

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.*

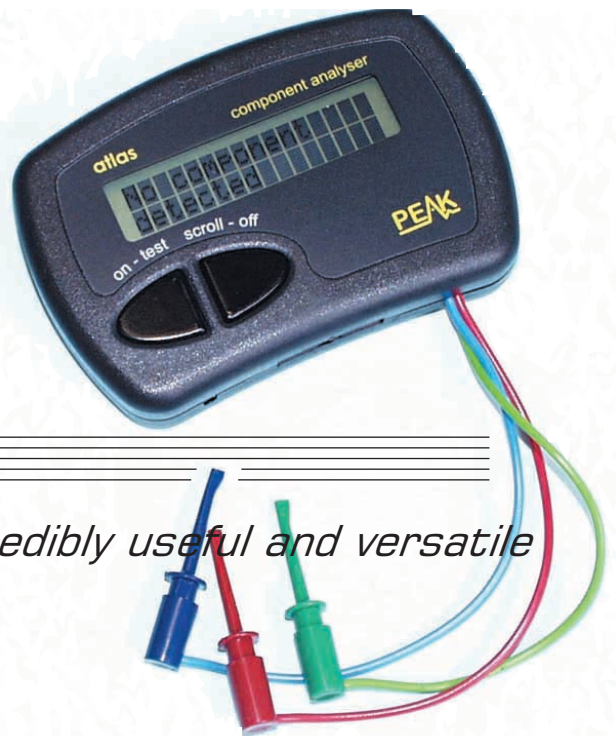
THE "Atlas" Component Analyser from Peak Electronics is a pocket-sized semiconductor tester. On opening the box, first impressions were of a very neat and simple-to-operate piece of equipment. Pleasant in appearance, the contoured case fits comfortably into the hand and could easily be carried in a shirt 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.

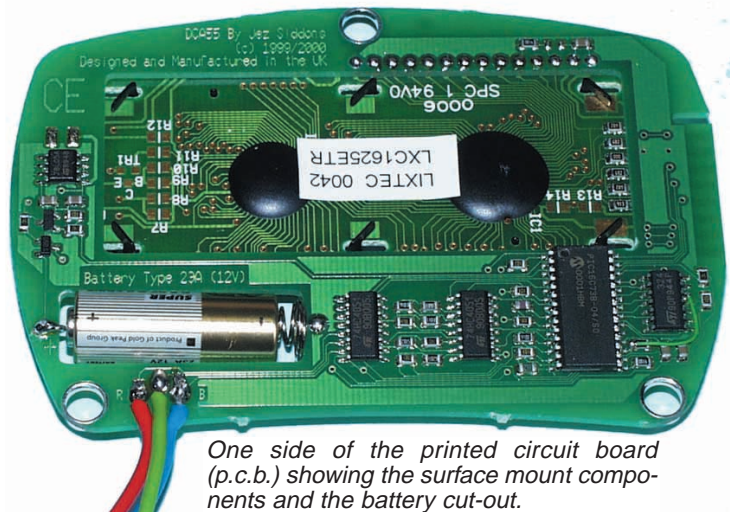


Of interest to users is the fact that if the three connection leads became damaged replacement would be a fairly simple matter since they are soldered to relatively large pads on the board. Changing the battery might be a bit fiddly but would be well within the capabilities of most *EPE* readers. The 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 test-  
ed 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 test-  
ed were germanium and Schottky types as well as various silicon  
ones, plus diode combinations such as bridge rectifiers, and I.e.d.s  
including two and three lead bi-colour types.

Germanium diodes have a recognisable low forward voltage,  
Schottkys lower still. It recognises I.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 I.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 corre-  
sponding 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 *n*pns  
and *p*nps 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 identi-  
fied as such and their high gain can also  
be measured and displayed. Special fea-  
tures such as internal protection diodes and shunt resistors may  
also be indicated on the I.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 uni-  
junction 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 infor-  
mation 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 semicon-  
ductors 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 *p*np  
transistor was required for a switching application during a design  
session.

RED GREEN BLUE  
Base Coll Emit

Some ZTX653 and ZTX  
753s were available, but the  
author was quite unable to  
remember which was the  
*p*np, let alone which lead  
was which. This would pre-  
viously have required a trip  
to the office to fetch a cata-  
logue, 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 engi-  
neer 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,**  
**Atlas House, Kiln Lane, Harpur Ind., Buxton, SK17 9JL.**  
Tel. 01298 70012, Fax 01298 70046, E-mail  
**sales@peakelec.co.uk.** More information and data is also avail-  
able 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.

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