

CSS2010FT40L0 Datasheet



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| | |
|------------------------------|---|
| DiGi Electronics Part Number | CSS2010FT40L0-DG |
| Manufacturer | Stackpole Electronics Inc |
| Manufacturer Product Number | CSS2010FT40L0 |
| Description | RES 0.04 OHM 1% 1W 2010 |
| Detailed Description | 40 mOhms \pm 1% 1W Chip Resistor 2010 (5025 Metric) Automotive AEC-Q200, Current Sense Metal Element |

This model CSS2010FT40L0 is available at DiGi Electronics.

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Purchase and inquiry

Manufacturer Product Number:

CSS2010FT40L0

Series:

CSS

Resistance:

40 mOhms

Power (Watts):

1W

Features:

Automotive AEC-Q200, Current Sense

Operating Temperature:

-55°C ~ 225°C

Supplier Device Package:

2010

Size / Dimension:

0.200" L x 0.100" W (5.08mm x 2.54mm)

Number of Terminations:

2

Manufacturer:

Stackpole Electronics Inc

Product Status:

Active

Tolerance:

±1%

Composition:

Metal Element

Temperature Coefficient:

±15ppm/°C

Package / Case:

2010 (5025 Metric)

Ratings:

AEC-Q200

Height - Seated (Max):

0.035" (0.90mm)

Failure Rate:

-

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8533.21.0030

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

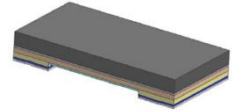
CSS / CSSH Series

Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Features:

- High temperature performance up to 225°C (for operation up to 275°C, contact Stackpole)
- Low thermal EMF (< 1 μ V/C) typically
- RoHS compliant, REACH compliant, lead free, and halogen free
- AEC-Q200 compliant



| Electrical Specifications | | | | | |
|---------------------------|--------------------------|--------------|--|--|----|
| Type/Code | Maximum Power Rating (W) | TCR (ppm/°C) | Ohmic Range (Ω) and Tolerance | | |
| | | | 0.5% | 1% | 5% |
| CSS0201 | 0.2 | ± 200 | - | 0.01, 0.02 | - |
| CSS0402 | 0.33 | ± 150 | - | 0.0025 | - |
| | | ± 100 | - | 0.005, 0.006, 0.008, 0.01, 0.015, 0.02 | - |
| CSS0603 | 0.33 | ± 150 | - | 0.002 | - |
| | | ± 100 | - | 0.0025, 0.003, 0.004, 0.005 | - |
| | | ± 75 | - | 0.01, 0.015, 0.02 | - |
| CSS0508 | 1 | ± 150 | - | 0.001, 0.0015 | - |
| | | ± 100 | - | 0.002, 0.003, 0.004, 0.005 | - |
| CSS0805 | 0.5 | ± 100 | - | 0.0015 | - |
| | | ± 75 | - | 0.002, 0.003, 0.004, 0.005 | - |
| | | ± 50 | - | 0.006, 0.007, 0.01, 0.015, 0.02 | - |
| CSSH0805 | 1 | ± 100 | - | 0.0005 | - |
| | | ± 75 | - | 0.001 - 0.002 | - |
| | | ± 50 | 0.007 - 0.013 | 0.0025 - 0.013 | - |
| CSS1206 | 1 | ± 175 | - | 0.0005 - 0.0006 | - |
| | | ± 75 | 0.005 - 0.006 | - | - |
| | | ± 50 | - | 0.001 - 0.004 | - |
| | | ± 25 | 0.007 - 0.015 | 0.005 - 0.015 | - |
| | | ± 15 | 0.016 - 0.05 | 0.016 - 0.05 | - |
| CSSH1206 | 2 | ± 75 | 0.005 | 0.001 - 0.005 | - |
| CSS2010 | 1 | ± 100 | - | 0.0005 - 0.0009 | - |
| | | ± 50 | - | 0.001 - 0.003 | - |
| | | ± 25 | 0.007 - 0.015 | 0.004 - 0.006 | - |
| | | ± 15 | 0.016 - 0.049 | 0.007 - 0.1 | - |
| CSSH2010 | 2 | ± 100 | - | 0.0005 - 0.0009 | - |
| | | ± 75 | - | 0.001 - 0.0019 | - |
| | | ± 50 | - | 0.002 - 0.0069 | - |
| | | ± 25 | 0.007 - 0.012 | 0.007 - 0.012 | - |
| CSS2512 | 2 | ± 150 | - | 0.0003 | - |
| | | ± 75 | 0.001 | - | - |
| | | ± 50 | 0.0011 - 0.003 | 0.0005 - 0.003 | - |
| | | ± 25 | 0.0031 - 0.0069 | 0.004 - 0.006 | - |
| | | ± 15 | 0.007 - 0.05 | 0.08 - 0.5 | - |
| CSSH2512 | 3 | ± 150 | - | 0.0003 | - |
| | | ± 75 | 0.001 | - | - |
| | | ± 50 | 0.0011 - 0.0025 | 0.0005 - 0.0025 | - |
| | | | 0.011 - 0.05 | 0.011 - 0.1 | - |
| | | ± 25 | 0.003 - 0.01 | 0.003 - 0.01 | - |

CSS / CSSH Series
Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

| Electrical Specifications (cont.) | | | | | |
|-----------------------------------|--------------------------|--------------|-------------------------------|------------------------------|----|
| Type/Code | Maximum Power Rating (W) | TCR (ppm/°C) | Ohmic Range (Ω) and Tolerance | | |
| | | | 0.5% | 1% | 5% |
| CSS2725 | 4 | ± 100 | - | 0.0002 | |
| | | ± 50 | - | 0.00025 - 0.003 | |
| CSS2728 | 3 | ± 25 | 0.004 - 0.007 | 0.004 - 0.007 0.101 - 0.2 | |
| | | ± 15 | 0.008 - 0.019 | 0.008 - 0.1 | |
| CSSH2728 | 4 | ± 25 | 0.004 - 0.007 | 0.004 - 0.007 | |
| | | ± 15 | 0.008 - 0.019 | 0.008 - 0.05 | |
| CSSH3637 | 7 | ± 50 | 0.0005, 0.00075 | 0.0003, 0.0005, 0.00075 | |
| | 6 | ± 50 | 0.001 | | |
| CSS4527 | 5 | ± 50 | 0.007 - 0.12 | 0.0005 - 0.2 | |

$V = \sqrt{P \cdot R}$

Mechanical Specifications



| Type/Code | Maximum Power Rating (W) | Resistance Range (Ω) | L | W | H | T1 | Unit |
|-----------|--------------------------|----------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| CSS0201 | 0.2 | 0.01, 0.02 | 0.024 ± 0.006 0.60 ± 0.15 | 0.012 ± 0.006 0.30 ± 0.15 | 0.010 ± 0.004 0.25 ± 0.10 | 0.006 ± 0.004 0.15 ± 0.10 | inches mm |
| CSS0402 | 0.33 | 0.0025 | 0.039 ± 0.006 1.00 ± 0.15 | 0.022 ± 0.006 0.55 ± 0.15 | 0.012 ± 0.004 0.30 ± 0.10 | 0.012 ± 0.004 0.30 ± 0.10 | inches mm |
| | | 0.005 - 0.02 | | | | 0.009 ± 0.004 0.23 ± 0.10 | inches mm |
| CSS0603 | 0.33 | 0.002 | 0.063 ± 0.010 1.60 ± 0.25 | 0.031 ± 0.010 0.80 ± 0.25 | 0.016 ± 0.010 0.40 ± 0.25 | 0.018 ± 0.008 0.45 ± 0.20 | inches mm |
| | | 0.0025, 0.003 | | | | 0.014 ± 0.008 0.35 ± 0.20 | inches mm |
| | | 0.004 - 0.02 | | | | 0.012 ± 0.008 0.30 ± 0.20 | inches mm |
| CSS0508 | 1 | 0.001 | 0.049 ± 0.010 1.25 ± 0.25 | 0.079 ± 0.010 2.00 ± 0.25 | 0.017 ± 0.006 0.42 ± 0.15 | 0.015 ± 0.010 0.38 ± 0.25 | inches mm |
| | | 0.0015 | | | | 0.015 ± 0.010 0.37 ± 0.25 | inches mm |
| | | 0.002 | | | | 0.014 ± 0.010 0.36 ± 0.25 | inches mm |
| | | 0.003 - 0.005 | | | | 0.013 ± 0.010 0.32 ± 0.25 | inches mm |
| CSS0805 | 0.5 | 0.0015 | 0.079 ± 0.010 2.00 ± 0.25 | 0.049 ± 0.010 1.25 ± 0.25 | 0.016 ± 0.010 0.40 ± 0.25 | 0.028 ± 0.008 0.70 ± 0.20 | inches mm |
| | | 0.002 | | | | 0.024 ± 0.008 0.60 ± 0.20 | inches mm |
| | | 0.003 - 0.02 | | | | 0.016 ± 0.008 0.40 ± 0.20 | inches mm |

CSS / CSSH Series
Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

| Mechanical Specifications (cont.) | | | | | | | |
|-----------------------------------|--------------------------|------------------------------|------------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Type/Code | Maximum Power Rating (W) | Resistance Range (Ω) | L | W | H | T1 | Unit |
| CSSH0805 | 1 | 0.0005 | 0.081 ± 0.010 2.05 ± 0.25 | 0.051 ± 0.012 1.30 ± 0.30 | 0.024 ± 0.008 | 0.030 ± 0.008 | inches |
| | | 0.001 | | | 0.60 ± 0.20 | 0.75 ± 0.20 | mm |
| | | | | | 0.022 ± 0.008 | 0.016 ± 0.008 0.40 ± 0.20 | inches |
| | | 0.0015 | | | 0.55 ± 0.20 | | mm |
| | | | | | 0.002 | 0.018 ± 0.008 | 0.016 ± 0.008 0.40 ± 0.20 |
| | | 0.45 ± 0.20 | | | | mm | |
| | | 0.0025 | | | 0.014 ± 0.008 | 0.016 ± 0.008 0.40 ± 0.20 | inches |
| | | | | | 0.35 ± 0.20 | | mm |
| 0.003 - 0.008 | 0.018 ± 0.008 | 0.016 ± 0.008 0.40 ± 0.20 | inches | | | | |
| 0.009 - 0.013 | 0.45 ± 0.20 | | mm | | | | |
| CSS1206 | 1 | 0.0005 - 0.0006 | 0.126 ± 0.010 3.20 ± 0.25 | 0.063 ± 0.010 1.60 ± 0.25 | 0.045 ± 0.010 | 0.029 ± 0.010 | inches |
| | | 0.001 - 0.0015 | | | 1.15 ± 0.25 | 0.73 ± 0.25 | mm |
| | | | | | 0.025 ± 0.010 | 0.020 ± 0.010 | inches |
| | | 0.002 - 0.004 | | | 0.65 ± 0.25 | 0.51 ± 0.25 | mm |
| | | 0.005 | | | 0.022 ± 0.010 | 0.020 ± 0.010 | inches |
| 0.006 - 0.05 | 0.55 ± 0.25 | 0.51 ± 0.25 | mm | | | | |
| CSSH1206 | 2 | 0.001 | 0.126 ± 0.010 3.20 ± 0.25 | 0.063 ± 0.010 1.60 ± 0.25 | 0.025 ± 0.010 | 0.020 ± 0.010 | inches |
| | | 0.002 - 0.004 | | | 0.65 ± 0.25 | 0.51 ± 0.25 | mm |
| | | | | | 0.005 | 0.021 ± 0.010 | 0.020 ± 0.010 |
| CSS2010 | 1 | 0.0005 - 0.0009 | 0.200 ± 0.010 5.08 ± 0.25 | 0.100 ± 0.010 2.54 ± 0.25 | 0.021 ± 0.010 | 0.021 ± 0.010 | inches |
| | | 0.001 - 0.003 | | | 0.55 ± 0.25 | 0.51 ± 0.25 | mm |
| | | | | | 0.0031 - 0.1 | 0.021 ± 0.010 | 0.024 ± 0.010 |
| CSSH2010 | 2 | 0.0005 - 0.0009 | 0.200 ± 0.010 5.08 ± 0.25 | 0.100 ± 0.010 2.54 ± 0.25 | 0.55 ± 0.25 | 0.60 ± 0.25 | mm |
| | | 0.001 - 0.003 | | | 0.031 ± 0.010 | 0.057 ± 0.010 | inches |
| | | | | | 0.79 ± 0.25 | 1.44 ± 0.25 | mm |
| | | 0.0031 - 0.004 | | | 0.031 ± 0.010 | 0.051 ± 0.010 | inches |
| 0.79 ± 0.25 | 1.30 ± 0.25 | | mm | | | | |
| CSS2512 | 2 | 0.0005 - 0.0009 | 0.200 ± 0.010 5.08 ± 0.25 | 0.100 ± 0.010 2.54 ± 0.25 | 0.025 ± 0.010 | 0.031 ± 0.010 | inches |
| | | 0.001 - 0.003 | | | 0.65 ± 0.25 | 0.79 ± 0.25 | mm |
| | | | | | 0.0031 - 0.004 | 0.025 ± 0.010 | 0.031 ± 0.010 |
| | | 0.0041 - 0.012 | | | 0.65 ± 0.25 | 0.79 ± 0.25 | mm |
| | | | | | 0.0003 | 0.045 ± 0.010 | 0.080 ± 0.010 |
| | | 1.15 ± 0.25 | | | | 2.02 ± 0.25 | mm |
| | | 0.0005 - 0.0007 | | | | 0.031 ± 0.010 | 0.080 ± 0.010 |
| 0.00075 | 0.79 ± 0.25 | 2.02 ± 0.25 | mm | | | | |
| | 0.0008 - 0.004 | 0.031 ± 0.010 | 0.054 ± 0.010 | inches | | | |
| 0.0041 - 0.075 | 0.79 ± 0.25 | 1.37 ± 0.25 | mm | | | | |
| | 0.08 - 0.1 | 0.031 ± 0.010 | 0.074 ± 0.010 | inches | | | |
| 0.3 - 0.5 | | 0.79 ± 0.25 | 1.88 ± 0.25 | mm | | | |
| | 0.026 ± 0.010 | 0.65 ± 0.25 | 1.12 ± 0.25 | mm | | | |
| 0.026 ± 0.010 | | 0.65 ± 0.25 | 0.025 ± 0.010 | inches | | | |
| 0.08 - 0.1 | 0.65 ± 0.25 | 0.62 ± 0.25 | mm | | | | |
| 0.3 - 0.5 | 0.028 ± 0.010 | 0.034 ± 0.010 | inches | | | | |
| | | 0.72 ± 0.25 | 0.87 ± 0.25 | mm | | | |

CSS / CSSH Series

Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

| Mechanical Specifications (cont.) | | | | | | | | |
|-----------------------------------|--------------------------|-------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------|
| Type/Code | Maximum Power Rating (W) | Resistance Range (Ω) | L | W | H | T1 | Unit | |
| CSSH2512 | 3 | 0.0003 | 0.246 \pm 0.010 6.25 \pm 0.25 | 0.126 \pm 0.010 3.20 \pm 0.25 | 0.045 \pm 0.010 1.15 \pm 0.25 | 0.080 \pm 0.010 2.02 \pm 0.25 | inches mm | |
| | | 0.0005 | | | 0.080 \pm 0.010 2.02 \pm 0.25 | inches mm | | |
| | | 0.0006 - 0.0007 | | | 0.074 \pm 0.010 1.88 \pm 0.25 | inches mm | | |
| | | 0.00075 | | | 0.054 \pm 0.010 1.37 \pm 0.25 | inches mm | | |
| | | 0.0008 - 0.0029 | | | 0.044 \pm 0.010 1.12 \pm 0.25 | inches mm | | |
| | | 0.003 - 0.0035 | | | 0.074 \pm 0.010 1.88 \pm 0.25 | inches mm | | |
| | | 0.0036 - 0.004 | | | 0.066 \pm 0.010 1.68 \pm 0.25 | inches mm | | |
| | | 0.0041 - 0.01 | | | 0.026 \pm 0.010 0.65 \pm 0.25 | 0.044 \pm 0.010 1.12 \pm 0.25 | inches mm | |
| | | 0.0101 - 0.079 ^(*) | | | 0.039 \pm 0.010 1.00 \pm 0.25 | 0.044 \pm 0.010 1.12 \pm 0.25 | inches mm | |
| | | 0.08 - 0.1 ^(*) | | | 0.039 \pm 0.010 1.00 \pm 0.25 | 0.034 \pm 0.010 0.87 \pm 0.25 | inches mm | |
| CSS2725 | 4 | 0.0002 - 0.0003 | 0.268 \pm 0.010 6.81 \pm 0.25 | 0.254 \pm 0.010 6.45 \pm 0.25 | 0.039 \pm 0.010 0.99 \pm 0.25 | 0.085 \pm 0.010 2.16 \pm 0.25 | inches mm | |
| | | 0.00035 | | | | 0.075 \pm 0.010 1.90 \pm 0.25 | inches mm | |
| | | 0.0004 - 0.00045 | | | | 0.051 \pm 0.010 1.30 \pm 0.25 | inches mm | |
| | | 0.0005 | | | | 0.085 \pm 0.010 2.16 \pm 0.25 | inches mm | |
| | | 0.0006 | | | | 0.071 \pm 0.010 1.80 \pm 0.25 | inches mm | |
| | | 0.00075 | | | | 0.059 \pm 0.010 1.50 \pm 0.25 | inches mm | |
| | | 0.001 | | | | 0.043 \pm 0.010 1.09 \pm 0.25 | 0.085 \pm 0.010 2.16 \pm 0.25 | inches mm |
| | | 0.0015 | | | | 0.039 \pm 0.010 0.99 \pm 0.25 | 0.085 \pm 0.010 2.16 \pm 0.25 | inches mm |
| | | 0.002 | | | | 0.035 \pm 0.010 0.89 \pm 0.25 | 0.071 \pm 0.010 1.80 \pm 0.25 | inches mm |
| | | 0.00225 - 0.0025 | | | | | 0.065 \pm 0.010 1.65 \pm 0.25 | inches mm |
| | | 0.003 | | | | | 0.051 \pm 0.010 1.30 \pm 0.25 | inches mm |
| CSS2728 | 3 | 0.004 - 0.2 | 0.264 \pm 0.010 6.71 \pm 0.25 | 0.283 \pm 0.010 7.19 \pm 0.25 | 0.039 \pm 0.010 0.99 \pm 0.25 | 0.045 \pm 0.010 1.14 \pm 0.25 | inches mm | |
| CSSH2728 | 4 | 0.004 - 0.05 | 0.264 \pm 0.010 6.71 \pm 0.25 | 0.283 \pm 0.010 7.19 \pm 0.25 | 0.039 \pm 0.010 0.99 \pm 0.25 | 0.045 \pm 0.010 1.14 \pm 0.25 | inches mm | |
| CSSH3637 | 7 | 0.0003 | 0.362 \pm 0.010 9.20 \pm 0.25 | 0.378 \pm 0.010 9.60 \pm 0.25 | 0.029 \pm 0.010 0.73 \pm 0.25 | 0.111 \pm 0.010 2.83 \pm 0.25 | inches mm | |
| | | 0.0005 | | | | 0.098 \pm 0.010 2.49 \pm 0.25 | inches mm | |
| | | 0.00075 | | | | 0.090 \pm 0.010 2.28 \pm 0.25 | inches mm | |
| | 6 | 0.001 | 0.090 \pm 0.010 2.28 \pm 0.25 | inches mm | | | | |

CSS / CSSH Series

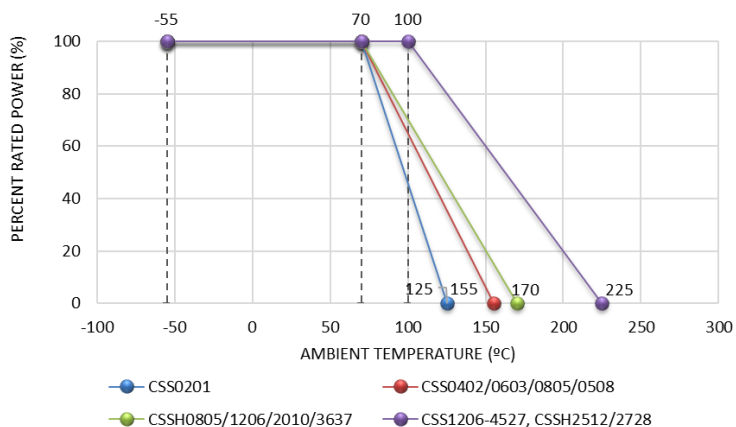
Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

| Mechanical Specifications (cont.) | | | | | | | |
|-----------------------------------|--------------------------|----------------------|-------------------------------|------------------------------|------------------------------|---------------|--------|
| Type/Code | Maximum Power Rating (W) | Resistance Range (Ω) | L | W | H | T1 | Unit |
| CSS4527 | 5 | 0.0005 | 0.450 ± 0.010 11.43 ± 0.25 | 0.270 ± 0.010 6.85 ± 0.25 | 0.059 ± 0.010 1.50 ± 0.25 | 0.137 ± 0.010 | inches |
| | | 0.0006 - 0.003 | | | | 3.47 ± 0.25 | mm |
| | | 0.004 - 0.005 | | | | 0.127 ± 0.010 | inches |
| | | 0.0051 - 0.2 | | | | 3.22 ± 0.25 | mm |
| | | | | | | 0.127 ± 0.010 | inches |
| | | | | | | 3.22 ± 0.25 | mm |
| | | | | | | 0.072 ± 0.010 | inches |
| | | | | | | 1.82 ± 0.25 | mm |

(*) with heat sink

Power Derating Curve:



| Performance Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------|---|--|---------------|---------------|---------|-----|----------|---------|------|--------------|---------|------|--------------|---------|---|--------------|---------|-----|--------------|----------|---|--------|---------|---|----------|----------|---|----------|---------|---|----------|----------|---|----------|---------|---|----------|----------|---|----------|---------|---|----------|---------|---|----------|----------|---|----------|----------|---------|----------------|---------|---|--------|--|------|-----------|-------------|---------|-----|-----------|---------|------|-----------|---------|------|-----------|---------|---|-----------|---------|-----|-----------|----------|---|---------|---------|---|---------|----------|---|---------|---------|---|---------|----------|---|---------|---------|---|---------|----------|---|---------|---------|---|---------|---------|---|---------|----------|---|---------|----------|---------|---------|---------|---|---------|
| Test | Test Method | Test Specification | Test Condition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature Coefficient of Resistance (TCR) | JIS-C-5201-1 4.8 | Per specification (refer to Electrical Specification table) | $TCR (ppm/^{\circ}C) = \frac{(R2 - R1)}{R1 (T2 - T1)} \times 10^6$ R1: resistance of room temperature (T1) R2: resistance of 125°C (T2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Short Time Overload | JIS C 5201-1 4.13 | <table border="1"> <thead> <tr> <th>Size</th> <th>Power (W)</th> <th>Max. R Change</th> </tr> </thead> <tbody> <tr><td>CSS0201</td><td>0.2</td><td>≤ ± 0.5%</td></tr> <tr><td>CSS0402</td><td>0.33</td><td>± 1% + 0.5mΩ</td></tr> <tr><td>CSS0603</td><td>0.33</td><td>± 1% + 0.5mΩ</td></tr> <tr><td>CSS0508</td><td>1</td><td>± 1% + 0.5mΩ</td></tr> <tr><td>CSS0805</td><td>0.5</td><td>± 1% + 0.5mΩ</td></tr> <tr><td>CSSH0805</td><td>1</td><td>≤ ± 1%</td></tr> <tr><td>CSS1206</td><td>1</td><td>≤ ± 0.5%</td></tr> <tr><td>CSSH1206</td><td>2</td><td>≤ ± 0.5%</td></tr> <tr><td>CSS2010</td><td>1</td><td>≤ ± 0.5%</td></tr> <tr><td>CSSH2010</td><td>2</td><td>≤ ± 0.5%</td></tr> <tr><td>CSS2512</td><td>2</td><td>≤ ± 0.5%</td></tr> <tr><td>CSSH2512</td><td>3</td><td>≤ ± 0.5%</td></tr> <tr><td>CSS2725</td><td>4</td><td>≤ ± 0.5%</td></tr> <tr><td>CSS2728</td><td>3</td><td>≤ ± 0.5%</td></tr> <tr><td>CSSH2728</td><td>4</td><td>≤ ± 0.5%</td></tr> <tr><td>CSSH3637</td><td>6 and 7</td><td>≤ 0.5% + 0.5mΩ</td></tr> <tr><td>CSS4527</td><td>5</td><td>≤ ± 2%</td></tr> </tbody> </table> | Size | Power (W) | Max. R Change | CSS0201 | 0.2 | ≤ ± 0.5% | CSS0402 | 0.33 | ± 1% + 0.5mΩ | CSS0603 | 0.33 | ± 1% + 0.5mΩ | CSS0508 | 1 | ± 1% + 0.5mΩ | CSS0805 | 0.5 | ± 1% + 0.5mΩ | CSSH0805 | 1 | ≤ ± 1% | CSS1206 | 1 | ≤ ± 0.5% | CSSH1206 | 2 | ≤ ± 0.5% | CSS2010 | 1 | ≤ ± 0.5% | CSSH2010 | 2 | ≤ ± 0.5% | CSS2512 | 2 | ≤ ± 0.5% | CSSH2512 | 3 | ≤ ± 0.5% | CSS2725 | 4 | ≤ ± 0.5% | CSS2728 | 3 | ≤ ± 0.5% | CSSH2728 | 4 | ≤ ± 0.5% | CSSH3637 | 6 and 7 | ≤ 0.5% + 0.5mΩ | CSS4527 | 5 | ≤ ± 2% | The number of rated power are as follows: <table border="1"> <thead> <tr> <th>Size</th> <th>Power (W)</th> <th>Rated Power</th> </tr> </thead> <tbody> <tr><td>CSS0201</td><td>0.2</td><td>2.5 times</td></tr> <tr><td>CSS0402</td><td>0.33</td><td>2.5 times</td></tr> <tr><td>CSS0603</td><td>0.33</td><td>2.5 times</td></tr> <tr><td>CSS0508</td><td>1</td><td>2.5 times</td></tr> <tr><td>CSS0805</td><td>0.5</td><td>2.5 times</td></tr> <tr><td>CSSH0805</td><td>1</td><td>4 times</td></tr> <tr><td>CSS1206</td><td>1</td><td>5 times</td></tr> <tr><td>CSSH1206</td><td>2</td><td>5 times</td></tr> <tr><td>CSS2010</td><td>1</td><td>5 times</td></tr> <tr><td>CSSH2010</td><td>2</td><td>5 times</td></tr> <tr><td>CSS2512</td><td>2</td><td>5 times</td></tr> <tr><td>CSSH2512</td><td>3</td><td>5 times</td></tr> <tr><td>CSS2725</td><td>4</td><td>5 times</td></tr> <tr><td>CSS2728</td><td>3</td><td>5 times</td></tr> <tr><td>CSSH2728</td><td>4</td><td>5 times</td></tr> <tr><td>CSSH3637</td><td>6 and 7</td><td>5 times</td></tr> <tr><td>CSS4527</td><td>5</td><td>5 times</td></tr> </tbody> </table> | Size | Power (W) | Rated Power | CSS0201 | 0.2 | 2.5 times | CSS0402 | 0.33 | 2.5 times | CSS0603 | 0.33 | 2.5 times | CSS0508 | 1 | 2.5 times | CSS0805 | 0.5 | 2.5 times | CSSH0805 | 1 | 4 times | CSS1206 | 1 | 5 times | CSSH1206 | 2 | 5 times | CSS2010 | 1 | 5 times | CSSH2010 | 2 | 5 times | CSS2512 | 2 | 5 times | CSSH2512 | 3 | 5 times | CSS2725 | 4 | 5 times | CSS2728 | 3 | 5 times | CSSH2728 | 4 | 5 times | CSSH3637 | 6 and 7 | 5 times | CSS4527 | 5 | 5 times |
| | | Size | Power (W) | Max. R Change | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0201 | 0.2 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0402 | 0.33 | ± 1% + 0.5mΩ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0603 | 0.33 | ± 1% + 0.5mΩ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0508 | 1 | ± 1% + 0.5mΩ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0805 | 0.5 | ± 1% + 0.5mΩ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH0805 | 1 | ≤ ± 1% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS1206 | 1 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH1206 | 2 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2010 | 1 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH2010 | 2 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2512 | 2 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH2512 | 3 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2725 | 4 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2728 | 3 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH2728 | 4 | ≤ ± 0.5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH3637 | 6 and 7 | ≤ 0.5% + 0.5mΩ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS4527 | 5 | ≤ ± 2% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Size | Power (W) | Rated Power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0201 | 0.2 | 2.5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0402 | 0.33 | 2.5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0603 | 0.33 | 2.5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0508 | 1 | 2.5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS0805 | 0.5 | 2.5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH0805 | 1 | 4 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS1206 | 1 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH1206 | 2 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2010 | 1 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH2010 | 2 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2512 | 2 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH2512 | 3 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2725 | 4 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS2728 | 3 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH2728 | 4 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSSH3637 | 6 and 7 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSS4527 | 5 | 5 times | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Rating power duration: 5 seconds. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

CSS / CSSH Series

Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Performance Characteristics (cont.)

| Test | Test Method | Test Specification | Test Condition |
|---------------------------------|------------------|---------------------------------------|---|
| Insulation Resistance | JIS-C-5201-1 4.6 | $\geq 10^9 \Omega$ | Put the resistor in the fixture, add 100 VDC in terminal for 60 seconds, then measure the insulation resistance between electrodes and insulating enclosure or between electrodes and base material |
| Dielectric Withstanding Voltage | JIS-C-5201-1 4.7 | No short or burned in the appearance. | Applied 500 VAC for 1 minute and limit surge current 50 mA (max) |

Operating Temperature Range for size CSS0201 is -55 to +125°C.

Operating Temperature Range for sizes CSS0402, CSS0603, CSS0805, and CSS0508 is -55 to +155°C.

Operating Temperature Range for size CSSH0805, CSSH1206, CSSH2010, and CSSH3637 is -55 to +170°C.

Operating Temperature Range for sizes CSS1206 - CSS4527, CSSH 2512 and CSSH 2728 is -55 to +225°C.

Mechanical Performance

| Test Item | Test Method | Test Specifications | Test Condition |
|---------------------------|-------------------|--|--|
| Resistance to Solder Heat | JIS C 5201-1 4.18 | 0201 - 0805: $\leq \pm 1\% + 0.5m\Omega$ CSSH0805 and above 1206: $\leq \pm 0.5\% + 0.5m\Omega$ CSSH3637: $\leq \pm 0.5\% + 0.5m\Omega$ Jumper < Rmax | 260 \pm 5°C for 10 \pm 1 seconds |
| Solderability | JIS C 5201-1 4.17 | > 95 % coverage | 245 \pm 5°C for 3 \pm 0.5 seconds |
| Substrate Bending | JIS C 5201-1 4.33 | $\pm 1\% + 0.5m\Omega$ CSSH3637: $\leq \pm 0.5\% + 0.5m\Omega$ | Span between fulcrums: 90 mm Bend width: 2 mm  |
| Resistance to Solvent | JIS C 5201-1 4.29 | $\leq \pm 0.5\%$ No evidence of mechanical damage | The tested resistor is immersed into isopropyl alcohol of 20 ~ 25°C for 60 seconds, then the resistor is left in the room for 48 hours. |
| Vibration | JIS C 5201-1 4.22 | $\leq \pm 0.5\%$ No evidence of mechanical damage | The resistor shall be mounted by its terminal leads to the supporting terminals on the solid table. The entire frequency range from 10 Hz to 55 Hz and return to 10 Hz, shall be transferred in 1 minute. Amplitude: 1.5 mm - This motion shall be applied for a period of 4 hours in each 3 mutually perpendicular directions (a total of 12 hours) |
| Mechanical Shock | JIS C 5202 6.7 | $\pm 1\% + 0.5m\Omega$ | a = 50 G, t = 11 ms, 5 times shock |

Environmental Performance

| Test Item | Test Method | Test Specifications | Test Condition |
|-------------------------------------|----------------------|---|---|
| Low Temperature Exposure (Storage) | JIS C 5201-1 4.23.4 | 0201 - 0805: $\leq \pm 1\% + 0.5m\Omega$ $\geq 1206: \pm 0.5\%$ | 1000 hours at -55 \pm 2°C |
| High Temperature Exposure (Storage) | JIS C 5201-1 4.23.2 | 0201 - 0805: $\leq \pm 1\% + 0.5m\Omega$ | 1000 hours at + 155 \pm 2°C |
| | | CSSH0805: $\pm 1\%$ CSSH3637: $\leq \pm 1\% + 0.5m\Omega$ $\geq 1206: \pm 1\%$ | 1000 hours at +170 \pm 5°C |
| | | 0201 Jumper < Rmax | 1000 hours at + 125 \pm 2°C |
| Temperature Cycling | JESD22 Method JA-104 | 0201 - 0805: $\leq \pm 1\% + 0.5m\Omega$ CSSH0805: $\leq \pm 0.5\% + 0.5m\Omega$ $\geq 1206: \leq \pm 0.5\% + 0.5m\Omega$ | -55 to +150°C 30 minutes each, except for 0201 which is -55 to +125°C 30 minutes each |

| Environmental Performance (cont.) | | | | | | | | | | | | | |
|-----------------------------------|---------------------------------|--|--|-------------------|--|-----------------------------|----------------|-----------------------------|----------------|----------------------------|------------|------------------------------|------|
| Test Item | Test Method | Test Specifications | Test Condition | | | | | | | | | | |
| Biased Humidity | JIS C 5201-1 4.24 | 0201 - 0805: $\leq \pm 2\% + 0.5m\Omega$ 0201 Jumper < R max | T = 40 \pm 2°C , RH = 90~95%, Load with Rated Current 1.5 hours "ON", 0.5 hours "OFF", 1000 hours | | | | | | | | | | |
| | | CSSH0805: $\pm 0.5\%$ CSSH3637: $\leq \pm 0.5\% + 0.5m\Omega$ $\geq 1206: \pm 0.5\%$ | 1000 hours at +85°C / 85% R.H., 10% of operating power 1.5 hours "ON" and 0.5 hours "OFF" | | | | | | | | | | |
| Load Life | JIS C 5201-1 4.25 | 0201 - 0805: $\leq \pm 2\% + 0.5m\Omega$ 0201 Jumper = R max CSSH0805: $\pm 1\%$ CSSH3637: $\leq \pm 1\% + 0.5m\Omega$ 1206 - 2728: $\pm 1\%$ 4527: $\pm 2\%$ | T = 70 \pm 2°C, load with Rated Current 1.5 hours "ON", 0.5 hours "OFF", 1000 hours | | | | | | | | | | |
| Whisker Test | JESD Standard No.22A121 class 2 | Max 50 μ m | Test item (Thermal Shock Test): <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Testing Condition</th> </tr> </thead> <tbody> <tr> <td>Minimum Storage Temperature</td> <td>-55 +0 / -10°C</td> </tr> <tr> <td>Maximum Storage Temperature</td> <td>85 + 10 / -0°C</td> </tr> <tr> <td>Temperature-Retaining Time</td> <td>10 minutes</td> </tr> <tr> <td>Number of Temperature Cycles</td> <td>1500</td> </tr> </tbody> </table> Inspection: Inspect for whisker formation on specimens that underwent the acceleration test, with a magnifier (stereo microscope) of about 40 or higher magnification. If judgement is difficult with this method, use a scanning electron microscope (SEM) of about 1000 or higher magnification. | Testing Condition | | Minimum Storage Temperature | -55 +0 / -10°C | Maximum Storage Temperature | 85 + 10 / -0°C | Temperature-Retaining Time | 10 minutes | Number of Temperature Cycles | 1500 |
| Testing Condition | | | | | | | | | | | | | |
| Minimum Storage Temperature | -55 +0 / -10°C | | | | | | | | | | | | |
| Maximum Storage Temperature | 85 + 10 / -0°C | | | | | | | | | | | | |
| Temperature-Retaining Time | 10 minutes | | | | | | | | | | | | |
| Number of Temperature Cycles | 1500 | | | | | | | | | | | | |

Recommended storage temperature: 25 \pm 5°C. Humidity: 60 \pm 20%.

Recommended Pad Layouts



| Type/Code | Maximum Power Rating (W) | Resistance Range (Ω) | a | b | i | Unit |
|-----------|--------------------------|-------------------------------|---------------|---------------|---------------|--------------|
| CSS0201 | 0.2 | 0.01, 0.02 | 0.008 0.20 | 0.013 0.33 | 0.010 0.25 | inches mm |
| CSS0402 | 0.33 | 0.0025 | 0.024 | 0.024 | 0.014 0.35 | inches mm |
| | | 0.005 - 0.02 | 0.60 | 0.60 | 0.016 0.40 | inches mm |
| CSS0603 | 0.33 | 0.002 | 0.056 1.41 | 0.036 0.92 | 0.015 0.38 | inches mm |
| | | 0.0025, 0.003 | 0.053 1.35 | 0.036 | 0.020 0.50 | inches mm |
| | | 0.004 - 0.02 | 0.051 1.30 | 0.92 | 0.024 0.60 | inches mm |
| CSS0508 | 1 | 0.001, 0.0015, 0.002 | 0.035 0.90 | 0.091 | 0.016 0.40 | inches mm |
| | | 0.003 - 0.005 | 0.033 0.85 | 2.30 | 0.020 0.50 | inches mm |
| CSS0805 | 0.5 | 0.0015, 0.002 | 0.061 1.55 | 0.057 | 0.020 0.50 | inches mm |
| | | 0.003 - 0.02 | 0.055 1.40 | 1.44 | 0.031 0.80 | inches mm |

CSS / CSSH Series

Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

Recommended Pad Layouts (cont.)

| Type/Code | Maximum Power Rating (W) | Resistance Range (Ω) | a | b | i | Unit |
|-----------|--------------------------|-------------------------------|---------------|----------------|---------------|--------------|
| CSSH0805 | 1 | 0.0005 | 0.053 1.35 | 0.071 1.80 | 0.012 0.30 | inches mm |
| | | 0.001 - 0.013 | 0.039 1.00 | | 0.039 1.00 | inches mm |
| CSS1206 | 1 | 0.0005 - 0.0006 | 0.065 1.65 | 0.086 2.18 | 0.035 0.90 | inches mm |
| | | 0.001 - 0.05 | 0.063 1.60 | 0.086 2.18 | 0.039 1.00 | inches mm |
| CSSH1206 | 2 | 0.001 - 0.005 | 0.063 1.60 | 0.086 2.18 | 0.039 1.00 | inches mm |
| CSS2010 | 1 | 0.0005 - 0.003 | 0.114 2.89 | 0.115 2.92 | 0.048 1.22 | inches mm |
| | | 0.0031 - 0.1 | 0.090 2.29 | | 0.095 2.41 | inches mm |
| CSSH2010 | 2 | 0.0005 - 0.003 | 0.114 2.89 | 0.115 2.92 | 0.048 1.22 | inches mm |
| | | 0.0031 - 0.012 | 0.090 2.29 | | 0.095 2.41 | inches mm |
| CSS2512 | 2 | 0.0003 - 0.0007 | 0.120 3.05 | 0.145 3.68 | 0.050 1.27 | inches mm |
| | | 0.00075 | 0.086 2.19 | 0.145 3.68 | 0.118 3.00 | inches mm |
| | | 0.0008 - 0.004 | 0.120 3.05 | 0.145 3.68 | 0.050 1.27 | inches mm |
| | | 0.00041 - 0.075 | 0.083 2.11 | 0.145 3.68 | 0.125 3.18 | inches mm |
| | | 0.08 - 0.1 | 0.083 2.11 | 0.145 3.68 | 0.125 3.18 | inches mm |
| | | 0.3 - 0.5 | 0.083 2.11 | 0.145 3.68 | 0.125 3.18 | inches mm |
| CSSH2512 | 3 | 0.0003 - 0.0005 | 0.120 3.05 | 0.145 3.68 | 0.050 1.27 | inches mm |
| | | 0.0006 - 0.0029 | 0.086 2.19 | | 0.118 3.00 | inches mm |
| | | 0.003 - 0.004 | 0.110 2.79 | | 0.071 1.80 | inches mm |
| | | 0.0101 - 0.1 | 0.086 2.19 | | 0.118 3.00 | inches mm |
| CSS2725 | 4 | 0.0002 - 0.003 | 0.125 3.18 | 0.270 6.86 | 0.052 1.32 | inches mm |
| CSS2728 | 3 | 0.004 - 0.2 | 0.108 2.75 | 0.308 7.82 | 0.138 3.51 | inches mm |
| CSSH2728 | 4 | 0.004 - 0.1 | 0.108 2.75 | 0.308 7.82 | 0.138 3.51 | inches mm |
| CSSH3637 | 7 | 0.0003 - 0.00075 | 0.152 | 0.413 10.50 | 0.114 2.90 | inches mm |
| | 6 | 0.001 | 3.85 | | | |
| CSS4527 | 5 | 0.0005 - 0.005 | 0.228 5.80 | 0.344 8.74 | 0.138 3.51 | inches mm |
| | | 0.0051 - 0.2 | 0.163 4.15 | | 0.268 6.81 | inches mm |

Recommended Solder Profiles

This information is intended as a reference for solder profiles for Stackpole resistive components. These profiles should be compatible with most soldering processes. These are only recommendations. Actual numbers will depend on board density, geometry, packages used, etc., especially those cells labeled with “*”.

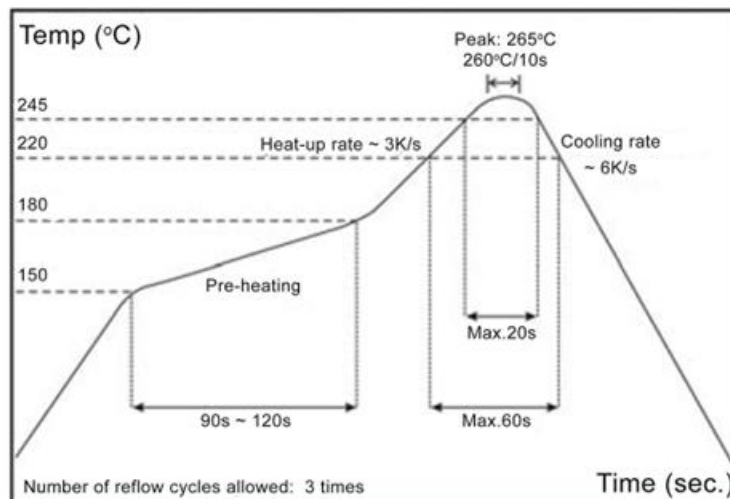
Soldering iron recommended temperatures: 330 to 350°C with minimum duration.
 Maximum number of reflow cycles: 3.

| Wave Soldering | | | |
|--------------------|------------|-------------|------------|
| Description | Maximum | Recommended | Minimum |
| Preheat Time | 80 seconds | 70 seconds | 60 seconds |
| Temperature Diff. | 140°C | 120°C | 100°C |
| Solder Temp. | 260°C | 250°C | 240°C |
| Dwell Time at Max. | 10 seconds | 5 seconds | * |
| Ramp DN (°C/sec) | N/A | N/A | N/A |

Temperature Diff. = Difference between final preheat stage and soldering stage.

| Convection IR Reflow | | | |
|----------------------|-------------|-------------|------------|
| Description | Maximum | Recommended | Minimum |
| Ramp Up (°C/sec) | 3°C/sec | 2°C/sec | * |
| Dwell Time > 217°C | 150 seconds | 90 seconds | 60 seconds |
| Solder Temp. | 260°C | 245°C | * |
| Dwell Time at Max. | 30 seconds | 15 seconds | 10 seconds |
| Ramp DN (°C/sec) | 6°C/sec | 3°C/sec | * |

Recommended Resistor Reflow Profile

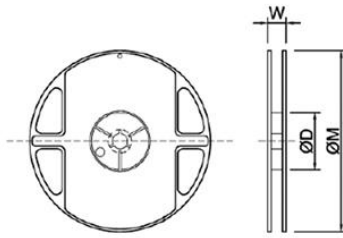


CSS / CSSH Series

Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Reel Specifications



| Type/Code | Tape Width | W | ØD | ØM | Unit |
|--------------------------------------|------------|-------------------------------|-------------------------------|--------------------------------|--------------|
| 0201, 0402, 0603 0508, 0805, 1206 | 8 mm | 0.354 ± 0.020 9.00 ± 0.50 | 2.362 ± 0.079 60.00 ± 2.00 | 7.008 ± 0.197 178.00 ± 5.00 | inches |
| CSSH0805 | | 0.472 ± 0.020 12.00 ± 0.50 | | | mm |
| CSSH3637 | 16 mm | 0.685 ± 0.039 17.40 ± 1.00 | 2.362 ± 0.039 60.00 ± 1.00 | 7.008 ± 0.079 178.00 ± 2.00 | inches mm |
| 2010, 2512, 2725, 2728 | 12 mm | 0.543 ± 0.020 13.80 ± 0.50 | 3.150 ± 0.039 80.00 ± 1.00 | 7.008 ± 0.197 178.00 ± 5.00 | inches |
| 4527 | 24 mm | 0.984 ± 0.039 25.00 ± 1.00 | 2.362 ± 0.039 60.00 ± 1.00 | | mm |

Packaging Specifications – Paper Tape

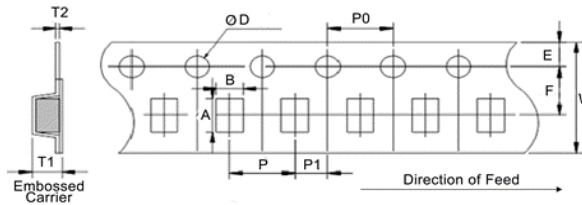


| Type/Code | W | P | E | F | ØD | Unit | | |
|-----------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------------|------------------------------|------------------------------|--------|
| CSS0201 | 0.315 ± 0.012 8.00 ± 0.30 | 0.079 ± 0.004 2.00 ± 0.10 | 0.069 ± 0.004 1.75 ± 0.10 | 0.138 ± 0.004 3.50 ± 0.10 | 0.059 +0.004 / -0 1.50 +0.1 / -0 | inches | | |
| CSS0402 | | mm | | | | | | |
| CSS0603 | | mm | | | | | | |
| CSS0508 | | mm | | | | | | |
| CSS0805 | | mm | | | | | | |
| Type/Code | G | H | A | B | T | Unit | | |
| CSS0201 | 0.157 ± 0.004 4.00 ± 0.10 | 0.079 ± 0.004 2.00 ± 0.10 | 0.016 ± 0.008 0.40 ± 0.20 | 0.028 ± 0.008 0.70 ± 0.20 | 0.018 ± 0.002 0.45 ± 0.05 | inches | | |
| CSS0402 | | | mm | | | | | |
| CSS0603 | | | 0.026 ± 0.008 0.65 ± 0.20 | 0.039 ± 0.008 0.98 ± 0.20 | 0.043 ± 0.008 1.10 ± 0.20 | 0.073 ± 0.008 1.85 ± 0.20 | 0.017 ± 0.002 0.42 ± 0.05 | inches |
| CSS0508 | | | mm | | | | | |
| CSS0805 | | | 0.061 ± 0.008 1.55 ± 0.20 | 0.091 ± 0.008 2.30 ± 0.20 | 0.024 ± 0.004 0.60 ± 0.10 | 0.028 ± 0.008 0.70 ± 0.20 | 0.030 ± 0.008 0.75 ± 0.20 | inches |
| | | | | | | mm | | |

CSS / CSSH Series
Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Packaging Specifications – Plastic Tape



| Type/Code | A | B | W | E | F | T1 | Unit | |
|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|-------------------------------|------------------------------|--------------|
| CSS1206/CSSH1206 (0.0005Ω - 0.0006Ω) | 0.138 ± 0.004 3.50 ± 0.10 | 0.075 ± 0.004 1.90 ± 0.10 | 0.315 ± 0.006 8.00 ± 0.15 | 0.069 ± 0.004 1.75 ± 0.10 | 0.138 ± 0.004 3.50 ± 0.10 | 0.050 ± 0.004 1.27 ± 0.10 | inches mm | |
| CSS1206/CSSH1206 (≥ 0.001Ω) | 0.137 ± 0.004 3.48 ± 0.10 | 0.072 ± 0.004 1.83 ± 0.10 | | | | 0.043 ± 0.004 1.10 ± 0.10 | inches mm | |
| CSS2010/CSSH2010 | 0.215 ± 0.004 5.45 ± 0.10 | 0.114 ± 0.004 2.90 ± 0.10 | 0.472 ± 0.006 12.00 ± 0.15 | | 0.217 ± 0.004 5.50 ± 0.10 | 0.052 ± 0.004 1.33 ± 0.10 | inches mm | |
| CSS2512/CSSH2512 (0.0003Ω) | 0.265 ± 0.004 6.74 ± 0.10 | 0.138 ± 0.004 3.50 ± 0.10 | | | | 0.063 ± 0.004 1.60 ± 0.10 | inches mm | |
| CSS2512/CSSH2512 | 0.266 ± 0.004 6.75 ± 0.10 | | | | | 0.051 ± 0.004 1.30 ± 0.10 | inches mm | |
| CSS2725 | 0.281 ± 0.004 7.15 ± 0.10 | 0.266 ± 0.004 6.75 ± 0.10 | | | | 0.077 ± 0.004 1.95 ± 0.10 | inches mm | |
| CSS2728 | 0.281 ± 0.004 7.15 ± 0.10 | 0.303 ± 0.004 7.70 ± 0.10 | 0.057 ± 0.004 1.45 ± 0.10 | | | inches mm | | |
| CSSH0805 0.0005Ω - 0.001Ω | 0.096 ± 0.004 2.45 ± 0.10 | 0.067 ± 0.004 1.70 ± 0.10 | 0.315 ± 0.012 8.00 ± 0.30 | | | 0.138 ± 0.004 3.50 ± 0.10 | 0.035 ± 0.010 0.90 ± 0.25 | inches mm |
| CSSH0805 0.0015Ω - 0.013Ω | 0.096 ± 0.004 2.45 ± 0.10 | | | | 0.022 ± 0.010 0.55 ± 0.25 | | inches mm | |
| CSSH3637 | 0.394 ± 0.004 10.00 ± 0.10 | 0.378 ± 0.004 9.60 ± 0.10 | 0.630 ± 0.008 16.00 ± 0.20 | | 0.295 ± 0.004 7.50 ± 0.10 | 0.051 ± 0.004 1.30 ± 0.10 | inches mm | |
| CSS4527 | 0.465 ± 0.004 11.80 ± 0.10 | 0.283 ± 0.004 7.20 ± 0.10 | 0.945 ± 0.006 24.00 ± 0.15 | 0.453 ± 0.004 11.50 ± 0.10 | | 0.079 ± 0.004 2.00 ± 0.10 | inches mm | |
| | | | | | | | | |
| Type/Code | T2 | P | P0 | P1 | ØD | Unit | | |
| CSS1206/CSSH1206 (0.0005Ω - 0.0006Ω) | 0.009 ± 0.004 0.23 ± 0.10 | 0.157 ± 0.004 4.00 ± 0.10 | 0.157 ± 0.004 4.00 ± 0.10 | 0.079 ± 0.004 2.00 ± 0.10 | 0.059 +0.004/- 1.50 +0.10/-0 | inches | | |
| CSS1206/CSSH1206 (≥ 0.001Ω) | 0.008 ± 0.002 0.20 ± 0.05 | | | | | inches | | |
| CSS2010/CSSH2010 | 0.009 ± 0.002 0.23 ± 0.05 | | | | | inches | | |
| CSS2512/CSSH2512 (0.0003Ω) | 0.009 ± 0.002 0.24 ± 0.05 | | | | | inches | | |
| CSS2512/CSSH2512 | 0.008 ± 0.002 0.20 ± 0.05 | | | | | inches | | |
| CSS2725 | 0.010 ± 0.002 0.25 ± 0.05 | | | | | 0.315 ± 0.004 8.00 ± 0.10 | inches | |
| CSS2728 | | | | | | 0.472 ± 0.004 12.00 ± 0.10 | inches | |
| CSSH0805 0.0005Ω - 0.001Ω | 0.008 ± 0.002 0.20 ± 0.05 | | | | | 0.157 ± 0.004 4.00 ± 0.10 | inches | |
| CSSH0805 0.0015Ω - 0.013Ω | | | | | | inches | | |
| CSSH3637 | 0.010 ± 0.002 0.25 ± 0.05 | | | | | 0.472 ± 0.004 12.00 ± 0.10 | inches | |
| CSS4527 | 0.012 ± 0.004 0.30 ± 0.10 | 0.472 ± 0.004 12.00 ± 0.10 | inches | | | | | |

RoHS Compliance

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union's directive regarding "Restrictions on Hazardous Substances" (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

| RoHS Compliance Status | | | | | | |
|-------------------------|--|----------------------------|--------------------------------|-----------------------------------|--|---------------------------------------|
| Standard Product Series | Description | Package / Termination Type | Standard Series RoHS Compliant | Lead-Free Termination Composition | Lead-Free Mfg. Effective Date (Std Product Series) | Lead-Free Effective Date Code (YY/WW) |
| CSS | Ultra-Precision Current Sensing Chip Resistor | SMD | YES | 100% Matte Sn over Ni | Always | Always |
| CSSH | Ultra-Precision Current Sensing Chip Resistor (High Power) | SMD | YES | 100% Matte Sn over Ni | Always | Always |

"Conflict Metals" Commitment

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the "conflict region" of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

Compliance to "REACH"

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, "The Registration, Evaluation, Authorization and Restriction of Chemicals", otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

Environmental Policy

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

CSS / CSSH Series
Ultra-Precision Metal Alloy Current Sensing Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

How to Order



| Product Series | | Size | Tolerance | | Packaging | | | | Resistance Value |
|----------------|-------------|------|-----------|------|-----------|--------------------|-------------------------|----------|---|
| Code | Description | Size | Code | Tol | Code | Description | Size | Quantity | Four characters with the multiplier used as the decimal holder. "L" used as multiplier of 10 ⁻³ for any value under 0.1 ohm. |
| CSS | Metal Alloy | 0201 | D | 0.5% | T | 7" Reel Paper Tape | 0201, 0402 | 10000 | |
| CSSH | High Power | 0402 | F | 1% | | | 0603, 0508 | 5000 | |
| | | 0603 | G | 2% | | | 0805 | | |
| | | 0805 | J | 5% | | | 1206 (≥0.001Ω) | 4000 | |
| | | 0508 | | | | | 1206 (0.0003 - 0.0006Ω) | 2000 | |
| | | 1206 | | | | | 2010, 2512 (>0.0003Ω) | | |
| | | 2010 | | | | | 2512 (0.0003Ω) | 1000 | |
| | | 2512 | | | | | 2725, 2728, 3637 | | |
| | | 2728 | | | | | 4527 | 500 | |
| | | 2725 | | | | | | | |
| | | 3637 | | | | | | | |
| | | 4527 | | | | | | | |

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