

#### General Description

The C Series power supplies are configurable with combinations of insertable DC modules for various single, multiple, or parallel output.

#### Features and Benefits

- High reliability with low noise and low leakage current
- Medical and information equipment approval to UL60950-1, C-UL, EN60950 and EN60601-1 3rd
- Higher withstand voltage and lower leakage current
- OCP, OVP and OHP, remote sensing, control, and alarm (AC power fail, fan alarm, and low output)

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#### Sample Test Conditions

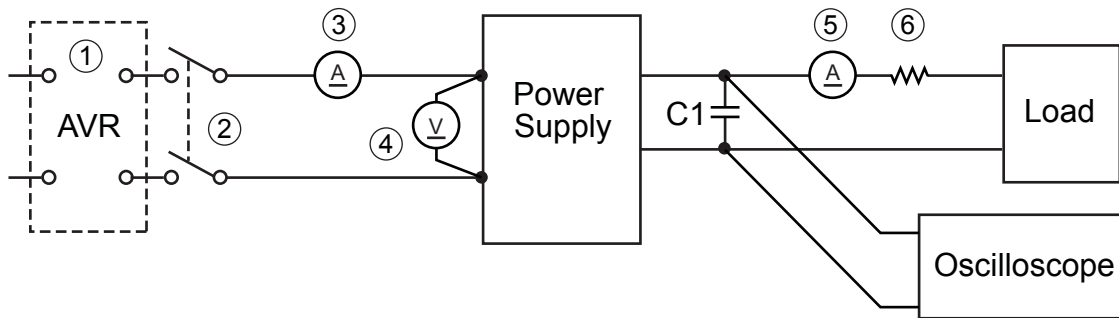
##### Input Voltage, $V_{IN}$

Min. (V)	Nom. (V)	Max. (V)
-	-	-

##### Load Current, $I_{LOAD}$ (Output Circuit: 3.3 V)

Min. (A)	Nom. (A)	Max. (A)
0	10	10

#### Sample Test Circuit Diagram



Key	Description	Remarks
-	Measuring instrument	Output voltage is measured with a digital multimeter
1	Automatic Voltage Regulator	-
2	Circuit breaker	-
3	Ammeter	-
4	Volt meter	-
5	Ammeter	-
6	Shunt resistor	-
C1	Load capacitor	Electrolytic capacitor: 47 $\mu$ F Film capacitor: 0.1 $\mu$ F

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		Overvoltage Protection	
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Output Setting Voltage		Vibration (Non-Operating)	
Input/Output Voltage Change Fluctuation		Power-On at High Temperature	
Temperature Drift		Power-On at Low Temperature	
Warm-Up Drift		Shock	
Total Regulation		<b>5. Other Characteristics</b>	<b>8</b>
Static Load Regulation		Withstand Voltage	
Ripple Voltage		Leakage Current at Withstand Voltage	
Ripple Noise Voltage		Insulation Resistance	
Output Voltage Variable Range			

Figures

Figure 1. Efficiency (By Load Current)

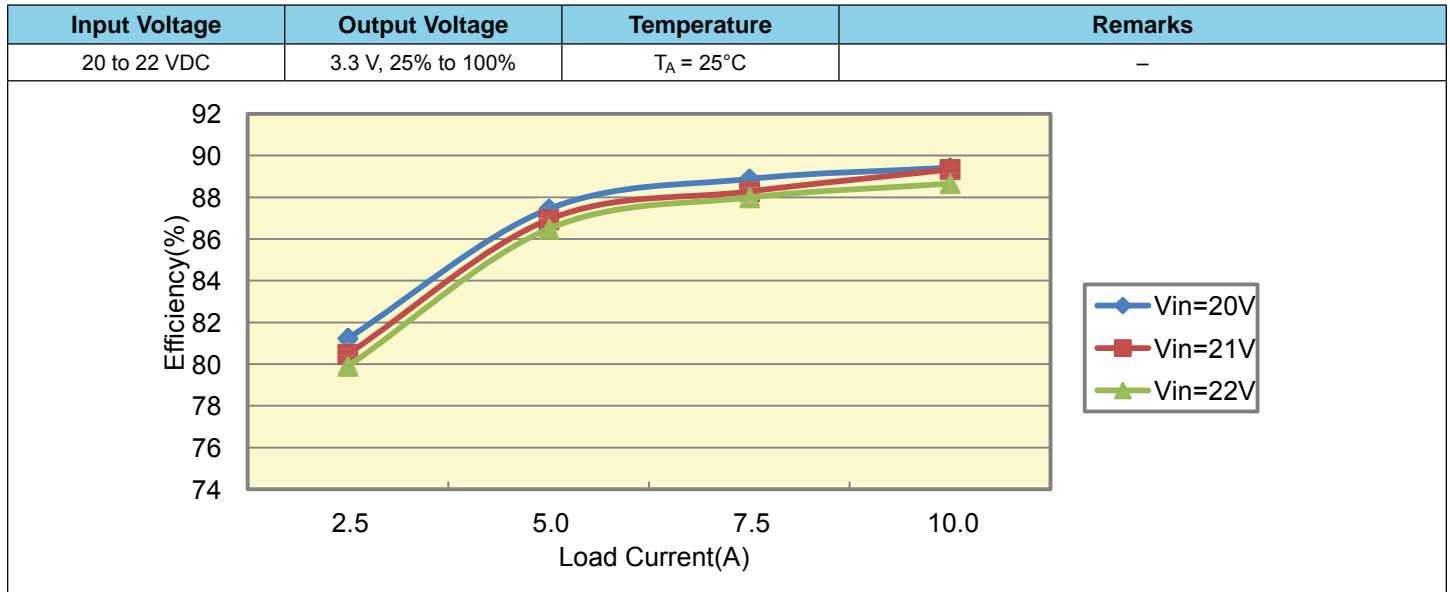


Figure 2. Output Voltage Accuracy (By Load Current)

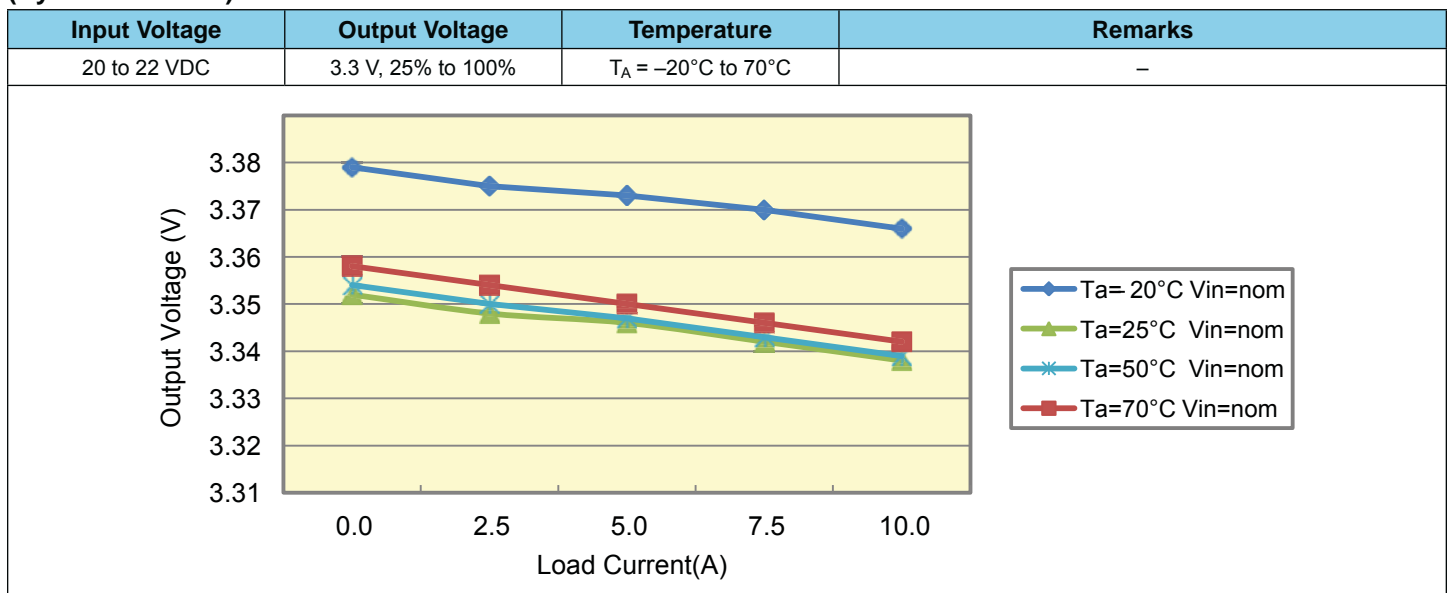


Figure 3. Warm-Up Drift

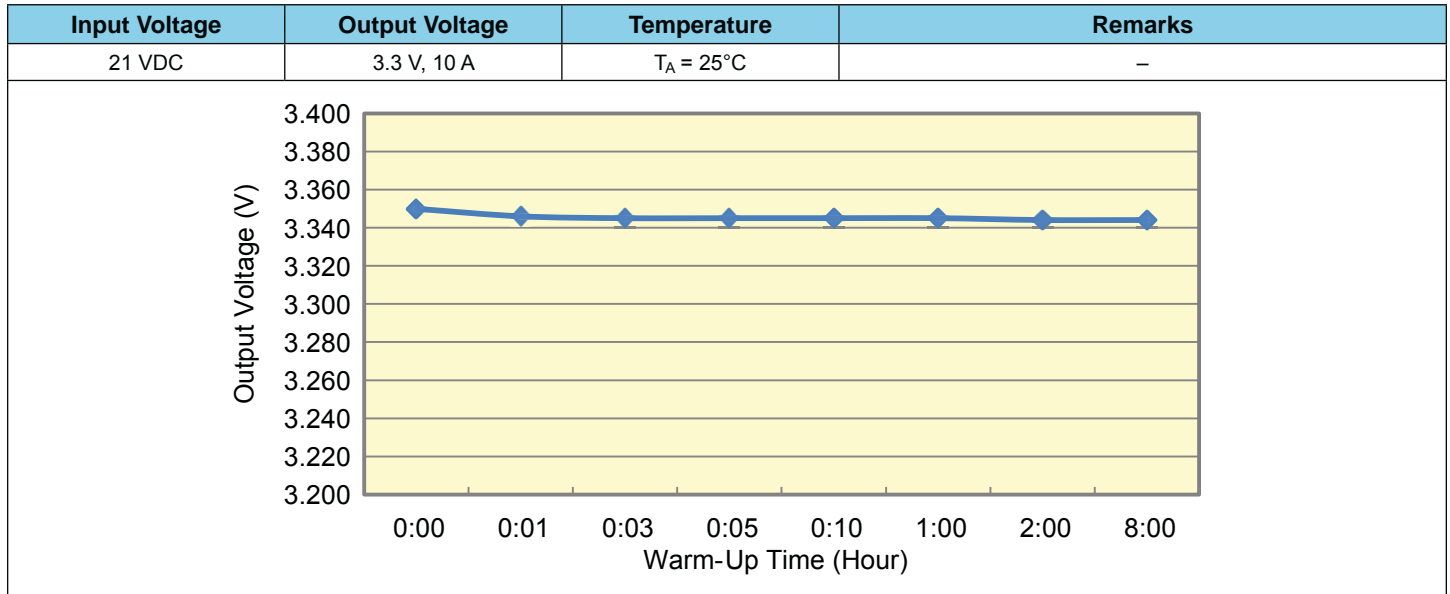


Figure 4. Ripple Voltage (By Load Current)

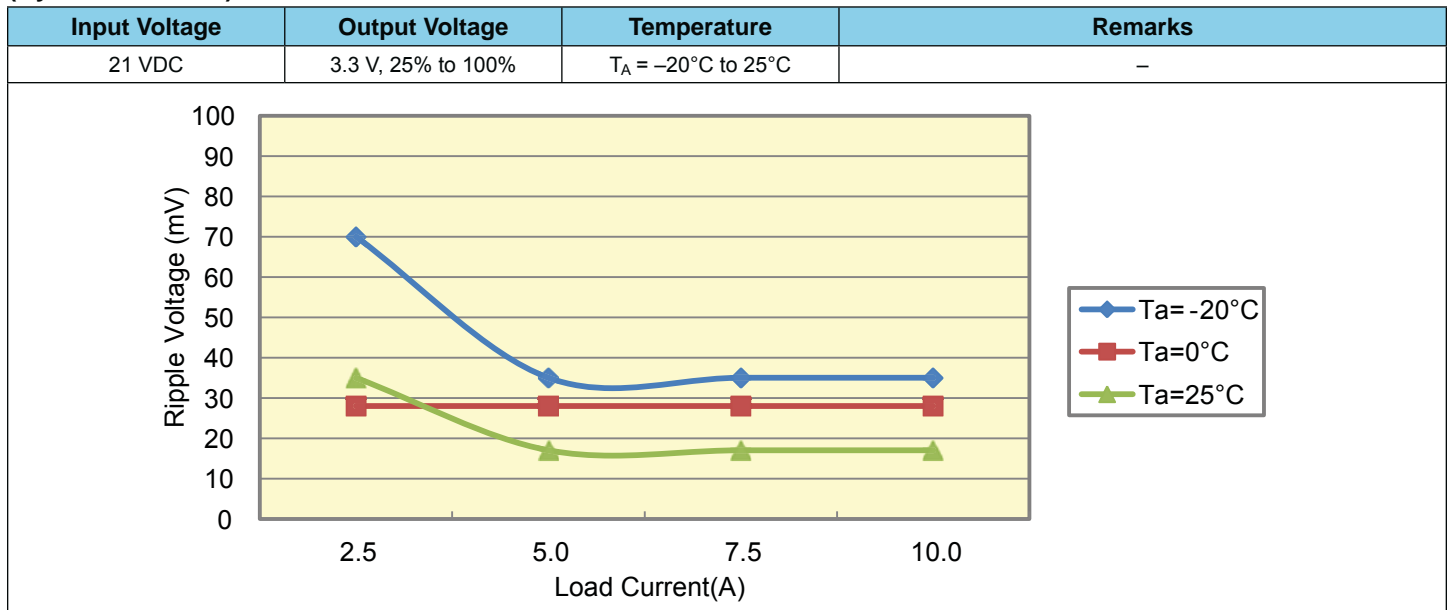


Figure 5. Ripple Noise Voltage  
(By Load Current)

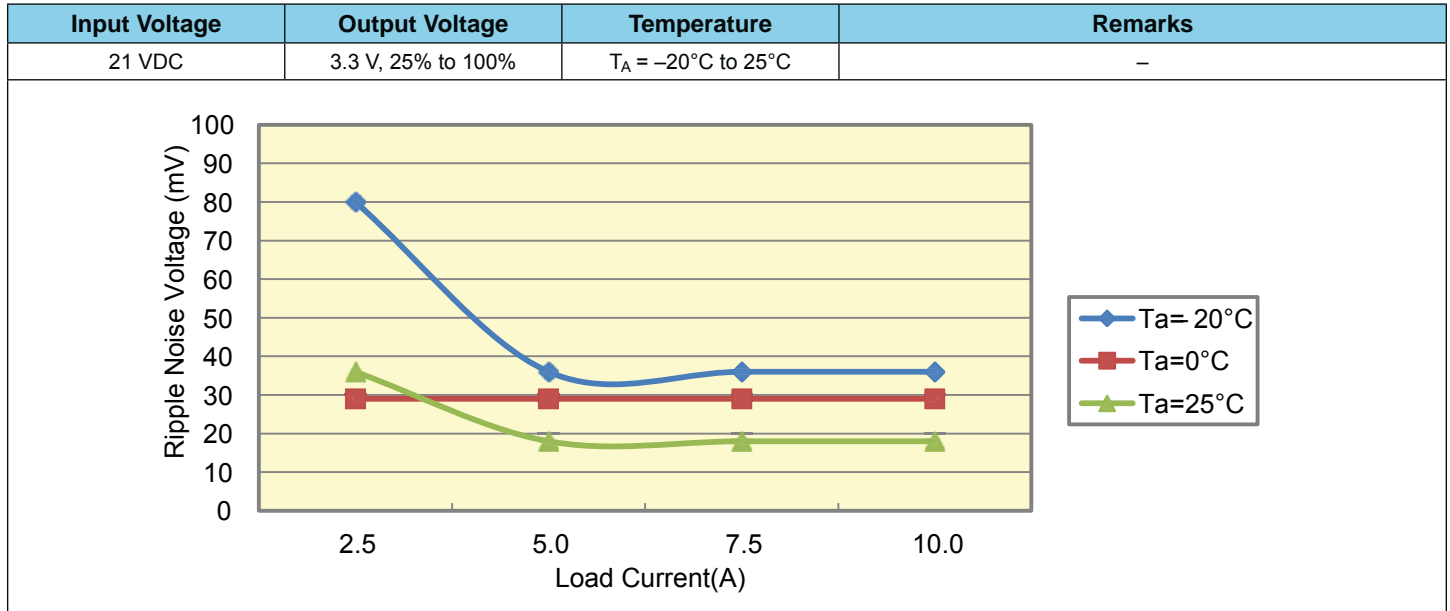


Figure 6. Overcurrent Protection  
(By Load Current)

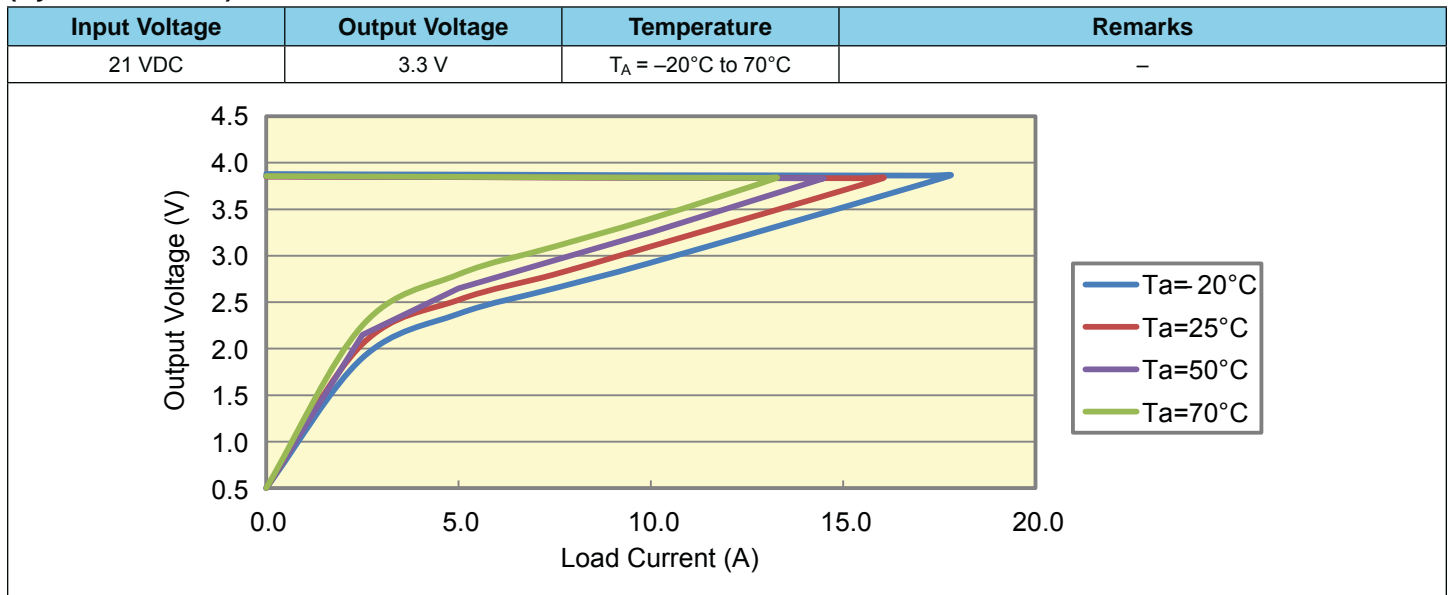
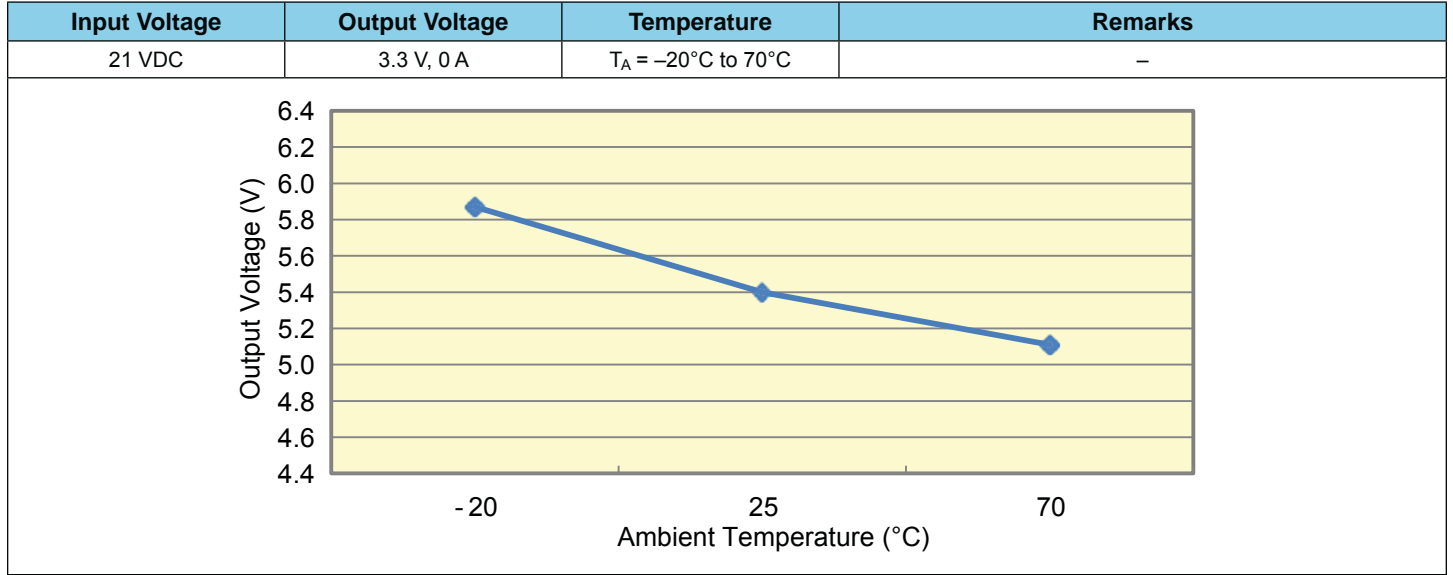


Figure 7. Overvoltage Protection  
(By Temperature)



## Tables

**Table 1. Input Characteristics**  
 (At  $T_A = 25^\circ\text{C}$ )

Test Item	Conditions		Test Results			Specification	Remarks
	$V_{IN}$	$I_{LOAD}$	$V_{IN} = 21\text{ V}$				
Efficiency	Nom	Nom	89.3%			86.0%	Figure 1

**Table 2. Output Characteristics**  
 (At  $T_A = 25^\circ\text{C}$ )

Test Item	Conditions		Test Results			Specification	Remarks
	$V_{IN}$	$I_{LOAD}$	$V_{IN} = 3.3\text{ V}$				
Output Setting Voltage	Nom	Nom	3.338 V				–
Input/Output Voltage Change Fluctuation	Min	Min	3.338 V				Note 1, figure 2
	Max	Max	3.352 V				
Temperature Drift	Nom	Nom	0 mV to +29 mV				Note 1, figure 2
Warm-Up Drift	Nom	Nom	–6 mV				Note 1, figure 3
Total Regulation	–	–	3.332 to 3.380 V				Note 1
Static Load Regulation	–	–	$\pm 99\text{ mV}$				Note 2
Ripple Voltage	Nom	Nom	17 mV at $T_A = 25^\circ\text{C}$			180 mV	Note 3, figure 4
Ripple Noise Voltage	Nom	Nom	18 mV at $T_A = 25^\circ\text{C}$			180 mV	Note 4, figure 5
Output Voltage Variable Range	–	–				2.6 to 3.6 V	–

1. Total Regulation (output regulation) is the sum of: Input/Output Voltage Change Fluctuation, Temperature Drift, and Warm-Up Drift.

2. This shows the static load regulation against the output voltage value set within the Output Variable Voltage Range.

3. Used probe = Ripple Voltage 1:1.

4. Used probe = Ripple Noise Voltage 1:1.

**Table 3. Protection Characteristics**  
 (At  $V_{IN} = +3.3\text{ V}$ )

Test Item	Conditions		Test Results			Specification	Remarks
	$V_{IN}$	$I_{LOAD}$	$T_A = -20^\circ\text{C}$	$T_A = 25^\circ\text{C}$	Overcurrent $T_A = 50^\circ\text{C}$ Overvoltage $T_A = 70^\circ\text{C}$		
Overcurrent Protection	Min	Max	17.8 A	16.0 A	14.5 A	$\geq 10.5\text{ A}$	Figure 6
Overvoltage Protection	Nom	Min	5.9 V	5.4 V	5.1 V	$\geq 3.8\text{ V}$	Figure 7

**Table 4. Environment Tests**  
(At  $T_A = 25^\circ\text{C}$ )

Test Item	Conditions		Test Results	Specification	Remarks
	$V_{IN}$	$I_{LOAD}$			
Vibration (Non-Operating)	–	–	Frequency = 10 to 55 Hz, Sweep Cycle = 3 minutes, Acceleration = 19.6 m/s <sup>2</sup> , Direction = x,y, and z axes at 60 minutes per axis	Normal operation	–
Power-On at High Temperature	Nom	Max	Power-off for 1 hour at 65°C, then power-on	Normal operation	–
Power-On at Low Temperature	Nom	Max	Power-off for 1 hour at –15°C, then power-on	Normal operation	–
Shock	–	–	Product is dropped from a height of 50 mm (98 m/s <sup>2</sup> ) onto a flat surface of wood (10 mm or thicker); the test is performed three times on each edge of the bottom side of the product	Normal operation	–

**Table 5. Other Characteristics**  
(At  $T_A = 25^\circ\text{C}$ )

Test Item	Conditions		Test Results			Specification	Remarks
	$V_{IN}$	$I_{LOAD}$	P–S	P–E	S–E		
Withstand Voltage	–	–	–	–	0.6 kV	S–E 500 V for 1 minute, 600 V for 1 second	–
Leakage Current at Withstand Voltage	–	–	–	–	0 mA	S–E ≤15 mA	–
Insulation Resistance	–	–	–	–	≥1000 MΩ	≥50 MΩ at 500 VDC Megger	–



## Important Information



- The products described in this document are built-in type DC stabilized power supplies with special structures and are designed for installation in equipment. Be sure to use the products only for installation in equipment.
- The products should be handled only by persons who have competent electrical knowledge.
- Be sure to read through all safety precaution and operation manuals before installation, operation, or maintenance and to use the products only for the intended use and in accordance with all applicable safety standards and regulations in the location of use.

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