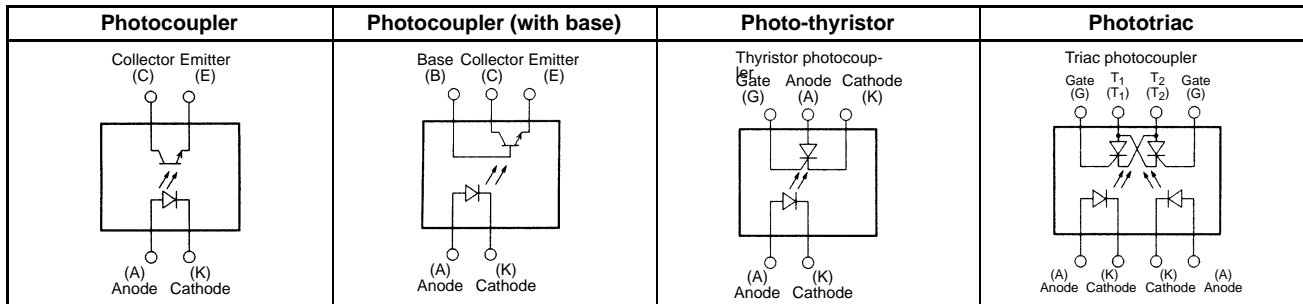


Technical Information

Photocoupler, Photo-thyristor, and Phototriac

Basic Configuration



Terminology

Symbol	Item	Definition
CTR	Current transfer rate	The percentage obtained from the following formula by substituting the collector current of the phototransistor imposed with a specified phototransistor bias voltage for I_C and a specified forward current flowing into the LED for I_F . $CTR (\%) = I_C / I_F \times 100$
P_T	Package dissipation	The maximum electric power that can be applied to the photocoupler. The maximum electric power is obtained from the result of the highest permissible power that can be applied to the LED plus the highest permissible power that can be applied to the phototransistor.
f_T	Response frequency	The frequency decreasing the relative output by 3 dB under specified input and output bias conditions.
Viso Viso (AC) Viso (DC)	Insulation dielectric strength AC insulation dielectric strength DC insulation dielectric strength	The minimum effective AC or peak DC voltage that does not cause any insulation breakdown between the input and output terminals under a specified humidity condition.
Riso	Insulation resistance	The insulation resistance between the input and output terminals under specified humidity and voltage conditions.
Ciso	Capacity	The capacity between the input and output terminals under specified humidity and bias conditions.
V_{DRM}	Peak repetitive OFF voltage	The maximum positive voltage on the basis of the electric potential of the cathode (T_1 or T_2) that can be repeatedly imposed on the anode (T_2 or T_1) under a specified gate condition.
V_{RRM} (see note)	Peak repetitive reverse voltage	The maximum negative voltage on the basis of the electric potential of the photoelectric thyristor's cathode that can be repeatedly imposed on the anode of the photoelectric thyristor.
$I_T (RMS)$	Effective ON current	The effective value of the ON current that is allowed to flow continuously into an element under a specified temperature condition.
I_{TSM}	Surge ON current	The maximum non-repetitive ON current that is allowed to flow per cycle under a specified temperature condition.
V_{RGM}	Peak gate reverse voltage	The maximum negative voltage on the basis of the electric potential of the cathode (T_1 or T_2) that can be imposed on the gate (T_2 or T_1) under a specified gate condition.
I_{DRM}	OFF current	The maximum OFF current of an element that is OFF when a commercial half-sine voltage, the peak value of which is equal to the V_{DRM} of the element, is imposed on the element in both directions respectively under specified temperature and gate conditions.
I_{RRM} (see note)	Reverse current	The reverse leaking current of the photoelectric thyristor when a commercial half-sine voltage, the peak value of which is equal to the V_{DRM} of the photoelectric thyristor, is imposed on the photoelectric thyristor reversely under specified temperature and gate conditions.
V_{TM}	ON voltage	The ON voltage drop caused by the anode (T_2 or T_1) and cathode (T_1 or T_2) under a specified ON current condition.
V_{GD}	Gate non-trigger voltage	The maximum DC voltage of the gate that is not turned ON from OFF when a specified OFF voltage is imposed on the anode (T_2 or T_1) and cathode (T_1 or T_2) under specified temperature and gate conditions.
I_H	Hold current	The minimum current of the anode (T_2 or T_1) of an element required to keep the element from being turned ON under specified temperature and gate conditions.

Symbol	Item	Definition
dv/dt	Critical OFF voltage rising rate	The maximum OFF voltage rising rate of an element that is not turned from OFF to ON when an exponential OFF voltage with a specified amplitude is imposed on the element under specified temperature and gate conditions.
I_{FT}	Trigger LED current	The minimum forward current of the LED that turns the photoelectric thyristor or photoelectric triac from OFF to ON under specified bias voltage and gate conditions for the photoelectric thyristor or photoelectric triac.

Note: Applied to the thyristor photocoupler.

Application Examples

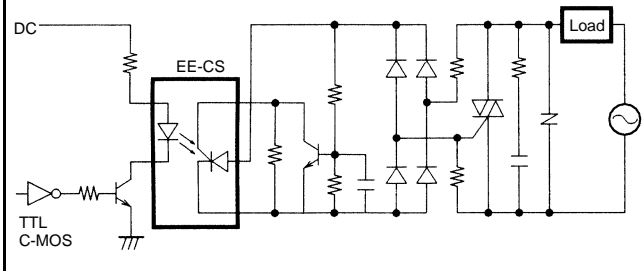
■ Photocoupler

EE-CF1/-CF2/-CF4/-CB

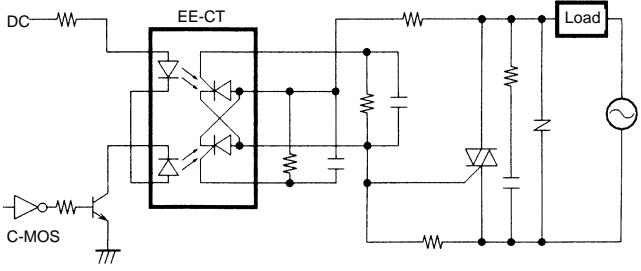
<p>1. Interface between TTL and HNIL (EE-CF)</p>	<p>4. Interface between Computer and Terminal (EE-CF)</p> <p>The photocoupler is used to shut off external noise when the distance between the computer and terminal is large.</p>	
<p>2. Interface between Systems (EE-CB)</p>	<p>5. Logic Circuit (EE-CF)</p> <p>Below is an AND circuit example. It is possible to design OR, NAND, and NOR circuits by using photocouplers.</p>	<p>6. Signal Transmission from Human Body (EE-CF)</p> <p>The photocoupler is used to shut off power source noise induced by sensing objects with high output impedance values, such as human bodies.</p>
<p>3. Interface between Systems with Schmitt Circuits (EE-CB)</p>	<p>7. Noise Shutoff (EE-CF)</p> <p>The photocoupler does not transfer any signal or noise in the opposite direction, thus not transmitting any noise generated by the inductive load to the input side.</p>	

■ Photo-thyristor/Phototriac
 EE-CS20/-CS40, EE-CT20/-CT40

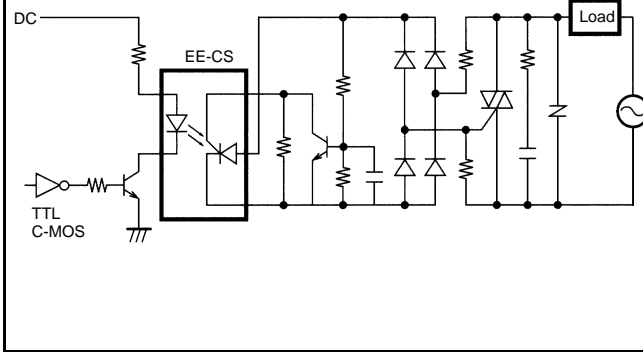
1. Driving Low-power Triac (EE-CS)



3. Driving Medium-power Triac (EE-CT)



2. Driving Medium-power Triac (EE-CS with Zero-cross Function)



4. Driving Medium-power Triac (EE-CT with Zero-cross Function)

