# DC Input Single Output, Long Life

### R Series DR-UGB(30 to 300W)

The R series DR-UGB products are high-reliability and multi-function power supplies with the rated input DC.110V. Various types are selectable out of an abundant lineup covering 24 types from 30W to 300W. This series is optimum for incorporating an uninterruptible device in addition to power electronics related devices for power or plant controls.

#### FEATURES

- DC.110V input high-reliability single-output power supply.
- Optimum to uses of pulse load.
- Input surge current reduced (Soft-start circuit built-in).
- Remote ON-OFF function (Floating).
- Remote sensing function.

#### PART NUMBERS AND RATINGS

Output voltage(V)	30W Type		50W Type		75W Type	75W Type	
	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.	
5	6	DR05-6R0UGB	10	DR05-10RUGB	15	DR05-15RUGB	
12	2.5	DR12-2R5UGB	5	DR12-5R0UGB	6.3	DR12-6R3UGB	
15			4	DR15-4R0UGB			
24	1.3	DR24-1R3UGB	2.5	DR24-2R5UGB	3.2	DR24-3R2UGB	
48	_		1.3	DR48-1R3UGB	1.6	DR48-1R6UGB	

Output voltage(V)	100W Type		150W Type	150W Type		300W Type	
	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.	
5	20	DR05-20RUGB	30	DR05-30RUGB	60	DR05-60RUGB	
12	8.5	DR12-8R5UGB	12	DR12-12RUGB	27	DR12-27RUGB	
24	4.5	DR24-4R5UGB	6	DR24-6R0UGB	16	DR24-16RUGB	
48	2.2	DR48-2R2UGB	3	DR48-3R0UGB	6	DR48-6R0UGB	





# DR-UGB30W Type

#### SPECIFICATIONS AND STANDARDS

Part No.		DR05-6R0UGB	DR12-2R5UGB	DR24-1R3UGB				
Rated output voltage and current*		5V•6A	12V • 2.5A	24V • 1.3A				
Maximun	n output power	W	33	33	34.4			
Input cor	ditions							
Input volt	tage Edc	V	88 to 143[Rating: 110]	88 to 143[Rating: 110]				
Input cur	rent	А	0.7max.[DC.88V]					
Fuse rati	ng	А	3.15[Built-in]					
Surge cu	rrent	Α	15max.[25°C, input and outp	out ratings, 1st surge current, reset a	after 5s minimum.]			
Leakage	current	mA	0.5max.(0.3typ.)					
Efficiency	/	%	75typ.[25°C, input and output	it ratings]				
Output cl	naracteristics							
Output ve	oltage Edc	V	5	12	24			
Voltage v	variable range Edc	V	4.25 to 5.5	9.5 to 13.5	19 to 26.5			
Maximun	n output current	А	6	2.5	1.3			
Overvolta	age threshold Edc	V	5.8 to 6.9	13.7 to 15.7	27 to 30.5			
Overcurr	ent threshold	А	6.6 to 7.8	2.8 to 3.3	1.5 to 1.8			
	Source effect	%	0.8max.(0.5typ.)[Within the input voltage range]					
Voltago	Load effect	%	0.8max.(0.4typ.)[10 to 100%	Total effect 2max.(1.3typ.)				
stability	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]					
Stability	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]					
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change, tr, tf $\geq$ 5µs]					
Ripple E	о-р	mV	50max.	80max.	100max.			
Ripple no	bise Ep-p	mV	75max. 110max. 170max.					
Start up t	time	ms	100max.(50typ.)[Input and output ratings]					
Hold up t	ime	ms	10min.(20typ.)[Input and output ratings]					
Auxiliary	functions							
Indicator	display		No					
Overvolta	age protection		Voltage shut-down type, recovers upon reset(interval approx. 5s), set value fixed.					
Overcurr	ent protection		Rectangular type, automatic recovery, set value fixed.					
Remote	ON-OFF		Yes(Floating)					
Remote :	sensing		Yes					
Standard	s							
Safety st	andards		-					
Noise terminal voltage			CISPR standard meet.					
Construc	tions							
External	dimensions	mm	130×35×146[H×W×L]					
Weight		g	650max.					
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.

# DR-UGB30W 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.



# DR-UGB50W Type

#### SPECIFICATIONS AND STANDARDS

Part No.		DR05-10RUGB	DR12-5R0UGB	DR15-4R0UGB	DR24-2R5UGB	DR48-1R3UGB			
Rated output voltage and current*		5V • 10A	12V • 5A	15V • 4A	24V • 2.5A	48V • 1.3A			
Maximun	n output power	W	55	68	66	66	69		
Input con	ditions			-	Ψ	ľ			
Input volt	age Edc	V	88 to 143[Rating: 110]						
Input cur	rent	А	0.9max.(0.7typ.)[DC	0.9max.(0.7typ.)[DC.88V]					
Fuse rati	ng	А	3.15[Built-in]						
Surge cu	rrent	А	12max.[25°C, input	and output ratings, 1s	t surge current, reset a	Ifter 5s minimum.]			
Efficiency	1	%	81typ.	83typ.	83typ.	85typ.	85typ.		
Output cl	naracteristics			-					
Output vo	oltage Edc	V	5	12	15	24	48		
Voltage v	ariable range Edc	V	4 to 5.5	9.5 to 13.5	12 to 16.5	19 to 26.5	38.4 to 53		
Maximun	n output current	A	10	5	4	2.5	1.3		
Overvolta	age threshold Edc	V	6 to 6.5	14 to 14.5	17 to 17.5	27 to 27.5	55 to 57		
Overcurr	ent threshold	A	11.5 to 12.5	5.7 to 6.3	4.6 to 5	2.8 to 3.2	1.5 to 1.7		
	Source effect	%	0.8max.(0.5typ.)[Wit	0.8max.(0.5typ.)[Within the input voltage range]					
Voltage	Load effect	%	1max.(0.5typ.)[10 to 100% load] Total effect 2max.(1.3typ.)						
stability	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]						
otability	Drift(Time effect)	%	0.5max.(0.1typ.)[25°C, input and output ratings, after input voltage ON for 30min to 8h]						
	Recovery	%/ms	±4max./1max.[50 to	100% sudden load ch	hange, tr, tf $\geq$ 5µs]		-		
Ripple Ep	р-р	mV	50max.	80max.	80max.	100max.	100max.		
Ripple no	bise Ep-p	mV	75max.	110max.	125max.	170max.	290max.		
Start up t	ime	ms	150max.(90typ.)[Input and output ratings]						
Hold up t	ime	ms	15min.(20typ.)[Input and output ratings]						
Auxiliary	functions								
Indicator	display		No						
Overvolta	age protection		Voltage shut-down type, recovers upon reset(interval approx. 5s).						
Overcurr	ent protection		Hectangular type, automatic recovery.						
Remote	JN-OFF		Yes(Floating)						
Remote s	sensing		Yes						
Standard	S		1						
Safety st	andards								
Construct	minai voitage		CISPH standard me	CISPH standard meet.					
Construc	lions								
External	aimensions	mm	130×55×191[H×W×L	-]					
Mounting	mathad	кд	1. IIIIax.	1 oldoo					
			Can be attached to 4	+ SIUES.					
Case material			Aluminum						

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

**<b>***<u>⊗</u>TDK* 

### DR-UGB50W Type

#### SHAPES AND DIMENSIONS



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



# DR-UGB75W Type

#### SPECIFICATIONS AND STANDARDS

Part No.			DR05-15RUGB	DR12-6R3UGB	DR24-3R2UGB	DR48-1R6UGB		
Rated output voltage and current*		5V • 15A	12V • 6.3A	24V • 3.2A	48V • 1.6A			
Maximum	n output power	W	82.5	85	85	85		
Input con	ditions							
Input volt	age Edc	V	88 to 143[Rating: 110]					
Input curi	rent	Α	1.2max.(0.85typ.)[DC.88V	]				
Fuse rati	ng	Α	4[Built-in]					
Surge cu	rrent	А	12max.[25°C, input and ou	utput ratings, 1st surge cu	urrent, reset after 5s minimur	m.]		
Efficiency	1	%	81typ.	83typ.	86typ.	86typ.		
Output ch	naracteristics							
Output vo	oltage Edc	V	5	12	24	48		
Voltage v	ariable range Edc	V	4 to 5.5	9.5 to 13.5	19 to 26.5	38.4 to 53		
Maximun	n output current	А	15	6.3	3.2	1.6		
Overvolta	age threshold Edc	V	6 to 6.5	14 to 14.5	27 to 27.5	55 to 57		
Overcurre	ent threshold	А	17.2 to 18.8	7.2 to 7.9	3.6 to 4	1.8 to 2		
	Source effect	%	0.8max.(0.5typ.)[Within the	e input voltage range]				
Voltogo	Load effect	%	1max.(0.5typ.)[10 to 100% load] Total effect 2max.(1.3typ.)					
vollage	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]					
Stability	Drift(Time effect)	%	0.5max.(0.1typ.)[25°C, input and output ratings, after input voltage ON for 30min to 8h]					
	Recovery	%/ms	±4max./1max.[50 to 100%	sudden load change, tr,	tf≧5µs]			
Ripple Ep	р-р	mV	50max.	80max.	100max.	100max.		
Ripple no	ise Ep-p	mV	75max.	110max.	170max.	290max.		
Start up t	ime	ms	150max.(90typ.)[Input and output ratings]					
Hold up t	ime	ms	15min.(20typ.)[Input and output ratings]					
Auxiliary	functions							
Indicator	display		No					
Overvolta	age protection		Voltage shut-down type, recovers upon reset(interval approx. 8s).					
Overcurre	ent protection		Rectangular type, automatic recovery.					
Remote (	ON-OFF		Yes(Floating)					
Remote s	sensing		Yes					
Standard	S							
Safety sta	andards		-					
Noise terminal voltage			CISPR standard meet.					
Construc	tions	1						
External	dimensions	mm	130×55×224[H×W×L]					
Weight		kg	1.2max.					
Mounting	method		Can be attached to 4 side	S.				
Case material			Aluminum					

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

### DR-UGB75W Type

#### SHAPES AND DIMENSIONS



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



# DR-UGB100W Type

#### SPECIFICATIONS AND STANDARDS

Part No		DB05-20BLIGB	DB12-885UGB	DB24-4B5UGB	DB48-2B2LIGB				
Bated output voltage and current*		5V • 20A	12V • 8.5A	24V • 4 5A	48V • 2 2A				
Maximun	n output power	w	110	115	119	117			
Input con	ditions		110	110	110				
Input volt	age Edc	V	88 to 143[Rating: 110]	88 to 143[Bating: 110]					
Input cur	rent	A	1 7max (1 1tvn) [DC 88V]						
Fuse rati	าต	A	5[Built-in]						
Surge cu	rrent	А	12max.[25°C, input and or	utput ratings,1st surge cur	rent, reset after 15s minimu	m.]			
Efficiency	1	%	81typ.	83typ.	86typ.	86typ.			
Output ch	naracteristics								
Output vo	oltage Edc	V	5	12	24	48			
Voltage v	variable range Edc	V	4 to 5.5	9.5 to 13.5	19 to 26.5	38.4 to 53			
Maximum	n output current	А	20	8.5	4.5	2.2			
Overvolta	age threshold Edc	V	6 to 6.5	14 to 14.5	27 to 27.5	55 to 57			
Overcurre	ent threshold	А	23 to 25	9.7 to 10.7	5.1 to 5.7	2.5 to 2.8			
	Source effect	%	0.8max.(0.5typ.)[Within th	0.8max.(0.5typ.)[Within the input voltage range]					
Valtaria	Load effect	%	1max.(0.5typ.)[10 to 100% load] Total effect 2max.(1.3typ.)						
voltage	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]						
Stability	Drift(Time effect)	%	0.5max.(0.1typ.)[25°C, input and output ratings, after input voltage ON for 30min to 8h]						
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change, tr, tf $\geq$ 5µs]						
Ripple Ep	р-р	mV	50max.	80max.	100max.	100max.			
Ripple no	oise Ep-p	mV	75max.	110max.	170max.	290max.			
Start up t	ime	ms	150max.(90typ.)[Input and output ratings]						
Hold up t	ime	ms	15min.(20typ.)[Input and output ratings]						
Auxiliary	functions								
Indicator	display		No						
Overvolta	age protection		Voltage shut-down type, recovers upon reset(interval approx. 15s).						
Overcurre	ent protection		Rectangular type, automatic recovery.						
Remote (	ON-OFF		Yes(Floating)						
Remote s	sensing		Yes						
Standard	S								
Safety sta	andards		—						
Noise ter	minal voltage		CISPR standard meet.						
Construc	tions								
External	dimensions	mm	130×83×224[H×W×L]						
Weight		kg	1.8max.						
Mounting	method		Can be attached to 4 side	S.					
Case ma	terial		Aluminum						

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

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• All specifications are subject to change without notice.
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### DR-UGB100W Type

#### SHAPES AND DIMENSIONS



 $<sup>\</sup>label{eq:dimensions} \begin{array}{l} \text{Dimensions in mm} \\ \pm 1 \text{mm}: \text{without specified dimensions} \end{array}$ 

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



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# DR-UGB150W Type

#### SPECIFICATIONS AND STANDARDS

Part No.			DR05-30RUGB	DR12-12RUGB	DR24-6R0UGB	DR48-3R0UGB			
Rated output voltage and current*		5V • 30A	12V • 12A	24V•6A	48V • 3A				
Maximum	n output power	W	165	162	159	159			
Input con	ditions		ł						
Input volt	age Edc	V	88 to 143[Rating: 110]						
Input curi	rent	А	2.7max.(1.6typ.)[DC.88V	]					
Fuse rati	ng	А	6[Built-in]						
Surge cu	rrent	А	15max. [25°C, input and	output ratings, 1st surge o	current, reset after 20s minin	num.]			
Efficiency	/	%	81typ.	83typ.	86typ.	86typ.			
Output ch	naracteristics								
Output vo	oltage Edc	V	5	12	24	48			
Voltage v	ariable range Edc	V	4 to 5.5	9.5 to 13.5	19 to 26.5	38.4 to 53			
Maximun	n output current	А	30	12	6	3			
Overvolta	age threshold Edc	V	6 to 6.5	14 to 14.5	27 to 27.5	55 to 57			
Overcurre	ent threshold	А	34.6 to 37.5	13.8 to 15	6.9 to 7.5	3.4 to 3.8			
	Source effect	%	0.8max.(0.5typ.)[Within the	0.8max.(0.5typ.)[Within the input voltage range]					
Voltago	Load effect	%	1max.(0.5typ.)[10 to 100% load] Total effect 2max.(1.3typ.)						
vollage	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature: 0 to +50°C]						
Stability	Drift(Time effect)	%	0.5max.(0.1typ.)[25°C, input and output ratings, after input voltage ON for 30min to 8h]						
	Recovery	%/ms	±4max./1max. [50 to 100	% sudden load change, ti	r, tf $\geq$ 5µs]				
Ripple Ep	р-р	mV	50max.	80max.	100max.	100max.			
Ripple no	bise Ep-p	mV	75max.	110max.	170max.	290max.			
Start up t	ime	ms	150max.(90typ.)[Input and output ratings]						
Hold up t	ime	ms	15min.(20typ.)[Input and output ratings]						
Auxiliary	functions								
Indicator	display		No						
Overvolta	age protection		Voltage shut-down type, recovers upon reset(interval approx. 20s).						
Overcurre	ent protection		Rectangular type, automatic recovery.						
Remote (	ON-OFF		Yes(Floating)						
Remote s	sensing		Yes						
Standard	S								
Safety sta	andards		—						
Noise ter	minal voltage		CISPR standard meet.						
Construc	tions								
External	dimensions	mm	130×103×224 [H×W×L]						
Weight		kg	2.3max.						
Mounting	method		Can be attached to 4 side	es.					
Case ma	terial		Aluminum						

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

### DR-UGB150W 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.

• Output terminals on 2 places. Connect both terminals when output current was over 25A.



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# DR-UGB300W Type

#### SPECIFICATIONS AND STANDARDS

Part No.		DR05-60RUGB	DR12-27RUGB	DR24-16RUGB	DR48-6R0UGB			
Rated output voltage and current*		5V • 60A	12V • 27A	24V • 16A	48V • 6A			
Maximun	n output power	W	330	365	384	318		
Input cor	ditions							
Input volt	age Edc	V	88 to 143[Rating: 110]					
Input cur	rent	А	7max.[DC.88V]					
Fuse rati	ng	А	15[Built-in]					
Surge cu	rrent	А	25max.[25°C, input ar	nd output ratings, 1st surge of	current, reset after 40s minim	num.]		
Leakage	current	mA	0.5max.(0.3typ.)[25°C	, input and output ratings]				
Efficiency	/	%	80typ.[25°C, input and	l output ratings]				
Output cl	naracteristics							
Output vo	oltage Edc	V	5	12	24	48		
Voltage v	variable range Edc	V	4 to 5.5	9.5 to 13.5	19 to 26.5	38.4 to 53		
Maximun	n output current	А	60	27	16	6		
Overvolta	age threshold Edc	V	6 to 6.5	14 to 14.5	27 to 27.5	55 to 57		
Overcurr	ent threshold	А	66 to 72	30 to 34	17 to 18	6.6 to 7.4		
	Source effect	%	0.8max.(0.5typ.)[Withi	n the input voltage range]				
Voltage	Load effect	%	1max.(0.5typ.)[10 to 100% load] Total effect 2max.(1.3typ.)					
	Temperature effect	%	1.2max.(0.4typ.)[Ambient temperature:0 to +50°C]					
otability	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]					
Recovery %/ms			±4max./1max.[50 to 100% sudden load change, tr, tf $\geq$ 5µs]					
Ripple E	р-р	mV	50max.	80max.	100max.	100max.		
Ripple no	pise Ep-p	mV	75max.	110max.	170max.	290max.		
Start up t	ime	ms	150max.(90typ.)[Input and output ratings] 500max.(250typ.)					
Hold up t	ime	ms	10min.(20typ.)[Input and output ratings]					
Auxiliary	functions		r					
Indicator	display		No					
Overvolta	age protection		Voltage shut-down type, recovers upon reset(interval approx. 40s).					
Overcurr	ent protection		Rectangular type, automatic recovery.					
Remote	ON-OFF		Yes(Floating)					
Remote :	sensing		Yes					
Standard	S		r					
Safety standards			_					
Noise terminal voltage			CISPR standard meet.					
Construc	tions							
External	dimensions	mm	130×153×224[H×W×L]	]				
Weight		kg	3.8max.					
Mounting	method		Can be attached to 4 s	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.

### DR-UGB300W 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.

• Output terminals on 2 places. Connect both terminals when output current was over 40A.



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### Characteristics, Functions, and Applications

# TERMINAL DESIGNATIONS AND FUNCTIONS30W TYPE50, 75W TYPES





100W TYPE



#### 150W TYPE



300W TYPE



Terminal No.	Designations and functions	
1	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.
2	Remote sensing terminals(+S, -S)	These terminals are used to compensate voltage loss from the output terminal to a load. Normally they are shorted with a metal bar.
3	DC output terminals(+, -)	Connect to load.
4	Remote ON-OFF terminals(+RC, -RC)	Output is turned ON-OFF by disconnecting-connecting the RC terminals(output ON when open). RC terminals are floating.
5	DC input terminals(INPUT DC.110V, +, -)	Connected to the DC.110V line.
6	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
7	Overcurrent value adjustment trimmer(OC)	Setting trimmer at delivery.
8	Overvoltage value adjustment trimmer(OV)	Setting trimmer at delivery.
9	Monitor terminals(MONITOR, +, -)	Monitor terminal for direct current. Do not connect a load line to this terminal. Unless the Remote Sensing is used, short with the Remote Sensing terminal.
10	Direct output terminals(DC OUTPUT, +, -) 150W Type	Connect a load line to this terminal. Allowable current per pin is 25A max. A use of two pins each is recommended.
11	Direct output terminals(DC OUTPUT, +, -) 300W Type	Connect a load line to this terminal. Allowable current per pin is 40A max. A use of two pins each is recommended.

#### **BLOCK DIAGRAM**



#### **COMMON SPECIFICATIONS**

Temperature and hum	idity				
Temperature range	Operating(°C)	0 to +60[Derating is necessary when operating environment temperature exceed 50°C.]			
	Storage(°C)	-25 to +75			
	Operating(%)RH	20 to 05[Maximum wat hulb tomporature: 25°C, without dowing]			
numiulity range	Storage(%)RH	20 to solvidarinum wet-build temperature. SS C, without dewing			
Vibration and shock					
Vibration	5 to 10Hz	All amplitude 10mm[3 directions, each 1h]			
VIDIALION	10 to 55Hz	Acceleration 19.6m/s <sup>2</sup> (2G)[3 directions, each 1h]			
Shock	Acceleration	196m/s <sup>2</sup> (20G)[3 directions, each 3 times]			
SHOCK	Pulse duration	11±5ms			
Withstand voltage and	insulation resistance				
Withstand voltage	Input terminal to case(G)	Eac: 2k// 1 min[Normal temporature, normal humidity, output ourrent 10mA]			
will island vollage	Input terminal to output terminal				
	Input terminal to case(G)				
Insulation resistance	Input terminal to output terminal	Edc: 500V, 100M $\Omega$ min. [Normal temperature, normal humidity]			
	Output terminal to case(G)				

#### **OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)**



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### Characteristics, Functions, and Applications

#### SURGE CURRENT, START UP/HOLD UP TIMES



#### **REMOTE ON-OFF**

Power supply output voltage can be turned on/off by this terminal for a power supply sequence or the like.

Between +RC and –RC: Turned on upon setting to high level (2.4 to 24V) or being open.

Between +RC and –RC: Turned off upon setting to low level (0 to 0.4V) or shorted.

The RC terminals are at a floating level to the AC input terminals and the DC output terminals.

Keep the +RC terminal open when not in use since it is internally pulled up.

#### **Remote ON-OFF circuit**

(\*D4 not connected for 30W type.)



#### START UP VOLTAGE AND MINIMUM REGULATION VOLTAGE



#### START UP VOLTAGE AND MINIMUM REGULATION VOLTAGE



### Characteristics, Functions, and Applications

#### **INPUT CURRENT**



#### **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.) were determined for 0 to +50°C temperature range and 10 to 100% load.