



**THE DATASHEET OF
BCR3AS-12B-T13#B01**



BCR3AS-12B

600V - 3A - Triac

Low Power Use

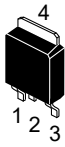
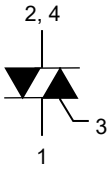
R07DS1439EJ0500
 (Previous: REJ03G0450-0400)
 Rev.5.00
 May. 10, 2019

Features

- $I_{T(RMS)}$: 3 A
- V_{DRM} : 600 V
- I_{FGT} , I_{RGT} , $I_{RGT III}$: 15 mA
- T_j : 150 °C
- Planar Passivation Type

Outline

RENESAS Package code: PRSS0004ZG-A
 (Package name: MP-3A)

1. T₁ Terminal
 2. T₂ Terminal
 3. Gate Terminal
 4. T₂ Terminal

Application

Small motor control, heater control, and other general purpose AC control applications.

Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak off-state voltage ^{Note1}	V_{DRM}	600	V
Non-repetitive peak off-state voltage ^{Note1}	V_{DSM}	720	V

Notes: 1. Gate open.

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	3	A	Commercial frequency, sine full wave 360°conduction, $T_c = 133^{\circ}C$ ^{Note3}
Surge on-state current	I_{TSM}	30	A	60 Hz sine wave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	3.7	A ² s	Value corresponding to 1 cycle of half wave 60 Hz, surge on-state current
Peak gate power dissipation	P_{GM}	3	W	
Average gate power dissipation	$P_{G(AV)}$	0.3	W	
Peak gate voltage	V_{GM}	6	V	
Peak gate current	I_{GM}	0.3	A	
Junction Temperature	T_j	-40 to +150	°C	
Storage temperature	T_{stg}	-40 to +150	°C	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions	
Repetitive peak off-state current	I_{DRM}	—	—	2.0	mA	$T_j = 150^\circ\text{C}$, V_{DRM} applied	
On-state voltage	V_{TM}	—	—	1.7	V	$T_c = 25^\circ\text{C}$, $I_{TM} = 4.5\text{ A}$, instantaneous measurement	
Gate trigger voltage ^{Note2}	I	V_{FGTI}	—	—	1.5	V	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II	V_{RGTI}	—	—	1.5	V	
	III	V_{RGTIII}	—	—	1.5	V	
Gate trigger current ^{Note2}	I	I_{FGTI}	—	—	15	mA	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II	I_{RGTI}	—	—	15	mA	
	III	I_{RGTIII}	—	—	15	mA	
Gate non-trigger voltage	V_{GD}	0.2	—	—	V	$T_j = 125^\circ\text{C}$, $V_D = 1/2 V_{DRM}$	
		0.1	—	—		$T_j = 150^\circ\text{C}$, $V_D = 1/2 V_{DRM}$	
Thermal resistance	$R_{th(j-c)}$	—	—	3.8	$^\circ\text{C/W}$	Junction to case ^{Note3}	
Critical-rate of rise of off-state commutating voltage ^{Note4}	$(dv/dt)_c$	5	—	—	V/ μs	$T_j = 125^\circ\text{C}$	
		1	—	—		$T_j = 150^\circ\text{C}$	

Notes: 2. Measurement using the gate trigger characteristics measurement circuit.

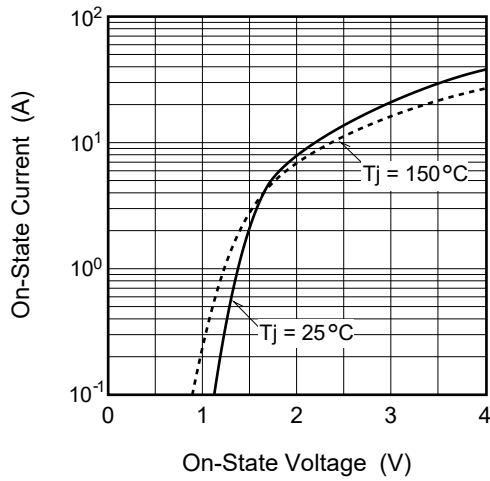
3. Case temperature is measured on the T_2 tab.

4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

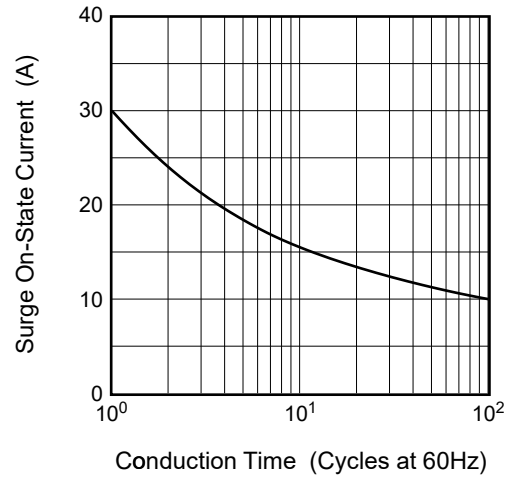
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -1.5\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

Performance Curves

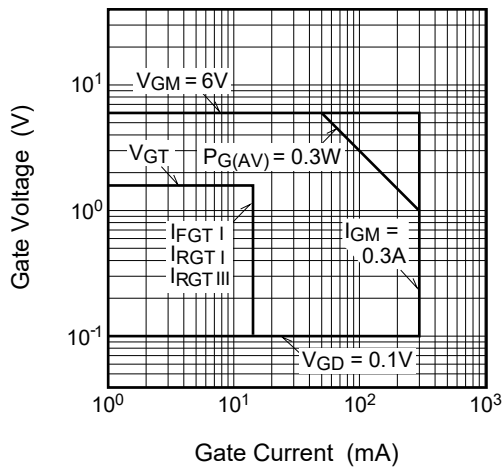
Maximum On-State Characteristics



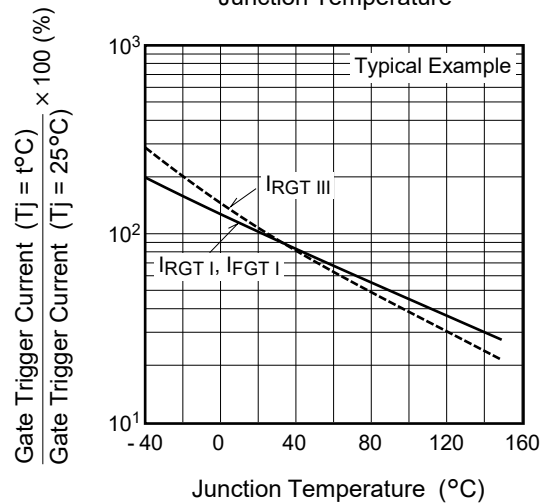
Rated Surge On-State Current



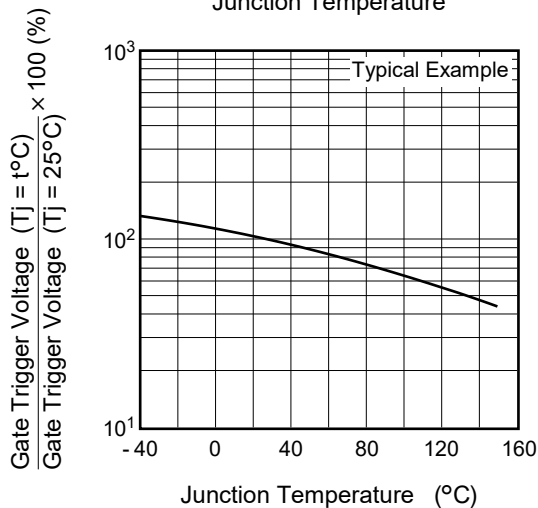
Gate Characteristics (I, II and III)



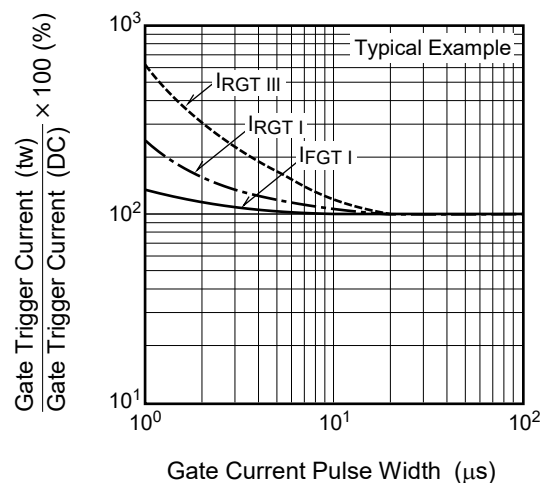
Gate Trigger Current vs. Junction Temperature

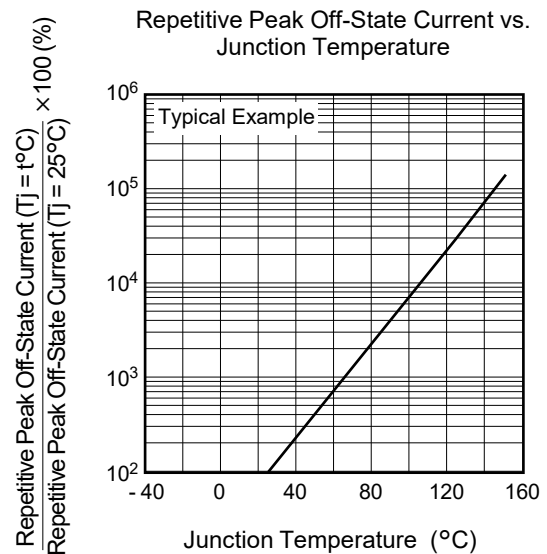
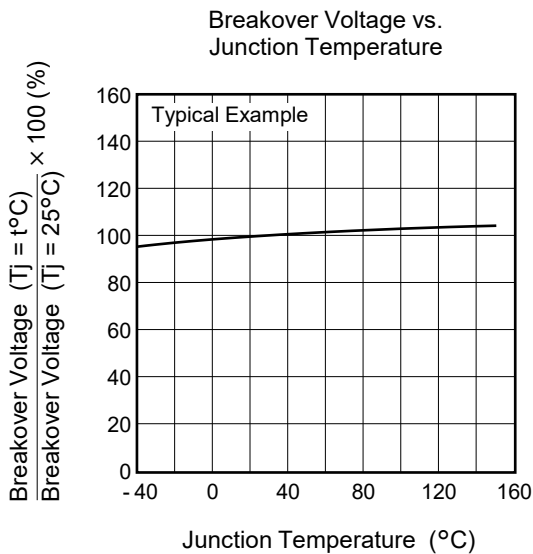
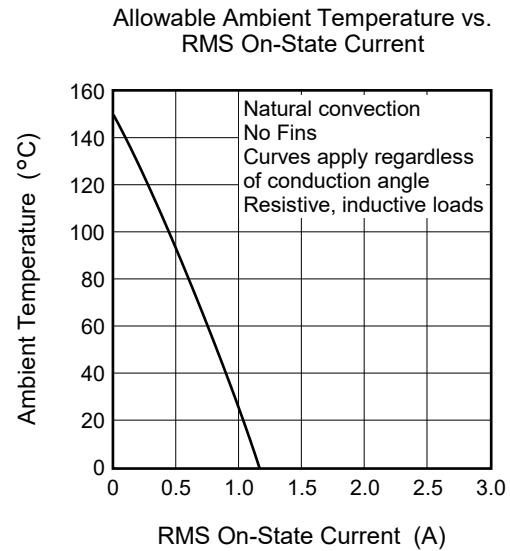
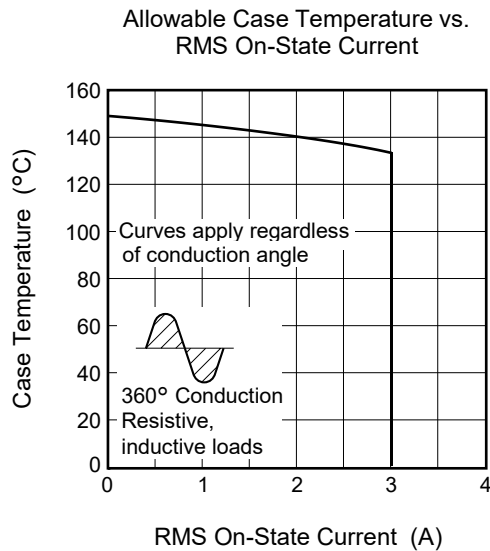
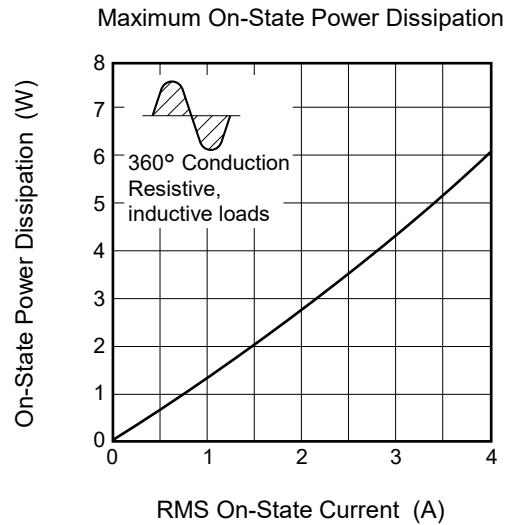
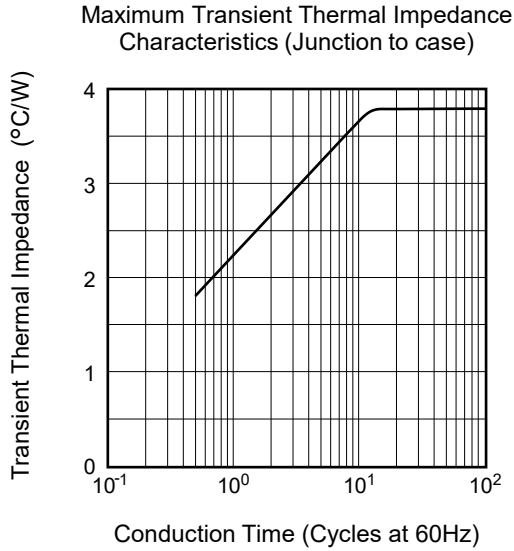


Gate Trigger Voltage vs. Junction Temperature

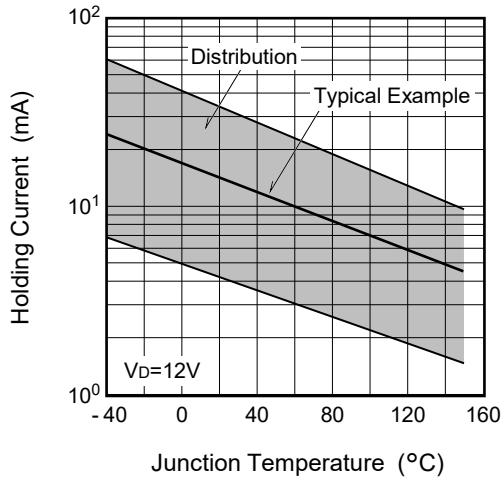


Gate Trigger Current vs. Gate Current Pulse Width

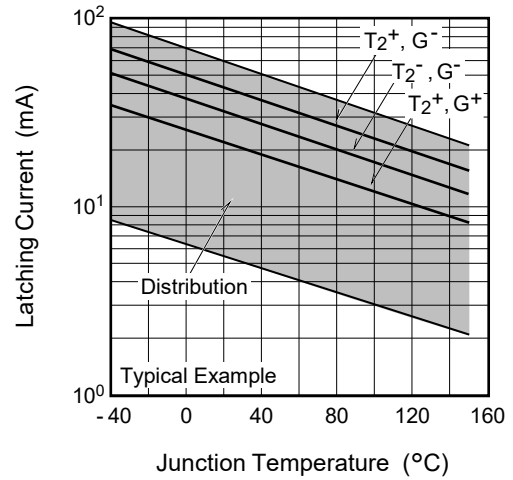




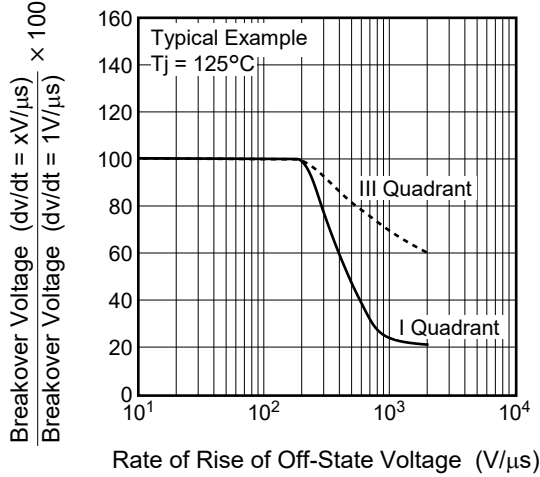
Holding Current vs. Junction Temperature



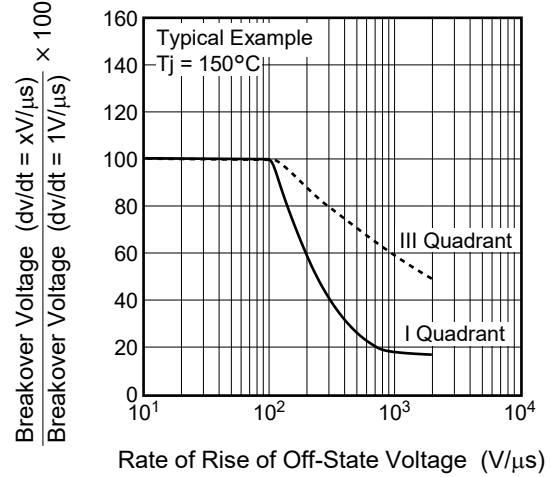
Latching Current vs. Junction Temperature



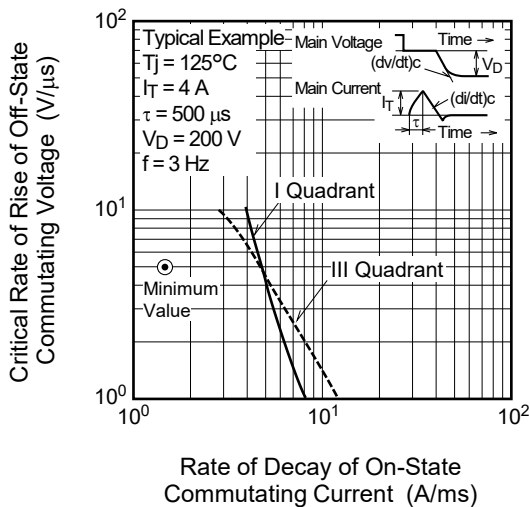
Breakover Voltage vs. Rate of Rise of Off-State Voltage (T_J=125°C)



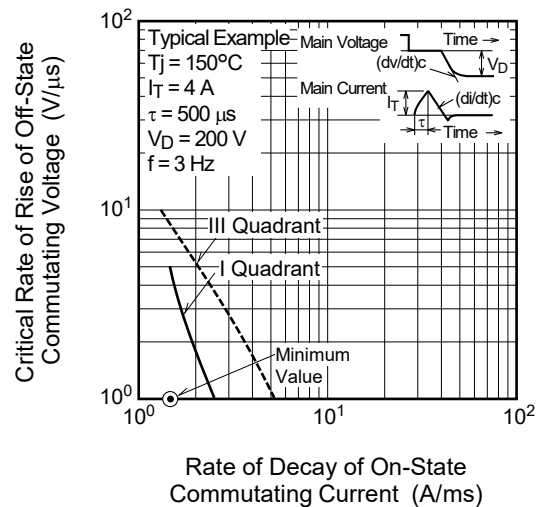
Breakover Voltage vs. Rate of Rise of Off-State Voltage (T_J=150°C)



Commutation Characteristics (T_J=125°C)

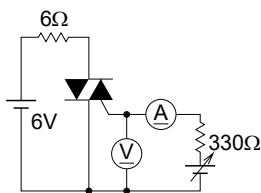


Commutation Characteristics (T_J=150°C)

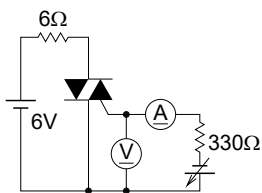


Gate Trigger Characteristics Test Circuits

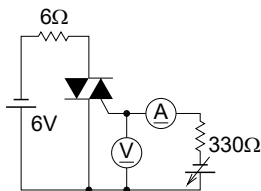
Recommended peripheral components for Triac



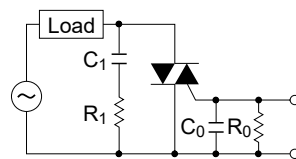
Test Procedure I



Test Procedure II



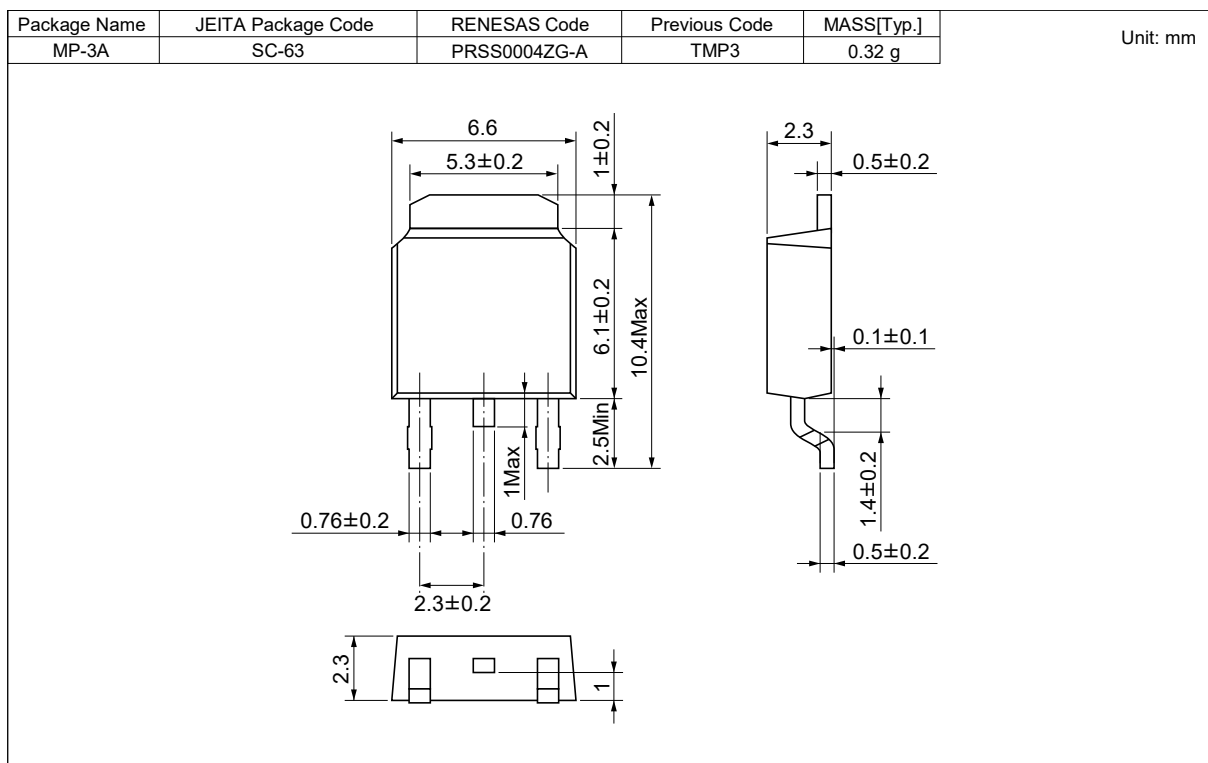
Test Procedure III



$C_1 = 0.1 \text{ to } 0.47 \mu\text{F}$ $C_0 = 0.1 \mu\text{F}$
 $R_1 = 47 \text{ to } 100 \Omega$ $R_0 = 100 \Omega$

Package Dimensions

Package Name: MP-3A



Ordering Information

Orderable Part Number	Package	Packing ^{Note5}	Quantity	Remark
BCR3AS-12B-T13#B01	MP-3A	Embossed tape	3000 pcs.	
BCR3AS-12B#B01	MP-3A	Tube	75 pcs.	Tube packing is to be abolished.

Note: 5. Please confirm the specification about the shipping in detail.

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