NQUNXIN
群芯微电子

中国芯 光电梦

晶体管光耦

Photo Transistor

QXH65R

宁波群芯微电子股份有限公司

NINGBO QUNXIN MICROELECTRONICS CO., LTD.

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概述 Description

QXH65R 是一款高隔离电压的光电耦合器由发光二极管和光电晶体管耦合到的 SOP8 封装体。
The QXH65R is high isolation voltage optocouplers consist of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 8 pin SOP package.

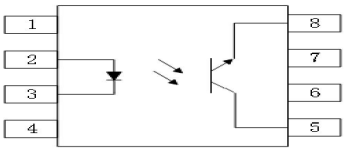
特性 Features

- 电流转换比 CTR:80%~400% (I_F=5mA, V_{CE}=5V, Ta=25℃)
  Current transfer ratio CTR:80%~400% (I_F=5mA, V_{CE}=5V, Ta=25℃)
- 输入和输出之间的高隔离电压(Viso:7500 V rms)
  High isolation voltage between input and output (Viso:7500 V rms)
- 较高的爬电距离和电气间隙(Cr/Cl≥15mm)
  High Clearance and Creepage (Cr/Cl≥15mm)

应用 Applications

- 开关电源，智能电表
  Switching power supply, intelligent meter
- 工业控制，测量仪器
  Industrial control, measuring instruments
- 太阳能、风能新能源
  Solar and wind power diagnostic
- 高压电机设备，焊接设备
  High voltage motors、Welding equipment

封装和原理图 Package and Schematic Diagram



Pin Configuration

1.NC	8. Emitter
2.Anode	7.NC
3.Cathode	6. NC
4.NC	5. Collector

产品型号命名规则 Order Code

QX H65R X -UN Y - W (V) (ZZ)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① 公司代码 Company Code（QX: 群芯 Qunxin）
② 产品系列 Product Series（H65R:H65R）
③ CTR 档位 Classification（代码 Code: A、B、C or None）
④ 框架类型 Lead Frame（Cu: 铜框架 Copper）
⑤ 树脂类型 Epoxy Type（H: 无卤 Halogen-free）
⑥ 封装形式 Package（L: LSOP）
⑦ 器件工作温度范围 Device Operating Temperature Range（特殊范围需填或者空白 Special Range need to be filled in or left blank）
⑧ 内部补充代码 Internal Supplementary Code（数字或者空白 Number or None）

印字信息 Marking Information

- 印字中“ ”为群芯品牌 LOGO
  “ ”denotes LOGO
- 印字中的“X”代表产品分档：A、B、C 或空白
  “X”denotes the classification：A、B、C or None
- 印字中“Y”代表年份；A(2018),B(2019),C(2020).....
  “Y”denotes YEAR：A(2018), B(2019), C(2020).....
- 印字中“WW”代表周号
  “WW”denotes week’s number
- 印字中“N”代表星期几
  “N”denotes day of the week
- 印字中的“H”代表无卤
  “H”denotes Halogen-free
- 印字中的“V”代表产品特殊标识：A~Z 或空白
  “V”denotes Product special code： A~Z or None

绝缘和安规信息 Insulation and Safety related specifications

项目 Item	符号 Symbol	数值 Value	单位 Unit	备注 Note
爬电距离 Creepage Distance	L	> 15	mm	从输入端到输出端，沿本体最短距离路径 Measured from input terminals to output terminals, shortest distance path along body.
电气间隙 Clearance Distance	L	> 15	mm	从输入端到输出端，通过空气的最短距离 Measured from input terminals to output terminals, shortest distance through air.
绝缘距离 Insulation Thickness	DTI	> 0.5	mm	发射器和探测器之间的绝缘厚度 Insulation thickness between emitter and detector.
电痕指数 Comparative Tracking Index	CTI	≥600	V	IEC60112
峰值隔离电压 Peak Isolation Voltage	V_{IORM}	2262	V_{peak}	DIN/EN/IEC EN60747-5-5.
瞬态隔离电压 Transient Isolation Voltage	V_{IOTM}	12000	V_{peak}	DIN/EN/IEC EN60747-5-5.
隔离电压 Isolation Voltage	V_{ISO}	> 7500	> V_{rms}	For 1 min

极限参数 Absolute Maximum Ratings (Ta=25℃)

参数 Parameter		符号 Symbol	额定值 Rating	单位 Unit
发射端 Input	正向电流 Forward Current	I_F	75	mA
	峰值正向电流(< 10us，脉冲) Peak forward current (< 10us, pulse)	I_{FP}	1500	mA
	反向电压 Reverse Voltage	V_R	5	V
	功耗 Power Dissipation	P_D	120	mW
接收端 output	集电极功耗 Collector Power Dissipation	P_C	150	mW
	集电极电流 Collector Current	I_C	50	mA
	集电极-发射极电压 Collector-Emitter Voltage	V_{CEO}	80	V
	发射电极-集电压 Emitter - Collector Voltage	V_{ECO}	7	V
总功耗 Total Power Dissipation		P_{TOT}	250	mW
工作温度 Operating Temperature		T_{opr}	-55~+110	℃
存储温度 Storage Temperature		T_{stg}	-55~+125	℃
焊接温度 Soldering Temperature		T_{sol}	260	℃

产品特性参数 Electro-optical Characteristics (Ta=25℃)

参数 Parameter		符号 Symbol	条件 Condition	最小 Min.	典型 Typ.	最大 Max.	单位 Unit
发射端 Input	正向电压 Forward Voltage	V_F	I_F=20mA	-	1.2	1.4	V
	反向电流 Reverse Current	I_R	V_R=5V	-	-	10	μA
	输入电容 Terminal Capacitance	C_t	V=0, F=1kHz	-	-	100	pF
接收端 Output	集电极暗电流 Collector Dark Current	I_{CEO}	V_{CE}=20V	-	-	200	nA
	集电极-发射极击穿电压 Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C=1mA, I_F=0	80	-	-	V
	发射极-集电极击穿电压 Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E=0.1mA, I_F=0	7	-	-	V
传输特性 Transfer Characteristics	电流传输比 Current Transfer Ratio	CTR*	I_F=5mA ,V_{CE}=5V	80	-	400	%
	集电极-发射极饱和压降 Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=10mA,I_C=1mA	-	-	0.3	V
	隔离电阻 Isolation Resistance	R_{ISO}	V_{I-O}=DC500V 40~60%R.H.	$1x10^{11}$	-	-	Ω
	隔离电容 Isolation capacitance	C_{ISO}	V=0,F=1MHz	-	0.3	-	pF
	开启时间 Turn-on time	T_{on}	V_{CC}=5V, I_F=10mA, R_L=1KΩ	-	2	-	μs
	关断时间 Turn-off time	T_{off}		-	28	-	
	上升时间 Rise Time	T_r		-	1	-	
	下降时间 Fall Time	T_f		-	8	-	

注*：电流传输比=I_C/I_F x 100%。

Note*：CTR=I_C/I_F x 100%.

电流传输比分档表 CTR Classification Table (I_F=5mA，V_{CE}=5V, Ta=25℃)

代码 Code	分档 classification	最小值 Min.	最大值 Max.
电流传输比 Current Transfer Ratio	None	80	400
	A	80	160
	B	130	260
	C	200	400

典型光电特性曲线 Typical Electro-Optical Characteristics Curves

Fig.1 Relative Current Transfer Ratio vs. Forward Current

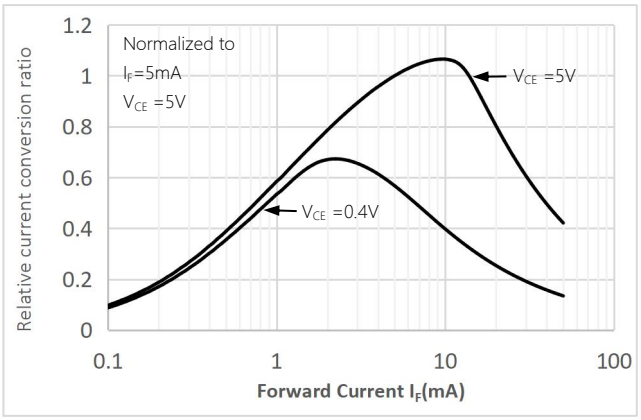


Fig.2 Forward Current vs. Forward Voltage

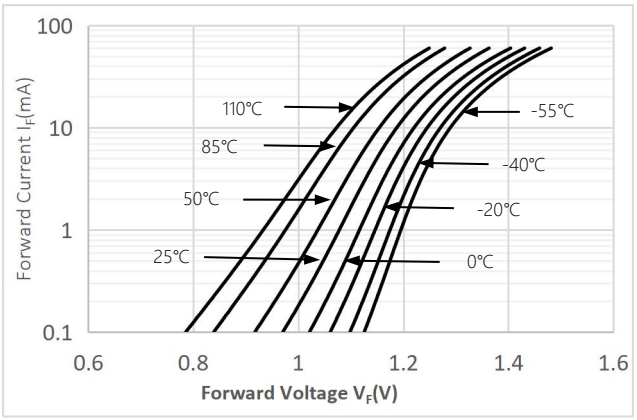


Fig.3 Collector Current vs. Collector-emitter Voltage

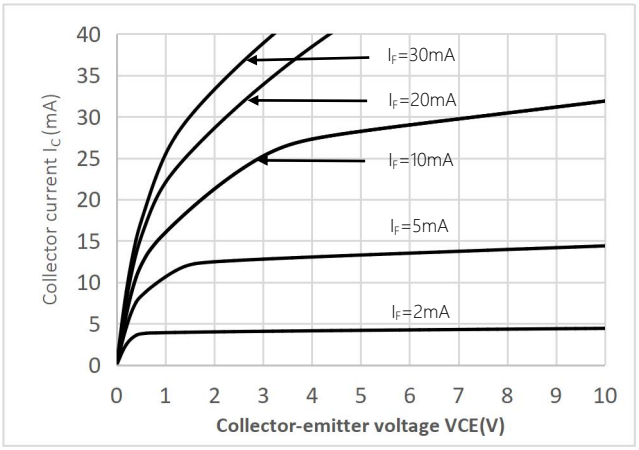


Fig.4 Relative Current Transfer Ratio vs.Ambient Temperature

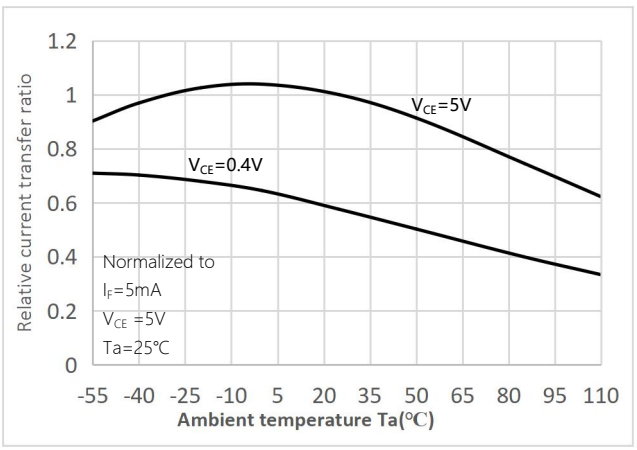


Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature

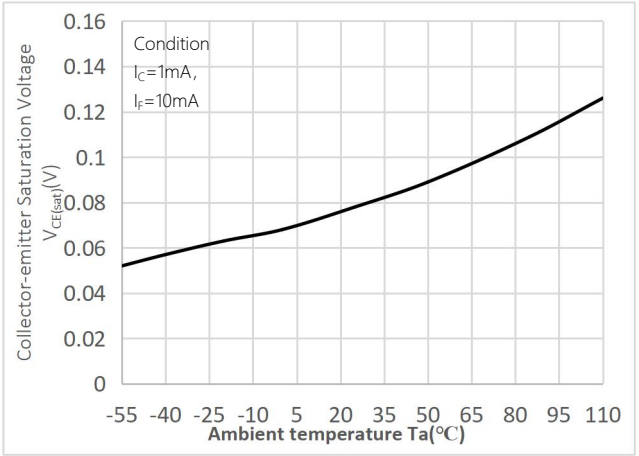


Fig.6 Collector Dark Current vs Ambient Temperature

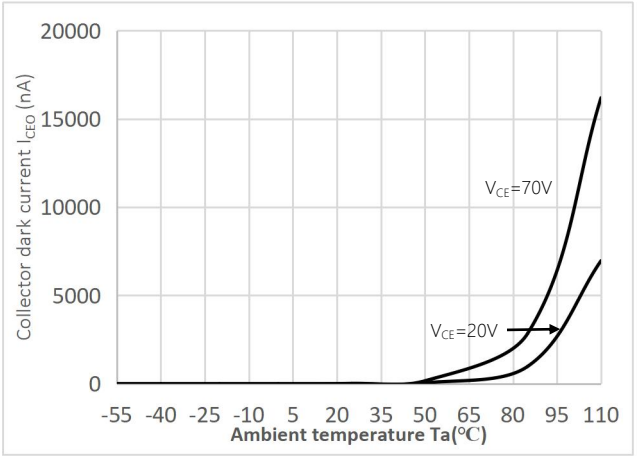


Fig.7 Response Time vs. Load Resistance

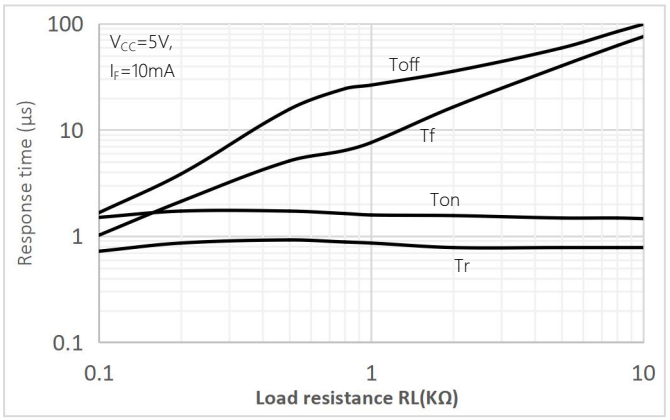
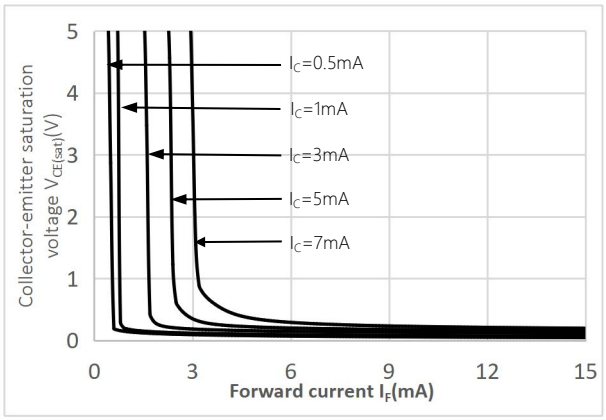
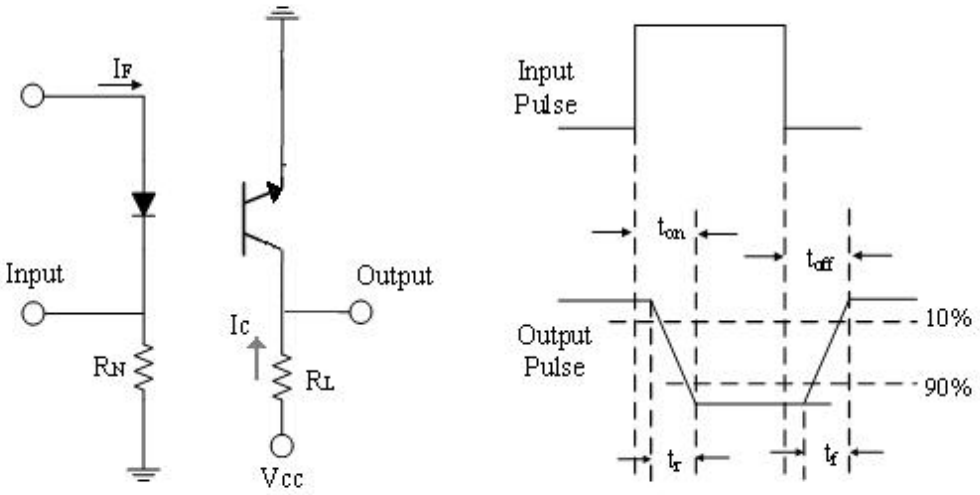


Fig.8 Collector-emitter Saturation Voltage vs Forward Current

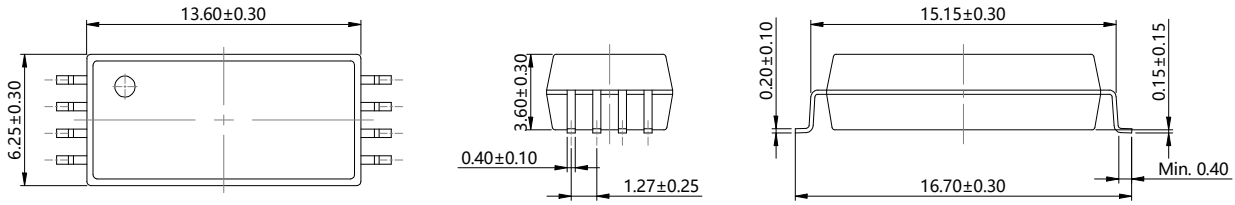


响应时间测试电路 Switching Time Test Circuit



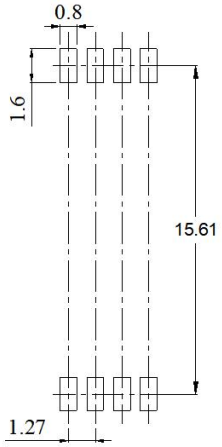
外形尺寸 Outline Dimensions

LSOP8



单位 Unit: mm

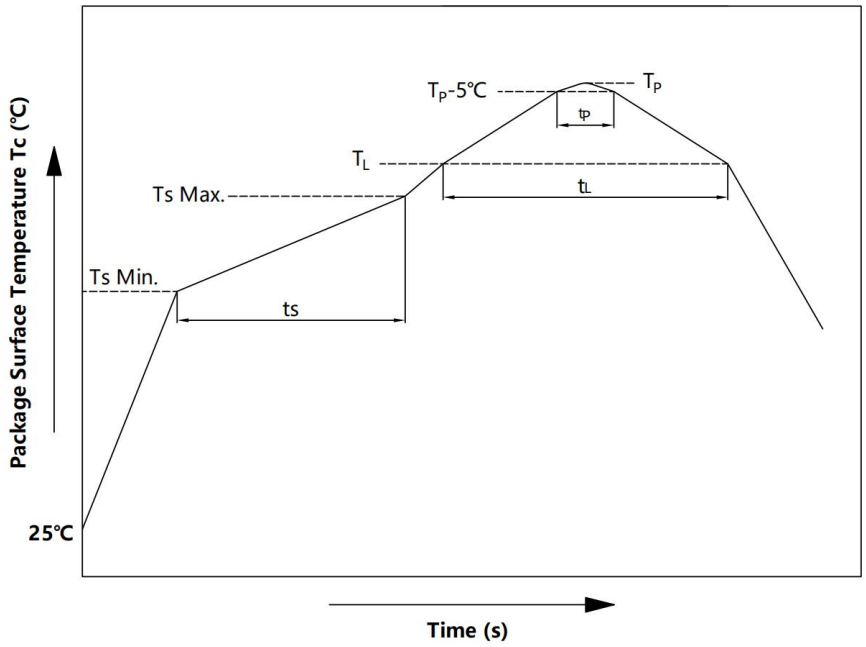
建议焊盘布局 Recommended Pad Layout



单位 Unit: mm

注：上图为产品正视图。
Note：The picture above is the front view of the product.

回流焊温度曲线图 Solder Reflow Profile



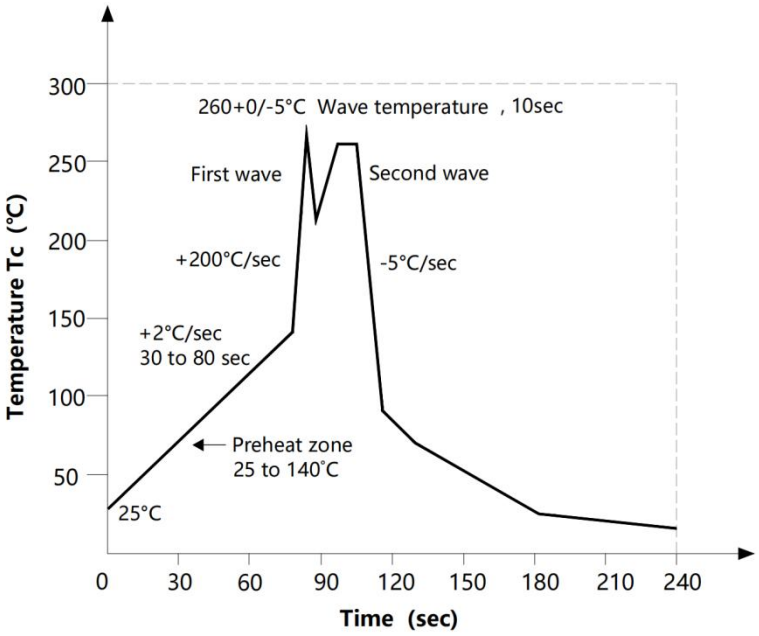
项目 Item	符号 Symbol	最小值 Min.	最大值 Max.	单位 Unit
预热温度 Preheat Temperature	Ts	150	200	℃
预热时间 Preheat Time	ts	60	120	s
升温速率 Ramp-Up Rate (T_L to T_P)	-	-	3	℃/s
液相线温度 Liquidus Temperature	T_L	217		℃
时间高于 T_L Time Above T_L	t_L	60	150	s
峰值温度 Peak Temperature	T_P	-	260	℃
Tc 在(T_P-5)和 T_P 之间的时间 Time During Which Tc Is Between (T_P-5) and T_P	t_p	-	30	s
降温速率 Ramp-down Rate(T_P to T_L)	-	-	6	℃/s

注 Note:

建议在所示的温度和时间条件下进行回流焊，最多不能超过三次;

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

波峰焊温度曲线图 Wave Soldering Profile



手工烙铁焊接 Soldering with hand soldering iron

A. 手工烙铁焊仅用于产品返修或样品测试；

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

B. 手工烙铁焊要求：温度 360℃ ± 5℃，时间≤3s。

Hand soldering iron requirements：Temperature：360℃ ± 5℃, within 3s.

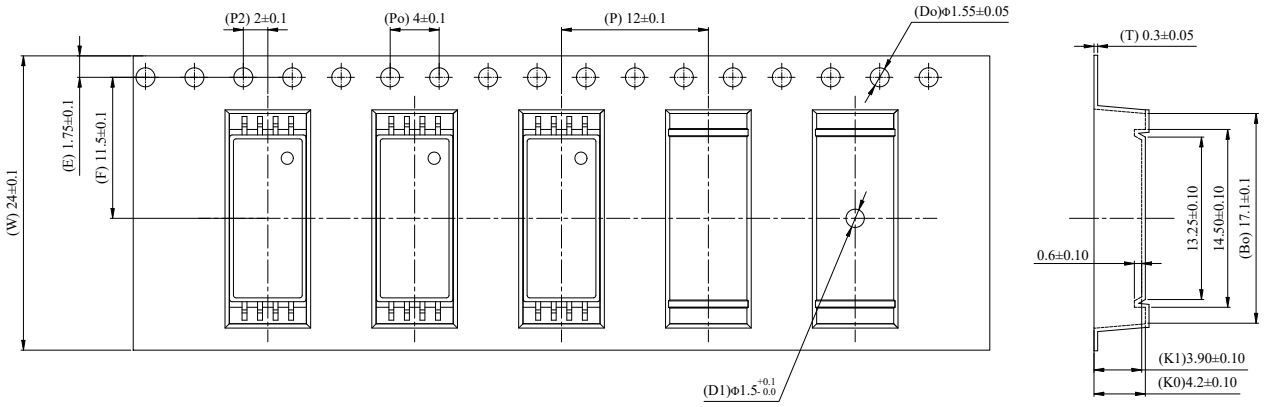
包装 Packing

■ 汇总表 Summary table

封装形式	包装方式	盘数量	盒数量	箱数量	静电袋规格	盒规格	箱(双瓦楞)规格	备注
LSOP8	卷盘 (ϕ330mm 蓝盘)	800 颗/盘	2 盘/盒	8 盒/箱	450*390*0.1mm	340*340*75mm	650*375*365mm	首尾端各空 50 格
Package Type	Packing Form	Quantity per Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
LSOP8	Reel (ϕ330mm Blue)	800 pcs/reel	2 reels/box	8 boxes/ctn	450*390*0.1mm	340*340*75mm	650*375*365mm	Guard band 50PCS.

■ 编带包装 Tape & Reel

1) 每卷数量：800 只。
   Qty/reel：800 pcs.
2) 每箱数量：12800 只。
   Qty/ctn：12800 pcs.
3) 内包装：每盒 2 盘。
   Inner packing：2 reels/box.
4) 示意图 Schematic：



注意 Attention

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