

MESSRS :

RELIABILITY DATA

CUSTOMER'S PRODUCT NAME:

TDK PRODUCT NAME: DC-DC CONVERTER
CC1R5 SERIES

TDK-Lambda

TDK Corporation
Power Systems Business Group

| | |
|---------|-------------|
| DWG.No. | TRSR-0106-6 |
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Revised 2006/12/01

| | Test Condition | Test Result | | | | |
|---|---|----------------------|---------------|--------------|---------------|----------|
| | | Item | Before test X | After test X | Criteria | Judgment |
| Thermal shock CC1R5-2412SF-E | -40~85degC 30min.Each 1500cycles N=5 Measuring Condition Ta=25degC Vin=24V Iout=0.125A | Efficiency | 81.1% | 81.6% | 79%~83% | OK |
| | | Output Current | 12.076V | 12.074V | 11.64V~12.36V | OK |
| | | Ripple | 18.8mVp-p | 14.3mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| Continuous operation under high temperature CC1R5-0505SF-E | 85degC 2000hours Nominal input and output N=5 Measuring Condition Ta=25degC Vin=5V Iout=0.3A | Efficiency | 77.1% | 76.5% | 75%~79% | OK |
| | | Output Current | 5.015V | 5.010V | 4.85V~5.15V | OK |
| | | Ripple | 37.0mVp-p | 34.2 mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| Intermittent operation in low temperature CC3-0505SF-E ※1 | -40degC 1h ON / 3h OFF 1000hours Nominal input and output N=5 Measuring Condition Ta=25degC Vin=5V Iout=0.6A | Efficiency | 76.6% | 76.2% | 75%~79% | OK |
| | | Output Current | 5.035V | 5.033V | 4.85V~5.15V | OK |
| | | Ripple | 67.5mVp-p | 68.5mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| Intermittent operation under humidity CC1R5-0505SF-E | 60degC·90%R.H. 1h ON / 3h OFF 1000hours Nominal input and output N=5 Measuring Condition Ta=25degC Vin=5V Iout=0.3A | Efficiency | 76.9% | 77.1% | 75%~79% | OK |
| | | Output Current | 5.023V | 5.006V | 4.85V~5.15V | OK |
| | | Ripple | 89.8mVp-p | 82.4mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |

※1 CC3-0505SF-E represents all CC1R5-Series.

| No. | MATERIALS NAME | QU | MATERIAL | REMARK |
|------------------------------|----------------|----|-------------|--------|
| PRODUCT NAME or MODEL, TITLE | | | | |
| DC-DC CONVERTER CC1R5 SERIES | | | | |
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| | Test Condition | Test Result | | | | |
|--|--|----------------------|---------------|--------------|---------------|----------|
| | | Item | Before test X | After test X | Criteria | Judgment |
| Vibration · Shock (Group test) CC1R5-2412SF-E | 10~500Hz, amplitude acceleration 10G, 1octave /min. sweep, XYZ each 2.5h 100G(pulse) Duration 6ms 1/2 sine pulse 3times each axis, total 18times N=5 Measuring Condition Ta=25degC Vin=24V Iout=0.125A | Efficiency | 81.2% | 81.3% | 78%~82% | OK |
| | | Output Current | 12.084V | 12.086V | 11.64V~12.36V | OK |
| | | Ripple | 19.4mVp-p | 17.0mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| Resistance to solder heat 1 CC1R5-2412SF-E | 380±10degC 3.5sec N=5 Measuring Condition Ta=25degC Vin=24V Iout=0.125A | Efficiency | 81.1% | 81.3% | 78%~82% | OK |
| | | Output Current | 12.074V | 12.074V | 11.64V~12.36V | OK |
| | | Ripple | 13.2mVp-p | 13.4mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| Resistance to solder heat 2 CC1R5-2412SF-E | 265±5degC 10sec N=5 Measuring Condition Ta=25degC Vin=24V Iout=0.125A | Efficiency | 81.0% | 81.1% | 78%~82% | OK |
| | | Output Current | 12.086V | 12.088V | 11.64V~12.36V | OK |
| | | Ripple | 13.4mVp-p | 13.2mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| Mechanical strength of terminal CC1R5-2412SF-E | JIS C 0052 pul, press, bend N=5 | Appearance | | | | OK |
| Solderability CC3-2405SF-E ※2 | Burn-in under steaming condition 8h 245±3degC N=5 | Appearance | | | | OK |

※2 CC3-2405SF-E represents all CC1R5-Series.

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| | Test Condition | Test Result | |
|--|---|-----------------------------|----------|
| | | Criteria | Judgment |
| Static electricity CC1R5-2412SF-E | 1. Human body model Electric discharge resistance: 1.5KΩ capacitance: 100pF Test voltage: 3KV 2. Machine model Electric discharge resistance: 0Ω capacitance: 200pF Test voltage: 1KV Test: 1time Polarity: +,- Measuring Condition Ta=25degC Vin=24V Iout=125mA N=2 | No change after the test | OK |
| Whisker test | Storage under humidity 60degC·90%R.H. 2000hours N=8 Thermal shock -40degC ~ 85degC Each30min 1500cycle N=8 | No whisker shall be allowed | OK |

| | Test Condition | Test Result | | | | |
|--|---|----------------------|---------------|--------------|---------------|----------|
| | | Item | Before test X | After test X | Criteria | Judgment |
| Resistance to sulfide gas (Group test) CC1R5-2412SF-E | SO2 5ppm 40degC 72~78R.H. 48hours H2S 5ppm 40degC 72~78R.H. 48hours N=5 Measuring Condition Ta=25degC Vin=24V Iout=0.125A | Efficiency | 80.1% | 80.1% | 79%~83% | OK |
| | | Output Current | 12.042V | 12.044V | 11.64V~12.36V | OK |
| | | Ripple | 7.0mVp-p | 7.4mVp-p | <100mVp-p | OK |
| | | Insulated Resistance | >50MΩ | >50MΩ | >50MΩ | OK |
| | | Withstanding voltage | >AC500V | >AC500V | >AC500V | OK |
| | | Appearance | | | | OK |

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CC1R5 series MTTF

Single output model

Total failure rates : 390 fit
MTTF : 2.56 million hour
(293 years)

Dual output model

Total failure rates : 460 fit
MTTF : 2.17 million hour
(248 years)

Calculation Condition

Ta : 50°C
πe : Gb

Vin : Rated voltage
Vout : Rated voltage
Iout : Rated voltage

MIL HDBK 217F

| No. | MATERIALS NAME | QU | MATERIAL | REMARK |
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