ORIENT

Photo coupler

Product Data Sheet

MPN: ORPC-847 series

Customer: _____

Date: _____

SHENZHEN ORIENT COMPONENTS CO ., LTD

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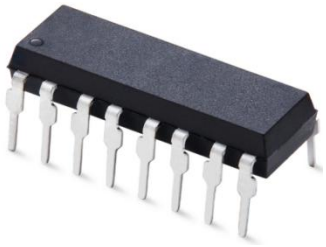
Preliminary

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

1. Features



(1) Current conversion ratio

(2) (Min 50% Working condition I_F=5mA, V_{CE}=5V)

(3) Insulation Voltage = 5,000Vrms，

(4) Response Time(tr: typ. 4μs； tf: TYP. 5μs at V_{CE}=2V, I_C=2mA, R_L=100 Ω)

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

(6) Safety approval

UL approved (No.E323844)

VDE approved (No.40029733)

(7) In compliance with RoHS, REACH standards

(8) MSL Class I

2. Instructions

(1) ORPC-847 series optical coupler consists of four GaAs transmitting tubes and four NPN transistors

(2) .Pin pitch of ORPC-847 is 2.54mm

3. Application Range

(1) Switching power supply

(2) Ammeter

(3) Computer

(4) Instrumental application, measurement machine

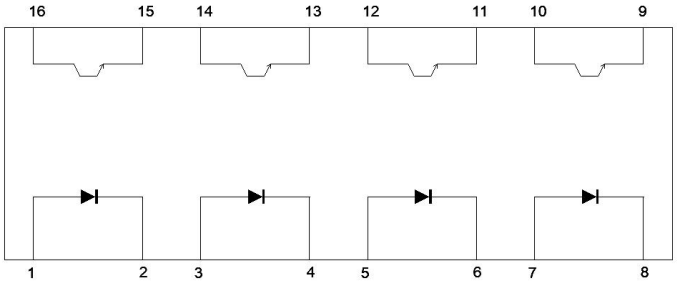
(5) Imbursement equipments, duplicating machine, automat

(6) Family-use electric equipments, such as fans

(7) Signal transforming systems

4. Functional Diagram

Pin No. and Internal connection diagram



1.3.5.7 Anode 2.4.6.8 /Cathode
9.11.13.15. Emitter 10.12.14.16. Collector

5. Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I_F	60	mA
	Peak forward Current (100μs pulse, 100Hz frequency)	I_{FP}	1	A
	Reverse Voltage	V_R	6	V
	Consume Power	P	70	mW
	Junction Temperature	T_j	125	℃
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 Consume Power		P_{tot}	200	mW
*1 Insulation Voltage		V_{iso}	5000	Vrms
Maximum transient isolation voltage (Insulating oil test)		V_{IOTM}	8000	V_{peak}
Maximum repetitive peak isolation voltage		V_{IORM}	850	V_{peak}
Operation Temperature		T_{opr}	-55 to + 110	℃
Storage Temperature		T_{stg}	-55 to + 125	
*2 Soldering Temperature		T_{sol}	260	

*1. AC Test, 1 minute, humidity = 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. soldering time is 10 seconds

6. Electrical optical characteristics at TA=25℃

Parameter		Symbol	Min	Typ.*	Max	Unit	Condition
Input	Forward Voltage	V_F	---	1.2	1.4	V	I_F=20mA
	Reverse Current	I_R	---	---	5	μA	V_R=5V
	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=0.01mA I_F=0mA
Transforming Characteristics	*1Current conversion ratio	CTR	50	---	600	%	IF=5mA VCE=5V
	Collector Current	I_C	2.5	---	30	mA	
	Collector and Emitter Saturation Voltage	$V_{CE(sat)}$	---	0.1	0.2	V	I_F=20mA I_C= 1mA
	Insulation Impedance	R_{iso}	$5\times10_{10}$	$1\times10_{12}$	---	Ω	DC500V 40~60%R.H.
	capacitance	C_f	---	0.6	1.0	pF	V=0, f=1MHz
	Transforming 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%

7. Rank table of current transfer ratio（CTR）

Grade Sign	Min (%)	Max (%)
ORPC-847 NO BIN	50	600
ORPC-847BC	130	400
ORPC-847CD	200	600
ORPC-847CD1	300	500

Note: Working condition: I_F=5mA, V_{CE}=5V, T_a=25℃

8. Order Information

Part Number

ORPC-847XV-W-Y-Z

Note

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

V = CTR Rank (BC, CD, CD1 or none)

W = Lead frame option (C:copper)

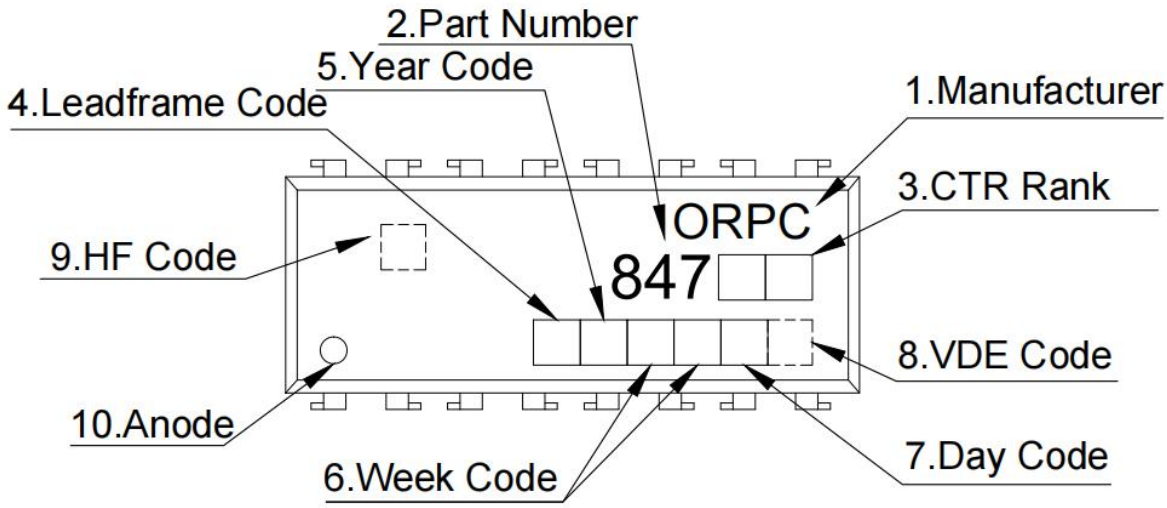
Y = 'V' code for VDE safety (This options is not necessary).

Z = 'G' code for Halogen free. (This options is not necessary).

* 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) 847 denotes Part Number.

(3) CTR Rand □□ .

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

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

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

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

(8) VDE Code ⬚. (Optional)

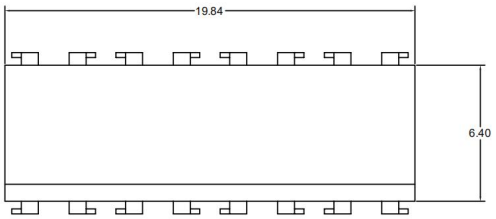
(9) HF Code ⬚: Halogen Free. (Optional)

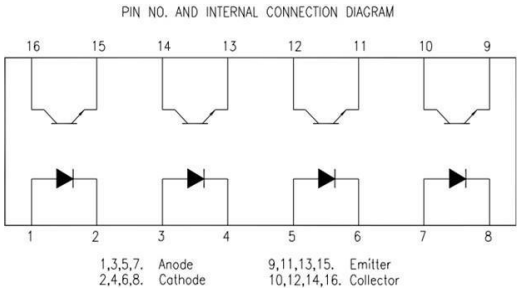
(10) Anode.

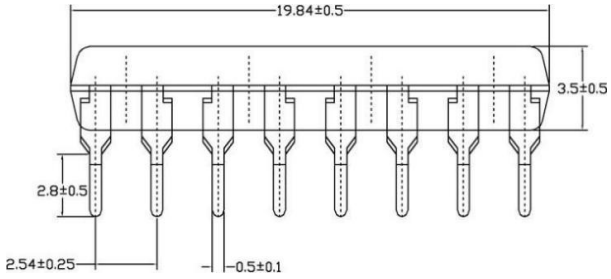
* VDE Mark can be selected.

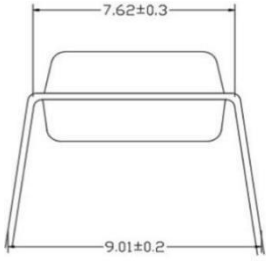
10. Outer Dimension (Unit： mm)

1. ORPC-847

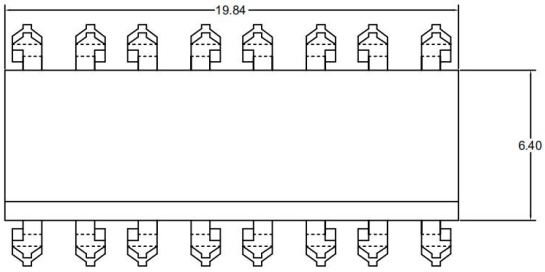


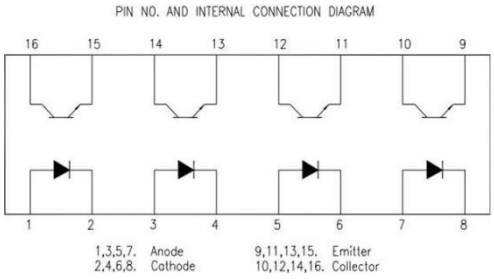


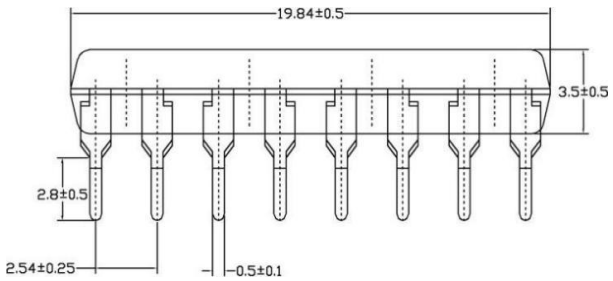


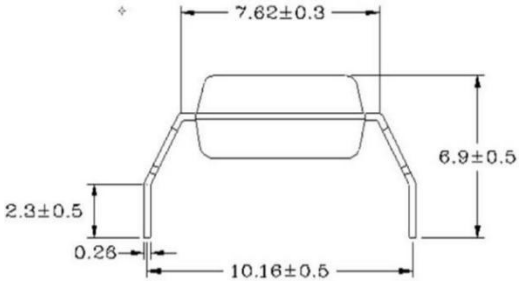


2.ORPC-847M

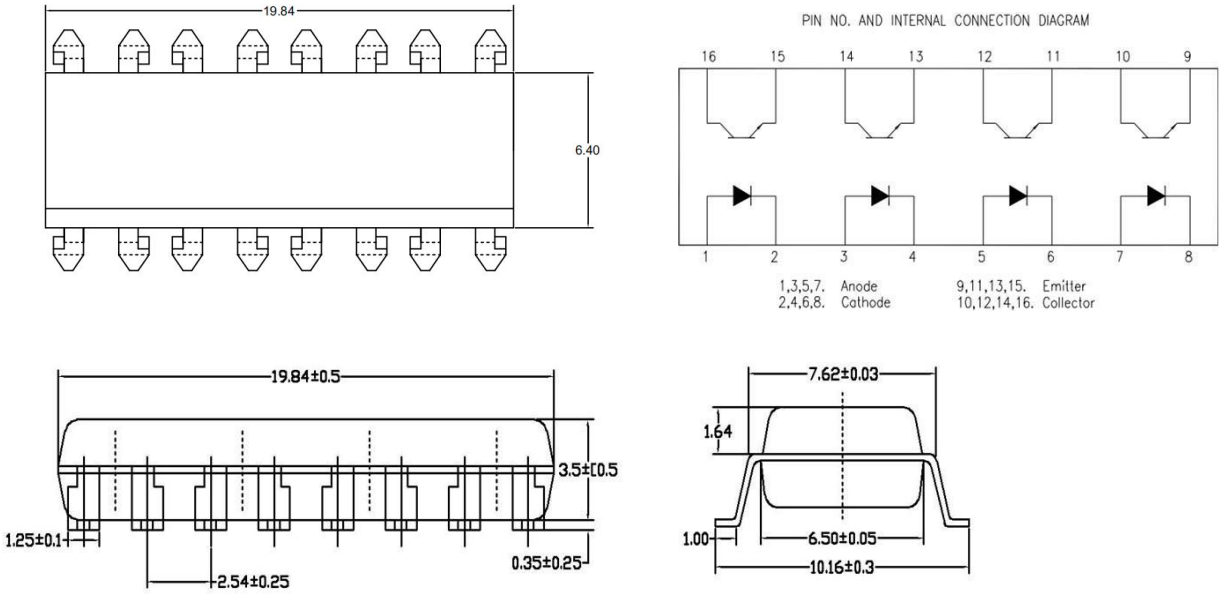




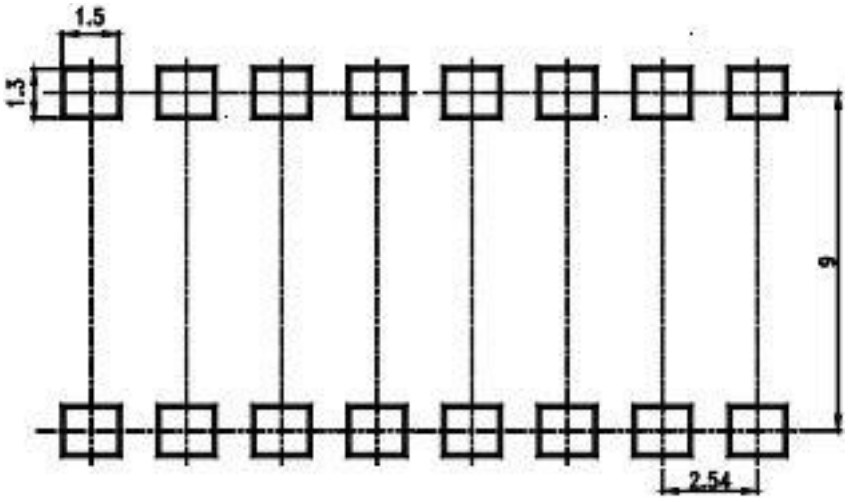




3.ORPC-847S



11. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)(Unit：mm)



12. Package Dimension

(1) package dimension

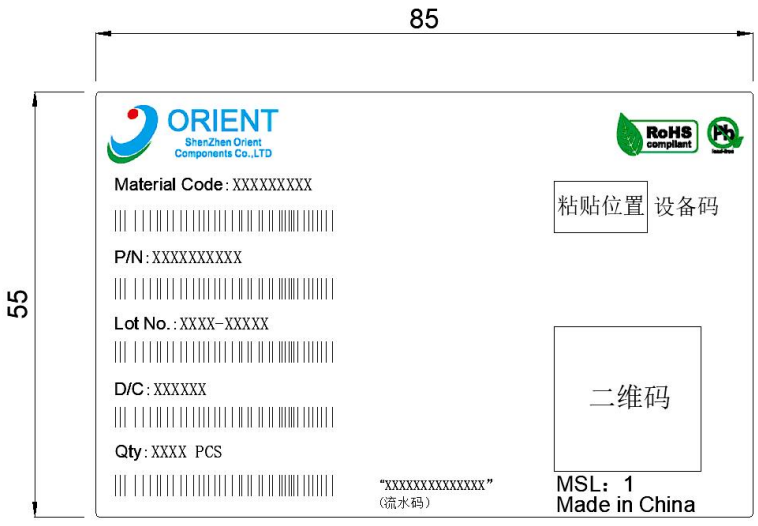
DIP Type

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:

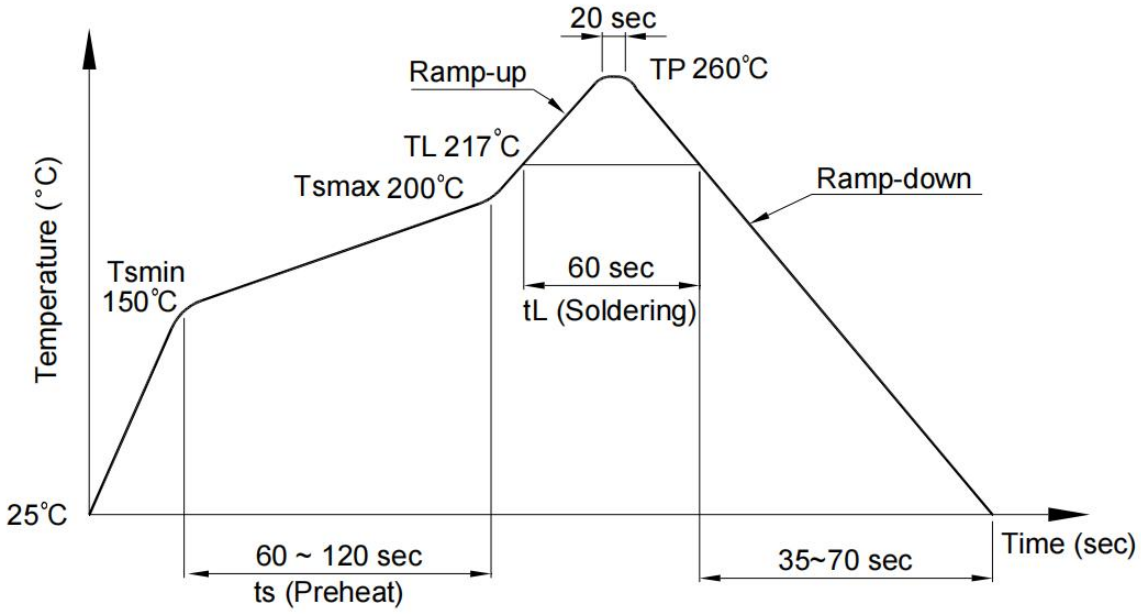
1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product weeks.
4. D/C :Product data.
5. Quantity :Packaging quantity.

13. Temperature Profile Of Soldering

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

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

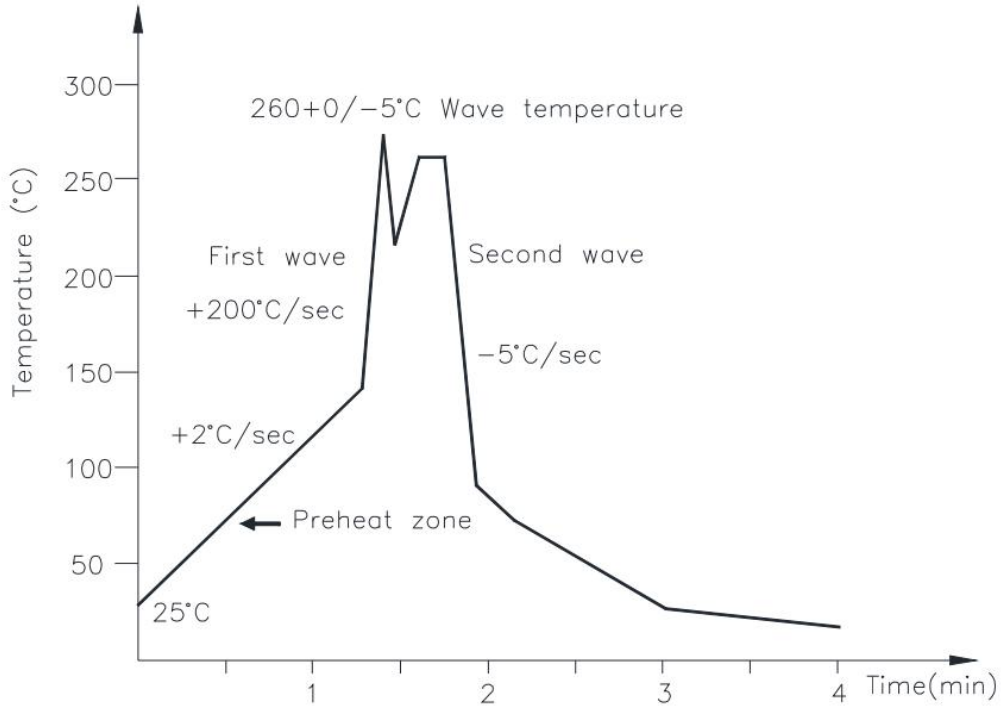
Profile item	Conditions
Preheat - Temperature Min (T Smin) - Temperature Max (T Smax) - Time (min to max) (ts)	 150˚C 200˚C 90±30 sec
Soldering zone - Temperature (TL) - Time (t L)	 217˚C 60 sec
Peak Temperature	260˚C
Peak Temperature time	20 sec
Ramp-up rate	3˚C / sec max.
Ramp-down rate from peak temperature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



（2） Wave soldering (JEDEC22A111 compliant

One time soldering is recommended within the condition of temperature.

Temperature Time	260+0/-5˚C 10 sec
Preheat temperature Preheat time	5 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

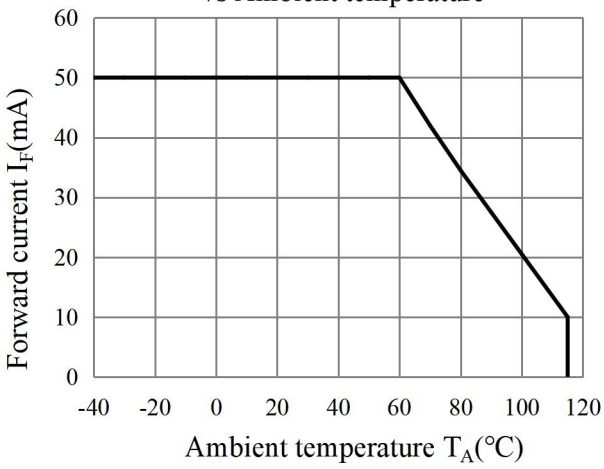


Fig.2 Collector Power Dissipation vs. Ambient temperature

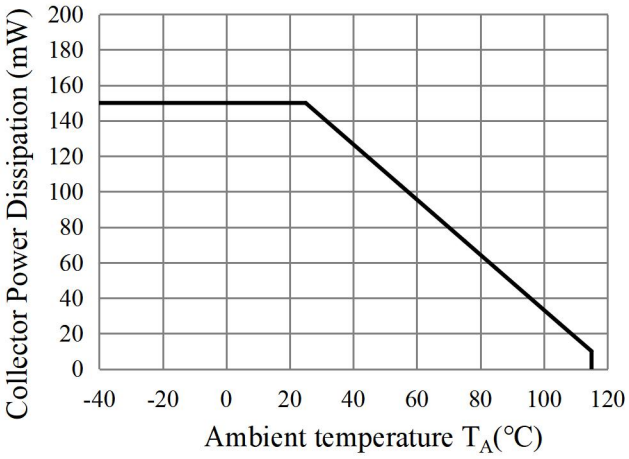


Fig.3 Forward Current vs. Forward Voltage

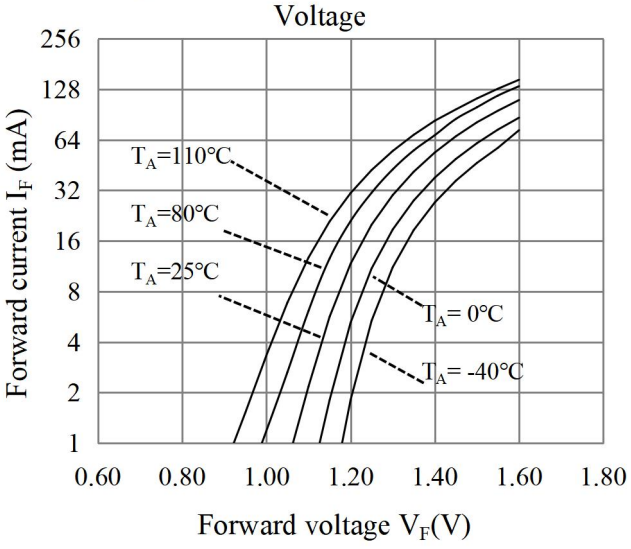


Fig.4 Collector-emitter Saturation Voltage vs. Forward Current

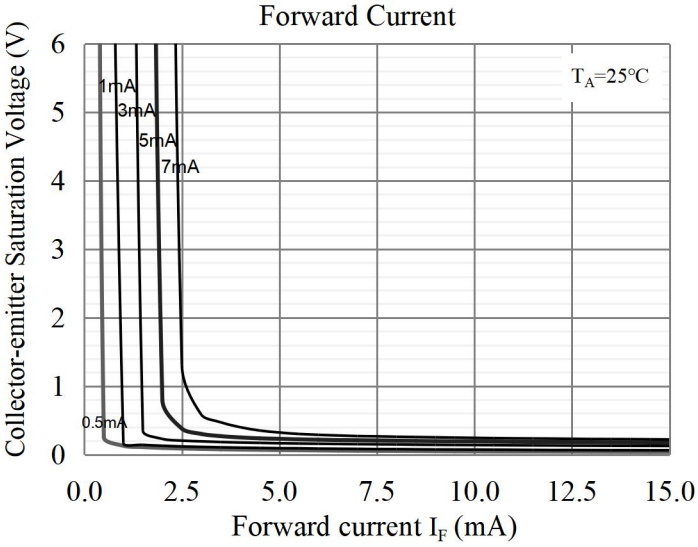


fig.5 Collector Current vs. Non-Saturated Collector Emitter Voltage

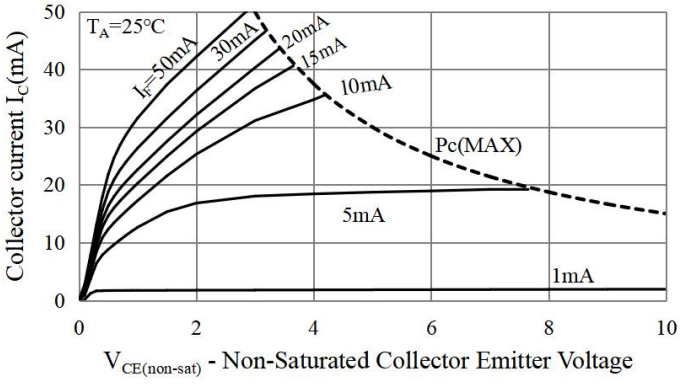


fig.6 Collector Current vs. Non-Saturated Collector Emitter Voltage

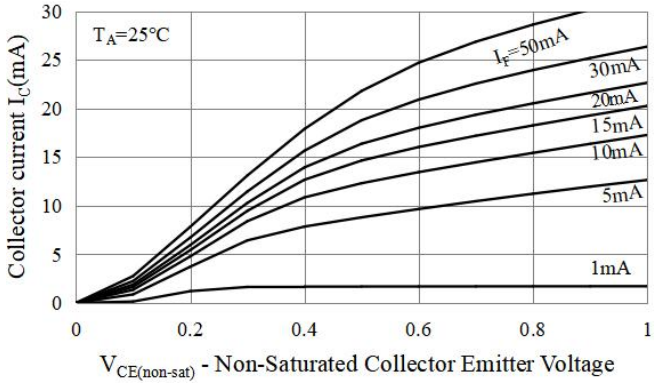


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

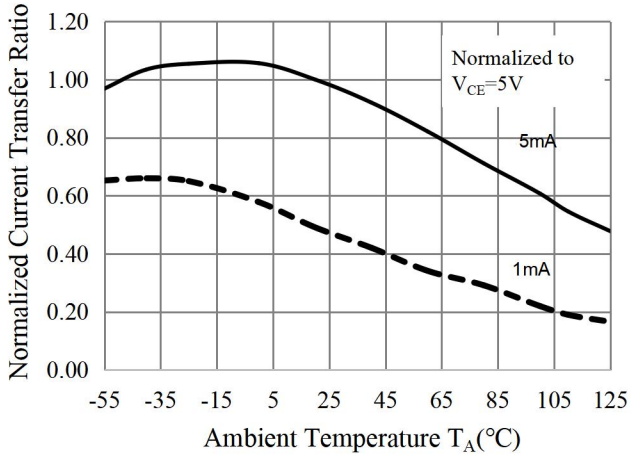


Fig.8 Relative Current Transfer Ratio vs. Ambient Temperature

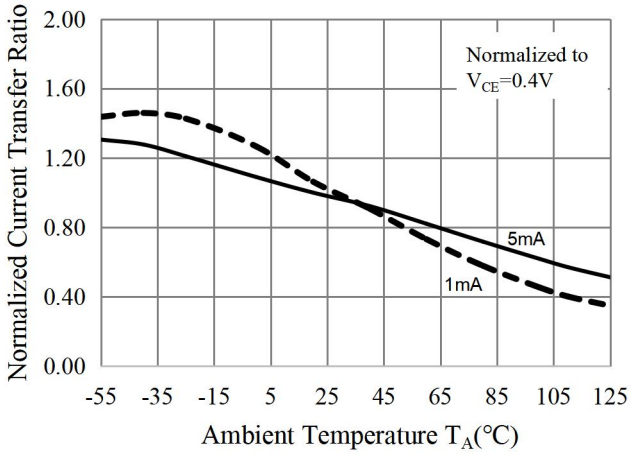


Fig.9 Forward Current vs. Current Transfer Ration

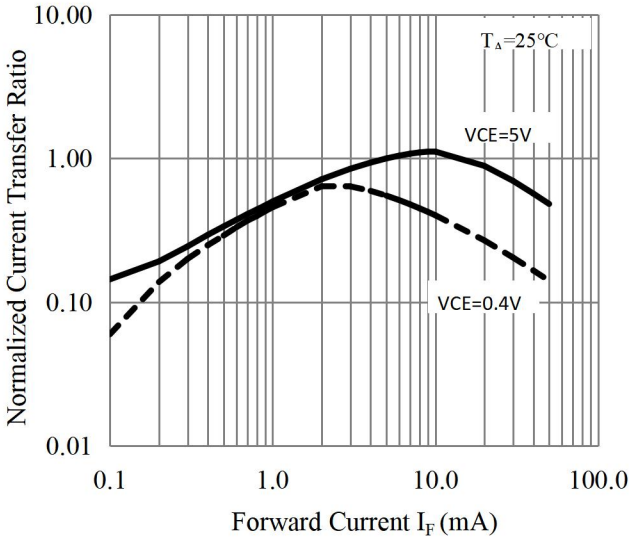


Fig.10 Collector Dark Current vs. Ambient Temperature

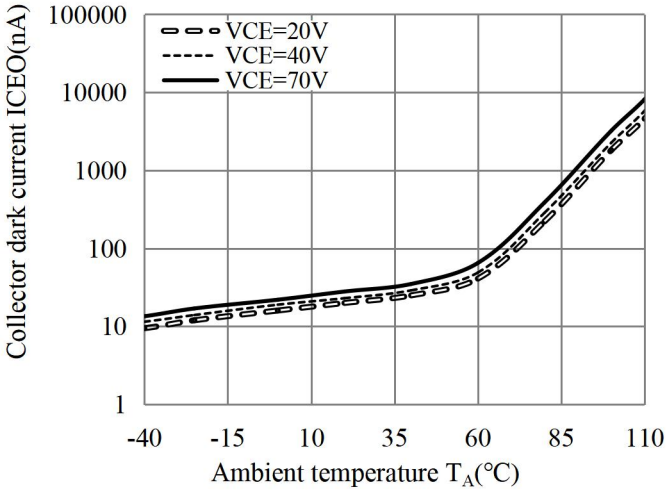


Fig.11 Collector-emitter Saturation Voltage vs. Ambient Temperature

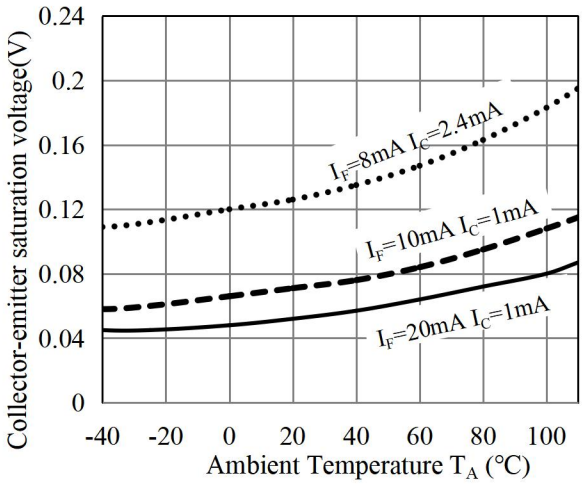


Fig.12 Switching Time vs. Load Resistance

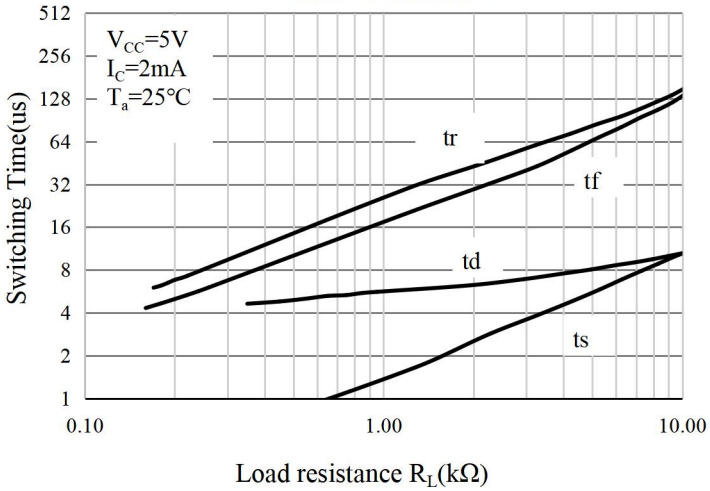


Fig.13 Respinse Time vs. Ambient temperature

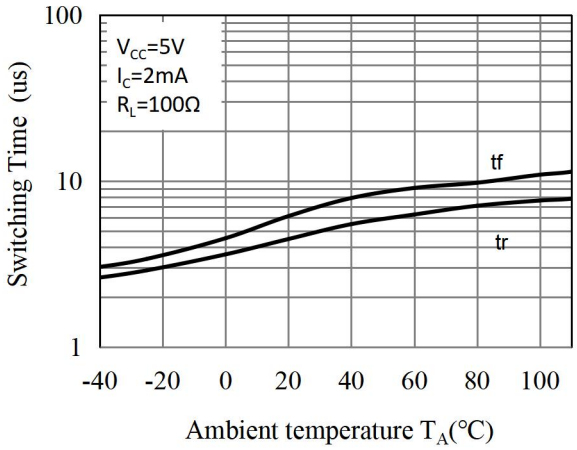
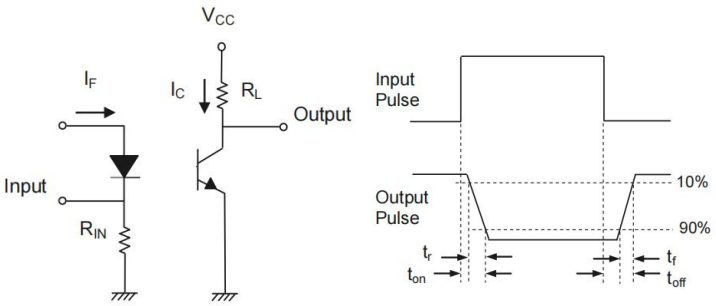


Fig.14 Switching Time Test Circuit & Waveforms



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.