



SUMIDA CORPORATION

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 $[\]square$ Specifications in this catalog are subject to change without notice. It is requested you confirm the specifications when ordering. \square Any dimensions without tolerance are typical values.

 $[\]label{eq:sumidadeclares} \square Sumida \ declares \ that \ no \ ozone \ depleting \ substances \ are \ used \ in \ the \ coil \ manufacturing \ process.$

Scope of Sumida products

- 1. Sumida components are manufactured and promoted for use in general AV electronics, home appliances, OAs, communications, measurement equipments and machine tools.
- 2. In the event the product is used in aerospace equipment, medical equipment, transportation equipment, disaster preventing equipment, or an equivalent which may affect human health or property, please do not fail to consult with our business headquarters, branch or business office.
 - When the suggested recommendations are not heeded, Sumida Group shall not be held liable for any dysfunctious in or damage to the equipment with which the product is used.
- 3. In the event a problem occurs which may affect industrial property and any other rights of Sumida Group (or a third party) during the use of the product and information described in this catalog, Sumida Group shall not be held liable for any such problem, nor grant any license to the offending party.

General stipulations for coil use

- 1. Products should not be kept in unsuitable storage conditions, such as areas susceptible to high temperatures, high humidity, dust or corrosion.
- 2. Always handle products with care.
- 3. Don't touch electrodes directly with bare hands as oil secretions may inhibit soldering. Always ensure optimum conditions for soldering.
- 4. Don't bend the terminals or subject them to excessive stress.
- 5. Please ensure that all terminals and case lugs are completely fixed with solder onto PCB.
- 6. Ensure the tuning slug or cap is not fixed by solder flux during the production process.
- 7. Refrain from rinsing coils. If necessary, please consult with our company.
- 8. Avoid placing coils near the edge of the PCB.
- 9. Our SMT coils are designed for automatic mounting. Please be careful if soldering by hand.
- 10. Don't touch any exposed winding part and avoid coming into contact with the guide of electrode in automatic mounting.
- 11. Our specification limits the quality of the component as a single unit.
 Please ensure the component is thoroughly evaluated in your application circuit.

Notes on FL inverter transformer use

Since FL Inverters transformers uses ultra thin wire in a small form factor and given the conditions that the FL inverters will be exposed to Hi Voltage and High Frequency conditions. It is important to adhere to all of guidelines and recommendations that are given in the following statements.

1. Terminal Polarity Connectivity

Please ensure that the correct polarity is applied to the Hi-Voltage (Secondary) and Low Voltage (GND) terminals. If floating or reverse polarity is applied to either Hi-Voltage or Low Voltage, the result will be degradation in the isolation and in the worst case it could cause a short.

2. Output voltage (the maximum opening voltage)

Every FL Inverter type has its own specification for maximum operating voltage. It's important that the output voltage doesn't exceed the specification. Operating beyond the specified voltage will result in poor isolation, self-generation of heat will increase, thus breaking the isolation. Please be aware when selecting a transformer on voltage output performance, that extreme environmental conditions will affect the transformer output voltage.

3. Operating temperature

An inverter transformer, switching transistor, and CCFL all generate some level of self-generation of heat. Please prevent the transformer from going over the limits of operating temperature. We also recommend the use of placing heat sinks near any parts that dissipate high level of heat.

4. Use circuit parts

1) Capacitor for Primary resonance

Due to Hi-frequency and resonance current, we recommend using the metalized polypropylene for high frequency (P. P), and a P.P.S film capacitor.

2) Secondary Ballast Capacitor

High Voltage rating for capacitor should be used; especially since the ballast capacitor will have a high voltage and current level. Also, recommend using a capacitor with the characteristic that are specified with high Q, low temperature coefficient (ie: SL Classification) or better.

5. Printed circuit board

- 1) We recommend punching a hole in the PCB between the Hi-Voltage termination. This will increase the distance between the Hi-Voltage and GND (termination). This will improve ensure safety distance between the Hi-Voltage and GND
- 2) Please avoid mounting transformer on the edge of PCB. Ensure that there is at least 2mm distance from Transformer to other components. This will help to prevent any type of leak current. Also, the top of transformer has a very high voltage potential.
- 3) When using multi-layer PCB's, please avoid placing a ground plane directly behind the Hi-Voltage side of the transformer.
- 4) When running traces from the transformer to connectors or from connector to CCFL, please use the shortest distance between these points. Keeping the traces shorter will reduce the stray capacitance (pF). The stray capacitance can contribute towards lower output voltage.
- 5) When running traces from the transformer, please avoid laying out traces in an angle direction. If the traces are running in an angle direction there is a possibility of causing leak current or corona electric discharge.
- 6) We recommend that silk screening be used between the Hi-Voltage side.
- 7) Recommendations for Breaking Away FL Inverter boards from Panel
 - Because of the low profile structure of the transformer, these parts are more susceptible to stress. We recommend that a slit or break away tabs for easier removal of the inverter unit from the panel.
 - When breaking away the inverter units from the panel, if using a V cut or perforated method. It's important that caution is used when breaking away the inverter units from the panel. Please ensure that the amount of stress is not exceeded over the specifications.

6. Brightness Circuit

If using a Pulse to control the brightness, please be aware that a pulse signal can generate an audible noise. We recommend using current or voltage signal for controlling the brightness.

7. Protection circuit

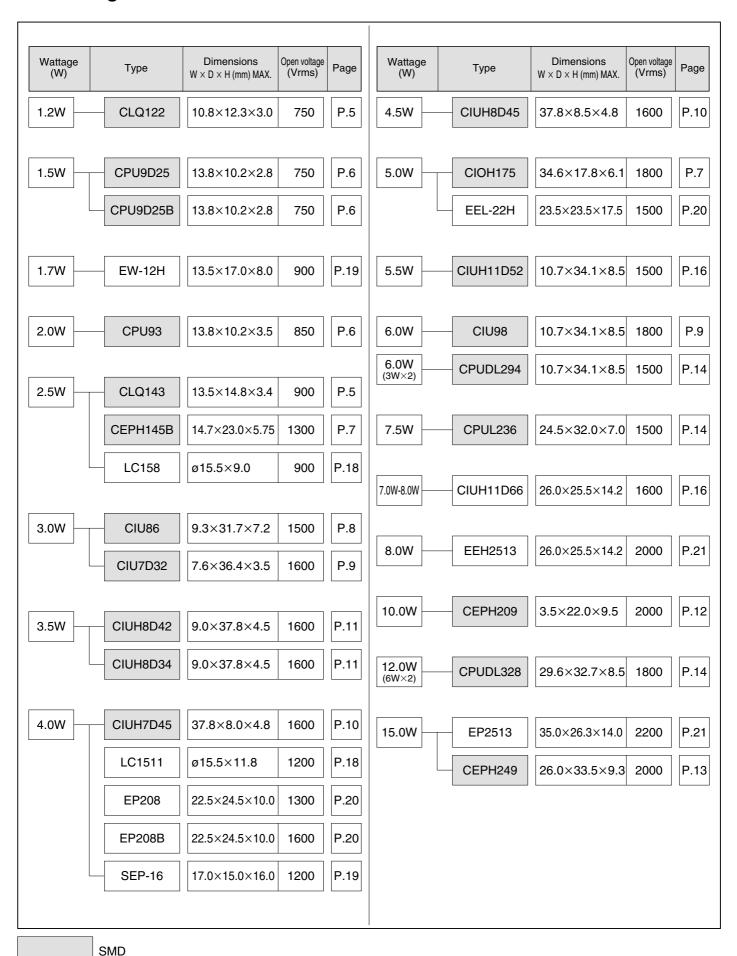
Since the FL inverter transformer is operating in the Hi-Voltage and Hi- frequency, we recommend incorporating a fuse on the input side or using a thermal fuse. Please consider this recommendation due to the fact that if there was ever a short circuit there could be a potential of part igniting.

8. Recommendations for Manufacture when handling our parts.

- 1) Please ensure to follow the specifications for terminal stress.
- 2) Please avoid bending the terminals.
- 3) When mounting onto printed circuit board, it's recommended to handle one piece at one time when taking out from the packaging.
- 4) Please avoid applying shock on top of the FL transformer and prevent any others part from coming into contact with the transformer.
- 5) After mounting part onto P.C.B. please avoid any parts from coming into contact with the transformer.
- 6) Please avoid using the product if a large level of shock is to be applied to the part. Please review our specifications for shock.
- 7) Please avoid cutting any part of the coil terminal.
- 8) Our packing boxes have indications as to which side of the box should face up. Please adhere to these markings on our packaging.
- 9) During transportation, each must withstand 20kg or less, and sufficient packing is recommended to protect the parts.
- 10) During transportation, please avoid placing packaging in a horizontal position.
- 9. We have taken many precautions to ensure the reliability of our FL transformers. However, depending on the usage of our FL transformers, it is possible that a disconnection may occur. This is why we strongly recommend that our guidelines be followed. We also recommend checking for DCR measurements on the Secondary Side. Other option would be to perform aging test. Measure the DCR after a pre-determined period of time.

If any quality issue should occur, it should be noted that the root cause of the failure might not have been contributed from disconnection. Discussion with the customer to identify the root cause of quality issues will be immediately entered into.

Selection guide



CLQ122 / CLQ143

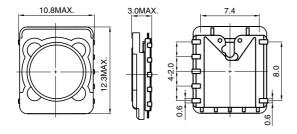
Outline

Low profile drum/ring type CCFL driving inverter transformer. Low Profile H: 3.0mm(Max)/3.4mm(Max).

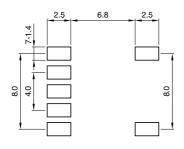


CLQ122

Dimensions(mm)



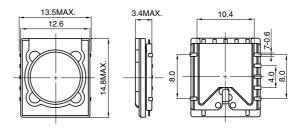
Recommended land patterns(mm)



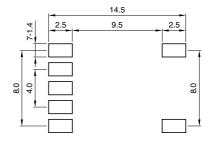
9

CLQ143

Dimensions(mm)



Recommended land patterns(mm)



Features

- Low profile H:3.0mm(Max)/3.4mm(Max)
- Winding terminals and user terminals are separated to prevent the wire from breaking.
- Reflow soldering is permitted.

Application

- Small LCD panel
- Digital camera
- PDA

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CLQ122	50kHz~140kHz	750Vrms	1.2W
CLQ143	50kHz~150kHz	900Vrms	2.5W



CPU9D25/CPU93/CPU9D25B

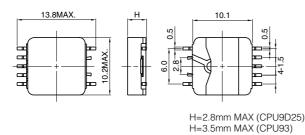
Outline

Low profile CCFL driving inverter transformer for 0.5 \sim 3.0 inch LCD monitor. Metal Shielding prevents magnetic leakage.

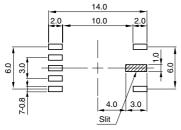


CPU93

■ Dimensions(mm)



Recommended land patterns(mm)



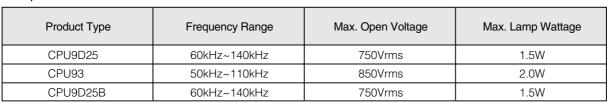
Features

- Small / low profile
- CPU9D25 H:2.8mm Max, CPU93 H:3.5mm Max
- High efficiency is achieved by magnetic shielding.
- Higher safety is achieved by covering the winding portion.
- Winding terminals and user terminals are separated to prevent the wire from breaking.
- Reflow soldering is permitted.

Application

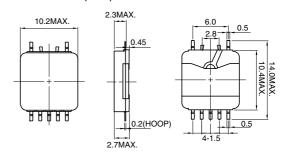
- Small LCD panel
- Digital camera
- PDA

Specifications

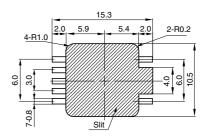




Dimensions(mm)



Recommended land patterns(mm)





CEPH145B/CIOH175

Outline

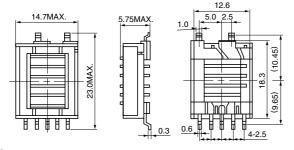
CCFL driving inverter transformer using EPC core which has a multiple secondary split winding space.

CCFL driving inverter transformer incorporates an OI core which has a multiple secondary split winding space.

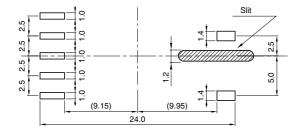


CEPH145B

Dimensions(mm)

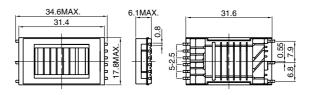


Recommended land patterns(mm)

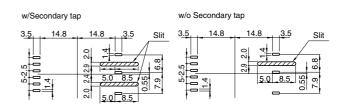


CIOH175

Dimensions(mm)



Recommended land patterns(mm)



Features

- Slim & low profile (H:5.75mm Max)
- Reflow soldering is possible

- Low profile (H:5.6mm Max)
- Winding terminals and user terminals are separated to prevent the wire from breaking.
- Reflow soldering is permitted.

Application

- PDA, Digital telephone/w LCD
- Security Systems

- Note PC
- LCD
- Car navigation system
- Scanner
- Copy Machine

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CEPH145B	50kHz~300kHz	1,300Vrms	2.5W
CIOH175	50kHz~150kHz	1,800Vrms	5.0W



CIU86

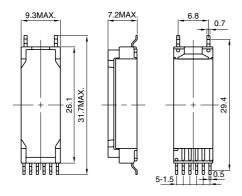
Outline

CCFL driving inverter transformer using EE core which has a multiple secondary split winding space.

Narrow & low profile type CCFL driving inverter transformer designed for the back light power supply for larger LCD application.



Dimensions(mm)



Recommended land patterns(mm)



Features

• Slim (D:9.3mm Max) & Low profile

Application

• Large LCD

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CIU86	50kHz~200kHz	1,500Vrms	3.0W

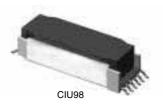


CIU98/ NEW CIU7D32

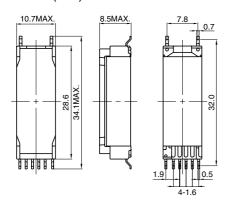
Outline

Narrow & low profile type CCFL driving inverter transformer designed for the back light power supply for larger LCD application.

It is the IC control type leakage inverter transformer. No ballast capacitor is required.



Dimensions(mm)

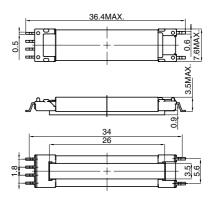


Recommended land patterns(mm)

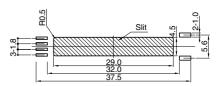


CIU7D32

Dimensions(mm)



Recommended land patterns(mm)



Features

• Slim (D:10.3mm Max) & Low profile

• Dimensions is smaller than CIUH8D45/42. (H : 8mm Max, W : 3.5 mm Max)

Application

• Large LCD

• Car Navigation system, Note PC

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CIU98	50kHz~300kHz	1,800Vrms	6.0W
CIU7D32	40kHz~100kHz	1,600Vrms	3.5W



CIUH7D45/CIUH8D45

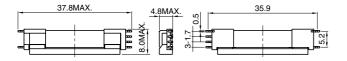
Outline

Narrow & low profile CCFL driving inverter transformer designed for the back light power supply for Note PC. Suitable for IC control type.



CIUH7D45

Dimensions(mm)

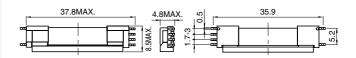


Recommended land patterns(mm)

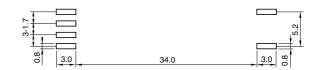


CIUH8D45

Dimensions(mm)



Recommended land patterns(mm)



◆ Features

- Slim (CIUH7D45; D:8.0mm Max, CIUH8D45; D:8.5mm Max)& low profile(H:4.8mm Max)
- IC control type
- No ballast capacitor is required.

Application

- Note PC
- Car navigation system
- LCD (Multi lamp type)

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CIUH7D45	50kHz~200kHz	1 600Vrmo	4.0W
CIUH8D45	OUKHZ~ZUUKHZ	1,600Vrms	4.5W

CIUH8D42/CIUH8D34

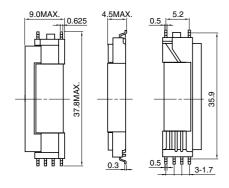
Outline

Narrow & low profile CCFL driving inverter transformer designed for the back light power supply for note PC. Suitable for IC control type.



CIUH8D42

Dimensions(mm)



Recommended land patterns(mm)



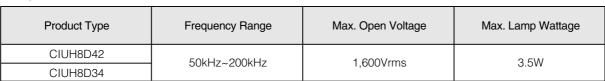
Features

- Slim (D:9.0mm Max) & Low profile (CIUH8D42; H:4.5mm Max, CIUH8D34; H:4.5mm Max)
- IC control type
- · No ballast capacitor is required.

Application

- Note PC
- Car navigation system
- LCD(Multi lamp)

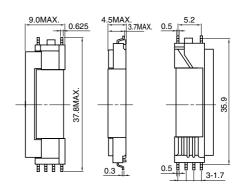
Specifications





CIUH8D34

Dimensions(mm)



Recommended land patterns(mm)



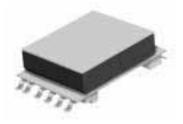




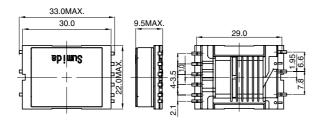
CEPH209

Outline

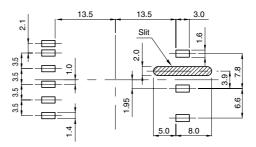
CCFL driving inverter transformer incorporates an EP core which has a multiple secondary split winding space.



Dimensions(mm)



Recommended land patterns(mm)



Features

- Low profile (H:9.5mm Max)
- Reflow soldering is permitted.
- High power type (10W)
- IC control type leakage transformer
- No ballast capacitor is required.

Application

- LCD (More than 15inch)
- •LCD
- Air Cleaner

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CEPH209	40kHz~100kHz	2,000Vrms	10W





CEPH249

Outline

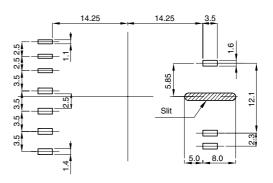
Correspondence with the large output capacity (15W) demand in the same height (9.5mm Max) of CEPH209.



Dimensions(mm)

33.5MAX. 30.5 9.3MAX. 9.00 1.21

Recommended land patterns(mm)



Features

- It is the larger wattage type than CEPH209.
- It is possible to light 2 CCFLs (7W x 2) in 1 transformer.
- Application is the 17inch LCD back light unit.
- No ballast capacitor is required

Application

• LCD TV

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CEPH249	35kHz~100kHz	2,000Vrms	15W



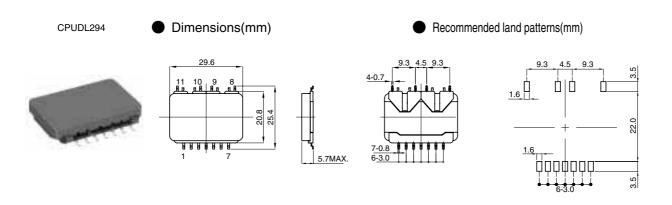


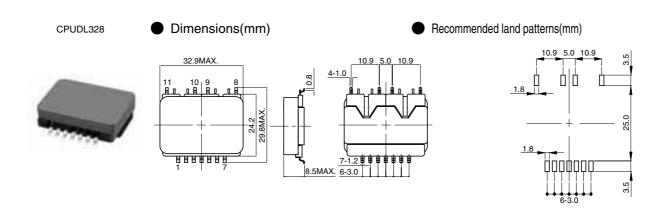
CPUL236/CPUDL294/CPUDL328

Outline

The leakage transformer has a special core that allows for co-axial winding.

Suitable for large LCD panel ,and complies to customer needs of high open voltage and high lamp wattage. Slim type Inverter transformer corresponding to multiple CCFL lamps driving for large LCD TV application. CPUDL294 and CPUDL328 is possible to drive 2 CCFLs in 1 transformer. No ballast capacitor is required.







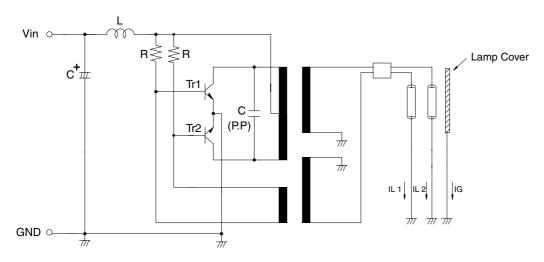
◆ Features

- Low profile
- Unique shielding reduces noise emissions.
- Leakage transformer types are magnetically shielded.
- The High Nickel Core allows High withstand voltage and high reliability.
- No ballast capacitor is required due to leakage structure of the transformer.
- High temperature reflow soldering is permitted. (Pb free)

Application

- Large LCD TV
- LCD monitor

Schematic (CPUDL294 and CPUDL328)



Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage	
CPUL236	40kHz~100kHz	1,500Vrms	7.5W	
CPUL230	40KI 12~ 100KI 12	1,800Vrms (for 3 second)	7.500	
CPUDL294	35kHz~70kHz	1,500Vrms	3W×2ch	
CPUDL328	40kHz~65kHz	1,500Vrms	6W×2	
	40KHZ~00KHZ	1,800Vrms (for 3 second)	OWXZ	





CIUH11D52/CIUH11D66

Outline

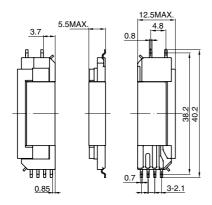
Slim type Inverter transformer corresponding to multiple CCFL lamps driving for large LCD TV application Designed secondary winding for out put voltage check

High efficiency suitable for IC controlled type circuit

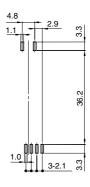


CIUH11D52

Dimensions(mm)



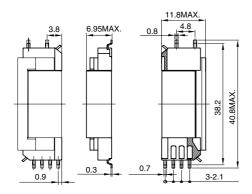
Recommended land patterns(mm)



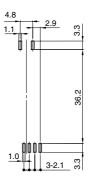


CIUH11D66

Dimensions(mm)



Recommended land patterns(mm)





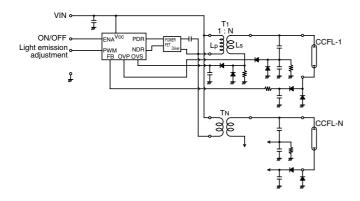
◆ Features

- Slim and low profile
- Leakage type inverter transformer designed for IC controlled type circuit
- Efficiency more than 90%
- High reliability for inflammability

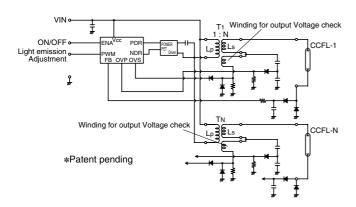
Application

- Large LCD TV
- LCD monitor

● SCHEMATICS(UNTIL NOW)



● SCHEMATICS(USED OUT PUT VOLTAGE CHECK)



Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
CIUH11D52	Max.100kHz	1,500Vrms	5.5W
CIUH11D66	50kHz~300kHz	1,600Vrms	7.0W~8.0W



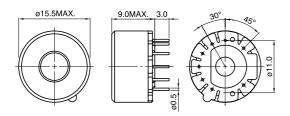
LC158/LC1511

Outline

Drum-Pot type inexpensive inverter transformer using nickel core.

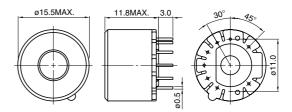


Dimensions(mm)





Dimensions(mm)



Features

- Inexpensive type
- High efficiency (more than 80%)

Application

- LCD TV
- Scanner
- Digital Telephone/w LCD

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
LC158	50kHz~100kHz	900Vrms	2.5W
LC1511	JUNI 12~ 100KI 12	1,200Vrms	4.0W

EW-12H/SEP-16

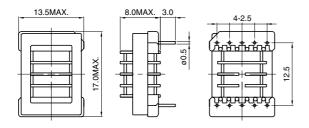
Outline

CCFL driving inverter transformer incorporates an EE core which has a multiple secondary split winding space.



EW-12H

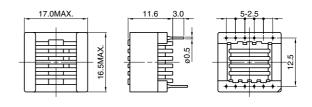
Dimensions(mm)





SEP-16

Dimensions(mm)



Features

• High reliability, inexpensive type

Application

• LCD TV, Fax, Scanner

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
EW-12H	50kHz~300kHz	900Vrms	1.7W
SEP-16	JUNI 12~JUUNI 12	1,200Vrms	4.0W



EP208/EP208B/EEL-22H

Outline

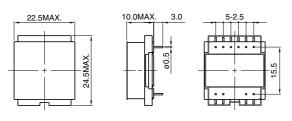
CCFL driving inverter transformer incorporates an EE core which has a multiple secondary split winding space.



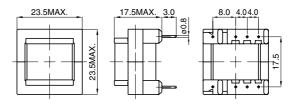
EP208/EP208B

EEL-22H

Dimensions(mm)



Dimensions(mm)



Features

• High reliability, low profile type (EP208/EP208B; H:10.0mm Max, EEL-22H; H:17.5mm Max)

Application

- FAX, Scanner
- Copier
- Air conditioner

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage	
EP208		1,300Vrms	4.0W	
EP208B	50kHz~300kHz	1,600Vrms	4.000	
EEL-22H		1,500Vrms	5.0W	

EP2513/EEH2513

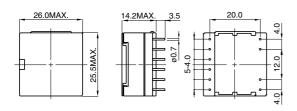
Outline

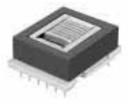
CCFL driving inverter transformer incorporates an EE core which has a multiple secondary split winding space.



EP2513

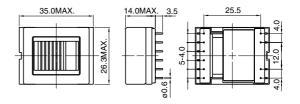
Dimensions(mm)





EEH2513

Dimensions(mm)



Features

- High power, High reliability type (EP2513 : 8.0W, EEH2513 : 15.0W)
- Winding terminals and user terminals are separated to prevent the wire from breaking.

Application

- Copy Machine
- Light catalyst related
- Portable Electronic Games

Product Type	Frequency Range	Max. Open Voltage	Max. Lamp Wattage
EP2513	50kHz~300kHz	2,000Vrms	8.0W
EEH2513	50kHz~500kHz	2,200Vrms	15.0W





INVERTER UNIT

OUTLINE

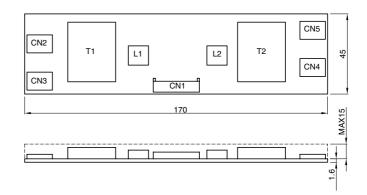
We make various CCFL driver inverter units which are suitable for customer's needs.

IV45170 (Sample reference)

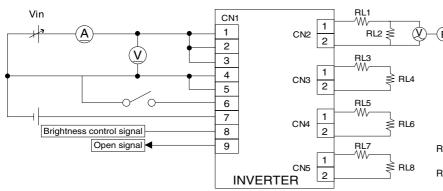
- Inverter transformer unit corresponding to 4CCFL lamps for 20 inch TV.
- Self-excited.



DIMENSIONS(mm)



MEASUREMENT CIRCUIT DIAGRAM



RL1, 3, 5, 7: Lamp equivalent resistance

RL2, 4, 6, 8 : Lamp current detect resistance

ELECTRICAL SPECIFICATIONS (SD2064)

Parameter	Symbol	Condition	Specifications			Unit
T didnictor	Cymbol	Containon	min.	typ.	max.	O'III
Input Voltage	Vin	_	14.5	15	15.5	V
Input Current	lin	Vin=15.0V±0.1V Vadj=3.0V±0.1V (ILmax)	-	-	930	mA
Frequency	fo	Vin=15.0V±0.1V fo Vadj=3.0V±0.1V (ILmax)		50	60	kHz
Lamp Current (Current / a lamp)	ILmax	Vin=15.0V±0.1V Vadj=3.0V±0.1V	5.5	6	6.5	. mArms
	ILmin	Vin=15.0V±0.1V Vadj=0V	1.7	2.2	2.7	

*CUSTOM SPECIFICATIONS

We develop electric units to customer's specifications. Please refer to the procedure for ordering below and contact our offices for further details.



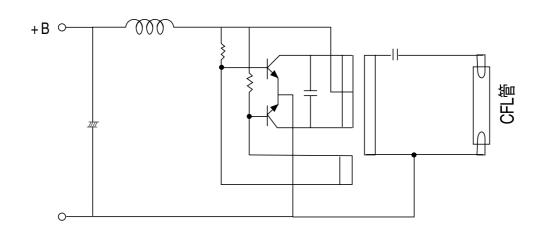


Sample order form

The following information is needed in order to design samples for your evaluation.

- 1) Vin ()V()V (Typ. V)
- 2) V open MAX.()Vrms or ()Vo-p
- 3) Frequency range ()kHz ()kHz
- 4) Iout ()mArms (Vin : at V)
- 5) Vout ()Vrms (V in : at V)
- 6) Provide us the CCFL sample which you may use.

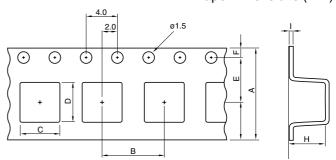
Evaluation circuit





Dimensions for carrier tapes with packed QTY

Tape Dimensions (mm)



Type	Dimensions(mm)						Amount (Pcs/Reel)		
Турс	Α	В	С	D	E	F	Н	I	() ;
CLQ122	24.0	20.0	12.4	14.0	11.5	1.75	3.1	0.4	500
CLQ143	24.0	20.0	14.9	17.0	11.5	1.75	3.5	0.4	500
CPU93	24.0	16.0	10.4	14.2	11.5	1.75	3.7	0.4	500
CPU9D25	24.0	16.0	10.4	14.2	11.5	1.75	3.2	0.4	1000
CPU9D25B	24.0	16.0	10.4	14.2	11.5	1.75	3.2	0.4	1000

Digital Convergence



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