Micro Signal Type Tester

Ⅰ. TH500 Series PIV test system for power semiconductor devices

Features

- Provide fixed static bias point for narrow pulse dynamic IV measurement, satisfying quasi-isothermal test conditions.
- Realize quantitative measurement and data calculation of device parasitic effects.
- Minimum pulse width as low as 200ns
- Has internal and external synchronization capabilities.
- Pulse timing setting and time domain waveform recording.
- Instruments can be connected with socket & semi-automatic probe station for packaging and wafer-level chip testing.

USB TMC	LAN
standard	standard

TH500 Series

Dimension TH500-2530M：220mm(W)x86mm(H)x378mm(D)
Dimension TH500-2530D：144mm(W)x62mm(H)x191mm(D)
Dimension TH500-2530G：144mm(W)x62mm(H)x191mm(D)
Weight TH500-2530M：3kg
Weight TH500-2530D：1kg
Weight TH500-2530G：1kg

Applications

- This equipment is mainly used for static characteristics and reliability testing of high-voltage power devices. Under a certain bias, a high-voltage pulse signal (Pulse-IV) is provided to the device under test, and then the fast switching process of the device is simulated to test the performance change of the device during operation.

Specifications

1. Gate probe parameters

a) Working Parameter

Working condition		TH500-2530G	
Parameter	Condition	MIN	MAX
Programmable voltage range	static, pulse	-25V	+25V
Pulse amplitude	Programmable maximum and minimum difference		30V
Pulse current	Output or input maximum effective value	-1A	+1A
DC/RMS current		-300mA	+300mA
Pulse power	Output or input		10W
DC Power	Output		3W
	Input		0.5W
Output DC Impedance	1A,10mA Range	14.5Ω±2%	
	100uA Range	210Ω±2%	
Output capacitance		20pF	
Probe to ground impedance	Max 1W	100Ω	

b) Pulse parameter

Working condition		TH500-2530G	
Parameter	Condition	MIN	MAX
Duty cycle	Any level under power-limited conditions	0%	100%
Frequency	Maximum Switching Voltage		500kHz
Pulse Width	Minimum pulse width when speed = FAST	200ns	
Rise Time	Speed = FAST, no load, 10% to 90%	33ns（typical value）	
Fall time	Speed = FAST, no load, 90% to 10%	32ns（typical value）	

c) Output voltage parameter

Working condition		TH500-2530G
Parameter	Condition	typical value
Programmable resolution	16位	0.8mV
Absolute accuracy	No load, one year	10mV+0.1%
Noise	00.1Hz-10kHz, no load, peak noise	0.6mV
	0.1Hz-5MHz, no load, peak noise	3mV
Pulse edge voltage tolerance	Speed=FAST	70mV
	Speed=MEDIUM	30mV
	Speed=SLOW	15mV

d) Measurement parameter

Working condition		TH500-2530G			
Parameter	Condition	Voltage range	Current range		
		25V	1A	10mA	100μA
ADC Resolution	16 Digit	880uV	35μA	0.35μA	4.8nA
Setting time	to 99.9%	250ns	300ns	350ns	4μs/400μs
	to 99.99%	400ns	550ns	700ns	-
Recovery delay				0.6μs	1μs
Bandwidth	-3dB	14MHz	14MHz	6MHz	1.3MHz
Absolute Accuracy	Offset+gain	2.5mV+0.07%	200μA+0.07%	15μA+0.08%	0.6μA+0.1%
Noise	Single sampling	±3.5mV	±140μA	±10μA	±1μA
	128 average	±0.3mV	±14μA	±1μA	±0.1μA

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2. Drain Probe Specifications

a) Working Parameter

Working condition		TH500-2530D	
Parameter	Condition	MIN	MAX
Programmable voltage range	static, pulse	0V	+250V
Pulse current	Probe working range		+33A
Pulse storage capacitor		1000uF	
DC/RMS current	Probe working range		+5A
Pulse power	Probe working range		3000W
DC Power	Probe working range		100W
Output Impedance	00.3A Range&Current< 0.7A	2Ω	
	30A, 3A, 0.3A Range & Current> 0.7A	0.4Ω	
Probe to ground impedance	Max 1W	100Ω	
Remote measurement work area	Maximum DC drop of power cord	-0.8V	+0.8V

b) Pulse parameter

Working condition		TH500-2530D	
Parameter	Condition	MIN	MAX
Duty cycle	Any value within the power range	0%	100%
Frequency	At 250V switch, selects fast speed		50kHz
	At 250V switch, selects slow speed		10kHz
	Absolute Value		500kHz
Pulse Width	Minimum pulse width when speed = FAST	200ns	
Rise Time	Speed = FAST, no load, 10% to 90%	20ns (typical value)	
Fall time	Speed = FAST, no load, 90% to 10%	22ns (typical value)	

c) Output voltage parameter

Working condition		TH500-2530D	
Parameter	Condition	MIN	MAX
Programmable resolution	18 Digit DAC	1mV	
Small step settling time	Positive 10V step	3ms to 30ms	
	Negative 10V step (low voltage drop circuit prohibited)	3ms to 20ms	
	Negative 10V step (used in low voltage drop circuit)	50ms to 80ms	
Full scale setting time	0 to 250V	325ms	
	250V to 0V (low voltage drop circuit prohibited)	200ms	
	250V to 0V(low voltage drop circuit prohibited)	250ms	
Voltage drop of pulse output	Low voltage drop circuit prohibited, 10A current 50μs pulse width	-750mV	-700mV

d) Measurement parameter

Working condition		TH500-2530D				
Parameter	Condition	Voltage range		Current range		
		250V	5V	30A	3A	300mA
ADC Resolution	16 bits	4.7mV	90μV	590μA	58μA	5.5μA
Setting time	to 99.9%	200ns	300ns	250ns	350ns	250ns
	to 99.99%	300ns	500ns	500ns	600ns	700ns
Recovery delay			0.5μs		0.5μs	0.5μs
Bandwidth	-3dB	14MHz	7MHz /4MHz	10MHz	7MHz	10MHz
Absolute Accuracy	offset + gain	20mV +0.1%	0.7mV +0.1%	5mA +0.3%	2.5mA +0.2%	0.1mA +0.1%

e) Internal protection circuit

Working condition		TH500-2530G
Parameter	Condition	Value
Range Threshold		1A / 33A
Threshold resolution		14 bits, 2.3mA
Threshold Setting Accuracy	Bias + Current Accuracy	100mA + 0.5%