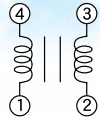
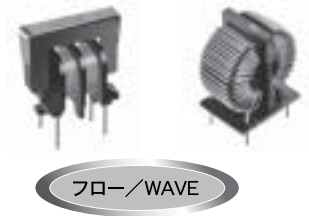


# コモンモードチョークコイル (ACライン用) COMMON MODE CHOKE COIL (FOR AC LINES)

等価回路 (Equivalent circuit)



OPERATING TEMP.	TLF25RAタイプ以外 Other than TLF25RA type : -25~+115℃
	TLF25RAタイプ TLF25RA type : -25~+105℃
(製品自己発熱を含む) (Including self-generated heat)	



## 特長 FEATURES

- TLF 9UA タイプ ..... 小型形状
- TLF 9UA TYPE ..... Small-sized configuration
- TLF14CB (H)タイプ ..... 普通形状
- TLF14CB(H) TYPE ..... Ordinary configuration
- TLF25RA タイプ ..... 大電流容量
- TLF25RA TYPE ..... Large current capacity for power supply line use

## 用途 APPLICATIONS

TV、VTR、SW電源、NCマシン、コンピュータおよび周辺機器、各種計測器、各種制御装置などの雑音端子電圧、電源ラインノイズ対策

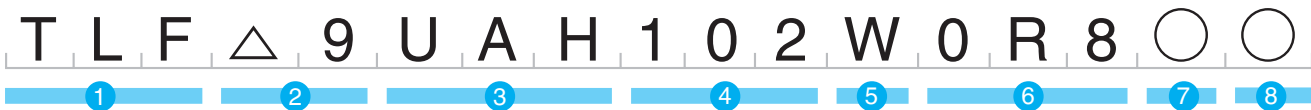
- TLF 9UA TYPE ..... 小電力用の機器
- TLF14CB TYPE ..... 入力電力数10Wの機器
- TLF25RA TYPE ..... 高電力用の機器

As a preventive measure against noise terminal voltage or power supply noise in TV or VTR units, SW power supplies, NC machines, computer systems, peripheral units, measuring instruments, and controllers.

- TLF 9UA Type ... low-current applications
- TLF14CB Types ... equipment with several tens of watts of input power
- TLF25RA Type .... high-current applications

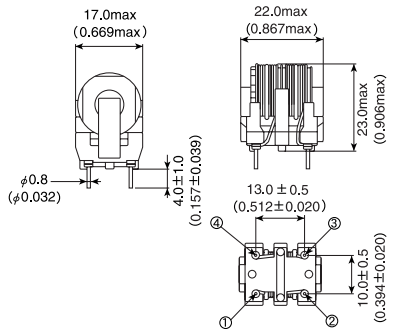
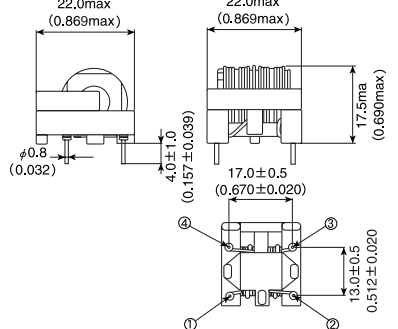
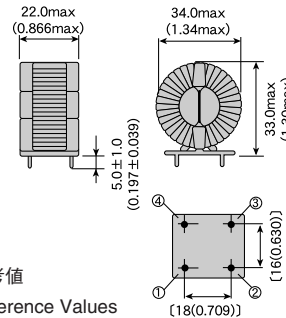
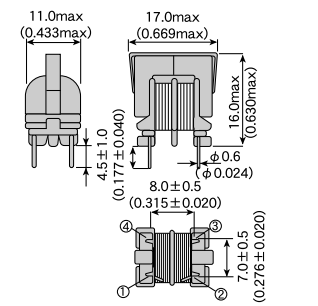
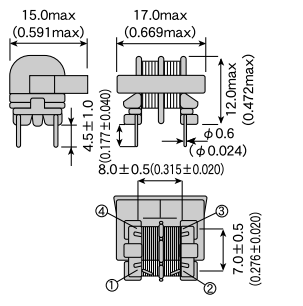
## 形名表記法 ORDERING CODE

<b>1</b> 形式 TLF   ラインフィルタ	<b>3</b> 形状 RA△   リングコア縦形 UA△   U字コア縦形 UAH   U字コア横形 CB△   □字コア分割巻縦型 CBH   □字コア分割巻横型 △=スペース	<b>4</b> 公称インダクタンス(μH) 例 102   1000 103   10000	<b>5</b> インダクタンス許容差(%) △   公称値以上 W   ± $\frac{100}{10}$ △=スペース	<b>6</b> 定格電流(A) R54   0.54 0R8   0.8 R=小数点
<b>2</b> コア寸法(mm) △9   9 14   14 25   25 △=スペース			<b>7</b> 製品区分記号 △   一般 △=スペース	<b>8</b> 当社管理記号 △   標準品 △=スペース



<b>1</b> Type TLF   Line filter	<b>3</b> Shape RA△   Ring core, vertical type UA△   U core, vertical type UAH   U core, horizontal type CB△   Square type core vertically split wound CBH   Square type core horizontally split wound △=Blank space	<b>4</b> Nominal Inductance(μH) example 102   1000 103   10000	<b>5</b> Inductance tolerance(%) △   Nominal Values or higher W   ± $\frac{100}{10}$ △=Blank space	<b>6</b> Rated current(A) R54   0.54 0R8   0.8 R=decimal point
<b>2</b> Core dimensions(mm) △9   9 14   14 25   25 △=Blank space			<b>7</b> Product classification code △   Standard △=Blank space	<b>8</b> Internal code △   Standard Product △=Blank space

# 外形寸法 EXTERNAL DIMENSIONS

TLF14CB Type	TLF14CBH Type	TLF25RA
		 <p data-bbox="1037 480 1228 535">〔 〕 参考値 〔 〕 Reference Values</p>
TLF9UA Type	TLF9UA H Type	<p data-bbox="1069 928 1212 950">unit : mm (inch)</p>
		

セレクションガイド  
Selection Guide

アイテム一覧  
Part Numbers

特性図  
Electrical Characteristics

梱包  
Packaging

信頼性  
Reliability Data

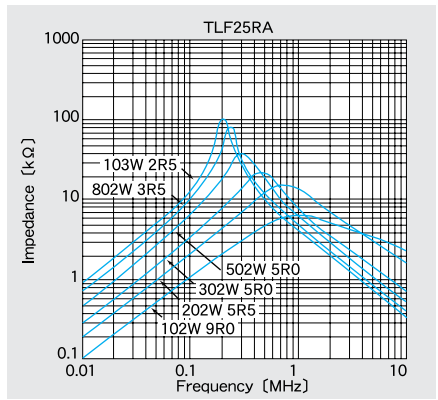
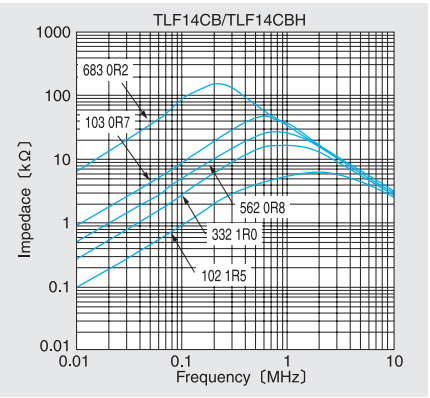
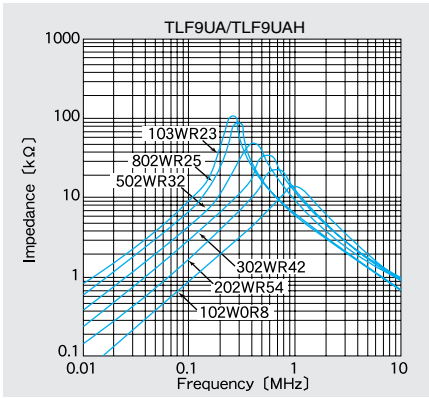
使用上の注意  
Precautions



etc

アイテム一覧 PART NUMBERS

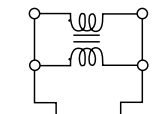
Type	形名 Ordering code	インダクタンス[mH] Inductance (+100% -10%)	直流抵抗[Ω] DC resistance (max)	定格電流[A] Rated current (max)	定格電圧[V] Rated voltage(max)	耐電圧[V] Withstanding voltage [AC/1 minute] (min)	適用周波数[MHz] Applicable frequency 参考値 Reference Value
TLF9UA	TLF 9UA 102W0R8	1	0.5	0.80	AC250	2000	0.1~10
	TLF 9UA 202WR54	2	1.0	0.54			
	TLF 9UA 302WR42	3	1.5	0.42			
	TLF 9UA 502WR32	5	2.5	0.32			
	TLF 9UA 802WR25	8	4.0	0.25			
	TLF 9UA 103WR23	10	4.5	0.23			
TLF9UAH	TLF 9UAH 102W0R8	1	0.5	0.80			
	TLF 9UAH 202WR54	2	1.0	0.54			
	TLF 9UAH 302WR42	3	1.5	0.42			
	TLF 9UAH 502WR32	5	2.5	0.32			
	TLF 9UAH 802WR25	8	4.0	0.25			
	TLF 9UAH 103WR23	10	4.5	0.23			
TLF14CB	TLF14CB 102 1R5	1.0min	0.1	1.5			
	TLF14CB 222 1R2	2.2min	0.18	1.2			
	TLF14CB 332 1R0	3.3min	0.32	1.0			
	TLF14CB 472 1R0	4.7min	0.38	1.0			
	TLF14CB 562 0R8	5.6min	0.42	0.8			
	TLF14CB 682 0R8	6.8min	0.6	0.8			
	TLF14CB 103 0R7	10.0min	0.85	0.7			
	TLF14CB 223 0R4	22.0min	1.7	0.4			
	TLF14CB 333 0R3	33.0min	2.7	0.3			
	TLF14CB 473 0R2	47.0min	3.6	0.2			
	TLF14CB 563 0R2	56.0min	5	0.2			
	TLF14CB 683 0R2	68.0min	6.5	0.2			
	TLF14CBH 102 1R5	1.0min	0.1	1.5			
	TLF14CBH 222 1R2	2.2min	0.18	1.2			
TLF14CBH 332 1R0	3.3min	0.32	1.0				
TLF14CBH 472 1R0	4.7min	0.38	1.0				
TLF14CBH 562 0R8	5.6min	0.42	0.8				
TLF14CBH 682 0R8	6.8min	0.6	0.8				
TLF14CBH 103 0R7	10.0min	0.85	0.7				
TLF14CBH 223 0R4	22.0min	1.7	0.4				
TLF14CBH 333 0R3	33.0min	2.7	0.3				
TLF14CBH 473 0R2	47.0min	3.6	0.2				
TLF14CBH 563 0R2	56.0min	5	0.2				
TLF14CBH 683 0R2	68.0min	6.5	0.2				
TLF25RA	TLF25RA 102W9R0	1	0.03	9.0			
	TLF25RA 202W5R5	2	0.05	5.5			
	TLF25RA 302W5R0	3	0.06	5.0			
	TLF25RA 502W5R0	5	0.07	5.0			
	TLF25RA 802W3R5	8	0.11	3.5			
	TLF25RA 103W2R5	10	0.17	2.5			
							0.1~20



(測定条件)

使用測定器 : HP-4192A  
Vosc=0.35V

測定回路



インピーダンス  
アナライザーへ

Test conditions

Equipment : HP-4192A  
Vosc=0.35V

Test circuit

To impedance analyzer

標準数量 Standard quantity  
CM / BU Type

Type	標準数量(pcs.) Standard quantity	
	箱づめ Box	袋づめ Bulk
CM05RA06	—	500
CM05RB□□	1000	—
CM08RA□□	—	250
CM08RB□□	500	—
CM12RA02	—	100
BU08RA□□	—	200

TLF Type

Type	標準数量(pcs.) Standard quantity
	箱づめ Box
TLF9UA□	500
TLF9UB□	500
TLF14CB□	500
TLF25RA	200

Item	Specified Value					Test method and remarks										
	CM-RA/ BU-RA Type	CM-RB Type	TLF9U TLF14CB	TLF25RA	Linearity coil											
1. Operating Temperature Range	-25~+105°C		-25~+115°C	-25~+105°C		Including temperature rise due to self-generated heat.										
2. Storage temperature range	-40~+85°C															
3. Rated current	Within the specified range					CM : The maximum DC value having temperature increase within specified temperature, as detailed in individual specification.  TLF9UA, 14CB, 25RA : The maximum AC value having temperature increase within 45°C by the application of AC current.  TLF9UB : 45°C by the application of DC current.										
4. Inductance	Within the specified tolerance					CM・Linearity coil : Measuring equipment : 4262A (HP) or its equivalent Measuring frequency : 1kHz  TLF9U, TLF14CB, 25RA : Measuring equipment : Impedance analyzer (HP4192A) or its equivalent Measuring frequency : 1kHz Measuring voltage : 0.35V <sub>osc</sub> (TLF14CB : 1.0V)										
5. DC resistance	Within the specified tolerance					CM, TLF : Measuring equipment : DC ohmmeter										
6. Temperature characteristi					±30%	Linearity coil : Change of maximum inductance deviation in step 1 to 5 <table border="1" style="margin-left: 20px;"> <tr> <td>Temperature at step 1</td> <td>20°C</td> </tr> <tr> <td>Temperature at step 2</td> <td>-25°C</td> </tr> <tr> <td>Temperature at step 3</td> <td>20°C (standard temperature)</td> </tr> <tr> <td>Temperature at step 4</td> <td>+85°C</td> </tr> <tr> <td>Temperature at step 5</td> <td>20°C</td> </tr> </table>	Temperature at step 1	20°C	Temperature at step 2	-25°C	Temperature at step 3	20°C (standard temperature)	Temperature at step 4	+85°C	Temperature at step 5	20°C
Temperature at step 1	20°C															
Temperature at step 2	-25°C															
Temperature at step 3	20°C (standard temperature)															
Temperature at step 4	+85°C															
Temperature at step 5	20°C															
7. Withstanding voltage between layers					Appearance : No abnormality Inductance change : Within ±20%	Linearity coil : Apply with peak voltage of 500V to both terminals in the coil for 1min.										

Item	Specified Value					Test method and remarks																						
	CM—RA/ BU—RA Type	CM—RB Type	TLF9U TLF14CB	TLF25RA	Linearity coil																							
8.Terminal strength : tensile force	No abnormality					<p>No abnormality such as cutoff or looseness of lead.</p> <p>CM : Fix the component in the direction to draw terminal and gradually apply tensile force as detailed in individual specifications.</p> <p>TLF9U : Apply the stated tensile force gradually in the direction to draw terminal.</p> <table border="1"> <thead> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>force (N)</th> <th>duration (S)</th> </tr> </thead> <tbody> <tr> <td><math>\phi 0.6</math></td> <td>5</td> <td>30±5</td> </tr> </tbody> </table> <p>TLF14CB : Apply the stated tensile force gradually in the direction to draw terminal.</p> <table border="1"> <thead> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>force (N)</th> <th>duration (S)</th> </tr> </thead> <tbody> <tr> <td><math>\phi 0.8</math></td> <td>20</td> <td>30±5</td> </tr> </tbody> </table> <p>TLF25RA : Apply the tensile force of 10N in the direction to draw terminal for 5 seconds.</p> <p>Linearity coil : Apply the stated tensile force gradually in the direction to draw terminal.</p> <table border="1"> <thead> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>force (N)</th> <th>duration (S)</th> </tr> </thead> <tbody> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>5</td> <td rowspan="3">30±5</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>10</td> </tr> <tr> <td><math>0.8 &lt; \phi d \leq 1.2</math></td> <td>25</td> </tr> </tbody> </table>	Nominal wire diameter tensile $\phi d$ (mm)	force (N)	duration (S)	$\phi 0.6$	5	30±5	Nominal wire diameter tensile $\phi d$ (mm)	force (N)	duration (S)	$\phi 0.8$	20	30±5	Nominal wire diameter tensile $\phi d$ (mm)	force (N)	duration (S)	$0.3 < \phi d \leq 0.5$	5	30±5	$0.5 < \phi d \leq 0.8$	10	$0.8 < \phi d \leq 1.2$	25
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$0.5 < \phi d \leq 0.8$	10																											
$0.8 < \phi d \leq 1.2$	25																											
9.Temperature rise	Refer to individual specification		45°C max.		Product Surface temperature : Within 50°C	TLF : Resistance substitution method Applied current : Rated current Duration : 1 hr																						
10.Terminal strength : bending					No abnormality such as cut lead, or looseness.	<p>Linearity coil : Applied current : Rated current Duration : 1 hr</p> <p>Linearity coil : Suspend a mass at the end the terminal, incline the body through angle of 90° and return it into position. This operation is done over a period of 2—3 sec. Then second bend in the opposite direction shall be made. Number of bends : Two times</p> <table border="1"> <thead> <tr> <th>Nominal wire diameter (mm)</th> <th>Bending force (N)</th> <th>Mass reference weight (kg)</th> </tr> </thead> <tbody> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>5</td> <td>0.5</td> </tr> <tr> <td><math>0.8 &lt; \phi d \leq 1.2</math></td> <td>10</td> <td>1.0</td> </tr> </tbody> </table>	Nominal wire diameter (mm)	Bending force (N)	Mass reference weight (kg)	$0.3 < \phi d \leq 0.5$	2.5	0.25	$0.5 < \phi d \leq 0.8$	5	0.5	$0.8 < \phi d \leq 1.2$	10	1.0										
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11.Insulation resistance : between the terminals and body					100M $\Omega$ min.	Linearity coil : Metal globule method : Applied voltage : 500VDC : Duration : 60 sec.																						
12.Insulation resistance : between wires	100M $\Omega$ min.					CM · TLF : Applied voltage : Rated voltage (CM—RA/BU—RA, CM—RB) : 500VDC (TLF9UA, 14CB, 25RA) : 250VDC (TLF 9 UB) Duration : 60sec.																						
13.Insulation resistance : between wire and core			100M $\Omega$ min.			TLF : Applied voltage : 500VDC (TLF9UA, 14CB) : 250VDC (TLF 9 UB) Duration : 60 sec.																						

Item	Specified Value					Test method and remarks
	CM—RA/ BU—RA Type	CM—RB Type	TLF9U TLF14CB	TLF25RA	Linearity coil	
14. Withstanding : between wires	No abnormality					CM・TLF : Applied voltage : 250VDC (CM—RA/BU—RA、CM—RB) : 2000VAC (TLF9UA、14CB、25RA) : 500VDC (TLF 9 UB) Duration : 60min.
15. Withstanding : between wires and core			No abnormality			TLF : Applied voltage : 2000VAC (TLF9UA、14CB) : 500VDC (TLF9UB) Duration : 60min.
16. Withstanding : between the terminals and body					No abnormality	Linearity coil : According to JIS (C) 5102.7.1.3 Metal globule method Applied voltage : 500VDC Duration : 60 sec.
17. Rated voltage	Within the specified range		TLF9UA, TLF14CB : 250VAC TLF9UB : 50VDC	250VAC		
18. Resisistance to vibration		Appearance : No abnormality Inductance change : Within±15%	Inductance change : Within±5%		Appearance : No abnormality Inductance change : Within±20%	CM, TLF : According to JIS C0040 Direction : 2hrs each in X, Y and Z direction Total : 6hrs Frequency range : 10 to 55 to 10Hz (1 min.) Amplitude : 1.5mm (shall not exceed acceleration 196m <sup>2</sup> /s) Mounting method : soldering onto PC board Recovery : 2 to 24 hrs of recovery under the standard condition after the test. (CM—RA、CM—RB) : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs. (TLF9U、14CB)  Linearity coil : According to JIS C0040 Vibration type : A Directions : 2 hrs each in X, Y and Z directions Total : 6hrs Frequency range : 10 to 55 to 10Hz (1 min.) Amplitude : 1.5mm (shall not exceed acceleration 196m <sup>2</sup> /s) Mounting method : soldering onto PC board
19. Solderability	At least 75% of terminal electrode is covered by new solder.		Solder shall be uniformly adhered onto immersed surfaces.		At least 75% of terminal electrode is covered by new solder.	CM : Solder temperature : 235±5°C Duration : 2±0.5sec. Immersion depth : According to detailed specification.  TLF : Solder temperature : 230±5°C Duration : 2±0.5sec. Immersion depth : Up to 1.0 to 1.5mm from PBC mounted level.  Linearity coil : Solder temperature : 230±5°C Duration : 2±0.5sec. Immersion depth : Up to 2.0~2.5mm from terminal root.

Item	Specified Value					Test method and remarks																														
	CM—RA/ BU—RA Type	CM—RB Type	TLF9U TLF14CB	TLF25RA	Linearity coil																															
20. Resistance to soldering heat	Appearance : No abnormality Impedance change : Refer to individual specification		Inductance change : Within±5%		Appearance : No abnormality Inductance change : Within±20% Terminals shall be satisfy the necessary strength.	<p>CM :</p> <p>Solder temperature : 260±5°C Duration : 5±0.5sec. Immersion depth : Up to 2~2.5mm from terminal root. Recovery : 1 to 2 hrs of recovery under the standard condition after the test.</p> <p>TLF :</p> <p>Solder temperature : 260±5°C Duration : 5±1sec. Immersion depth : Up to 1.0 to 1.5mm from PBC mounted level. Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs.</p> <p>Linearity coil :</p> <p>Solder temperature : 270±5°C Duration : 3±0.5sec. Immersion depth : Up to 2.0~2.5mm from terminal root. Recovery : 1 to 2 hrs of recovery under the standard condition after the test.</p>																														
21. Thermal shock	Appearance : No abnormality Inductance change : Refer to individual specification		Inductance change : Within±15%		Appearance : No abnormality Inductance change : Within ±20%	<p>CM, TLF :</p> <p>Accoding to JIS C0025</p> <p>Conditions for 1 cycle</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>+85±2</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table> <p>Number of cycles : 10</p> <p>Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. (CM—RA) : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. (CM—RB) : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2 hrs. (TLF9U、TLF14CB、TLF25RA)</p> <p>Linearity coil :</p> <p>Accoding to JIS C0025</p> <p>Conditions for 1 cycle</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25<sup>+0</sup>/<sub>-3</sub></td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>+85<sup>+2</sup>/<sub>-0</sub></td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table> <p>Number of cycles : 10</p> <p>Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber.</p>	Step	Temperature (°C)	Duration (min)	1	-25±3	30±3	2	Room Temperature	Within 3	3	+85±2	30±3	4	Room Temperature	Within 3	Step	Temperature (°C)	Duration (min)	1	-25 <sup>+0</sup> / <sub>-3</sub>	30±3	2	Room Temperature	Within 3	3	+85 <sup>+2</sup> / <sub>-0</sub>	30±3	4	Room Temperature	Within 3
Step	Temperature (°C)	Duration (min)																																		
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2	Room Temperature	Within 3																																		
3	+85 <sup>+2</sup> / <sub>-0</sub>	30±3																																		
4	Room Temperature	Within 3																																		

Item	Specified Value					Test method and remarks				
	CM—RA/ BU—RA Type	CM—RB Type	TLF9U TLF14CB	TLF25RA	Linearity coil					
22.Damp heat			Inductance change : Within±15%			TLF : Temperature : 60±2°C Humidity : 90~95%RH Duration : 500 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs.				
23.Loading under damp heat	Appearance : No abnormality Inductance change : Refer to individual specification		Withstanding voltage : No abnormality Insulation resistance : No abnormality		Appearance : No abnormality Inductance change : Within±20%	CM : Temperature : 40±2°C Humidity : 90~95%RH Duration : 500 (+12, -0) hrs Applied current : Rated current Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. : 1 to 2hrs of recovery under the standard condition after the removal from test chamber.  TLF : Temperature : 60±2°C Humidity : 90~95%RH Duration : 100 hrs Applied voltage : Apply the following specified voltage between windings. <table border="1" style="margin-left: 20px;"> <tr> <td>TLF9UA、14CB、25RA</td> <td>250VAC</td> </tr> <tr> <td>TLF9UB</td> <td>50VDC</td> </tr> </table> Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs.  Linearity coil : Temperature : 40±2°C Humidity : 90~95%RH Duration : 500±12 hrs Applied current : Rated current Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber.	TLF9UA、14CB、25RA	250VAC	TLF9UB	50VDC
TLF9UA、14CB、25RA	250VAC									
TLF9UB	50VDC									
24.Loading at high temperature			Withstanding voltage : No abnormality Insulation resistance : No abnormality			TLF : Temperature : 85±2°C Duration : 100 hrs Applied voltage : Apply the following specified voltage between windings. <table border="1" style="margin-left: 20px;"> <tr> <td>TLF9UA、14CB、25RA</td> <td>250VAC</td> </tr> <tr> <td>TLF9UB</td> <td>50VDC</td> </tr> </table> Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs.	TLF9UA、14CB、25RA	250VAC	TLF9UB	50VDC
TLF9UA、14CB、25RA	250VAC									
TLF9UB	50VDC									

Item	Specified Value					Test method and remarks
	CM—RA/ BU—RA Type	CM—RB Type	TLF9U TLF14CB	TLF25RA	Linearity coil	
25.Low temperature life test	Appearance : No abnormality Inductance change : Refer to individual specification		Inductance change : Within±15%		Appearance : No abnormality Inductance change : Within±20%	CM : Temperature : -40±3°C Duration : 500 (+12, -0) hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. (CM—RA) : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. (CM—RB)  TLF : Temperature : -25±2°C Duration : 500 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs.  Linearity coil : Temperature : -40±3°C Duration : 1000±24 hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber.
26.High Temperature life test	Appearance : No abnormality Inductance change : Refer to individual specification		Inductance change : Within±15%		Appearance : No abnormality Inductance change : Within±20%	CM : Temperature : 85±2°C Duration : 500 (+12, -0) hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. (CM—RA) : 1 to 2hrs of recovery under the standard condition after the removal from test chamber. (CM—RB)  TLF : Temperature : 85±2°C Duration : 500 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs.  Linearity coil : Temperature : 85±2°C Duration : 1000±24 hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from test chamber.

## CM-RA Type, CM-RB Type, TLF Type

Stages	Precautions	Technical considerations
1.Circuit Design	<p>Operating environment,</p> <p>1.The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.</p>	
2.PCB Design	<p>Design</p> <p>1.Please design insertion pitches of a base in the pitches that fitted a terminal interval.</p>	<p>1.When Inductors are mounted onto a PC board, hole dimensions on the board should match the lead pitch of the component, if not, it will cause breakage of the terminals or cracking of terminal roots covered with resin as excess stress travels through the terminal legs.</p>
3.Soldering	<p>Wave soldering</p> <p>1.Please refer to the specifications in the catalog for a wave soldering.</p> <p>2.Do not immerse the entire Inductors in the flux during the soldering operation.</p> <p>Lead free soldering</p> <p>1.When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to soldering heat, etc. sufficiently.</p> <p>Recommended conditions for using a soldering iron</p> <p>Put the soldering iron on the land-pattern.</p> <p>Soldering iron's temperature - Below 350 °C</p> <p>Duration - 3 seconds or less</p> <p>The soldering iron should not directly touch the product.</p>	<p>1.If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p>
4.Cleaning	<p>Cleaning conditions</p> <p>1.TLF type</p> <p>Please contact any of our offices for about a cleaning,</p>	
5.Handling	<p>Handling</p> <p>1.Keep the product away from all magnets and magnetic objects.</p> <p>Mechanical considerations</p> <p>1.Please do not give the product any excessive mechanical shocks.</p> <p>2.TLF type</p> <p>Please do not add any shock or and power to a product in transportation.</p> <p>Packing</p> <p>1.Please do not give the product any excessive mechanical shocks.</p> <p>In loading, please pay attention to handling indication mentioned in a packing box (a loading direction / number of maximum loading / fragile item).</p>	<p>1.There is a case that a characteristic varies with magnetic influence.</p> <p>1.There is a case to be damaged by a mechanical shock.</p> <p>2.TFL type</p> <p>There is a case to be broken by a fall.</p> <p>1.There is a case that a lead route turns at by a fall or an excessive shock.</p>
6.Storage conditions	<p>Storage</p> <p>1.To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled..</p> <p>• Recommended conditions</p> <p>Ambient temperature           0~40°C</p> <p>Humidity                         Below 70% RH</p> <p>The ambient temperature must be kept below 30°C. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, product should be used within one year from the time of delivery.</p> <p>In case of storage over 6 months, solderability shall be checked before actual usage.</p>	<p>1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/package materials may take place.</p>

\* It comes down to "PRECAUTIONS" of Linearity coils and Please contact any of our offices for confirmation on delivery specifications after confirmation.