

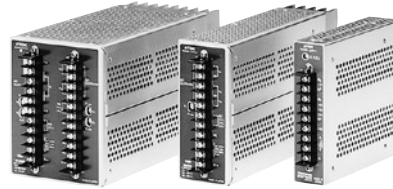
Power Supplies

R Series TRM-GB

AC Input

Multi Output, General-Purpose

The R series TRM-GB products are 3-output power supplies designed based on the RM-GB type having high reliability and achievements with surge and noise countermeasures. Voltages are selectable around +5V out of -5V, -9V, +12V, -12V, +15V, and -15V. Various uses are possible with adopting a floating method or adding the remote ON-OFF or remote sensing functions.



FEATURES

- AC.100V input and high-reliability 2-output power supply.
- 30W/125W types are floating.
30W type: Floating for 5V and $\pm$ NV.
125W type: Floating for 3 outputs.
- Remote ON-OFF function (75W/125W type).
- Remote sensing function (125W type).
- Long-life.
- Low-noise (CISPR standard compliant).

PART NUMBERS AND RATINGS

Part No.	Input voltage Eac(V)	Output power(W)	Output voltage(Current: A)							
			5V	-5V	-9V	+12V	-12V	+15V	-15V	
TRM-021GB	85 to 132	32.2	0 to 5	—	—	0 to 0.3	0 to 0.3	—	—	
TRM-022GB	85 to 132	34	0 to 5	—	—	—	—	0 to 0.3	0 to 0.3	
TRM-023GB	85 to 132	30.1	0 to 5	0 to 0.3	—	0 to 0.3	—	—	—	
TRM-031GB	85 to 132	74	2 to 10	—	—	0.2 to 1	0.2 to 1	—	—	
TRM-032GB	85 to 132	80	2 to 10	—	—	—	—	0.2 to 1	0.2 to 1	
TRM-041GB	85 to 132	123	0 to 15	—	—	0 to 2	0 to 2	—	—	
TRM-042GB	85 to 132	123	0 to 15	—	—	—	—	0 to 1.6	0 to 1.6	

Power Supplies

R Series TRM-GB

AC Input

Multi Output, General-Purpose

TRM-GB30W TYPE(TRM-02GB)

SPECIFICATIONS AND STANDARDS

Part No.		TRM-021GB			TRM-022GB			TRM-023GB		
Rated output voltage and current*		5V • 5A			5V • 5A			5V • 5A		
		+12V • 0.3A			+15V • 0.3A			+12V • 0.3A		
		-12V • 0.3A			-15V • 0.3A			-5V • 0.3A		
Maximum output power	W	32.2			34			30.1		
Input conditions										
Input voltage Eac	V	85 to 132[Rating: 100 to 115]								
Input frequency	Hz	47 to 440[Rating: 50 to 60](Single phase)								
Input capacitance	VA	100max.[At maximum output power]								
Fuse rating	A	3.15[Built-in]								
Surge current	A	15 to 17max.[25°C, AC.100 to 115V, output rating, 1st surge current, reset after 5s minimum.]								
Leakage current	mA	0.5max.(0.3typ.)[25°C, input and output ratings]								
Efficiency	%	74typ.[25°C, input and output ratings]								
Output characteristics										
Output voltage	V	5	+12	-12	5	+15	-15	5	+12	-5
Maximum output current	A	5	0.3	0.3	5	0.3	0.3	5	0.3	0.3
Voltage variable range Edc	V	5V: 4.25 to 5.5, ±NV: Fixed								
Overvoltage threshold Edc	V	5V: 5.8 to 6.9								
Overcurrent threshold	A	5V: 5.5 to 6.9, ±NV: 0.33 to 0.6								
Voltage stability	Input effect	%	0.8max.(0.5typ.)[Within the input voltage range]				Total effect 2max.(1.3typ.)			
	Load effect	%	0.8max.(0.4typ.)[10 to 100% load]							
	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]							
	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]							
	Ripple Ep-p	mV	5V:75max., ±NV:10max.							
	Noise Ep-p	mV	Output voltage×1%+50max.[50MHz max., including ripple]							
Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]								
Start up time	ms	100max.(50typ.)[25°C, input and output ratings]								
Hold up time	ms	20min.(30typ.)[25°C, input and output ratings]								
Auxiliary functions										
Overvoltage protection		Only 5V built-in protection, voltage shut-down type, recovers upon reset, set value fixed.								
Overcurrent protection		5V: Fixed current and voltage threshold type, ±NV: Higher overcurrent detection point at low load, automatic recovery, set value fixed.								
Remote ON-OFF		No								
Remote sensing		No								
Standards										
Safety standards		—								
Noise terminal voltage		CISPR standard compliant.								
Constructions										
External dimensions	mm	130×35×146[H×W×L]								
Weight	kg	0.65max.								
Mounting method		Can be attached to 4 sides.								
Case material		Aluminum(Phosphoric acid anodized surface)								

* Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

Power Supplies

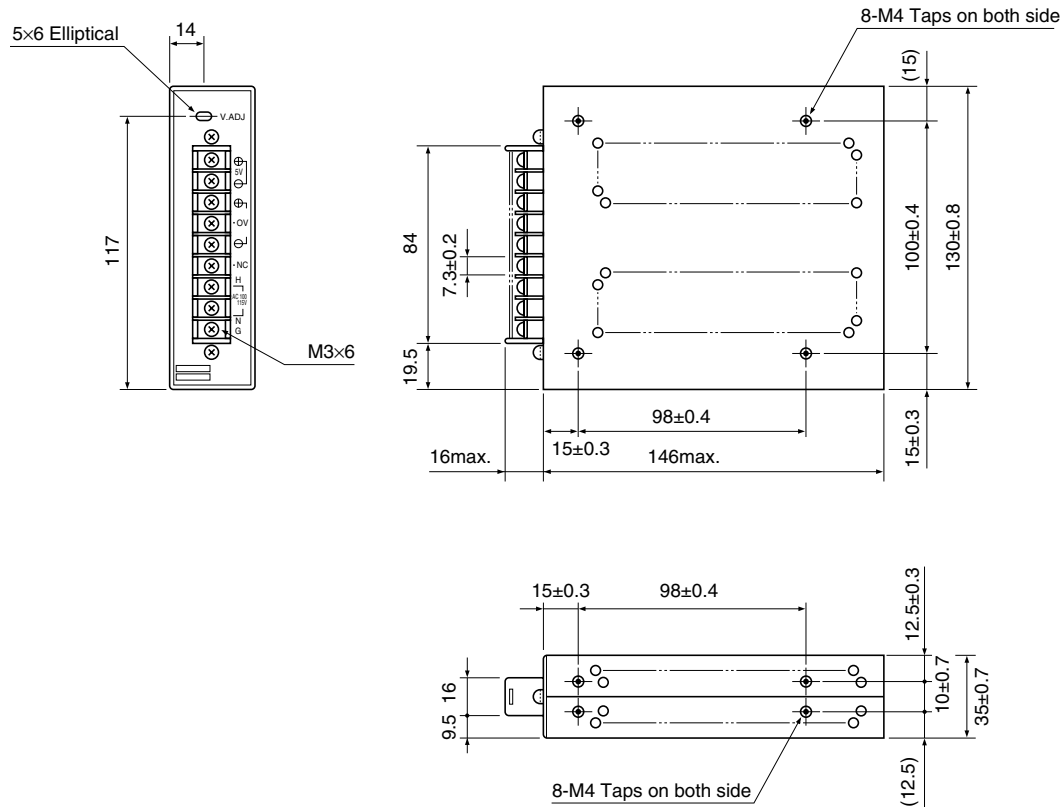
AC Input

Multi Output, General-Purpose

R Series TRM-GB

TRM-GB30W TYPE

SHAPES AND DIMENSIONS



Dimensions in mm
±1mm : without specified dimensions

- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

R Series TRM-GB

AC Input

Multi Output, General-Purpose

TRM-GB75W TYPE(TRM-03GB)

SPECIFICATIONS AND STANDARDS

Part No.		TRM-031GB			TRM-032GB			
Rated output voltage and current*1	V ₁	+5V • 10A			+5V • 10A			
	V ₂	+12V • 1A			+15V • 1A			
	V ₃	−12V • 1A			−15V • 1A			
Maximum output power		W	74			80		
Input conditions								
Input voltage Eac		V	85 to 132[Rating: 100 to 115]					
Input frequency		Hz	47 to 440[Rating: 50 to 60](Single phase)					
Input capacitance		VA	220max.[At maximum output power]					
Fuse rating		A	4[Built-in]					
Surge current		A	15 to 17max.[25°C, AC.100 to 115V, output rating, 1st surge current, reset after 10s minimum.]					
Leakage current		mA	0.5max.(0.3typ.)[25°C, input and output ratings]					
Efficiency		%	78typ.[25°C, input and output ratings]					
Output characteristics								
Output voltage		V	5	+12	−12	5	+15	−15
Maximum output current		A	10	1	1	10	1	1
Minimum output current*2		A	2	0.2	0.2	2	0.2	0.2
Output current setting condition		A	6	0.6	0.6	6	0.6	0.6
Voltage variable range E _{dc}		V	5V: 4.5 to 5.5, ±NV: Changes at the same time and in the same direction to 5V.					
Overvoltage threshold E _{dc}		V	5V: 5.8 to 6.9					
Overcurrent threshold		A	5V: 11 to 15, ±NV: 1.1 to 1.6					
Voltage stability	Input/output effects	%	5V: ±1max., ±NV: ±3max.[Within the input voltage range, minimum and maximum output current range]					
	Temperature effect	%	±1max.(0.4typ.)[Ambient temperature: 0 to +50°C]					
	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]					
	Ripple E _{p-p}	mV	5V: 60max., 12V: 100max., 15V: 100max.					
	Noise E _{p-p}	mV	Output voltage×1%+50max.[50MHz max., including ripple]					
	Cross effect	%	5V: ±1max.[±NV load variation: 20 to 100%], ±NV: ±4max.[5V load variation: 50 to 100%]					
Recovery		%/ms	±4max./2max.[50 to 100% sudden load change]					
Start up time		ms	150max.(100typ.)[25°C, input and output ratings]					
Hold up time		ms	20min.(30typ.)[25°C, input and output ratings]					
Auxiliary functions								
Overvoltage protection		Only 5V built-in protection, voltage shut-down type, recovers upon reset, set value fixed.						
Overcurrent protection		Rectangular type, automatic recovery, set value fixed.						
Remote ON-OFF		Yes[For RC(−) terminal, same potential as 0V terminal.]						
Remote sensing		No						
Standards								
Safety standards		—						
Noise terminal voltage		CISPR standard compliant.						
Constructions								
External dimensions		mm	130×55×224[H×W×L]					
Weight		kg	1.4max.					
Mounting method		Can be attached to 4 sides.						
Case material		Aluminum(Phosphoric acid anodized surface)						

*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

*2 When the current is less than the minimum output current, the nominal voltage output may not be produced.

Power Supplies

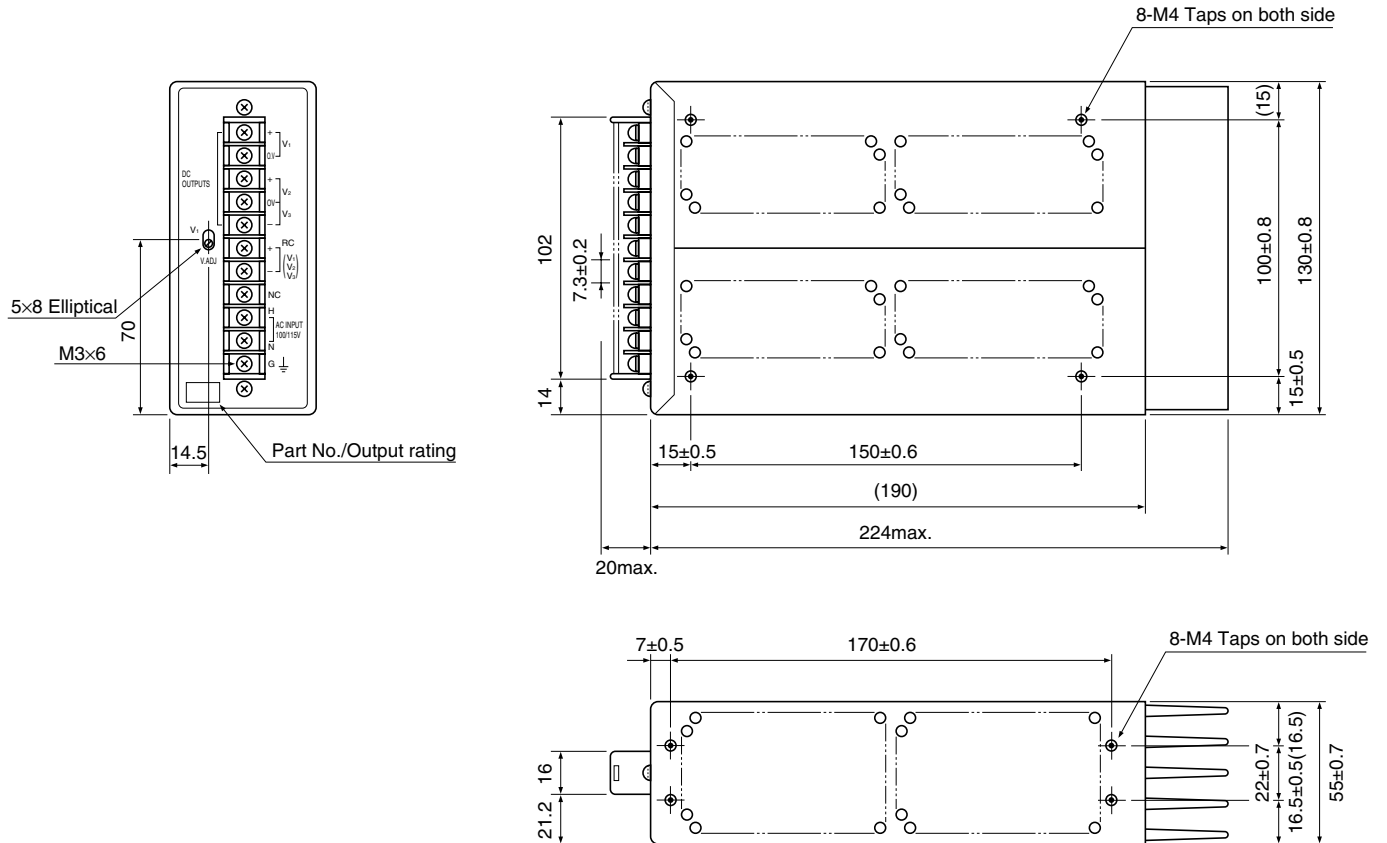
AC Input

Multi Output, General-Purpose

R Series TRM-GB

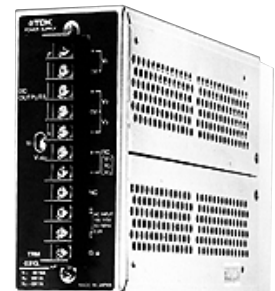
TRM-GB75W TYPE(TRM-03GB)

SHAPES AND DIMENSIONS



Dimensions in mm
±1mm : without specified dimensions

- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

R Series TRM-GB

AC Input

Multi Output, General-Purpose

TRM-GB125W TYPE(TRM-04GB)

SPECIFICATIONS AND STANDARDS

Part No.		TRM-041GB			TRM-042GB		
Rated output voltage and current*	V ₁	5V • 15A			5V • 15A		
	V ₂	12V • 2A			15V • 1.6A		
	V ₃	12V • 2A			15V • 1.6A		
Maximum output power	W	123			123		
Input conditions							
Input voltage Eac	V	85 to 132[Rating: 100 to 115]					
Input frequency	Hz	47 to 440[Rating: 50 to 60](Single phase)					
Input capacitance	VA	300max.[At maximum output power]					
Fuse rating	A	6[Built-in]					
Surge current	A	15 to 17max.[25°C, AC.100 to 115V, output rating, 1st surge current, reset after 15s minimum.]					
Leakage current	mA	0.5max.(0.3typ.)[25°C, input and output ratings]					
Efficiency	%	78typ.[25°C, input and output ratings]					
Output characteristics							
Output voltage	V	5	12	12	5	15	15
Maximum output current	A	15	2	2	15	1.6	1.6
Voltage variable range Edc	V	5V: 4 to 5.5, 12V: 9.5 to 13.5, 15V: 12 to 16.5					
Overvoltage threshold Edc	V	5V: 5.8 to 6.9, 12V: 13.7 to 15.7, 15V: 17 to 19					
Overcurrent threshold	A	5V(V ₁): 16.5 to 18.8, V ₂ , V ₃ : Maximum current×(110 to 140%)					
Voltage stability	Input effect	% 0.8max.(0.5typ.)[Within the input voltage range]			Total effect 2max.(1.3typ.)		
	Load effect	% 0.8max.(0.4typ.)[0 to 100% load]					
	Temperature effect	% 1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]					
	Drift(Time effect)	% 0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]					
	Ripple Ep-p	mV 5V: 50max., 12V:80max., 15V: 80max.					
	Noise Ep-p	mV Output voltage×1%+50max.(50MHz max., including ripple)					
Dynamic load	%/ms	±4max./1max.[50 to 100% sudden load change]					
Start up time	ms	200max.(100typ.)[25°C, input and output ratings]					
Hold up time	ms	20min.(30typ.)[25°C, input and output ratings]					
Auxiliary functions							
Overvoltage protection		Voltage shut-down type, recovers upon reset, set value fixed.					
Overcurrent protection		Rectangular type, automatic recovery, adjustable for 5V(V ₁) and fixed for others.					
Remote ON-OFF		Yes[For RC(V ₁), RC(V ₂ , V ₃) are independent.]					
Remote sensing		For 5V(V ₁) only Yes					
Standards							
Safety standards		—					
Noise terminal voltage		CISPR standard compliant.					
Constructions							
External dimensions	mm	130×103×224[H×W×L]					
Weight	kg	2.5max.					
Mounting method		Can be attached to 4 sides.					
Case material		Aluminum(Phosphoric acid anodized surface)					

* Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

Power Supplies

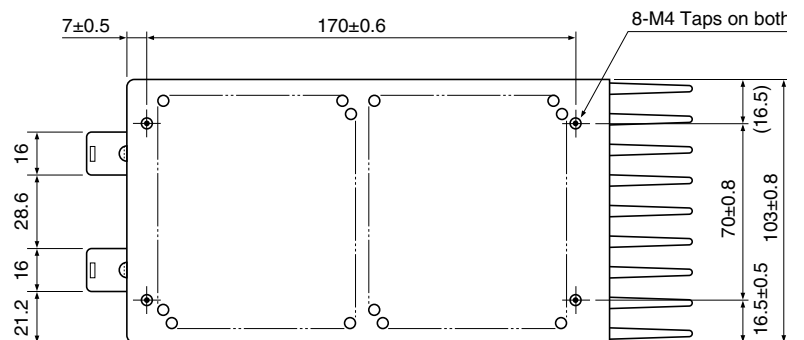
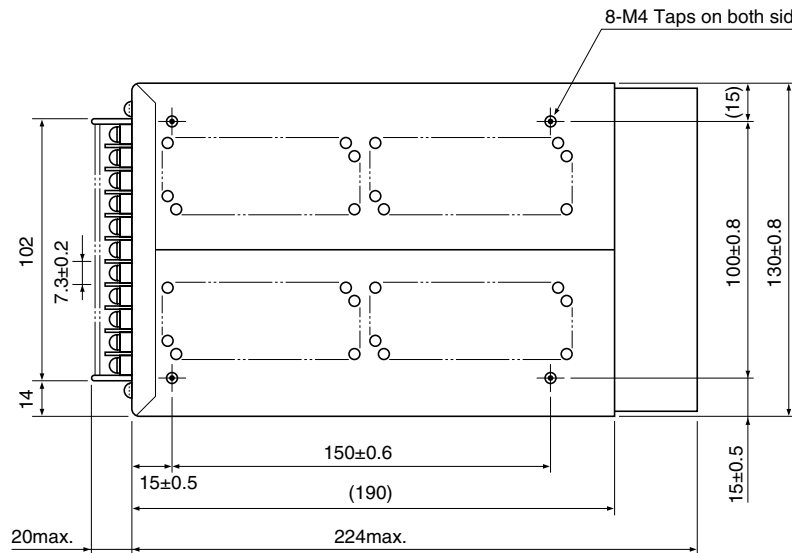
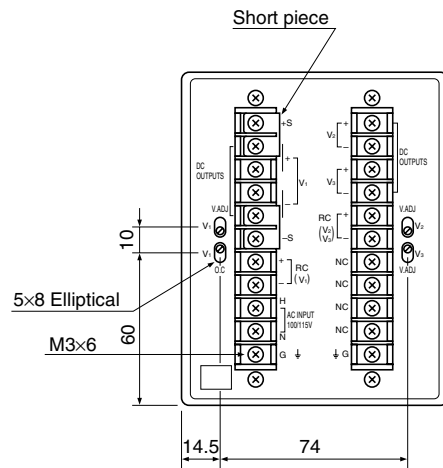
AC Input

Multi Output, General-Purpose

R Series TRM-GB

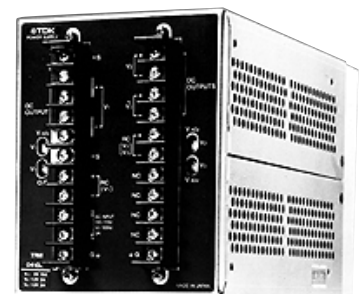
TRM-GB125W TYPE

SHAPES AND DIMENSIONS



Dimensions in mm
±1mm : without specified dimensions

- Do not insert M4 tap installation screws more than 7mm from surface of power supply.



Power Supplies

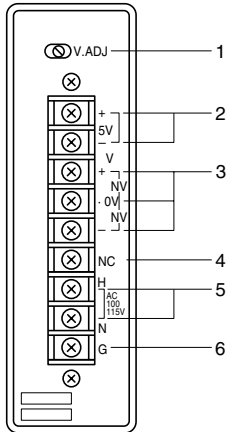
R Series TRM-GB

AC Input

Multi Output, General-Purpose

TERMINAL DESIGNATIONS AND FUNCTIONS

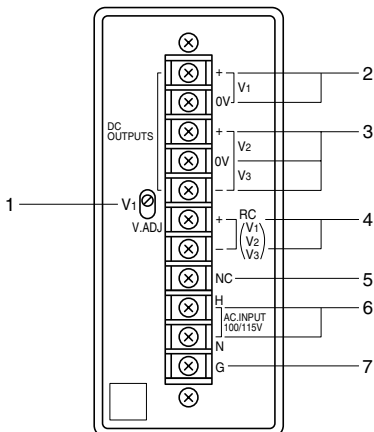
30W TYPE



Terminal No.	Designations and functions	
1	5V output voltage adjustment trim(V.ADJ)	Adjusts 5V output voltage.
2	5V DC output terminals(5V, +, -)	Connect to load.
3	±NV DC output terminals(+, 0V, -)	Connect to load.
4	No connection(NC)	Connect none to this terminal.
5	AC input terminals(H, N, AC 100/150V)	Connect to AC.100/115V single phase input line.
6	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.

• 5V output and ±NV outputs are floating.

75W TYPE



Terminal No.	Designations and functions	
1	V1 output voltage adjustment trim(V1, V.ADJ)	The V1 output voltage is adjustable (The ±NV output voltage concurrently changes in the same direction).
2	V1 DC output terminals(V1, +, -)	Connect to load.
3	±NV DC output terminals(±NV, +, -)	Connect to load.
4	Remote ON-OFF terminals(RC, +, -)	The output can be turned on or off by an open or close control between the RC terminals (when open, output is on). The RC(-) terminal is at the same level as for the 0V terminal.
5	No connection(NC)	Connect none to this terminal.
6	AC input terminals(H, N, AC INPUT100/150V)	Connect to AC.100/115V single phase input line.
7	Frame ground terminal(G)	Connected to a ground wire. It is connected to a case.

• The 0V terminal for each output is connected internally.

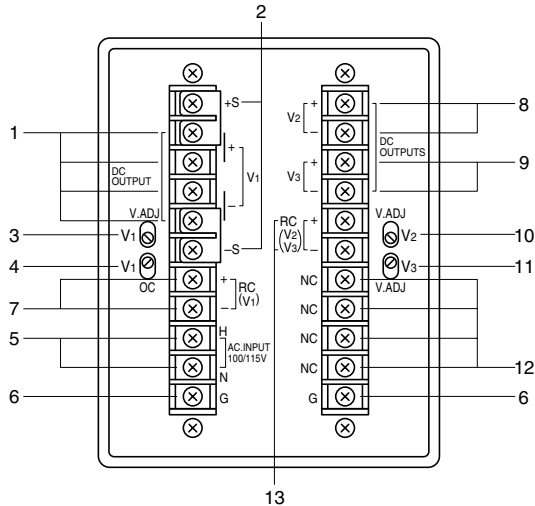
Power Supplies

R Series TRM-GB

AC Input

Multi Output, General-Purpose

125W TYPE



Terminal No.	Designations and functions	
1	V ₁ DC output terminals(V ₁ , +, -)	Connect to load. These terminals are used to compensate voltage loss from the output terminal to a load, normally they are shorted with a metal bar. When compensation for voltage loss to the V ₁ load is desired, remove the bar and connect with wiring.
2	Remote sensing terminals(+S, -S)	
3	V ₁ output voltage adjustment trim(V ₁ , V.ADJ)	Adjusts V ₁ output voltage.
4	V ₁ output overcurrent adjustment trim (V ₁ , OC)	Trimmer for settings at delivery.
5	AC input terminals(H, N, AC INPUT100/150V)	Connect to AC.100/115V single phase input line.
6	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
7	V ₁ output remote ON-OFF terminals (RC(V ₁), +, -)	The V ₁ output can be turned on or off by an open or close control between the RC terminals (when open, output is on). The RC(V ₁)(-) terminal has the same level as for the -S terminal.
8	V ₂ DC output terminals(V ₂ , +, -)	Connect to load.
9	V ₃ DC output terminals(V ₃ , +, -)	Connect to load.
10	V ₂ output voltage adjustment trim(V ₂ , V.ADJ)	Adjusts V ₂ output voltage.
11	V ₃ output voltage adjustment trim(V ₃ , V.ADJ)	Adjusts V ₃ output voltage.
12	No connection(NC)	Connect none to this terminal.
13	V ₂ , V ₃ output remote ON-OFF terminals(RC(V ₂ , V ₃), +, -)	The V ₂ and V ₃ outputs can be turned on or off by an open or close control between the RC terminals (when open, output is on). The RC(V ₂ , V ₃)(-) terminals have the same level as for the V ₂ (-) terminal.

• Respective outputs are floating.

Power Supplies

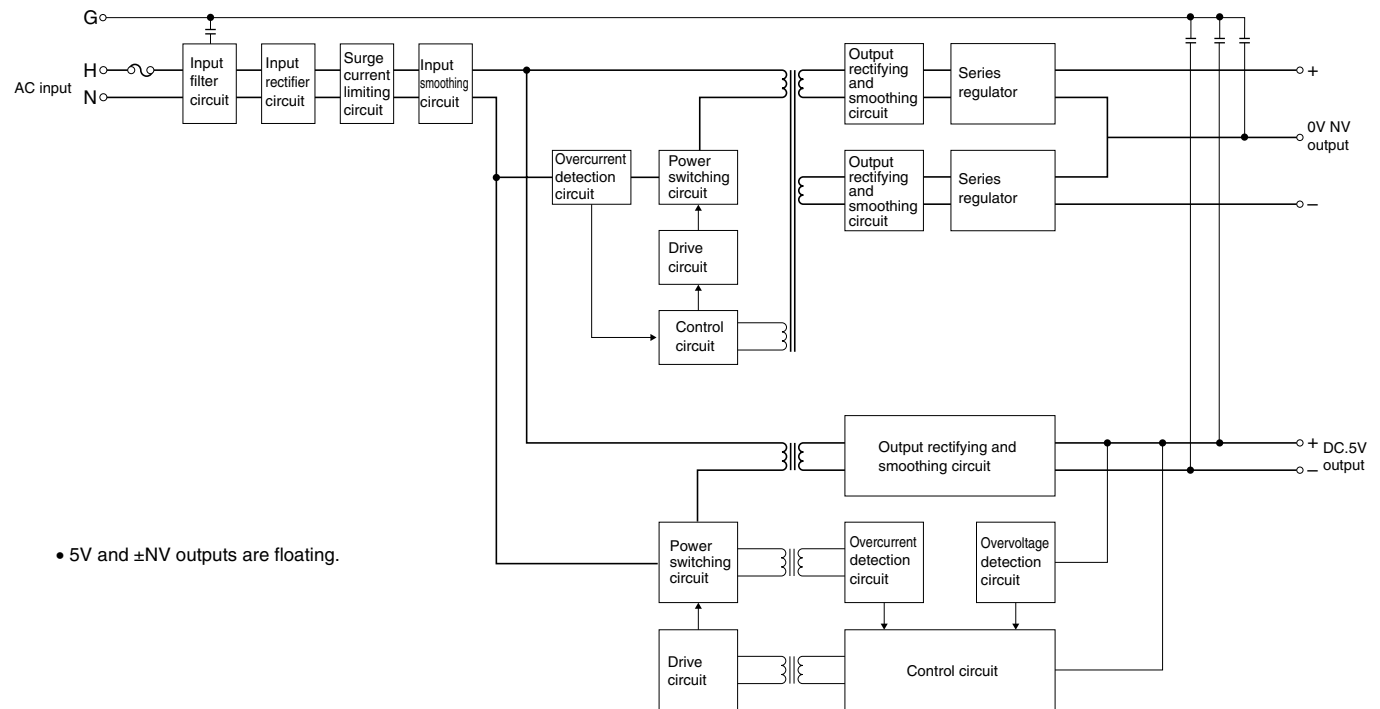
R Series TRM-GB

AC Input

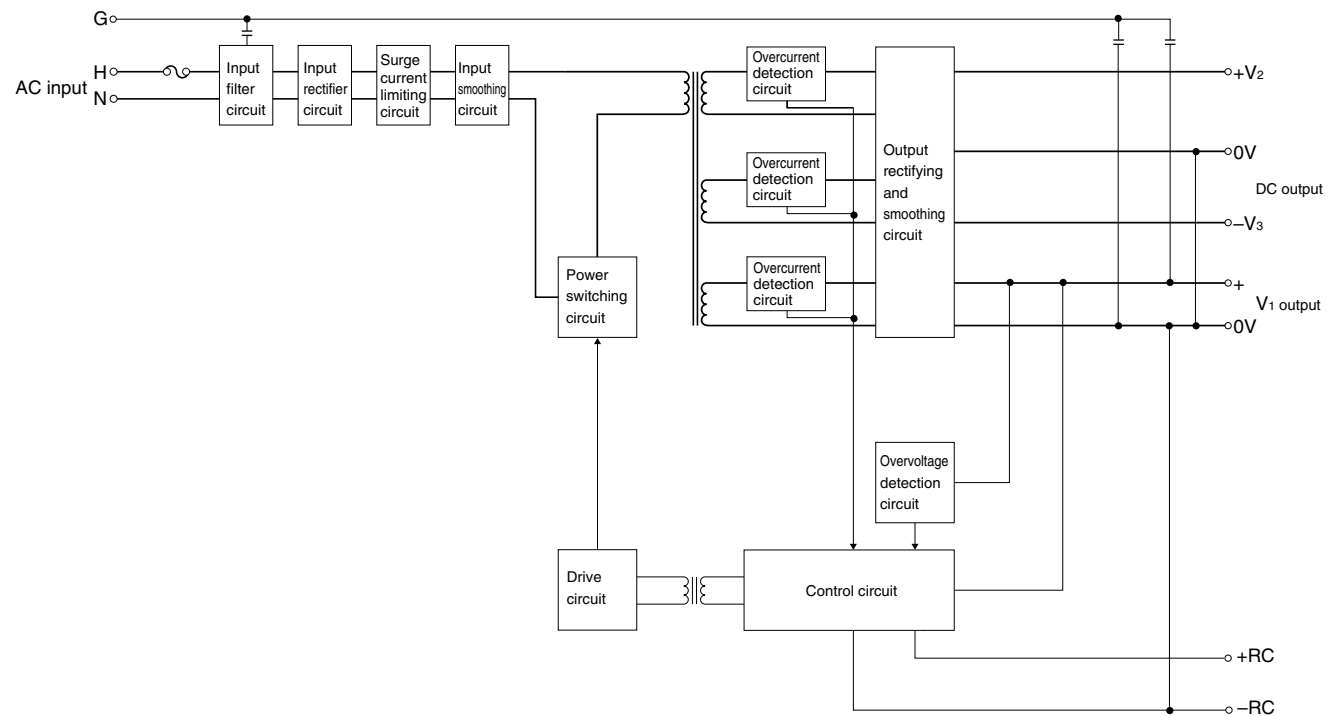
Multi Output, General-Purpose

BLOCK DIAGRAM

TRM-GB30W



TRM-GB75W



Power Supplies

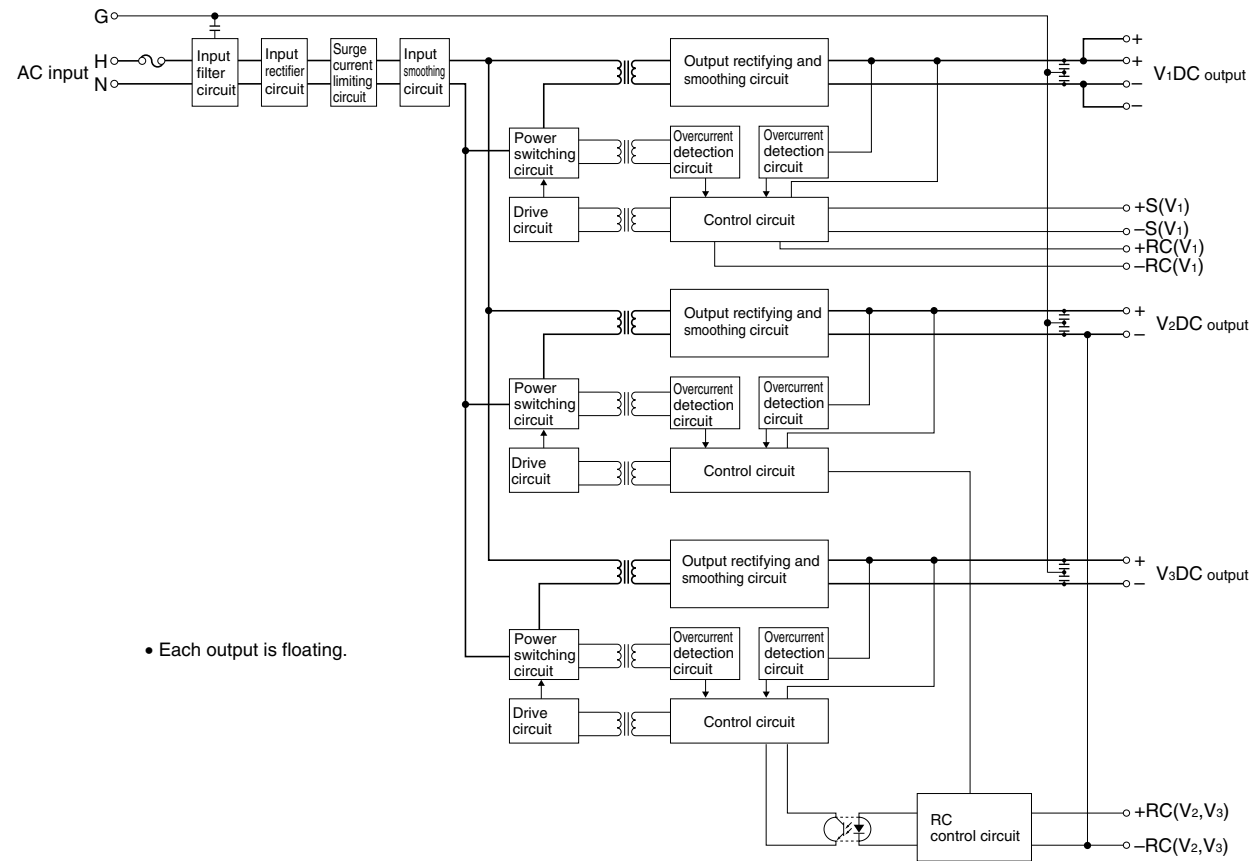
R Series TRM-GB

AC Input

Multi Output, General-Purpose

BLOCK DIAGRAM

TRM-GB125W



COMMON SPECIFICATIONS

Temperature and humidity		
Temperature range	Operating(°C)	0 to +60[Derating is necessary when operating environment temperature exceed 50°C.]
	Storage(°C)	
Humidity range	Operating(%)RH	20 to 95[Maximum wet-bulb temperature: 35°C, without dewing]
	Storage(%)RH	
Vibration and shock		
Vibration	5 to 10Hz	All amplitude 10mm[3 directions, each 1h]
	10 to 55Hz	Acceleration 19.6m/s ² (2G)[3 directions, each 1h]
Shock	Acceleration	196m/s ² (20G)[3 directions, each 3 times]
	Pulse duration	11±5ms
Withstand voltage and insulation resistance		
Withstand voltage	Input terminal to case(G)	Eac: 2kV, 1min[Normal temperature, normal humidity, cutout current 5mA]
	Input terminal to output terminal	
Insulation resistance	Input terminal to case(G)	Edc: 500V, 100MΩ min. [Normal temperature, normal humidity]
	Output terminal to case(G)	

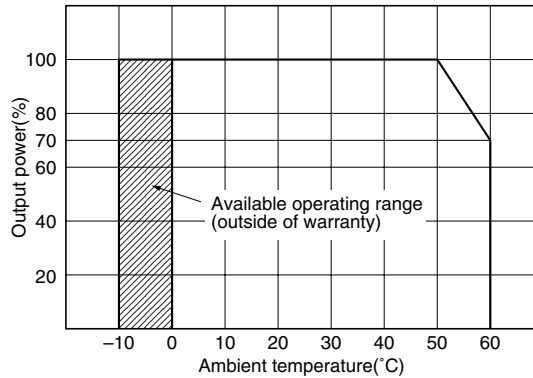
Power Supplies

AC Input

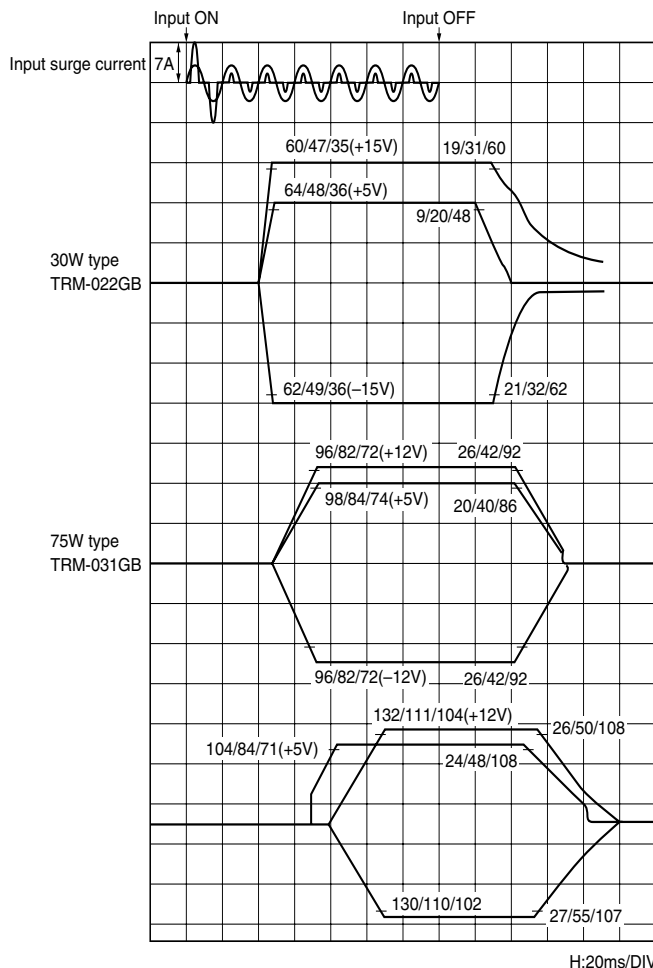
Multi Output, General-Purpose

R Series TRM-GB

OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)



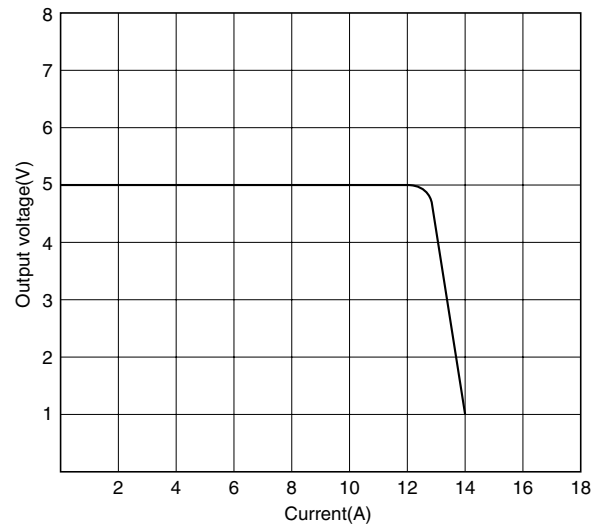
INPUT SURGE CURRENT, START UP / HOLD UP TIMES (REFERENCE VALUE)



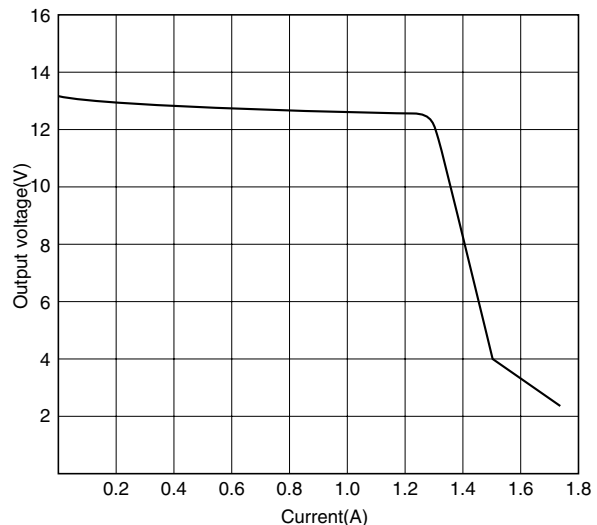
[Reference]

Three numeric values in the above data indicate output voltages exceed 90% of the rated output voltage at the input voltage AC.85/100/132V.

OUTPUT CHARACTERISTICS(75W TYPE: TRM-031GB) 5V OUTPUT CHARACTERISTICS (±12V: 1A FIXED, AC.115V INPUT)



±12V OUTPUT CHARACTERISTICS (±12V: EITHER + OR - IS VARIABLE, 5V: 10A FIXED, AC.115V INPUT)



While an overcurrent detected point exists at approx. 125% of the rated value on the load characteristic curve, a 100% or higher load cannot be adopted as a continuous rated value. If a certain load value exceeds an overcurrent detected point, the corresponding voltage drops while other output voltages drop in the same manner.

Power Supplies

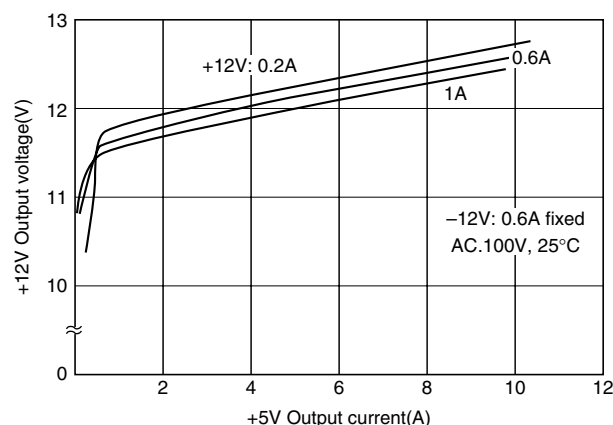
AC Input

Multi Output, General-Purpose

R Series TRM-GB

CROSS REGULATION

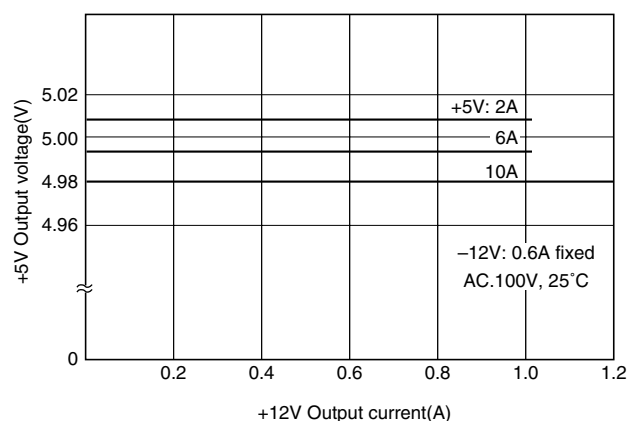
1. VARIATION OF +12V OUTPUT TO +5V OUTPUT



[Reference]

This table shows that the +12V voltage varies within a range of 12 to 12.5V during a transition of the load of the 5V output current from 4A to 8A with the -12V/0.6A load applied.

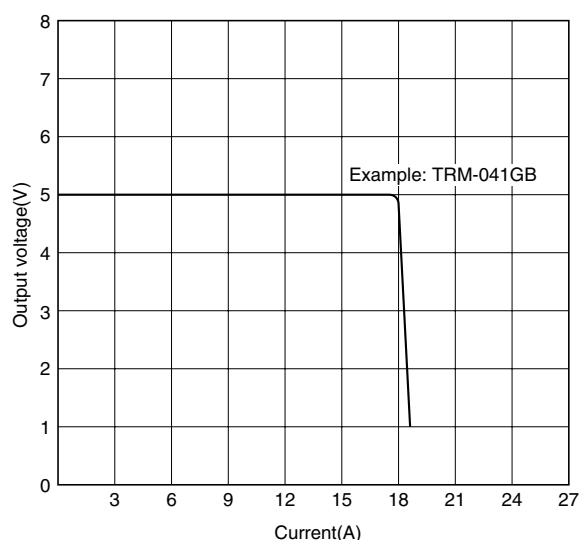
2. VARIATION OF +5V OUTPUT TO +12V OUTPUT



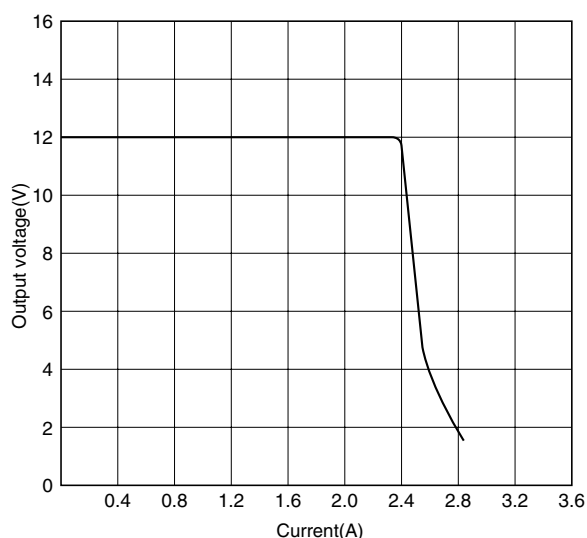
It should be particularly noted when using the 75W type that the circuit system focuses on the 5V output for control in this method. Therefore, the lowest 5V current requires 2A min. It is because, as apparent from the table in 1 in CROSS REGULATION, the $\pm 12V$ output abnormally drops if the 5V output current is 2A or lower. The 5V output current is solely very stable. The both output voltages are stable at fixed current and therefore they can be used without any problem.

OUTPUT CHARACTERISTICS(75W TYPE: TRM-041GB)

5V OUTPUT CHARACTERISTICS ($\pm 12V$: 2A FIXED, AC.115V INPUT)



$\pm 12V$ OUTPUT CHARACTERISTICS ($\pm 12V$: EITHER + OR - IS VARIABLE, 5V: 15A FIXED, AC.115V INPUT)



MINIMUM OUTPUT CURRENT

While the TRM-03GB75W type has a regulation of the minimum output current, each of 3 outputs is independently controlled for the TRM-02GB 30W and TRM-04GB 125W types without this regulation.

OTHER CONDITIONS

- Unless conditions are otherwise specified in the specifications or standards, 25°C and rated input-output should be applied.
- Ripple and noise (50MHz max.) should be specified at a temperature within a range of 0 to +50°C.