Reliability testing of semiconductor devices

RF Burn-In Testing System

Tamagawa Electronics co.,ltd.

Characteristics

•Reliability testing for high-frequency FET

•6 testing patterns

•Programmable control and measurement by using PC

•Configurable with 4, 8, 12, 16, 20, 24 channels. Expandable up to 24 channels

•RF burn-in testing using both of DC voltage and RF signal

•Configurable with gate voltage and drain voltage

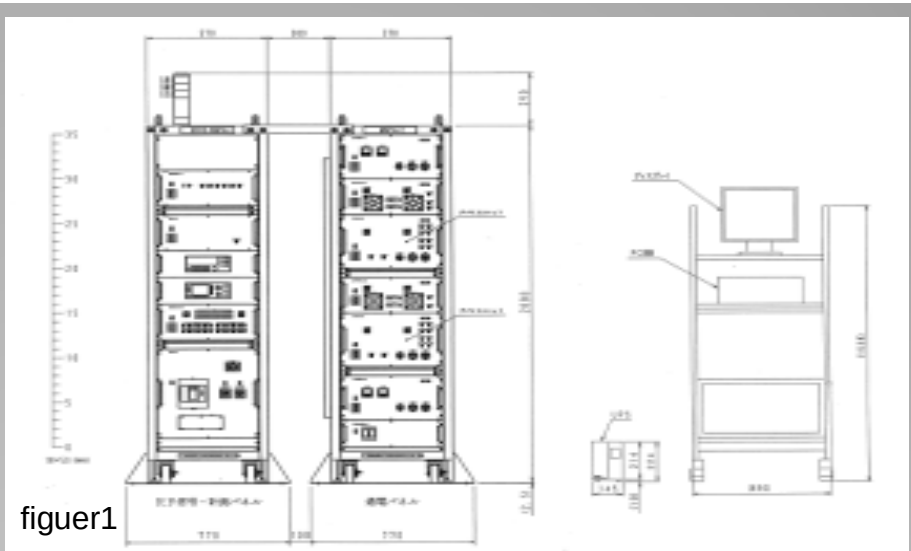
•Tests devices at a maximum temperatures of 250 degrees C

•Automated output of burn-in testing data (temperature, voltage, current, power) to PC (excel formatted files)

•Multiple alarm features

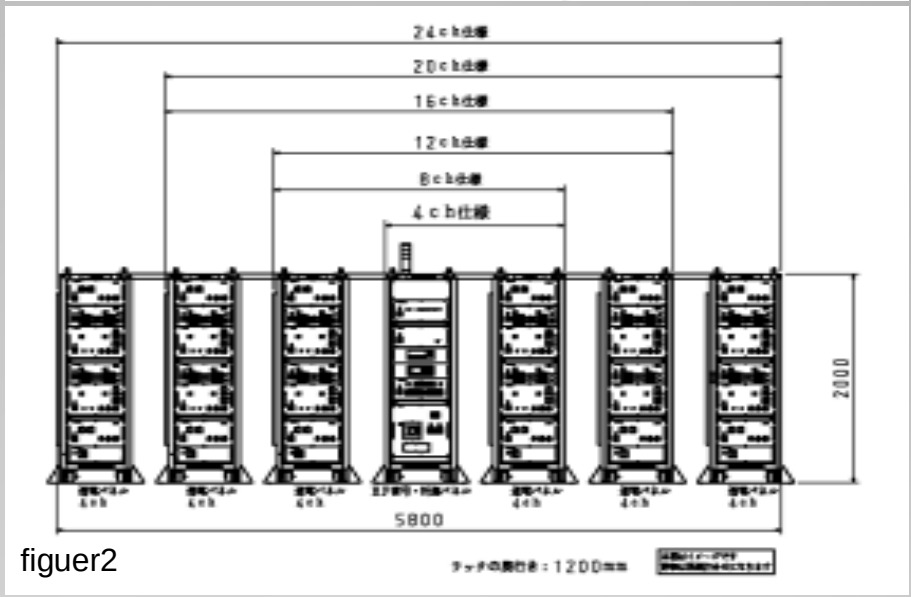
- Outdrawing

·Example:(figure1)
4ch Configuration



figuer1

·Example:(figure2)
24ch Configuration



figuer2

• Product specifications

No	Items		Specifications	Recitals
1	Number of CH		4～24ch	Expandable per ever 4 units
2	Temperatu-re control	Testing tempreture range	+40℃～+250℃	
3		Resolution	0.1℃	
4		Temperature control torelence	±2℃ Max.	
5		Temperature rise period	45分 Max.	(+40℃→+250℃)
6		Tempreture drop period	45分 Max.	(+250℃→40℃)
7		Configurable unit	Per channel	
8	DC power	Gate power supply	0～-17V/0.5A	
9		Drain power supply	0～+60V/6A	
10		Configurable unit	Per channel	
11		Protection function	Current alarm	
12	RF signal	Frequency range	1～10GHz	Assign the desirable frequency
13		Max. power input	50W(1～3GHz) 25W(3～7GHz) 10W(7～10GHz)	Assign the desiable value
14		Input power variable range	25dB	
15		Input power tolerance	±0.5dB Max.	
16		Max. Power output	200W	
17		Configurable unit	Per channel	
18	Monitoring features		Temperature monitor	
19			Voltage monitor	
20			Current monitor	
21			Input power monitor	
22			Output power monitor	
23			Gain monitor	
24	Size	Per rack	width ：570mm depth ：1200mm height：2000mm	
25	Weight	RF signal･measurement rackl	250kg	
		Power indicator rack	490kg	

No	Items	Specifications	Recitals
26	Testing contents	DC burn-in RF burn-in DC burn-in/sweep test RF burn-in/sweep test DC sweep test (stand-alone) RF sweep test (stand-alone)	
27	Temperature ・ Voltage ・ Current ・ Power measurement	Programmable with 2 steps, 2 minutes intervals (Min.)	
28	Monitoring data display	Numerical display Graphical display Previous data display	
29	Testing time	1～10000 hours	

・jig

Retrieve the chassis

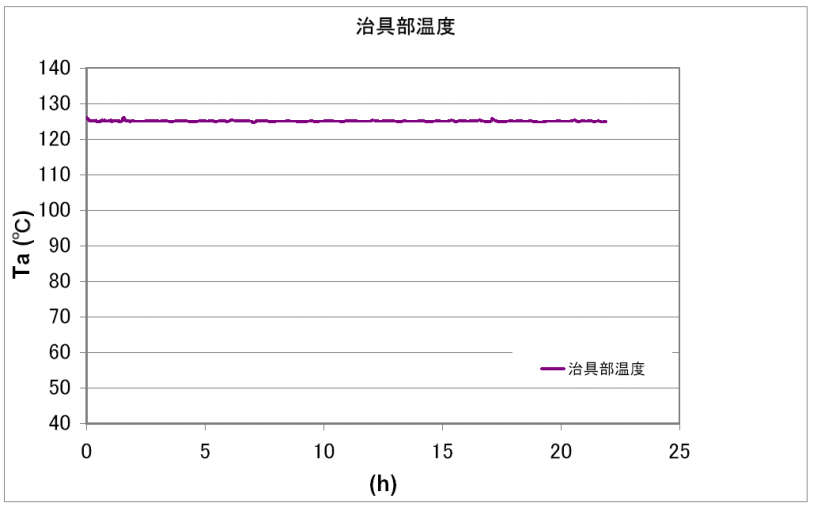
Detach the insulator

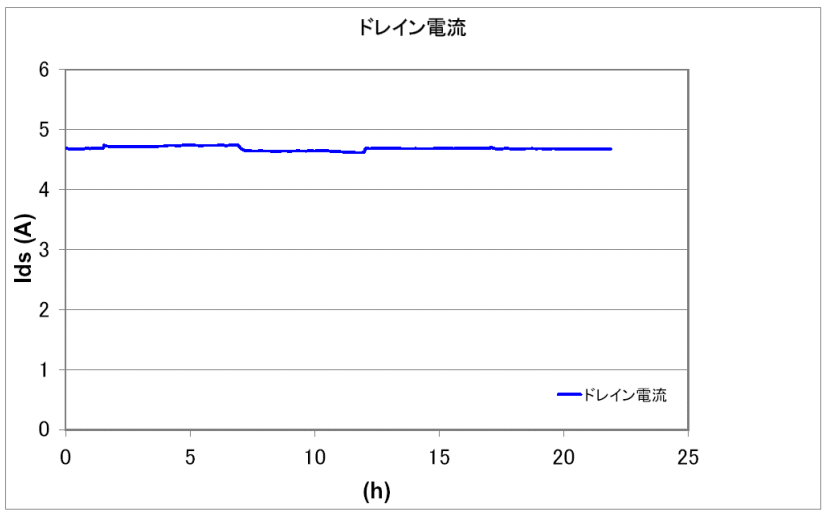
- Testing items

  • RF burn-in • RF sweeping test • Stand-alone RF sweeping test
  • DC burn-in • DC sweeping test • Stand-alone DC sweeping test

- Reference of measured data examples:

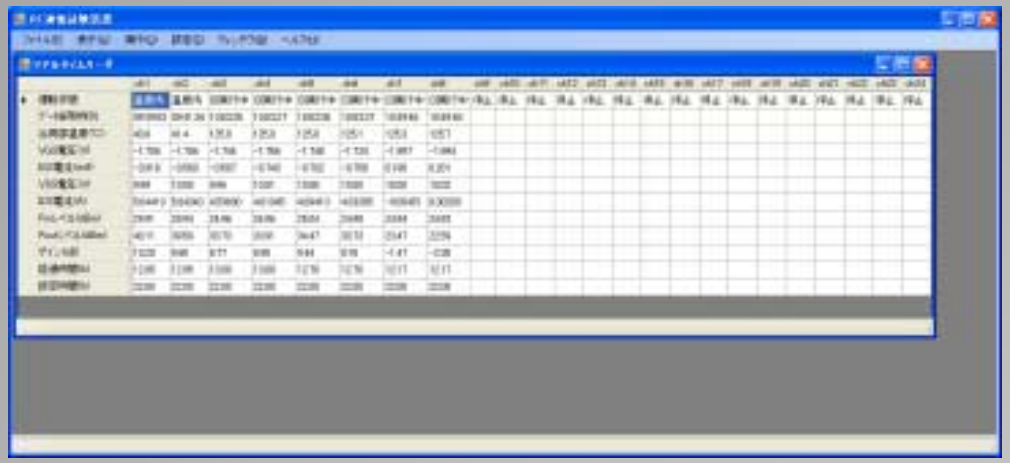
(Surface temperature of jig)





- Screens of software (reference examples)

Burn-In Testing



Operation mode

burn-in parameters entry

sweep parameters entry

- Alarm features

No	Alarm class	Action taken when alarm is activated
1	Blackout	Automatic shutdown
2	Electric leakage	Automatic shutdown
3	Overcurrent	Automatic shutdown
4	Emergency stop button	Automatic shutdown
5	RF signal alarm	Automatic shutdown
6	RF Amp alarm	Abort the testing on the channel
7	Temperature error 1st alarm	Abort the testing on the channel
8	Temperature error 2nd alarm	Automatic shutdown
9	Bias voltage alarm	Abort the testing on the channel
10	Bias current alarm	Abort the testing on the channel

- Recital

• Safety interlock for protection against electrical shock while swapping FET
• Safety design for burn prevention with the lid on device's surface under testing at a temperatures of 250 degrees C