

## ECM Series



- Compact Size - High Power Density
- Low Leakage Current
- Industrial & Medical Approvals
- Class I and Class II Approved
- Level B Conducted Emissions
- EN61000-3-2, -3 Compliant
- Convection Cooled

## Specification

## Input

Input Voltage	• 85-264 VAC (120-370 VDC 40 & 60 W models, 120-270 VDC 100 W models)
Input Frequency	• 47-63 Hz; 440 Hz
Input Current	• 40 W: 0.4 A max at 230 VAC 60 W: 0.6 A max at 230 VAC 100 W: 0.9 A max at 230 VAC
Inrush Current	• 40 A max at 230 VAC
Earth Leakage Current	• <100 $\mu$ A at 115 VAC <200 $\mu$ A at 230 VAC
Input Protection	• Internal 3.15 A fuse in line and neutral

## Output

Output Voltage	• See tables
Output Voltage Trim	• $\pm$ 5% on 3V3 and 5V versions, $\pm$ 10% on other single output models and V1 of multi-output models. See note 1
Initial Set Accuracy	• $\pm$ 1.0% V1, $\pm$ 5% V2, V3 and V4
Minimum Load	• See tables
Start Up Delay	• 2 s max
Start Up Rise Time	• 50 ms
Hold Up Time	• 16/75 ms min at 115/230 VAC
Line Regulation	• $\pm$ 0.5%
Load Regulation	• $\pm$ 1% single output models; $\pm$ 3% V1, $\pm$ 5% V2 & V3 ECM40/60 multi-output models. $\pm$ 1% V1 & V2, $\pm$ 5% V3 & V4 ECM100
Cross Regulation	• 2% on ECM40/60
Over/Undershoot	• None at turn on/off
Transient Response	• 4% max. deviation, recovery to within 1% in 500 $\mu$ s for a 25% load change
Ripple & Noise	• 1% pk-pk, 20 MHz bandwidth
Overvoltage Protection	• 115-135% Vnom, recycle input to reset
Overload Protection	• 110-150% on primary power limit, auto recovery
Short Circuit Protection	• Trip and restart (Hiccup mode)
Temperature Coefficient	• 0.05% / $^{\circ}$ C

## General

Efficiency	• 80-85% depending on model
Isolation	• 4000 VAC Input to Output 1500 VAC Input to Ground 1500 VAC Output to Ground
Switching Frequency	• 70 kHz typical
Power Density	• 60 W: 6.25 W/In <sup>3</sup> 100 W: 7.40 W/In <sup>3</sup>
MTBF	• 250 kHrs per MIL-HDBK-217F

## Environmental

Operating Temperature	• 0 $^{\circ}$ C to +80 $^{\circ}$ C. Refer to derating curves for specific operating limitations
Cooling	• Convection-cooled
Operating Humidity	• 95% RH, non-condensing
Storage Temperature	• -20 $^{\circ}$ C to +85 $^{\circ}$ C
Operating Altitude	• 3000 m
Shock	• 30 G pk, half sine, 6 axis
Vibration	• 2 G rms, 5 Hz to 500 kHz, 3 axis

## EMC &amp; Safety

Emissions	• EN60601-1-2, EN61204-3, FCC 20780, EN55022 & EN55011, level B conducted
Harmonic Currents	• EN61000-3-2
Voltage Flicker	• EN61000-3-3
ESD Immunity	• EN61000-4-2, level 2 Perf Criteria B
Radiated Immunity	• EN61000-4-3, 10 V/m Perf Criteria B
EFT/Burst	• EN61000-4-4, level 2 Perf Criteria B
Surge	• EN61000-4-5, level 3 Perf Criteria B
Conducted Immunity	• EN61000-4-6, 10 V Perf Criteria B
Dips & Interruptions	• EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms Perf Criteria A, B, B
Safety Approvals	• EN60950, UL60950, CSA 22.2 601.1, EN60601-1, UL60601-1, EN61010-1 for ECM100

**Models and Ratings**

Max Power	Outputs						Model Number
	V1	Imin/Imax <sup>(3)</sup>	V2	Imin/Imax	V3	Imin/Imax	
40 W	+5.0 V	0.0 A / 8.0 A					ECM40US05†*
	+7.0 V	0.0 A / 5.7 A					ECM40US07
	+9.0 V	0.0 A / 4.4 A					ECM40US09*
	+12.0 V	0.0 A / 3.5 A					ECM40US12†*
	+15.0 V	0.0 A / 2.7 A					ECM40US15†*
	+18.0 V	0.0 A / 2.2 A					ECM40US18
	+24.0 V	0.0 A / 1.7 A					ECM40US24†*
	+33.0 V	0.0 A / 1.2 A					ECM40US33
	+48.0 V	0.0 A / 0.9 A					ECM40US48†*
	+5.0 V	0.5 A / 6.0 A	+12.0 V	0.1 A / 2.0 A			ECM40UD21
	+5.0 V	0.5 A / 6.0 A	+15.0 V	0.1 A / 1.5 A			ECM40UD22
	+5.0 V	0.5 A / 6.0 A	+12.0 V	0.1 A / 2.0 A	-12.0 V	0.1 A / 0.5 A	ECM40UT31†*
	+5.0 V	0.5 A / 6.0 A	+24.0 V	0.1 A / 1.0 A	-12.0 V	0.1 A / 0.5 A	ECM40UT32†
	+5.0 V	0.5 A / 6.0 A	+15.0 V	0.1 A / 1.5 A	-15.0 V	0.1 A / 0.5 A	ECM40UT33†*
	+3.3 V	0.5 A / 6.0 A	+5.0 V	0.1 A / 1.5 A	+12.0 V	0.1 A / 0.5 A	ECM40UT34†*
	+5.0 V	0.5 A / 6.0 A	+3.3 V	0.1 A / 1.5 A	+12.0 V	0.1 A / 0.5 A	ECM40UT35†

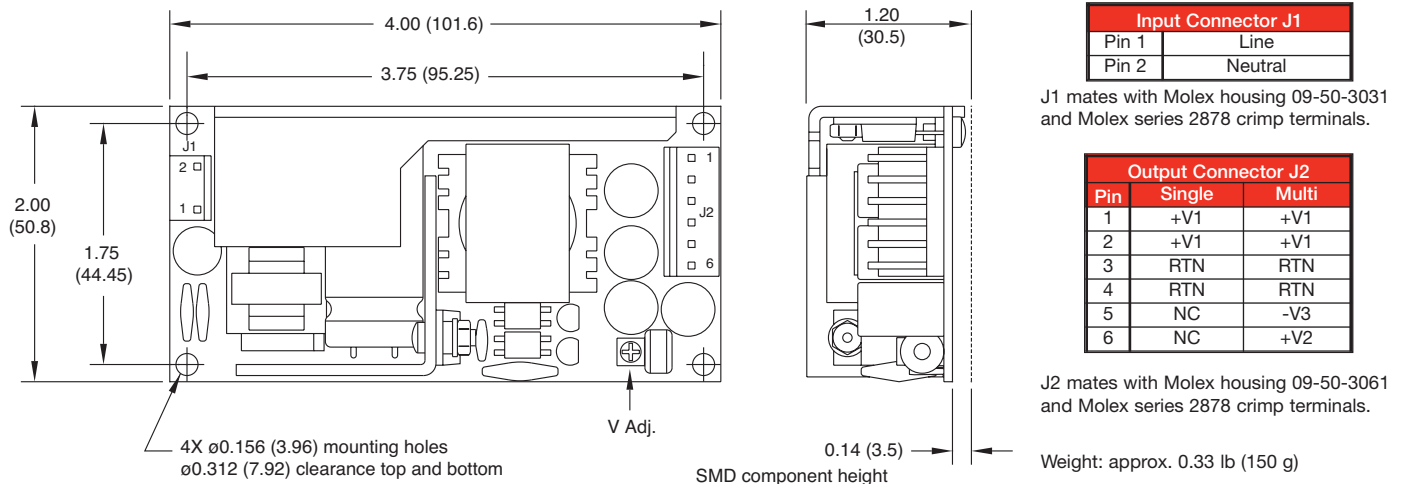
**Notes**

- V2 will track a change in V1 by the same percentage change in voltage as V1 is trimmed.
- To receive unit with cover fitted, add suffix '-C' to model number. For Class I operation only.
- A 120% peak load can be taken for up to 100 ms with a 25% duty cycle.

† Available from Farnell InOne.

\*Available from Newark InOne.

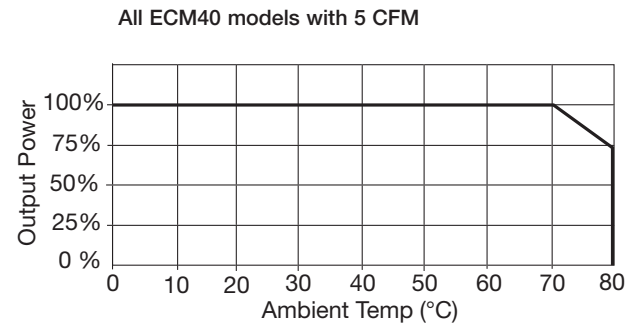
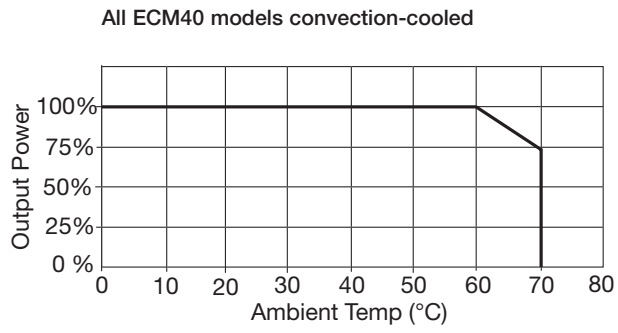
**Mechanical Details**



**Notes**

- All dimensions in inches (mm). Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)
- Cable harnesses with 300mm wire available.  
For single output models, order part number ECM40/60S LOOM.  
For multi-output models, order part number ECM40/60DT LOOM.
- Mating connector kit available. Order part number ECM40/60 CONKIT.
- Covers available. Order part number ECM40/60 COVER. Cover dimensions are 4.49 x 2.52 x 1.52 (114 x 64 x 38.5)
- † All accessories available from Farnell InOne.

**Derating Curves**



Note: Derate by 10% if cover is fitted

Max Power	Outputs						Model Number
	V1	Imin/Imax <sup>(3)</sup>	V2	Imin/Imax	V3	Imin/Imax	
60 W	+5.0 V	0.0 A / 12.00 A					ECM60US05†*
	+7.0 V	0.0 A / 8.60 A					ECM60US07
	+9.0 V	0.0 A / 6.70 A					ECM60US09*
	+12.0 V	0.0 A / 5.00 A					ECM60US12†*
	+15.0 V	0.0 A / 4.00 A					ECM60US15†*
	+18.0 V	0.0 A / 3.30 A					ECM60US18
	+24.0 V	0.0 A / 2.50 A					ECM60US24†*
	+33.0 V	0.0 A / 1.80 A					ECM60US33
	+48.0 V	0.0 A / 1.25 A					ECM60US48†*
	+5.0 V	0.5 A / 8.00 A	+12.0 V	0.1 A / 3.0 A			ECM60UD21
	+5.0 V	0.5 A / 8.00 A	+15.0 V	0.1 A / 2.5 A			ECM60UD22
	+5.0 V	0.5 A / 8.00 A	+12.0 V	0.1 A / 3.0 A	-12.0 V	0.0 A / 0.5 A	ECM60UT31†*
	+5.0 V	0.5 A / 8.00 A	+24.0 V	0.1 A / 1.5 A	-12.0 V	0.0 A / 0.5 A	ECM60UT32†
	+5.0 V	0.5 A / 8.00 A	+15.0 V	0.1 A / 2.5 A	-15.0 V	0.0 A / 0.5 A	ECM60UT33†*
	+3.3 V	0.5 A / 8.00 A	+5.0 V	0.1 A / 1.5 A	+12.0 V	0.0 A / 0.5 A	ECM60UT34†*
	+5.0 V	0.5 A / 8.00 A	+3.3 V	0.1 A / 1.5 A	+12.0 V	0.0 A / 0.5 A	ECM60UT35†

Notes

- V2 will track a change in V1 by the same percentage change in voltage as V1 is trimmed.
- To receive unit with cover fitted, add suffix '-C' to model number. For Class I operation only.
- A 120% peak load can be taken for up to 100 ms with a 25% duty cycle.

† Available from Farnell InOne. See pages 236-237

\*Available from Newark InOne. See pages 238

Mechanical Details

Input Connector J1	
Pin 1	Line
Pin 2	Neutral

J1 mates with Molex housing 09-50-3031 and Molex series 2878 crimp terminals.

Output Connector J2		
Pin	Single	Multi
1	+V1	+V1
2	+V1	+V1
3	RTN	RTN
4	RTN	RTN
5	NC	-V3
6	NC	+V2

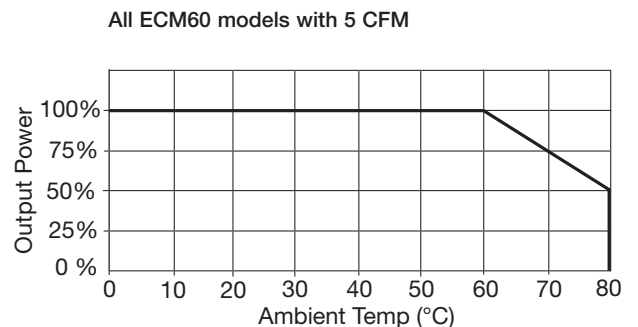
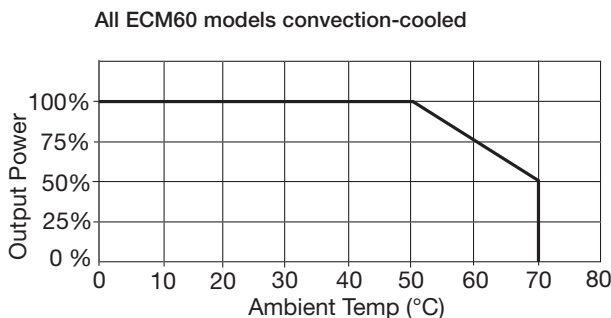
J2 mates with Molex housing 09-50-3061 and Molex series 2878 crimp terminals.

Weight: approx. 0.33 lb (150 g)

Notes

- All dimensions in inches (mm). Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)
- Cable harnesses with 300mm wire available.  
For single output models, order part number ECM40/60S LOOM.  
For multi-output models, order part number ECM40/60DT LOOM .
- Mating connector kit available. Order part number ECM40/60 CONK1T.
- Covers available. Order part number ECM40/60 COVER. Cover dimensions are 4.49 x 2.52 x 1.52 (114 x 64 x 38.5)
- † All accessories available from Farnell InOne.

Derating Curves



Note: Derate by 10% if cover is fitted

**Models and Ratings**

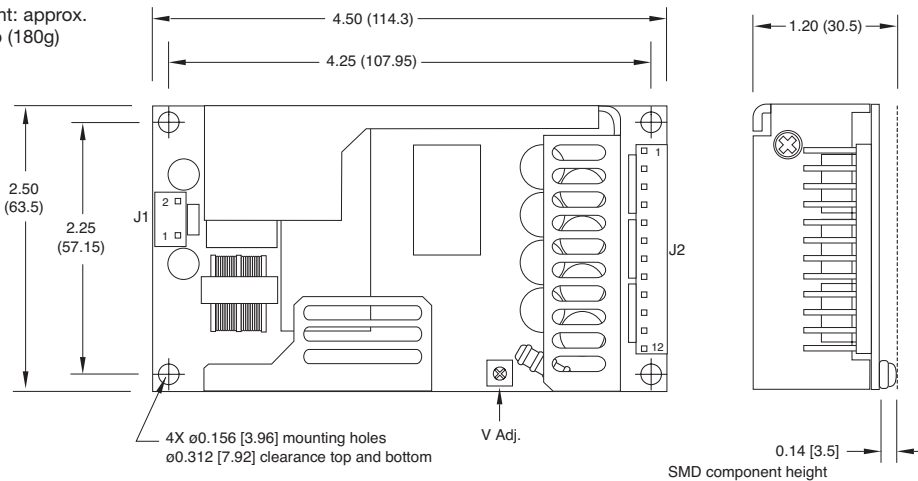
Output 1	Imin	I <sub>max</sub> Convection	5 CFM Cooling	Output 2	Imin/I <sub>max</sub>	Output 3	Imin/I <sub>max</sub>	Output 4	Imin/I <sub>max</sub>	Model Number
+3.3 V	0.0 A	16.0 A	20.0 A							ECM100US03
+5.0 V	0.0 A	16.0 A	20.0 A							ECM100US05
+7.0 V	0.0 A	11.4 A	14.3 A							ECM100US07
+9.0 V	0.0 A	8.8 A	11.1 A							ECM100US09
+12.0 V	0.0 A	7.5 A	8.3 A							ECM100US12
+15.0 V	0.0 A	6.0 A	6.6 A							ECM100US15
+18.0 V	0.0 A	5.0 A	5.5 A							ECM100US18
+24.0 V	0.0 A	4.1 A	4.1 A							ECM100US24
+33.0 V	0.0 A	3.0 A	3.0 A							ECM100US33
+48.0 V	0.0 A	2.1 A	2.1 A							ECM100US48
+5.0 V	0.0 A	12.0 A	12.0 A	+12.0 V	0.00 A / 3.0 A					ECM100UD21 <sup>(2)</sup>
+5.0 V	0.0 A	12.0 A	12.0 A	+15.0 V	0.00 A / 3.0 A					ECM100UD22 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+12.0 V	0.00 A / 3.0 A	-12.0 V	0.0 A / 0.8 A			ECM100UT31 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+24.0 V	0.00 A / 2.0 A	-12.0 V	0.0 A / 0.8 A			ECM100UT32 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+15.0 V	0.00 A / 3.0 A	-15.0 V	0.0 A / 0.8 A			ECM100UT33 <sup>(2)</sup>
+3.3 V	0.5 A	10.0 A	10.0 A	+5.0 V	0.00 A / 5.0 A	+12.0 V	0.0 A / 0.8 A			ECM100UT34 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+3.3 V	0.00 A / 5.0 A	+12.0 V	0.0 A / 0.8 A			ECM100UT35 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+12.0 V	0.00 A / 3.0 A	-5.0 V	0.0 A / 0.8 A			ECM100UT36 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+15.0 V	0.00 A / 3.0 A	-5.0 V	0.0 A / 0.8 A			ECM100UT37 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+3.3 V	0.10 A / 5.0 A	+12.0 V	0.0 A / 0.8 A	-12.0 V	0.0 A / 0.5 A	ECM100UQ41 <sup>(2)</sup>
+3.3 V	0.5 A	10.0 A	10.0 A	+5.0 V	0.10 A / 5.0 A	+12.0 V	0.0 A / 0.8 A	-12.0 V	0.0 A / 0.5 A	ECM100UQ42 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+24.0 V	0.10 A / 2.0 A	+12.0 V	0.0 A / 0.8 A	-12.0 V	0.0 A / 0.5 A	ECM100UQ43 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+24.0 V	0.10 A / 2.0 A	+15.0 V	0.0 A / 0.8 A	-15.0 V	0.0 A / 0.5 A	ECM100UQ44 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+12.0 V	0.10 A / 3.0 A	-12.0 V	0.0 A / 0.8 A	-5.0 V	0.0 A / 0.5 A	ECM100UQ45 <sup>(2)</sup>
+5.0 V	0.5 A	10.0 A	10.0 A	+15.0 V	0.10 A / 3.0 A	-15.0 V	0.0 A / 0.8 A	-5.0 V	0.0 A / 0.5 A	ECM100UQ46 <sup>(2)</sup>

**Notes**

1. To receive unit with cover fitted, add suffix '-C' to model number. For Class I operation only.
2. Available Q4 2005.
3. Maximum power with 5 CFM cooling is 100 W (66 W for 03 version). For maximum power with convection cooling, see derating curves.

**Mechanical Details**

Weight: approx.  
0.4 lb (180g)



Input Connector J1	
Pin 1	Line
Pin 2	Neutral

J1 mates with Molex housing 09-50-3031 and Molex series 2878 crimp terminals. Optional ground (0.25 faston) tab available.

Output Connector J2		
Pin	Single	Multi
1	+V1	+V1
2	+V1	+V1
3	+V1	+V1
4	+V1	+V1
5	V1 RTN	RTN
6	V1 RTN	RTN
7	V1 RTN	RTN
8	V1 RTN	RTN
9	NOT USED	+V2
10	NOT USED	+V2
11	NOT USED	±V3
12	NOT USED	-V4

J2 mates with Molex housing 09-50-3121 & Molex series 2878 crimp terminals (2 pt contact) or Molex housing 09-50-8031 & Molex series 6838 crimp terminals (3 pt contact).

Cover dimensions are 4.96 x 3.05 x 1.52 (126 x 77.5 x 38.5)

**Notes**

1. All dimensions in inches (mm). Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)
2. Cable harnesses with 300mm wire available. For single output models, order part number ECM100S LOOM. For multi-outputs, p/n ECM100DT LOOM.
3. Mating connector kit available. Order part number ECM100 CONKIT.
4. Covers available. Order part number ECM100 COVER.

**Derating Curves**

