Advisory opinion

Advisory opinion No. 2016-600026

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The advisory opinion on the technical scope of a patent invention for Japanese Patent No. 2733817 between the parties above is stated and concluded as follows.

Conclusion

The "INVERTER CIRCUIT FOR DISCHARGE TUBE" indicated in the drawings and explanatory document of Article A does not fall within the technical scope of the invention in Japanese Patent No. 2733817.

Reason

No. 1 Object of the demand and History of the procedures

1 Object of the demand

The object of the advisory opinion is to demand the advisory opinion that "INVERTER CIRCUIT FOR DISCHARGE TUBE" indicated in the drawings and explanatory document of Article A falls within the technical scope of the invention in Japanese Patent No. 2733817."

2 History of the procedures and the patent invention

August 30, 1993: Application

January 9, 1998:	Patent Registration
September 30, 1998:	Opposition to the grant of a patent
June 22, 1999:	Decision on opposition (the correction was approved; the patent relating to Claim 1 of Japanese Patent No. 2733817 is maintained.)
June 10, 2016:	Request for the advisory opinion of the case
July 29, 2016:	Written Amendment of the request for the advisory opinion of the case (addition of a translation and an oath)
August 19, 2016:	Demandant's written amendment (correction of errors in the translation)
September 16, 2016:	Written reply to the request for the advisory opinion

No. 2 The invention of Japanese Patent No. 2733817

The invention relating to Claim 1 of Japanese Patent No. 2733817 of the case (hereinafter, referred to as the "patent invention") is as follows. (For the sake of convenience, constituent components are separately described and reference symbols A-E are added.)

"E. An inverter circuit for discharge tubes

D. made a part of a resonant circuit constituted between inductive output generated from a loosely coupling part of a leakage-flux type step-up transformer and parasitic capacitance generated on a secondary side circuit,

A. the leakage-flux type step-up transformer having one continuous rod-shaped core, a primary winding, and a secondary winding,

B. the primary winding and the secondary winding being wound around the rod-shaped core in a relationship in which they are adjacently arranged in parallel along the core,

C. thereby the secondary winding has a tightly coupling part near the primary winding which is magnetically tightly coupled to the primary winding and the loosely coupling part apart from the primary winding which is magnetically loosely coupled to the primary winding." (Hereinafter, successively referred to as "Constituent component A" to "Constituent component E".)

No. 3 Product A

No. 1 The demandant's allegation

The demandant sets "(4) Description of Article A" as

"e. An inverter circuit for discharge tubes

d. made a part of a resonant circuit constituted between inductive output generated from a loosely coupling part of a leakage-flux type step-up transformer and parasitic capacitance generated in a discharge tube mounted on an LCD panel,
a. the leakage-flux type step-up transformer having one continuous rod-shaped core, a U-shaped exterior core, a primary winding, and a secondary winding,
b. the primary winding and the secondary winding being wound around the rod-shaped core in a relationship in which they are adjacently arranged in parallel along the core,
c. the secondary winding having a tightly coupling part near the primary winding which is magnetically tightly coupled to the primary winding, and the loosely coupling part apart from the primary winding which is magnetically loosely coupled to the primary winding, without having a decoupling capacitor connected to the secondary winding in series."

2 The demandee's allegation

The demandee makes no particular allegation about "(4) Description of Article A."

3. Recognition by the body

(1) Figure 1 of Evidence A No. 1 the Drawings of Article A is "a circuit diagram in which an LCD panel is connected to a CIUH8D45" (Evidence A No. 1 "explanatory document"), and in Fig. 1, a discharge tube lighting circuit using the "CIUH8D45" circuit (a circuit within a dashed line frame on the left side in Fig. 1) is shown. Similarly, in Fig. 2 (A), an illustration of a transformer T1 part of the CIUH8D45 circuit is shown, and also in Fig. 2 (B), a picture of the transformer T1 part of the CIUH8D45 circuit is shown. Similarly, in Fig. 3 (A), a picture of the CIUH8D45 circuit is shown, and also in Fig. 3(B), a technical specification (January 2001) of an MP1010 part of the CIUH8D45 circuit is shown, and the following matters are indicated.

A. In the picture of Fig. 2(B), members described as the rod-shaped core, the primary winding, and the secondary winding are reflected, and furthermore, corresponding to this, Fig. 2(A) shows members described as the same.

B. In the picture of Fig. 2(B), above the rod-shaped core, a U-shaped member of the same color as the rod-shaped core which is joined with both end portions of the rod-shaped core is reflected, and this is also shown in Fig. 2(A).

C. The members described as the primary winding and the secondary winding are wound around the member described as the rod-shaped core in a relationship in which they are adjacently arranged in parallel along the core.

D. The circuit diagram of Fig. 1 does not describe a capacitor connected to the secondary winding of the transformer T1 and a discharge tube DT1 in series, between the secondary winding of the transformer T1 and the discharge tube DT1.

E. The member described as the secondary winding in Fig. 2(A)(B) has a part near the primary winding and a part apart from the primary winding.

F. In the circuit diagram of Fig. 1, a secondary side of the transformer T1 is described as a series body of a winding SW1 and a coil Le1, and a circuit in which output generated from the Le1 part of the transformer T1 is connected to the discharge tube DT1 mounted on the LCD panel is constituted.

G. Capacitor Cs1 is constituted between the discharge tube DT1 and an LCD FRAME GND.

H. On an output side of the Le1 part of the transformer T1, C11 described as a resonant capacitor C11 in Fig. 3(A) is connected.

(2) According to (1) above, the following matters can be recognized from "the Drawings of Article A."

*The transformer T1 of the CIUH8D45 circuit has the continuous one rod-shaped I core, the U-core joined to both end portions of the I-core, the primary winding, and the secondary winding.

*The primary winding and the secondary winding are wound around the rod-shaped core in a relationship in which they are adjacently arranged in parallel along the core.

*The decoupling capacitor connected with the secondary winding in series is not provided.

*The secondary winding has the part near the primary winding and the part apart from the primary winding.

*The CIUH8D45 circuit is made a part of the circuit in which the output of the transformer T1 is connected to the discharge tube DT1 mounted on the LCD panel.

(3) Recognition of constitutions of Product (Article) A

According to (2) above, the constitutions of Product A are recognized as follows. Also, the constitutions thereof are separately described into constitution a.-constitution e.

"e. A CIUH8D45 circuit

d. made a part of a circuit in which output of a transformer T1 is connected to a discharge tube DT1 mounted on an LCD panel,

a. the transformer T1 having one continuous rod-shaped I-core, a U-core joined to both end portions of the I-core, a primary winding, and a secondary winding,

b. the primary winding and the secondary winding being wound around the rod-shaped core in a relationship in which they are adjacently arranged in parallel along the core,
c. the secondary winding having a part near the primary winding and a part apart from the primary winding, without having a decoupling capacitor connected to the second winding in series."

No. 4 Judgment
1 Comparison / Judgment of Constituent components of the patent invention and the constitutions of Product A

Each of Constituent Components A to C is a technical matter for specifying the leakage-flux type step-up transformer, and modifies the leakage-flux type step-up transformer of Constituent component D, so that they are examined together.

(1) Interpretation of Constituent components A to D
A. Consideration of descriptions in the specification of the case

Regarding a point described as "one continuous rod-shaped core" in a column of the scope of claims, it cannot be said that it is immediately apparent from the description whether it is enough if "the step-up transformer" includes "one rod-shaped core" as one configuration of combinations, or whether it should consist of "one continuous rod-shaped core" only. Then, regarding this point, referring to the descriptions of other parts of the specification of the case, there are the following descriptions.
(a) In a column of problem to be solved by the invention, "although EI type or EE type form is adopted as a core in the conventional inverter circuit for discharge tubes, the ratio that the volume of a core accounts for the whole inverter circuit has obstructed the miniaturization of the circuit largely in the core form. However, as long as a blockade magnetic flux type transformer structure is adopted, there is a limit to the miniaturization of a step-up transformer. Then, it is necessary to materialize the miniaturization of the step-up transformer by improving the core form and a magnetic circuit."([0007]),
(b) In a column of effect, "a leakage-flux type transformer has the current-limiting effect in the transformer itself, and although the output thereof has the same effect as a choke coil so as to be inductive, advancing this further, if the extreme leakage-flux effect is given by forming a core material in a rod shape, and using a rod-shaped leakage-flux type transformer as a form of the step-up transformer, the secondary winding near the primary winding has an effect as the leakage-flux transformer," ([0010]),

(c) In a column of embodiments, "Figure 4 and Fig. 5 show an outline when the step-up transformer 1 is made to be an extreme leakage-flux type, and the step-up transformer 1 is made into a columnar form. In addition, it can be also formed in a prismatic form and the like. A base winding 12 of the step-up transformer 1 is wound around one terminal of the round-bar-shape core 11, and a collector winding 13 which is a primary winding is adjacently wound. Furthermore, a secondary winding 14 adjacently wound is started to be wound from a neighborhood 15 of the primary winding" ([0015]), and "the form of the step-up transformer 1 is set to 4.8 mm in diameter, and 35 mm in length, and will become very small as compared with the inverter circuit of the same technical specification which uses the step-up transformer of the conventional EE type or the EI type core. Since the assembly of a step-up transformer is carried out only by inserting the round-bar-shape core 11 in a bobbin after winding, it becomes a form which is the most advantageous also in mass production." ([0017])

In light of the descriptions from (a) to (c), "the step-up transformer" in the patent invention refers to one in which a winding is provided on "one continuous rod-shaped core," and which releases both ends of a magnetic path, and does not include one equipped with a core portion forming the magnetic path around its center core. With such a configuration, it is understood that the step-up transformer becomes the extreme leakage-flux type and can be made very small.

Then, it should be understood that "one continuous rod-shaped core" means one consisting of one continuous rod-shaped core only, and does not include one provided with the core forming the magnetic path around the rod-shaped core.

B. Consideration of the prosecution history

(a) "The scope of claims" of the initial application described "an inverter circuit for discharge tubes which uses a secondary side circuit of the inverter circuit for discharge tubes as a feeder circuit of high frequency, and employs parasitic capacitance generated in the secondary side circuit as a part of a resonant circuit constituted between an inductive ballast or inductive output of a leakage-flux type transformer and the parasitic capacitance," and did not give a description about the "one continuous rod-shaped core" part.

(b) On 04 June, 1996, a notice of reasons for refusal was issued, and with this notification, the examiner pointed out that a resonant inverter employing the parasitic capacitance of the secondary side circuit or a leakage inductance of a transformer as a part of a resonant circuit was well-known, and that it was widely performed to use such a well-known resonant inverter for lighting discharge tubes.

(c) Against that, the demandant (applicant) amended the scope of claims (Claim 1) as "an inverter circuit for discharge tubes which uses a secondary side circuit of the inverter circuit for discharge tubes as a feeder circuit of high frequency, makes a step-up transformer become a rod-shaped leakage-flux type, and employs parasitic capacitance generated in the secondary side circuit as a part of a resonant circuit constituted between inductive output of a leakage-flux type transformer and the parasitic capacitance," and added the description "makes a step-up transformer become a rod-shaped leakage-flux type." Furthermore, in the written opinion submitted simultaneously with the written amendment above, the demandant (applicant) stated that "the leakage-flux type transformer has a current-limiting effect in the transformer itself, and although output thereof has the same effect as a choke coil so as to be inductive, advancing this further, if the extreme leakage-flux effect is given by forming a core material in a rod-shape, and using a rod-shaped leakage-flux type transformer as a form of the step-up transformer, the secondary winding near the primary winding has an effect as the leakage-flux transformer, and simultaneously, the secondary winding at a far end from the primary winding has an effect as the choke coil."

(d) On 15 July, 1997, a notice of reasons for refusal was issued, and with this notice, the examiner pointed out the existence of well-known art (U.S. Patent No. 4698741) considering parasitic capacitance by using a leakage-flux type transformer. U.S. Patent No. 4698741 above is an invention relating to high efficiency high- voltage power source for a gas discharge device, and in the specification of the patent, there are the descriptions "the core material is a ferrite typically of the type that has been used in television fly-back circuits for many years," and "the core should preferably incorporate one or more air gaps totaling between about 0.1 and 0.2 inches, thereby providing a leakage inductance which serves to lower the terminal output voltage as the load is increased (decreased resistance)."

(e) Against that, on 02 September, 1997, the demandant (applicant) amended the scope of claims (Claim 1) as described in the publication of examined patent application.

(f) In light of prosecution history from (a) to (e) above and the well-known arts of (b) and (d), it should be understood that "one continuous rod-shaped core" (Constituent component A) of the patent invention excludes one provided with a core forming a magnetic path around a center core.

C. Allegation of the written request for the advisory opinion

(A) The demandant, in "regarding (A) 2001 (Wa) No. 7153," alleges the following.

(a) "In the patent invention, it is important to be 'wound in a relationship in which they are adjacently in parallel,' and a constitution making this configuration clear for convenience is 'one continuous rod-shaped core'."
(b) "If a number of windings is not changed, the external core increases a leakage flux. Even if the external core exists, the patent invention is embodied."
(c) "It is a big misunderstanding that miniaturization in the patent invention was materialized for such a simple reason, and as described in 'the size of the transformer can be principally (omitted) miniaturized' in Evidence No. 6, it can be miniaturized because 'the secondary side circuit' is used as 'the feeder circuit of high frequency.' An effect of the miniaturization is far beyond the level where 'it has become smaller in physical size, as the external core has been eliminated'."

However,

(A) As described in "A." above, "the step-up transformer" in the patent invention refers to one in which the winding is provided on "one continuous rod-shaped core," and which releases both ends of the magnetic path, and does not include one equipped with the core portion forming the magnetic path around its center core. With such a configuration, it is understood that the step-up transformer becomes the extreme leakage-flux type and can be made very small. It cannot be said that "one continuous rod-shaped core" is employed for convenience.
(B) It is determined based on the descriptions of the specification of the patent that, in "A." above, "the step-up transformer" in the patent invention refers to one in which the winding is provided on "one continuous rod-shaped core," and which releases both ends of the magnetic path, and does not include one equipped with the core portion forming the magnetic path around its center core, but it cannot be said that "even if the external core exists, the patent invention can be embodied" as alleged by the demandant.
(C) The miniaturization by a high frequency feeder circuit has been conventionally made, as handled as [Conventional Art] in the specification of the patent.

The descriptions of "A." "(a)" to "(c)" above of the specification of the patent can be understood that further miniaturization can be materialized by providing a winding on "one continuous rod-shaped core" to release both ends of a magnetic path, as compared with the conventional miniaturization by the high frequency feeder circuit, and are not denied the miniaturization by the high frequency feeder circuit alleged by the demandant.

Also, Evidence A No. 6 is a document created in 1999 after the application of the patent, and is not the application document of the patent.

(B) The demandant, on Page 12 of the written request for the advisory opinion "(B) Regarding consideration of the specification and the prosecution history," alleges as follows.

(d) "When adding the constituent component of the invention 'makes a step-up transformer become a rod-shaped leakage-flux type,' when stating 'the secondary winding at a far end from the primary winding has an effect as the choke coil,' and in any other scenes of the prosecution history, the demandant (applicant) did not allege 'one provided with an external core is not included.' The demandant just alleged that a magnetic flux formed by the primary winding and the secondary winding satisfied predetermined requirements. Especially, the invention was applied before the amendment of the Patent Act in 1994, and in Article 36(5)(ii) of the former Patent Act, it was supposed to describe 'only matter indispensable for the constitutions of the invention for which a patent is sought,' so that it is interpreted that only the center core should be described regardless of whether or not the external core is included, if a the description is limited to 'only matter indispensable for the constitution of the invention for which a patent is sought,' and the embodiment was described according to claims."

However,

(D) First, although, in Article 36(5)(i) of the former Patent Act, it was supposed that "the invention for which a patent is sought is one described in detailed explanation of the invention," in the detailed explanation of the invention, for the external core alleged by the demandant, except for "EI type," "EE type" as the conventional art, the external core serving as a core of the patent invention is not described at all.

Then, as described in "A." above, according to the descriptions of the specification of the patent, it should be understood that "one continuous rod-shaped core" means one consisting of one continuous rod-shaped core only, and does not include the core forming the magnetic path around the rod-shaped core, so that the allegation of the demandant cannot be accepted.

D. Summary

(A) As mentioned above, it should be understood that the constitution "having one continuous rod-shaped core, a primary winding, and a secondary winding" (Constituent component A) relating to the step-up transformer of the patent invention means one consisting of one continuous rod-shaped core only, and does not include the core forming the magnetic path around the rod-shaped core.

(B) Also, it should be understood that "the primary winding and the secondary winding being wound around the rod-shaped core" of the patent invention means being

wound around "one continuous rod-shaped core" of Constituent component A.

(C) Also, it should be understood that "tightly coupling" and "loosely coupling" of "thereby the secondary winding having a tightly coupling part near the primary winding which is magnetically tightly coupled to the primary winding and the loosely coupling part apart from the primary winding which is magnetically loosely coupled to the primary winding" of the patent invention (Constituent component C) are "tightly coupling" and "loosely coupling" supposing the configurations of Constituent components A, B, as described, "thereby ...having a tightly coupling part...and the loosely coupling part" ("thereby" indicates Constituent components A, B).

(D) Also, "a tightly coupling part of a leakage-flux type step-up transformer" of the patent invention is "the tightly coupling part apart from the primary winding," so that it should be understood that "inductive output generated from a loosely coupling part of a leakage-flux type step-up transformer" (Constituent component D) is "inductive" output "generated from a tightly coupling part" of the step-up transformer of "a leakage-flux type" supposing the configurations of Constituent components A to C; namely, the step-up transformer of "a leakage-flux type" of the core consisting of one continuous rod-shaped core only.

(2) Regarding whether or not the transformer T1 having constitutions a-c of Product A satisfies the leakage-flux type step-up transformer having Constituent components A-C of the patent invention

The constitutions a-c of Product A modify the transformer T1 of the constitution d, and Constituent components A-C of the patent invention modify the leakage-flux step-up transformer of Constituent component D, so that we will examine whether or not the transformer T1 having the constitutions a-c of Product A satisfies the leakage-flux type step-up transformer having Constituent components A-C of the patent invention.

In the configuration "having one continuous rod-shaped I-core, a U-core joined to both end portions of the I-core, a primary winding, and a secondary winding," the core is composed of "one continuous rod-shaped I-core" and "a U-core joined to both end portions of the I-core," and does not consist of one continuous rod-shaped core, so that it cannot be said that the constitution a of Product A is Constituent component A of the patent invention. Then, the description that the primary winding and the secondary winding are wound "around the rod-shaped core" means that they are wound around "one continuous rod-shaped I-core" of the transformer T1 "having one continuous rod-

shaped I-core, a U-core joined to both end portions of the I-core, a primary winding, and a secondary winding," and are not wound around the rod-shaped core of the step-up transformer consisting of one continuous rod-shaped core only, so that it cannot be said that the constitution b of Product A is Constituent component B of the patent invention. Furthermore, it cannot be said that "a part near the primary winding" and "a part apart from the primary winding" in the configuration "the secondary winding having a tightly coupling part near the primary winding which is magnetically tightly coupled with the primary winding and the loosely coupling part apart from the primary winding which is magnetically loosely coupled to the primary winding" are "tightly coupling" and "loosely coupling" supposing the transformer consisting of one rod-shaped core continued to the primary and secondary windings only, so that it cannot be said that the constitution c of Product A is Constituent component C of the patent invention.

Then, it cannot be said that the constitutions a-c of Product A and the transformer T1 having a-c are Constituent components A-C of the patent invention and the leakage-flux type step-up transformer having A-C, so that the transformer T1 having the constitutions a-c of Product A does not satisfy the leakage-flux type step-up transformer having Constituent components A-C of the patent invention.

(3) Whether or not the constitution d of Product A satisfies Constituent component D of the patent invention

A. The transformer T1 of the constitution d of Product A is shown as the series body of the winding SW1 and the coil Le1 on the secondary side, and the technical specification of Evidence A No. 4 describes "Leakage (4-5) : 240 mH±25% TURNS AND WIRE 1-3 4-5TURNS 24T...2400TT."

However, "output of a transformer T1" of Product A is output of the step-up transformer having the core composed of "one continuous rod-shaped I-core, and a U-core joined to both end portions of the I-core" of the constitution a different from Constituent component A of the patent invention.

Furthermore, the circuit in which the output of the transformer T1 is connected to the discharge tube DT1 mounted on the LCD panel of the constitution d of Product A cannot be confirmed to be resonated with the coil Le1 and the capacitor Cs1, from the evidence submitted by the demandant, and it cannot be said that "a circuit in which output of the transformer T1 is connected to the discharge tube DT1 mounted on the LCD panel" of the constitution d is "a resonant circuit constituted between inductive output and parasitic capacitance generated on a secondary side circuit."

Therefore, the constitution d of Product A does not satisfy Constitution component D of the patent invention.

B. Regarding the allegation of the written request for the advisory opinion

Although the demandant, in " the relationship of 3d and D" on Page 16 in the written request for the advisory opinion, alleges that "parasitic capacitance Cs1 is naturally generated on the LCD panel provided on the secondary side circuit....Article A forcibly produces resonance by using an MP1010 on the primary side circuit....Furthermore, even if there is no resonance in the primary side circuit, on the secondary circuit side, resonance is naturally generated between the inductive output and the parasitic capacitance Cs1," in Evidence A No. 1 Translation, it is described that "Figure 4a shows a drive stage of the MP1010 in which a voltage source drives an RCL (a resistance, a capacitor, and a coil) resonant circuit. Resonance frequency is determined by elements of the resonant circuit (a series capacitor Cs, a parallel capacitor Cp, transformer secondary side leakage inductance L, and a cold cathode fluorescent tube)," and in Evidence A No. 1 Fig. 3(A), "Resonant capacitor C11" is described as corresponding to C11 of the Drawings of Article A, and there is no description of the resonant circuit constituted by the inductive output and the parasitic capacitance Cs1 generated on the secondary side circuit, so that the allegation of the demandant cannot be accepted.

(4) Whether or not the constitution e of Product A satisfies Constituent component E of the patent invention

Since "the CIUH8D45 circuit" in the constitution e of Product A configures the circuit in which the output of the transformer T1 thereof is connected to the discharge tube DT1 mounted on the LCD panel and corresponds to "the inverter circuit for discharge tubes" of the patent invention, the constitution e of Product A satisfies Constituent component E of the patent invention.

No. 5 Closing

As described in "No. 4(6)" above, the constitutions of Product A satisfy Constituent component E of the patent invention, but do not satisfy Constituent components A-D.

Consequently, the constitutions of Product A do not fall within the technical scope of the patent invention.

Therefore, the advisory opinion shall be made as described in the conclusion.

22 December, 2016

Chief Administrative judge: HORIKAWA, Ichiro
Administrative judge: NAKAGAWA, Shinichi
Administrative judge: YAJIMA, Shinichi

甲第一号証　Evidence A No. 1
副本　Duplicate
イ号図面　　the Drawings of Article A
図１　Fig. 1

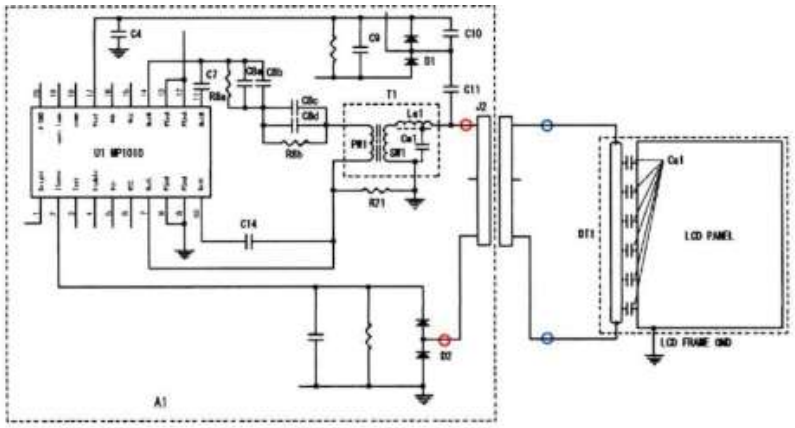
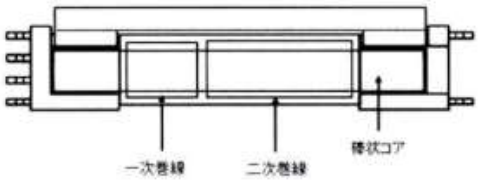


図２（Ａ）　Fig. 2(A)



一次巻線　　Primary winding
二次巻線　　Secondary winding
棒状コア　　Rod-shaped core

図２（Ｂ）　Fig. 2(B)

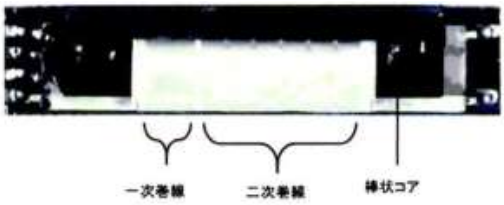
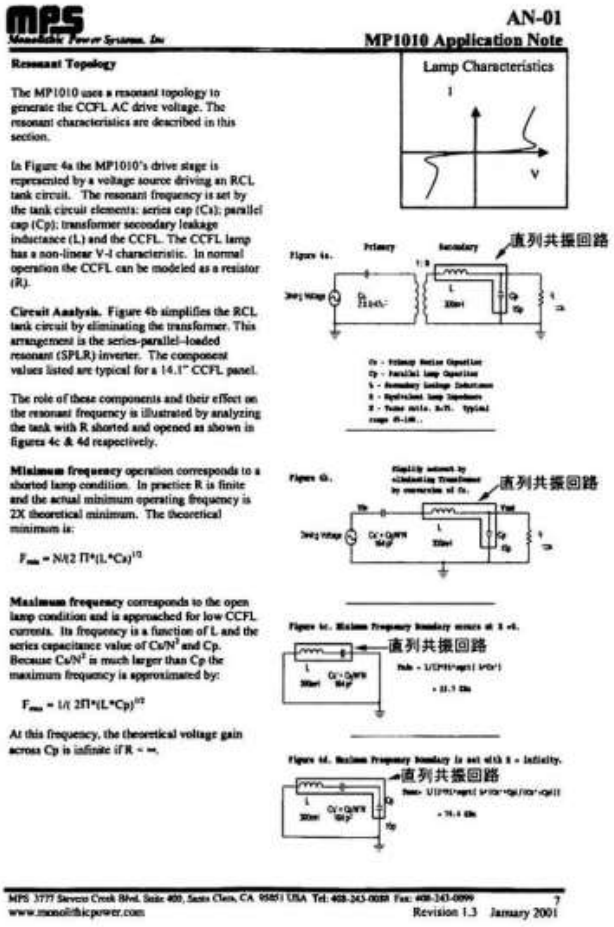


図３（Ａ）　Fig. 3(A)

トランス　　Transformer
共振コンデンサＣ１１　　Resonant capacitor C11

図３（Ｂ）　Fig. 3(B)



AN-01
MP1010 Application Note

Resonant Topology

The MP1010 uses a resonant topology to generate the CCFL AC drive voltage. The resonant characteristics are described in this section.

In Figure 4a the MP1010's drive stage is represented by a voltage source driving an RCL tank circuit. The resonant frequency is set by the tank circuit elements: series cap (Cs); parallel cap (Cp); transformer secondary leakage inductance (L) and the CCFL. The CCFL lamp has a non-linear V-I characteristic. In normal operation the CCFL can be modeled as a resistor (R).

Circuit Analysis. Figure 4b simplifies the RCL tank circuit by eliminating the transformer. This arrangement is the series-parallel-loaded resonant (SPLR) inverter. The component values listed are typical for a 14.1" CCFL panel.

The role of these components and their effect on the resonant frequency is illustrated by analyzing the tank with R shorted and opened as shown in figures 4c & 4d respectively.

Minimum frequency operation corresponds to a shorted lamp condition. In practice R is finite and the actual minimum operating frequency is 2X theoretical minimum. The theoretical minimum is:

$$F_{min} = N/(2\,\Pi^*(L^*Cs)^{1/2}$$

Maximum frequency corresponds to the open lamp condition and is approached for low CCFL currents. Its frequency is a function of L and the series capacitance value of Cs/N^2 and Cp. Because Cs/N^2 is much larger than Cp the maximum frequency is approximated by:

$$F_{max} = 1/(\,2\Pi^*(L^*Cp)^{1/2}$$

At this frequency, the theoretical voltage gain across Cp is infinite if R = ∞.

Lamp Characteristics

I

V

直列共振回路

直列共振回路

直列共振回路

MPS 3779 Stevens Creek Blvd. Suite 400, Santa Clara, CA 95051 USA Tel: 408-243-0088 Fax: 408-243-0099
www.monolithicpower.com
7
Revision 1.3 January 2001

直列共振回路　　Series resonant circuit

Explanatory Document

Fig. 1 is a circuit diagram in which an LCD panel is connected to a CIUH8D45. Red circles and blue circles are added by the demandant for explanation. The CIUH8D45 (within a dashed-line frame on the left side in Fig. 1) does not have a decoupling capacitor at places indicated by the red circles. The LCD panel (within a dashed-line frame on the right side in Fig. 1) has parasitic capacitance Cs1. Also, the demandant alleges that it is not necessary to be provided with the decoupling capacitor (a ballast capacitor) at places indicated by the blue circles (Evidence A No. 5).

Fig. 2(A) is an illustration of a transformer part of the CIUH8D45. A primary winding and a secondary winding are wound around one rod-shaped core, and the secondary winding extends from a part near the primary winding (the left side in the drawing) to a part apart from the primary winding.

Fig. 2(B) is a picture of the transformer part of the CIUH8D45.

Fig. 3(A) is a picture of the CIUH8D45. An IC circuit MP1010 is used. (Although it is reversed in the picture, the characters "MP1010" can be read.)

Fig. 3(B) is a technical specification of the MP1010 (the characters of "Series resonant circuit" and arrows are added by the demandant). If the MP1010 is operated according to the technical specification, the resonant circuit is forcibly configured to forcibly resonate.