BCR40RM-12LB

Triac
Medium Power Use

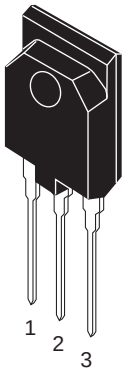
R07DS0516EJ0100
Rev.1.00
Oct 14, 2011

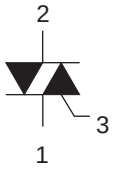
Features

- $I_{T\,(RMS)}$: 40A
- V_{DRM} : 600 V
- Tj: 150 °C
- I_{FGTI}, I_{RGTI}, I_{RGT} :50 mA
- Viso:2000V
- Insulated Type
- Planar Passivation Type

Outline

RENESAS Package code: PRSS0003ZA-A
(Package name: TO-3PFM)





1. T_1 Terminal
2. T_2 Terminal
3. Gate Terminal

Applications

Contactless AC switch, electric heater control, light dimmer, on/off and speed control of small induction motor, on/off control of copier lamp

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

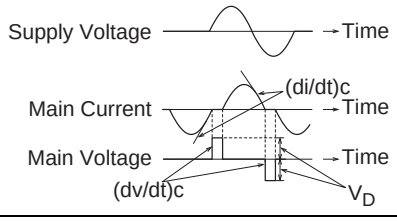
Notes: 1. Gate open.

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T\ (RMS)}$	40	A	Commercial frequency, sine full wave 360°conduction, Tc = 61°C Note3
Surge on-state current	I_{TSM}	400	A	60Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusion	I^2t	667	A^2s	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	P_{GM}	5	W	
Average gate power dissipation	$P_{G\ (AV)}$	0.5	W	
Peak gate voltage	V_{GM}	10	V	
Peak gate current	I_{GM}	2	A	
Junction Temperature	Tj	–40 +150	°C	
Storage temperature	Tstg	–40 +150	°C	
Mass	—	5.2	g	Typical value
Isolation voltage	Viso	2000	V	Ta=25 , AC 1 minute T_1 T_2 G terminal to case

Electrical Characteristics

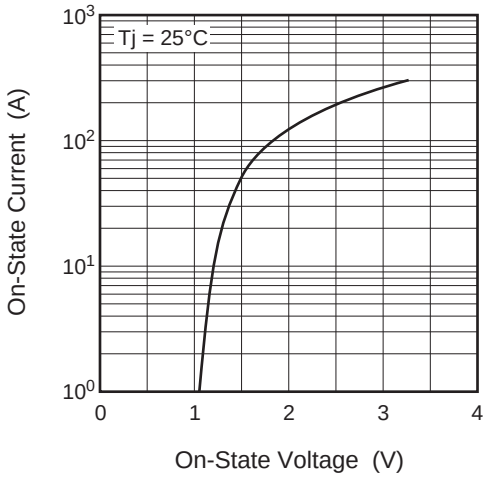
Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current		I_{DRM}	—	—	10.0	mA	Tj = 150°C, V_{DRM} applied
On-state voltage		V_{TM}	—	—	1.55	V	Tc = 25°C, I_{TM} = 60A, instantaneous measurement
Gate trigger voltage Note2	I	V_{FGTI}	—	—	2.5	V	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	V_{RGTI}	—	—	2.5	V	
	III	V_{RGTIII}	—	—	2.5	V	
Gate trigger curent Note2	I	I_{FGTI}	—	—	50	mA	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	I_{RGTI}	—	—	50	mA	
	III	I_{RGTIII}	—	—	50	mA	
Gate non-trigger voltage		V_{GD}	0.2	—	—	V	Tj = 125°C, V_D = 1/2 V_{DRM}
			0.1				Tj = 150°C, V_D = 1/2 V_{DRM}
Thermal resistance		$R_{th\ (j-c)}$	—	—	1.8	°C/W	Junction to case Note3
Critical-rate of rise of off-state commutation voltage Note4		(dv/dt)c	20	—	—	V/μs	Tj = 125°C
			2	—	—	V/μs	Tj = 150°C

Notes: 2. Measurement using the gate trigger characteristics measurement circuit.
3. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 0.5°C/W.
4. Test conditions of the critical-rate of rise of off-state commutating voltage shown in the table below.

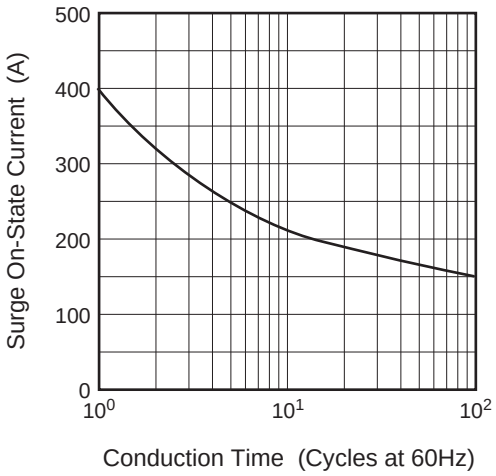
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature Tj = 125/150°C 2.Rate of decay of on-state commutating current (di/dt)c =-20 A/ms 3.Peak off-state voltage V_D = 400 V	

Performance Curves

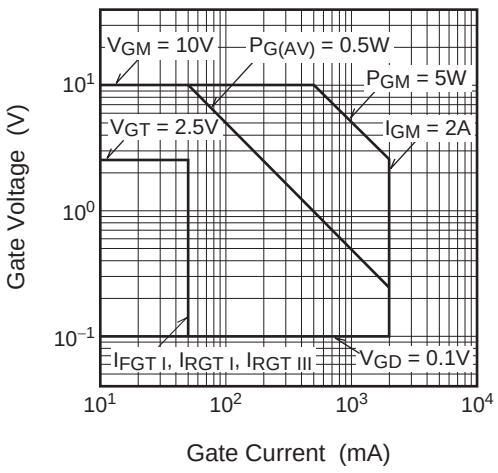
Maximum On-State Characteristics



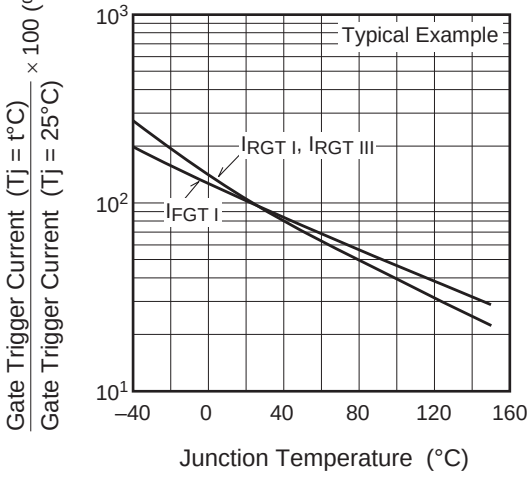
Rated Surge On-State Current



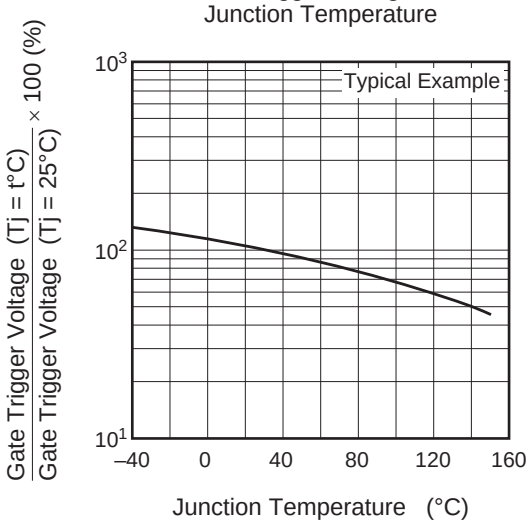
Gate Characteristics (I, II and III)



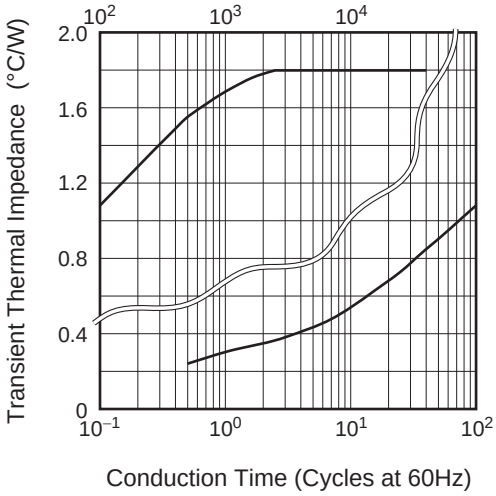
Gate Trigger Current vs. Junction Temperature



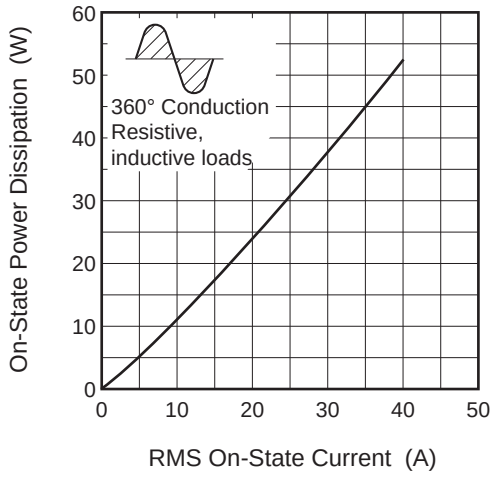
Gate Trigger Voltage vs. Junction Temperature



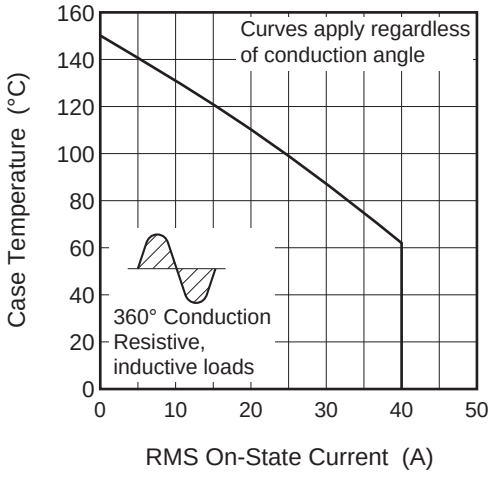
Maximum Transient Thermal Impedance Characteristics (Junction to case)



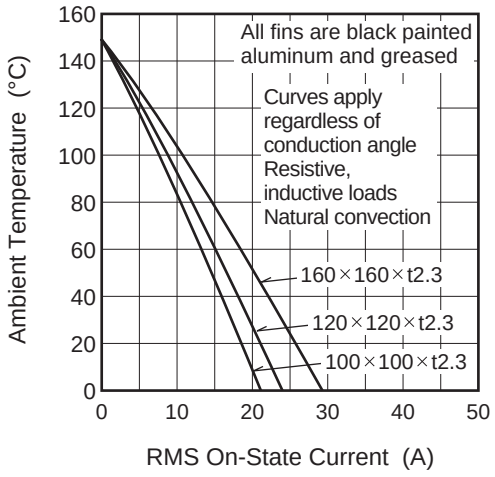
Maximum On-State Power Dissipation



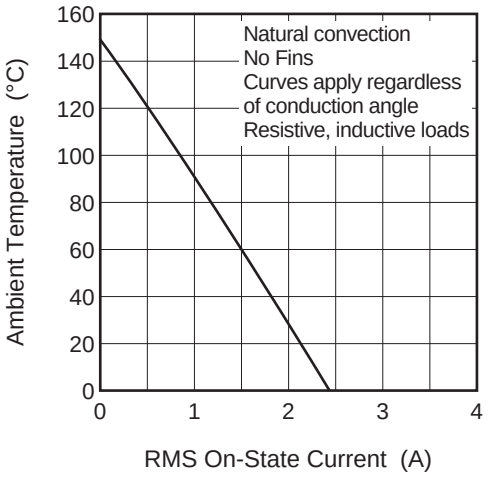
Allowable Case Temperature vs.
RMS On-State Current



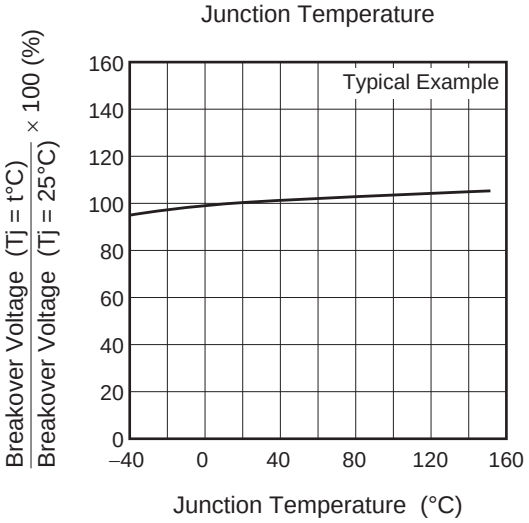
Allowable Ambient Temperature vs.
RMS On-State Current



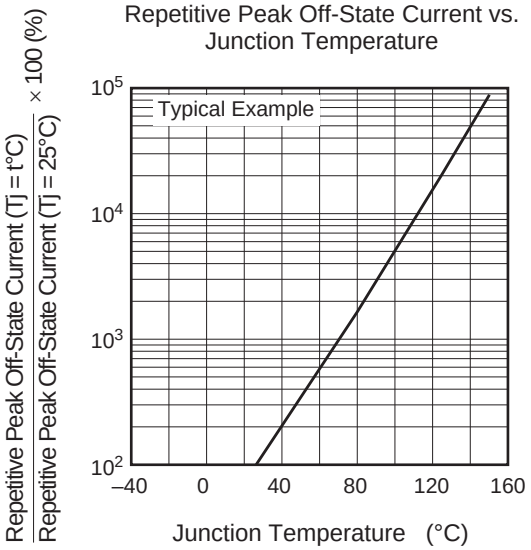
Allowable Ambient Temperature vs.
RMS On-State Current



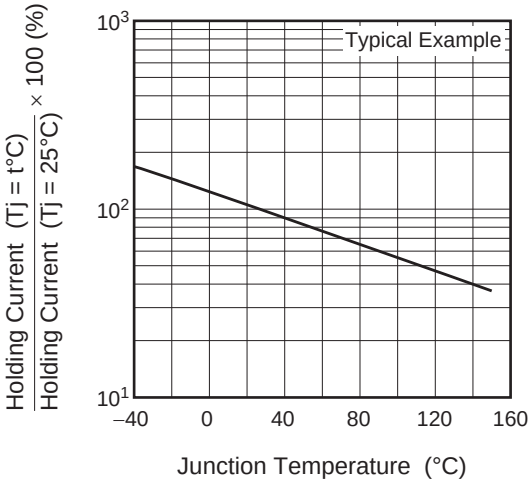
Breakover Voltage vs.
Junction Temperature



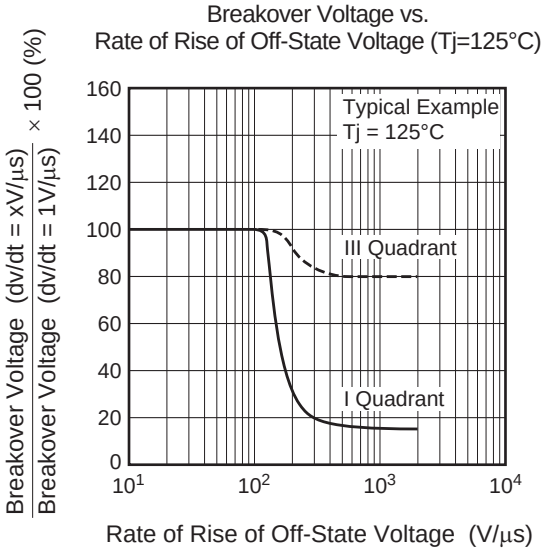
Repetitive Peak Off-State Current vs.
Junction Temperature



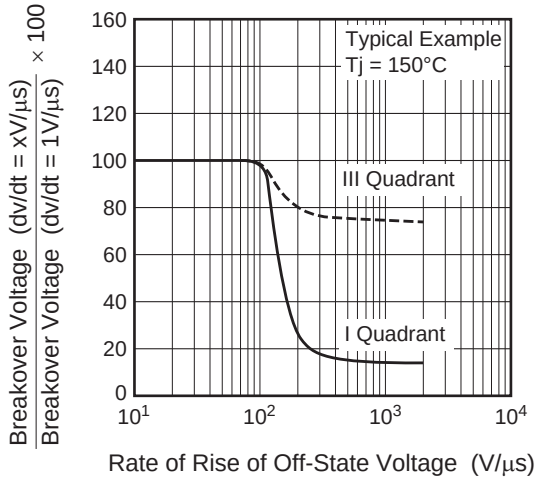
Holding Current vs.
Junction Temperature



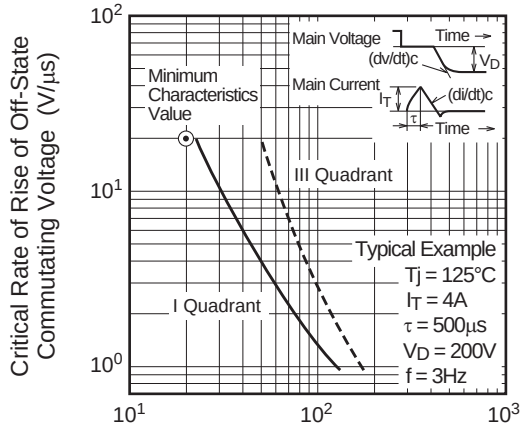
Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=125°C)



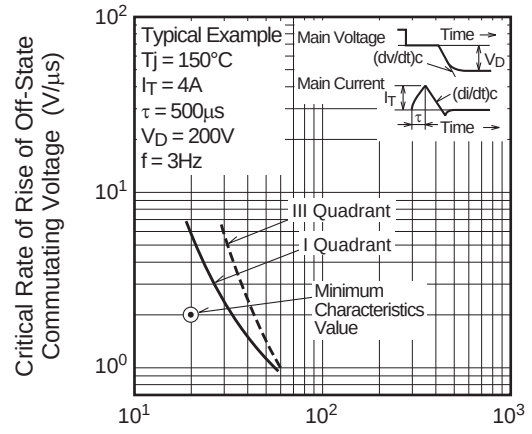
Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=150°C)



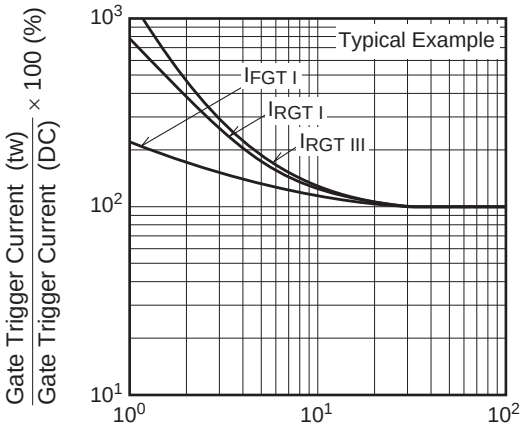
Commutation Characteristics (Tj=125°C)



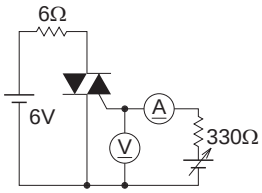
Commutation Characteristics (Tj=150°C)



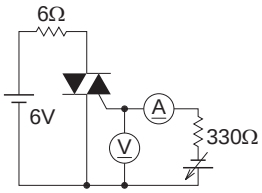
Gate Trigger Current vs.
Gate Current Pulse Width



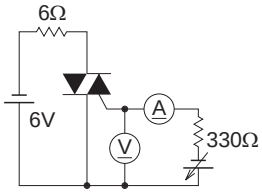
Gate Trigger Characteristics Test Circuits



Test Procedure I

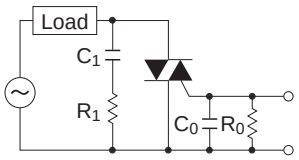


Test Procedure II



Test Procedure III

Recommended Circuit Values Around The Triac

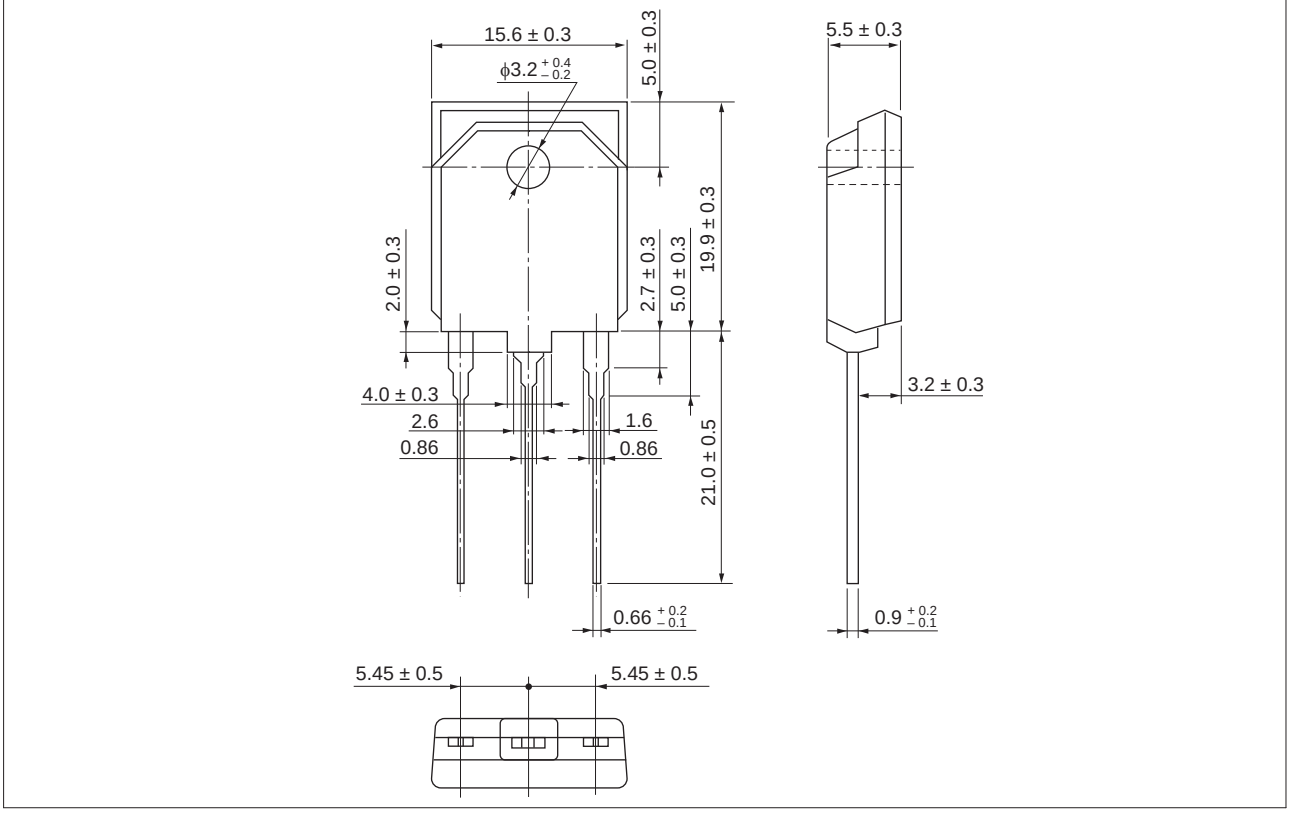


C_1 = 0.1 to 0.47μF C_0 = 0.1μF
R_1 = 47 to 100Ω R_0 = 100Ω

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-3PFM	SC-93	PRSS0003ZA-A	TO-3PFM / TO-3PFMV	5.2g

Unit: mm



Ordering Information

Orderable Part Number	Packing	Quantity	Remark
BCR40RM-12LB#B00	Tube	30 pcs.	Straight type

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

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