

Fully Sealed Container Cermet Potentiometer Professional Grade



DESIGN SUPPORT TOOLS AVAILABLE



Their excellent performances are due to the use of a cermet-track sealed in a large case.

P13 interchangeability with RV6, combined with the excellent stability of its rated characteristics make it fully acceptable for military and professional uses.

FEATURES

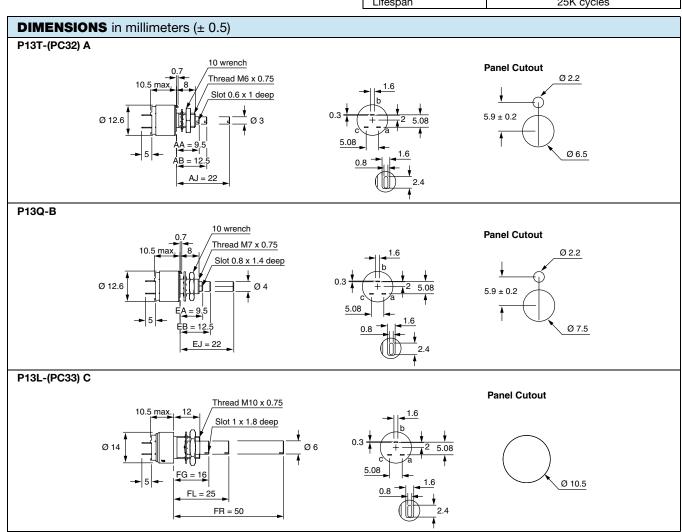
- High power rating 1.5 W at 70 °C
- Product qualification: According to CECC 41 301-001 (A, B, C)

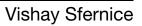




- GAM T1
- Cermet element
- Fully sealed case
- Tight temperature coefficient (± 75 ppm/°C typical)
- Mechanical strength
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

QUICK REFERENCE DATA						
Multiple module	No					
Switch module	n/a					
Detent module	n/a					
Special electrical laws	A: linear, L: logarithmic, F: reverse logarithmic					
Sealing level	IP 67					
Lifespan	25K cycles					







ELECTRICAL SPECIFICATIONS						
Resistive element	Cermet					
Electrical travel	270° ± 10°					
linear taper	22 Ω to 10 M Ω					
Resistance range logarithmic taper	1 k Ω to 2.2 M Ω					
Standard series e3	1, 2.2, 4.7 and on request 1, 2, 5					
Tolerance standard	± 20 %					
on request	± 10 % to ± 5 %					
Taper	100 80 F 40 20 30 40 40 20 40 60 80 100 % CLOCKWISE SHAFT ROTATION					
Circuit diagram	$ \begin{array}{c} a \\ \bigcirc \\ (1) \\ b \\ \downarrow \\ (2) \end{array} $ $ \begin{array}{c} c \\ (3) \\ (3) \end{array} $					
Power rating	Linear 1.5 W at 70 °C Logarithmic 0.75 W at 70 °C 0 20 40 60 70 80 100 120 140 AMBIENT TEMPERATURE IN °C					
	± 150 ppm/°C					
Temperature coefficient (typical)	For values \geq 100 Ω and in temperature range +20 °C to +70 °C, the typical temperature coefficient is \pm 75 ppm/°C					
Limiting element voltage (linear law)	350 V					
Contact resistance variation	3 % Rn or 3 Ω					
End resistance (typical)	1 Ω					
Dielectric strength (RMS)	2000 V					
Insulation resistance (300 V _{DC})	$10^6\mathrm{M}\Omega$					
	± 5 %					

Vishay Sfernice

		LINEAR TAPER			LOG. TAPER				
STANDARD RESISTANCE VALUES	ESISTANCE MAX. MAX.		MAX. CUR. THROUGH WIPER	MAX. MAX. POWER WORKING AT 70 °C VOLTAGE		MAX. CUR. THROUGH WIPER	TCR -55 °C +125 °C		
Ω	W	V	mA	W	V	mA	ppm/°C		
22	1.5	5.74	261						
47	1.5	8.4	177						
100	1.5	12.2	122						
220	1.5	18.2	82.6						
470	1.5	26.5	56.5						
1K	1.5	38.7	38.7	0.75	27	27			
2.2K	1.5	57.5	26.1	0.75	40	18			
4.7K	1.5	84	17.9	0.75	59	12			
10K	1.5	122.5	12.2	0.75	87	8.7	± 150		
22K	1.5	182	8.26	0.75	128	5.8	± 150		
47K	1.5	265	5.65	0.75	187	3.9			
100K	1.22	350	3.5	0.75	273	2.7			
220K	0.56	350	1.6	0.56	350	1.6			
470K	0.26	350	0.74	0.26	350	0.74			
1M	0.12	350	0.35	0.12	350	0.35			
2.2M	0.05	350	0.16	0.05	350	0.16			
4.7M	0.026	350	0.074						
10M	0.012	350	0.035						

MECHANICAL SPECIFICATIONS		
Mechanical travel	300)° ± 5°
Operating torque (typical)	2 Ncm	2.85 oz. inch
End stop torque		
style T, Q	35 Ncm max.	3.1 lb inch max.
style L	80 Ncm max.	7.1 lb inch max.
Tightening torque of mounting nut		
style T, Q	150 Ncm max.	13.3 lb inch max.
style L	250 Ncm max.	22.1 lb inch max.
Unit weight	6 g to 18 g	0.22 oz. to 0.64 oz.
Terminals	e3: r	oure Sn

ENVIRONMENTAL SPECIFICATIONS					
Temperature range	-55 °C to +125 °C				
Climatic category	55 / 125 / 56				
Sealing	Fully sealed - container IP67				

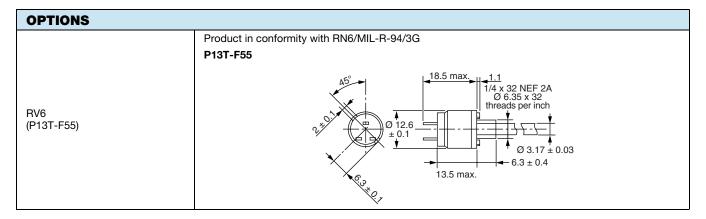




OPTIONS							
Special feature command shaft	Length is measured from the mounting surface to the free end of the shaft. The screwdriver slot is aligned with the wiper within \pm 10°. Special shafts are available, in accordance to drawings supplied by customers. We recommend that customers should not machine tool shafts, in order to avoid damage. Bending or torsion of terminals should also be avoided.						
	Potentiometers P13T and P13L can be fitted with a device providing sealing between the threaded bushing and the front panel. Their designation is P13P and P13N respectively or with a locating peg P13PE and P13NE. Panel sealed version P13P P13PE: Including locating peg						
Panel sealing	13.2 max. Solution 1.6 Solution						
	Panel sealed version P13N						
	P13NE: Including locating peg						
	Thread M10 x 0.75 Slot 1 x 1.8 deep 0.3 FE = 13.5 FQ = 47.5 Panel Cutout 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.						
	On potentiometers equipped with a 3 mm Ø shaft, shaft locking can be obtained: • Either by a taper nut tightening a slotted bushing. Ask for P13O type. These devices are normally equipped with an AB type shaft (12.5 mm with a slot). P13O						
	0.7 Slotted bushing Thread M6 x 0.75 8 wrench AB = 12.5						
Shaft locking	 Or by a tightening nut locked by a screw. Ask for ES1 type. On potentiometers equipped with a Ø 6 mm shaft, locking can be obtained by a taper nut applying pressure on a slotted notched washer This device is supplied in a box as an accessory. Ask for DBAN. These devices are ordered separately. Please consult Vishay Sfernice. P13L DBAN 						
	6.5						
	No locking on shaft Ø 4 mm.						

www.vishay.com

Vishay Sfernice



MARKING

Printed:

- · Vishay trademark
- Part number (including ohmic value code, tolerance code and taper)
- Manufacturing date
- Marking of terminals a

PACKAGING

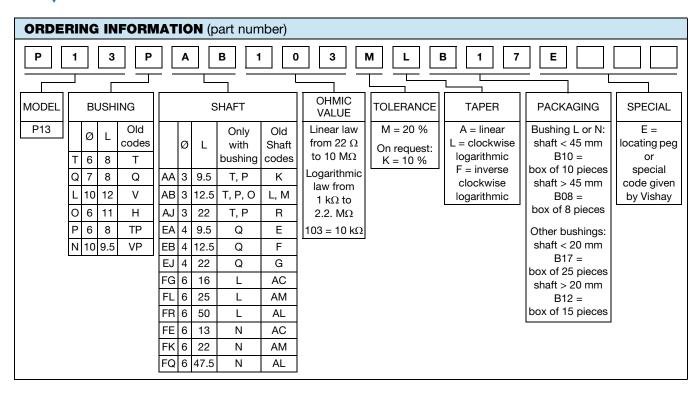
• In box

PERFORMANCE									
			REQUIR	EMENTS	TYPICAL VALUES AND DRIFTS				
TESTS	CONDITIONS	∆R _T /R _T (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER	∆R _T /R _T (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER		
Electrical endurance	1000 h at rated power 90'/30' - ambient temp. 70 °C	± 10 %	-	Contact res. variation: < 7 % Rn	± 1 %	-	Contact res. variation: < 3 % Rn		
Climatic sequence	Phase A dry heat 125 °C Phase B damp heat Phase C cold -55 °C Phase D damp heat 5 cycles	± 10 %	± 10 %	-	± 0.5 %	± 1 %	-		
Damp heat, steady state	56 days 40 °C, 93 % HR	± 10 %	± 10 %	Dielectric strength: 250 V Insulation resistance: $> 100 \text{ M}\Omega$	± 0.5 %	± 1 %	Dielectric strength: 1000 V Insulation resistance: $> 10^4 \ M\Omega$		
Change of temperature	5 cycles -55 °C at +125 °C	± 3 %	-	-	± 0.5 %	-	-		
Mechanical endurance	25 000 cycles	± 10 %	-	Contact res. variation: < 7 % Rn	± 3 %	-	Contact res. variation: < 2 % Rn		
Shock	50 g's at 11 ms 3 successive shocks in 3 directions	± 2 %	-	-	± 0.1 %	± 0.2 %	-		
Vibration	10 Hz to 55 Hz 0.75 mm or 10 <i>g</i> 's during 6 h	± 2 %	-	-	± 0.1 %	-	$\Delta V_{1-2}/V_{1-3} < \pm 0.2 \%$		

Note

· Nothing stated herein shall be construed as a guarantee of quality or durability

Vishay Sfernice



PART	NUMBER	R DESCF	RIPTIO	N (for in	format	ion only	y)					
P13	Т	PE	М	10K	20 %	L		ВО				e3
MODEL	BUSHING	SPECIAL	SHAFT	OHMIC VALUE	TOL.	TAPER	SPECIAL	PACKAGING	SPECIAL	SHAFT	SPECIAL	LEAD (Pb)-FREE

RELATED DOCUMENTS	
APPLICATION NOTES	
Potentiometers and Trimmers	www.vishay.com/doc?51001
Guidelines for Vishay Sfernice Resistive and Inductive Components	www.vishay.com/doc?52029



Legal Disclaimer Notice

Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:

<u>P13QEJ222MAB12</u> <u>P13LFL103KAB10</u> <u>P13TAJ103MLB12</u> <u>P13NFK222MAB10E</u> <u>P13LFG102MAB10</u> <u>P13QEJ103MLB12</u> <u>P13QEB472MAB17</u> <u>P13TAA102MAB17</u> <u>P13LFR472MAB08</u> <u>P13TAB103MAB17</u> <u>P13OAB471MAB17</u> <u>P13PAB103MAB17</u> <u>P13QEJ103MAB12</u> <u>P13QEJ472MAB12</u>