



No. CHD40010-001-01

参考資料
Reference data

TECHNICAL DATA

MODEL: SWJ075P-12

SANKEN ELECTRIC CO.,LTD.

CHD40010-001-01
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| | | |
|--------------------------|------|------|
| 入力電圧 Input Voltage | MIN | 85V |
| | NOM | 100V |
| | | 240V |
| MAX | 265V | |

| | | | | | |
|----------------------|------|------|--|--|--|
| 出力 Output Circuit | | 12V | | | |
| 負荷電流 Load Current | MIN | 0A | | | |
| | NOM | 6.3A | | | |
| | MAX | - | | | |
| | PEAK | 8.3A | | | |

1.入力特性 Input Characteristics

Ta=25°C

| 試験項目 Test Item | 条件 Condition | | 試験結果 Test Results | | | 仕様 SPEC | 備考 Remarks |
|---|-----------------|------------|-----------------------|----------|------------------|--|---------------|
| | 入力 Vin | 負荷 Load | Vin=100V | Vin=240V | | | |
| | | | 入力電流 Input Current | NOM | NOM | | |
| 入力電力 Input Power | NOM | NOM | 86.0W | 84.1W | | --- | |
| 力率 Power Factor | NOM | NOM | 0.99 | 0.93 | | 0.99/0.92 _{typ} | 図2 Fig.2 |
| 効率 Efficiency | NOM | NOM | 88.1% | 89.9% | | 88/90% _{typ} | 図3 Fig.3 |
| 突入電流 Inrush Current | 100V 200V | NOM | 15.7A | | 34.0A (Vin=200V) | 100V:15A _{typ} 200V:30A _{typ} | 図4 Fig.4 |
| 漏洩電流 Leakage Current | NOM | NOM | 0.080mA | 0.205mA | | 0.150/0.300mA or less 60Hz | 図5 Fig.5 |
| 起動停止電圧 Startup Voltage & Stop Voltage | --- | MIN | | | ON20V・OFF8V | --- | --- |
| | --- | NOM | | | ON63V・OFF58V | --- | --- |
| 入力瞬断時間 Hold up time | 100V | NOM | 57ms | | | 20ms or more | 図12 Fig.12 |

Model: SWJ075P-12

2.出力特性 Output Characteristics

*総合安定度:②+③+④ Output Regulation:②+③+④

Ta=25°C

| 試験項目 Test Item | | 条件 Condition | | 試験結果 Test Results | | | | 備考 Remarks |
|----------------------------------|---|------------------------|------------|---|--|--|--|---------------|
| | | 入力 Vin | 負荷 Load | | | | | |
| | | | | +12V | | | | |
| 1 | 出力偏差 Output Standard Voltage | NOM | NOM | 12.012V | | | | |
| 2 | 入出力相互変動 Voltage Change Fluctuation | MIN | MIN | 11.999V | | | | 図6 Fig.6 |
| | | MAX | MAX | 12.037V | | | | |
| 3 | 温度ドリフト Temperature Drift | NOM | NOM | -0.061V 0.076V | | | | 図6 Fig.6 |
| 4 | 経時ドリフト Warm-Up Drift | NOM | NOM | -0.001V 0.003V | | | | 図7 Fig.7 |
| 総合安定度 Total Regulation | | | | 11.937V ~ 12.116V | | | | |
| 仕様 SPEC | | | | 11.640V ~ 12.360V | | | | |
| 5 | リップル電圧 Ripple Voltage | NOM | NOM | 60mVp-p | | | | 図8 Fig.8 |
| | | 室温 Room Temperature | | Ta=25°C | | | | |
| 仕様 SPEC | | | | 320(Ta=-10~0°C) 240(Ta=0~50°C) | | | | |
| | リップルノイズ電圧 Ripple Noise Voltage | NOM | NOM | 69mVp-p | | | | |
| | | 室温 Room Temperature | | Ta=25°C | | | | |
| 仕様 SPEC | | | | 360(Ta=-10~0°C) 300(Ta=0~50°C) | | | | |
| 6 | 出力電圧可変範囲 Output Voltage Variable Range | MIN | MIN | 9.865V | | | | |
| | | MAX | MAX | 14.391V | | | | |
| 仕様 SPEC | | | | 10.800V ~ 13.200V | | | | |
| コメント Comment | | | | | | | | |
| 使用プローブ=リップル電圧1:1 リップルノイズ電圧1:1 | | | | Used Probe = Ripple Voltage 1:1 Ripple Noise Voltage 1:1 | | | | |

Model: SWJ075P-12

3.保護特性 Protection Characteristics

| 試験項目 Test Item | 条件 Condition | | 試験結果 Test Results | | | 仕様 SPEC | 備考 Remarks |
|-----------------------------------|-----------------|------------|----------------------|---------|---------|------------------|---------------|
| | 入力 Vin | 負荷 Load | | | | | |
| 過電流検出値 Over Current Protection | | | Ta=-10°C | Ta=25°C | Ta=60°C | | |
| +12V | MIN | MAX | 9.69A | 9.94A | 10.00A | 8.49A以上(or more) | 図9 Fig.9 |
| 過電圧検出値 Over Voltage Protection | | | Ta=-10°C | Ta=25°C | Ta=60°C | | |
| +12V | MAX | MIN | 16.3V | 16.7V | 16.8V | 13.8V以上(or more) | 図10 Fig.10 |
| リセット時間 Reset Time | MAX | MIN | 17.9s (Ta=25°C) | | | --- | --- |

4.環境試験 Environment Test

Ta=25°C

| 試験項目 Test Item | 条件 Condition | | 試験結果 Test Results | | | 仕様 SPEC | 備考 Remarks |
|--|-----------------|------------|---|--|--|--|---------------|
| | 入力 Vin | 負荷 Load | | | | | |
| 振動試験(非動作時) Vibration (Non-Operating) | --- | --- | 周波数10Hz~55Hz,周期3分,加速度2G X・Y・Z方向に各60分,にて試験後外観・特性に問題なし Frequency 10~55Hz, Sweep cycle 3min., Acceleration 19.6m/s ² , Direction X/Y/Z 60 minutes par each axis. There is no problem in appearance and characteristics | | | 正常に起動 Normal Operation | |
| 高温スタート Power on at high temp | NOM | NOM | POWER OFFにて80°Cに1時間放置後POWER ON Left the power supply at 80°C for one hour and turned on. | | | 正常に起動 Normal Operation | |
| 低温スタート Power on at low temp | NOM | NOM | POWER OFFにて-15°Cに1時間放置後POWER ON Left the power supply at -15°C for one hour and turned on. | | | 正常に起動 Normal Operation | |
| 耐衝撃 Shock | --- | --- | 床面から50mmの高さより各辺3回自然落下後 外観・特性に問題なし Lift one side of surface of the unit 50mm and drop it on the board. Drop 3 times for each side. There is no problem in appearance and characteristics | | | 196m/s ² 正常に起動 Normal Operation | --- |

5.耐ノイズ特性 Noise Tolerance Characteristics

Ta=25°C

| 試験項目 Test Item | 条件 Condition | | 試験結果 Test Results | | | 仕様 SPEC | 備考 Remarks |
|---|-----------------|-----------------|----------------------|---------------------------|---------|------------|---------------|
| | 入力 Vin | 負荷 Load | | | | | |
| 注入ノイズ耐量 ACLineNoise (50ns~1000ns) | MIN ~ MAX | MIN ~ MAX | L-L | ±2.0 kV No Err, No Damage | L-L | ±2.0kV | --- |
| | | | L-FG | ±2.0 kV No Err, No Damage | L-FG | ±2.0kV | |
| | | | N-FG | ±2.0 kV No Err, No Damage | | | |
| 雷サージ耐量 LightningSurge (1.2×50μs) | NOM | NOM | L-L | ±2.0 kV No Err, No Damage | L-L | ±2.0kV | --- |
| | | | L-FG | ±2.0 kV No Err, No Damage | L-FG | ±2.0kV | |
| | | | N-FG | ±2.0 kV No Err, No Damage | | (3 times) | |
| 静電気耐量ESD | MIN ~ MAX | MIN ~ MAX | Air | ±8.0 kV No Err, No Damage | Air | ±8.0kV | --- |
| | | | Contact | ±6.0 kV No Err, No Damage | Contact | ±6.0kV | |
| | | | C: 150pF, R: 330Ω | | | | |

6. その他の特性 Other Characteristics

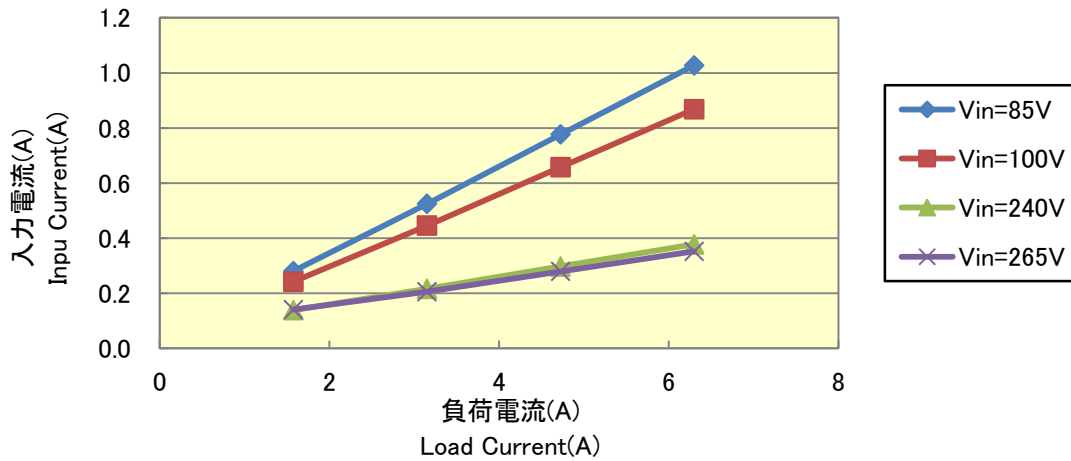
Ta=25°C

| 試験項目 Test Item | 条件 Condition | | 試験結果 Test Results | | | 仕様 SPEC | 備考 Remarks |
|-------------------------------|-----------------|------------|---|---|---|--|---------------|
| | 入力 Vin | 負荷 Load | | | | | |
| 絶縁耐圧 Withstand Voltage | --- | --- | P-S 3.0/3.6kV (漏電流) Leakage Current 1.22/1.33mA | P-E 2.0/2.4kV (漏電流) Leakage Current 0.95/1.03mA | S-E 0.5/0.6kV (漏電流) Leakage Current 1.24/1.36mA | P-S:3.0kV1m,3.6kV 1s P-E:2.0kV1m,2.4kV 1s S-E:0.5kV1m,0.6kV 1s (漏電流10mA以下) Leakage Current 10mA or less | --- |
| 絶縁抵抗 Insulation Resistance | --- | --- | P-S1000MΩ 以上 (or more) | P-E1000MΩ 以上 (or more) | S-E1000MΩ 以上 (or more) | P-S100MΩ 以上 (DC500V μ g ⁻) P-S100MΩ or more (DC500VMegger) | --- |

7. ダイナミック時の負荷特性 Dynamic Load Characteristics 参考データ Reference data

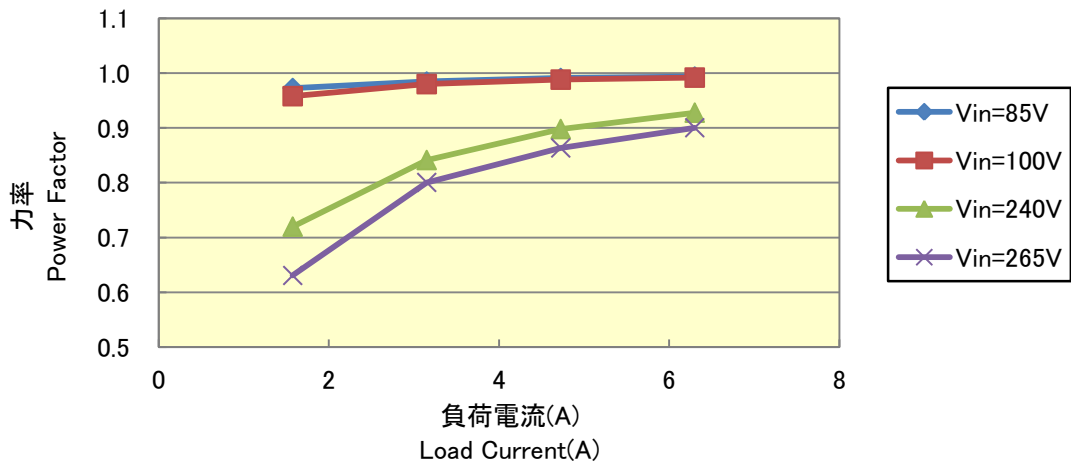
| 試験条件 Test Condition | | 試験結果 Test Results | | | | | 備考 Remarks |
|------------------------|-----------------|------------------------|-----------------------------------|-------|-------|-------|---------------|
| | | +12V | | | | | |
| 出力電圧 Output Voltage | Ta=25°C | | 11.5V 12.2V | ----- | ----- | ----- | 図13 |
| | 条件 Condition | 入力電圧 Vin | NOM | | | | |
| | | 出力電流 Output Current | 0A (1ms) ~ 6.3A (1ms) | | | | |

図1 入力電流特性(負荷電流に対して)
Fig.1 Input Current Characteristics (vs Load Current)



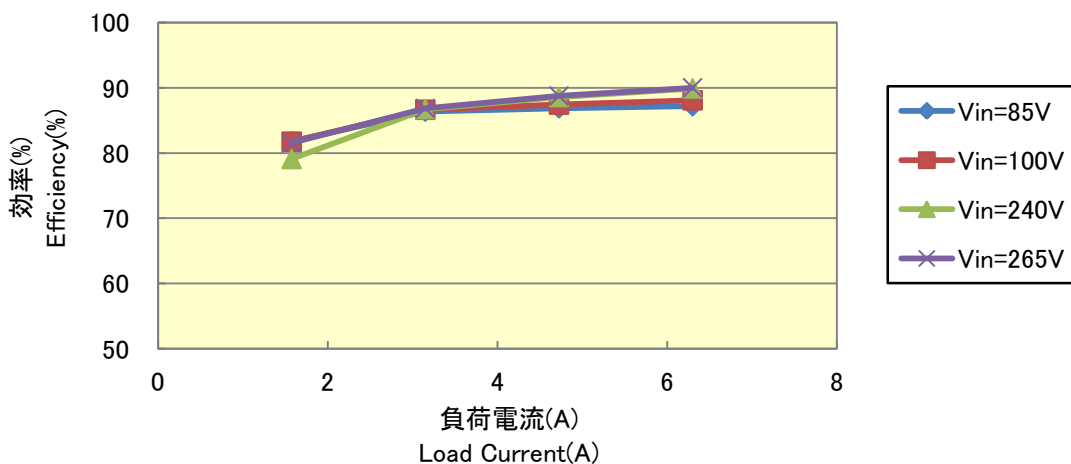
| | |
|----------------|--------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC85V~265V |
| 出力:Output | 12V 25%~100% |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | |

図2 力率特性(負荷電流に対して)
Fig.2 Power Factor Characteristics (vs Load Current)



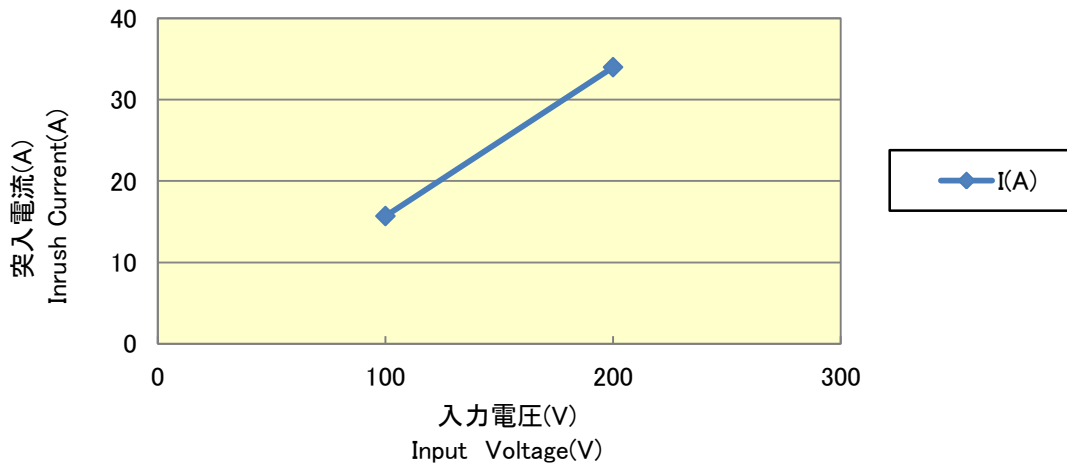
| | |
|----------------|--------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC85V~265V |
| 出力:Output | 12V 25%~100% |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | |

図3 効率特性(負荷電流に対して)
Fig.3 Efficiency Characteristics (vs Load Current)



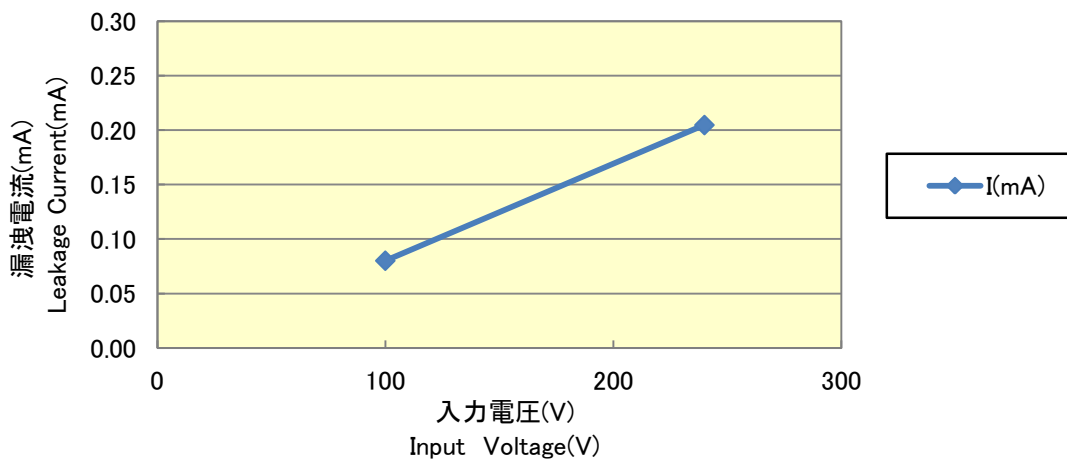
| | |
|----------------|--------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC85V~265V |
| 出力:Output | 12V 25%~100% |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | |

図4 突入電流特性(入力電圧に対して)
Fig.4 Inrush Current Characteristics (vs Input Voltage)



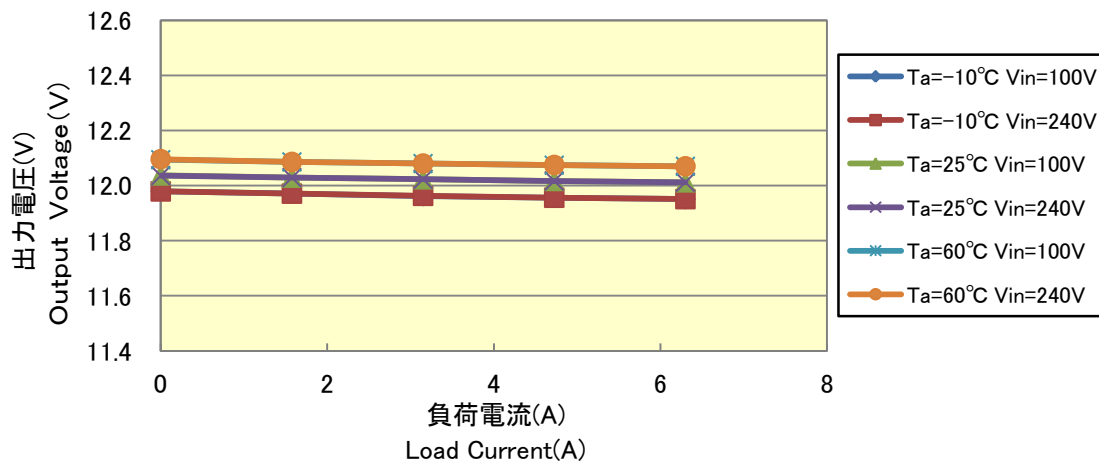
| | |
|----------------|-------------------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100~200V |
| 出力:Output | 12V 6.3A |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | コールドスタート時 Cold Start |

図5 漏洩電流特性(入力電圧に対して)
Fig.5 Leakage Current Characteristics (vs Load Current)



| | |
|----------------|-----------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100~240V 60Hz |
| 出力:Output | 12V 6.3A |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | |

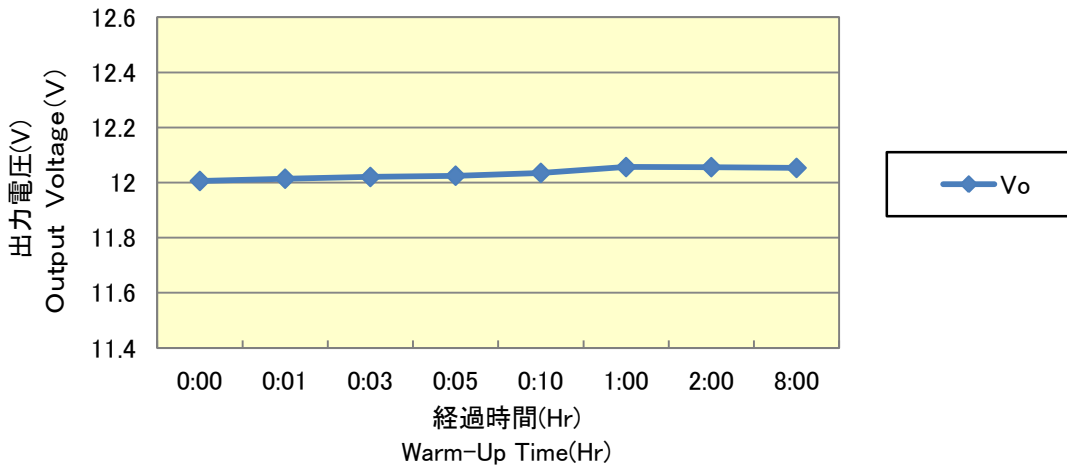
図6 出力電圧精度特性(負荷電流に対して)
Fig.6 Output Voltage Accuracy Characteristics (vs Load Current)



| | |
|----------------|---------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100~240V |
| 出力:Output | 12V 0%~100% |
| 温度:Temperature | Ta=-10°C~60°C |
| 備考:Remarks | |

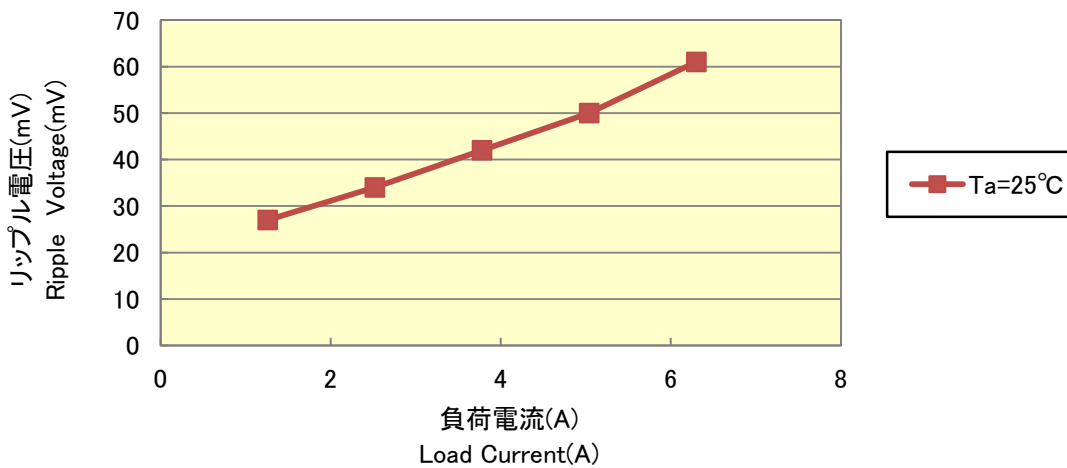
Model: SWJ075P-12

図7 経時ドリフト特性
Fig.7 Warm-Up Drift Characteristics



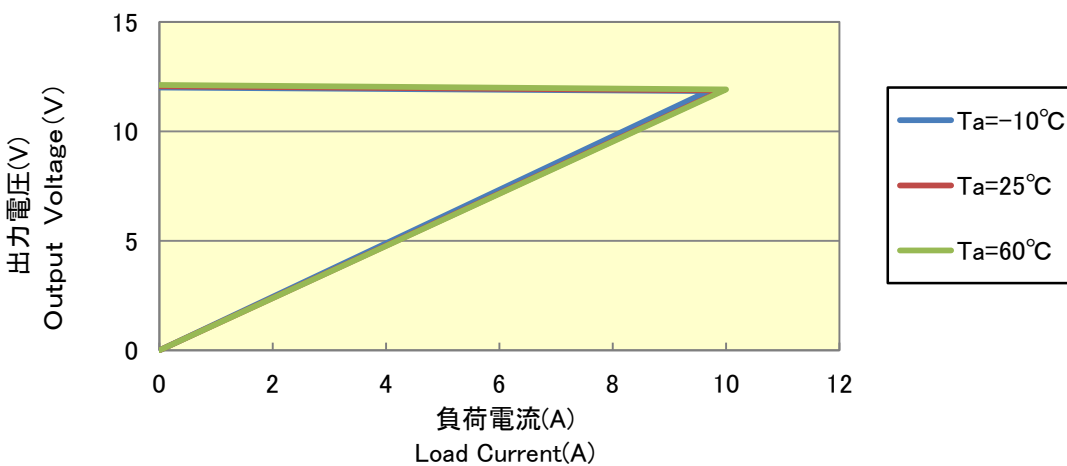
| | |
|----------------|------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100V |
| 出力:Output | 12V 6.3A |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | |

図8 リプル電圧特性(負荷電流に対して)
Fig.8 Ripple Voltage Characteristics (vs Load Current)



| | |
|----------------|--------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100V |
| 出力:Output | 12V 20%~100% |
| 温度:Temperature | Ta=25°C |
| 備考:Remarks | |

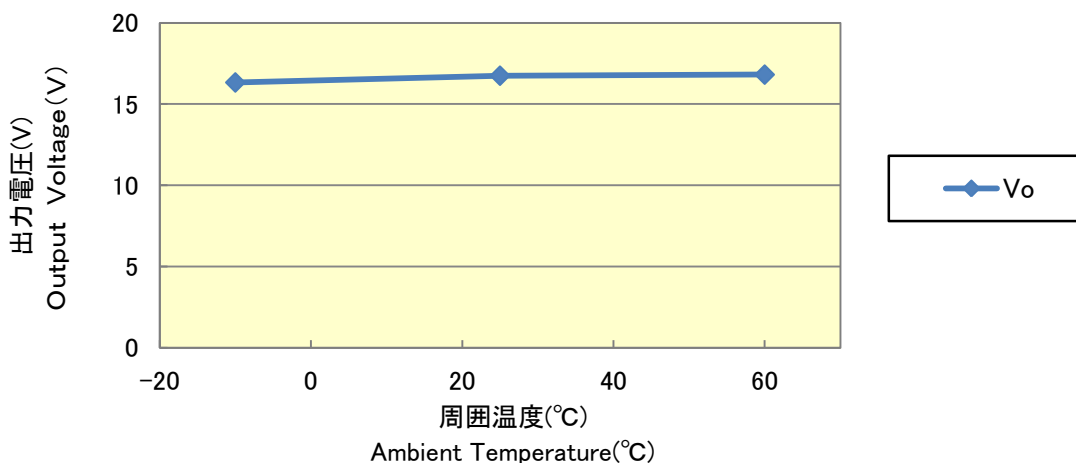
図9 過電流特性(負荷電流に対して)
Fig.9 Over Current Protection Characteristics (vs Load Current)



| | |
|----------------|---------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC85V |
| 出力:Output | 12V |
| 温度:Temperature | Ta=-10°C~60°C |
| 備考:Remarks | |

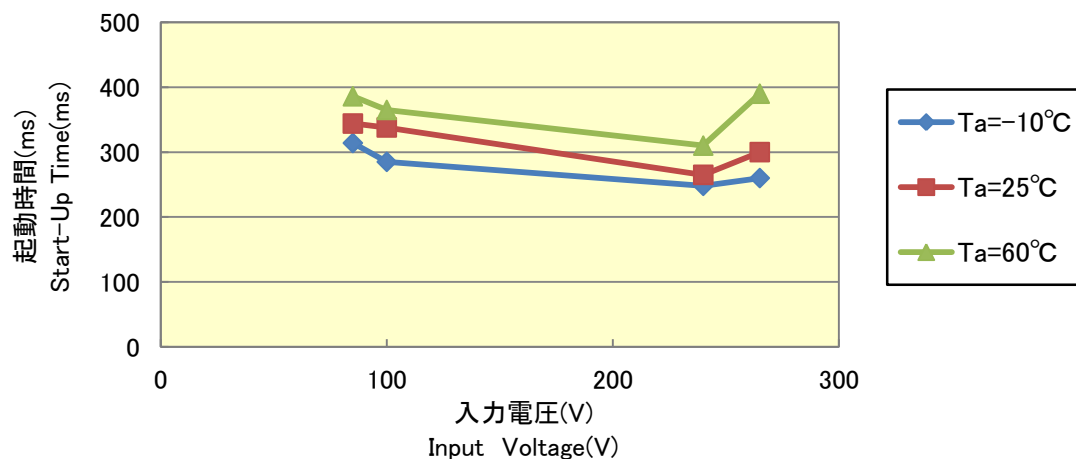
Model: SWJ075P-12

図10 過電圧特性(温度に対して)
Fig.10 Over Voltage Protection Characteristics (vs Temperature)



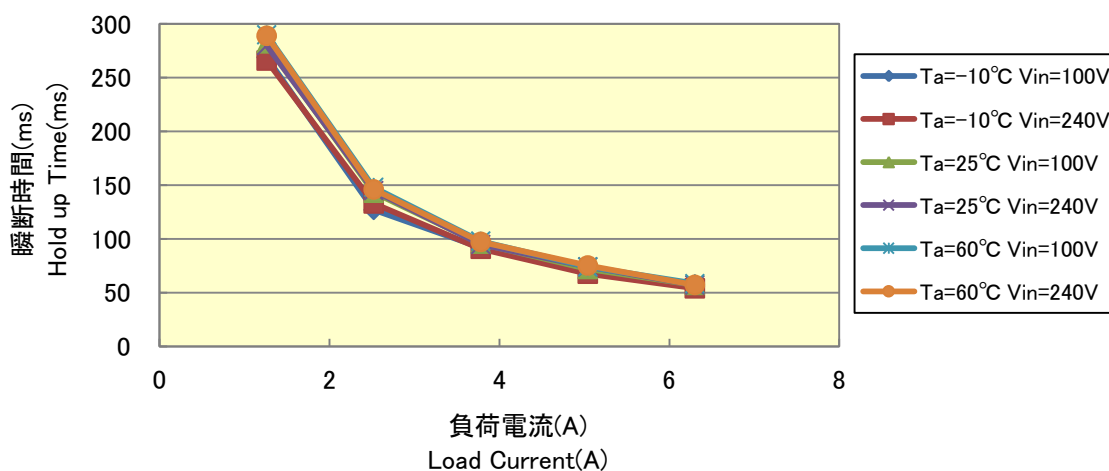
| | |
|----------------|---------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC265V |
| 出力:Output | Io=0A |
| 温度:Temperature | Ta=-10°C~60°C |
| 備考:Remarks | |

図11 起動時間特性(入力電圧に対して)
Fig.11 Start-Up Time Characteristics (vs Input Voltage)



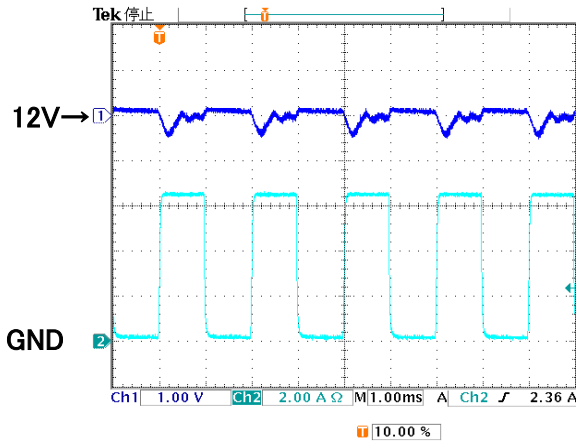
| | |
|----------------|---------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC85V~265V |
| 出力:Output | Io=6.3A |
| 温度:Temperature | Ta=-10°C~60°C |
| 備考:Remarks | |

図12 入力瞬断時間(負荷電流に対して)
Fig.12 Hold up time Characteristics (vs Load Current)



| | |
|----------------|---------------|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100V~240V |
| 出力:Output | 12V 20%~100% |
| 温度:Temperature | Ta=-10°C~60°C |
| 備考:Remarks | |

図13 ダイナミック時の負荷波形
Fig.13 Dynamic Load Waveform

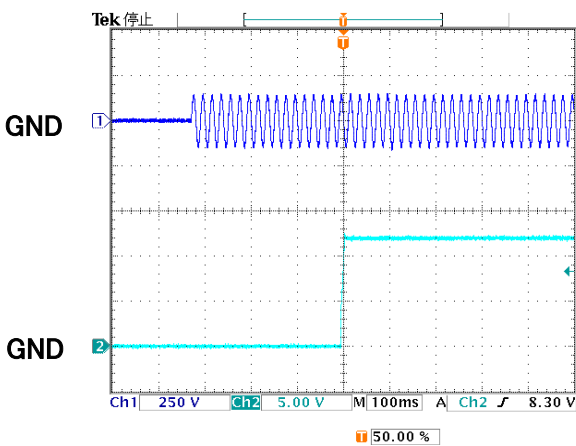


出力電圧
Output Voltage

出力電流
Output Current

| |
|---------------------------------------|
| 型名:Model SWJ075P-12 |
| 入力:Input AC100V |
| 出力:Output Io=0A⇔6.3A |
| 温度:Temperature Ta=25°C |
| 備考:Remarks |
| 出力電圧 OutputVoltageVertical: 1V/div |
| 出力電流 OutputCurrentVertical: 2A/div |
| 時間 TimeHorizontal: 1ms/div |

図14 出力電圧立上り波形
Fig.14 Output Voltage Rising Waveform

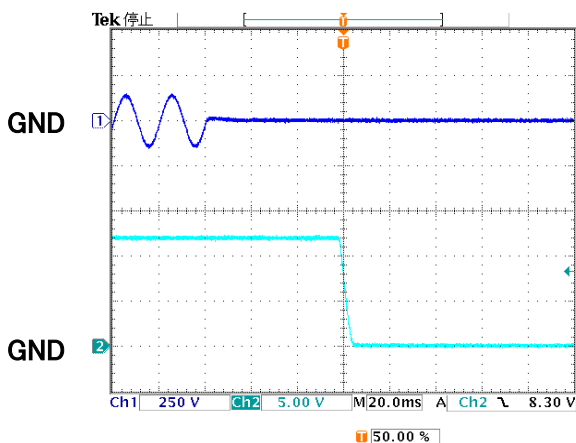


入力電圧
Input Voltage

出力電圧
Output Voltage

| |
|--|
| 型名:Model SWJ075P-12 |
| 入力:Input AC100V |
| 出力:Output Io=6.3A |
| 温度:Temperature Ta=25°C |
| 備考:Remarks |
| 入力電圧 InputVoltageVertical: 250V/div |
| 出力電圧 OutputVoltageVertical: 5V/div |
| 時間 TimeHorizontal: 100ms/div |

図15 出力電圧立下り波形
Fig.15 Output Voltage Falling Waveform



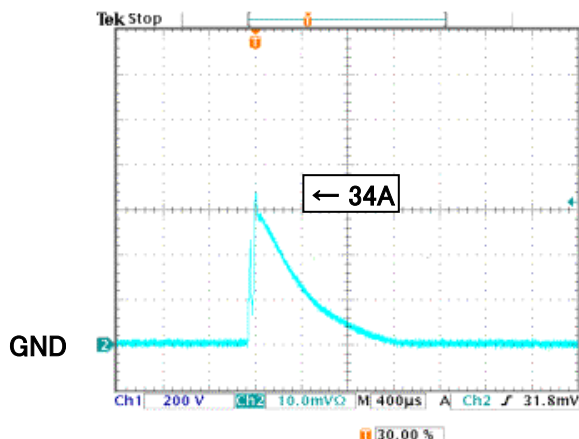
入力電圧
Input Voltage

出力電圧
Output Voltage

| |
|--|
| 型名:Model SWJ075P-12 |
| 入力:Input AC100V |
| 出力:Output Io=6.3A |
| 温度:Temperature Ta=25°C |
| 備考:Remarks |
| 入力電圧 InputVoltageVertical: 250V/div |
| 出力電圧 OutputVoltageVertical: 5V/div |
| 時間 TimeHorizontal: 20ms/div |

Model: SWJ075P-12

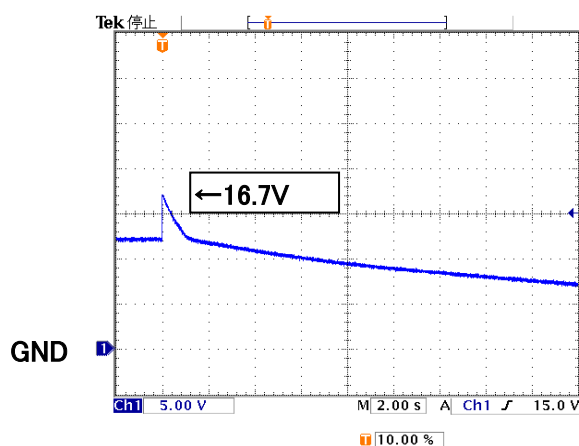
図16 突入電流波形
Fig.16 Inrush Current Waveform



突入電流
Inrush Current

| | |
|----------------|---|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC200V |
| 出力:Output | $I_o=6.3A$ |
| 温度:Temperature | $T_a=25^{\circ}C$ |
| 備考:Remarks | 入力電流 InrushCurrentVertical : 10A/div 時間 TimeHorizontal: 400us/div ノイズフィルタへの突 入電流は除く Excluding inrush current to noise filter |

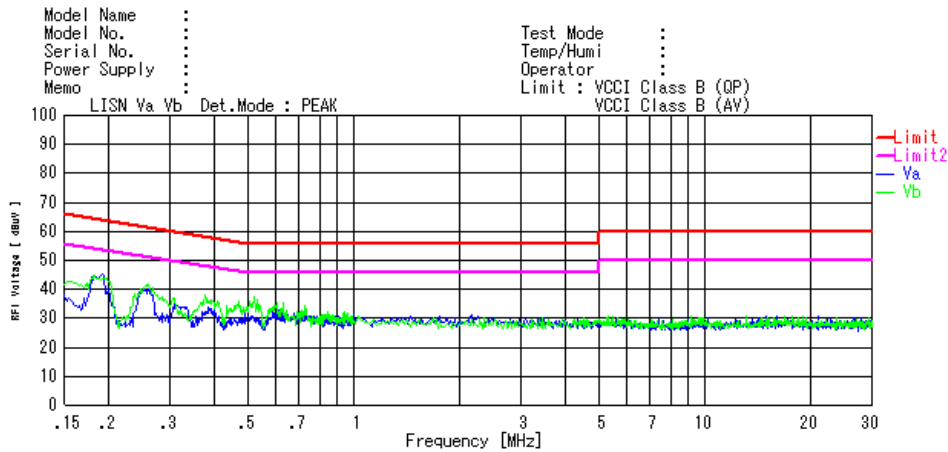
図17 過電圧波形
Fig.17 Over Voltage Waveform



出力電圧
Output Voltage

| | |
|----------------|--|
| 型名:Model | SWJ075P-12 |
| 入力:Input | AC100V |
| 出力:Output | $I_o=0A$ |
| 温度:Temperature | $T_a=25^{\circ}C$ |
| 備考:Remarks | 出力電圧 OutputVoltage Vertical: 5V/div 時間 TimeHorizontal: 2S/div |

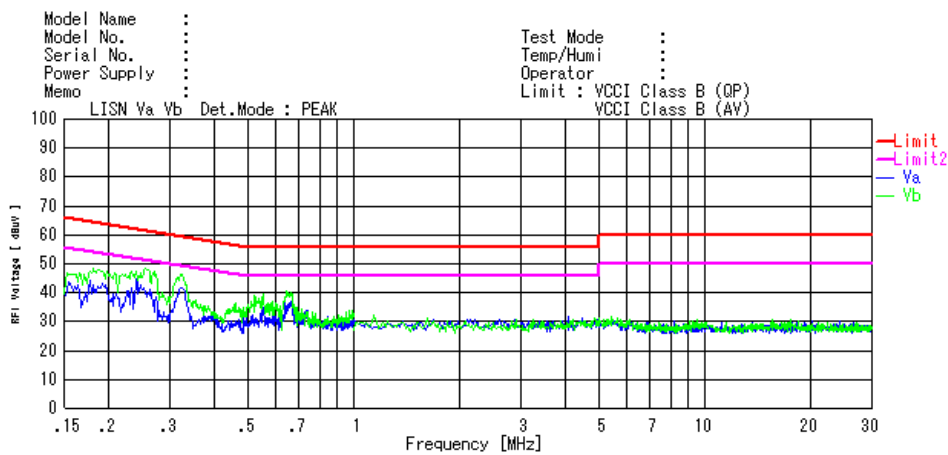
図18 雑音端子電圧波形 参考データ
Fig.18 Conduction Noise Waveform Reference data



| Line | Phase | Frequency [MHz] | Results | | Limit | | Margin | |
|------|-------|-----------------|----------|-----------|----------|-----------|----------|-----------|
| | | | QP[dBuV] | AVE[dBuV] | QP[dBuV] | AVE[dBuV] | QP[dBuV] | AVE[dBuV] |
| A | | 0.199 | 46.8 | 38.3 | 63.7 | 53.7 | 16.9 | 15.4 |
| B | | 0.199 | 49.3 | 43.8 | 63.7 | 53.7 | 14.4 | 9.9 |

| |
|---------------------------|
| 型名:Model SWJ075P-12 |
| 入力:Input AC100V |
| 出力:Output Io=6.3A |
| 温度:Temperature Ta=25°C |
| 備考:Remarks |

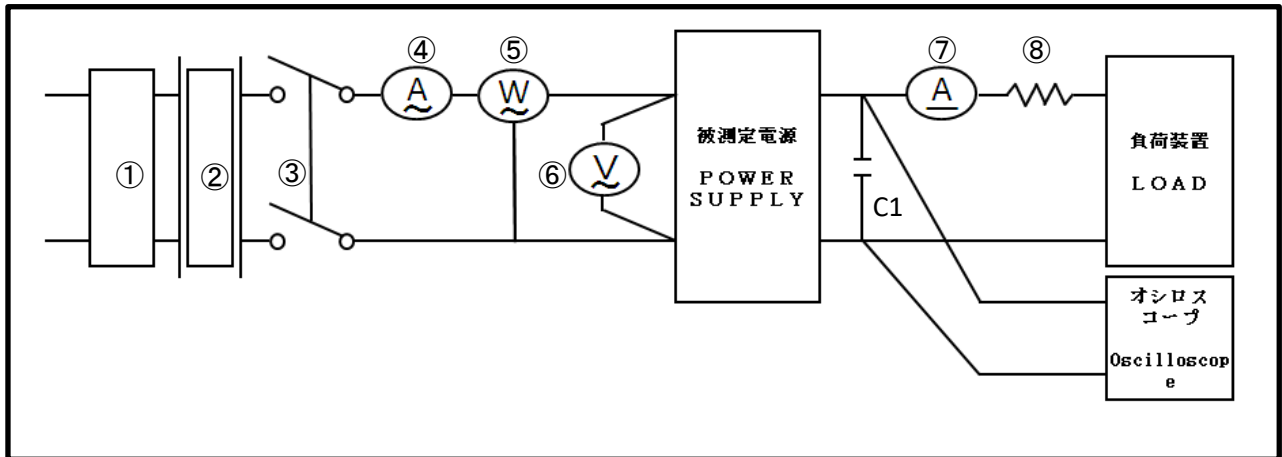
図19 雑音端子電圧波形 参考データ
Fig.19 Conduction Noise Waveform Reference data



| Line | Phase | Frequency [MHz] | Results | | Limit | | Margin | |
|------|-------|-----------------|----------|-----------|----------|-----------|----------|-----------|
| | | | QP[dBuV] | AVE[dBuV] | QP[dBuV] | AVE[dBuV] | QP[dBuV] | AVE[dBuV] |
| A | | 0.198 | 46.1 | 38.1 | 63.7 | 53.7 | 17.6 | 15.6 |
| B | | 0.348 | 48.9 | 37.1 | 59.0 | 49.0 | 10.1 | 11.9 |

| |
|---------------------------|
| 型名:Model SWJ075P-12 |
| 入力:Input AC230V |
| 出力:Output Io=6.3A |
| 温度:Temperature Ta=25°C |
| 備考:Remarks |

試験回路図 Test Circuit



使用計測機器

- ①スライダック
- ②絶縁トランス
- ③ブレーカー
- ④電流計
- ⑤電力計
- ⑥電圧計
- ⑦電流計
- ⑧シャント抵抗

- Measuring instruments
- Variable autotransformer
 - Isolation transformer
 - A circuit breaker
 - Ammeter
 - Wattmeter
 - Voltmeter
 - Ammeter
 - Shunt resistor

2次側出力電圧はDMMで測定
Output voltage is measured with DMM

負荷コンデンサ Load capacitor
C1: Electrolytic Capacitor 100 μ F
Film Capacitor 0.1 μ F