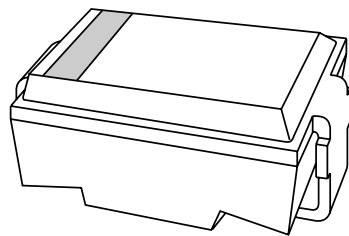


DATA SHEET



BYG60 series Fast soft-recovery controlled avalanche rectifiers

Product specification
Supersedes data of 1996 June 05

2000 Jul 03

Fast soft-recovery controlled avalanche rectifiers

BYG60 series

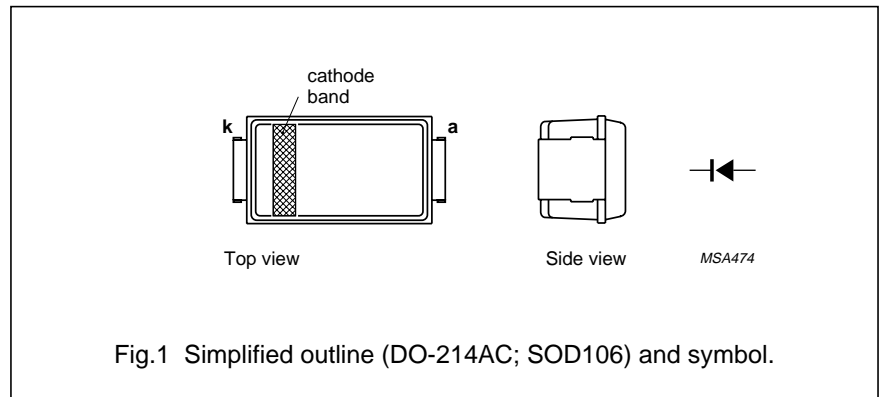
FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- UL 94V-O classified plastic package
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|--------------------|-------------------------------------|--|------|------|------|
| V _{RRM} | repetitive peak reverse voltage | | | | |
| | BYG60D | | – | 200 | V |
| | BYG60G | | – | 400 | V |
| | BYG60J | | – | 600 | V |
| | BYG60K | | – | 800 | V |
| | BYG60M | | – | 1000 | V |
| V _R | continuous reverse voltage | | | | |
| | BYG60D | | – | 200 | V |
| | BYG60G | | – | 400 | V |
| | BYG60J | | – | 600 | V |
| | BYG60K | | – | 800 | V |
| | BYG60M | | – | 1000 | V |
| I _{F(AV)} | average forward current | averaged over any 20 ms period; T _{tp} = 100 °C; see Fig.2 | – | 1.9 | A |
| | | averaged over any 20 ms period; Al ₂ O ₃ printed-circuit board mounting (see Fig.7); T _{amb} = 60 °C; see Fig.3 | – | 0.9 | A |
| | | averaged over any 20 ms period; epoxy printed-circuit board mounting (see Fig.7); T _{amb} = 60 °C; see Fig.3 | – | 0.65 | A |
| I _{FSM} | non-repetitive peak forward current | t = 10 ms half sine wave; T _j = T _{jmax} prior to surge; V _R = V _{RRMmax} | – | 25 | A |

Fast soft-recovery controlled avalanche rectifiers

BYG60 series

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|---|--|------|------|------|
| E_{RSM} | non-repetitive peak reverse avalanche energy BYG60D to J BYG60K and M | L = 120 mH; $T_j = T_{j,max}$ prior to surge; inductive load switched off | – | 10 | mJ |
| | | | – | 7 | mJ |
| T_{stg} | storage temperature | | –65 | +175 | °C |
| T_j | junction temperature | see Fig.4 | –65 | +175 | °C |

ELECTRICAL CHARACTERISTICS

$T_j = 25$ °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|---|--|------|------|------|------|
| V_F | forward voltage | $I_F = 1$ A; $T_j = T_{j,max}$; see Fig.5 | – | – | 0.98 | V |
| | | $I_F = 1$ A; see Fig.5 | – | – | 1.2 | V |
| $V_{(BR)R}$ | reverse avalanche breakdown voltage BYG60D BYG60G BYG60J BYG60K BYG60M | $I_R = 0.1$ mA | 300 | – | – | V |
| | | | 500 | – | – | V |
| | | | 700 | – | – | V |
| | | | 900 | – | – | V |
| | | | 1100 | – | – | V |
| I_R | reverse current | $V_R = V_{RRMmax}$; see Fig.6 | – | – | 5 | µA |
| | | $V_R = V_{RRMmax}$; $T_j = 165$ °C; see Fig.6 | – | – | 100 | µA |
| t_{rr} | reverse recovery time BYG60D to J BYG60K and M | when switched from $I_F = 0.5$ A to $I_R = 1$ A; measured at $I_R = 0.25$ A; see Fig.8 | – | – | 250 | ns |
| | | | – | – | 300 | ns |
| C_d | diode capacitance BYG60D to J BYG60K and M | $V_R = 0$ V; $f = 1$ MHz | – | 30 | – | pF |
| | | | – | 25 | – | pF |

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th j-tp}$ | thermal resistance from junction to tie-point | | 25 | K/W |
| $R_{th j-a}$ | thermal resistance from junction to ambient | note 1 | 100 | K/W |
| | | note 2 | 150 | K/W |

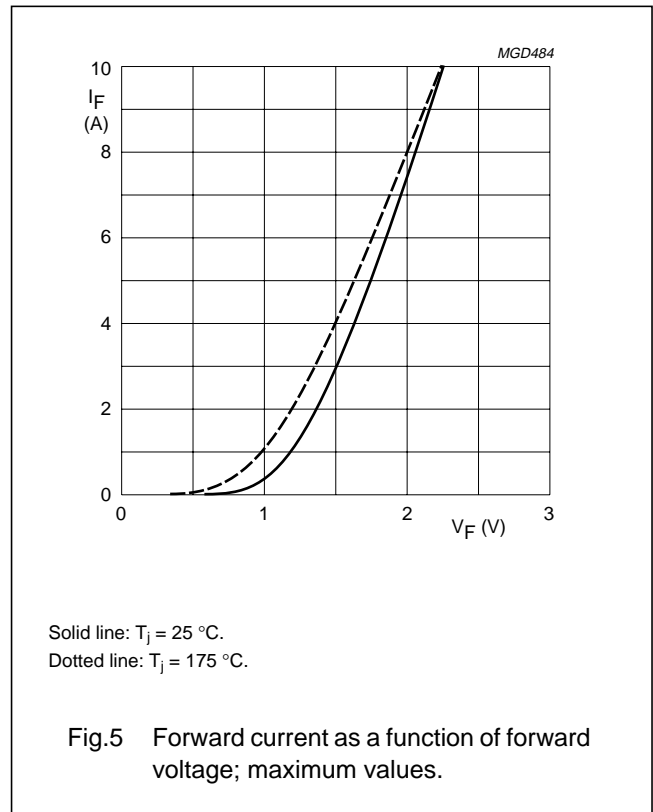
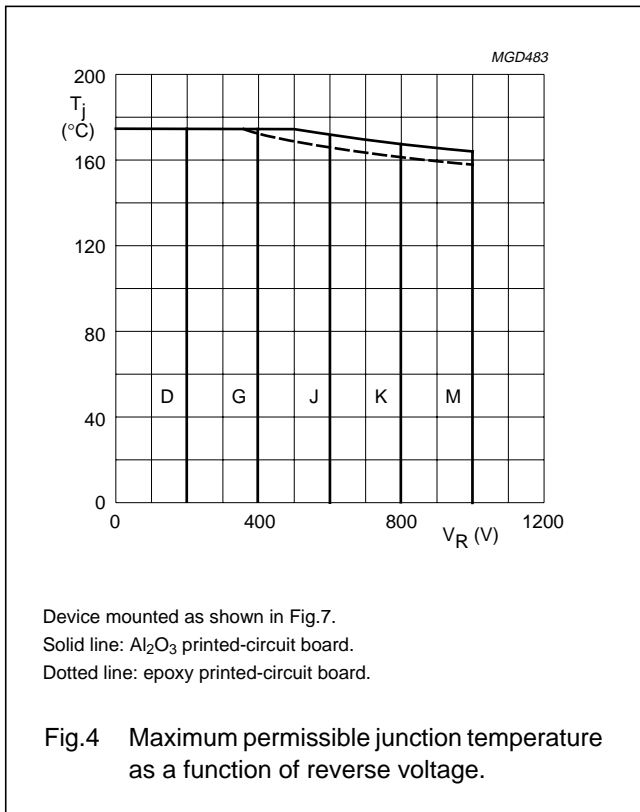
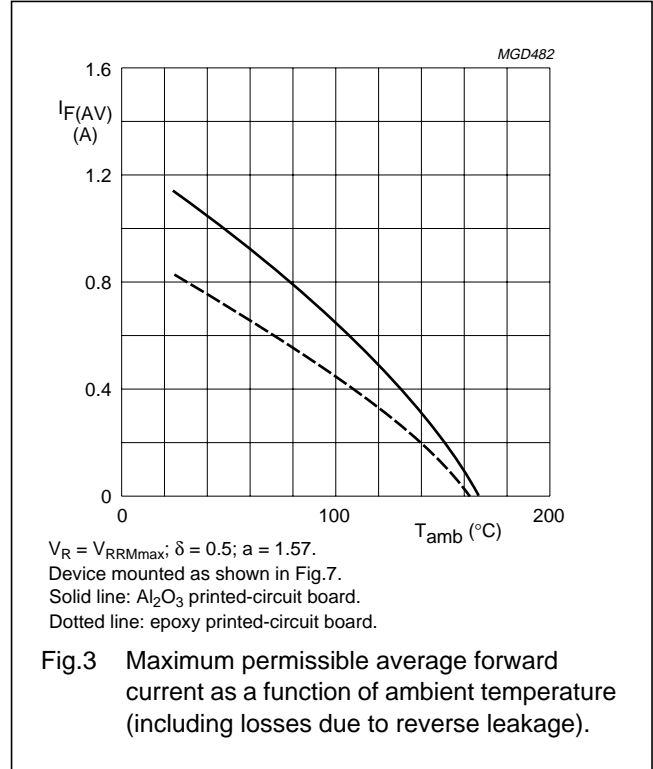
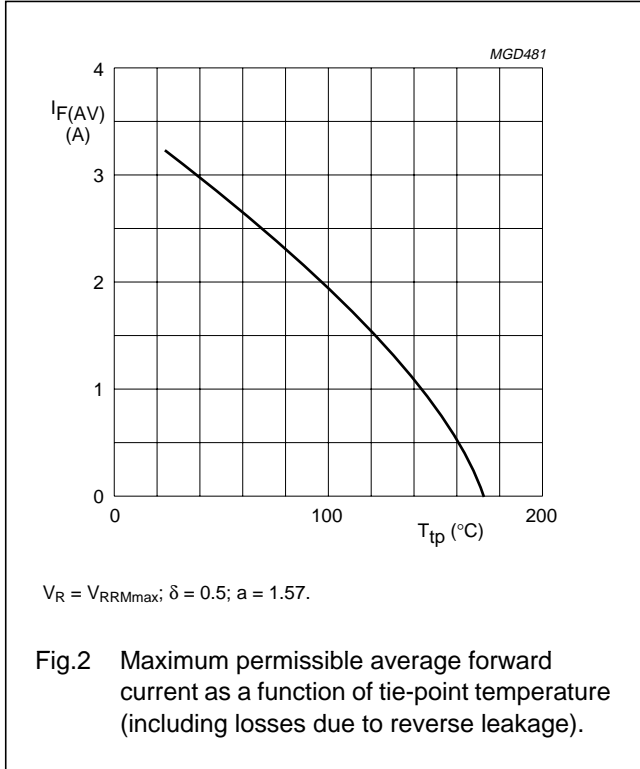
Notes

- Device mounted on Al₂O₃ printed-circuit board, 0.7 mm thick; thickness of copper ≥35 µm, see Fig.7.
- Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 µm, see Fig.7.
For more information please refer to the 'General Part of associated Handbook'.

Fast soft-recovery
controlled avalanche rectifiers

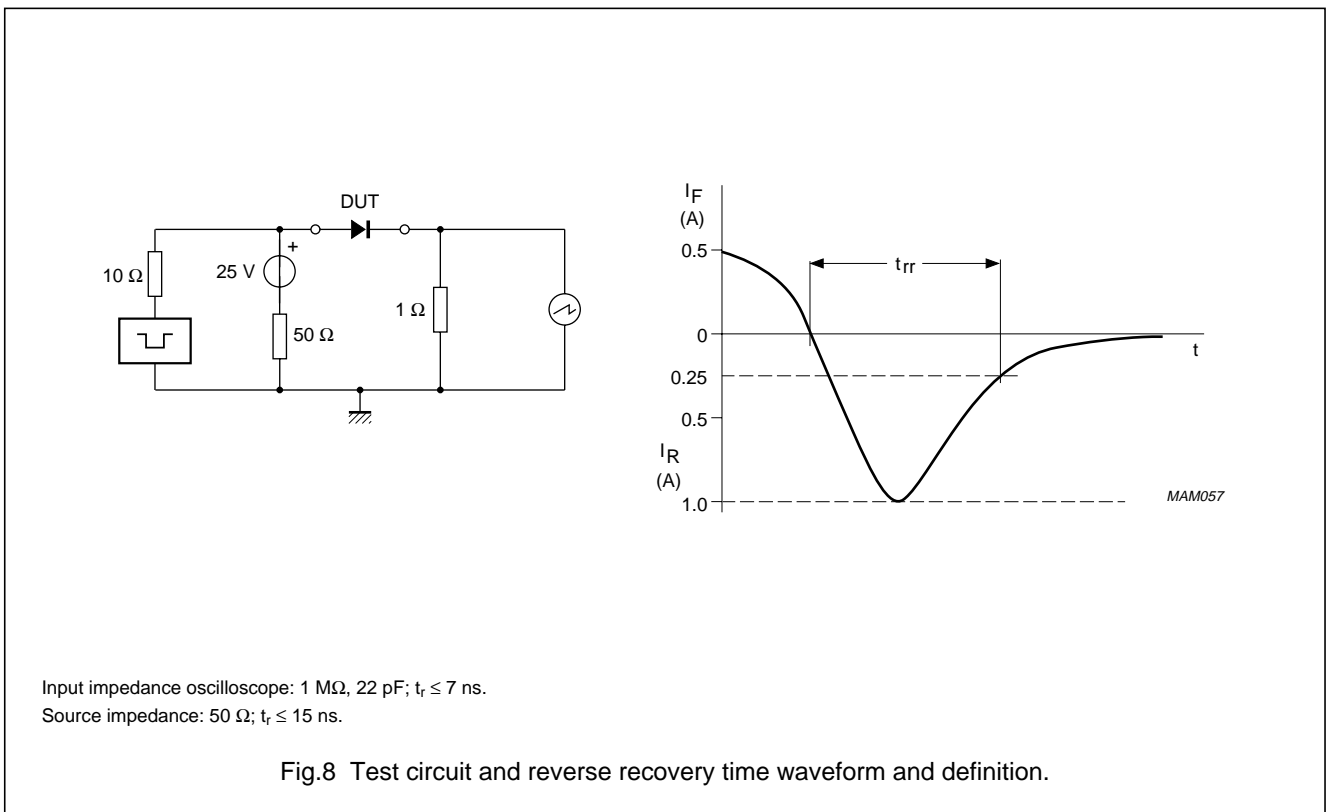
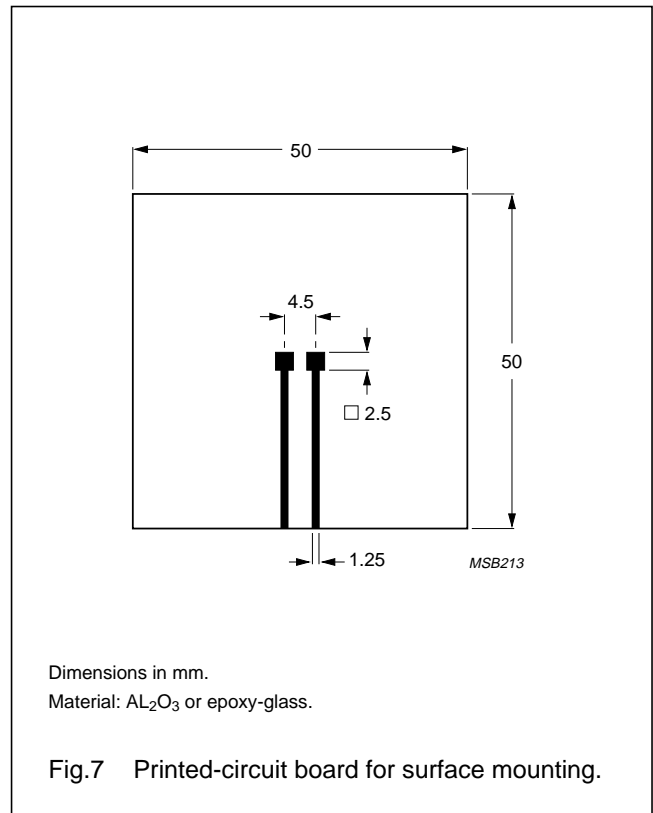
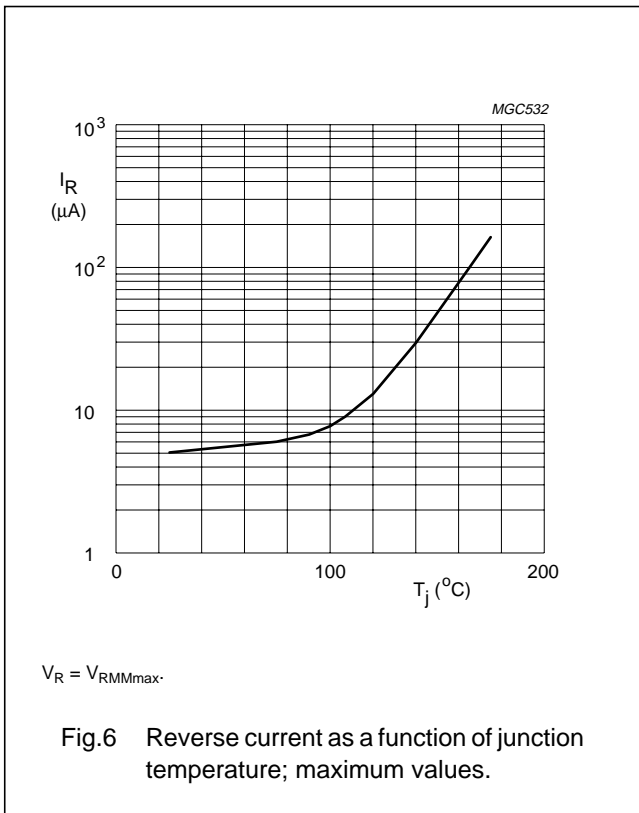
BYG60 series

GRAPHICAL DATA



Fast soft-recovery controlled avalanche rectifiers

BYG60 series



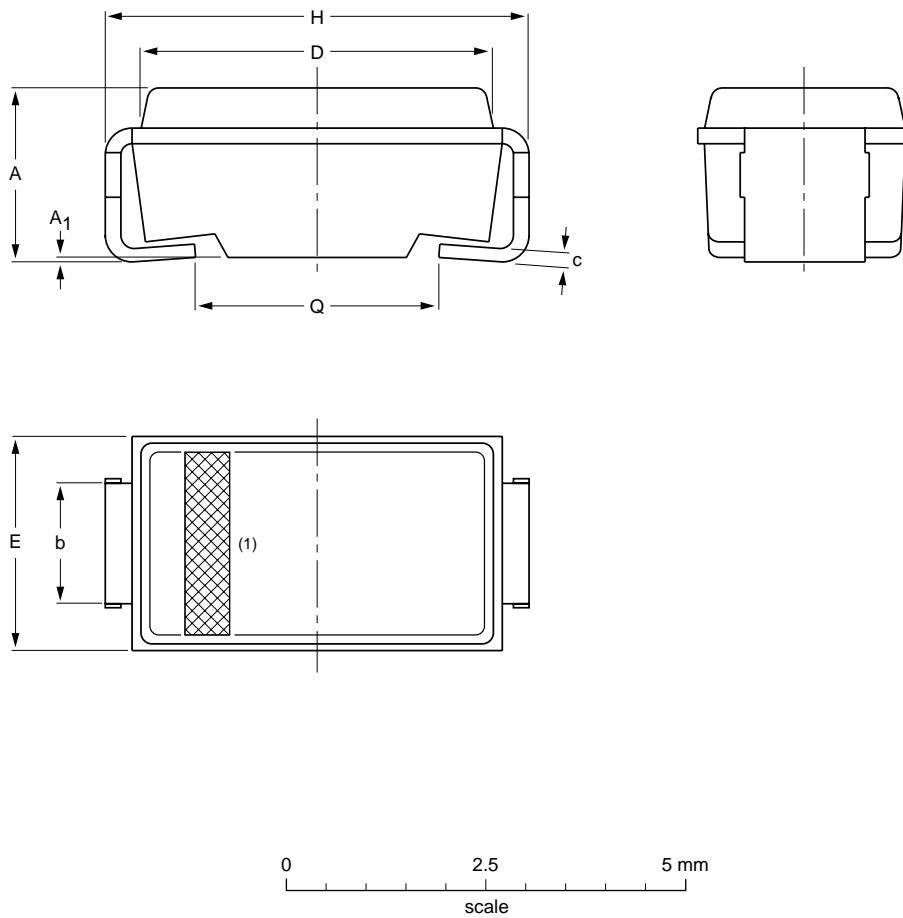
Fast soft-recovery
controlled avalanche rectifiers

BYG60 series

PACKAGE OUTLINE

Transfer-moulded thermo-setting plastic small rectangular surface mounted package;
2 connectors

SOD106



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ | b | c | D | E | H | Q |
|------|------------|----------------|------------|-----|------------|------------|------------|------------|
| mm | 2.3 2.0 | 0.05 | 1.6 1.4 | 0.2 | 4.5 4.3 | 2.8 2.4 | 5.5 5.1 | 3.3 2.7 |

Note

1. The marking band indicates the cathode.

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|----------|------|---------------------|------------|
| | IEC | JEDEC | EIAJ | | |
| SOD106 | | DO-214AC | | | 97-06-09 |

Fast soft-recovery controlled avalanche rectifiers

BYG60 series

DATA SHEET STATUS

| DATA SHEET STATUS | PRODUCT STATUS | DEFINITIONS ⁽¹⁾ |
|---------------------------|----------------|--|
| Objective specification | Development | This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice. |
| Preliminary specification | Qualification | This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |
| Product specification | Production | This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |

Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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Printed in The Netherlands

613514/02/pp8

Date of release: 2000 Jul 03

Document order number: 9397 750 07185

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