



XSC357 Series

Phototransistor Photocoupler

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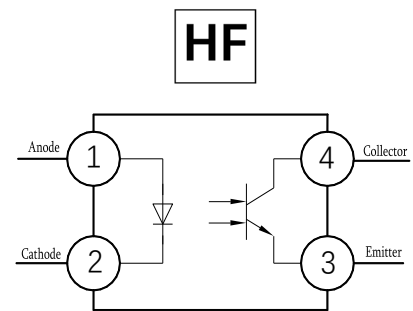
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1. FEATURES

- Current transfer ratio
- (CTR: 80~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output
(Viso = 3750V rms)
- Collector - emitter breakdown voltage $BV_{CEO} \geq 80\text{V}$
- Operating Temperature: $-55^{\circ}\text{C} \sim 110^{\circ}\text{C}$



2. APPLICATIONS

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as Fan Heaters, etc
- Signal transmission between circuits of different potentials and impedances



3. MECHANICAL DATA

- Case: SOP4
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

4. ORDERING INFORMATION

XSC 357 (M) (G) (X) - (U) (N) (Y)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- 1) Brand(XSC)
- 2) Product series(357)
- 3) Package type(None:SOP4)
- 4) Halogen option(None :Halogen free)
- 5) CTR Bank(A,B,C,D,E,F 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
XSC357A	SOP4	3000 pcs / Tape & Reel	XSC357A

Notes 1: X denotes CTR Rank : A, B, C, D or None.

5. MARKING INFORMATION

- "XSC" denotes brand and product type
- "X" denotes CTR Rank : A, B, C, D , E,F, None.
- "Y" denotes Year : A(2024), B(2025), C(2026)
- "WW" denotes Week's number
- "N" denotes the day of Week.



6. MAXIMUM RATINGS (@ T_A = 25°C UNLESS OTHERWISE SPECIFIED)

Parameter		Symbol	Value	Unit
Input	Forward Current	I _F	50	mA
	Peak Forward Current *1	I _{FM}	1	A
	Reverse Voltage	V _R	6	V
	Power Dissipation	P _D	70	mW
Output	Collector Power Dissipation	P _C	150	mW
	Collector Current	I _C	50	mA
	Collector-Emitter Voltage	V _{CEO}	80	V
	Emitter-Collector Voltage	V _{ECO}	7	V

7. THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Total Power Dissipation	P_{TOT}	200	mW
Isolation Voltage ^{*2}	V_{ISO}	3750	V _{rms}
Rated Impulse Isolation Voltage	V_{IOTM}	5000	V
Rated Repetitive Peak Isolation Voltage	V_{IORM}	600	V
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	430	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	350	°C/W
Thermal Resistance Junction-to-Lead	$R_{\theta JL}$	368	°C/W
Operating Temperature	T_{OPR}	-55 ~ +110	°C
Storage Temperature Range	T_{STG}	-55 ~ +125	°C
Soldering Temperature ^{*3}	T_{SOL}	260	°C

Notes:

1. Pulse width ≤ 1μs, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

8. ELECTRICAL CHARACTERISTICS

(@TA=25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$I_F = 20\text{mA}$	-	1.2	1.4	V
	Peak Forward Voltage	V_{FM}	$I_{FM} = 0.5\text{A}$	-	-	3.0	V
	Reverse Current	I_R	$V_R = 4\text{V}$	-	-	10	μA
	Input Capacitance	C_{in}	$V_R = 0\text{V}$, $f = 1\text{kHz}$	-	30	250	pF
Output	Collector-Emitter Dark Current	I_{CEO}	$V_{CE} = 20\text{V}$, $I_F = 0$	-	-	100	nA
	Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0.1\text{mA}$, $I_F = 0$	80	-	-	V
	Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}$, $I_F = 0$	7	-	-	V
Transfer Characteristics	Collector Current	I_C	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$	2.5	-	30	mA
	Current Transfer Ratio	CTR	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$	50	-	600	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}$, $I_C = 1\text{mA}$	-	0.1	0.2	V
	Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{Vdc}$ 40~60% R.H.	1×10^{12}	-	-	Ω

Isolation current	Risc	DC6000V, 40~60%R.H	-	-	2	μA
Floating Capacitance	C _{IO}	V _{IO} = 0, f = 1MHz	-	0.6	1.0	pF
Cut-off frequency	f _c	VCE = 5V, IC = 2mA RL=100 Ω , -3dB	-	80	-	kHz
Turn On Time	T _{on}	V _{CE} =2V, RL= 100 Ω I _C =2mA	-	4	18	μs
Turn Off Time	T _{off}		-	3	18	

9. RANK TABLE OF CURRENT TRANSFER RATIO CTR

Rank Mark	Min. (%)	Max. (%)	Condition
A	80	160	I _F = 5 mA, V _{CE} = 5V
B	130	260	
C	200	400	
D	300	600	
E	100	200	
F	150	300	
No mark	80	600	

10. RATINGS AND CHARACTERISTICS CURVES

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

Fig.1 Allowable Forward Current vs. Ambient Temperature

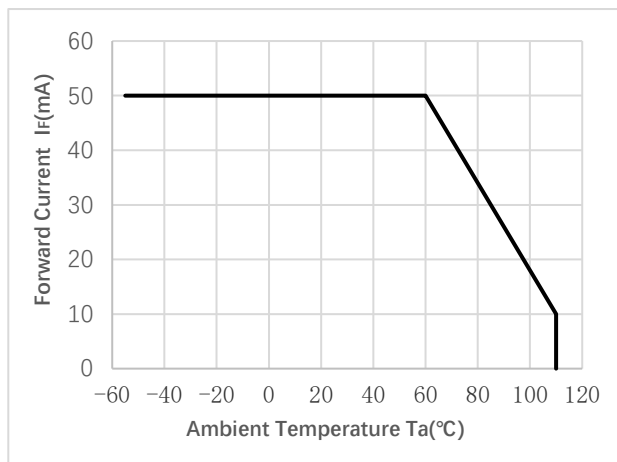


Fig.2 Allowable collector power dissipation vs. Ambient Temperature(°C)

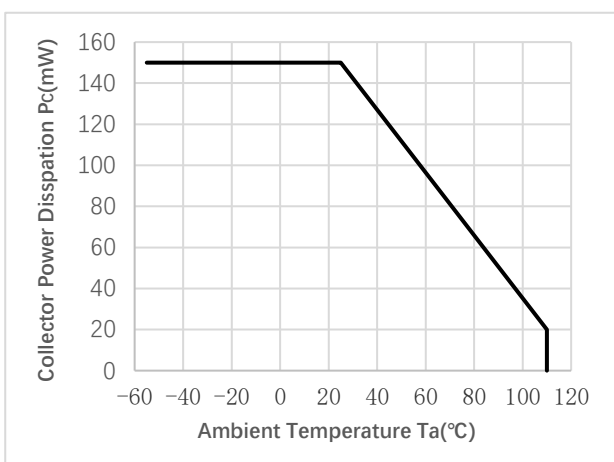


Fig.3 Relative Current Transfer Ratio vs. Forward Current

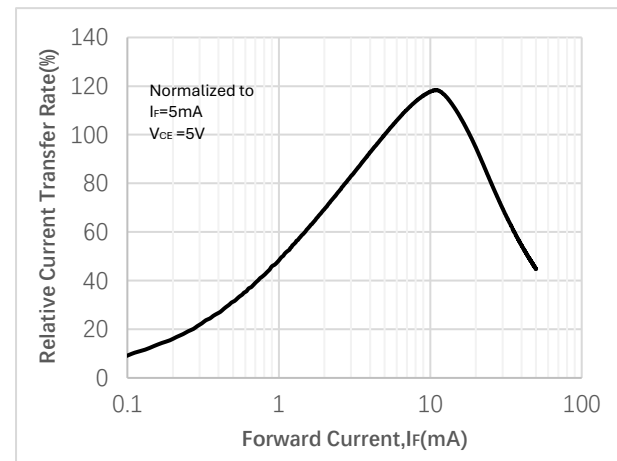


Fig.4 Forward Current vs. Forward Voltage

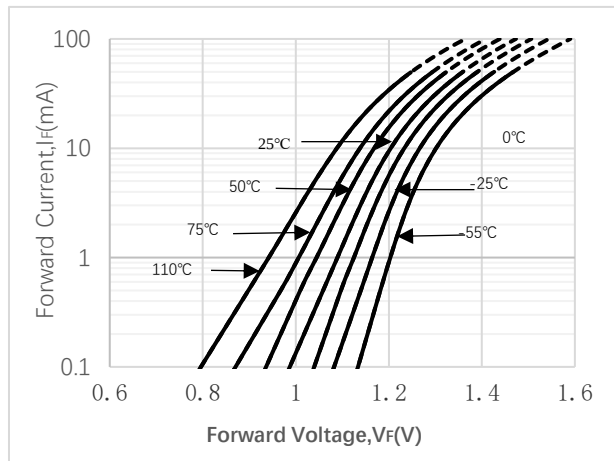


Fig.5 Collector Current vs. Collector-emitter Voltage

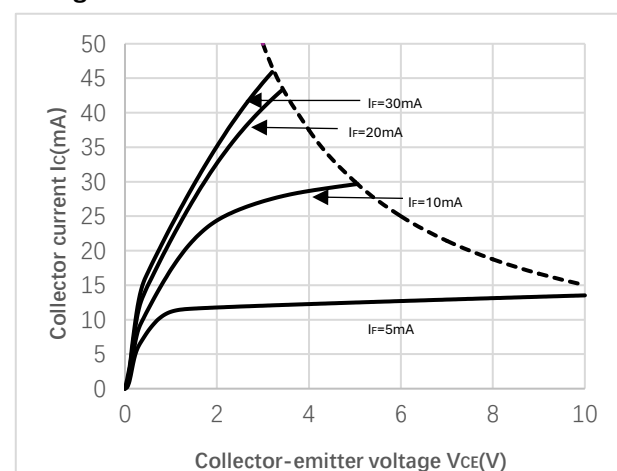


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

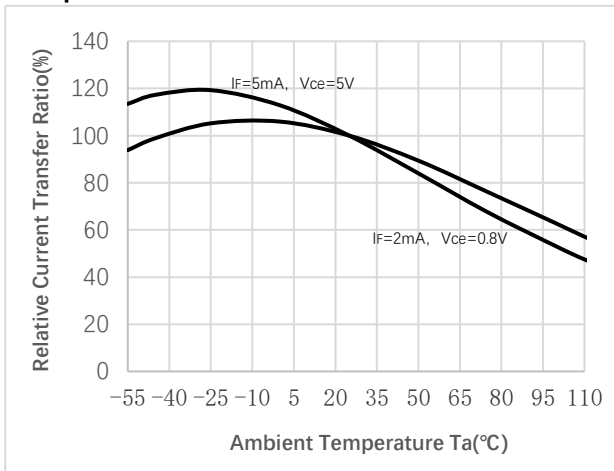


Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

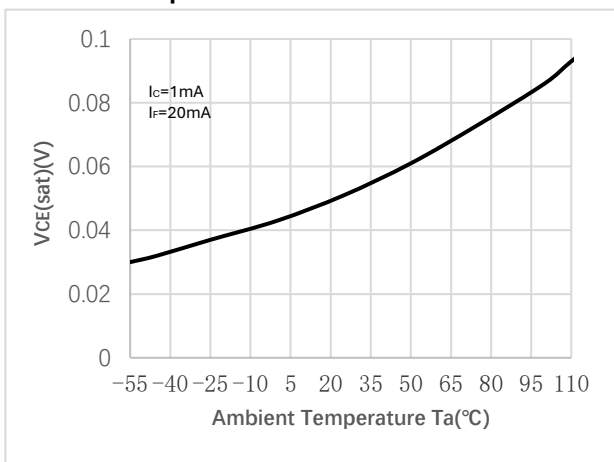


Fig.8 Collector Dark Current vs. Ambient Temperature

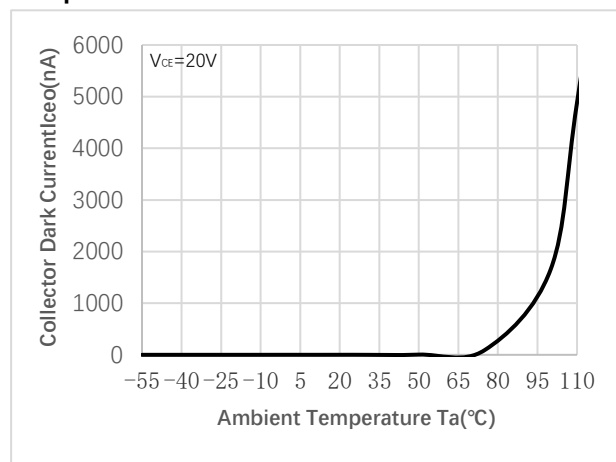


Fig.9 Response Time vs. Load Resistance

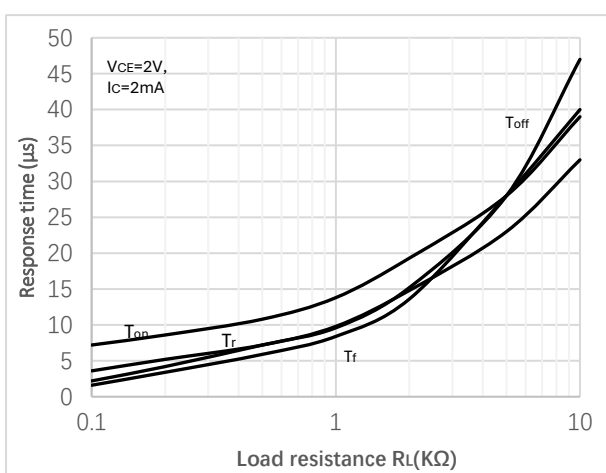


Fig.10 Frequency Response

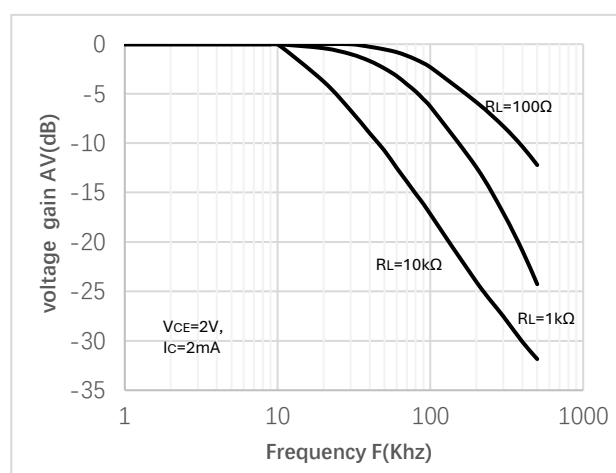


Fig.11 Collector-emitter Saturation Voltage vs. Forward current

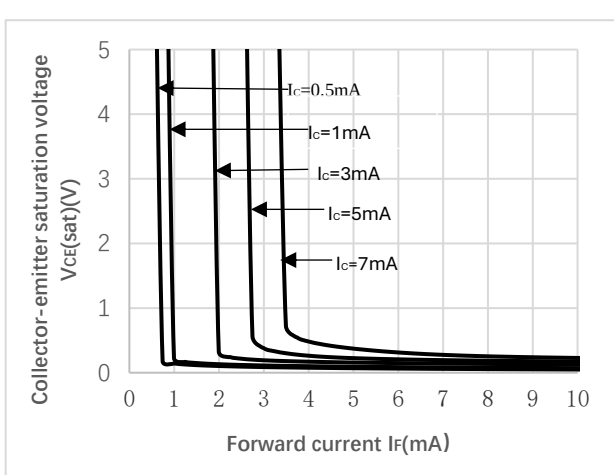
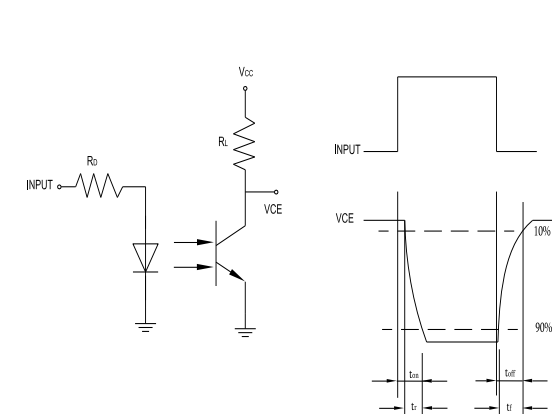
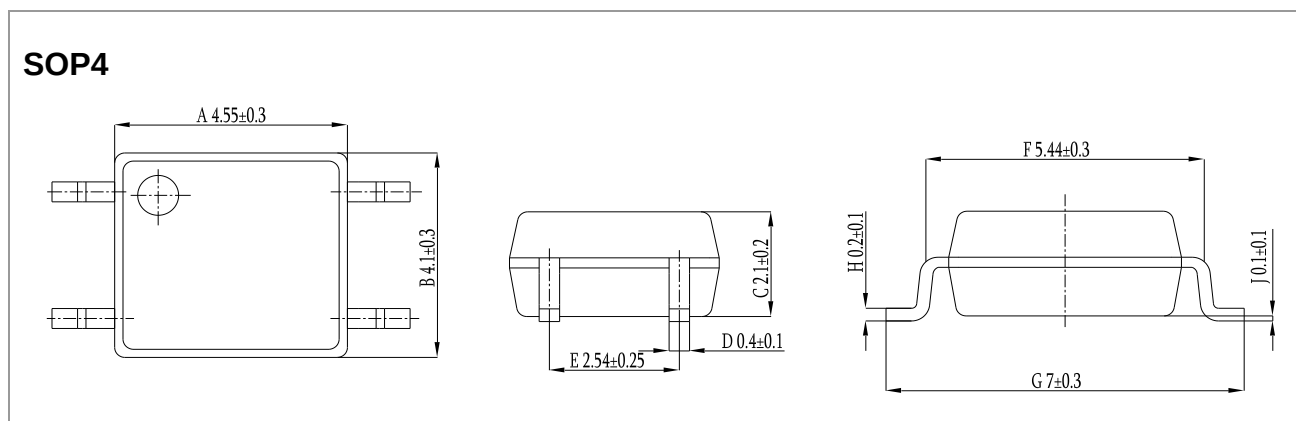
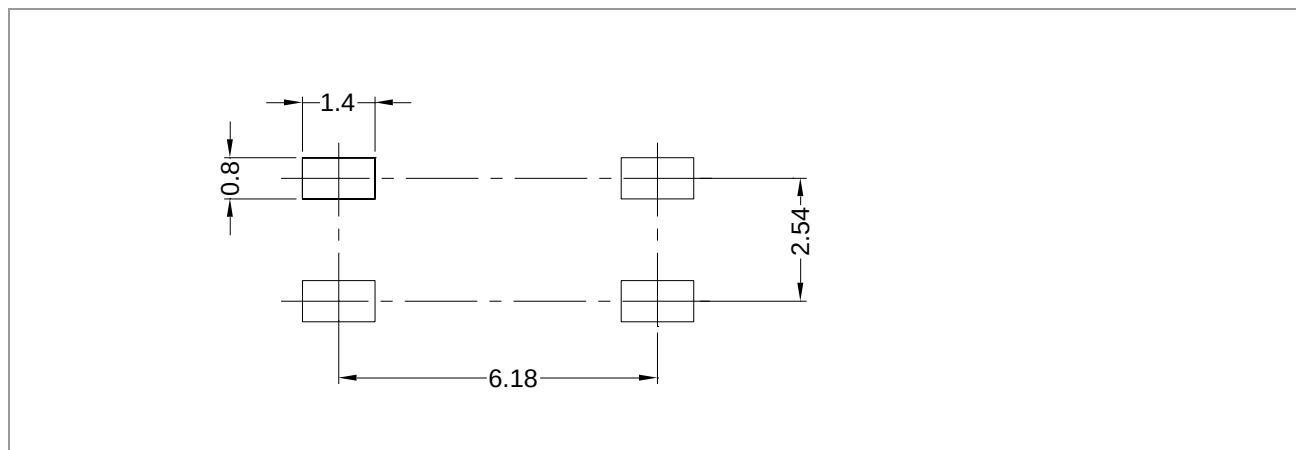
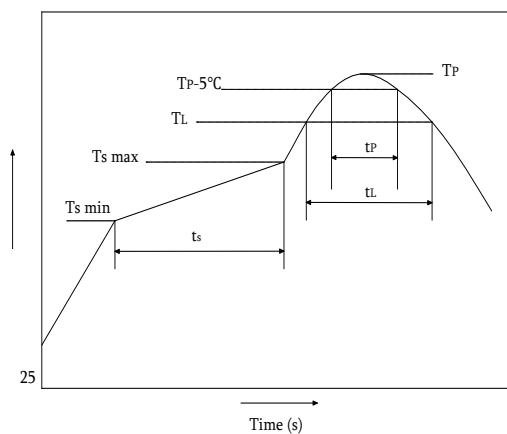


Fig.12 Switching Time Test Circuit & Waveforms



11. PACKAGE OUTLINE DIMENSIONS (UNIT: MM)**12. SOLDERING FOOTPRINT (UNIT: MM)**

13. REFLOW SOLDERING

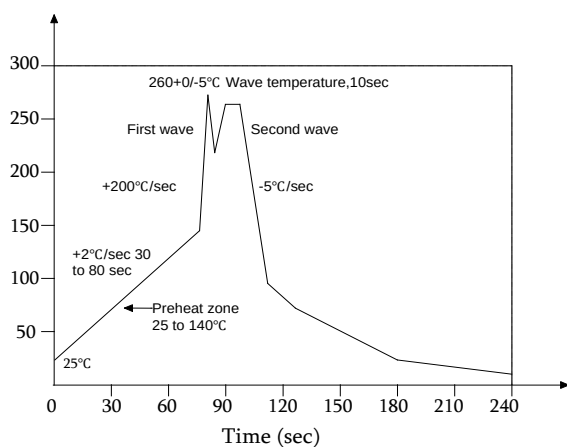


Note:

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

	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	°C
Preheat time	ts	60	120	s
Ramp-up rate(T _L to T _P)			3	°C/s
Liquidus temperature	T _L	217		°C
Time above T _L	t _L	60	150	s
Peak temperature	T _P		260	°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	°C/s

Wave soldering



Soldering with hand soldering iron

Hand soldering iron is only used for product rework or sample testing.

Hand soldering iron requirements: Temperature: 360 °C±5°C within 3s.

Profile feature	
Average ramp-up rate	~200°C/s
Heating rate during preheat	1°C/s to 2°C/s typical; 4°C/s maximum
Final preheat temperature Ts	~130°C
Preheat time (25°C to Ts)	> 60s
Peak temperature Tp	260°C
Time within peak temperature tp	10s
Ramp-down rate	5°C/s maximum

14. PACKAGE INFORMATION

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP4	Reel(ϕ 330mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	/	350*340*60mm	365*330*370mm	Guard band 200mm /min.

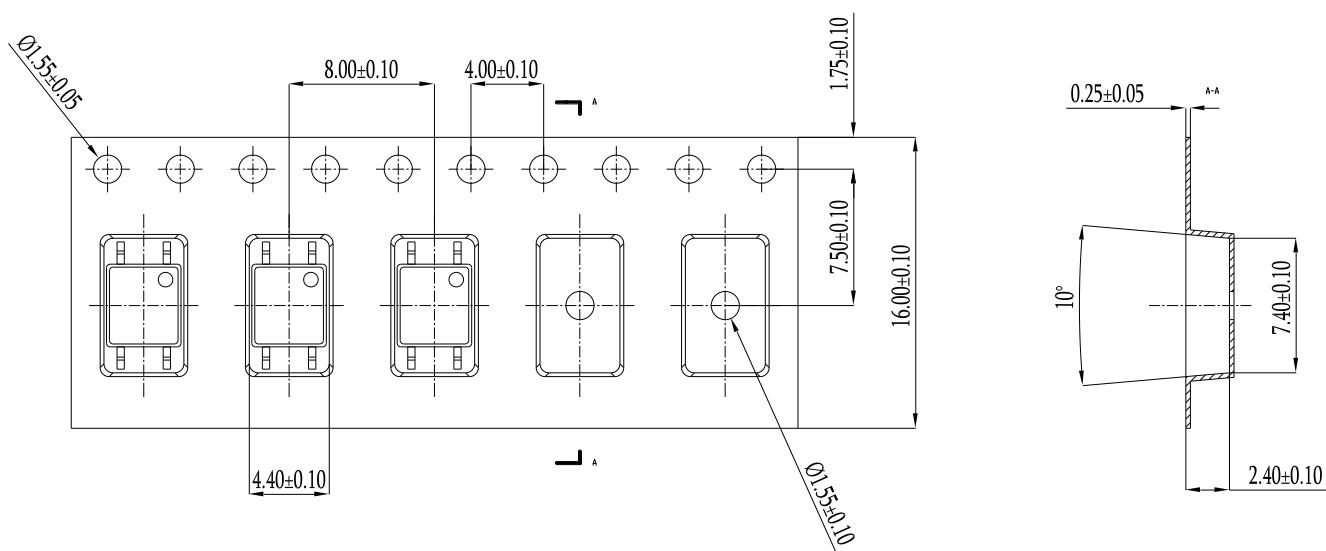
■ Summary table

■ SOP4 (Reel)

Qty/reel: 3000 pcs. Qty/box: 6000 pcs.

Qty/ctn : 30000 pcs.

Schematic: (unit:mm)



15. REVISION HISTORY

Revision	Content	Date
V1.0	Initial release	July 2024