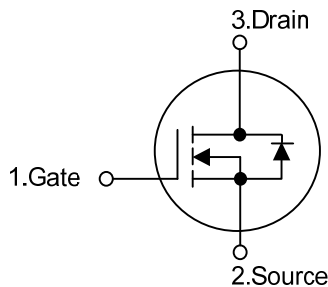


**BSS127****Power MOSFET****0.021A, 600V ENHANCEMENT N-CHANNEL MOSFET****DESCRIPTION**

The UTC **BSS127** is an enhancement N-channel mode Power FET, it uses UTC's advanced technology to provide customers ultra high switching speed and ultra low gate charge.

**FEATURES**

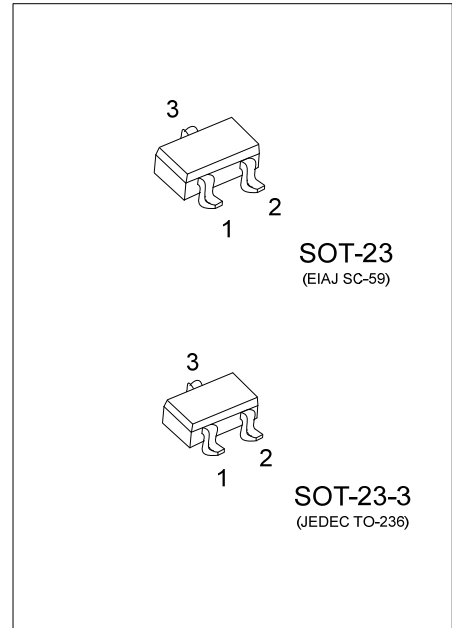
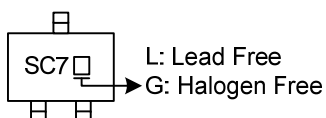
- \*  $R_{DS(ON)} \leq 600 \Omega$  @  $V_{GS} = 4.5V$ ,  $I_D = 0.016A$
- $R_{DS(ON)} \leq 500 \Omega$  @  $V_{GS} = 10V$ ,  $I_D = 0.016A$
- \* Ultra Low Gate Charge (Typical 140nC)
- \* Ultra High Switching Speed

**SYMBOL****ORDERING INFORMATION**

| Ordering Number |               | Package  | Pin Assignment |   |   | Packing   |
|-----------------|---------------|----------|----------------|---|---|-----------|
| Lead Free       | Halogen Free  |          | 1              | 2 | 3 |           |
| BSS127L-AE2-R   | BSS127G-AE2-R | SOT-23-3 | G              | S | D | Tape Reel |
| BSS127L-AE3-R   | BSS127G-AE3-R | SOT-23   | G              | S | D | Tape Reel |

Note: Pin Assignment: G: Gate S: Source D: Drain

|                                                                                               |                                                                                                                      |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <p>BSS127G-AE2-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p> | <p>(1) R: Tape Real</p> <p>(2) AE2: SOT-23-3, AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|

**MARKING**

### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

| PARAMETER                                |                               |                      | SYMBOL           | RATINGS    | UNIT  |
|------------------------------------------|-------------------------------|----------------------|------------------|------------|-------|
| Drain-Source Voltage                     |                               |                      | V <sub>DSS</sub> | 600        | V     |
| Gate-Source Voltage                      |                               |                      | V <sub>GSS</sub> | ±20        | V     |
| Drain Current                            | Continuous                    | T <sub>A</sub> =25°C | I <sub>D</sub>   | 0.021      | A     |
|                                          |                               | T <sub>A</sub> =70°C |                  | 0.017      | A     |
|                                          | Pulsed (T <sub>A</sub> =25°C) |                      | I <sub>DM</sub>  | 0.09       | A     |
| Peak Diode Recovery dv/dt                |                               |                      | dv/dt            | 6          | kV/μs |
| Power Dissipation (T <sub>A</sub> =25°C) |                               |                      | P <sub>D</sub>   | 0.3        | W     |
| Junction Temperature                     |                               |                      | T <sub>J</sub>   | -55 ~ +150 | °C    |
| Storage Temperature Range                |                               |                      | T <sub>STG</sub> | -55 ~ +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.

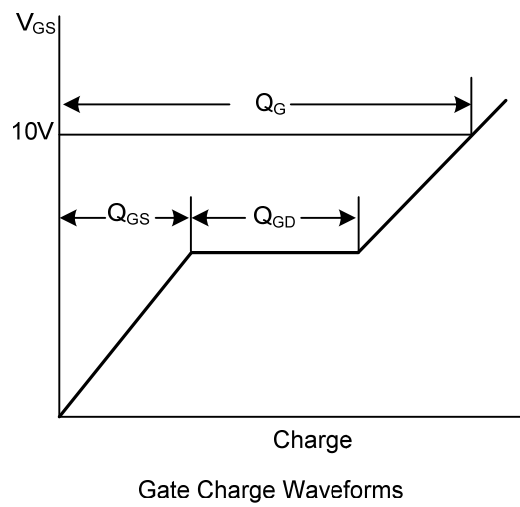
### ■ THERMAL DATA

| PARAMETER           | SYMBOL          | RATINGS | UNIT |
|---------------------|-----------------|---------|------|
| Junction to Ambient | θ <sub>JA</sub> | 325     | °C/W |

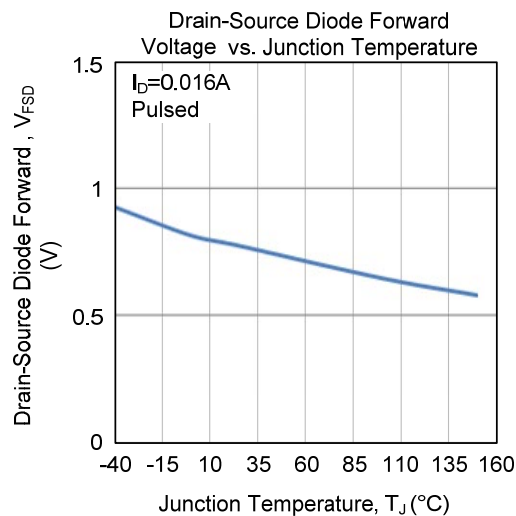
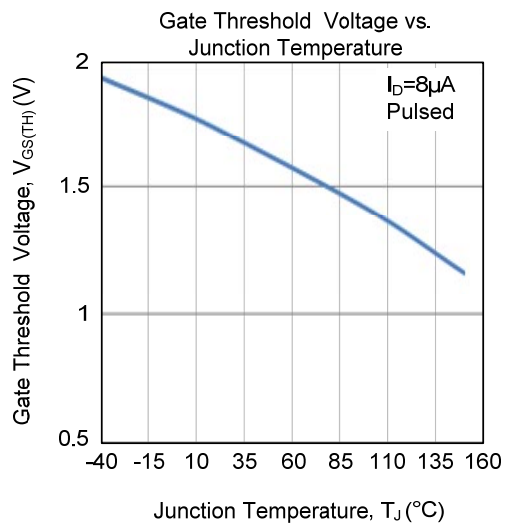
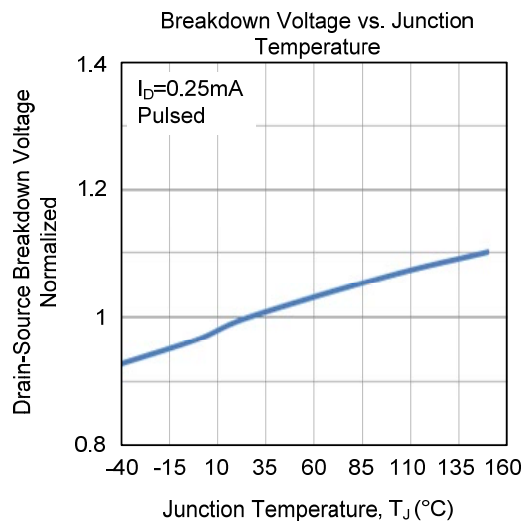
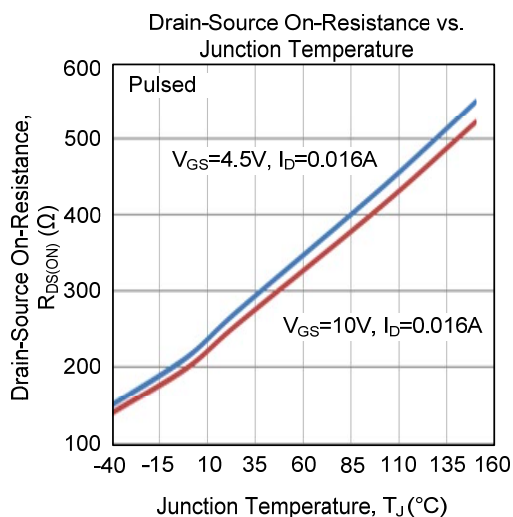
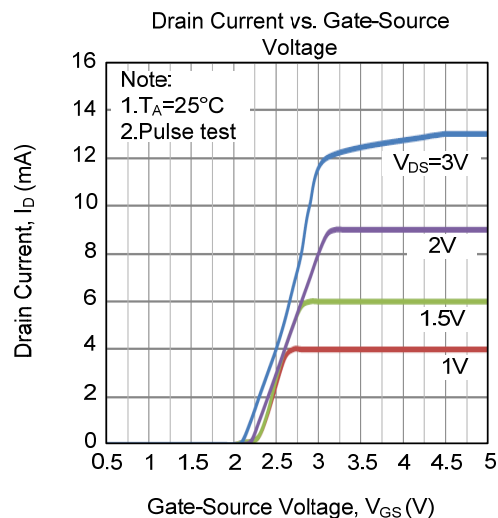
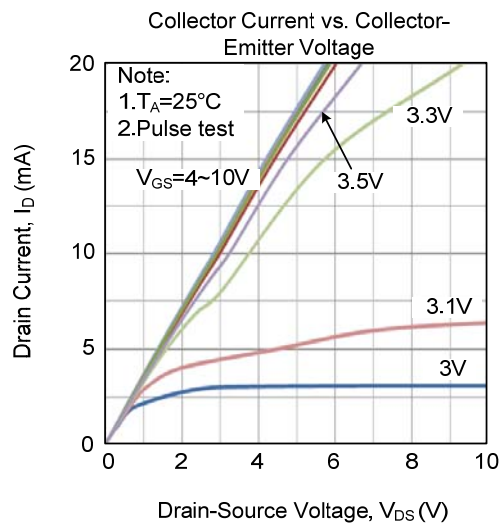
### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

| PARAMETER                                             |         | SYMBOL               | TEST CONDITIONS                                                                        | MIN   | TYP   | MAX   | UNIT |
|-------------------------------------------------------|---------|----------------------|----------------------------------------------------------------------------------------|-------|-------|-------|------|
| OFF CHARACTERISTICS                                   |         |                      |                                                                                        |       |       |       |      |
| Drain-Source Breakdown Voltage                        |         | BV <sub>DSS</sub>    | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V                                             | 600   |       |       | V    |
| Gate-Source Leakage Current                           | Forward | I <sub>GSS</sub>     | V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V                                             |       | +10   | +100  | nA   |
|                                                       | Reverse |                      | V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V                                             |       | -10   | -100  | nA   |
| Drain-Source Leakage Current                          |         | I <sub>D(OFF)</sub>  | V <sub>GS</sub> =0V, V <sub>DS</sub> =600V, T <sub>J</sub> =25°C                       |       |       | 0.1   | μA   |
|                                                       |         |                      | V <sub>GS</sub> =0V, V <sub>DS</sub> =600V, T <sub>J</sub> =150°C                      |       |       | 10    | μA   |
| ON CHARACTERISTICS                                    |         |                      |                                                                                        |       |       |       |      |
| Gate Threshold Voltage                                |         | V <sub>GS(TH)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =8μA                                 | 1.4   | 2.0   | 2.6   | V    |
| Static Drain-Source On-State Resistance               |         | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.016A                                          |       | 330   | 600   | Ω    |
|                                                       |         |                      | V <sub>GS</sub> =10V, I <sub>D</sub> =0.016A                                           |       | 310   | 500   | Ω    |
| Forward Transconductance                              |         | g <sub>FS</sub>      | V <sub>DS</sub>  >2 I <sub>D</sub>  R <sub>DS(ON)MAX</sub> , I <sub>D</sub> =0.01A     | 0.007 | 0.015 |       | S    |
| DYNAMIC PARAMETERS                                    |         |                      |                                                                                        |       |       |       |      |
| Input Capacitance                                     |         | C <sub>ISS</sub>     | V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz                                    |       | 21    | 28    | pF   |
| Output Capacitance                                    |         | C <sub>OSS</sub>     |                                                                                        |       | 2.4   | 3     | pF   |
| Reverse Transfer Capacitance                          |         | C <sub>RSS</sub>     |                                                                                        |       | 1.0   | 1.5   | pF   |
| SWITCHING PARAMETERS                                  |         |                      |                                                                                        |       |       |       |      |
| Total Gate Charge                                     |         | Q <sub>G</sub>       | V <sub>GS</sub> =0~10V, V <sub>DS</sub> =300V, I <sub>D</sub> =0.01A                   |       | 0.65  | 1.0   | nC   |
| Gate to Source Charge                                 |         | Q <sub>GS</sub>      |                                                                                        |       | 0.07  | 0.10  | nC   |
| Gate to Drain Charge                                  |         | Q <sub>GD</sub>      |                                                                                        |       | 0.31  | 0.5   | nC   |
| Gate Plateau Voltage                                  |         | V <sub>plateau</sub> | V <sub>DD</sub> =300V, V <sub>GS</sub> =10V, I <sub>D</sub> =0.01A, R <sub>G</sub> =6Ω |       | 3.56  |       | V    |
| Turn-ON Delay Time                                    |         | t <sub>D(ON)</sub>   |                                                                                        |       | 6.1   | 19.0  | ns   |
| Rise Time                                             |         | t <sub>R</sub>       |                                                                                        |       | 9.7   | 14.5  | ns   |
| Turn-OFF Delay Time                                   |         | t <sub>D(OFF)</sub>  |                                                                                        |       | 14    | 21    | ns   |
| Fall-Time                                             |         | t <sub>F</sub>       |                                                                                        |       | 115   | 170   | ns   |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS       |         |                      |                                                                                        |       |       |       |      |
| Maximum Continuous Drain-Source Diode Forward Current |         | I <sub>S</sub>       | T <sub>A</sub> =25°C                                                                   |       |       | 0.016 | A    |
| Maximum Pulsed Drain-Source Diode Forward Current     |         | I <sub>SM</sub>      | T <sub>A</sub> =25°C                                                                   |       |       | 0.09  | A    |
| Drain-Source Diode Forward Voltage                    |         | V <sub>SD</sub>      | I <sub>F</sub> =0.016A, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C                      |       | 0.82  | 1.2   | V    |
| Body Diode Reverse Recovery Time                      |         | t <sub>rr</sub>      | V <sub>R</sub> =300V, I <sub>F</sub> =0.016A,                                          |       | 160   | 240   | ns   |
| Body Diode Reverse Recovery Charge                    |         | Q <sub>rr</sub>      | dl <sub>F</sub> /dt=100A/μs                                                            |       | 13.2  | 19.8  | μC   |

Notes: 1. The Power Dissipation of the package may result in a lower continuous drain current.  
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%.

**■ TEST CIRCUITS AND WAVEFORMS**

## TYPICAL CHARACTERISTICS



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