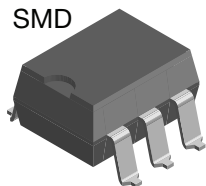
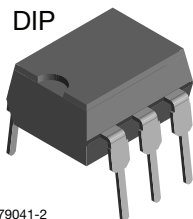


**Optocoupler, Phototriac Output, Non-Zero Crossing, 400 V_{DRM}**

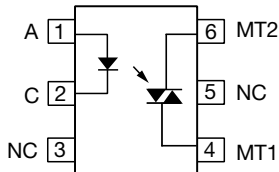
SMD



DIP



i179041-2

**FEATURES**

- 400 V blocking voltage
- Isolation test voltage, 5300 V_{RMS}, t = 1 s
- Isolation materials per UL94
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

**RoHS**
COMPLIANT**APPLICATIONS**

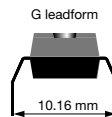
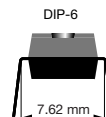
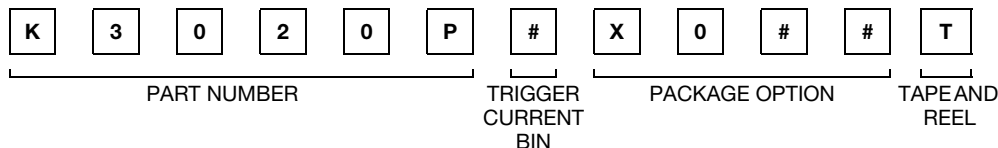
- High current triac driver
- Solid state relay
- Switch small AC loads

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
- CQC: GB8898-2001

DESCRIPTION

The K3020P, K3020PG 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 (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

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
COUPLER					
Isolation voltage	$t = 1\text{ s}$		V_{ISO}	5300	V_{RMS}
Total power dissipation			P_{tot}	350	mW
Storage temperature range			T_{stg}	- 55 to + 150	$^{\circ}\text{C}$
Ambient temperature			T_{amb}	- 55 to + 100	$^{\circ}\text{C}$
Junction temperature			T_j	100	$^{\circ}\text{C}$
Lead soldering temperature ⁽¹⁾	2 mm from case, $t < 10\text{ s}$		T_{sld}	260	$^{\circ}\text{C}$

Notes

- 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.

⁽¹⁾ Refer to wave profile for soldering conditions for through hole devices (DIP) "Assembly Instructions" (www.vishay.com/doc?80054)

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	$I_F = 50\text{ mA}$		V_F		1.3	1.6	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$		V_R	5			V
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$		C_j		50		pF
OUTPUT							
Forward peak off-state voltage (repetitive)	$I_{DRM} = 100\text{ nA}$		$V_{DRM}^{(1)}$	400			V
Peak on-state voltage	$I_{TM} = 100\text{ mA}$		V_{TM}		1.5	3	V
Critical rate of rise of off-state voltage	$I_F = 0\text{ A}$, $V_D = 0.67\text{ }V_{DRM}$		dV/dt_{cr}		10		V/ μs
Critical rate of rise of on-state current commutation	$V_D = 30\text{ }V_{RMS}$, $I_D = 15\text{ mA}_{RMS}$		dV/dt_{crq}	0.1	0.15		V/ μs
COUPLER ⁽²⁾							
Emitting diode trigger current	$V_S = 3\text{ V}$, $R_L = 150\text{ }\Omega$	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	$I_F = 10\text{ mA}$, $V_S \geq 3\text{ V}$		I_H		200		μA

Notes

- 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.

⁽¹⁾ Test voltage must be applied within dV/dt ratings.

⁽²⁾ I_{FT} is defined as a minimum trigger current.

**SAFETY AND INSULATION RATINGS**

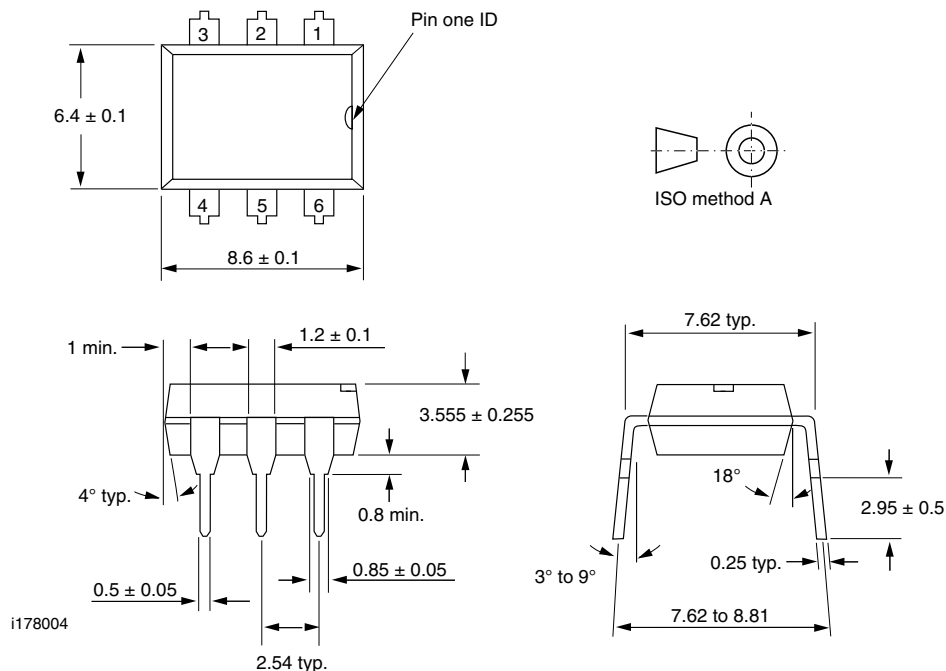
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Climatic classification (according to IEC 68 part 1)			55/100/21		
Pollution degree (DIN VDE 0109)			2		
Comparative tracking index	CTI	175			
Peak transient overvoltage	V_{IOTM}			8000	V_{peak}
Peak working insulation voltage	V_{IORM}			890	V_{peak}
Partial discharge test voltage (method a, $V_{pd} = V_{IORM} \times 1.875$)	V_{pd}			1669	V_{peak}
Isolation resistance at $T_{amb} = 100\text{ }^{\circ}\text{C}$, $V_{DC} = 500\text{ V}$	R_{IO}	10^{11}			Ω
Isolation resistance at $T_{amb} = 25\text{ }^{\circ}\text{C}$, $V_{DC} = 500\text{ V}$	R_{IO}	10^{12}			Ω
Safety rating - power	P_{SO}			265	mW
Safety rating - input current	I_{SI}			130	mA
Safety rating - temperature	T_{SI}			150	$^{\circ}\text{C}$
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

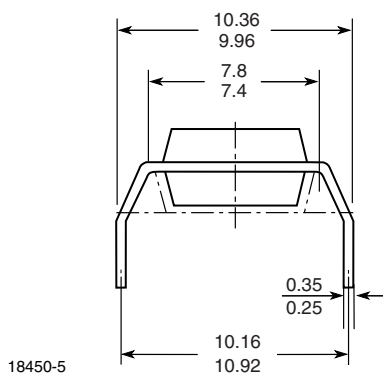
- According to DIN EN60747-5-5 (see figure 4). This optocoupler is suitable for safe electrical isolation only within the safety ratings. Compliance with the safety ratings shall be ensured by means of suitable protective circuits.



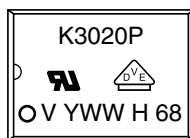
PACKAGE DIMENSIONS millimeters



G Series



PACKAGE MARKING (example)



Notes

- The "G" of the G leadform type is not marked on the body.
- The VDE logo is only marked on option1 parts.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.