YBD868
Digital IC Tester

Operation Manual

PART 1
INTRODUCTION

1. Summary

YBD868 digital IC tester is an universal apparatus with high performance. The maximum pin number of DIP type IC that can be tested is 40 pins. The test range has covered most of ICs and the result is stable and reliable with an easy operation. The basic functions of the tester are as below:

* Devices PASS/FAIL test
* Device model no. identification
* Device dynamic burn-in
* Device substitution query

YBD868 digital IC tester uses advanced microprocessor and ICs produced by famous companies such as Intel, Motorola etc as main components. With supporting software and surrounding expansion system, this IC tester can completely simulate the comprehensive functions of tested IC. It covers nearly all digital ICs with fixed output and can be widely used in maintaining, testing all kinds of computers, industrial automate instruments, large medical instruments, numerical control machines, peripheral of microcomputers, SPC exchanges, digital instruments and apparatus, digital communication equipments, electronic relay protection equipments and other kinds of electronic products.

1) Complete Appliance and Accessories

a. YBD868 digital IC tester	1pc
b. Power cord	1pc
c. Operate manual	1pc
d. Guarantee card	1pc

2) Specifications
   a. Operating system: 16 key film keypad with dual tone announcing.
   b. Display system: 6 digit LED display shows the model no. of tested device and all kinds of function prompts;4 LED indicator show the working condition of the tester.
   c. Power supply voltage: 220V±10%, 50Hz
   d. Power consumption: 12VA
   e. Operating temperature: 0℃~+40℃
   f. Operating time: turn off for 5 minutes after one hour continuous running. For non-stop operating, please keep the supply voltage <230V, ambient temperature <25℃.
   g. Structure: Bench top, plastic chassis
   h. Dimension: 292x235x75 cm
   i. Weight: 2.0kg

3) Test Range

   YBD868 contains a library of over 2000 devices, including following series
      a)   TTL54 series
      b)   TTL55 series
      c)   TTL74 series
      d)   TTL75 series

e) CMOS14 series

f) CMOS40 series

g) CMOS45 series

h) Optocoupler series

i) LED display series

j) Universal RAM series

k) Universal SCM series

l) Microprocessor peripheral series

:

4) Function Summary

a) Devices PASS/FAIL test: When unaware of the device's functionality, you just need to enter the model no. of the device and insert the device into corresponding place of socket, and the tester would judge whether the device is functional.

b) Device model no. identification: When unaware of the devices model no., you just need to enter the pin number of the device and insert the device into corresponding place of socket, and the tester would judge the model no. of the device.

c) Device substitution query: Enter the model of the tested device, press' Substitution Query' key and you will find if there is any other device that has the same logic function.

d) Device dynamic burn-in: When unsure of the dynamic stability of tested device, you just need to enter the model of the device and insert the device into corresponding place of socket, press 'Dynamic Burn-in' and the tester will run dynamic burn-in and continuous test towards this device.

5) Maintenance

This tester should be kept out of wet, dust, direct sunlight, heating equipments and violent moving place. No hard press or knot of the power cord. Don't connect to the same power socket with temperature-controlled heating device, charged motor, or any other load over 2KW. The supply voltage should keep in 220V±10%, and regulated power supply is needed when necessary.

Water must be kept out of the tester. Once water gets in, cut off the power at once and overhaul the tester. Keep small things especially of metal away from the tester to avoid their dropping-in through the ventilation holes. The tester should not be placed at an ambient higher than 50℃

In order to extend the life of ZIF socket, be gentle when operating it. The pin of the tested IC shouldn't be hardly bended, and no piles of solder or copper cover on the pin.

PART 2
OPERATING INTRODUCTION

1. Self Test

The operating components of YBD 868 digital IC tester are showed as figure 1:

FAIL Indicator   PASS Indicator
Display   Ventilation Hole
40P ZIF Socket
                              Upper Cover   Power Switch
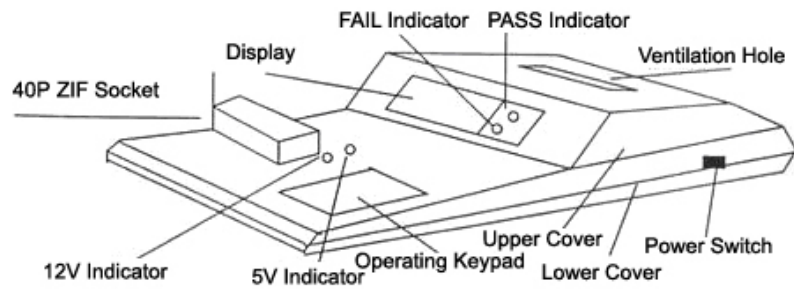12V Indicator   5V Indicator Operating Keypad Lower Cover

Figure 1

Access the power cord into the socket in the rear panel. Put the plug into power supply socket, turn on the power in the right part of the tester and the red indicator lights, which shows the power has run in.

After power on, the apparatus has the following response

* A treble sound prompts.

* 4 LED indicators turn on.

* One second later, the light of the display runs out and 3 of the indicators turn off, only the 5V Power indicator lights.

* The tester runs into the self-test status.

* If no problem happens during self-test, 2 treble sound prompt and the display shows: PLEASE

* If self-test not available, 2 bass sound prompt and the display shows: 1-value or 2-value.

NOTE: No IC is inserted to the ZIF socket when turn on the power.

2. Operating Introduction

Panel Introduction: including the keypad and the ZIF socket for the

tested device.

Display: Large-screen digital display

Status Indicator: 4 LED
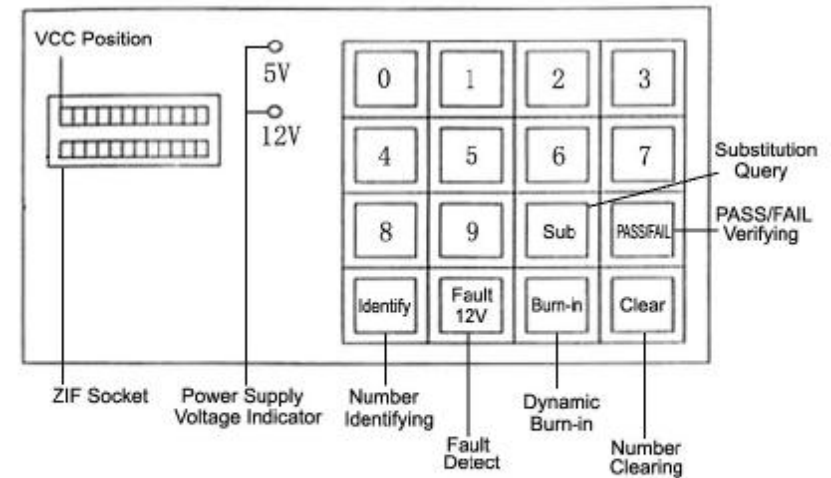
Figure 2

1) The functions of the keys on the panel are showed as figure 2.

  a) 0-9 are numeric keys which are used to entering the IC number or the number of pins.

  b) 'Substitution Query' is a function key. After at least 3 digits have been entered, this function would be available.

  c) "PASS/FAIL Verifying" is a function key. Once is a number entered, you should enter at least 3 digit of number to make the key available. If you press this key before entering any model, no., the device will be verified against the number already stored

internally. This function can be used to test some more devices with same model number. When turning on the power or reset the tester, the storage of the internal number will clear, and then the model number is 000.

d) 'Number Identifying' key is a function key. This key is available only if the tester is under the status of PLEASE, PASS, FAIL or 000000. It would become unavailable once any number is entered.

e) 'Fault Detect + 12V' key is a multi-function key. Pressing this key before entering any number will bring the tester into the status of Fault Detect. And if you press this key after entering at least 3 digits of numbers, the tester would automatically switch the power supply voltage to the tested device from +5V to +12V. The state of +12V will just be held for one test. Every time you a +12V is needed for testing devices, you should press this key.

f) 'Dynamic Burn-in' is a function key which only available after entering at least 3 digits of numbers. Even for the devices with same model, you should enter the model number every time. This is different from PASS/FAIL Verifying.

g) 'Number Clearing' is a operate key. Press this key and then you can re-enter the number of tested device. It's worth noting that, pressing this key only means the user is allowed to re-enter the model or do some other operation, instead of clear the stored number internal. For example, after entering 7400, you press this key, and the display will show 000000. But the tester still treat current model as 7400 and can test the performance of 7400.

There for, only after entering new numbers the internal storage will be changed.

3. Basic operation (7400 as an example)

NOTE: Only numeric information of model no. of the devices is needed when entering the numbers, manufacturer's prefixes and suffixes should be omitted. For example, only 7400 should be entered for all following ICs: N74LS00N, N74S00N, 74ALS00N, etc

1) Turn on the power: No IC or any other metal short-circuit wire inserted on the ZIF socket when turning on the power. Or the tester will consider the self-test fail; PLEASE is displayed when self-test runs okay.
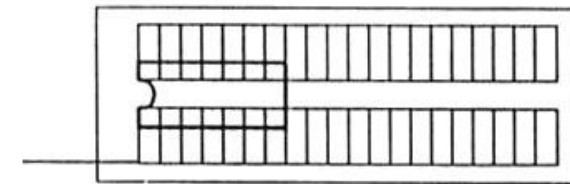
Figure 3

2) PASS/FAIL Verifying:
* Press 7,4,0,0, '7400' will be on the display.
* Confirm, and then insert the 74LS00 chips' nick of tested device align with the left of the ZIF socket and lock (as showed in Figure 3).
* Press 'PASS/FAIL Verifying' key.
  a) If the display shows PASS, and at the same time a treble sound occurs with the green LED indicator turns on, it means the logic function of the device is in good condition.
  b) If the display shows FAIL, and at the same time a bass sound

occurs with the red LED indicator turns on, it means the function of the device is unavailable.

* It may take a long time to test large storage capacity RAM.

3) Device Dynamic Burn-in

* Press 7,4,0,0, '7400' will be on the display.

* Insert 74LS00 into ZIF socket and lock, then press 'Dynamic Burn-in'. The tester will start dynamic burn-in and continuous test the 74LS00 in the ZIF socket immediately. At this time, the keyboard is unavailable and the burn-in length would be on user's decision. If the user wants to quit the state of Dynamic Burn-in, he only needs to unlock the ZIF socket. With this operation, the tester would show FAIL, and the keyboard become available,

* When in the state of Dynamic Burn-in, user can heat the tested device with external heating source (say, electric iron), to observe the temperature characteristic of the tested device.

* You have to enter model number every time when changing the devices even with the same number for burn-in.

4) Device Number Identifying:

* Insert the 74LS00 into ZIF socket and lock, and press 'Number Identifying' key, the display shows P, asking the user to enter the number of pins of the tested device. For example, if the device has 14 pins, you can press '14', and the display shows 'P14'.

* Press 'Number Identifying' key.

    a) If the tested device is functional, and its model is in the library of the tester, the display will directly show the model number of the tested device (say, 7400), and green LED turns on, with a treble sound prompt.

    b) If the tested device has been broken, or the model is not in the library of the tester, the tester will display OEE with a bass sound prompt. When running Number Identifying, the entered numbers of pins should be in double digits. For example, if the numbers of pins is eight, you have to enter 08. You can enter the number continuously. For example, you can enter 16 right after entering 15. But be attention, the tester doesn't accept the entering numbers begin with 5 or above.

    c) If the tested device is EPROM or EEPROM, the tester cannot perform Number Identifying.

5) Device Substitution Query

* Enter the model of original device,say,'7400', then press 'Substitution Query'.

    a) If there is substituted model in the library, the display would show the model number, say, 7403. The model number will change every time you press 'Substitution Query' until all the models have been shown up and display shows NODVCE.

    b) If there is no substituted model in the storage, the display shows NODVCE.

    c) NOTE: The tester considers the devices with the same logical function and the same input output pin array to be the devices that can be substituted. With no other detailed parameters, the substitution should be used with caution.

4. Special Operation

1) When running PASS/FAIL Verifying and Dynamic Burn-in, after the first time you press 'PASS/FAIL Verifying' or 'Dynamic Burn-in' key, there might be 3 special situations as below:

    a) The display shows '1-2' with a long treble sound prompt, which

means the user should align the first pin of tested device with the second pin of the ZIF socket and insert the tested device into ZIF socket and lock. Then the user can press 'PASS/FAIL Verifying' or 'Dynamic Burn-in' key again. For example: To test the performance of LM324, press 3-2-4, and the display shows 324, then press 'PASS/FAIL Identifying' or 'Dynamic Burn-in' key and the display would show 1-2 with a long treble sound prompt.. align the first pin of tested device with the second pin of the ZIF socket and insert the tested device into ZIF socket and lock well, then press 'PASS/FAIL Verifying' or 'Dynamic Burn-in' key again. See Figure 4.
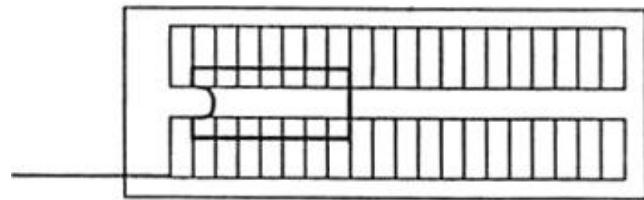
Figure 4

b) The display showing VCC-numbers with a long treble sound prompt means the tested device is a special VCC pin devices. The position of the VCC pin is the number the display shows. At this time the user should align the first pin of tested device with the second pin of the ZIF socket and insert the tested device into ZIF socket and lock. Then connect the VCC to the pin number of the device the display shows with a jumping wire as shown in figure 5. Press 'PASS/FAIL Verifying' or 'Dynamic Burn-in' key again.

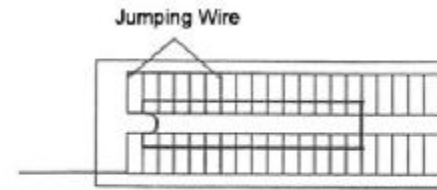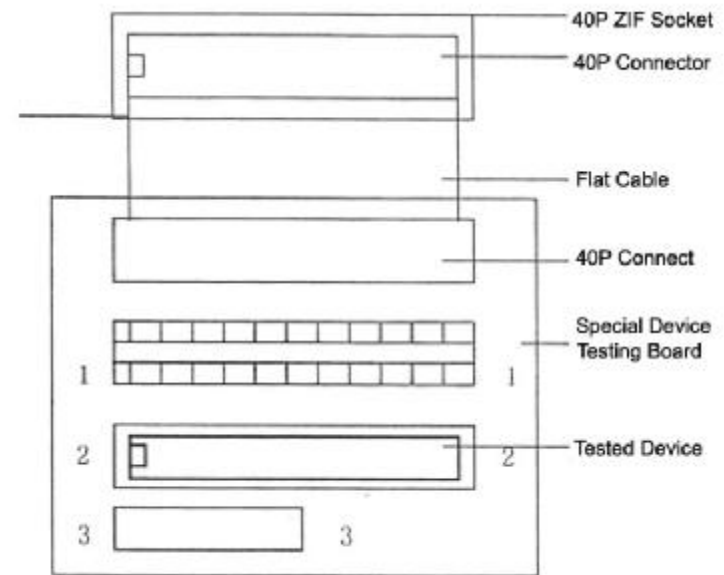Fegure 5 Illustration of placing device in case 'VCC-24' is shown

Figure 6

c) Display shows OU-number with a long treble sound prompt, means the tested device should be inserted into 'Special Device Testing Board'. At this time, user should connect 'Special Device Testing Board' to 40 pins ZIF socket and insert the tested device into the corresponding socket shown in the display. Then press

'PASS/FAIL Identifying' or 'Dynamic Burn-in' key again.

For example, to test PASS/FAIL of 8255, when display shows OU-1 with a long treble sound prompts, connect 'Special Device Testing Board' to 40 pins ZIF socket and put the tested device into the second socket in the Special Device Testing Board(as shown in Figure 6), then press 'PASS/FAIL Verifying' or 'Dynamic Burn-in' key again.

For the above 3 special situations, the tester prompts only once for each. You can press 'PASS/FAIL Verifying' key directly when testing several devices with same model number.

d) When running PASS/FAIL Verifying or Dynamic Burn-in, the supplied voltage for tested device is 5V. If you want to test in 12V, press 'Fault Detect + 12V' key after entering the model number. Then press 'PASS/FAIL Verifying' or 'Dynamic Burn-in' key, and the tester will test or burn-in the device with +12V. But this is available only once. You still have to repeat the procedure of 'Enter model number'—'Press Fault Detect +12V key'—' Press PASS/FAIL Verifying key' every time you change the tested device. For devices that can be tested in +12V only, the tester will turn the voltage into +12V automatically. For devices that can be tested in +5V only, the tester fixes on the voltage of +5V and will not accept +12V even the user choose +12V.

5. Caution:

1) Please refer to chapter 'Maintenance' when operating the tester.
2) When turn on the power, there should be no IC or any other short-circuited wire on the ZIF socket. Otherwise the tester would judge self-test fail.

3) Ignore the letter or any other symbol when entering the model number. For example, for model number 74LS123, only 74123 need to be entered; for 4N30, only 430 is needed; TLP521-4, entering 5214 is okay. For some kinds of reasons, the models of some devices which need to be entered would be different from their actual model. For example, for MC14013 you should enter 4013; for MC14510 you should enter 4510.For more details you can read the list of the measurable devices.

4) Number Clearing: when the user notices that he has entered a wrong model number, press 'Number Clearing' key, the display would show 000000, the user can re-enter the model or do some other operations. When the user run the tester into Number Identifying state, only after entering a two digit numbers of pins and press 'model cancel' twice continuously, the tester can quit the state of Number Identifying.

5) When in the state of Number Identifying, if the model number of the tested device has been confirmed, the number is only used for showing on the display and has not been saved into the storage of the tester. If the user wants to perform PASS/FAIL Verifying or Dynamic Burn-in, he still needs to enter the model number through keyboard again.

6) If the user wants to test devices with the same model number, he only needs to enter the model number once and press 'PASS/FAIL Verifying' every time he changes the devices.

7) If the display shows OEE with a bass sound prompt after entering the model and pressing 'PASS/FAIL Verifying' key, it means the device is not in the library of tester.

8) Generally speaking, if all devices are tested faulty when testing batch devices, it is most probably because of poor contact of the ZIF socket or malfunction of the tester.

9) When operating with keyboard, a treble sound responded by the tester shows validity of your operation. A bass sound shows invalidity and misoperation. No misoperation would damage the tester.

10) When place the tested device, please pay attention to the direction the pins align, or misjudge would occur. This situation won't do harm to tested device generally but there is still possibility of damage to the device. None of above situations may damage the tester.

11) Please wait for more than 5 seconds before restarting after the tester is turned off. Or the tester may be unable to reset.

12) The nick of the IC should align the left side of the ZIF socket.

6. Fault Detect

Turn on the power

1) There is no any response of the tester and the indicator doesn't turn on. This means there is something wrong with the power input. Say, broken power cord, power failure, broken power switch or any other reasons.

2) The display shows irregularly with no any sound prompt. It means the main system is not working. The failure might be: It's less than 5 seconds after the tester has been turned off and has not reset yet.

3) There is sound prompt but fail when self-test. The failure might be:
   a) IC or any other short-circuited wire is on the ZIF socket.
   b) Press 'Fault Detect' key and the display shows AUCHP--, press '6' and the display and LED all turn on. Or else it means there is some problem with the display system.

4. When performing the PASS/FAIL Verifying, the result is not stable.
   a) Poor contact of the tested device. Check and insert it into the ZIF socket again then lock.
   b) Poor stability of the tested device.

If any other problem besides the above mentioned ones occurs, please contact our company or the dealer. Free service can be provided by our company in the warranty period.

PART 3
LIST OF MEASURABLE COMPONENTS

1. CMOS40 Series

4000	4001	4002	4006	4007	4008	4009
4009	4010	4011	4012	4013	4014	4016
4017	4018	4019	4020	4021	4022	4023
4024	4025	4026	4027	4028	4029	4030
4032	4033	4034	4035	4038	4040	4041
4042	4043	4044	4047	4048	4049	4050
4051	4052	4053	4054	4055	4056	4060
4061	4063	4066	4067	4068	4069	4070
4071	4072	4073	4075	4076	4077	4078
4081	4082	4085	4086	4089	4093	4094
4095	4096	4097	4098	4099	40101	40102
40103	40106	40107	40109	40110	40147	40160
40161	40162	40163	40174	40175	40192	40193
40194	40195					

2. CMOS MC140 Series

For MC140 Series, enter the numbers corresponding to that of 40 series. For example, MC14013 is regarded as 4013, MC140195 as 40195, etc.

3. CMOS45 Series

4501	4502	4503	4504	4506	4508	4510
4511	4512	4513	4514	4515	4516	4518
4519	4520	4522	4526	4527	4528	4529
4530	4531	4532	4537	4538	4539	4541
4543	4544	4547	4551	4555	4556	4558
4559	4560	4561	4572	4581	4582	4584
4585	4599					

4. CMOS MC Series

For MC145 series, please refer to MC140 series, that is MC14510 is regarded as 4510.

5. Optocoupler Series

507	5072	5073	617	627	637	521-1
521-2	521-3	521-4	621	622	624	36
817	827	837	847	810	812	818
504	880	885	066	074	829	504
614	714	509	519	532	632	503
613	713	508	531	027	034	836
212	825	830	831	836	026	210
111	112	113	114	115	116	117

118	723	5121	270	271	272	273
274	275	276	277	017	075	703
631	535	068	815	835	845	618
551	505	515	570	715	716	890
850	855	860	865	230	231	255
119	571	4N25	4N26	4N27	4N28	4N35
4N36	4N37	4N29	4N30	4N31	4N32	4N33
4N38						

6. TTL74\54 Series

74/5400	74/5401	74/5402	74/5403	74/5404	74/5405	74/5406
74/5407	74/5408	74/5409	74/5410	74/5411	74/5412	74/5413
74/5414	74/5415	74/5416	74/5417	74/5418	74/5419	74/5420
74/5421	74/5422	74/5423	74/5424	74/5425	74/5426	74/5427
74/5428	74/5430	74/5431	74/5432	74/5433	74/5434	74/5435
74/5437	74/5438	74/5439	74/5440	74/5441	74/5442	74/5443
74/5444	74/5445	74/5446	74/5447	74/5448	74/5449	74/5450
74/5451	74/5453	74/5454	74/5455	74/5460	74/5463	74/5464
74/5465	74/5468	74/5469	74/5470	74/5472	74/5473	74/5474
74/5475	74/5476	74/5477	74/5478	74/5480	74/5436	74/5458
74/5482	74/5483	74/5485	74/5486	74/5489	74/5490	74/5491
74/5492	74/5493	74/5494	74/5495	74/5496	74/54100	74/54104
74/54105	74/54107	74/54109	74/54110	74/54111	74/54112	74/54113
74/54114	74/54116	74/54121	74/54122	74/54123	74/54125	74/54126
74/54128	74/54131	74/54132	74/54133	74/54134	74/54135	74/54136
74/54137	74/54138	74/54139	74/54140	74/54141	74/54142	74/54145
74/54147	74/54148	74/54150	74/54151	74/54152	74/54153	74/54154
74/54155	74/54156	74/54157	74/54158	74/54159	74/54160	74/54161
74/54162	74/54163	74/54164	74/54165	74/54166	74/54167	74/54168

74/54169	74/54170	74/54173	74/54174	74/54175	74/54176	74/54177
74/54178	74/54179	74/54180	74/54181	74/54182	74/54183	74/54184
74/54185	74/54189	74/54190	74/54191	74/54192	74/54193	74/54194
74/54195	74/54196	74/54197	74/54198	74/584199	74/54230	74/54231
74/54237	74/54238	74/54240	74/54241	74/54242	74/54243	74/54244
74/54245	74/54246	74/54247	74/54248	74/54249	74/54251	74/54253
74/54255	74/54256	74/54257	74/54258	74/54259	74/54260	74/54261
74/54265	74/54266	74/54273	74/54274	74/54276	74/54278	74/54279
74/54280	74/54283	74/54284	74/54285	74/54289	74/54290	74/54293
74/54295	74/54298	74/54299	74/54319	74/54322	74/54323	74/54347
74/54348	74/54350	74/54351	74/54352	74/54353	74/54354	74/54356
74/54363	74/54364	74/54365	74/54366	74/54367	74/54368	74/54373
74/54374	74/54375	74/54376	74/54377	74/54378	74/54379	74/54381
74/54382	74/54386	74/54388	74/54390	74/54393	74/54395	74/54396
74/54398	74/54399	74/54425	74/54426	74/54440	74/54441	74/54442
74/54443	74/54444	74/54447	74/54465	74/54466	745/4467	74/54468
74/54490	74/54518	74/54519	74/54520	74/54521	745/4522	74/54533
74/54534	74/54537	74/54538	74/54539	74/54540	74/54541	74/54543
74/54544	74/54545	74/54563	74/54564	74/54568	74/54569	74/54573
74/54574	74/54575	74/54576	74/54577	74/54580	74/54588	74/54589
74/54590	74/54594	74/54597	74/54604	74/54605	74/54620	74/54621
74/54622	74/54623	74/54639	74/54640	74/54641	74/54642	74/54644
74/54645	74/54646	74/54647	74/54648	74/54651	74/54652	74/54653
74/54654	74/54655	74/54656	74/54657	74/54658	74/54659	74/54664
74/54665	74/54668	74/54669	74/54670	74/54674	74/54675	74/54676
74/54677	74/54678	74/54679	74/54680	74/54700	74/54730	74/54731
74/54734	74/54795	74/54796	074/54797	74/54798	74/54804	74/54805
74/54821	74/54822	74/54823	74/54824	74/54825	74/54826	74/54841
74/54842	74/54843	74/54844	74/54845	74/54846	74/54990	74/54991
74/54992	745/4993	74/54994	74/54995	74/54996		

7. TT75/55 Series

75/55113	75/55121	75/55122	75/55123	75/55124	75/55125	75/55127
128	129	136	138	151	153	158
159	160	172	173	174	175	176
177	178	183	189	270	401	402
403	404	411	412	413	414	416
417	418	419	430	431	432	433
434	437	446	447	448	449	450
451	452	453	454	470	471	472
473	474	497	498			

8. LED Display Series

0.5 Common Anode (001)   Common cathode (002)
0.3 Common Anode (003)   Common cathode (004)
0.7 Common Anode (005)   Common cathode (006)

9. Universal RAM Series

2114   2016   6116   6264   62256

10. Microprocessor Peripheral Series

8155	8156	8255	8253	8259	8212	8282
8283	8216	8816	8243	8226	8205	8286
8287	6820	6821	6880	6888	6887	6889
6810	6520	8254	8279	6840	Z80CTC(802)	

11. Universal SCM Series

8031　　8032　　8051　　8052　　8048　　8039　　8035

8049　　8751

12. Others

2002　　2003　　2004　　3486　　3487　　2631　　2632

2633　　1831　　1908　　339　　393　　555　　556

324　　22100　　2802　　2803　　2804　　2902(324)　　8T26(826)

MC1413(2003)　　　MC1416(2004)　　　MC14160(40106)

MC14161(40161)　　　MC14162(40162)　　　MC14163(40163)

MC14189(75189)