

## 20W CONVECTION COOLED

AC-DC POWER SUPPLIES

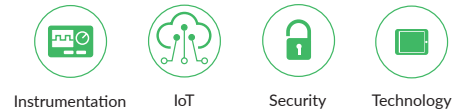
The ECE20 is a series of PCB mounting encapsulated AC-DC single output power supplies designed for low power ITE and industrial applications. With approvals to world-wide safety standards, compliance with class B for conducted and radiated emissions and a 20%, 30s peak load capability, these class II isolation parts benefit system designers with easy integration into a wide range of applications.



### Features

- Compact Size
- Single Outputs from 3.3 to 48V
- Encapsulated
- PCB Mount
- <0.3W No Load Input Power
- Peak Load Capability
- 3 Year Warranty

### Applications



### Dimensions

2.06" x 1.07" x 0.91" (52.4 x 27.2 x 23.0mm)

### Models & Ratings

Model Number	Output Voltage	Output Current		Efficiency <sup>(2)</sup>	Output Power
		Nominal	Peak <sup>(1)</sup>		
ECE20US03	3.3VDC	4.55A	5.85A	73%	15W
ECE20US05	5.0VDC	4.00A	5.20A	77%	20W
ECE20US09	9.0VDC	2.22A	2.89A	83%	20W
ECE20US12	12.0VDC	1.67A	2.17A	82%	20W
ECE20US15	15.0VDC	1.33A	1.73A	83%	20W
ECE20US24	24.0VDC	0.83A	1.08A	82%	20W
ECE20US48	48.0VDC	0.42A	0.55A	86%	20W

#### Notes:

1. Peak load lasting <30s with a maximum duty cycle of 10%, average output power not to exceed nominal power.
2. Average of efficiencies measured at 25%, 50%, 75% & 100% load with 230VAC input.

## Summary

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	85		264	VAC	Derate from 100% at 90VAC to 90% at 85VAC
No Load Input Power			0.3	W	
Efficiency		83		%	Model dependent
Operating Temperature	-25		+70	°C	Derate linearly from 100% at +50°C to 50% at +70°C
EMC	EN55032 Level B Conducted & Radiated, EN601000-3-2, EN61000-3-3				
Safety Approvals	IEC60950-1/ IEC62368-1, UL 62368-1 & CAN/CSA C22.2 No. 62368-1, EN62368-1				

## Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	85		264	VAC	Derate load from 100% at 90VAC to 90% at 85VAC
	120		370	VDC	DC input not included in safety approvals, external DC rated fuse required. Derate load from 100% at 127VDC to 90% at 120VDC
Input Frequency	47		63	Hz	
Input Current			0.3	A rms	At 230VAC
No Load Input Power			0.3	W	
Inrush Current			20/40	A	20A at 115VAC, 40A at 230VAC, cold start at 25°C
Earth Leakage Current					Class II construction no earth
Input Protection	Internal T1 A/250VAC fuse				
Power Factor	EN61000-3-2 Class A				

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		48	VDC	
Initial Set Accuracy			±1	%	
Minimum Load	0			A	No minimum load required
Line Regulation			±0.5	%	
Load Regulation			±1		
Start Up Delay			2	s	
Start Up Rise Time			16	ms	
Hold Up Time		8		ms	At full load and 115VAC
Transient Response			4	%	Max deviation, recovery to within 1% in less than 500µs for a 25% load change
Ripple & Noise			60	mV pk-pk	3.3 & 5V models, 20MHz bandwidth
			1	% pk-pk	All other models, 20MHz bandwidth
Overvoltage Protection	195		216	%	3.3V models
	115		140		All other models
Overload Protection	110		180	%	
Short Circuit Protection					Trip & Restart (hiccup mode)
Temperature Coefficient			0.05	%/°C	

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		83		%	See Models & Ratings
Isolation: Input to Output	3000			VAC	
Switching Frequency		100		kHz	
Power Density			9.97	W/in <sup>3</sup>	
Mean Time Between Failure	450			khrs	MIL-HDBK-217F, +25°C GB
Weight		0.13 (60)		lb (g)	

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-25		+70	°C	Derate linearly from 100% at +50°C to 50% at +70°C
Storage Temperature	-40		+85	°C	
Cooling	Convection-cooled				
Humidity			95	%RH	Non-condensing
Operating Altitude			3000	m	
Vibration	2g, 10Hz to 500Hz, 10 mins/cycle, 60 mins each of 3 axes.				

## Safety Approvals

Certification	Standard	Notes & Conditions
CB	IEC60950-1	
	IEC62368-1	
UL	UL62368-1	
TUV	EN62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

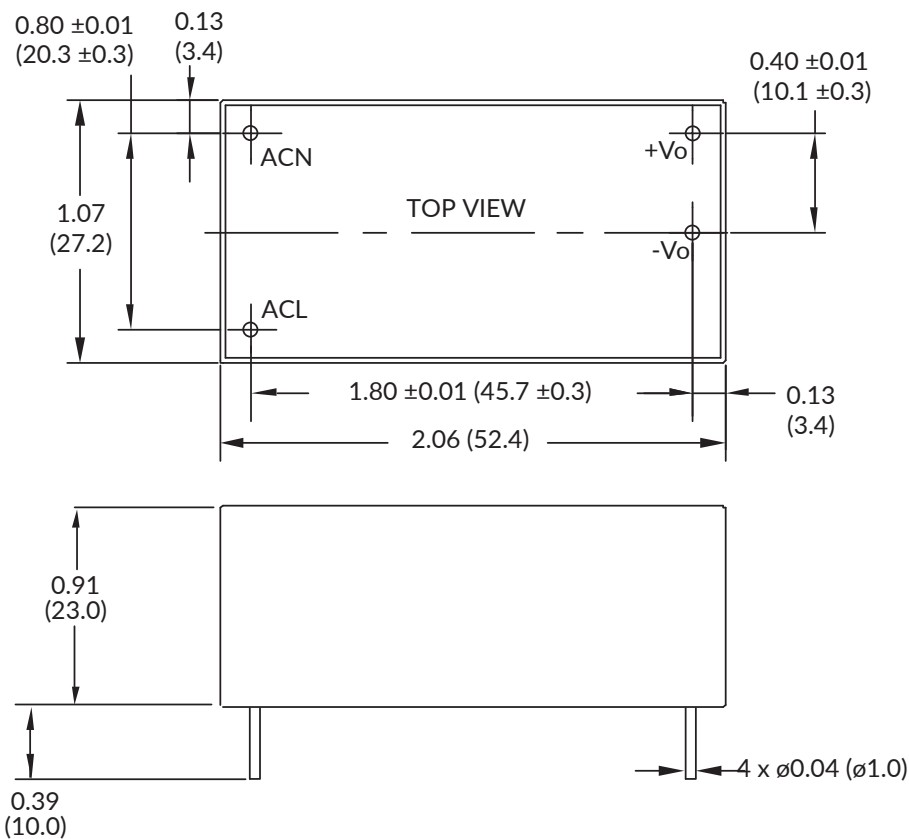
## EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	If output is connected to ground, please contact applications engineering for further information
Radiated	EN55032	Class B	
Harmonic Current	EN61000-4-2, EN61000-3-3	Class A	

## EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	3	A	
Radiated Immunity	EN61000-4-3	10 V/m, 80%	A	
EFT/Burst	EN61000-4-4	3	A	
Surge	EN61000-4-5	3	A	Line to line
Conducted	EN61000-4-6	10Vrms	A	
Magnetic Fields	EN61000-4-8	10A/m	A	
Dips and Interruptions	EN61000-4-11	30% for 10ms	A	
		60% for 100ms	A	
		100% for 5000ms	B	

Mechanical Details



Pin	Function
1	ACN
2	ACL
3	+Vout
4	-Vout

Notes:

1. All dimensions in inches (mm).
2. Weight: 0.13lbs (60g)
3. Tolerances: x.xx = 0.02 (x.x = 0.5), x.xxx = 0.01 (x.xx = 0.25)