# imall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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### **ECE60** Series

### **AC-DC Power Supplies**



### 60 Watts

- Ultra Compact Size
- Single Outputs from 3.3 to 48 V
- Encapsulated
- PCB & Chassis Mount Versions
- <0.3 W No Load Input Power</p>
- -40 to +70 °C Operation
- Peak Load Capability
- 3 Year Warranty



The ECE60 series of compact encapsulated AC-DC power modules are available in both PCB & chassis mount versions offering exceptional power density of  $>10W/in^3$ . Output voltages are available from 3.3 – 48 VDC and these "green power" modules offer high active mode efficiency and low no load power consumption. They also provide a peak load capability up to 130% of nominal power for up to 30s and a wide operating temperature range from -40 to +70°C.

### Dimensions:

ECE60: 3.60 x 1.50 x 1.10" (91.4 x 38.1 x 28.0 mm) ECE60-S: 4.45 x 1.57 x 1.12" (113.0 x 40.0 x 28.5 mm)

### Models & Ratings

Output Dowor	Output Voltage	Output	Current	Efficiency <sup>(4)</sup>	Model Number (2,3)
Output Power	Output voltage	Nominal	Peak (1)		
33 W	3.3 V	10.00 A	13.00 A	79%	ECE60US03
50 W	5.0 V	10.00 A	13.00 A	83%	ECE60US05
60 W	9.0 V	6.67 A	8.67 A	87%	ECE60US09
60 W	12.0 V	5.00 A	6.50 A	87%	ECE60US12
60 W	15.0 V	4.00 A	5.20 A	88%	ECE60US15
60 W	24.0 V	2.50 A	3.25 A	89%	ECE60US24
60 W	36.0 V	1.67 A	2.17 A	88%	ECE60US36
60 W	48.0 V	1.25 A	1.63 A	86%	ECE60US48

#### Notes

1. Peak load lasting <30 s with a maximum duty cycle of 10%, average output power not to exceed nominal power.

2. Add suffix -S to model number to denote chassis mount with screw terminal type, e.g. ECE60US12-S.

3. A screw terminal version (-S) is available with DIN Clip attached. Add suffix 'D', e.g. ECE60US24-SD. DIN Rail mounting clip is available as a separate item, order code ECE60 DIN CLIP.

4. Average of efficiencies measured at 25%, 50%, 75% & 100% load with 230 VAC input.

Summary							
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions		
Input Range	85		264	VAC	Derate load from 100% at 90 VAC to 90% at 85 VAC		
input hange	120		370	VDC			
No Load Input Power		<0.3		W	12-36 V versions		
		<0.5		W	3.3-9 V & 48 V versions		
Efficiency	79	87	89	%	See note 4 above		
Operating Temperature	-40		+70	°C	Some specification parameters may not met below -25 °C. Derate linearly from 100% load at +50 °C to 50% load at 70 °C.		
EMC	EN55022 Level E	EN55022 Level B Conducted & Radiated, EN61000-4, EN61000-3					
Safety Approvals	EN60950-1, UL60950-1, CSA22.2 No. 234 per cUL						

### **ECE60** Series



Input Maximum Notes & Conditions Characteristic Minimum Typical Units 85 264 VAC Input Voltage - Operating Derate load from 100% at 90 VAC to 90% at 85 VAC 120 370 VDC Input Frequency 47 63 Hz Power Factor EN61000-3-2 class A compliant Input Current 0.6 At 230 VAC A rms 0.3 W 12-36 V versions No Load Input Power 0.5 W 3.3-9 V & 48 V versions 25/50 Inrush Current А 115/230 VAC cold start at 25 °C Earth Leakage Current Class II construction no earth Internal T1 A/250 VAC fuse Input Protection

Output					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		48	VDC	See Models and Ratings table
Initial Set Accuracy			±1	%	
Minimum Load	0			A	
Start Up Delay			2	S	
Start Up Rise Time			30	ms	
Hold Up Time	16			ms	At full load and 115 VAC
Line Regulation			±0.5	%	
Load Regulation			±2	%	ECE60US03/05-S
			±1	%	All other models
Transient Response			4	%	Recovery within 1% in less than 500 µs for a 25% load change
			60	mV pk-pk	3.3-5 V versions, 20 MHz bandwidth
Ripple & Noise			75	mV pk-pk	3.3-5 V '-S' versions, 20 MHz bandwidth, 0.1 $\mu F$ capacitor at output terminals
			1	% pk-pk	20 MHz bandwidth all other models
Overveltere Pretection	195		216	% Vnom	ECE60US03 models
Overvoltage Protection	115		140	% Vnom	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	79	87	89	%	See Models & Ratings table
Isolation	3000			VAC	Input to Output
Switching Frequency		100		kHz	
Power Density			10.1	W/in <sup>3</sup>	
Mean Time Between Failure		>300		kHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.42 (191)		lb (g)	ECE60
		0.44 (200)			ECE60-S

Environmental					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+70	°C	Some specification parameters may not met below -25 °C. Derate linearly from 100% load at +50 °C to 50% load at 70 °C.
Storage Temperature	-40		+85	°C	
Cooling					Convection-cooled
Humidity			95	%RH	Non-condensing
Operating Altitude			3048	m	
Vibration	2 g, 10 Hz to 500 Hz, 10 mins/cycle, 60 mins each cycle				

### **ECE60** Series



#### **EMC: Emissions**

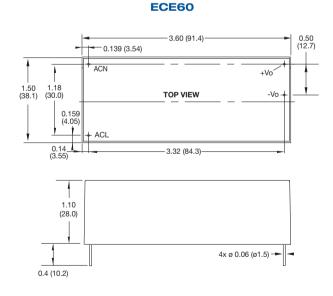
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Conducted	EN55022	Class B		
Radiated	EN55022	Class B		
Harmonic Current	EN61000-3-2			Class A
Voltage Flicker	EN61000-3-3			

### EMC: Immunity

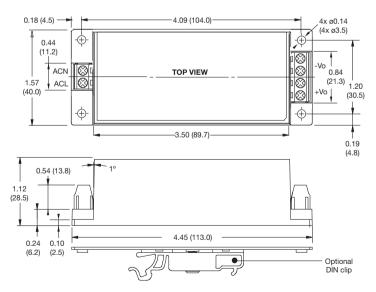
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	3	A	
Radiated	EN61000-4-3	10 V/m 80% mod	A	
EFT	EN61000-4-4	3	A	
Surges	EN61000-4-5	Installation Class 3	A	
Conducted	EN61000-4-6	3	A	
Dips and Interruptions	EN61000-4-11	DIP: 100% 10 ms DIP: 30% 500 ms INT: 100% 5000 ms	A A B	

Safety Approvals		
Safety Agency	Safety Standard	Notes & Conditions
UL	UL60950-1, CSA 22.2 No.234 per cUL	
TUV	EN60950-1	
СВ	IEC60950-1	

### **Mechanical Details**



#### ECE60 Screw Terminal (-S)



#### Notes

1. All dimensions in inches (mm).

2. Weight: ECE60: 0.42 lbs (191 g)

ECE60-S: 0.44 lbs (200 g)

3. Tolerances:  $x.xx = \pm 0.02 (x.x = \pm 0.5), x.xxx = \pm 0.01 (x.xx = \pm 0.25)$