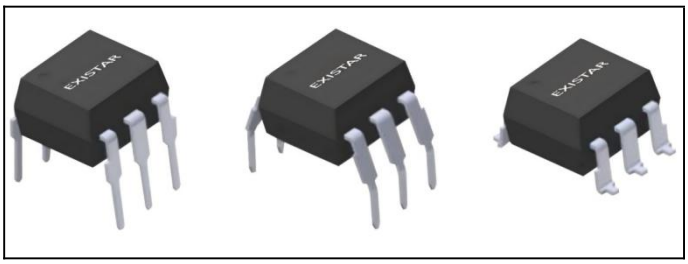
RANDOM-PHASE TRIAC DRIVER PHOTOCOUPLER

随机相位双向可控硅驱动光电耦合器

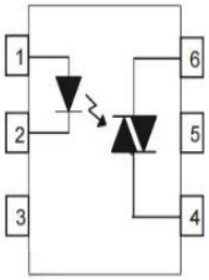
DIP6



产品特点 Product features

- 峰值击穿电压 Peak breakdown voltage
- EX302X: 400V
- 输入与输出间高隔离电压(Viso=5000 V rms)
  High isolation voltage between inputs and output (Viso=5000 V rms)
- 紧凑型双列直插式封装
  Compact dual-in-line package
- 符合欧盟REACH法规 Compliance with EU REACH
- 无Pb且符合ROHS标准 Pb free and RoHS compliant

功能图 FunctionalDiagram



引脚配置 Pin Configuration
1. 阳极Anode
2. 阴极Cathode
3. 无连线No Connection
4. 终端Terminal
5. 基板(不接线)Substrate (do not connect)
6. 终端Terminal

产品描述 Product Description

- EX302X系列由一个砷化镓红外发光二极管和一个单晶硅芯片的随机相位光电双向晶闸管组成的可控硅光电耦合器
  The EX302X of device consists of a GaAs infrared emitting diode optically coupled to a monolithic silicon random phase photo Triac.
- 它被设计用于电子控制和电源试验之间的接口，以控制115到240V AC操作的电阻和感应负载
  It is designed for interfacing between electronic controls and power triacs to control resistive and inductive loads for 115 to 240 VAC operations.

产品应用 Product Applications

- 电磁阀控制、温度控制、电机控制
  Solenoid/valve controls, Temperature controls, Motor controls
- 静态交流电源开关 Static AC power switch
- 微处理器与115至240C AV外围设备接口 Interfacing microprocessors to 115 to 240Vac peripherals
- 白炽灯调光器、灯整流器 Incandescent lamp dimmers, Lamp ballasts

Ordering Information

Part Number	Package	Packing quantity
EX302X	直插DIP	65 / Tube
	贴片SMD	1000 / Reel

光电特性 Electrical-Optical characteristics

最大限度额定值(温度=25℃) Absolute Maximum Ratings(Ta=25℃)

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	60	mA
	反向电压 Reverse voltage	V_R	6	V
	输入功耗 Input Power dissipation	P_D	100	mW
	降额系数(高于Ta=85℃) Derating factor (above Ta = 85°C)		3.8	mW /°C
输出 Output	断态输出端电压 Off-state Output Terminal Voltage	V_{DRM}	400	V
	峰值重复浪涌电流 Peak Repetitive Surge Current (pw=1ms,120pps)	I_{TSM}	1	A
	导通有效值电流 On-State RMS Current	$IT_{(RMS)}$	100	mA
	输出功耗 Output Power dissipation	P_C	300	mW
	降额系数(高于Ta=85℃) Derating factor (above Ta = 85°C)		7.4	mW /°C
总消耗功率 Total Consume Power		P_{TOT}	330	mW
隔离电压(1*) Isolation Voltage		V_{iso}	5000	Vrms
工作温度 Operating temperature		T_{OPR}	-55 to +100	℃
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, and3,4 are shorted together

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

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	-	1.18	1.5	V	I_F=10mA
	反向电流 Reverse current	I_R	-	-	10	μA	V_R=6V
输出 Out put	断态峰值电流 Peak Blocking Current	I_{DRM}	-	-	100	nA	V_{DRM} = Rated V_{DRM} I_F = 0 mA 2*
	峰值导通电压 Peak On-state Voltage	V_{TM}	-	-	3.0	V	I_{TM}=100 mA peak, I_F=Rated I_{FT}
	断态电压临界上升率 Critical Rate of Rise off-state Voltage	dv/dt	-	100	-	V/μs	V_{PEAK} =Rated V_{DRM}, I_F=0mA 3*

附注(Notes):

1*. Ta=25℃时的规格值 Typical values at Ta = 25°C

2*. 测试电压必须在dv/dt额定值范围内 Test voltage must be applied within dv/dt rating

3*. 这是静态的dv/dt，转换直流dv/dt只有负载驱动晶闸管的函数
This is static dv/dt,Commutating dv/dt is a function of the load-driving thyristor(s) only

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
LED触发电流 LED Trigger Current	EX3020	I_{FT}	-	-	30	mA	主端子电压 =3V Main terminal Voltage=3V
	EX3021		-	-	15		
	EX3022		-	-	10		
	EX3023		-	-	5		
保持电流 Holding Current		I_H	-	250	-	uA	

特性曲线 Characteristic Curves

图1.正向电流与正向电压的关系

Figure1. Forward Current VS Forward Voltage

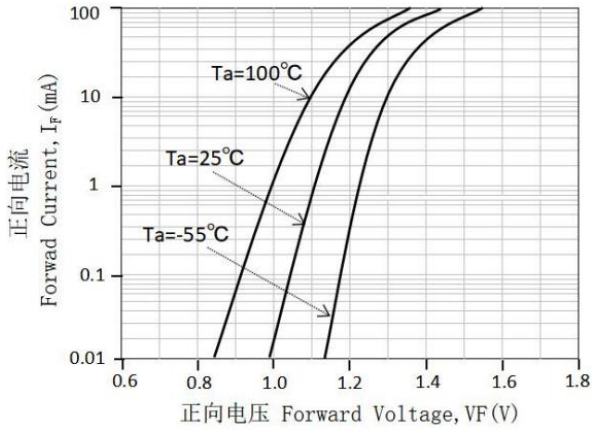


图2.导通特性

Figure2. On-State Characteristics

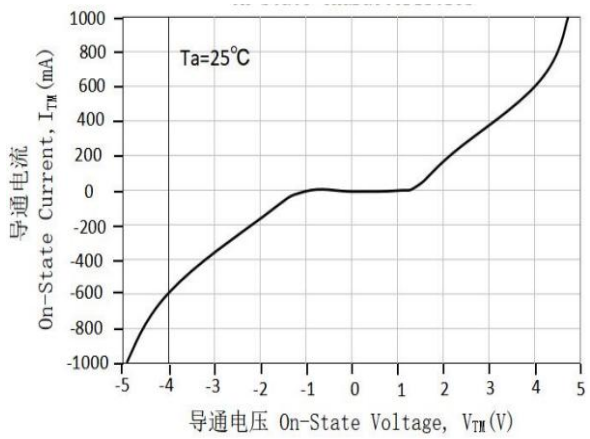


图3.保持电流 vs 环境温度的关系

Figure3. Normalized Holding Current vs Ambient Temperature

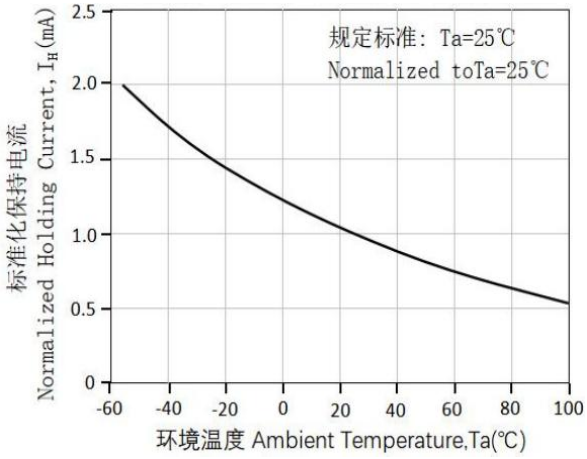


图4.触发所需LED电流 vs LED脉冲宽度的关系

Figure4. LED Current Required to Trigger vs vs LED Pulse Width

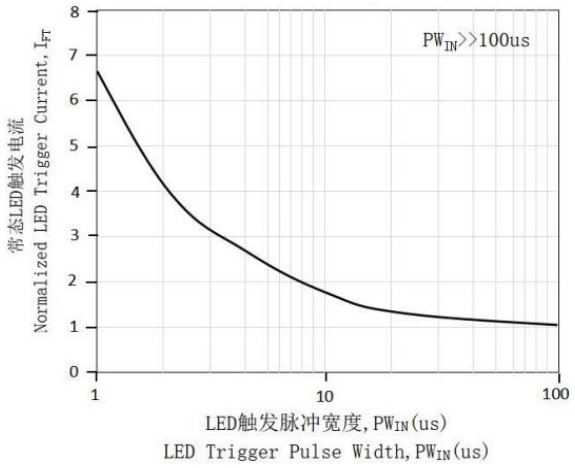


图5.漏电流 vs 环境温度的关系

Figure5. Leakage Current vs Ambient Temperature

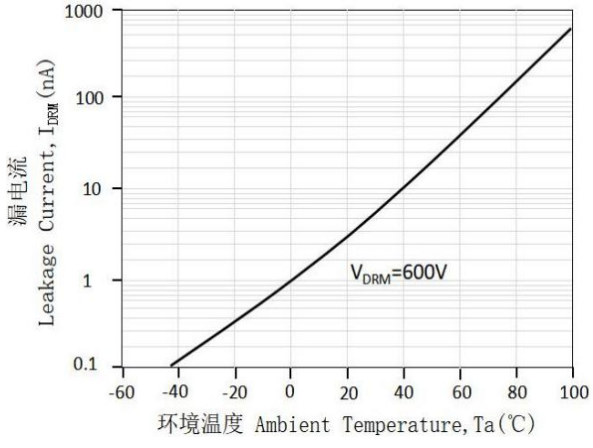


图6.LED触发电流 vs 环境温度的关系

Figure6. Normalized LED Trigger Current vs Ambient Temperature

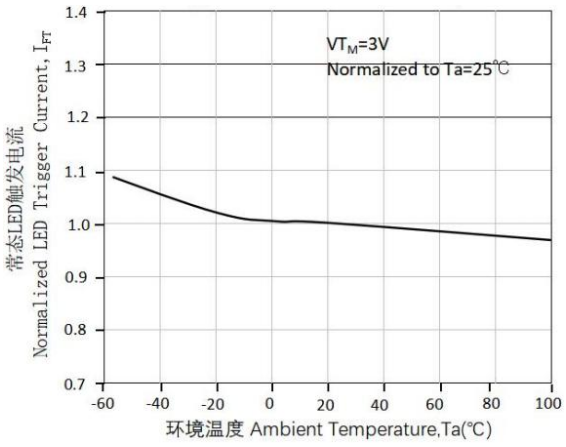


图7.关闭状态输出端电压 vs 环境温度的关系

Figure7. Off-State Output Terminal Voltage vs Ambient Temperature

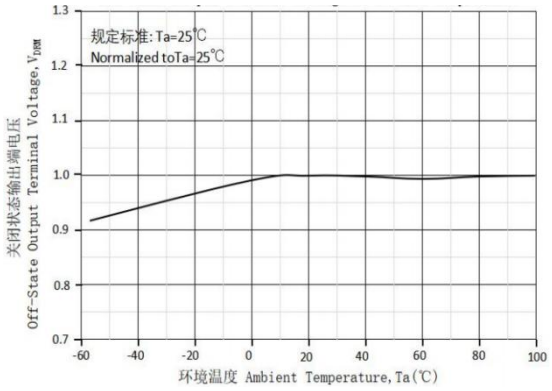
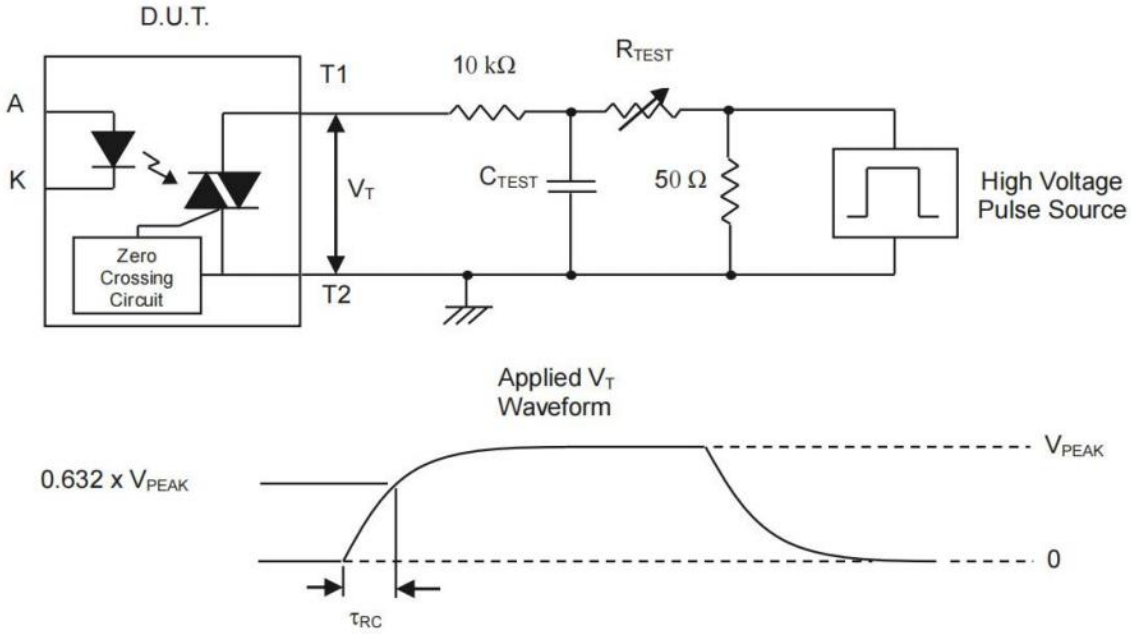


图8. 静态dv/dt测试电流和波形

Figure8. Static dv/dt Test Circuit & Waveform



测量方法 Measurement Method

高压脉冲设置为所需的V_{PEAK}值，并通过上述RC电路应用于D.U.T输出值，不应用LED电流,使用X100范围探头监视波形VR，通过改变RTEST，dv/dt(斜率)增加，直到DU被观察到触发(波形崩溃)。dv/dt随后下降,直到D.U.T. 停止触发，此时记录 τRC，计算dv/dt=0.632*V_{PEAK}/τRC

The high voltage pulse is set to the required V_{PEAK} value and applied to the D.U.T. output side through the RC circuit above. LED current is not applied. The waveform VT is monitored using a x100 scope probe. By varying RTEST, the dv/dt (slope) is increased, until the D.U.T. is observed to trigger (waveform collapses). The dv/dt is then decreased until the D.U.T. stops triggering. At this point, τRC is recorded and the dv/dt calculated. dv/dt=0.632*V_{PEAK}/τRC

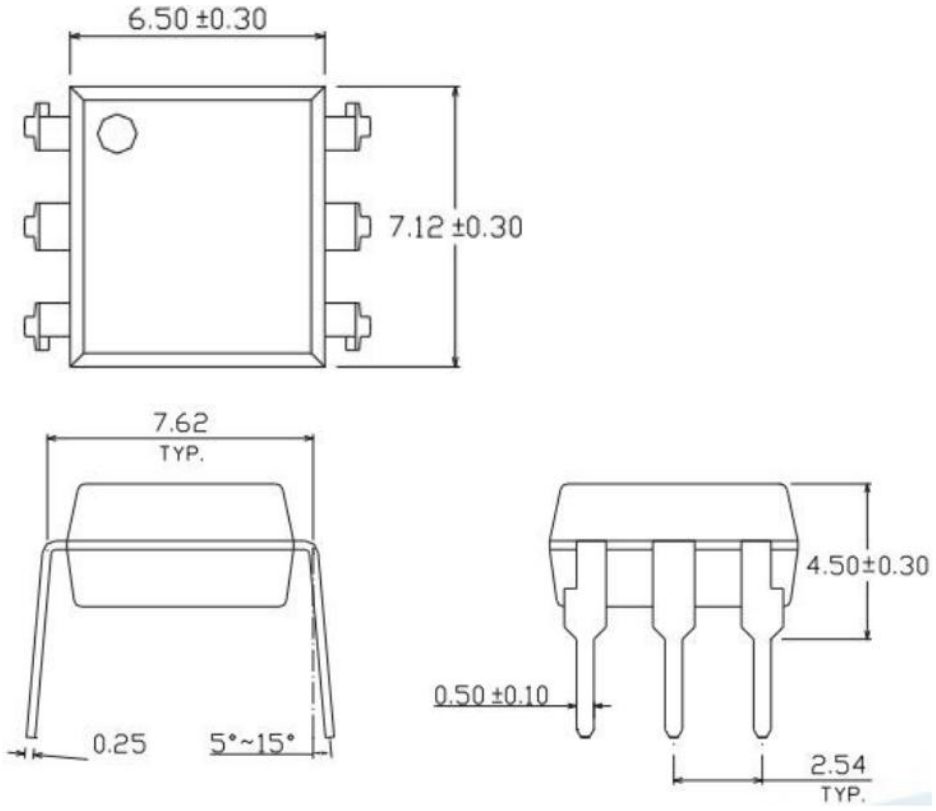
例如, EX302X系列的V_{PEAK}=250V, dv/dt值的计算公式如下：

For example, V_{PEAK} = 250V for EX302X series. The dv/dt value is calculated as follows:

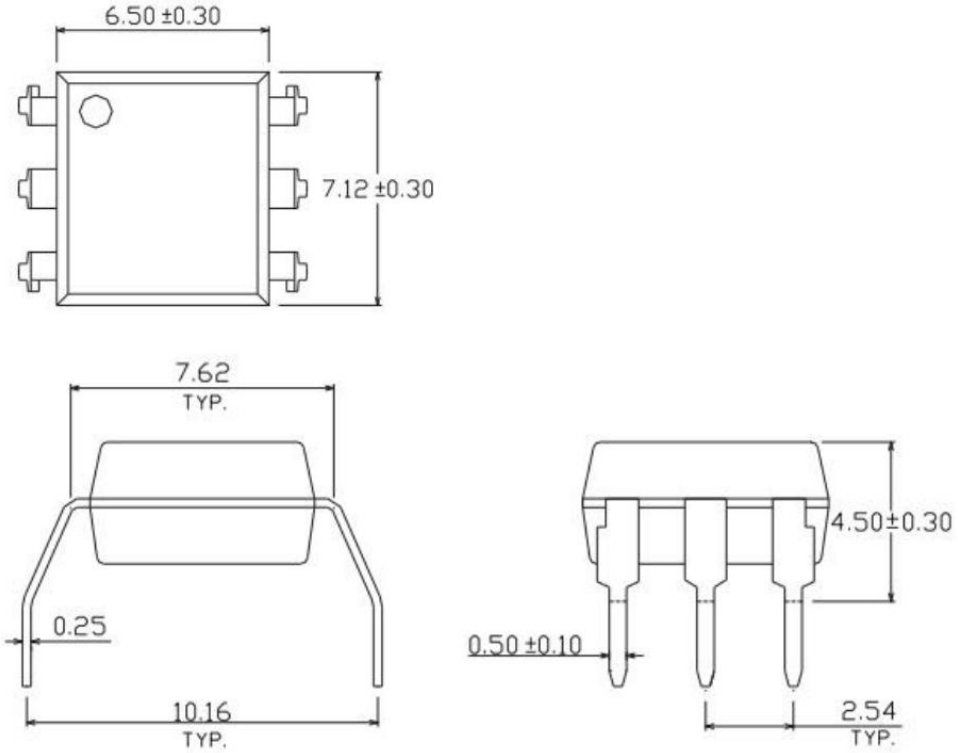
dv/dt= 0.632*250/τRC

封装尺寸(单位:毫米) Package Drawing(Unit:mm)

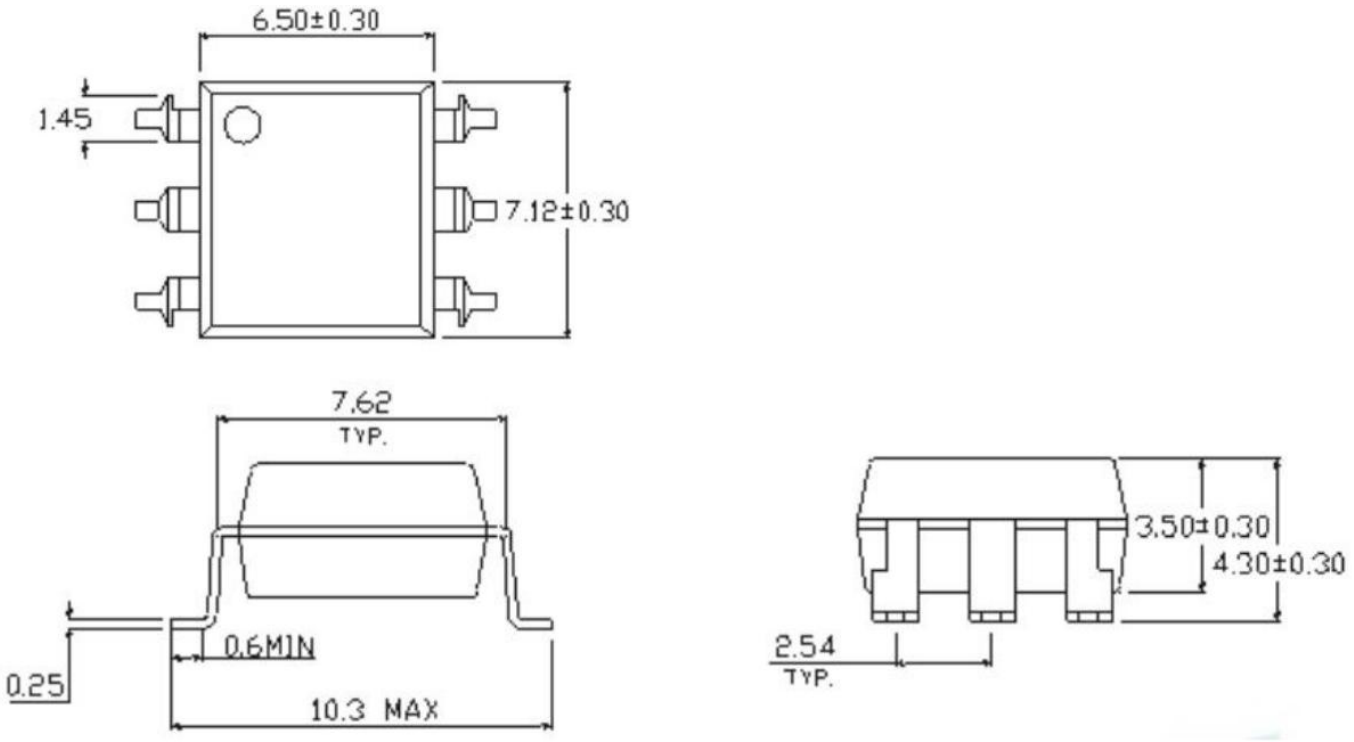
- 标准DIP型号 Standard DIP Type



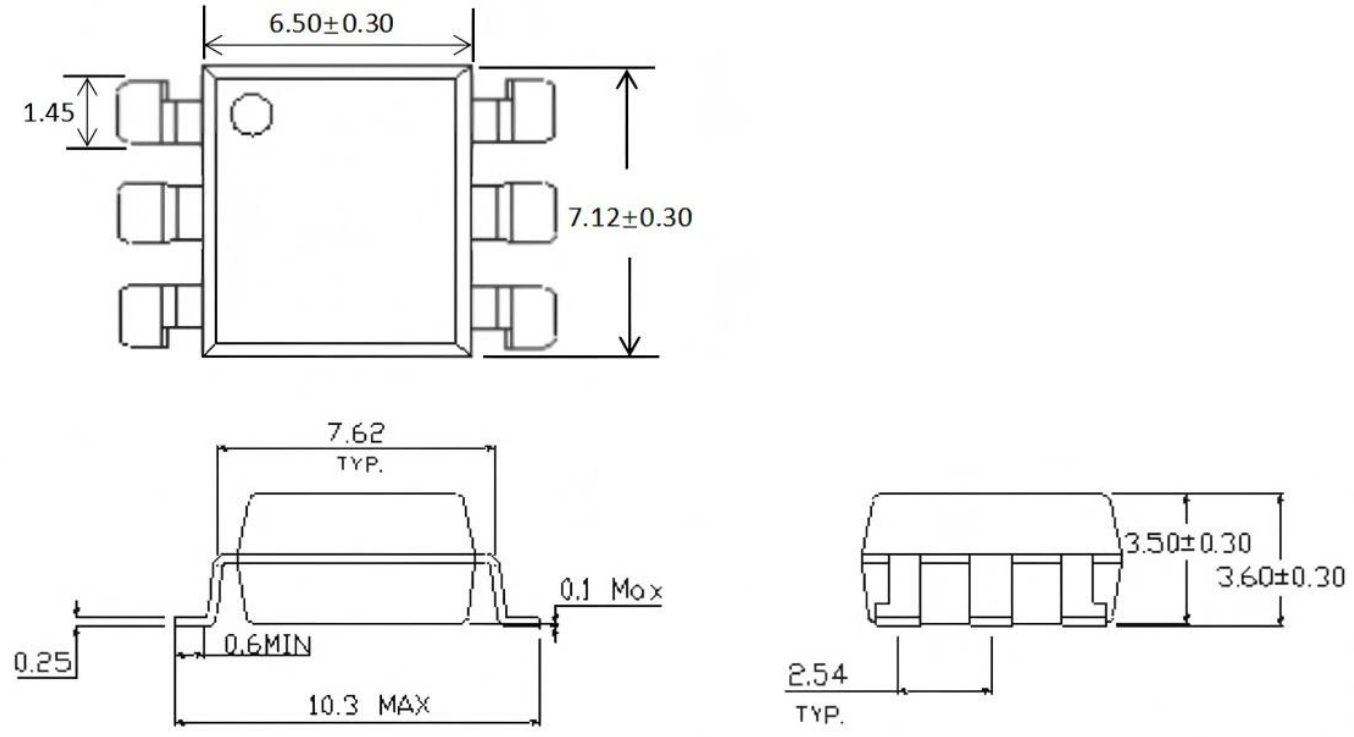
- 选择M型号 Option M Type



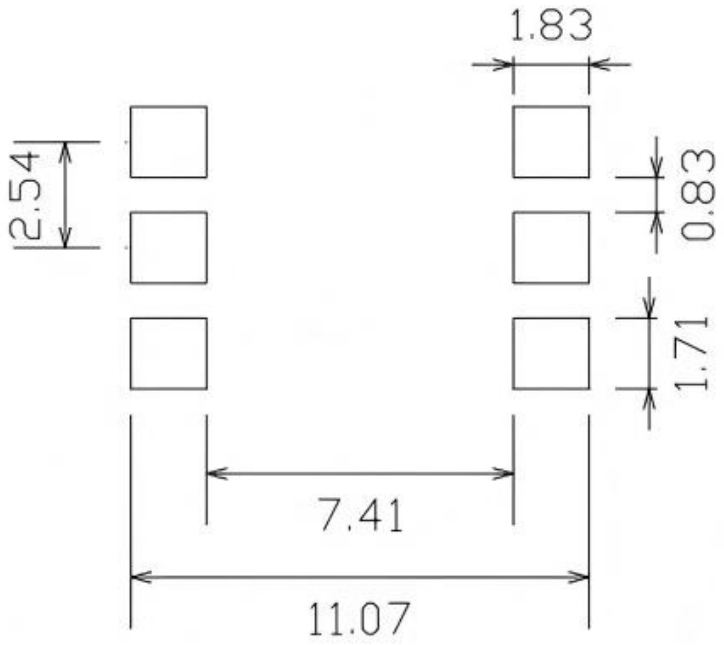
• 选择S型号 Option S Type



• 选择S1型号 Option S1 Type



表面贴片类型PIN脚焊盘布局 Surface patch type PIN foot pad layout



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