

Product Name: TMPM380FYFG

Package Name: LQFP100

1. Thermal tests

Test Item	Test Condition	Failure Size / Sample Size
Resistance to Soldering Heat for Packages	Reflow peak temperature and moisture soak conditions are specified per package type. 3 times	0 / 32
Temperature Cycling	-65deg.C (20min) to 25deg.C to 150deg.C (20min) to 25deg.C 300 cycles	0 / 32
-	-	-
-	-	-

2. Mechanical tests

Test Item	Test Condition	Failure Size / Sample Size
Solderability	Solder temperature : 245deg.C for Solder type Sn-3Ag-0.5Cu Solder immersion time : 5s ,Flux type : non-active flux ,1 time	0 / 22
Lead Integrity (Tension)	Tension : according to relevant specification Maintain the specified tension for 30s	0 / 22
-	-	-
-	-	-
-	-	-

3. Life tests

Test Item	Test Condition	Failure Size / Sample Size
High Temperature Operating Life	Max operating temperature, Max operating voltage ,1000h	0 / 32
High Temperature Storage Life	Max storage temperature ,1000h	0 / 32
High Temperature High Humidity Bias	Ta=85deg.C, RH=85%, Max operating voltage ,1000h	0 / 32
Autoclave	Ta=121deg.C, RH=100%, 203kPa ,96h	0 / 32
-	-	-
-	-	-

The information contained in Reliability Test Report represents the result of our internal reliability tests conducted in accordance with JEITA ED-4701 test standards, and is provided for your reference only.
TOSHIBA DISCLAIMS ANY WARRANTY AND ASSUMES NO LIABILITY FOR CUSTOMERS' DESIGNS AND/OR PRODUCTS DEVELOPED USING SUCH INFORMATION.
For detailed reliability test information, such as test conditions and criteria, please contact your Toshiba sales representative.

Estimated Failure Rate

Product Name	Estimated Failure Rate
TMPM380FYFG	19 Fit

Note)

This failure rate was calculated on the assumption that the device operated normally at $T_j = 75$ deg.C, under normal environmental conditions without any surge, etc.

This calculation was performed at development stage using data from the same technology with the reported device above.

The Estimated Failure Rate contained herein represents the result of our internal product reliability tests, and is provided for your reference only.
TOSHIBA DISCLAIMS ANY WARRANTY AND ASSUMES NO LIABILITY FOR CUSTOMERS' DESIGNS AND/OR PRODUCTS DEVELOPED USING SUCH INFORMATION.
For detailed reliability test information, please contact your Toshiba sales representative.

Product Name: TPM380FYFG

Package Name: LQFP100

1.Reflow

Number: 3 times maximum

Peak : 260 deg.C

Reflow zone : 255 deg.C within 30 seconds, 217 deg.C 60 to 150 seconds

Preheat : 150 to 200 deg.C , 60 to 120 seconds

NOTE: All temperatures refer to the package body surface.

The heat-resistant temperature profile is shown in Fig.1.

The temperatures in this profile are the maximum guaranteed temperatures that the device endures.

Select the temperatures for a pre-heat and a heat most suitable for your solder paste type, etc. within the conditions described in Fig.1.

This package is dry-packed in a moisture barrier bag. After opening the bag, keep the devices at or lower than 30deg.C/ 60%RH and complete a final reflow process within 168hours.

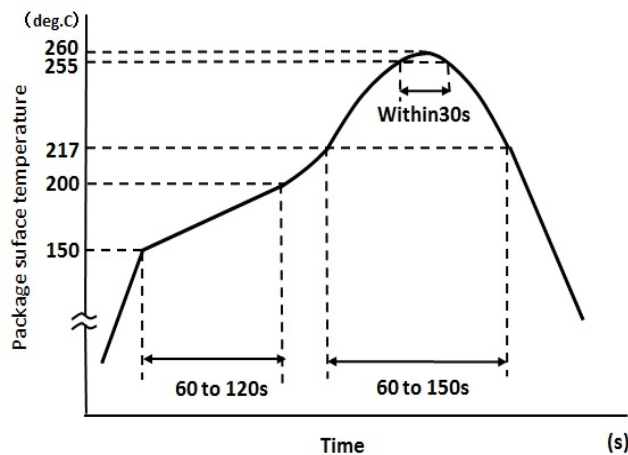


Fig.1 Example of Heat-resistant Temperature Profile

2.Others

We urge you to verify well before mounting to assure enough solder joint strength.

Always solder the Product in accordance with the heat-resistance mounting conditions set forth above. In the event the Product is soldered otherwise, the applicable product warranty, if any, is void.

Moisture Absorption Control Level (Moisture Sensitivity Level)

Product Name : TPM380FYFG

Package Name : LQFP100

Always store the Product under moisture sensitivity level equivalent to level 3 (JEDEC J-STD-020 Moisture Sensitivity Level). In the event the Product is stored otherwise, the applicable warranty, if any, is void.

Always perform reflow soldering in accordance with methods and conditions as specified in applicable engineering documents or specifications provided by Toshiba, or as instructed in writing by your TOSHIBA sales representative.
In the event the Product is soldered otherwise, the applicable product warranty, if any, is void.

RESTRICTIONS ON PRODUCT USE

- Toshiba Corporation, and its subsidiaries and affiliates (collectively "TOSHIBA"), reserve the right to make changes to the information in this document, and related hardware, software and systems (collectively "Product") without notice.
 - This document and any information herein may not be reproduced without prior written permission from TOSHIBA. Even with TOSHIBA's written permission, reproduction is permissible only if reproduction is without alteration/omission.
 - Though TOSHIBA works continually to improve Product's quality and reliability, Product can malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Before customers use the Product, create designs including the Product, or incorporate the Product into their own applications, customers must also refer to and comply with (a) the latest versions of all relevant TOSHIBA information, including without limitation, this document, the specifications, the data sheets and application notes for Product and the precautions and conditions set forth in the "TOSHIBA Semiconductor Reliability Handbook" and (b) the instructions for the application with which the Product will be used with or for. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this Product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. **TOSHIBA ASSUMES NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.**
 - **PRODUCT IS NEITHER INTENDED NOR WARRANTED FOR USE IN EQUIPMENTS OR SYSTEMS THAT REQUIRE EXTRAORDINARILY HIGH LEVELS OF QUALITY AND/OR RELIABILITY, AND/OR A MALFUNCTION OR FAILURE OF WHICH MAY CAUSE LOSS OF HUMAN LIFE, BODILY INJURY, SERIOUS PROPERTY DAMAGE AND/OR SERIOUS PUBLIC IMPACT ("UNINTENDED USE").** Except for specific applications as expressly stated in this document, Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, devices related to electric power, and equipment used in finance-related fields. **IF YOU USE PRODUCT FOR UNINTENDED USE, TOSHIBA ASSUMES NO LIABILITY FOR PRODUCT.** For details, please contact your TOSHIBA sales representative.
 - Do not disassemble, analyze, reverse-engineer, alter, modify, translate or copy Product, whether in whole or in part.
 - Product shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable laws or regulations.
 - The information contained herein is presented only as guidance for Product use. No responsibility is assumed by TOSHIBA for any infringement of patents or any other intellectual property rights of third parties that may result from the use of Product. No license to any intellectual property right is granted by this document, whether express or implied, by estoppel or otherwise.
 - **ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE FOR PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, TOSHIBA (1) ASSUMES NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO SALE, USE OF PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.**
 - Do not use or otherwise make available Product or related software or technology for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). Product and related software and technology may be controlled under the applicable export laws and regulations including, without limitation, the Japanese Foreign Exchange and Foreign Trade Law and the U.S. Export Administration Regulations. Export and re-export of Product or related software or technology are strictly prohibited except in compliance with all applicable export laws and regulations.
 - Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. Please use Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. **TOSHIBA ASSUMES NO LIABILITY FOR DAMAGES OR LOSSES OCCURRING AS A RESULT OF NONCOMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.**
-