1. Scope

This specification applied to the products of current sensing resistor of metal foil for Lead-Free RLP series manufactured by TA-I TECHNOLOGY CO.,LTD.

.

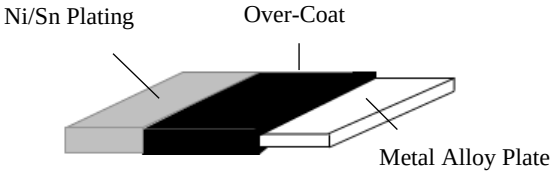
2. Type Designation

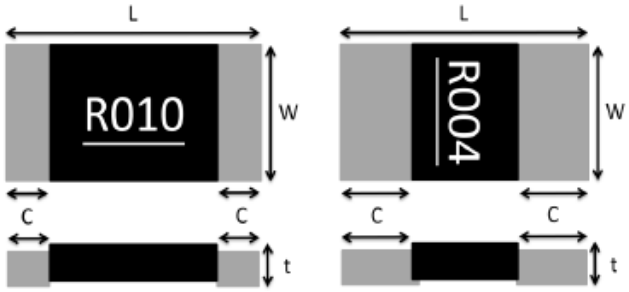
RLP 25	F	E	C	(M)	R001

Series No.	Tolerance	Packaging	Power	Metal	Resistance
25：2512 28：2817 45：4527	F= ±1% G= ±2% J= ±5%	E= Embossed	C= 1W D= 1.5W E= 2W G= 3W J= 5W	M= MnCu	e.g. R010= 10mΩ R001= 1mΩ

3. Construction and Dimension

3.1 RLP25





Series	L	W	C	t	Material
RLP25	6.4±0.2	3.2±0.2	2.2±0.2(≦4mΩ) 0.9±0.2(R>4mΩ)	0.9±0.20	Strip：Alloy Over Coating：polymer Compound UL-94V-0 grade

UNIT: mm

Marking

For RLP25

(1) If R≦4mΩ, the marking pattern is as follows.

Resistance value is expressed by 4 digits.

E.G.:

R002 = 0.002Ω = 2mΩ

R004 = 0.004Ω = 4mΩ

(2) If R>4mΩ, the marking pattern is as follows.

Resistance value is expressed by 4 digits.

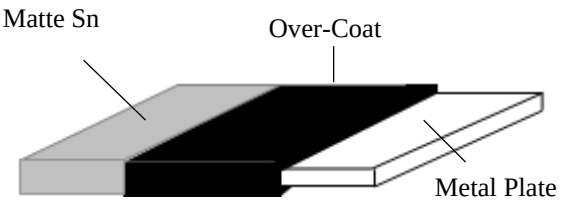
E.G.:

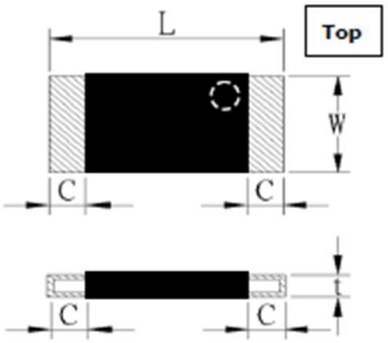
R010 = 0.010Ω = 10mΩ

R020 = 0.020Ω = 20mΩ

*Note: If the marking pattern has underline, it is indicated as a MnCu material

3.2 RLP28



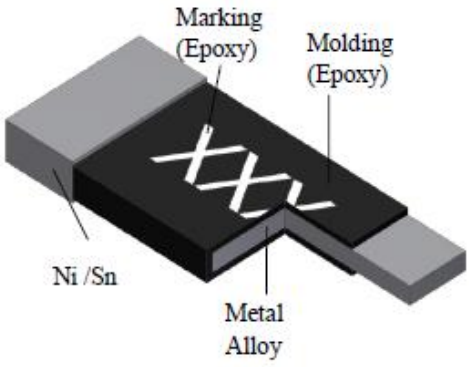


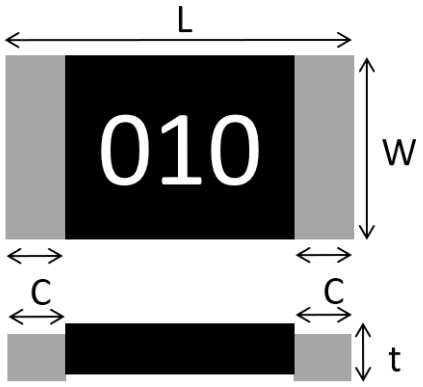
Series	L	W	C	T	Material
RLP28	7.1±0.2	4.2±0.1	0.9±0.2	0.8±0.20	Strip：Alloy Over Coating：Polymer Compound UL-94V-0 grade

UNIT: mm

Marking **For RLP28：No marking**

3.3 RLP45





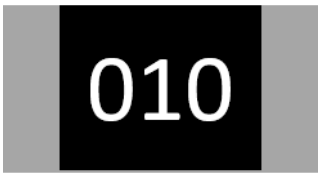
Series	L	W	C	T
RLP45	11.65±0.25	6.85±0.25	1.85±0.25	1.10±0.25

UNIT: mm

Marking

For RLP45

The marking pattern is as follows.



Resistance value is expressed by 3 digits.

E.G.:

010 = 0.010Ω = 10mΩ

7.5=0.0075Ω= 7.5mΩ

4. Features

Type	*RLP25	RLP25 (MnCu)	RLP28	RLP45
Size	2512	2512	2817	4527
Power Rating	1mΩ＜R≦100mΩ (1W、1.5 W、2 W、3W) 100mΩ＜R≦680mΩ (1W、1.5 W、2 W)	1 mΩ≦R≦70mΩ (1W、1.5 W、2 W、3W)	5W	5W
Resistance Value	1mΩ < R≦680mΩ	1~70mΩ	10mΩ /20mΩ	5~60mΩ
Operation Temperature Range	-55℃~+170℃			
TCR	±50ppm/℃	±50ppm/℃	±50ppm/℃	±75ppm/℃
Tolerance	±1%, ±2%, ±5%			
Insulation Resistance	Over 100MΩ			
Maximum Working Voltage(V)	$(P*R)^{1/2}$			

Note1: For RLP25, 2&3watts total Solder pad and trace size of 300mm^2

Thickness does not include protective layer

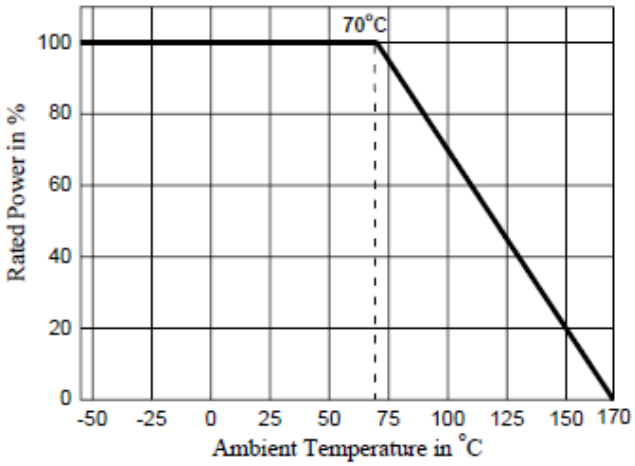
Note2: For RLP25, 2&3watts, copper foil minimum thickness of PCB：105μm

5. Reliability Tests

Test Items	Reference	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC60115-1 4.8	+25 ~ 125℃	Refer 4.0
High Temperature Exposure (Storage)	AEC-Q200-REV D-Test 3 MIL-STD202 Method 108	T=170℃.1000hrs, Measurement at 24hrs after test conclusion.	< ±1%
Temperature Cycling	AEC-Q200-REV D-Test 4 JESD22 Method JA-104	1000Cycle (-55℃ to 125℃), Measurement at 24hrs after test conclusion.	< ±0.5%
Short time overload	IEC60115-1 4.13	5 X rated power for 5s	< ±0.5%
Moisture Resistance	AEC-Q200-REV D-Test 6 MIL-STD-202 Method 106	T=24 hours / Cycle ,10 Cycles. Notes: Steps 7a& 7b not required. Unpowered	< ±1%
Biased Humidity	AEC-Q200-REV D-Test 7 MIL-STD-202 Method 103	10%Rated power at 85℃.RH:85% 1000hrs, Measurement at 24hrs after test conclusion.	< ±0.5%
Operation life	AEC-Q200-REV D-Test 8 MIL-STD-202 Method 108	1000 hours TA=125℃ at 45% rated power. Measurement at 24±4 hours after test conclusion.	< ±1%
External Visual	AEC-Q200-REV D-Test 9 MIL-STD-883 Method 2009	Electrical test not required. Inspect device construction, marking and workmanship.	
Physical Dimension	AEC-Q200-REV D-Test 10 JESD22 Method JB-100	Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers spec. Electrical test not required.	
Resistance to Solvents	AEC-Q200-REV D-Test 12 MIL-STD-202 Method 215	a: Isopropyl Alcohol：Mineral Spirits = 1：3 b: Terpene Defluxer (Bioact EC-7R) c: Deionized water ：Propylene Glycol Monomethyl Ether：monoethanolamine = 42：1：1	Marking and protective layer cannot be detached
Resistance to Soldering Heat	AEC-Q200-REV D-Test 15 MIL-STD-202 Method 210	T=260+/-5℃ solder,10+/-1 sec dwell	< ±0.5%
Mechanical Shock	AEC-Q200-REV D-Test 13 MIL-STD-202 Method 213	100g's, Normal duration is 6ms, half sine shock pulse	< ±0.5%
Resistance to vibration	AEC-Q200-REV D-Test 14 MIL-STD-202 Method 204	5g's for 20min.12cycles, 10-2000Hz	<±0.5%
Board Flex	AEC-Q200-REV D-Test 21 AEC-Q200-005	Min 2mm deflection ,60sec.	< ±0.5%
Flammability	AEC-Q200-REV D-Test 20 UL-94	V-0 or V-1are acceptable, Electrical test not required	V-0
Thermal Shock	AEC-Q200-REV D-Test 16 MIL-STD-202 Method 107	-55°C/+155°C. Note: Number of cycles required-300, Maximum transfer time-20 seconds, Dwell time-15 minutes. Air-Air.	< ±1.0%

ESD	AEC-Q200-REV D-Test 17 AEC-Q200-002 or ISO/DIS 10605	verify the voltage setting at 500V	< ±1.0%
Solderability	AEC-Q200-REV D-Test 18 J-STD-002	Method B, aging 4 hours at 155 °C dry heat Lead-free solder bath at 235±3 °C Dipping time: 3±0.5 seconds	> 95% area covered with tin
Terminal Strength (SMD)	AEC-Q200-REV D-Test 22 AEC-Q200-006	Force of 1.8kg for 60 seconds Remarks: 0201-NA	< ±1.0%

5.1 Derating Curve



5.2 Rated Current

The rated current is calculated by the following formula:

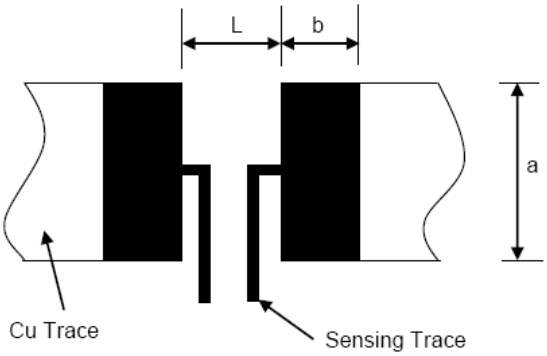
$$I = \sqrt{P \div R}$$

I: Rated Current (A)

P: Rated Power (W)

R: Resistance Value (Ω)

6. Recommended Solder Pad Dimension



Type	Resistance Range(mΩ)	a	b	L
RLP25	R >4	4.0±0.1	2.1±0.1	4.1±0.1
	R≦4	4.0±0.1	3.1±0.1	1.3±0.1
RLP28	10~20	5.0±0.1	2.4±0.1	5.2±0.1
RLP45	5 ≦ R ≦ 60	8.0±0.1	4.0±0.1	7.6±0.1

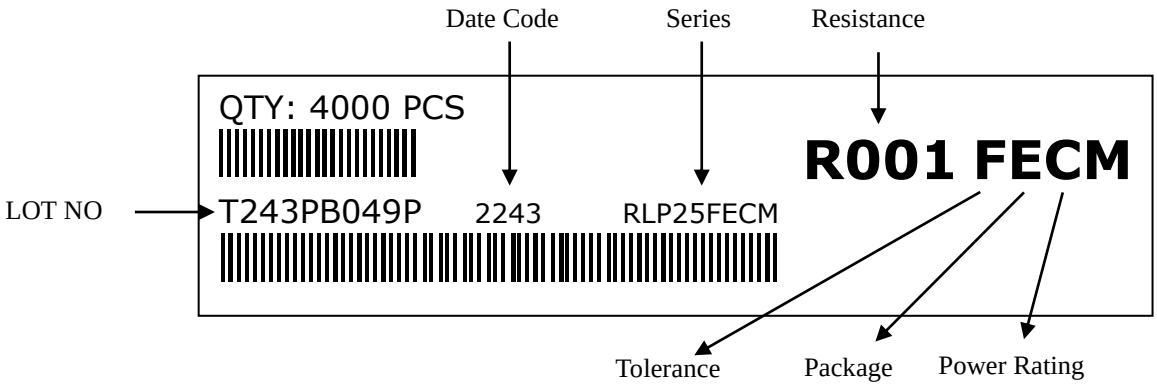
Note: *The copper foil minimum thickness of PCB needs 3 oz

Unit: mm

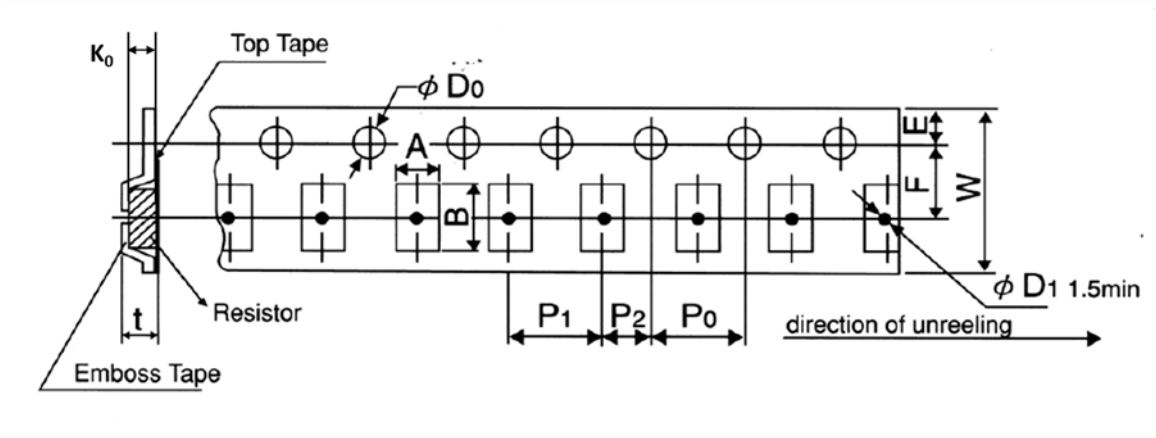
7. Number of Package

	RLP25	RLP28	RLP45
Pieces	4000	2000	2000

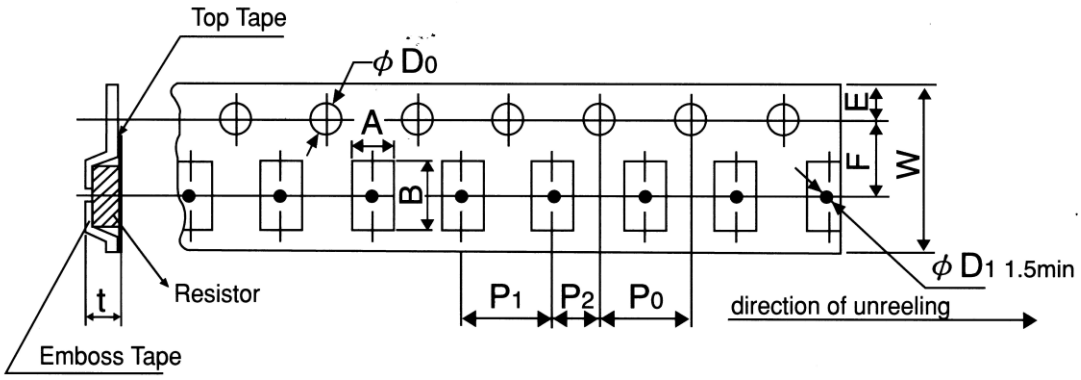
8. Label



9. Packaging



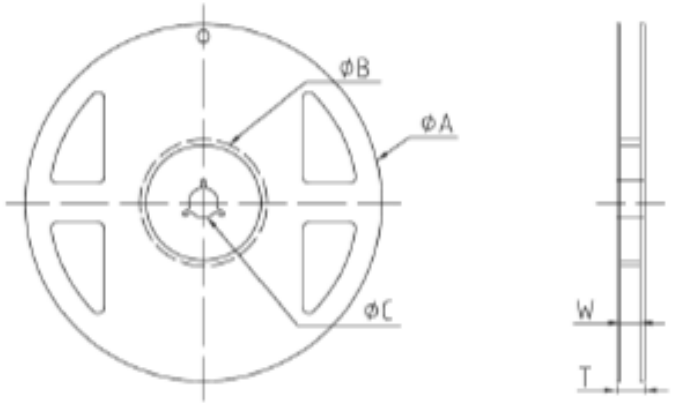
Packing	Type	A	B	W	F	E	P_1	P_2	P_0	ϕD_0	t	K_0
Emboss Tape	RLP25	3.6 ±0.2	6.9 ±0.2	12 ±0.2	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.05	ϕ 1.5 (+0.1/-0)	1.2 ±0.15	1.0 ±0.15



Packing	Type	A	B	W	F	E	P_1	P_2	P_0	D_0	t
Emboss Tape	RLP28	4.5 ±0.2	7.4 ±0.2	12 ±0.2	5.5 ±0.05	1.7 ±0.1	8.0 ±0.1	2.0 ±0.05	4.0 ±0.05	ψ1.5 (+0.1/-0)	0.85 ±0.15
	RLP45	7.30 ±0.10	11.90 ±0.10	24.0 ±0.20	11.50 ±0.10	1.75 ±0.10	12.0 ±0.10	2.0 ±0.10	4.0 ±0.10	ψ1.55 ±0.10	1.3 ±0.10

UNIT: mm

10. Reel Specification

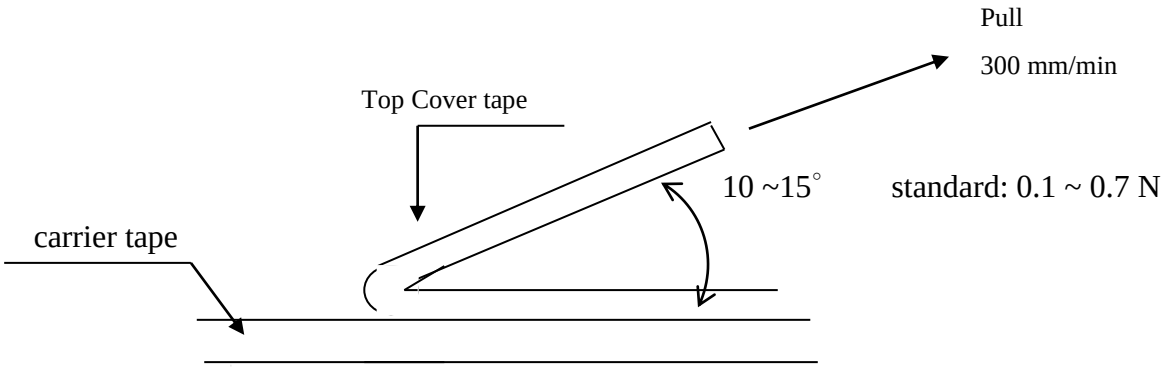


Series	ϕ A	ϕ B	ϕ C	W	T
RLP25	180(+0/-3)	60.0 ±1.0	13.0 ±1.0	13.0 ±1.0	15.4 ±2.0
RLP28	180(+0/-3)	60.0 ±1.0	13.0 ±1.0	13.0 ±1.0	15.4 ±2.0
RLP45	350.0 ±2.0	60.0 ±1.0	13.0 ±1.0	25.0 ±1.0	27.4±1.0

Unit: mm

11. Peeling Strength of Top Cover Tape

Test Condition: 0.1 to 0.7 N at a peel-off speed of 300 mm / min.



12. Storage Conditions

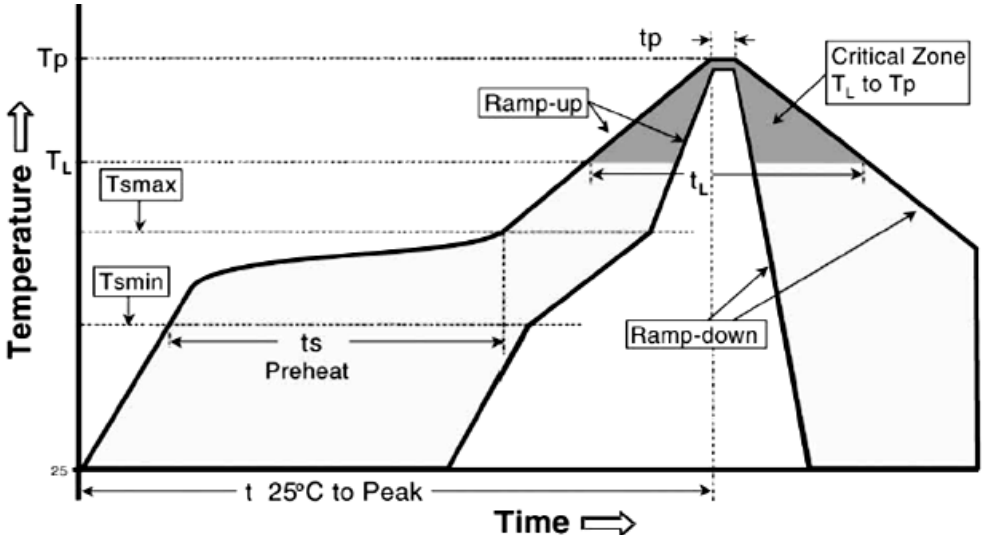
Temperature: 5℃~35℃, Humidity:40%~75%

Humidity storage level: Level 1

13. Shelf Life

2 years from manufacturing date.

14. Recommend IR – Reflow profile (solder: Sn96.5 / Ag3 / Cu0.5)



Alloyed Re-flow times: 3 times

Remark: To avoid discoloration phenomena of chip on terminal electrodes, please use N2 Re-flow furnace.

Iron Solder:350±10℃, 3+1/-0 sec,1 time

Profile Feature	Lead (Pb)-Free Assembly
Average ramp-up rate (Tsmax to Tp)	3℃ / second max
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (T_{smin} to T_{smax}) (ts)	 150℃ 200℃ 60 -120 seconds
Time maintained above - Temperature (TL) - Time (TL)	 217℃ 60-150 seconds
Peak Temperature (Tp)	260℃
Time within +0/-5℃ of actual Peak Temperature $(tp)^2$	10 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8mimutes max.

15. ECN

Engineering Change Notice: The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.

16. Manufacturing Country & City

TA-I TECHNOLOGY CO., LTD. (Taiwan– Tao Yuan)

Tel: (+886) 3-3246169 Fax: (+886) 3-3246167

Associated companies

(1)TA-I TECHNOLOGY (SU ZHOU) CO., LTD. (China – Su Zhou)

Tel :(+86) 512-63457879 Fax: (+86) 512-63457869

(2)TA-I TECHNOLOGY ELECTRONIC (DONGGUAN) CO., LTD. (China –Dongguan)

Tel : (+86) 769-8339-4790～3 Fax : (+86) 769-8339-4794

(3)FORTUNE TASK RESISTOR FACTORY (China – Dongguan)

Tel : (+86) 769-8339-4790～3 Fax : (+86) 769-8339-4794

(4)TAI OHM ELECTRONICS (M) SDN. BHD. (Malaysia –Penang)

Tel: (+60)4- 3900480 Fax: (+60)4-3901481

(5)P.T.TAI ELECTRONIC Indonesia (Indonesia – Jakarta)

Tel: (+62)-21-89830123 Fax: (+62)-21-89830703

单击下面可查看定价，库存，交付和生命周期等信息

>>TA-I(大毅)