

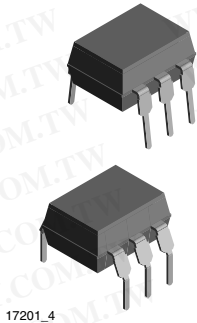


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K3020P, K3020PG Series

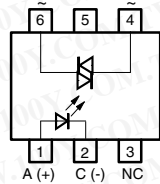
Vishay Semiconductors

Optocoupler, Phototriac Output, 400 V_{DRM}



17201_4

Note: pin 5 must not be connected



17221-2

FEATURES

- 400 V blocking voltage
- Isolation test voltage, 5300 V_{RMS}, t = 1 s
- Isolation materials per UL94
- Compliant to RoHS directive to 2002/95/EC and in accordance WEEE 2002/96/EC



RoHS COMPLIANT

APPLICATIONS

- High current triac driver
- Solid state relay
- Switch small AC loads

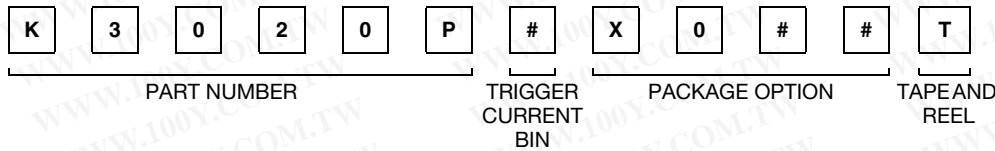
AGENCY APPROVALS

- UL1577, file no. E52744 system code H
- CSA notice 5A compliant, cUL tested
- DIN EN 60747-5-5 (VDE0884)
- BSI IEC 60950; IEC 60065 pending

DESCRIPTION

The K3020P, 3020PG series consists of a phototriac optically coupled to a gallium arsenide infrared-emitting diode in a 6-lead plastic dual inline package

ORDERING INFORMATION



AGENCY CERTIFIED/PACKAGE	TRIGGER CURRENT, I _{FT}				
VDE, cUL, BSI	3.6 mA	5 mA	10 mA	15 mA	30 mA
DIP-6	K3036P	K3023P	K3022P	K3021P	K3020P
DIP-6, 400 mil	K3036PG	K3023PG	K3022PG	K3021PG	K3020PG

Note

- G = leadform 10.16 mm; G is not marked on the body.

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾ (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
INPUT					
Reverse voltage			V _R	5	V
Forward current			I _F	80	mA
Surge current	P.W. < 10 μs		I _{FSM}	3	A
Power dissipation			P _{diss}	100	mW
Junction temperature			T _j	100	°C
OUTPUT					
Peak off-state voltage			V _{DRM}	400	V
On-state RMS current			I _{D(RMS)}	100	mA
Peak surge current	t _p ≤ 10 ms		I _{FSM}	1.5	A
Power dissipation			P _{diss}	300	mW
Junction temperature			T _j	100	°C

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ABSOLUTE MAXIMUM RATINGS ⁽¹⁾ (T _{amb} = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
COUPLER					
Isolation voltage	t = 1 s		V _{ISO}	5300	V _{RMS}
Creepage distance				≥ 7	mm
Clearance distance				≥ 7	mm
Isolation resistance	V _{IO} = 500 V, T _{amb} = 25 °C		R _{IO}	≥ 10 ¹²	Ω
	V _{IO} = 500 V, T _{amb} = 100 °C		R _{IO}	≥ 10 ¹¹	Ω
Total power dissipation			P _{tot}	350	mW
Storage temperature range			T _{stg}	- 55 to + 100	°C
Ambient temperature			T _{amb}	- 40 to + 85	°C
Junction temperature			T _j	100	°C
Lead soldering temperature ⁽²⁾	2 mm from case, t < 10 s		T _{slid}	260	°C

Notes

⁽¹⁾ Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

⁽²⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

ELECTRICAL CHARACTERISTICS ⁽¹⁾ (T _{amb} = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	I _F = 50 mA		V _F		1.3	1.6	V
Reverse voltage	I _R = 10 μA		V _R	5			V
Junction capacitance	V _R = 0 V, f = 1 MHz		C _j		50		pF
OUTPUT							
Forward peak off-state voltage (repetitive)	I _{DRM} = 100 nA		V _{DRM} ⁽²⁾	400			V
Peak on-state voltage	I _{TM} = 100 mA		V _{TM}		1.5	3	V
Critical rate of rise of off-state voltage	I _F = 0 A, V _D = 0.67 V _{DRM}		dV/dt _{cr}		10		V/μs
Critical rate of rise of on-state current commutation	V _D = 30 V _{RMS} , I _D = 15 mA _{RMS}		dV/dt _{crq}	0.1	0.15		V/μs
COUPLER ⁽³⁾							
Emitting diode trigger current	V _S = 3 V, R _L = 150 Ω	K3020P	I _{FT}		15	30	mA
		K3020PG	I _{FT}		15	30	mA
		K3021P	I _{FT}		8	15	mA
		K3021PG	I _{FT}		8	15	mA
		K3022P	I _{FT}		5	10	mA
		K3022PG	I _{FT}		5	10	mA
		K3023P	I _{FT}		3	5	mA
		K3023PG	I _{FT}		3	5	mA
		K3036P	I _{FT}		2	3.6	mA
K3036PG	I _{FT}		2	3.6	mA		
Holding current	I _F = 10 mA, V _S ≥ 3 V		I _H		200		μA

Notes

⁽¹⁾ Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

⁽²⁾ Test voltage must be applied within dV/dt ratings.

⁽³⁾ I_{FT} is defined as a minimum trigger current.



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MAXIMUM SAFETY RATINGS (1)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT (2)						
Forward current		I _F			130	mA
OUTPUT						
Power dissipation		P _{diss}			300	mW

Notes

- (1) According to DIN EN 60747-5-5 (see figure 1). This optocoupler is suitable for safe electrical isolation only within the safety ratings. Compliance with the safety ratings shall be ensured by means of suitable protective circuits.
- (2) The device is used for protective separation against electrical shock within the maximum safety ratings. This must be ensured by protective circuits in the applications.

SAFETY AND INSULATION RATINGS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Climatic classification (according to IEC 68 part 1)				55/100/21		
Pollution degree	DIN VDE0109			2		
Comparative tracking index		CTI	175			
V _{IOTM}			8000			V _{peak}
V _{IORM}			890			V _{peak}
Insulation resistance at 25 °C	V _{IO} = 500 V	R _{IS}			≥ 10 ¹²	Ω
Insulation resistance at T _S	V _{IO} = 500 V	R _{IS}			≥ 10 ⁹	Ω
Insulation resistance at 100 °C	V _{IO} = 500 V	R _{IS}			≥ 10 ¹¹	Ω
Partial discharge test voltage	Method a, V _{pd} = V _{IORM} x 1.875	V _{pd}			1669	V _{peak}
P _{SO}					500	mW
I _{SI}					250	mA
T _{SI}					175	°C
Clearance distance	Standard DIP-6		7			mm
Creepage distance	Standard DIP-6		7			mm
Clearance distance	400 mil DIP-6		8			mm
Creepage distance	400 mil DIP-6		8			mm

Note

As per IEC60747-5-5, § 7.4.3.8.1, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

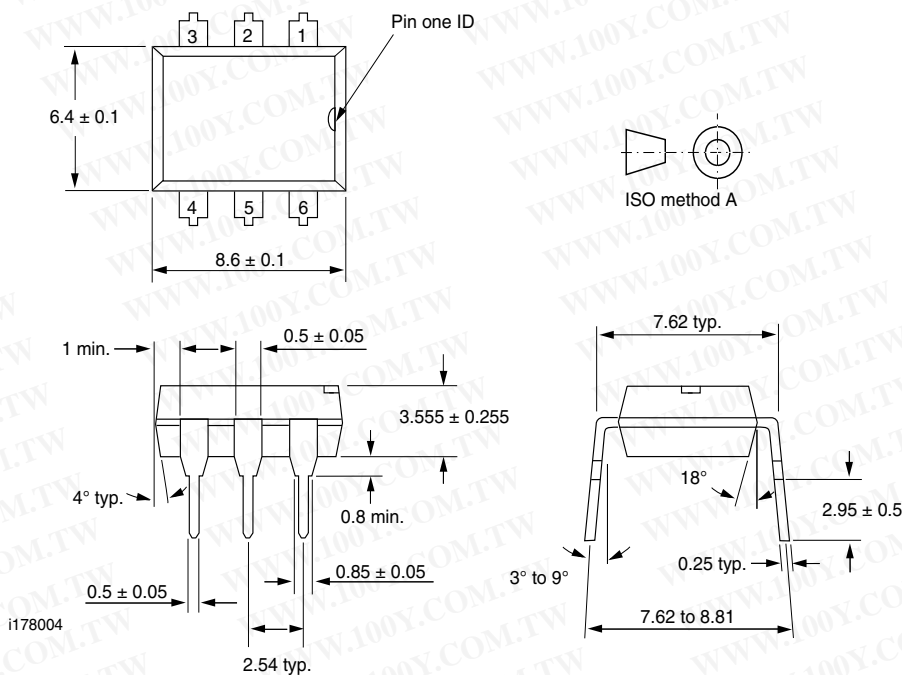
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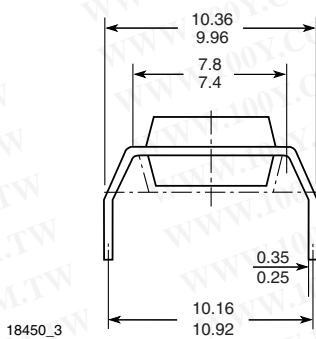
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PACKAGE DIMENSIONS millimeters



K3020PG type



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PACKAGE MARKING

