

# Electrical Characterization

Drawing on years of experience in electrical testing of test vehicles for volatile and non-volatile memory technologies, logic and thin-film transistor applications, we offer comprehensive offerings for electrical characterization.

TECHNOLOGY	LEVEL	MEASUREMENT	DESCRIPTION	COMMENT	PRICE / SAMPLE, \$	
DRAM	1	IV	Leakage vs. voltage		\$695.00	
		CVf	Capacitance vs. voltage and/or frequency	Frequency range: 20Hz ~ 1MHz	\$695.00	
	2	VBD	Breakdown voltage		\$695.00	
		TDDDB	Time dependent dielectric breakdown	Down to 50ms resolution (5ns with high speed sampling)	\$695.00	
	3	IV vs. Temp	IV at different temperatures	Temperature range: -50C to 200C or RT to 300C	\$771.00	
		IPE	Photocurrent vs. wavelength	Measurement range: 1eV ~4.25eV	\$1,927.00	
ReRAM	1	DC forming/ switching	DC voltage or current controlled forming and switching		\$1,851.00	
		PIV forming/ switching	Pulsed voltage forming and switching			
	2	Program and verify	PIV switching with read verification			
	3	Endurance	Burst SET/RESET pulses with PIV sweeps every decade			
Retention		Memory state vs. time (RT or elevated temperature)				
OTS Selector	1	DC forming/ switching	DC voltage or current controlled forming and switching			\$1,851.00
	2	PIV forming/ switching	Pulsed voltage forming and switching			
		$V_{th}$ and $V_s$ measurement from a single triangle pulse				
	$V_{hold}$	$V_{hold}$ measurement using stepped down waveforms				
	3	$V_{th}$ drift	$V_{th}$ vs. delay time	Double pulses with delay time = 100ns ~ 10s		
		$V_{th}$ vs. $T_{fall}$	Investigate dependence of $V_{th}$ with $T_{fall}$ of previous pulse			
	Endurance	Burst pulses with PIV sweeps every decade				

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NAND	1	IV	Leakage vs. voltage	Frequency range: 20Hz ~ 1MHz	\$695.00
		CVf	Capacitance vs. voltage and/or frequency		
	2	Pulsed CV	Program/erase voltage pulse interlaid with CV sweeps	\$1,851.00	
	3	Endurance	Burst program/erase pulses with CV sweeps every decade		
Retention		Memory state vs. time (RT or elevated temperature)			
Ferroelectric	1	IV	Leakage vs. voltage	Frequency range: 20Hz ~ 1MHz	\$695.00
		CVf	Capacitance vs. voltage and/or frequency		
	2	PV	Polarization vs. voltage	Maximum hysteresis frequency: 250kHz @ 10V	
TFT	1	Id_Vgs	Drain current vs. gate-to-source voltage	\$1,081.00	
		Id_Vds	Drain current vs. drain-to-source voltage		