PS-1142

MicroTCA 1000W Power Module

PICMG MTCA.4 Standard

Wide range AC/DC 16X12Vdc/7.6A

16x3.3Vdc/0.2A

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Power Module (PM) Description

The PS–1142 power module designed for use in µTCA 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 µTCA 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 ≤ 3
- Monitor and Report power system status and condition of operation
- Fully monitoring each of the 16 Payload output current

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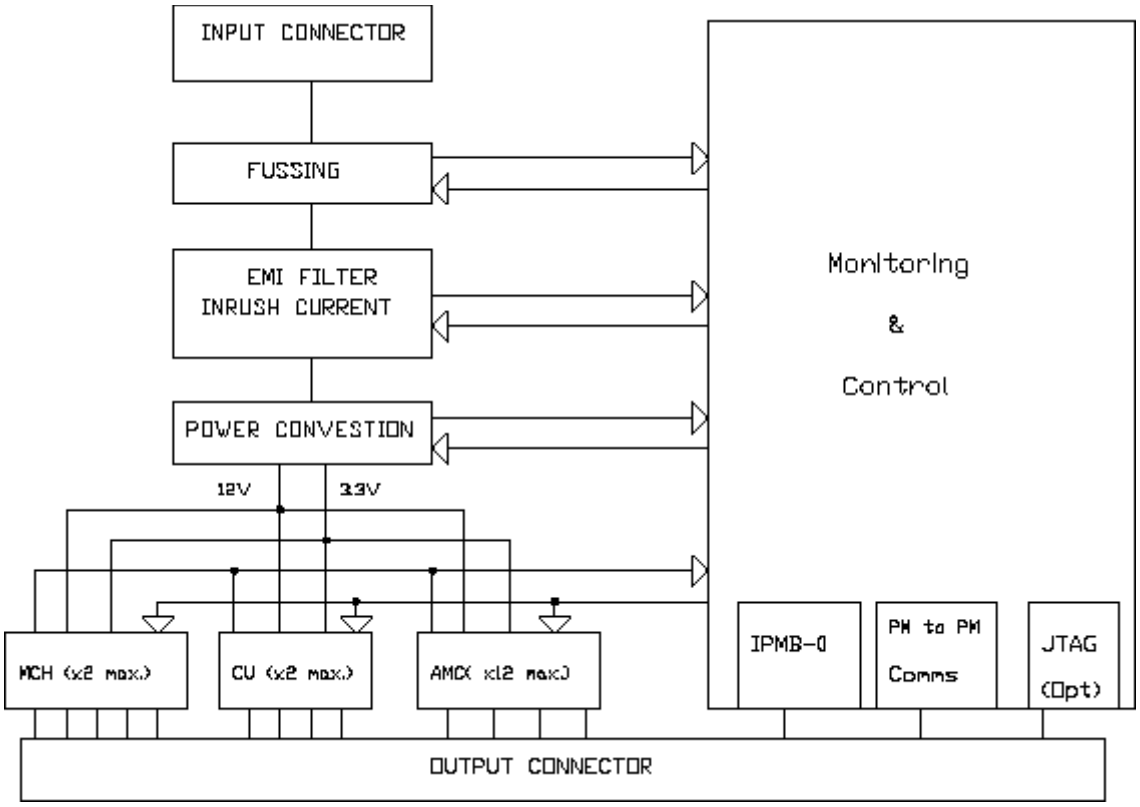
Power Module Basic Functionality



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 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 to14.5V+/-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 ± 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:	±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 to14.5V+/-0.5V (Latched Shut-Down)
Channel Fault Operation:	Both output 3.3Vand 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)# : PS1_M1,PS1_M2,PS1_CU1,PS1_CU2,PS1_...PS_12 (330uA with PS1_(SLOT)# at 0.0V)	10K Pull ups to 3.3V, low = 1.1Vmax., high = 2.6V min.
PWRON_(MCH): PWRON_M1,PWRON_M2 (Per Utca .0 R1.0 Power section 4.4.6)	10K Pull Down, low = 0.5Vmax., high = 1.63V min.
RST_PM_IN#:	low = 0.6Vmax., high = 2.4V min.
PMP_(X)#: PMP_A#,PMP_B#,PMP_C# (330uA with PMP_(X)# at 0.0V)	10K Pull ups to 3.3V, low = 0.5Vmax., high = 1.63V min.
PS_PM:	10K Pull ups to 3.3V, low = 0.6Vmax., high = 2.4V min.

Output Signals:

EN1_(SLOT)# : EN1_M1,EN1_M2,EN1_CU1,EN1_CU2,EN1_...EN_12	Open Collector Output, I sink 10mA max. 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 4.221-4.225	Voltage Range 4.5V min., 6V max. I sink = 750mA I source 350mA

Environmental Specification:

Operating Temperature:	Operation: -5ºC to +55ºC full load with 300LFM Forced Air Cooling
Storage Temperature	-40ºC to +85ºC
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 30ºC

Safety Regulatory & EMC Specifications:

Meets FCC PART 15 CLASSA, 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**

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Outline Drawing