

# TOSHIBA

TOSHIBA INTERNATIONAL CORPORATION

## UNINTERRUPTIBLE POWER SYSTEMS

# G9400 Series



**POWER  
ELECTRONICS  
DIVISION**

# SMALL FOOTPRINT, HIGH EFFICIENCY, AND RELIABILITY REDEFINE UPS STANDARDS

The Toshiba G9400 Series Uninterruptible Power System (UPS) features the latest generation of advanced Carrier Stored Trench Bi-Polar Transistor (CSTBT) IGBT technology, the “engine” of the UPS. The G9400 advanced technology allows for high reliability and high power density parallel module design in a small footprint. With 97% on-line efficiency, even at low loads, this UPS is ideal for large Colocation or Hyper-Scale Data Centers around the globe.

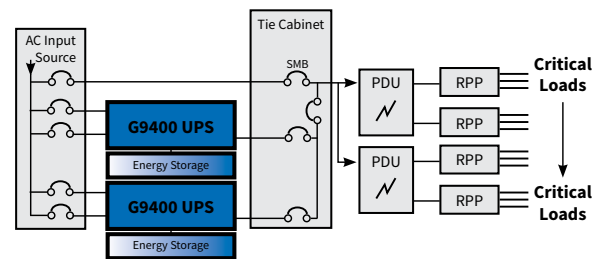
- True VFI Double-Conversion UPS
- 7<sup>th</sup> Generation Carrier Stored Trench Bi-Polar Transistors (CSTBT) Designed Specifically for UPS
- Parallel Module Design
- Small Footprint & High Power Density
- 97% Efficiency for Lower Operational Cost
- Electronic Battery Isolation for Battery Longevity
- Wide Input Voltage Range +15%, -20%
- Input Current THD < 3% Typical
- Input Power Factor > 0.99
- Generator-Friendly Compatibility
- Complete Front-Access for ease of Installation, Operation, & Service
- Toshiba RemotEye®4 SNMP and/or Modbus TCP Edge Network Card included
- 24/7 Monitoring by Factory Experts Utilizing IoT Technology
- Three-Year Warranty for Lower Cost of Ownership



<b>Parallel Redundant UPS Power Module Design</b>	Parallel Redundant UPS Power Modules allow for one Power to be inactive (fault) while the other Power Modules remain on line protecting the critical load with double conversion power
<b>Fast Switching 7<sup>th</sup> Generation CSTBT IGBT</b>	CSTBT IGBT technology delivers an impressive efficiency curve maxing out at 97% and holding strong at loads as low as a fifth of the rated UPS capacity.
<b>Active CSTBT Rectifier &amp; Harmonic Input Filter</b>	Reduces input total harmonic distortion (THD) which lessens heat loss in feed equipment and increases internal component life.
<b>IGBT DC-to-DC Chopper</b>	Produces lower DC ripple on the charging circuit, extending battery and capacitor life.
<b>Hybrid Static-Bypass Switch</b>	Combined bypass static switch & contactor offers high dependability when transferring between power sources and clearing faults.
<b>Exceptional Output Voltage Regulation</b>	Provides superior transient response, easily handling 100% step loads without requiring battery support.
<b>Generator-Friendly Design</b>	Allows sizing of 1.1 kW generator capacities per 1.0 UPS kVA load.
<b>Robustly Engineered Design</b>	Top of the line components ensure mean time between failure of over 200,000 hours.

## END-TO-END SOLUTIONS

- Toshiba Lithium Titanate Oxide (LTO) SCiB™ Batteries and VRLA are two energy storage options compatible with the G9400 Series UPS. The robust charging circuitry of the G9400 Series, featuring a flexible range of recharge operations, allows compatibility with multiple energy storage technologies including SCiB, VRLA and Wet Cells without external supplemental charger circuits. SCiB and VRLA cabinets match the G9400 Series appearance for a clean install look.
- The Toshiba Tie Cabinet (TTC) provides a simple and economical landing point for a multi-module G9400 Series system's output. The TTC functions without control electronics typically required by manufacturers, resulting in a smaller and lighter solution. The TTC allows paralleling of up to six 1000-2000 kVA UPS of equal kVA ratings.
- The G9400 Series UPS may be equipped with a Maintenance Bypass Switch (MBS) Cabinet that seamlessly matches the height, depth, and color of the UPS enabling interruption-free maintenance of the system. MBS Cabinets are available with additional monitoring or switching features as applications demand.
- Optional Power Distribution Units (PDU) with internal 480/208 transformers and remote power panels (RPP) are available in a wide variety of capacities and with features to meet application needs.



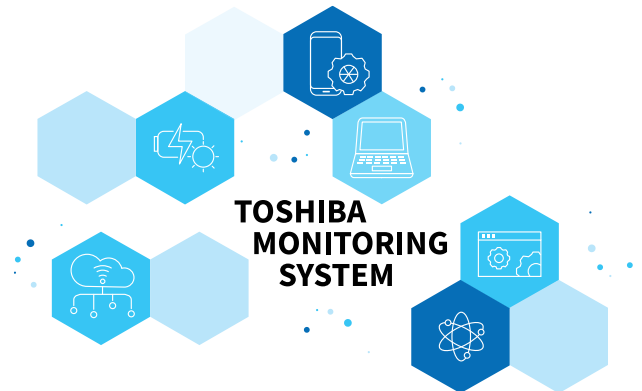
## MONITORING OPTIONS

Included with the G9400, RemotEye® 4 Edge/IoT network card offers remote monitoring and analysis of UPS operation via multiple network protocols.

- |   |                |
|---|----------------|
| • Detailed Real-Time Status of UPS  | • SNMP         |
| • Email Notification of Status & Events   | • Modbus RTU   |
| • Event & Alarm History Logging   | • Modbus TCP   |
| • Ambient temperature and humidity monitoring via environmental monitoring device | • BACnet MS/TP |
|   | • BACnet/IP    |

Toshiba Monitoring Systems (TMS) is a cloud-based remote monitoring service\* that allows Toshiba experts to monitor your UPS assets 24/7. This helps provide peace of mind by quickly resolving issues and decreasing downtime.

\*Service Requires Monthly Subscription Fee.



## PREVENTIVE MAINTENANCE

Derived Mean Time Between Failure (MTBF) rates are based on an ideal operating environment. Real operating environments can vary from benign to outright hostile. Preventive maintenance needs of a G9400 Series UPS are minimal, but crucial in helping to ensure you get the maximum service out of your Toshiba system.

- Periodic inspection, calibration, and adjustment of the control and monitoring systems are necessary to ensure continued optimal performance and the highest level of reliability.
- Regular maintenance can help detect early signs of degradation in components, allowing for timely repair without the UPS unexpectedly failing. This is particularly important in harsh environments with excessive humidity, temperature extremes, frequent out-of-specification voltage excursions, and abrasive air particles.

## AUTHORIZED SERVICE PROVIDERS

Toshiba’s expansive network of more than 120 authorized service providers supply factory trained technicians to service and support Toshiba UPSs throughout the globe.

## FACTORY WITNESS TESTING

Toshiba has a 3 MVA Witness Testing Facility at its plant in Houston, Texas. Customers have the option of witness testing\* for validation of a system’s performance specifications in all operating modes prior to accepting delivery.

Multi-module parallel configurations, including energy storage backup, can be assembled and tested in all modes before shipment for final installation.

\*Witness Testing Requires Additional Fee.

## MAINTENANCE AGREEMENTS

Maintenance Agreement packages are available to provide the service support appropriate to the customers’ needs and budget while maximizing the performance and lifespan of the Toshiba UPS. Site specific service agreements range from simple scheduled preventative maintenance programs to a Platinum Service Agreement with Holiday, Weekend, & Afterhours On-Site Service, 24/7/365 Technical Support, and discounted replacement parts.

## WARRANTY

The G9400 UPS and the accompanying energy storage system are supported by Toshiba’s industry-leading three-year parts and labor warranty\* and a 24/7/365 hotline. This ensures that customers get the quickest possible resolution to any warranty or service issues that may arise.

\*Conditional to system startup by an authorized Toshiba UPS service provider. See three-phase warranty for details.

# 3 THREE YEAR WARRANTY

### INDUSTRIES SERVED

- Hyper Scale Colocation
- Enterprise Data Centers

### G9400 SERIES APPLICATIONS

- Large Computer Systems
- Large Scale Server Rooms
- Edge Data Centers
- Banking Systems
- School Institution Data Networks
- Medical Research Laboratories





# 1200, 1600, 2000 kVA

## 480 V

MODEL NUMBER	G94SH1D2MWWW1C	G94SH1D6MWWW1C	G94SH2D0MWWW1C
Capacity (KVA/KW)	1200/1200	1600/1600	2000/2000
Topology	Voltage Frequency Independent (VFI) True On-Line, Double-Conversion, All-IGBT Technology		
<b>INPUT</b>			
Voltage (Standard)	480 V Three-Phase, Three-Wire + Ground Dual Input (Factory Configured with Bus Bar Jumpers for Single Input)		
Voltage Range	-20% to +15%		
Power Factor	>0.98 Lagging		
Current THD	<3% at 100% Load		
Frequency	60 +/- 10% Hz		
<b>OUTPUT</b>			
Voltage (Standard)	480 V: Three-Phase, Three-Wire + Ground		
Frequency	60 Hz (+/- 0.01% in Free Running Mode)		
Voltage Regulation	+/- 1% (0-100% Balanced Load)		
Power Factor	1.0 (Unity)		
Power Factor Range	0.7 Lagging to .8 Leading within kW rating		
Voltage THD	<2% at 100% Linear Load, <5% at 100% non-linear load		
Overload Capacity	Inverter: 125% for 10 Minutes, 150% for 60 Seconds, Bypass: 500% for 1 cycle		
<b>ENERGY STORAGE</b>			
DC Link	480 V Standard (Adjustable for Specific Energy Storage Systems)		
<b>ENVIRONMENT</b>			
Temperature Range	32° to 104°F (0° to 40°C)		
Relative Humidity	5% to 95% Non-Condensing		
Heat Rejection	124.4 kBTU/Hour	168.8 kBTU/Hour	211.1 kBTU/Hour
Full-Load Efficiency	96.9%	96.9%	96.9%
25% Load Efficiency	96.4%	96.4%	96.4%
Altitude	6500 ft. (1980 m) Maximum Without Derating		
Audible Noise	73dBA @ 1 m Typical		
Air Filters	Merv 7 Filters Included		
<b>DIMENSIONS</b>			
Dimensions	133.9" W x 35.5" D x 81.0" H	169.3" W x 35.5" D x 81.0" H	192.9" W x 35.5" D x 81.0" H
Weight	7,720 lbs. (3,300 kg)	9,750 lbs. (4,425 kg)	11,470 lbs. (5,200 kg)
<b>COLOR</b>			
	Munsell N1.5 (Black)		
<b>MONITORING</b>			
	10 inch LCD Touchscreen Operator Interface, UPS Status N/O Dry Contacts, RS232 Port, Included RemotEye® 4 Intelligent Monitoring System		
<b>OPTIONS</b>			
	Remote Status Alarm Panel, Spare Parts Kits		
<b>FEATURES</b>			
	Dual-Input Feed, Fully Digital IGBT Rectifier & Inverter, High Efficiency Over Wide Load Range, Transformer-Less Design, N+1 & N+N (Up to Six in Parallel) Capability, Dual-Input Feed, Electronic Battery Isolation, RS232 and Dry Contact Interface, Small Footprint & Lightweight Design		
<b>CERTIFICATIONS</b>			
	UL1778 5th Edition, CSA22.2, EN 62040-1:2008, IEEE587, ANSI C62.41, UL, cUL and (FCC)		
<b>WARRANTY</b>			
	3-Year On-Site Warranty; See Toshiba Warranty Policy for Full Details		
<b>SERVICE</b>			
	24-Hour, 365-Day Technical Support: 1-877-867-8773		





# 1050, 1400, 1750 kVA

## 400 V

MODEL NUMBER	G94SG1D0MUI1C	G94SG1D4MUI1C	G94SG1D7MUI1C
Capacity (KVA/KW)	1050/1050	1400/1400	1750/1750
Topology	Voltage Frequency Independent (VFI) True On-Line, Double-Conversion, All-IGBT Technology		
<b>INPUT</b>			
Voltage (Standard)	400/415V Dual Input - Three Phase Three-Wire + Ground Rectifier Input, Three Phase Four-Wire + Ground Static Bypass Input		
Voltage Range	-20% to +15%		
Power Factor	>0.98 Lagging		
Current THD	<3% at 100% Load		
Frequency	50/60 +/- 10% Hz		
<b>OUTPUT</b>			
Voltage (Standard)	400/415 V: Three-Phase, Four-Wire + Ground		
Frequency	50/60 Hz (+/- 0.01% in Free Running Mode)		
Voltage Regulation	+/- 1% (0-100% Balanced Load)		
Power Factor	1.0 (Unity)		
Power Factor Range	0.7 Lagging to .8 Leading within kW rating		
Voltage THD	<2% at 100% Linear Load, <5% at 100% non-linear load		
Overload Capacity	Inverter: 125% for 10 Minutes, 150% for 60 Seconds, Bypass: 500% for 1 cycle		
<b>ENERGY STORAGE</b>			
DC Link	480 V Standard (Adjustable for Specific Energy Storage Systems)		
<b>ENVIRONMENT</b>			
Temperature Range	32° to 104°F (0° to 40°C)		
Relative Humidity	5% to 95% Non-Condensing		
Heat Rejection	143.7 kBTU/Hour	191.6 kBTU/Hour	239.5 kBTU/Hour
Full-Load Efficiency	96.0%	96.0%	96.0%
25% Load Efficiency	95.2%	95.2%	95.2%
Altitude	6500 ft. (1980 m) Maximum Without Derating		
Audible Noise	71dBA @ 1 m Typical	73dBA @ 1 m Typical	
Air Filters	Merv 7 Filters		
<b>DIMENSIONS</b>			
Dimensions	133.9" W x 35.5" D x 82.1" H	169.3" W x 35.5" D x 82.1" H	192.9" W x 35.5" D x 82.1" H
Weight	7,495 lbs. (3,400 kg)	9,920 lbs. (4,500 kg)	11,685 lbs. (5,300 kg)
<b>COLOR</b>			
	Munsell N1.5 (Black)		
<b>MONITORING</b>			
	10 inch LCD Touchscreen Operator Interface, UPS Status N/O Dry Contacts, RS232 Port, RemotEye® 4 Intelligent Monitoring System		
<b>OPTIONS</b>			
	Remote Status Alarm Panel, Spare Parts Kits		
<b>FEATURES</b>			
	Dual-Input Feed, Fully Digital IGBT Rectifier & Inverter, High Efficiency Over Wide Load Range, Transformer-Less Design, N+1 & N+N (Up to Six in Parallel) Capability, Dual-Input Feed, Electronic Battery Isolation, RS232 and Dry Contact Interface, Small Footprint & Lightweight Design		
<b>CERTIFICATIONS</b>			
	UL1778 5th Edition, CSA22.2, EN 62040-1:2008, IEEE587, ANSI C62.41, UL, cUL		
<b>WARRANTY</b>			
	3-Year On-Site Warranty; See Toshiba Warranty Policy for Full Details		
<b>SERVICE</b>			
	24-Hour, 365-Day Technical Support: 1-877-867-8773		

## FLEXIBLE BY DESIGN

The G9400 is a high efficiency VFI - double-conversion UPS requiring less space per kilowatt than many similar capacity UPS systems in the market. The G9400 UPS delivers design flexibility to provide the ideal solution for the user's critical power and backup needs.

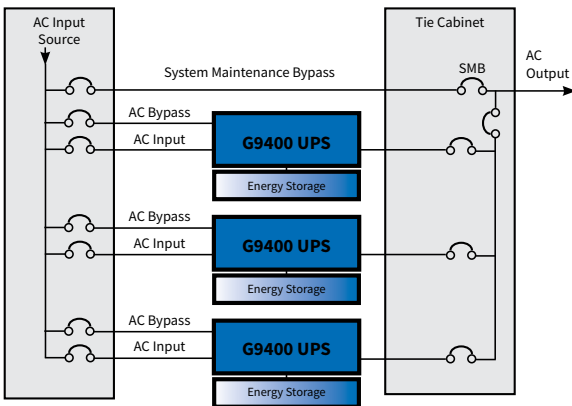
### SINGLE-MODULE

- Dual-Source Input: 480 V Models Factory Configured with Bus Bar Jumpers for Single-Input
- DC-to-DC Isolation
- Internal Hybrid Static Bypass Circuit
- Controllable at Local LCD Panel or Through Customer Supplied Interface
- Monitor UPS Locally or Remotely

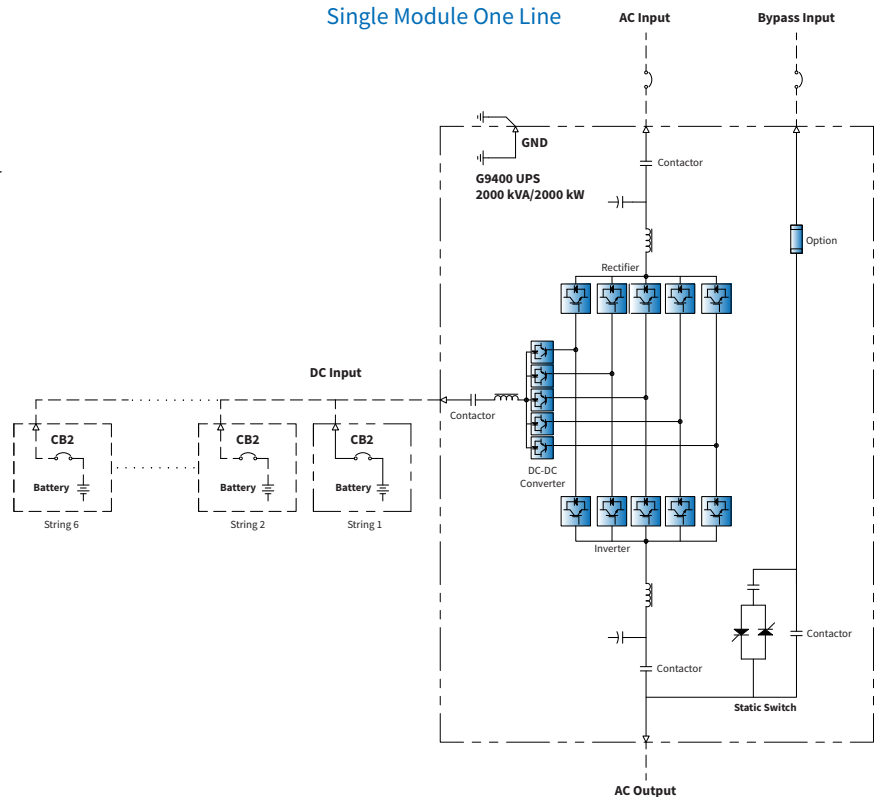
### MULTI-MODULE

- Parallel up to 6 Units without Additional Control Circuitry
- Load Capacity up to 12 MW
- Distributed Bypass Eliminates Single Point of Failure in Bypass Mode
- Tie Cabinet Does Not Require Special Control Circuitry for Future Expansion
- Individual Modules & Entire System Monitored & Controlled via Local Displays in Each UPS or Through Optional System Display in TTC
- Load Balance & Synchronization Intelligence are Self-Contained in Each UPS Module & Not in External Sync Controller, Increasing System Reliability & Making Expansion/Reconfiguration of Parallel Multi-Module Systems Easy

Three Unit Multi-Module System One Line  
(Up to Six Possible)



Single Module One Line



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