



# 200E/300E series

## Single & Dual Output DC/DC Converter



### DESCRIPTIONS

The 200E and 300E series is a family of compact high performance 2 to 3 W DC/DC converters that operate over input voltage ranges of 4.3-6 VDC, 10.3-15.0 VDC, 15.5-22.5 VDC, 20.4-30.0 VDC, 24.2-36.0 VDC and 41.3-60.0 VDC and provide precisely regulated output voltages of 5V, 12V, 15V,  $\pm 12V$  and  $\pm 15V$ .

The -30°C to +75°C operating temperature range makes it ideal for data communication equipment, mobile battery driven equipment, distributed power systems, telecommunication equipment, mixed analog/digital subsystems, process/machine control equipment, computer peripheral systems industrial robot systems.

### OUTPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Output Voltage Set Point			$\pm 5$	% Output voltage at nominal line & FL
Output Voltage Balance			$\pm 3$	%; Equal Output Loads
Line Regulation			$\pm 0.3$	% Output voltage measured from min. input line to maximum
Load Regulation			$\pm 0.3$	% Output voltage measured from FL to no load
Ripple/Noise			15	mV p-p, Nom.Line @FL, 20MHz B.W., using 1 $\mu$ F bypass capacitor
Short Circuit Protection				Continuous, Automatic Recovery
Temperature Coefficient			$\pm 0.01$	% per °C

### FEATURES

- Up to 65% Efficiency
- Single & Dual output, 2 to 3 watt converters
- 500 VDC Input / Output Isolation
- Continuous Short Circuit Protection
- Continuous Six-Sided Shielding
- UL1950 Approved, File No. E104645
- CSA 22.2 Approved, File No. LR89494
- >1,600,000 Hours MTBF

### INPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
<b>Input Voltage</b>				
5 VDC Input Models	4.65	5	5.25	VDC @ FL
12 VDC Input Models	10.9	12	13.2	VDC @ FL
24 VDC Input Models	21.6	24	26.4	VDC @ FL
28 VDC Input Models	25.2	28	30.8	VDC @ FL
48 VDC Input Models	43.2	48	52.8	VDC @ FL
<b>Input Fuse Requirements</b>				
5 VDC Input Models		2000		mA; Slow blow type
12 VDC Input Models		1000		mA; Slow blow type
24 VDC Input Models		500		mA; Slow blow type
28 VDC Input Models		350		mA; Slow blow type
48 VDC Input Models		200		mA; Slow blow type
Input Filter				Pi Filter

### GENERAL CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Switching Frequency		100		kHz
Isolation Voltage	500			VDC, 1 minute
Isolation Resistance	1000			Mohm, 500VDC
Isolation Capacitance		70		pF, 100kHz, 1Volt
MTBF (MIL-HBK-217F)	1.6			Million Hours, +25°C, Ground Benign

Martek Power reserves the right to change specifications without notice.



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**ENVIRONMENTAL SPECIFICATIONS**

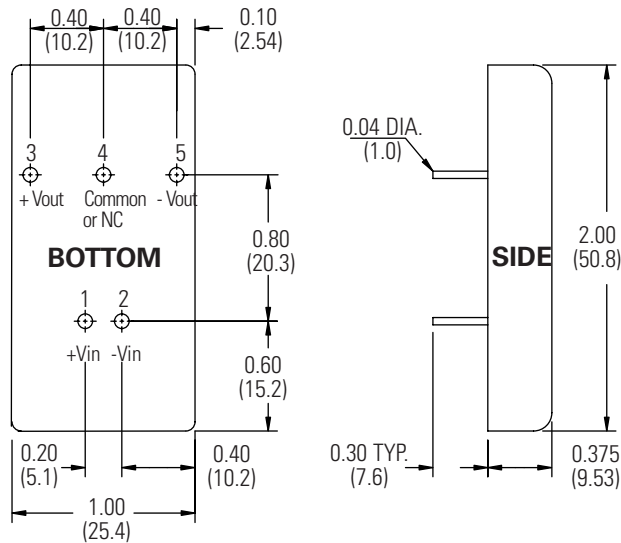
	Min	Typ	Max	Unit/Comments
Operating Temp. Range	-30		+75	°C; Ambient
Storage Temp. Range	-40		+125	°C
Relative Humidity			+95	% Humidity; non-condensing
Cooling				Free-Air Convection

**PHYSICAL CHARACTERISTICS**

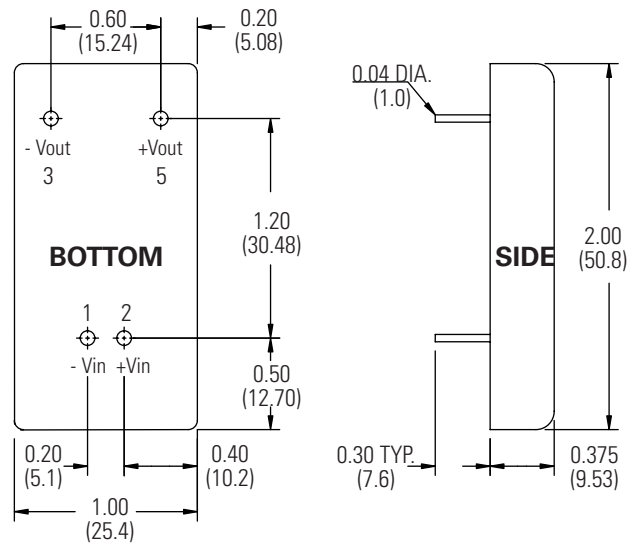
	Unit/Comments
Case Size	1.0 X 2.0 X 0.375 inches (25.4 X 50.8 X 9.53 mm)
Case Material	Black Coated Metal
Shield Connection	
Single Output	Negative Output Pin
Dual Output	Common Output Pin
Flammability	UL94V-0
Weight	1.5 oz.

**OUTLINE DRAWING**

**CASE "D"**



**CASE "D1" (OPTIONAL)**



**PIN OUT CHART - CASE "D"**

Pins	Single	Dual
1	+ Vin	+ Vin
2	- Vin	- Vin
3	+ Vout	+ Vout
4	NC	Common
5	- Vout	- Vout

NC = No Connection

**PIN OUT CHART - CASE "D1" (OPTIONAL)**

Pins	Single
1	- Vin
2	+ Vin
3	- Vout
5	+ Vout

**Notes:**

1. Unless otherwise specified dimensions are in inches (mm).

Tolerances	Inches	mm
	X.XX = ±0.02	X.X = ±0.5
	X.XXX = ±0.010	X.XX = ±0.25

2. Case D pinning is standard. Case D model numbers do not require suffixing.

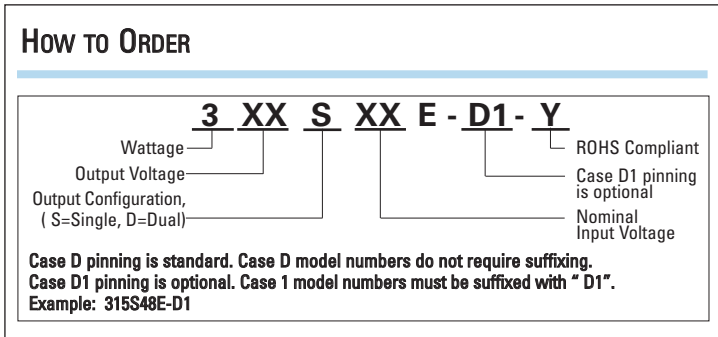
3. Case D1 pinning is optional. Case D1 model numbers must be suffixed with "D1". Example: 315S48E-D1

All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.  
 External, low ESR, 10 microfarad (minimum) capacitor across input is recommended for operation.



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HOW TO ORDER



INPUT VOLTAGE RANGE VS OUTPUT LOAD

**Input Voltage Range (VDC) at:**

<b>Nominal Input (VDC)</b>	<b>20% Load</b>	<b>40% Load</b>	<b>60% Load</b>	<b>100% Load</b>
5	4.30 - 6.00	4.40 - 5.70	4.55 - 5.60	4.65 - 5.25
12	10.3 - 15.0	10.4 - 14.6	10.6 - 13.6	10.9 - 13.2
24	20.4 - 30.0	20.6 - 29.0	21.0 - 27.0	21.6 - 26.4
28	24.2 - 36.0	24.5 - 34.0	24.9 - 31.3	25.2 - 30.8
48	41.3 - 60.0	42.0 - 58.0	42.3 - 54.4	43.2 - 52.8



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**MODEL SELECTION CHART**

Model	Nominal Input Voltage (VDC)	Output Voltage (VDC)	Full Load Output Current (mA)	No Load Input Current (mA)	Full Load Input Current (mA)	Efficiency @ FL (%)	Case Style
205S5E	5	5	400	60	670	59	D or D1
312S5E	5	12	250	60	1030	58	D or D1
315S5E	5	15	200	60	1030	58	D or D1
205S12E	12	5	400	20	238	70	D or D1
312S12E	12	12	250	20	415	60	D or D1
315S12E	12	15	200	20	410	61	D or D1
205S24E	24	5	400	15	130	64	D or D1
312S24E	24	12	250	20	205	61	D or D1
315S24E	24	15	200	20	200	62	D or D1
205S28E	28	5	400	15	110	65	D or D1
312S28E	28	12	250	20	178	60	D or D1
315S28E	28	15	200	20	175	61	D or D1
205S48E	48	5	400	15	60	69	D or D1
312S48E	48	12	250	15	104	60	D or D1
315S48E	48	15	200	15	102	61	D or D1
212D5E	5	±12	±100	100	800	60	D
315D5E	5	±15	±100	100	980	61	D
212D12E	12	±12	±100	30	327	61	D
315D12E	12	±15	±100	30	403	62	D
212D24E	24	±12	±100	25	163	61	D
315E24E	24	±15	±100	25	201	62	D
212D28E	28	±12	±100	25	140	61	D
315D28E	28	±15	±100	25	173	62	D
212D48E	48	±12	±100	13	79	63	D
315D48E	48	±15	±100	13	99	63	D