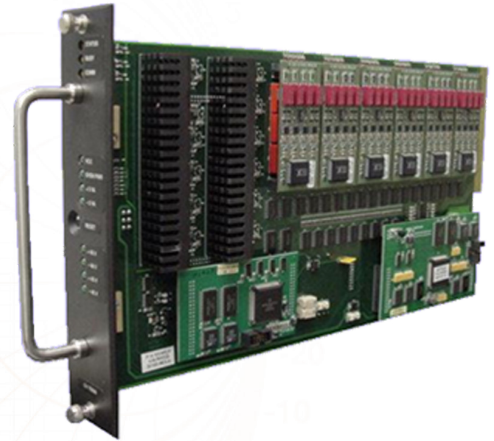


# HATDDB

High-Accuracy TDDDB  
40 V / 350 mA



DATA SHEET

Cascade Microtech's High-Accuracy Time Dependent Dielectric Breakdown Module (HATDDB) is designed specifically for precise TDDDB and SILC (Stress Induced Leakage Current) evaluation of the latest generations of high-k metal gate (HKMG), thin gate oxides and ILDs.

Dedicated, high-accuracy ammeters measure every DUT at the same high speed during stress, many times per second, regardless of total system capacity. This instantly captures breakdown precursor events (soft breakdown and noise) and DUT failures. There is no scanning of measurements. During SILC characterization the TDDDB ammeters measure all DUTs in parallel to minimize their time off stress conditions. This reduces relaxation, measures all DUTs with the same timing and reduces total SILC experiment time.

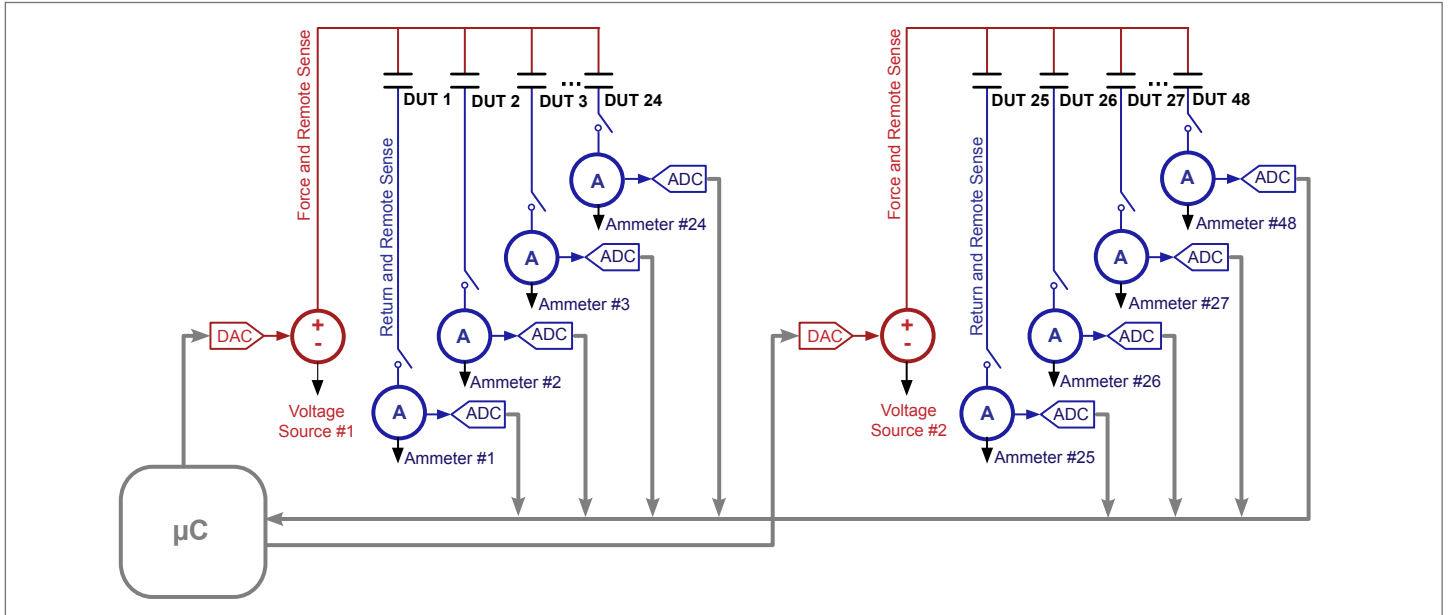
With an intuitive, full-featured test suite, TDDDB/BTS and SILC experiment data, both stress and use condition measurements, are analyzed quickly to determine DUT failure times. The data analysis tools offer Arrhenius and voltage/E-field evaluation for accurate lifetime projections with confidence intervals. All data can easily be exported to other applications for analysis.

## FEATURES / BENEFITS

Flexibility	Compatible with both 1164 and Symphony™ reliability test systems Broad measurement range, setpoints up to $\pm 40$ V Temperatures up to 450°C Package and wafer-level testing in same system Accurate source/measurement system Full-featured test suite, including constant voltage TDDDB, SILC and BTS
Full parallel measurements	Dedicated, high-accuracy ammeter for each DUT position — no switching or scanning Continuous monitoring — more than 100 samples per second Instant capture and detailed recording of leakage current changes
Maximum efficiency	Industry's best package-level test throughput with 1164 Highly parallel wafer-level reliability testing with 1164 or Symphony

## FULL PARALLEL MEASUREMENT

2 SMUs	Each with 6 voltage drivers (one per 4 DUTs) Each sourcing and measuring voltage for up to 24 DUTs in parallel using Kelvin connections (remote sense) Each SMU may have a different stress set point
48 ammeters	One per DUT To continuously monitor DUT leakage current without scanning through a switch matrix Ammeters use Kelvin measurements (remote sense)



Full parallel measurement system: dedicated, high-accuracy ammeters, one each per DUT.

## SPECIFICATIONS

Parameter	SMU Specification	Ammeter Specification
Capacity	Up to 48 DUTs	Up to 48 DUTs
Maximum voltage	±40 V	-
Source resolution	310 µV (5 V – 40 V) 40 µV (below 5 V)	-
Source accuracy	0.1% ± 700 µV (5 V – 40 V) 0.1% ± 100 µV (below 5 V)	0 V ± 800 µV
Maximum current compliance	±500 mA per DUT (limited to: ±500 mA per group of 4 DUTs and 4 A per Module)	
Maximum current measurement	-	±350 mA per DUT
Measure resolution	160 µV (5 V – 40 V) 20 µV (below 5 V)	2 µA (1 mA – 350 mA) 4 nA (5 µA – 1 mA) 20 pA (20 nA – 5 µA) 100 fA (below 20 nA)
Measure accuracy	0.1% ± 700 µV (5 V – 40 V) 0.1% ± 100 µV (below 5 V)	±0.5% ± 10 µA (1 mA – 350 mA) ±0.1% ± 20 nA (5 µA – 1 mA) ±0.1% ± 150 pA (20 nA – 5 µA) ±0.1% ± 5 pA (below 20 nA)
Sampling interval	<0.01 sec	<0.01 sec

\*Data, design and specification depend on individual process conditions and can vary according to equipment configurations.

Not all specifications may be valid simultaneously.

## RECOMMENDED OPERATING RANGE

Voltage set-point range	10 mV ~ 40 V
Current measurement range	5 pA ~ 350 mA
DUT power range	Up to 2 W per package

## REGULATORY COMPLIANCE

Certification	CE, SEMI S2
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## WARRANTY

Warranty*	Fifteen months from date of delivery or twelve months from date of installation (whichever comes first)
Service contracts	Single- and multi-year programs available to suit your needs

\*See Cascade Microtech's Terms and Conditions of Sale for more details.

## ORDERING INFORMATION

Consult factory for more detailed specifications, additional options, suitability of configuration for intended usage, part numbers, pricing, and delivery.

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Data subject to change without notice.

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