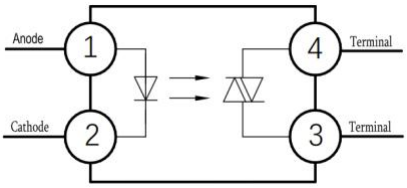
Random-phase Triac Driver Photocouple

PCM301X-E,PCM302X-E,PCM305X-E

Features

HF

- Peak breakdown voltage:
  250V：PCM301X；400V：PCM302X； 600V：PCM305X
- High isolation voltage between input and output (Viso =3750V rms)
- Operating Temperature: -55℃~110℃



Applications

- Electromagnetic valve controls
- Ballasts
- Static AC power switch
- Interfacing microprocessors to 115 to 240Vac peripherals.
- Incandescent lamp dimmer
- Temperature controls
- Motor controls



Mechanical Data

- Case: SOP4
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

PC M30VX (M) (G) - (U) (N) E

① ② ③ ④ ⑤ ⑥ ⑦

① Brand(PC)
② Product series(V:1,2,5;X:0,1,2,3,4)
③ Package type(SOP4:None)
④ Halogen option(None :Halogen free)
⑤ Lead frame (None: Copper)
⑥ Customer option 1 (0-9 or A-Z or None)
⑦ Product Versions: E

Part Number	Package	Shipping Quantity	Marking Code
PCM30V*1X*2-E	SOP4	3000 pcs / Tape & Reel	PCM30V*1X*2…E

Notes 1: V denotes VDRM digitsr: 1, 2, 5.
2: X denotes IFT digitsr:0, 1, 2, 3, 4.

Marking Information

- "PC" denotes brand
- "V" denotes V_{DRM} digitsr: 1, 2, 5
- "X" denotes I_{FT} digitsr: 0, 1, 2, 3, 4
- "Y" denotes Year : A(2024), B(2025), C(2026) .....
- "WW" denotes Week's number
- "N" denotes the day of Week
- "E" fixed



Maximum Ratings (@ TA = 25°C unless otherwise specified)

Parameter			Symbol	Value	Unit
Input	Forward Current		I_F	60	mA
	Reverse Voltage		V_R	6	V
	Power Dissipation		P_D	100	mW
	Derating factor (above Ta = 85 ℃)			3.8	mW/°C
Output	Power Dissipation		P_C	300	mW
	Derating factor (above Ta = 85 ℃)			7.4	mW/°C
	Off-state Output Terminal Voltage	PCM301X	V_{DRM}	250	V
		PCM302X		400	
		PCM305X		600	
	Peak repetitive surge current (pw=100μs,120pps)		I_{TSM}	1	A
	Turn-on current (root mean square value)		$I_{T(RMS)}$	100	mA

Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P_{TOT}	330	mW
Isolation Voltage *1	V_{ISO}	3750	Vrms
Operating Temperature	T_{OPR}	-55 ~ +110	°C
Storage Temperature Range	T_{STG}	-55 ~ +125	°C
Soldering Temperature *2	T_{SOL}	260	°C

Notes:
1. 40 to 60% RH, AC for 1 minute. At this time, pins 1, 2 & 3 are shorted, and pins 4, 5 & 6 are shorted together.
2. For 10 seconds

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Parameter			Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage		V_F	I_F=20mA	-	1.23	1.5	V
	Reverse Leakage current		I_R	V_R=6V	-	-	10	μA
Output	Peak Blocking Current		I_{DRM}	V_{DRM} =Rated V_{DRM}, I_F= 0mA	-	-	100	nA
	Peak on-state voltage		V_{TM}	I_{TM}=100mA, I_F=Rated I_{FT}	-	-	2.5	V
	Critical Rate of Rise off-state Voltage	PCM301X	dv/dt	V_{PEAK} =Rated V_{DRM}, I_F= 0mA	-	100	-	V/μs
		PCM302X						
		PCM305X		V_{PEAK} =400V, I_F=0	1000	-	-	
Transfer Characteristics	LED trigger current	PCM3010	I_{FT}	Main terminal voltage = 3V	-	-	30	mA
		PCM3020						
		PCM3011			-	-	15	
		PCM3021						
		PCM3051						
		PCM3012			-	-	10	
		PCM3022						
		PCM3052						
		PCM3013			-	-	5	
		PCM3023						
		PCM3053						
		PCM3014			-	-	3	
		PCM3024						
		PCM3054						
	Holding Current		I_H		-	250		μA

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

Fig.1 LED Positive voltage vs Positive current

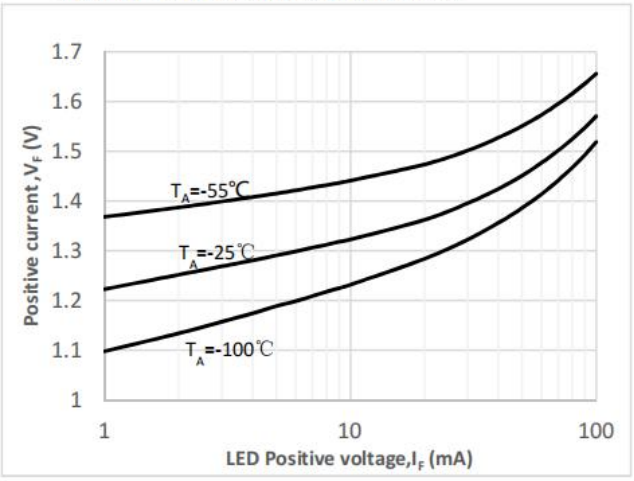


Fig.2 On-state characteristic

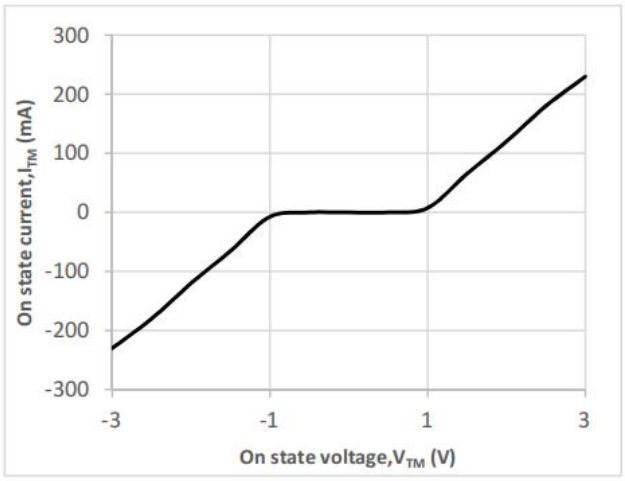


Fig.3 Trigger current vs Ambient temperature

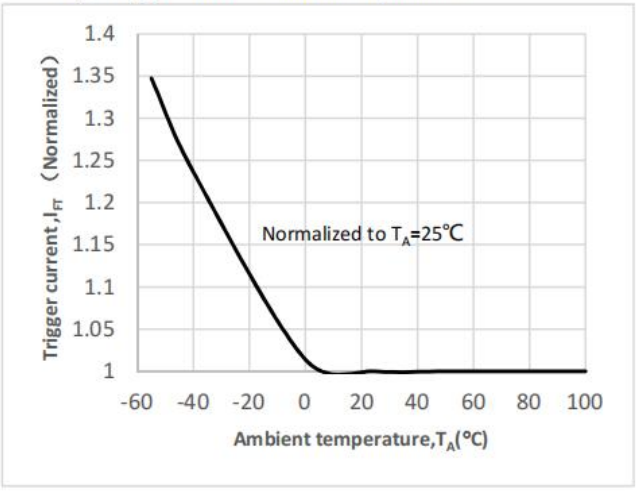


Fig4 LED Trigger current vs LED Pulse Width

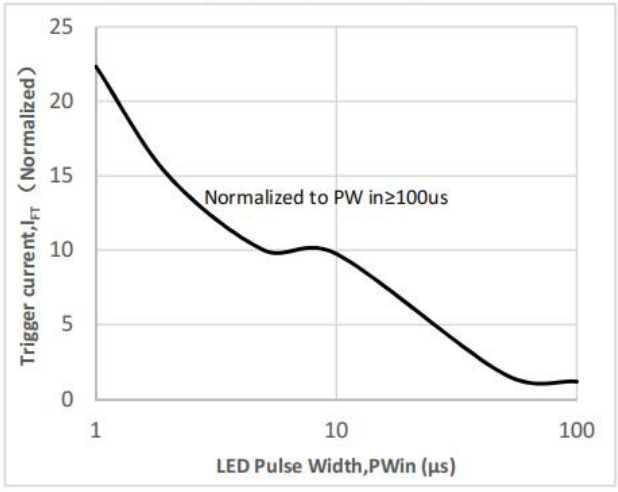


Fig.5 Holding current vs Temperature

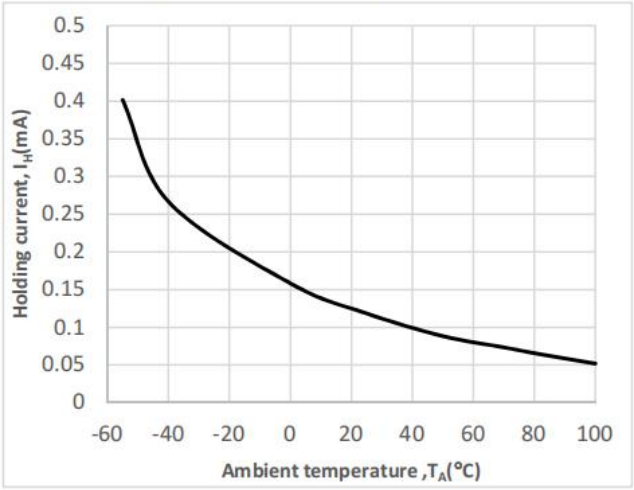


Fig.6 Leakage current vs Temperature

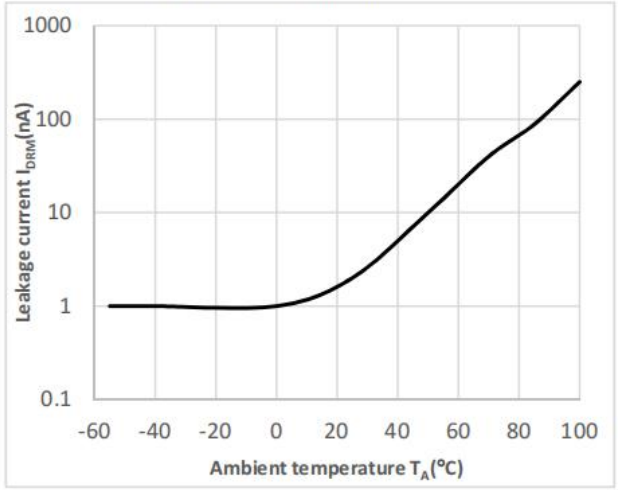
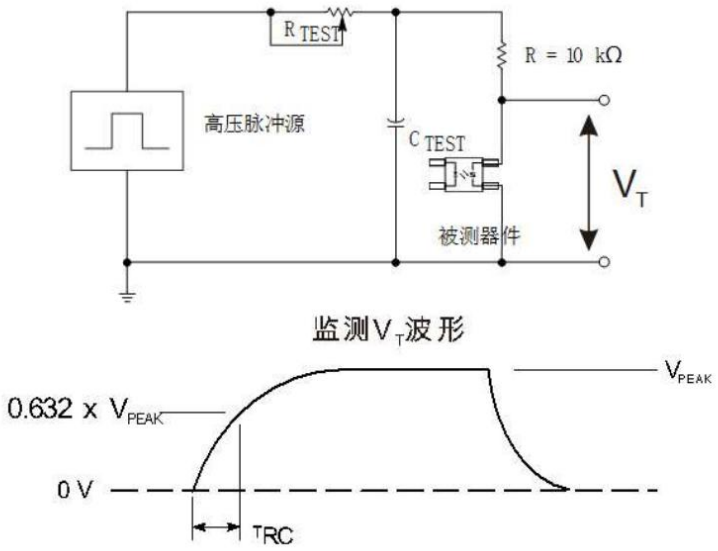


Fig.7 Static dv / dt test circuit and waveform



The high voltage pulse applied to the output of the device under test through the RC circuit is set to the required V_{PEAK} value. LED current is not applied. The waveform V_T is monitored with X100 probe. By adjusting the R_{TEST} value, the dv/dt (slope) increases until the device under test is observed to be triggered (waveform collapse). Then dv/dt drops until the device under test stops being triggered. At this point, RC is recorded and the dv/dt calculated.

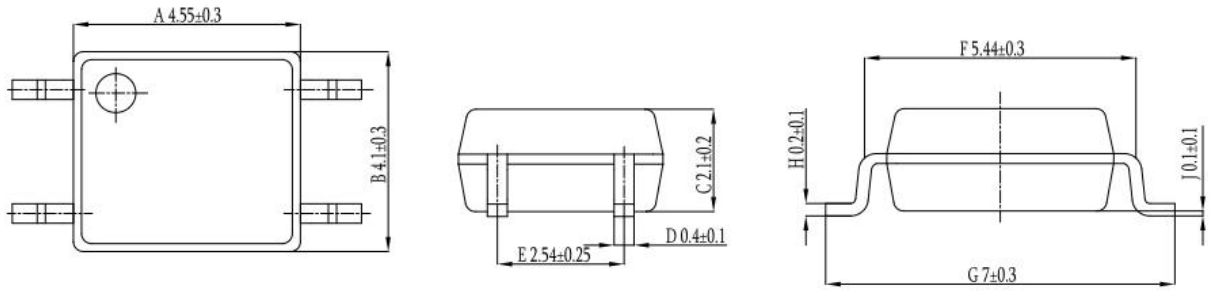
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

For example, VPEAK = 400V for BLM302X series. The dv/dt value is calculated as follows:

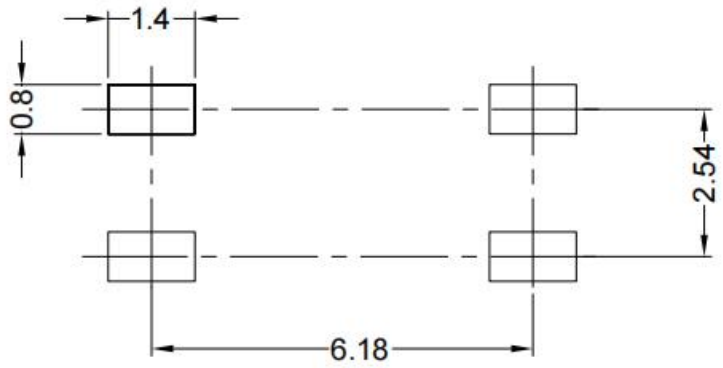
$$dv/dt = \frac{0.632 \times 400}{\tau_{RC}} = \frac{252}{\tau_{RC}}$$

Package Outline Dimensions (unit: mm)

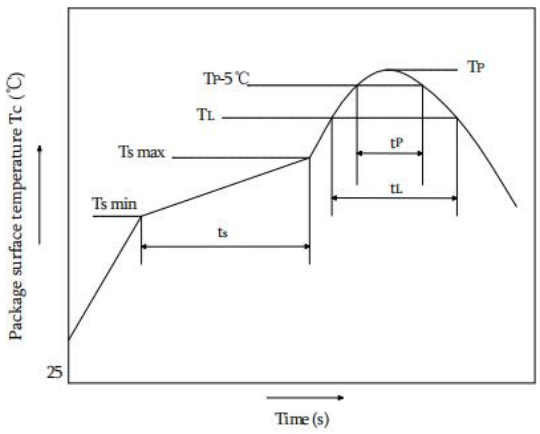
SOP4



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

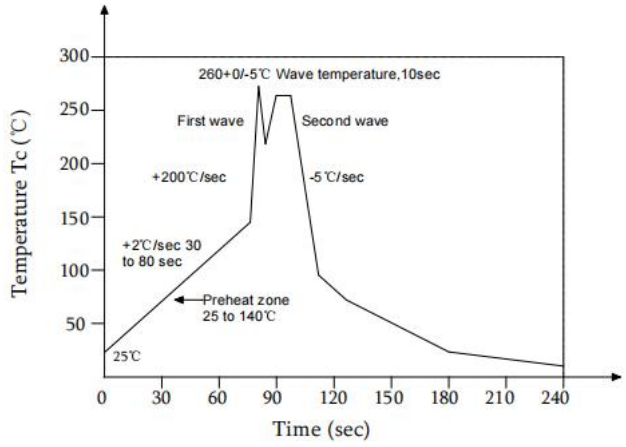


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	℃
Preheat time	ts	60	120	s
Ramp-up rate(T_L to T_P)			3	℃/s
Liquidus temperature	T_L	217		℃
Time above T_L	t_L	60	150	s
Peak temperature	Tp		260	℃
Time during which Tc is between (T_P-5) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	℃/s

Note:

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

Wave soldering



Profile feature	
Average ramp-up rate	~200℃/s
Heating rate during preheat	1℃/s to 2℃/s typical;4℃/s maximum
Final preheat temperature Ts	~130℃
Preheat time (25℃ to Ts)	>60s
Peak temperature Tp	260℃
Time within peak temperature tp	10s
Ramp-down rate	5℃/s maximum

Soldering with hand soldering iron

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

B. Hand soldering iron requirements:Temperature:360 ℃+5℃ within 3s.

Packing

Package Type	Packing Form	Quantity per Tube &Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
SOP4	Reel(ϕ330mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Leave 25 Spaces at the beginning and 50 Spaces at the end

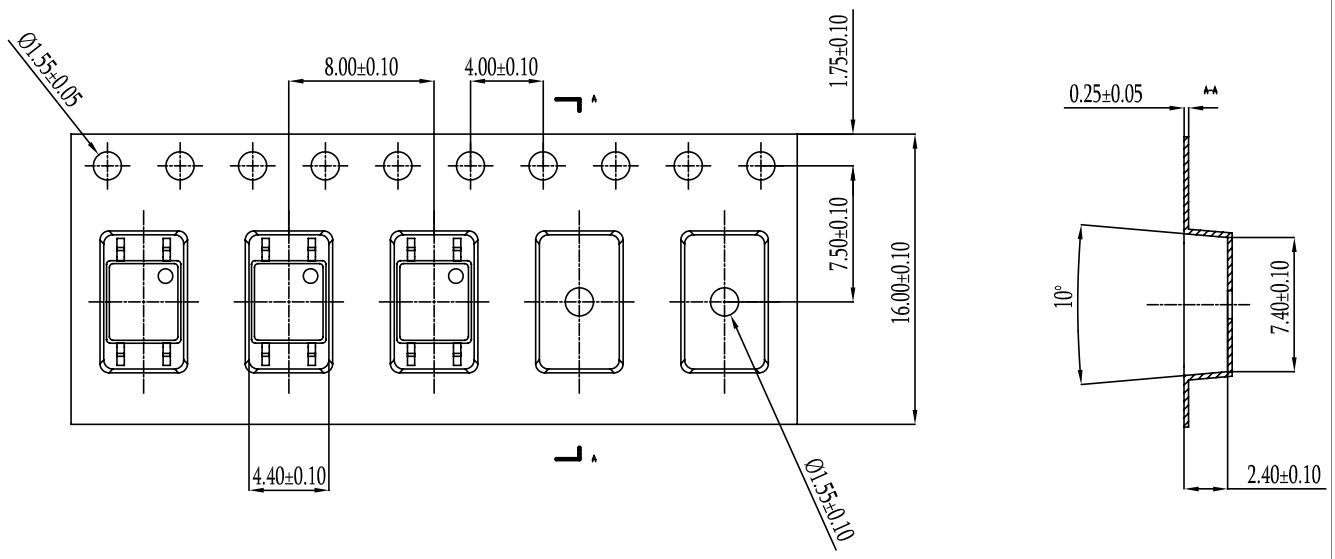
■Summary table

■■SOP4 （Reel)

Qty/reel：3000 pcs. Qty/box：6000 pcs.

Qty/ctn ： 30000 pcs.

Schematic：(unit:mm)



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