

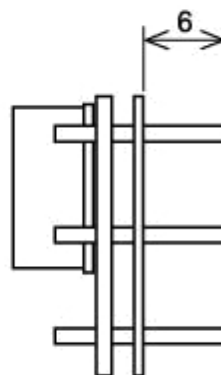
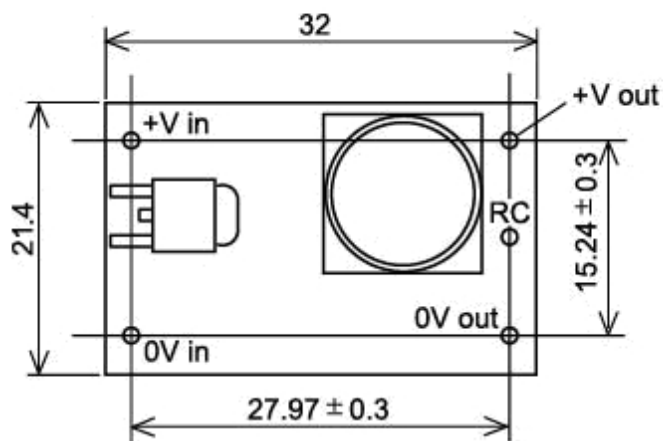


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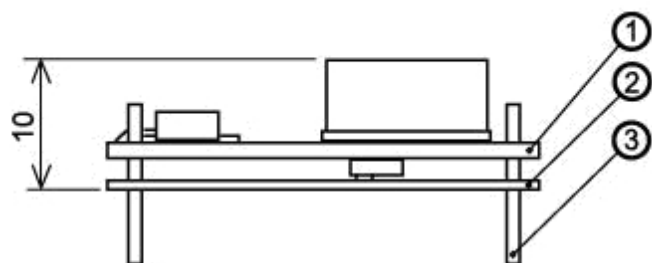


OC1XX-SCXXXX-A

4.6~28.8 WATT
NON-ISOLATED
DC-DC CONVERTER



Turn on by inputting voltage (4.5 to 56V) between "RC" pin and "0V" pin. Put a 5k ohm resistor between "+ in" pin and "RC" pin when remote on/off is not used



- ① Double-sided PCB FR4t=1.0
- ② t=0.5 Insulator UL94V0
- ③ 1.0DIA PIN Material:BsB 2700 1/2H

Solder Plating

*Tolerance ± 0.5



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At rated input and output, 25[°C] ambient unless noted.

SPECIFICATION		MODEL	OC1-24SC48U1A
INPUT SPECIFICATION			
Rated Input Voltage	[V] DC		DC 48
Rated Input Current	[mA] Max.		700
Allowable Input Voltage Range	[V]		DC40.8 ~ 56
Inrush Current	※1		Not Specified (Reference : 33[A], 7[μs], DC48[V] in)
Stand-by Input Current	[mA] Typ.		14
Input Current when Remote Control is off.	[μA] Typ.		5
Input Leakage Ripple Voltade	[mVp-p] Typ.		1000
Efficiency	[%] Typ.		95.0
OUTPUT SPECIFICATION			
Maximum Output Power	[W]		4.6 ~ 28.8
Rated Output Voltage	[V]		24
Rated Output Current	[mA]		1200
Output Voltage Accuracy	[V]		23.28 ~ 24.72
Ripple and Noise	[mVp-p] Max.	※2	200
Voltage Regulation	a. Line Regulation	[mV] Max. ※3	120
	b. Load Regulation	[mV] Max. ※4	120
	c. Temperature Effect	[mV] Max. -20~+71[°C]	655
	d. Drift	[mV] Max. ※5	135
	e. Dynamic Line Regulation	[mV] Max. ※6	±1500
	f. Dynamic Load Regulation	[mV] Max. ※7	±200
	g. Recovery Time	[ms] Max. ※6	5
Start-up Time	[ms] Max.	※7	5
Hold-up Time			Not Specified (= 0[S])
OPTIONAL FUNCTIONS			
Over Current Protection	[A] Min.		Auto recover. Hiccup. 1.30
Over Voltage Protection	[V] Min.		Zener diode limiting 26.4
Operation Indicator			None
Remote Control (RC)	※8		Available
Remote Sensing (RS)			None
Power Fail (PF)			None
Output Voltage Trimming			None
Input Fuse			Built-in (2[A])
Serial Operation			Not available
Parallel Operation			Not available (1+1 redundant with using OR-ing diode is acceptable.)
GENERAL SPECIFICATIONS			
Operating Temperature	[°C]		Refer to the De-Rating Condition. -20 ~ +71
Storage Temperature	[°C]		-20 ~ +85 Except thermal shock
Operating Humidity	[%] RH		20 ~ 90 Without condensation
Storage Humidity	[%] RH		20 ~ 90 Without condensation
Withstanding Voltage			Non Isolated
Insulation Resistance			Non Isolated
Vibration	※9		5 - 10[Hz] / XYZ axis 10[mm], 10 - 550[Hz] / 24.5[m/s ²] XYZ axis (non-operating)
Shock	※9		294[m/s ²] / XYZ axis.
Cooling Method			Convection Cooling
APPLIED STANDARDS			
Safety Standards			North America : UL60950-1 2nd ed. 2011-12-19 Approved : CAN/CSA-C22.2 No. 60950-1-07 2nd ed. 2011-12 Approved
DIMENSION AND WEIGHT			
Appearance			On-Board Type
Dimension	[mm] (HxWxD)		10 x 32 x 21.4
Weight	[g] Max.		8
REFERENCE			
MTBF	[h]	※10	587,986.27

※1 Reference : At cold start.

※2 Measured by Measured by a Bayonet type probe. Bandwidth DC-100[MHz].

※3 40.8 to 56[V] DC input voltage.

※4 At 48[V] DC , 0 to 100[%] load.

※5 Up to 8[h] after 1[h].

※6 At rated load , input voltage is changed between 40.8[V] DC and 56[V] DC.

※7 At 48[V] DC , load is changed between 25[%] and 75[%]

※8 ON : Apply DC2.8V-Input Voltage between PIN "RC" and "OV" (Inflowing current will be 5-500[μA]Typ. when 5-56V applied)

OFF: When PIN "RC" and "OV" is open

Short the PIN "RC" and "+Input Voltage" when not using the RC function

※9 The hole size of the mother board have to be 1.3[φ]. Solder resist window 3.4[φ]
(In Thickness 1.6[mm] CEM-3 mother board).

Mother board have to be Non-resonated.

※10 Standard for recommended reliability estimation of components' count method of JEITA's switching power supply. According to JEITA RCR-9102B (MIL-HDBK-217F-NOTICE 2).





At rated input and output, 25[°C] ambient unless noted.

SPECIFICATION		MODEL	OC1-3.3SC1224U1A		OC1-05SC1224U1A		OC1-06SC1224U1A	
INPUT SPECIFICATION								
Rated Input Voltage	[V] DC		12	24	12	24	12	24
Rated Input Current	[mA] Max.		500	300	800	400	900	450
Allowable Input Voltage Range	[V]		DC10.2 ~ 32					
Inrush Current		※1	Not Specified (Reference : 8[A], 10[μs], DC12[V] in / 13[A], 8[μs], DC24[V] in)					
Stand-by Input Current	[mA] Typ.		10	11	10	11	10	11
Input Current when Remote Control is off.	[μA] Typ.		1	2	1	2	1	2
Input Leakage Ripple Voltage	[mVp-p] Typ.		500	500	700	700	700	700
Efficiency	[%] Typ.		84.0	81.0	89.0	87.0	90.0	88.0
OUTPUT SPECIFICATION								
Maximum Output Power	[W]		4.6 ~ 28.8					
Rated Output Voltage	[V]		3.3		5		6	
Rated Output Current	[mA]		1400		1400		1400	
Output Voltage Accuracy	[V]		3.20~3.40		4.85~5.15		5.82~6.18	
Ripple and Noise	[mVp-p] Max.	※2	200		200		200	
Voltage Regulation	a. Line Regulation	[mV] Max. ※3	18		25		30	
	b. Load Regulation	[mV] Max. ※4	18		25		30	
	c. Temperature Effect	[mV] Max. -20~71[°C]	91		137		164	
	d. Drift	[mV] Max. ※5	30		40		45	
	e. Dynamic Line Regulation	[mV] Max. ※6	±500		±1000		±1000	
	f. Dynamic Load Regulation	[mV] Max. ※7	±200		±200		±200	
	g. Recovery Time	[ms] Max. ※6			5			
			※7					
Start-up Time	[ms] Max.				5			
Hold-up Time			Not Specified (= 0[S])					
OPTIONAL FUNCTIONS								
Over Current Protection			Auto recover.Hiccup.					
	[A] Min.		1.50		1.50		1.50	
Over Voltage Protection			Zener diode limiting					
	[V] Min.		3.63		5.75		6.90	
Operation Indicator			None					
Remote Control (RC)		※8	Available					
Remote Sensing (RS)			None					
Power Fail (PF)			None					
Output Voltage Trimming			None					
Input Fuse			Built-in (2[A])					
Serial Operation			Not available					
Parallel Operation			Not available (1+1 redundant with using OR-ing diode is acceptable.)					
GENERAL SPECIFICATIONS								
Operating Temperature			Refer to the De-Rating Condition.					
	[°C]		-20 ~ +71					
Storage Temperature			-20 ~ +85 Except thermal shock					
	[°C]							
Operating Humidity			20 ~ 90 Without condensation					
	[%]RH							
Storage Humidity			20 ~ 90 Without condensation					
	[%]RH							
Withstanding Voltage			Non Isolated					
Insulation Resistance			Non Isolated					
Vibration		※9	5 - 10[Hz] / XYZ axis 10[mm], 10 - 55 0[Hz] / 24.5[m/s ²]					
Shock		※9	294[m/s ²] / XYZ axis.					
Cooling Method			Convection Cooling					
APPLIED STANDARDS								
Safety Standards			North America : UL60950-1 2nd ed. 2011-12-19				Approved	
DIMENSION AND WEIGHT								
Appearance			On-Board Type					
Dimension	[mm] (HxWxD)		10 x 32 x 21.4					
Weight	[g] Max.		8					
REFERENCE								
MTBF	[h]	※10	564,882.39		564,882.39		564,882.39	

※1 Reference : At cold start.

※2 Measured by Measured by a Bayonet type probe. Bandwidth DC-100[MHz].

※3 40.8 to 56[V] DC input voltage.

※4 At 48[V] DC, 0 to 100[%] load.

※5 Up to 8[h] after 1[h].

※6 At rated load, input voltage is changed between 40.8[V] DC and 56[V] DC.

※7 At 48[V] DC, load is changed between 25[%] and 75[%]

※8 ON : Apply DC2.8V-Input Voltage between PIN "RC" and "OV" (Inflowing current OFF: When PIN "RC" and "OV" is open
Short the PIN "RC" and "+Input Voltage" when not using the RC function

※9 The hole size of the mother board have to be 1.3[φ], Solder resist window (In Thickness 1.6[mm] CEM-3 mother board).

Mother board have to be Non-resonated.

※10 Standard for recommended reliability estimation of components' count method of JEITA's switching power supply. According to JEITA RCR-9102B(MIL-HDBK-





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At rated input and output, 25[°C] ambient unless noted.

SPECIFICATION			MODEL	OC1- 3.3SC2448U1A	OC1- 05SC2448U1A	OC1- 06SC2448U1A	OC1- 09SC2448U1A	OC1- 12SC2448U1A	OC1- 15SC2448U1A					
INPUT SPECIFICATION														
Rated Input Voltage	[V] DC		24	48	24	48	24	48	24	48	24	48		
Rated Input Current	[mA] Max.		300	150	400	200	450	250	650	350	800	400	850	450
Allowable Input Voltage Range	[V]		DC20.4 ~ 56											
Inrush Current		※1	Not Specified (Reference : 16[A], 8[μs], DC24[V] in / 33[A], 7[μs], DC48[V] in)											
Stand-by Input Current	[mA] Typ.		11	13	11	13	11	13	11	13	12	13	12	13
Input Current when Remote Control is off.	[μA] Typ.		2	5	2	5	2	5	2	5	2	5	2	5
Input Leakage Ripple Voltade	[mVp-p] Typ.		500	500	700	700	700	700	700	700	800	800	900	900
Efficiency	[%] Typ.		79.0	74.0	85.0	82.0	87.0	83.0	90.0	87.0	93.0	90.0	95.0	92.0
OUTPUT SPECIFICATION														
Maximum Output Power	[W]		4.6 ~ 28.8											
Rated Output Voltage	[V]		3.3	5	6	9	12	15						
Rated Output Current	[mA]		1400	1400	1400	1400	1300	1200						
Output Voltage Accuracy	[V]		3.20~3.40	4.85~5.15	5.82~6.18	8.73~9.27	11.64~12.36	14.55~15.45						
Ripple and Noise	[mVp-p] Max.	※2	200	200	200	200	200	200						
Voltage Regulation	a. Line Regulation	[mV] Max.	※3	18	25	30	45	60	75					
	b. Load Regulation	[mV] Max.	※4	18	25	30	45	60	75					
	c. Temperature Effect	[mV] Max.	-20~71[°C]	90	137	164	246	328	410					
	d. Drift	[mV] Max.	※5	30	40	45	60	75	90					
	e. Dynamic Line Regulation	[mV] Max.	※6	±500	±1000	±1000	±1500	±1500	±1500					
	f. Dynamic Load Regulation	[mV] Max.	※7	±200	±200	±200	±200	±200	±200					
	g. Recovery Time	[ms] Max.	※6	5										
Start-up Time	[ms] Max.	※7	5											
Hold-up Time			Not Specified (= 0[S])											
OPTIONAL FUNCTIONS														
Over Current Protection	[A] Min.		1.50	1.50	1.50	1.50	1.40	1.30						
Over Voltage Protection	[V] Min.		3.63	5.75	6.90	10.35	13.80	17.25						
Operation Indicator			None											
Remote Control (RC)		※8	Available											
Remote Sensing (RS)			None											
Power Fail (PF)			None											
Output Voltage Trimming			None											
Input Fuse			Built-in (2[A])											
Serial Operation			Not available											
Parallel Operation			Not available (1+1 redundant with using OR-ing diode is acceptable.)											
GENERAL SPECIFICATIONS														
Operating Temperature	[°C]		Refer to the De-Rating Condition. -20 ~ +71											
Storage Temperature	[°C]		-20 ~ +85 Except thermal shock											
Operating Humidity	[%] RH		20 ~ 90 Without condensation											
Storage Humidity	[%] RH		20 ~ 90 Without condensation											
Withstanding Voltage			Non Isolated											
Insulation Resistance			Non Isolated											
Vibration		※9	5 - 10[Hz] / XYZ axis 10[mm], 10 - 550[Hz] / 24.5[m/s ²] XYZ axis (non-operating)											
Shock		※9	294[m/s ²] / XYZ axis.											
Cooling Method			Convection Cooling											
APPLIED STANDARDS														
Safety Standards			North America : UL60950-1 2nd ed. 2011-12-19 Approved : CAN/CSA-C22.2 No. 60950-1-07 2nd ed. 2011-12 Approved											
DIMENSION AND WEIGHT														
Appearance			On-Board Type											
Dimension	[mm] (HxWxD)		10 x 32 x 21.4											
Weight	[g] Max.		8											
REFERENCE														
MTBF	[h]	※10	564,882.39	564,882.39	564,882.39	564,882.39	564,882.39	570,125.43	570,125.43					

※1 Reference : At cold start.

※2 Measured by Measured by a Bayonet type probe. Bandwidth DC-

※3 40.8 to 56[V] DC input voltage.

※4 At 48[V] DC , 0 to 100[%] load.

※5 Up to 8[h] after 1[h].

※6 At rated load , input voltage is changed between 40.8[V] DC and

※7 At 48[V] DC , load is changed between 25[%] and 75[%]

※8 ON : Apply DC2.8V-Input Voltage between PIN "RC" and "OV"

OFF: When PIN "RC" and "OV" is open

Short the PIN "RC" and "+Input Voltage" when not using the RC function

※9 The hole size of the mother board have to be 1.3[φ], Solder

(In Thickness 1.6[mm] CEM-3 mother board).

Mother board have to be Non-resonated.

※10 Standard for recommended reliability estimation of components' count method of JEITA's switching power supply. According to

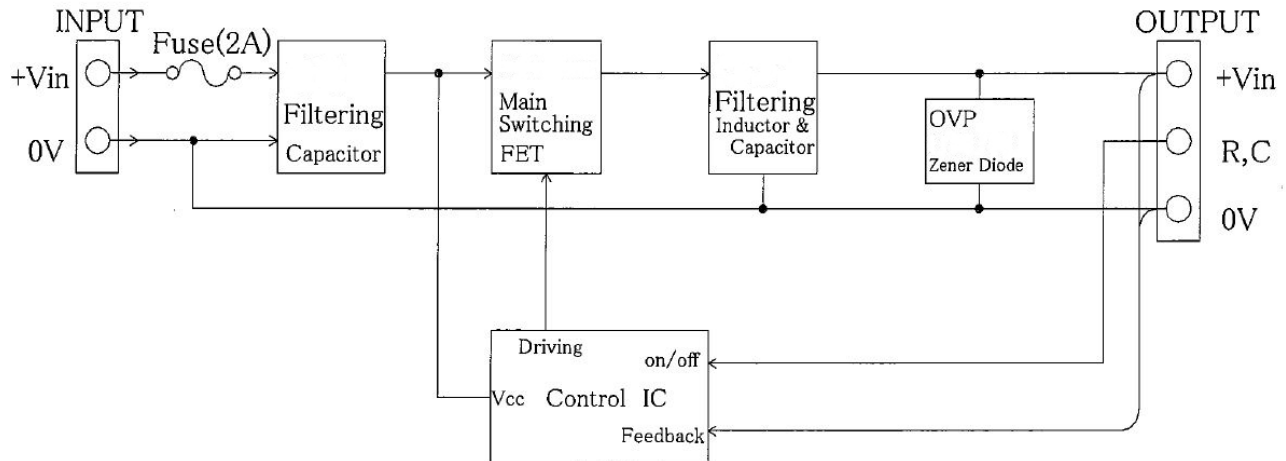


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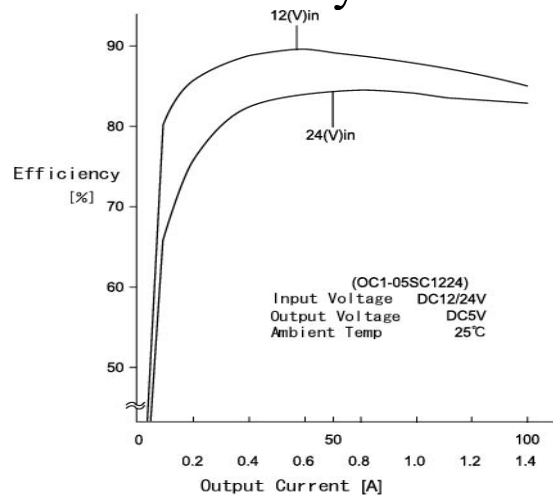
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Block Diagram



Efficiency Curve





SPEC SHEET

Subject	Part number	Old IC	New IC
Rated Input current	OC1-3.3SC1224u1	550/250 [mA]	500/300 [mA] Max.
	OC1-05SC1224u1	800/350 [mA]	800/400 [mA] Max.
	OC1-06SC1224u1	950/450 [mA]	900/450 [mA] Max.
	OC1-3.3SC2448u1	300/150 [mA]	300/150 [mA] Max.
	OC1-05SC2448u1	450/200 [mA]	400/200 [mA] Max.
	OC1-06SC2448u1	500/250 [mA]	450/250 [mA] Max.
	OC1-09SC2448u1	700/350 [mA]	650/350 [mA] Max.
	OC1-12SC2448u1	850/400 [mA]	800/400 [mA] Max.
	OC1-15SC2448u1	950/450 [mA]	850/450 [mA] Max.
	OC1-24SC48u1	750 [mA]	700 [mA] Max.
No load Rated Input current	OC1-3.3SC1224u1	4/5 [mA] Typ.	10/11 [mA] Typ.
	OC1-05SC1224u1	5/3 [mA] Typ.	10/11 [mA] Typ.
	OC1-06SC1224u1	5/3 [mA] Typ.	10/11 [mA] Typ.
	OC1-3.3SC2448u1	4/5 [mA] Typ.	11/13 [mA] Typ.
	OC1-05SC2448u1	2/2 [mA] Typ.	11/13 [mA] Typ.
	OC1-06SC2448u1	2/2 [mA] Typ.	11/13 [mA] Typ.
	OC1-09SC2448u1	3/2 [mA] Typ.	11/13 [mA] Typ.
	OC1-12SC2448u1	4/4 [mA] Typ.	12/13 [mA] Typ.
	OC1-15SC2448u1	6/4 [mA] Typ.	12/13 [mA] Typ.
	OC1-24SC48u1	4 [mA] Typ.	14 [mA] Typ.
Input current when RC is OFF	OC1-3.3SC1224u1	0.2/0.56 [mA] Typ.	1/2 [μ A] Typ.
	OC1-05SC1224u1	0.24/0.6 [mA] Typ.	1/2 [μ A] Typ.
	OC1-06SC1224u1	0.24/1.15 [mA] Typ.	1/2 [μ A] Typ.
	OC1-3.3SC2448u1	0.39/0.9 [mA] Typ.	2/5 [μ A] Typ.
	OC1-05SC2448u1	0.42/0.93 [mA] Typ.	2/5 [μ A] Typ.
	OC1-06SC2448u1	0.42/0.92 [mA] Typ.	2/5 [μ A] Typ.
	OC1-09SC2448u1	0.37/0.9 [mA] Typ.	2/5 [μ A] Typ.
	OC1-12SC2448u1	0.34/1.47 [mA] Typ.	2/5 [μ A] Typ.
	OC1-15SC2448u1	0.27/1.50 [mA] Typ.	2/5 [μ A] Typ.
	OC1-24SC48u1	0.56 [mA] Typ.	5 [μ A] Typ.
Input current leakage ripple voltage	OC1-3.3SC1224u1	1000/1000 [mVp-p] Typ.	500/500 [mVp-p] Typ.
	OC1-05SC1224u1	1000/1000 [mVp-p] Typ.	700/700 [mVp-p] Typ.
	OC1-06SC1224u1	1000/1000 [mVp-p] Typ.	700/700 [mVp-p] Typ.
	OC1-3.3SC2448u1	700/1000 [mVp-p] Typ.	500/500 [mVp-p] Typ.
	OC1-05SC2448u1	1000/1300 [mVp-p] Typ.	700/700 [mVp-p] Typ.
	OC1-06SC2448u1	1200/1800 [mVp-p] Typ.	700/700 [mVp-p] Typ.
	OC1-09SC2448u1	1500/2000 [mVp-p] Typ.	700/700 [mVp-p] Typ.
	OC1-12SC2448u1	1500/2000 [mVp-p] Typ.	800/800 [mVp-p] Typ.
	OC1-15SC2448u1	1500/2500 [mVp-p] Typ.	900/900 [mVp-p] Typ.
	OC1-24SC48u1	3000 [mVp-p] Typ.	1000 [mVp-p] Typ.





Efficiency	OC1-3.3SC1224u1	78/75 [%] Typ.	84/81 [%] Typ.
	OC1-05SC1224u1	84/82 [%] Typ.	89/87 [%] Typ.
	OC1-06SC1224u1	86/84 [%] Typ.	90/88 [%] Typ.
	OC1-3.3SC2448u1	74/69 [%] Typ.	79/74 [%] Typ.
	OC1-05SC2448u1	81/78 [%] Typ.	85/82 [%] Typ.
	OC1-06SC2448u1	84/80 [%] Typ.	87/83 [%] Typ.
	OC1-09SC2448u1	88/85 [%] Typ.	90/87 [%] Typ.
	OC1-12SC2448u1	91/88 [%] Typ.	93/90 [%] Typ.
	OC1-15SC2448u1	93/90 [%] Typ.	95/92 [%] Typ.
	OC1-24SC48u1	93 [%] Typ.	95 [%] Typ.
Dynamic Load Voltage	OC1-3.3SC1224u1	±500[mV] Max.	±500[mV] Max.
	OC1-05SC1224u1	±600[mV] Max.	±1000[mV] Max.
	OC1-06SC1224u1	±600[mV] Max.	±1000[mV] Max.
	OC1-3.3SC2448u1	±500[mV] Max.	±500[mV] Max.
	OC1-05SC2448u1	±600[mV] Max.	±1000[mV] Max.
	OC1-06SC2448u1	±600[mV] Max.	±1000[mV] Max.
	OC1-09SC2448u1	±600[mV] Max.	±1500[mV] Max.
	OC1-12SC2448u1	±1000[mV] Max.	±1500[mV] Max.
	OC1-15SC2448u1	±1000[mV] Max.	±1500[mV] Max.
	OC1-24SC48u1	±400[mV] Max.	±1500[mV] Max.
Remote Control (Add voltage ON)	All model	ON when 4.5-56V	ON when 2.8-56V
Remote Control Current	All model	150~1800 [μ A]	5~500 [μ A]
Block Diagram	All model		See attached

