
Introduction of INR18650-30Q



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Energy Business Division

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INR18650-30Q

- **Specification**
- **Capacity (0.2C vs. 10A)**
- **AC/DC impedance**
- **Capacity & temperature vs. discharge capacity**
- **Energy & avg. voltage at different current**
- **Cycle life**
- **Storage characteristics**
- **Safety test**

Specification

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| Type | | Spec.(Tentative) | Typical INR18650-30Q |
|-------------------------------|------------------------|-------------------|----------------------|
| Chemistry | | NCA | NCA |
| Dimension (mm) | Diameter | 18.33 ± 0.07 | 18.33 ± 0.07 |
| | Height | 64.85 ± 0.15 | 64.85 ± 0.15 |
| Weight (g) | | Max. 48.0 | 45.6 |
| Initial IR (mΩ AC 1kHz) | | ≤ 18 | 13.13 ± 2 |
| Initial IR (mΩ DC (10A-1A)) | | ≤ 30 | 19.94 ± 2 |
| Nominal Voltage (V) | | 3.60 | 3.61 |
| Charge Method (100mA cut-off) | | CC-CV (4.2±0.05V) | CC-CV (4.2±0.05V) |
| Charge Time | Standard (min), 0.5C | 180min | 134min |
| | Rapid (min), 4A | 70min | 68min |
| Charge Current | Standard current (A) | 1.5 | 1.5 |
| | Max. current (A) | 4.0 | 4.0 |
| Discharge | End voltage (V) | 2.5 | 2.5 |
| | Max. cont. current (A) | 15 | 15 |
| Rated discharge Capacity | Standard (mAh) (0.2C) | 3,000 | 3,040 |
| | rated (mAh) (10A) | 2,700 | 2,983 |

Capacity _ 0.2C vs. 10A

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▪ 0.2C capacity

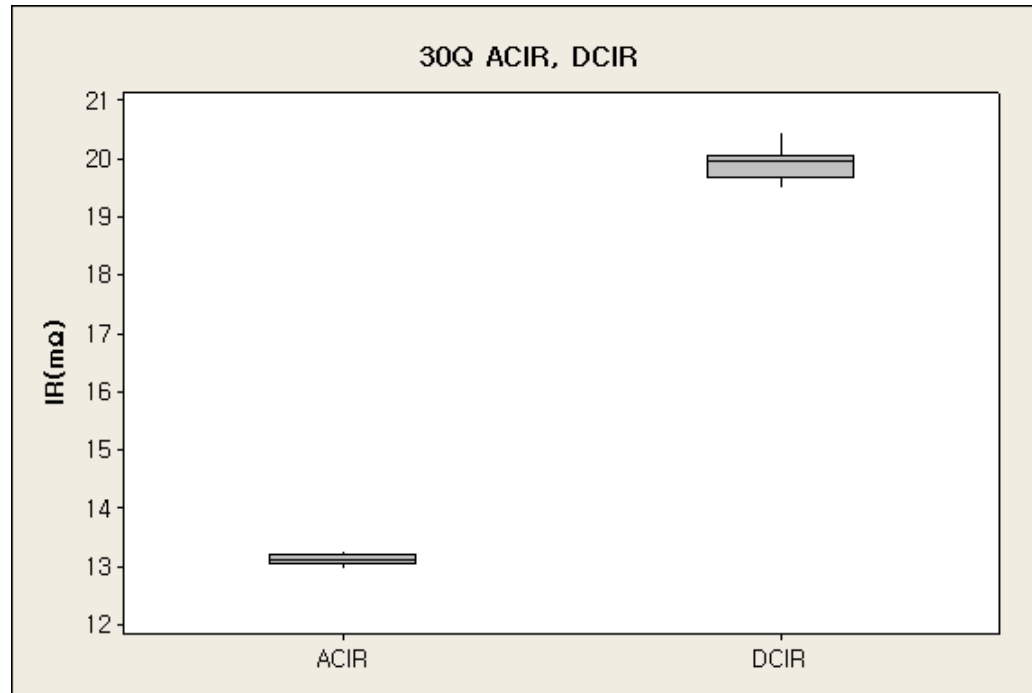
| Cell | Capacity(Ah) | Energy(Wh) | Avg. volt(V) |
|-------------|--------------|-------------|--------------|
| 1 | 3.041 | 11.0 | 3.61 |
| 2 | 3.043 | 11.0 | 3.61 |
| 3 | 3.035 | 11.0 | 3.61 |
| Avg. | 3.040 | 11.0 | 3.61 |

▪ 10A capacity

| Cell | Capacity(Ah) | Energy(Wh) | Avg. volt(V) |
|-------------|--------------|-------------|--------------|
| 1 | 2.978 | 10.1 | 3.38 |
| 2 | 2.992 | 10.1 | 3.39 |
| 3 | 2.980 | 10.1 | 3.39 |
| Avg. | 2.983 | 10.1 | 3.39 |

AC/DC Impedance

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AC-IR

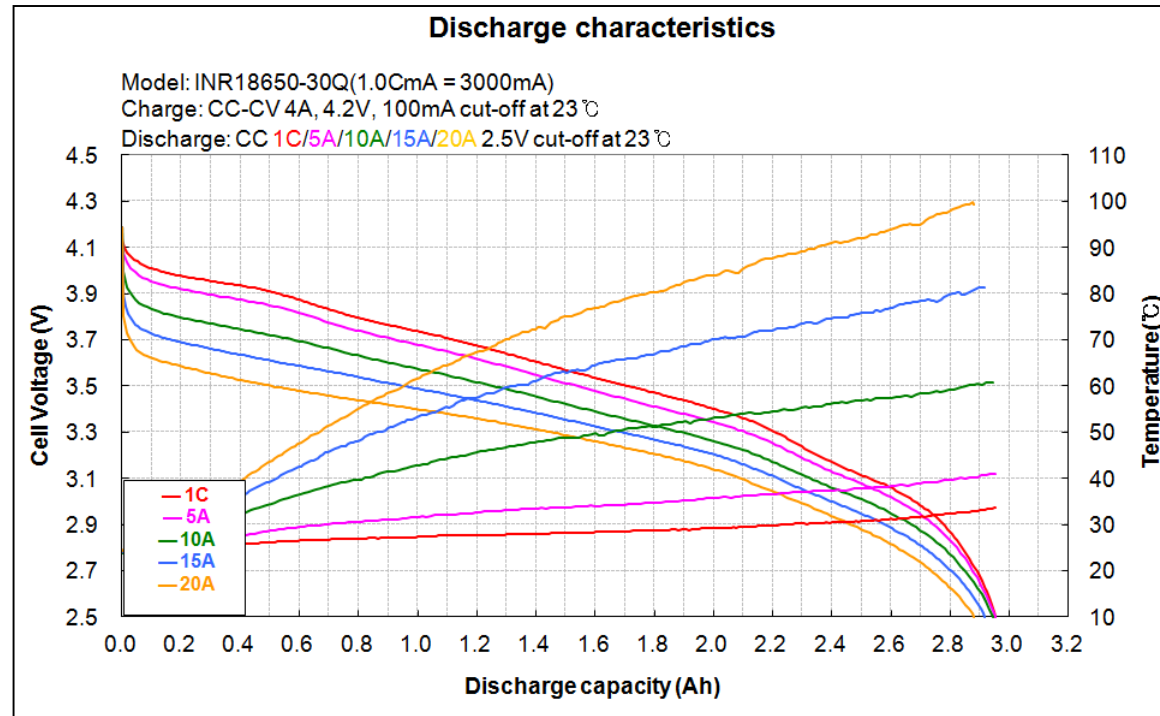
$13.13 \pm 2\text{m}\Omega$

DC-IR

$19.94 \pm 2\text{m}\Omega$

Capacity & Temperature vs. discharge capacity

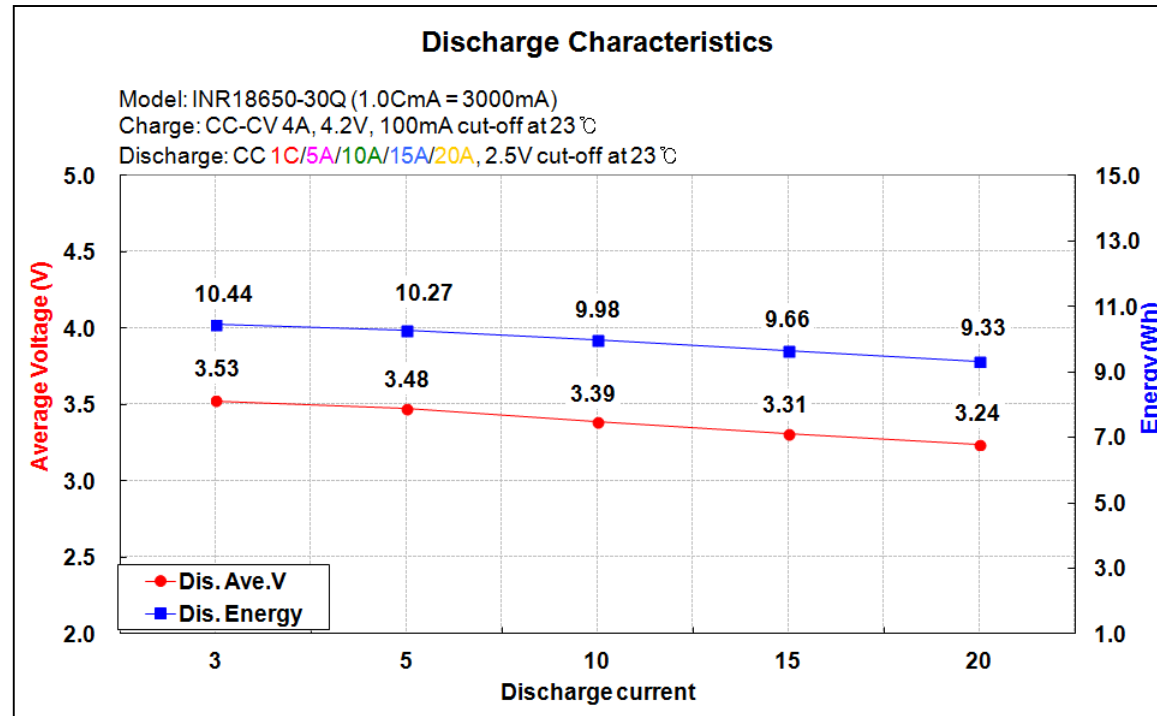
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| Discharge current | | | | | |
|-------------------|-------|-------|-------|-------|-------|
| | 1C | 5A | 10A | 15A | 20A |
| Capa.(Ah) | 2.953 | 2.950 | 2.945 | 2.917 | 2.879 |
| Temp.(°C) | 33.7 | 41.0 | 60.9 | 81.2 | 99.4 |
| Time(min.) | 59.1 | 35.4 | 17.7 | 11.7 | 8.6 |

Energy & Avg. voltage at different current

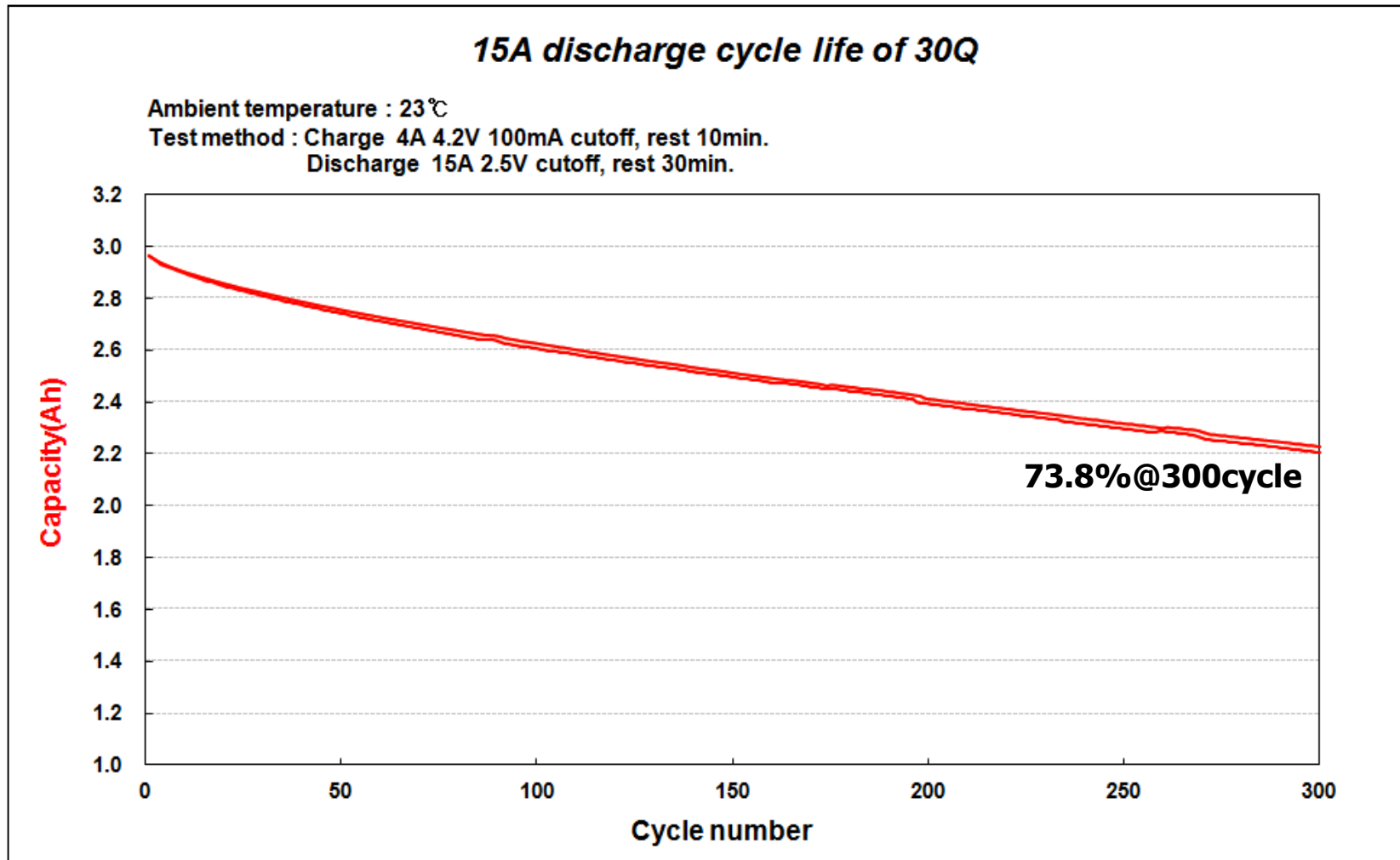
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| Discharge current | | | | | |
|-------------------|-------|-------|------|------|------|
| | 1C | 5A | 10A | 15A | 20A |
| Energy(Wh) | 10.44 | 10.27 | 9.98 | 9.66 | 9.33 |
| Avg. voltage(V) | 3.53 | 3.48 | 3.39 | 3.31 | 3.24 |

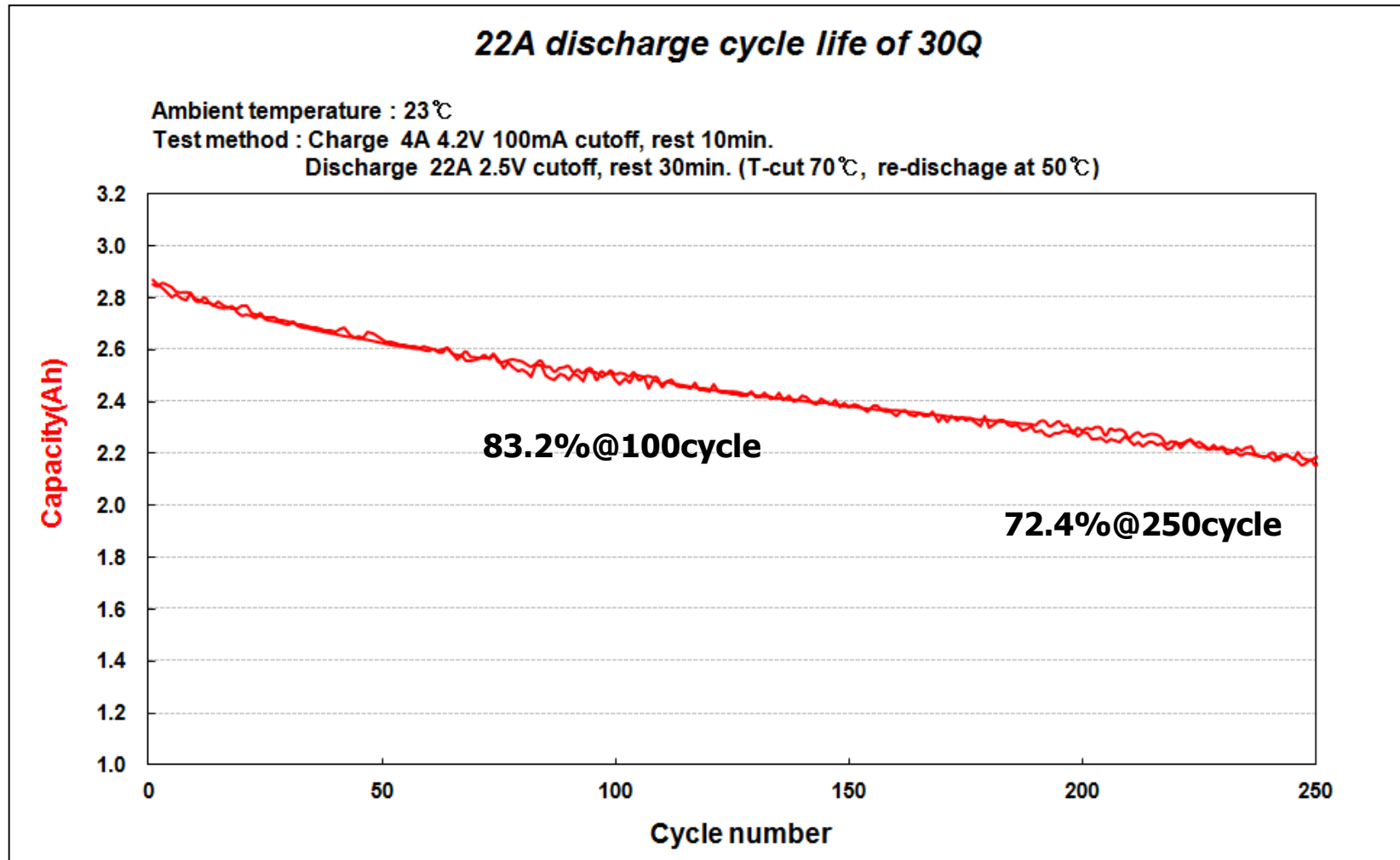
Cycle life _ 15A cycle

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Cycle life _ 22A cycle(70 °C T-cut)

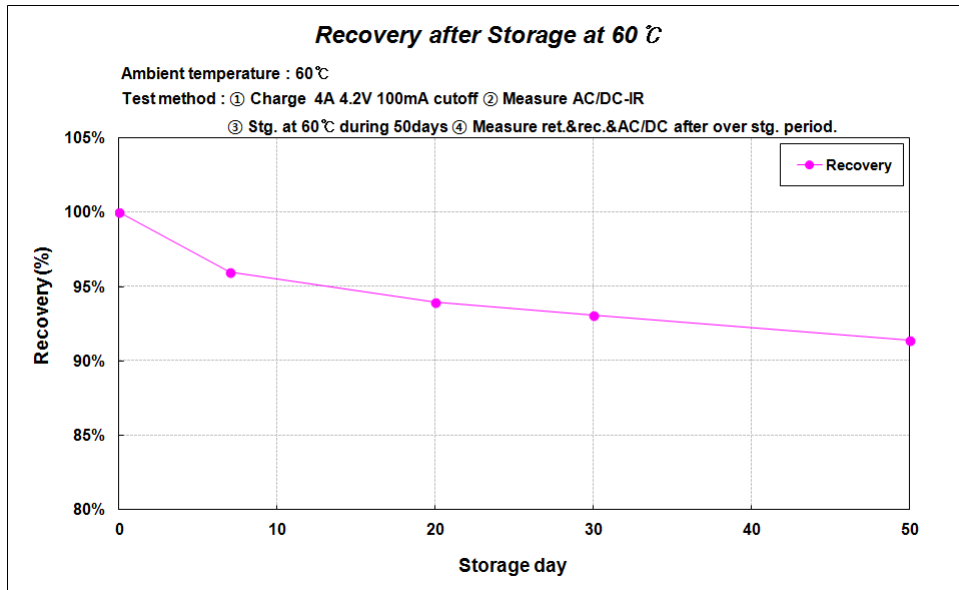
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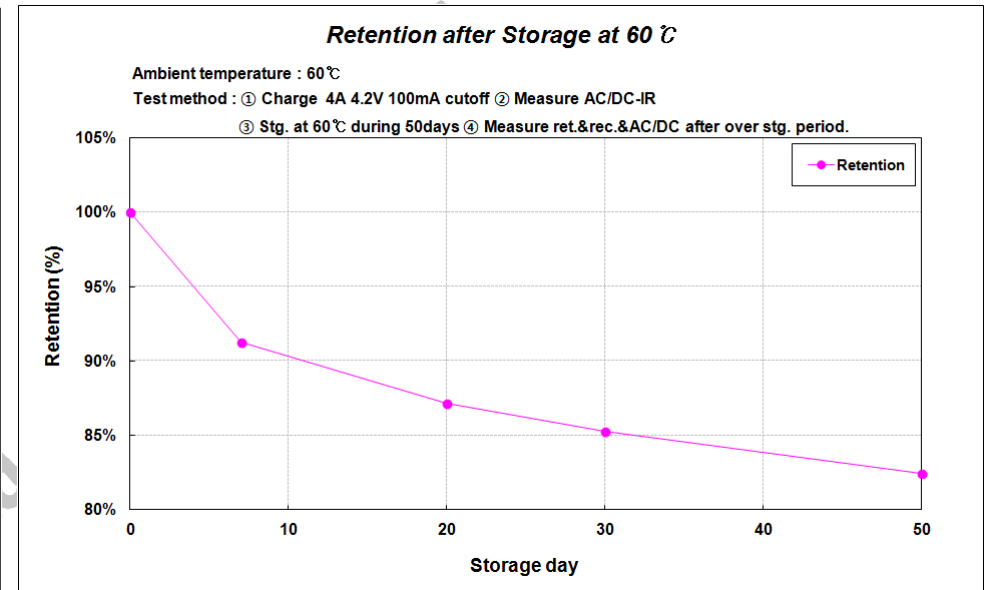
Storage at 60 °C

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Recovery



Retention



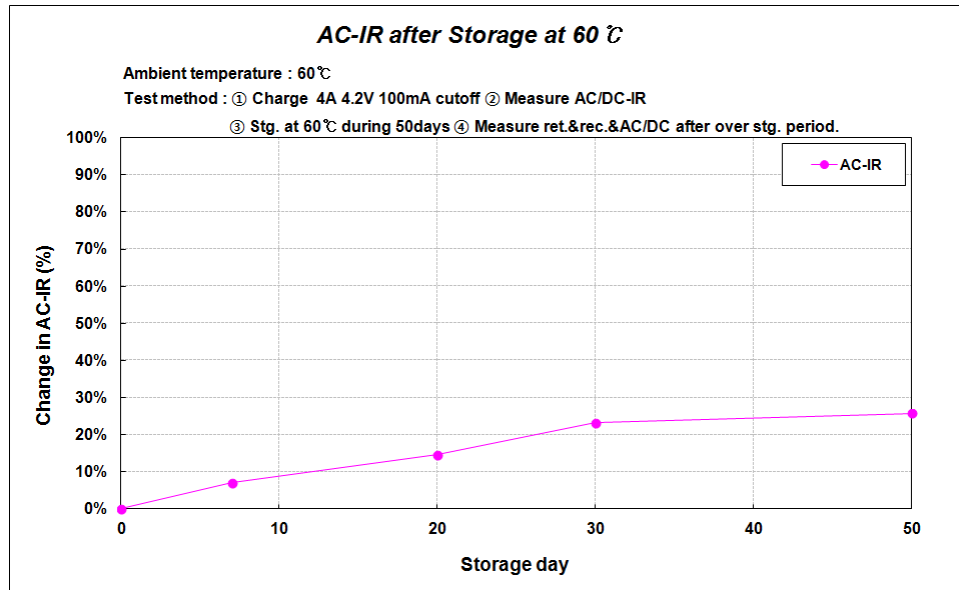
Storage at 60 °C

| storage day | initial | | | after storage | | | | Ratio(%) | | | |
|-------------|---------|------|----------|---------------|------|-----------|----------|----------|------|-----------|----------|
| | ACIR | DCIR | Capacity | ACIR | DCIR | Retention | Recovery | ACIR | DCIR | Retention | Recovery |
| 7 | 13.2 | 20.0 | 2.981 | 14.2 | 27.0 | 2.720 | 2.862 | 7.2 | 35.1 | 91.3 | 96.0 |
| 20 | 13.2 | 19.9 | 2.986 | 15.1 | 31.9 | 2.604 | 2.807 | 14.7 | 60.5 | 87.2 | 94.0 |
| 30 | 13.1 | 20.2 | 2.990 | 16.1 | 34.7 | 2.550 | 2.783 | 23.2 | 72.0 | 85.3 | 93.1 |
| 50 | 13.1 | 19.9 | 2.986 | 16.4 | 38.4 | 2.463 | 2.730 | 25.8 | 93.3 | 82.5 | 91.4 |

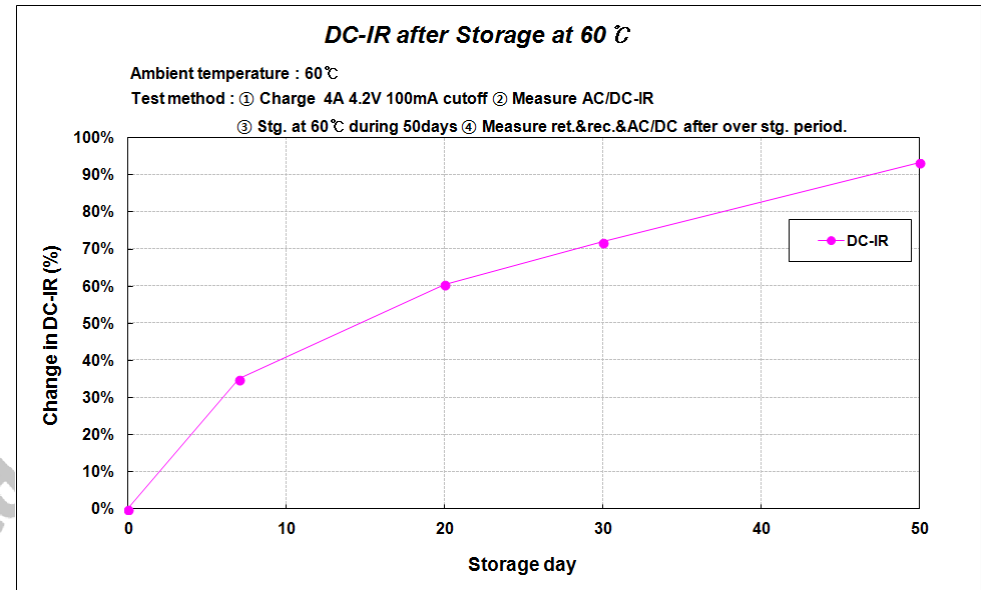
Storage at 60 °C

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AC-IR



DC-IR



Storage at 60 °C

| storage day | initial | | | after storage | | | | Ratio(%) | | | |
|-------------|---------|------|----------|---------------|------|-----------|----------|----------|------|-----------|----------|
| | ACIR | DCIR | Capacity | ACIR | DCIR | Retention | Recovery | ACIR | DCIR | Retention | Recovery |
| 7 | 13.2 | 20.0 | 2.981 | 14.2 | 27.0 | 2.720 | 2.862 | 7.2 | 35.1 | 91.3 | 96.0 |
| 20 | 13.2 | 19.9 | 2.986 | 15.1 | 31.9 | 2.604 | 2.807 | 14.7 | 60.5 | 87.2 | 94.0 |
| 30 | 13.1 | 20.2 | 2.990 | 16.1 | 34.7 | 2.550 | 2.783 | 23.2 | 72.0 | 85.3 | 93.1 |
| 50 | 13.1 | 19.9 | 2.986 | 16.4 | 38.4 | 2.463 | 2.730 | 25.8 | 93.3 | 82.5 | 91.4 |

Safety test _ Summary

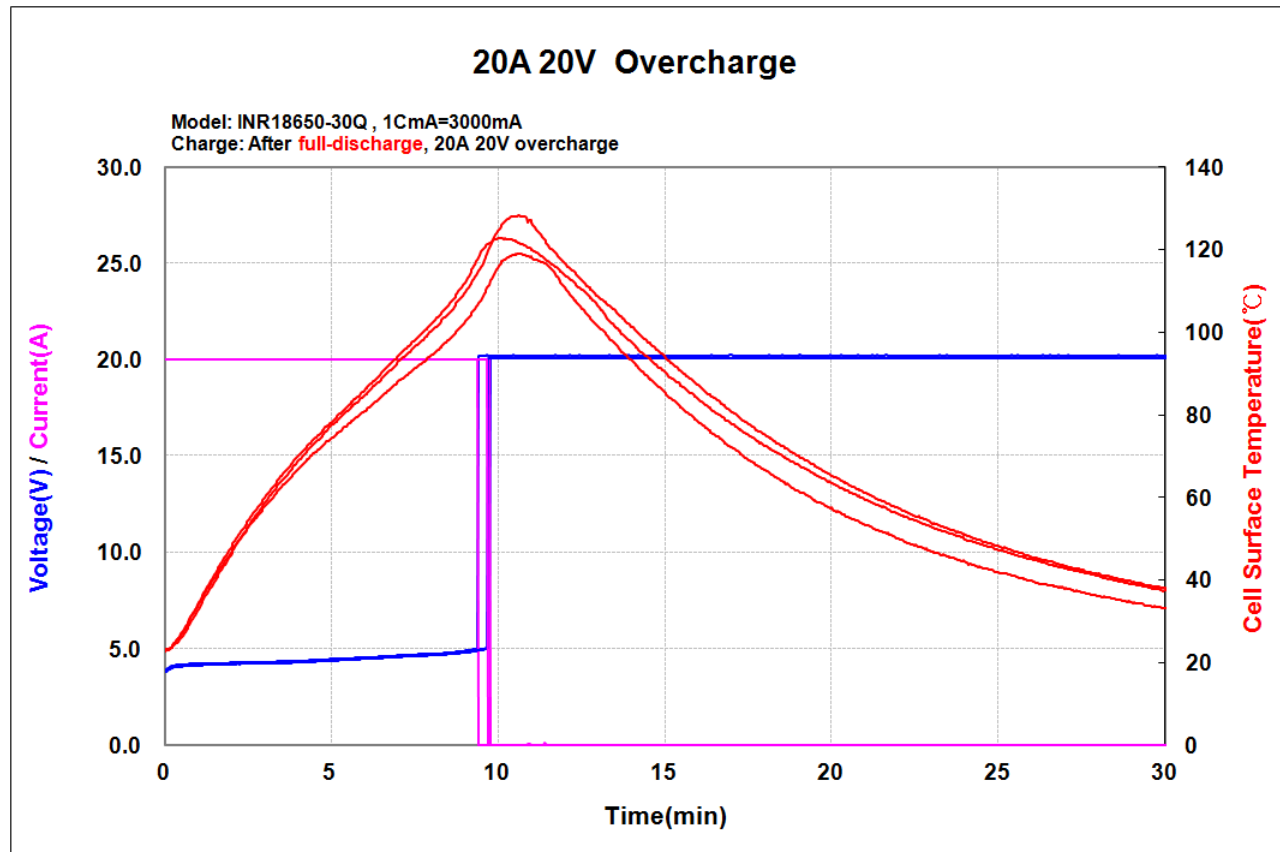
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| | | | 30Q | | |
|------------------|---------------|--------------|-------|---------|------------|
| Test item | | | Spec. | Results | |
| | | | | Results | Max. temp. |
| Electrical Abuse | Overcharge | 20A, 20V(UL) | L1 | 3L1 | 128.4 |
| | Short circuit | 10mΩ at 23℃ | L1 | 3L1 | 87.0 |
| Mechanical Abuse | Impact | UL | L1 | 5L0 | 22.1 |
| Thermal Abuse | Hot oven | 140℃ | - | 3L1 | 147.6 |



Safety test _ Overcharge

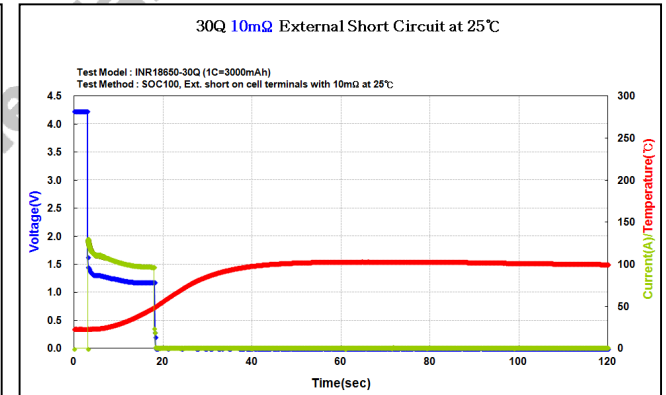
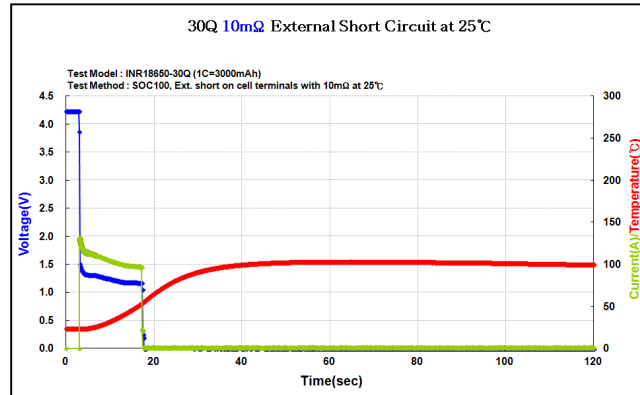
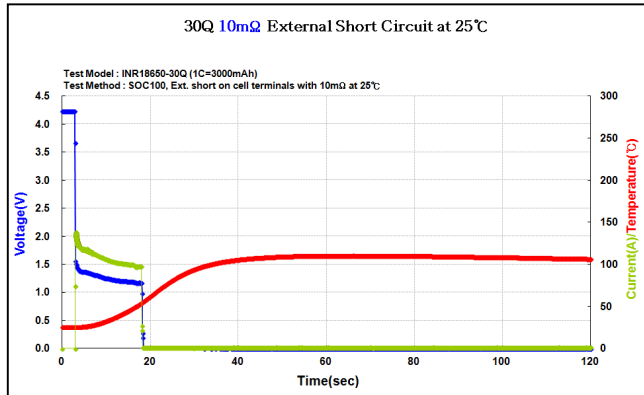
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| Cell | Results | CID open time | Max. temp. |
|------|---------|---------------|------------|
| 1 | L1 | 9.76 | 119.0 |
| 2 | L1 | 9.40 | 122.9 |
| 3 | L1 | 9.70 | 128.4 |
| Avg. | | 9.62 | 123.4 |

Safety test _ Short circuit

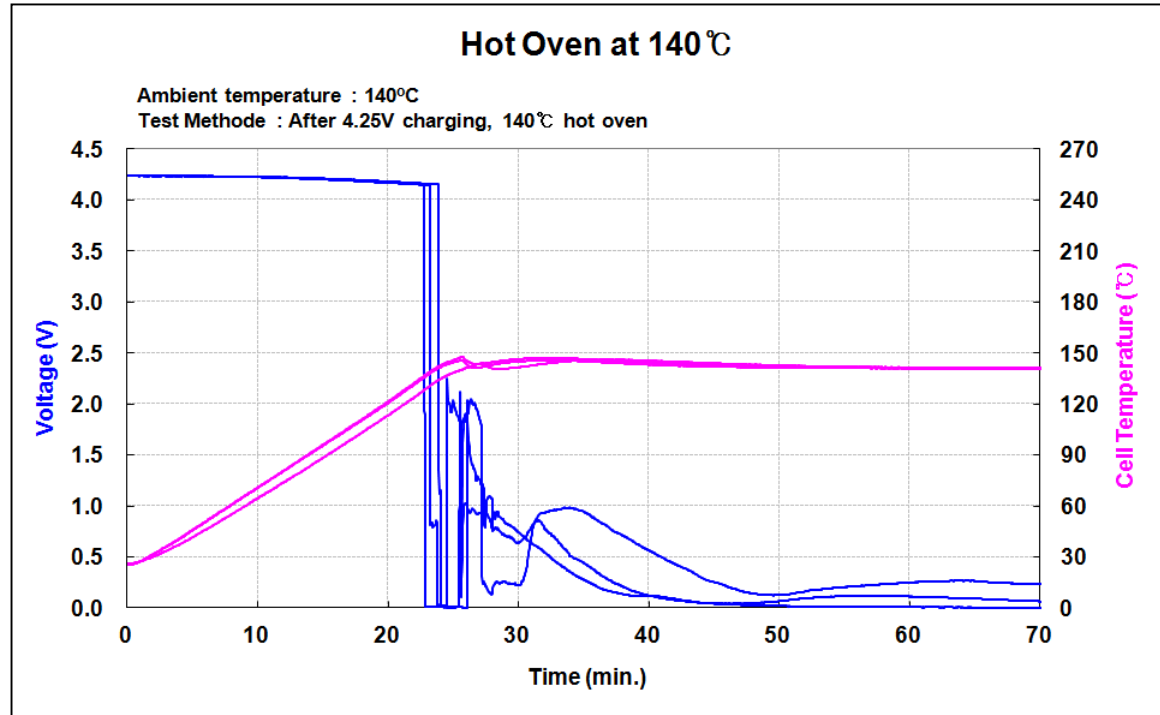
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| Cell | Results | Max. current (A) | Max. temp.(°C) |
|-------------|---------|------------------|----------------|
| 1 | L1 | 138 | 111 |
| 2 | L1 | 132 | 104 |
| 3 | L1 | 130 | 103 |
| Avg. | | 133 | 106 |

Safety test _ Hot oven(140°C)

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| Cell | Results | Max. temp. |
|-------------|---------|--------------|
| 1 | L1 / OK | 147.6 |
| 2 | L1 / OK | 145.9 |
| 3 | L1 / OK | 146.1 |
| Avg. | | 146.5 |

Safety test _ Impact

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| Cell | Results |
|------|---------|
| 1 | L0 / OK |
| 2 | L0 / OK |
| 3 | L0 / OK |
| 4 | L0 / OK |
| 5 | L0 / OK |

- Thank you -

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