

June 2021

Automotive Grade

Component Guide



BOURNS®

Introduction



Systems and electronics within automobiles have become increasingly more sophisticated with the introduction of new and improved features every year. Crucial to customer satisfaction is that each of these features must be reliably powered, protected and connected to its respective interface within the overall automotive system. Bourns has substantial automotive component level experience and supplies leading component solutions. The Bourns Automotive division has extensive experience designing, building and supplying high reliability AEC-Q compliant components. Bourns offers a wide variety of resistors and magnetics to condition and filter electronic circuits. To complement our conditioning products, we offer a portfolio of circuit protection products that have been used by our customers in typical automotive applications.

All Bourns® standard components that are approved for typical automotive applications are manufactured in facilities that are fully certified to IATF 16949, and have been tested, qualified using the AEC-Q product validation standard for passive components and presented to the customer for selection and approval using PPAP. Bourns also offers customers access to our application test lab.

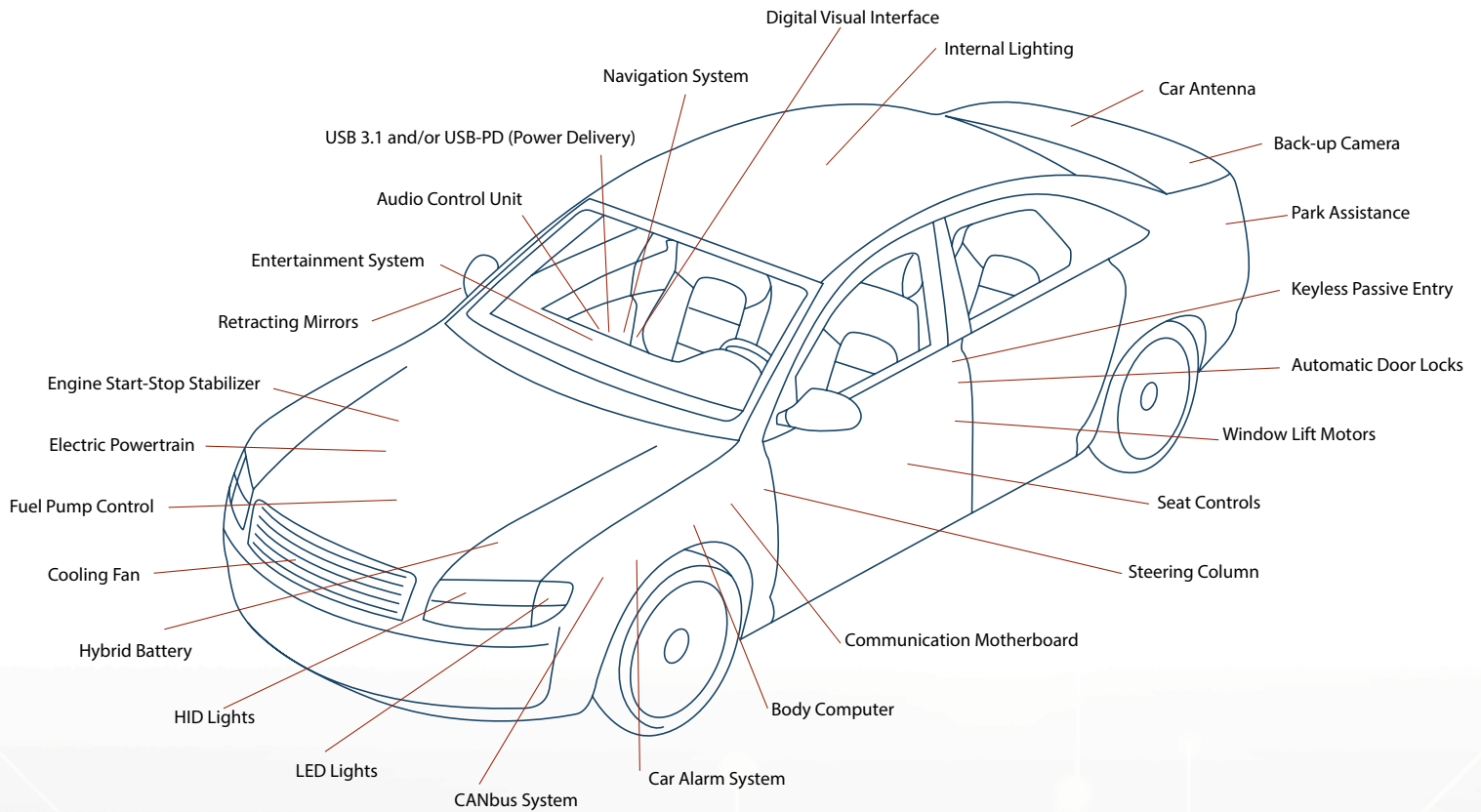
Bourns has a long history of serving the automotive market with quality sensor products. The company's inductive and circuit protection components are available to meet the board level requirements of many automotive applications. With excellent customer service and the availability of field application engineers, Bourns works closely with automotive system designers in helping customers select the right components, providing layout support, and making modifications as requested by the customer. Bourns performs surge tests and offers application and customer-specific testing.

Bourns® Automotive Grade standard components are designed and developed to meet the following criteria:

- Compliance with the latest applicable AEC-Q200, AEC-Q101 or AEC-Q102 product validation standard or its equivalent as determined by Bourns
- New product and new process development meets or exceeds the requirements established in the latest AIAG revision of the Advanced Product Quality Planning (APQP) process. Bourns' design review process may be used if the Bourns quality and design engineering teams have established that the Bourns® standard component meets or exceeds the requirements of the APQP process
- The manufacturing facility(ies) has a VDA 6.3 process audit score greater than 80 % with no downgrade
- The manufacturing site (Bourns or third-party subcontractor) that manufactures the Bourns® standard components must be certified to IATF 16949
- The Bourns® standard components must be presented to a customer for approval using PPAP

The "Automotive Grade" designation is not a substitute for the customer's careful selection and testing of such Bourns® standard components in their particular applications.

Typical Uses by Customers - Bourns® Automotive Grade Components



Comfort & Positioning

- Window Lift Motor
- Seat Position Motor
- Seat Heater
- Park Assistance
- Back-up Camera
- Keyless Passive Entry
- Automatic Door Lock
- Body Computer
- Steering Column
- Retracting External Mirror
- Rear View Interior Mirror

Electrification

- Fuel Pump
- Start-Stop Module
- Battery Charger
- Cooling Fan
- Body Control
- Parking Assist
- Start-Stop Engine Control
- On Board Charging (OBC)
- Battery Management System (BMS)
- Advanced Driving Assistance System (ADAS)

Infotainment

- Instrument Cluster
- Stereo (Audio) Control
- In-Car Camera
- In-Car Television
- Ethernet Hub/Switch
- USB Charging Port
- Antenna
- Communications ECU
- GPS & Navigation Control


































Lighting

- HID Headlight
- LED Headlight
- Internal LED Light

Networks

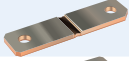
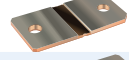
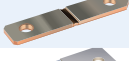












- CAN
- FlexRay
- LIN
- Ethernet

Fixed Resistors

| Model | Photo | Tolerances | Temperature Coefficient, (ppm/°C) | Power (W) | Resistance Range (Ω) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|------------|---|--------------|-----------------------------------|------------|----------------------|--------------------|--------------------|--------------------|
| CAT10A-LF |  | 5% | ±300 | 0.063 | 10 - 1M | Yes | Level 3 | Yes |
| CAT16A-LF |  | 1%, 5% | ±200, ±400 | 0.063 | 10 - 1M | Yes | Level 3 | Yes |
| CAY10A-AS |  | 5% | ±250, ±500 | 0.063 | 3 - 1M | Yes | Level 3 | Yes |
| CAY10A-LF |  | 5% | ±250, ±500 | 0.063 | 3 - 1M | Yes | Level 3 | Yes |
| CAY16A-AS |  | 5% | ±200, ±400 | 0.063 | 3 - 1M | Yes | Level 3 | Yes |
| CAY16A-LF |  | 1%, 5% | ±200, ±400 | 0.063 | 3 - 1M | Yes | Level 3 | Yes |
| CHP-A |  | 1%, 5% | ±100, ±200 | 0.33 - 3 | 10 - 1M | Yes | Level 3 | Yes |
| CMP-A |  | 1%, 5% | ±100, ±200 | 0.25 - 1.5 | 10 - 1M | Yes | Level 3 | Yes |
| CR0201A-AS |  | 1%, 5% | ±100, ±200, -200+600 | 0.05 | 1 - 10 M | Yes | Level 3 | Yes |
| CR0402A-AS |  | 1%, 5% | ±100, ±200, -200+500 | 0.063 | 1 - 20 M | Yes | Level 3 | Yes |
| CR0603A-AS |  | 1%, 5% | ±100, ±200, ±400 | 0.1 | 1 - 20 M | Yes | Level 3 | Yes |
| CR0805A-AS |  | 1%, 5% | ±100, ±200, ±400 | 0.125 | 1 - 20 M | Yes | Level 3 | Yes |
| CR1206A-AS |  | 1%, 5% | ±100, ±200, ±400 | 0.25 | 1 - 20 M | Yes | Level 3 | Yes |
| CR1210A-AS |  | 1%, 5% | ±100, ±200, ±400 | 0.33 | 1 - 20 M | Yes | Level 3 | Yes |
| CR2010A-AS |  | 1%, 5% | ±100, ±200, ±400 | 0.5 | 1 - 20 M | Yes | Level 3 | Yes |
| CR2512A-AS |  | 1%, 5% | ±100, ±200, ±400 | 1 | 1 - 20 M | Yes | Level 3 | Yes |
| CRA2512 |  | 1%, 5% | ±50 | 3 | 10 m - 100 m | Yes | Level 3 | Yes |
| CRE2512 |  | 1% | ±50 | 2/3 | 1 m - 9 m | Yes | Level 3 | Yes |
| CRF0805 |  | 1%, 5% | ±50 | 0.5 | 3 m - 20 m | Yes | Level 3 | Yes |
| CRF1206 |  | 1%, 5% | ±50 | 1 | 1 m - 30 m | Yes | Level 3 | Yes |
| CRF2512 |  | 1%, 5% | ±50 | 1; 2 | 1 m - 50 m | Yes | Level 3 | Yes |
| CRM0603A |  | 0.5%, 1%, 5% | ±100, ±200 | 0.125 | 50 m - 1 M | Yes | Level 3 | Yes |
| CRM0805A |  | 0.5%, 1%, 5% | ±100, ±200 | 0.25 | 50 m - 1 M | Yes | Level 3 | Yes |
| CRM1206A |  | 0.5%, 1%, 5% | ±100, ±200 | 0.5 | 50 m - 1 M | Yes | Level 3 | Yes |
| CRM1210A |  | 0.5%, 1%, 5% | ±100, ±200 | 0.5 | 50 m - 1 M | Yes | Level 3 | Yes |
| CRM2010A |  | 0.5%, 1%, 5% | ±100, ±200 | 1 | 50 m - 1 M | Yes | Level 3 | Yes |
| CRM2512A |  | 0.5%, 1%, 5% | ±100, ±200 | 2 | 50 m - 1 M | Yes | Level 3 | Yes |
| CRS0603A |  | 1%, 5% | ±100, ±200 | 0.125 | 1 - 1 M | Yes | Level 3 | Yes |
| CRS0805A |  | 1%, 5% | ±100, ±200 | 0.25 | 1 - 1 M | Yes | Level 3 | Yes |
| CRS1206A |  | 1%, 5% | ±100, ±200 | 0.5 | 1 - 1 M | Yes | Level 3 | Yes |
| CRS1210A |  | 1%, 5% | ±100, ±200 | 0.5 | 1 - 1 M | Yes | Level 3 | Yes |
| CRS2010A |  | 1%, 5% | ±100, ±200 | 1 | 1 - 1 M | Yes | Level 3 | Yes |
| CRS2512A |  | 1%, 5% | ±100, ±200 | 2 | 1 - 1 M | Yes | Level 3 | Yes |






Fixed Resistors

| Model | Photo | Tolerances | Temperature Coefficient, (ppm/ °C) | Power (W) | Resistance Range (Ω) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|------------|---|------------|------------------------------------|-----------|----------------------|--------------------|--------------------|--------------------|
| CSM2F-6918 |  | 5 % | ±50 | 36 | 0.05 m - 0.1 m | Yes | Level 3 | Yes |
| CSM2F-7036 |  | 1 %, 5 % | ±50 | 50 | 0.05 m - 0.1 m | Yes | Level 3 | Yes |
| CSM2F-8518 |  | 5 % | ±50 | 36 | 0.05 m - 0.1 m | Yes | Level 3 | Yes |
| CSM2F-8536 |  | 5 % | ±150, ±200 | 50 | 25 - 100 μ | Yes | Level 3 | Yes |
| CSS2H-2512 |  | 1 %, 5 % | ±50 | 1.5 - 6 | 0.3 m - 5 m | Yes | Level 3 | Yes |
| CSS2H-3920 |  | 1 %, 5 % | ±50 | 2 - 12 | 0.2 m - 5 m | Yes | Level 3 | Yes |
| CSS2H-5930 |  | 1 %, 5 % | ±50 | 4 - 15 | 0.2 m - 3 m | Yes | Level 3 | Yes |
| CSS4J-4026 |  | 1 %, 5 % | ±50 | 3 - 5 | 0.2 - 5 m | Yes | Level 3 | Yes |
| CST0612 |  | 1 % | ±100, ±200 | 1 | 0.5 m - 5 m | Yes | Level 3 | Yes |
| PWR163 |  | 1 %, 5 % | ±100 | 25 | 20 m - 130 K | Yes | Level 3 | Yes |
| PWR220T-20 |  | 1 %, 5 % | ±100 | 20 | 0.02 - 130K | Yes | Level 3 | Yes |
| PWR220T-35 |  | 1 %, 5 % | ±100 | 35 | 0.02 - 130K | Yes | Level 3 | Yes |
| PWR221T-30 |  | 1 %, 5 % | ±100, ±300, ±600 | 30 | 0.02 - 130K | Yes | Level 3 | Yes |
| PWR263S-20 |  | 1 %, 5 % | ±100 | 20 | 20 m - 130 K | Yes | Level 3 | Yes |
| PWR263S-35 |  | 1 %, 5 % | ±100 | 35 | 20 m - 130 K | Yes | Level 3 | Yes |


























Transformers

| Model | Photo | Size (mm) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|-----------|---|-------------------|--------------------|--------------------|--------------------|
| SM91071AL |  | 12.8 x 9.5 x 5.65 | Yes | Level 3 | Yes |
| SM91072AL |  | 12.8 x 9.5 x 5.65 | Yes | Level 3 | Yes |
| SM91073AL |  | 12.8 x 9.5 x 5.65 | Yes | Level 3 | Yes |
| SM91074AL |  | 12.8 x 9.5 x 5.65 | Yes | Level 3 | Yes |
| SM91501AL |  | 14.8 x 14.73 x 5 | Yes | Level 3 | Yes |
| SM91509AL |  | 14.81 x 14.73 x 5 | Yes | Level 3 | Yes |
| SM91509AL |  | 7.6 x 8.9 x 5.7 | Yes | Level 3 | Yes |

Trimpot® Trimming Potentiometers & Position Sensors


























| Model | Photo | Size (mm) | Resistance Range | Rotational Life | Linearity | Power Rating | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|-------|---|-----------|-------------------------|-----------------|-----------|--------------|--------------------|--------------------|--------------------|
| 3313 |  | 3 | 10 ohms - 2 megohms | 100 cycles | - | .125 watts | Yes | Level 3 | Yes |
| 3314 |  | 4 | 10 ohms - 2 megohms | 100 cycles | - | .25 watts | Yes | Level 3 | Yes |
| 3382 |  | 12 | 2.5 K ohms - 100 K ohms | 1 M cycles | +/- 2% | .05 watts | Yes | Level 3 | Yes |

Power Inductors



| Model | Photo | Size (mm) | Shielded | Inductance Range (μ H) | Current Range (A) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|-----------|---|-------------------|----------|-----------------------------|-------------------|----------------------------|--------------------|--------------------|
| PQ2614BHA |  | 28 x 28 x 16 | Yes | 2.2 - 33 | 30 | -2R2K, -330K | Level 3 | Yes |
| PQ2614BLA |  | 28 x 28 x 16 | Yes | 1 - 33 | 30 | -330K | Level 3 | Yes |
| PQ2617BHA |  | 28 x 28 x 19 | Yes | 3.3 - 33 | 30 | -220K | Level 3 | Yes |
| SDE0403A |  | 4.5 x 4 x 3.2 | No | 1 - 68 | 0.4 - 2.7 | -2R2M, -150M, -680K | Level 3 | Yes |
| SDE0604A |  | 5.8 x 5.2 x 4.5 | No | 1.2 - 150 | 0.52 - 5.3 | -3R3M, -330M, -101K | Level 3 | Yes |
| SDE0805A |  | 7.8 x 7 x 5 | No | 1.5 - 470 | 0.55 - 5.8 | -100M, -101K, -471K | Level 3 | Yes |
| SDE1006A |  | 10 x 9 x 5.4 | No | 1.5 - 820 | 0.45 - 7.2 | -2R2M, -150M, -680K | Level 3 | Yes |
| SRF1010DA |  | 12 x 9.6 x 11.6 | Yes | 0.43 - 15 | 4.6 - 27 | -R43M, -150M, -7R5M | Level 3 | Yes |
| SRN2508A |  | 2.5 x 2 x 0.8 | Yes | 0.47 - 10 | 0.45 - 1.45 | -R47M, -2R2M, -6R8M | Level 3 | Yes |
| SRN2010TA |  | 2 x 1.6 x 1 | Yes | 0.47 - 22 | 0.27 - 2.35 | -3R3M, -150M, -R47Y | Level 3 | Yes |
| SRN3010TA |  | 3 x 3 x 1 | Yes | 1 - 22 | 0.6 - 2.1 | -1R5Y, -6R8M, 220M | Level 3 | Yes |
| SRN3012TA |  | 3 x 3 x 1.2 | Yes | 1 - 22 | 0.61 - 2 | -3R3M, -150M, -1R0Y | Level 3 | Yes |
| SRN3015TA |  | 3 x 3 x 1.5 | Yes | 1 - 47 | 0.4 - 2.2 | -2R2M, -100M, -330M | Level 3 | Yes |
| SRN4012TA |  | 4 x 4 x 1.2 | Yes | 0.47 - 22 | 0.62 - 3.2 | -2R2M, -150M, -R47M | Level 3 | Yes |
| SRN4018TA |  | 4 x 4 x 1.8 | Yes | 1 - 150 | 0.27 - 3.2 | -1R0M, -150M, -101M | Level 3 | Yes |
| SRN5020TA |  | 5 x 5 x 2 | Yes | 1 - 47 | 0.7 - 4.1 | -1R0M, -220M, -6R8M | Level 3 | Yes |
| SRN5040TA |  | 5 x 5 x 4.1 | Yes | 0.6 - 100 | 0.72 - 8 | -1R0M, -330M, -4R7M | Level 3 | Yes |
| SRN6045TA |  | 6 x 6 x 4.5 | Yes | 1 - 470 | 0.4 - 8 | -1R0M, -220M, -221M | Level 3 | Yes |
| SRN8040TA |  | 8 x 8 x 4.5 | Yes | 0.5 - 330 | 0.7 - 12 | -1R0Y, -221M, -470M, -6R8M | Level 3 | Yes |
| SRP1038A |  | 11 x 10 x 3.8 | Yes | 0.22 - 47 | 3 - 35 | -2R2Y, -150Y, -101Y | Level 3 | Yes |
| SRP1040VA |  | 11 x 10 x 3.8 | Yes | 1 - 68 | 3.5 - 27 | -3R3M, -100M, -470M | Level 3 | Yes |
| SRP1238A |  | 13.5 x 12.5 x 3.3 | Yes | 0.1 - 10 | 7 - 43 | -1R0Y, -100M, -101M | Level 3 | Yes |
| SRP1245A |  | 13.5 x 12.5 x 4.8 | Yes | 0.33 - 18 | 7.5 - 42 | -R33M, -2R2M, -100M | Level 3 | Yes |
| SRP1265A |  | 13.5 x 12.5 x 6.2 | Yes | 0.15 - 68 | 6.5 - 55 | -R33M, -1R5M, -680M | Level 3 | Yes |
| SRP1770TA |  | 17.3 x 16.9 x 6.7 | Yes | 1 - 100 | 5.3 - 52 | -330M, -331M, -681M | Level 3 | Yes |








Power Inductors

| Model | Photo | Size (mm) | Shielded | Inductance Range (μ H) | Current Range (A) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|-----------|---|------------------|----------|-----------------------------|-------------------|----------------------------|--------------------|--------------------|
| SRP2313AA |  | 23.5 x 22 x 12.6 | Yes | 1.5 - 68 | 21 - 57 | -1R5M, -6R8M, -330M | Level 3 | Yes |
| SRP2510A |  | 2.5 x 2 x 1 | Yes | 0.22 - 4.7 | 1.36 - 5.9 | -R47M, -1R0M, -4R7M | Level 3 | Yes |
| SRP2512A |  | 2.5 x 2 x 1.2 | Yes | 0.47 - 4.7 | 1.55 - 4.6 | -R47M, -1R0M, -4R7M | Level 3 | Yes |
| SRP3012TA |  | 3.5 x 3.2 x 1.2 | Yes | 0.15 - 10 | 1 - 10 | -1R0M, -100M, -R33M | Level 3 | Yes |
| SRP3020TA |  | 3.5 x 3.2 x 2 | Yes | 0.1 - 10 | 1.4 - 10.5 | -2R2M, -6R8M, -R33M | Level 3 | Yes |
| SRP4012TA |  | 4.45 x 4 x 1 | Yes | 0.1 - 10 | 1.3 - 11.5 | -1R0M, -4R7M, -100M | Level 3 | Yes |
| SRP4020TA |  | 4.45 x 4 x 1.8 | Yes | 0.1 - 22 | 1.2 - 12 | -R47M, -2R2M, -100M | Level 3 | Yes |
| SRP5015TA |  | 5.7 x 5.2 x 1.3 | Yes | 0.15 - 22 | 1.2 - 16 | -R47M, -3R3M, -100M | Level 3 | Yes |
| SRP5020TA |  | 5.7 x 5.2 x 1.8 | Yes | 0.33 - 10 | 2.3 - 12 | -R47M, -2R2M, -100M | Level 3 | Yes |
| SRP5030TA |  | 5.7 x 5.2 x 2.8 | Yes | 0.33 - 10 | 2.75 - 14 | -R47M, -2R2M, -100M | Level 3 | Yes |
| SRP6030VA |  | 7.1 x 6.6 x 2.8 | Yes | 0.47 - 22 | 3.4 - 20 | -R68M, -4R7M, -150M | Level 3 | Yes |
| SRP7028A |  | 7.3 x 6.6 x 2.8 | Yes | 0.15 - 33 | 2 - 27 | -R33M, -2R2M, -100M | Level 3 | Yes |
| SRP7050TA |  | 7.3 x 6.6 x 4.8 | Yes | 0.33 - 68 | 1.2 - 25 | -R33M, -1R5M, -680M | Level 3 | Yes |
| SRR3818A |  | 3.8 x 3.8 x 1.8 | Yes | 1 - 100 | 0.34 - 3.6 | -2R2Y, -3R3Y, -100M | Level 3 | Yes |
| SRR4818A |  | 4.8 x 4.8 x 1.8 | Yes | 1 - 47 | 0.75 - 5.1 | -1R0Y, -100M, -220M | Level 3 | Yes |
| SRR4828A |  | 4.8 x 4.8 x 2.8 | Yes | 1.2 - 220 | 0.5 - 5 | -1R2Y, -220M, -470M, -221M | Level 3 | Yes |
| SRU1028A |  | 10 x 10 x 2.8 | Yes | 1 - 150 | 0.6 - 7 | -100Y, -220Y, -330Y | Level 3 | Yes |
| SRU1038A |  | 10 x 10 x 3.8 | Yes | 1.5 - 330 | 0.55 - 7.2 | -3R5Y, -330Y, -101Y | Level 3 | Yes |
| SRU1048A |  | 10 x 10 x 4.8 | Yes | 1.5 - 330 | 0.65 - 7 | -R47M, -2R2M, -100M | Level 3 | Yes |
| SRU1063A |  | 10 x 10 x 6.8 | Yes | 4.7 - 100 | 1.1 - 5.5 | -4R7Y, -220M, -680M | Level 3 | Yes |
| SRU3028A |  | 3.5 x 3.3 x 2.8 | Yes | 10 - 33 | 0.47 - 0.72 | -100Y, -220Y, -330Y | Level 3 | Yes |
| SRU5028A |  | 5.2 x 5.2 x 2.8 | Yes | 1.2 - 100 | 0.47 - 3.5 | -2R2Y, -150Y, -101Y | Level 3 | Yes |
| SRU6025A |  | 6.2 x 6.5 x 2.5 | Yes | 1.2 - 220 | 0.42 - 4 | -2R2Y, -220Y, -221Y | Level 3 | Yes |
| SRU8028A |  | 8 x 8 x 2.8 | Yes | 2.5 - 100 | 0.75 - 4.5 | -6R8Y, -220Y, -101Y | Level 3 | Yes |
| SRU8045A |  | 8 x 8 x 4.8 | Yes | 3.5 - 100 | 1 - 5 | -6R2Y, -330M, -101M | Level 3 | Yes |





Chip Inductors

| Model | Photo | Size (mm) | Inductance Range (μ H) | Current Range (A) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|-----------|---|-----------------|-----------------------------|-------------------|-----------------------|--------------------|--------------------|
| CC322522A |  | 3.2 x 2.9 x 2.4 | 1 - 100 | 0.18 - 1.45 | -4R7K, -101K, -470K | Level 3 | Yes |
| CC453232A |  | 4.5 x 3.2 x 3.2 | 1 - 1000 | 0.09 - 2.30 | -330KL, -101KL -102KL | Level 3 | Yes |
















Common Mode Chip Inductors

| Model | Photo | Size (mm) | Inductance Range (Ohms) | Inductance Range (μ H) | Current Range (A) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|----------------|---|---------------|-------------------------|-----------------------------|-------------------|---------------------|--------------------|--------------------|
| SRF2012AA |  | 2 x 1.2 x 1.2 | 67 - 360 | 300 - 400 | 0.25 - 0.5 | -670Y, -161Y, -361Y | Level 3 | Yes |
| SRF2012A-801Y |  | 2 x 1.2 x 1.2 | 800 | — | 0.3 | -801Y | Level 3 | Yes |
| SRF3216A |  | 3.2 x 1.6 x 2 | 90 - 2200 | 200 - 400 | 0.3 - 1.2 | -900Y, -261Y, -222Y | Level 3 | Yes |
| SRF4530A |  | 4.5 x 3.2 x 3 | — | 11 - 100 | 0.20 - 0.36 | -110Y, -220Y, -101Y | Level 3 | Yes |
| SRF4530AG-201Y |  | 4.5 x 3.2 x 3 | — | 200 | 0.1 | -201Y | Level 3 | Yes |













Varistor Products

| Model | Photo | Size (EIA, mm) | Peak Single Pulse Current 8/20 μ s (A) | Operating Temperature ($^{\circ}$ C) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|----------|---|------------------------------|--|---------------------------------------|--------------------|--------------------|--------------------|
| AVHT-SMD |  | 0805, 1206, 1812, 2220, 3225 | 200 - 2000 | -55 - +150 | Yes | Level 3 | Yes |
| AV-TH |  | 602, 802, 902, 1103 | 400 - 2000 | -55 - +125 | Yes | Level 3 | Yes |
| AV-SMD |  | 0805, 1206, 1812, 2220, 3225 | 200 - 2000 | -55 - +125 | Yes | Level 3 | Yes |
| OV |  | 9, 12 | 800, 1200 | -55 - +125 | Yes | Level 3 | Yes |






Transient Voltage Suppressor (TVS) Diodes

| Model | Photo | Package | Size | P _{pp} (W) | | V _{RWM} (V) | AEC-Q101 Compliant | PPAP Documentation | IATF 16949 Factory |
|------------------------|---|----------------|-------------------|---------------------|------------|----------------------|--------------------|--------------------|--------------------|
| | | | | 8/20 μs | 10/1000 μs | | | | |
| 5.0SMDJ-Q |  | DO-214AB (SMC) | 7.9 mm x 5.9 mm | | 5000 | 5 - 170 | Yes | Level 3 | Yes |
| 15KPA-SD-Q |  | DO-218 | 15.5 mm x 10.0 mm | | 15000 | 16 - 66 | Yes | Level 3 | Yes |
| CDSOD323-TxxS-Q |  | SOD-323 | Various | | 500 | 5 - 18 | Yes | Level 3 | Yes |
| CDSOD323-T12C-DSLQ |  | SOD-323 | 2.5 mm x 1.3 mm | 350 | | 12 | Yes | Level 3 | Yes |
| CDSOD323-T24C-DSLQ |  | SOD-323 | 2.5 mm x 1.3 mm | 350 | | 24 | Yes | Level 3 | Yes |
| CDSOT23-T03-Q ~ T15C-Q |  | SOT-23 | 2.9 mm x 2.3 mm | 500 | | 3.3 / 8 / 15 | Yes | Level 3 | Yes |
| CDSOT23-T24CAN-Q |  | SOT-23 | 2.9 mm x 2.3 mm | 200 | | 24 | Yes | Level 3 | Yes |
| SM8S-Q |  | DO-218 | 15.5 mm x 10.0 mm | | 6000 | 16 - 43 | Yes | Level 3 | Yes |
| SM8SF-Q |  | DFN | 10.5 mm x 8.1 mm | | 7000 | 24 - 36 | Yes | Level 3 | Yes |
| SMA6J-Q |  | DO-214AC (SMA) | 5.1 mm x 2.3 mm | | 600 | 5 - 130 | Yes | Level 3 | Yes |
| SMAJ-Q / P4SMA-Q |  | DO-214AC (SMA) | 5.1 mm x 2.3 mm | | 400 | 5 - 220 | Yes | Level 3 | Yes |
| SMBJ-Q / P6SMB-Q |  | DO-214AA (SMB) | 5.4 mm x 3.6 mm | | 600 | 5 - 220 / 5.8 - 214 | Yes | Level 3 | Yes |
| SMCJ-Q / 1.5SMC-Q |  | DO-214AB (SMC) | 7.9 mm x 5.9 mm | | 1500 | 5 - 120 / 5.8 - 111 | Yes | Level 3 | Yes |
| SMLJ-Q |  | DO-214AB (SMC) | 7.9 mm x 5.9 mm | | 3000 | 12 - 58 | Yes | Level 3 | Yes |
| SMF4L-Q |  | SOD-123F | 3.70 mm x 1.65 mm | | 600 | 12 - 58 | Yes | Level 3 | Yes |



Multifuse® PPTC Resettable Fuses

| Model | Photo | Size (EIA, mm) | Hold Current (A) | Max. Operating Voltage (V) | Max. Operating Current (A) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|---------|---|-------------------------|------------------|----------------------------|----------------------------|--------------------|--------------------|--------------------|
| MF-DC |  | Custom | Custom | 16 | 50 | Yes | Level 3 | Yes |
| MF-LSMF |  | 2920, 7555 | 1.85 - 4.0 | 6 - 33 | 20 - 40 | Yes | Level 3 | Yes |
| MF-MSMF |  | 1812, 4532 | 0.1 - 2.6 | 6 - 60 | 10 - 100 | Yes | Level 3 | Yes |
| MF-MSHT |  | 1812 | 0.20 - 1.75 | 9 - 42 | 40 | Yes | Level 3 | Yes |
| MF-NSHT |  | 1206, 3216 | 0.10 - 0.75 | 12 - 30 | 20 - 40 | Yes | Level 3 | Yes |
| MF-NSMF |  | 1206, 3216 | 0.12 - 2.0 | 6 - 30 | 10 - 100 | Yes | Level 3 | Yes |
| MF-PSHT |  | 0805, 2012 | 0.05 - 0.50 | 12 - 16 | 40 | Yes | Level 3 | Yes |
| MF-RG |  | Various | 3.0 - 11.0 | 16 | 100 | Yes | Level 3 | Yes |
| MF-RHT |  | Various | 0.50 - 13.0 | 16 - 32 | 40, 100 | Yes | Level 3 | Yes |
| MF-SMHT |  | 3425, 8763 / 2920, 7555 | 1.36, 1.6 | 16 | 100 | Yes | Level 3 | Yes |
| MF-USHT |  | 1210, 3225 | 0.10 - 1.50 | 12 - 30 | 20 - 40 | Yes | Level 3 | Yes |
| MF-USMF |  | 1210, 3225 | .05 - 1.75 | 6 - 30 | 10 - 40 | Yes | Level 3 | Yes |

SinglFuse™ SMD Fuses

| Model | Photo | Size (EIA, mm) | Rated Current (A) | Rated Voltage (V) | Operating Temperature (°C) | AEC-Q200 Compliant | PPAP Documentation | IATF 16949 Factory |
|--------------|---|----------------|-------------------|-------------------|----------------------------|--------------------|--------------------|--------------------|
| SF-0603HIA-M |  | 0603, 1608 | 1 - 5 | 32 | -55 - +125 | Yes | Level 3 | Yes |
| SF-1206HIA-M |  | 1206, 3216 | 0.5 - 6 | 24 - 65 | -55 - +150 | Yes | Level 3 | Yes |
| SF-1206SA-W |  | 1206, 3216 | 1.5 - 15 | 32 - 110 | -55 - +125 | Yes | Level 3 | Yes |
| SF-2410FA-W |  | 2410, 6125 | 1 - 10 | 125 - 250 | -55 - +125 | Yes | Level 3 | Yes |
| SF-2410FPA-W |  | 2410, 6125 | 12 - 20 | 65 | -55 - +125 | Yes | Level 3 | Yes |

TBU® High-Speed Protectors

| Model | Photo | Size (mm) | V _{imp} | V _{rms} | AEC-Q101 Compliant | PPAP Documentation | IATF 16949 Factory |
|----------|--|-----------------|------------------|------------------|--------------------|--------------------|--------------------|
| TBU-CA-Q |  | 6.5 mm x 4 mm | 250 - 850 V | 100 - 425 V | Yes | Level 3 | Yes |
| TBU-DB-Q |  | 6.5 mm x 5.5 mm | 550 V | 100 V | Yes | Level 3 | Yes |

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