P-DUKE POWER

Innovative Power for your Visions.

URCD20U Series
DC/DC Converters

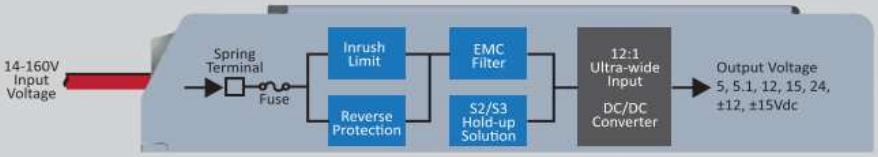
Railway Industrial

High Performance DC/DC Converters for Harsh Railway and Industrial Environments

20W All-In-One DC/DC Converters for Railway Applications

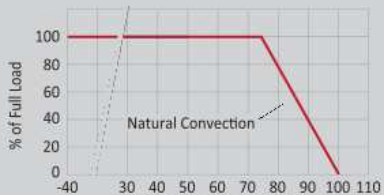
P-DUKE はこの度、鉄道用途に特化した、ユニット型の 20W DC/DCコンバータ、URCD20Uを発売しました。
このDC/DCは、EN 50155 規格に準拠しているだけでなく、さまざまな鉄道関連の電子機器での使用に適しており、EN 61373 の衝撃および振動試験要件に準拠するように設計されています。これは、堅牢な機械設計と包括的かつ完全な機能構成によるもので、過酷な環境でも確実に動作することが保証されています。

URCD20U には、突然の停電時のシステム損傷を防ぐための S2/S3 電源遮断ソリューションや、突入電流制限や逆極性保護などの複数の保護機能を搭載しています。さらに、EMI規格 EN 55032 クラス B に準拠し、厳しいノイズ環境でも安定した動作を保証し、安全性をさらに強化する統合ライン ヒューズも備えています。
これらの機能により、システム開発の時間の短縮が可能となります。



このDC/DCは、14～160Vdc の入力電圧範囲をサポートしており、単一モジュールでさまざまな入力電圧に対応できます。そして出力は、5V、5.1V、12V、15V、24V、±12V、±15Vdc のシングルおよびデュアル出力が利用できます。また、安全性と信頼性を念頭に置いて設計されており、過電流、短絡、過電圧、低電圧、過熱に対する保護機構を備え、システムの安定した動作を保証します。

URCD20U の設計コンセプトは、極限環境のニーズを考慮しており、最高 5,000 メートルの高度で動作し、周囲温度が 70°C を超えても全負荷動作を維持できます。
優れた技術パラメータと設計機能により、このDC/DCは、鉄道車両、線路脇で頻繁に遭遇する、さまざまな過酷な環境条件に特に適しており、現代の輸送システムの電子機器に求められる高い信頼性要件を満たします。



Derating curve: URCD20-72S05U

Features

- 20W Output Power
- 12:1 Ultra-wide Input Range From 14V to 160V
- Output Voltage: 5, 5.1, 12, 15, 24, ±12, and ±15Vdc
- Integrated Line Fuse
- Reverse Polarity Protection
- Inrush Current Limit
- 20ms Hold-up Time
- Built-in EN 55032 EMI Class B Filter
- 5000m Operating Altitude
- EN 50155, IEC/UL/EN 62368-1 Safety Approval
- 3 Years Product Warranty *pending

Applications

- Automated driving systems
- Signal processing units
- data recording
- PLCs
- HMIs
- DCS

【お問い合わせ先】

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URCD20U Series

Chassis-Mount DC-DC Converter
Up to 20 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

URCD20 - 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	**05:** 5 **12:** 12 **15:** 15 **24:** 24	12:1	□**:** S2 **H:** S3	□**:** None **DR:** Din Rail Mounting Type
		D: Dual	**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
URCD20-72S05U	14 ~ 160	5	4000	15	85	5000
URCD20-72S12U	14 ~ 160	12	1670	15	86	850
URCD20-72S15U	14 ~ 160	15	1330	15	86	700
URCD20-72S24U	14 ~ 160	24	835	15	86	220
URCD20-72D12U	14 ~ 160	±12	±833	15	86	±500
URCD20-72D15U	14 ~ 160	±15	±667	15	86	±350

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range			14	72	160	VDC
Input fuse	Slow Blow			3.15		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				
		5Vout	-1.5		+1.5	
		12Vout, 15Vout, 24Vout	-1.0		+1.0	%
		Dual				
		12Vout, 15Vout	-1.5		+1.5	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Voltage adjustability	Single output	12Vout	-10		+10	%
		Others	-10		+20	%
Ripple and noise	Measured by 20MHz bandwidth	Single				
		5Vout		75		
		12Vout, 15Vout		100		
		24Vout		125		mVp-p
		Dual				
		12Vout, 15Vout		100		
Temperature coefficient			-0.02		+0.02	%/℃
Transient response recovery time	25% load step change			250		μs
Over voltage protection		5Vout	6.3		7.4	
		12Vout	13.5		19.6	VDC
		15Vout	18.3		22.0	
		24Vout	29.1		32.5	
Output indicator				Green LED		
Over load protection	% of Iout rated; Hiccup mode			155		%
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			190	220	250	KHz
Safety meets						IEC/ EN/ UL62368-1
Standard approvals						EN50155 EN45545-2
Chassis material						Aluminum
Weight						95g (3.35oz)
MTBF	MIL-HDBK-217F, Full load					1.003 x 10^6 hrs

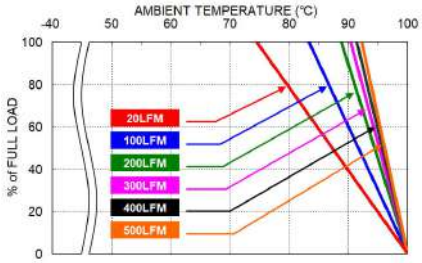
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature		-40		+100	℃
Maximum case temperature				100	℃
Over temperature protection			108		℃
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

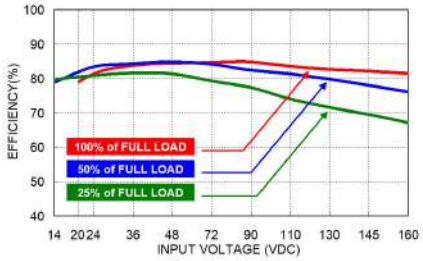
EMC SPECIFICATIONS

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

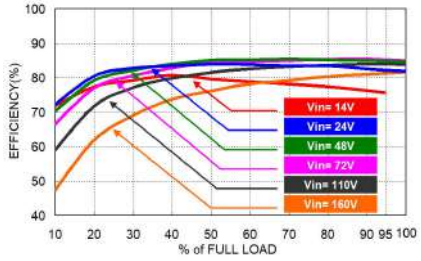
CHARACTERISTIC CURVE



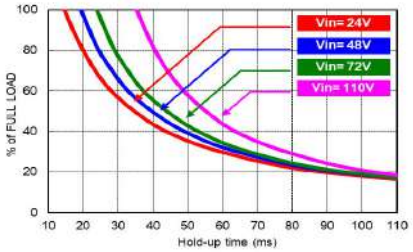
URCD20-72S05U Derating Curve



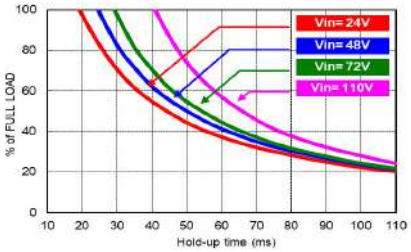
URCD20-72S05U Efficiency vs. Input Voltage



URCD20-72S05U Efficiency vs. Output Load



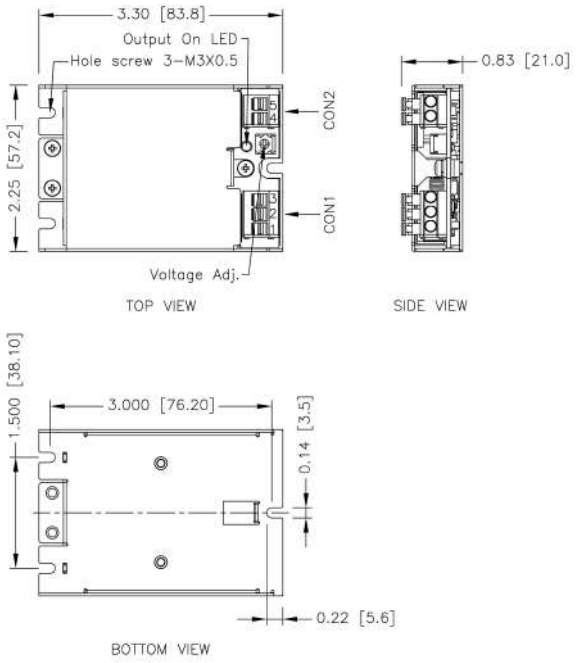
URCD20-72S05U Hold-up Time Curve



URCD20-72S05U-H Hold-up Time Curve (Options)

MECHANICAL DRAWING

CHASSIS MOUNTING TYPE

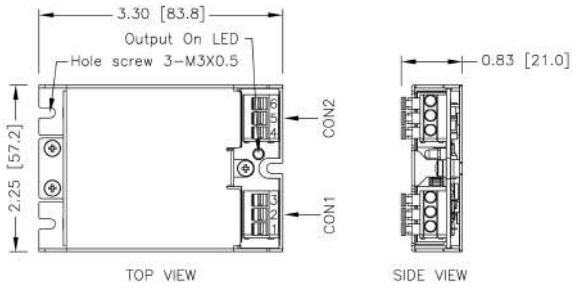


TERMINAL CONNECTION

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

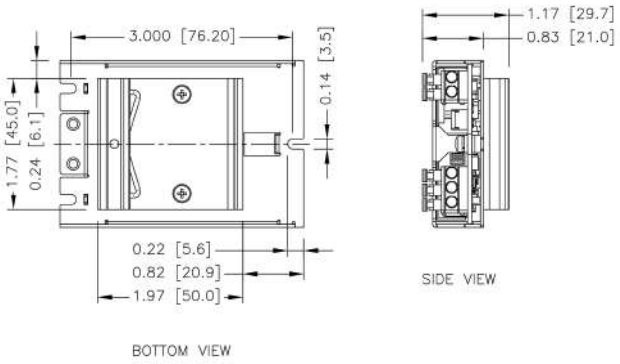
NO.	DUAL
1	+Vin
2	-Vin
3	Ctrl
4	-Vout
5	Common
6	+Vout

※ 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 (OPTION)

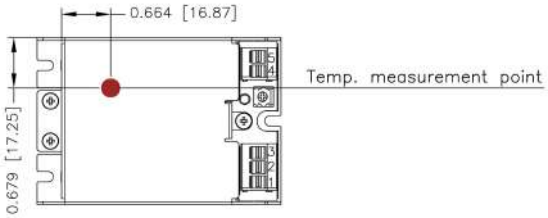


1. All dimensions in Inch [mm]
   Tolerance : X.XX±0.02 [X.X±0.5]
   X.XXX±0.01 [X.XX±0.25]
2. M3x0.5 screw locked torque MAX 3.4kgf-cm/0.33N-m

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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