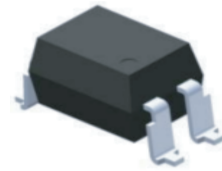


产品特点 Product features

- 电流转换比 CTR: 50 ~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$
- 输入与输出高隔离电压($V_{iso} = 5000\text{V rms}$)
- 反应时间 (在 $V_{CE}=2\text{V}$, $I_C=2\text{mA}$, $R_L=100\ \Omega$ 条件下上升时间 t_r : 典型值 $4\mu\text{s}$)



DIP-4



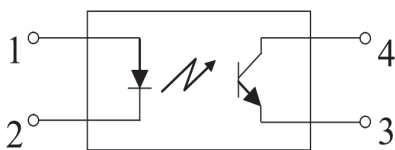
SMD-4

产品应用 Product Applications

- 开关电源、电源电路接口
- 工业控制、测量仪器
- 办公设备、自动售货机
- 家用电器, 比如风扇、热水器等等
- 高低电压电路间的电气隔绝和信号传输

功能图 Functional Diagram

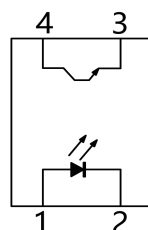
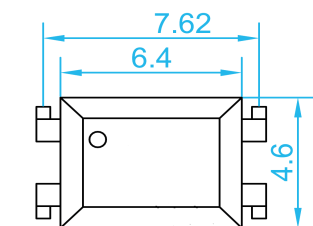
引脚配置 Pin Configuration



1. 阳极Anode
2. 阴极Cathode
3. 发射极Emitter
4. 集电极Collector

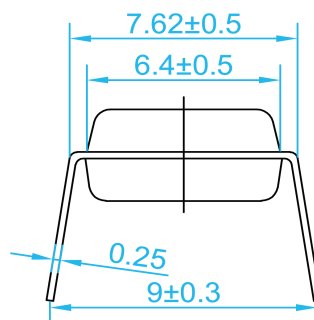
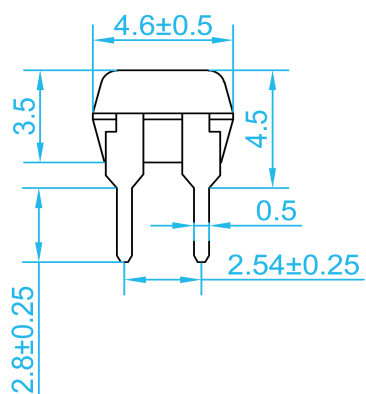
● 外形尺寸

典型的直插模式

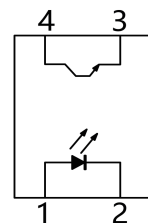
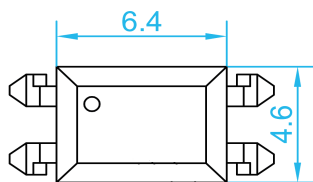


引脚编号及极性

- 1 正极
- 2 负极
- 3 发射极
- 4 集电极

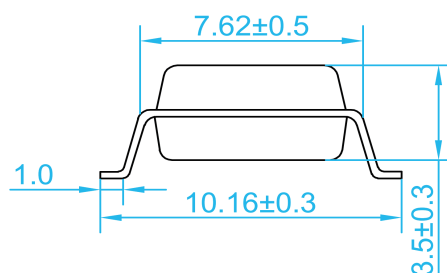
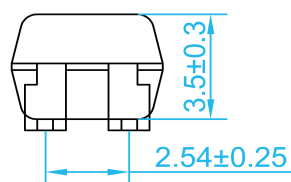


贴片模式



引脚编号及极性

- 1 正极
- 2 负极
- 3 发射极
- 4 集电极



● 极限参数 (Ta=25°C)

参数		符号	额定值	单位
输入端	正向电流	I_F	50	mA
	反向电压	V_R	6	V
	输入功耗	P_D	70	mW
输出端	集电极-发射极电压	V_{CEO}	70	V
	发射极-集电极电压	V_{ECO}	6	V
	集电极电流	I_C	50	mA
	集电极功耗	P_C	150	mW
总功耗		P_{tot}	200	mW
*1 绝缘电压		V_{iso}	5000	V_{rms}
工作温度		T_{opr}	-55~+100	°C
存储温度		T_{stg}	-55~+125	°C
*2 焊接温度		T_{sol}	260	°C

*1. 交流1分钟，湿度为40~60%

使用如下方式测试高压：

- (1)输入端的正极和负极短接、输出端的集电极和发射极短接：
- (2)所使用交流电电压须为正弦波。

*2. 焊接时间在10秒内

● 光电特性 (Ta=25°C)

参数		符号	测试条件	最小值	典型	最大	单位
输入	正向电压	V_F	$I_F=20\text{mA}$	---	1.2	1.4	V
	反向电流	I_R	$V_R=4\text{V}$	---	---	10	μA
	终端电容	C_t	$V=0, f=1\text{KHz}$	---	30	250	pF
输出	集电极暗电流	I_{CEO}	$V_{CE}=20\text{V}, I_F=0\text{mA}$	---	---	100	nA
	集电极-发射极击穿电压	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	70	100	---	V
	发射极-集电极击穿电压	BV_{ECO}	$I_C=0.1\text{mA}, I_F=0$	6	9	---	V
	集电极电流	I_C	$I_F=5\text{mA}$ $V_{CE}=5\text{V}$	2.5	---	30	mA
传输特性	*1 电流转换比	CTR		50	---	600	%
	集电极-发射极饱和压降	$V_{CE(sat)}$	$I_F=20\text{mA}, I_C=1\text{mA}$	---	0.1	0.2	V
	绝缘电阻	R_{ISO}	DC500V 40~60%RH	5×10^{10}	1×10^{11}	---	Ω
	输入-输出电容	C_f	$V=0, f=1\text{MHz}$	---	0.6	1	pF
	截止频率	F_c	$V_{CE}=5\text{V}, I_C=2\text{mA}$ $R_L=100\Omega, -3\text{dB}$	---	80	---	kHz
	响应时间(上升)	T_r	$V_{CE}=2\text{V}, I_C=2\text{mA}$ $R_L=100\Omega$	---	4	18	μs
	响应时间(下降)	T_f		---	3	18	μs

*1: $CTR = I_C / I_F \times 100\%$

● CTR的分档

BIN级	最小值 (%)	最大值 (%)
L	50	100
A	80	160
B	130	260
C	200	400
D	300	600
LorAorBorCorD	50	600

注意：以上测试条件是： $I_F=5\text{mA}$, $V_{CE}=5\text{V}$, $T_a=25^\circ\text{C}$.

• 特性曲线

Fig.1 Forward Current
vs. Ambient Temperature

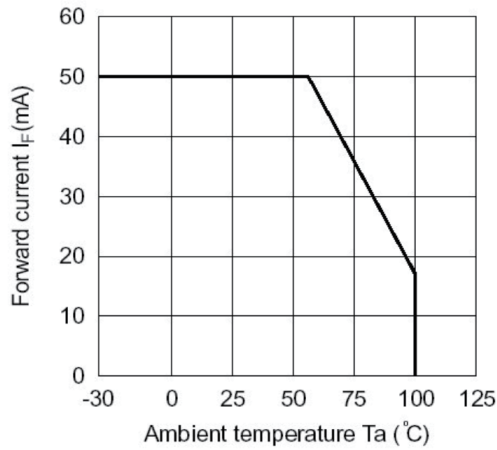


Fig.2 Collector Power Dissipation
vs. Ambient Temperature

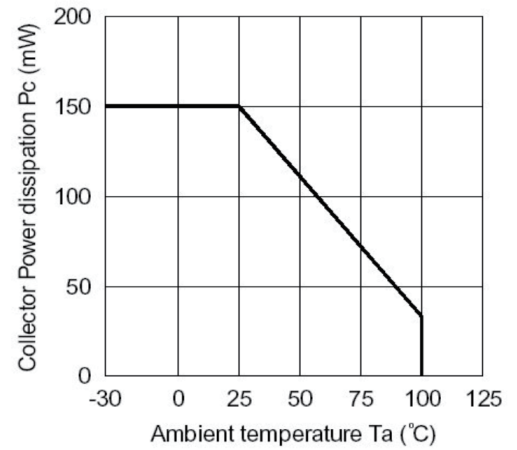


Fig.3 Collector-emitter Saturation
Voltage vs. Forward Current

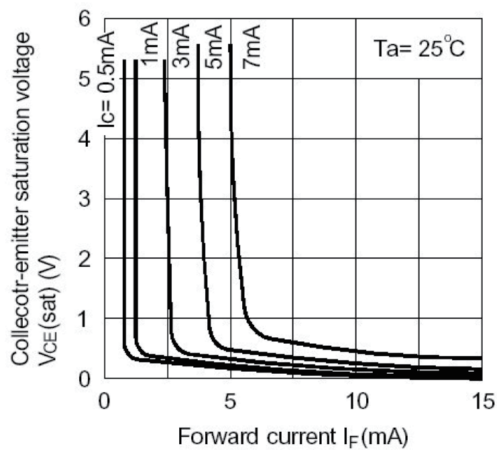


Fig.4 Forward Current vs. Forward
Voltage

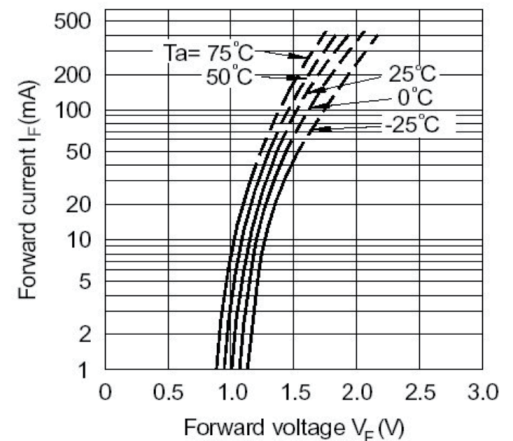


Fig.5 Current Transfer Ratio vs.
Forward Current

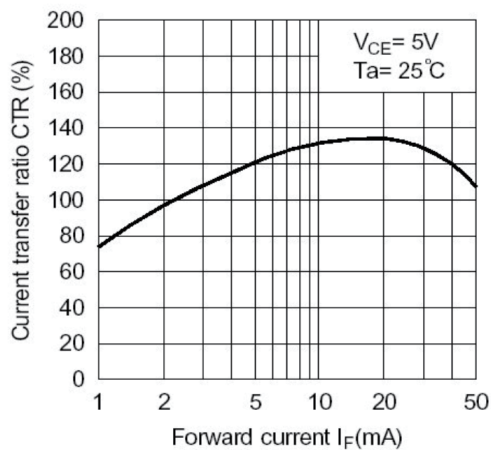
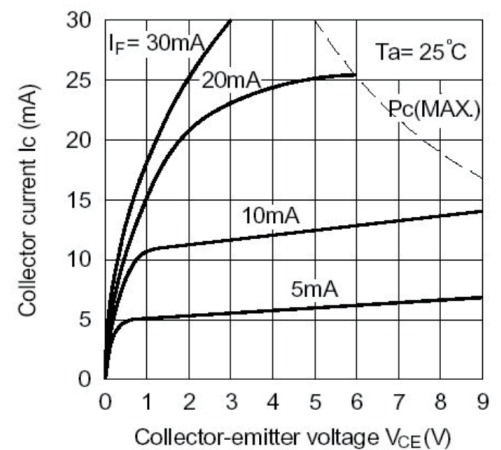


Fig.6 Collector Current vs.
Collector-emitter Voltage



• 特性曲线

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

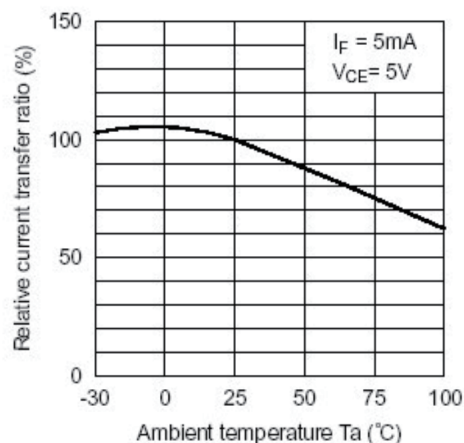


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

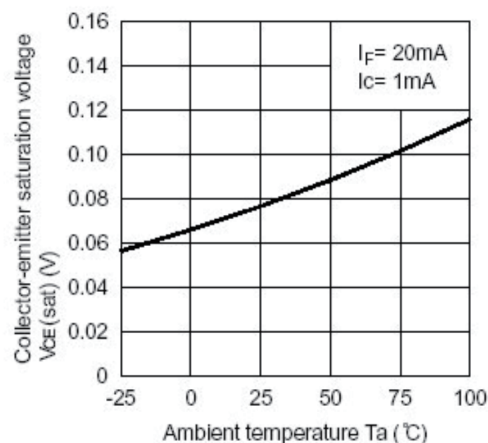


Fig.9 Collector Dark Current vs. Ambient Temperature

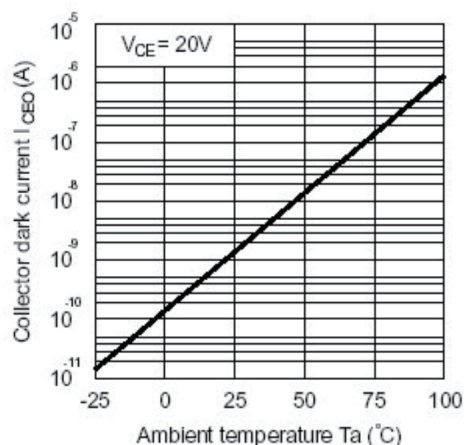


Fig.10 Response Time vs. Load Resistance

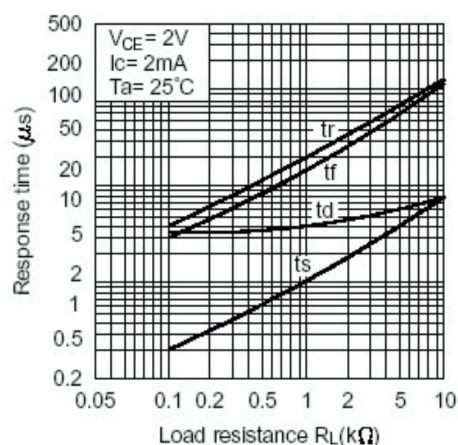
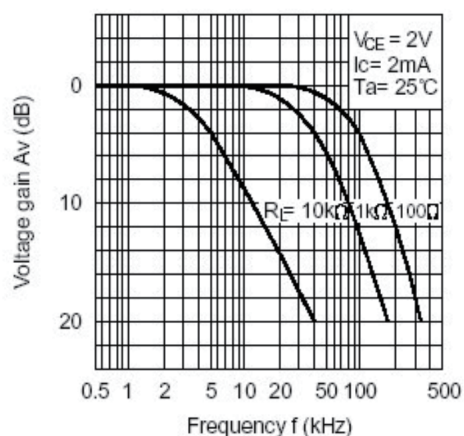
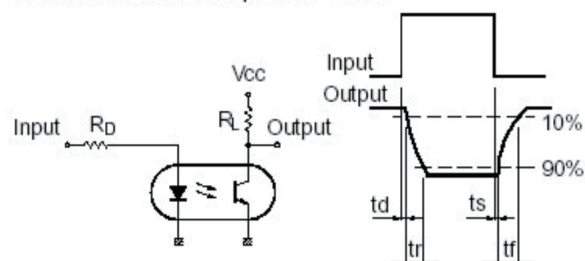


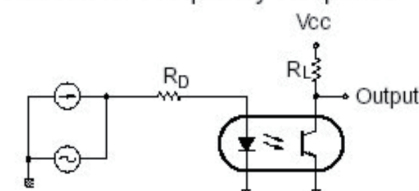
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



● 信赖度试验

类别	项目	参照标准	测试条件	结果
耐性测试	寿命试验	MIL-STD-750:1026 MIL-STD-883:1005 JIS C 7021:B-1	输入端通电: $I_f=50\text{mA}$ 温度: 室温 测试时间: 1,000hrs	0/20
	高温高湿加偏压试验 (H3TRB)	JIS C 7021:B-11	$T_a=+85^{\circ}\text{C}\pm 5^{\circ}\text{C}$, $\text{RH}=85\%$ 输出端通电: $V=V_{CE}$ (额定值) *80% 测试时间: 1000hrs	0/20
	高温加偏压试验 (HTRB)	JIS C 7021:B- 8	$T_a=+105^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 输出端通电: $V=V_{CE}$ (额定值) 测试=1000hrs	0/20
	高温存储试验	MIL-STD-883:1008 JIS C 7021:B-10	高温: $+125^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 测试时间: 1,000hrs	0/20
	低温存储试验	JIS-C-7021:B-12	低温: $-55^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 测试时间: 1,000hrs	0/20
	高压试验	JESD 22-A102-B	压强: 15PSIG; 温度: 121°C 湿度: 100%; 测试时间: 48hrs	0/20
环境测试	温度循环试验	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS C 7021:A-4	$125^{\circ}\text{C}\sim 25^{\circ}\text{C}\sim -55^{\circ}\text{C}\sim 25^{\circ}\text{C}$ 30min 5min 30min 5min 循环次数: 20cycle	0/20
	冷热冲击试验	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	$125^{\circ}\text{C} \sim -55^{\circ}\text{C}$ 20min 20min 循环次数: 20cycle	0/20
	焊锡试验	MIL-STD-202:201A MIL-STD-750:2031 JIS C 7021 :A-1	温度: 260°C ; 时间: $10\pm 1\text{seconds}$.	0/20
	沾锡试验	MIL-S-883:2003 JIS C 7021 :A-2	温度: 235°C ; 时间: $5\pm 1\text{seconds}$.	0/20

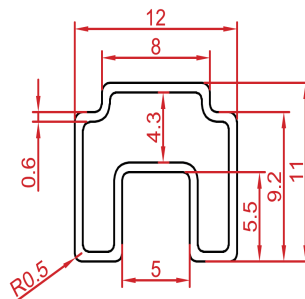
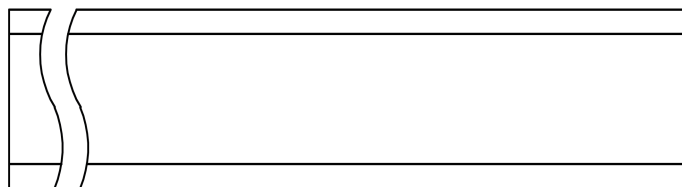
● 信赖度失效之判断标准

符号	测试条件	判断失效之标准
$V_F(V)$	$I_f=50\text{mA}$	Over $U_{x1.0}$
$I_r(uA)$	$V_r=5V$	Over $U_{x1.0}$
CTR(%)	$I_f=5\text{mA}$, $V_{CE}=5V$	Shift>1.2
$V_{CE(sat)}$	$I_F=20\text{mA}$, $I_C=1\text{mA}$	Over $U_{x1.0}$
BV_{CEO}	$I_C=0.1\text{mA}$, $I_F=0$	Over $L_{x1.0}$
BV_{ECO}	$I_E=10\mu A$, $I_F=0$	Over $L_{x1.0}$

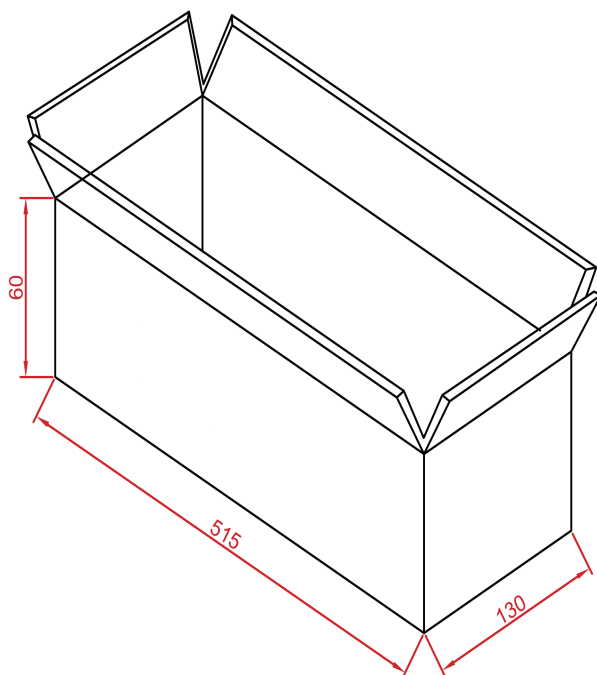
● 包装规格

1. 管装规格（适用于典型直插和M直插模式）

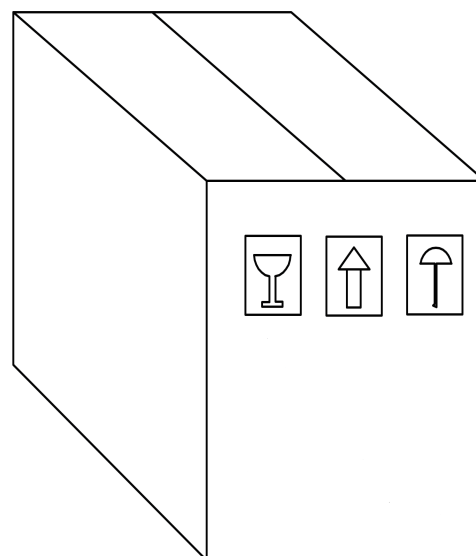
A. 典型直插模式之料管尺寸（单位：mm）



B. 内盒（单位mm）



C. 外箱（单位mm）



D. 包装数量

每管装100pcs

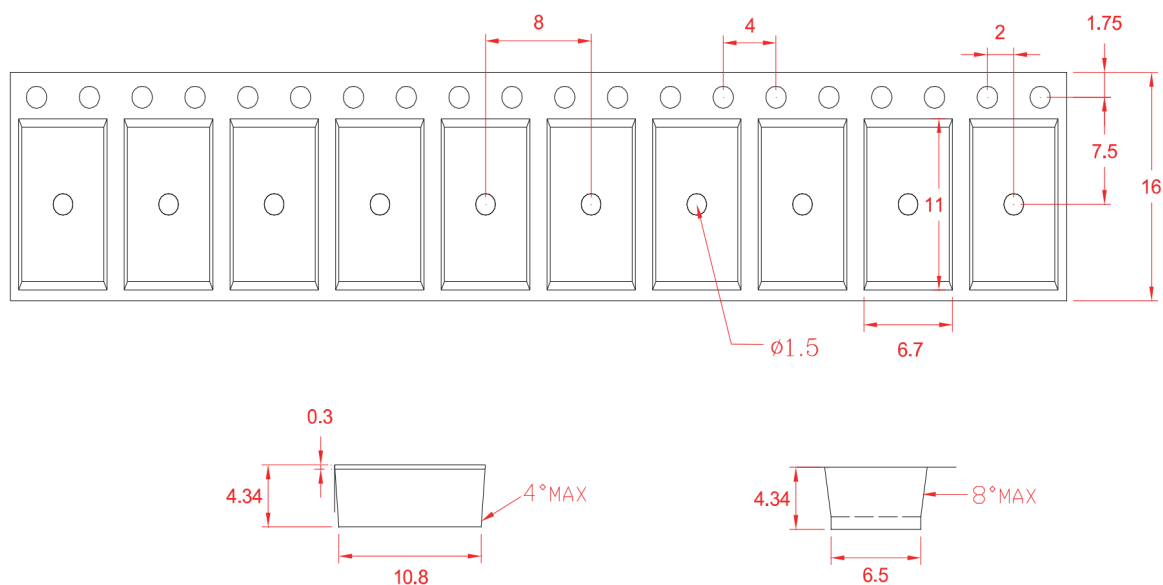
典型直插模式每内盒装50管；

每外盒装10内盒

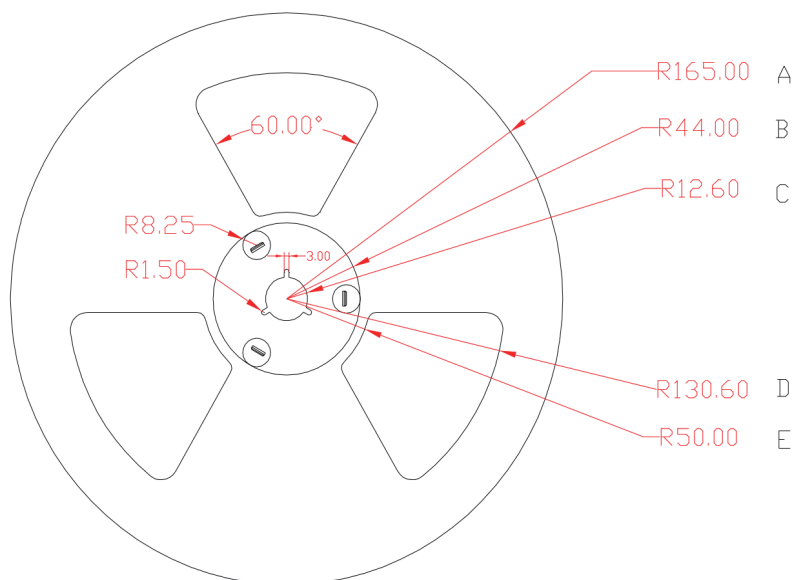
● 包装规格

2. 卷轴、料带包装规格(适用于两种贴片模式)

A. 料带尺寸



B. 卷轴尺寸



C. 包装数量

每卷 2Kpcs;

每内盒装 2 卷;

每外箱装 10 内盒