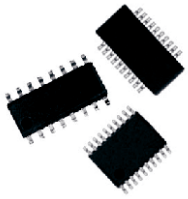
Molded, 25 mil or 50 mil Pitch, Dual-In-Line Thin Film Resistor, Surface Mount Network



Actual Size

Vishay Dale Thin Film resistor networks are designed to be used in either analog or digital circuits. The use of thin film resistive elements within the network allows you to achieve an infinite number of very low noise and high stability circuits for industrial, medical and scientific instrumentation. Vishay Dale Thin Film resistor networks are packaged in molded plastic packages with sizes that are recognized throughout the world. The rugged packaging offers superior environmental protection and consistent dimensions for ease of placement with automatic SMT equipment. Vishay Dale Thin Film stocks many designs and values for off-the-shelf convenience. With Vishay Dale Thin Film you can depend on quality products delivered on time with service backing the product.

FEATURES

- Reduces total assembly costs
- Compatible with automatic surface mounting equipment
- UL 94 V-0 flame resistant
- Thin film tantalum nitride on silicon
- Choice of package sizes: VTSR (TSSOP) JEDEC MC-153, VSSR (SSOP or QSOP) JEDEC MS-137, VSOR (SOIC narrow) JEDEC MS-012
- Moisture sensitivity level 1 (per IPC/JEDEC STD-20C)
- Isolated/bussed/dual terminator/differential terminator circuits
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition

Pb-free

RoHS COMPLIANT

HALOGEN FREE

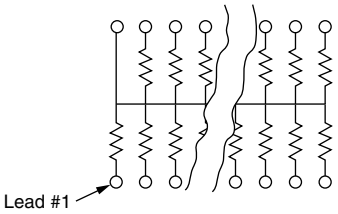
TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
TCR	100	NA
	ABSOLUTE	RATIO
TOL.	5, 2, 1	NA

SCHEMATICS

01 SCHEMATIC

Resistance Range:
10 Ω to 47 kΩ



RESISTORS WITH ONE PIN COMMON

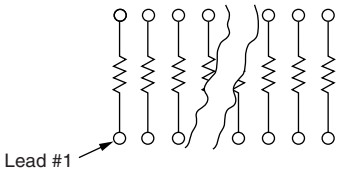
The 01 circuit provides nominally equal resistors connected between a common pin and a discrete PC board pin.
Commonly used in the following applications:

- MOS/ROM pull-up/-down
- Open collector pull-up
- "Wired OR" pull-up
- Power driven pull-up
- TTL input pull-down
- Digital pulse squaring
- TTL unused gate pull-up
- High speed parallels pull-up

Broad selection of standard values available

03 SCHEMATIC

Resistance Range:
10 Ω to 47 kΩ



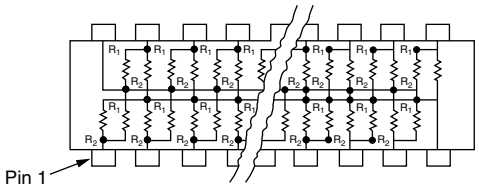
ISOLATED RESISTORS

The 03 circuit provides nominally equal resistors isolated from all others and wired directly across.
Commonly used in the following applications:

- "Wired OR" pull-up
- Power driven pull-up
- Powergate pull-up
- Line termination
- Long-line impedance balancing
- LED current limiting
- ECL output pull-down
- TTL input pull-down

Broad selection of standard values available

05 SCHEMATIC



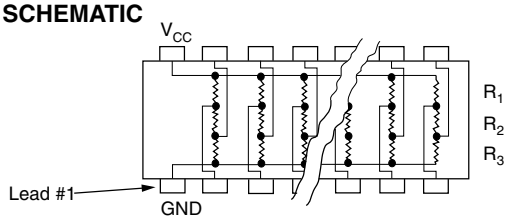
DUAL-LINE TERMINATOR; PULSE SQUARING

The 05 circuit contains pairs of resistors connected between ground and a common line. The junctions of these resistor pairs are connected to the input leads. The 05 circuits are designed for dual-line termination and pulse squaring.
Standard values are:

VSSR1605:
R_1 = 220 Ω, R_2 = 330 Ω
R_1 = 330 Ω, R_2 = 470 Ω

VSSR2005:
R_1 = 220 Ω, R_2 = 330 Ω
R_1 = 220 Ω, R_2 = 1.8 kΩ
R_1 = 1.5 kΩ, R_2 = 3.3 kΩ

47 SCHEMATIC



DIFFERENTIAL TERMINATOR

The 47 schematic consists of series resistor sections connected between V_{CC} and ground. Each contains 3 resistors of 2 different resistance values.
Standard values are:

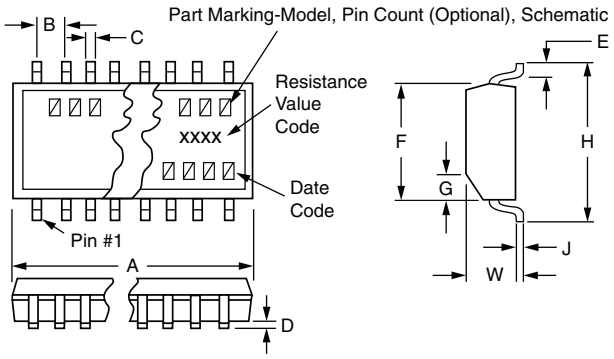
VSSR20 and VTSR20:
R_1 = 270 Ω, R_2 = 120 Ω

VSSR16 and VTSR16:
R_1 = 330 Ω, R_2 = 150 Ω
R_1 = 330 Ω, R_2 = 220 Ω

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride	-
Pin/Lead Number	16, 20, 24	-
Resistance Range	10 Ω to 47 kΩ	Per E-24 table
TCR: Absolute	± 100 ppm/°C	- 55 °C to + 125 °C
TCR: Tracking	n/a	-
Tolerance: Absolute	± 5 % standard (± 2 % available) ± 1 % standard (check factory)	Per E-24 table Per E-96 table
Tolerance: Ratio	NA	-
Power Rating: Resistor	100 mW max.	At + 70 °C
Power Rating: Package	16 = 1.0 W, 20 = 1.2 W, 24 = 1.4 W	0 °C to + 70 °C
Stability: Absolute	-	-
Stability: Ratio	-	-
Voltage Coefficient	5 ppm/V (typical)	-
Working Voltage	50 V_{DC}	-
Operating Temperature Range	- 55 °C to + 125 °C	-
Storage Temperature Range	- 55 °C to + 150 °C	-
Noise	< - 35 dB	-
Thermal EMF	-	-
Shelf Life Stability: Absolute	-	-
Shelf Life Stability: Ratio	-	-

DIMENSIONS AND IMPRINTING in inches (millimeters)



DIMENSION	VTSR-xxxx	VSSR-xxxx	VSOR-xxxx
A - 16 PIN	0.206 ± 0.003 (5.23 ± 0.08)	0.193 ± 0.004 (4.90 ± 0.010)	0.390 ± 0.010 (9.91 ± 0.25)
A - 20 PIN	0.256 ± 0.003 (6.50 ± 0.08)	0.341 ± 0.003 (8.66 ± 0.08)	NA
A - 24 PIN	0.306 ± 0.003 (7.77 ± 0.08)	0.341 ± 0.003 (8.66 ± 0.08)	NA
B (Ref.)	0.0256 (0.65)	0.025 (0.64)	0.050 (1.27)
C (Ref.)	0.0087 (0.22)	0.010 (0.25)	0.016 (0.41)
D	0.004 (0.10)	0.006 (0.15)	0.008 (0.20)
E (Typ.)	0.024 (0.61)	0.025 (0.64)	0.030 (0.76)
F	0.173 ± 0.003 (4.39 ± 0.08)	0.154 ± 0.003 (3.91 ± 0.08)	0.152 ± 0.003 (3.86 ± 0.08)
G	0.015 × 45° (0.38)	0.015 × 45° (0.38)	0.015 × 45° (0.38)
H	0.252 ± 0.005 (6.40 ± 0.13)	0.236 ± 0.008 (5.99 ± 0.20)	0.236 ± 0.005 (5.99 ± 0.13)
J (Ref.)	0.005 (0.13)	0.010 (0.25)	0.008 (0.20)
W	0.043 ± 0.005 (1.09 ± 0.13)	0.064 ± 0.005 (1.63 ± 0.13)	0.064 ± 0.005 (1.63 ± 0.13)

MARKING

MODEL	PIN COUNT (Optional)	SCHEMATIC	RESISTANCE		RESISTANCE	DATE CODE
VXXX	**XX**	**XX**	**XXXX**		**XXX**	**XXXX**
VSOR VSSR VTSR	16 20 24	01, 03, 05 or 47	1 % RESISTANCE e.g.: 43R2 4 digits are used to express ohmic values only less than 100 Ω. R is used to designate the decimal position	**OR**	1 %, 2 %, 5 % RESISTANCE e.g.: 103 = 10K The first 2 digits are significant figures, the last digit specifies the number of zeros to follow.	

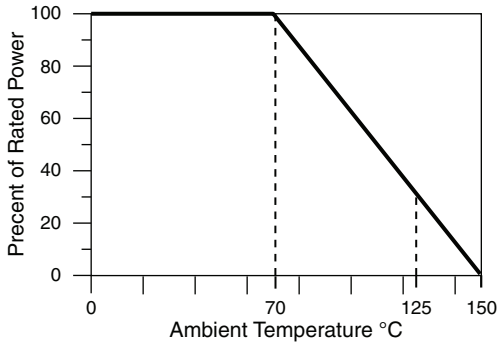
MECHANICAL SPECIFICATIONS

Resistive Element	Tantalum nitride
Substrate Material	Silicon
Body	Molded epoxy
Terminals	Copper alloy
Plating	100 % matte tin
Lead Coplanarity	0.0005"
Marking Resistance to Solvents	Permanency testing per MIL-STD-202, method 215

PACKAGING INFORMATION

MODEL	LEADS	TAPE AND REEL	TUBES
VTSR (TSSOP)	16	2500	94
	20	2500	74
	24	2500	62
VSSR (QSOP)	16	2500	98
	20	2500	55
	24	2500	55
VSOR (SOIC)	16	2500	48

DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: VTSR1601103JTF

V	T	S	R	1	6	0	1			1	0	3		J	T	F
V	S	O	R	1	6	0	5	3	3	1	4	7	1	G	T	F

GLOBAL MODEL	PIN COUNT	SCHEMATIC	RESISTANCE (3, 4 or 6 digits)	TOLERANCE	PACKAGING
VTSR **VSSR** **VSOR** Lead (Pb)-free (e3) date code > 2705	**20** (not VSOR) **24** (not VSOR)	**01** (bussed) **03** (isolated)	XXX: ≥ 100R and all 1 %, 2 % and 5 % First 2 digits are significant figures. Last digit specifies number of zeros to follow. XXXX: < 100R 1 % First 3 digits are significant figures. Last digit specifies number of zeros to follow.	**F** = 1.0 % **G** = 2.0 % **J** = 5.0 %	TAPE AND REEL **TF** = Full reel 2500 **UF** = Tubed
	16 (not VTSR) **20** (not VSOR)	**05** (terminator) **47** (terminator)	xxx xxx First 2 digits are significant figures. Last digit specifies number of zeros.	**G** = 2.0 % **J** = 5.0 %	

Historical Part Number example: VSSR2001102GT/R (for reference purposes only)

VSSR	20	01	102	G	T/R
MODEL	PIN COUNT	SCHEMATIC	RESISTANCE	TOLERANCE	PACKAGING

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.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9