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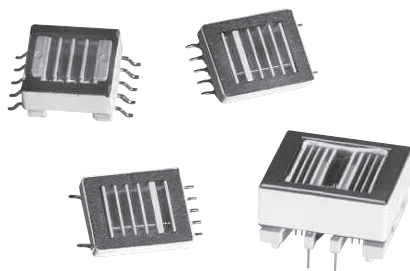
sales@integrated-circuit.com

Technical Data **4303**

Effective October 2015
Supersedes March 2007

CCFL Transformers

Cold cathode fluorescent lamp inverter transformers



Product description

- Transformers for use in CCFL power supplies, available in through-hole and surface mount recess or gull wing versions, incorporating floating or fixed secondary technology
- Supply output current up to 30 milli-Amps
- Frequency range from 40 to 80 KHz
- Deliver output power from 2.5 to 14 Watts
- Operate in royer and other topologies
- Ferrite core material

Applications

- CCFL power supplies

Environmental data

- Storage temperature range: -40°C to +85°C
- Operating ambient temperature range: 0°C to +70°C

Packaging

- Supplied in bulk packaging



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Product specifications

Part number	Schematic diagram	Pout watts	Lp uH ¹	DCRp ohms max	DCRs ohms max	TR Ns/Np	Vpri volts max ²	Vsec volts max ²	Is max A rms	Vpri abnormal ³	Vsec abnormal ³	Mechanical dimensions	PCB pad layout
2.5 Watt Versions													
CTX110652-R	A	2.5	43	0.220	285	67	20	1340	.005	30	2000	A	A
CTX110655-R	B	2.5	43	0.220	285	67	20	1340	.005	30	2000	A	A
CTX110657-R	B	2.5	26	0.190	285	86	15	1340	.005	23	2000	A	A
CTX110659-R	B	2.5	19	0.220	285	100	13	1340	.005	23	2000	A	A
CTX210652-R	A	2.5	43	0.220	285	67	20	1340	.005	30	2000	B	B
CTX210655-R	B	2.5	43	0.220	285	67	20	1340	.005	30	2000	B	B
CTX210657-R	B	2.5	26	0.212	285	86	15	1340	.005	23	2000	B	B
CTX210659-R	B	2.5	19	0.190	285	100	13	1340	.005	23	2000	B	B
2.5 Watt Versions													
CTX210403-R	C	4	44	0.220	165	50	26	1340	.007	40	2000	C	C
CTX210407-R	C	4	27	0.160	220	86	15	1340	.007	23	2000	C	C
CTX210409-R	C	4	20	0.160	220	100	13	1340	.007	23	2000	C	C
CTX210411-R	C	4	20	0.160	330	125	10	1340	.007	16	2000	C	C
CTX310403-R	C	4	44	0.220	165	50	26	1340	.007	40	2000	D	D
CTX310407-R	C	4	27	0.160	220	86	15	1340	.007	23	2000	D	D
CTX310409-R	C	4	20	0.160	220	100	13	1340	.007	23	2000	D	D
CTX310411-R	C	4	20	0.160	330	125	10	1340	.007	16	2000	D	D
6 Watt Versions													
CTX110600-R	D	6	44	0.160	176	67	20	1340	.011	30	2000	E	E
CTX110603-R	C	6	44	0.160	132	50	26	1340	.011	40	2000	E	E
CTX110605-R	C	6	44	0.160	176	67	20	1340	.011	30	2000	E	E
CTX110607-R	C	6	27	0.132	176	86	15	1340	.011	23	2000	E	E
CTX110609-R	C	6	20	0.132	176	100	13	1340	.011	23	2000	E	E
CTX110611-R	C	6	20	0.132	291	125	11	1340	.011	16	2000	E	E
CTX210600-R	D	6	44	0.160	176	67	20	1340	.011	30	2000	F	C
CTX210603-R	C	6	44	0.160	132	50	26	1340	.011	40	2000	F	C
CTX210605-R	C	6	44	0.160	176	67	20	1340	.011	30	2000	F	C
CTX210607-R	C	6	27	0.132	176	86	15	1340	.011	23	2000	F	C
CTX210609-R	C	6	20	0.132	176	100	13	1340	.011	23	2000	F	C
CTX210611-R	C	6	20	0.132	291	125	11	1340	.011	16	2000	F	C
14 Watt Versions													
CTX410805-R	E	14	24	0.030	262	67	20	1340	.030	30	2000	G	F
CTX410807-R	E	14	16	0.024	272	86	15	1340	.030	23	2000	G	F
CTX410809-R	E	14	16	0.024	314	100	13	1340	.030	23	2000	G	F

1. Inductances are nominal values
2. Continuous RMS Voltage
3. Maximum Instantaneous RMS Voltage

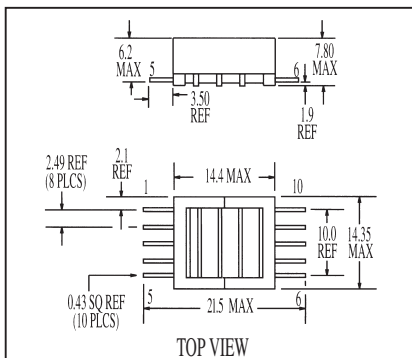
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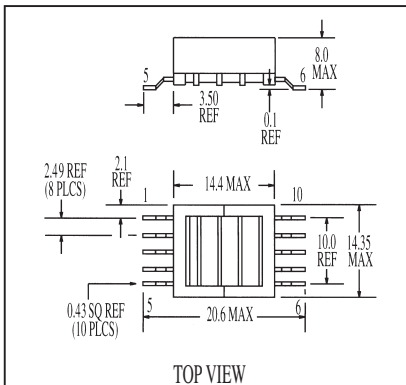
Dimensions—mm

2.5 Watt Versions

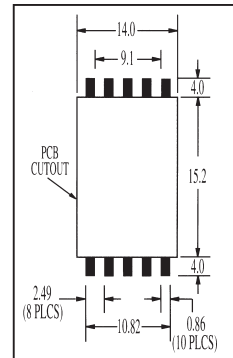
Mechanical A



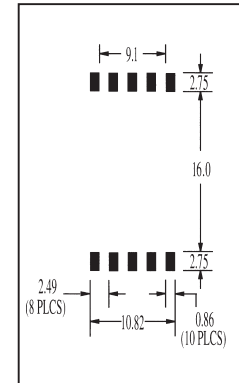
Mechanical B



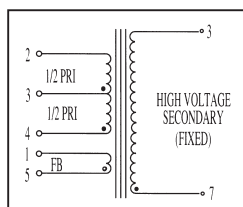
Pad Layout A



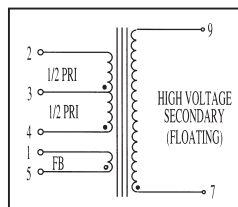
Pad Layout B



Schematic A

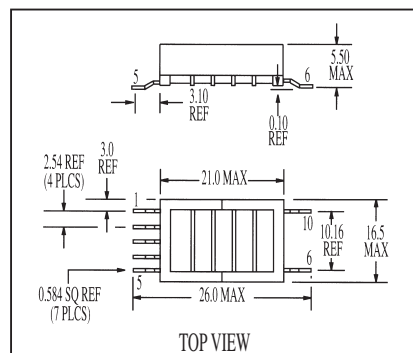


Schematic B

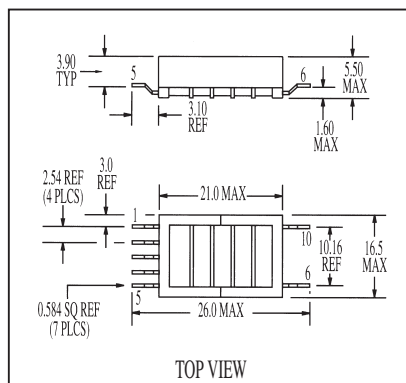


4 Watt Versions

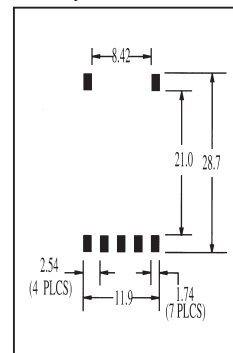
Mechanical C



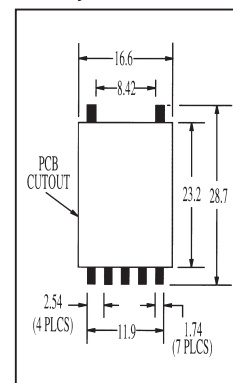
Mechanical D



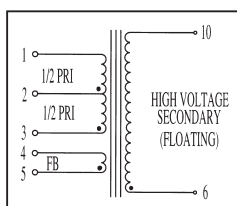
Pad Layout C



Pad Layout D



Schematic C



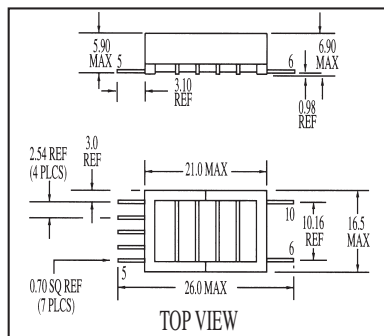
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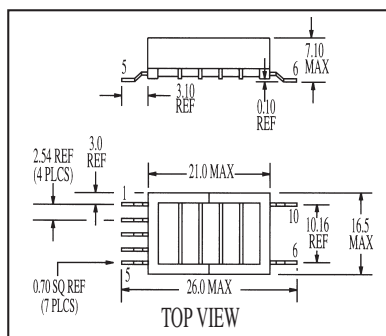
Dimensions—mm

6 Watt Versions

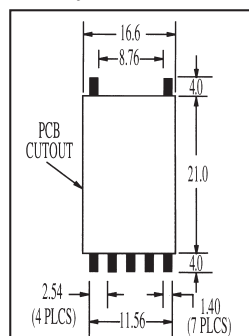
Mechanical E



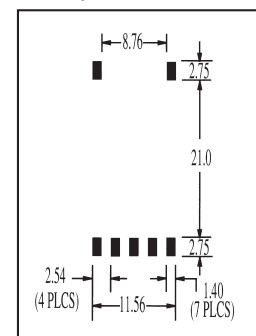
Mechanical F



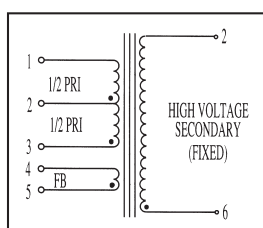
Pad Layout E



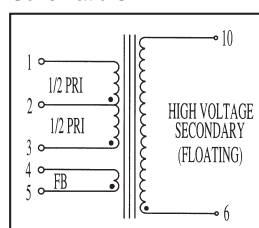
Pad Layout C



Schematic D

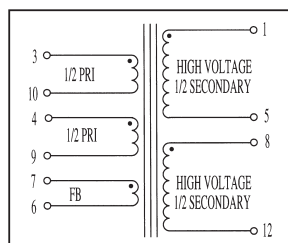


Schematic C

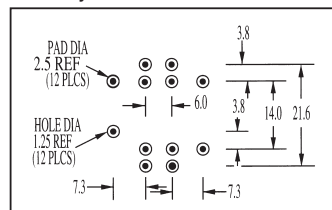


14 Watt Versions

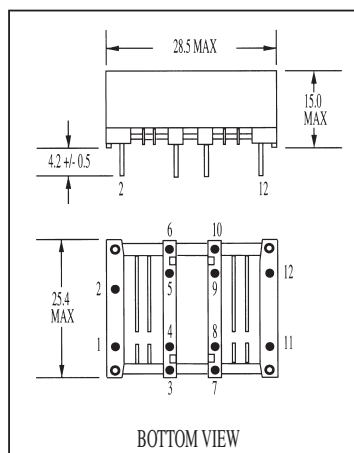
Schematic E



Pad Layout F



Mechanical G

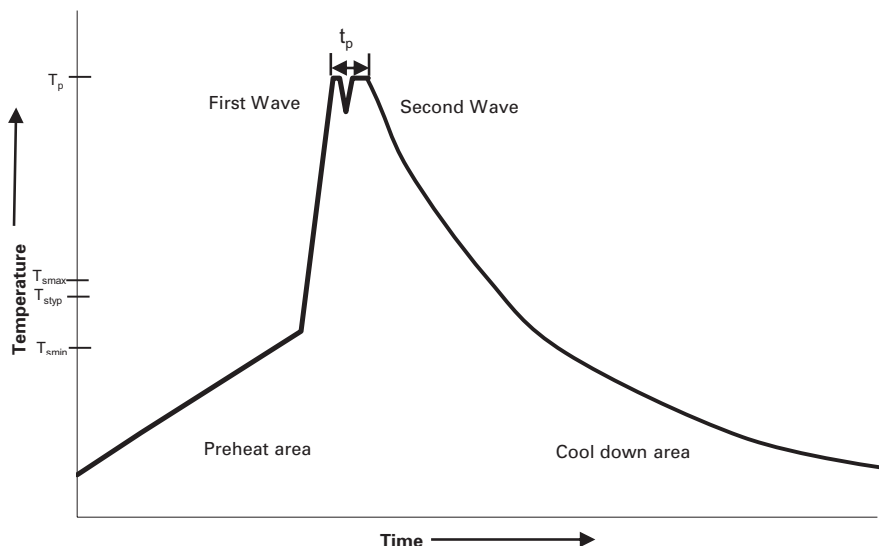


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Through-hole wave solder profile

Reflow soldering not recommended



Reference EN 61760-1:2006

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat		
• Temperature min. (T_{smin})	100°C	100°C
• Temperature typ. (T_{styp})	120°C	120°C
• Temperature max. (T_{smax})	130°C	130°C
• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature	150°C max.	150°C max.
Peak temperature (T_p)*	235°C – 260°C	250°C – 260°C
Time at peak temperature (t_p)	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25°C to 25°C	4 minutes	4 minutes

Manual solder

350°C, 4-5 seconds. (by soldering iron), generally manual, hand soldering is not recommended.

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Surface mount solder reflow profile

Wave and manual soldering not recommended

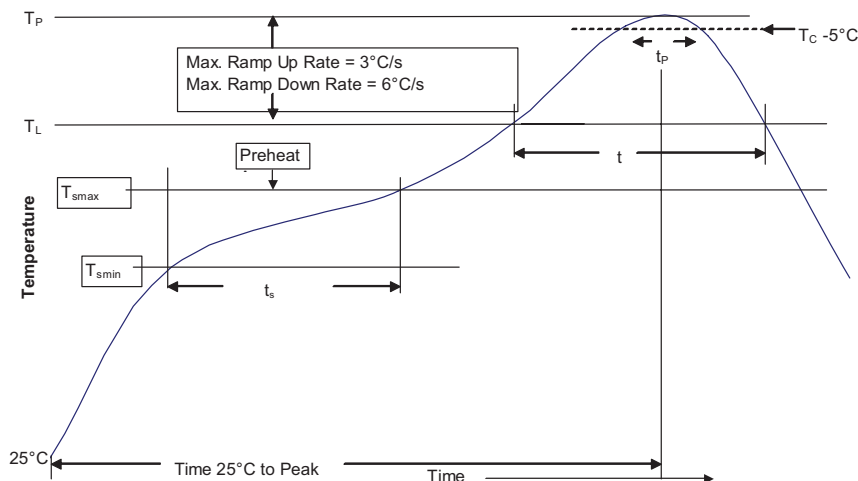


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >2000
<1.6mm	260°C	260°C	260°C
1.6 - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Reference JDEC J-STD-020D

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak		
• Temperature min. (T_{smin})	100°C	150°C
• Temperature max. (T_{smax})	150°C	200°C
• Time (T_{smin} to T_{smax}) (t_s)	60-120 Seconds	60-120 Seconds
Average ramp up rate T_{smax} to T_p	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60-150 Seconds	60-150 Seconds
Peak package body temperature (T_p)*	Table 1	Table 2
Time (t_p)** within 5 °C of the specified classification temperature (T_C)	20 Seconds**	30 Seconds**
Average ramp-down rate (T_p to T_{smax})	6°C/ Second Max.	6°C/ Second Max.
Time 25°C to Peak Temperature	6 Minutes Max.	8 Minutes Max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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