# Advanced Specification
126W DC/DC Power Module
48 V Input; 12V Output

- *High Efficiency 90% Typ*

- *Fast Dynamic Response, 150us,*
  +/- 100 mVpeak Typ

- *Heatsinks available as an option for extended operation*

- *Low Output Ripple, 75mV$_{p-p}$ Typ*

- *High power density, 76.2 W/in^3*

- *Wide input voltage range (36-75V) according to ETSI Specifications*

- *Industry standard footprint & pin-out*

- *1,500 Vdc isolation voltage*

- *Max case temperature +100ºC*

- *UL 1950/UL$_C$ 1950 Recognized Pending*

- *Demonstrated compliance with isolation requirements equivalent to Basic Isolation*
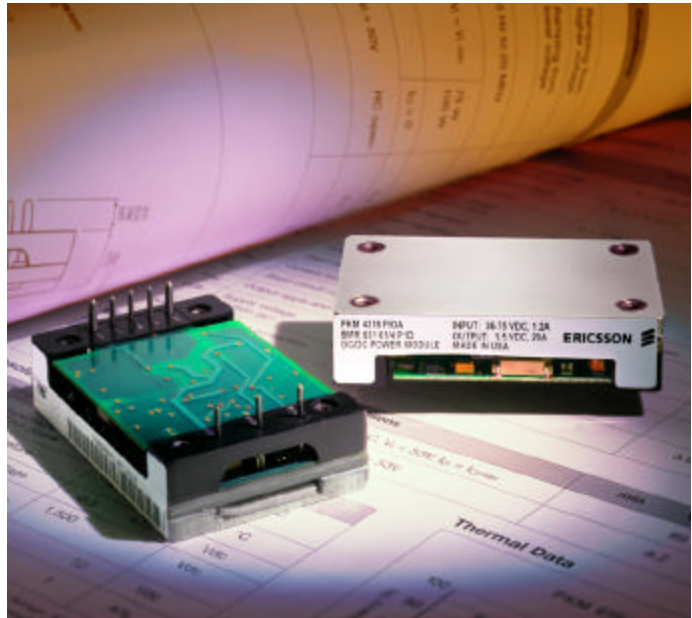
The PKM 4000 series of DC/DC power modules represents another Ericsson "industry first" achievement in the continued development of our "third generation" of high density, high efficiency DC/DC power modules in an industry standard quarter brick package with unparalleled performance. The PKM 4113 PI module is a new addition to the series family with 76.2W/in^3 at 90% efficiency. These breakthrough features have been achieved by using the most advanced patented topology, ultilizing integrated magnetics and synchronous rectification on a low resistivity multilayer PCB.

The product features fast dynamic response times and low output ripple, which are important parameters when supplying low voltage logics. The PKM 4000 series is especially suited for limited board space and high dynamic load applications

Ericsson's PKM 4000 Power Modules address the converging "New Telecoms" market by specifying the input voltage range in accordance with ETSI specifications. Included in the PKM 4000 series are over-voltage protection, under voltage protection, over temperature protection, soft-start, and short circuit protection. The PKM 4000 Series also offers the flexibility of using an optional heatsink when needed, enabling reduced airflow, extended reliability, and higher ambient temperature operation.

These modules are manufactured using highly automated manufacturing lines with a world-class quality commitment which is reflected in our standard five-year warranty. Ericsson Inc., Microelectronics has been an ISO 9001 certified supplier since 1991.

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General

Connections

Pin	Designation	Function
1	- IN	Negative Input
2	ON/OFF	Remote control (primary). To turn on and turn off the output.
3	+ IN	Positive Input.
4	- OUT	Negative Output.
5	- SEN	Negative Remote Sense
6	Trim	Output Voltage Adjust
7	+ SEN	Positive Remote Sense
8	+ OUT	positive Output

Weight

Maximum 55 g

Case

Aluminum baseplate with metal standoffs.

Pins
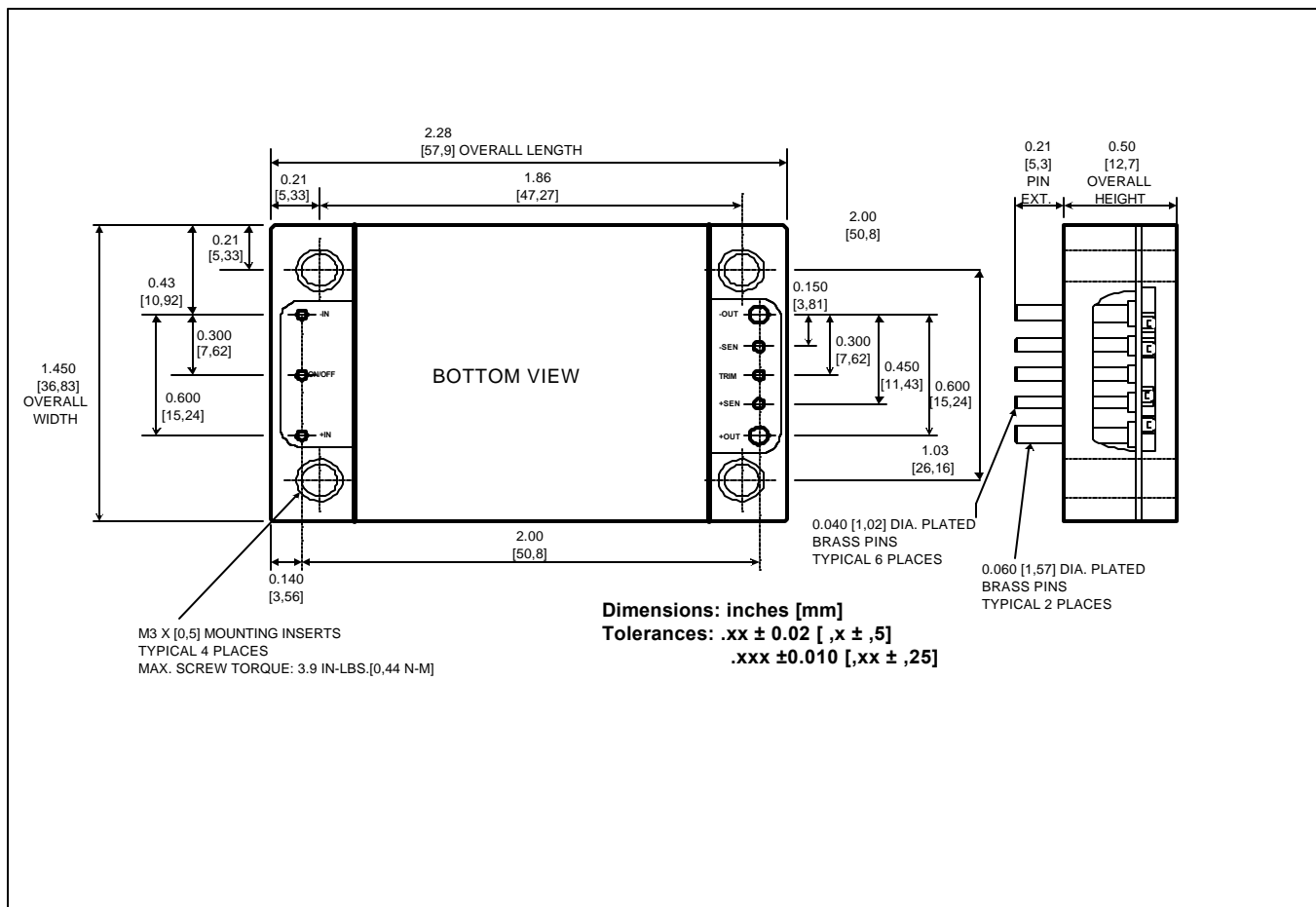
Pin material: Brass
Pin plating: Tin/Lead over Nickel.

Input $T_C < T_{C\,max}$

Characteristics		Conditions	min	typ	max	Unit
V_I	Input voltage range[1]		36		75	Vdc
V_{Ioff}	Turn-off input voltage	Ramping from higher voltage	31	33		Vdc
V_{Ion}	Turn-on input voltage	Ramping from lower voltage		34	36	Vdc
C_I	Input capacitance			2.8		µF
I_{Iac}	Reflected ripple current	5 Hz to 20 MHz		20		mA$_{p-p}$
$I_{I\,max}$	Maximum input current	$V_I = V_{Imin}$, V_I = 53V PKM 4113 PI			4.28	A
P_{Ii}	Input idling power	I_O =0, V_I = 53 V		2.6	4.6	W
P_{RC}	Input stand-by power (turned off with RC)	V_I=53V, RC open		0.4	0.6	W
VTRIM	Maximum input				6	Vdc

Note:

1) The input voltage range 36...75 V meets the requirements in the European Telecom Standard prETS 300 132-2 for Normal input voltage range in 48 V and 60 V DC power systems, −40.5...−57.0 V and −50.0...−72.0 V respectively.

Mechanical Data

2.28 [57,9] OVERALL LENGTH
0.21 [5,33]
1.86 [47,27]
0.21 [5,33]
0.43 [10,92]
1.450 [36,83] OVERALL WIDTH
0.300 [7,62]
0.600 [15,24]

BOTTOM VIEW

-IN
ON/OFF
+IN
-OUT
-SEN
TRIM
+SEN
+OUT

2.00 [50,8]
0.150 [3,81]
0.300 [7,62]
0.450 [11,43]
0.600 [15,24]
1.03 [26,16]
2.00 [50,8]
0.140 [3,56]

0.21 [5,3] PIN EXT.
0.50 [12,7] OVERALL HEIGHT

0.040 [1,02] DIA. PLATED BRASS PINS TYPICAL 6 PLACES
0.060 [1,57] DIA. PLATED BRASS PINS TYPICAL 2 PLACES

M3 X [0,5] MOUNTING INSERTS TYPICAL 4 PLACES MAX. SCREW TORQUE: 3.9 IN-LBS.[0,44 N-M]

Dimensions: inches [mm]
Tolerances: .xx ± 0.02 [,x ± ,5]
.xxx ±0.010 [,xx ± ,25]

PKM 4113 PI (126W)

$T_C = -40...+100°C$, $V_I = 36...75V$ unless otherwise specified.

Output

Characteristics		Conditions	Output			Unit
			min	typ	max	
V_{Oi}	Output voltage initial setting and accuracy	$T_C = +25°C$, $V_I = 53$ V, $I_O = I_{Omax}$	11.8	12.0	12.2	V
	Output adjust range	$I_O = I_{Omax}$	9.6		13.3	V
V_O	Output voltage tolerance band	$I_O = 0$ to I_{Omax}	11.6		12.4	V
	Line regulation	$I_O = I_{Omax}$		3	10	mV
	Load regulation	$V_I = 53V$, $I_O = 0$ to I_{Omax},		3	10	mV
V_{tr}	Load transient voltage deviation	Load step = 0.25 x I_{Omax} di/dt = 1A/us		+/-100		mV
t_{tr}	Load transient recovery time			150		μs
t_s	Start-up time	From V_I connection to $V_O = 0.9 \times V_{Onom}$		30	40	ms
I_O	Output current		0		10.5	A
P_{Omax}	Max output power	At $V_O = V_{Onom}$			126	W
I_{lim}	Current limit threshold	$V_O = 0.96$ V_{Onom} @ $T_C < 100ºC$	11.5	12.5	14.0	A
I_{sc}	Short circuit current			14.5	16.0	A
V_{Oac}	Output ripple & noise	$I_O = I_{Omax}$, f < 20 MHz		75	100	mV$_{p-p}$
SVR	Supply voltage rejection (ac)	f < 1kHz	-53			dB
OVP	Over voltage protection	$V_I = 50$ V		14.9	15.5	V

Miscellaneous

Characteristics		Conditions	min	typ	max	Unit
η	Efficiency	$I_O = I_{Omax}$, $V_I = 53V$, $T_C = +25°C$		90		%
P_d	Power dissapation'	$I_O = I_{Omax}$, $V_I = 53V$, $T_C = +25°C$		14		W
f_s	Switching frequency	$I_O = 0...1.0 \times I_{Omax}$		150		kHz

Absolute Maximum Ratings

Characteristics		min	max	Unit
T_C	Maximum Operating Case Temperature	-40	+100	°C
T_S	Storage temperature	-40	+125	°C
V_I V dc	Input voltage Continuous	-0.5	+80	Vdc
	Transient (100ms)		+100	V dc
V_{ISO}	Isolation voltage (input to output test voltage)	1,500		V dc
V_{RC}	Remote control voltage		12	Vdc
I^2t	Inrush transient		1	A^2s

Stress in excess of Absolute Maximum Ratings may cause permanent damage. Absolute Maximum Ratings, sometimes referred to as "no destruction limits," are normally tested with one parameter at a time exceeding the limits of output data or electrical characteristics. If exposed to stress above these limits, function and performance may degrade in an unspecified manner.

Thermal Data

PKM 4113 PI Efficiency
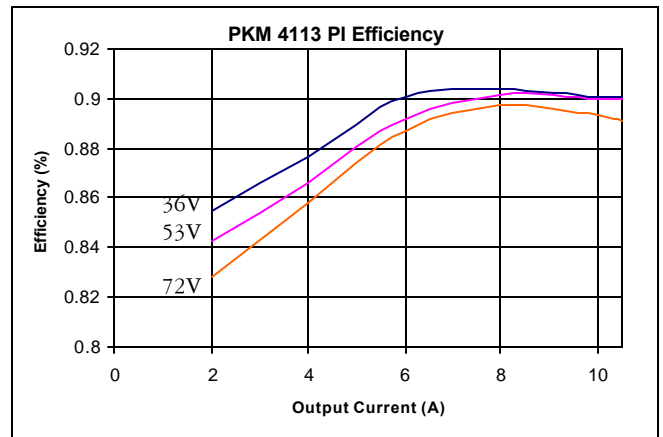
Product Program

V_I	V_O/I_O max	P_O max	Ordering No.
48/60 V	12V/10.5A	126 W	PKM 4113 PI

The PKM 4113 PI DC/DC power module will be available with the different options listed in the Product Options Table

Please check with the factory for availability.

Product Options

Option	Suffix	Example
Negative remote on/off logic, Industry Standard trim (i.e. V_o Adjust)	-	PKM 4113 PI
Positive remote on/off logic	P	PKM 4113 PIP
Lead length 0.145"± 0.010"	LA	PKM 4113 PILA

The latest and most complete information can be found on our website!

Advanced Specification

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