URCD10U series

P-DUKE POWER

Innovative Power for your Visions.

10- 40W Comprehensive Power Solutions for Railway Auxiliary Systems

URCD10U、URCD20U、URED40Uシリーズは、鉄道用途向けに設計されたシャーシマウント型およびDINレール型DC/DCコンバーターです。
これらのコンバータは、耐久性の高い機械設計と高度な機能により、鉄道車両搭載電子機器に関する EN50155規格、および耐衝撃・耐振動性に関する EN61373規格に準拠しています。

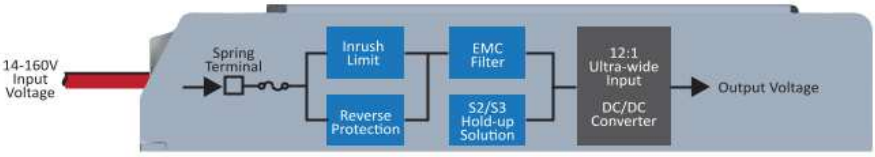
主な機能として、S2/S3電源遮断ソリューション、突入電流制限、逆極性保護、EN55032クラスA/B準拠のEMIフィルタリング、および内蔵ラインヒューズが挙げられます。これらの機能により、システム設計が容易になり、開発時間を抑えることができます。

14V～160Vdcの広い12:1入力電圧範囲により、単一モジュールで多様な電力システムに対応し、出力は、DC3.3V、5V、12V、15V、24V、±5V、±12V、±15Vに対応しています。
また、過電流、短絡、過電圧、低電圧、過熱に対する保護機能を備えています。

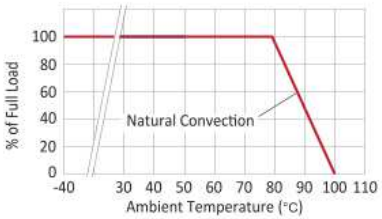
URCD10U、URCD20U、URED40Uシリーズは、標高5000mまでの動作と、70℃を超える高温環境下でもフル負荷性能を維持できるよう設計されており、鉄道車両、線路脇などの厳しい環境条件に適応出来ます。

URCD10U Series
URCD20U Series
URED40U Series
DC/DC Converters

INDUSTRIAL RAILWAY



Functional block diagram



Derating curve: URED40-72S12U

Features

- 10W、20W、40W出力
- 12:1広入力範囲：14-160Vdc
- 出力：3.3, 5, 12, 15, 24, ±5, ±12, ±15Vdc
- S2/S3電源遮断対応
- 突入電流制限、逆極性保護
- EMIフィルタ EN 55032 Class A/B準拠
- 内蔵ラインヒューズ
- EN 0155、EN61373、IEC/UL/EN 62368-1
- 5000m運用高度
- 3年製品保証

Applications

- 鉄道補助システム
- 鉄道車両電子機器
- 線路沿い監視機器
- 産業オートメーション制御
- 遠隔監視・通信システム

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P-DUKE POWER

URCD10U Series

Chassis-Mount DC-DC Converter

Up to 10 Watts

3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT

Railway | Automation | Datacom

IPC | Industry | Measurement

Telecom | Automobile | Boat

Charger | Medical | PV

CE

3000 VDC Isolation Voltage | 12:1 Ultra-Wide Input Range | FUSE Installed | HOLD UP | INRUSH CURRENT LIMIT | Internal EN55032 Class B Filter | LOW Standby Power | NO Min. Load Required | Operating Altitude 5000 meter | REMOTE ON OFF | REVERSE POLARITY PROTECTION | OCP | OVP | SCP | UVP | OTP

PART NUMBER STRUCTURE

URCD10 - 72 S 05 U - H DR

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Hold-up grade Options	Assembly Options
	72: 14~160	**S:** Single	**3P3:** 3.3 **05:** 5 **12:** 12 **15:** 15 **24:** 24	12:1	□: S2 **H:** S3	□: None **DR:** Din Rail Mounting Type
		D: Dual	**05:** ±5 **12:** ±12 **15:** ±15			

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25℃ unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	μF
URCD10-72S3P3U	14 ~ 160	3.3	3000	12	82	3500
URCD10-72S05U	14 ~ 160	5	2000	12	86	2500
URCD10-72S12U	14 ~ 160	12	830	12	86	430
URCD10-72S15U	14 ~ 160	15	670	12	87	350
URCD10-72S24U	14 ~ 160	24	420	12	85	125
URCD10-72D05U	14 ~ 160	±5	±1000	12	82	±1440
URCD10-72D12U	14 ~ 160	±12	±416	12	85	±250
URCD10-72D15U	14 ~ 160	±15	±333	12	86	±180

INPUT SPECIFICATIONS

Parameter	Conditions			Min.	Typ.	Max.	Unit
Operating input voltage range				14	72	160	VDC
Input fuse	Slow Blow				1.6		A
In-rush current					15		A
Start up voltage						14	VDC
Shutdown voltage				10	11.5	13	VDC
Start up time	Constant resistive load	Power up			50		ms
Input surge voltage	1 second, max.					200	VDC
Interruption of power supply		EN50155 Class S2		10			ms
		EN50155 Class S3 (Options)		20			ms
Remote ON/OFF	Referred to –Vin pin	Positive logic	DC-DC ON		Open or 3 ~ 12VDC		
			DC-DC OFF		Short or 0 ~ 1.2VDC		
		Input current of Ctrl pin		-0.5		+0.5	mA
		Remote off input current			2.5		mA

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy			-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load		-1.0		+1.0	%
Load regulation	No Load to Full Load	Single 3.3Vout, 5Vout 12Vout, 15Vout, 24Vout Dual 5Vout, 12Vout, 15Vout	 -1.5 -1.0 -1.5		 +1.5 +1.0 +1.5	 %
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Voltage adjustability	Single output	3.3Vout, 12Vout Others	-10 -10		+10 +20	% %
Ripple and noise	Measured by 20MHz bandwidth	Single 3.3Vout, 5Vout 12Vout, 15Vout 24Vout Dual 5Vout, 12Vout, 15Vout	 	 75 100 125 75 100	 	 mVp-p
Temperature coefficient			-0.02		+0.02	%/℃
Transient response recovery time	25% load step change			250		μs
Over voltage protection		3.3Vout 5Vout 12Vout 15Vout 24Vout	3.7 6.3 13.5 18.3 29.1		5.4 7.4 19.6 22.0 32.5	 VDC
Output indicator				Green LED		
Over load protection	% of Iout rated; Hiccup mode			160		%
Short circuit protection				Continuous, automatics recovery		

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output Input (Output) to Case	3000 2250			VDC
Isolation resistance	500VDC		1			GΩ
Isolation capacitance				6000		pF
Switching frequency		3.3Vout, 5Vout Others	220 200	250 230	280 260	KHz
Safety meets						IEC/ EN/ UL62368-1
Standard approvals						EN50155 EN45545-2
Chassis material						Aluminum
Weight						85g (3.00oz)
MTBF	MIL-HDBK-217F, Full load					1.343 x 10^6 hrs

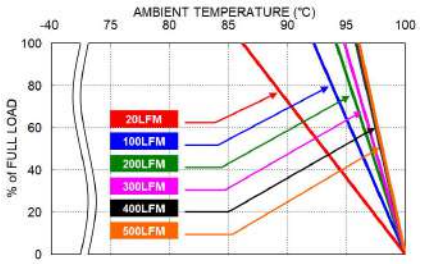
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating case temperature			-40		+100	℃
Maximum case temperature					100	℃
Over temperature protection				113		℃
Storage temperature range			-40		+105	℃
Operating altitude					5000	m
Thermal shock						MIL-STD-810F
Shock		□□□□□U □□□□□U - DR				EN61373, MIL-STD-810F EN61373, IEC60068-2-27
Vibration		□□□□□U □□□□□U - DR				EN61373, MIL-STD-810F EN61373, IEC60068-2-6
Relative humidity						5% to 95% RH

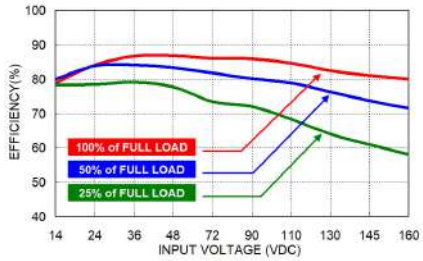
EMC SPECIFICATIONS

Parameter	Conditions		Level
EMI	EN55032, EN50121-3-2		Class B
EMS	EN55035, EN50121-3-2		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	±2kV	Perf. Criteria A
Surge	EN61000-4-5	EN55035:±1kV and EN50121-3-2:±2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

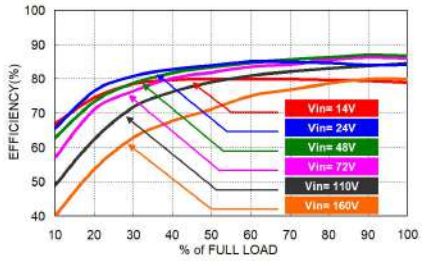
CHARACTERISTIC CURVE



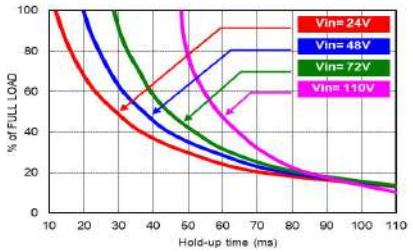
URCD10-72S05U Derating Curve



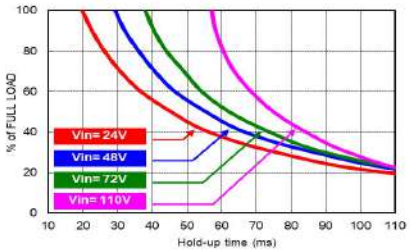
URCD10-72S05U Efficiency vs. Input Voltage



URCD10-72S05U Efficiency vs. Output Load



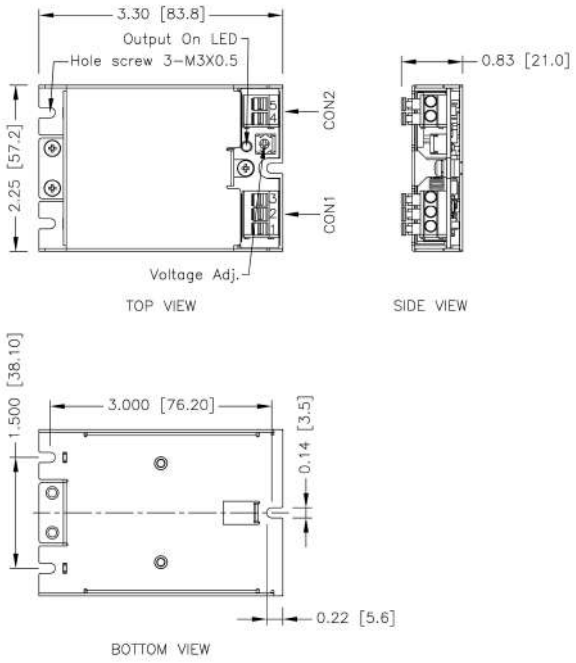
URCD10-72S05U Hold-up Time Curve



URCD10-72S05U-H Hold-up Time Curve (Options)

MECHANICAL DRAWING

CHASSIS MOUNTING TYPE

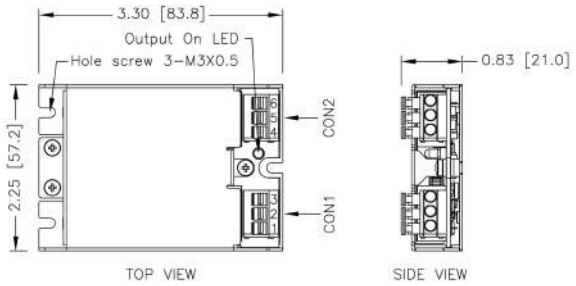


TERMINAL CONNECTION

NO.	SINGLE
1	+Vin
2	-Vin
3	Ctrl
4	-Vout
5	+Vout

※ Terminals – wire range from 14 to 20 AWG

1. All dimensions in Inch [mm]
   Tolerance : X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
2. M3x0.5 screw locked torque MAX 3.4kgf-cm/0.33N-m



TERMINAL CONNECTION

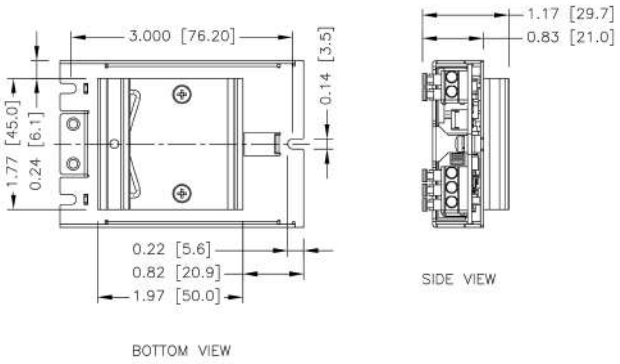
NO.	DUAL
1	+Vin
2	-Vin
3	Ctrl
4	-Vout
5	Common
6	+Vout

※ Terminals – wire range from 14 to 20 AWG

1. All dimensions in Inch [mm]
   Tolerance : X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
2. M3x0.5 screw locked torque MAX 3.4kgf-cm/0.33N-m

MECHANICAL DRAWING (CONTINUED)

DIN RAIL MOUNTING TYPE (OPTIONS)

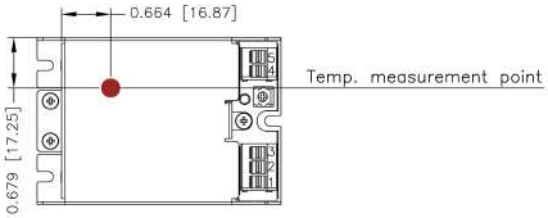


1. All dimensions in Inch [mm]
   Tolerance : X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
2. M3x0.5 screw locked torque MAX 3.4kgf-cm/0.33N-m

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments.
However, sufficient cooling should be provided to help ensure reliable operation of the unit.
Heat is removed by conduction, convection, and radiation to the surrounding environment.
Proper cooling can be verified by measuring the point as the figure below.
The temperature at this location should not exceed “Maximum case temperature”.
When operating, adequate cooling must be provided to maintain the test point temperature at or below “Maximum case temperature”.
You can limit this temperature to a lower value for extremely high reliability.

■ Thermal test condition with vertical direction by natural convection (20LFM).



TOP VIEW

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