

SFD550-12BG Front-End Preliminary Data Sheet

DC Input, 12V Output, 550 Watts



Features

- RoHS compliant for all six substances
- Wide DC input range (-40 to -75 VDC)
- 1U or 2U height configurations
- Active current share with ORing FET on +12V
- I²C interface status and monitoring
- Standby voltage of 3.3 VDC @ 3 A
- Overtemperature, overload, and overvoltage protection
- Status LEDs: INPUT OK, OUTPUT OK, and FAULT
- Two-speed fan for low noise at low ambient temperatures

Applications

- Datacom
- Distributed power systems
- Server

Description

The SFD550-12BG expands the 'excellence in design' of our SFP Series by providing a 550-watt, DC-input front-end which complements the SFP450-12BG and the SFP650-12BG AC-DC front ends. It provides a main 12 VDC output for datacom and other distributed power applications, and a 3.3 VDC standby output. Its compact size enables mounting in both 1U and 2U height racks. High efficiencies, advanced thermal management techniques, and an internal fan increase reliability over a broad range of operating conditions. Internal OR'ing FET's facilitate use in hot-swap, redundant configurations.

Status is provided with front panel LEDs, logic signals, and via an I²C management interface bus. In addition, the I²C bus can supply status information about the power supply including output current and voltage.

The SFD550-12BG meets international safety requirements and is CE marked to the Low Voltage Directive (LVD).

Model Selection

Model	Nominal Output Voltage (VDC)	Adjustment Range (VDC)	Maximum Output Current (Amps)	Regulation %	Ripple & Noise @ 20 MHz BW ¹ (mV)
SFD550-12BG	12 3.3 (Standby)	N/A N/A	45.0 3.1	± 3 ± 3	100 100

¹ With an external capacitance of 740 µF on +12 V output and 50 µF on +3.3 V output.

Input Specifications

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
DC Input Voltage	Continuous input range.	-40	-48 to -60	-75	VDC
Hold-up Time	On all outputs. At -52 VDC.	10			ms
Input Current	At full-rated load. At -40 VDC.			16.5	A
Inrush Surge Current	Excluding Xcap. @ 25 °C			30	A pk

Output Specifications

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	30-80% load from -48 to -66 VDC input.	90	91.5		%
Minimum Load	Minimum loading required to maintain regulation.	0			A
Output Power				550	W
Overshoot	Output voltage overshoot at turn-on.		0	< 10	%
Transient Response	Maximum recovery time to within 1% of initial set point due to a 25% load change, 1A/μs. 12 VDC output: Standby output:			1 1	ms ms
	Maximum deviation: 12 VDC output: Standby output:		1 1	3 3	% %
Turn-On Delay with PS_ON signal	Time required for initial output voltage stabilization after application of AC input or ON/OFF signal.			< 3	sec
Output Regulation	See Model Selection data on page 1.				
Allowable Output Capacitance	+12 VDC	0		10,000	μF
	+3.3 VDC	0		1,000	μF

Interface Signals and Internal Protection¹

Parameter	Conditions/Description		Min.	Nom.	Max.	Units
Overvoltage Protection	Latch-style overvoltage protection.			14.5	15 4.3	V
Overcurrent Protection	Current limit (Latching Mode). 12 V output: Standby output:		47.2 3.25		58.5 4.65	A
Short-Circuit Protection	Latching Mode: +12 V Foldback: +3.3 V					
Overtemperature/ Fan Failure Warning	12V output will shut down in the event of an overtemperature condition or blocked fan rotor. Supply's fan and Vaux are active. Power supply will recover when OT condition is removed. Amber OT LED will turn ON to indicate fault condition.					
Signal	Input/ Output	Conditions/Description				
PS_KILL	Input	Output enable. Pulled low in conjunction with PS_ON being pulled low; allows V1 (+12V) to be activated. Signal has internal 100 kohm pull-up resistor to 3V.				
+12V Current Share	Input/ Output	0 to 4.5 V (0.1 V/Amp) signal used for active current sharing.				
Write Protect	Input	For factory use only.				
PS A0	Input	Sets the I ² C Address. Low = 0 High = 1 Signal has an internal 4.75 kohm pull-up resistor to 3V.				
SDA	Input/ Output	I ² C Data line (3.3 V).				
SCL	Input/ Output	I ² C Clock line (3.3 V).				
Tach_1	Output	Two pulses per fan revolution. Signal has an internal 2 kohm pull-up resistor to 3.3 VDC				
DC_OK/H	Output	High signal indicates DC is within PSU limits. Signal is open drain with an internal 10 kohm pull-up resistor to 3.3 VDC.				
Present/L	Output	Internally connected to Filter ground allowing the PSU to be detected on insertion.				
Alert/L	Output	Low signal indicates PSU fan is running below speed or an overtemperature limit was exceeded. Signal is open drain with an internal 1kohm pull-up resistor to 3.3 VDC.				
PWROK/H	Output	High signal indicates both outputs are within regulation limits. Signal is open drain with an internal 1 kohm pull-up resistor to 3.3 VDC.				
PSON	Input	Same as PS_KILL; must be low for +12V to be ON. Signal has 10kohm pull-up resistor to 3.3 VDC.				
+12V Sense	Input	Connect to positive side of the load				
+12V Return Sense	Input	Connect to negative side of the load				

¹ Refer to product specification for internal pull-up impedances and timing of these signals.

I²C Bus Management Interface¹

Static	Includes static information such as: part number and revision level, output rating, serial number, date code, and manufacturing location.
Status (Logic 1 or 0)	DC Input OK. DC Output OK. Overtemperature. Overcurrent. Fan OK. Overvoltage Alert Undervoltage Alert
Real-Time Monitoring	Output voltage (main output). LSB = 19.8 mV Output current (main output). LSB = 73.3 mA

¹ Reference "I²C Management Interface" and "EEPROM Table of Contents" documents for SFD550-12BG (consult factory).

Safety, Regulatory, and EMI Specifications

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Agency Approvals	UL60950-1 (UL recognized), CSA C22.2 60950-1 (CSA recognized thru UL, cUR), EN60950-1 (TÜV), IEC60950-1, CE Mark (Low Voltage Directive 2006/95/EC)				
Electromagnetic Interference	FCC CFR title 47 Part 15 Sub-Part B, EN55022/CISPR 22.	Conducted: A Radiated: A			Class
Harmonics	Per IEC61000-3-2.	A			Class
ESD Susceptibility	Per EN61000-4-2, Level 4.	8		.	kV
Radiated Susceptibility	Per EN 61000-4-3, Level 3.	10		.	V/M
EFT/Burst	Per EN 61000-4-4, Level 4.	±4		.	kV
Input Transient Protection	Per EN 61000-4-5, Class 3.	Line-to-Line: 1 Line-to-Ground: 2		.	kV
RF Conducted Disturbances	Per EN 61000-4-6, Level 3.	10		.	V

Environmental Specifications

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Altitude	Operating. Non-Operating.			10K 40K	ASL ft ASL ft
Operating Temperature	Internal DC fan for cooling. At 100% load:	0		50	°C
Storage Temperature		-40		85	°C
Temperature Coefficient	0 °C to 50 °C (after 15-minute warm-up).			0.02	%/°C
Relative Humidity	Non-condensing.			93	%RH
Shock	Operating: half-sine, 10 ms, 3-axis.			+20	Gpk
	Non-Operating: half-sine, 10 ms, 3-axis.			+40	Gpk
Vibration	Operating: Fast swept sine 5-500-5 Hz, Slow swept sine 5-100 Hz			2 2	Gpk
	Non-operating: random 10-500 Hz.			6.15	Grms

Reliability

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
MTBF	(Calculated) MILHDBK 217F Ground Benign. Demonstrated.	100,000 200,000			hrs hrs

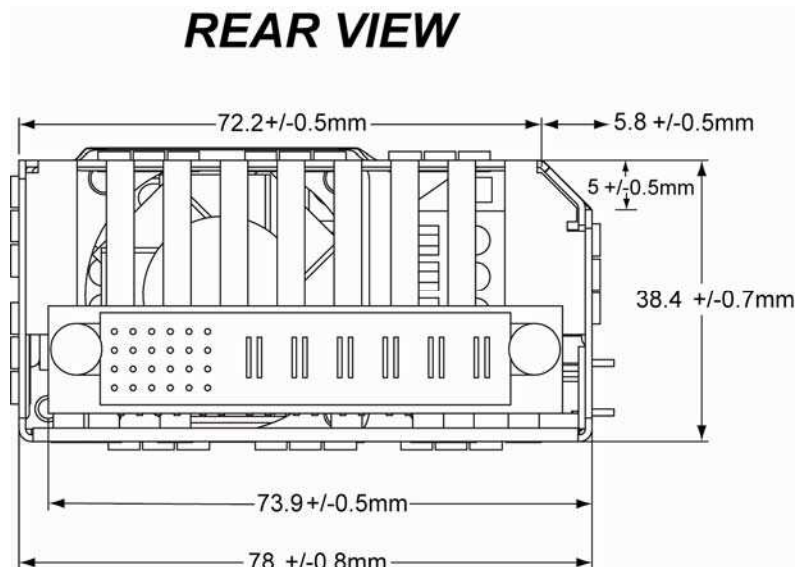
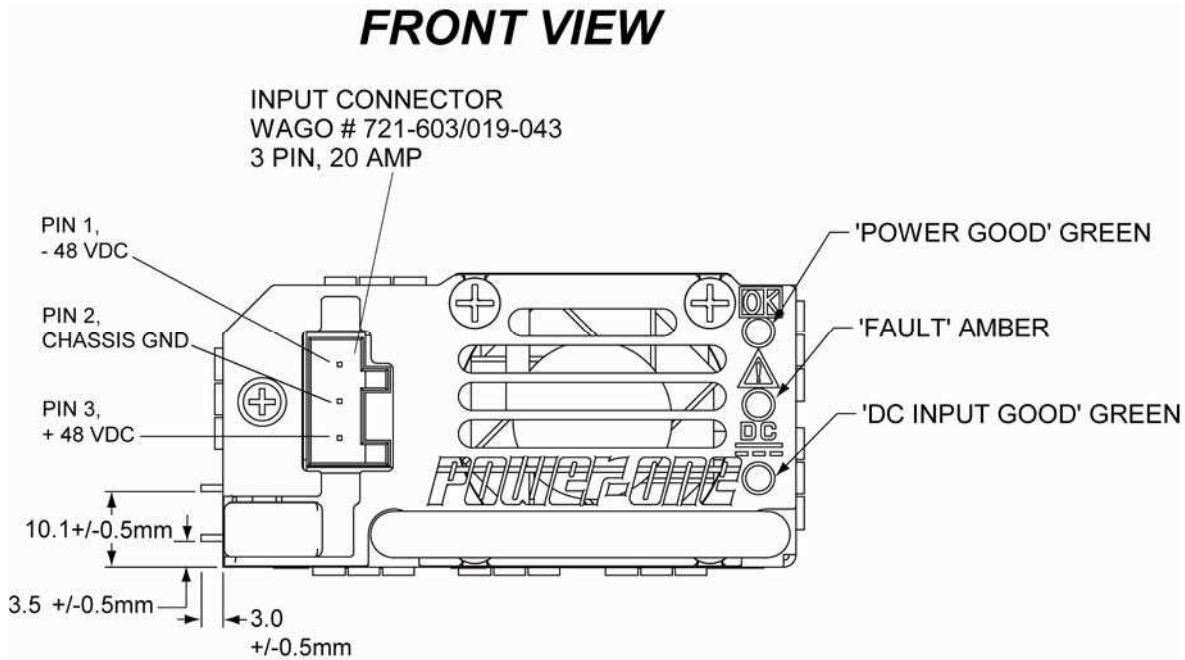
LED Indicators

Indicator	LED Color/State
Power Good	GREEN / ON
DC INPUT OK	GREEN / ON
FAULT	AMBER / ON

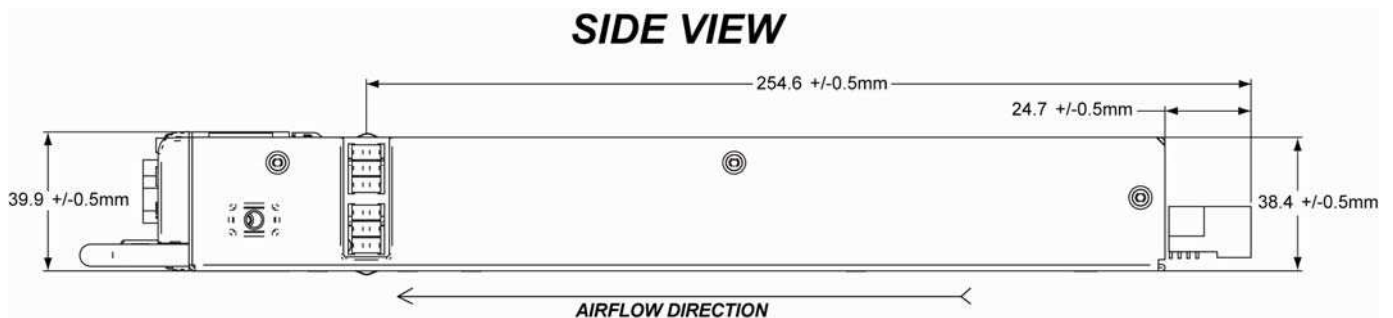
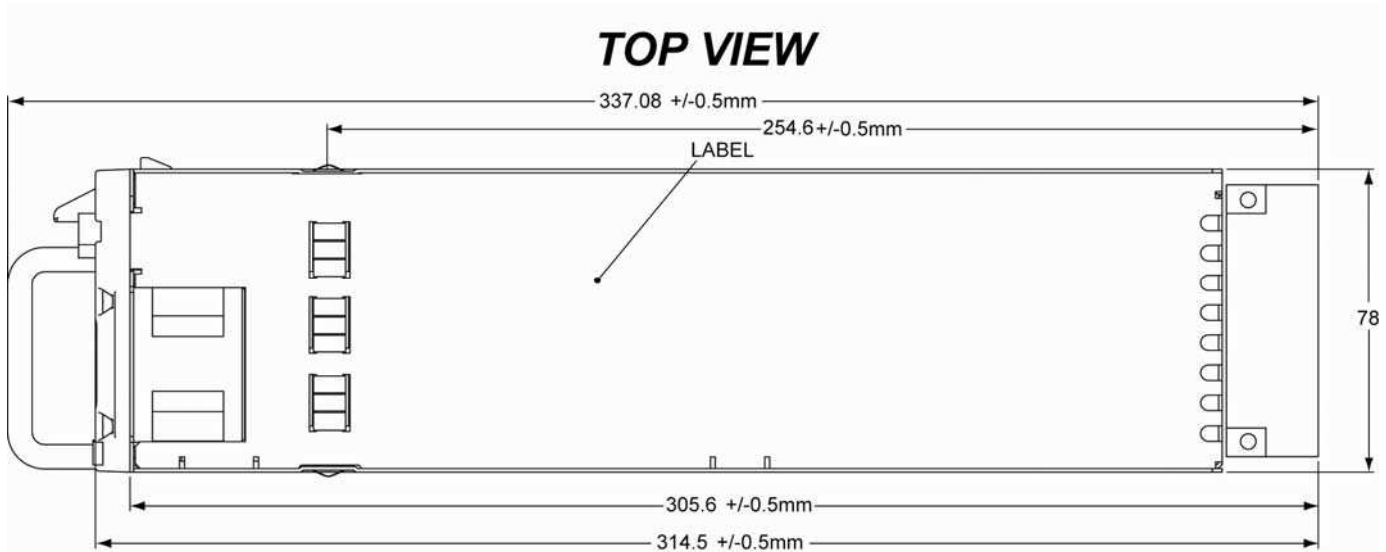
Mechanical Drawings (Drawing dimensions are shown in mm)

Overall Dimensions: 12.03 X 3.07 X 1.57 inches (305.6 X 78 X 40 mm)

Weight: max of 2.50 lb



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Connector Information

Power Supply:

Input - WAGO #721-603/019-043

Output - P/N FCI 51721-10002406AA or equivalent

Mating Connections:

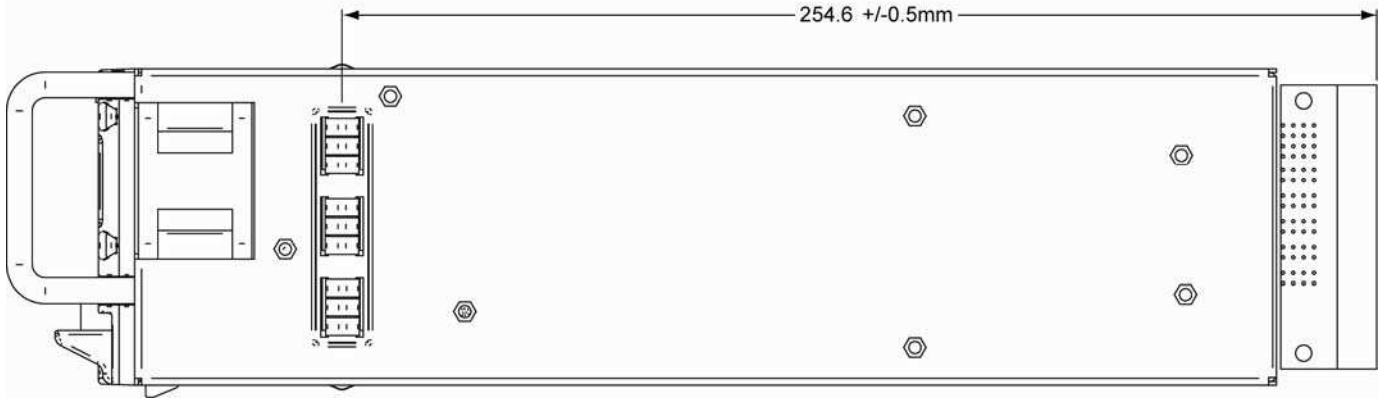
Input - WAGO #721-103/026-000 (Strain relief model #232-603 is optional)
or 721-103/037-000

Output - P/N: FCI 5174-10002406AA

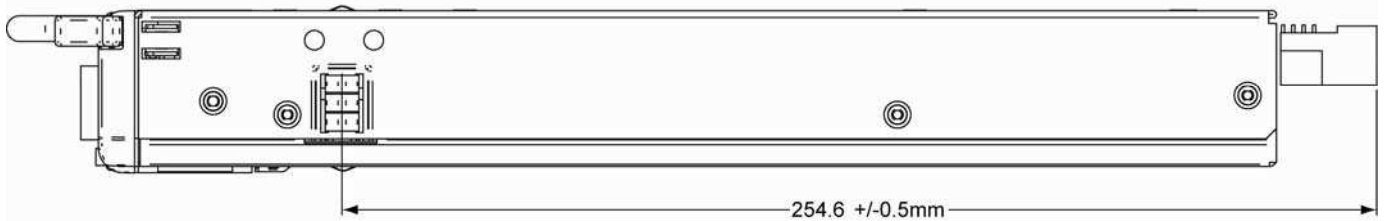
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BOTTOM VIEW



SIDE VIEW



OUTPUT CONNECTOR:

FCI (POWER BLADE)
51721-10002406AA

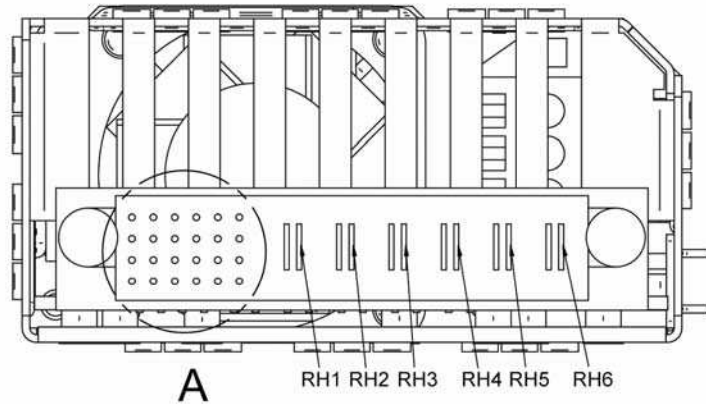
WILL MATE WITH SYSTEM BOARD CONNECTOR:

FCI (POWER BLADE)
5174-10002406AA
5174-10002406BA
5174-10002406CB

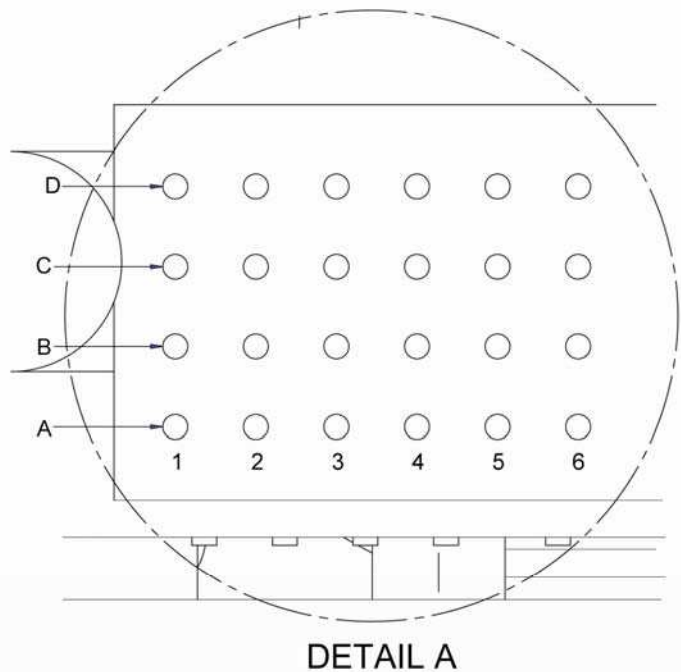
STRAIGHT IN CONNECTOR

FCI (POWER BLADE)
51761-10002406AA
51761-10002406BA
51761-10002406CB

RIGHT ANGLE CONNECTOR



PIN	SIGNAL NAME
RH1	RETURN (15A PER BLADE)
RH2	RETURN (15A PER BLADE)
RH3	RETURN (15A PER BLADE)
RH4	+12V (15A PER BLADE)
RH5	+12V (15A PER BLADE)
RH6	+12V (15A PER BLADE)
A1	PS_KILL
A2	+12V CURRENT SHARE
A3	RETURN
A4	EEPROM WRITE PROTECT
A5	PS_A0
A6	+3.3V SB (1A MAX)
B1	FILTER GROUND (CONNECT TO RETURN ON SYSTEM SIDE)
B2	+12V RETURN SENSE
B3	RETURN
B4	+3.3V SB (1A MAX)
B5	SDA
B6	-PS_ON
C1	FILTER GROUND (CONNECT TO RETURN ON SYSTEM SIDE)
C2	TACH 1
C3	RETURN
C4	+3.3V SB (1A MAX)
C5	SCL
C6	IN_OK
D1	-PRESENT (CONNECT TO FILTER GND IN THE PSU)
D2	+12V SENSE
D3	RETURN
D4	+3.3V SB (1A MAX)
D5	-ALERT
D6	PWOK



Note: Filter ground is the return for bypass capacitors on the input and output signal lines. Filter ground pins must be connected to the return pins on the user PCB at the user connector pins.

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WILL MATE WITH SYSTEM BOARD CONNECTOR:

FCI (POWER BLADE)
 5174-10002406AA **STRAIGHT IN CONNECTOR**
 5174-10002406BA
 5174-10002406CB

FCI (POWER BLADE)
 51761-10002406AA **RIGHT ANGLE CONNECTOR**
 51761-10002406BA
 51761-10002406CB

FCI 51761-10002406
FCI 51741-10002406 A A
 B A
 C B

"A" = .135 +/- .010 (3.43 +/- 0.25) SOLDER TO BOARD.
 "B" = .090 +.005 / -.010 (2.29 +0.13 / -0.25) SOLDER TO BOARD
 "C" = .154 +/- .010 (3.91 +/- 0.25) PRESS FIT TO BOARD

"A" = BOARD LOCK (REQUIRES .098 +.002/- .001 (2.49 +0.05/ -0.03) THRU HOLE IN PCB
 MOUNTING FOOT HEIGHT: .220 (5.59)
 ** NOT AVAILABLE FOR PRESS FIT **
 "B" = .150 (3.81) THRU HOLE (REQUIRES .158 +/- 0.003 (4.01 +/- 0.08) THRU HOLE IN PCB).
 MOUNTING FOOT HEIGHT .160 (4.06)
 ** ALWAYS FOR PRESS FIT **

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