



## Low-profile AC/DC Converter



There are countless different outputs. Currently there are 6 models available.

### **Features**

- Medical Safety Standards
- Patient contact approved
- Universal input voltage
- Single, dual & triple outputs
- Short circuit protected
- Overload protected
- Very low noise
- 5 year warranty



### **SPECIFICATIONS**

OC Input Voltage Range 110 Otal Output Power 60 W Input Fuse Two Input Current < 1A Inrush Current < 15	240V 47-65Hz. Limits: 90 - 264 VRMS (270V Surge), 47 to 65 Hz to 373V DC (380V surge)  Vatts Maximum or surge (See "Operating Temperature" below)  1 A fast-blow fuses (for Live and Neutral lines) internal  RMS at 95V RMS input and full load  A max. peak for 264Vac or 375Vdc, cold start at 25°C		
Total Output Power         60 W           Input Fuse         Two           Input Current         < 1A           Inrush Current         < 15	Vatts Maximum or surge (See "Operating Temperature" below)  1 A fast-blow fuses (for Live and Neutral lines) internal  RMS at 95V RMS input and full load		
nput Fuse Two nput Current < 1A nrush Current < 15	1 A fast-blow fuses (for Live and Neutral lines) internal RMS at 95V RMS input and full load		
nput Current < 1A nrush Current < 15	RMS at 95V RMS input and full load		
nrush Current < 15	·		
	A max. peak for 264Vac or 375Vdc, cold start at 25°C		
Efficiency > 83	> 83% at rated loads		
Short Circuit Protection Short	Short circuit on any output causes no damage to the power supply.		
Over Load Protection Over	Over power at 105% to 135% rated power, shut-off with auto restart		
<b>linimum Load</b> No n	No minimum load necessary (but regulation best with 10% min. load)		
switching frequency ~ 60	~ 60KHz.		
Operating Temperature (Nati	(Natural convection) 0°C to +40°C Derate linearly at 1W/°C to 65°C		
Operating Temperature (200	(200 linear feet per minute airflow) 0°C to +65°C		
Shipping and Storage -40°	-40°C to 105°C , Relative Humidity: 5% to 95% non-condensing		
IEC	601, AS 3200, VDE 0705/EN60601-1, UL 1012, UL2601, UL544, CSA 22.2 No.		
Safety Standards 234-	M90 & No. 601.1. (And AS3260, UL1950, EN60950)		
approvals CB#	CB###AU		
CISF	PR 11 Class B, EN55011 Class B, AS 2064 Class B, FCC part 15 (47 CFR 15)		
MC Standards (conducted) Clas	s A, VDE 0878 PT3 Class B. EN60601-2		
Electromagnetic Susceptibility Desi	Designed to meet IEC 801, -2, -3, -4, -5, -6, Level 3 (IEC1000-4 series)		
eakage Current < 75	μA to safety ground and to secondary at 264V input		
solation between outputs 500\	500V DC, 10nF, >10M $\Omega$ (functional)		



# Low-profile AC/DC Converter

# **X55 Series**

Outputs performance – Model:		X55T12M			
Mutually Isolated Outputs:	#1	#2	#3		
DC Output Voltage	5 V	12V	12V		
Maximum Continuous Load <sup>(1)</sup>	6A	1A	1A		
Maximum Surge Load	10A	2A	2A		
Output Ripple and Noise (F.L.)	50mV P - P	150 mV P - P	150 mV P - P		
Total Band Regulation, Output 1					
Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup>	< ± 1% for any combination of input voltage, load and temperature within the specified ranges. x ± 89/ for loads > 109/ 8 any combination of input voltage, other loads 8 town within appointed range.				
	< ± 8% for loads > 10%, & any combination of input voltage, other loads & temp within specified range For 50% to 100% 400% at a 100% 400% at a 100% at a 100				
Step Response, Output 1  Outputs performance – Model:	For 50% to 100% 100nS step, < ±0.1V overshoot, <150µS recovery time. <b>X55T1205M</b>				
Mutually Isolated Outputs:	#1	#2	#3		
DC Output Voltage	5 V	12V	12V		
Maximum Continuous Load <sup>(1)</sup>	6A	1A	1A		
Maximum Surge Load	10A	2A	2A		
Output Ripple and Noise (F.L.)	50mV P - P	150 mV P - P	150 mV P - P		
Regulation, Output 2		1	130 111 1 - 1		
Regulation, Outputs & <b>3</b> <sup>(3)</sup>	< ± 1% for any combination of inpu				
	< ± 8% for loads > 10%, as above				
Step Response, Output 2 Outputs performance – Model:	For 50% to 100% 100nS step, < ±0	υ.1V oversnoot, <150μ5 recovery t <b>X55T15M</b>	ime.		
Mutually Isolated Outputs:	#1	#2	#3		
	5 V		<u> </u>		
DC Output Voltage  Maximum Continuous Load <sup>(1)</sup>	6A	15V	15V		
	10A	0.8A 2A	0.8A 2A		
Maximum Surge Load					
Output Ripple and Noise (F.L.)	50mV P - P	150 mV P - P	150 mV P - P		
Total Band Regulation, Output 1	< ± 1% for any combination of inpu	ut voltage, as above			
Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup>	< ± 8% for loads > 10%, as above	0.41/	*		
Step Response, Output 1  Outputs performance – Model:	For 50% to 100% 100nS step, < ±0	X55T1505M	ime.		
Mutually Isolated Outputs:	#1	#2	#3		
DC Output Voltage	5 V	15V	15V		
Maximum Continuous Load <sup>(1)</sup>	6A	0.8A	0.8A		
Maximum Surge Load	10A	2A	2A		
Maximum Surge Load					
Output Pipple and Noice (E.L.)					
Output Ripple and Noise (F.L.)	50mV P - P	150 mV P - P	150 mV P - P		
Total Band Regulation, Output 2	50mV P - P < ± 1% for any combination of inpu	150 mV P - P ut voltage, as above			
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup>	50mV P - P $<\pm$ 1% for any combination of inpute $<\pm$ 8% for loads > 10%, as above	150 mV P - P ut voltage, as above	150 mV P - P		
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2	50mV P - P < ± 1% for any combination of inpu	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to	150 mV P - P		
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2  Outputs performance – Model:	50mV P - P $<\pm$ 1% for any combination of inpute $<\pm$ 8% for loads > 10%, as above	150 mV P - P ut voltage, as above	150 mV P - P		
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2  Outputs performance – Model:  Mutually Isolated Outputs:	50 mV P - P < $\pm$ 1% for any combination of inputed $\pm$ 8% for loads > 10%, as above For 50% to 100% 100nS step, < $\pm$ 0	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2	150 mV P - P ime. #3		
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2  Outputs performance – Model:  Mutually Isolated Outputs:  DC Output Voltage	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to  X55D12M  #2  12V	150 mV P - P  ime.  #3  12V		
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2  Outputs performance – Model:  Mutually Isolated Outputs:  DC Output Voltage  Maximum Continuous Load <sup>(1)</sup>	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery t  X55D12M  #2  12V  1A	150 mV P - P  ime.  #3  12V  1A		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A	150 mV P - P  ime.  #3  12V  1A  2A		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.)	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery t  X55D12M  #2  12V  1A  2A  150 mV P - P	150 mV P - P  ime.  #3  12V  1A		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery t  X55D12M  #2  12V  1A  2A  150 mV P - P	150 mV P - P  ime.  #3  12V  1A  2A		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup>	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above	150 mV P - P  ime.  #3  12V  1A  2A  150 mV P - P		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   0.1V overshoot, <150μS	150 mV P - P  ime.  #3  12V  1A  2A  150 mV P - P		
Total Band Regulation, Output 2  Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2  Outputs performance – Model:  Mutually Isolated Outputs:  DC Output Voltage  Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load  Output Ripple and Noise (F.L.)  Total Band Regulation, Output 1  Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1  Outputs performance – Model:	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D15M	150 mV P - P  ime.  #3  12V  1A  2A  150 mV P - P		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs:  DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1 Outputs performance – Model: Mutually Isolated Outputs:	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D15M  #2	150 mV P - P  ime.  #3  12V  1A  2A  150 mV P - P		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs:  DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  15 V	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D15M  #2  15V	150 mV P - P  time.  #3  12V  1A  2A  150 mV P - P		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup>	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  15 V  4A	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D15M  #2  15V  0.8A	150 mV P - P  ime.  #3  12V  1A  2A  150 mV P - P		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs:  DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  15 V  4A  5A	150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  ut voltage, as above  0.1V overshoot, <150μS recovery to   X55D15M  #2  15V  0.8A  2A	#3 12V 1A 2A 150 mV P - P		
Total Band Regulation, Output 2 Total Band Regulation, Outputs 1 & 3 <sup>(3)</sup> Step Response, Output 2 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup> Maximum Surge Load Output Ripple and Noise (F.L.) Total Band Regulation, Output 1 Total Band Regulation, Outputs 2 & 3 <sup>(3)</sup> Step Response, Output 1 Outputs performance – Model: Mutually Isolated Outputs: DC Output Voltage Maximum Continuous Load <sup>(1)</sup>	50mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  12 V  4A  5A  100mV P - P  < ± 1% for any combination of input < ± 8% for loads > 10%, as above  For 50% to 100% 100nS step, < ±0  #1  15 V  4A	150 mV P - P  at voltage, as above  0.1V overshoot, <150μS recovery to   X55D12M  #2  12V  1A  2A  150 mV P - P  at voltage, as above  0.1V overshoot, <150μS recovery to   X55D15M  #2  15V  0.8A  2A  150 mV P - P	150 mV P - P  ime.  #3  12V  1A  2A  150 mV P - P		

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## Low-profile AC/DC Converter

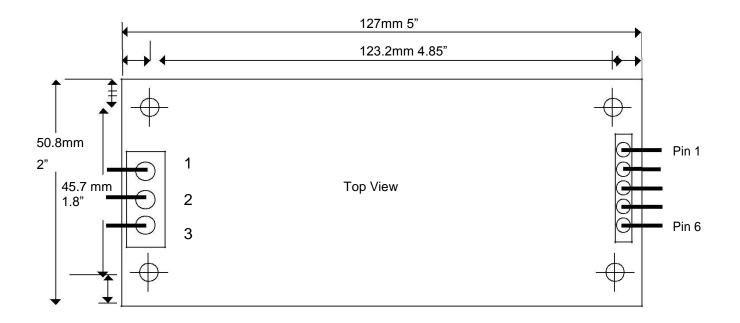
## **X55 Series**

Step Response, Output 1	For 50% to 100% 100nS step, $<\pm0.1V$ overshoot, $<150\mu S$ recovery time.		
General			
Elevibility	The three outputs in each model are isolated and can be interconnected in series (or		
Flexibility	parallel for same voltages) at the mating O/P connector		
Degulation	In models X55T1205M and X55T1505M, feedback control is taken from output #2 instead of		
Regulation	#1, to provide closer control if this is the more critical.		
Maximum Power	Sum of power from individual outputs is larger than the rated total, which should not be		
	exceeded. Can be loaded unevenly as indicated.		
Tomporature Coefficient	Any change in output voltage due to warm-up drift and operation temperature, change does		
Temperature Coefficient	not exceed regulation limit.		
Dimensions (L x W x H)	127 x 5.8 x 20.1 mm (5 x 2 x 0.8")		
Mounting	Four (4) holes 3.2mm (0.125") diameter at 123.2 x 45.7mm (4.85x1.8") centres.		
Vibration	3g 5 to 200 Hz, 1g 5 to 500Hz, three orthogonal axes, 1 oct/min, 5 min. dwell at four major		
	resonances (operational).		
Shock	30g, any axis		
Terminations	Molex KK series locking headers for input and output, 0.156" pitch.		

#### NOTES to specification table above:

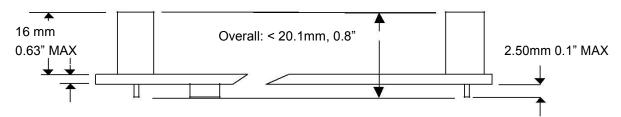
- 1. The maximum loads listed are the maximum continuous loads on each output. However the total load should not exceed the rated total power. For continuous loads, note operating temperature conditions.
- 2. The ripple and noise voltage of the output is measured at the output connectors. This measurement should be made using a differential technique having a common mode rejection ratio (CMRR) greater than 10,000 to 1.
- 3. The minimum load for which these outputs remain within the "Total Band Regulation" limits listed (for all input voltages within the input range and all mixes of load on other outputs within the limits of "Maximum Continuous Load" and maximum total power) is 10% of the rated load of the noted outputs.

#### **MECHANICAL SPECIFICATIONS**





All specifications subject to change without notice.



Tolerances:  $\pm$  0.1mm  $\pm$  0.004"

INPUT CONNECTOR (J1)		OUTPUT CONNECTOR (J2)	
PIN 1 EITHER LINE OR NEUTRAL, + OR -	FITHER LINE OR	PIN 1	+12V/+15V (O/P-3)
	PIN 2	RETURN (O/P-3)	
	,	PIN 3	+12V/+15V (O/P-2)
PIN 2	EITHER LINE OR	PIN 4	RETURN (O/P-2)
1 114 2	NEUTRAL, + OR -	PIN 5	+5V, +12V (O/P-1)
PIN 3	GROUND/EARTH	PIN 6	RETURN (O/P-1)