

# ENGINEERING DATA SHEET

# P170 SERIES

SOLID STATE POWER CONTROLLER  
28 VDC, 1PNO-WITH CURRENT OR VOLTAGE  
STATUS OUTPUT  
UP TO 15 AMP RATING



SIZE: 37.97 x 27.31 x 8 mm

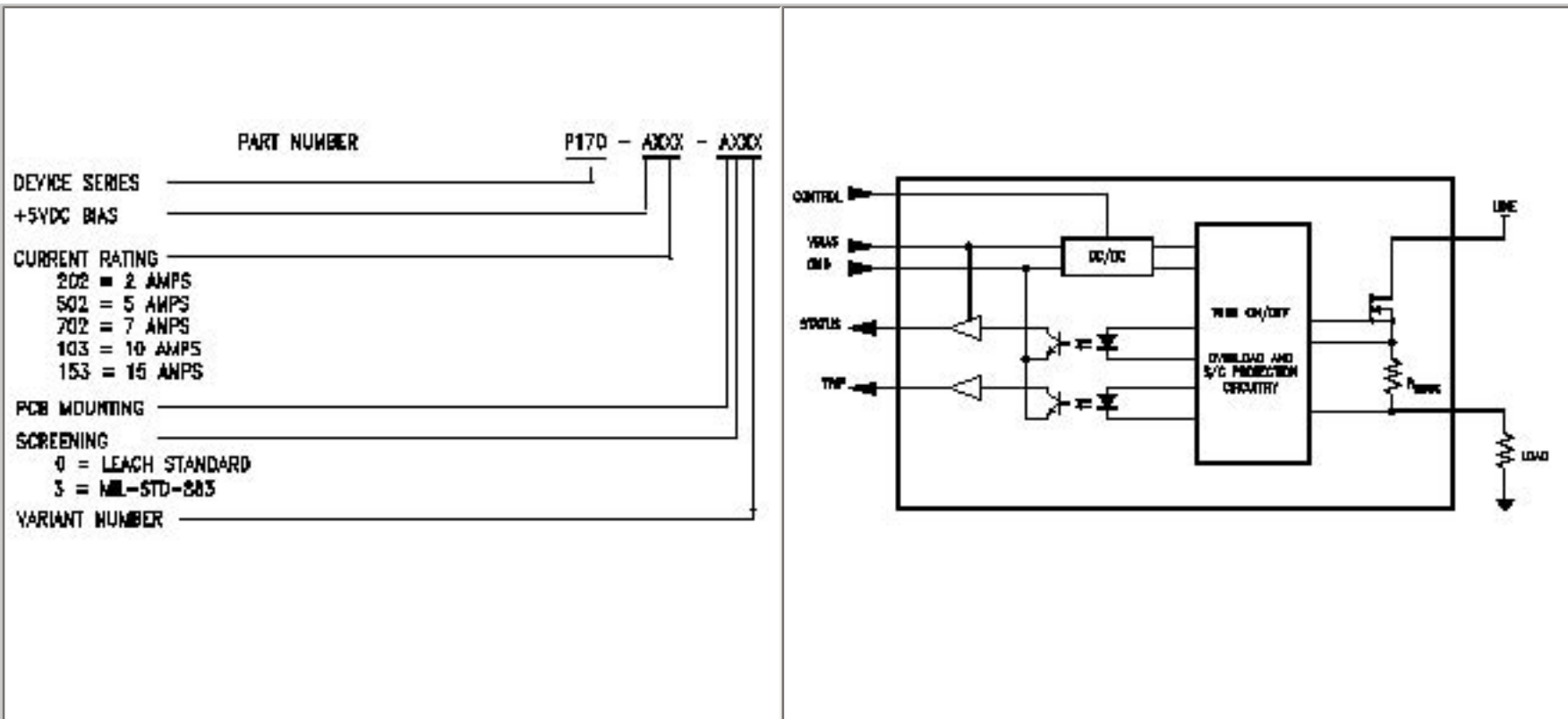
## DESCRIPTION

The P170 Series of Solid State Power Controllers (SSPC) is rated from 2 to 15 Amperes. These LEACH SSPC's feature reliable, trouble free switching together with real short circuit protection. Employing a power FET output stage, and built using thick film technology, they offer low on state resistance and low on state voltage drop. They react to fault condition and can shutdown within microseconds, if required. Two status signals, derived from the load current value and from the device gate, are reported via optical isolators. Designed to operate in 28 VDC systems, these devices do not require derating for any load type. They are hermetically sealed, in a metal package.

## FEATURES

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>.Fast acting</li> <li>.Built-in overload and short circuit protection</li> <li>.Load current or voltage status</li> </ul> | <ul style="list-style-type: none"> <li>.FET Gate status or trip status</li> <li>.Very low voltage drop</li> <li>.No derating up to 105° C</li> <li>.Trip free</li> </ul> | <ul style="list-style-type: none"> <li>.Fully isolated bias, control and status</li> <li>.No derating for non-resistive loads</li> <li>.Exceeds MIL-P-81653C requirements</li> <li>.Very low voltage drop output stage</li> </ul> |
|--|--|---|

## BLOCK DIAGRAM



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Data sheets are for initial product selection and comparison. Contact Esterline Power Systems prior to choosing a component.

# ELECTRICAL CHARACTERISTICS (CURRENT STATUS)

# P170 SERIES

Typical values are at 25 ± 5° C INPUT	DEVICE WITH CURRENT STATUS					
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
BIAS On Voltage	V <sub>IHB</sub>	4.5		5.5	V	1,2
BIAS On current	I <sub>IHB</sub>			30	mA	3
BIAS Off current	I <sub>ILB</sub>			1	mA	3
CONTROL voltage on	V <sub>IHC</sub>	2.4			V	
CONTROL voltage off	V <sub>ILC</sub>	-0.8		0.8	V	
CONTROL current on	I <sub>IHC</sub>			50	μA	4
CONTROL current off	I <sub>ILC</sub>			-10	μA	5
Transients (BIAS input)	V <sub>TB</sub>			+50	V	6

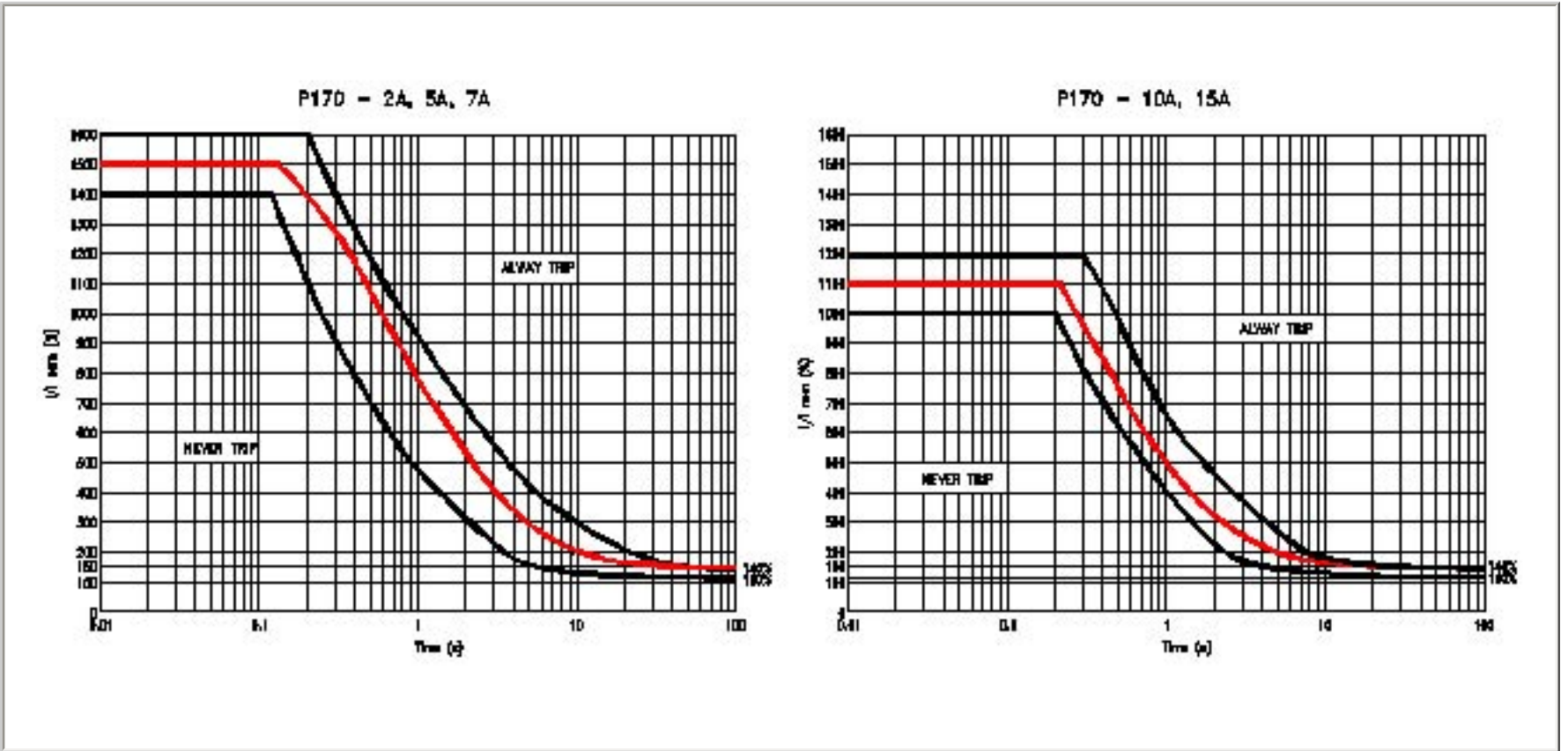
**Notes:**

1. BIAS voltage must be a step function.
2. No reverse polarity protection.
3. BIAS voltage is 5.0 V.
4. Control voltage at 2.4 vdc.
5. Control voltage at 0.4 vdc.
6. Max. Duration 50 ms, Duty Cycle 1%, Repetition Rate 1 Hz.

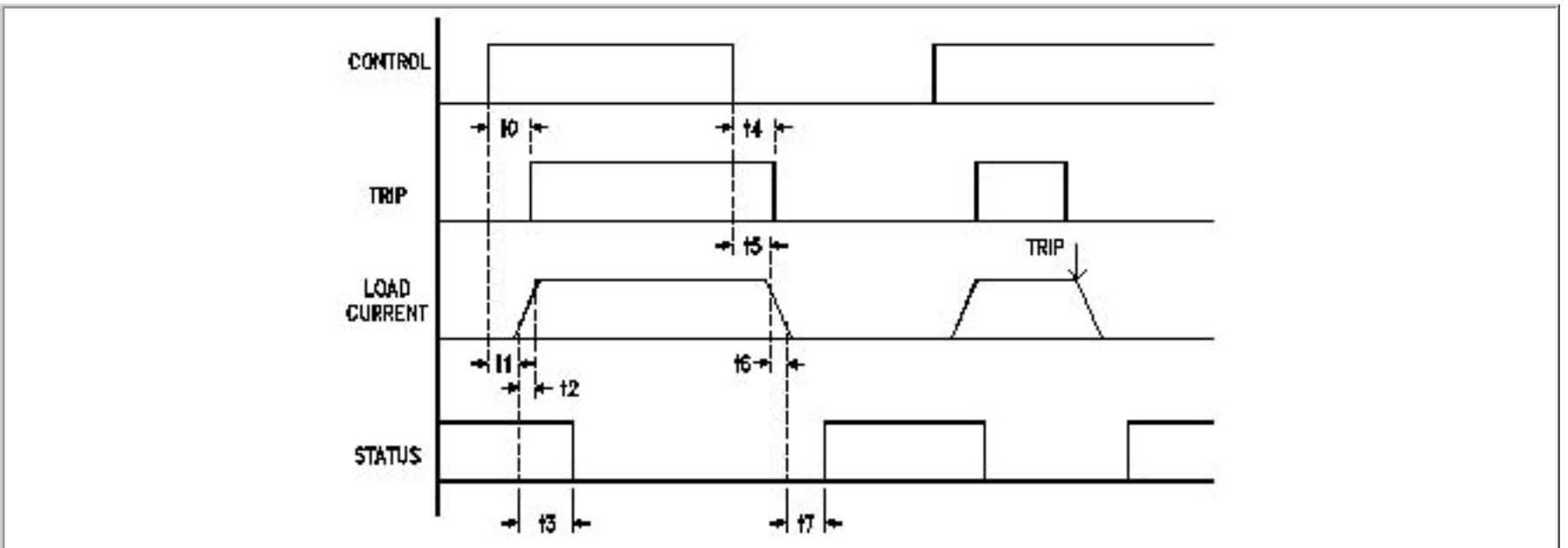
OUTPUT						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Load current	I <sub>L</sub>	0		100	%I rated	1
On state voltage drop	V <sub>LD</sub>			200	mV	2
Off state line voltage	V <sub>L</sub>			32	V	3
TRIP high voltage	V <sub>OHS</sub>	2.4			V	
TRIP high current	I <sub>OHS</sub>			50	μA	
TRIP low voltage	V <sub>OLS</sub>			0.8	V	
TRIP low current	I <sub>OLS</sub>			0.2	mA	
Status pick up	I <sub>SON</sub>			15	%I rated	
Status drop out	I <sub>SOFF</sub>	5			%I rated	
Leakage current	I <sub>LL</sub>			1	mA	4
Transient voltage	V <sub>T</sub>			+50	V	5
Spikes	V <sub>S</sub>	-600		+600	V	6
Trip current	I <sub>TR</sub>	110	130	145	%I rated	7
Isolation voltage	V <sub>ISO</sub>			750	V <sub>rms</sub>	
Insulation resistance	R <sub>INS</sub>	100		1000	MΩ	8

**Notes:**

1. Load current is subject to thermal derating.
2. At load current I<sub>L</sub>=100% rated value.
3. Reverse polarity is not blocked and may damage the SSPC.
4. At V<sub>L</sub>=28V, Case temperature = 105° C.
5. Duration 12.5 ms max. per MII-STD-704D.
6. Duration 10 μs max. per Mil-STD-704D.
7. See Trip Characteristics.
8. 500 Vdc, ± 10%



TIMING DIAGRAM (CURRENT STATUS)



TIMING

Parameter	Symbol	Typ.	Max.	Unit	Note
CONTROL to TRIP delay	$t_0$	300	1000	$\mu s$	
Turn on delay	$t_1$	150	200	$\mu s$	
Load current rise time	$t_2$	30	1000	$\mu s$	
Turn on to LOAD delay	$t_3$	75	1000	$\mu s$	
CONTROL to TRIP	$t_4$	150	1000	$\mu s$	
Turn off delay	$t_5$	150	200	$\mu s$	
Load current fall time	$t_6$	20	1000	$\mu s$	2
Turn off to LOAD delay	$t_7$	400	1000	$\mu s$	

Notes:

1. All timing measurements taken at 10% and 90% points into resistive rated load.
2. Current fall time from trip dependant on overload condition.

# ENVIRONMENTAL DATA

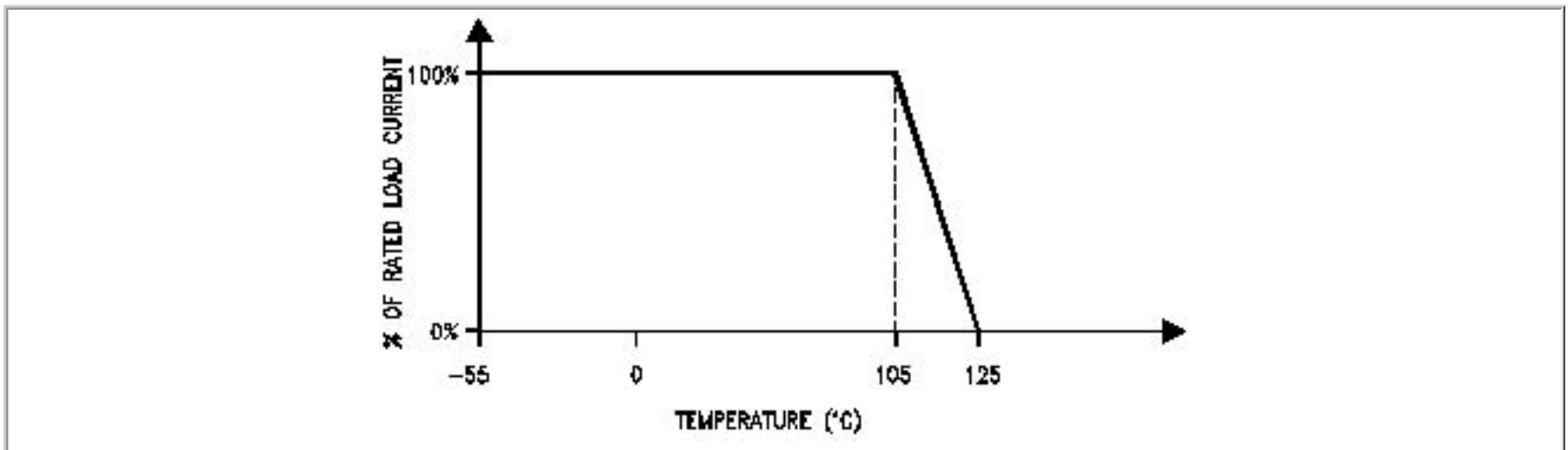
# P170 SERIES

Parameter	Symbol	Min.	Max.	Unit	Notes
Operational Temp. Range	$T_{op}$	-55	105	° C	1,2
Storage Temp. Range	$T_{st}$	-55	125	° C	
Thermal resistance junction to case $\theta_{jc}$	$\theta_{jc}$		3.2	° C/W	
Max. Junction Temperature of Output Stage	$T_{j(max)}$		150	° C	
Vibration			20	g	3
Acceleration			5000	g	4
Shock			1500	g	5
Altitude			80000	ft	
MTBF			1.5	hours	6

Notes:

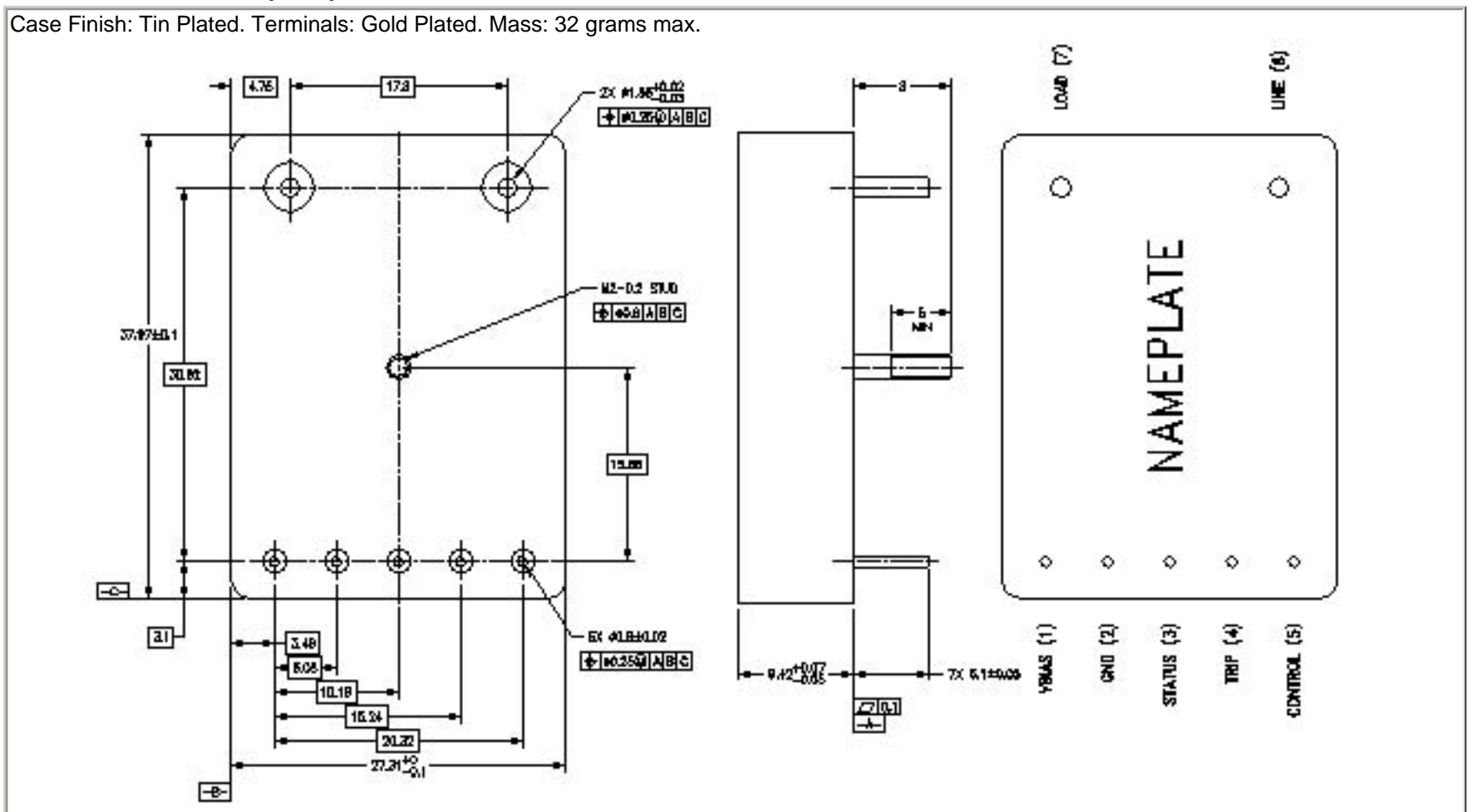
1. Case temperature
2. See thermal derating curve
3. MIL-STD-883C, Method 2007, test condition A, 20-2000 Hz
4. MIL-STD-883C, Method 2001, test condition A, Y1 axis
5. MIL-STD-883C, Method 2002, test condition B, 0.5 ms
6. Per MIL-HBK-217E, Quality level B-1, AUT environment at 25° C

## THERMAL DERATING



## PHYSICAL DATA (mm)

Case Finish: Tin Plated. Terminals: Gold Plated. Mass: 32 grams max.



This engineering data sheet is designed for initial selection and comparison of products. While every effort is made to ensure the accuracy of all data, each part number, and its application, must be controlled by a Product Control Drawing (PCD). Please contact PowerCom, a Leach International Company, for further information.