# 9.5mm width potentiometer ideal for





## various types of control



#### ■ Typical Specifications

Items	Specifications
Total resistance tolerance	±20%
Maximum operating voltage	50V AC, 10V DC
Total rotational angle	$300^{\circ}\pm5^{\circ}$ (For shaft movable type, $300^{\circ}\pm10^{\circ}$ )
Rotational torque	2 to 25mN·m
Operating life	15,000 cycles
Operating temperature range	$-20^{\circ}\text{C to } +70^{\circ}\text{C}$ $-40^{\circ}\text{C to } +85^{\circ}\text{C (Vehicle-compatible)}$

#### Product Line

Single-shaft without switch type

Number of resistor	Mounting	Shaft	Length of the shaft	Center	Total resistance	Resistance	Minimum ord	er unit (pcs.)	Products No.	Drawing											
elements	direction	type	Lı (mm)	detent	(k Ω)	taper	Japan	Export	T TOUGE TO	No.											
				Without	10	15A			RK097111080J												
			15	Without	20	1B			RK0971110909												
			15	With	10	15A			RK0971110D7F	]											
				Without	50	1B	1,200 (A type)	2,400 (A type)	RK097111020N												
Single-unit				Without	10	15A									RK097111080R	1					
			20	With	10	10	1B				RK0971110D88										
					50	16			RK09711100F8												
	Horizontal type				05	Without	10	15A	800	1,600	RK097111091M										
						Flat	25	Without	10		(B type)	(B type)	RK0971110D57								
															ļ			15		50	1B
Dual-unit for tone			20	With	20	16	800	1,600	RK0971210Z2M												
			25				(B type)	(B type)	RK0971210097												
			15			15A	1,200	2,400	RK09712200MC	2											
			15					10	3B	(A type)	(A type)	RK09712200MY									
Dual-unit for vol.				Without		15A			RK09712200HA												
761 461.				20			3B	800 (B type)		RK097122008T											
					20	15A			RK09712200MT												

- 1. Other varieties are also available. Refer to "Other Specifications" (P.332, 333).
- 2. For automotive use, please contact us with detailed specifications.

#### Product Line

Single-shaft with rotary switch type

Number of	Mounting	Shaft	Length of the	Center	Total resistance	Resistance	Minimum ord	er unit (pcs.)	Products No.	Drawing																				
resistor elements	direction	type	shaft L <sub>1</sub> (mm)	detent	(k Ω)	taper	Japan	Export	T TOUGE TO	No.																				
			15		20				RK0971111Z0P																					
Single-unit			15		50	15A			RK0971111Z32	3																				
Jii igie-ui ii t	Horizontal	Horizontal Flat	. I FIAT I	Flat	Flat	Flat	20	Without			700	1,400	RK09711110AL																	
	type Fla	I FIAT I					riat	Flat	riat	riat	riat	Flat	riat	riat	Flat	Flat	Flat	riat	riat	Flat	FIAT	Flat	Flat	Flat	Flat	Flat	20	Without	10	1B
Dual-unit			15																			3B			RK0971221Z05	4				
for vol.			20		20				RK0971221Z11	] +																				

#### Single-shaft push-on push-off (1.5mm travel) switch type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum ord Japan	er unit (pcs.) Export	Products No.	Drawing No.
Single-unit			25		10	15A	700	1,400	RK097111202P	5
Sirigle-uriit	nit Horizontal type	. I Flat		Without	10	1B	(C type)	(C type)	RK097111202Q	5
Dual-unit for vol.			20		50	3B	600 (D type)	1,200 (D type)	RK097122200G	6

#### Single-shaft momentary push (0.5mm travel) switch type

Number of	Mounting	Shaft	Length of the	Center	Total resistance		Minimum ord	er unit (pcs.)	Products No.	Drawing
resistor elements	direction	type	shaft L1 (mm)	detent	(k Ω)	taper	Japan	Export	1 1000010 110.	No.
Single-unit			15	With		3B			RK0971114D0B	7
Dual-unit for tone	Horizontal type	Flat	20	Without	10	1B	700 (C type)	1,400 (C type)	RK0971214Z06	8
Dual-unit for vol.			20	without		15A			RK0971224Z01	<u> </u>

#### Single-shaft momentary push (1.5mm travel) switch type

Number of	Mounting	Shaft	Length of the	Center	Total resistance	Resistance	Minimum ord	er unit (pcs.)	Products No.	Drawing
resistor elements	direction	type	shaft L1 (mm)	detent	(k Ω)	taper	Japan	Export	T TOUUGES NO.	No.
Single-unit	Horizontal type	Flat	20	Without	10	1B	700 (C type)	1,400 (C type)	RK0971114Z07	9

- 1. Other varieties are also available. Refer to "Other Specifications" (P.332, 333).
- 2. For automotive use, please contact us with detailed specifications.

#### Product Line

Single-shaft with push-lock mechanism type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum ord Japan	er unit (pcs.) Export	Products No.	Drawing No.
					10	1B			RK097111T065	
				Without	100	15A			RK097111TZ17	
Single-unit					100		700 (C type)	1,400 (C type)	RK097111T064	10
	Horizontal	Flat	25		10	1B			RK097111TD2M	
	type	Flat	25	With	100	ID			RK097111TD44	
Dual-unit for tone					10				RK097121TD57	
Dual-unit				M/i+bou+	10	15A	600 (D type)	1,200 (D type)	RK097122T017	11
for vol				Without	50	3B			RK097122TZ0A	

#### Single-shaft with push-lock switch type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum ord Japan	er unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	25	Without	5	1B	700 (C type)	1,400 (C type)	RK097111U00S	12

#### Dual-shaft, dual-unit without switch type

Number of resistor elements	Mounting direction	Shaft	Shaft type	Length of the shaft L <sub>1</sub> L <sub>2</sub> (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum ord Japan	er unit (pcs.) Export	Products No.	Drawing No.	
		The outer shaft	Slotted	15			15A			RK097221005C		
Dual-unit (Single-shaft,	Horizontal	The inner shaft	Flat	25	Without	10	ISA	700		700 1,400	HK09/221005C	13
Single-unit)	type	The outer shaft	Slotted	15	VVILITOUT	10	15C	(C type)	(C type)	RK097221004C		
		The inner shaft	Flat	25			130			HN091221004C		

#### Notes

- 1. Other varieties are also available. Refer to "Other Specifications" (P.332, 333).
- 2. For automotive use, please contact us with detailed specifications.

#### Packing Specifications

#### Tray

Minimum order unit type	Number of pa	ckages (pcs.)	Export package
with international arms eyes	1 case /Japan	1 case /export packing	measurements (mm)
A type	1,200	2,400	375×490×185
B type	800	1,600	373×540×207
C type	700	1,400	373×540×181
D type	600	1,200	373×540×225

Refer to P.332 for other specifications.
Refer to P.334 for attached parts.
Refer to P.336 for ordering products not listed.
Refer to P.359 for soldering conditions.

Dir	mensions		Unit:mm
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	Single-shaft, single-unit RK0971110	L <sub>1</sub> 15 20 25 L <sub>B</sub> 5 7 10 ℓ 7 12 12  7.05 L <sub>1</sub> ℓ μη 6 R <sub>1</sub> 0.8  Shaft shown in full CCW position	Mounting surface 3-ø1 hole
2	Single-shaft, dual-unit RK0971210 (For tone) RK0971220 (For vol.)	L <sub>1</sub> 15 20 25 L <sub>B</sub> 5 7 10 ℓ 7 12 12  9.55 L <sub>1</sub> 9.55 L <sub>1</sub> 9.55 L <sub>2</sub> 9.5 ½  9.5 ½	2.5 5 Mounting surface  of 6-ø1 hole
3	Single-shaft, single-unit with rotary switch RK0971111-5R1211	L <sub>1</sub> 15 20 L <sub>B</sub> 5 7 L <sub>B</sub> 7 12	6.25 5 Mounting surface  5-ø1 hole
4	Single-shaft, dual-unit with rotary switch RK0971221-5R1211 (For vol.)	L <sub>1</sub> 15 20 L <sub>B</sub> 5 7 L 7 12  15.8  L <sub>1</sub> L <sub>2</sub> L <sub>3</sub> L <sub>4</sub> Switch R2R1 0.8  M7×0.75  Shaft shown in full CCW position	6.25 / 5 Mounting surface  8-ø1 hole



Dir	nensions		Unit:mm_
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
5	Single-shaft, single-unit with push-on push-off switch RK0971112-5R2412	L1 25 LB 10  \$\mathcal{Q}\$ 12  Switch travel  20.8  Switch R1 0.8  Switch R1 0.8  Switch R1 0.8  Switch R1 0.8	Mounting surface  A C 7-ø1 hole  A C 7-ø1 hole
6	Single-shaft, dual-unit with push-on push-off switch RK0971222-5R2412 (For vol.)	L1 20 LB 7  \$\mathcal{U}\$ 10  Switch travel  22.05  \[ \begin{array}{cccccccccccccccccccccccccccccccccccc	4 5.55 / 5 Mounting surface  A C D F F
7	Single-shaft, single-unit with momentary push switch travel 0.5mm RK0971114-5R4211	Switch travel  Switch travel	6.25 5 Mounting surface  5-ø1 hole
8	Single-shaft, dual-unit with momentary push switch travel 0.5mm RK0971214-5R4211 (For tone) RK0971224-5R4211 (For vol.)	Switch travel  14.55  7  10  9.5  8  9.5  9.5  9.5  8  Switch R2R1  0.8  Switch R2R1  0.8  Switch travel	5 5 Mounting surface  8-ø1 hole



Dir	nensions		Unit:mm
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
9	Single-shaft, single-unit with momentary push switch travel 1.5mm RK0971114-5R4611	L <sub>1</sub> 20 L <sub>B</sub> 7 \$\mathcal{l}\$ 10  Switch travel    12.05	5 5 Mounting surface  5-ø1 hole
10	Single-shaft, single-unit with push-lock mechanism RK097111T	20.75  25  Total travel  10  4.5  9  Lock travel  9  4.5  9  10  4.5  9  10  10  10  10  10  10  10  10  10	5 Mounting surface  3-ø1 hole
11	Single-shaft, dual-unit with push-lock mechanism RK097121T (For tone) RK097122T (For vol.)	Total travel  23.25  Shaft shown in full CCW position	2.5 5 Mounting surface
12	Single-shaft, single-unit with push-lock switch RK097111U-5R2522	22.05  25  Total travel  10  8  10  10  10  10  10  10  10  10	ΔACB Surface  AACCB 9-φ1 hole  AACCCBB' Shaft side  Relased Locked
13	Dual-shaft, dual-unit RK0972210	12.05 25 15 9,5 96 97 97 98 98 98 98 98 98 98 98 98 98 98 98 98	5 5 Mounting surface surface 6-ø1 hole



## 9mm Size Metal Shaft Multi-ganged Type / Other Specifications

In addition to the products listed, we can accommodate the follow specifications.

#### ■ Total Resistance Variety

Total resistance (kΩ)	5	10	20	50	100
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#### Resistance Taper

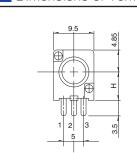
Resistance taper	15A	1B	ЗВ	15C

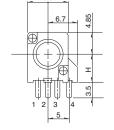
#### Notes

Can be fitted with center-taps.

#### Dimensions of Terminal

Unit:mm





9.5



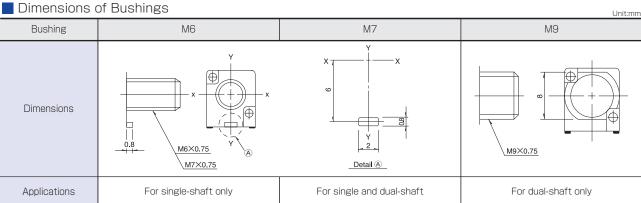
available upon request.)

\* Mounting height (H): 6.5mm (10mm and12.5mm also

Outline drawing with tap

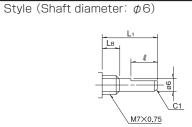
Detail of 2 terminal belong part

Outline drawing without tap



#### Single-shaft Dimension

Flat type Unit:mm



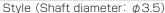


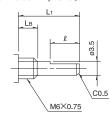
Shaft shown in full CCW

## Detail dimensions

L <sub>1</sub>	L <sub>B</sub>	l
15	5	7
20	7	12 (10)
25	10	12
30	10	12

Models in parenthesis apply to those with a push-on switch and those with a push-on, pushoff switch.









#### Detail dimensions

L <sub>1</sub>	L <sub>B</sub>	l
15	5	7
20	7	12 (10)
25	10	12
30	10	12

Models in parenthesis apply to those with a push-on switch and those with a push-on, push-off switch.



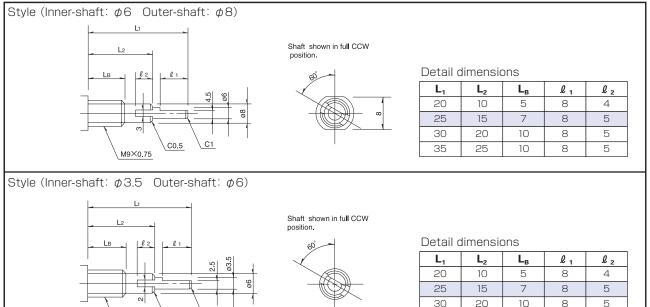
## 9mm Size Metal Shaft Multi-ganged Type / Other Specifications

In addition to the products listed, we can accommodate the follow specifications.

#### ■ Dimension of Dual-shaft Type

Flat type for inner shaft, slotted type for outer shaft

Unit:mm



35

25

10

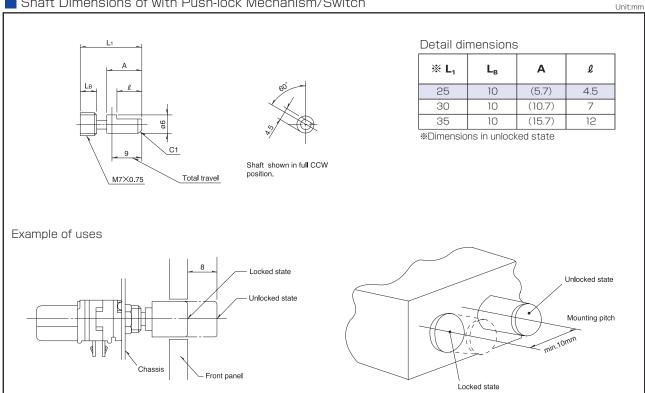
8

5

Applications Both switchless and rotary switch models are available.



M7×0.75



#### Note

Marked are specifications recommended by Alps.

#### Push-on push-off Rotary switch Momentary push switch Push-lock switch Switch type 5R2412 5R1211 5R4211 5R4611 5R2522 Single pole and single Single pole and single Double pole and Contact arrangement Single pole and single throw throw throw double throw $0.5^{+0.7}_{-0.3}$ mm Travel 50° max. 1.5±0.5mm 1.5±0.5mm 8±0.5mm Changeover force 50mN·m max. 12±8N $4^{+4}_{-2}\,\mathrm{N}$ 5±2N 8N max. Operating life 20,000 cycles 10,000 cycles 10,000 cycles under load 0.5A 12V DC (10mA 12V DC min. ratings) 3A 16V DC (10mA 16V DC min. ratings) 0.3A 12V DC Rating Contact $100m\Omega$ max. for initial period, $200m\Omega$ max. after operating life. resistance Electrical performance Insulation $100M\Omega$ min. 250V DC resistance

9mm Size Metal Shaft Multi-ganged Type / Switch Specifications

## 9mm Size Metal Shaft Multi-ganged Type / Attached Parts

300V AC for 1 minute

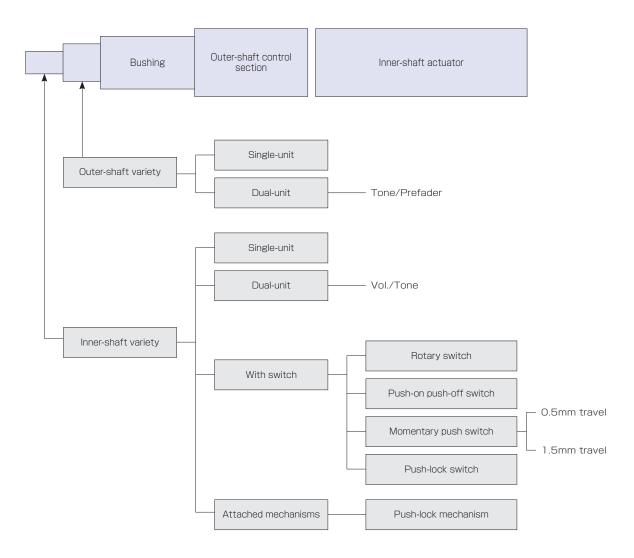
The following parts are included with the product.

Voltage

proof

	Nut			Washer	
B×0.75	A			A B	0.5
Bearing screw	Dim	ension	Bearing screw	Dime	ension
-1:	А	В	diameter	А	В
diameter		M6	M6	φ10	φ6.2
M6	8				
	8 11	M7	M7	<i>φ</i> 12	φ7.2

## 9mm Size Metal Shaft Multi-ganged Type / Configuration Chart



#### Note

The single-shaft type product lineups are the same as those in the inner-shaft variety.

Potentic

ro a

Shaft

Operating

Type

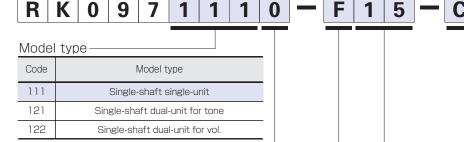
3

0

1

When ordering product varieties that are not listed, specify referring to the examples below.

#### Sample Part Number



#### Switch specifications

Code	Switch specifications
0	Without switch
1	With rotary switch
2	With push-on push-off switch
4	With momentary push switch (0.5mm travel)
T With push-lock mechanism U Push-lock switch	

\* Push on switch 1.5mm stroke is individually specified.

#### Shaft type -

Code	Shaft type
F	Flat (shaft diameter: 6)

\* Shaft diameter 3.5 is individually specified.

#### Length of the shaft L<sub>1</sub> (mm)

Code	Length of the shaft	Code	Length of the shaft
15	15	25	25
20	20	30	30

#### Detent-

Code	Detent	Code	Detent
CO	Without	11	11
C1	Center	31	31

\* With rotary switch; for applications in types other than push-lock mechanism.

#### Resistance taper -

Code	Resistance taper	Code	Resistance taper
Α	15A	V	3B
В	1B	С	15C

- \* The resistance taper for rotary switches are individually defined.
- B: For tone & general (model type: 111, 121)
- V: For vol. (model type: 111, 122)

#### 

#### Total resistance -

10tal 1000tal 100				
Code	Total resistance (k Ω)	Code	Total resistance (k Ω)	
103	10	503	50	
203	20	104	100	

- 1. Marked are specifications recommended by Alps.
- 2. The above specification is only applicable to the one-shaft single-unit model and dual-unit ganged model.



# Metal Shaft Potentiometers List of Varieties

Type			11mm size				
Series		RK	09L	RK0971	RK0972	RK119	
		Single-shaft			Dual-shaft	Single-shaft	
Number of resistor elements		I	Single/dual		Dual	Single	
Photo						4	
Terminal mounting		Horizontal	Vertical	Horizontal		Vertical	
Fixing me	ethod of bushing		Screw				
Operating	temperature range	-10℃ to +70℃		-20°C t -40°C to +85°C ('	o +70°C Vehicle-compatible)	-40℃ to +85℃	
Ор	erating life	15,000 cycles					
Available f	or automotive use	_	_	0	0	0	
Life cy	cle (availability)	<b>*</b> 2	<b>2</b>	<b>*</b> 2	<b>*</b> 2	<b>2</b>	
Mechanical performance	Total resistance (k Ω)	10, 20, 50, 100				10	
	Resistance taper		1B				
	Rated Power						
	Residual resistance		R≦10kΩ 50Ω max.				
	Maximum attenuation (Volume control)	5kΩ≦R< 10 10kΩ≦R< 50 50kΩ≦R		5kΩ≦R< 10 10kΩ≦R< 50 50kΩ≦R<100 100kΩ≦R	_		
	Gang error applicable to Dual-unit parts for audio volume control purposes		_				
	Insulation resistance						
	Voltage proof	300V AC for 1minute				300V AC for 1 minute or 360V for 2s	
	Center-taps	Without		Without / With		Without	
	Detent	Without, Center		Without, Center, 11, 31		Without	
Electrical	Stopper strength	0.5N·m		0.5N·m (With push-loo	0.5N·m		
performance	Push-pull strength	80N	80N max.		100N max.		
	Vibration			., the amplitude is 1.5mm for all the frequencies, of X, Y and Z and for 2 hours respectively			
Shaft style			Flat type		Inner-shaft flat type Outer-shaft slotted type	Flat type	
Terminal style			Inse	ertion		Reflow	
Attached switch		_	_	Rotary switch Push-on push-off switch Push-on switch Push-lock switch	_	Push-on switch	
Page		32	22	32	337		

- $\hbox{1. For the switch attached, the single-shaft or inner shaft of the dual-shaft type can be chosen.}\\$
- 2. The operating temperature range for automotive applications can be raised upon request. Please contact us for details.
- 3. O Indicates applicability to some products in the series.



## Reference for Manual Soldering

Series		Tip temperature	Soldering time	No. of solders	
RK09L, RK097		350℃ max.	3s max.	1 time	
RK203		300°C max.	3s max.	1 time	
RK119		350±10℃	3 +1 s	1 time	
RK271		350℃ max.	5s max.	1 time	
RK501		350±10℃	5 <sup>+1</sup> <sub>0</sub> s	1 time	
RK163		350°C max.	5s max.	1 time	
RK168	Potentiometer terminal	300°C max.	3s max.	1 time	
NN 100	Motor terminal	350°C max.	2s max.	1 time	

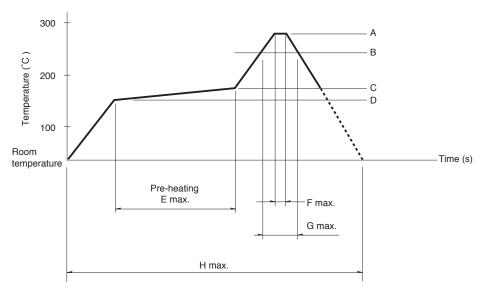
#### ■ Reference for Dip Soldering

	Preheating		Dip so		
Series 	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	No. of solders
RK09L, RK097, RK203	100°C max.	2 min. max.	260±5℃	5±1s	2 time max.
RK501	120±10℃	2 min. max.	260±5℃	5±1s	2 time

Metal Shaft Potentiometers / Soldering Conditions

#### ■ Example of Reflow Soldering Condition

#### Temperature profile



Series	А	В	С	D	Е	F	G	Н	No. of reflows
RK119	260℃	230℃	180℃	150℃	2 min.	3s	40s	4 min.	2 time max.

- 1. When using an infrared reflow oven, solder may sometimes not be applied. Be sure to use a hot air reflow oven or at type that uses infrared rays in combination with hot air.
- 2. The temperatures given above are the maximum temperatures at the terminals of the potentiometer when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the potentiometer may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the potentiometer does not rise to 250°C or greater.
- 3. Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.

## **Mouser Electronics**

**Authorized Distributor** 

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### ALPS:

RK0971110D7Z RK097111080R RK09711100F8 RK09712200HA RK097122008T RK097122200G

RK097111TZ17 RK097111TD44 RK097221005C RK0971110D7F RK0971111Z32 RK0971210097 RK09712100AV

RK0971210Z2M RK09712200MT RK0971221Z11 RK097122TZ0A RK097221004C RK0971110F25C1B103

RK0971110909 RK097111T065 RK097111TD2M RK0971114Z07 RK097111T064 RK097122T017 RK097121TD57

RK097111091M RK0971214Z06 RK0971110D88 RK0971111Z0P RK0971221Z05 RK097111020N

RK09711110AL RK0971114D0B RK097111080J RK09711110EL RK097111202P RK097111202Q RK09712200MY

RK0971110D57 RK09712200MC RK0971224Z01 RK097111050B RK0971110-F25-31-B103 RK0971110-F25-31-B203 RK0971111UZ0D RK0971111-F30-CO-B103 RK0971111Z05 RK0972210C1F RK0971221-F15-C0-A503