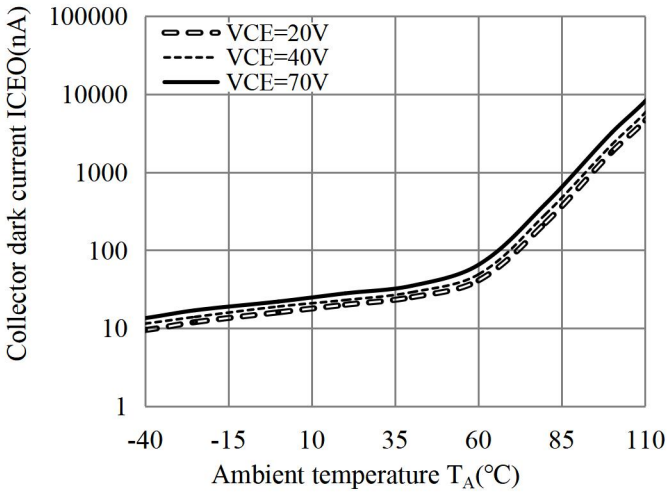


Fig.11 Collector-emitter Saturation Voltage vs. Ambient Temperature

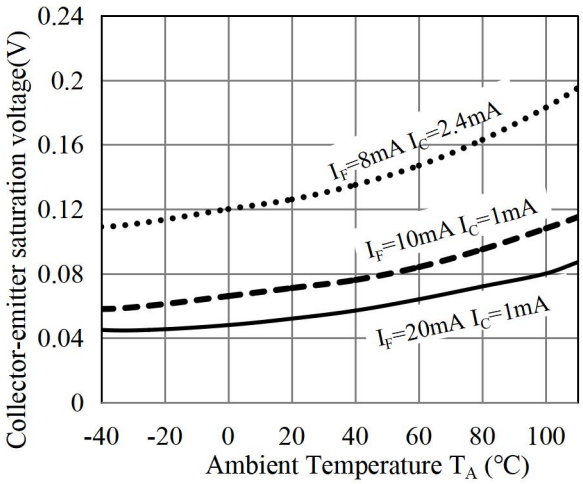


Fig.12 Switching Time vs. Load Resistance

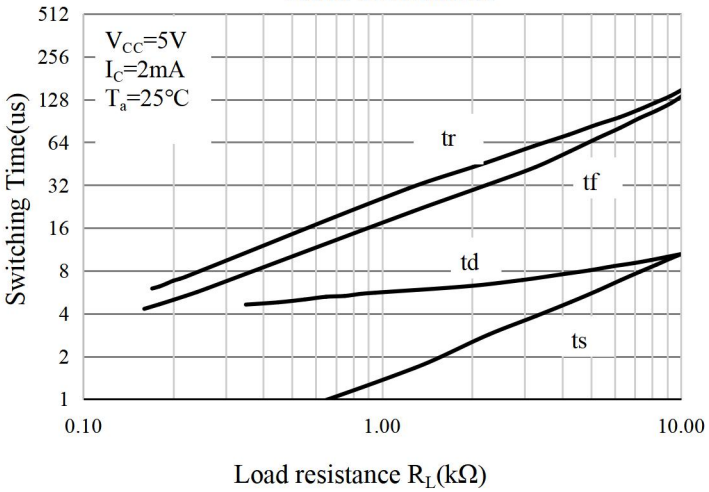


Fig.13 Respinse Time vs. Ambient temperature

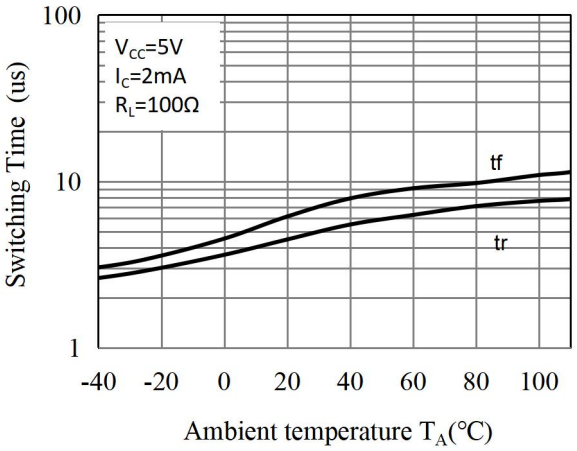
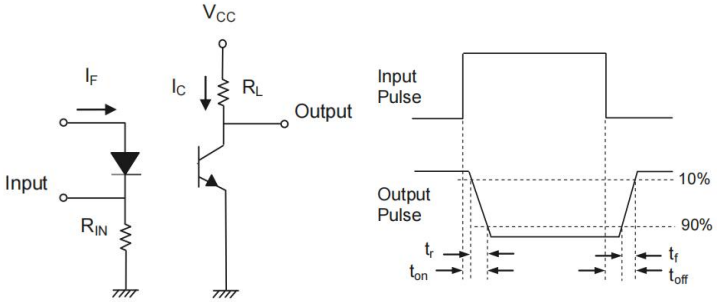


Fig.14 Switching Time Test Circuit & Waveforms



15. NOTES

1. Orient is continually improving the quality, reliability, function or design and Orient reserves the right to make changes without further notices.

2. 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.

3. 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.

4. When requiring a device for any “specific” application, please contact our sales in advice.

5. If there are any questions about the contents of this publication, please contact us at your convenience.

6. The contents described herein are subject to change without prior notice.

7. Immerge unit’s body in solder paste is not recommended.