

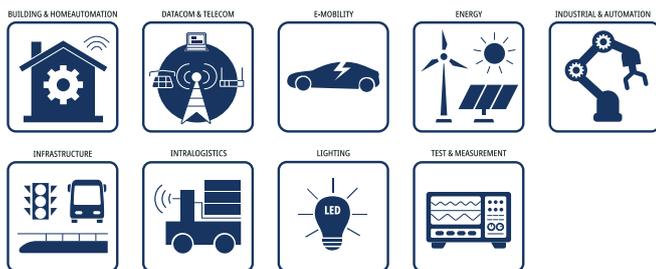
### FEATURES

- Extended input: 90-305VAC
- 65 watts with 11 W/in<sup>3</sup> or 20 W/in<sup>3</sup> density
- OVC III up to 3000 or 5000m altitude
- Thermally effective basplate on 1.5 x 3 inch footprint
- THT solder module on 1.5 x 2 inch; P12+ pinning
- No-load power <100mW; Efficiency: 90% plus
- Safety ratings up to 90 °C operating temperature
- Print module EMI: EN55032 “B” @ floating loads only
- Open brick: EN55032 “B” incl. earth referenced load
- 3 year warranty



THT: 52.5 x 40.0 x 25.5mm (2.06 x 1.57 x 1.0 inch)  
 OIB: 79.0 x 40.8 x 31.0mm (3.11 x 1.60 x 1.22 inch)

### APPLICATIONS



### SAFETY & EMC



### DESCRIPTION

RACM65S-K/277 are the new benchmark in power density for low power AC-DC power supplies with over 90% efficiency over a load range of 6 to 65 watts. Two different mounting options as encapsulated solder mount modules on industry standard P12+ pinning at 20 W/in<sup>3</sup> or in an open chassis mount structure with optional cover on a 1.5”x3” footprint with 31 mm overall height. International safety approvals according to medical, household and industrial standards with OVC III rating up to 5000m operating altitude ensure worldwide use in ambient temperatures from -40 °C to 90 °C. The integrated EMC filter according to EN55032 Class “B” for floating loads only in the solder modules and additionally for grounded load connections in the chassis mount modules simplify system implementation.

### SELECTION GUIDE

Part Number	Input Voltage Range [VAC]	Output Voltage nom. [VDC]	Output Current nom. [A]	Efficiency <sup>(1)</sup> typ. [%]	Output Power continuous [W]
RACM65S-05SK/277 <sup>(2)</sup>	90-305	5	8	88	40
RACM65S-12SK/277 <sup>(2)</sup>	90-305	12	5.42	91	65
RACM65S-15SK/277 <sup>(2)</sup>	90-305	15	4.34	91	65
RACM65S-24SK/277 <sup>(2)</sup>	90-305	24	2.71	90	65
RACM65S-36SK/277 <sup>(2)</sup>	90-305	36	1.81	91	65
RACM65S-48SK/277 <sup>(2)</sup>	90-305	48	1.35	91	65
RACM65S-52SK/277 <sup>(2)</sup>	90-305	52	1.25	91	65

Note1: Efficiency is tested at 230VAC and full load at +25°C ambient

# RACM65S-K/277 Series $\diamond$ AC/DC Power Supply

65W  $\diamond$  Input: 100V-277VAC

## MODEL NUMBERING



Note2: "/277" only= THT-solder mount, encapsulated, potted  
add suffix "/OIB" open frame with integrated base

## ORDERING INFORMATION

Model	Output Voltage	Package Type	
		2.06" x 1.57" THT-solder mount	3.11" x 1.6" open frame with integrated base "/OIB"
RACM65S-05SK/277	5VDC	y	y
RACM65S-12SK/277	12VDC	y	y
RACM65S-15SK/277	15VDC	y	y
RACM65S-24SK/277	24VDC	y	y
RACM65S-36SK/277	36VDC	y	y
RACM65S-48SK/277	48VDC	y	y
RACM65S-52SK/277	52VDC	y	y

y= standard portfolio; on request= MOQ may apply on project base

## BASIC CHARACTERISTICS (measured @ $T_{AMB} = 25^{\circ}\text{C}$ , nom. $V_{IN}$ , full load and after warm-up unless otherwise stated)

Parameter	Condition	Min.	Typ.	Max.
Nominal Input Voltage	50/60Hz	100VAC		277VAC
Operating Range <sup>(3)</sup>	47-63Hz	90VAC		305VAC
Input Current	5Vout			1.2A
	others			1.5A
Inrush Current	cold start at 25°C	120VAC		25A
		230VAC		50A
		277VAC		60A
No Load Power Consumption	5Vout		100mW	200mW
	others		60mW	100mW
Ecodesign Standby Mode Use (Available output power for stated input power)	$P_{IN} = 0.3\text{W}$	150mW		
	$P_{IN} = 0.5\text{W}$	300mW		
Input Frequency Range	AC Input	47Hz		63Hz
Minimum Load		0%		
Power Factor	120VAC		0.6	
	230/277VAC		0.5	
Start-up time				200ms
Rise time				25ms
Hold-up time	230VAC	5Vout	50ms	
		others	20ms	
Internal Operating Frequency				100kHz
Output Ripple and Noise <sup>(4)</sup>	20MHz BW	5Vout		100mVp-p
		others		1% of Vout

Note3: The products were submitted for safety files at AC-Input operation. (90V-305VAC)

Note4: Measurements are made with a 0.1µF MLCC & 10µF E-cap in parallel across output. (low ESR)

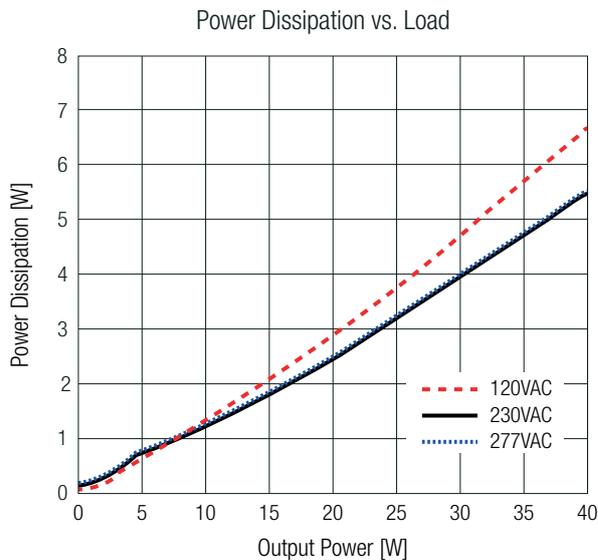
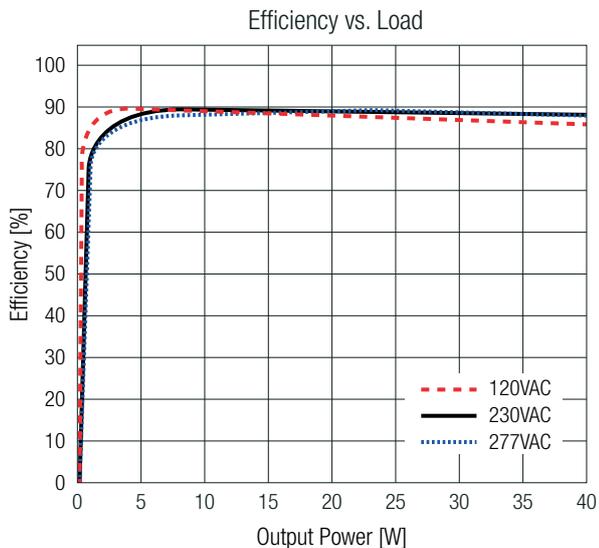
The test setup can have an impact on ripple noise values (placement of scope probe, capacitors, it's specifications, wires, PCB tracks, distances, etc.)

# RACM65S-K/277 Series $\diamond$ AC/DC Power Supply

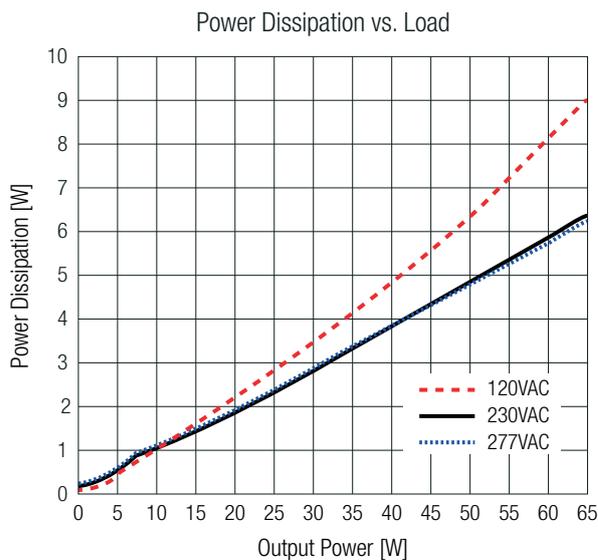
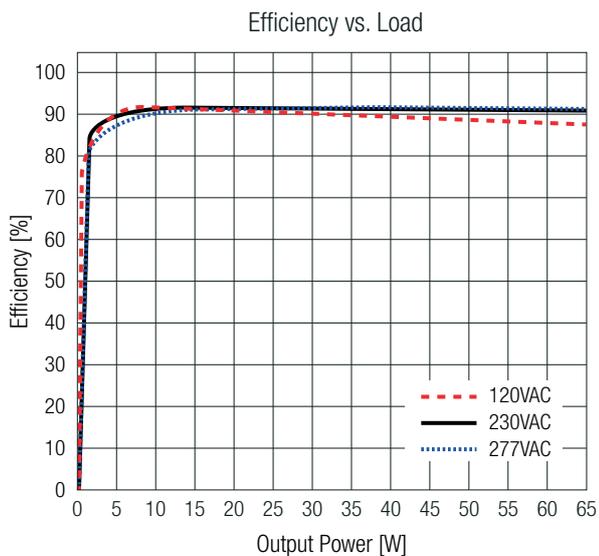
65W  $\diamond$  Input: 100V-277VAC

**BASIC CHARACTERISTICS** (measured @  $T_{AMB}= 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

**5Vout**



**others**



**REGULATIONS** (measured @  $T_{AMB}= 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

Parameter	Condition	Value
Output Accuracy		$\pm 3.0\%$ max.
Line Regulation	low line to high line	$\pm 1.0\%$ max.
Load Regulation <sup>(5)</sup>	10% to 100% load	2.5% max.
Transient Response	25% load step change	1.0V max.
	recovery time	3ms max.

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

# RACM65S-K/277 Series $\diamond$ AC/DC Power Supply

65W  $\diamond$  Input: 100V-277VAC

**PROTECTIONS** (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

Parameter	Type		Value
Internal Input Fuse			T3.15A, slow blow type
Short Circuit Protection (SCP)			hiccup mode, auto recovery
Over Voltage Protection (OVP)			105%-150%, hiccup mode
Over Current Protection (OCP)			110%-150%, hiccup mode
Over Voltage Category (OVC)	according to 62368-1, 61558	all versions	OVC II (5000m)
		"/277" version	OVC III (5000m)
		"/OIB" version	OVC III (3000m)
DC ON LED	"/OIB" version only		green light, output voltage present
Class of Equipment			Class II
Isolation Voltage <sup>(6)</sup>	I/P to O/P	1 minute	4kVAC
Insulation Grade			reinforced
Isolation Resistance			1G $\Omega$ min.
Isolation Capacitance			100pF typ.
Means of Protection			2MOPP
Suitable For Medical Device Classification			designed to support type BF applications

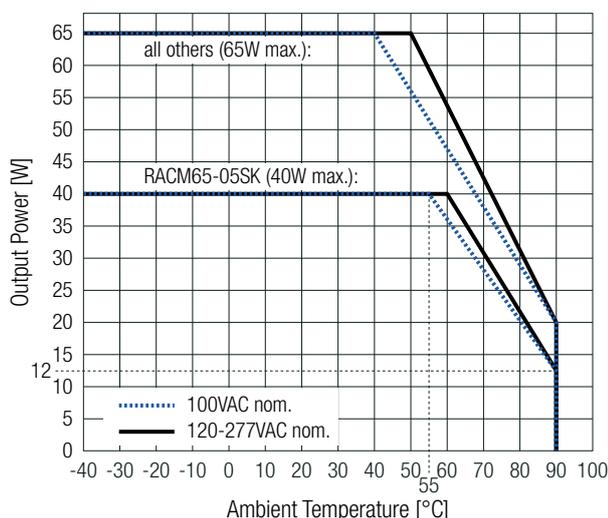
Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

**ENVIRONMENTAL** (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

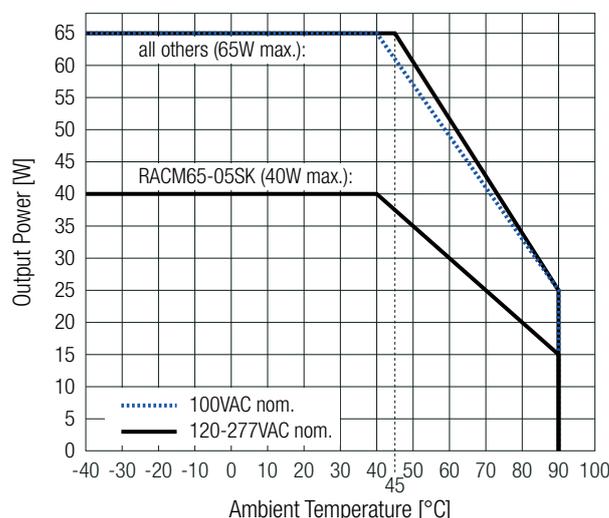
Parameter	Condition		Value
Operating Ambient Temperature Range			-40°C to +90°C
Maximum Case Temperature			+110°C
Temperature Coefficient			$\pm 0.03\%/K$
Operating Altitude	according to 62368-1, 61558	all versions	5000m
Operating Humidity	non-condensing		90% RH max.
Pollution Degree			PD2
Shock			5-500Hz, 20m/s <sup>2</sup> 15 min for each axis
MTBF	according to MIL-HDBK-217, G.B.	$T_{AMB} = +25^{\circ}\text{C}$	450 x 10 <sup>3</sup> hours
Design Lifetime	230VAC and full load	$T_{AMB} = +25^{\circ}\text{C}$	10 x 10 <sup>3</sup> hours

**Convection cooled rating @ still air <0.1m/s<sup>(7)</sup>**

THT-solder mount Versions



"/OIB" Version

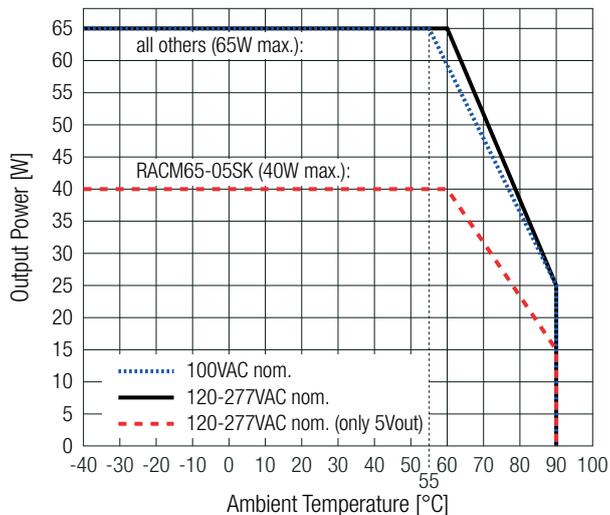


# RACM65S-K/277 Series $\diamond$ AC/DC Power Supply

65W  $\diamond$  Input: 100V-277VAC

**ENVIRONMENTAL** (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

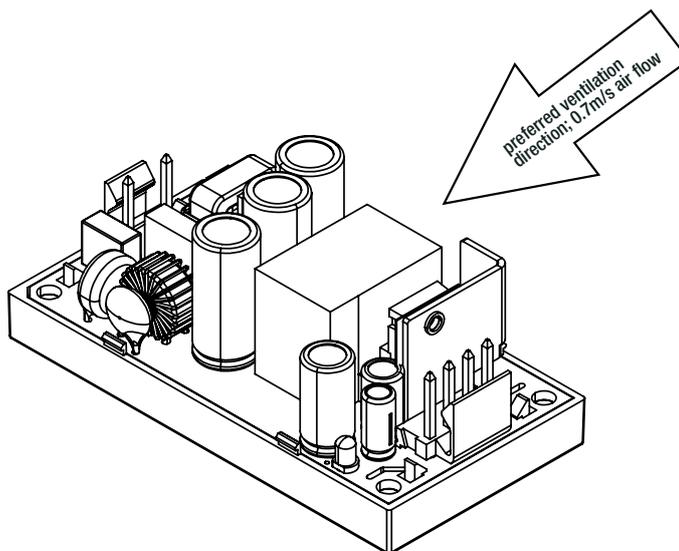
Air flow rating @ 0.7m/s<sup>(7)</sup>



Note7: "VAC nom." values include  $\pm 10\%$  tolerance

**ENVIRONMENTAL** (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

Preferred ventilation direction  
valid for "/OIB"



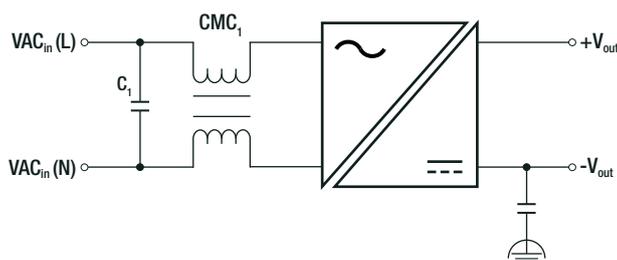
## SAFETY & CERTIFICATIONS

Certificate Type (Safety)	Report Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements 3rd Edition	E491408-A6044-UL	UL62368-1:2019 3rd Edition CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
Audio/Video, information and communication technology equipment - Part1: Safety requirements 3rd Edition	241213015	IEC62368-1:2018 3rd Edition EN IEC 62368-1:2020+A11:2020
Medical electrical equipment Part 1: General requirements for basic safety and essential performance	241213014	IEC60601-1:2005+AM2:2020 Edition 3.2
Household and similar electrical appliances – Safety – Part 1: General requirements	64.110.24.06952.01	IEC60335-1:2010 + C1:2016 5th Edition EN60335-1:2012+ A15:2021
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V 3rd Edition	085-240695101-000	IEC61558-1:2017 3rd Edition
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements		IEC61558-2-16:2009+A1:2013 1st Edition
RoHS2		RoHS-2011/65/EU + AM-2015/863

### SAFETY & CERTIFICATIONS

EMC Compliance according to EN55032	Condition	Standard
Electromagnetic compatibility of multimedia equipment – Emission Requirements	All Versions without external filter under floating load THT-print-mount version plus „external filter“ under earth coupled load	EN55032:2015+A11:2020
EMC Compliance according to EN61204-3	Condition	Standard
Low voltage power supplies, d.c. output Part 3: Electromagnetic compatibility (EMC)		EN IEC 61204-3:2018
ESD Electrostatic discharge immunity test	Air: $\pm 2, 4, 8kV$ Contact: $\pm 4kV$	IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10V/m (80-1000MHz), 3V/m (1400-2000MHz), 1V/m (2000-2700MHz)	IEC/EN61000-4-3:2006 + A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Port: L, N, L-N: $\pm 2kV$	IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	valid for THT versions: AC Port without Filter: $\pm 1kV$ L-N; $\pm 2kV$ L-PE & N-PE	IEC/EN61000-4-5:2014 + A1:2017, Criteria A
	valid for THT versions: AC Port with Filter: $\pm 2kV$ L-N; $\pm 4kV$ L-PE & N-PE	
Immunity to conducted disturbances, induced by radio-frequency fields	10Vrms (0.15-80MHz)	IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	30A/m	IEC61000-4-8:2009, Criteria A EN61000-4-8:2010, Criteria A
Voltage Dips	100% (0.5P, 1.0P); 20%, 30%, 60%	EN61000-4-11:2004 + A1:2017, Criteria A
Voltage Interruptions	100%	EN61000-4-11:2004 + A1:2017, Criteria B
Limits of Voltage Fluctuations & Flicker		EN61000-3-3:2013

### Suggested external filter to comply with EN55032 “B” for loads coupled to earth or GND and PELV circuits



#### Component List

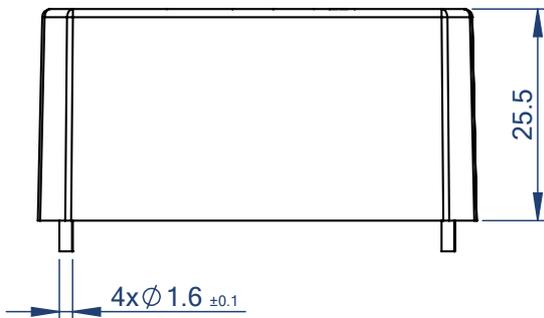
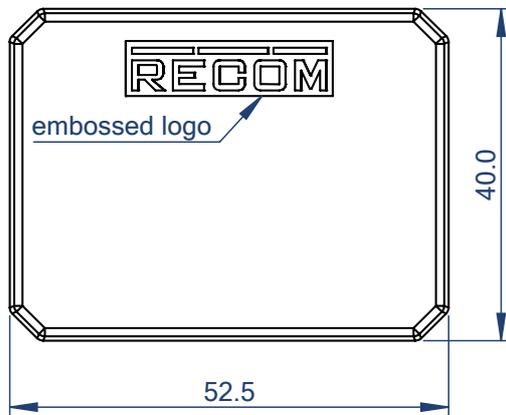
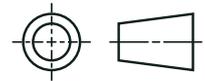
C <sub>1</sub>	CMC <sub>1</sub>
0.22 $\mu$ F	25mH

### DIMENSION & PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Materials	case/baseplate (isolated)	plastic, (UL94 V-0)
	potting (THT-solder mount only)	silicone, (UL94 V-0)
	PCB	FR4, (UL94 V-0)
Dimension (LxWxH)	THT versions	52.5 x 40.0 x 25.5mm 2.06 x 1.57 x 1.0 inch
	“/OIB”	79.0 x 40.8 x 31.0mm 3.11 x 1.60 x 1.22 inch
Weight	THT-solder mount	122g typ. 0.27 lbs
	“/OIB”	81g typ. 0.18 lbs

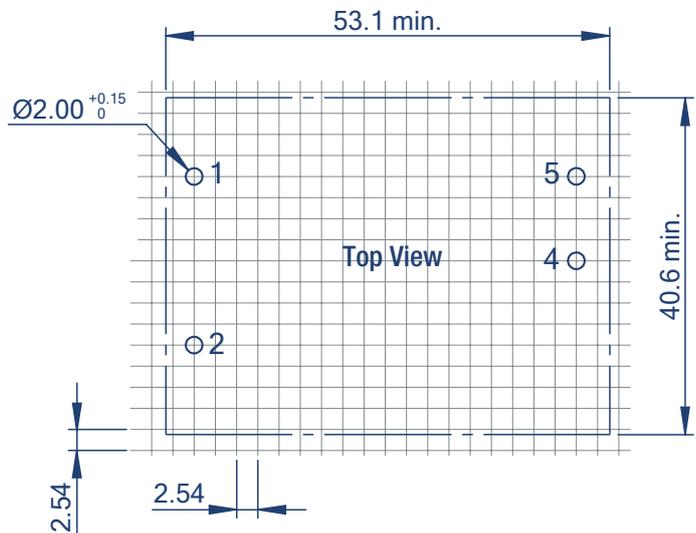
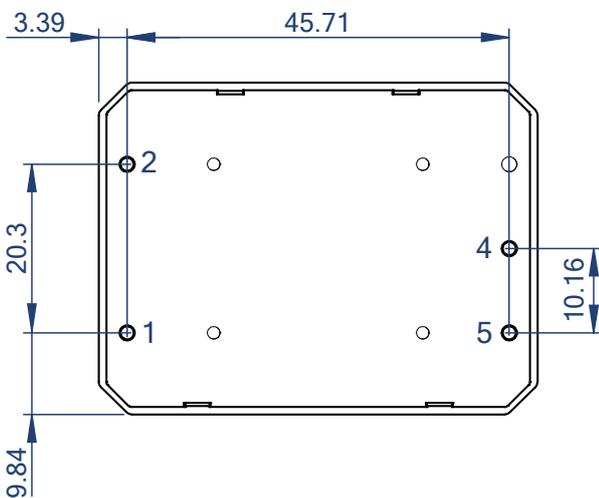
### DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing THT-solder mount (mm)



#### Pinning information [P12]

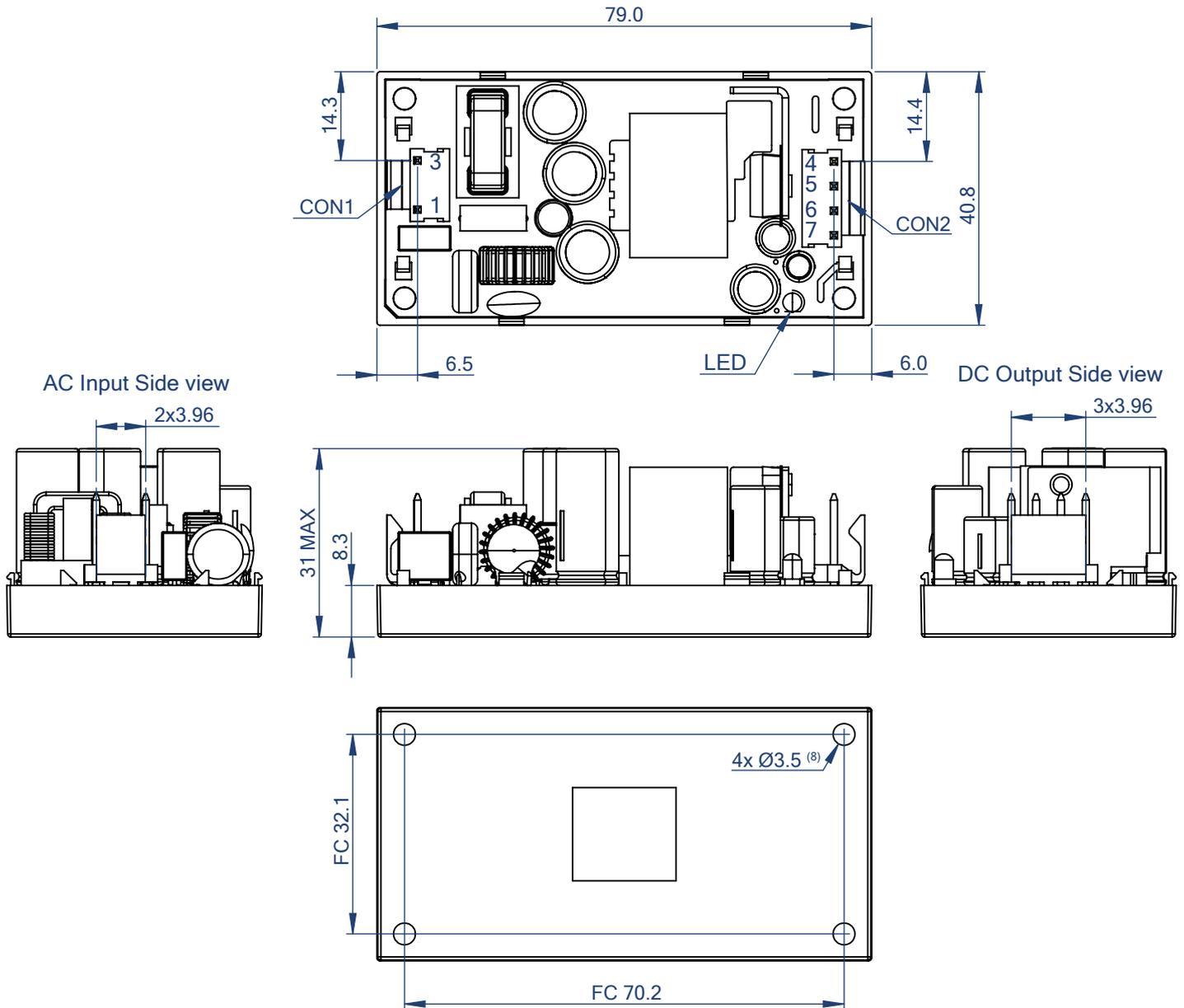
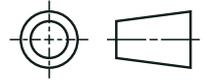
Pin #	Single
1	VAC in (N)
2	VAC in (L)
4	-Vout
5	+Vout



Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.25mm

### DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing "/0IB" (mm)



Note8: Secure the device to the mounting surface using two M3 screws. Use cylinder head screws only. Countersunk screws are not permitted. Recommended tightening torque= 0.7Nm

#### Connector Information

AC Input (CON1)		
#	Function	Connector
1	VAC in (L)	3 Pins (Pin2 removed)
3	VAC in (N)	with 3.96mm pitch

#### DC Output (CON2)

#	Function	Connector
4, 5	-Vout	4 Pins
6, 7	+Vout	with 3.96mm pitch

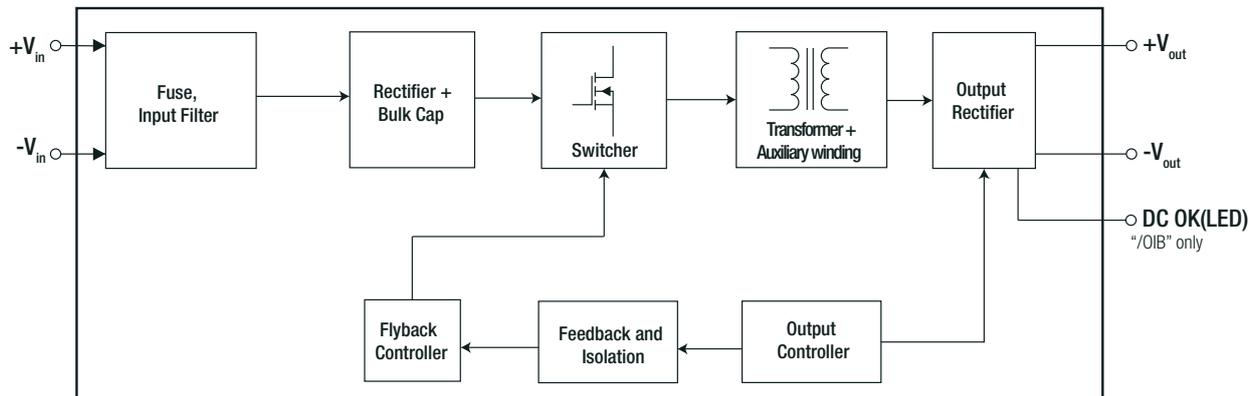
FC= Fixing centers

#### Compatible Connector CON1 & CON2

Housing	Crimp Terminal
Molex 41695 Series or equivalent	Molex 2478 Series or equivalent

Tolerance: xx.x=  $\pm 0.5$ mm  
xx.xx=  $\pm 0.25$ mm

### BLOCK DIAGRAMM



### PACKAGING INFORMATION

Parameter	Type		Value
	Packaging Dimension (LxWxH)	tube	
	tray	"/OIB" version	365.0 x 210.0 x 56.0mm
Packaging Quantity	THT version		11pcs
	"/OIB" version		12pcs
Storage Temperature Range			-40°C to +90°C
Storage Humidity	non-condensing		90% RH max.

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