

**PS-1142**

**MicroTCA 1000W Power Module**

**PICMG MTCA.4 Standard**

**Wide range AC/DC 16X12Vdc/7.6A**

**16x3.3Vdc/0.2A**



## Power Module (PM) Description

The PS-1142 power module designed for use in  $\mu$ TCA system compliant to PICMG MicroTCA .4 Revision 1.0 specifications.

The PS-1142 Power Module is Low Noise and Ripple; Hot swappable, fully redundant, Double Height /Double Width form factor (187.2mm x 57.9 mm x 148.5mm).

The PS-1142 provides the functionality necessary to power, manage and protect a  $\mu$ TCA system comprising up to:

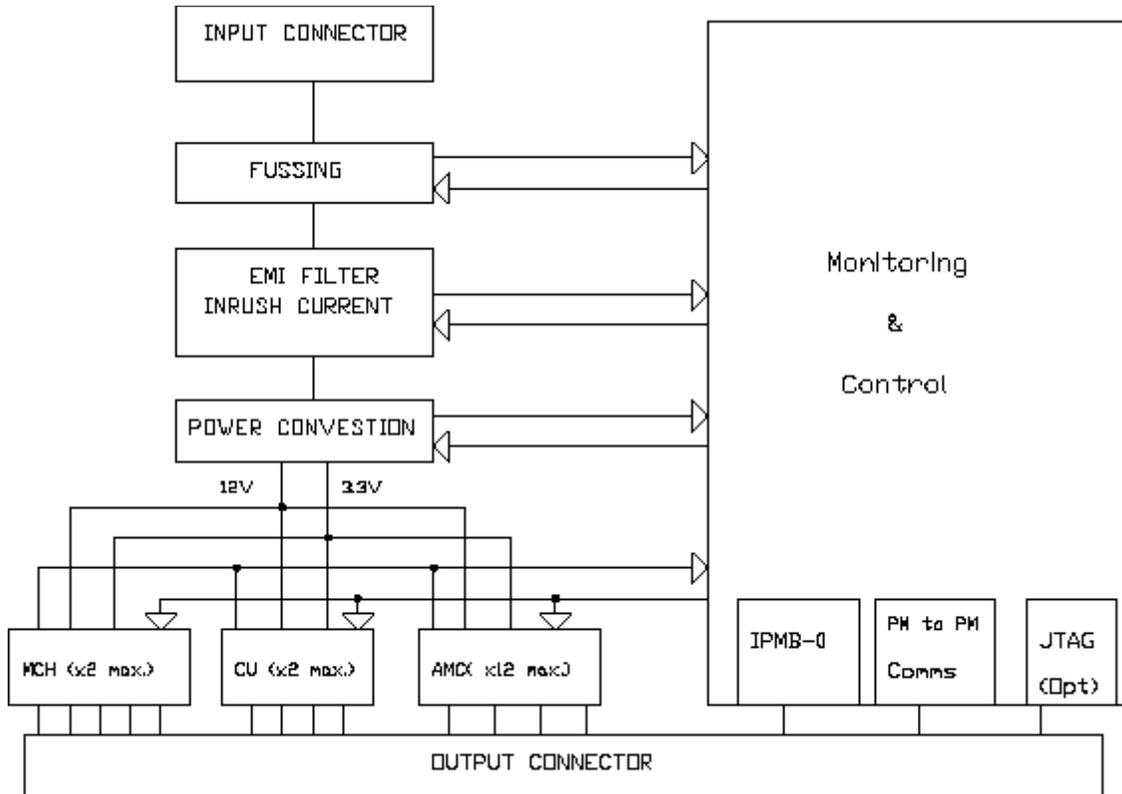
- 12 x Advanced Mezzanine Card (AM)
- 2 x MicroTCA Carrier Hub (MCH)
- 2 x Cooling Unit (CU)

The PS-1142 PM Include Enhanced Module Management Controller (PM-EMMC) card for management communications with the Carrier Manager using two IPMBs referenced as IPMB-A and IPMB-B. The aggregation of the two IPMBs is IPMB-0.

The PM-EMMC aggregate IPMB-A and IPMB-B IPMI 1.5 Protocol, provide under command of the carrier manager:

- Enable and Provide Power to AMCs, CUs, and additional MCHs
- Manage and Isolated fault affecting the power system
- Support redundant IPMI (IPMB-0) communication with the MCH/Carrier - Manager
- Support N+1 output redundancy,  $N \leq 3$
- Monitor and Report power system status and condition of operation
- Fully monitoring each of the 16 Payload output current

## Power Module Basic Functionality



### Input:

Input Voltage:	90 - 264Vac
Frequency:	47 - 63Hz
Inrush Current:	≤35A
Efficiency:	85% typical at 115Vac, full load 89% typical at 230Vac, full load
Power Factor:	0.99 typical
Input Current	5.5A typical at 1000W out and 230Vac 11A typical at 1000W out and 110Vac
Input Protection:	Internal Line Fuse: Replaceable 12A 250Vac Normal- Blow
Brown – Out:	75 to 300Vac, (power supply will not be damaged at this input voltage range)
Input Connector:	IEC 320 – C14
Hold-up Time:	10mSec minimum at 1000W

### Output Voltages & Currents:

Output	Output Voltage	Min. Load	Total Max. Load	Max. per Channel
V1	16 x 12Vdc	0	1000W / 83.3A	80W / 7.6A max.
V2	16 x 3.3Vdc	0	12.5W / 3.8 A	0.66W / 0.2A

### 12V Output PP (Payload Power):

General	12V will not be applied without 3.3V applied to load, Removal of 3.3V also removes 12V and de-assert ENABLE signal.
Set Point:	Configure as Primary PM 12.6± 0.05 Configure as Redundant PM 11.8± 0.05
Total Regulation Range:	Configure as Primary PM 12.25 to 12.95Vdc Configure as Redundant PM 11.6 to 12.00Vdc
Rated Load:	1000W max. Per module and 80W/7.6A per load channel.
Ripple & Noise:	50mV Max. V p-p 20Mhz BW measured with a 0.1u ceramic and 10uF tantalum connected across the output connector.
Overshoot:	Less than 1% of the nominal output voltage at turn ON and OFF
Transient Load Response:	±3% Max. Deviation 2mSec recovery time for load change of 25% to 75% at slew rate of 1A/uSec .
Rise Time (per channel):	10mSec Max With 1600uF on output under test
Turn On Delay(per channel):	1 sec. maximum (time from AC line turn ON, to output voltage presence)
Short Circuit Protection:	9.7A maximum within 10mSec auto recovery, over 10mSec latch shut down.
Over-voltage Protection:	Outputs shut down when output rise to 14.5V+/-0.5V (Latched Shut-Down)
Channel Fault Operation:	Shut Down under fault, 3.3V on the same channel and other channels are not affected.
Note:	All 16 channels have individually possibility to adjust the current limits with load specific values.

### 3.3V Output MP (Management Power)

General	3.3V must be applied before 12V, Removal of 3.3V also removes 12V and de-assert Enable# signal.
Set Point:	3.3V $\pm$ 0.02Vdc
Total Regulation Range:	3.13 to 3.63Vdc
Rated Load:	12.5W max. per module ,0.5W / 150mA max. per load channel.
Ripple & Noise:	30mV Max. V p-p 20Mhz BW measured with a 0.1u ceramic and 10uF tantalum connected across the output connector.
Overshoot:	Less than 1% of the nominal output voltage at turn ON and OFF
Transient Load Response:	$\pm$ 3% max. Deviation 2mSec recovery time for load change of 25% to 75% at slew rate of 1A/uSec.
Rise Time (per channel):	25mSec max with 150uF on output under test
Short Circuit Protection:	225mA max. within 12mSec auto recovery, over 10uSec latch shut down.
Over-voltage Protection:	Outputs shut down when output rise to 14.5V $\pm$ 0.5V (Latched Shut-Down)
Channel Fault Operation:	Both output 3.3V and 12V Shut Down and Enable # is de-asserted. Other channels are not affected.

### Power Module General Features:

Early Power:	The PM support Early Power Requirement per MicroTCA.0 Rev1.0 Section 4.4.11.1 Critical systems elements (MCH, CU) can be powered up without involvement of the Carrier Manager.
Normal Power:	The PM support Normal Power Requirement per MicroTCA.0 Rev1.0 Section .4.11.2 The Carrier Manager assume control of application of MP, PWR, and Enable #
Autonomous Operation:	The PM support Autonomous Power Requirement per MicroTCA.0 REV1.0 Section 4.4.11.3 powering the Carrier element when Carrier Manager is not found within specified time.
Diagnostic Mode:	The PM shall support up to three Geographic Address Lines (GA0, GA1, GA2)
Hot Swap Operation:	The PM support Hot Swap Operation, Removal or Addition of a PM will not cause a fault or out-of – regulation condition
Fault Isolation:	The PM isolated from other PMs in such a way that fault in one PM will not cause the shutdown of another PM
Thermal Protection:	The PM is activated when the ambient temperature or the power supply internal temperature exceeds a safe temperature. The MP output shut down After remove of the fault the output channel is available again under control of the Carrier Manager.
Led Status Indication:	DC OK Green Led, DC Fail Red Led and Blue Led for hot swap.
Redundant Module:	The PM support Redundant Power Requirement per MicroTCA.0 Rev1.0 Section 4.4.11.2 when configured as a redundant PM, the PM is capable of accepting the load of a failed PM within specified voltage magnitude and timing parameters.
RS232 Diagnostic Port	The PM provides status and sequencing data of the PM includes current & voltage of each module

**Input Signals:**

Geographic Address : GA0, GA1, GA2 (300uA with GAX at 0.0V)

11K Pull ups to 3.3V, low = 0.5Vmax., high = 1.63V min.

PS1\_(SLOT)# :

10K Pull ups to 3.3V, low = 1.1Vmax., high = 2.6V min.

PS1\_M1,PS1\_M2,PS1\_CU1,PS1\_CU2,PS1\_...PS\_12

(330uA with PS1\_(SLOT)# at 0.0V)

PWRON\_(MCH): PWRON\_M1,PWRON\_M2 ( Per Utca .0 R1.0

10K Pull Down, low = 0.5Vmax., high = 1.63V min.

Power section 4.4.6)

RST\_PM\_IN#:

low = 0.6Vmax., high = 2.4V min.

PMP\_(X)#: PMP\_A#,PMP\_B#,PMP\_C# (330uA with PMP\_(X)# at

10K Pull ups to 3.3V, low = 0.5Vmax., high = 1.63V min.

0.0V)

PS\_PM:

10K Pull ups to 3.3V, low = 0.6Vmax., high = 2.4V min.

**Output Signals:**

EN1\_(SLOT)# :

Open Collector Output, I sink 10mA max.

EN1\_M1,EN1\_M2,EN1\_CU1,EN1\_CU2,EN1\_...EN\_12

Low = 0.8Vmax. High = 5.5V Max.

PM\_OK# :

Open Collector Output, I sink 10mA max.

Low = 0.8Vmax. High = 5.5V Max

RST\_PM\_(X)#: RST\_PM\_A#,RST\_PM\_B#,RST\_PM\_C#

Open Collector Output, I sink 10mA max.

Low = 0.8V max. High = 5.5V max.

SMP: Complaint to Utca.0 R1.0 Section 4.6.5.4.3 Requirement

Voltage Range 4.5V min., 6V max. I sink = 750mA I

4.221-4.225

source 350mA

**Environmental Specification:**

Operating Temperature:	Operation: -5°C to +55°C full load with 300LFM Forced Air Cooling
Storage Temperature	-40°C to +85°C
Humidity:	Up to 95% RH non-condensing.
Shock:	Peak acceleration 1GPK max.
Vibration:	Random vibration, 10Hz to 500Hz, 3 axis 1.9GRMS max.
Altitude	Operation 6K feet, Non operation 40K feet.
MTBF	400,000 hours per Bellcore standard B332 GB 30°C

**Safety Regulatory & EMC Specifications:**

Meets FCC PART 15 CLASS A, CISPR 22 CLASS B, EN55022 CLASS B.

EN61000-3-2	Harmonics
EN61000-3-3	Voltage fluctuations
EN61000-4-2	ESD ±15KV discharge by AIR, ±12KV contact discharge, no damage. ESD ±10KV discharge by AIR, ±6KV contact discharge, no mis-operation.
EN61000-4-3	Radiated Immunity: 80-1000Mhz 3V/m, AM 80% (1KHz), criteria A
EN61000-4-4	Fast transient: 4KV on AC power port performance criteria B
EN61000-4-5	Surge: 1KV line to line and 2KV line to Ground
EN61000-4-6	3VRMS, 80% A.M. BY 1kHz
EN61000-4-8	3A /m at 50Hz, performance criteria A.

**Dielectric Withstand:**

- Input to Case: 1500VAC
- Input to Output: 3000VAC
- Output to Case: 500 VDC.

**Safety Agency Compliance:**

CB IEC60950-1, TUV Rheinland GS to EN60950-1, TUV Rheinland c TUV us to UL60950-1 and CSA22.2.NO.60950-1, CE mark(LVD), NEBS GR-63and GR-1089

**Leakage Current:**

0.5mA max. @ 50/60 Hz, 264Vac input

**MTBF:**

300,000 hours minimum per BELCOR 332, issue 6 specification @ 50 degrees C.

## Mechanical Specification

### Output connector :

EPT P/N 501-50096-183,  
Tyco P/N 1469920-1  
or equivalent

### Mating Connector :

EPT P/N 502-50096-183  
Tyco P/N 1469920-1  
or equivalent

### Pinout :

P1	PP_M1	PP_1	P13
P2	PP_CU1	PP_2	P14
P3	PP_CU2	PP_3	P15
P4	GND	PP_4	P16
P5	GND	PP_5	P17
P6	GND	PP_6	P18
P7	GND	PP_7	P19
P8	GND	PP_8	P20
P9	GND	PP_9	P21
P10	GND	PP_10	P22
P11	GND	PP_11	P23
P12	PP_M2	PP_12	P24

1	PS_PM#	PM_OK#	PS1_M1#	PS1_CU1#	EN_M1#	EN_CU1#	MP_M1#	MP_CU1#
2	N/C	PMP_A#	PS1_2#	PS1_1#	EN_2#	EN_1#	MP_2#	MP_1#
3	N/C	PMP_B#	PS1_4#	PS1_3#	EN_4#	EN_3#	MP_4#	MP_3#
4	N/C	PMP_C#	PS1_6#	PS1_5#	EN_6#	EN_5#	MP_6#	MP_5#
5	N/C	RST_PM_IN#	PS1_8#	PS1_7#	EN_8#	EN_7#	MP_8#	MP_7#
6	N/C	RST_PM_A#	PS1_10#	PS1_9#	EN_10#	EN_9#	MP_10#	MP_9#
7	GA0	RST_PM_B#	PS1_12#	PS1_11#	EN_12#	EN_11#	MP_12#	MP_11#
8	GA1	RST_PM_C#	PS1_M2#	PS1_CU2#	EN_M2#	EN_CU2#	MP_M2#	MP_CU2#
9	GA2	SMP	SCL_B	SDA_B	SCL_A	SDA_A	PWR_ON_M2	PWR_ON_M1
	A	B	C	D	E	F	G	H

**Diagnostic Connector: Harwin P/N M80-5C10405M3**

**Mating Connector: Harwin P/N M80-4800405**

### Pinout:

1. A1
2. A2
3. A3

# Outline Drawing

