**IC Packages**

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### ROHM Packages

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<td>P. A154</td>
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<td>P. A159</td>
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### LAPIS Semiconductor Packages

<table>
<thead>
<tr>
<th>Package Type</th>
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<td>P. A161</td>
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<td>P. A166</td>
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<tr>
<td>BGA Packages</td>
<td>P. A169</td>
</tr>
</tbody>
</table>

*Please check the dimensions of each products in detail. LAPIS Semiconductor products and ROHM Semiconductor dimensions products have different although they have a same package name.*
Part No. Explanation

- When ordering, specify the part number.
- Check each code against the tables shown below.
- Fill in from the left, leaving any extra boxes empty on the right.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Custom Specification code</th>
<th>Packaging and forming specification</th>
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<tbody>
<tr>
<td>BA4558F</td>
<td>E2</td>
<td>Embossed tape and reel Pin 1 fed last</td>
</tr>
<tr>
<td></td>
<td>(E1)</td>
<td>Embossed tape and reel Pin 1 fed first</td>
</tr>
<tr>
<td></td>
<td>TR</td>
<td>Embossed tape and reel Pin 1 fed last</td>
</tr>
<tr>
<td></td>
<td>(TL)</td>
<td>Embossed tape and reel Pin 1 fed first</td>
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</tbody>
</table>

For example:

1. A packaging specification is required for packaging other than taping.
   (Ex.) BA4558F or BA4558F-EX

2. A packaging specification is required for tape packaging.
   (Ex.) Example of E2-oriented embossed taping: BA4558F-E2 or BA4558F-DXE2

Ordering information

1. A packaging specification is not required for packaging other than taping.
   (Ex.) BA4558F or BA4558F-DX

Please refer packages from page, A160 for LAPIS Semiconductor products.
## Package Ordering Units

### Embossed tape packaging <Package specification name : E2(E1)>

<table>
<thead>
<tr>
<th>Package ordering unit quantity</th>
<th>Non - Lead Gull Wing Packages</th>
<th>SOP Packages</th>
<th>Power Packages</th>
<th>QFP Packages</th>
<th>BGA / QFN</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>*SGON004X1216, SSON004X1010</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>4,000</td>
<td>USON016X3315, WSON008X2120</td>
<td>–</td>
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<tr>
<td>3,000</td>
<td>*SSOP, *SSOP58, *VSOP, HYSOF5, MSOP, MSOP10, WSON008X2300, VSON010X3200, VSON010X3300, VSON010X3400, USON014X3200, VQFN016X3300, VQFN016X3400, WL-CSP (2.8mm and under)</td>
<td>TSSOP-B8</td>
<td>–</td>
<td>–</td>
<td>3 x 3mm</td>
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<tr>
<td>2,500</td>
<td>VQFN020V4040, VQFN024V4040, VQFN028V5050, VQFN032V5050, VQFN036V5050, VQFN040V5050, WL-CSP (over 2.81mm)</td>
<td>SOP8/14/16, SSOP-A16, TSSOP-B16, TSSOP-B14J, SSOP-B8/14/16/20, SOP-J8/14, HTSSOP-B20/28/32, HTSOP-K8, TSSOP-B6J, HTSSOP-B6J, TSSOP-C30</td>
<td>–</td>
<td>–</td>
<td>4 x 4mm, 5 x 5mm</td>
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<tr>
<td>2,000</td>
<td>VQFN040V6060, UQFN046V4565, UQFN048V6060</td>
<td>SOP18/20/22/24, HTSSOP-B30, SSOP-A20/24/32, SSOP-B24/28/30, HTSSOP-C48, HTSSOP-B24/30, HSOP25, TSSOP-C44</td>
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<td>–</td>
<td>6 x 6mm</td>
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<tr>
<td>1,500</td>
<td>VQFN048V7070, VQFN048V7070, VQFN048V7070</td>
<td>SSOP28, SSOP-A44, HTSSOP-A44/B34/A44R/B54R, HSOP28/M28/M36</td>
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<td>–</td>
<td>7 x 7mm</td>
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<tr>
<td>1,000</td>
<td>VQFN056V8080, VQFN064V8080, VQFN064V8080, VQFN064V8080</td>
<td>TGQFP32, VQFP48C, HTQFP48V UQFP64, TQFP64U</td>
<td>–</td>
<td>–</td>
<td>8 x 8mm, 9 x 9mm, 10 x 10mm</td>
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<tr>
<td>500</td>
<td>–</td>
<td>–</td>
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### Tray packaging

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<th>Pin pitch: 0.65 mm</th>
<th>Pin pitch: 0.5 mm</th>
<th>Pin pitch: 0.4 mm</th>
<th>Individual package quantity</th>
<th>Tray quantity</th>
<th>Package ordering unit quantity</th>
<th>ESR Data dimensions (mm) A B C E V C</th>
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<tbody>
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<td>–</td>
<td>VQFP48C</td>
<td>–</td>
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<td>100</td>
<td>1,000</td>
<td>60 x 200 x 200</td>
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<tr>
<td>QFP44</td>
<td>SQFP76, SQFP-T32M, SQFP-T64</td>
<td>VQFP64, VQFP64M, VQFP80, TQFP64V, HTQFP64V, HTQFP64V</td>
<td>–</td>
<td>216 x 116</td>
<td>50</td>
<td>20</td>
<td>70 x 130 x 510</td>
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<tr>
<td>QFP-A64, QFP80/T60</td>
<td>SQFP80, SQFP-T80C, SQFP100/T100</td>
<td>VQFP100, VQFP128, VQFP100V, HTQFP100V</td>
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<td>256 x 116</td>
<td>50</td>
<td>10</td>
<td>75 x 200 x 290</td>
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<tr>
<td>QFP120</td>
<td>SQFP160C</td>
<td>VQFP208</td>
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<td>322.6 x 135.9</td>
<td>24</td>
<td>10</td>
<td>75 x 140 x 338</td>
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<tr>
<td>–</td>
<td>–</td>
<td>VQFP176</td>
<td>–</td>
<td>322.6 x 135.9</td>
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<td>10</td>
<td>75 x 140 x 338</td>
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<tr>
<td>–</td>
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<td>–</td>
<td>TQFP176U</td>
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<td>20</td>
<td>75 x 200 x 290</td>
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<td>–</td>
<td>–</td>
<td>–</td>
<td>VQFP144 / T144</td>
<td>UQFP160 / 184</td>
<td>60</td>
<td>10</td>
<td>75 x 140 x 338</td>
</tr>
</tbody>
</table>

Please refer packages from page A160 for LAPIS Semiconductor products.

QFP Packages

QFP <Pin Pitch : 0.8mm>

QFP32

QFP44

Tray/1,000pcs
Embosed carrier tape/1,500pcs

Tray/1,000pcs
Embosed carrier tape/1,000pcs

SQFP <Pin Pitch : 0.65mm>

SQFP-T52

SQFP-T64

SQFP160C

Tray/1,000pcs
Embosed carrier tape/1,000pcs

Tray/1,000pcs

Tray/240pcs

TQFPV <Pin Pitch : 0.5mm>

TQFP48V

TQFP64V

TQFP80V

TQFP100V

Tray/1,000pcs
Embosed carrier tape/1,500pcs

Tray/1,000pcs
Embosed carrier tape/1,000pcs

Tray/1,000pcs

Tray/500pcs
Embosed carrier tape/500pcs
QFP Packages

VQFP <Pin Pitch : 0.5mm>

Please refer packages from page, A160 for LAPIS Semiconductor products.
Please refer packages from page, A160 for LAPIS Semiconductor products.

**QFP Packages**

**UQFP <Pin Pitch : 0.4mm>**

**UQFP64M**

![UQFP64M Diagram](image1)

Tray: 1,000pcs
Embosed carrier tape: 1,500pcs

**UQFP80**

![UQFP80 Diagram](image2)

Tray: 1,000pcs
Embosed carrier tape: 1,000pcs

**UQFP120**

![UQFP120 Diagram](image3)

Tray: 500pcs

**TQFPU <Pin Pitch : 0.4mm>**

**TQFP64U**

![TQFP64U Diagram](image4)

Tray: 1,000pcs
Embosed carrier tape: 1,500pcs

**TQFP128U**

![TQFP128U Diagram](image5)

Tray: 500pcs

**HTQFPV <Pin Pitch : 0.5mm>**

**HTQFP48V**

![HTQFP48V Diagram](image6)

Tray: 1,000pcs
Embosed carrier tape: 1,500pcs

**HTQFP64V**

![HTQFP64V Diagram](image7)

Tray: 1,000pcs
Embosed carrier tape: 1,000pcs

**HTQFP100V**

![HTQFP100V Diagram](image8)

Tray: 500pcs

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www.rohm.com
IC Packages (ROHM)

SON / QFN Packages

SSON-X <Pin Pitch : 0.65mm>

VSON-V <Pin Pitch : 0.5mm>

VSON-X <Pin Pitch : 0.5mm> / USON-X <Pin Pitch : 0.4mm>

Please refer packages from page, A160 for LAPIS Semiconductor products.

SON / QFN Packages

VSON-X <Pin Pitch : 0.5mm> / USON-X <Pin Pitch : 0.4mm>

IC Packages

www.rohm.com
SON / QFN Packages

VQFN-V <Pin Pitch : 0.5mm>

VQFN032V5050  VQFN040V6060  VQFN048V7070

VQFN-X <Pin Pitch : 0.5mm>

VQFN016X3030  VQFN020V4040  VQFN024V4040  VQFN028V5050

Embosed carrier tape: 3,000pcs

Embosed carrier tape: 3,000pcs

Embosed carrier tape: 2,500pcs

Embosed carrier tape: 2,500pcs

Embosed carrier tape: 2,500pcs

Embosed carrier tape: 2,000pcs

Embosed carrier tape: 1,500pcs

Embosed carrier tape: 1,000pcs

(Unit: mm)
SON / QFN Packages

UQFN-V <Pin Pitch : 0.4mm>

SON / QFN Packages

UQFN036V5050

UQFN040V5050

UQFN044V6060

UQFN048V6060

UQFN046V4565

UQFN048V7070

UQFN056V7070

UQFN064V8080

UQFN068V8080

UQFN088V0100

Please refer packages from page, A160 for LAPIS Semiconductor products.
Please refer packages from page, A160 for LAPIS Semiconductor products.

### SOP Packages

#### SOP <Pin Pitch : 1.27mm>

- **SOP8**
  - Embossed carrier tape: 2,500pcs

- **SOP14**
  - Embossed carrier tape: 2,500pcs

- **SOP16**
  - Embossed carrier tape: 2,500pcs

- **SOP18**
  - Embossed carrier tape: 2,000pcs

- **SOP20**
  - Embossed carrier tape: 2,000pcs

- **SOP22**
  - Embossed carrier tape: 2,000pcs

- **SOP24**
  - Embossed carrier tape: 2,000pcs

- **SOP28**
  - Embossed carrier tape: 2,000pcs

#### SSOP-A <Pin Pitch : 0.8mm>

- **SSOP-A16**
  - Embossed carrier tape: 2,500pcs

- **SSOP-A20**
  - Embossed carrier tape: 2,000pcs

- **SSOP-A24**
  - Embossed carrier tape: 2,000pcs

- **SSOP-A32**
  - Embossed carrier tape: 2,000pcs

- **SSOP-A44**
  - Embossed carrier tape: 1,500pcs
SOP Packages

SSOP-B <Pin Pitch : 0.65mm>

Embosed carrier tape: 2,500pcs

JEDEC <Pin Pitch : 1.27mm/0.65mm/0.5mm>

Embosed carrier tape: 2,500pcs

Please refer packages from page, A160 for LAPIS Semiconductor products.
Please refer packages from page, A160 for LAPIS Semiconductor products.

**HSOP Packages**

**HSOP** <Pin Pitch : 0.8mm>

-_HSOP Packages (ROHM)_

**HTSOP-J** <Pin Pitch : 1.27mm>

**HTSSOP-C** <Pin Pitch : 0.5mm>

**HTSSOP-A** <Pin Pitch : 0.8mm>
Please refer packages from page, A160 for LAPIS Semiconductor products.

**HSOP Packages**

**HTSSOP-B <Pin Pitch : 0.65mm>**

- **HTSSOP-B8J**
  - [Diagram](#)
  - Embossed carrier tape: 2,500 pcs

- **HTSSOP-B28**
  - [Diagram](#)
  - Embossed carrier tape: 2,500 pcs

- **HTSSOP-B30**
  - [Diagram](#)
  - Embossed carrier tape: 2,000 pcs

- **HTSSOP-B40**
  - [Diagram](#)
  - Embossed carrier tape: 2,000 pcs

- **HTSSOP-B54**
  - [Diagram](#)
  - Embossed carrier tape: 1,500 pcs
Please refer packages from page, A160 for LAPIS Semiconductor products.

Non-Lead Packages

Optical Non-Lead

- **WSOF5 (Clear Type)**
  - Embossed carrier tape: 3,000pcs

- **WSOF6 (Clear Type)**
  - Embossed carrier tape: 3,000pcs

- **WSOF6i**
  - (MAX. 0.1 include BURR)
  - Embossed carrier tape: 3,000pcs

- **WSON008X2120 (Clear Type)**
  - Embossed carrier tape: 4,000pcs

Power Packages

**POWER-3PIN**

- **TO220CP-3**
  - Embossed carrier tape: 500pcs

- **TO252S-3**
  - Embossed carrier tape: 2,000pcs

- **TO252-3**
  - Embossed carrier tape: 2,000pcs

- **TO263-3**
  - Embossed carrier tape: 500pcs

**POWER-4PIN**

- **SOT223-4**
  - Embossed carrier tape: 2,000pcs

[www.rohm.com](http://www.rohm.com)
Please refer packages from page, A160 for LAPIS Semiconductor products.

**BGA Packages**

**VBGA-W <Pin Pitch : 0.5mm>**

- VBGA035W040
- VBGA048W040
- VBGA063W050
- VBGA080W050

**SBGA-W <Pin Pitch : 0.65mm>**

- VBGA063T060
- VBGA099T070
- VBGA120T080

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**ICs**

**IC Packages (ROHM)**

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[www.rohm.com](http://www.rohm.com)
Please refer packages from page, A160 for LAPIS Semiconductor products.

**BGA Packages**

**SBGA-W <Pin Pitch : 0.65mm>**

- **SBGA024W040**
- **SBGA063W060**
- **SBGA099W070**
- **SBGA120W080**

**WL-CSP Packages**

**VCSP <Pin Pitch : 0.5mm>**

- **VCSP85H**
- **VCSP50L**
- **VCSP35L**
- **VCSP30L**

**UCSP <Pin Pitch : 0.4mm>**

- **UCSP75M**
- **UCSP50L**
- **UCSP35L**
- **UCSP30L**

Visit www.rohm.com for more information.
**LAPIS Semiconductor LSI package list**

<table>
<thead>
<tr>
<th>No</th>
<th>PKG type</th>
<th>Title</th>
<th>TRAY</th>
<th>T&amp;R</th>
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<td>GFF</td>
<td>GFF1420-0.40</td>
<td>420</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>GFF</td>
<td>GFF1428-0.80</td>
<td>240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Regarding an unstated package, please inquire to the sales.*

---

**LAPIS Semiconductor LSI Part No. Explanation**

Product names are assigned to our semiconductor devices using the following convention, starting with the character "M".

<table>
<thead>
<tr>
<th>Character</th>
<th>Package symbol</th>
<th>Device code</th>
<th>Device function</th>
<th>Option classification symbol</th>
<th>Derived code</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Analog</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Process classification</td>
<td>Circuit category</td>
<td>Package profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>B-CMOS, multi-chip product</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Bipolar logic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following shows the convention of item name assignment for conventional products.

- The actual package profile is not shown here.

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**ICs**

LAPIS Semiconductor LSI package list
LAPIS Semiconductor LSI Part No. Explanation

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**Notes**

- Regarding an unstated package, please inquire to the sales.

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**IC Packages**

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**A170**

www.rohm.com
The device code expresses a function specific to a device using a combination of numbers and alphanumeric characters.

The character symbol is added to indicate the modification of an existing product, to emphasize a specification that differs from the standard specification of an existing product, or to indicate a design standard.

The derived code indicates the speed ranking for DRAM products and is used as a derived code for logic products.

The option code indicates a symbol that identifies the specification of a product with an option.

The package symbol expresses the type and lead bending profile of a package in two digits.

The option classification symbol is used to distinguish between the option symbol and the package symbol.
These package sizes are an example. For details, please inquire to the sales.

**SOP Packages**

**SSOP**

**TSOP (Type I)**

**TSOP (Type II)**

**AIC Packages**

www.rohm.com
These package size are an example. For details, please inquire to the sales.
These package size are an example. For details, please inquire to the sales.

QFP Packages

QFP

QFP Packages

(Units: mm)
These package size are an example. For details, please inquire to the sales.

**QFP Packages**

**LQFP**

**LQFP144**

**LQFP176**

**TQFP**

**TQFP44**

**TQFP48**

**TQFP52**

**TQFP64**

**P-TQFP80-1010-0.40**

**P-TQFP80-1212-0.50**

**P-QFP80-1414-0.65**

**P-QFP100-1420-0.65-TK**

**P-QFP100-1414-0.50-K**

**P-QFP128-1420-0.50**

**QFP80-P-1420-0.80**

**QFP100-P-1420-0.65**

**QFP128-P-2828-0.80**

**QFP208**

**P-QFP-80-1414-0.65**

**TQFP100**
These package size are an example. For details, please inquire to the sales.

**QFP Packages**

**TQFP**

- **TQFP120**
- **TQFP128**

**QFN Packages**

**VQFN**

- **VQFN28**
- **VQFN32**

**WQFN**

- **WQFN12**
- **WQFN16-0303-0.50**
- **WQFN16-0404-0.50**

- **WQFN20**
- **WQFN24 P-WQFN28-0404-0.40-63**
- **WQFN28 P-WQFN32-0505-0.50-63**
- **WQFN32 P-WQFN40-0505-0.40 P-WQFN40-0606-0.50**

- **TQFP120 TQFP128**

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A166  www.rohm.com
These package size are an example. For details, please inquire to the sales.
QFN Packages

WQFN

WQFN48

WQFN52

WQFN56

WQFN64

WQFN80

C-TQFN

C-TQFN12

C-TQFN18

These package sizes are an example. For details, please inquire to the sales.

(Unit: mm)
These package size are an example. For details, please inquire to the sales.
BGA Packages

These package sizes are an example. For details, please inquire to the sales.