DATA SHEET

Part No.	AN80M18RSP
Package Code No.	SP-5SUA (Exclusive use for AN80MxxRSP)

Contents

AN80M18RSP

5-pin, low dropout voltage regulator with standby function (500 mA type)

■ Overview

The AN80MxxRSP series is a 0.5 A, low dropout voltage regulator IC with standby function, featuring low current consumption and low noise.

■ Features

- Standby consumption current : max.3 μA
- Dropout voltage : 0.25 V
- Output voltage accuracy : ±3%
- 5-pin surface mounting package
- Ripple rejection ratio : 30 dB (f = 500 kHz)
- Output voltage : 1.8 V

■ Applications

- General use power supply

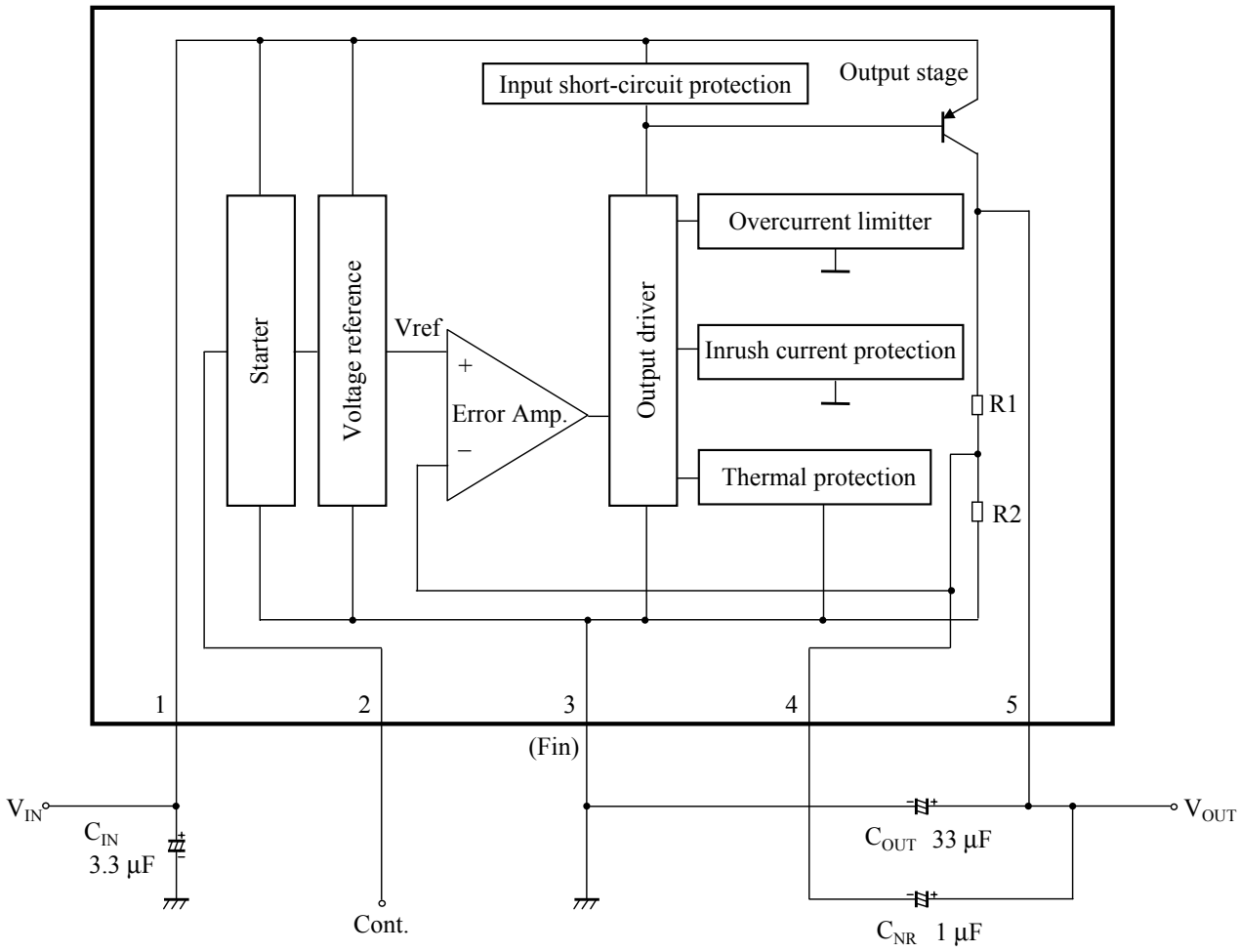
■ Package

- 5 pin Plastic Surface Mount Power Package (SP Type)

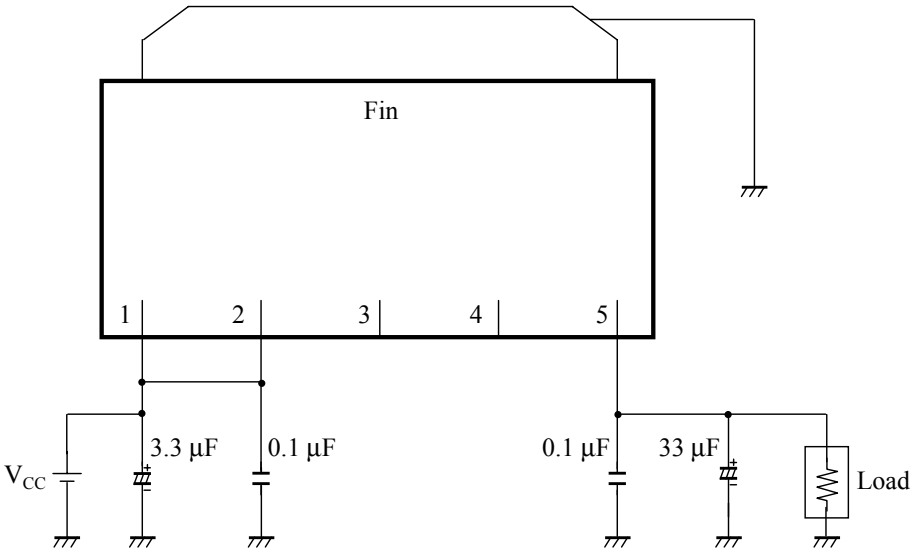
■ Type

- Silicon Monolithic Bipolar IC

■ Block Diagram



■ Application Circuit Example



■ Pin Descriptions

Pin No.	Pin name	Type	Description
1	V_{IN}	Input	Input voltage pin
2	Cont.	Input	Control pin High: operation, Low: stop
3	GND	Ground	Grounding pin Electrically in common with radiation fin
4	N.R.	—	Noise reduction pin Open when the noise reduction function is not used
5	V_{OUT}	Output	Output voltage pin

■ Absolute Maximum Ratings

No.	Parameter	Symbol	Rating	Unit	Note
1	Supply voltage	V_{CC}	14.4	V	*1,4
2	Supply current	I_{CC}	—	A	—
3	Power dissipation	P_D	255	mW	*2,4
4	Operating ambient temperature	T_{opr}	−30 to +85	°C	*3,4
5	Storage temperature	T_{stg}	−55 to +150	°C	*3,4

Note) *1: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.

*2: The power dissipation shown is the value at T_a = 85°C for the independent (unmounted) IC package.
When using this IC, refer to the • P_D-T_a diagram in the ■ Technical Data and use under the condition not exceeding the allowable value.

*3: Except for the power dissipation, operating ambient temperature, and storage temperature, all ratings are for T_a = 25°C.

*4: This IC is not suitable for automobile equipment use.

■ Operating supply voltage range

Parameter	Symbol	Range	Unit	Note
Supply voltage range	V_{CC}	2.3 to 14.0	V	*

Note) *: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.

■ Electrical Characteristics

Note) Unless otherwise specified, T_a = 25°C±2°C, C_{IN} = 3.3 µF, CNR = Open and C_{OUT} = 33 µF

B No.	Parameter	Symbol	Conditions	Limits			Unit	Note
				Min	Typ	Max		
1	Output voltage	V_{OUT}	V_{IN} = 2.8 V I_{OUT} = 250 mA	1.746	1.8	1.854	V	*1
2	Line regulation	REG_{IN}	V_{IN} = 2.8 V → 14.0 V I_{OUT} = 250 mA	—	—	18	mV	*1
3	Load regulation	REG_{LOA}	V_{IN} = 2.8 V I_{OUT} = 0 mA → 500 mA	—	—	36	mV	*1
4	Peak output current	I_{PEAK1}	V_{IN} = 2.8 V The output current value when V_{OUT} decreases by 5% from its value at I_{OUT} = 250 mA	600	—	—	mA	*1
5	Bias current under no load	I_{BIAS}	V_{IN} = 2.8 V I_{OUT} = 0 mA	—	1.1	3.0	mA	—
6	Bias current fluctuation to input	$\Delta Ibias_{(IN)}$	V_{IN} = 2.8 V → 14.0 V I_{OUT} = 250 mA	–5	—	5	mA	*1
7	Bias current fluctuation to load	$\Delta Ibias_{(LOA)}$	V_{IN} = 2.8 V I_{OUT} = 0 mA → 500 mA	—	—	50	mA	*1
8	Standby consumption current	I_{STB}	V_{IN} = 14.0 V V_{CONT} = 0 V	—	—	3.0	µA	—
9	Bias current before starting regulation	I_{RUSH}	V_{IN} = 1.71 V I_{OUT} = 0 V	—	—	5	mA	—
10	Control terminal current	I_{CONT}	V_{IN} = 2.8 V, I_{OUT} = 250 mA V_{CONT} = 1.8 V	—	—	30	µA	—
11	Ripple rejection ratio 1	RR1	V_{IN} = 3.8 V ±1 V f = 120 Hz , I_{OUT} = 100 mA	58.8	—	—	dB	—
12	Minimum input / output voltage difference 1	$V_{DIF(min)1}$	V_{IN} = 1.9 V I_{OUT} = 250 mA	—	0.3	0.6	V	*1
13	Minimum input / output voltage difference 2	$V_{DIF(min)2}$	V_{IN} = 2.0 V I_{OUT} = 500 mA	—	—	1.0	V	*1
14	Control terminal threshold high voltage	$V_{CONT(H)}$	V_{IN} = 2.8 V	1.8	—	—	V	—
15	Control terminal threshold low voltage	$V_{CONT(L)}$	V_{IN} = 2.8 V	—	—	0.5	V	—

Note) *1: Unless otherwise specially provided, shorten each test time (within 10 ms) so that the test is conducted under the condition that the drift to the temperature increase in the chip junction part can be neglected.

■ Electrical Characteristics (Reference values for design)

Note) Unless otherwise specified, T_a = 25°C±2°C, C_{IN} = 3.3 µF, CNR = Open and C_{OUT} = 33 µF
The characteristics listed below are reference values for design of the IC and are not guaranteed by inspection.
If a problem does occur related to these characteristics, Panasonic will respond in good faith to user concerns.

B No.	Parameter	Symbol	Conditions	Reference values			Unit	Note
				Min	Typ	Max		
1	Ripple rejection ratio 2	RR2	V_{IN} = 3.8 V ± 1 V f = 500 kHz , I_{OUT} = 100 mA	—	30	—	dB	—
2	Output noise voltage	V_{NO}	10 Hz ≤ f ≤ 100 kHz I_{OUT} = 100 mA, V_{IN} = 2.8 V CNR = 1 µF	—	40	—	µV[rms]	*1
3	Output voltage temperature coefficient	$\frac{\Delta V_{OUT}}{T_a}$	V_{IN} = 2.8 V, I_{OUT} = 5 mA –30°C < T_a < +125°C	—	±40	—	ppm /°C	—
4	Output short-circuit current	I_{OSHORT}	V_{IN} = 14.0 V V_{OUT} = GND	—	300	—	mA	—
5	Overheat protection operating temperature	$T_{j(TH)}$	V_{IN} = 2.8 V I_{OUT} = 5 mA	—	150	—	°C	—

Note) *1: For this measurement, use the filter.

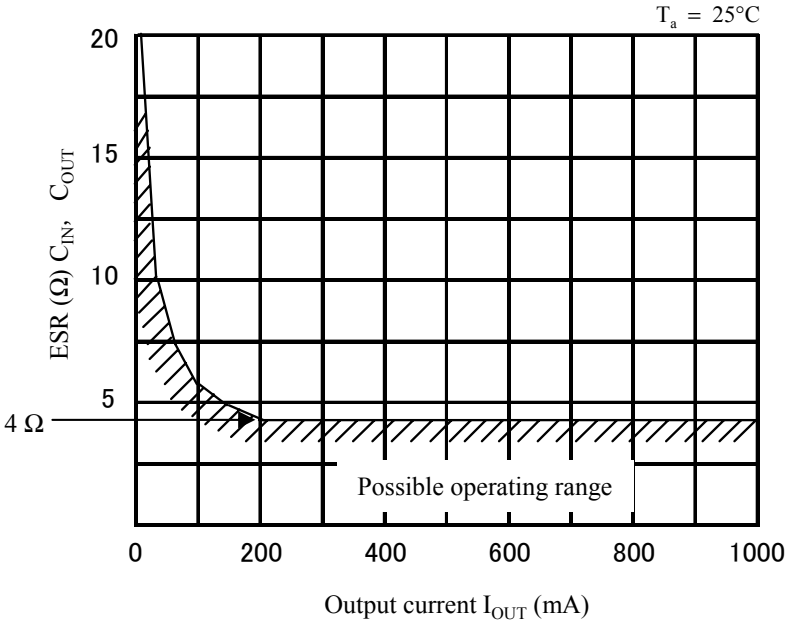
■ Technical Data

- External compensation capacitor

To ensure stability, a 3.3 µF capacitor should be connected on the input side as close to GND as possible, and a 3.3 µF capacitor should be connected on the output side as close to GND.

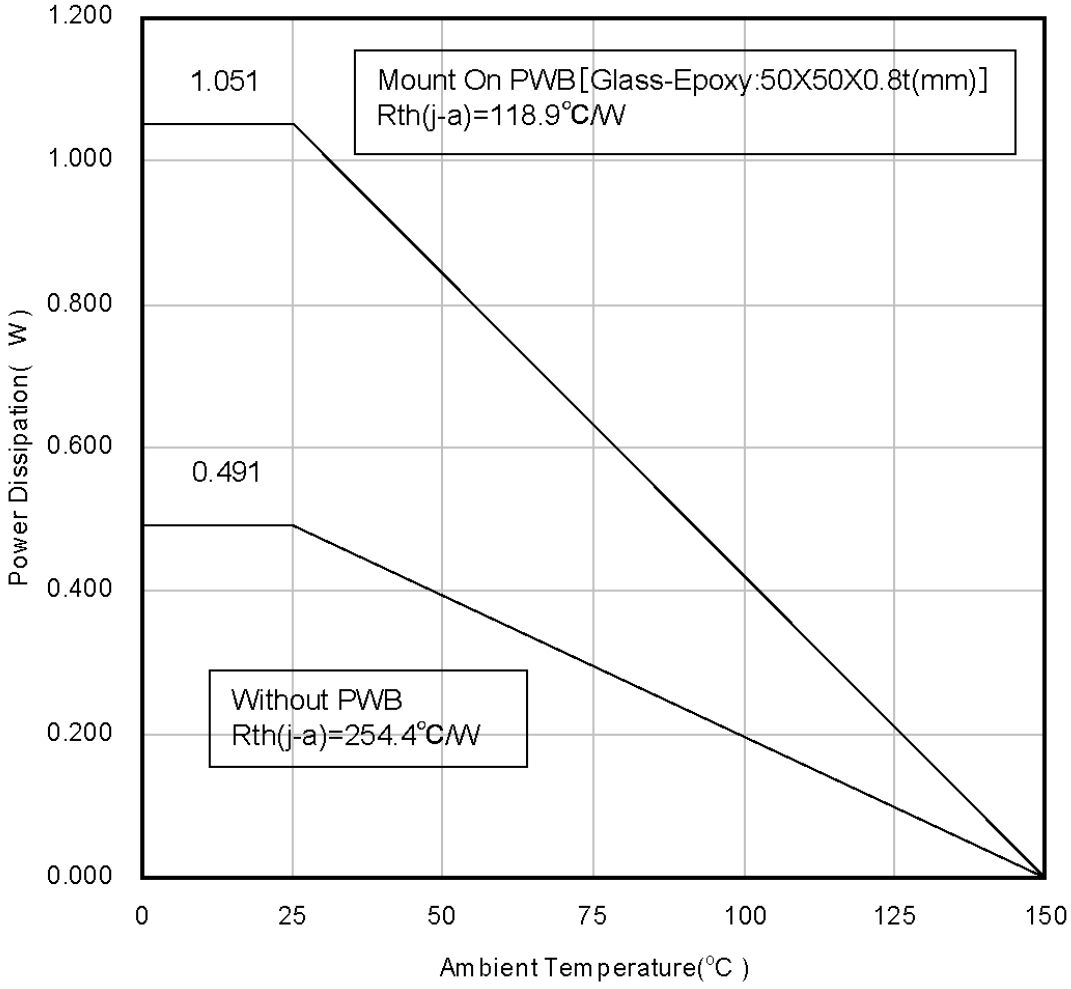
Note that when used at low temperatures, oscillations may result from an increase in the ESR of the aluminum electrolytic capacitor. Necessary to connect parallel ceramic etc. over 0.1 µF with aluminum electrolytic capacitor.

Output current vs. Input / Output capacitor ESR (equivalent series resistance)



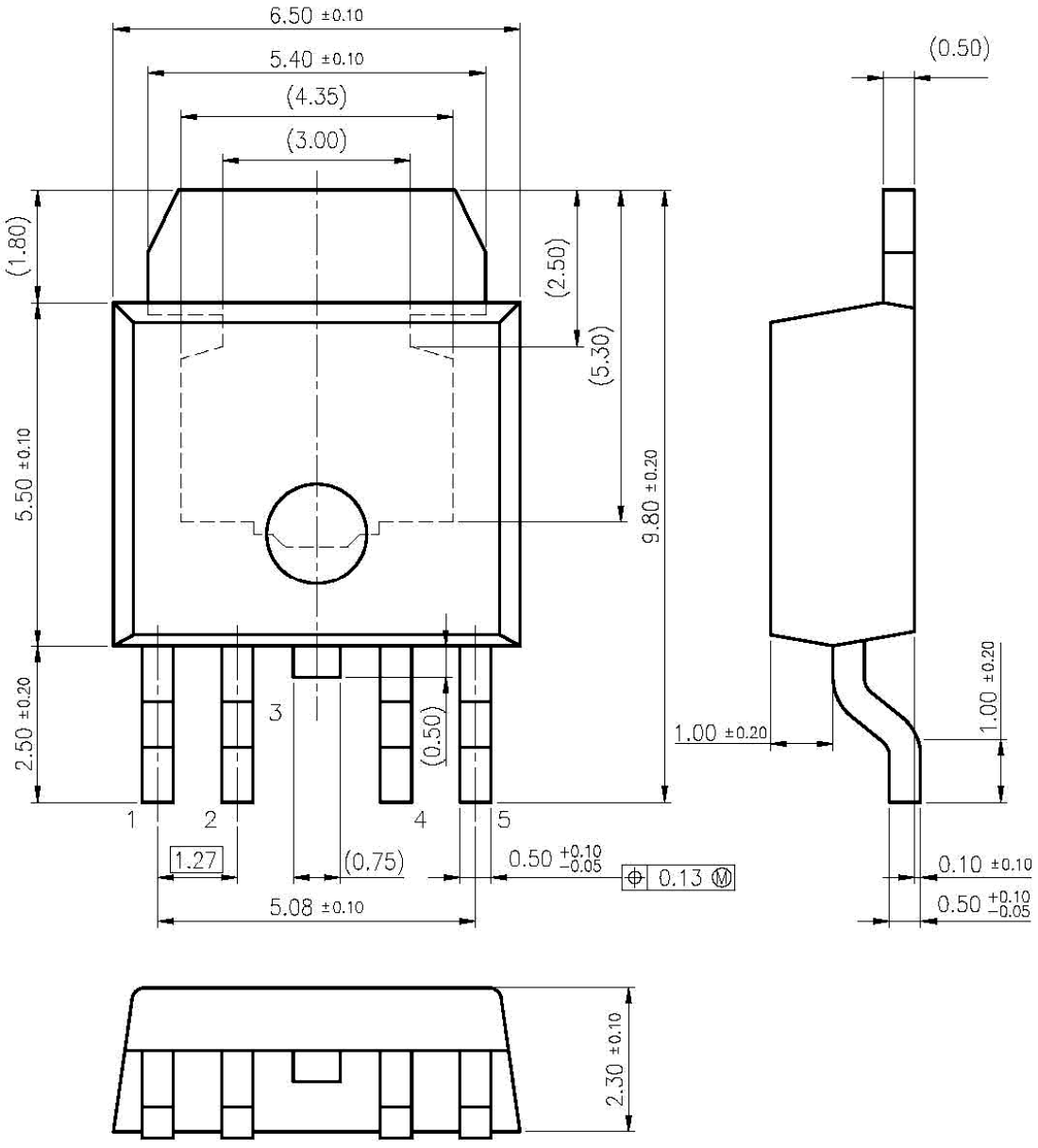
■ Technical Data (Continued)

• P_D — T_a diagram



■ Package Dimensions (Unit: mm)

• SP-5SUA (Exclusive use for AN80MxxRSP)



■ Usage Notes

1. Be careful to the ESR of external capacitors when selecting them, and perform a sufficient evaluation under the environmental conditions.
   Wiring impedance of the mother board and the parasitic capacitance will also have an effect on the characteristics.
   Make sure the wiring pattern layout will not cause an increase in the ESR.

2. Trough the capacitance value can be reduced if the ESR of the capacitors connected to input/output pins are sufficiently small, be careful to the temperature characteristics of the ESR of the capacitors and the capacitance value.

3. Control Input threshold voltage, V_{CONT} varies with change in temperature.
   Pay careful attention that V_{CONT} increases as the temperature falls.
   (Reference values)
   Rate of change of Control Input (threshold voltage) Logic High, V_{CONT} (H) : About –6.9 mV /°C
   Rate of change of Control Input (threshold voltage) Logic Low, V_{CONT} (L) : About –2.2 mV /°C

Request for your special attention and precautions in using the technical information and semiconductors described in this book

(1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.

(2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.

(3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.

20080805