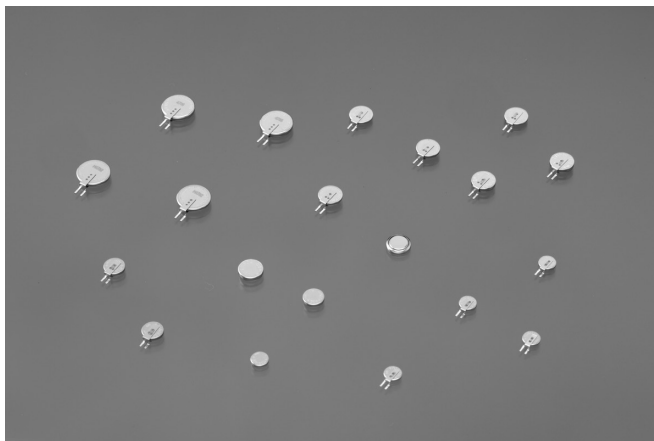
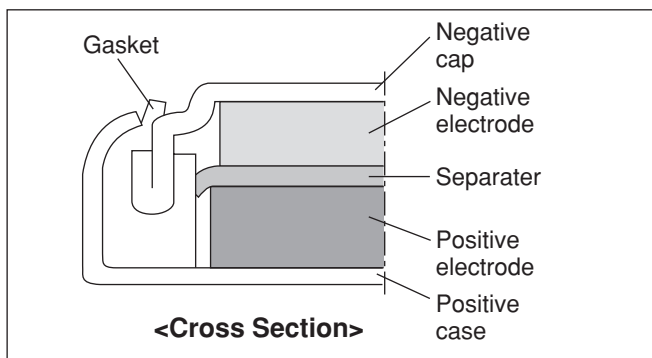


### MS414GE / MS412FE / MS518SE / MS614SE / MS621FE / MS920SE



MS (Manganese Silicon) lithium rechargeable batteries, developed by Seiko Instruments Inc., use silicon oxide as the anode and a lithium manganese composite oxide as the cathode. As a result, they offer long cycle life and highly stable overdischarge characteristics.



### FEATURES

- Large discharge capacity :  
For high operational voltage range of 3.3V to 2.0V.
- Long cycle life :  
Cycle life of over 100 cycles (over 50 cycles for MS414GE) under charge/discharge conditions of 3.1V to 2.0V (D.O.D.100%).
- Excellent overdischarge characteristics :  
Continued stable capacity characteristics even after the battery is overdischarged down to 0.0V.
- Operation over a wide temperature range:  
Operating temperature range : -20°C to +60°C  
Consult us for using the battery at a temperature beyond the above temperature range.
- RoHS Compliant
- Approved by UL (Underwriters Laboratories Inc.)  
UL File No. MH15628

### APPLICATIONS

- Backup power supply for memory or clock function in various types of electronic equipment for mobile communication, office automation, audio-visual equipment, mobile information equipment, etc. (smartphone, tablet, cellphone, PHS, cordless phone, fax machine, PC, video camera, digital camera, tuner, handy terminal, etc.)
- Main power supply for small and slim portable equipment.

### SPECIFICATIONS

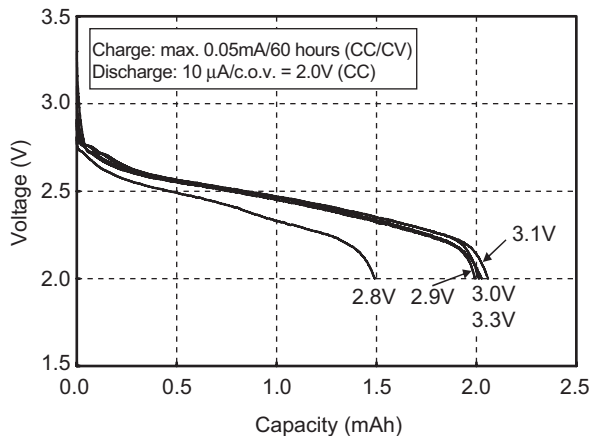
Type	Nominal Voltage (V)	Charge Voltage (Standard Charge Voltage)*6 (V)	Nominal Capacity (mAh)*1	Internal Impedance (Ω)*2	Standard Charge/Discharge Current (mA)	Maximum Discharge Current (Continuous) (mA)*3	Cycle Life (Time)*4		Size (mm)		Weight (g)
							100%*5 D.O.D. (Depth of Discharge)	20%*5 D.O.D. (Depth of Discharge)	Diameter	Height	
MS414GE	3	2.8 to 3.3 (3.1)	2.0	100	0.010	0.05	50	500	4.8	1.4	0.08
MS412FE	3	2.8 to 3.3 (3.1)	1.0	100	0.010	0.10	100	1000	4.8	1.2	0.07
MS518SE	3	2.8 to 3.3 (3.1)	3.4	60	0.010	0.15	100	1000	5.8	1.8	0.13
MS614SE	3	2.8 to 3.3 (3.1)	3.4	80	0.015	0.25	100	1000	6.8	1.4	0.17
MS621FE	3	2.8 to 3.3 (3.1)	5.5	80	0.015	0.25	100	1000	6.8	2.1	0.23
MS920SE	3	2.8 to 3.3 (3.1)	11.0	35	0.050	0.80	100	1000	9.5	2.1	0.47

\*1. Nominal capacity: Typical value of discharge capacity between 3.1V and 2.0V  
 \*2. Internal impedance is measured using an AC (Alternating Current) method at the fully charged state.  
 \*3. Maximum discharge current indicates the value of a current for approximately 50% of the nominal capacity.  
 \*4. Cycle Life indicates the times charge/discharge is repeated for approximately 50% of the capacity values in the specification sheet.  
 \*5. 100% and 20% are based on nominal capacity.  
 \*6. A constant voltage charge is recommended, but due to a limit in charge current, it is necessary to insert a resistor to regulate the charge current.  
 Please see Page 19 for resistor value. Contact us for further details.  
 If a constant current charge is required, contact us for more information.

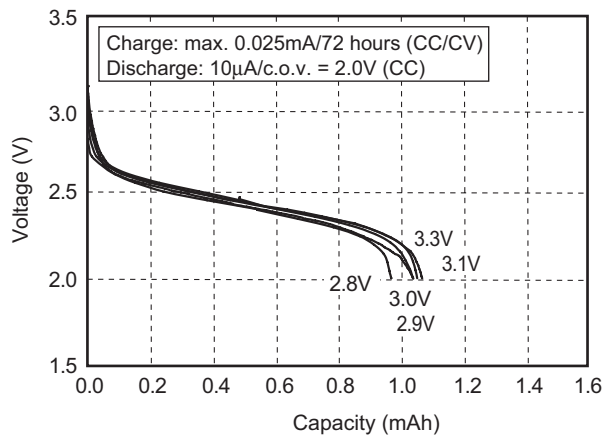
MS Lithium Rechargeable Batteries are not reflowable. Please mount them on PCB by hand soldering.

**DISCHARGE CHARACTERISTICS (CHARGE VOLTAGE DEPENDENCE)**

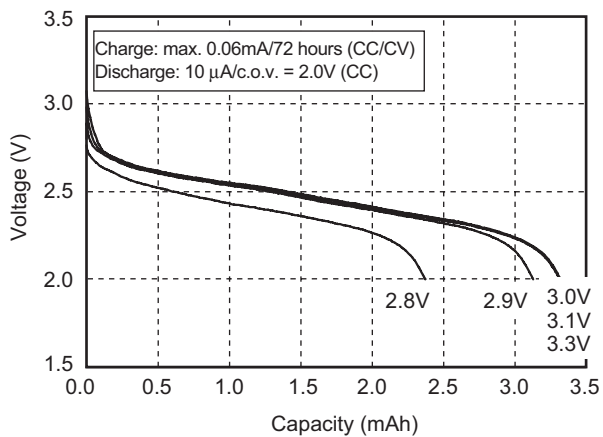
**MS414GE**



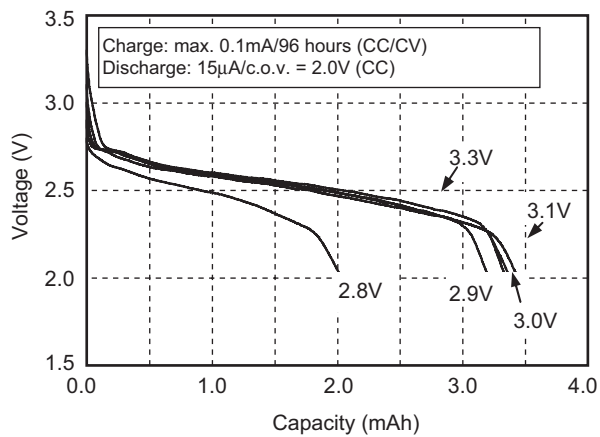
**MS412FE**



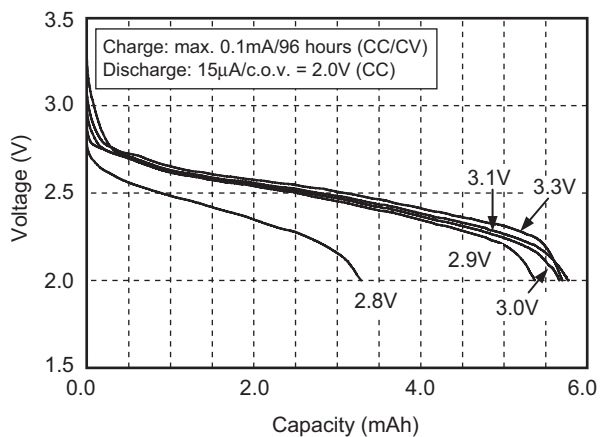
**MS518SE**



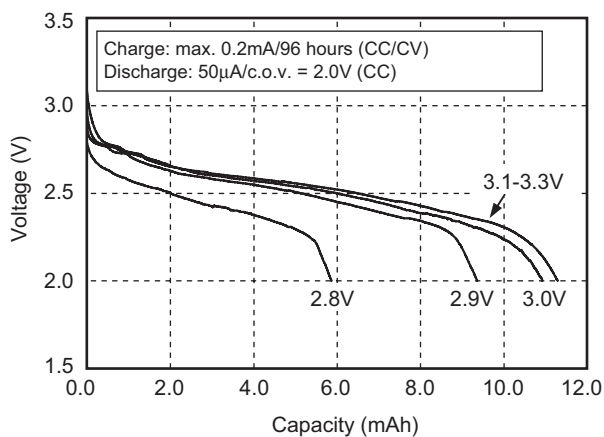
**MS614SE**



**MS621FE**



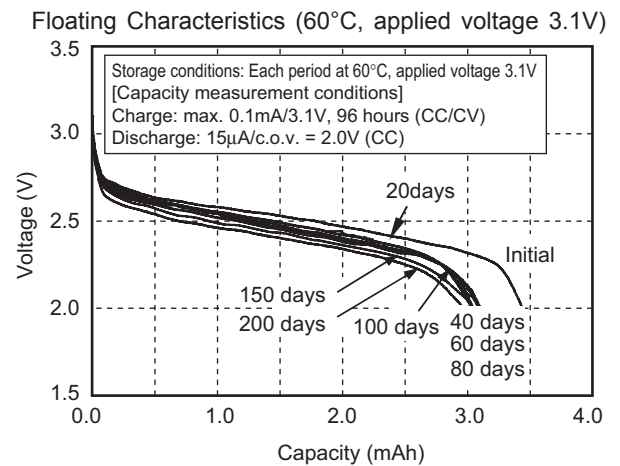
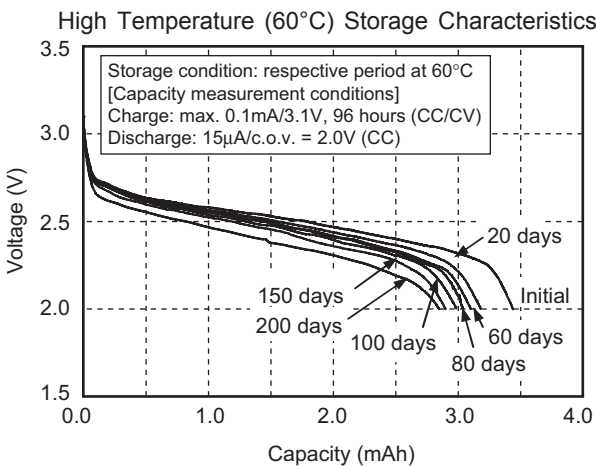
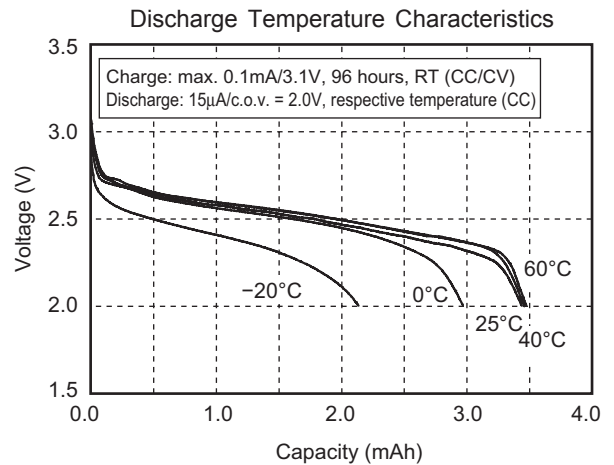
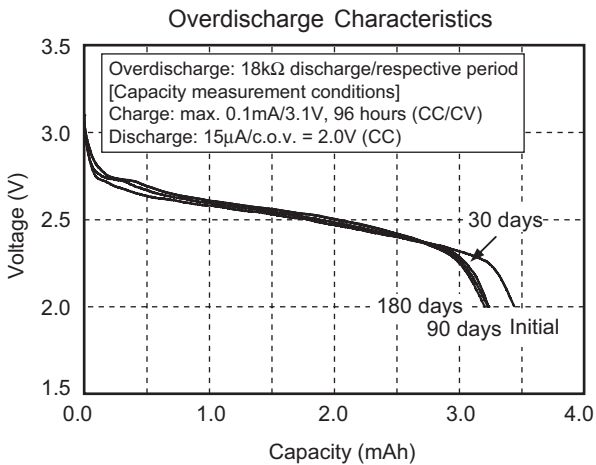
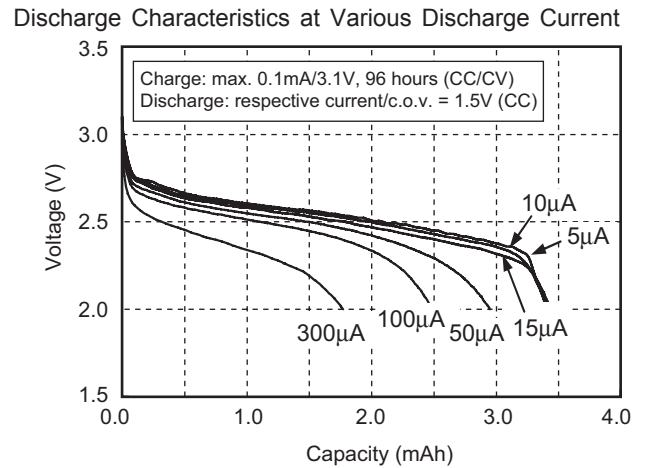
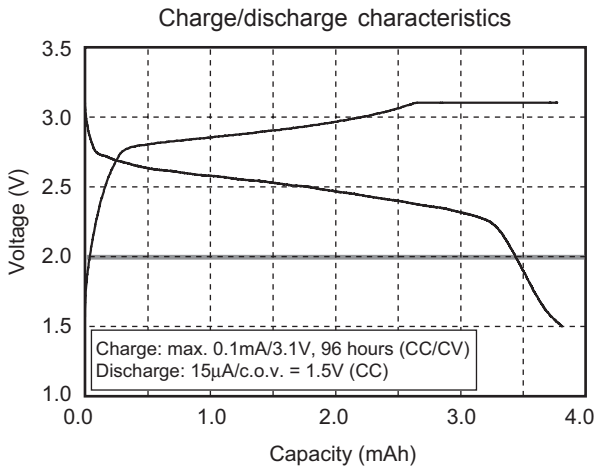
**MS920SE**



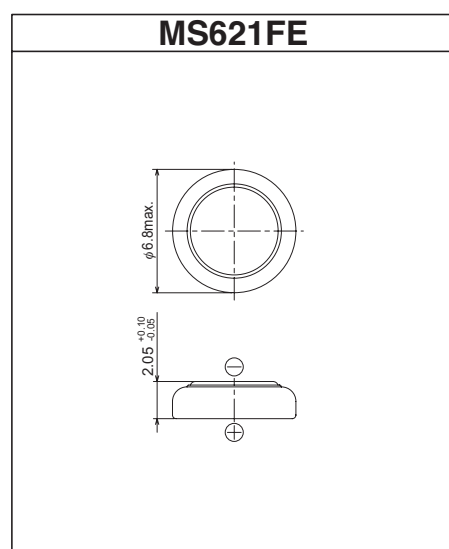
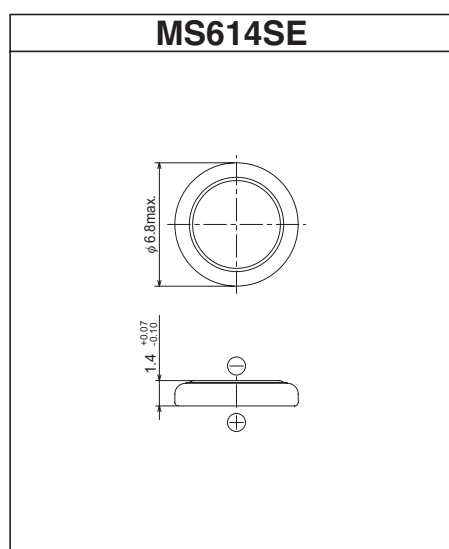
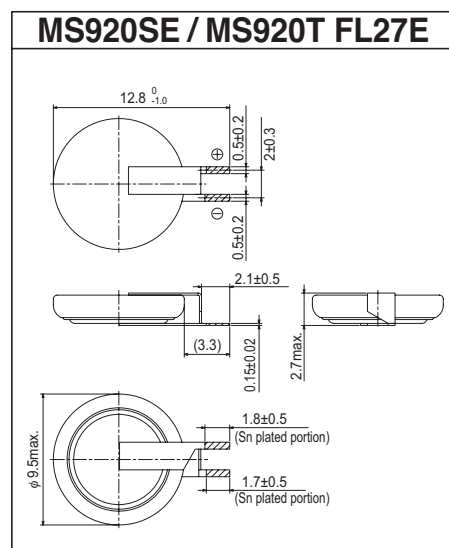
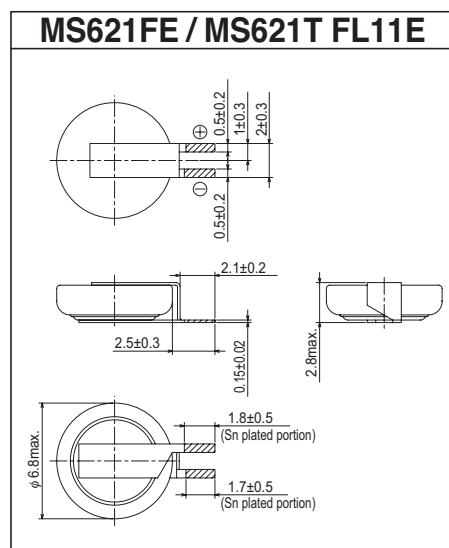
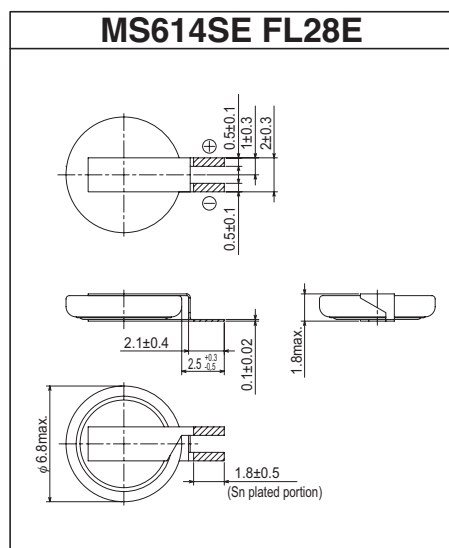
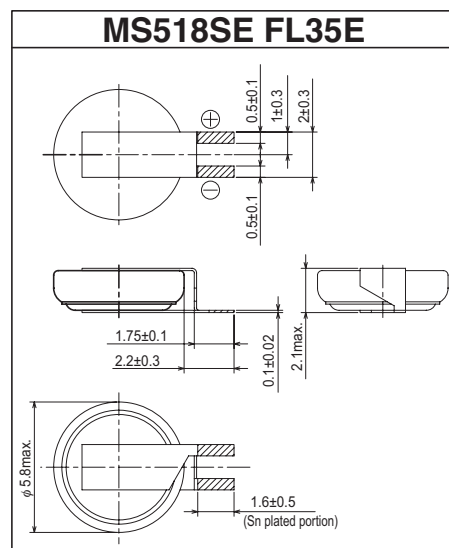
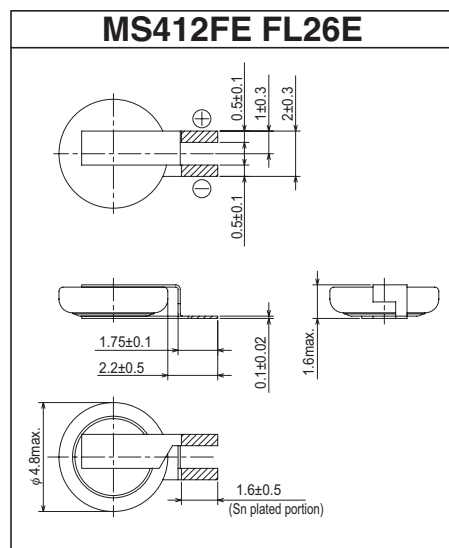
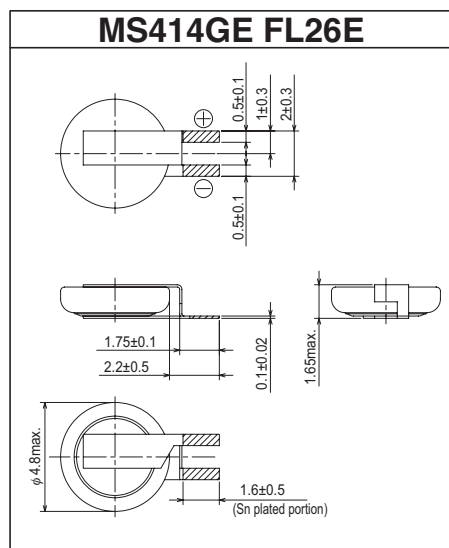
\* c.o.v. : Cut off Voltage

### CHARACTERISTICS

#### MS614SE



**DIMENSIONS OF STANDARD TERMINALS OF MS LITHIUM RECHARGEABLE BATTERIES**



\* Rechargeable batteries are all available without tabs.

- Units: mm  
 - The hatched parts are tin plated (Sn: 100%).