# E/H (Ta2N) (Military M/D55342)

Vishay Dale Thin Film

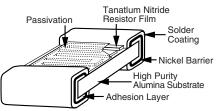
## QPL MIL-PRF-55342 Qualified Ta<sub>2</sub>N Thin Film Resistor, Surface Mount Chip



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Thin Film Mil chip resistors feature all sputtered wraparound termination for excellent adhesion and dimensional uniformity. They are ideal in applications requiring stringent performance requirements. Established reliability is assured through 100 % screening and extensive environmental lot testing.

## CONSTRUCTION



### **FEATURES**

- Established reliability, "R" failure rate level (0.01 % per 1000 h), C = 2
- High purity alumina substrate 99.5% Al<sub>2</sub>O<sub>3</sub>
- Wraparound termination featuring a tenacious adhesion layer covered with an electroplated nickel barrier layer for + 150 °C operating conditions
- Very low noise and voltage coefficient (< 25 dB, 0.5 ppm/V)
- Non-inductive
- Laser-trimmed tolerances ± 0.1 %
- Complete MIL-testing available in-house
- · Antistatic waffle pack or tape and reel packaging available
- Military/aerospace/QPL approval

### **TYPICAL PERFORMANCE**

|      | ABSOLUTE |
|------|----------|
| TCR  | 25       |
| TOL. | 0.1      |

| STANDARD ELECTRICAL SPE        | CIFICATIONS  |                     |
|--------------------------------|--|---------------------|
| TEST                           | SPECIFICATIONS                                     | CONDITIONS          |
| Material                       | Tantalum nitride (Ta <sub>2</sub> N) resistor film | -                   |
| Resistance Range               | 49.9 Ω to 3.3 MΩ                                   | -                   |
| TCR: Absolute                  | ± 25 ppm/°C to ± 300 ppm/°C                        | - 55 °C to + 125 °C |
| Tolerance: Absolute            | ± 0.1 % to ± 10 %                                  | + 25 °C             |
| Stability: Absolute            | $\Delta R \pm 0.02 \%$                             | 2000 h at + 70 °C   |
| Stability: Ratio               | -  | -                   |
| Voltage Coefficient            | 0.1 ppm/V  | -                   |
| Working Voltage                | 30 V to 200 V                                      | -                   |
| Operating Temperature Range    | - 55 °C to + 125 °C                                | -                   |
| Storage Temperature Range      | - 55 °C to + 150 °C                                | -                   |
| Noise                          | < - 25 dB  | -                   |
| Shelf Life Stability: Absolute | $\Delta R \pm 0.01 \%$                             | 1 year at + 25 °C   |

### **COMPONENT RATINGS**

|           | POWER          | WORKING        | RESIS                     | TANCE RANGE BY TOLER          | ANCE                          |
|-----------|----------------|----------------|---------------------------|-------------------------------|-------------------------------|
| CASE SIZE | RATING<br>(mW) | VOLTAGE<br>(V) | 0.1 %, 0.25 %, 0.5 %, 1 % | 2.0 % and 5.0 %               | 10 %                          |
| M55342/01 | 50             | 40             | 49.9 Ω to 64.9 KΩ         | 51 $\Omega$ to 68 K $\Omega$  | 51 $\Omega$ to 68 K $\Omega$  |
| M55342/02 | 125            | 40             | 49.9 Ω to 140 KΩ          | 51 $\Omega$ to 150 K $\Omega$ | 51 $\Omega$ to 150 K $\Omega$ |
| M55342/03 | 200            | 75             | 49.9 Ω to 357 KΩ          | 51 Ω to 360 KΩ                | 51 Ω to 360 KΩ                |
| M55342/04 | 150            | 125            | 49.9 Ω to 806 KΩ          | 51 Ω to 820 KΩ                | 51 Ω to 820 KΩ                |
| M55342/05 | 225            | 175            | 49.9 Ω to 1.5 MΩ          | 51 Ω to 1.5 MΩ                | 51 Ω to 1.5 MΩ                |
| M55342/06 | 150            | 50             | 49.9 Ω to 309 KΩ          | 51 Ω to 820 KΩ                | 51 Ω to 820 KΩ                |
| D55342/07 | 250            | 100            | 49.9 Ω to 1 MΩ            | 51 $\Omega$ to 1 M $\Omega$   | 51 Ω to 1 MΩ                  |
| M55342/08 | 800            | 150            | 49.9 Ω to 2.0 MΩ          | 49.9 Ω to 2.0 MΩ              | 51 Ω to 2.23 MΩ               |
| M55342/09 | 1000           | 200            | 49.9 Ω to 3.01 MΩ         | 51 $\Omega$ to 3 M $\Omega$   | 51 Ω to 3.3 MΩ                |
| M55342/10 | 500            | 75             | 49.9 Ω to 604 KΩ          | 51 Ω to 620 KΩ                | 51 Ω to 680 KΩ                |
| M55342/11 | 50             | 30             | 49.9 Ω to 49.9 KΩ         | 51 $\Omega$ to 51 K $\Omega$  | 51 Ω to 51 KΩ                 |
| M55342/12 | 100            | 50             | 49.9 Ω to 130 KΩ          | 51 Ω to130 KΩ                 | 51 Ω to 150 KΩ                |

#### Note

• Values listed are a guide, refer to MIL spec for value/tolerance allowance

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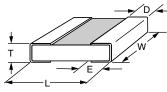
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## **DIMENSIONS** in inches



| CASE SIZE | TERM. | L                     | w                 | т              | D                     | E                     |
|-----------|-------|-----------------------|-------------------|----------------|-----------------------|-----------------------|
| M55342/01 | В     | $0.055 \pm 0.006$     | $0.025 \pm 0.005$ | 0.010 to 0.030 | 0.010 ± 0.005         | 0.015 ± 0.005         |
| M55342/02 | В     | $0.055 \pm 0.006$     | $0.050 \pm 0.005$ | 0.012 to 0.033 | 0.010 ± 0.005         | 0.015 ± 0.005         |
| M55342/03 | В     | 0.105 ± 0.007         | $0.050 \pm 0.005$ | 0.015 to 0.033 | $0.015 \pm 0.005$     | 0.015 ± 0.005         |
| M55342/04 | В     | 0.155 ± 0.007         | $0.050 \pm 0.005$ | 0.015 to 0.033 | $0.015 \pm 0.005$     | 0.015 ± 0.005         |
| M55342/05 | В     | 0.230 ± 0.007         | $0.075 \pm 0.005$ | 0.015 to 0.033 | $0.020 \pm 0.005$     | $0.020 \pm 0.005$     |
| M55342/06 | В     | $0.080 \pm 0.006$     | $0.050 \pm 0.005$ | 0.015 to 0.033 | 0.016 ± 0.008         | 0.015 ± 0.005         |
| D55342/07 | В     | 0.126 ± 0.008         | $0.063 \pm 0.005$ | 0.015 to 0.033 | 0.020 + 0.005/- 0.010 | 0.020 + 0.005/- 0.010 |
| M55342/08 | В     | 0.209 + 0.009/- 0.018 | $0.098 \pm 0.005$ | 0.015 to 0.033 | $0.020 \pm 0.005$     | $0.020 \pm 0.005$     |
| M55342/09 | В     | 0.259 + 0.009/- 0.015 | 0.124 ± 0.005     | 0.015 to 0.033 | $0.020 \pm 0.005$     | $0.020 \pm 0.005$     |
| M55342/10 | В     | 0.105 ± 0.007         | $0.100 \pm 0.005$ | 0.015 to 0.033 | $0.015 \pm 0.005$     | 0.015 ± 0.005         |
| M55342/11 | В     | 0.040 ± 0.005         | $0.025 \pm 0.005$ | 0.010 to 0.030 | 0.010 ± 0.005         | 0.015 ± 0.005         |
| M55342/12 | В     | $0.064 \pm 0.006$     | $0.032 \pm 0.005$ | 0.010 to 0.033 | $0.012 \pm 0.005$     | 0.015 ± 0.005         |

| ENVIRONMENTAL TESTS        |                                |                              |
|----------------------------|--------------------------------|------------------------------|
| ENVIRONMENTAL TEST         | MIL-PRF-55342 LIMITS<br>(ΔR ±) | VISHAY PERFORMANCE<br>(ΔR ±) |
| Thermal Shock              | 0.1 %                          | 0.020 %                      |
| Low Temperature Operation  | 0.1 %                          | 0.025 %                      |
| Short Time Overload        | 0.1 %                          | 0.050 %                      |
| High Temperature Exposure  | 0.1 %                          | 0.009 %                      |
| Resistance to Bonding      | 0.2 %                          | 0.006 %                      |
| Moisture Resistance        | 0.2 %                          | 0.004 %                      |
| TCR                        | ± 25 ppm/°C                    | < 15 ppm/°C                  |
| Life (2000 h at + 70 °C)   | 0.5 %                          | 0.02 %                       |
| Life (10 000 h at + 70 °C) | 2.0 %                          | 0.04 %                       |

| MECHANICAL SPECIFICATIONS |                                      |  |  |  |  |  |  |  |
|---------------------------|--------------------------------------|--|--|--|--|--|--|--|
| Resistive Element         | Tantalum nitride (Ta <sub>2</sub> N) |  |  |  |  |  |  |  |
| Substrate Material        | Alumina                              |  |  |  |  |  |  |  |
| Chip Terminations         | Solder over nickel                   |  |  |  |  |  |  |  |
| Plated Solder             | 90/10                                |  |  |  |  |  |  |  |

**FSCM CAGE # - 57489** 

### Revision: 24-Apr-13

2 For technical questions, contact: <u>thinfilm@vishay.com</u> Document Number: 60120

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| GLO   | GLOBAL PART NUMBER INFORMATION New Global Part Numbering: M55342E06B9B00MT12 |                  |                           |                    |                          |      |      |  |   |     |      |     |       |      |                         |                                     |                                    |           |   |   |                      |                           |              |                  |  |                                   |  |           |
|---|--|------------------|---------------------------|--------------------|--------------------------|------|------|--|---|-----|------|-----|-------|------|-------------------------|-------------------------------------|------------------------------------|-----------|---|---|----------------------|---------------------------|--------------|------------------|--|-----------------------------------|--|-----------|
| New (   | Glo  | oba              | l Pa                      | art                | Nur                      | nber | ring | g: M   | 5534  | 2   | E06  | 39E | 300N  | /IT1 | 2                       |                                     |                                    |           |   |   |                      |                           |              |                  |  |                                   |  |           |
|   | М  | ][               | 5                         |                    | 5                        |      | 3    |  | 4   |     | 2    |     | Ε     | ][   | 0                       |                                     | 6                                  |           | В   |   | 9                    |                           | В            | ;                | 0  |                                   | 0 M T 1 4  |           |
|   |  |                  |                           | Γ                  |                          |      |      |  |   |     |      |     | '     |      |                         |                                     |                                    | _         | <br>  |   |                      |                           |              |                  |  |                                   |  |           |
| GLOBAL TCR CASE<br>MODEL CHARACTERISTIC SIZE          |  |                  |                           |                    |                          |      |      |  | TEF   | RMI | NATI | ON  |       |      | С                       | DHM                                 | 1IC V                              | /ALI      | JE  |   |                      | ł                         | FAILU<br>RAT |                  | PACKAGING THIN FI  |                                   |  |           |
| MODEL<br>M55342<br>or<br>D55342<br>(/07 size<br>only) | 2<br>2<br>e  | E<br>H<br>K<br>L | = 2<br>= 5<br>= 1<br>= 20 | 25 p<br>60 p<br>00 | opm<br>opm<br>opm<br>opm | /°C  |      | 01 =<br>02 =<br>03 =<br>04 =<br>05 =<br>06 =<br>07 =<br>08 =<br>10 =<br>10 = | 220<br>0502<br>1005<br>1505<br>2208<br>0705<br>1206<br>2010<br>2512<br>1010<br>0402<br>0603 |     | B =  | So  | ldera | ble  | id<br>m<br>Tc<br>(<br>C | ent<br>ulti<br>olera<br>0.1<br>0.25 | ifies<br>plier<br>%<br>%<br>%<br>% | tc<br>and | and<br>lerar<br>dec<br>M<br>I Ω<br>A<br>R<br>W<br>D<br>G<br>J<br>J<br>M | nce,<br>cima<br>IUL1<br>1  <br>E<br>I<br>I<br>I<br>I<br>I<br>I<br>I | ac<br>al loc<br>TIPL | cts<br>catc<br>IER<br>1 I | as<br>or.    | р<br>Р<br>Р<br>В | <b>1</b> = 1.<br>er 10<br>er 10<br>= 0.<br>= 0.0<br>er 10<br>er 10 | 0 %<br>00 h<br>1 %<br>00 h<br>1 % | Standard Packaging:     4       BS = BULK     for       100 min., 1 mult     Ta <sub>2</sub> N       WS = WAFFLE     resistor       100 min. 1 mult     type | l<br>film |
|   |  |                  |                           |                    |                          |      |      |  |   |     |      |     |       |      |                         |                                     |                                    |           |   |   |                      |                           |              |                  |  |                                   | <b>TP</b> = 100 min., 1 mult<br>(package unit single lot<br>date code)   |           |

3 For technical questions, contact: <u>thinfilm@vishay.com</u>

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