

MESSRS :

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RELIABILITY DATA

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CUSTOMER'S PRODUCT NAME:

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TDK PRODUCT NAME: DC-DC CONVERTER  
CC1R5 SERIES

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***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
<b>Thermal shock</b>  <b>CC1R5-2412SF-E</b>	-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
<b>Continuous operation under high temperature</b>  <b>CC1R5-0505SF-E</b>	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
<b>Intermittent operation in low temperature</b>  <b>CC3-0505SF-E</b> ※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
<b>Intermittent operation under humidity</b>  <b>CC1R5-0505SF-E</b>	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				
NAME OF DRAWING			DRAWING No.	
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PAGE			PAGE	
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TDK CORPORATION

	Test Condition	Test Result				
		Item	Before test X	After test X	Criteria	Judgment
<b>Vibration · Shock (Group test)</b>  <b>CC1R5-2412SF-E</b>	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
<b>Resistance to solder heat 1</b>  <b>CC1R5-2412SF-E</b>	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
<b>Resistance to solder heat 2</b>  <b>CC1R5-2412SF-E</b>	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
<b>Mechanical strength of terminal</b> <b>CC1R5-2412SF-E</b>	JIS C 0052 pul, press, bend N=5	Appearance				OK
<b>Solderability</b>  <b>CC3-2405SF-E</b> ※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
<b>Static electricity</b>  <b>CC1R5-2412SF-E</b>	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
<b>Whisker test</b>	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
<b>Resistance to sulfide gas (Group test)</b>  <b>CC1R5-2412SF-E</b>	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

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