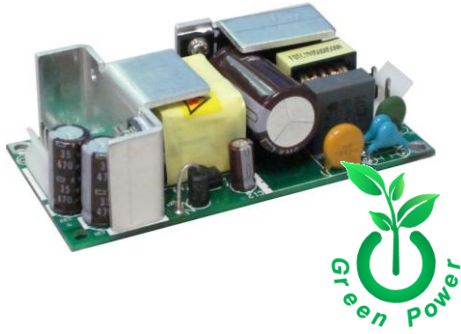




power supplies for industry
open frame PSU 60w 24VDC
TYP INR ES 065
NR. 20065



Features

- 60W with convection-cooled and 80W with forced air cooling of single output power supply
- Compact size 2 x 4 inch
- Class I & Class II construction
- Meets EMI CISPR/FCC class B
- No-load power consumption < 0.5W
- Optional +5Vsb & Remote on/off function

1. Description

The INR ES 065 is a 60W rated, 80W max., single output power supply for general purpose, which has additional +5vsb output function. Dual constructions design, both class I & class II are available.

Output Voltage	Mini. Output Current	Rated Output Current	Max Output Current	Line	Load	Ripple & Noise p-p (Note 1)	Initial Setting Accuracy (Note 2)
				Regulation (Note 5)	Regulation (Note 5)		
+24V	0A	2.5A	3.33A	±1%	±1%	±1%	±1%
+5Vsb (Note 3)	0A	-	0.5A	±1%	±1%	±1%	±2.5%

Total Output Power: Max. 80W with 7 CFM force air cooling^(Note 4); 60W convection cooled at 50°C environment temperature.

Note: 1) Measured by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor.

2) Initial Setting Accuracy is at Input 110VAC and all output at 60% rated load.

3) With optional +5Vsb combining remote on/off function, please refer to paragraph 5 for the detail model name coding.

4) Air flow from IC3 to the body of PSU with distance 50mm maximum.

5) Please see the definition in paragraph 3.

6) MAX output current can be sustained if the total power doesn't exceed 60W.

2. Input Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Input Voltage	Continuous input range.	90	115/230	264	VAC
Input Frequency	AC input.	47		63	Hz
Hold Up Time	Nominal AC Input Voltage (115VAC/230VAC), rated load.	16			ms
Input Current	Nominal AC Input Voltage (115VAC/230VAC), rated load.			1.5	A
Inrush Current	Nominal AC Input Voltage (115VAC/230VAC), one cycle at 25°C.			60	A
Input Protect	Non-user serviceable internally located AC input line fuse.				
No-load power consumption	Nominal AC Input Voltage (115VAC/230VAC)			<0.5	W

3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	At 230VAC Input , rated load ^(Note 1) .	88	89		%
Minimum load		See Chart of Description			
Ripple & Noise	Rated load, 20MHz bandwidth	See Chart of Description			
Output Power	Continuous output power.	See Chart of Description			
Line Regulation	Less than $\pm 1\%$ at rated load with $\pm 10\%$ changing in input voltage 115VAC.	See Chart of Description			
Load Regulation	Measured from 60% to 100% rated load and from 60% to 20% rated load ($60\% \pm 40\%$ rated load).	See Chart of Description			
Turn-on Delay	Time required for initial output voltage stabilization		0.3		Sec

Note: 1) It shall be warmed up above 1 hr.

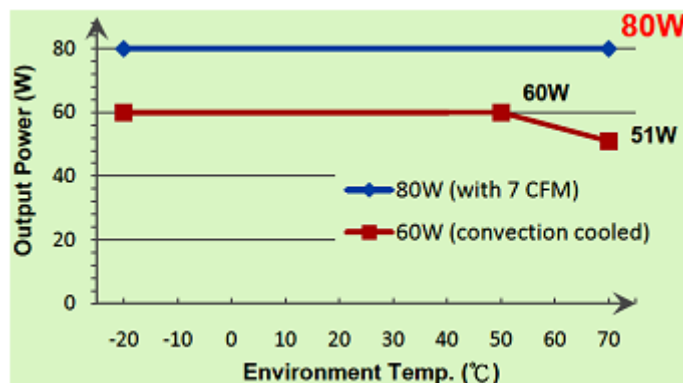
4. Interface Signals and Internal Protection

Parameter	Conditions/Description
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.
Over Voltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will auto recovery the outputs to prevent damaging external circuits.
Remote on/off (optional)	The power supply will be turned on when the power On/Off pin is connected to secondary GND. This function exists only with optional +5Vsb.

5. Environment Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Operating Temperature	Derate linearly above 50°C by 0.75% per °C to a maximum temperature of 70°C, with convection cooled.	-20		+70	°C
Storage Temperature		-40		+85	°C
Relative Humidity	Non-condensing.	5		95	%RH
Altitude	Operating Non-operating			3K 4K	Meter

Performance curve



* Test within horizontal installation, for other orientation, please confirm with us.

6. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units	
Approvals	IEC 60950-1, 2 nd Edition				CE approved	
	EN 60950-1, 2 nd Edition					
	UL 60950-1, 2nd Edition,				UL, cUL approved	
	CSA C22.2 No. 60950-1-07, 2nd Edition					
	GB 4943-2011				CCC approved	
Hi-Pot	Input to output	3000			VAC	
EMI (Note 1, 2.)	EN 55022 / CISPR 22 & FCC Part 15	B			Class	
	EN 61204-3	B				
EMS	IEC 61000-4-2 ±8KV air discharge, ±6KV contact discharge	A			Criteria	
	IEC 61000-4-3 10V/m	A				
	IEC 61000-4-4 ±2KV Line & PE	A				
	IEC 61000-4-5 L-N:±1KV, L/N-PE:±2KV	A				
	IEC 61000-4-6 10Vrms	A				
	IEC 61000-4-8 10A/m	A				
	IEC 61000-4-11	Voltage dips >95%, 0.5 cycle	A			
		Voltage dips 30%, 25 cycles	A			
		Voltage dips 60%, 5 cycles	A / B			
	Voltage interruptions >95%, 250 cycles	B			(Note 3.)	

Note: 1) As a build-in type power supply, the power supply needs to be installed in a suitable enclosure to pass the EMI/EMC

tests. The final assembly has to comply with the valid EMI/EMC and safety.

2) The mounting holes should be connected to each other to conform the EMI limit.

3) The test result of input 240Vac / 100Vac is criteria A / B.

7. Mechanical Specification

Parameter	Conditions/Description					
Dimension	101.6 (L) x 50.8 (W) x 30 (H) mm, Tolerance +/- 0.4mm.					
Connector & Pin Assignment	Location	Pin (Note 1)		Assignment	Proposed Housing	Proposed Terminals
	CN1 (Input)	MX1	JT2	AC in (N)	a. MOLEX : 09-50-1031 (5195-03) or 09-52-4034 (5239-03) or equivalent	a. MOLEX :5194 or 5225 2478, 2578,5167 or 5168 or equivalent
MX2		JT1	AC in (L)	b. JST: VHR-3N or equivalent(Note 2)	b. JST: SVH-21T-P1.1 or equivalent	
CN2 (Output) (Single)	MX1	JT4	0 V	a. MOLEX : 09-50-1041 (5195-04) or 09-52-4044 (5239-04) or equivalent	a. MOLEX :5194 or 5225 2478, 2578,5167 or 5168 or equivalent	
	MX2	JT3	0 V			
	MX3	JT2	+ V	b. JST: VHR-4N or equivalent(Note 2)	b. JST: SVH-21T-P1.1 or equivalent	
	MX4	JT1	+ V			
CN3 (Note 3)	MX1	JT3	+5Vsb	a. MOLEX : 22-01-1032 (5051-03) or 51191-0300 or equivalent	a. MOLEX :2759 or 5159, 50802 or equivalent	
	MX2	JT2	0 V			
	MX3	JT1	RC	b. JST: XHP-3 or equivalent (Note 2)	b. JST: SXH-001T-P0.6N, SXH-001T-P0.6 or SXH-002T-P0.6 or equivalent	

Note: 1) The pin assignment "MX" for Molex type connector or equivalent, "JT" for JST type connector.

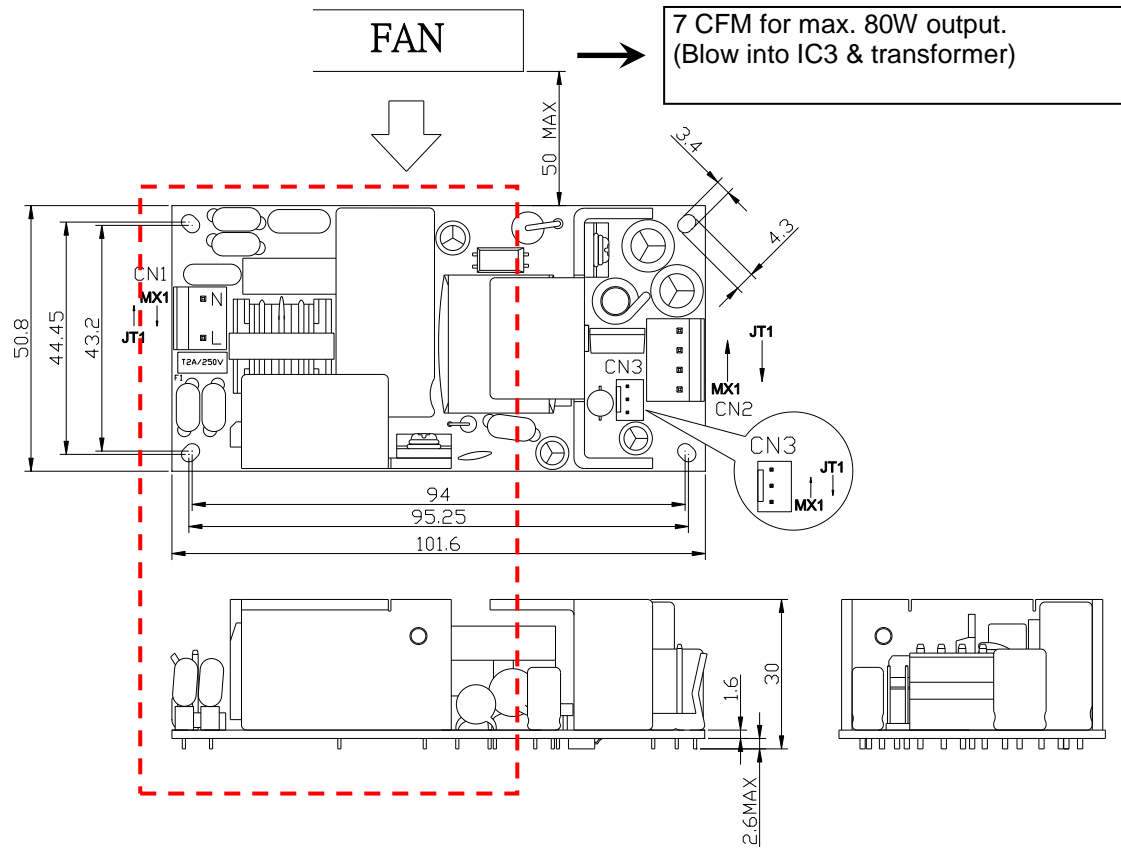
2) Exist with model no. suffixed -J, please see the comparison in paragraph 5.

3) Exist with model no. suffixed -SB, please see the comparison in paragraph 5.

Mechanical drawing (M/N:INR ES 065)

Unit: mm

Tolerance: +/- 0.4mm



*Application note:

The installation shall be kept in an isolation distance min. 2.8mm between the unit and the system chassis. There exist hazardous voltage in dotted area, keep insulating to avoid hazardous electric shock.

SPECIFICATION

For

SWITCHING POWER SUPPLY

INR ES 065

Revision history

REV.	Feb. 23 rd 2011	Established.
REV.	Apr. 15 th 2011	Added the EMI conditions.
		Added the mechanical drawing.
		Revised the initial setting accuracy of +5Vsb to $\pm 1.5\%$.
REV.	Jun. 1 st 2011	Revised the mechanical drawing; updated the Dip test criteria.
REV.	Jul. 14 th 2011	Updated the safety approval status; Revised the mechanical drawing.
REV.	Nov. 2 nd 2011	INR ES 065 have no-load power consumption < 0.5W capability.
REV.	Apr. 6 th 2012	Revised the dimensions of mounting holes.
REV.	Jan. 3 rd 2013	Added second type of connector.
REV.	July 9 th 2013	Add CCC safety approval logo and standard for only INR ES 065
REV.	May 21 st 2015	Changed the initial setting accuracy of +5Vsb from $\pm 1.5\%$ to $\pm 2.5\%$
REV.	Nov. 5 th 2015	1.Changed Molex Proposed Terminals from 5176 to 5167.
		2.Added "or equivalent" after "Molex" and "JST".
REV.	Jan. 19 th 2016	a)Changed +5Vsb Rated Output Current 0.1A to "-", Max Output Current 0.1A to 0.5A
		b)Added note 6 at Description.



■ REO Elektronik AG

Im Halbiacker 5a · CH-8352 Elsau

Tel.: +41 (0)52 363 2820

Fax: +41 (0)52 363 1241

E-Mail: info@reo.ch

Internet: www.reo.ch

Shop: shop.reo.ch

Divisions:

REO Vibratory Feeding and Power Electronics Division

REO Vibratory Feeding and Power Electronics Division
Brühler Straße 100 · D-42657 Solingen
Tel.: +49 (0)212 8804 0 · Fax: +49 (0)212 8804 188
E-Mail: info@reo.de

REO Train Technologies Division

REO Train Technologies Division
Erasmusstraße 14 · D-10553 Berlin
Tel.: +49 (0)30 3670236 0 · Fax: +49 (0)30 3670236 10
E-Mail: zentrale.berlin@reo.de

REO Drives Division

REO Drives Division
Holzhausener Straße 52
D-16866 Kyritz
Tel.: +49 (0)33971 485 0 · Fax: +49 (0)33971 485 90
E-Mail: info@reo.de

REO Medical and Current Transformer Division

REO Medical and Current Transformer Division
Schulholzinger Weg 7 · D-84347 Pfarrkirchen
Tel.: +49 (0)8561 9886 0 · Fax: +49 (0)8561 9886 40
E-Mail: info@reo.de

REO Test and PowerQuality Division

REO Test and PowerQuality Division
Brühler Straße 100 · D-42657 Solingen
Tel.: +49 (0)212 8804 0 · Fax: +49 (0)212 8804 188
E-Mail: info@reo.de

PRODUCTION+SALES:

■ China

REO Shanghai Inductive Components Co., Ltd
No. 536 ShangFeng Road · Pudong, 201201 Shanghai · China
Tel.: +86 (0)21 5858 0686 · Fax: +86 (0)21 5858 0289
E-Mail: info@reo.cn · Internet: www.reo.cn

■ India

REO GPD INDUCTIVE COMPONENTS PVT. LTD
2/202 Luna Road · Village Luna · Taluka Padra
Vadodara · 391440 · India
Tel.: +91 (2662) 221723
E-Mail: info@reogpd.com · Internet: www.reo-ag.in

■ USA

REO-USA, Inc.
8450 E. 47th St · USA-Indianapolis, IN 46226
Tel.: +1 317 8991 395 · Fax: +1 317 8991 396
E-Mail: info@reo-usa.com · Internet: www.reo-usa.com

SALES:

■ France

REO VARIAC S.A.R.L.
ZAC Du Clos aux Pois 1 · 6/8 rue de la Closerie-LISSES · F-91048 Evry Cédex
Tel.: +33 (0)1 6911 1898 · Fax: +33 (0)1 6911 0918
E-Mail: reovariac@reo.fr · Internet: www.reo.fr

■ Great Britain

REO (UK) Ltd.
Units 2-4 Callow Hill Road · Craven Arms · Shropshire SY7 8NT · UK
Tel.: +44 (0)1588 673 411 · Fax: +44 (0)1588 672 718
E-Mail: main@reo.co.uk · Internet: www.reo.co.uk

■ Italy

REO ITALIA S.r.l.
Via Treponti, 29 · I-25086 Rezzato (BS)
Tel.: +39 030 279 3883 · Fax: +39 030 279 0600
E-Mail: info@reotalia.it · Internet: www.reotalia.it

■ Poland

REO CROMA Sp. z o.o.
ul. Pozaryskiego 28, bud 20 · PL-04-703 Warszawa
Tel.: +48 (0)22 812 3066 · Fax: +48 (0)22 815 6906
E-Mail: croma@croma.com.pl · Internet: www.croma.com.pl

■ Spain

REO ESPAÑA 2002 S.A.
C/Manuel Ventura i Campeny 21B · local 9 · E-08339 Vilassar de Dalt (Barcelona)
Tel.: +34 937 509 994 · Fax: +34 937 509 995
E-Mail: info@reospain.com · Internet: www.reospain.com

■ Turkey

REOTURKEY ELEKTRONİK San. ve Tic. Ltd. Şti.
Halil Rifatpasa Mah. · Darülceme CD Perpa Tic Merkezi
B Blok Kat 8 No:1095 · TR-34384 Sisli – Istanbul
Tel.: +90 (0)212 2215 118 · Fax: +90 (0)212 2215 119
E-Mail: info@reo-turkey.com · Internet: www.reo-turkey.com