1. 产品特点 Product features

- 电流转换率(Current transfer ratio)
  CTR: 50~600% at I_F =5mA, V_{CE} =5V
  CTR: 40~320% at I_F =10mA, V_{CE} =5V
- 输入与输出间高隔离电压(Viso=3750 V rms)
  High isolation voltage between inputs and output (Viso=3750 V rms)
- 外形为2.0mm的紧凑型4pin SSOP
  Compact 4 Pin SSOP with a 2.0 mm profile
- 符合无卤素(溴<900ppm, 氯<900ppm, 溴+氯<1500ppm)
  Compliance Halogen Free (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)

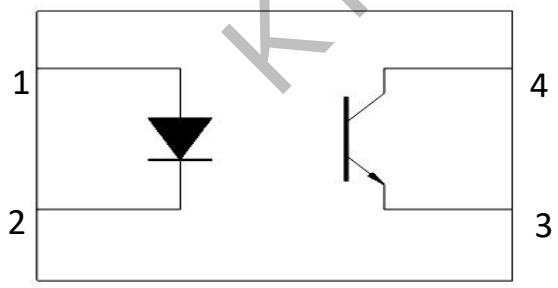
2. 产品描述 Product Description

- KTP3H7光耦合器由一个红外发射二极管和光电晶体管构成光电耦合器
  The KTP3H7 series devices consist of an infrared emitting diodes, optically coupled to a phototransistor detector with green compound
- 它们被封装在一个4引脚小外形SMD中.
  They are packaged in a 4-pin small outline SMD package

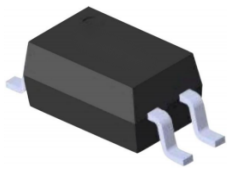
3. 产品应用 Product Applications

- DC-DC转换器 DC-DC converter
- 可编程序控制器 Programmable controllers
- 电信设备 Telecommunication equipments
- 不同电位,不同阻抗的电路之间的信号传输
  Signal transmission between circuits of different potentials and impedances

4. 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



5. 光电特性 Electrical-Optical characteristics

• 最大限度额定值(温度=25°C) Absolute Maximum Ratings(Ta=25°C)

参数 Parameter		符号 Symbol	额定值 Rated Value	单位 Unit
输入 Input	正向电流 Forward current	I_F	50	mA
	峰值正向电流(1us脉冲) Peak forward current (1us，pulse)	I_{FP}	1	A
	反向电压 Reverse voltage	V_R	6	V
	功耗 Power dissipation	P_D	70	mW
	降额系数(高于Ta=90℃以上) Derating factor (above Ta=90℃)	P_D	2.0	mW/℃
输出 Output	集电极电流 Collector current	I_C	50	mA
	集电极-发射极电压 Collector and emitter Voltage	V_{CEO}	80	V
	发射极-集电极电压 Emitter and Collector Voltage	V_{ECO}	7	V
	功耗 Power dissipation	P_C	150	mW
	降额系数(高于Ta=70℃以上) Derating factor (above Ta=70℃)	P_C	3.1	mW/℃
总功耗 Total Consume Power		P_{TOT}	200	mW
隔离电压 *1 Isolation Voltage		V_{iso}	3750	Vrms
工作温度 Operating temperature		T_{OPR}	-55 to +110	℃
储存温度 Storage temperature		T_{STG}	-55 to +125	℃
焊接温度 *2 Soldering temperature		T_{SOL}	260	℃

附注(Notes):

1* 交流电源1分钟内, 相对湿度40~60%环境下, 隔离电压测试方法, 引脚1&2短接在一起, 引脚3&4短接在一起
AC for 1 minute, 40~60%RH in this test, Pin 1,2 are shorted together, and 3,4 are shorted together

2* 焊接时间为10秒 Soldering time is 10 seconds

6. 电气特性(Ta=25℃,除非另有规定)

Electrical Characteristics(Ta=25℃ unless specified otherwise)

参数 Parameter		符号 Symbol	最小值 Min.	规格值 Typ.	最大值 Max.	单位 Unit	条件 Condition
输入 In put	正向电压 Forward voltage	V_F	-	1.2	1.4	V	I_F=20mA
	反向电流 Reverse current	I_R	-	-	10	μA	V_R=4V
	输入电容 Input capacitance	C_{in}	-	30	250	pF	V=0, f=1kHz
输出 Out put	集电极暗电流 Collector-Emitter dark current	I_{CEO}	-	-	100	nA	V_{CE}=20V I_F =0mA
	集电极-发射极击穿电压 Collector-Emitter breakdown voltage	V_{CEO}	80	-	-	V	I_C=0.1mA I_F=0mA
	发射极-集电极击穿电压 Emitter-Collector breakdown voltage	V_{ECO}	7	-	-	V	I_E=0.1mA I_F=0mA
传输特性 Transfer Characteristics	集电极-发射极饱和压降 Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	I_F=10mA I_C=1mA
	隔离电阻 Isolation resistance	R_{ISO}	$5x10^{10}$	-	-	Ω	V_{IO}=500Vdc 40~60% R.H.
	浮动电容 Floating capacitor	C_{IO}	-	0.3	1.0	pF	V_{IO}=0V f=1MHz
	上升时间 Response Time (Rise)	T_r	-	5	18	μs	V_{CE}=2V, I_C=2mA R_L=100Ω
	下降时间 Response Time (Fall)	T_f	-	3	18	μs	

• 温度Ta=25℃下规格值 Typical values at Ta = 25°C

• 传输特性等级表(Ta=25℃, 除非另有规定)

Transfer Characteristics level table (Ta=25℃ unless specified otherwise)

参数 Parameter		符号 Symbol	最小值 Min.	规格值 Typ.*	最大值 Max.	单位 Unit	条件 Condition
电流传输比 Current Transferratio	KTP3H7	CTR	50	-	600	%	I_F=5mA V_{CE}=5V
	KTP3H7A		80	-	160		
	KTP3H7B		130	-	260		
	KTP3H7C		200	-	400		
	KTP3H7D		300	-	600		
	KTP3H7E		100	-	200		
	KTP3H7F		150	-	300		
	KTP3H7H		40	-	80		I_F=10mA V_{CE}=5V
	KTP3H7I		63	-	125		
	KTP3H7J		100	-	200		
	KTP3H7K		160	-	320		

7. 特性曲线 Characteristic Curves

图1 正向电流与正向电压的关系

Fig.1 Forward Current vs Forward Voltage

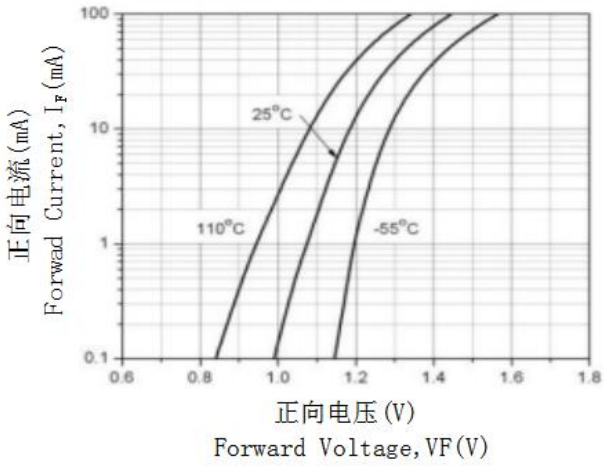


图2 集电极电流vs正向电流曲线图

Fig.2 Relative collector current vs. forward current diagram

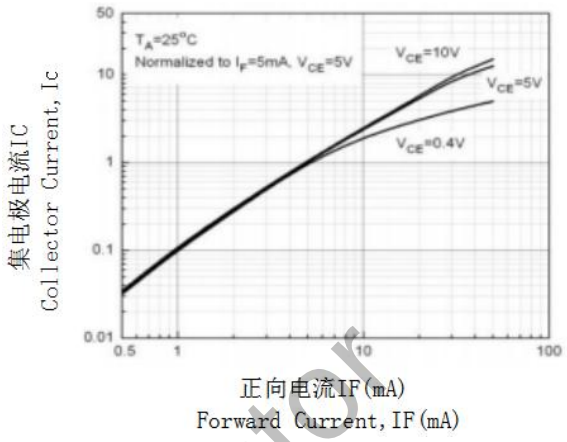


图3 电流转换比 vs正向电流曲线图

Fig.3 Relative current conversion ratio vs forward current curve

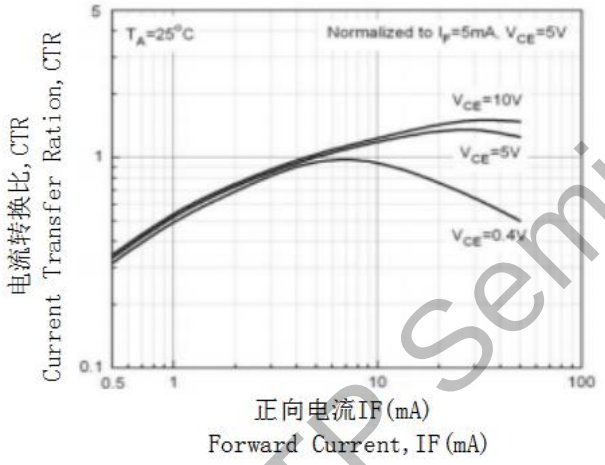


图4 集电极电流 vs环境温度曲线图

Fig.4 Relative collector current vs. ambient temperature

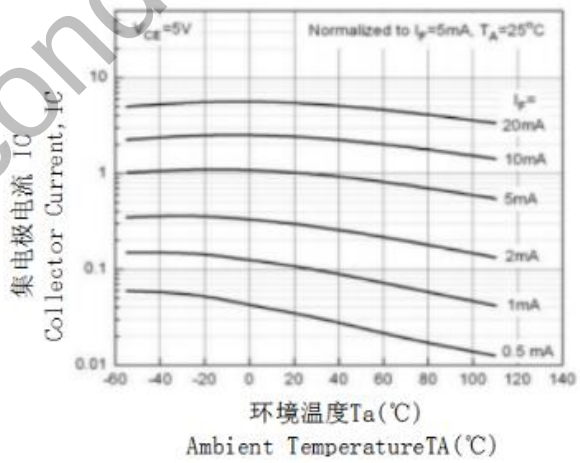


图5 相对电流转换比vs环境温度曲线图

Fig.5 Relative current conversion ratio vs ambient temperature curve

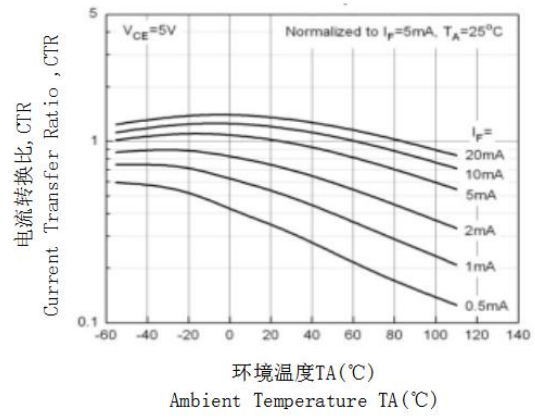


图6 集电极电流 vs 集电极-发射电压曲线图

Fig.6 Collector current vs. collector-emission voltage diagram

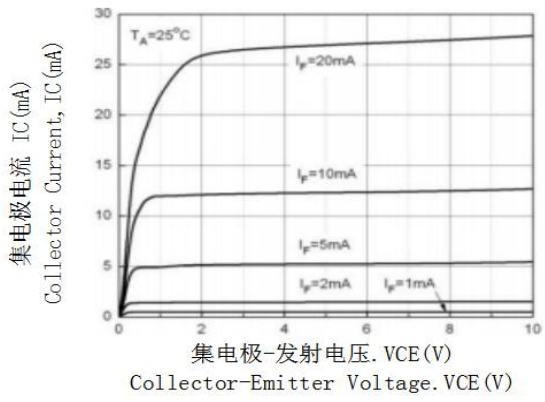


图7 集电极电流 vs集电极-发射电压曲线图
Fig.7 Collector current vs. collector-emission voltage diagram

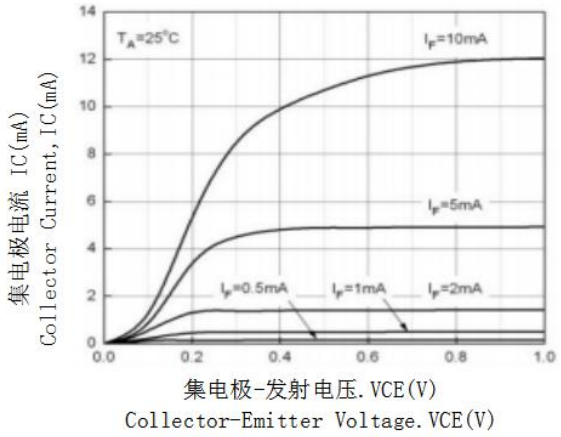


图8 集电极暗电流 vs 环境温度曲线图
Fig.8 Collector dark current vs. ambient temperature curve

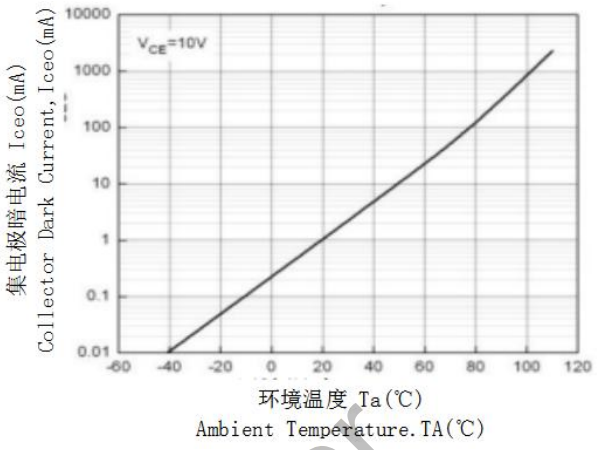


图9 集电极-发射极饱和电压 vs 环境温度曲线图
Fig.9 Collector-emitter saturation pressure drop vs. ambient temperature curve

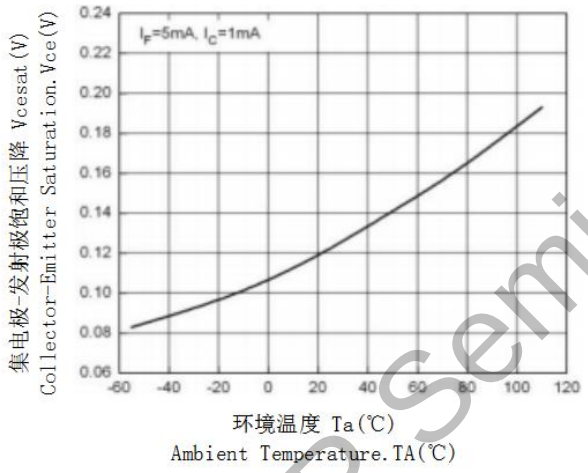


图10 响应时间 vs 负载电阻曲线图
Fig.10 Response time vs. load resistance diagram

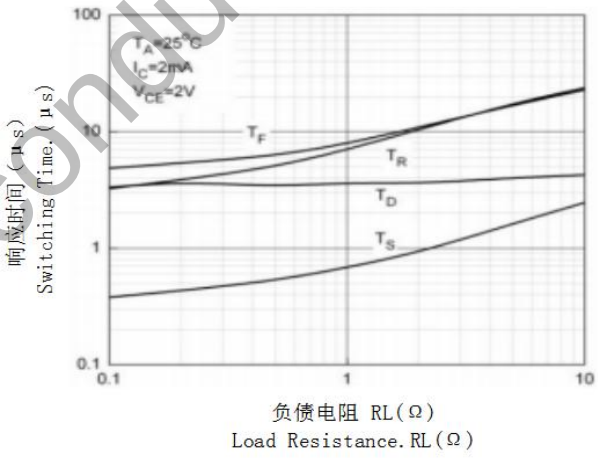
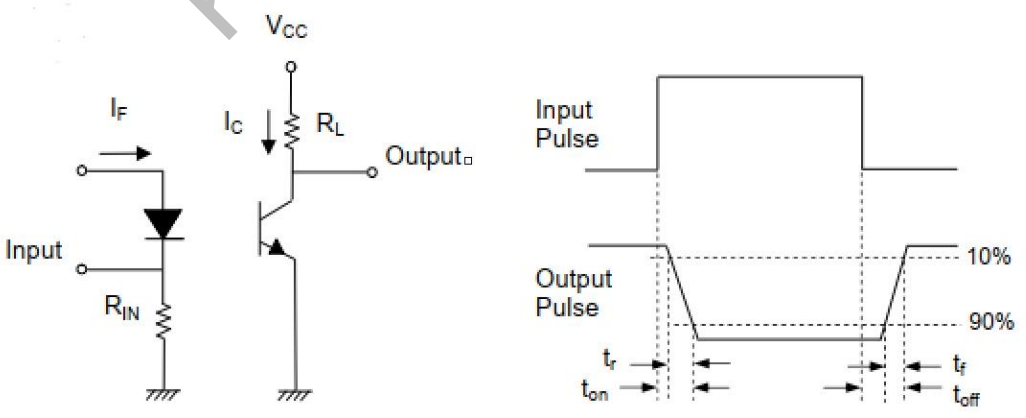


图11 开关时间测试电路及波形
Fig.11 Switching Time Test Circuit & Waveforms



8. 订单信息 Order Information

• 零件编号 Part Number

KTP-3H7-X-Y-W

附注(Notes):

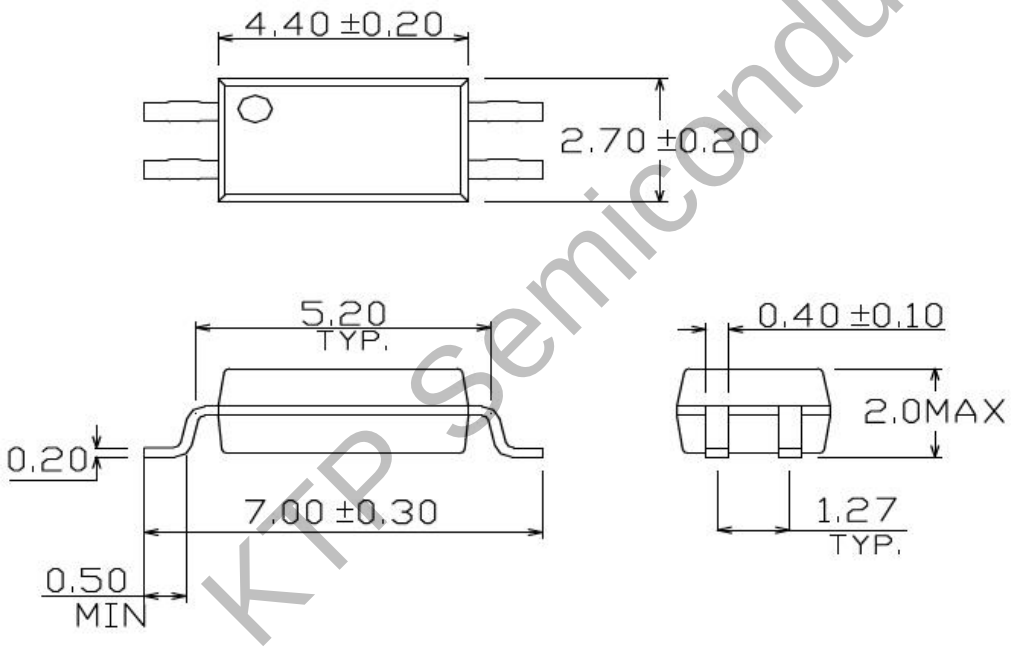
X = 表示CTR等级(A、B、C、D、E、F、H、I、J、K 或无)
CTR Rank (A, B, C, D, E, F, H, I, J, K or none)

Y = 载带和卷轴包装方式(TA)
Tape and reel option (TA)

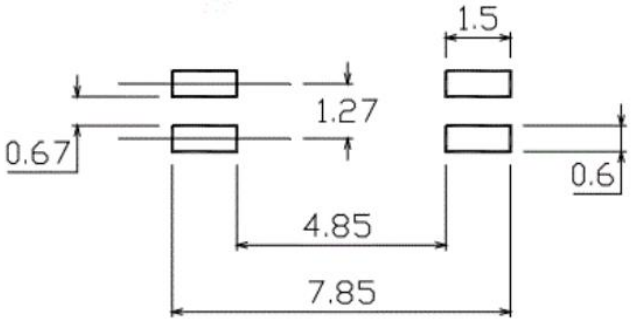
AW = 表示消费级 Consumer-grade

W =表示内部标识码(有或无) Lndicates internal identification code (with or without)

9. 封装尺寸(单位:毫米) Package Drawing(Unit:mm)



• 表面贴装引线框架及推荐焊盘布局 Recommended pad layout for surface mount leadform

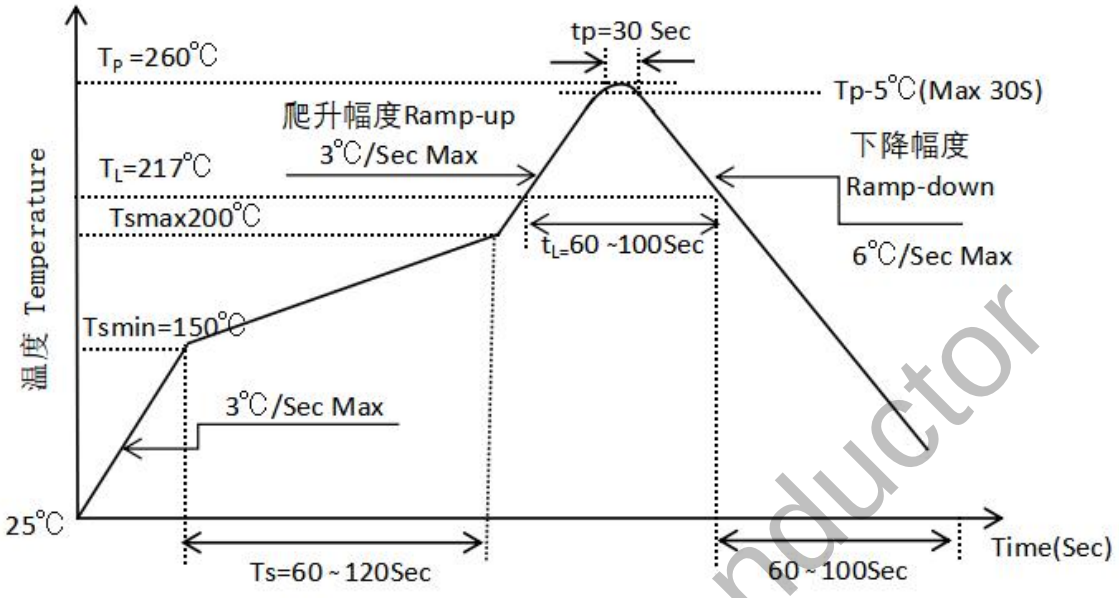


10. 焊接温度曲线 Temperature Profile Of Soldering

• 回流焊温度曲线 Reflow soldering

建议在下面所示的温度和时间分布条件下, 进行一次回流焊作业, 不得超过三次

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.



项目 Item	符号 Symbol	最小值 Min.	最大值 Max.	单位 Unit
预热温度 Preheat Temperature	T_s	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		℃
高于液相线温度(T_L)的时间 Time above Liquidus Temperature T_L	t_L	60	100	s
峰值温度 Peak Temperature	T_P	-	260	℃
T_c 在(T_P-5)和 T_P之间的时间 Time During Which T_c 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