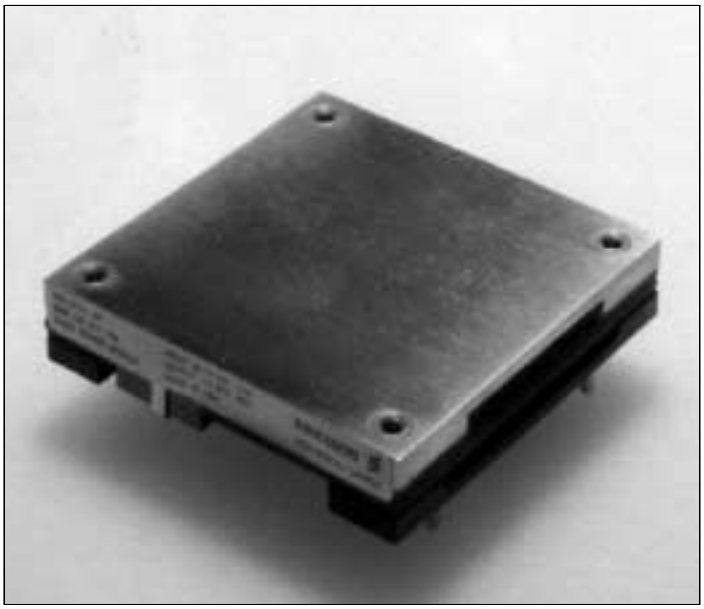
# Advanced Specification
# 300 Watt DC/DC Power Module
# 48V Input, 12V Output

- *High efficiency 92% Typ (25A) at full load*
- *High power density, 103 W/in$^3$, (12V @ 25A)*
- *Fast dynamic response, 200µs, ±200 mVpeak Typ*
- *Low output ripple, 80 mVp-p Typ*
- *Paralllelable with no external components*
- *Wide input voltage range (36-75V)*
- *1,500Vdc isolation voltage*
- *Max case temperature +100°C*
- *UL 1950/UL$_C$ 1950 Recognized*
- *TUV EN 60 950 Type Approval*



The PKL series represents another one of Ericsson's "industry first" achievements in the continued development of our "Third Generation" of high-density, high-efficiency power modules. This module packs 103 W/in$^3$ at 92% efficiencies (12V @ 25A) in an industry standard footprint that has been enhanced to include two additional output pins for motherboard connection reliability. These breakthrough features come from using the most advanced patented topology utilizing integrated magnetics and synchronous rectification on a low-resistivity multilayer PCB.

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

Ericsson's PKL Power Module has been designed with the converging "New Telecoms" market in mind, by specifying the input voltage range in accordance with ETSI specifications. The PKL series also offers over-voltage protection, under-voltage protection, over-temperature protection, soft-start, and is short circuit proof.

These modules are manufactured on highly automated manufacturing lines. Ericsson's world-class quality commitment is reflected in our standard five-year warranty. Ericsson Microelectronics has been an ISO 9001 certified supplier since 1991.

*For a complete product program, please reference the back cover.*

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# General

## Connections

| Designation | Function |
|---|---|
| -IN | Negative input |
| CASE | Connected to base plate |
| RC | Remote control (primary) to turn-on and turn-off the output |
| +IN | Positive input |
| -OUT | Negative output |
| -SEN | Negative remote sense |
| TRIM | Output voltage adjust |
| +SEN | Positive remote sense |
| +OUT | Positive output |

Note: If the remote sense is not needed the "-Sense" should be connected to -Out and "+Sense" should be connected to +Out.

### Weight
100 grams

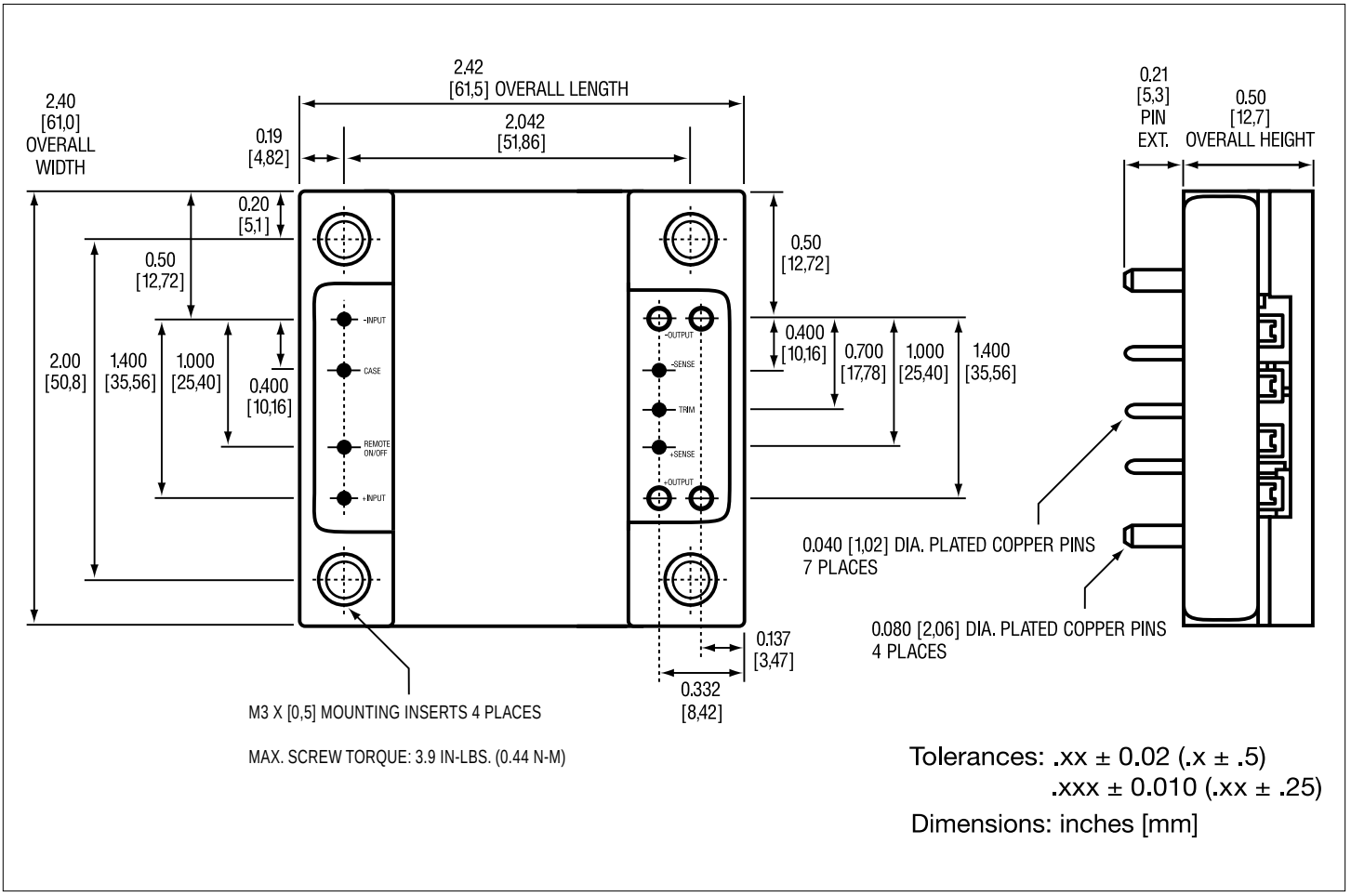
### Case
Aluminum baseplate with metal standoffs

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

## Input $T_C < T_{Cmax}$

| Characteristics | | Conditions | | min | typ | max | Unit |
|---|---|---|---|---|---|---|---|
| $V_I$ | Input voltage range | | | 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 | | | 3.5 | | | µF |
| $I_{Imax}$ | Maximum input current | $V_I = V_{I\ min}$ | 250 W<br>300 W | | | 8.0<br>9.6 | A |
| $P_{Ii}$ | Input idling power | | $I_O = 0$ | | 9 | | W |
| $P_{RC}$ | Input stand-by power (turned off with RC) | $V_I$ = 50V | RC open | | 1.2 | | W |
| TRIM | Maximum input voltage on trim pin | | | | | 6 | Vdc |

## Mechanical Data



# PKL 4313 PIT/PKL 4213 PIT

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

## Output

| Characteristics | | Conditions | Device | Output | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | min | typ | max | |
| $V_{Oi}$ | Output voltage initial setting and accuracy | $T_C$ = +25°C, $V_I$ = 53V, $I_O$ = $I_{Omax}$ | All | 11.8 | 12 | 12.2 | V |
| | Output adjust range | $I_O$ = 0 to $I_{Omax}$ | All | 9.6 | | 13.3 | V |
| $I_O$ | Output current | | PKL 4313 PIT<br>PKL 4213 PIT | 0<br>0 | | 25<br>20 | A |
| $V_O$ | Output voltage tolerance band | $I_O$ = 0 to $I_{Omax}$ | All | 11.64 | | 12.36 | V |
| | Line regulation | $I_O$ = $I_{Omax}$ | All | | 5 | 20 | mV |
| | Load regulation | $V_I$ = 53V, $I_O$ = 0 to $I_{Omax}$ | All | | 5 | 20 | mV |
| $V_{tr}$ | Load transient voltage deviation | Load step = 0.25 x $I_{Omax}$<br>dI/dt = 1A/µs | All | | ±200 | | $mV_{peak}$ |
| $t_{tr}$ | Load transient recovery time | | All | | 200 | | µs |
| $t_s$ | Start-up time | From $V_I$ connection to $V_O$ = 0.9 x $V_{Onom}$ | All | | 20 | 30 | ms |
| $I_{lim}$ | Current limit threshold | $V_O$ = 0.96 $V_{Onom}$ @ $T_C$<100°C | PKL 4313 PIT<br>PKL 4213 PIT | 26<br>22 | 27.5<br>23.5 | 32<br>28 | A |
| $I_{SC}$ | Short circuit current | | PKL 4313 PIT<br>PKL 4213 PIT | | 30<br>26 | 33<br>29 | A |
| $V_{Oac}$ | Output ripple and noise | $I_O$ = $I_{Omax}$ f ≤ 20 MHz | All | | 80 | 150 | mVp-p |
| SVR | Supply voltage rejection (ac) | f<1kHz | All | -50 | | | dB |
| OVP | Over voltage protection | Vin = 50V | All | | 14.9 | 15.5 | V |

## Miscellaneous

| Characteristics | | Conditions | Device | min | typ | max | Unit |
|---|---|---|---|---|---|---|---|
| η | Efficiency | $T_A$ = +25°C, $V_I$ = 53V, $I_O$ = $I_{Omax}$ | PKL 4313 PIT<br>PKL 4213 PIT | | 92<br>92 | | % |
| $P_d$ | Power dissipation | $I_O$ = $I_{Omax}$, $V_I$ = 53V | PKL 4313 PIT<br>PKL 4213 PIT | | 26<br>20.9 | | W |

## Absolute Maximum Ratings

| Characteristics | | min | max | Unit |
|---|---|---|---|---|
| $T_C$ | Case temperature @ max output power | -40 | +100 | °C |
| $T_S$ | Storage temperature | -40 | +125 | °C |
| $V_I$ | Continuous input voltage | -0.5 | +80 | Vdc |
| $V_{ISO}$ | Isolation voltage (input to output test voltage) | 1,500 | | Vdc |
| $V_{RC}$ | 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.

## Product Program

| $V_I$ | $V_O/I_O$ | $P_{Omax}$ | Ordering Number |
|---|---|---|---|
| 48/60 V | 12V/25A | 300W | PKL 4313 PIT |
| 48/60 V | 12V/20A | 240W | PKL 4213 PIT |

The PKL 4000 DC/DC power modules 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<br>Industry Standard Trim,<br>(i.e. $V_{out}$ Adjust) | – | *PKL 4119A PIT* |
| Positive remote on/off logic | P | *PKL 4119A PIPT* |
| Lead length of 0.145" ± 0.010" | LA | *PKL 4119A PITLA* |



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

**Preliminary Data Sheet**

AE/LZT 108 4895 R2