TAMURA Power Modules ?
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Five Key advantage

① Improve Efficiency

② Improve Noise

③ Improve SCM

④ Improve Form-Factor

⑤ Improve time to market
Concerns about Energy Efficiency…

Improving Energy efficiency…
Complying with energy regulations…

Solution !!

① Improve Stand-by Power

Compliance with standby energy regulations
(Example: EPM0510SJ)

Click “Tamura’s web site” for target block diagrams and other useful information!
Concerns about Noise and Vibration Sound …

We want to reduce humming sound in power supply.

Is there a way to reduce it?

Solution !!

② Improve Audible Noise level

Humming sound is reduced by Tamura’s unique structure.

Visit “Ways to Reduce Power Supply Noise” on Tamura’s web site for noise reduction solutions and more information!
Component Management is Troublesome …
Concerns about Component Management …

Management of discontinued components is troublesome.

We want to simplify component management.

Solution!!

③ Easy Management

<table>
<thead>
<tr>
<th></th>
<th>Primary side</th>
<th>Replaced components</th>
<th>Secondary side</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPM</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Discrete</td>
<td>26</td>
<td>1</td>
<td>11</td>
<td>38</td>
</tr>
</tbody>
</table>

(Example: Substrate sample)

When discrete components are used, 29 components need to be prepared.

When the power supply module is used, 1 component needs to be prepared!

A comparison of the number of components

29 : 1

(Comparison with Tamura’s previous Power Module)
Concerns about Size …

Mounting space is limited.

Substrates should be as small as possible…
What should we do …?

Solution !!

4 Compact Form-Factor

Discrete components having the same functions as EPM

Area ratio 2:1

EPM

S=38mm X 53mm =2014mm²

S=33mm X 31mm =1023mm²

50% Less!!

(Comparison with Tamura’s previous Power Module)

Visit Tamura’s web site for mounting methods and other details!
Concerns about Time Required for Development/Design …

No human Resource are left to design standby power supplies.  
Product development cycle is short …

Solution !!

Facilitates Circuit Design

Development/design Human Resource can be reduced.

Support provided by application note

External component design

Reduced by approx. 80%

External component design

Transformer design, circuit design, control IC evaluation, heat release design, substrate design, EMI/EMC evaluation, application for approval of safety standards, component/material arrangement for individual prototypes, etc.

(Comparison with Tamura’s previous Power Module)

Visit Tamura’s web site for application note!
## Product Lineup

### SPM

<table>
<thead>
<tr>
<th>Part No</th>
<th>Input voltage</th>
<th>Output voltage</th>
<th>Rated load</th>
<th>Output tolerance</th>
<th>RoHS</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPM0307SJ</td>
<td>DC110<del>420V (AC85</del>276V &amp; PFC)</td>
<td>3.3V</td>
<td>0.7A</td>
<td>±5%</td>
<td>OK</td>
<td>development</td>
</tr>
<tr>
<td>SPM0507SJ</td>
<td>5V</td>
<td>0.66A</td>
<td></td>
<td></td>
<td>OK</td>
<td>sample</td>
</tr>
<tr>
<td>SPM1203SJ</td>
<td>12V</td>
<td>0.28A</td>
<td></td>
<td></td>
<td>OK</td>
<td>sample</td>
</tr>
<tr>
<td>SPM1502SJ</td>
<td>15V</td>
<td>0.24A</td>
<td></td>
<td></td>
<td>OK</td>
<td>sample</td>
</tr>
<tr>
<td>SPM2402SJ</td>
<td>24V</td>
<td>0.15A</td>
<td></td>
<td></td>
<td>OK</td>
<td>development</td>
</tr>
</tbody>
</table>

### EPM

<table>
<thead>
<tr>
<th>Part No</th>
<th>Input voltage</th>
<th>Output voltage</th>
<th>Rated load</th>
<th>Output tolerance</th>
<th>RoHS</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPM0310SJ</td>
<td>DC110<del>450V (AC85</del>276V &amp; PFC)</td>
<td>3.3V</td>
<td>1A</td>
<td>±5%</td>
<td>OK</td>
<td>mass production</td>
</tr>
<tr>
<td>EPM0510SJ</td>
<td>5V</td>
<td>1A</td>
<td></td>
<td></td>
<td>OK</td>
<td>mass production</td>
</tr>
<tr>
<td>EPM1205SJ</td>
<td>12V</td>
<td>0.5A</td>
<td>1A</td>
<td></td>
<td>OK</td>
<td>mass production</td>
</tr>
<tr>
<td>EPM1210SJ</td>
<td>15V</td>
<td>0.5A</td>
<td>1A</td>
<td></td>
<td>OK</td>
<td>mass production</td>
</tr>
<tr>
<td>EPM1510SJ</td>
<td>24V</td>
<td>0.5A</td>
<td></td>
<td></td>
<td>OK</td>
<td>mass production</td>
</tr>
</tbody>
</table>

### BPM

<table>
<thead>
<tr>
<th>Part No</th>
<th>Input voltage</th>
<th>Output voltage</th>
<th>Rated load</th>
<th>Output tolerance</th>
<th>RoHS</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPM0390SJ</td>
<td>DC110<del>420V (AC85</del>276V &amp; PFC)</td>
<td>3.3V</td>
<td>9A</td>
<td>±5%</td>
<td>OK</td>
<td>development</td>
</tr>
<tr>
<td>BPM0580SJ</td>
<td>5V</td>
<td>8A</td>
<td></td>
<td></td>
<td>OK</td>
<td>development</td>
</tr>
<tr>
<td>BPM1234SJ</td>
<td>12V</td>
<td>3.4A</td>
<td></td>
<td></td>
<td>OK</td>
<td>development</td>
</tr>
<tr>
<td>BPM1527SJ</td>
<td>15V</td>
<td>2.7A</td>
<td></td>
<td></td>
<td>OK</td>
<td>development</td>
</tr>
<tr>
<td>BPM2417SJ</td>
<td>24V</td>
<td>1.7A</td>
<td></td>
<td></td>
<td>OK</td>
<td>sample</td>
</tr>
</tbody>
</table>
Switching Power Supply can be easily created

**Internal parts and functions**
- Insulation Transformer
- Isolated Transformer (FET)
- IC control
- Output rectifier diode
- Photo-coupler
- Output voltage detection circuit
- Primary side control circuit
- Over voltage protection
- Over current protection
- Heating protection circuit
SPM External Dimensions

Note: 1. The dimensional tolerance without directions is ±0.5mm.

SPM Recommended Hole Diameter/Land Dimensions

* Numbers in circles indicate pin numbers.

Component side

Unit: mm
EPM External Dimensions (FE19S Type)

EPM Recommended Hole Diameter/Land Dimensions (FE19S Type)

* Numbers in circles indicate pin numbers.
BPM External Dimensions

Note: 1. The dimensional tolerance without directions is ± 0.5mm.

BPM Recommended Hole Diameter/Land Dimensions

* Numbers in circles indicate pin numbers.

Component side

Unit: mm
Features

1. Easy to design compact AC/DC due to small number of external components
2. Potential design evaluation time savings; EMC, open/short circuit testing, & etc.
3. Enables significant reduction in power consumption of no-load and light load
4. Corresponding world wide input and PFC output voltage
5. Unique Tamura design insures significant reduction in ‘buzz’ under light-load conditions for lower noise level

Applications

Consumer electronics, Information processing equipment, AV equipment, Stand-by Power

- REFRIGERATOR
- MICROWAVE OVEN
- AV
- OA
- AIR-CONDITIONER
- TOILETARY
- SMART METER
- LED LIGHTING
- UPS
- GENERAL-INVERTER
- PV INVERTER
Example of Application

[Images of SPM, EPM, and BPM components with corresponding circuit boards]
http://www.tamura-ss.co.jp/electronics/en/

Thank you!!