

# TI 111-112-113-114

## RING CORE BASED GATE DRIVE TRANSFORMERS



### PURPOSE

Pulse transformers are used in high frequency power converters, when an electrical pulse has to be transferred from the control stage to the power stage, by keeping the galvanic isolation between the circuits, according to the required safety standards. The electrical signal is applied to the primary winding and transferred to the secondary side, to fire electronic switches. The 111, 112, 113 and 114 families are based on different sizes of ring cores.

### FEATURES

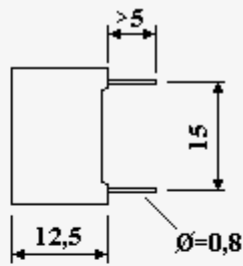
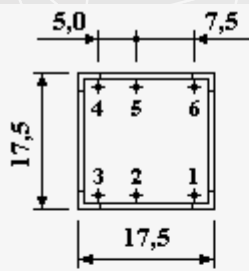
Characteristics of these components are quite different, because several magnetic core materials and sizes can be used and different windings distributions can be chosen.

Ferrite cores are the cheapest choice for high frequency applications. Alternatively, more expensive magnetic materials are available, typically based on high frequency lamination alloys. Those laminated materials have much higher values of saturation flux density (compared to ferrites), that allows to reduce dimensions especially for medium-low switching frequency values (some tens kHz), and a much stable behaviour with temperature, so they are preferred in case of critical environment conditions.

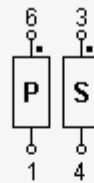
Toroidal components generally have very good technical features. The production process is by nature a one-by-one building style and it cannot be implemented automatically.

Standard versions are designed with one or two secondary windings. The standard codes, listed in the table for your reference, are just some examples of some most wanted codes.

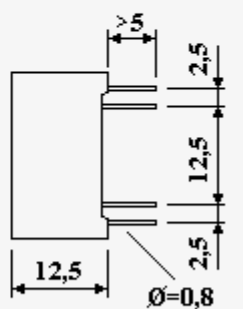
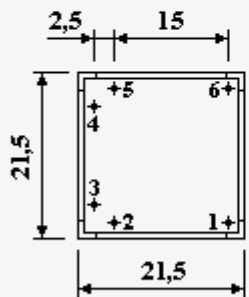
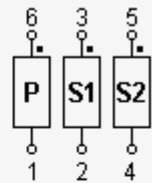
Code	n	Vt [ $\mu$ Vs]	I <sub>MAX</sub> [mA]	t <sub>r</sub> [ $\mu$ s]	R <sub>C</sub> [ $\Omega$ ]	C <sub>k</sub> [pF]	U <sub>is</sub> [Vrms]	U <sub>p</sub> [Vrms]	Drawing
TI 111010	1 : 1	200	400	1	27	160	380	2000	111A
TI 111020	1 : 1 : 1	200	400	1	27	160	380	2000	111B
TI 112130	1 : 1	500	2000	1	15	70	500	4000	112A
TI 112140	1 : 1 : 1	500	2000	1	15	70	500	4000	112B
TI 113150	1 : 1	1000	2000	1	10	100	500	5000	113A
TI 113160	1 : 1 : 1	1000	2000	1	10	100	500	5000	113B
TI 114070	1 : 1	2000	2000	1	8	230	380	3100	114A
TI 114080	1 : 1 : 1	2000	2000	1	8	230	380	3100	114B



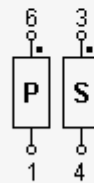
111A



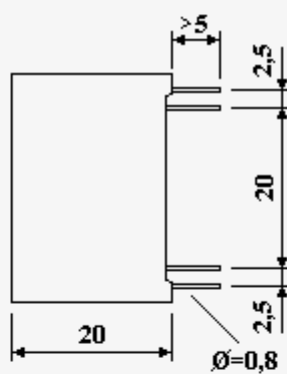
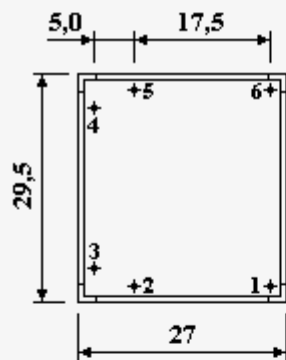
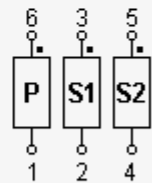
111B



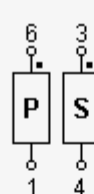
112A



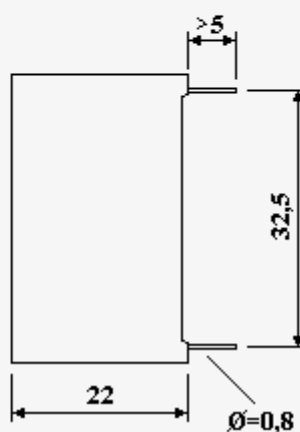
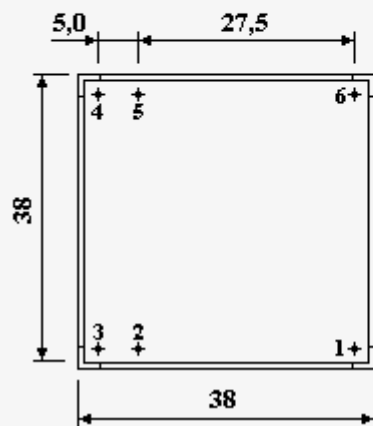
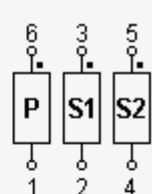
112B



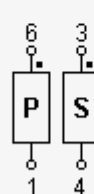
113A



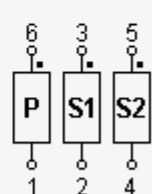
113B



114A



114B



values in mm

## SYMBOLS:

- n turns ratio
- $Vt$  secondary transfer area (voltage\*time integral), that can be transferred with unipolar pulse
- $t_r$  rise time, needed to transfer the pulse when the rated load resistance is connected to the secondary side
- $I_{MAX}$  maximum secondary current, available with a rise time equal to  $t_r$  (rated load resistance connected to the output)
- $R_C$  rated burden resistance
- $L_p$  primary winding inductance
- $L_s$  primary leakage inductance
- $C_k$  coupling capacity between windings
- $R_p$  primary winding resistance
- $R_s$  secondary winding resistance
- $I_p$  rated primary effective current (thermal current)
- $U_{is}$  rated working voltage
- $U_p$  isolation voltage

T103 - Rev.0



Certificate nr. 50 100 3372



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