



PHOTOTRIAC



Optoelectronics



PHOTOTRIAC

Features and Applications

Vishay Semiconductors offers a broad line of phototriacs, giving designers a range of choices from industry-standard phototriacs to the highest dV/dt rated devices in the market.

Features

- Zero crossing or non zero crossing
- dV/dt range: 10 kV/μs, 5 kV/μs, 1.5 kV/μs, 10 V/μs
- V_{DRM} range: 250 V, 400 V, 600 V, 700 V, 800 V
- Isolation test voltage: 5300 V_{RMS} minimum
- Worldwide safety agency certifications: UL, CUL, VDE
- SMD and 400 mil through-hole lead bend options available
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Applications

- Solid-state relays
- Lighting controls
- AC motor starters and drives
- Utilities metering over AC lines
- Solenoid/valve controls
- Temperature controls
- Electromechanical contactors
- Static power switches

Device data sheets and other technical information are available from the Vishay website at <http://www.vishay.com/optocouplers/opto-triac/>

The phototriac optocoupler consists of an infrared LED optically coupled to a photosensitive TRIAC detector die. The detector chip is a complex device which functions in the same manner as a small TRIAC, generating the signals necessary to drive the gate of a larger TRIAC.

For electrically noisy environments, the integrated zero-crossing circuit (ZCC) on the detector chip eliminates current surges and the resulting EMI noise and reliability issues.

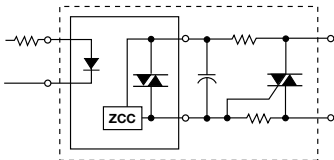
Both the non-zero and zero-crossing output detector chips are designed to drive TRIACs controlling loads on 115 V and 220 V AC power lines.

Power phototriacs combine a phototriac and a power TRIAC in the same package, thereby eliminating the need for an external power TRIAC.

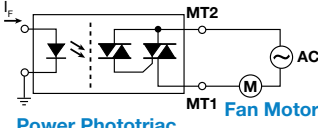
A phototriac application note is available on the Vishay website at <http://www.vishay.com/docs/84780/phototri.pdf>

Application Examples

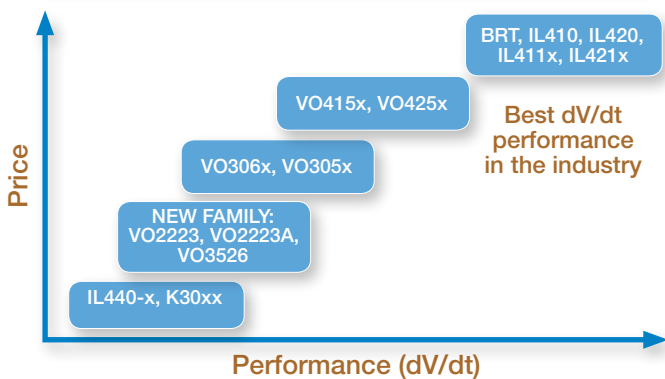
- Phototriac in a solid-state relay design



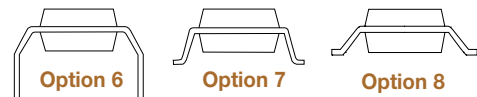
- Power phototriac driving a fan motor



Power Phototriac **Fan Motor**



Lead Form Options



Phototriacs are available in surface-mount and 400 mil through-hole lead form options. Options 7 and 8 call out the surface mount lead form (i.e., VO4256D-X007) and option 6 calls out the 400 mil through-hole lead form (i.e., VO3053-X006).

Note: See datasheets for details on product options

Part Number Recommendations for High Noise Applications

Application	Standards	Comments	Test Level	Recommended Devices
Solid State Relay	IEC/EN1000-4-4	Standard	2 kV	VO415x, VO425x
	IEC/EN1000-4-4	Above Standard	4 kV	IL41xx, IL42xx, BRTxx
	IEC/EN1000-4-4	Above Standard	6 kV	IL41xx, IL42xx, BRTxx
Lighting Control	IEC 61000-4-2	ESD	1 kV	VO415x, VO425x
	IEC 61000-4-3	Radiated EMF	1 V/m, 1000 MHz	VO415x, VO425x
	IEC 61000-4-4	Electrical Fast Transient (EFT)	0.5 kV	VO415x, VO425x
	IEC 61000-4-5	Surge	0.5 kV	VO415x, VO425x
	IEC 61000-4-6	RF Voltage	1 V, 80 MHz	VO415x, VO425x
	IEC 61000-4-11	Voltage Dips	0 - 100 %, 10 ms - 3 s	VO415x, VO425x
Home Appliances	IEC 61000-4-5	Surge	2 kV	VO305x, VO306x
	IEC 61000-4-5		0.5 kV	VO3526, VO2223, VO2223A

Zero Crossing				
 ZCC = Zero Crossing Circuit Part Number	Minimum Critical Rate of Rise of Off-State Voltage Min. dV/dt_{cr} (V/ μ s)	Trigger Current I_{FT} (mA)	Blocking Voltage V_{DRM} (V)	Isolation Test Voltage V_{ISO} (V_{RMS})
BRT22F	10,000	1.2	600	5,300
BRT23F	10,000	1.2	800	5,300
IL4116	10,000	1.3	600	5,300
IL4117	10,000	1.3	700	5,300
IL4118	10,000	1.3	800	5,300
BRT21H	10,000	2	400	5,300
IL410 (BRT22H)	10,000	2	600	5,300
IL4108 (BRT23H)	10,000	2	800	5,300
BRT21M	10,000	3	400	5,300
BRT22M	10,000	3	600	5,300
BRT23M	10,000	3	800	5,300
VO4154D	5,000	1.6	400	5,300
VO4156D	5,000	1.6	600	5,300
VO4157D	5,000	1.6	700	5,300
VO4158D	5,000	1.6	800	5,300
VO4154H	5,000	2	400	5,300
VO4156H	5,000	2	600	5,300
VO4157H	5,000	2	700	5,300
VO4158H	5,000	2	800	5,300
VO4154M	5,000	3	400	5,300
VO4156M	5,000	3	600	5,300
VO4157M	5,000	3	700	5,300
VO4158M	5,000	3	800	5,300
VO3063	1,500	5	600	5,300
VO3062	1,500	10	600	5,300

Non Zero Crossing				
 Part Number	Minimum Critical Rate of Rise of Off-State Voltage Min. dV/dt_{cr} (V/ μ s)	Trigger Current I_{FT} (mA)	Blocking Voltage V_{DRM} (V)	Isolation Test Voltage V_{ISO} (V_{RMS})
BRT12F	10,000	1.2	600	5,300
BRT13F	10,000	1.2	800	5,300
IL4216	10,000	1.3	600	5,300
IL4217	10,000	1.3	700	5,300
IL4218	10,000	1.3	800	5,300
BRT11H	10,000	2	400	5,300

Non Zero Crossing (continued)				
 Part Number	Minimum Critical Rate of Rise of Off-State Voltage Min. dV/dt_{cr} (V/ μ s)	Trigger Current I_{FT} (mA)	Blocking Voltage V_{DRM} (V)	Isolation Test Voltage V_{ISO} (V_{RMS})
IL4208 (BRT13H)	10,000	2	800	5,300
BRT11M	10,000	3	400	5,300
BRT12M	10,000	3	600	5,300
BRT13M	10,000	3	800	5,300
VO4254D	5,000	1.6	400	5,300
VO4256D	5,000	1.6	600	5,300
VO4257D	5,000	1.6	700	5,300
VO4258D	5,000	1.6	800	5,300
VO4254H	5,000	2	400	5,300
VO4256H	5,000	2	600	5,300
VO4257H	5,000	2	700	5,300
VO4258H	5,000	2	800	5,300
VO4254M	5,000	3	400	5,300
VO4256M	5,000	3	600	5,300
VO4257M	5,000	3	700	5,300
VO4258M	5,000	3	800	5,300
VO3053	1,500	5	600	5,300
VO3052	1,500	10	600	5,300
K3023P	10	3.6	400	6,000
IL440-6	10	5	400	5,300
K3012P	10	5	250	6,000
K3023P	10	5	400	6,000
IL440-5	10	10	400	5,300
K3011P	10	10	250	6,000
K3022P	10	10	400	6,000
IL440-4	10	15	400	5,300
K3010P	10	15	250	6,000
K3021P	10	15	400	6,000
K3020P	10	30	400	6,000

Non Zero Crossing Power Phototriac				
 Part Number	Trigger Current I_{FT} (mA)	On-State RMS Current $I_{T(RMS)}$ (A)	Blocking Voltage V_{DRM} (V)	Peak On-State Voltage V_{TM} (V)
VO2223	10	0.9	600	2.5
VO2223A	10	1.0	600	1.7

Notes: New product

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VMN-SG2131-1006