

## An application note for soldering leads to thyristors, GTO's and IGBT's

Figure 1

*All device types - Set up*

Ensure that the temperature controller for the soldering iron is set high enough to melt the solder.



Figure 2

*Cathode tag and gate pin solder process*

Use a pair of pliers to attach the cathode tag to the cathode terminal.

Note that this solder process also applies to GTO's.



Figure 3

*Cathode tag and gate pin solder process*

Use a pair of pliers to attach the gate terminal to the gate pin. The pin will click into position when it is correctly seated.



Figure 4

*Cathode tag and gate pin solder process*

Wipe the soldering iron tip with a sponge moistened with water and apply a small amount of solder to the tip of the soldering iron. This will assist the wetting process.



Figure 5

*Cathode tag and gate pin solder process*

Place the soldering iron in contact with the cathode tag as shown and allow the solder to wet the joint.

Pull the device away from the soldering iron and allow the joint to cool.



Figure 6

*Cathode tag and gate pin solder process*

Place the gate terminal and pin into contact with the soldering iron and apply solder to the joint. Ensure that the solder wets the joint. Pull the device away from the soldering iron and allow the joint to cool.

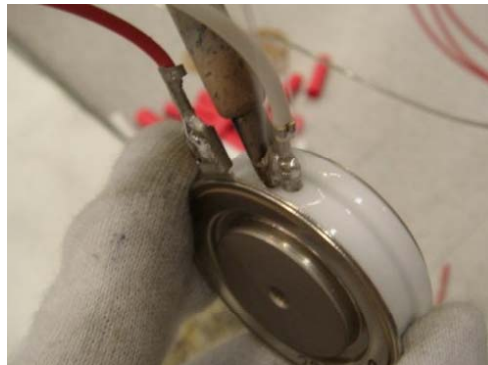


Figure 7

*Solder inspection - Cathode tag*

Some evidence of flux can be seen on the weld flange area but the solder must not have flow beyond the weld area.



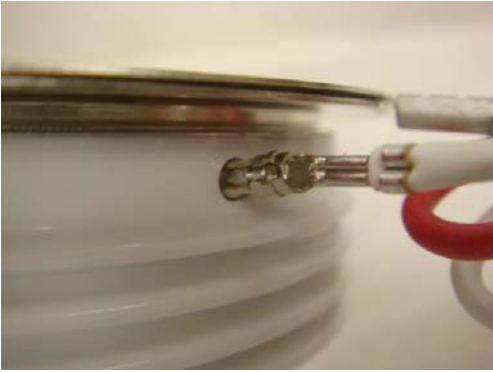
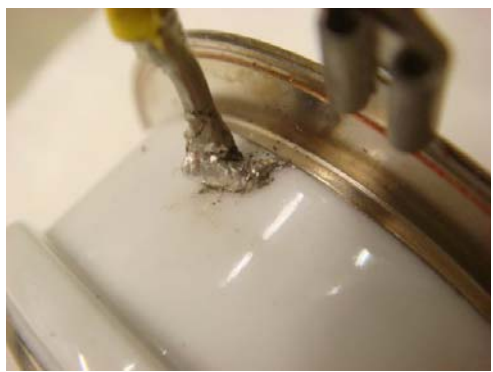


<p>Figure 8</p> <p><i>Solder inspection - Gate pin</i></p> <p>Inspect the cathode tag soldered joint. Ensure that the solder has fully wet the joint.</p>	
<p>Figure 9</p> <p><i>Solder inspection - Gate pin</i></p> <p>Check that the solder has flowed correctly onto the gate pin.</p> <p>The picture shows EXCESSIVE SOLDER shorting the gate to the cathode. This solder must be removed, cleaned and re-soldered.</p>	
<p>Figure 10</p> <p><i>Shrink sleeving</i></p> <p>Place the sleeving (if required) over the soldered leads and push up to the gate and cathode tag terminals.</p>	
<p>Figure 11</p> <p><i>Shrink sleeving</i></p> <p>Shrink the sleeving using a hot air gun. Inspect the sleeving to ensure it has shrunk evenly around the terminals and that no exposed copper wire is showing between the end of the terminal and the lead insulation.</p>	

Figure 12

*Cleaning process*

Spray a small amount of flux removing solvent onto a tissue and remove the flux from the top face of the cathode return flange. Note that if clear sleeving is used the flux removal should be carried out before the sleeving process is complete.



Figure 13

*Cleaning process*

Gently remove the flux from the underside of the cathode flange.



Figure 14

*Cleaning process*

Apply a small amount of flux removing solvent to a short bristled brush.



Figure 15

*Cleaning process*

Remove the flux underneath the cathode tag using the brush.





Figure 16

*Cleaning process*

Remove the excess flux close to the gate pin using the tweezers.



Figure 17

*Cleaning process*

Clean the anode poleface with a tissue soaked in flux removing solvent.



Figure 18

*Cleaning process*

Clean the cathode poleface with a tissue soaked in flux removing solvent.







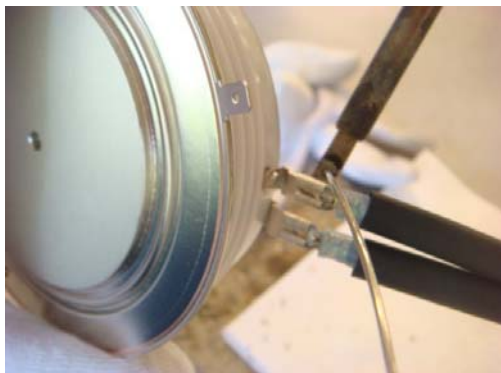

Figure 19

*IGBT solder instructions*

Take ESD precautions when soldering IGBT devices.



<p>Figure 20</p> <p><i>IGBT solder instructions</i></p> <p>Tighten the ESD wrist strap onto the appropriate wrist.</p>	
<p>Figure 21</p> <p><i>IGBT solder instructions</i></p> <p>Place the heatshrink onto the lead terminations as shown.</p>	
<p>Figure 22</p> <p><i>IGBT solder instructions</i></p> <p>Remove the shorting clip from the emitter and gate connectors.</p>	
<p>Figure 23</p> <p><i>IGBT solder instructions</i></p> <p>Gently push on the connectors to the termination.</p>	

<p>Figure 24</p> <p><i>IGBT solder instructions</i></p> <p>Solder using the same process as shown for thyristors.</p> <p>Follow the thyristor instructions for the heatshrink process.</p>	
<p>Figure 25</p> <p>Ensure that the gate lead terminals are shorted before removing the ESD protection shown in figures 19 and 20.</p>	

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