Ni-Plating Method Change

Customer : All
Date : 16. Nov 2023

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SAMSUNG SDI

ECN : Ni-Plating method change

■ **Purpose : Synchronization of Ni-plating method of Cap-up for IT customers**

■ **Improvement : Ni-plating thickness of electroless plating is stable and welding tensile strength is high**

■ **Effect : Stable Ni plating thickness and advantage for resistance welding**

■ **Change Item**

	As-Is (40T3)	To-Be (40T5)	Remark
Cap-up diameter (outer)	18.52 mm	←	
Cap-up height	2.3mm	←	
Cap-up thickness	0.6mm	←	
Plating	**Electro plating** (Thickness spec: 3~7um)	**Electroless plating** (Thickness spec: 3~6um)	**Difference**
Tube marking			**No. will be change from 3 to 5 in 2nd row**

■ **Apply Schedule: ~2023/10/28**

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1. Electro / Electroless plating Comparison

	Items		Electroplating	Electroless plating	Remark
Basic characteristic	Plating thickness dispersion		○	◎	plating thickness of electroless plating more stable than electro plating
	Material		Ni	Ni+P	
	Melting Point (℃)		1275	880	Melting point difference↑
	Electrical resistance(mΩ·cm)		30	100	
	Thermal conductivity(W/cm·K)		0.6	0.08	
	Corrosion resistance TEST		○	◎	Electroless plating : Corrosion resistance↑
	Abrasion, Corrosion		○	◎	Electroless plating : Abrasion, Corrosion ↑
Application Characteristic	Welding type	Wire bonding	○	○	Al wire test result
		Laser	○	△	Ni Tab test result
		Resistance	△	○	Cu Tab test result
	Tab Selectivity		◎	○	Electroless plating : Not available for SUS Tab
	Plating layer peeling TEST		○	○	Similar level

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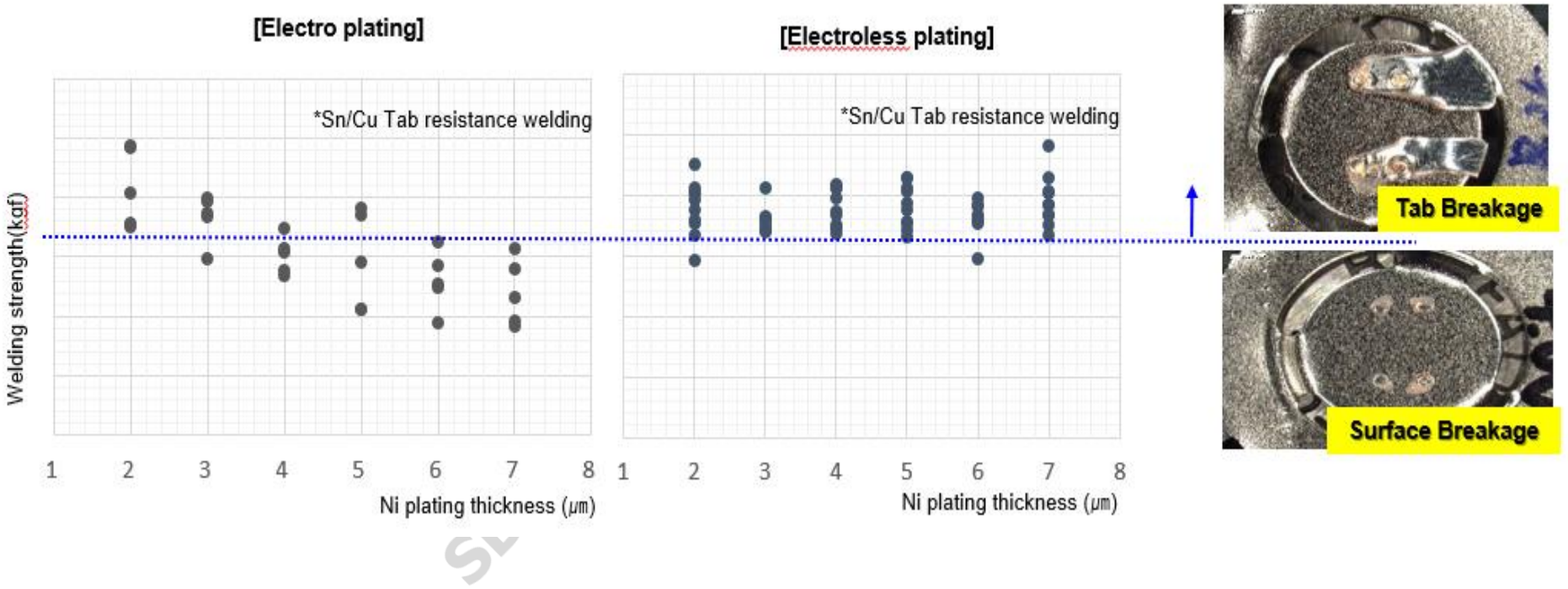
2. Tensile strength comparison

- Electroless plating has advantage for resistance welding



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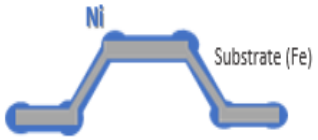
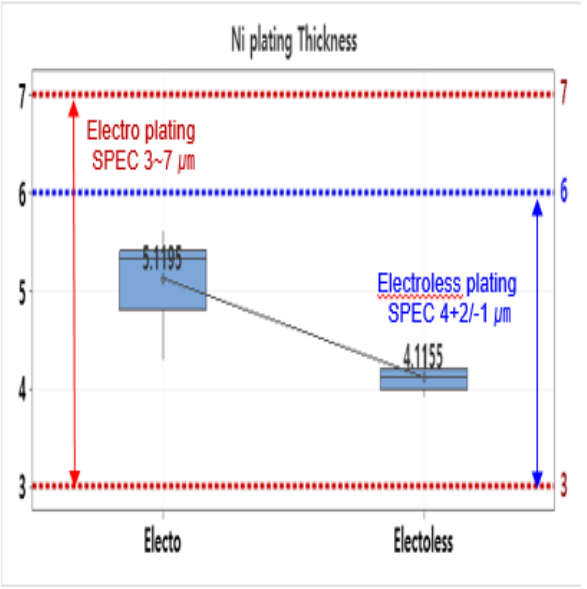
3. Cap-up comparison

- Ni-plating thickness dispersion of Cap- up is small

Ni-plating thickness		Electro plating	Electroless plating
Cap up	Ni shape		
	Thickness dispersion	Ni growth on Edge ↑	Stable

Ni-plating thickness



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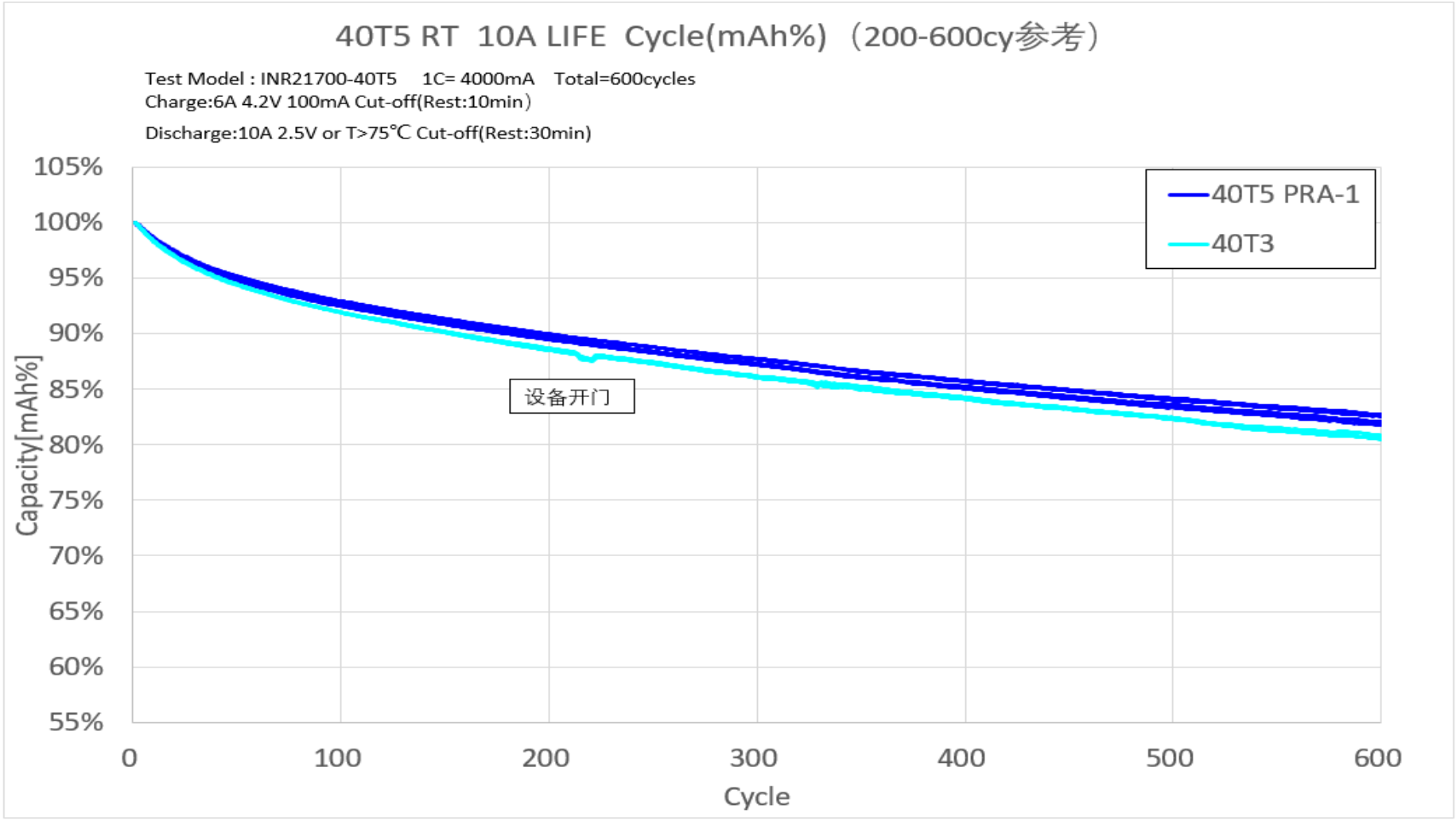
※40T5 Vs 40T3 @10A DSG Life Cycle@RT



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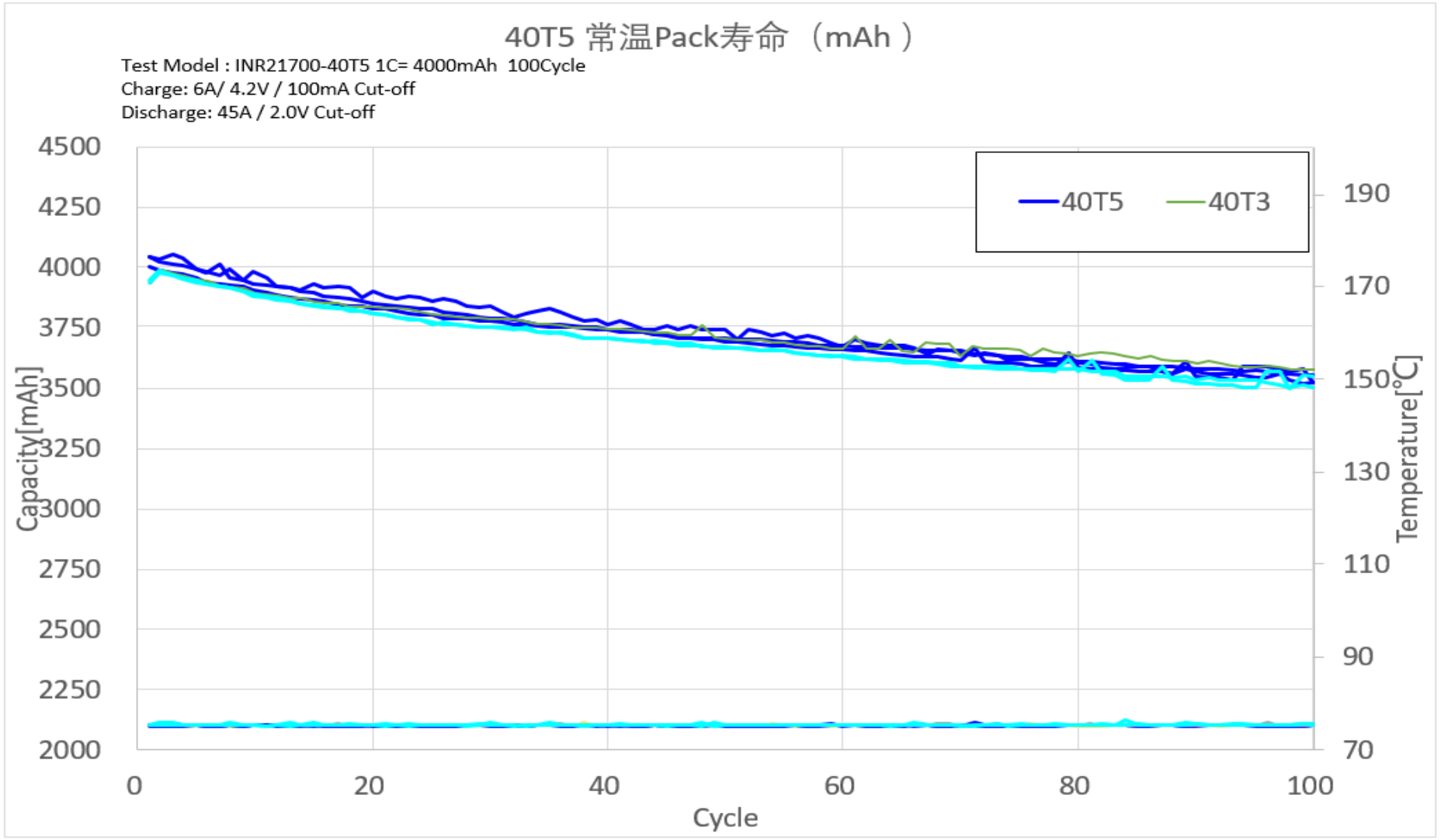
※40T5 Vs 40T3 @45A DSG Life Cycle@RT



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※Performance Test

- Test result : No abnormality on basic inspection

	NO	Height	Weight	Diameter	Shipping Capacity	IR	OCV
SU		70.30	70.00	21.22	4200	11.60	3.480
SL		70.00	60.00	21.08	4000	9.00	3.450
MAX		70.23	68.49	21.21	4111	11.079	3.464
MIN		70.16	67.98	21.19	4090	10.236	3.462
AVERAGE		70.19	68.24	21.20	4102	10.627	3.462
QCNA201724802	1	70.17	68.26	21.21	4101	10.416	3.462
	2	70.18	67.99	21.20	4111	10.668	3.462
	3	70.18	68.06	21.19	4104	10.681	3.463
	4	70.16	68.28	21.20	4102	10.861	3.464
	5	70.21	68.24	21.21	4108	10.296	3.462
	6	70.18	68.28	21.21	4106	10.868	3.462
	7	70.22	68.20	21.20	4107	10.632	3.462
	8	70.19	68.18	21.20	4108	10.626	3.462
	9	70.21	68.27	21.21	4108	10.789	3.463
	10	70.19	68.12	21.21	4110	10.236	3.462
	11	70.22	68.22	21.20	4111	10.468	3.462
	12	70.19	68.49	21.21	4102	10.669	3.462
	13	70.18	68.22	21.19	4092	10.248	3.462
	14	70.22	68.12	21.20	4099	10.869	3.462
	15	70.22	68.26	21.20	4101	10.402	3.462
	16	70.23	68.24	21.20	4108	10.938	3.463
	17	70.17	68.29	21.19	4093	10.908	3.462
	18	70.22	68.17	21.20	4099	10.699	3.462
	19	70.19	68.08	21.20	4106	10.691	3.462
	20	70.23	68.09	21.20	4097	10.831	3.462
	21	70.17	68.28	21.20	4101	10.689	3.462
	22	70.22	68.48	21.20	4106	10.587	3.462
	23	70.21	68.20	21.19	4102	10.876	3.462
	24	70.19	68.44	21.20	4099	10.629	3.463
	25	70.16	68.26	21.20	4101	10.608	3.462
	26	70.21	67.98	21.21	4108	10.496	3.462
	27	70.18	68.05	21.20	4093	10.561	3.462
	28	70.17	68.16	21.19	4092	10.832	3.462
	29	70.17	68.06	21.20	4094	10.629	3.462
	30	70.16	68.00	21.20	4106	11.079	3.462
	31	70.17	68.21	21.20	4100	10.648	3.462
	32	70.22	68.40	21.20	4090	10.366	3.463

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※Safety Test

- Test result : No abnormality on Safety test items

项目	SPEC	Sample		BATCH/LOT QC-74B	电阻 IR	电压 OCV	重量 g	温度	等级	评价
过充电4 과충전4 Overcharge ①10A 2.5V discharge ②20A 20V 1H ※Tab2层	L1	5	No1	Q40NJ41BK	10.8	4.179	68.44	108	L1	OK
			No2	Q40NJ41BK	10.8	4.178	68.41	112	L1	OK
			No3	Q40NJ41BK	9.9	4.179	68.41	114	L1	OK
			No4	Q40NJ41BK	10.8	4.178	68.43	104	L1	OK
			No5	Q40NJ41BK	10.5	4.179	68.37	104	L1	OK
压缩 압축 用13KN的压力使电池的变形量达到2/3为止	L1	5	No1	Q40NJ41BK	10.2	4.223	68.36	24	L1	OK
			No2	Q40NJ41BK	10.2	4.223	68.41	24	L1	OK
			No3	Q40NJ41BK	10.0	4.223	68.41	24	L1	OK
			No4	Q40NJ41BK	10.9	4.223	68.35	24	L1	OK
			No5	Q40NJ41BK	9.9	4.221	68.42	24	L1	OK
热暴出 Heating 25±5℃ 5℃/min 130℃ 1h	L1	5	No1	Q40NJ41BK	10.6	4.223	68.38	137	L1	OK
			No2	Q40NJ41BK	10.8	4.222	68.49	137	L1	OK
			No3	Q40NJ41BK	10.5	4.224	68.41	138	L1	OK
			No4	Q40NJ41BK	10.5	4.224	68.41	137	L1	OK
			No5	Q40NJ41BK	10.6	4.225	68.48	135	L1	OK
UL Impact UL冲击 15.8φ 9.1kg 610mm 平行冲击	L1	5	No1	Q40NJ41BK	10.7	4.179	68.43	24	L0	OK
			No2	Q40NJ41BK	10.7	4.179	68.42	24	L0	OK
			No3	Q40NJ41BK	10.6	4.178	68.46	24	L0	OK
			No4	Q40NJ41BK	10.7	4.179	68.45	24	L0	OK
			No5	Q40NJ41BK	9.9	4.178	68.37	24	L0	OK

Level 0
•No change

Level 1
•Leak

Level 2
•Smoke, < 200℃

Level 3
•Smoke, > 200℃

Level 4
•Fire

Level 5
•Explosion

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Thank you

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