PRODUCTS

Pulse trasformers

Features

- **Used in SCR and TRIAC starting circuits of low, medium and high powers.**
- **Wide range of standard products available.**
- **Special versions according to customers' requirements**
- **Manufactured according to EN61558 and EN60950 standards**
- **Compact size**

Technical description

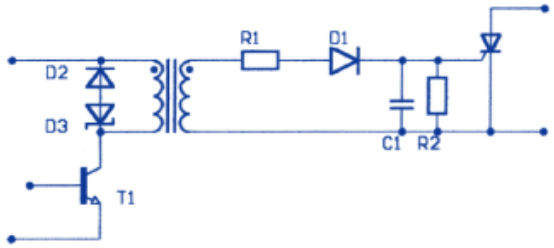
UTK pulse transformers, normally used to drive semiconductors as thyristors and triacs, can transfer a square wave or a pulse with very short rise and fall times without appreciable distortion of the waveform. In such applications they provide both the firing pulse to the semiconductor's gate, and the isolation between the low power control circuit and the power semiconductors, according to the international standards for the safety of the transformers.

UTK pulse transformers have the following characteristics:
• Compact construction. They are vacuum-filled and encapsulated in plastic box made with self extinguishing material UL94-HB, suitable for the application on high density PCBs.
• Availability in a standard temperature range (0+80°) or an extended range
• Safe and reliable galvanic insulation
• Excellent magnetic coupling between the primary and secondary winding, which provides high fidelity in the transmission of the pulse having the shortest propagation times, and a low magnetizing current.
• Transmission of high instantaneous power values
• High degree of immunity from noise and interference, thanks to the low coupling capacitance between primary and secondary.
• Low losses.
• Maximum working voltage up to 1KV. Dielectric strength tests are conducted according to the international standards EN61558 and EN60950.

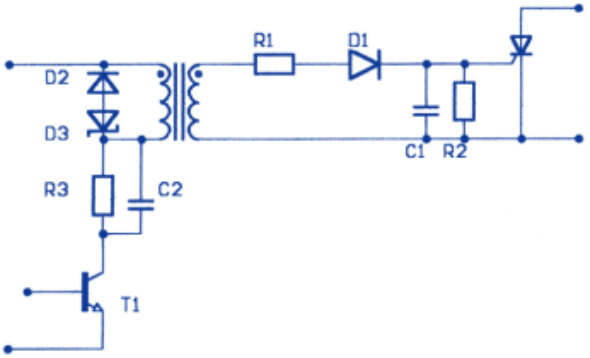
A wide range of standard products is available for the driving of low to high power devices. In order to satisfy specific requirements UTK Component can develop special products according to the customers' needs.

UTK Component controls closely the production during the process and at the end of it, granting the quality and reliability of the product. The carried out tests include:
• Visual inspection
• Pinout and polarity check
• Value of the reference parameters (n, Lp, Ld, Ck, Rp, Rs)
• Dielectric strength

Applications



Firing circuit for SCR. Resistance R2 and capacitor C1improve the noise immunity of the driving circuit and prevent spurious triggering . Resistance R1 limits the gate current. D2 and D3 allow fast core recovery in the transformer. D1 inhibits the gate current during the demagnetization.



Through the addition of the resistance R3 and capacitor C2 a double level driving pulse is obtained: a higher starting peak in order to optimise the firing of the thyristor, followed by a fall of the driving current for lower dissipation.

Reference parameters

Winding ratio n
Turns ratio of the primary winding to the secondary.

Voltage time area ∫udt
Voltage time Integral on the secondary winding, or voltage time area. In case of application of unipolar pulse to the primary winding, udt shows the maximum permitted value for the integral of secondary voltage, to avoid saturation of the magnetic core. Expressed in Vμs.

Rise time Ts
Time interval calculated on the rising slope of the secondary waveform, between 10% and 90% of the peak value, with resistive load equal to Rn and driving voltage 12V with duty cycle 50%. This parameter is mainly related to the quality of the magnetic coupling between the primary and the secondary winding and with the value of the leakage inductance Ld.

Peak current Ip
Maximum permitted secondary current

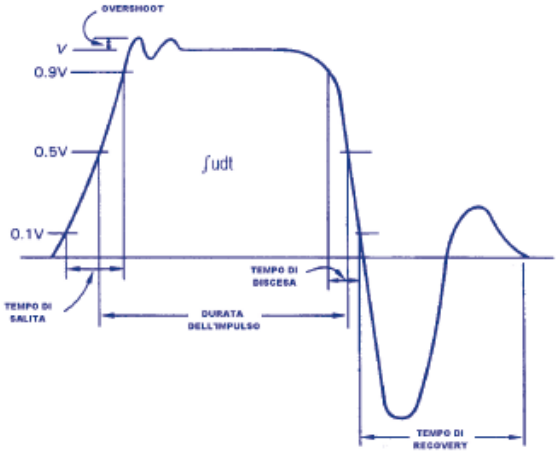
Load Resistance Rn
Nominal load resistance

Inductance Lp
Nominal value of inductance on primary winding. The maximum deviation from the nominal value (tolerance) is +\-30%. Measured with LCR meter at the primary winding (Ambient temp 25°C, frequency 10KHz, drive UAC,rms=250mV).

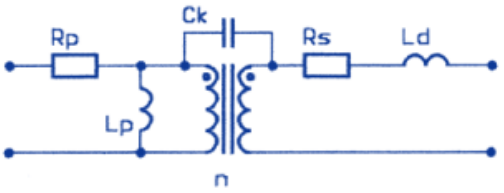
Coupling capacitance Ck
Coupling capacitance between primary and secondary winding, depending on electric coupling of the coils. Low Ck values provide a high level of noise immunity to the firing circuit, preventing transmission of voltage spikes or high frequency noise coupling to the secondary and avoiding spurious triggering. Measured with LCR meter between the primary and secondary windings, with both windings shorted (frequency 10KHz, drive UAC,rms=250mV).

Winding resistance Rp,Rs
Resistance measured with LCR meter at the primary and secondary windings.

Pulse



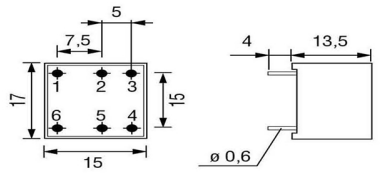
Equivalent circuit of the pulse ransformer.

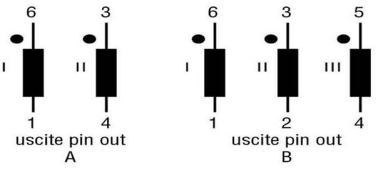


Code	n	∫udt (µVs)	Ts (µs)	Ip (mA)	Rn (Ω)	Lp (mH)	Ck (pF)	Rp (Ω)	Rs (Ω)	Model	Pin Out
TI-120010	1:1	300	<0.8	750	15	3.2	25	0.7	0.7	TI-120	A
TI-120020	1:1:1	300	<0.8	750	15	3.2	23	0.7	0.7	TI-120	B
TI-120030	2:1	250	<0.8	1100	10	7.3	28	0.5	0.25	TI-120	A
TI-120040	2:1:1	250	<0.8	1100	10	7.3	31	0.5	0.25	TI-120	B
TI-120050	3:1	150	<0.5	1100	10	7.3	22	0.5	0.15	TI-120	A
TI-125010	1:1	500	<1	1100	10	2.3	35	0.45	0.45	TI-125	A
TI-125020	1:1:1	500	<1	1100	10	2.3	35	0.45	0.45	TI-125	B
TI-125030	2:1:1	500	<1	1100	10	9	55	0.9	0.45	TI-125	B
TI-125040	1:1	1000	<2	600	20	7.6	45	0.8	0.8	TI-125	A
TI-125050	1:1:1	1000	<2	600	20	9	55	0.9	0.9	TI-125	B
TI-125060	3:1	300	<0.8	1100	10	8.3	40	0.6	0.2	TI-125	A
TI-125070	3:1:1	300	<0.8	1100	10	8.3	40	0.6	0.2	TI-125	B

Modello
Model
TI-012

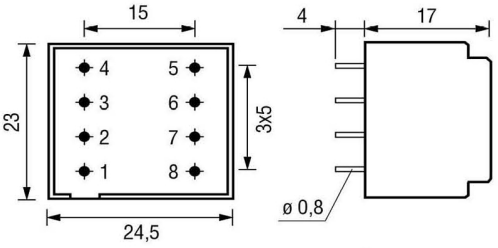
View pin-side

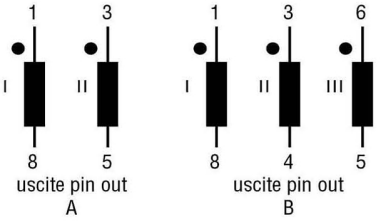




Modello
Model
TI-120

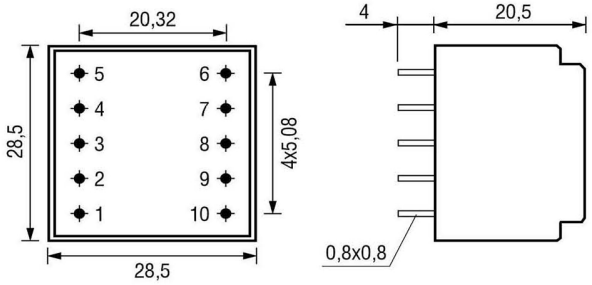
View pin-side

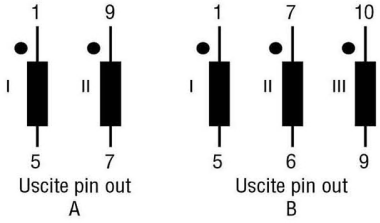




Modello
Model
TI-125

View pin-side





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