RFS30TZ6S

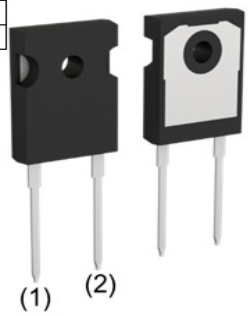
Ultra Fast Recovery Diode

Data sheet

V_R	650	V
I_o	30	A
I_{FSM}	160	A
$t_{rr(typ)}$	27	ns

● Outline

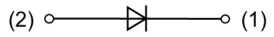
Package Code	TO-247-2L
JEITA Code	-
ROHM Code	TO-247GE-2L



● Features

Ultra fast recovery / Ultra soft recovery type
Ultra low switching loss
High current overload capacity

● Inner Circuit



(1)Cathode
(2)Anode

● Application

General rectification
For PFC (CCM : Continuous Current Mode)

● Structure

Silicon epitaxial planar

● Packaging Specifications

Packing	Tube
Reel Size(mm)	-
Taping Width(mm)	-
Quantity(pcs)	600
Taping Code	C13
Marking	RFS30TZ6S

● Absolute Maximum Ratings (T_c=25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Limits	Unit
Repetitive peak reverse voltage	V_{RM}	Duty≦0.5	650	V
Reverse voltage	V_R	Reverse direct voltage	650	V
Average rectified forward current	I_o	60Hz half sin waveform resistive load, T_c=105℃Max	30	A
Peak forward surge current	I_{FSM}	60Hz half sin waveform non-repetitive, T_c=25℃	160	A
Junction temperature	T_j	-	175	℃
Storage temperature	T_{stg}	-	-55 ~ 175	℃

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●Electrical Characteristics (T_j=25°C unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Forward voltage	V_F	I_F=30A	T_j=25°C	1.5	1.9	2.3	V
			T_j=125°C	-	1.5	-	V
Reverse current	I_R	V_R=650V		-	-	5	μA
Reverse recovery time	t_{rr}	I_F=0.5A, I_R=1A I_{rr}=0.25xI_R		-	27	35	ns
		I_F=30A, V_R=400V dI_F/dt= -200A/μs		-	38	-	ns
Peak reverse recovery current	I_{Rp}	I_F=30A, V_R=400V dI_F/dt= -200A/μs	T_j=125°C	-	8.0	-	A
Reverse recovery charges	Q_{rr}			-	432	-	nC
Forward recovery time	t_{fr}	I_F=30A, dI_F/dt= 200A/μs V_{FR}=1.1xV_{Fmax}		-	260	-	ns
Forward recovery voltage	V_{FR}			-	7.3	-	V

●Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance (Junction to case)(1) (2)	$R_{\theta JC}$	-	-	0.8	°C/W
Thermal resistance (Junction to ambient)(1) (3)	$R_{\theta JA}$	-	35	-	°C/W

(1) Value is guaranteed by desing.
(2) Transient dual interface measurement (TDIM) method.
(3) In free air.

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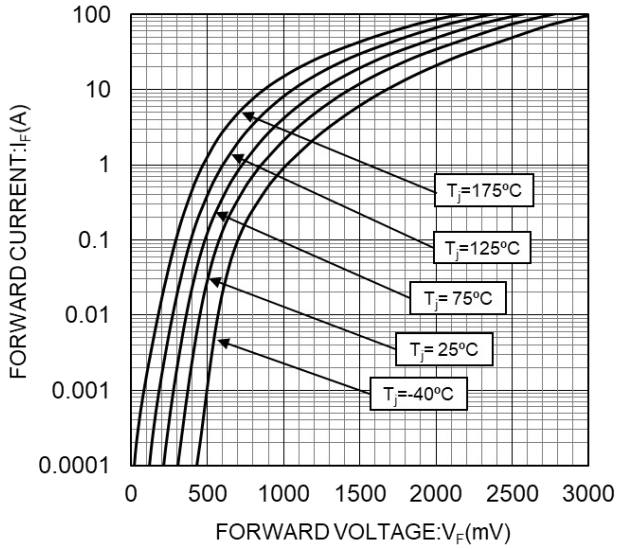
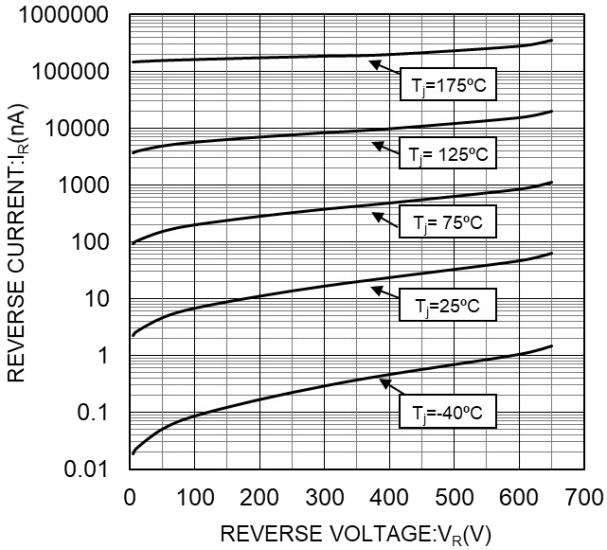
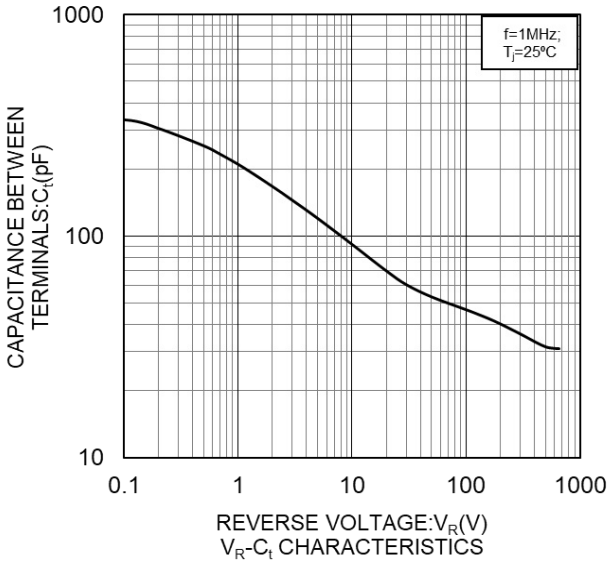
● Characteristic Curves



V_F-I_F CHARACTERISTICS



V_R-I_R CHARACTERISTICS



V_R-C_t CHARACTERISTICS

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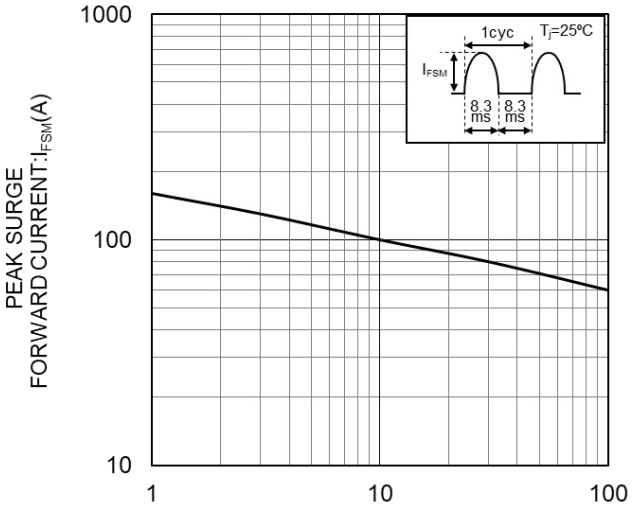
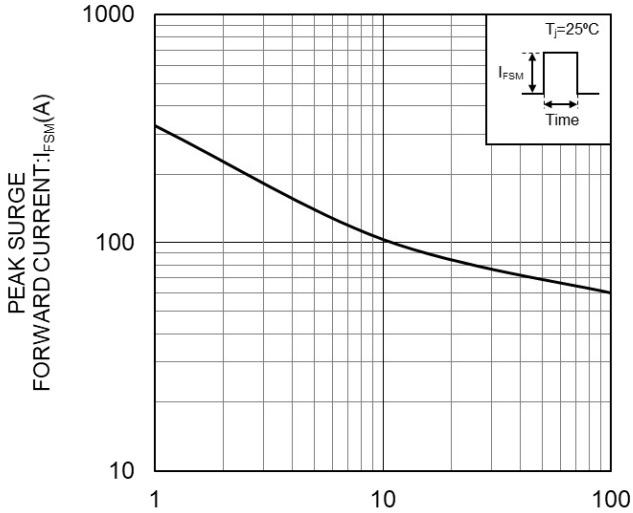
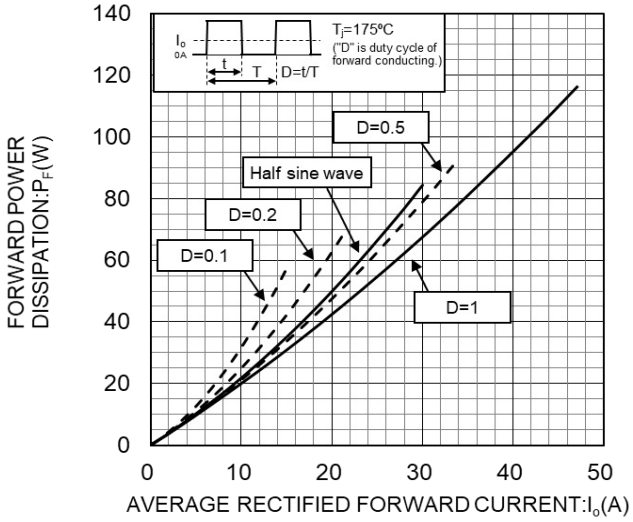
●Characteristic Curves



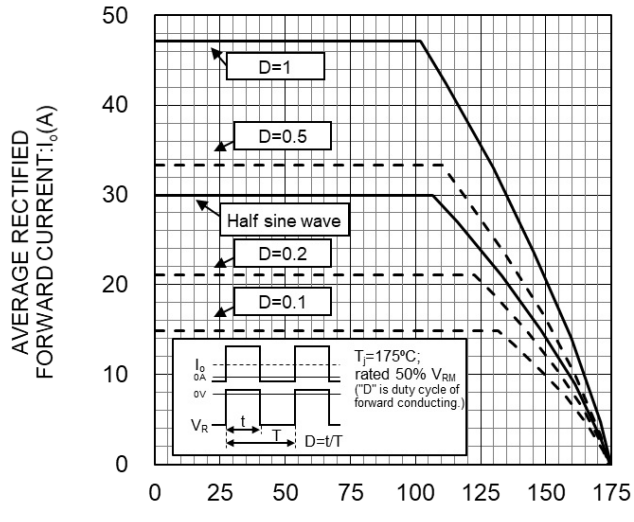
I_{FSM}-CYCLE CHARACTERISTICS



I_{FSM}-TIME CHARACTERISTICS



I_o-P_F CHARACTERISTICS



DERATING CURVE(I_o-T_C)

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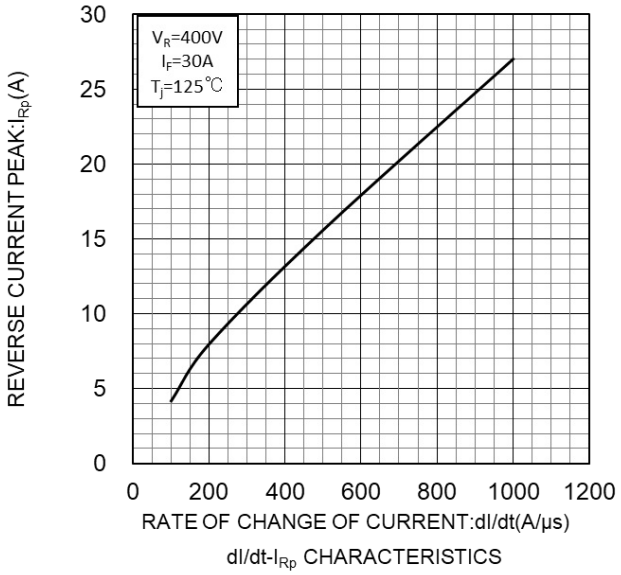
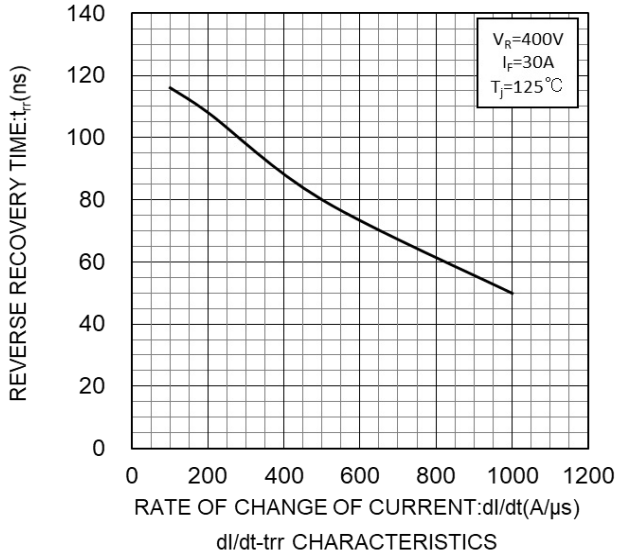
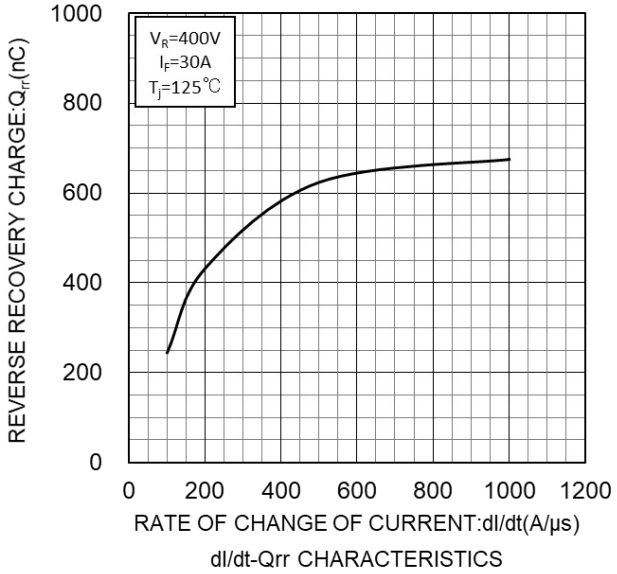
●Characteristic Curves



dI/dt-I_{Rp} CHARACTERISTICS



dI/dt-trr CHARACTERISTICS



dI/dt-Qrr CHARACTERISTICS

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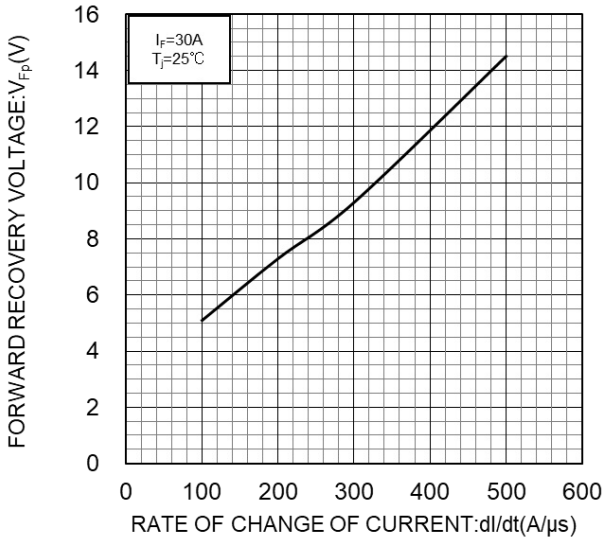
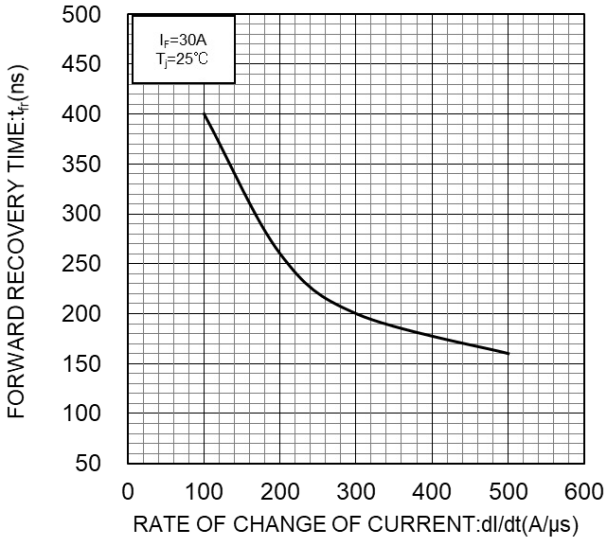
● Characteristic Curves



dI/dt-V_{Fp} CHARACTERISTICS



dI/dt-t_{fr} CHARACTERISTICS

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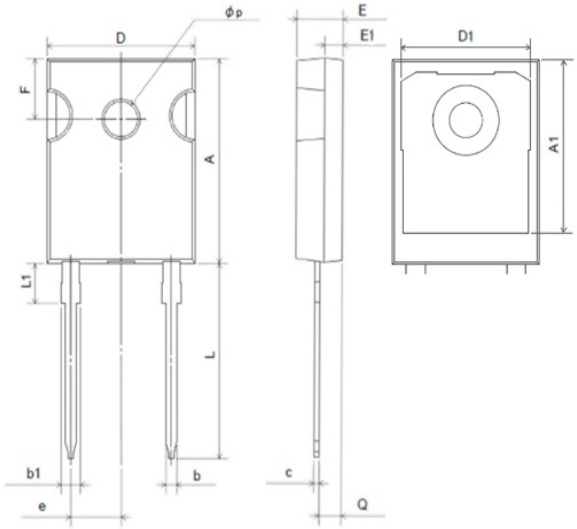
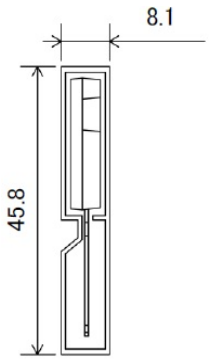
●Dimensions

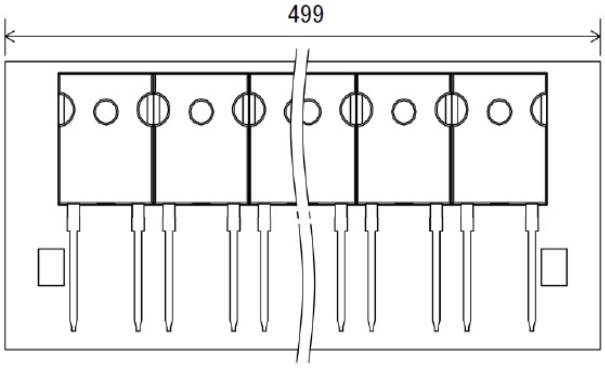
TO-247-2L, (TO-247GE-2L)



DIM	Milimeters			Inches		
	Min.	Average	Max.	Min.	Average	Max.
A	20.65	20.95	21.25	0.813	0.825	0.837
A1	-	17.74	-	-	0.698	-
b	1.00	1.20	1.40	0.039	0.047	0.055
b1	1.80	2.00	2.20	0.071	0.079	0.087
c	0.45	0.60	0.75	0.018	0.024	0.030
D	15.64	15.94	16.24	0.616	0.628	0.639
D1	-	14.20	-	-	0.559	-
E	4.82	5.02	5.22	0.190	0.198	0.206
E1	1.80	2.00	2.20	0.071	0.079	0.087
e	-	5.44	-	-	0.214	-
F	5.97	6.17	6.37	0.235	0.243	0.251
L	19.77	20.07	20.37	0.778	0.790	0.802
L1	3.99	4.19	4.39	0.157	0.165	0.173
p	3.51	3.61	3.71	0.138	0.142	0.146
Q	2.11	2.41	2.71	0.083	0.095	0.107

●Taping (Unit:mm)





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(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASSⅢ	CLASSⅢ	CLASSⅡb	CLASSⅢ
CLASSⅣ		CLASSⅢ	

2. ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
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   [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure

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   [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
   [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
   [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
   [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
   [f] Sealing or coating our Products with resin or other coating materials
   [g] Use of our Products without cleaning residue of flux (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.) ; or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
   [h] Use of the Products in places subject to dew condensation

4. The Products are not subject to radiation-proof design.

5. Please verify and confirm characteristics of the final or mounted products in using the Products.

6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse, is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.

8. Confirm that operation temperature is within the specified range described in the product specification.

9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.

2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

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2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
   [a] the Products are exposed to sea winds or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [b] the temperature or humidity exceeds those recommended by ROHM
   [c] the Products are exposed to direct sunshine or condensation
   [d] the Products are exposed to high Electrostatic

2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.

3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

Precaution for Product Label

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

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