Technical Data Sheet- Light Transmitting Unit

DATA LINK : DLT13M1

Features

- High speed signal transmission (13.2Mbps, NRZ signal)
- Input TTL compatible
- +3~+5V power source
- Automatically detects the presence of a mini-plug in the jack and distinguishes an optical mini-plug from an electrical mini-plug

Descriptions

The light transmitting unit is a standard-package product with connector and opto-electric component packaged with LED and drive IC. The function of unit changes the electric signal into light signal and be transmitted by plastic fiber.

The unit is operated at single+3V~ +5V and the input signal is TTL compatible. The DLT13M1 has a maximum operating speed of 13.2 Mbps. The light signal is coupled into plastic fiber by connector. The unit has high performance at low dissipation current, steady light output and efficient light coupling.

Applications

- MD player
- Portable player

Device Selection Guide

Chip		Operating Voltage (Vcc)	Dissipation Current(mA)	Fiber Coupling Light Output (dBm)		
IC Material	LED λp(nm)		Typ.	Min.	Typ.	Max.
Si	650	2.7~5.5	5.5	-21	-	-15

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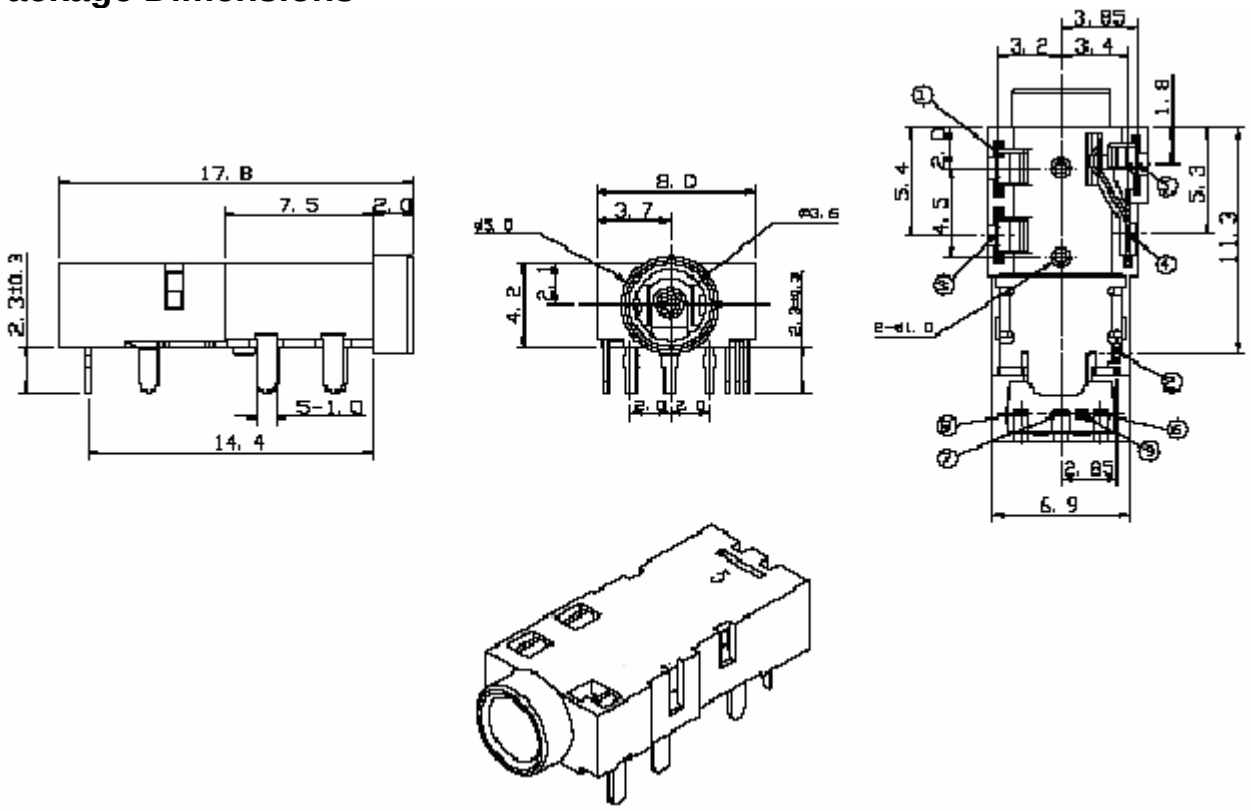
Package Dimensions



Notes: 1.All dimensions are in millimeters.

2.General Tolerance:±0.2mm

3. Pin 1 ~ 5 golden plating.

Pin Function

1 ~ 5 : jack terminal (1,5 : detector ; 4: GND ; 2 : left channel ; 3 : right channel)

6 ~ 9 : device terminal (6 : GND ; 7 : Vcc ; 8 : Vin ; 9 : internal connection)

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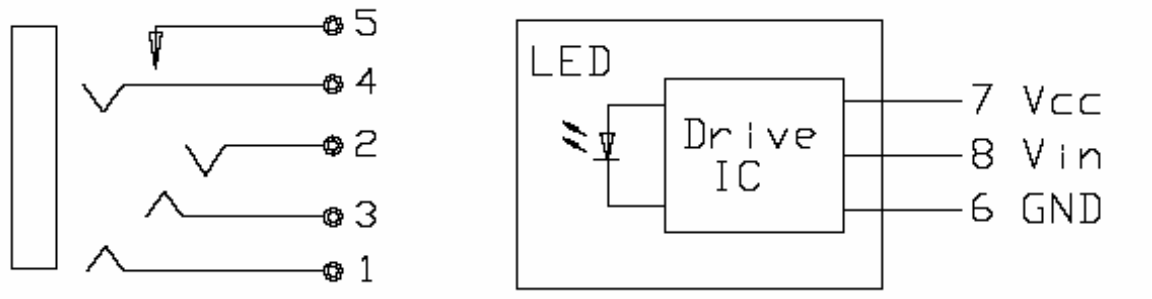
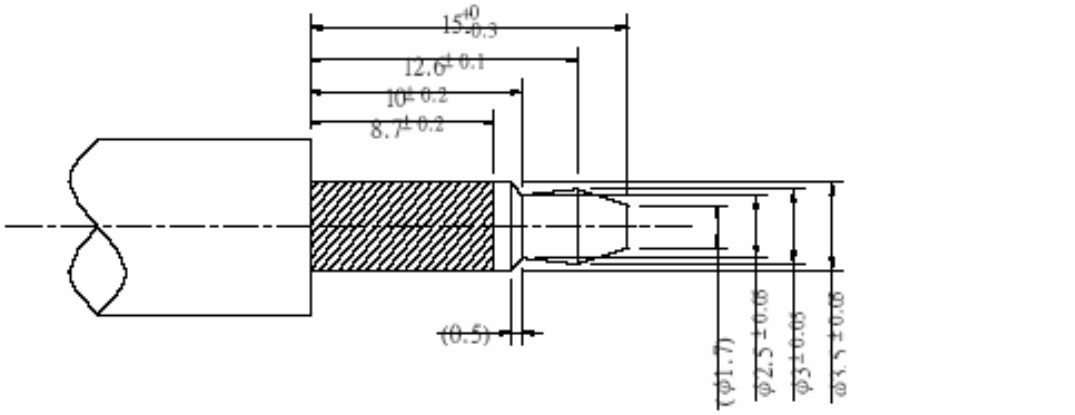
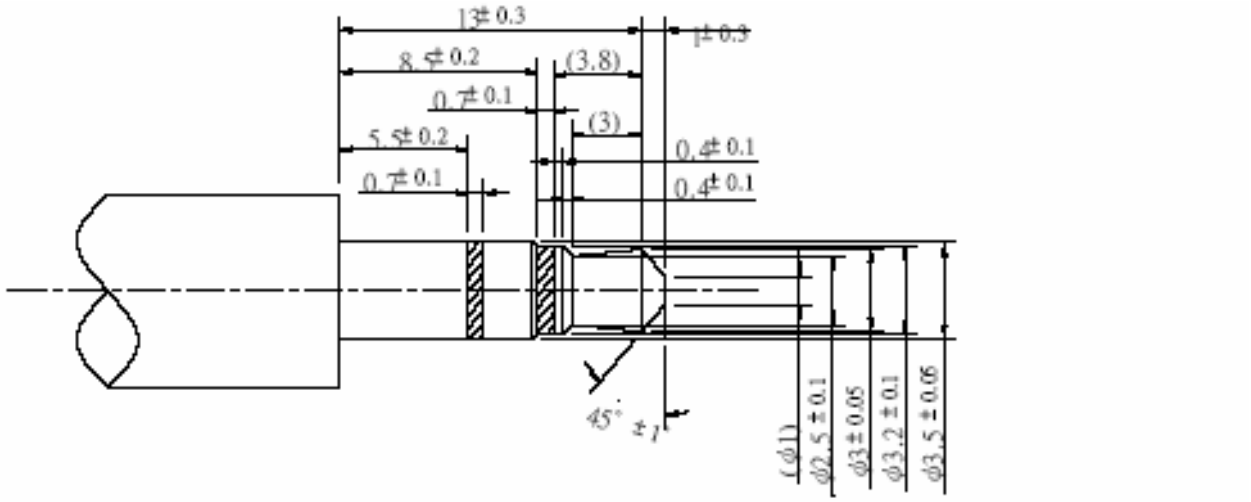
Jack Terminal Configuration



Optical circular plug (satisfys EIAJ RC-5720B)



3-pole small-sized concentric plug (satisfy JIS C 6560)



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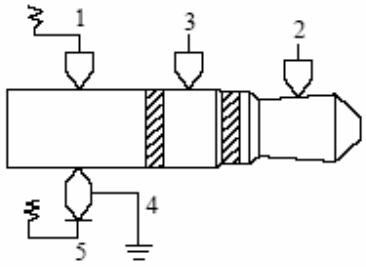
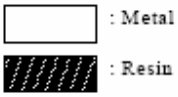
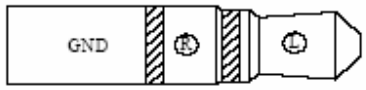
Optical Mini-jack Connection

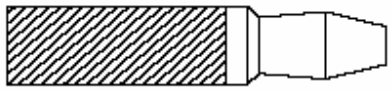




Analog electric signal



Digital optical signal



Input side	Output side
LINE IN MIC	LINE OUT HEAD PHONE
Optical digital input	Optical digital output

Type of plug	Output of terminal		Output of terminal
	5	1	2,3
Analog electricity	L	L	Signal data input/output
Digital optics	L	H	Signal data output
No plug	H	H	-

Absolute Maximum Ratings(Ta = 25℃)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	-0.5 to 7	V
DC Input Voltage	Vin	-0.5 to Vcc+0.5	V
Power Dissipation	P	120	mW
Storage Temperature	Tstg	-30 to 80	℃
Operating Temperature	Topr	-20 to 70	℃
Soldering Temperature	Tsol	260*	℃

*Soldering time ≤ 5 s / 2times.

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Electro-Optical Characteristics

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	Vcc	-	2.7	-	5.5	V
Peak Emission Wavelength	λp	-	640	-	670	nm
Transmission Speed		NRZ signal	DC	-	13.2	Mbps
Transmission Distance		Using APF	0.2	-	20	m
Pulse Width Distortion	Δtw	13.2Mbps NRZ Signal	-25	-	25	ns
Fiber Coupling Light Output	Pf	*1	-21	-17	-15	dBm
Dissipation Current	Icc	*2	-	-	10	mA
High Level Input Voltage	V_{IH}		2	-	-	v
Low Level Input Voltage	V_{IL}		-	-	0.8	v
Rise Time	t_r	*3	-	30	40	ns
Fall Time	t_f	*3	-	20	30	ns
Low → High propagation delay time	t_{PLH}	*3	-	-	100	ns
High → Low propagation delay time	t_{PHL}	*3	-	-	100	ns
Jitter	Δtj	*3	-	1.5	25	ns

Mechanical Electro-Optical Characteristics (Jack)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Insertion and withdrawal force	Fp	*a	3.9	-	34.3	N
Contact resistance	Rcon	*b	-	-	30	mΩ
Isolation resistance	Riso	D.C.500V, 1min	100	-	-	MΩ

*a Using JIS C6560 standard plug (ϕ3.5) for test.

*b It measures at 100 mA or less 1000 Hz at the condition of inserting JIS C6560 plug .

The DLT13M1 light transmitting unit satisfies EIAJ CP-1301A digital audio interface standard.

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Reliability Test Items

No.	Item	Test Condition	Test Hour/Cycle	Samples	Number (n) Failure (c)
1	Soldering Heat	260℃±5℃	5 sec./2times	22	n=22, c=0
2	High temp. & Hum. storage	Ta=40℃, 90%RH	500	22	n=22, c=0
3	High temp. storage	Ta=80℃	500	22	n=22, c=0
4	Low Temp. storage	Ta=-30℃	500	22	n=22, c=0
5	Temp. cycling	-30℃ ~ 80℃ (30min) (5min) (30min)	20	22	n=22, c=0
6	High Temp. Operation life	Ta=60℃, Vcc=5V ON	500	22	n=22, c=0
7	Repeated operation	500 times	Coupling force < 3.5kg 0.4kg<Detaching force <3.5kg	22	n=22, c=0
8	Terminal Strength(tension)	Weight: 500 g 30 sec./each terminal		22	n=22, c=0
9	Terminal Strength(bending)	Weight: 500 g 2 times/each terminal		22	n=22, c=0
10	Mechanical Shock	Acceleration: 1000m/s2 Pulse width: 6 ms 3 times/ X,Y,Z direction		22	n=22, c=0
11	Vibration	Frequency range: 10~55 Hz /sweep 1 min Overallamplitude:1.5 mm 2H./X,Y,Z direction		22	n=22, c=0

Icc (dissipation current): CURRENT ATTENUATE DIFFERENCE < 20%

Pf (fiber coupling light output): BRIGHTNESS ATTENUATE DIFFERENCE < 20%

T_{PLH} (propagation L → H delay time): DELAY TIME DIFFERENCE < 20%

T_{PHL} (propagation H → L delay time): DELAY TIME DIFFERENCE < 20%

T_r (rise time): TIME DIFFERENCE < 20%

Tf (fall time): TIME DIFFERENCE < 20%

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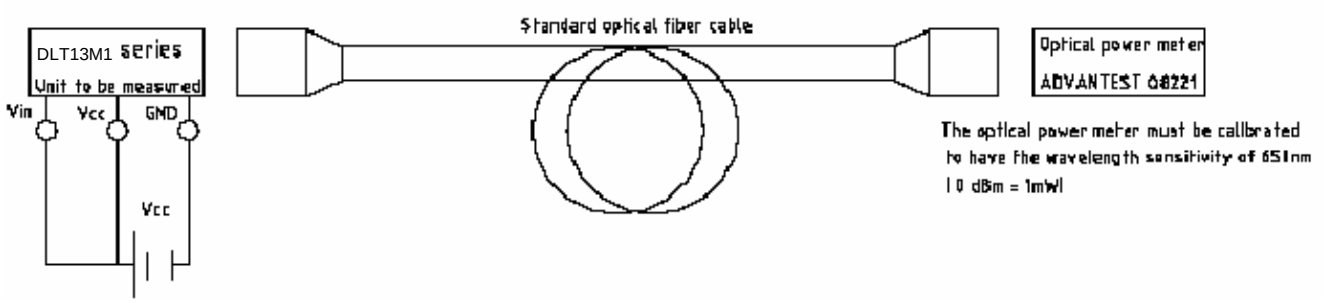
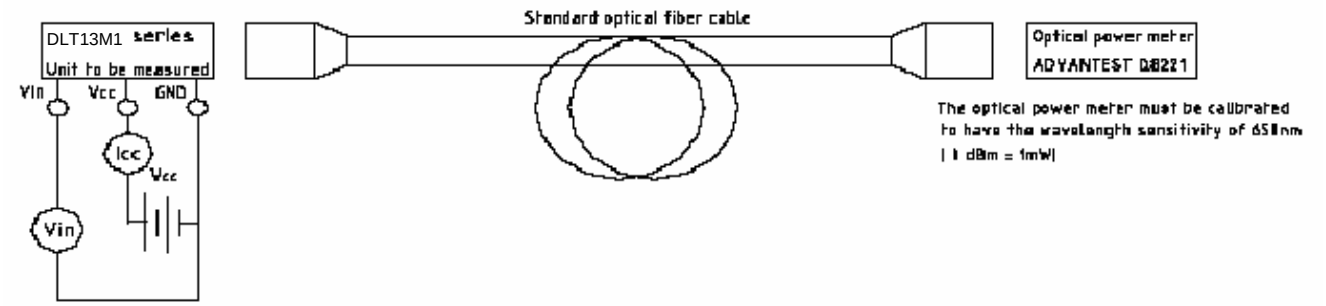
Measuring Method

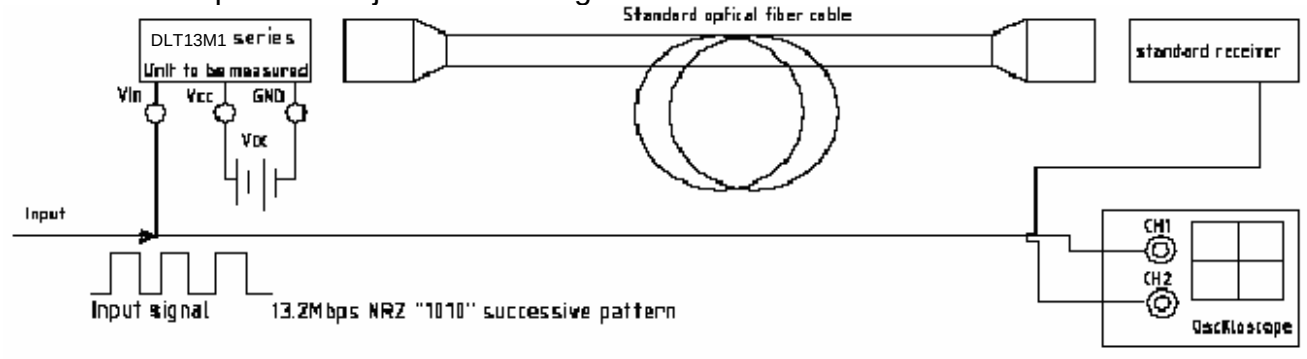
*1 Measuring method of optical output coupling fiber



* 2 Input voltage/power dissipation measuring method



*3 Pulse response and jitter measuring method



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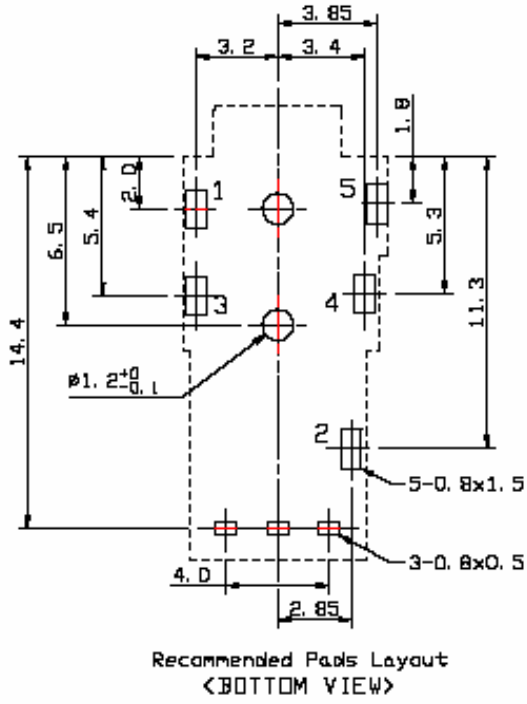
PCB Layout For Electrical Circuit



Recommended Pads Layout
<BOTTOM VIEW>

Notes:

1. unit:mm
2. Unspecified tolerance: ±0.3mm
3. Substrate Thickness:1.6mm

Precautions for Using Method

1. Connect a by-pass capacitor (0.1uF) close to the DLT13M1 within 7 mm of the unit lead frame.
2. Take proper electrostatic-discharge (ESD) precautions while handling these devices. These devices are sensitive to ESD.
3. IR-reflow Maximum ratings

IR-reflow time	Peak Temp.	Over 200℃ time
400 sec	240℃	150 sec

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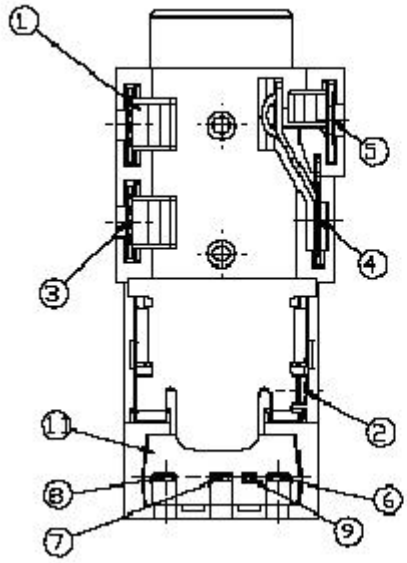
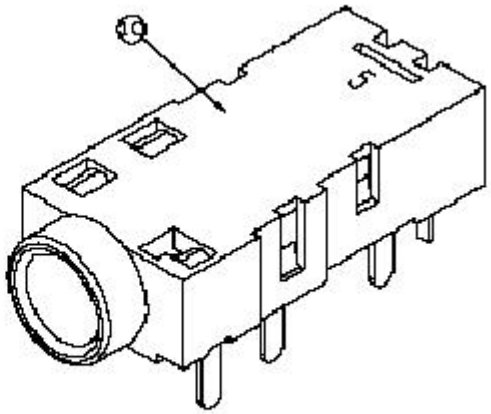
Material Description





ITEM	NAME	MATERIAL	FINISH	NOTE
1	Jack Terminal	PBS	Au	
2	Jack Terminal	PBS	Au	
3	Jack Terminal	PBS	Au	
4	Jack Terminal	Be-Cu	Au	
5	Jack Terminal	PBS	Au	
6	GND	PBS	Tin	
7	Vcc	PBS	Tin	
8	Vin	PBS	Tin	
9	Connection	PBS	Tin	
10	Jack Body	PA-9T		UL94V-0
11	Cover	PA-9T		UL94V-0

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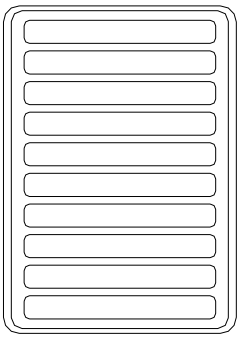
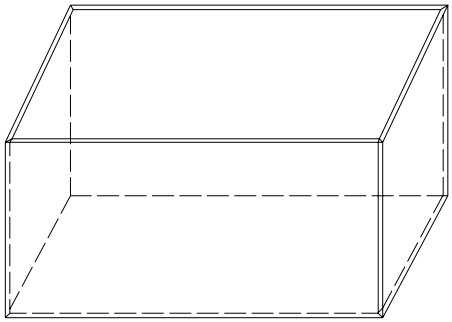
Package

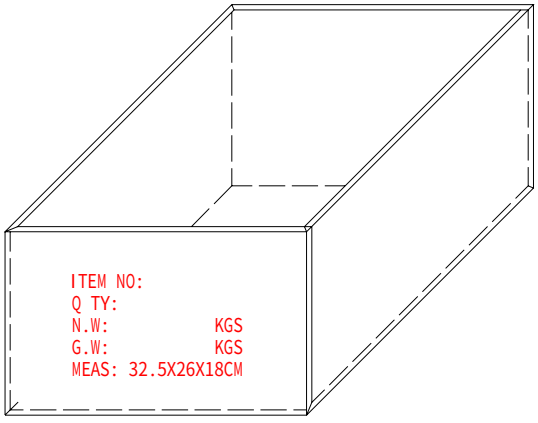
Item	Quantity	Total	Size（long*width*high）
Tray	1	100 pcs	30.5*22*1.3 cm
Inner box	5 tray/box	500 pcs	31.5*25*8 cm
Outer box	2 inner box/outer box	1000 pcs	32.5*26*18 cm



100 pcs/tray
(30.5*22*1.3 cm)



5 tray/box(500pcs)
(31.5*25*8cm)



2 inner box/outer box (1000pcs)
(32.5*26*18cm)

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REV	DESCRIPTION	RELEASE DATE