

Thin Film Precision Chip Resistor – RT Series

Features

- Advanced thin film technology
- Very tight tolerance down to $\pm 0.01\%$
- Extremely low TCR down to $\pm 5\text{PPM}/^\circ\text{C}$
- Wide resistance range 1ohm ~ 3Mega ohm
- Miniature size 0201 available
- RoHS compliant

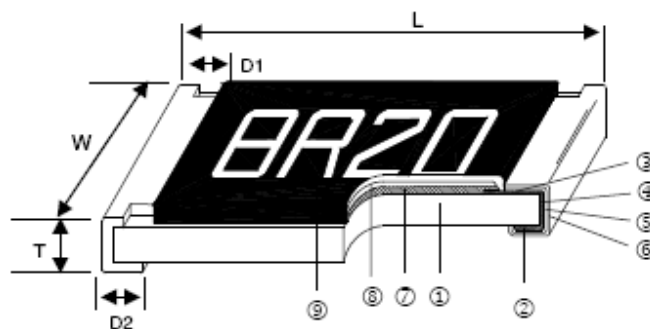


**HALOGEN
FREE**

Applications

- Medical Equipment
- Testing / Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDA

Constructions



① Alumina Substrate	④ Edge Electrode (NiCr)	⑦ Resistor Layer (NiCr)
② Bottom Electrode (Ag)	⑤ Barrier Layer (Ni)	⑧ Overcoat (Epoxy)
③ Top Electrode (Ag-Pd)	⑥ External Electrode (Sn)	⑨ Marking

Thin Film Precision Chip Resistor

RT03 ~ RT50

Dimensions (in mm)

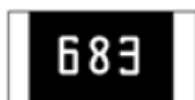
Type	Size Inch (mm)	L	W	T	D1	D2	Average Weight
RT03_0201	0201(0603)	0.58±0.05	0.29±0.05	0.23±0.05	0.12±0.05	0.15±0.05	0.14mg
RT06_0402	0402(1005)	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.20±0.10	0.54mg
RT06_0603	0603(1608)	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	1.83mg
RT10_0805	0805(2012)	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.25	4.71mg
RT12_1206	1206(3216)	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25	9.02mg
RT20_1210	1210(3225)	3.10±0.15	2.40±0.15	0.55±0.10	0.40±0.20	0.55±0.25	10mg
RT25_2010	2010(5025)	4.90±0.15	2.40±0.15	0.55±0.10	0.60±0.30	0.50±0.25	23.61mg
RT50_2512	2512(6432)	6.30±0.15	3.10±0.15	0.55±0.10	0.60±0.30	0.50±0.25	38.06mg

Marking Code

1. RT03_0201& RT06_0402 are without marking due to too small size.
2. RT06_0603~RT50_2512:
 - 2.1. E-24 series, 3 digits Code, the first two digits are significant figures; the third digit is number of zeros to follow. Letter "R" is as decimal point;
 - 2.2. E-96 series, 4 digits Code(except 0603 size), the first three digits are significant figures; the fourth digit is number of zeros. Letter "R" is as decimal point;
 - 2.3. E-96 series with special marking code for 0603 Size, see below table (Page 10).



No Marking
Item 1



683 = $68 \times 10^3 \Omega$
= 68K Ω
Item 2.1



6812 = 681×10^2
= 68.1K Ω
Item 2.2



49X = 316×10^{-1}
= 31.6 Ω
Item 2.3

Thin Film Precision Chip Resistor

RT03 ~ RT50

Absolute Maximum Ratings & Electrical Characteristics

Type	Power Rating @70°C	TCR (PPM/°C)		Size (Inch)	Tolerance (E-24 & E-96)		MAX. Working Voltage	MAX. Overload Voltage	Resistance Range	Operating Temperature Range
RT03_0201	1/32W	D	±25	0201	D F	±0.5% ±1%	15V	30V	49.9Ω ~ 5KΩ	-55°C ~ +155°C
		E	±50						49.9Ω ~ 33KΩ	
		E	±50							
RT06_0402	1/16W	S	±5	0402	L	±0.01%	25V	50V	49.9Ω ~ 5KΩ	-55°C ~ +155°C
		B	±10						49.9Ω ~ 12KΩ	
		C	±15						49.9Ω ~ 5KΩ	
		S	±5		A	±0.05%			49.9Ω ~ 12KΩ	
		B	±10						49.9Ω ~ 5KΩ	
		C	±15						49.9Ω ~ 12KΩ	
		S	±5		B	±0.1%			49.9Ω ~ 5KΩ	
		B	±10						49.9Ω ~ 12KΩ	
		C	±15						49.9Ω ~ 70KΩ	
		D	±25		C D F	±0.25% ±0.5% ±1%			10Ω ~ 205KΩ	
		E	±50						10Ω ~ 205KΩ	
		D	±25							
RT06_0603	1/16W	S	±5	0603	L	±0.01%	50V	100V	24.9Ω ~ 15KΩ	-55°C ~ +155°C
		B	±10						24.9Ω ~ 100KΩ	
		C	±15						24.9Ω ~ 15KΩ	
		S	±5		A	±0.05%			24.9Ω ~ 100KΩ	
		B	±10						4.7Ω ~ 332KΩ	
		C	±15						4.7Ω ~ 332KΩ	
		D	±25		B	±0.1%			24.9Ω ~ 15KΩ	
		E	±50						24.9Ω ~ 100KΩ	
		S	±5						4.7Ω ~ 332KΩ	
		B	±10		C D F	±0.25% ±0.5% ±1%			4.7Ω ~ 1MΩ	
		C	±15						2Ω ~ 1MΩ	
		D	±25							
E	±50									

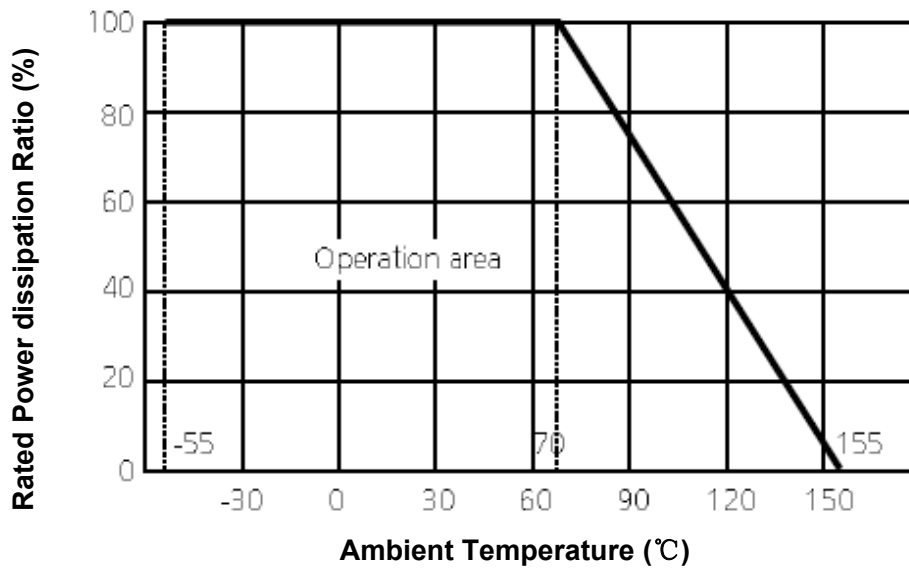
Thin Film Precision Chip Resistor

RT03 ~ RT50

Type	Power Rating @70°C	TCR (PPM/°C)		Size (Inch)	Tolerance (E-24 & E-96)		MAX. Working Voltage	MAX. Overload Voltage	Resistance Range	Operating Temperature Range
RT10_0805	1/10W	S	±5	0805	L	±0.01%	100V	200V	24.9Ω ~ 30KΩ	-55°C~+155°C
		B	±10						24.9Ω ~ 200KΩ	
		C	±15						24.9Ω ~ 30KΩ	
		S	±5		A	±0.05%			24.9Ω ~ 200KΩ	
		B	±10						4.7Ω ~ 511KΩ	
		C	±15						4.7Ω ~ 511KΩ	
		D	±25		B	±0.1%			24.9Ω ~ 30KΩ	
		E	±50						24.9Ω ~ 200KΩ	
		S	±5						4.7Ω ~ 511KΩ	
		B	±10		C	±0.25%			24.9Ω ~ 200KΩ	
		C	±15						4.7Ω ~ 511KΩ	
		D	±25						4.7Ω ~ 2MΩ	
E	±50	D	±0.5%	1Ω ~ 2MΩ						
S	±5			E	±1%					
B	±10									
C	±15									
RT12_1206	1/8W	S	±5	1206	L	±0.01%	150V	300V	24.9Ω ~ 50KΩ	-55°C~+155°C
		B	±10						24.9Ω ~ 500KΩ	
		C	±15						24.9Ω ~ 50KΩ	
		S	±5		A	±0.05%			24.9Ω ~ 500KΩ	
		B	±10						4.7Ω ~ 1MΩ	
		C	±15						4.7Ω ~ 1MΩ	
		D	±25		B	±0.1%			4.7Ω ~ 1MΩ	
		E	±50						24.9Ω ~ 50KΩ	
		S	±5						24.9Ω ~ 500KΩ	
		B	±10		C	±0.25%			4.7Ω ~ 1MΩ	
		C	±15						4.7Ω ~ 2.5MΩ	
		D	±25						1Ω ~ 2.5MΩ	
E	±50	D	±0.5%							
S	±5			E	±1%					
B	±10									
C	±15									
RT20_1210	1/5W	S	±5	1210	L	±0.01%	150V	300V	24.9Ω ~ 50KΩ	-55°C~+155°C
		B	±10						24.9Ω ~ 500KΩ	
		C	±15						24.9Ω ~ 50KΩ	
		S	±5		A	±0.05%			24.9Ω ~ 500KΩ	
		B	±10						4.7Ω ~ 1MΩ	
		C	±15						4.7Ω ~ 1MΩ	
		D	±25		B	±0.1%			4.7Ω ~ 1MΩ	
		E	±50						24.9Ω ~ 50KΩ	
		S	±5						24.9Ω ~ 500KΩ	
		B	±10		C	±0.25%			4.7Ω ~ 1MΩ	
		C	±15						4.7Ω ~ 2.5MΩ	
		D	±25						1Ω ~ 2.5MΩ	
E	±50	D	±0.5%							
S	±5			E	±1%					
B	±10									
C	±15									

Power Derating Curve

For resistors operate in the ambient temperature over 70°C, loading power ratio will derate in accordance with following curve.



Thin Film Precision Chip Resistor

RT03 ~ RT50

Environmental Characteristics

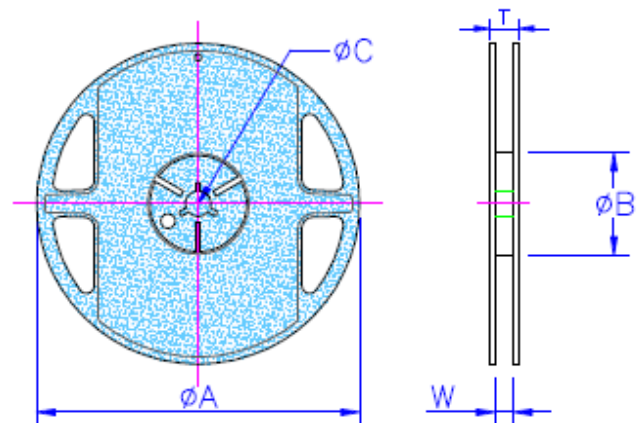
Item	Requirement		Test Method
	Tol. $\leq 0.05\%$	Tol. $> 0.05\%$	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		+25/-55/+25/+125/+25°C
Short Time Overload	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	RCWV*2.5 or Max. overload voltage for 5 seconds
	$\Delta R \pm 0.2\%$ for high power rating		
Insulation Resistance	$> 1000 \text{ M}\Omega$		Apply $100V_{DC}$ for 1 minute
Endurance	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	$70 \pm 2^\circ\text{C}$, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$> 7k\Omega \Delta R \pm 0.5\%$		
	$\Delta R \pm 0.5\%$ for high power rating		
Damp Heat with Load	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.3\%$	$40 \pm 2^\circ\text{C}$, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\Delta R \pm 0.5\%$ for high power rating		
Bending Strength	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	Bending amplitude 3 mm for 10 seconds
Solderability	95% min. coverage		$245 \pm 5^\circ\text{C}$ for 3 seconds
Resistance to Soldering Heat	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	$260 \pm 5^\circ\text{C}$ for 10 seconds
Dielectric Withstand Voltage	By Type		Max. overload voltage for 1 minute
Thermal Shock	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.25\%$	$-55^\circ\text{C} \sim 150^\circ\text{C}$, 100 cycles
Low Temperature Operation	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	1 hour, -65°C , followed by 45 minutes of RCWV
	$\Delta R \pm 0.5\%$ for high power rating		

■ Reference Standards: MIL-STD-202, JIS-C 5201-1

■ Storage Temperature: $25 \pm 3^\circ\text{C}$; Humidity $< 80\%RH$

Packing Information:

Packaging Quantity & Reel Specification



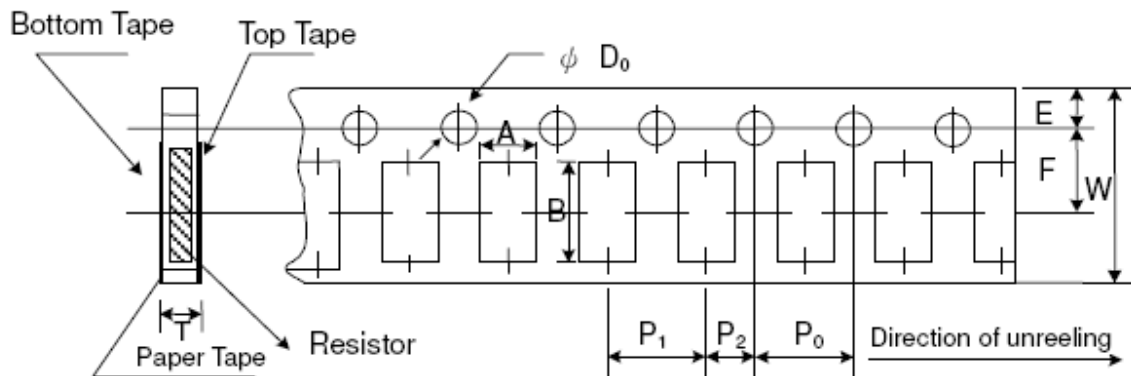
Thin Film Precision Chip Resistor

RT03 ~ RT50

Unit: mm

Type	ΦA	ΦB	ΦC	W	T	PCS per Paper Tape	PCS per Embossed Tape	PCS per Carton
RT03_0201	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	10,000	-	600,000
RT06_0402	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	10,000	-	600,000
RT06_0603	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-	300,000
RT10_0805	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-	300,000
RT12_1206	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-	300,000
RT20_1210	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-	300,000
RT25_2010	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	13.5 ± 1.0	15.5 ± 1.0	-	4,000	192,000
RT50_2512	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	13.5 ± 1.0	15.5 ± 1.0	-	4,000	192,000

Paper Tape Dimensions (in mm)

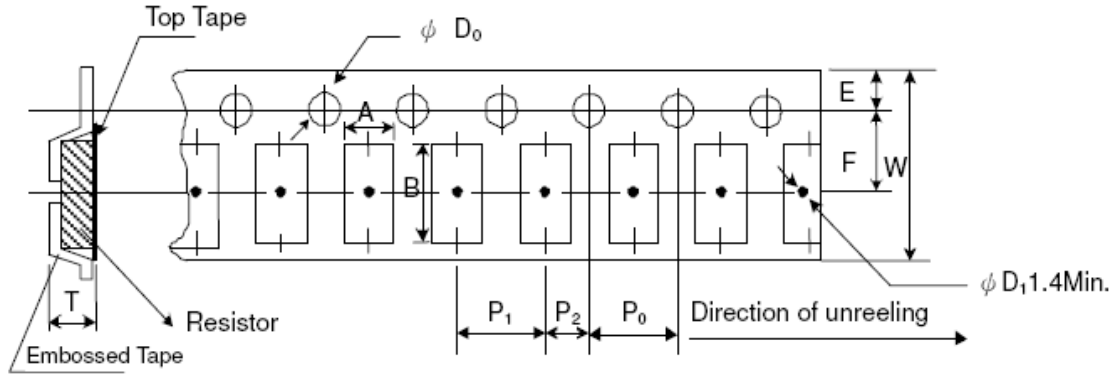


Type	A	B	W	E	F	P0	P1	P2	ΦD0	T
RT03_0201	0.40±0.05	0.70±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.03	0.42±0.02
RT06_0402	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.03	0.42±0.02
RT06_0603	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.03	0.60±0.03
RT10_0805	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.03	0.75±0.05
RT12_1206	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.03	0.75±0.05
RT20_1210	2.75±0.05	3.40±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.60±0.10	0.75±0.05

Thin Film Precision Chip Resistor

RT03 ~ RT50

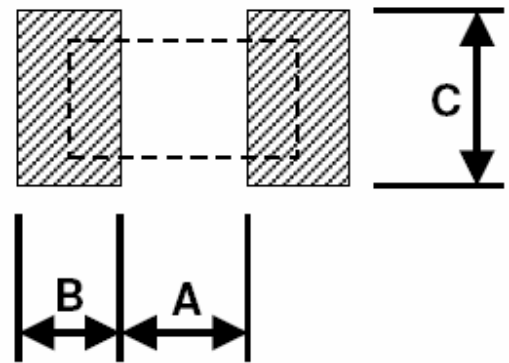
Embossed Plastic Tape Dimensions (in mm)



Type	A	B	W	E	F	P0	P1	P2	ϕD0	T
RT25_2010	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20
RT50_2512	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20

Recommend Land Pattern (in mm)

Type	A	B	C
RT03_0201	0.25	0.30	0.40±0.2
RT06_0402	0.50	0.50	0.60±0.2
RT06_0603	0.80	1.00	0.90±0.2
RT10_0805	1.00	1.00	1.35±0.2
RT12_1206	2.00	1.15	1.70±0.2
RT20_1210	2.00	1.15	2.50±0.2
RT25_2010	3.60	1.40	2.50±0.2
RT50_2512	4.90	1.60	3.10±0.2



Thin Film Precision Chip Resistor

RT03 ~ RT50

Table - E-96 series Special marking code (0603 Size)

Code	R value	Code	R value	Code	R value	Code	R value	Code	R value	Code	R value	Code	R value	Code	R value
01	100	13	133	25	178	37	237	49	316	61	422	73	562	85	750
02	102	14	137	26	182	38	243	50	324	62	432	74	576	86	768
03	105	15	140	27	187	39	249	51	332	63	442	75	590	87	787
04	107	16	143	28	191	40	255	52	340	64	453	76	604	88	806
05	110	17	147	29	196	41	261	53	348	65	464	77	619	89	825
06	113	18	150	30	200	42	267	54	357	66	475	78	634	90	845
07	115	19	154	31	205	43	274	55	365	67	487	79	649	91	866
08	118	20	158	32	210	44	280	56	374	68	499	80	665	92	887
09	121	21	162	33	215	45	287	57	383	69	511	81	681	93	909
10	124	22	165	34	221	46	294	58	392	70	523	82	698	94	931
11	127	23	169	35	226	47	301	59	402	71	536	83	715	95	953
12	130	24	174	36	232	48	309	60	412	72	549	84	732	96	976

This table shows the first two digits for the three-digit EIA-96 part marking scheme.
 The third character is the letter of multiplier: Y=10⁻² X=10⁻¹ A=10⁰ B=10¹ C=10² D=10³ E=10⁴ F=10⁵

Thin Film Precision Chip Resistor

RT03 ~ RT50

How to Order

RT 10 B 0805 D 1002 - XX - RG70

→ Packing Code: RG70: 7" reel in Tape and Reel, RoHS and Halogen Free

→ Factory Location Code

→ Resistance Code:

1002=100 x10²=10KΩ (E-24&E-96); 1R00=1Ω; 5R60=5.6Ω; 1004=1MΩ

→ Tolerance Code: L: ±.01%; A: ±.05%; B: ±.1%; C: ±.25%; D: ±.5%; F: ±1%

→ Size Code in inch (mm):0603(1608): 1.6×0.8(mm) Refer Size table for detail

→ TCR(PPM/°C): S: ±5 B: ±10; C: ±15; D: ±25; E: ±50

→ Power Code: 03:1/32W; 06:1/16W; 10:1/10W; 12:1/8W; 20:1/5W; 25:1/4W; 50:1/2W

→ Thin Film Precision Chip Resistor

How to contact us:

US HEADQUARTERS

28040 WEST HARRISON PARKWAY, VALENCIA, CA 91355-4162

Tel: (800) TAITRON (800) 824-8766 (661) 257-6060

Fax: (800) TAITFAX (800) 824-8329 (661) 257-6415

Email: taitron@taitroncomponents.com

Http://www.taitroncomponents.com

TAITRON COMPONENTS MEXICO, S.A .DE C.V.

BOULEVARD CENTRAL 5000 INTERIOR 5 PARQUE INDUSTRIAL ATITALAQUIA, HIDALGO C.P. 42970 MEXICO

Tel: +52-55-5560-1519

Fax: +52-55-5560-2190

TAITRON COMPONETS INCORPORATED E REPRESENTAÇÕES DO BRASIL LTDA

RUA DOMINGOS DE MORAIS, 2777, 2.ANDAR, SALA 24 SAÚDE - SÃO PAULO-SP 04035-001 BRAZIL

Tel: +55-11-5574-7949

Fax: +55-11-5572-0052

TAITRON COMPONETS INCORPORATED, SHANGHAI REPRESENTATIVE OFFICE

METROBANK PLAZA, 1160 WEST YAN'AN ROAD, SUITE 1503, SHANGHAI, 200052, CHINA

Tel: +86-21-5424-9942

Fax: +86-21-5424-9931