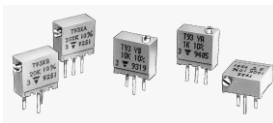


3/8" Square Multiturn Cermet Trimmers



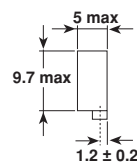
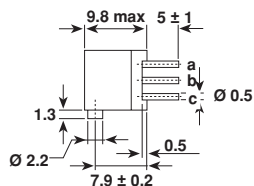
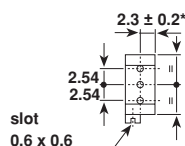
The T93 is a small size trimmer - 3/8" x 3/8" x 3/16" - answering PC board mounting requirements. Five versions are available which differ by the position of the control screw in relation to the PC board plane and by the spacing of the terminals. Excellent operational stability is provided by the use of a cermet element.

FEATURES

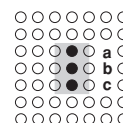
- Industrial Grade
- 0.5 Watt at 70°C
- CECC 41 100
- MIL-R-22097
- Good stability
- Contact resistance variation < 1% typical
- Meet MIL-R-22097 specifications

DIMENSIONS in millimeters

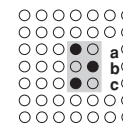
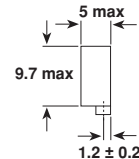
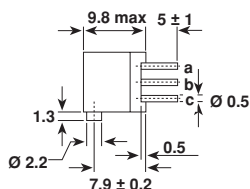
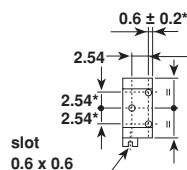
T93XA



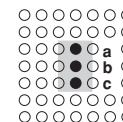
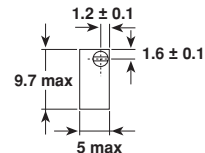
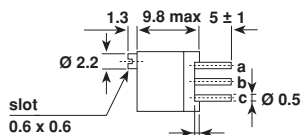
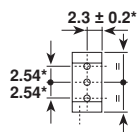
Terminal Spacing on a 2.54 PCB



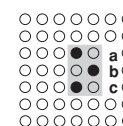
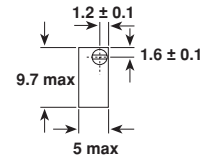
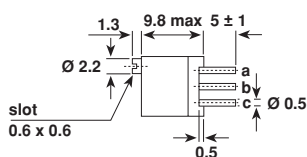
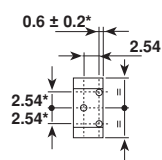
T93XB



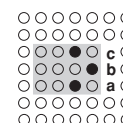
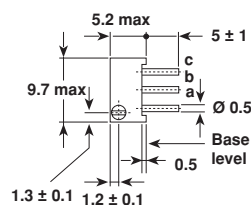
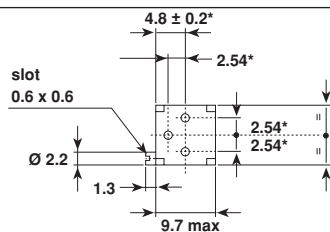
T93YA



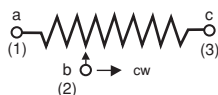
T93YB



T93Z



CIRCUIT DIAGRAM



*to be measured at base level

**ELECTRICAL SPECIFICATIONS**

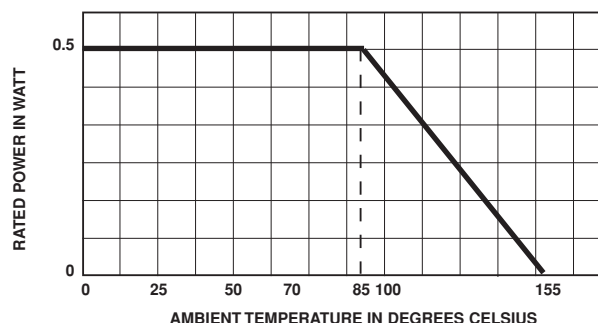
Resistive Element	cermet
Electrical Travel	19 turns $\pm$ 2
Resistance Range	10 to 2.2 M Ω
Standard Series E3	1 - 2.2 - 4.7 and 1 - 2 - 5
Tolerance	Standard $\pm$ 10%
	On Request $\pm$ 5%
Power Rating	Linear 0.5 W at + 85°C
	Logarithmic not applicable
Temperature Coefficient	See Standard Resistance Element Data
Limiting Element Voltage (Linear Law)	250 V
Contact Resistance Variation	2% Rn or 2 Ω
End Resistance (Typical)	1 Ω
Dielectric Strength (RMS)	1000 V
Insulation Resistance (500 VDC)	10 ⁶ M Ω

MECHANICAL SPECIFICATIONS

Mechanical Travel	22 turns $\pm$ 5
Operating Torque (max. Ncm)	1.5
End Stop Torque	clutch action
Unit Weight (max. g)	1.2

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55°C + 155°C
Climatic Category	55/125/56
Sealing	fully sealed container IP67

POWER RATING CHART**PERFORMANCE**

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\frac{\Delta R_{T1-2}}{R_{T1-2}}$ (%)	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours at rated power 90°/30' - ambient temperature 85°C	$\pm$ 1% Contact resistance variation : < 1% Rn	$\pm$ 2%
Climatic Sequence	Phase A dry heat 125°C - 30% Pr Phase B damp heat Phase C cold -55°C Phase D damp heat 5 cycles	$\pm$ 0.5%	$\pm$ 1%
Long Term Damp Heat	56 days	$\pm$ 0.5% Dielectric strength : 1000 V RMS Insulation resistance : > 10 ⁶ M Ω	$\pm$ 1%
Rapid Temperature Change	5 cycles - 55°C at + 125°C	$\pm$ 0.5 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1\%$
Shock	50 g 11 ms 3 successive shocks in 3 directions	$\pm$ 0.1%	$\pm$ 0.2%
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 hours	$\pm$ 0.1%	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 0.2\%$
Rotational Life	200 cycles	$\pm$ 2 % Contact resistance variation : < 1% Rn	

STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR LAW			T.C. – 55°C + 125°C
	MAX. POWER AT + 85°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	W	V	mA	ppm/°C
10	0.5	2.2	224	0 + 200
22		3.3	150	
47		4.8	103	
100	↓	7	70	± 100
220		10.5	47	
470		15.3	32	
1k		22.4	22	
2.2k		33.2	15	
4.7k		48.5	10	
10k		70.7	7	
22k		105	4.8	
47k		153	3.2	
100k		224	2.2	
220k	0.5	250	1.1	
470k	0.28	250	0.53	
1M	0.13	250	0.25	
2.2M	0.06	250	0.11	
	0.028			

MARKING

Printed : VISHAY logo, series, style, rated ohmic value (in Ω , k Ω , M Ω), tolerance (in %), manufacturing date, marking of terminal 3.

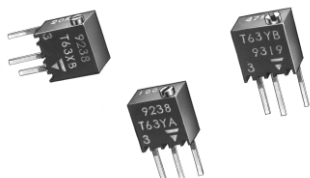
PACKAGING

– In magazine pack by 50 pieces (tube) code “TU50”.

ORDERING INFORMATION

T93	XA	220kΩ	± 10 %	TU50
SERIES	VERSION	OHMIC VALUE	TOLERANCE	PACKAGING TU50: Tube

1/4" Multiturn Sealed Container Cermet Trimmers



Due to their square shape and small size (6.8 x 6.8 x 5 mm), the multiturn trimmers of the T63 series are ideally suited for PCB use, enabling high density board mounting with reduced space requirement between cards.

Four versions are available differing by the top or side position of the adjustment screw and by PC pins configuration.

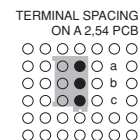
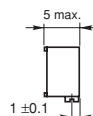
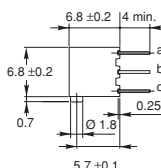
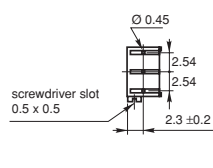
The use of cermet for the resistive track ensures an excellent stability of nominal specifications throughout life.

FEATURES

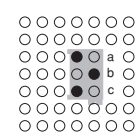
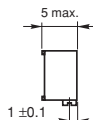
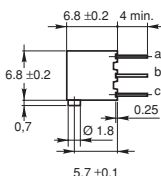
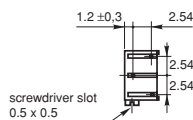
- 0.25 Watt at 85°C
- Industrial grade
- CECC 41 100
- MIL-R-22097
- Multiturn operation
- A low contact resistance variation
- Tight tolerancing
- Low end contact resistance

DIMENSIONS in millimeters

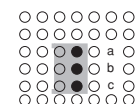
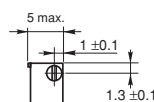
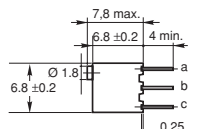
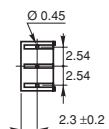
T63XA



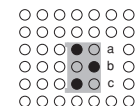
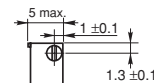
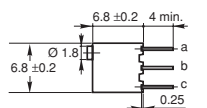
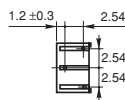
T63XB



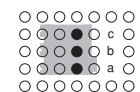
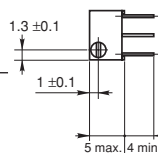
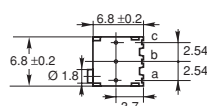
T63YA



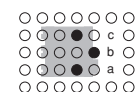
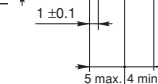
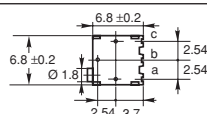
T63YB



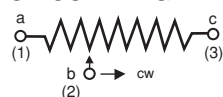
T63ZA



T63ZB



CIRCUIT DIAGRAM



**ELECTRICAL SPECIFICATIONS**

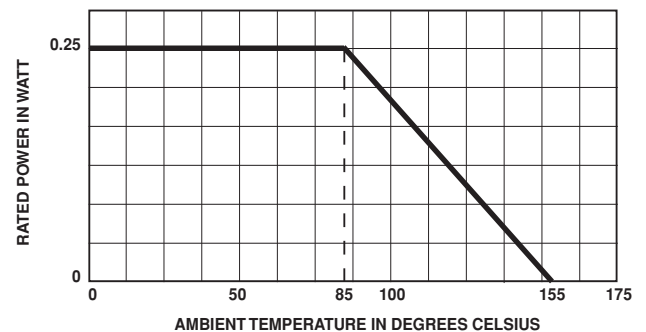
Resistive Element	cermet
Electrical Travel	13 turns $\pm$ 2
Resistance Range	10 to 2M Ω
Standard Series and on Request Series E3	1 - 2 - 5. (1 - 2.2 - 4.7)
Tolerance	Standard $\pm$ 10%
	On request $\pm$ 5%
Power Rating	Linear 0.25W at + 85°C
Temperature Coefficient	See Standard Resistance Element Data
Limiting Element Voltage (Linear Law)	250V
Contact Resistance Variation	2% Rn or 2 Ω
End Resistance (Typical)	1 Ω
Dielectric Strength (RMS)	1000V
Insulation Resistance (500 VDC)	10 ⁶ M Ω

MECHANICAL SPECIFICATIONS

Mechanical Travel	15 turns $\pm$ 5
Operating Torque (max. Ncm)	1
End Stop Torque	clutch action
Unit Weight (max. g)	0.5

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55°C + 155°C
Climatic Category	55/125/56
Sealing	fully sealed container IP67

POWER RATING CHART**PERFORMANCE**

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\frac{\Delta R_{T-2}}{R_{T-2}}$ (%)	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours at rated power 90°/30° - ambient temperature 85°C	$\pm$ 1% Contact resistance variation : < 1% Rn	$\pm$ 2%
Climatic Sequence	Phase A dry heat 125°C - 30% Pr Phase B damp heat Phase C cold -55°C Phase D damp heat 5 cycles	$\pm$ 0.5%	$\pm$ 1%
Long Term Damp Heat	56 days	$\pm$ 0.5% Dielectric strength : 1000 V RMS Insulation resistance : > 10 ⁶ M Ω	$\pm$ 1%
Rapid Temperature Change	5 cycles - 55°C at + 125°C	$\pm$ 0.5 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1\%$
Shock	50 g 11 ms 3 successive shocks in 3 directions	$\pm$ 0.1%	$\pm 0.2\%$
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 hours	$\pm$ 0.1%	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 0.2\%$
Rotational Life	200 cycles	$\pm$ 2 % Contact resistance variation : < 1% Rn	

STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR LAW			T.C. – 55°C + 125°C
	MAX. POWER AT 85°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	W	V	mA	ppm/°C
10	0.25 ↓	1.58	158	0 + 200
20		2.23	112	
50		3.53	77	
100		5	50	± 100
200		7.07	35	
500		11.2	22	
1k		15.8	15.8	
2k		22.3	11.2	
5k		35.3	7.1	
10k		50	5	
20k		70.7	3.5	
25k		79	3.2	
50k		112	2.2	
100k		158	1.6	
200k	0.25	224	1.1	
250k	0.25	250	1.1	
500k	0.13	250	0.50	
1M	0.06	250	0.25	
2.2M	0.03	250	0.125	

MARKING

Printed : VISHAY trademark, series, style, ohmic value (in Ω, kΩ, MΩ), tolerance (in %), only if non-standard, manufacturing date, marking of terminal 3.

PACKAGING

– In magazine pack (tube) by 50 pieces code “TU50”.

ORDERING INFORMATION

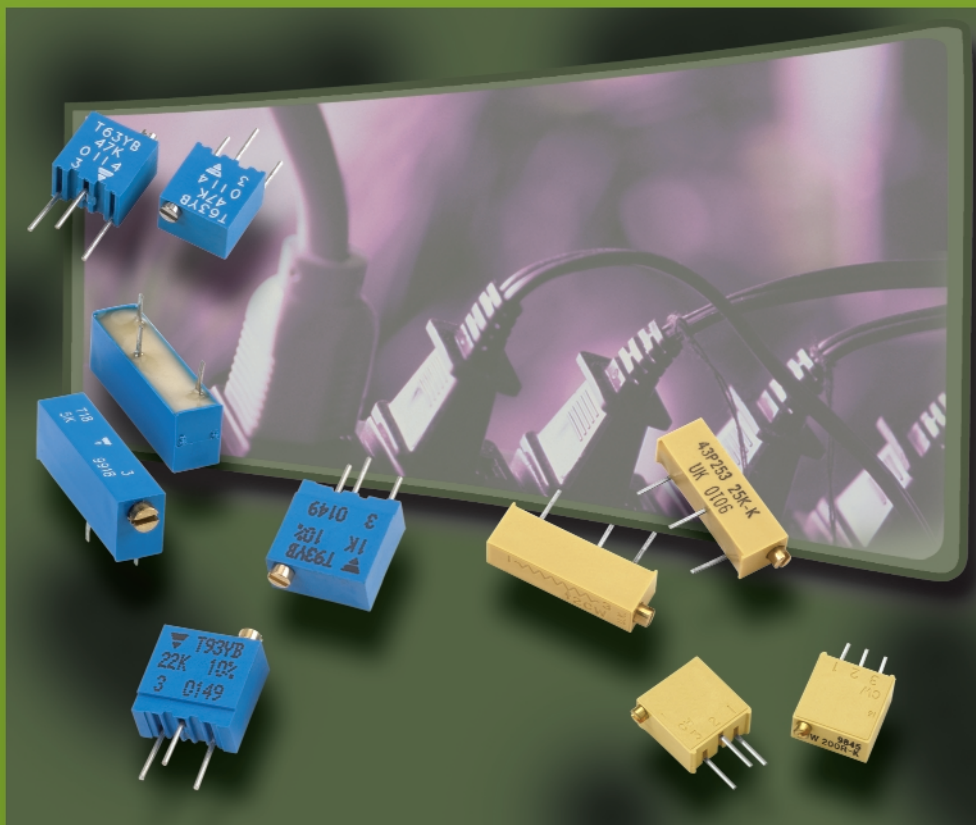
T63	XA	100kΩ	± 10 %	TU50
SERIES	VERSION	OHMIC VALUE	TOLERANCE	PACKAGING
	N.B.: On delivery the wiper is positioned at mid-travel.			TU50 : Tube



VISHAY INTERTECHNOLOGY, INC.

MULTI-TURN CERMET TRIMMERS

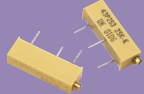
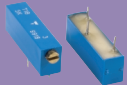
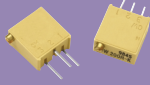
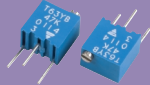
SELECTOR GUIDE



- Various electrical travel
- Top and side adjust versions
- 10 Ω to 2.2 M Ω resistance range
- Tube, Tape and Reel, Ammo Pack options

For technical questions, contact sfer@vishay.com

MULTI-TURN CERMET TRIMMERS

MODEL	43 	T18 	64 	T93 	T63 
PACKAGE SIZE	19mm (3/4") rectangular	19mm (3/4") rectangular	10mm (3/8") square	10mm (3/8") square	6.35mm (1/4") square
RESISTANCE RANGE	10 Ω to 2 M Ω	10 Ω to 2.2 M Ω	10 Ω to 2 M Ω	10 Ω to 2.2 M Ω	10 Ω to 2 M Ω
STANDARD RESISTANCE TOLERANCE	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$
TC PPM/ $^{\circ}\text{C}$ 100 Ω TO 2 M Ω	± 100	± 100	± 100	± 100	± 100
POWER RATING	0.75W @ 70 $^{\circ}\text{C}$	0.75W @ 70 $^{\circ}\text{C}$	0.5W @ 70 $^{\circ}\text{C}$	0.5W @ 85 $^{\circ}\text{C}$	0.25W @ 85 $^{\circ}\text{C}$
ELECTRICAL TRAVEL	20 Turns	15 Turns	25 Turns	19 Turns	13 Turns
CONTACT RESISTANCE VARIATION (CRV)	1% or 1 Ω	2% or 1 Ω	2% or 2 Ω	2% or 2 Ω	2% or 2 Ω
MECHANICAL LIFE	200 Cycles	200 Cycles	200 Cycles	200 Cycles	200 Cycles
OPERATING TEMPERATURE	-55 $^{\circ}\text{C}$ to +55 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to +55 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$
FEATURES AND PACKAGING	Panel mount, clear lid, box	Panel mount, tube	Tube, tape and reel, ammopack, box	Tube, custom screw on request	Tube, custom screw on request

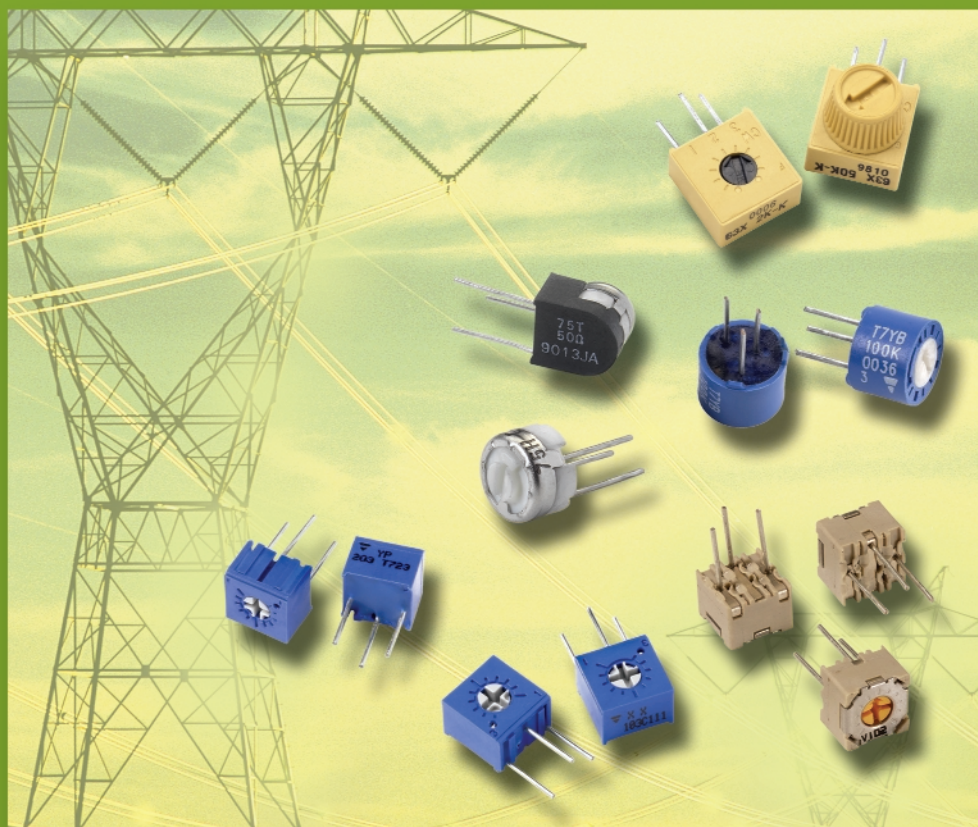
VMN-SG2010-0304



VISHAY INTERTECHNOLOGY, INC.

SINGLE-TURN CERMET TRIMMERS

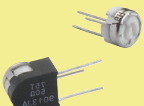
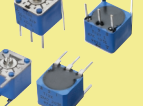
SELECTOR GUIDE



- Various electrical travel
- Top and side adjust versions
- 10 Ω to 10 M Ω resistance range
- Various pin styles
- Tube, tape and reel options

For technical questions, contact sfer@vishay.com

SINGLE-TURN CERMET TRIMMERS

MODEL	63 	75 	T7 	76 	T73 	T12 	P8 
PACKAGE SIZE	10mm (3/8") sq.	6.35mm (1/4") dia.	7mm (1/4") dia.	6.35mm (1/4") sq.	6.35mm (1/4") sq.	12mm (1/2") sq.	8.5mm (1/3") dia.
RESISTANCE RANGE (ohms)	10 to 2 M Ω	10 to 2 M Ω	10 to 2.2 M Ω	10 to 5 M Ω	10 to 2 M Ω	22 Ω to 10 M Ω	10 to 2.2 M Ω
STANDARD RESISTANCE TOLERANCE	$\pm 10\%$	$\pm 10\%$	$\pm 20\%$	$\pm 20\%$	$\pm 10\%$	$\pm 20\%$	$\pm 10\%$
TC PPM/ $^{\circ}\text{C}$	± 100	± 100	± 100	± 100	± 100	± 100	± 100
POWER RATING	0.5W @ 70 $^{\circ}\text{C}$	0.5W @ 85 $^{\circ}\text{C}$	0.5W @ 85 $^{\circ}\text{C}$	0.5 W @ 70 $^{\circ}\text{C}$	0.5 W @ 85 $^{\circ}\text{C}$	1 W @ 70 $^{\circ}\text{C}$	1 W @ 70 $^{\circ}\text{C}$
ELECTRICAL TRAVEL	270 $^{\circ}$	240 $^{\circ}$	270 $^{\circ}$	240 $^{\circ}$	240 $^{\circ}$	270 $^{\circ}$	270 $^{\circ}$
CONTACT RESISTANCE VARIATION (CRV)	2% or 2 Ω	3% or 3 Ω	3% or 3 Ω	1% or 2 Ω	1% or 2 Ω	3% or 3 Ω	2% or 1 Ω
MECHANICAL LIFE	200 Cycles	200 Cycles	200 Cycles	200 Cycles	200 Cycles	200 Cycles	200 Cycles
OPERATING TEMPERATURE	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to + 150 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$
FEATURES & PACKAGING	Top adjust, side adjust, knob adjust, extended rotor, box	Top adjust, side adjust, box	Top adjust, box or tube	Top adjust, side adjust, box	Top adjust, side adjust, tubes, tape and reel	Locking device, log law, box	Top adjust, side adjust, panel sealed, panel mount with solder lugs, box

VMN-SG2009-0304



VISHAY INTERTECHNOLOGY, INC.

SMD CERMET TRIMMERS

SELECTOR GUIDE



- Military and professional grade
- Multi turn and single turn options
- Fully sealed trimmers
- Tape and reel, tube packaging

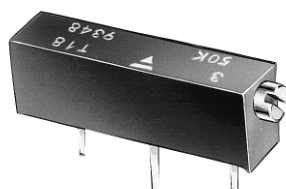
For technical questions, contact sfer@vishay.com

SMD CERMET TRIMMERS

MODEL	TS5 	TS53 	TS6 	TS63 	TSM4 	TSM43 	TS3 
PACKAGE SIZE	5mm (13/64")	5mm (13/64")	6.85mm (1/4")	6.85mm (1/4")	5mm (13/64")	5mm (13/64")	3.2mm (1/8")
GRADE	Military and Professional	Industrial	Military and Professional	Industrial	Military and Professional	Industrial	Industrial
RESISTANCE RANGE	10 Ω - 1 M Ω	10 Ω - 1 M Ω	10 Ω - 2 M Ω	10 Ω - 2 M Ω	10 Ω - 1 M Ω	10 Ω - 2 M Ω	10 Ω - 2 M Ω
STANDARD RESISTANCE TOLERANCE	$\pm 10\%$	$\pm 20\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 20\%$
TC PPM/°C 100 Ω TO 2 M Ω	± 100	± 100	± 100	± 100	± 100	± 100	± 150
POWER RATING	0.25W @ +70°C	0.25W @ +70°C	0.25W @ +85°C	0.25W @ +85°C	0.25W @ +85°C	0.25W @ +85°C	0.125W @ +70°C
ELECTRICAL TRAVEL/ TURNS	220°	220°	13 Turns	13 Turns	11 Turns	11 Turns	220°
CONTACT RESISTANCE VARIATION (CRV)	1% or 3 Ω	1% or 3 Ω	2% or 2 Ω	2% or 2 Ω	1% or 3 Ω	1% or 3 Ω	3% or 3 Ω
MECHANICAL LIFE	100 Cycles	100 Cycles	200 Cycles	200 Cycles	100 Cycles	100 Cycles	50 Cycles
OPERATING TEMPERATURE	-55°C to +125°C	-55°C to +125°C	-55°C to +155°C	-55°C to +155°C	-55°C to +125°C	-65°C to +150°C	-55°C to +125°C
FEATURES AND PACKAGING	J-hook and gull wing, tape and reel	J-hook and gull wing, tape and reel	Tube, tape and reel	Tube, tape and reel	J-hook and gull wing, top adjust, side adjust, tape and reel	J-hook and gull wing, top adjust, side adjust, tape and reel	Tape and reel

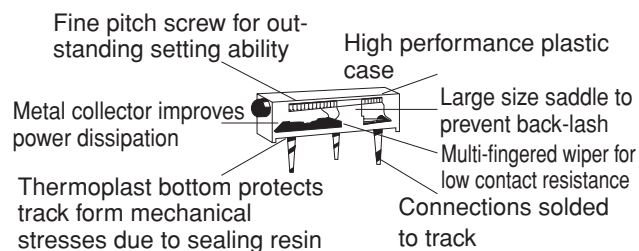
VMN-SG2038-0305

3/4" Rectangular Multiturn Cermet Trimmer



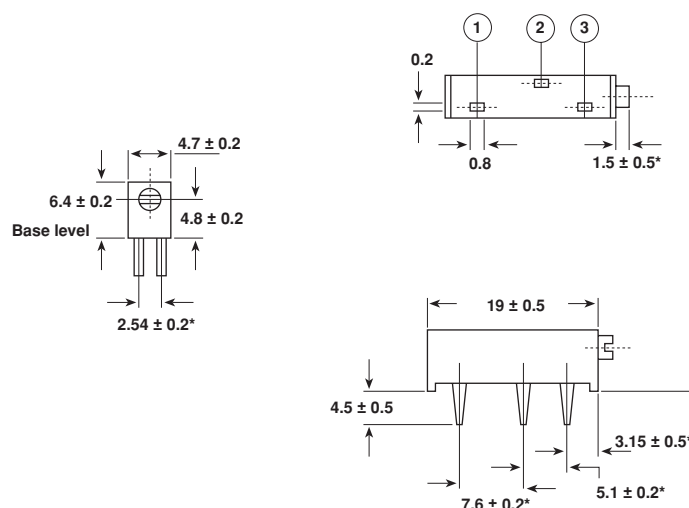
FEATURES

- Industrial Grade
- 0.75 Watt at 70°C
- MIL-R-22097
- CECC 41 100

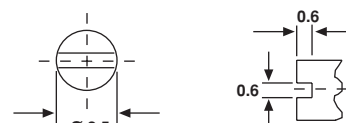


DIMENSIONS in millimeters

T18

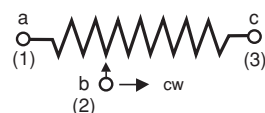


SHAFT



* To be measured at base level

CIRCUIT DIAGRAM



ELECTRICAL SPECIFICATIONS

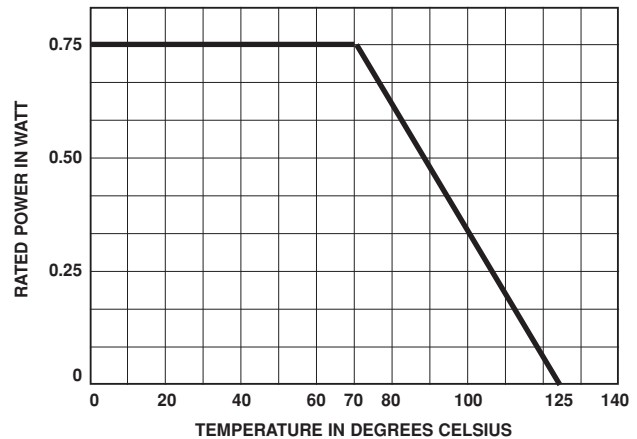
Resistive Element	cermet
Electrical Travel	15 turns $\pm$ 1
Resistance Range	10 Ω to 2.2 M Ω
Standard Series E3	1 - 2.2 - 4.7 and 1 - 2 - 5
Tolerance	Standard $\pm$ 10%
	On Request $\pm$ 5%
Power Rating	Linear 0.75 W at + 70°C
	Logarithmic not applicable
Temperature Coefficient	See Standard Resistance Element Table
Limiting Element Voltage (Linear Law)	250 V
Contact Resistance Variation	2% Rn or 1 Ω
End Resistance (Typical)	1 Ω
Dielectric Strength (RMS)	1000 V
Insulation Resistance (500 VDC)	10 ⁶ M Ω

MECHANICAL SPECIFICATIONS

Mechanical Travel	18 turns $\pm$ 5
Operating Torque (max. Ncm)	2
End Stop Torque	clutch action
Unit Weight (max. g)	1

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	T18 : - 55°C + 125°C
Climatic Category	55/100/56
Sealing	T18 : fully sealed container IP67

POWER RATING CHART**PERFORMANCE**

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\frac{\Delta R_T}{R_T}$ (%)	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours at rated power 90'/30' - ambient temperature 70°C	$\pm$ 1% Contact resistance variation : < 1% Rn	$\pm$ 2%
Climatic Sequence	Phase A dry heat 125°C Phase B damp heat Phase C cold -55°C Phase D damp heat 5 cycles	$\pm$ 0.5%	$\pm$ 1%
Long Term Damp Heat	56 days	$\pm$ 0.5% Dielectric strength : 1000 V RMS Insulation resistance : > 10 ⁶ M Ω	$\pm$ 1%
Rapid Temperature Change	5 cycles - 55°C at + 125°C	$\pm$ 0.5 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1\%$
Shock	50 g 11 ms 3 successive shocks in 3 directions	$\pm$ 0.2%	$\pm$ 0.3%
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 hours	$\pm$ 0.2%	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 0.3\%$
Rotational Life	200 cycles	$\pm$ 1 % Contact resistance variation : < 2% Rn	

**STANDARD RESISTANCE ELEMENT DATA**

STANDARD RESISTANCE VALUES	LINEAR LAW			T.C. – 55°C + 125°C
	MAX. POWER AT + 70°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	W	V	mA	ppm/°C
10	0.75	2.7	270	0 + 200
22		4.06	184	
47		5.93	126	
100	↓	8.7	87	± 100
220		12.8	58	
470		18.7	40	
1k		27.4	27	
2.2k		40.6	18	
4.7k		59.3	11	
10k		86.6	9	
22k		128.4	5.8	
47k		187	4	
100k		250	2.5	
220k	0.625	250	1.09	
470k	0.28	250	0.44	
1M	0.13	250	0.25	
2.2M	0.06	250		

MARKING

Printed :

- VISHAY trademark
- series
- style
- ohmic value (in Ω, kΩ, MΩ)
- manufacturing date
- marking of terminal 3.

PACKAGING

- In plastic box of 100 pieces, no code
- In tube by 25 pieces code "TU25".

ORDERING INFORMATION

OPAQUE

T18

10KΩ

± 10 %

TU25

SERIES

OHMIC VALUE

TOLERANCE

PACKAGING

N.B.: On delivery the wiper is positioned at mid-travel.

TU25: Tube

Miniature Trimmer Single Turn Cermet

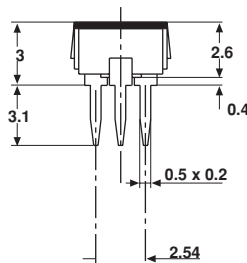
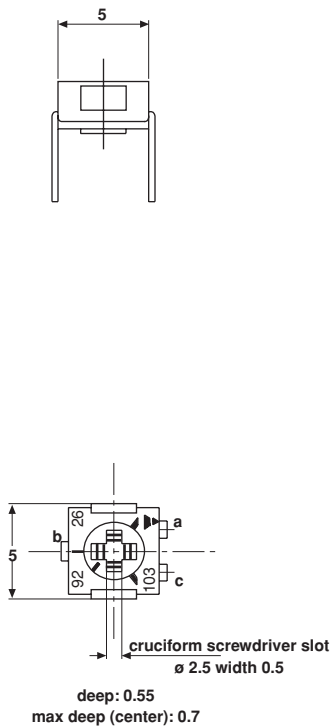


The T53 trimming potentiometer volumetric efficiency (5 x 5 x 2.7 mm) with high performance and stability. The T53 design is suitable for both manual or automatic operation.

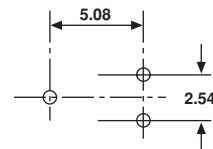
FEATURES

- Fully sealed
- 0.25 Watt at 70°C
- Excellent stability
- Wide ohmic range
- Low temperature coefficient
- Low contact resistance variation
- Small size for optimum packing density
- Suitable for both manual or automatic operation
- For SMD version see TS53Y series

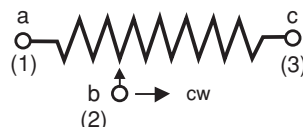
DIMENSIONS in millimeters



PCB LAYOUT



CIRCUIT DIAGRAM



ELECTRICAL SPECIFICATIONS

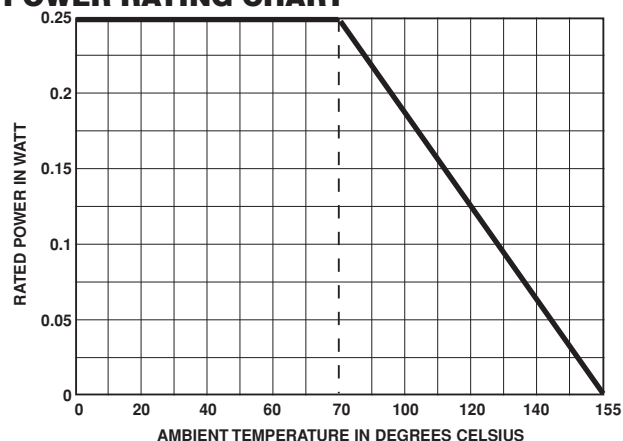
Resistive Element	Cermet
Electrical Travel	220° ± 15°
Resistance Range	10Ω to 1MΩ
Standard Series	1 - 2 - 5
Tolerance Standard	± 20%
Power Rating	0.25W at 70°C
Linear	
Logarithmic	not applicable
Temperature Coefficient	See Standard Resistance Element Data
Limiting Element Voltage (Linear Law)	200V
Contact Resistance Variation	2% or 3Ω
End Resistance (Typical)	0.1% or 3Ω
Dielectric Strength (RMS)	1000V
Insulation Resistance	10 ⁶ MΩ
Specification	in accordance with CECC 41 100

MECHANICAL SPECIFICATIONS

Mechanical Travel	270° ± 10°
Operating Torque (max. Ncm)	1.5
End Stop Torque (max. Ncm)	3.5
Unit Weight (max. g)	0.15

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	– 55°C + 155°C
Climatic Category	55/125/56
Sealing	enables cleaning IP67

POWER RATING CHART

PERFORMANCE

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS $\frac{\Delta R}{R}$ $\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours at rated power 90°/30° - ambient temperature + 70°C	± 2% ± 3 % Contact resistance variation : $\Delta R < 1\%$ Rn
Moisture Resistance	MIL STD 202 Method 106 10 cycles of 24 hours constituted with damp heat - cold - vibrations	± 2% ± 3 % Dielectric strength : 1000 V RMS Insulation resistance : > 10 ⁴ MΩ
Long Term Damp Heat	Temperature 40°C - RH 93 % 56 days	± 2% ± 3 % Dielectric strength : 1000 V RMS Insulation resistance : > 10 ⁴ MΩ
Thermal Shock	- 55°C to + 125°C - 5 cycles	± 1 % $\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 2\%$
Rotational Life (Electrical and Mechanical)	100 cycles - rated power	± 3 %
Shock	MIL STD 202 Method 213/1 100 g - 6 ms 3 successive shocks in 3 directions	± 1 % $\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1\%$
Vibration	MIL STD 202 Method 204/D 20 g - 12 hours	± 1 % $\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1\%$

STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	LINEAR LAW			T.C. – 55°C + 125°C
	MAX. POWER AT 85°C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	W	V	mA	ppm/°C
10	0.20	1.41	141	0 + 200
20		2	100	
50		3.16	63	
100		4.47	45	± 100
200		6.32	32	
500		10	20	
1k		14.1	14	
2k		20	10	
5k		31.6	6.3	
10k		44.7	4.5	
20k	↓	63.2	3.2	
50k	0.2	100	2	
100k	0.2	141	1.4	
200k	0.2	200	1	
500k	0.08	200	0.4	
1M	0.04	200	0.2	

MARKING

VISHAY trademark, ohmic value, manufacturing date.

The ohmic value is indicated by a 3 figure code, the first two are significant figures, the third one is the multiplier.

Example: 100 = 10 Ω
 101 = 100 Ω
 102 = 1000 Ω
 503 = 50000 Ω

The manufacturing date is indicated by four digits, the first two for the year, the last two for the week number.

SOLDERING RECOMMENDATIONS

Vapour phase: 215°C/20 to 40 seconds

Reflow: 230°C/ 20 seconds

Do not exceed peak 260°C, or with IRON: 40W: 3 seconds
 at 350°C soldering is possible by wave, reflow and vapor phase.

PACKAGING

– In bulk (plastic box of 250 pieces), code BO250

ORDERING INFORMATION

T53	Y	500KΩ	$\pm 20\%$	BO250
SERIES	STYLE	OHMIC VALUE	TOLERANCE	PACKAGING