



### 81mm Front End AC-DC Power Converter

### **FEATURES**

- Extended Power Range to 1300W
- 1.57" (1U) x 11.0" x 3.2"
- 92% efficiency at 50% FL
- 12VDC Main output
- 3.3VSB or 5VSB output (20W)
- >23W/in<sup>3</sup> power density
- N+1 Redundancy Capable; hot plug/swap (up to 8 modules in parallel)
- Active current sharing on 12V main output; integral MOSFET ORING
- Over-Voltage, Over-Current; Over-Temperature Protection
- Internal variable speed cooling fans
- PMBus<sup>™</sup> Power Management Bus
- RoHS Compliant

**3D** Models of AC-DC **Power Supplies** in STEP, IGES, or PDF format **Click here** 

www.murata-ps.com/en/3d/acdc.html



The D1U3CS-W-1300F-12-Hx4EC are high efficiency 1300W power factor corrected front end supplies with a 12V main output and a 5V or 3.3V (20W) standby. Active current sharing is provided to allow up to eight (8) supplies to be operated in parallel. The supplies may be hot plugged and include integral isolation devices.

The power modules are fully protected from overload and overvoltage and are able to auto-recover from overtemperature faults. Status LEDS are provided on the front panel and additional control and status reporting is provided by hardware logic signals and via a PMBus<sup>™</sup> digital interface.

A low profile sub 1U height enclosure provides a power density of >23W/in<sup>3</sup> that is ideal for delivering reliable, efficient power to servers, workstations, storage systems and other 12V distributed power systems.

ORDERING GUIDE							
		Power	Power Output		Standby		
		e & Temp 64V; 40°C)	AC Line & Temp (90-264V; 50°C)	Main Output	Output	Aiı	rflow
D1U3CS-W-1300F-12-HA4EC D1U3CS-W-1300F-12-HC4EC	13	800W	1200W	12V	5V 3.3V	Back	to Front
INPUT CHARACTERISTICS							
Parameter		Conditions		Min	Тур	Max	Units
Voltage Operating Range	Voltage Operating Range			90	115/230	264	Vac
Input Frequency				47	50/60	63	Hz
Turn-on Input Voltage		Ramp Up		81	85	89	Vac
Turn-off Input Voltage		Ramp Dow	'n	70.5	74.3	78.0	vac
Maximum Current @ VIN = 200	Vac	1300W @ 40°C (max)				8	Arms
Maximum Current @ VIN = 90Vac		1200W @ 50°C (max)				15	AIIIIS
Inrush Current		Cold start between 0 to 200ms				25	Apk
Power Factor		At 230Vac; FL			0.99		
		20% FL		88			
Efficiency (230Vac) excluding fa	n load	50% FL		92			%
		100% FL		92			

#### OUTPUT VOLTAGE CHARATERISTICS

	TAUL UNANATENISTIUS					
Output Voltage	Parameter	Conditions	Min	Тур	Max	Units
	Voltage Set Point Accuracy			12		Vdc
	Line & Load Regulation		11.4		12.6	Vuc
	Ripple & Noise <sup>1</sup>	20MHz Bandwidth			150	mV P-P
12V	Output Current (230Vac)		0		108.3	Α
	Output Current (120Vac)				108.3	
	Output Current (90Vac)				100	
	Load Capacitance				30,000	μF
	Voltage Set Point			3.3		Vda
	Line & Load Regulation		3.2		3.4	Vdc
3.3VSB	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			100	mV P-P
	Output Current		0		6	Α
	Load Capacitance				10,000	μF
	Voltage Set Point			5.0		Vda
	Line & Load Regulation		4.85		5.1	Vdc
5VSB	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			50	mV P-P
	Output Current		0		4	Α
	Load Capacitance				10,000	μF

Ripple and noise are measurements are to be performed with a parallel combination of a 0.1µF ceramic capacitor and 10µF tantalum capacitance on each of the power module output measurement nodes. A short coaxial cable shall be used.



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Parameter		Conditions	Min	Тур	Max	Units
Remote Sense		Compensation at full load (total loop for positive & negative connections)	IVIIII	ijp	120	mV
Output Rise (Monotonic)		10% to 95% rise time	No volta	age excursio		1110
		AC Ramp Up	NO VOIL	1.5	2.5	S
Startup Time		PS_ON activation		150	2.5	ms
		12V, 50-100% step load 1A/µs		600		1113
Transient Response		3.3/5VSB 50-100% step load 1A/µs		165/250		mV
Current Sharing Accuracy	v (up to 8 in parallel)	At 100% load		103/230	±7	%
Hot Swap Transients		At 100 % load			5	%
Hold Up Time		FL (Full Load)	12		5	ms
						mo
ENVIRONMENTAL CHAR/ Parameter	ACTERISTICS	Conditions	Min	Тур	Max	Units
Storage Temperature Rar	200	Non-Condensing	-40	iyp	70	Units
Slorage temperature hai	lige	1200W	-40		50	°C
Operating Temperature R	Range	1300W	0		40	U
Operating Humidity		Non-Condensing	5		40 90	
Operating Humidity Storage Humidity			5		90	%
Altitude (no derating at 4	0.00		3000		90	m
Shock	0 0)	Operating	3000		30	G
					30	u
Sinusoidal Vibration MTBF		Operational, 2.0G; 5-500Hz Telcordia SR-332 M1C1 @ 40°C	500			K Hours
Safety Approvals (Standa	ards)	CSA/UL C22.2 No.60950-1-07, Amendment 1_2011 ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011				
Safety Approvals (Standa	ards)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009				
	ards)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011				
Safety Approvals (Standa Input Fusing Switching Frequency	ards)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS				
Input Fusing Switching Frequency	ırds)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter				
Input Fusing Switching Frequency Material Flammability	ards)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the Main Output Converter			3.15/1.43	3 Lbs/kg
Input Fusing Switching Frequency Material Flammability Weight		ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the Main Output Converter			3.15/1.4	3 Lbs/kg
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI		ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the Main Output Converter	Min.	Тур.	3.15/1.43 Max.	3 Lbs/kg Units
Input Fusing	ERISTICS	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter UL94-V0	Min. 57			3 Lbs/kg Units °C
Input Fusing Switching Frequency Material Flammability Weight <b>PROTECTION CHARACTI</b> Output Voltage	ERISTICS Parameter	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter UL94-V0 Conditions		Тур.	Max.	Units
Input Fusing Switching Frequency Material Flammability Weight <b>PROTECTION CHARACTI</b> Output Voltage	ERISTICS Parameter Over-Temperature	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching	57	Тур.	Max. 63	Units °C V
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A	ERISTICS Parameter Over-Temperature Over-Voltage	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching Latching	57 13.3	Тур.	Max. 63 14.5	Units °C
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main)	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching Latching	57 13.3 115	Тур.	Max. 63 14.5 125	Units °C V
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main)	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W)	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching Latching Latching	57 13.3 115 108	Тур.	Max. 63 14.5 125 118	Units °C V A
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main) 3.3VSB	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W) Over-Voltage	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching Latching Latching Latching	57 13.3 115 108 3.9	Тур.	Max. 63 14.5 125 118 4.3	Units °C V A V
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main) 3.3VSB	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W) Over-Voltage Over-Current	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 UL94-V0 Conditions Auto re-start Latching Latching Latching Latching Latching Latching Auto-recovery	57 13.3 115 108 3.9 6.5	Тур.	Max. 63 14.5 125 118 4.3 9.0	Units °C V A V A
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main) 3.3VSB 5VSB	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W) Over-Voltage Over-Current Over-Voltage Over-Current	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 UL94-V0 Conditions Auto re-start Latching Latching Latching Auto-recovery Latching	57 13.3 115 108 3.9 6.5 5.6	Тур.	Max. 63 14.5 125 118 4.3 9.0 6.0	Units °C V A V A V A V V
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main) 3.3VSB 5VSB ISOLATION CHARACTER	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W) Over-Voltage Over-Current Over-Voltage Over-Current	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 UL94-V0 Conditions Auto re-start Latching Latching Latching Auto-recovery Latching	57 13.3 115 108 3.9 6.5 5.6	Typ. 60	Max. 63 14.5 125 118 4.3 9.0 6.0	Units °C V A V A V A V
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A 12V (Main) 3.3VSB 5VSB ISOLATION CHARACTER Parameter	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W) Over-Current Over-Voltage Over-Current Over-Voltage Over-Current NISTICS	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 +A1 :2010 +A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching Latching Latching Latching Auto-recovery Latching Auto-recovery	57 13.3 115 108 3.9 6.5 5.6 5.0	Тур.	Max. 63 14.5 125 118 4.3 9.0 6.0 6.5	Units °C V A V A V A
Input Fusing Switching Frequency Material Flammability Weight PROTECTION CHARACTI Output Voltage N/A	ERISTICS Parameter Over-Temperature Over-Voltage Over-Current (1300W) Over-Current (1200W) Over-Current Over-Voltage Over-Current Over-Voltage Over-Current NISTICS	ANSI/UL 60950-1-2011 IEC 60950-1:2005, (2 <sup>nd</sup> Edition) + A1:2009 EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 CE Marking per LVD DIRECTIVE 2006/95/ECS Internal 16A/250V rated fast blow in AC line 90KHz for the PFC Boost Converter 130KHZ for the PFC Boost Converter 130KHZ for the Main Output Converter UL94-V0 Conditions Auto re-start Latching Latching Latching Latching Latching Auto-recovery Latching Auto-recovery Latching Auto-recovery	57 13.3 115 108 3.9 6.5 5.6 5.0 <b>Min</b> .	Typ. 60	Max. 63 14.5 125 118 4.3 9.0 6.0 6.5	Units °C V A V A V A V A Units

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STATUS INDICATORS			
Conditions		LED Status	
Standby Rail ON; Main Output OFF; AC Present & correct			Blinking Green
Standby Rail ON; Main Output ON			Solid Green
Main Output overcurrent; undervoltage, overvoltage warn	iing		Blinking Amber
FAN_FAULT; overtemperature; standby rail overcurrent, M	lain Output overcurrent or ov	/ervoltage	Red
EMISSIONS AND IMMUNITY			
Characteristic	Standard	Compliance	
Input Current Harmonics	IEC/EN 61000-3-2	Complies with Class A Limits	
Voltage Fluctuation & Flicker	IEC/EN 61000-3-3	Complies	
Conducted Emissions	FCC 47 CFR Part 15 CSIPR 22/EN55022	Class B	
ESD Immunity	IEC/EN 61000-4-2;	Level 3; Criteria A	
Radiated Field Immunity	IEC/EN 61000-4-3	Level 3; Criteria B	
Electrical Fast Transients/Burst Immunity	IEC/EN 61000-4-4	Level 3; Criteria B	
Surge Immunity	IEC/EN 61000-4-5	Level 3; Criteria A	
RF Conducted Immunity	IEC/EN 61000-4-6	Level 3; Criteria A	
Magnetic Field Immunity	IEC/EN 61000-4-8	3A/m; Criteria B	
Voltage Dips & Interruptions	IEC/EN 61000-4-11	230Vin, 50% load, Phase 0	0°, Dip 100% Duration 10ms (A) °, Dip 100% Duration 20ms (VSB:A, V1:A) 0°, Dip 100% Duration > 12ms (VSB:A, V1:B)

#### **OUTPUT CONNECTOR & SIGNAL INTERFACE**

DC Output and Signal Connector: FCI# 51731-057-LF

	r			r			,		-	r	
D1	D2	D3	D4	D5	D6						
C1	C2	C3	C4	C5	C6			550	55.4	DDC	550
B1	B2	B3	B4	B5	B6	PB1	PB2	PB3	PB4	PB5	PB6
A1	A2	A3	A4	A5	A6						

#### NB: B4 is the shortest "last make, first break" sequenced signal pin

Blade Assignment	Function	Description	Current (Amps per Pin)
PB1, PB2, PB3	+12V GND	Main Output Voltage, Return	30
PB4, PB5, PB6	+12V OUT	Main Output Voltage	30
Signal Pin Assignment	Signal Name	Description	
A1	PS_ON_L	An input pulled up via an internal 10K ohm to the Standby rail. When pulled low (via an open collector/drain drive or connection to GND) the Main Output will be turned on/enabled)	N/A
A2	+12VRS_RETURN	Main Output Remote Sense (-VE/Return)	N/A
A3	TEMP_0K	TTL compatible Logic HIGH provided when the temperature is within the allowable range of operation.	
A4	PS_SEATED	Internally connected to GND; when the power module is correctly seated the corresponding mating connector pin is grounded and therefore allows detection that the power module is in situ.	N/A
A5, B5, C5, D5	+VSB	Standby Voltage Output	2.0
A6, B6, C6, D6	+VSB GND	Standby Voltage Output, Return/GND	2.0
B1	AC_0K	Incoming AC Source voltage "OK" (present and within operational limits)	N/A
B2	+12VRS	Main 12V output remote sense line	N/A
B3	+12V_ISHARE	Main 12V output current share bus	N/A
B4	PS_INHIBIT/PS_KILL	This is the shortest "last make, first break" (last to mate in the sequence). If left open circuit then the main output will be inhibited (no output). When inserted in to the system slot this pin must be pulled "low" by the system to enable (turn on) the Main output and only after all other pins are connected and the power module is correctly seated.	N/A
C1	SDA	I <sup>2</sup> C Serial Data Line	N/A
C2	SCL	I <sup>2</sup> C Serial Clock Line	N/A

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Signal Pin Assignment	Signal Name		Description				
C3	PWR_GD	Power Good signal. An ac	ctive TTL HIGH signifies when the out	tput is within regulation limits.	N/A		
C4	FAN_FAIL	Fan Fail signal (failure or	locked rotor)		N/A		
D1	AO	I <sup>2</sup> C LSB (Least Significan	I <sup>2</sup> C LSB (Least Significant Bit) Address Line				
D2	A1	I <sup>2</sup> C MSB (Most Significan	I <sup>2</sup> C MSB (Most Significant Bit) Address Line				
D3	S_INT	System Interrupt			N/A		
D4	N/A	Reserved; no end user co	Reserved; no end user connection				
MATING CONNECTOR							
Supplier		Press Fit, Straight	ess Fit, Straight Press Fit, Right Angle Solder Straight				
FCI			51761-10002406AA				

#### WIRING DIAGRAM FOR OUTPUT

Dotted lines show optional remote sense connections. Optional remote sense lines can be attached to a load that is a distance away from the power supply to improve regulation at the load.



#### CURRENT SHARING NOTES

- Main 12VDC Output: Analogue active share bus. The ISHARE bus (Pin B3) must be connected on all sharing modules. It is not required that the SENSE signals are connected to the remote load for current share 1. to operate correctly.
- 2. Up to eight (8) power modules can be connected in parallel (non-redundant) or N+1 configuration. The current share bus is analogue bi-directional (can source or sink current from the ISHARE bus). The voltage of the bus would measure 8VDC for a single power module at 100% load; for two (2) modules sharing a common load the ISHARE bus voltage would be 4V for a perfect 50/50 current share scenario.
- 3. VSTANDBY output power modules can also be connected in parallel and have internal output isolation devices; however the combined available power is limited to that available from a single power module (3.3V or 5V: 20W) irrespective of the number of modules connected in parallel.

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OPTIONAL ACCESSORIES				
Description	Part Number			
D1U3CS-12 Output Interface Connector Card	D1U3CS-12-CONC			

APPLICATION NOTES		
Document Number	Description	Link
ACAN-41	D1U3CS-12-CONC Output Interface Connector Card	www.murata-ps.com/data/apnotes/acan-41.pdf
ACAN-49	D1U3CS-12 Communications Protocol	www.murata-ps.com/data/apnotes/acan-49.pdf

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