

# BRCS700P10DPQ

Rev.A Dec.-2023

## / Descriptions

TO-252                  P                  MOS

P-CHANNEL MOSFET in a TO-252 Plastic Package.

## / Features

$V_{DS}(V)=-100V$                    $I_D=-22A$

$R_{DS(ON)}@-10V<70m\Omega(Typ.67mR)$

$R_{DS(ON)}@-4.5V<85m\Omega(Typ.70mR)$

AEC-Q101

Qualified to AEC-Q101 Standards for High Reliability,

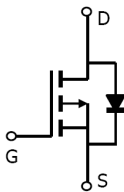
HF Product.

## / Applications

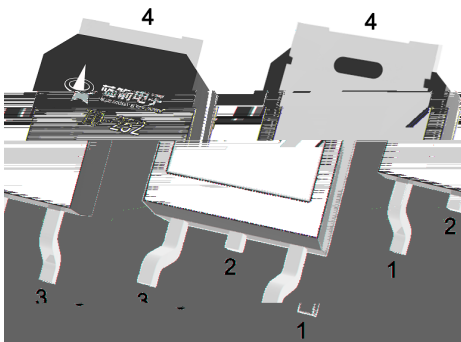
DC/DC

Power Management of Industrial DC/DC Converter, Meet the stringent requirements of automotive applications.

## / Equivalent Circuit



## / Pinning



PIN1 G

PIN 2 D

PIN 3 S

PIN 4 D

## / Marking

See Marking Instructions.

/ Absolute Maximum Ratings( $T_a=25^\circ\text{C}$ )

| Parameter                                         |              | Symbol                      | Rating     | Unit |
|---------------------------------------------------|--------------|-----------------------------|------------|------|
| Drain-Source Voltage                              |              | $V_{DS}$                    | -100       | V    |
| Drain Current - Continuous                        |              | $I_D(T_c=25^\circ\text{C})$ | -22        | A    |
| Drain Current – Pulsed                            |              | $I_{DM}$                    | -66        | A    |
| Gate-Source Voltage                               |              | $V_{GS}$                    | 20         | V    |
| Power Dissipation                                 |              | $P_D(T_c=25^\circ\text{C})$ | 75         | W    |
| Single Pulse Avalanche Energy( $L=0.5\text{mH}$ ) |              | $E_{AS}$                    | 176.4      | mJ   |
| Avalanche Current( $L=0.5\text{mH}$ )             |              | $I_{AS}$                    | -21        | A    |
| Junction and Storage Temperature Range            |              | $T_j, T_{stg}$              | -55 to 150 |      |
| Thermal resistance, junction - ambient            | Steady-State | $R_{JA}$                    | 62         | / W  |
| Thermal resistance, junction - case               | Steady-State | $R_{JC}$                    | 1.67       |      |

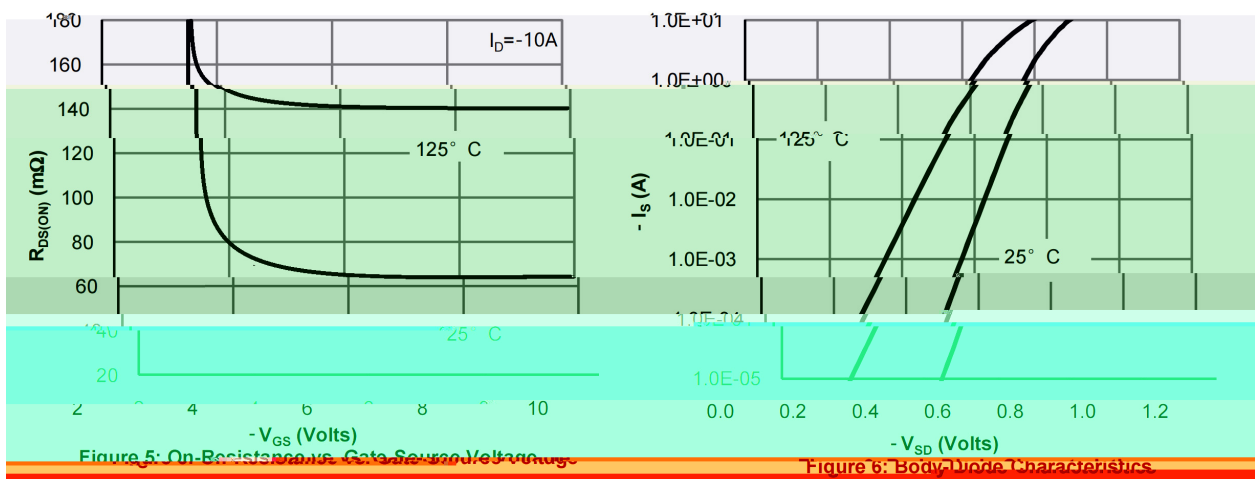
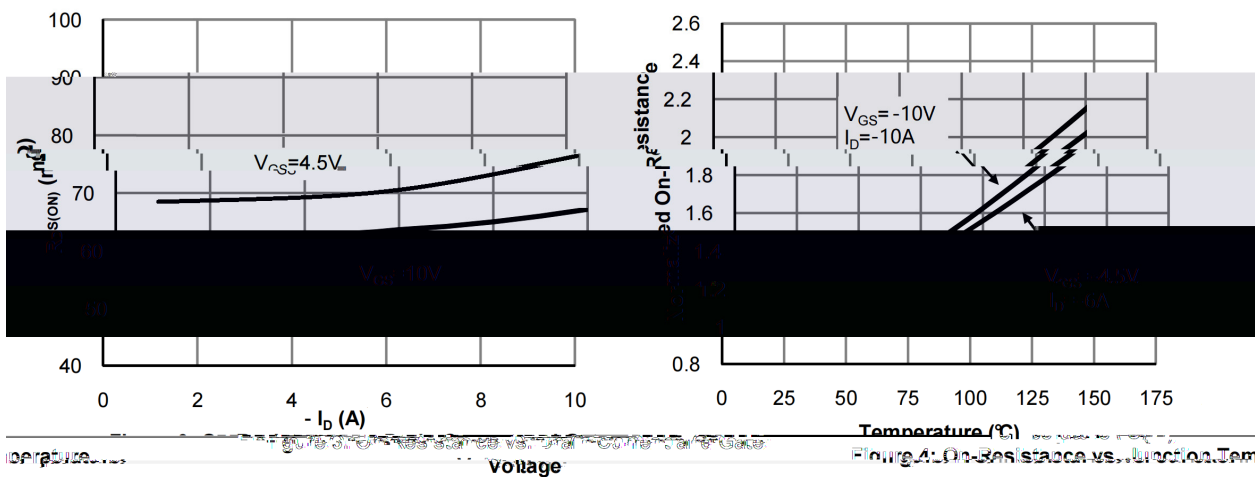
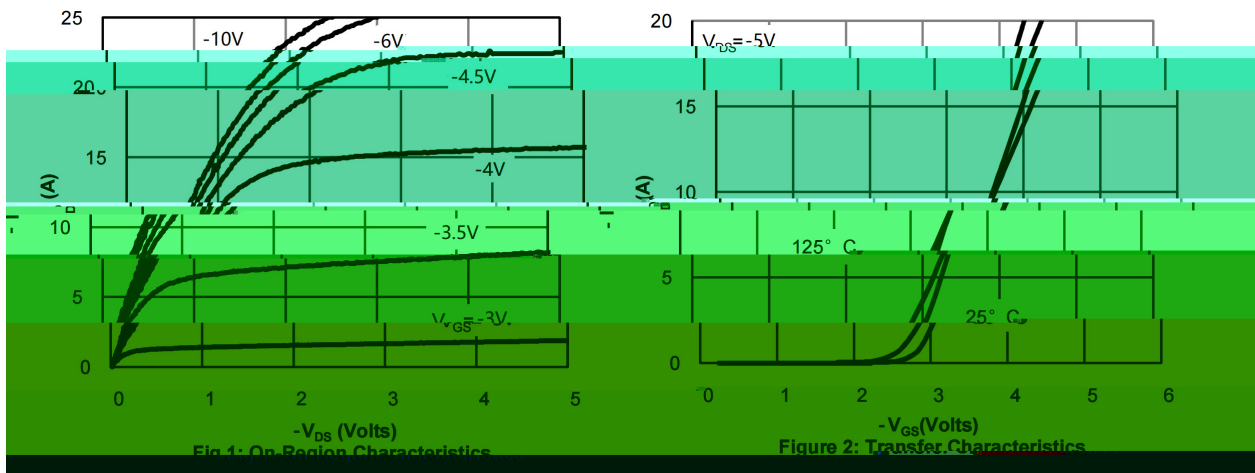
/ Electrical Characteristics( $T_a=25^\circ\text{C}$ )

| Parameter                         | Symbol        | Test Conditions                                                   | Min  | Typ  | Max  | Unit          |
|-----------------------------------|---------------|-------------------------------------------------------------------|------|------|------|---------------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$    | $I_D=-250\mu\text{A}$ $V_{GS}=0\text{V}$                          | -100 | -113 |      | V             |
| Zero Gate Voltage Drain Current   | $I_{DSS}$     | $V_{DS}=-100\text{V}$ $V_{GS}=0\text{V}$                          |      |      | -1   | $\mu\text{A}$ |
| Gate-Body leakage current         | $I_{GSS}$     | $V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$                      |      |      | 100  | nA            |
| Gate Threshold Voltage            | $V_{GS(th)}$  | $V_{DS}=V_{GS}$ $I_D=-250\mu\text{A}$                             | -1   | -2.0 | -2.5 | V             |
| Static Drain-Source On-Resistance | $R_{DS(on)}$  | $V_{GS}=-10\text{V}$ , $I_D=-10\text{A}$                          |      | 67   | 70   | m $\Omega$    |
|                                   |               | $V_{GS}=-4.5\text{V}$ , $I_D=-6\text{A}$                          |      | 70   | 85   |               |
| Diode Forward Voltage             | $V_{SD}$      | $I_S=-1\text{A}$ , $V_{GS}=0\text{V}$                             |      |      | -1.2 | V             |
| Input Capacitance                 | $C_{iss}$     | $V_{DS}=-15\text{V}$ $V_{GS}=0\text{V}$<br>$f=1.0\text{MHz}$      |      | 2820 |      | pF            |
| Output Capacitance                | $C_{oss}$     |                                                                   |      | 840  |      |               |
| Reverse Transfer Capacitance      | $C_{rss}$     |                                                                   |      | 670  |      |               |
| Gate resistance                   | $R_g$         | $V_{GS}=0\text{V}$ $V_{DS}=0\text{V}$<br>$f=1\text{MHz}$          |      | 2.7  |      | $\Omega$      |
| Total Gate Charge                 | $Q_{g(10V)}$  | $V_{GS}=-10\text{V}$ , $V_{DS}=-50\text{V}$ ,<br>$I_D=-5\text{A}$ |      | 5.9  |      | nC            |
| Total Gate Charge                 | $Q_{g(4.5V)}$ |                                                                   |      | 2.7  |      |               |
| Gate Source Charge                | $Q_{gs}$      |                                                                   |      | 1.2  |      |               |
| Gate Drain Charge                 | $Q_{gd}$      |                                                                   |      | 1.2  |      |               |

## / Electrical Characteristics(Ta=25 )

| Parameter           | Symbol       | Test Conditions                                     | Min | Typ | Max | Unit |
|---------------------|--------------|-----------------------------------------------------|-----|-----|-----|------|
| Turn-On Delay Time  | $t_{d(on)}$  | $V_{GS}=-10V$ $V_{DS}=-50V$<br>$R_L=10$ $R_{GEN}=3$ |     | 6   |     | ns   |
| Turn-On Rise Time   | $t_r$        |                                                     |     | 2.4 |     |      |
| Turn-Off Delay Time | $t_{d(off)}$ |                                                     |     | 19  |     |      |
| Turn-Off Fall Time  | $t_f$        |                                                     |     | 2.6 |     |      |

/ Electrical Characteristic Curve



/ Electrical Characteristic Curve

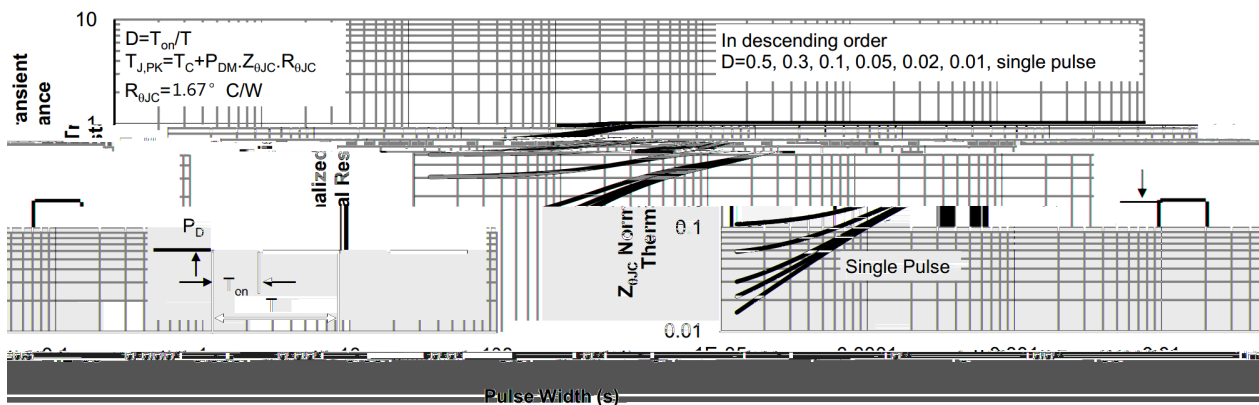
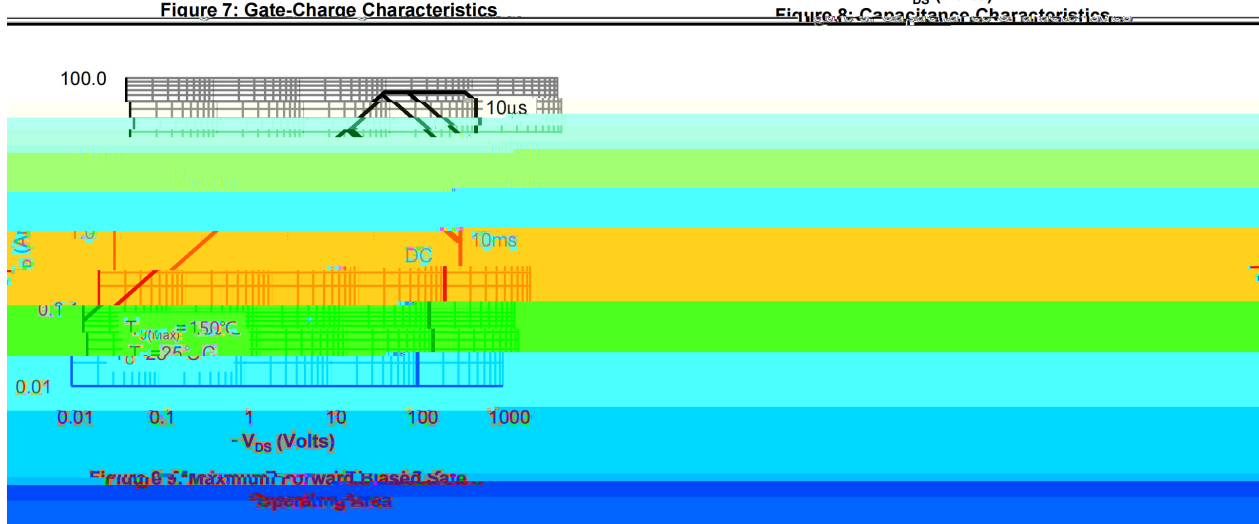
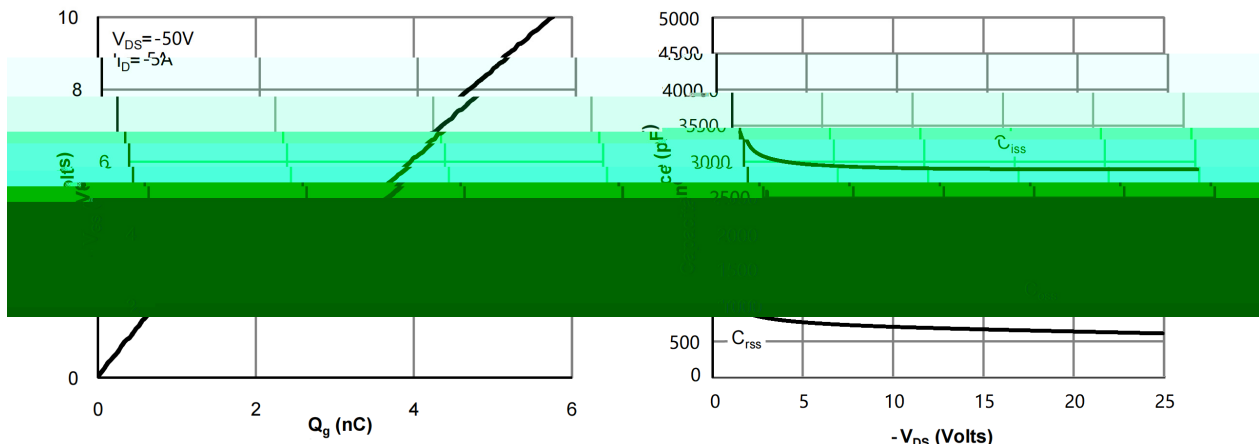
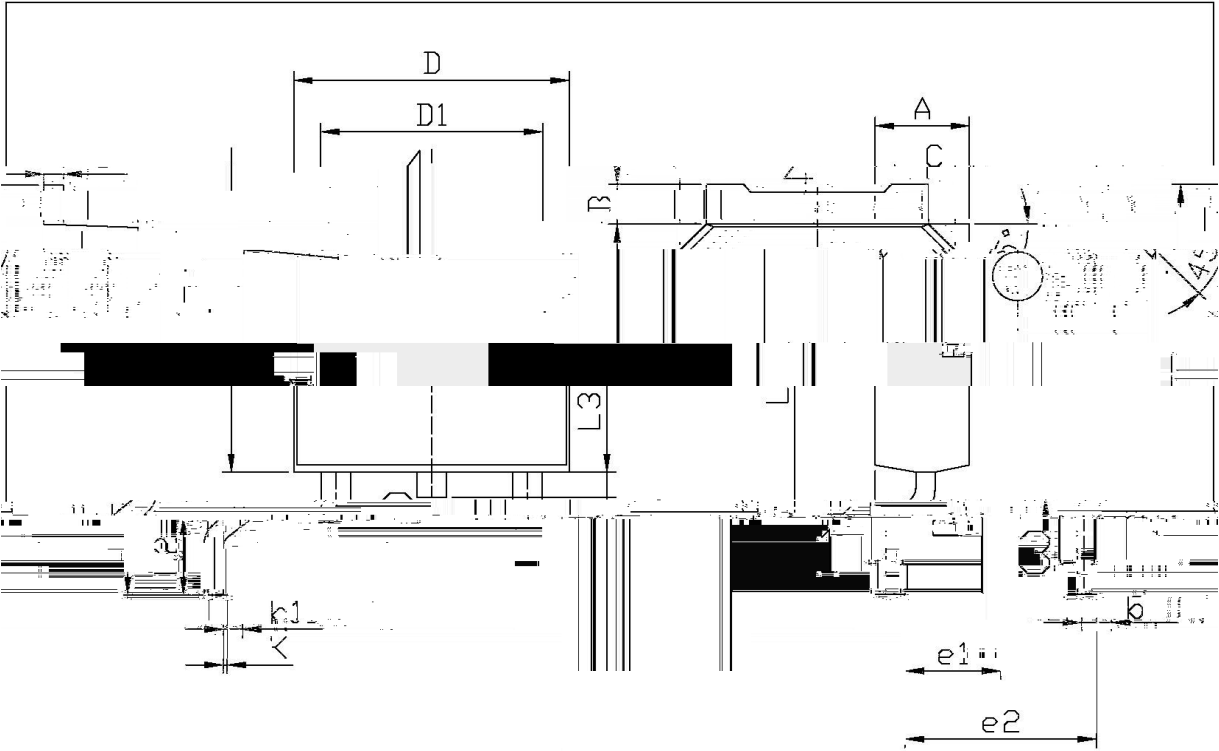


Figure 10: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions



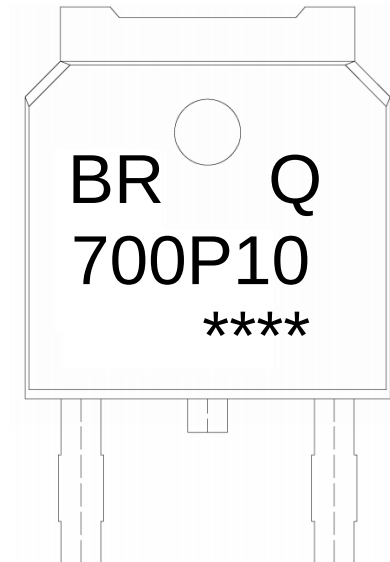
单位: mm

| Symbol |      |      | Dimensions In Millimeters |       |      | Symbol |      |       | Dimensions In Millimeters |      |     |
|--------|------|------|---------------------------|-------|------|--------|------|-------|---------------------------|------|-----|
|        |      |      | Min                       |       | Max  |        |      |       | Min                       |      | Max |
| 95     | 1.00 | 6.25 | 0.20                      |       |      | 2.20   | 2.20 | 2.40  | 2.10                      |      | 5   |
|        | 2.24 |      | 2.34                      |       |      | B      | 0.95 |       | 1.25                      |      | e1  |
|        | 4.42 |      | 4.72                      |       |      |        | 0.70 |       | 0.90                      |      | e2  |
| E1     |      | 9.85 |                           | 10.35 |      | b1     |      | 0.45  |                           | 0.55 |     |
|        |      |      | 0.45                      |       | 0.55 | L2     |      | 70.00 |                           | 2.00 |     |
| 60     |      | 0.90 |                           |       |      | 6.45   |      | 6.75  |                           | 1.3  | 0.1 |
| 50     | R    |      | 0.00                      |       | 0.10 | J1     |      | 5.10  |                           | 5.7  |     |

0-252

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## / Marking Instructions



BR

Q

700P10

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Note:

BR: Company Code

Q: Automobile halogen-free product Code

700P10: Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No

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|  |

Note:

- 1

150 200

60 120sec;

1.Preheating:150~200 , Time:60~120sec.
- 2

255±5

5±0.5sec;

2.Peak Temp.:255±5 , Duration:5±0.5sec.
- 3

2 10

/sec.

3. Cooling Speed: 2~10 /sec.