

## / Descriptions

TO-252 Voltage Regulator in a TO-252 Plastic Package.

## / Features

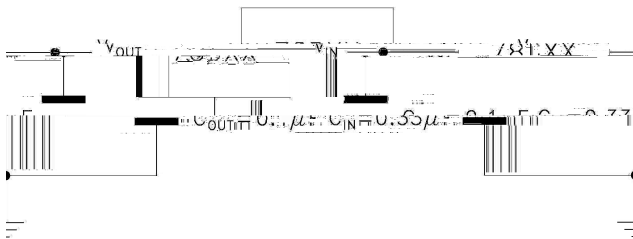
1.5A, AEC-Q100

3-Terminal regulators ,output current up to 1.5A, internal thermal overload protection and short-circuit limiting, Qualified to AEC-Q100 Standards for High Reliability, HF Product.

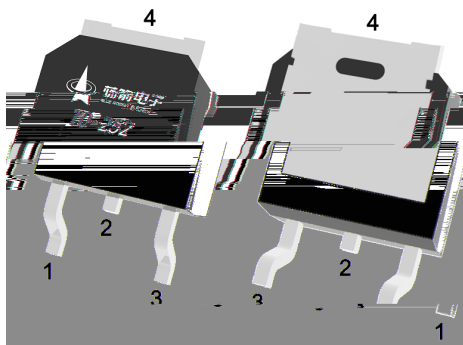
## / Applications

Voltage Regulator, Meet the stringent requirements of automotive applications.

| I | I | Equivalent Circuit or Application Circuit |
|---|---|-------------------------------------------|
|---|---|-------------------------------------------|



## / Pinning



PIN1 IN PIN 2 4 GND PIN 3 OUT

## / Marking

See Marking Instructions.

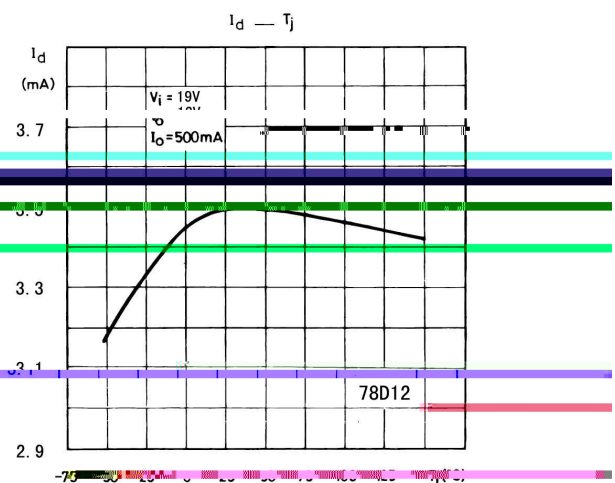
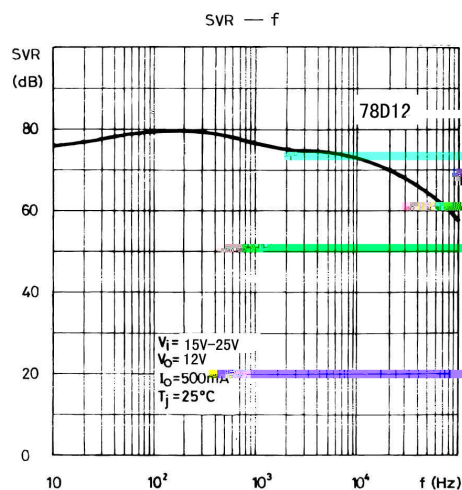
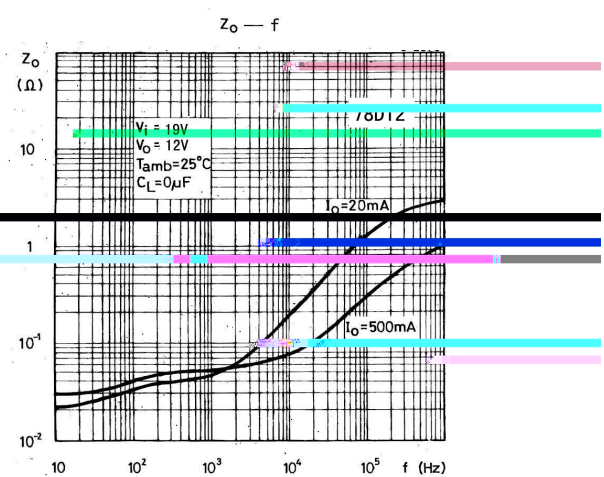
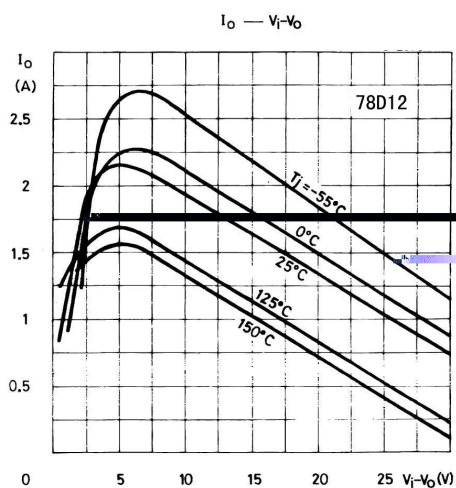
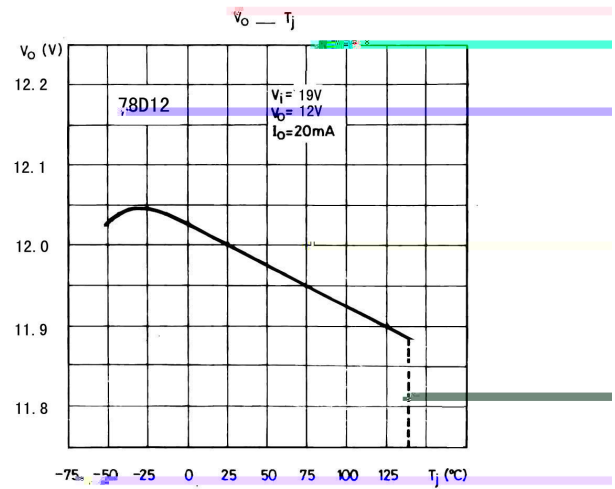
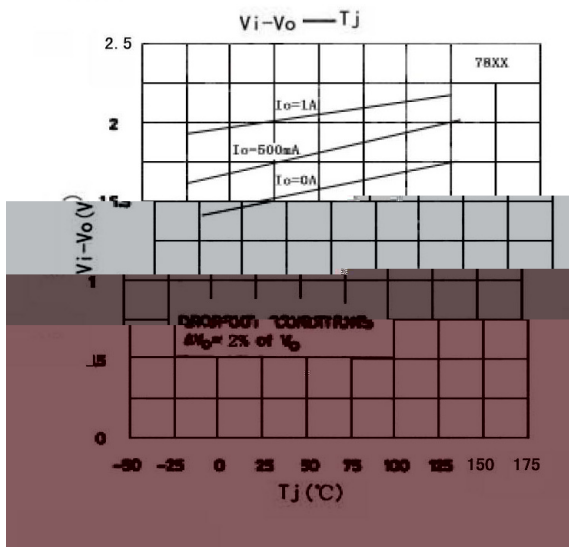
**/ Absolute Maximum Ratings(Ta=25 )**

| Parameter                           | Symbol          | Rating  | Unit                        |
|-------------------------------------|-----------------|---------|-----------------------------|
| Input voltage                       | $V_i$           | 35      | V                           |
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 105     | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance Junction-Case    | $R_{\theta JC}$ | 10      | $^{\circ}\text{C}/\text{W}$ |
| Operating Temperature Range         | $T_{OPR}$       | -40~125 | $^{\circ}\text{C}$          |
| Storage temperature range           | $T_{stg}$       | -65~150 | $^{\circ}\text{C}$          |

**/ Electrical Characteristics(Ta=25  $V_i=19\text{V}$ ,  $I_o=500\text{mA}$  unless otherwise specified)**

| Parameter                  | Symbol                | Test Conditions                                                                   | Min  | Typ  | Max  | Unit                   |
|----------------------------|-----------------------|-----------------------------------------------------------------------------------|------|------|------|------------------------|
| Output voltage             | $V_o$                 | $T_j=25$                                                                          | 11.5 | 12.0 | 12.5 | V                      |
|                            |                       | $V_i=14.5\text{V}-27\text{V}$<br>$I_o=5\text{mA}-1\text{A}$ $P_o \leq 15\text{W}$ | 11.4 | 12.0 | 12.6 | V                      |
| Load Regulation            | $\Delta V_o$          | $T_j=25^{\circ}\text{C}$<br>$I_o=5.0\text{mA}-1.5\text{A}$                        |      |      | 240  | mV                     |
|                            |                       | $T_j=25^{\circ}\text{C}$<br>$I_o=250\text{mA}-750\text{mA}$                       |      |      | 120  | mV                     |
| Line regulation            | $\Delta V_o$          | $T_j=25^{\circ}\text{C}$ $V_i=14.5\text{V}-30\text{V}$                            |      |      | 240  | mV                     |
|                            |                       | $T_j=25^{\circ}\text{C}$ $V_i=16\text{V}-22\text{V}$                              |      |      | 120  | mV                     |
| Quiescent Current          | $I_q$                 | $T_j=25^{\circ}\text{C}$                                                          |      |      | 8.0  | mA                     |
| Quiescent Current Change   | $\Delta I_q$          | $V_i=14.5\text{V}-30\text{V}$                                                     |      |      | 1.0  | mA                     |
|                            |                       | $I_o=5\text{mA}-1\text{A}$                                                        |      |      | 0.5  | mA                     |
| Output Voltage Drift       | $\Delta V_o/\Delta T$ | $I_o=5\text{mA}$                                                                  |      | -1   |      | mV/ $^{\circ}\text{C}$ |
| Output Noise Voltage       | eN                    | B=10Hz-100KHz<br>$T_j=25^{\circ}\text{C}$                                         |      | 75   |      | $\mu\text{V}/V_o$      |
| Supply Voltage Rejection   | SVR                   | $V_i=15\text{V}-25\text{V}$ $f=120\text{Hz}$                                      | 55   |      |      | dB                     |
| Dropout Voltage            | $V_d$                 | $I_o=1\text{A}$ $T_j=25^{\circ}\text{C}$                                          |      | 2.0  |      | V                      |
| Output Resistance          | $R_o$                 | $f=1\text{KHz}$                                                                   |      | 18   |      | m $\Omega$             |
| Short Circuit Current      | $I_{sc}$              | $V_i=35\text{V}$ $T_j=25^{\circ}\text{C}$                                         |      | 0.35 |      | A                      |
| Short Circuit Peak Current | $I_{scp}$             | $T_j=25^{\circ}\text{C}$                                                          |      | 2.2  |      | A                      |

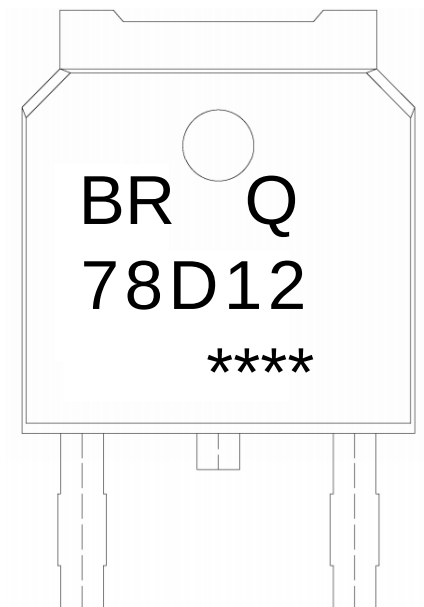
/ Electrical Characteristic Curve



Technical drawing of a mechanical part, showing a side view and a top view. The side view (top) shows a horizontal shaft with a central section of length  $L$  and a diameter of  $\phi$ . The shaft is supported by bearings, with dimensions  $e_1$  and  $e_2$  indicating the distances from the shaft centerline to the bearing centers. The top view (bottom) shows a rectangular plate with dimensions  $D$  and  $D_1$ . The plate has a central section of length  $A$  and a width of  $C$ . The plate is supported by a base, with dimensions  $B$  and  $L_3$  indicating the distances from the plate centerline to the base edges. The drawing includes a section line  $A-A$  and a section symbol  $1$ .

| 单位: mm |                           |       |        |                           |      |
|--------|---------------------------|-------|--------|---------------------------|------|
| Symbol | Dimensions In Millimeters |       | Symbol | Dimensions In Millimeters |      |
|        | Min                       | Max.  |        | Min                       | Max  |
| 5-95   | 6.25                      | A     | 2-20   | 2.40                      | 2.50 |
| el     | 2.24                      | 2.34  | B      | 0.95                      | 1.25 |
| 5-95   | 9.85                      | 10.35 | 51     | 0.45                      | 0.55 |
| 55     | 0.45                      | 0.55  | 51     | 0.45                      | 0.55 |
| 90     | 6.45                      | 6.75  | 51     | 0.60                      | 0.70 |
| 10-100 | 5.10                      | 5.50  | 51     | 0.60                      | 0.70 |
| TO-252 |                           |       |        |                           |      |

/ Marking Instructions



BR

Q

78D12

\*\*\*\*

Note:

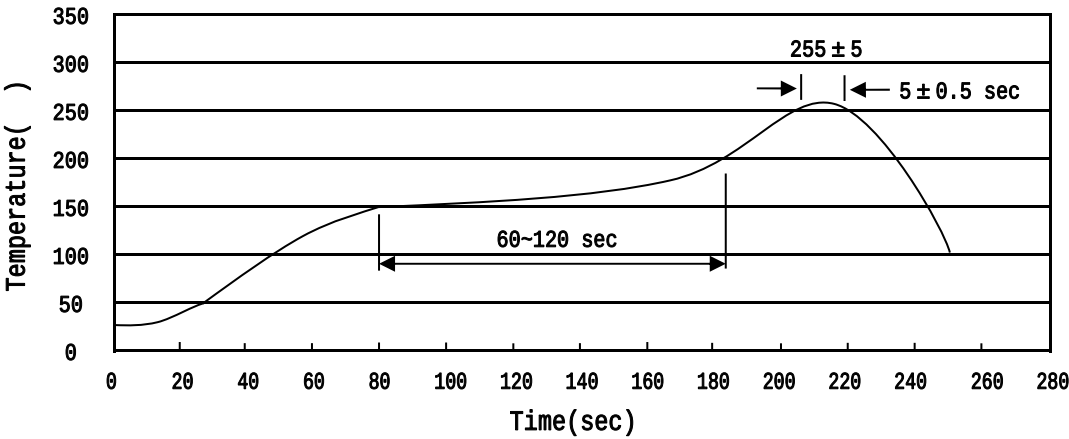
BR: Company Code

Q: Automobile halogen-free product Code

78D12: Product Type

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

( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)



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.

/ Resistance to Soldering Heat Test Conditions

260±5                      10±1 sec.                      Temp.:260±5                      Time:10±1 sec

/ Packaging SPEC.

/ REEL

| Package Type<br>封装形式 | Units 包装数量 |      |       |     |        | Dimension 包装尺寸 (unit: mm³) |            |             |
|----------------------|------------|------|-------|-----|--------|----------------------------|------------|-------------|
|                      | 只 卷盘       | 卷盘 盒 | 只 盒   | 盒 箱 | 只 箱    |                            | 盒          | 箱           |
| TO-252               | 2,500      | 2    | 5,000 | 6   | 30,000 | 13" ×16                    | 360×360×50 | 380×335×366 |

/ TUBE

| Package Type<br>封装形式 | Units 包装数量 |      |       |     |        | Dimension 包装尺寸 (unit: mm³) |            |             |
|----------------------|------------|------|-------|-----|--------|----------------------------|------------|-------------|
|                      | 只 套管       | 套管 盒 | 只 盒   | 盒 箱 | 只 箱    | 套管                         | 盒          | 箱           |
| TO-251/252           | 75         | 48   | 3,600 | 5   | 18,000 | 526×20.5×5.25              | 555×164×50 | 575×290×180 |

/ Notices