

**UZ2085****LINEAR INTEGRATED CIRCUIT****3A ADJUSTABLE/FIXED LOW DROPOUT LINEAR REGULATOR****■ DESCRIPTION**

The UTC **UZ2085** series are low dropout three-terminal regulators with 3A output current capability. These devices have been optimized for low voltage applications including VTT bus termination in which transient response and minimum input voltage are critical.

Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal limitation provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.

**■ FEATURES**

- \* Fast transient response
- \* Low dropout voltage at up to 3A
- \* Load regulation: 0.05% typical
- \* Trimmed current limit
- \* On-chip thermal limiting
- \* Ultra low current consumption (0.35mA typ.)
- \* Ultra low Adjustment Current (7 $\mu$ A typ.)
- \* Ultra low minimum Load (0.3mA typ.)
- \* Stable with low ESR ceramic output capacitor (MLCC)

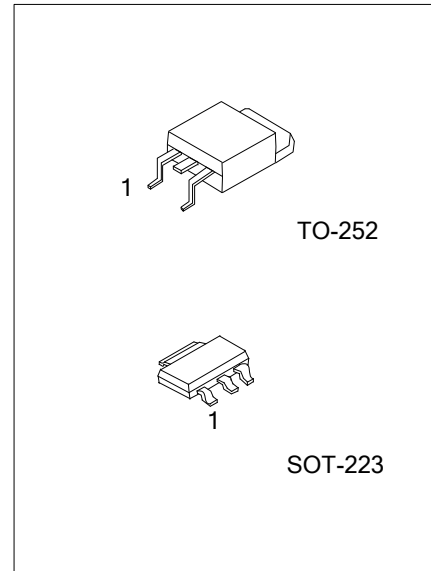
**■ ORDERING INFORMATION**

| Ordering Number  |                  | Package | Pin Assignment |   |   | Packing   |
|------------------|------------------|---------|----------------|---|---|-----------|
| Lead Free        | Halogen Free     |         | 1              | 2 | 3 |           |
| -                | UZ2085G-xx-AA3-R | SOT-223 | A/G            | O | I | Tape Reel |
| UZ2085L-xx-TN3-R | UZ2085G-xx-TN3-R | TO-252  | A/G            | O | I | Tape Reel |

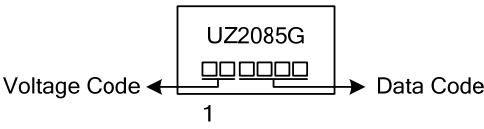
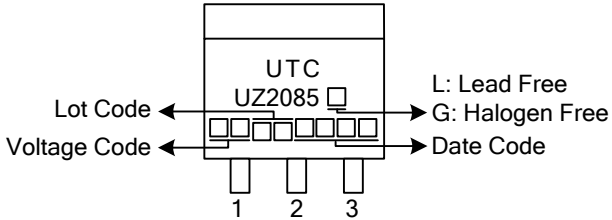
Note: 1. xx: Output Voltage, refer to Marking Information.

2. A: ADJ (for adjustable regulator), G: GND (for fixed regulator), O:  $V_{OUT}$ , I:  $V_{IN}$

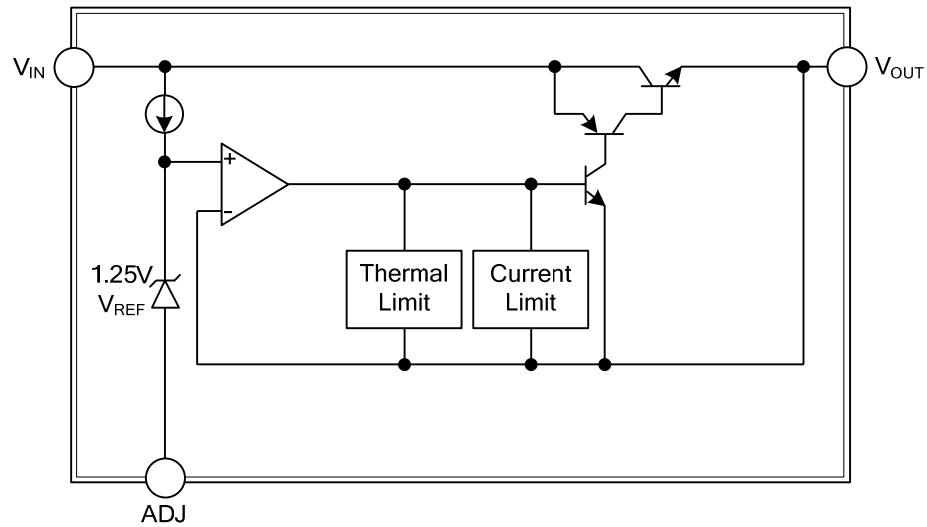
|                         |                                                 |
|-------------------------|-------------------------------------------------|
| UZ2085G-xx-AA3-R        |                                                 |
| (1) Packing Type        | (1) R: Tape Reel                                |
| (2) Package Type        | (2) AA3: SOT-223, TN3: TO-252                   |
| (3) Output Voltage Code | (3) xx: Refer to Marking Information            |
| (4) Green Package       | (4) G: Halogen Free and Lead Free, L: Lead Free |



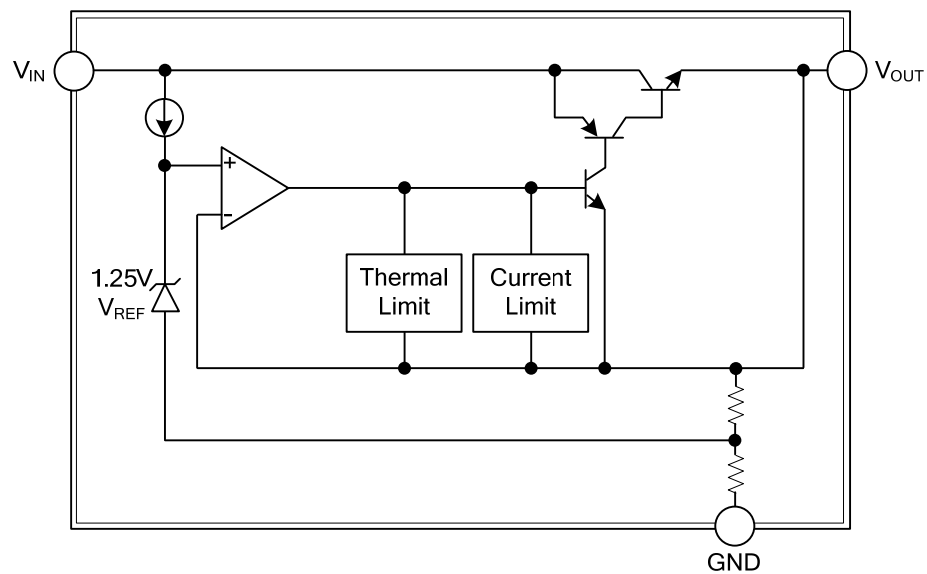
### MARKING INFORMATION

| PACKAGE | VOLTAGE CODE      | MARKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOT-223 | 50:5.0V<br>AD:ADJ |  <p>Diagram of SOT-223 marking: A rectangular package with 'UZ2085G' at the top. Below it is a row of six small squares. An arrow labeled 'Voltage Code' points to the first square, and an arrow labeled 'Data Code' points to the last square. A small '1' is centered below the row of squares.</p>                                                                                                                      |
| TO-252  |                   |  <p>Diagram of TO-252 marking: A package with 'UTC' and 'UZ2085' at the top. Below is a row of six small squares. An arrow labeled 'Lot Code' points to the first square, an arrow labeled 'Voltage Code' points to the second square, and an arrow labeled 'Date Code' points to the last square. To the right, 'L: Lead Free' and 'G: Halogen Free' are listed. Below the package are three pins labeled 1, 2, and 3.</p> |

## ■ BLOCK DIAGRAM



For Adjustable Voltage



For Fixed Voltage

## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER             | SYMBOL    | RATINGS            | UNIT |
|-----------------------|-----------|--------------------|------|
| Input Voltage         | $V_{IN}$  | 18                 | V    |
| Power Dissipation     | $P_D$     | Internally Limited | W    |
| Junction Temperature  | $T_J$     | +150               | °C   |
| Operating Temperature | $T_{OPR}$ | -20 ~ +85          | °C   |
| Storage Temperature   | $T_{STG}$ | -40 ~ +150         | °C   |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

| PARAMETER           |         | SYMBOL        | RATINGS | UNIT |
|---------------------|---------|---------------|---------|------|
| Junction to Ambient | SOT-223 | $\theta_{JA}$ | 170     | °C/W |
|                     | TO-252  |               | 118     | °C/W |
| Junction to Case    | SOT-223 | $\theta_{JC}$ | 20      | °C/W |
|                     | TO-252  |               | 12      | °C/W |

## ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , $C_{OUT}=22\mu\text{F}$ , unless otherwise specified.)

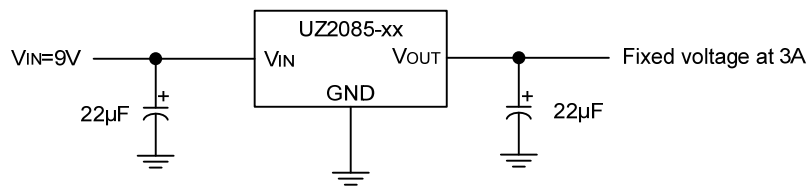
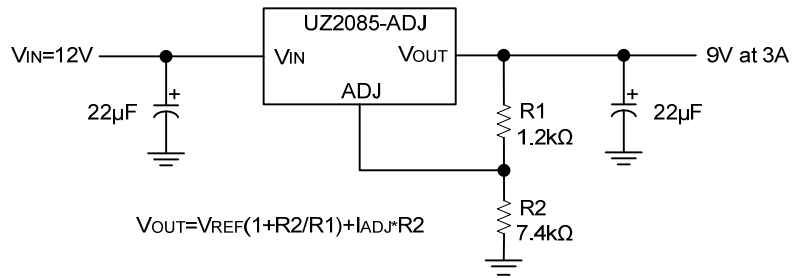
### For UZ2085-ADJ (Adjustable)

| PARAMETER                     | SYMBOL           | TEST CONDITIONS                                                          | MIN.  | TYP.  | MAX.  | UNIT          |
|-------------------------------|------------------|--------------------------------------------------------------------------|-------|-------|-------|---------------|
| Reference Voltage             | $V_{REF}$        | $1.5V \leq (V_{IN} - V_{OUT}) \leq 8.25V$<br>$10mA \leq I_{OUT} \leq 3A$ | 1.225 | 1.25  | 1.275 | V             |
| Line Regulation               | $\Delta V_{OUT}$ | $(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$ , $I_{OUT}=10mA$                 |       | 0.005 | 0.2   | %             |
| Load Regulation               | $\Delta V_{OUT}$ | $(V_{IN} - V_{OUT})=3V$ , $10mA \leq I_{OUT} \leq 3A$                    |       | 0.05  | 0.5   | %             |
| Dropout Voltage               | $V_D$            | $\Delta V_{REF}\%=1\%$ , $I_{OUT}=3A$                                    |       | 1.2   | 1.40  | V             |
| Current Limit                 | $I_{LIMIT}$      | $(V_{IN}-V_{OUT})=2V$                                                    | 3.1   | 5.8   |       | A             |
| Adjust Pin Current            | $I_{ADJ}$        |                                                                          |       | 7     | 10    | $\mu\text{A}$ |
| Adjust Pin Current Change     | $\Delta I_{ADJ}$ | $(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$ , $10mA \leq I_{OUT} \leq 3A$    |       | 0.3   | 2     | $\mu\text{A}$ |
| Minimum Load Current          | $I_{O(MIN)}$     | $(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$                                  |       | 0.3   | 1     | mA            |
| Ripple Rejection              | RR               | $f=120\text{Hz}$ , Tantalum, $(V_{IN}-V_{OUT})=3V$ , $I_{OUT}=3A$        | 75    |       |       | dB            |
| Thermal Regulation            |                  | $T_A=25^\circ\text{C}$ , 30ms pulse                                      |       | 0.004 | 0.02  | %/W           |
| Temperature Stability         | $\Delta V_{OUT}$ |                                                                          |       | 0.5   |       | %             |
| Long-Term Stability           | $\Delta V_{OUT}$ | $T_A=125^\circ\text{C}$ , 1000hr                                         |       | 0.03  | 1.0   | %             |
| Output Noise(% of $V_{OUT}$ ) | $e_N$            | $T_A=25^\circ\text{C}$ , $10\text{Hz} \leq f \leq 10\text{kHz}$          |       | 0.003 |       | %             |
| Thermal Shutdown              |                  |                                                                          |       | 150   |       | °C            |

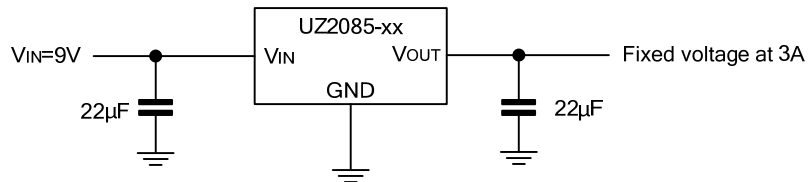
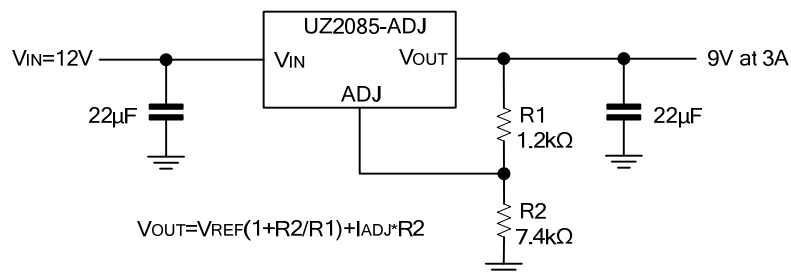
### For UZ2085-xx (Fixed Voltage)

| PARAMETER                     | SYMBOL              | TEST CONDITIONS                                                   | MIN. | TYP.  | MAX. | UNIT |
|-------------------------------|---------------------|-------------------------------------------------------------------|------|-------|------|------|
| Output Voltage                | UZ2085-50 $V_{OUT}$ | $6.5V \leq V_{IN} \leq 12V$ , $10mA \leq I_{OUT} \leq 3A$         | 4.9  | 5.0   | 5.1  | V    |
| Line Regulation               | $\Delta V_{OUT}$    | $(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$ , $I_{OUT}=10mA$          |      | 0.005 | 0.2  | %    |
| Load Regulation               | $\Delta V_{OUT}$    | $(V_{IN} - V_{OUT})=3V$ , $10mA \leq I_{OUT} \leq 3A$             |      | 0.05  | 0.5  | %    |
| Dropout Voltage               | $V_D$               | $\Delta V_{REF}\%=1\%$ , $I_{OUT}=3A$                             |      | 1.2   | 1.40 | V    |
| Current Limit                 | $I_{LIMIT}$         | $(V_{IN}-V_{OUT})=2V$                                             | 3.1  | 5.8   |      | A    |
| Minimum Load Current          | $I_{O(MIN)}$        | $(V_{OUT} + 1.5V) \leq V_{IN} \leq 12V$                           |      |       | 1    | mA   |
| Quiescent Current             | $I_Q$               | $V_{IN}=12V$                                                      |      | 0.35  | 0.5  | mA   |
| Ripple Rejection              | RR                  | $f=120\text{Hz}$ , Tantalum, $(V_{IN}-V_{OUT})=3V$ , $I_{OUT}=3A$ | 75   |       |      | dB   |
| Thermal Regulation            |                     | $T_A=25^\circ\text{C}$ , 30ms pulse                               |      | 0.004 | 0.02 | %/W  |
| Temperature Stability         | $\Delta V_{OUT}$    | $T_A=125^\circ\text{C}$ , 1000hr                                  |      | 0.5   |      | %    |
| Long-Term Stability           | $\Delta V_{OUT}$    |                                                                   |      | 0.03  | 1.0  | %    |
| Output Noise(% of $V_{OUT}$ ) | $e_N$               | $T_A=25^\circ\text{C}$ , $10\text{Hz} \leq f \leq 10\text{kHz}$   |      | 0.003 |      | %    |
| Thermal shutdown              |                     |                                                                   |      | 150   |      | °C   |

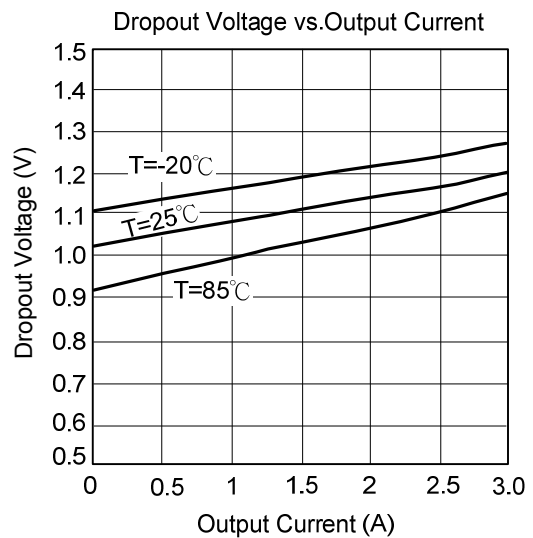
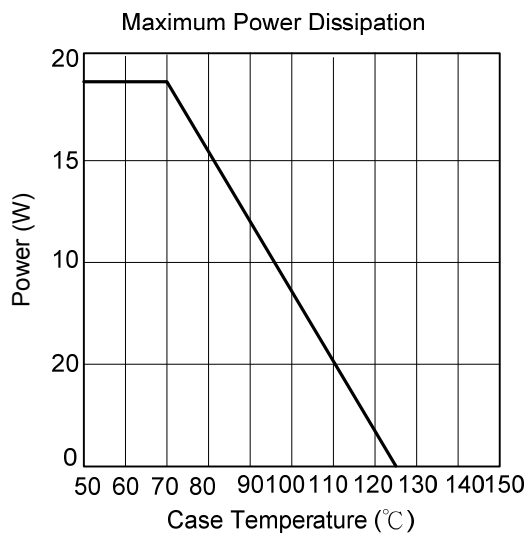
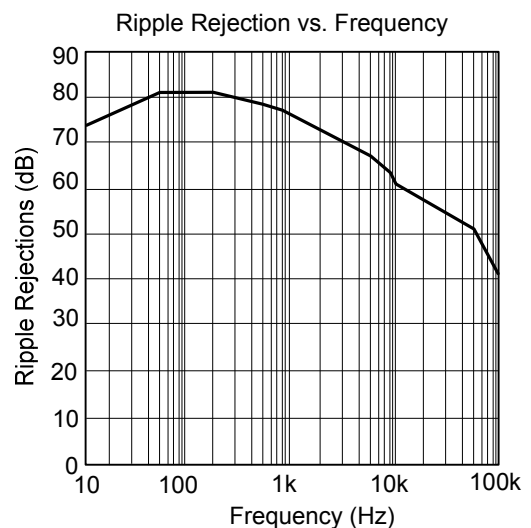
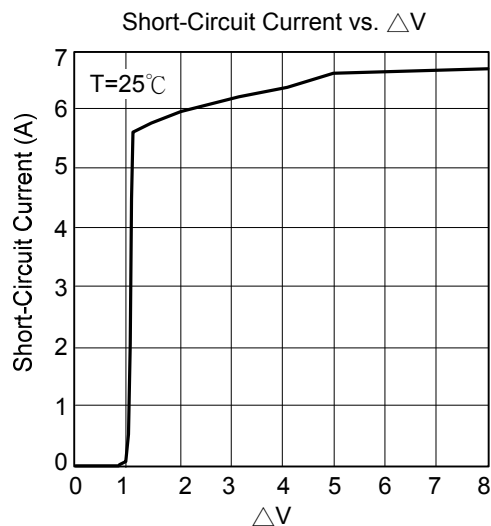
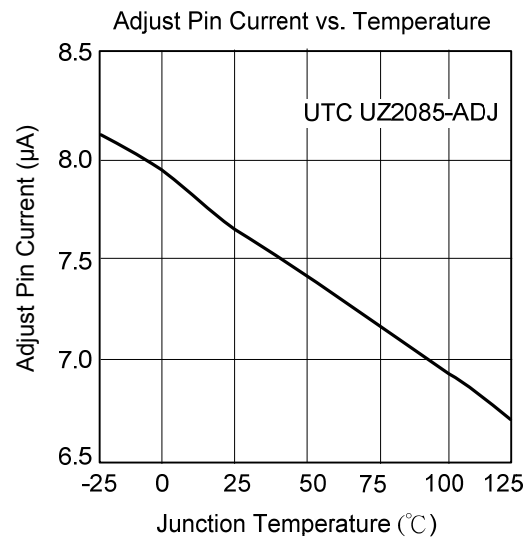
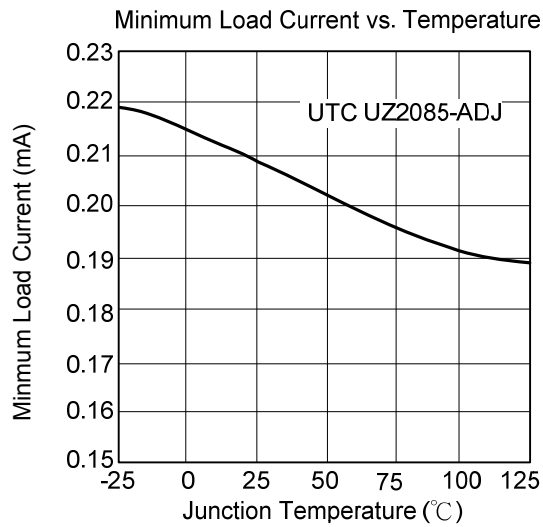
### ■ TYPICAL APPLICATION CIRCUIT



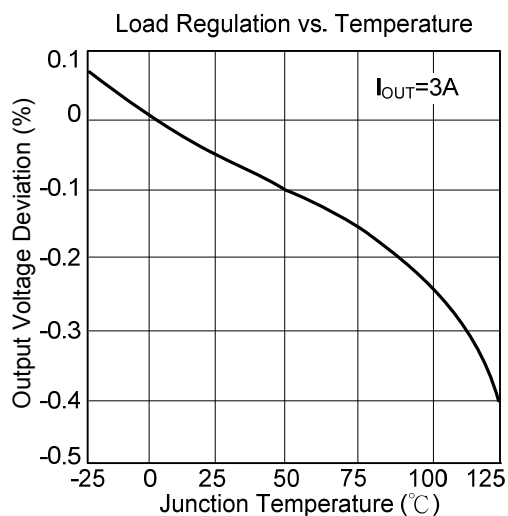
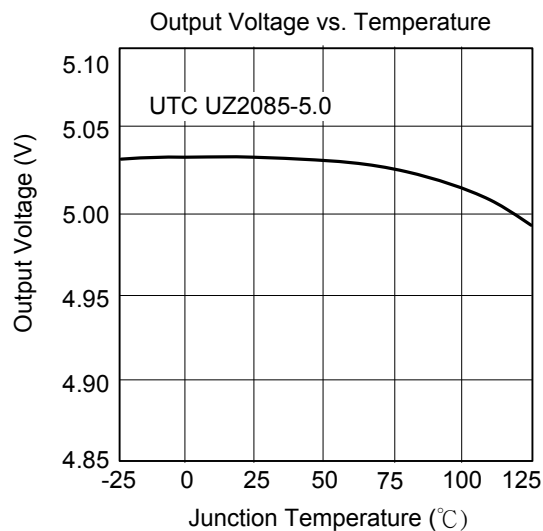
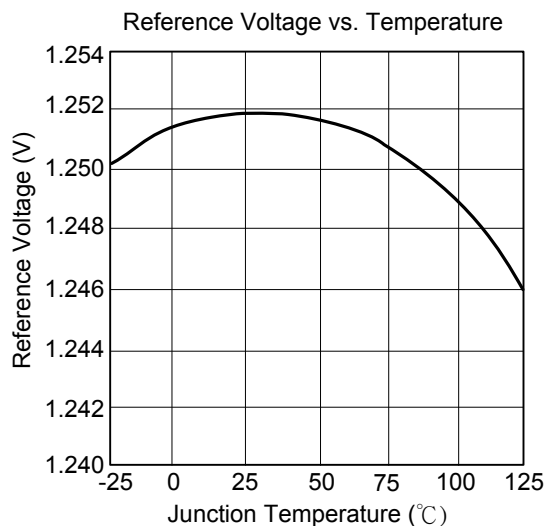
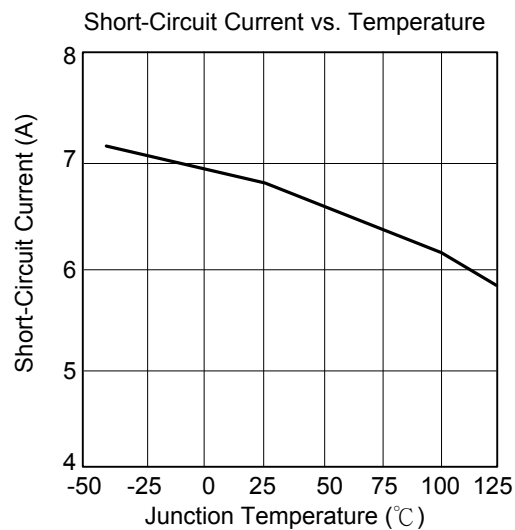
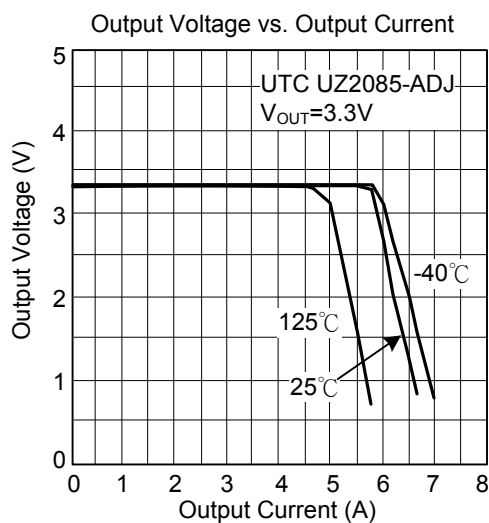
The UTC **UZ2085** also supports MLCC.



### TYPICAL CHARACTERISTICS



### ■ TYPICAL CHARACTERISTICS(Cont.)



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