Operating Characteristics

Operating Characteristics are specified with the Measurement/Storage Module installed on an Agilent 54600–Series Oscilloscope.

Measurements

Voltage	Vamp, Vavg, Vrms, Vpp, Vpre, Vovr, Vtop, Vbase, Vmin & Vmax	
Time	Delay, Duty Cycle, Frequency, Period, Phase Angle, Rise Time, Fall Time, +Width, & -Width	
Thresholds	User-selectable among, 10%/90%, 20%/80% or voltage levels	
Cursor Readout	Voltage, time, percentage, and phase angle.	
Waveform Math Functions	Addition, subtraction, multiplication, differentiation, integration, and FFT.	
Fast Fourier Transforms		
Test Region	Each pixel is selectable to be tested or not.	
Inputs	On either ch1, ch2, or F1	
Freq Cursor Resolution	From 1.22 mHz (milliHz) to 9.766 MHz (1.22 mHz to 48.828 MHz for 54615/54616)	
Points	Fixed at 1024 for all models except 54615/54616 Fixed at 1024 for 54615/54616 with vectors off Fixed at 512 for 54615/54616 with vectors on	
Peak Find:	Find Peak automatically snaps cursor to the two largest peaks located anywhere in the displayed frequency span. Measurement information is automatically displayed at the bottom of the screen together with the difference in frequency between the two selected peaks.	
Variable Sensitivity and Offset	Sensitivity and vertical offset (position) are controlled from the front panel to display an optimum view of the spectrum. Sensitivity is calibrated in dB per divisions; vertical offset is calibrated in dBV.	
Time Record Length	10x main sweep speed.	
Horizontal Magnification and Center Frequency Control	As the frequency span is changed, the display is magnified about center frequency so that you get a closer view.	

Reference Information Operating Characteristics

Selectable Four windows are selectable: Hanning, for best frequency resolution and general purpose use; flattop, for best amplitude accuracy; rectangular, for single-shot signals such as transients and signals where there are an integral number of cycles in the time record, and exponential for best transient analysis.

Window

Characteristics

	Window	Highest Side Lobe (dB)	3dB Bandwidth(b ins)	6dB Bandwidth(b ins)	Scallop Loss (dB)
	Rectangular Hanning Flattop	-13 -32 -70	0.89 1.44 3.38	1.21 2.00 4.17	3.92 1.42 0.005
FFT Freq Range	dc to 100 MHz (54600 dc to 150 MHz (54602 dc to 60 MHz (54603) dc to 500 MHz (54610)/54601/54645) 2))/54615/54616)			
Freq Span Control	This control allows y When the Span is ac center frequency as 3-1 for the limits of th	rou to specify tl ljusted the disp set by the Cen ne Frequency S	he frequency s Ilay will expan ter Frequency Span control.	pan of the FFT d or contract a control. Refer	display. bout the to Figure
Center Freq Control	This control allows y display. When the F expand or contract a Refer to Figure 3-1 fo	rou to specify th requency Span about the frequ or the limits of t	he frequency a n is changed, th ency at the ce his control.	It the center of The FFT display Inter of the disp	the FFT will olay.
Move 0 Hz to Left	Pressing this soft ke of the display will be	y will move the OHz.	FFT display so	that the left h	and edge
FFT Vector display	When the time doma displayed in vector o turned off by pressin	in display is tu Irawing mode. Ig the Channel	rned off the FF The time dom # key twice	T display will b ain display can	ie i be
Display	FFT vertical units in a	dB.			
Units/Div	This control allows y a 1-2-5 sequence fro	rou to adjust the om 1 dB/div to 5	e vertical scali 0 dB/div.	ng of the FFT d	isplay in
Reference Level	This control allows a across a range of 40 decreasing to 0 dBV dB/div, decreasing to	djustment of th 0 dBV. The mir at 50 dBV/div. o 204 dB at 1 dB	ne reference le nimum setting The maximum 3V/div.	evel of the FFT is -196 dB at 1 setting is 400	display dBV/div dBV at 50
Programmability	All front-panel contr or RS-232 (54658A ar	ols are fully pro 1d 54659B)	ogrammable ov	ver GPIB (5465)	7A)



FFT Operation Frequency Span and Effective Sampling Rate vs Sweep Speed

3-5

Reference Information Operating Characteristics

Mask Template Testing	
2, nonvolatile	
Automask generates a mask from waveform data with variable tolerances.	
Mask editor allows pixel-by-pixel editing and line drawing editing. Smooth mask function performs a running average of 3 pixels.	
Each pixel is selectable to be tested or not	
Inside-signal fails if it falls inside the region bounded by the maximum and minimum limit lines.	
Outside-signal fails if it falls outside the region bounded by the maximum and minimum limit lines.	
Failure zone indicator shows where the signal fails the mask template.	
Failure modes are stop or continue on failure. Failure(s) can be saved to trace memory or printed	

Trace Memory (all nonvolatile)

1 through 3	High-speed storage without compression.
4 through 100	Storage with compression, number of traces is a function of complexity. Storage time is less than 10 seconds.

Real Time Clock	
Can be set from front panel.	24-hour format with battery back-up.

Hardcopy Output	
Printer/Plotter Supported	HP ThinkJet, HP QuietJet, HP PaintJet, HP DeskJet, and HP LaserJet printer. HP-GL compatible plotters.
54658A and 54659B only	Epson FX-80 or compatible printer.

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RS-232 Configurations	
Connector Type	With the adapter cable connected, at the end of the cable is a 9 pin/25 pin DTE port; a printer cable is required to connect it to hardcopy devices or a computer.
Protocols	XON/XOFF, hardware.
Data Bits	8
Stop Bits	1
Parity:	none.
Baud Rates	1200, 2400, 9600, 19200.

Programmability

All instrument settings and operating modes may be remotely programmed via RS-232 and GPIB (IEEE-488).