

L16P*D15 data sheet**

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Tamura Corporation
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《Output voltage linearity》

『Hysteresis width』

RL=10kΩ Vcc=±15V

Detected current If (A)	Output voltage Vout(V)					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
0.000	0.021	0.025	0.014			
2.500	1.013	1.025	1.000			
5.000	2.013	2.003	2.003			
7.500	3.015	3.005	3.014			
10.000	4.019	4.001	4.016			rated current

【considering offset voltage】

Detected current If (A)	Output voltage Vout(V)					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
0.000	0.000	0.000	0.000			revise zero
2.500	0.992	1.000	0.990			↓
5.000	1.992	1.978	1.989			↓
7.500	2.994	2.980	3.000			↓
10.000	3.998	3.976	4.002			↓

【revosing output voltage.】(converting detected current into primary value.)

Detected current If (A)	Output voltage after revising Vout(V)					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
2.500	3.968	4.000	3.960			four times
5.000	3.984	3.956	3.978			double
7.500	3.991	3.972	3.999			4/3 time
10.000	3.998	3.976	4.002			rated current

Avarage A	3.985	3.976	3.985		
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【calculating allowance percentage.】

1. We take average 4point ; rated current, three fourths of rated current, half of rated current, one fourth of rated current.

2. Linearity error percentage on each point is given by following equation.

$$\varepsilon = (V_{out} - A) / A \times 100 (\%)$$

● 《Output voltage linearity》

【standard value】 less than ±1%

Detected current If (A)	Output voltage after revising Vout(V)					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
2.500	-0.433	0.601	-0.621			
5.000	-0.031	-0.505	-0.169			
7.500	0.144	-0.094	0.358			
10.000	0.320	-0.002	0.433			

● 『Hysteresis width』

standard value】 less than 20mV

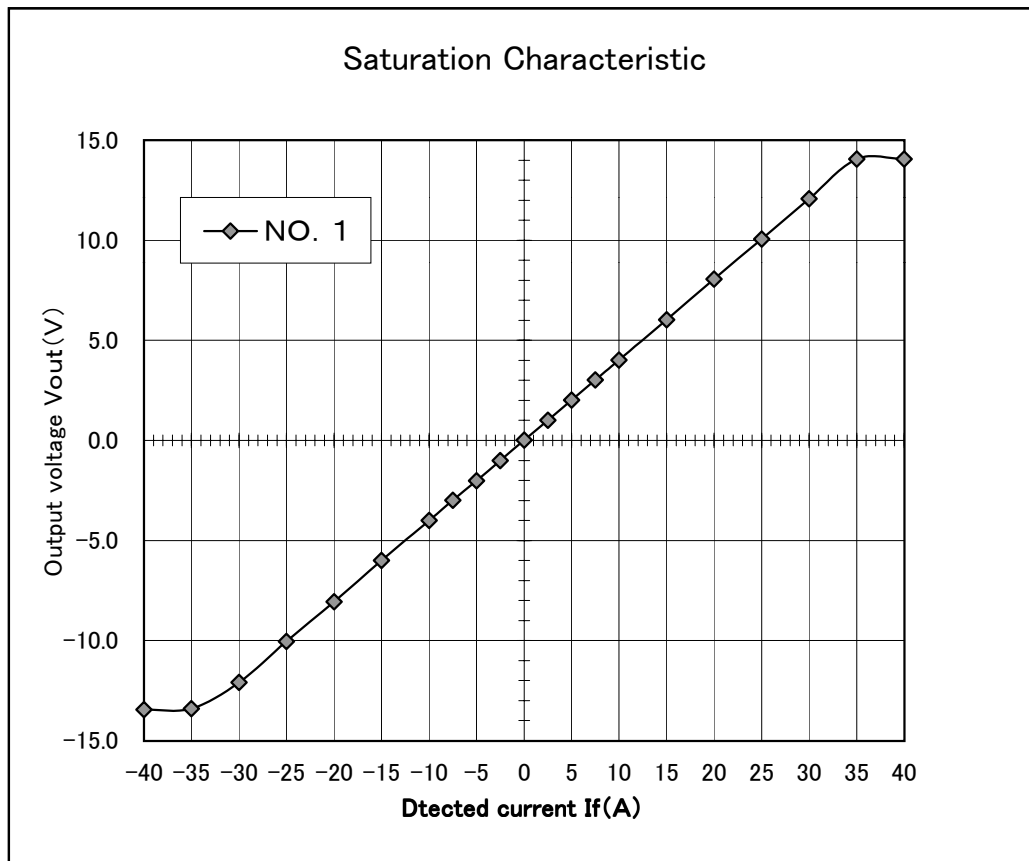
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	Remarks
+If(A)→0(A)	0.012	0.027	0.020			output voltage
-If(A)→0(A)	0.007	0.018	0.013			output voltage
Hysteresis width	0.005	0.009	0.007			

《Saturation characteristic》

 $RL=10k\Omega$ $V_{CC}=\pm 15V$

Detected current I_f (A)	Output voltage V_{out} (V)					Remarks
	NO. 1	NO. 2	NO. 3			
40	14.06	14.09	14.08			
35	14.06	14.08	14.08			
30	12.07	12.06	12.09			
25	10.07	10.05	10.01			
20	8.05	8.05	8.04			
15	6.03	6.02	6.02			
10	4.02	4.00	4.02			rated current
7.5	3.02	3.01	3.01			
5	2.01	2.00	2.00			
2.5	1.01	1.03	1.00			
0	0.02	0.03	0.01			
-2.5	-1.00	-0.98	-0.99			
-5	-2.01	-1.99	-1.99			
-7.5	-3.00	-2.97	-3.00			
-10	-4.00	-4.01	-4.01			
-15	-6.00	-6.02	-5.94			
-20	-8.06	-7.99	-8.03			
-25	-10.05	-10.01	-10.40			
-30	-12.09	-12.02	-12.03			
-35	-13.40	-13.40	-13.40			
-40	-13.45	-13.47	-13.46			

【standard value 30A以上

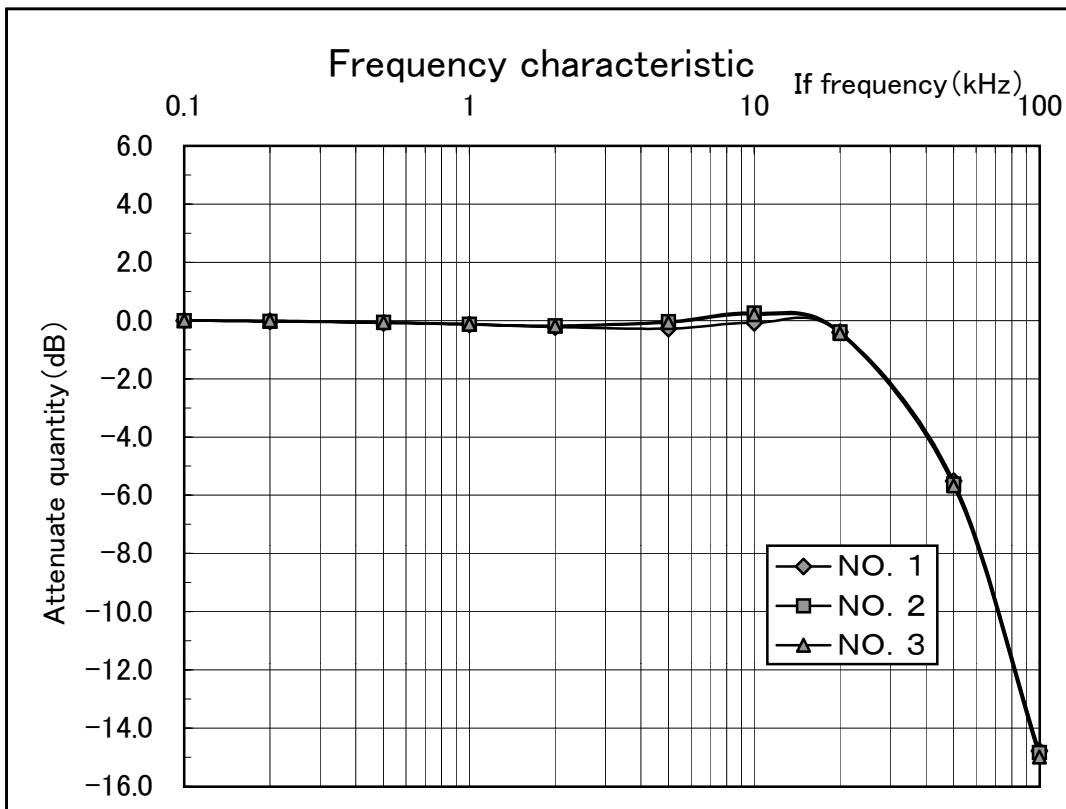


《Frequency characteristic》

Primary normal current $I_f=3.00(\text{Arms})$ $V_{cc}=\pm 15\text{V}$ $R_L=10\text{k}\Omega$

If frequency (kHz)	Output voltage Vout (V)					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
0.1	1.162	1.158	1.151			
0.2	1.159	1.155	1.150			
0.5	1.152	1.150	1.142			
1	1.144	1.141	1.134			
2	1.132	1.134	1.126			
5	1.126	1.153	1.142			
10	1.151	1.193	1.178			
20	1.110	1.108	1.094			
50	0.616	0.607	0.599			
100	0.212	0.210	0.205			

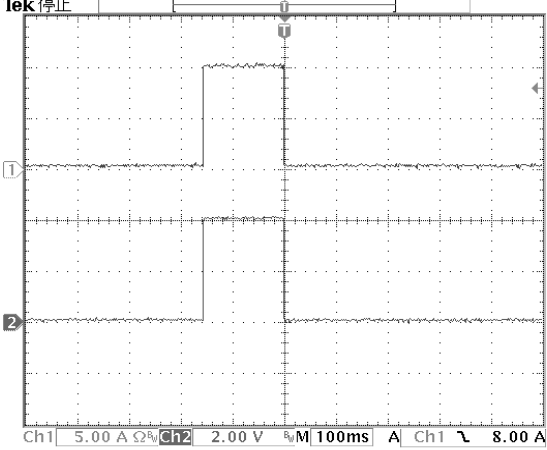
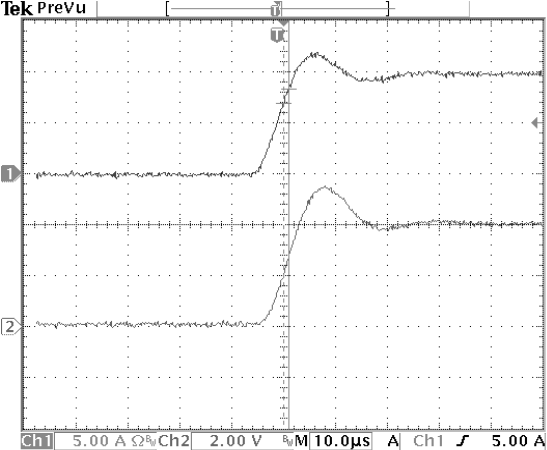
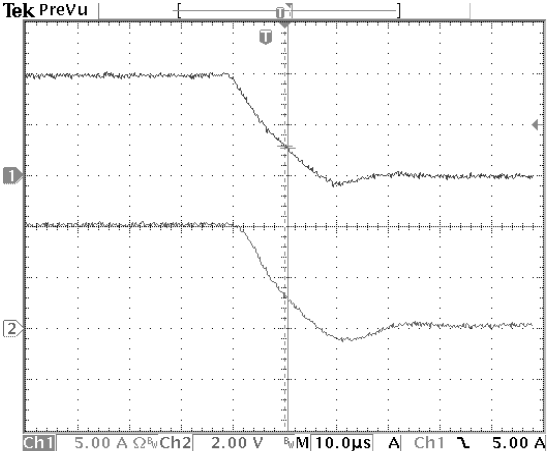
If frequency (kHz)	Output voltage attenuate quantity (dB)					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
0.1	0.000	0.000	0.000			
0.2	-0.022	-0.023	-0.008			
0.5	-0.075	-0.060	-0.068			
1	-0.136	-0.128	-0.129			
2	-0.227	-0.182	-0.191			
5	-0.273	-0.038	-0.068			
10	-0.083	0.259	0.201			
20	-0.398	-0.383	-0.441			
50	-5.513	-5.610	-5.673			
100	-14.777	-14.830	-14.986			



CONDITION

【Standard value】 less than 10μs, but delay time is 70% for input wave form:10A/5μs

Response wave form

TEST POINT	OSCILLOSCOPE SETTING	WAVE FORM
No. 1－1	Vert. 5A /div 2.0V/div /div /div Horiz 100ms/div Notes wave form1: input wave form wave form2: output wave form	Tek停止  Ch1 5.00 A Ω Ch2 2.00 V M 100ms A Ch1 8.00 A 0.00000 s 22 Jan 2002 13:06:26
No. 1－2	Vert. 5A /div 2V/div /div /div Horiz 10μs/div Notes	Tek PreVu  Ch1 5.00 A Ω Ch2 2.00 V M 10.0μs A Ch1 5.00 A 1.20000μs 5 Mar 2002 19:02:23 Δ: 1.40 A @: 8.30 A Δ: 1.00μs @: 2.20μs
No. 1－3	Vert. 5A /div 2V/div /div. /div. Horiz 10μs/div Notes	Tek PreVu  Ch1 5.00 A Ω Ch2 2.00 V M 10.0μs A Ch1 5.00 A 3.60000μs 5 Mar 2002 19:00:39 Δ: 200mA @: 2.70 A Δ: 600ns @: 4.20μs

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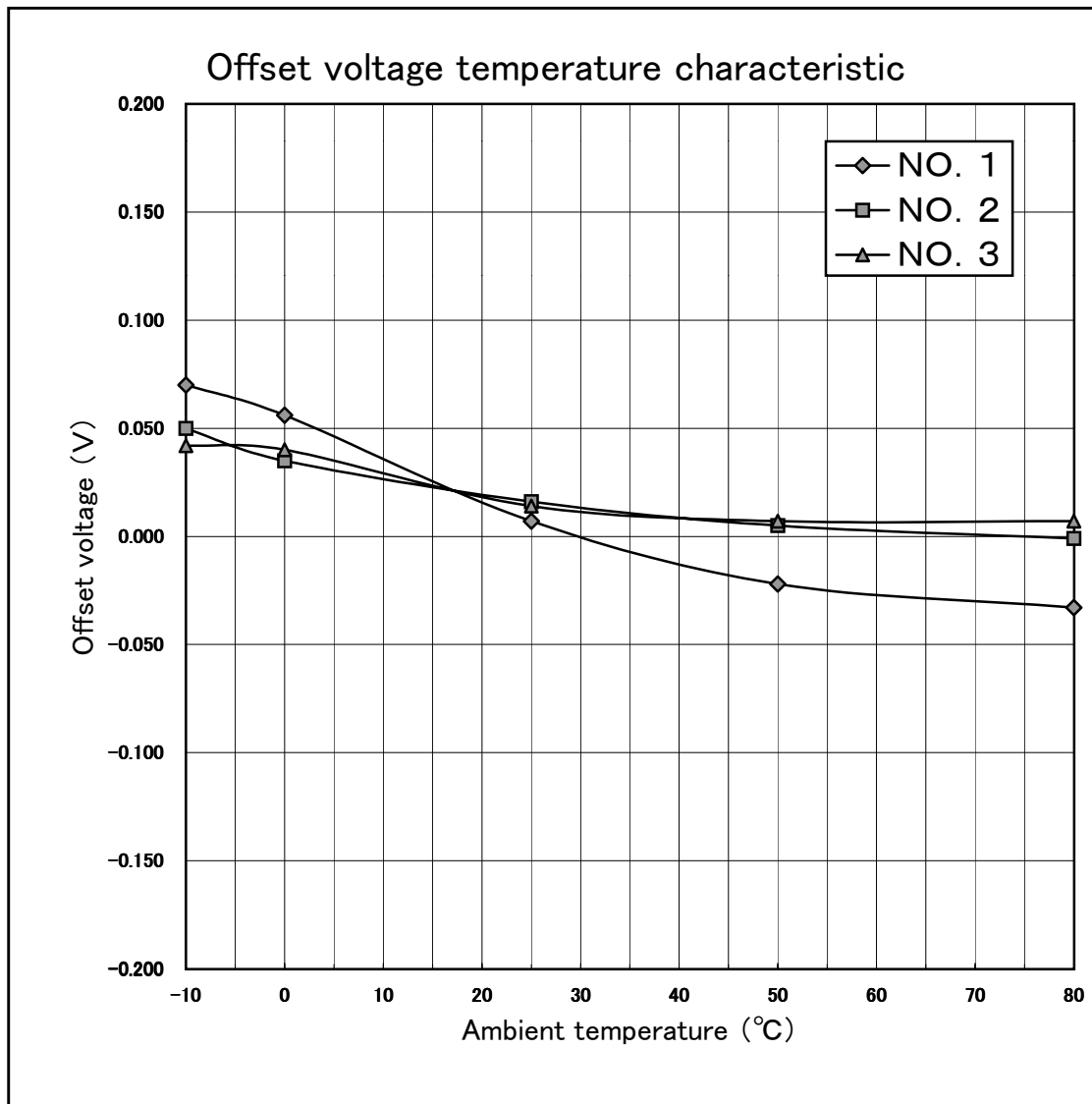
《Temperature characteristic – 1 (Offset voltage)》

Detected current $I_f=0(A)$ $R_L=10k\Omega$ $V_{CC}=\pm 15V$

Ambient temperature	Output voltage $V_{out}(V)$					Remarks
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
-10	0.070	0.050	0.042			
0	0.056	0.035	0.040			
25	0.007	0.016	0.014			
50	-0.022	0.005	0.007			
80	-0.033	-0.001	0.007			

(mV/°C) 【standard value】

coefficient 25→-10	-1.800	-0.971	-0.800			1.2mV/°C typ
coefficient 25→80	-0.727	-0.309	-0.127			1.2mV/°C typ



L16P010D15

Temperature characteristic—2 (Primary normal output voltage)

Detected current $I_f = 10(A)$ $R_L = 10k\Omega$ $V_{CC} = \pm 15V$

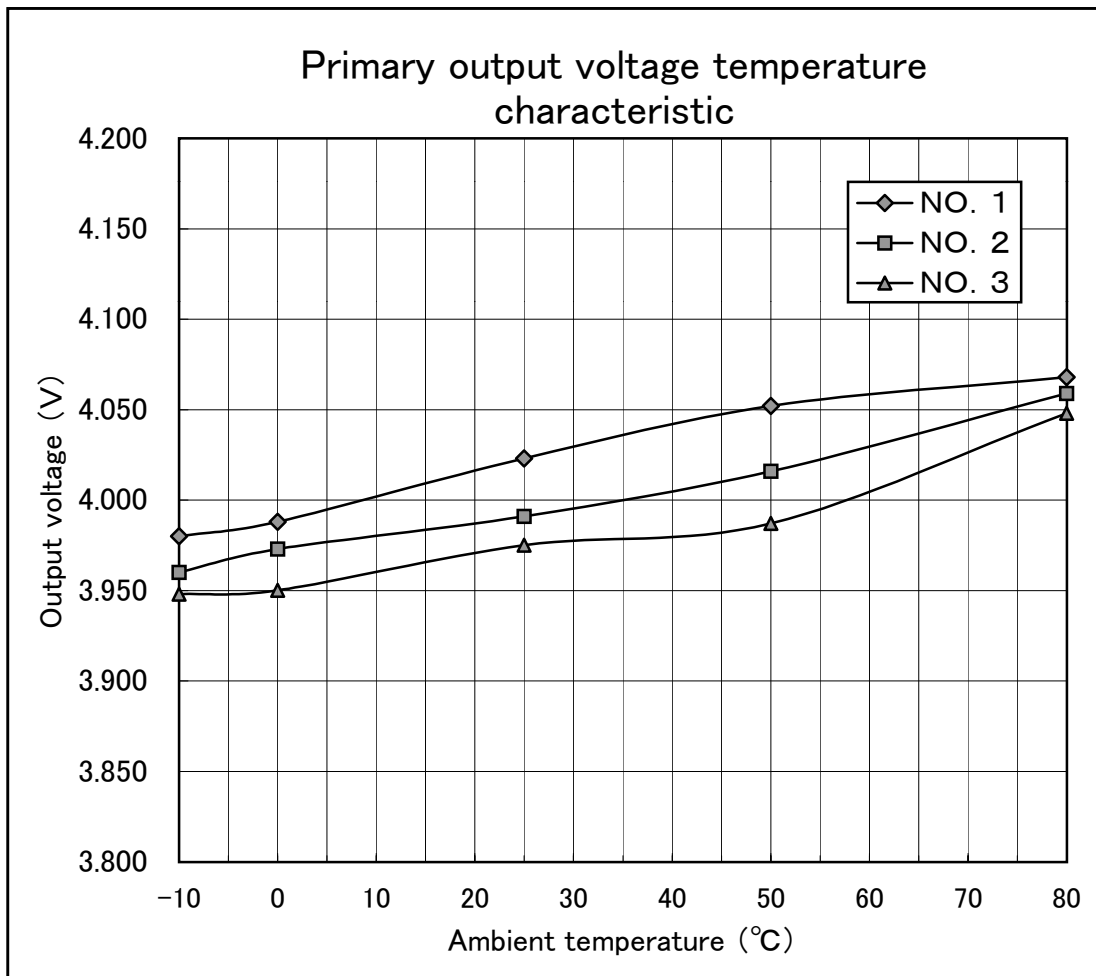
Ambient temperature	Output voltage $V_{out}(V)$					Notes
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
-10	4.050	4.010	3.990			
0	4.044	4.008	3.990			
25	4.030	4.007	3.989			
50	4.030	4.021	3.994			
80	4.035	4.058	4.055			

【considering offset voltage temperature fluctuations】 Temperature characteristic-1(Offset voltage).

Ambient temperature	Output voltage $V_{out}(V)$					Notes
	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	
-10	3.980	3.960	3.948			
0	3.988	3.973	3.950			
25	4.023	3.991	3.975			
50	4.052	4.016	3.987			
80	4.068	4.059	4.048			

(%/°C) 【standard value】

Coefficient 25→-10	0.031	0.022	0.019			0.10
Coefficient 25→ 80	0.045	0.031	0.027			0.10

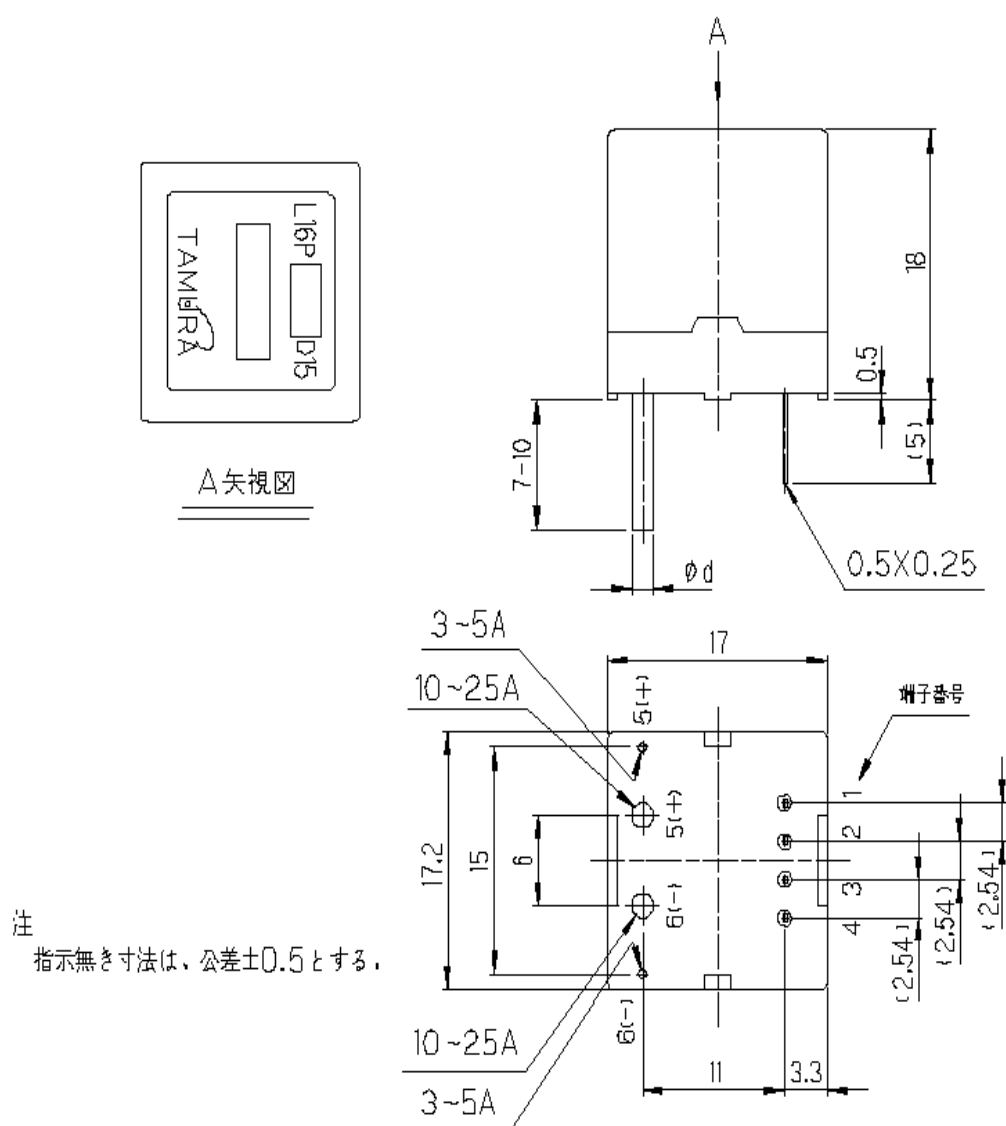


Current Sencors Spec

Ta=25°C,RL=10kΩ,Vcc=±15V

Type Spec	L16P003D15	L16P005D15	L16P010D15	L16P015D15	L16P020D15	L16P025D15
Rated current	3A	5A	10A	15A	20A	25A
Saturation current	more than ±9A	more than ±15A	more than ±30A	more than ±45A	more than ±60A	more than ±75A
Output voltage	4V ±1% (Rated current,RL=10KΩ)					
Offset voltage	less than ±40mV (Input current=0)					
Output linearity	less than ±1% (Rated current)					
Power supply	±15V ±5% (Current draw from power supply approx. ±12mA)					
di/dt Response time	less than 5μsec (di/dt=FS/5μSec)					
Output temperature characteristic	less than ±0.1%/°C					
Offset temperature characteristic	±1.2mV/°C Typical (Input current=0)					
Hysteresis width	less than 25mV (0↔ rated current)					
Insulation withstanding	AC2000V for 1minute,inside of through hole-terminal					
Insulation resistance	more than 500MΩ					
Operating temperature rage	-10°C~ +80°C					
Storage temperature range	-20°C~ +85°C					

L16P***D15 series current sensors dimension



Type	Rated current	ϕd
L16P003D15	3A	$\phi 0.5$
L16P005D15	5A	$\phi 0.6$
L16P010D15	10A	$\phi 0.8$
L16P015D15	15A	$\phi 1.2$
L16P020D15	20A	$\phi 1.4$
L16P025D15	25A	$\phi 1.4$

Terminal number	
1	-15V
2	0V
3	+15V
4	OUT
5	+IN
6	-IN