

Features

HF

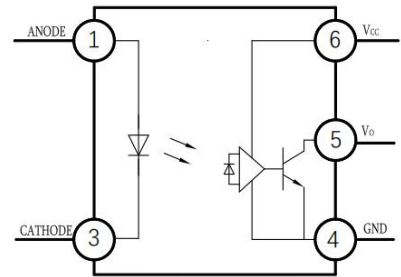
- Very high speed :10 MBit/s
- High isolation voltage between input and output (Viso =3750V rms)
- Operating Temperature: -40°C~85°C

Applications

- Ground loop elimination
- LSTTL to TTL, LSTTL or 5-volt CMOS
- Line receiver, data transmission
- Data multiplexing
- Switching power supplies
- Pulse transformer replacement
- Computer-peripheral interface

Mechanical Data

- Case: SOP5
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



Truth Table:

LED	VO, OUTPUT
OFF	H
ON	L

Ordering Information

TWS M6XX (M) (G) (X) - (U) (N) (Y)

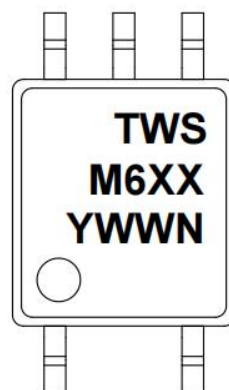
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Brand(TWS)
- ② Product series(M600,M601,M611)
- ③ Package type(SOP5:None)
- ④ Halogen option(None :Halogen free)
- ⑤ CTR Bank(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
TWSM601	SOP5	3000 pcs / Tape & Reel	TWSM601

Marking Information

- "TWS" denotes brand
- "XX" denotes Product series:00,01,11.
- "Y" denotes Year : A(2024), B(2025), C(2026)
- "WW" denotes Week's number
- "N" denotes the day of Week.



Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Emitter	Forward Current	I _F	50	mA
	Reverse Voltage	V _R	5	V
	Power Dissipation	P _D	100	mW
Detector	Collector Output	P _O	85	mW
	Output Current	I _O	50	mA
	Supply Voltage	V _{CC}	7	V
	Output Voltage	V _O	7	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Isolation Voltage *2	V _{ISO}	3750	V _{rms}
Operating Temperature	T _{OPR}	-40 ~ +85	°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

Electrical Characteristics (@ T_A = -40°C ~ 85°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V _F	I _F = 10mA	-	1.33	1.8	V
	Reverse Breakdown Voltage	B _{VR}	I _R = 10μA	5	-	-	V
	Capacitance	C _{in}	V _R = 0V, f = 1kHz	-	70	-	pF
	Diode Temperature Coefficient	ΔV _F /ΔT _A	I _F = 10mA	-	-1.9	-	mV/°C
Output	High Level Supply Current	I _{CCH}	V _{CC} = 5.5V, I _F = 0mA	-	6.0	9	mA
	Low Level Supply Current	I _{CCL}	V _{CC} = 5.5V, I _F = 10mA	-	7.5	10	mA
Transfer Characteristics	High Level Output Current	I _{OH}	V _{CC} = 5.5V V _O = 5.5V I _F = 250μA	-	2.1	30	μA
	Low Level Output Voltage	V _{OL}	V _{CC} = 5.5V I _F = 5mA I _{CL} = 13mA	-	0.4	0.6	V
	Input Threshold Current	I _{FT}	V _{CC} = 5.5V V _O = 0.6V I _{OL} = 13mA	-	2.4	5	mA
	Isolation Resistance	R _{IO}	V _{IO} = 500Vdc 40~60% R.H.	-	1×10 ¹²	-	Ω
	Floating Capacitance	C _{IO}	f = 1MHz	-	0.6	-	pF

Switching Characteristics (@ $T_A = -40^{\circ}\text{C} \sim 85^{\circ}\text{C}$, $V_{CC} = 5\text{V}$, $I_F = 7.5\text{mA}$, unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to Output HIGH Level		T_{PLH}	$C_L = 15\text{pF}$ $R_L = 350\Omega$ $T_A = 25^{\circ}\text{C}$	-	41	100	ns
Propagation Delay Time to Output Low Level		T_{PHL}		-	50	100	ns
Pulse Width Distortion		$ T_{PHL} - T_{PLH} $		-	9	35	ns
Output Rise Time (10–90%)		t_r		-	40	-	ns
Output Rise Time (90–10%)		t_f		-	10	-	ns
Propagation Delay Skew		t_{psk}		-	-	40	ns
Common Mode Transient Immunity(at Logic High)	M600	$ CM_H $	$T_A = 25^{\circ}\text{C}, I_F = 0\text{mA}$ $ V_{CM} = 10\text{V(Peak)}$ $V_{OH} = 2.0\text{V}, R_L = 350\Omega$	-	-	-	$\text{V}/\mu\text{s}$
	M601		$T_A = 25^{\circ}\text{C}, I_F = 0\text{mA}$ $ V_{CM} = 50\text{V(Peak)}$ $V_{OH} = 2.0\text{V}, R_L = 350\Omega$	5000	-	-	
	M611		$T_A = 25^{\circ}\text{C}, I_F = 0\text{mA}$ $ V_{CM} = 1000\text{V(Peak)}$ $V_{OH} = 2.0\text{V}, R_L = 350\Omega$	20000	-	-	
Common Mode Transient Immunity (at Logic Low)	M600	$ CM_L $	$I_F = 7.5\text{mA}, V_{OL} = 0.8\text{V}$ $R_L = 350\Omega, T_A = 25^{\circ}\text{C}$ $ V_{CM} = 10\text{V(Peak)}$	-	-	-	$\text{V}/\mu\text{s}$
	M601		$I_F = 7.5\text{mA}, V_{OL} = 0.8\text{V}$ $R_L = 350\Omega, T_A = 25^{\circ}\text{C}$ $ V_{CM} = 50\text{V(Peak)}$	5000	-	-	
	M611		$I_F = 7.5\text{mA}, V_{OL} = 0.8\text{V}$ $R_L = 350\Omega, T_A = 25^{\circ}\text{C}$ $ V_{CM} = 1000\text{V(Peak)}$	20000	-	-	

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

Fig.1 Forward Current vs. Forward Voltage

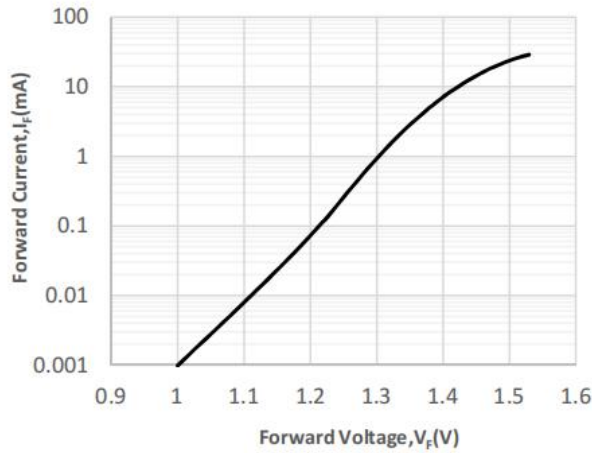


Fig.2 Low Level Output Voltage vs. Ambient Temperature

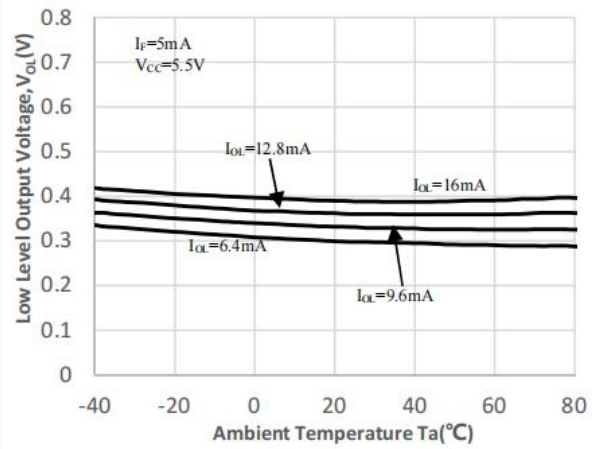


Fig.3 Switching time vs. Forward Current

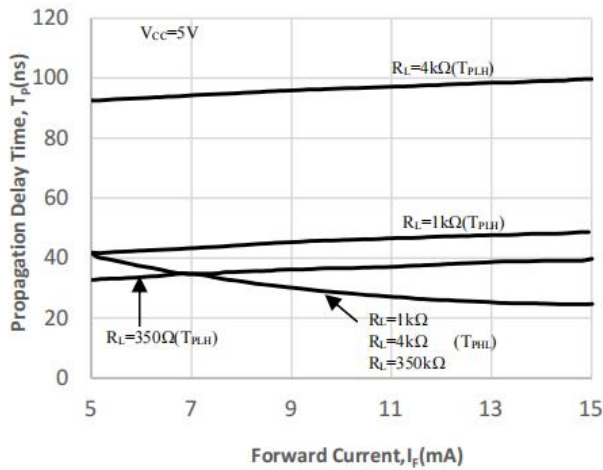


Fig.4 Low Level Output Current vs. Ambient Temperature

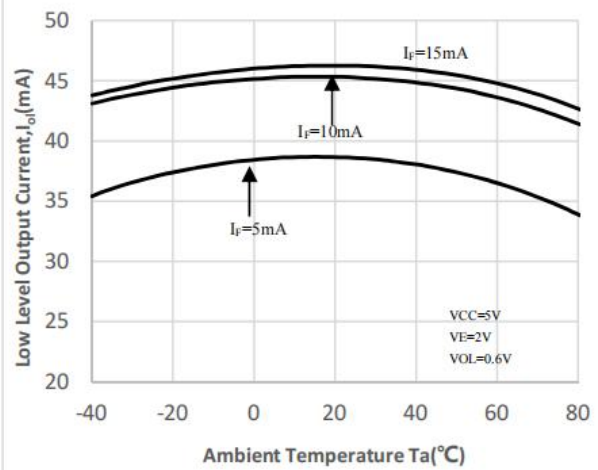


Fig.5 Start Current vs. Ambient Temperature

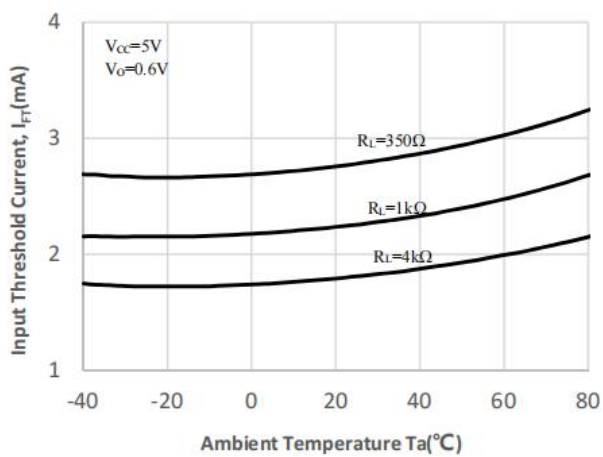


Fig.6 Output Voltage vs. Input Forward Current

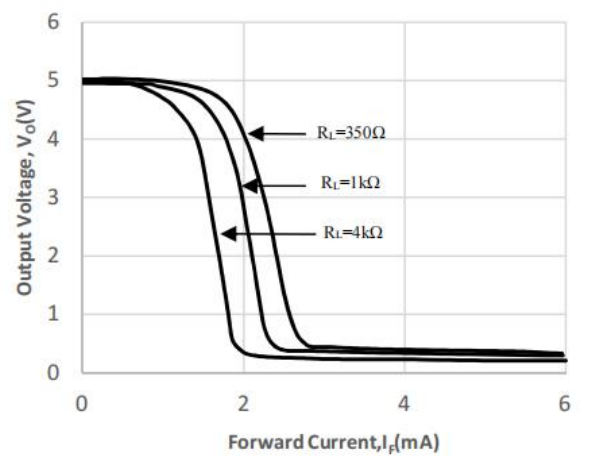


Fig.7 Pulse Width Distortion vs. Ambient Temperature

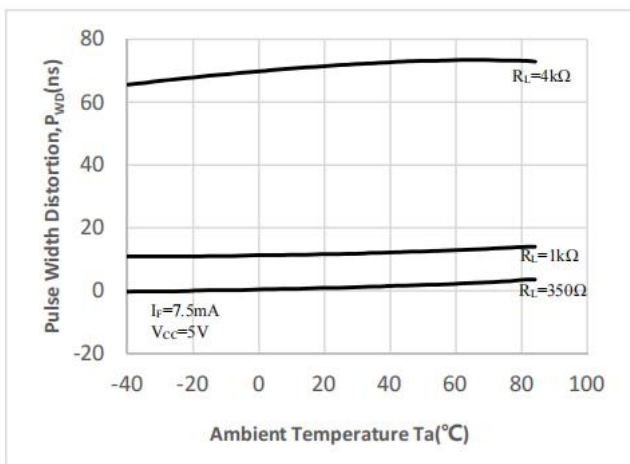


Fig.8 Rise and Fall Time vs. Ambient Temperature

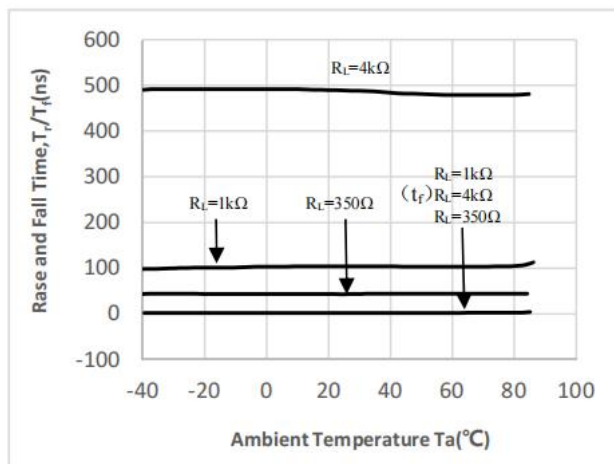


Fig.9 Test Circuit and Waveforms for t_{PLH} , t_{PHL} , t_r and t_f

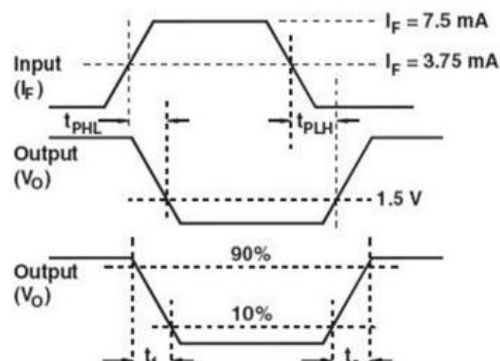
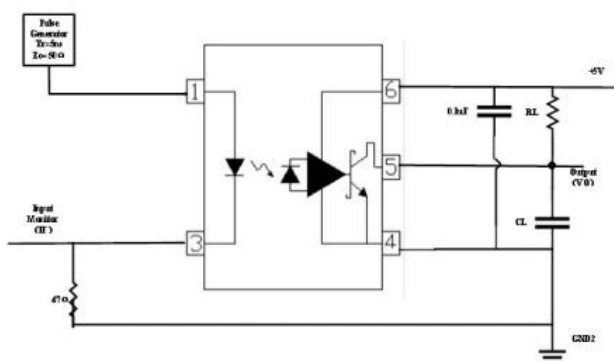
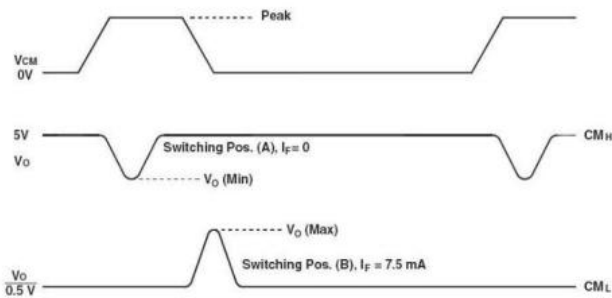
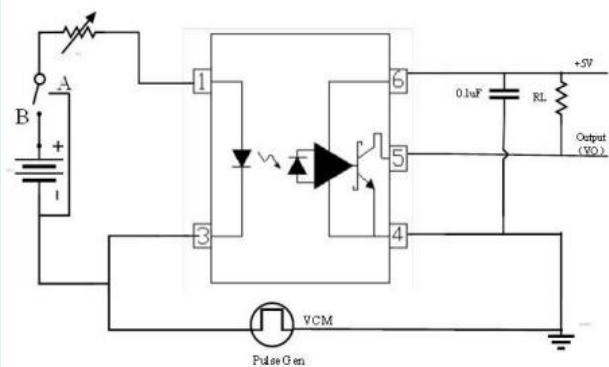
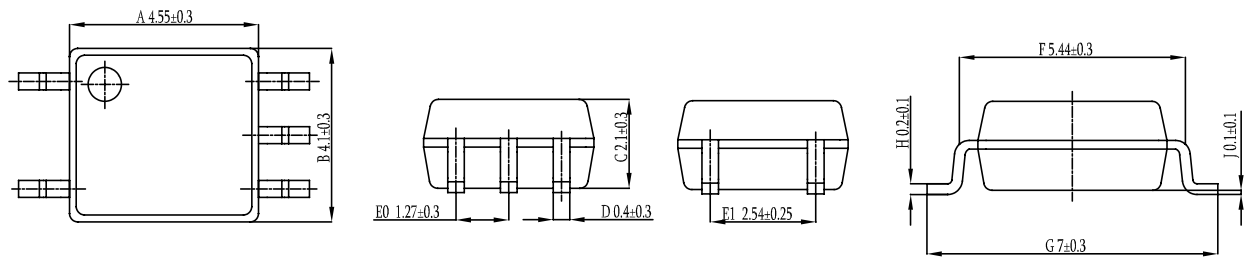


Fig.10 Test Circuit Common Mode Transient Immunity

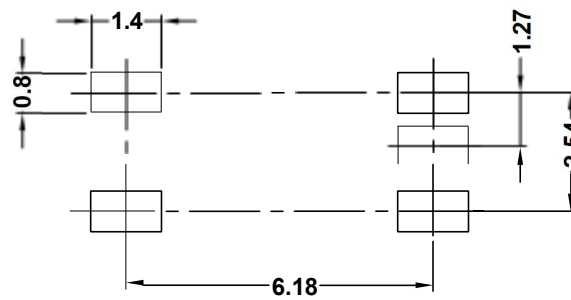


Package Outline Dimensions (unit: mm)

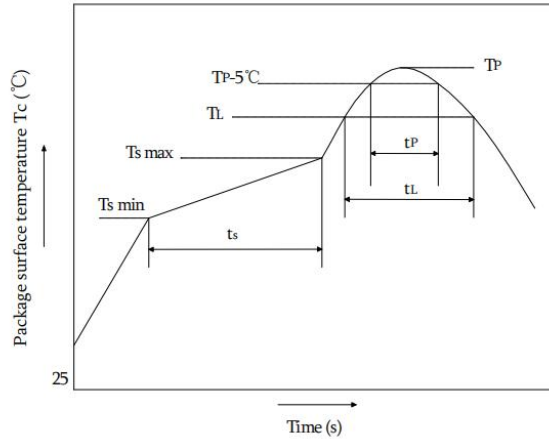
SOP5



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

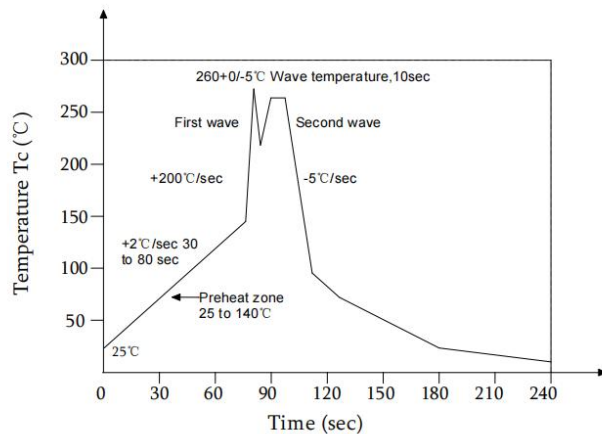


	Symbol	Min	Max	Unit
Preheat temperature	T_s	150	200	°C
Preheat time	t_s	60	120	s
Ramp-up rate(T_L to T_P)			3	°C/s
Liquidus temperature	T_L	217		°C
Time above T_L	t_L	60	150	s
Peak temperature	T_P		260	°C
Time during which T_c is between ($T_P - 5$) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	°C/s

Note:

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

Wave soldering



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 T_s	~130°C
Preheat time (25°C to T_s)	> 60s
Peak temperature T_P	260°C
Time within peak temperature t_p	10s
Ramp-down rate	5°C/s maximum

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.

Packing

Package Type	Packing Form	Quantity per Tube & Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP5	Reel($\phi 330$ mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Leave 25 Spaces at the beginning and 50 Spaces at the end

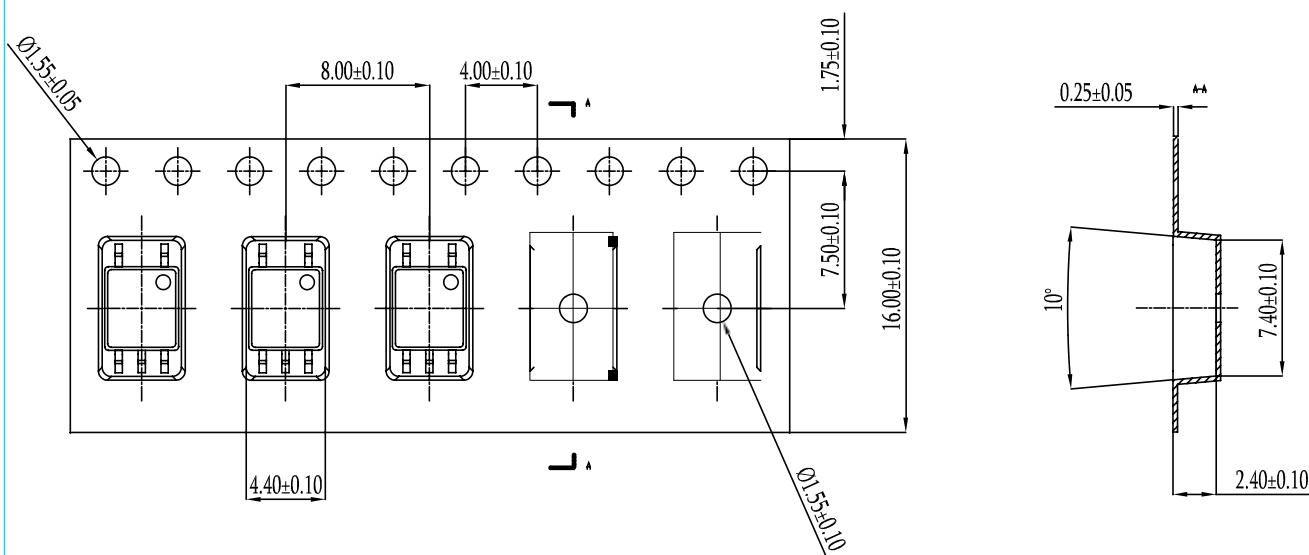
■Summary table

■SOP5 (Reel)

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

Qty/ctn : 30000 pcs.

Schematic: (unit:mm)



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