

Application Note MSL Cross-Reference for SMT Devices

Originally used for semiconductors, the Moisture Sensitivity Level (MSL) is nowadays an important specification for many SMD components. This information comprises MOSFET relays, electromechanical relays, drivers and couplers.



MSL for SMT devices

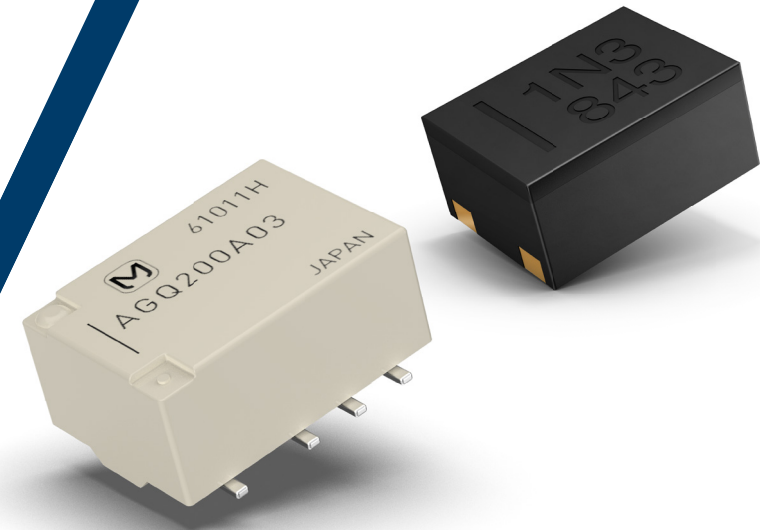
PRODUCT

Signal & HF relays, PhotoMOS® MOSFET relays including Automotive types
Photovoltaic MOSFET drivers, phototriac couplers

PURPOSE

Plastic-molded SMD components are not hermetically sealed which means that moisture e.g. from the storage location can diffuse in. If such moisture-laden components are reflow soldered, the trapped moisture can abruptly evaporate during heating. Since the hot vapor leads to an increase in pressure, this can cause the components to burst.

Such can be avoided by defining storage and process conditions for components by using the MSL.



Facts & Figures

General information

SMT components are sensitive to humidity. That's why they are packed with tightly sealed anti-humidity packaging. However, when storing, please refer to the following tips:

- Please solder promptly once the anti-humidity pack is opened. Refer to table 1 for floor life times.
- If left with the pack open, the relay will absorb moisture which will cause thermal stress during reflow mounting. This may cause the case to expand. As a result, the seal may break.
- When storing components for a long period after opening the anti-humidity pack, you must take measures to prevent humidity. For example, by promptly resealing the humidity pack of the component or dehumidify the components in a desiccator (baking). You may also store it in an anti-humidity bag to which silica gel has been added.
- For baking conditions see page 5 for more information and contact us info.pieu@eu.panasonic.com

- To avoid incorrect handling of our moisture-sensitive products, Panasonic Industry affixes a cautionary label to the vacuum-sealed bag in which the products are delivered.

The following table shows the cross-reference between the floor-life of Panasonic Industry moisture-sensitive products and an MSL-classification, which is based on JEDEC standard J-STD-020.*

***Please note** that our moisture-sensitive products do not comply with the JEDEC standard J-STD-020. Therefore, it is not allowed to use the soldering profile mentioned in the related JEDEC standard as a soldering profile for Panasonic Industry products. Please refer to our "Cautions For Use" and/or to the related product specification for the recommended soldering profile for each product. All other products which are not sealed in a moisture barrier bag aren't moisture sensitive, which is comparable with MSL-Level 1 in accordance to the related JEDEC standard.

Facts & Figures

Floor life/MSL cross reference table for Panasonic Industry products

Type	Series / Package	Ambient Conditions	Floor Life	Comparable with MSL
Signal Relays	GN, GQ, TQ, TX, TXS, TXD	at max. 30°C/60%RH	3 days	4
HF Relays	RA, RJ, RS, RN			
PhotoMOS®Relays	SOP, SSOP, SON, VSSOP, TSON	at max. 45°C/75%RH	30 days	2a
Automotive PhotoMOS®Relays	SOP, DIP			
APV Photovoltaic MOSFET Drivers	SOP, SSOP	at max. 30°C/75%RH		
APT Phototriac Couplers	SOP			

All other products, which are not sealed in a moisture barrier bag aren't moisture sensitive, which is comparable with MSL 1 in accordance to the related JEDEC standard.

Facts & Figures

Baking conditions for Panasonic Industry relays

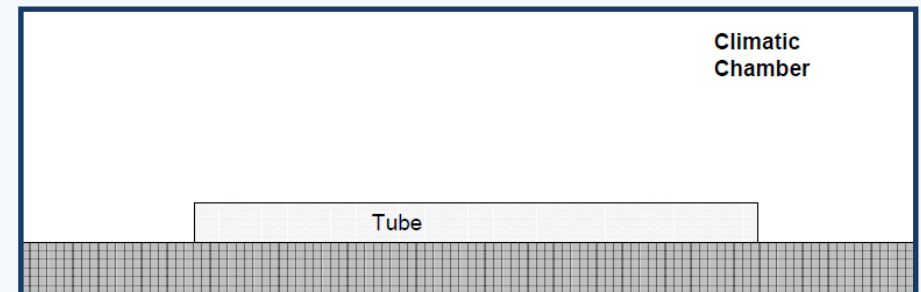
In general we recommend following baking conditions for Panasonic Signal, HF and PhotoMOS® relays:

	Tape & Reel or Tube	Without Packaging
Temperature	45°C	60°C
Duration	96h	35h
Relative Humidity	≤ 5%	≤ 5%

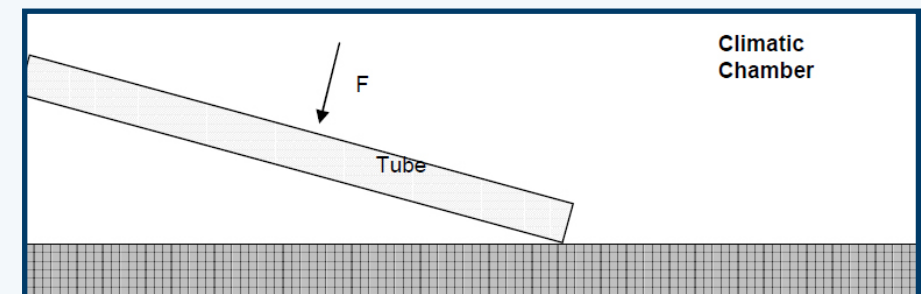
Please note:

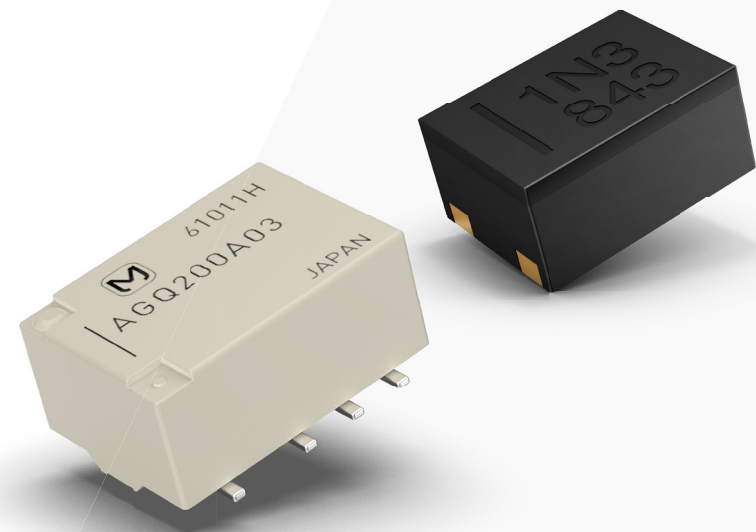
We recommend to remove the relays from the tubes during baking procedure to avoid deformation of the tubes. If they cannot be removed, the tubes have to lay flat in the oven. Reels also have to lay flat in the oven.

Okay



Not okay





Application Note - How to solve various tasks with PhotoMOS® Automotive Relays

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Notes: Data and descriptions in this document are subject to change without notice.

Product renderings are for illustration purposes only and may differ from the real product appearance.