

POWER RELAY

1 POLE—10, 15 A (HEAVY POWER CONTROL)

VS SERIES

■ FEATURES

- UL, CSA, VDE, SEV, SEMKO, FIMKO, IMQ recognized TV-5, TV-8 rated
- Working class: C
- UL class B (130°C) insulation
- Type of service: continuous duty
- Heavy duty miniature slim type power relay
- High isolation in small package
 - Insulation distance: 8 mm
 - Dielectric strength: 5,000 VAC (between coil and contacts)
 - Surge strength: 10,000 V
- Standard and high sensitivity types available
- Flux free type and plastic sealed type available



■ ORDERING INFORMATION

[Example] $\frac{VS}{(a)}$ - $\frac{12}{(*)}$ $\frac{S}{(b)}$ $\frac{M}{(c)}$ $\frac{B}{(d)}$ $\frac{U}{(e)}$ - $\frac{NR}{(g)}$

(a)	Series Name	VS: VS Series
(b)	Nominal Voltage	Refer to the COIL DATA CHART
(c)	Coil Type	Nil : Standard type S : High sensitivity type (not available with TV-8 type)
(d)	Contact Arrangement	T : 1 form C (SPDT) (non VS-NR type) M : 1 form A (SPST-NO)
(e)	Enclosure	B : Flux free type C : Plastic sealed type (with tape) K : Plastic sealed type
(f)	Standard	Nil : TV rating type U : Non TV rating type (standard type)
(g)	Contact Material	NR: Silver alloy (TV-8 rating type) Nil : Silver-cadmium oxide (TV-5 rating type) 5 : Silver-cadmium oxide (non TV rating) Nil : Gold overlay silver-nickel (non TV rating) E : Silver-nickel (non TV rating)

Note: Actual marking omits the hyphen (-) of (*)

■ SAFETY STANDARD AND FILE NUMBERS

UL508, (File No. E56140, E108658)

C22.2 No. 1, No. 14 (File No. LR35579)

VDE0435, 0630, 0631, 0700, 0860 (File No. 11039-4940-1008)

Please note that UL/CSA ratings may differ from the standard ratings.


Please request when the approval markings are required on the cover and/or relay recognized by VDE, SEV, SEMKO, FIMKO, IMQ is required.


	Type	Nominal voltage	Contact rating
TV-Rating	VS-()M-NR	3 to 100 VDC	TV-8 120 VAC 1/3 HP 120 VAC/240 VAC 15 A 24 VDC/120 VAC resistive 10 A 240 VAC resistive Pilot duty B 150
	VS-()M VS-()SM	3 to 100 VDC	TV-5 120 VAC 1/3 HP 120 VAC/240 VAC 10 A 24 VDC/240 VAC resistive Pilot duty C 150
General	VS-()MU-NR VS-()SMU-NR VS-()U-N VS-()SU-N	3 to 100 VDC	1/3 HP 120 VAC/240 VAC 15 A 24 VDC/120 VAC resistive 10 A 240 VAC resistive 4.3A 250 VAC inductive (PF=0.4) Pilot duty B 150
	VS-()()U-() VS-()S()U-()	3 to 100 VDC	1/3 HP 120 VAC/240 VAC 10 A 24 VDC/240 VAC resistive 2.9A 250 VAC inductive (PF=0.4) Pilot duty C 150

■ SPECIFICATIONS

Item		TV-8 Rating Type	TV-5 Rating Type	Standard Type	
		VS-()M-NR	VS-()M	VS-()-5	VS-() VS-()-E
Contact	Arrangement	1 form A (SPST-NO)		1 form A (SPST-NO) or 1 form C (SPDT)	
	Material	Silver alloy	Silver-cadmium oxide		Gold overlay silver-nickel (non gold overlay: only VS-E)
	Style	Single			
	Resistance (initial) (at 1 A 6 VDC)	Maximum 200 mΩ			Max. 100 mΩ
	Rating (resistive)	15 A 120 VAC/24 VDC	10 A 120 VAC/24 VDC		
	Maximum Carrying Current	15 A	10A		
	Maximum Switching Power	3,600 VA/360 W	2,400 VA/240 W		
	Maximum Switching Voltage	380 VAC, 150 VDC			
	Maximum Switching Current	15 A	10 A		
	Minimum Switching Load*1	100 mA 5 VDC (VS-NR, M, 5, E), 10 mA 5 VDC (VS-)			
	Max. Inrush Current (at lamp load)	117 A 120 VAC	78 A 120 VAC	—	
Coil	Nominal Power (at 20°C)	Standard type: 0.7 to 0.75 W. High sensitivity type: 0.53 W			
	Operate Power (at 20°C)	Standard type: 0.35 to 0.37 W. High sensitivity type: 0.26 W			
	Operating Temperature	Standard type: -40°C to +65°C. High sensitivity type: -40°C to +75°C (no frost)			
Time Value	Operate (at nominal voltage)	Maximum 20 ms			
	Release (at nominal voltage)	Maximum 10 ms			
Insulation	Resistance (at 500 VDC)	Minimum 1,000 MΩ			
	Dielectric Strength	between open contacts	1,000 VAC 1 minute		
		between coil and contacts*2	5,000 VAC 1 minute		
Surge Strength*3	10,000 V (at 1.2 x 50μs)				
Life	Mechanical	2 × 10 ⁷ operations minimum			
	Electrical	1 × 10 ⁵ operations minimum (at contact rating, resistive)		3 × 10 ⁴ ops. minimum (at 1/4 HP 120 VAC, motor)	
		2.5 × 10 ⁴ ops. min. (at 17 A 120 VAC, lamp)	5 × 10 ⁴ ops. min. (at 78A 120 VAC, lamp)	—	
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 1.5 mm)		
		Endurance	10 to 55 Hz (double amplitude of 1.5 mm)		
	Shock Resistance	Misoperation	100 m/s ² (11 ±1 ms)		
		Endurance	1,000 m/s ² (6 ±1 ms)		
Weight	Approximately 17 g				

*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

*2 IMQ 

*3 IMQ 

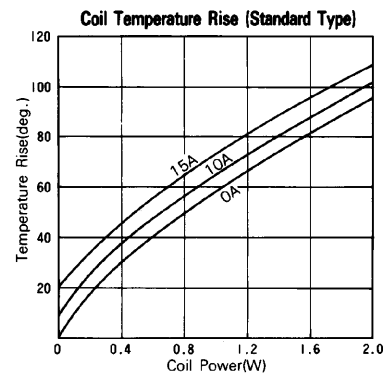
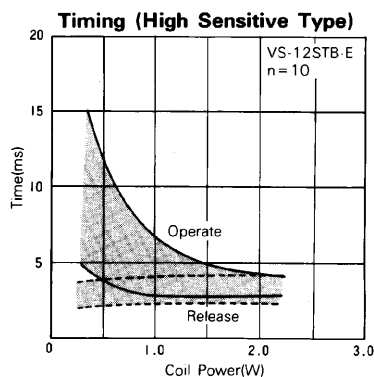
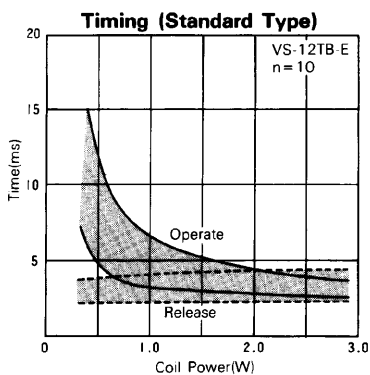
VS SERIES

COIL DATA CHART

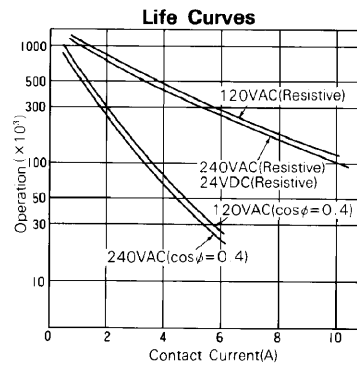
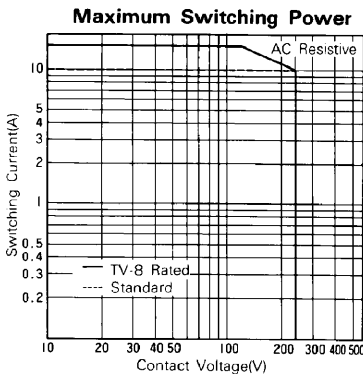
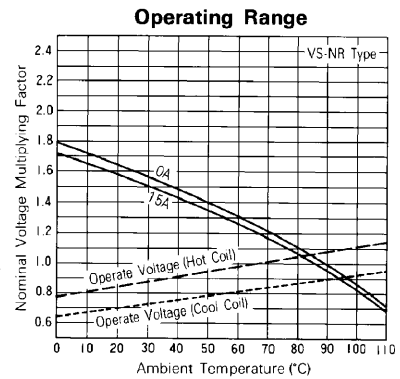
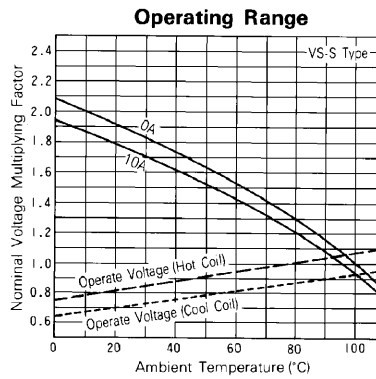
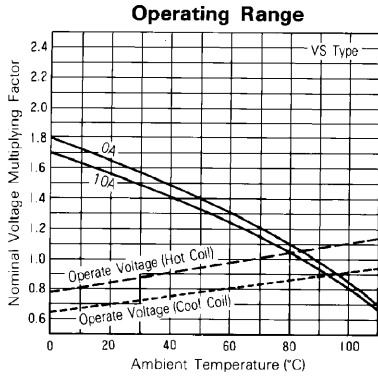
	MODEL			Nominal voltage	Coil resistance ($\pm 10\%$)	Must operate voltage	Must release voltage	Nominal power
	TV-8 Rating	TV-5 Rating	Standard					
	15 A Type	10 A Type	10 A Type					
Standard Type	VS- 3M()-NR	VS- 3M()	VS- 3() ()U-()	3 VDC	12.5 Ω	2.1 VDC	0.3 VDC	0.72 W
	VS- 5M()-NR	VS- 5M()	VS- 5() ()U-()	5 VDC	36 Ω	3.5 VDC	0.5 VDC	0.70 W
	VS- 6M()-NR	VS- 6M()	VS- 6() ()U-()	6 VDC	50 Ω	4.2 VDC	0.6 VDC	0.72 W
	VS- 9M()-NR	VS- 9M()	VS- 9() ()U-()	9 VDC	115 Ω	6.3 VDC	0.9 VDC	0.70 W
	VS- 12M()-NR	VS- 12M()	VS- 12() ()U-()	12 VDC	200 Ω	8.4 VDC	1.2 VDC	0.72 W
	VS- 14M()-NR	VS- 14M()	VS- 14() ()U-()	14 VDC	280 Ω	9.8 VDC	1.4 VDC	0.70 W
	VS- 18M()-NR	VS- 18M()	VS- 18() ()U-()	18 VDC	460 Ω	12.6 VDC	1.8 VDC	0.70 W
	VS- 24M()-NR	VS- 24M()	VS- 24() ()U-()	24 VDC	820 Ω	16.8 VDC	2.4 VDC	0.70 W
	VS- 36M()-NR	VS- 36M()	VS- 36() ()U-()	36 VDC	1,850 Ω	25.2 VDC	3.6 VDC	0.70 W
	VS- 48M()-NR	VS- 48M()	VS- 48() ()U-()	48 VDC	3,300 Ω	33.6 VDC	4.8 VDC	0.70 W
	VS- 60M()-NR	VS- 60M()	VS- 60() ()U-()	60 VDC	5,100 Ω	42.0 VDC	6.0 VDC	0.70 W
	VS-100M()-NR	VS-100M()	VS-100() ()U-()	100 VDC	13,400 Ω	70.0 VDC	10.0 VDC	0.75 W
High Sensitive Type	VS- 3SM()	VS- 3S() ()U-()	3 VDC	17 Ω	2.1 VDC	0.3 VDC	0.53 W	
	VS- 5SM()	VS- 5S() ()U-()	5 VDC	47 Ω	3.5 VDC	0.5 VDC	0.53 W	
	VS- 6SM()	VS- 5S() ()U-()	6 VDC	68 Ω	4.2 VDC	0.6 VDC	0.53 W	
	VS- 9SM()	VS- 9S() ()U-()	9 VDC	155 Ω	6.3 VDC	0.9 VDC	0.53 W	
	VS- 12SM()	VS- 12S() ()U-()	12 VDC	270 Ω	8.4 VDC	1.2 VDC	0.53 W	
	VS- 14SM()	VS- 14S() ()U-()	14 VDC	370 Ω	9.8 VDC	1.4 VDC	0.53 W	
	VS- 18SM()	VS- 18S() ()U-()	18 VDC	610 Ω	12.6 VDC	1.8 VDC	0.53 W	
	VS- 24SM()	VS- 24S() ()U-()	24 VDC	1,100 Ω	16.8 VDC	2.4 VDC	0.53 W	
	VS- 36SM()	VS- 36S() ()U-()	36 VDC	2,450 Ω	25.2 VDC	3.6 VDC	0.53 W	
	VS- 48SM()	VS- 48S() ()U-()	48 VDC	4,400 Ω	33.6 VDC	4.8 VDC	0.53 W	
	VS- 60SM()	VS- 60S() ()U-()	60 VDC	6,800 Ω	42.0 VDC	6.0 VDC	0.53 W	
	VS-100SM()	VS-100S() ()U-()	100 VDC	18,860 Ω	70.0 VDC	10.0 VDC	0.53 W	

Note: All values in the table are measured at 20°C

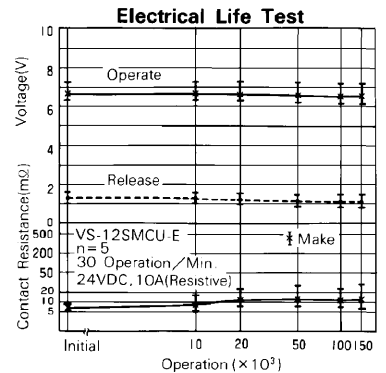
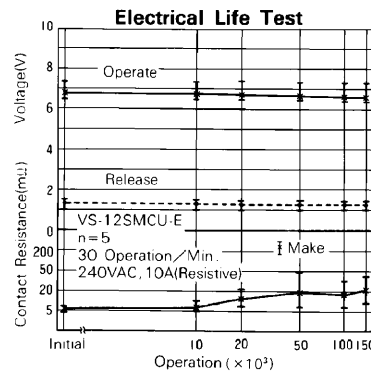
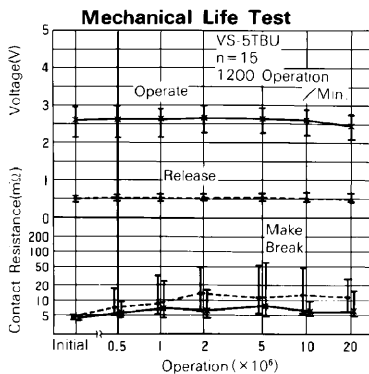
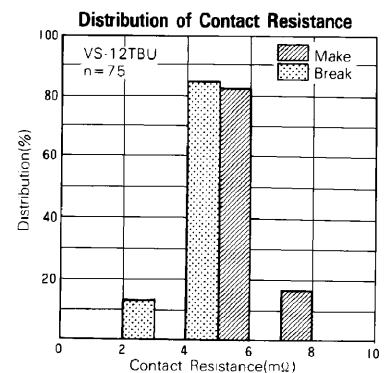
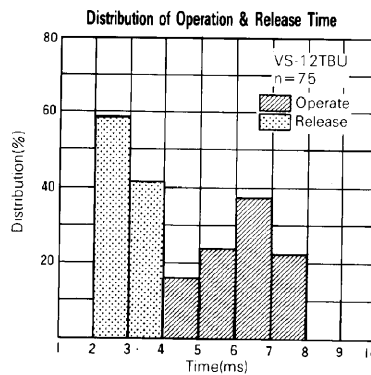
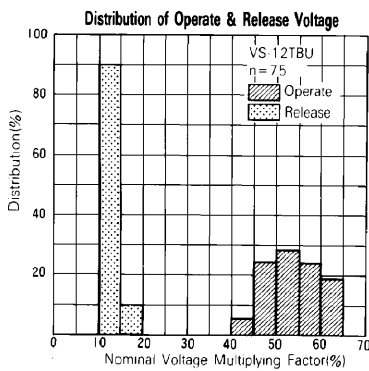
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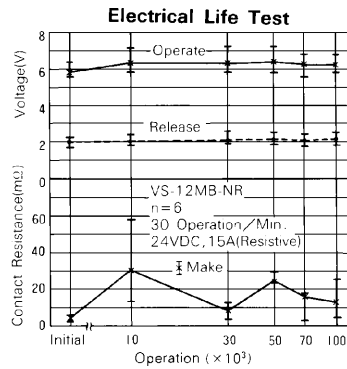
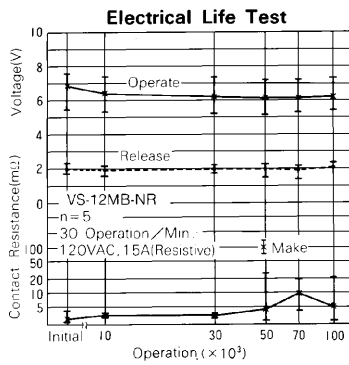
VS SERIES



REFERENCE DATA



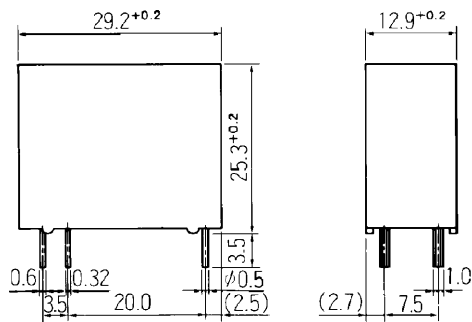
VS SERIES



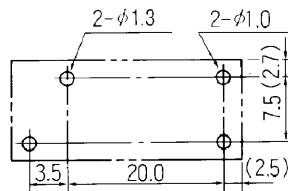
■ DIMENSIONS

● Dimensions

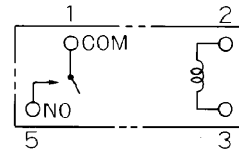
VS-M type



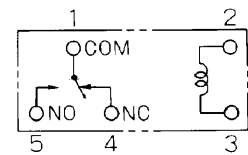
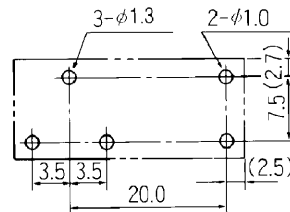
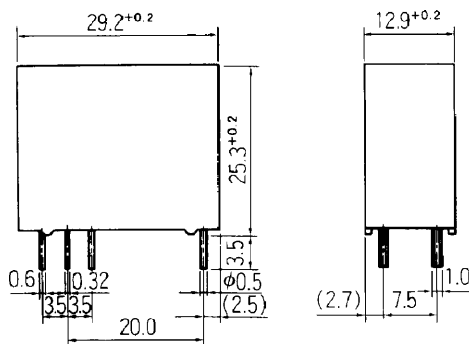
● Schematics (BOTTOM VIEW)



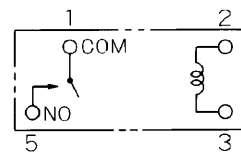
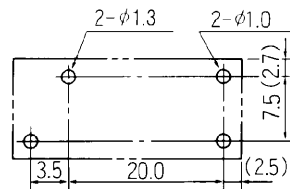
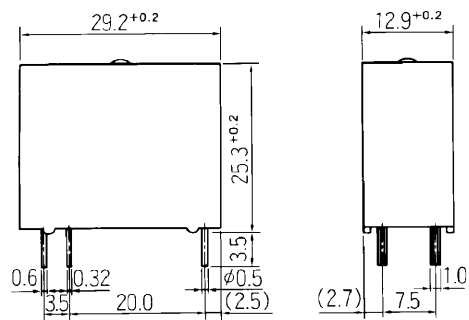
● PC board mounting hole layout (BOTTOM VIEW)



VS type



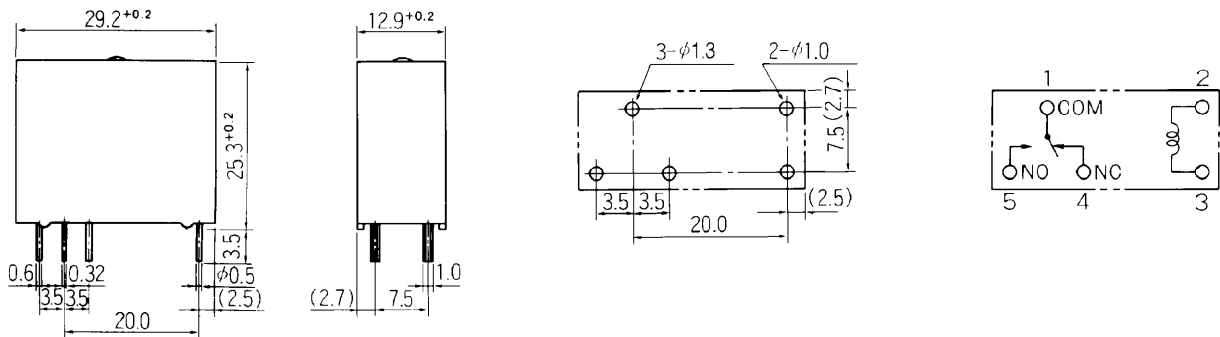
VS-MK type (Plastic sealed type)



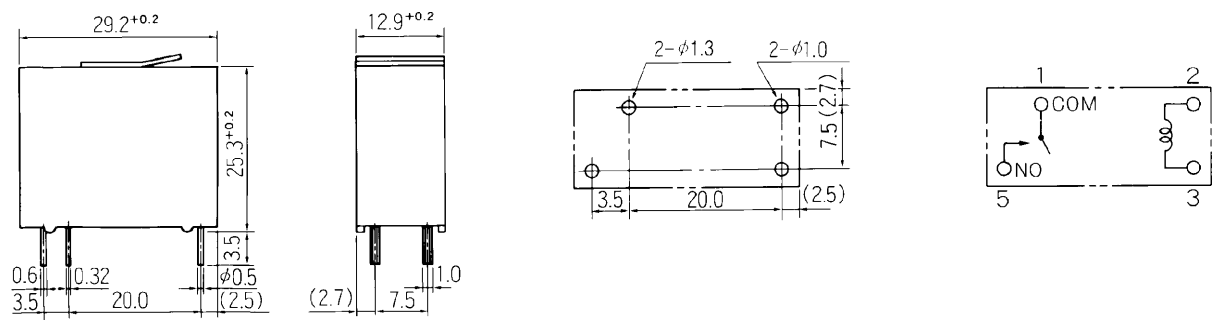
Unit: mm

VS SERIES

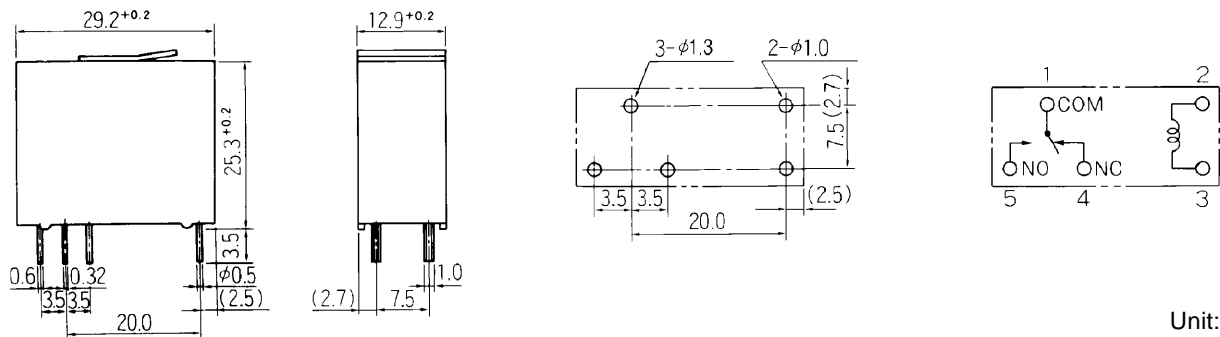
VS-K type (Plastic sealed type)



VS-MC type (Plastic sealed type with tape)



VS-C type (Plastic sealed type with tape)



Unit: mm

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