



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.

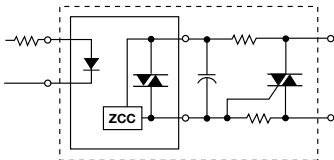
Both the non-zero and zero-crossing output detector chips are designed to drive TRIACs controlling loads on 115 V and 220 V AC power lines.

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

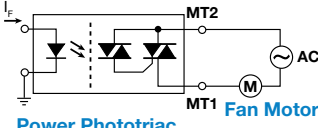
A phototriac application note is available on the Vishay website at <http://www.vishay.com/docs/84780/phototri.pdf>

Application Examples

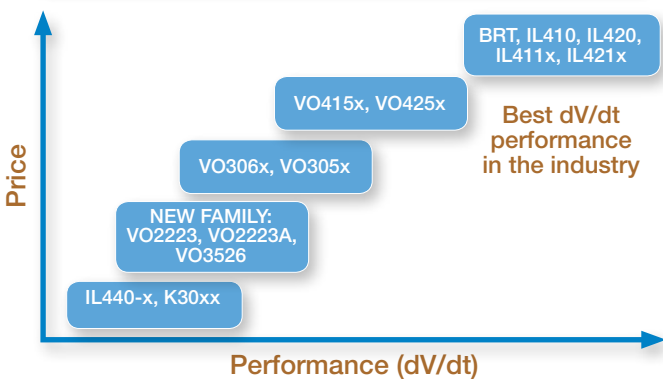
- Phototriac in a solid-state relay design



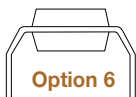
- Power phototriac driving a fan motor



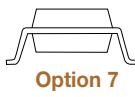
Power Phototriac **Fan Motor**



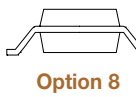
Lead Form Options



Option 6



Option 7



Option 8

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

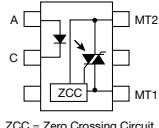
Part Number Recommendations for High Noise Applications

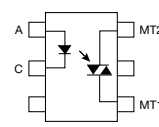
Application	Standards	Comments	Test Level	Recommended Devices
Solid State Relay	IEC/EN1000-4-4	Standard	2 kV	VO415x, VO425x
	IEC/EN1000-4-4	Above Standard	4 kV	IL41xx, IL42xx, BRTxx
	IEC/EN1000-4-4	Above Standard	6 kV	IL41xx, IL42xx, BRTxx
Lighting Control	IEC 61000-4-2	ESD	1 kV	VO415x, VO425x
	IEC 61000-4-3	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

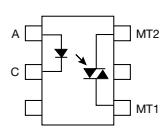
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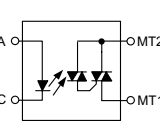
Features and Applications



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})
	BRT21F	10,000	1.2	400
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})
	BRT11F	10,000	1.2	400
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})
	IL420 (BRT12H)	10,000	2	600
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)
	VO3526	10	1.0	600
VO2223	10	0.9	600	2.5
VO2223A	10	1.0	600	1.7

 Notes: New product

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