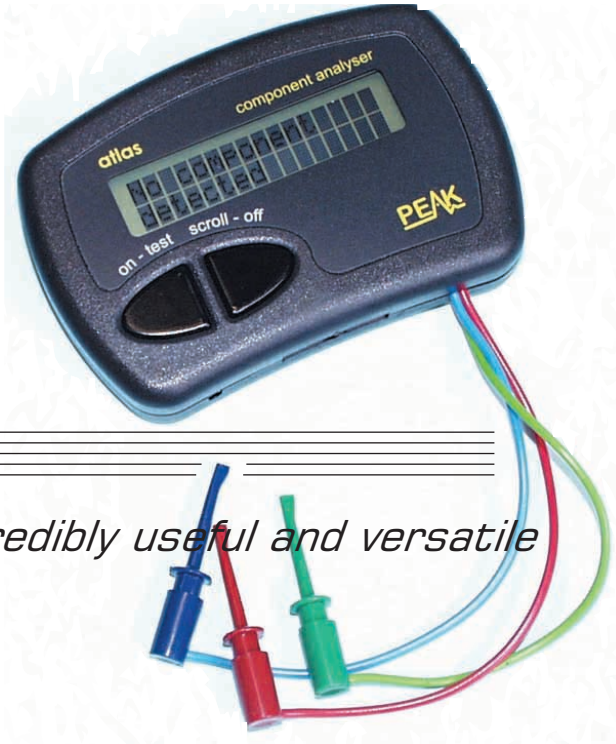
Special Review

PEAK ATLAS COMPONENT ANALYSER



ANDY FLIND

It may be small, but Atlas is an incredibly useful and versatile little tester, reports Andy Flind.

THE "Atlas" Component Analyser from Peak Electronics is a pocket-sized semiconductor tester. On opening the box, first impressions were of a very neat and simple-to-operate piece of equipment. Pleasant in appearance, the contoured case fits comfortably into the hand and could easily be carried in a shirt pocket. It has just two control buttons marked "On-Test" and "Scroll-Off" plus a two-line sixteen-character l.c.d. and it sports three leads coloured red, blue and green with matching test clips for connection to the component to be tested.

The small manual supplied is clear and easy to follow, and in addition to explaining what the unit can do is honest about its limitations, which is refreshing. Despite its simplicity the Atlas is surprisingly powerful, able to test a wide range of semiconductor devices from simple diodes right up to power MOSFETs and triacs.

INSIDE STORY

Before trying out the Atlas, a quick inspection was made of its construction. Removal of three self-tapping screws allows the back of the case to be removed, officially for battery replacement, but the p.c.b. can also be simply lifted out for examination. To enable it to fit into the slim case the board has two cut-outs to accommodate a small 12V battery and the l.c.d. display, an intelligent type with COB (Chip-On-Board) controlling i.c.s.

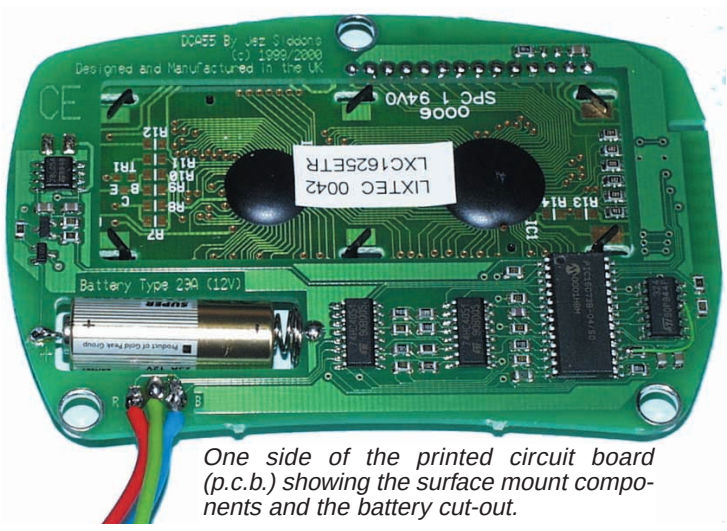
The main circuit is implemented mainly with surface-mount components, some easily recognisable ones being a 78L05 voltage regulator, two 74HC4051 "one-of-eight" electronic switches and an LM324 quad op.amp. The main processing unit is a PIC16C73, one of the more powerful members of the PIC microcontroller family with 4K of program memory and up to five analogue-to-digital converters.

Of interest to users is the fact that if the three connection leads became damaged replacement would be a fairly simple matter since they are soldered to relatively large pads on the board. Changing the battery might be a bit fiddly but would be well within the capabilities of most *EPE* readers. The overall impression was of neat and tidy construction.

ON TRIAL

Following the physical inspection the unit was tried out on a wide variety of semiconductors. To use it, either two or all three test leads are connected to the device to be tested. They may be applied in any order, which makes connection rapid and simple. The "On-Test" button is then pressed and the unit displays *"The Peak Atlas is analysing . . . ."* for a second or two, following which the first data screen appears.

In the case of a bipolar transistor, for example, it may tell you that the device is an *"NPN transistor"*, following which successive presses of the "Scroll-Off" button will bring up further screens, showing firstly which colour leads are connected to the emitter (e), the base (b) and the collector (c), then the current gain (H_{fe}), the collector test current used, the base-emitter voltage (V_{be}) and the test current used to determine this. Further scrolling returns to the first screen so if the user wishes to see a particular screen again repeated pressing of the scroll button soon brings it back into view.



One side of the printed circuit board (p.c.b.) showing the surface mount components and the battery cut-out.

The Peak Atlas is analysing....	NPN bipolar transistor

The actual testing is completed in one go at the start, so the tested semiconductor may be disconnected whilst the various screens are read. It can be turned off ready for the next test by holding the "Scroll-Off" button for a couple of seconds, or it will shut down automatically thirty seconds after the last button press, allowing ample time to make notes of the data if required.

The unit was tried with a large range of components, old and exotic types as well as standard modern components, and by and large gave an excellent account of itself. Amongst the diodes tested were germanium and Schottky types as well as various silicon ones, plus diode combinations such as bridge rectifiers, and l.e.d.s including two and three lead bi-colour types.

Germanium diodes have a recognisable low forward voltage, Schottkys lower still. It recognises l.e.d.s from their higher forward voltage drops (try three silicon diodes in series and it will tell you that it has found an l.e.d.!) and bi-colours are determined from their differing forward voltage drops.

Though it doesn't actually tell you which diode is which colour, it gives their forward voltages and the manual gives the likely corresponding colours. L.E.D.s, by the way, flicker briefly as the test current is applied, which shows they are working and gives the colour for clear-bodied types.

UP THE JUNCTION

Transistors of most varieties can be checked. Bipolar *npn*s and *pnp*s of all kinds, including power types, will have their polarity shown, leads identified, and gain figure displayed. Some old germanium transistors, such as OC44 and AC127, were tested satisfactorily.

Darlington types will be clearly identified as such and their high gain can also be measured and displayed. Special features such as internal protection diodes and shunt resistors may also be indicated on the l.c.d. screen. Enhancement mode MOSFETs of both polarities and high and low power can be checked as easily as bipolar transistors. At the time of testing a *p*-type MOSFET was not available, so the internal ones in a CMOS 4007B i.c. were substituted for this and were checked out by the unit with no problems.

A couple of types the unit cannot test are junction f.e.t.s and unijunction transistors, but these will at least be identified as two diodes with a common anode or cathode, which of course they are from a practical point of view. At least it gives a clue as to which lead is which.

BEING SENSITIVE

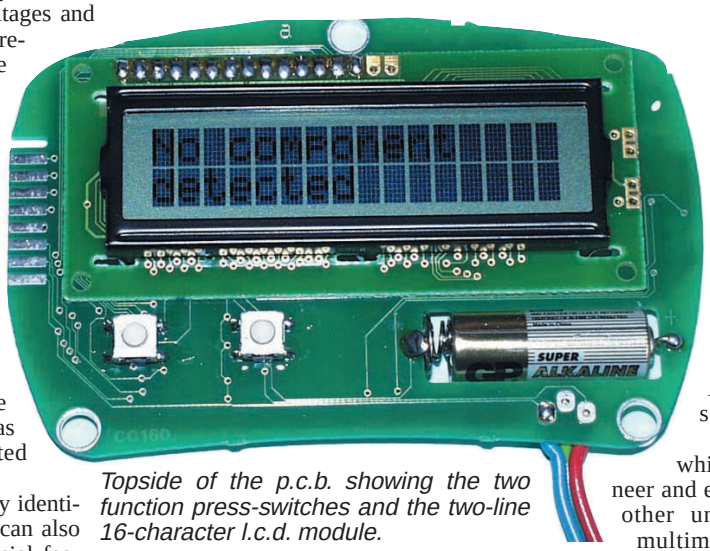
With thyristors and triacs the practical tests were slightly less successful. To be fair the manual does state that only "sensitive or low power" types can be tested, but in practice it was found that most of the ones tried, including some normally classed as "sensitive" produced an uninspiring *"Faulty/Unknown Component"* message.

Rather sad this, because when it does recognise one the information is just as clear as for transistors, with the gate, the cathode and anode or the MT1 and MT2 connections clearly identified. It seems likely that the problem is due to the high threshold voltages of some of these devices, perhaps combined with the minimum "holding" current required by some of them.

IN CONCLUSION

The verdict on the Atlas is that despite the limitation described above, it is an incredibly useful and versatile little tester, well worth the current asking price of £60 including postage and VAT. Many readers will have large collections of old or unidentified semiconductors which could be easily put to use if analysed with this unit.

For those with poor memories (like the author!) it can save much time searching through data sheets for device connection and polarity data. A classic example came when a medium power *pnp* transistor was required for a switching application during a design session.



Topside of the p.c.b. showing the two function press-switches and the two-line 16-character l.c.d. module.

RED GREEN BLUE Base Coll Emit

Some ZTX653 and ZTX 753s were available, but the author was quite unable to remember which was the *pnp*, let alone which lead was which. This would previously have required a trip to the office to fetch a catalogue, followed by five minutes locating the device in the data sheets, but the Atlas resolved the problem in seconds.

It's the kind of instrument which should be on every engineer and enthusiast's bench, along with other universal items such as the multimeter. All in all, it can be thoroughly recommended.

The Atlas Component Analyser cost £60 all inclusive and for more information contact: ***Peak Electronic Design Ltd., Dept EPE, West Road House, West Road, Buxton, Derbyshire, SK17 6HF.*** Tel. 01298 70012, Fax 01298 22044, E-mail **sales@peakelec.co.uk**. More information and data is also available at the Peak Web site at **www.peakelec.co.uk**. □

Forward voltage Vf=0.67V	Enhancement mode N-Ch MOSFET

The reviewer would like to thank the Handy Shop of Taunton, Somerset, for their help and the loan of components used to test the Atlas Component Analyser.

Please note that since this review was written, extra features have been added including the support of Junction FETs and Depletion Mode MOSFETs.

Reproduced with kind permission of
Everyday Practical Electronics.