

LS Ultracapacitor

New-generation Energy Storage Devices with
Low Resistance and Great Reliability



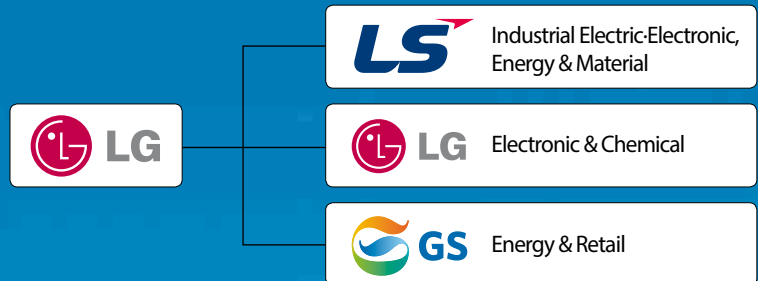


Leading Solution

*LS Mtron, LS Cable & System, LSIS,
LS-Nikko Copper, Gaon Cable, E1 and Yesco*

Vision Statement

In order to become a leader in the competitive global market LG has been divided into three business groups based upon their core competencies, Industrial Electric-Electronic Energy & Materials(LS), Electronic & Chemical(LG), and Energy & Retail(GS).



INNOVATIVE TECHNOLOGY PARTNER - LS Mtron

LS Mtron's mission is to grow into a company that provides market leading solutions while developing a workplace where its employee can achieve their dreams. All employees of LS Mtron stand behind the vision of becoming an Innovative Technology Partner and work tirelessly to make LS Mtron a world-class company

LS Mtron will secure world-class core technologies to find and implement the most efficient solutions based on a market knowledge that can meet the challenges of our today's markets We will work hand-in-hand with our customers in order to grow into a global leader.

Business of LS Mtron

Component

Ultracapacitor

Electronic Parts

Connectors / Antenna's

Circuit Material

Copper Foils / FCCL

Vehicle Parts

Automotive Rubber Hose

Machinery

Tractor

Injection Molding Machine

Track Shoes

LS Ultracapacitor

New-generation Energy Storage Devices with Low Resistance and Great Reliability



Overview

LS Ultracapacitor energy storage devices are positioned between conventional electrolytic capacitors and rechargeable batteries. LS Ultra capacitors feature high power, high energy, reliability and long life which enables use in a variety of applications such as back-up power, auxiliary power, instantaneous power compensation and peak power compensation.

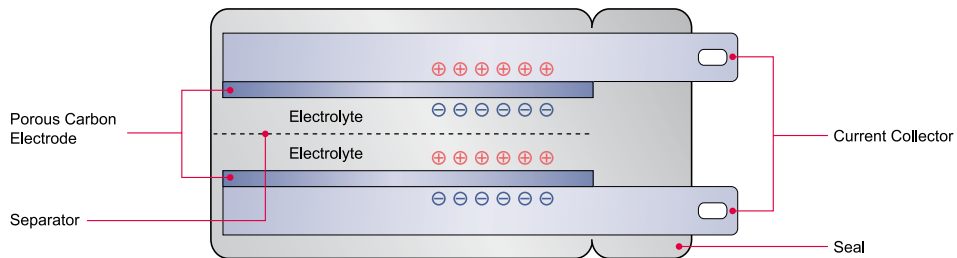
- Rated voltage : up to 3.0V
- High power performance (vs. Battery)
- High energy performance (vs. Conventional electrolytic capacitor)
- Environmentally friendly
- Maintenance-free
- Wide operating temperature range (-40°C ~ +65°C)



Introduction to LS Ultracapacitor Technology

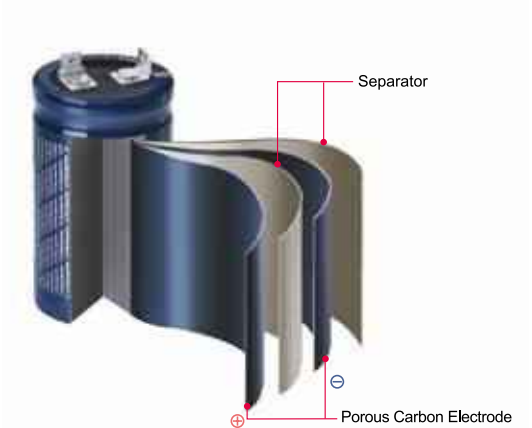
Structure

An Ultracapacitor consists of two electrodes immersed in an electrolyte and a separator which prevents the charge from moving between two electrodes of opposite polarity.

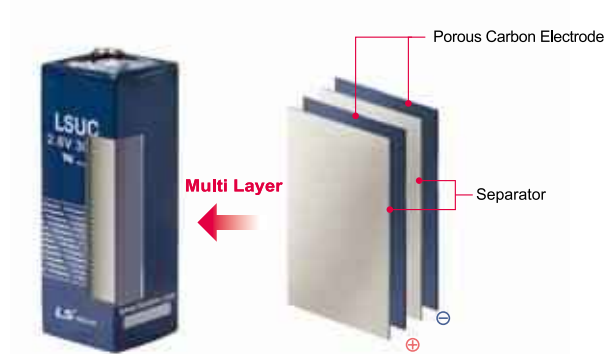


LS Mtron provides optimal package design to provide the best in performance and reliability.

LS Ultracapacitor Cylindrical Type

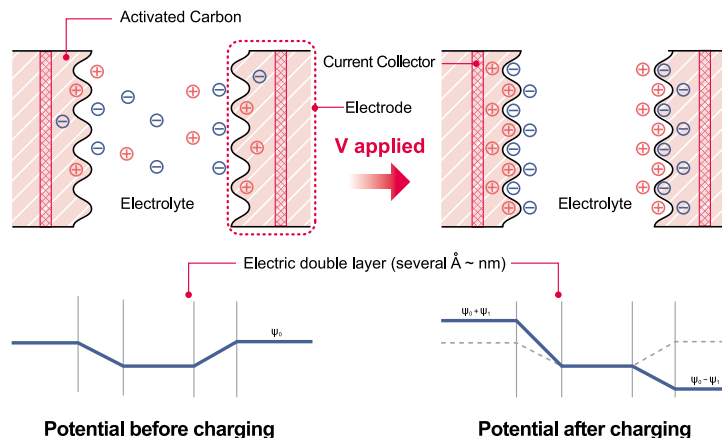


LS Ultracapacitor Prismatic Type



Operating Principle

Ultracapacitors store energy based on electrostatic charges on opposite electrode surface of the electric double layer which is formed between the electrodes and the electrolyte. Randomly distributed ions in the electrolyte move toward the electrode surface of opposite polarity under electric field when charged. It is a purely physical phenomenon rather than a chemical reaction and is a highly reversible process. This results in a high power, high cycle life, long shelf life and maintenance-free product.

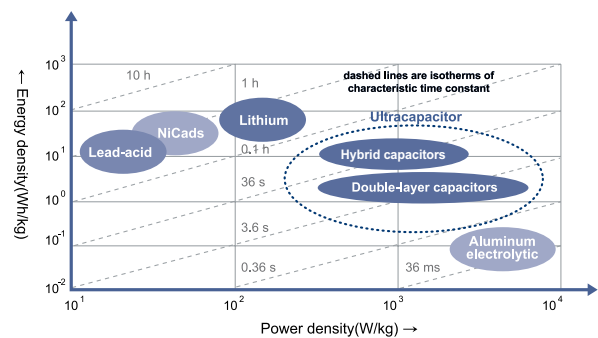
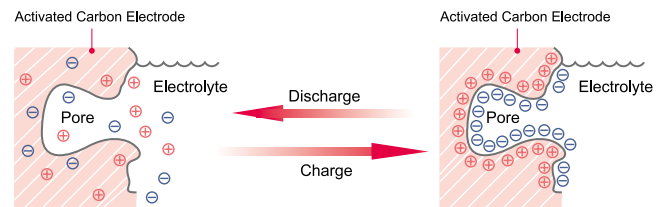


Differences Between LS Ultracapacitor & Other Energy Storage Devices

High Energy & High Power

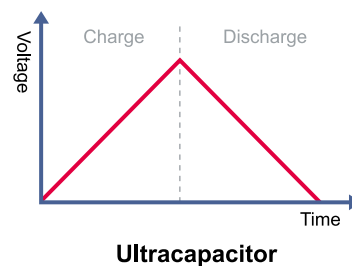
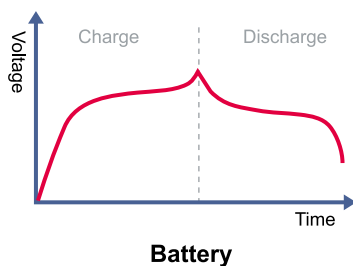
Ultracapacitors are unique energy storage devices offering high power and high energy simultaneously, compared with conventional electrolytic capacitors and batteries. The high energy stored by Ultracapacitors in comparison to conventional electrolytic capacitors is derived from activated carbon electrode material having the extremely high surface area and the short distance of charge separation created by the opposite charges in the interface between electrode and electrolyte.

High power, long shelf and cycle life performance of Ultracapacitors originate in the energy storage mechanism differing from batteries. With batteries, energy is stored and released via chemical reaction inside electrode material that causes degradation of the entire system. On the other hand, Ultracapacitors use physical charge separation phenomena between the charge on an electrode and ions in electrolyte at the interface. Since the charge and discharge processes are purely physical and highly reversible, Ultracapacitors can release energy much faster and with more power compared to batteries which rely on slow chemical reactions and can be cycled hundreds of thousands of times without significant effect on performance.



Charge & Discharge

Ultracapacitors possess different charge and discharge characteristics compared with rechargeable batteries. Batteries have a voltage plateau region but Ultracapacitors have a linear relationship with voltage during charge and discharge. This linear relationship with voltage can change to constant voltage by simply utilizing a DC-DC converter. The amount of energy stored in an Ultracapacitor can be easily calculated by measuring voltage.



Formulas for calculating energy in a capacitor

The different units used between Ultracapacitors (Farad) and batteries (Ampere hour) can be confusing to users when adopting Ultracapacitors in their system. The amount of energy stored in an Ultracapacitor can be easily calculated by using following equation.

$$\text{Energy (Joule)} = 1/2 \times \text{Capacitance (Farad)} \times \text{Voltage}^2 \text{ (Volt)}$$

This can be converted from Farad for Ultracapacitors to Watt hour unit which is normally used for conventional rechargeable batteries.

$$\text{Energy (Watt hour)} = \text{Energy (Joule)} / 3600 \text{ (sec)}$$

LS Mtron recommends discharging Ultracapacitors from 100% of their rated voltage to 50% of their rated voltage in order to deliver 75% of their total energy.

LS Ultracapacitor Cells

Specifications

Series	Part No.	Capacitance	Rated Voltage	ESR (DC)	Max. Current	Leakage Current	Max. Stored Energy	Weight	Operating Temperature Range	Type	Dimension
Snap-in & Lug Type	LSUC 002R8S 0100F EA	100F	2.8V	9mΩ	74A	<0.3mA	0.11Wh	0.023kg	-40~65°C	Snap-in	Φ22 X L46mm
	LSUC 002R8S 0120F EA	120F	2.8V	9mΩ	81A	<0.4mA	0.13Wh	0.023kg	-40~65°C	Snap-in	Φ22 X L46mm
	LSUC 002R8L 0350F EA	350F	2.8V	3.2mΩ	231A	<1mA	0.38Wh	0.072kg	-40~65°C	Lug/Snap-in	Φ35 X L61mm
	LSUC 002R8L 0400F EA	400F	2.8V	3mΩ	255A	<1mA	0.44Wh	0.080kg	-40~65°C	Lug/Snap-in	Φ35 X L66mm
	LSUC 002R8L 0450F EA	450F	2.8V	3mΩ	268A	<1mA	0.49Wh	0.088kg	-40~65°C	Lug/Snap-in	Φ35 X L71mm
	LSUC 003ROL 0380F EA	380F	3.0V	3.2mΩ	257A	<1mA	0.48Wh	0.072kg	-40~65°C	Lug/Snap-in	Φ35 X L61mm
	LSUC 003ROL 0430F EA	430F	3.0V	3mΩ	282A	<1mA	0.54Wh	0.080kg	-40~65°C	Lug/Snap-in	Φ35 X L66mm
	LSUC 003ROL 0480F EA	480F	3.0V	3mΩ	295A	<1mA	0.60Wh	0.088kg	-40~65°C	Lug/Snap-in	Φ35 X L71mm

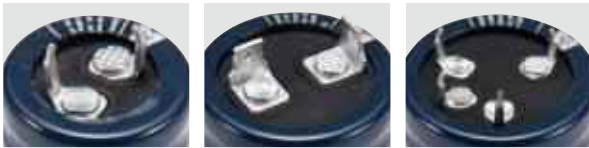
- Endurance time (65°C, V_R): 1500 hours for 2.8V / 1000 hours for 3.0V (ΔC<20% decrease, ΔESR<100% increase of initial specified value)
- Life time (25°C, V_R): 10 years (ΔC<20% decrease, ΔESR<100% increase of initial specified value)
- Cycle life time (25°C, V_R): 500,000 cycles (ΔC<20% decrease, ΔESR<100% increase of initial specified value)

Prismatic Type	Part No.	Capacitance	Rated Voltage	ESR (DC)	Max. Current	Leakage Current	Max. Stored Energy	Weight	Operating Temperature Range	Type	Dimension
	LSUC 002R8P 3000F EA	3000F	2.8V	0.36mΩ	2019A	<5mA	3.27Wh	0.650kg	-40~65°C	Prismatic	W55 X D55 X L155mm

- Endurance time (65°C, V_R): 1500 hours (ΔC<20% decrease, ΔESR<100% increase of initial specified value)
- Life time (25°C, V_R): 10 years (ΔC<20% decrease, ΔESR<100% increase of initial specified value)
- Cycle life time (25°C, V_R): 500,000 cycles (ΔC<20% decrease, ΔESR<100% increase of initial specified value)

Products

Terminal Type



• Snap-in (100F/120F)

• Lug (350F~480F)

• Snap-in (4pin, 350F~480F)



• 2.8/3.0V Lug & Snap-in Type Cell



• Prismatic Type Cell

Specifications

Серия	Part No.	Capacitance	Rated Voltage	ESR (DC)	Max. Current	Leakage Current	Max. Stored Energy	Weight	Operating Temperature Range	Type	Dimension
Cylindrical Type	LSUC 002R7C 0650F EA	650F	2.7V	0.57mΩ	640A	<1.5mA	0.66Wh	0.200kg	-40~65°C	Cylindrical	Φ60 X L51.5mm
	LSUC 002R7C 1200F EA	1200F	2.7V	0.33mΩ	1160A	<2.7mA	1.22Wh	0.280kg	-40~65°C	Cylindrical	Φ60 X L74mm
	LSUC 002R7C 1500F EA	1500F	2.7V	0.28mΩ	1426A	<3.0mA	1.52Wh	0.320kg	-40~65°C	Cylindrical	Φ60 X L85mm
	LSUC 002R7C 2000F EA	2000F	2.7V	0.27mΩ	1753A	<4.0mA	2.03Wh	0.380kg	-40~65°C	Cylindrical	Φ60 X L102mm
	LSUC 002R7C 3000F EA	3000F	2.7V	0.23mΩ	2396A	<5.0mA	3.04Wh	0.515kg	-40~65°C	Cylindrical	Φ60 X L138mm
	LSUC 02R85C 3400F EA	3400F	2.85V	0.23mΩ	2719A	<8.0mA	3.84Wh	0.515kg	-40~65°C	Cylindrical	Φ60 X L138mm

- Endurance time (65°C, V_R): 1500 hours (ΔC<20% decrease, ΔESR<100% increase of initial specified value)
- Life time (25°C, V_R): 10 years (ΔC<20% decrease, ΔESR<100% increase of initial specified value)
- Cycle life time (25°C, V_R): 1,000,000 cycles (ΔC<20% decrease, ΔESR<100% increase of initial specified value)

Products



• Cylindrical Type Cell

Terminal Type



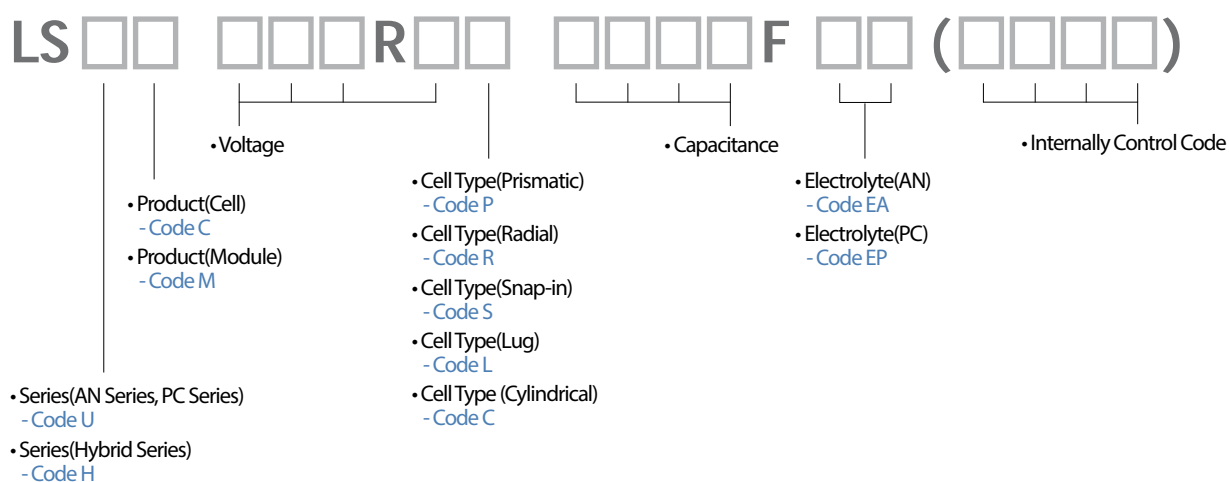
• Short Screw

• Weldable

• Long Screw (LT01)
※M16 Terminal

• Long Screw (LT02)
※M12 Terminal

Cell/Module Part No. Rule



LS Ultracapacitor Modules

LS Ultracapacitor Modules provide the optimal solution for high voltage and current requirements by connecting Ultracapacitor unit cells in series. Higher voltage and capacitance modules can be built simply by connecting the modules.

Low internal resistance and high working voltage features of LS Mtron modules maximize the available energy while keeping maintenance free, high reliability and wide operating temperature features of LS Ultracapacitor unit cell.

Features

- Low Internal Resistance
- Balancing and Overvoltage Protection
- Easy Build-up Design for High Voltage Module
- Efficient Heat Transfer to Outside
- Pressure / Moisture Control

LS Ultracapacitor modules are suitable energy storage systems for a wide variety of applications.

Specifications

Part No.	Capacitance	Rated Voltage	ESR (DC)	Max. Continuous Current ($\Delta T = 40^{\circ}\text{C}$)	Leakage Current ⁽¹⁾	Energy Density	Weight	Balancing	Monitoring	Operating Temperature Range	Dimension
LSUM 016R8L 0058F EA	58F	16.8V	22m Ω	20A	<11mA	3.2Wh/kg	0.7kg	Active or Passive	-	-40 ~ 65°C	L245 x W47 x H76.6mm
LSUM 168R0L 0005F EA	5.8F	168V	240m Ω	12A	<25mA	3.5Wh/kg	6.5kg	Passive	Temperature (NTC) Half Voltage Terminal	-40 ~ 65°C	L235 x W367 x H79mm
LSUM 0380R8L 0002F EA	2.5F	380V	650m Ω	12A	<12mA	2.6Wh/kg	19kg	Passive	Temperature (PTC) / Over Voltage	-40 ~ 65°C	L191 x W750 x H163mm
LSUM 016R2C 0250F EA AG	250F	16.2V	2m Ω	150A	<3mA	2.3Wh/kg	3.9kg	Active or Passive	Temperature (NTC)	-40 ~ 65°C	L311 x W166 x H70mm
LSUM 016R2C 0500F EA	500F	16.2V	1.7m Ω	200A	<5mA	3.3Wh/kg	5.6kg	Active or Passive	Temperature (NTC)	-40 ~ 65°C	L67.2 x W416.2 x H175.9mm
LSUM 016R2C 0500F EA AG	500F	16.2V	1.7m Ω	200A	<5mA	3.3Wh/kg	5.4kg	Active or Passive	Temperature (NTC)	-40 ~ 65°C	L470 x W166 x H70mm
LSUM 032R4C 0250F EA	250F	32.4V	3.3m Ω	150A	<120mA	3.6Wh/kg	10kg	Passive	Temperature (NTC)	-40 ~ 65°C	L137.1 x W426.6 x H184mm
LSUM 048R6C 0166F EA DC	166F	48.6V	5m Ω	130A	<5mA	3.9Wh/kg	14kg	Active or Passive	-	-40 ~ 65°C	L194.5 x W419.5 x H175.4mm
LSUM 048R6C 0166F EA YJ	166F	48.6V	5m Ω	200A	<5mA	3.2Wh/kg	17.2kg	Active or Passive	Temperature (NTC)	-40 ~ 65°C	L471 x W418 x H71mm
LSUM 086R4C 0093F EA	93F	86.4V	11.3m Ω	80A	<120mA	3.6Wh/kg	27kg	Passive	Temperature (PT100)	-40 ~ 65°C	L517 x W265 x H210.5mm
LSUM 129R6C 0062F EA	62F	129.6V	13.2m Ω	260A	<5mA	2.6Wh/kg	55kg	Active or Passive	Temperature & Voltage (CAN2.0B)	-40 ~ 65°C	L720 x W405 x H226mm

- Leakage Current⁽¹⁾ can be changed by Balancing method
- NTC Thermistor & Group voltage monitoring via CAN2.0B
- Customized module can be supplied under the customer's requirement

LS Ultracapacitor

New-generation Energy Storage Devices with Low Resistance and Great Reliability





• LSUM 016R2C 0500F EA AG



• LSUM 048R6C 0166F EA YJ



Size Scalable (Up or Down)



• LSUM 016R8L 0058F EA



• LSUM 168R0L 0005F EA



• LSUM 016R2C 0500F EA



• LSUM 048R6C 0166F EA DC



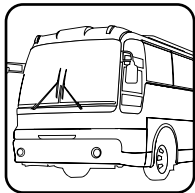
• LSUM 086R4C 0093F EA



• LSUM 129R6C 0062F EA

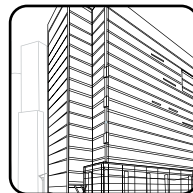


Markets for LS Ultracapacitors



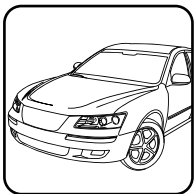
HEV (Hybrid Electric Vehicle)

- **Auxiliary power**
Recapture braking energy and compensate peak power load Increase energy efficiency of vehicle
- **Emergency backup power for brake**
Increase reliability of safety system



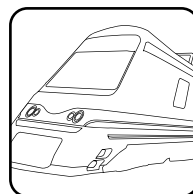
Power Quality Solution (UPS)

- **Instantaneous power compensation**
Suitable for short time backup (~30 sec)
Fast reacting time could prevent voltage sag
Increase power quality for delicate process



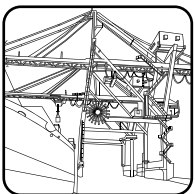
FCEV (Fuel Cell Electric Vehicle)

- **Output load compensation for fuel cell**
Provide peak power compensation
(Fuel cell has constant power performance)



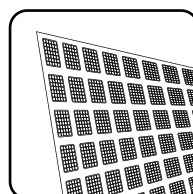
Locomotives

- **Auxiliary power**
Regenerate energy while braking
Provide peak power compensation
Installed in vehicle or station
Increase energy efficiency



Hybrid Harbor Crane

- **Auxiliary power**
Regenerate the energy while lowering the container Provide output load compensation during lifting container
Reduce size of ICE Increase energy efficiency of crane



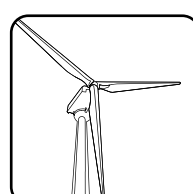
Photovoltaic & Solar light

- **Energy storage**
 - Photovoltaic
Provide energy for motor used in heliostats
 - Solar light
Store energy generated from the sun light during daytime
Provide energy for light during night time
Increase service life of solar light product



Hybrid Construction & Distribution Equipment

- **Auxiliary power**
Recapture the energy from equipment operation
Excavator : Boom movement, Upper part rotation etc
Forklift : Lowering goods, braking forklift etc
Provide peak power compensation



Wind Turbine

- **Emergency backup power**
Provide emergency power for pitch system
Increase reliability of pitch system



TRA CERTIFICATION DIRECTORY

08001-01/04567
Capacitors, Electrochemical - Component

Capacitors, Electrochemical - Component

TRA CERTIFICATION INTERNATIONAL (TRACI) hereby declares that this facility has been audited in accordance with the requirements of OHSAS 18001:2007 and issues the accreditation certificate according to the certification scheme of TRA Certification International (TRACI) #1106, ACT Twin Tower 1, 212 (1st floor), Jangjeon, Guro-gu, Seoul, Korea, Republic of Korea

Model	Model	Model	Model	Model	Model	Model
LSM-1000-001	LSM-1000-002	LSM-1000-003	LSM-1000-004	LSM-1000-005	LSM-1000-006	LSM-1000-007
LSM-1000-008	LSM-1000-009	LSM-1000-010	LSM-1000-011	LSM-1000-012	LSM-1000-013	LSM-1000-014
LSM-1000-015	LSM-1000-016	LSM-1000-017	LSM-1000-018	LSM-1000-019	LSM-1000-020	LSM-1000-021
LSM-1000-022	LSM-1000-023	LSM-1000-024	LSM-1000-025	LSM-1000-026	LSM-1000-027	LSM-1000-028
LSM-1000-029	LSM-1000-030	LSM-1000-031	LSM-1000-032	LSM-1000-033	LSM-1000-034	LSM-1000-035
LSM-1000-036	LSM-1000-037	LSM-1000-038	LSM-1000-039	LSM-1000-040	LSM-1000-041	LSM-1000-042
LSM-1000-043	LSM-1000-044	LSM-1000-045	LSM-1000-046	LSM-1000-047	LSM-1000-048	LSM-1000-049
LSM-1000-050	LSM-1000-051	LSM-1000-052	LSM-1000-053	LSM-1000-054	LSM-1000-055	LSM-1000-056
LSM-1000-057	LSM-1000-058	LSM-1000-059	LSM-1000-060	LSM-1000-061	LSM-1000-062	LSM-1000-063
LSM-1000-064	LSM-1000-065	LSM-1000-066	LSM-1000-067	LSM-1000-068	LSM-1000-069	LSM-1000-070
LSM-1000-071	LSM-1000-072	LSM-1000-073	LSM-1000-074	LSM-1000-075	LSM-1000-076	LSM-1000-077
LSM-1000-078	LSM-1000-079	LSM-1000-080	LSM-1000-081	LSM-1000-082	LSM-1000-083	LSM-1000-084
LSM-1000-085	LSM-1000-086	LSM-1000-087	LSM-1000-088	LSM-1000-089	LSM-1000-090	LSM-1000-091
LSM-1000-092	LSM-1000-093	LSM-1000-094	LSM-1000-095	LSM-1000-096	LSM-1000-097	LSM-1000-098
LSM-1000-099	LSM-1000-100	LSM-1000-101	LSM-1000-102	LSM-1000-103	LSM-1000-104	LSM-1000-105
LSM-1000-106	LSM-1000-107	LSM-1000-108	LSM-1000-109	LSM-1000-110	LSM-1000-111	LSM-1000-112
LSM-1000-113	LSM-1000-114	LSM-1000-115	LSM-1000-116	LSM-1000-117	LSM-1000-118	LSM-1000-119
LSM-1000-120	LSM-1000-121	LSM-1000-122	LSM-1000-123	LSM-1000-124	LSM-1000-125	LSM-1000-126
LSM-1000-127	LSM-1000-128	LSM-1000-129	LSM-1000-130	LSM-1000-131	LSM-1000-132	LSM-1000-133
LSM-1000-134	LSM-1000-135	LSM-1000-136	LSM-1000-137	LSM-1000-138	LSM-1000-139	LSM-1000-140
LSM-1000-141	LSM-1000-142	LSM-1000-143	LSM-1000-144	LSM-1000-145	LSM-1000-146	LSM-1000-147
LSM-1000-148	LSM-1000-149	LSM-1000-150	LSM-1000-151	LSM-1000-152	LSM-1000-153	LSM-1000-154
LSM-1000-155	LSM-1000-156	LSM-1000-157	LSM-1000-158	LSM-1000-159	LSM-1000-160	LSM-1000-161
LSM-1000-162	LSM-1000-163	LSM-1000-164	LSM-1000-165	LSM-1000-166	LSM-1000-167	LSM-1000-168
LSM-1000-169	LSM-1000-170	LSM-1000-171	LSM-1000-172	LSM-1000-173	LSM-1000-174	LSM-1000-175
LSM-1000-176	LSM-1000-177	LSM-1000-178	LSM-1000-179	LSM-1000-180	LSM-1000-181	LSM-1000-182
LSM-1000-183	LSM-1000-184	LSM-1000-185	LSM-1000-186	LSM-1000-187	LSM-1000-188	LSM-1000-189
LSM-1000-190	LSM-1000-191	LSM-1000-192	LSM-1000-193	LSM-1000-194	LSM-1000-195	LSM-1000-196
LSM-1000-197	LSM-1000-198	LSM-1000-199	LSM-1000-200	LSM-1000-201	LSM-1000-202	LSM-1000-203
LSM-1000-204	LSM-1000-205	LSM-1000-206	LSM-1000-207	LSM-1000-208	LSM-1000-209	LSM-1000-210
LSM-1000-211	LSM-1000-212	LSM-1000-213	LSM-1000-214	LSM-1000-215	LSM-1000-216	LSM-1000-217
LSM-1000-218	LSM-1000-219	LSM-1000-220	LSM-1000-221	LSM-1000-222	LSM-1000-223	LSM-1000-224
LSM-1000-225	LSM-1000-226	LSM-1000-227	LSM-1000-228	LSM-1000-229	LSM-1000-230	LSM-1000-231
LSM-1000-232	LSM-1000-233	LSM-1000-234	LSM-1000-235	LSM-1000-236	LSM-1000-237	LSM-1000-238
LSM-1000-239	LSM-1000-240	LSM-1000-241	LSM-1000-242	LSM-1000-243	LSM-1000-244	LSM-1000-245
LSM-1000-246	LSM-1000-247	LSM-1000-248	LSM-1000-249	LSM-1000-250	LSM-1000-251	LSM-1000-252
LSM-1000-253	LSM-1000-254	LSM-1000-255	LSM-1000-256	LSM-1000-257	LSM-1000-258	LSM-1000-259
LSM-1000-260	LSM-1000-261	LSM-1000-262	LSM-1000-263	LSM-1000-264	LSM-1000-265	LSM-1000-266
LSM-1000-267	LSM-1000-268	LSM-1000-269	LSM-1000-270	LSM-1000-271	LSM-1000-272	LSM-1000-273
LSM-1000-274	LSM-1000-275	LSM-1000-276	LSM-1000-277	LSM-1000-278	LSM-1000-279	LSM-1000-280
LSM-1000-281	LSM-1000-282	LSM-1000-283	LSM-1000-284	LSM-1000-285	LSM-1000-286	LSM-1000-287
LSM-1000-288	LSM-1000-289	LSM-1000-290	LSM-1000-291	LSM-1000-292	LSM-1000-293	LSM-1000-294
LSM-1000-295	LSM-1000-296	LSM-1000-297	LSM-1000-298	LSM-1000-299	LSM-1000-300	LSM-1000-301
LSM-1000-302	LSM-1000-303	LSM-1000-304	LSM-1000-305	LSM-1000-306	LSM-1000-307	LSM-1000-308
LSM-1000-309	LSM-1000-310	LSM-1000-311	LSM-1000-312	LSM-1000-313	LSM-1000-314	LSM-1000-315
LSM-1000-316	LSM-1000-317	LSM-1000-318	LSM-1000-319	LSM-1000-320	LSM-1000-321	LSM-1000-322
LSM-1000-323	LSM-1000-324	LSM-1000-325	LSM-1000-326	LSM-1000-327	LSM-1000-328	LSM-1000-329
LSM-1000-330	LSM-1000-331	LSM-1000-332	LSM-1000-333	LSM-1000-334	LSM-1000-335	LSM-1000-336
LSM-1000-337	LSM-1000-338	LSM-1000-339	LSM-1000-340	LSM-1000-341	LSM-1000-342	LSM-1000-343
LSM-1000-344	LSM-1000-345	LSM-1000-346	LSM-1000-347	LSM-1000-348	LSM-1000-349	LSM-1000-350
LSM-1000-351	LSM-1000-352	LSM-1000-353	LSM-1000-354	LSM-1000-355	LSM-1000-356	LSM-1000-357
LSM-1000-358	LSM-1000-359	LSM-1000-360	LSM-1000-361	LSM-1000-362	LSM-1000-363	LSM-1000-364
LSM-1000-365	LSM-1000-366	LSM-1000-367	LSM-1000-368	LSM-1000-369	LSM-1000-370	LSM-1000-371
LSM-1000-372	LSM-1000-373	LSM-1000-374	LSM-1000-375	LSM-1000-376	LSM-1000-377	LSM-1000-378
LSM-1000-379	LSM-1000-380	LSM-1000-381	LSM-1000-382	LSM-1000-383	LSM-1000-384	LSM-1000-385
LSM-1000-386	LSM-1000-387	LSM-1000-388	LSM-1000-389	LSM-1000-390	LSM-1000-391	LSM-1000-392
LSM-1000-393	LSM-1000-394	LSM-1000-395	LSM-1000-396	LSM-1000-397	LSM-1000-398	LSM-1000-399
LSM-1000-400	LSM-1000-401	LSM-1000-402	LSM-1000-403	LSM-1000-404	LSM-1000-405	LSM-1000-406
LSM-1000-407	LSM-1000-408	LSM-1000-409	LSM-1000-410	LSM-1000-411	LSM-1000-412	LSM-1000-413
LSM-1000-414	LSM-1000-415	LSM-1000-416	LSM-1000-417	LSM-1000-418	LSM-1000-419	LSM-1000-420
LSM-1000-421	LSM-1000-422	LSM-1000-423	LSM-1000-424	LSM-1000-425	LSM-1000-426	LSM-1000-427
LSM-1000-428	LSM-1000-429	LSM-1000-430	LSM-1000-431	LSM-1000-432	LSM-1000-433	LSM-1000-434
LSM-1000-435	LSM-1000-436	LSM-1000-437	LSM-1000-438	LSM-1000-439	LSM-1000-440	LSM-1000-441
LSM-1000-442	LSM-1000-443	LSM-1000-444	LSM-1000-445	LSM-1000-446	LSM-1000-447	LSM-1000-448
LSM-1000-449	LSM-1000-450	LSM-1000-451	LSM-1000-452	LSM-1000-453	LSM-1000-454	LSM-1000-455
LSM-1000-456	LSM-1000-457	LSM-1000-458	LSM-1000-459	LSM-1000-460	LSM-1000-461	LSM-1000-462
LSM-1000-463	LSM-1000-464	LSM-1000-465	LSM-1000-466	LSM-1000-467	LSM-1000-468	LSM-1000-469
LSM-1000-470	LSM-1000-471	LSM-1000-472	LSM-1000-473	LSM-1000-474	LSM-1000-475	LSM-1000-476
LSM-1000-477	LSM-1000-478	LSM-1000-479	LSM-1000-480	LSM-1000-481	LSM-1000-482	LSM-1000-483
LSM-1000-484	LSM-1000-485	LSM-1000-486	LSM-1000-487	LSM-1000-488	LSM-1000-489	LSM-1000-490
LSM-1000-491	LSM-1000-492	LSM-1000-493	LSM-1000-494	LSM-1000-495	LSM-1000-496	LSM-1000-497
LSM-1000-498	LSM-1000-499	LSM-1000-500	LSM-1000-501	LSM-1000-502	LSM-1000-503	LSM-1000-504
LSM-1000-505	LSM-1000-506	LSM-1000-507	LSM-1000-508	LSM-1000-509	LSM-1000-510	LSM-1000-511
LSM-1000-512	LSM-1000-513	LSM-1000-514	LSM-1000-515	LSM-1000-516	LSM-1000-517	LSM-1000-518
LSM-1000-519	LSM-1000-520	LSM-1000-521	LSM-1000-522	LSM-1000-523	LSM-1000-524	LSM-1000-525
LSM-1000-526	LSM-1000-527	LSM-1000-528	LSM-1000-529	LSM-1000-530	LSM-1000-531	LSM-1000-532
LSM-1000-533	LSM-1000-534	LSM-1000-535	LSM-1000-536	LSM-1000-537	LSM-1000-538	LSM-1000-539
LSM-1000-540	LSM-1000-541	LSM-1000-542	LSM-1000-543	LSM-1000-544	LSM-1000-545	LSM-1000-546
LSM-1000-547	LSM-1000-548	LSM-1000-549	LSM-1000-550	LSM-1000-551	LSM-1000-552	LSM-1000-553
LSM-1000-554	LSM-1000-555	LSM-1000-556	LSM-1000-557	LSM-1000-558	LSM-1000-559	LSM-1000-560
LSM-1000-561	LSM-1000-562	LSM-1000-563	LSM-1000-564	LSM-1000-565	LSM-1000-566	LSM-1000-567
LSM-1000-568	LSM-1000-569	LSM-1000-570	LSM-1000-571	LSM-1000-572	LSM-1000-573	LSM-1000-574
LSM-1000-575	LSM-1000-576	LSM-1000-577	LSM-1000-578	LSM-1000-579	LSM-1000-580	LSM-1000-581
LSM-1000-582	LSM-1000-583	LSM-1000-584	LSM-1000-585	LSM-1000-586	LSM-1000-587	LSM-1000-588
LSM-1000-589	LSM-1000-590	LSM-1000-591	LSM-1000-592	LSM-1000-593	LSM-1000-594	LSM-1000-595
LSM-1000-596	LSM-1000-597					



Outstanding People, Best-in-Class Product, Winning Partnership

LS Mtron
www.lsmtron.com

Distributed by:



1573 Laperriere Ave. Ottawa ON K1Z 7T3
(613) 725-3704 www.cantecsystems.com